

# **MELSEC FX Series**

Programmable Logic Controllers

User's Manual

## **Profibus/DP Interface Unit**

### **FX2N-32DP-IF**

### **FX2N-32DP-IF-D**

## Foreword

- This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of the FX<sub>2N</sub>-32DP-IF Profibus-DP Interface Unit. It should be read and understood before attempting to install or use the unit.
- Further information can be found in the FX<sub>2N</sub> Series and FX<sub>0</sub>/FX<sub>0N</sub> Series Hardware Manual, manuals for special function units/blocks and Profibus-DP master CPUs.
- If in doubt at any stage during the installation of the FX<sub>2N</sub>-32DP-IF Profibus-DP Interface Unit always consult a professional electrical engineer who is qualified and trained to the local and national standards.
- If in doubt about operation or use of the FX<sub>2N</sub>-32DP-IF Profibus-DP Interface Unit please consult the nearest Mitsubishi Electric distributor.
- This manual is subject to change without notice.



# **FX<sub>2</sub>N-32DP-IF Profibus-DP Interface Unit**

## **User's Manual**

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## FAX BACK

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## Guidelines for the Safety of the User and Protection of the FX2N-32DP-IF Profibus-DP Interface Unit.

This manual provides information for the use of the FX2N-32DP-IF Profibus-DP Interface Unit. The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows:

- a) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with regards to automated equipment.
- b) Any commissioning or service engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill that job. These engineers should also be trained in the use and maintenance of the completed product. This includes being completely familiar with all associated documentation for the said product. All maintenance should be carried out in accordance with established safety practices.
- c) All operators of the completed equipment should be trained to use that product in a safe and coordinated manner in compliance to established safety practices. The operators should also be familiar with documentation which is connected with the actual operation of the completed equipment.

**Note :** the term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

### Notes on the Symbols Used in this Manual

At various times through out this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of the equipment. Whenever any of the following symbols are encountered its associated note must be read and understood. Each of the symbols used will now be listed with a brief description of its meaning.

#### Hardware Warnings



- 1) Indicates that the identified danger **WILL** cause physical and property damage.



- 2) Indicates that the identified danger could **POSSIBLY** cause physical and property damage.



- 3) Indicates a point of further interest or further explanation.

#### Software Warnings



- 4) Indicates special care must be taken when using this element of software.



- 5) Indicates a special point which the user of the associate software element should be aware of.



- 6) Indicates a point of interest or further explanation.

- Under no circumstances will Mitsubishi Electric be liable responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
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- Please contact a Mitsubishi distributor for more information concerning applications in life critical situations or high reliability.

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## 1. Introduction

The FX<sub>2N</sub>-32DP-IF(-D) Profibus-DP Interface Unit (hereafter called “32DP-IF”) can be used to connect FX<sub>2N</sub>/FX<sub>0N</sub> series extension blocks/units and special function blocks/units directly to an existing Profibus-DP network.

The 32DP-IF provides an intelligent slave function for decentralized control applications. Digital and analog data from a Profibus-DP master CPU (hereafter called “DP-master”) can be sent and received to/from any of the supported I/O blocks and special function blocks.

### 1.1 Features of the 32DP-IF

Using the 32DP-IF FX<sub>2N</sub>/FX<sub>0N</sub> series extension blocks/units or special function blocks/units can exchange data with any DP-master.

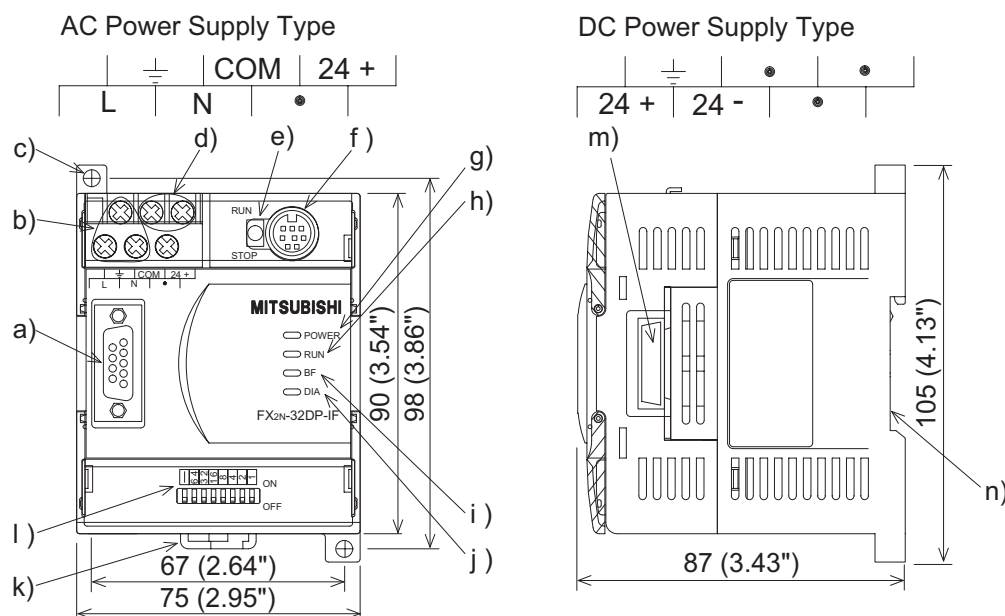
- Up to 256 I/O points and/or up to 8 special function blocks can be connected to the 32DP-IF. However, adjust total control I/O points to 256 or less. See section 1.3.
- The slave address of the 32DP-IF is adjusted by DIP switches. See chapter 6.
- The 32DP-IF can be connected to a Profibus-DP network via a standard 9-pin D-SUB connector and a shielded twisted pair cable complying with EN50170. Optional glassfiber adapters are supported by the 32DP-IF and are available from other vendors. See chapter 3.
- An FX-20P-E or personal computer can be used to monitor the status of the 32DP-IF and the data exchanged with the Profibus network. For operating instructions of the FX-20P-E or personal computer, refer to their respective operation manuals and to section 1.3.1. For device numbers and explanation, refer to Chapter 5. For parameter of 32DP-IF.

## 1.2 External Dimensions and Each Part Name

Dimensions: mm (inches) MASS (Weight): Approx. 0.4 kg (0.88 lbs)

Accessory: GSD files (FD: 1 piece)

**Figure 1.1: External Dimensions**

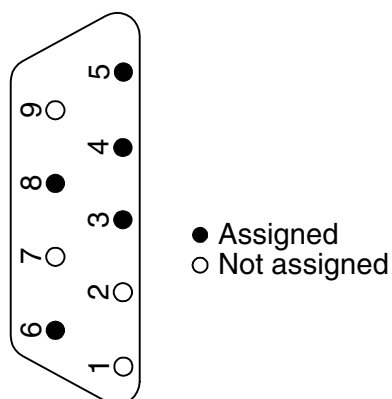


- a) Profibus-DP communication port (D-SUB 9 pin)
- b) Power supply terminals (screw terminal: M3.5 (0.14"))  
FX<sub>2N</sub>-32DP-IF (AC power supply type): L, N and grounding terminal  
FX<sub>2N</sub>-32DP-IF-D (DC power supply type): 24+, 24- and grounding terminal
- c) Direct mounting hole (2-φ4.5 (0.18"))
- d) 24 V DC power terminal (screw terminal: M3.5 (0.14"))  
FX<sub>2N</sub>-32DP-IF-D does not have this terminal.
- e) RUN/STOP switch: When this switch is in the RUN position, the 32DP-IF will exchange data with extension units/blocks and special function blocks. If this switch is in the STOP position, the 32DP-IF will exchange only input data with extension units/blocks.
- f) Communication port for FX-20P-E or personal computer
- g) POWER LED : ON when power is supplied.
- h) RUN LED : ON when 32DP-IF is exchanging data with extension units/blocks and special function blocks.
- i) BF LED : ON when a communication error is detected (No data exchange).
- j) DIA LED : ON when diagnostic data is detected.
- k) Hook for DIN rail mounting
- l) DIP switches for slave address of this unit
- m) Extension port
- n) Groove for DIN rail mounting (DIN rail width: 35 mm (1.38"))

### 1.2.1 Pin Configuration

The connector is a 9-pin D-SUB type and the pin configuration is shown below.

**Figure 1.2: Pin Layout 9-pin D-SUB**

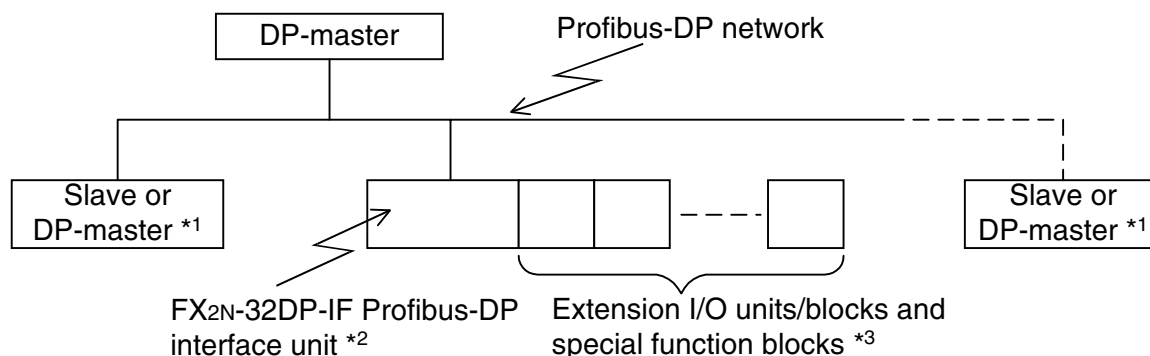


**Table 1.1: Pin Configuration**

| Connector | Signal    | Meaning                 |
|-----------|-----------|-------------------------|
| 3         | RXD/TXD-P | Receive/transmit-Data-P |
| 4         | RTS       | Request to send         |
| 5         | DGND      | Data Ground             |
| 6         | VP        | Voltage-Plus            |
| 8         | RXD/TXD-N | Receive/transmit-Data-N |
| 1,2,7,9   | NC        | Pin not assigned        |

## 1.3 System Configuration

**Figure 1.3: System Configuration**



\*1 The units at each end of the Profibus-DP network must have a terminating resistor. This will either be in the master, slave unit or in the Profibus connector.

\*2 For connecting a monitoring tool, refer to subsection 1.3.1

\*3 For connecting units/blocks, refer to subsection 1.3.2.



### Caution

The parameter data of the 32DP-IF must be set correctly in the DP-master, if the parameter data is not correct, the operation of the module may be affected. For a detailed overview of the parameter of 32DP-IF, refer to chapter 7.

### 1.3.1 Connected Programming Tools

An FX-20P-E or personal computer can be used to monitor the 32DP-IF and the data exchanged with the Profibus-DP. For operating instructions of the FX-20P-E or personal computer, refer to their respective operation manuals. For device numbers and explanation, refer to chapter 5.

Connecting cable is same as FX<sub>2N</sub> MPU.

**Table 1.2: Connected Programming Tools**

| Monitoring Tools                         | Description    |
|------------------------------------------|----------------|
| FX-20P-E                                 | Device monitor |
| Personal Computer<br>(MELSEC MEDOC PLUS) |                |



### Caution

For monitoring the 32DP-IF with a personal computer the PLC setting must be adjusted as for the FX series PLC type.

### 1.3.2 Connected Extension Units/Blocks

The tables below shows extension units/blocks and their data lengths when connected to a 32DP-IF. Data is exchanged between the 32DP-IF and DP-master during every cycle. The maximum amount of data that can be exchanged with the 32DP-IF is total 200 bytes of input data + output data, and user parameter is maximum 193 bytes. Please check the specification of the DP-master, it may limit the total amount of exchanged data.

For the exchange data length, refer to table 1.9.

**Table 1.3: Connected Extension Units/Blocks**

| Items                |                               | Description                                                                             | Supported Version                   |
|----------------------|-------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------|
| Extension I/O Units  | FX <sub>2N</sub> -32ER-ES/UL  | AC power supply type,<br>Digital DC Input = 16 points,<br>Relay Output = 16 points      | Model: V1.00 ~<br>GSD file: V1.00 ~ |
|                      | FX <sub>2N</sub> -32ET-ESS/UL | AC power supply type,<br>Digital DC Input = 16 points,<br>Transistor Output = 16 points |                                     |
|                      | FX <sub>2N</sub> -48ER-ES/UL  | AC power supply type,<br>Digital DC Input = 24 points,<br>Relay Output = 24 points      |                                     |
|                      | FX <sub>2N</sub> -48ET-ESS/UL | AC power supply type,<br>Digital DC Input = 24 points,<br>Transistor Output = 24 points |                                     |
|                      | FX <sub>2N</sub> -48ER-UA1/UL | AC power supply type,<br>Digital AC Input = 24 points,<br>Relay Output = 24 points      |                                     |
|                      | FX <sub>2N</sub> -48ER-DS     | DC power supply type,<br>Digital DC Input = 24 points,<br>Relay Output = 24 points      | Model: V2.10 ~<br>GSD file: V2.10 ~ |
|                      | FX <sub>2N</sub> -48ET-DSS    | DC power supply type,<br>Digital DC Input = 24 points,<br>Transistor Output = 24 points |                                     |
| Extension I/O Blocks | FX <sub>2N</sub> Series       | FX <sub>2N</sub> -16EX-ES/UL                                                            | Model: V1.00 ~<br>GSD file: V1.00 ~ |
|                      |                               | FX <sub>2N</sub> -16EYR-ES/UL                                                           |                                     |
|                      |                               | FX <sub>2N</sub> -16EYT-ESS/UL                                                          |                                     |
|                      | FX <sub>0N</sub> Series       | FX <sub>0N</sub> -8EX-UA1/UL                                                            |                                     |
|                      |                               | FX <sub>0N</sub> -8EX-ES/UL                                                             |                                     |
|                      |                               | FX <sub>0N</sub> -16EX-ES/UL                                                            |                                     |
|                      |                               | FX <sub>0N</sub> -8ER-ES/UL *1                                                          |                                     |

**Table 1.3: Connected Extension Units/Blocks**

| Items                   |                         | Description                                                                                                               | Supported Version                   |
|-------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Extension I/O Blocks    | FX <sub>0N</sub> Series | FX <sub>0N</sub> -8EYR-ES/UL<br>Input = 0 point<br>Relay Output = 8 points                                                | Model: V1.00 ~<br>GSD file: V1.00 ~ |
|                         |                         | FX <sub>0N</sub> -8EYT-ESS/UL<br>Input = 0 point<br>Transistor Output = 8 points                                          |                                     |
|                         |                         | FX <sub>0N</sub> -16EYR-ES/UL<br>Input = 0 point<br>Relay Output = 16 points                                              |                                     |
|                         |                         | FX <sub>0N</sub> -16EYT-ESS/UL<br>Input = 0 point<br>Transistor Output = 16 points                                        |                                     |
| Special Function Blocks |                         | FX <sub>2N</sub> -2DA<br>2ch digital to analog converter block                                                            | Model: V1.10 ~<br>GSD file: V1.10 ~ |
|                         |                         | FX <sub>2N</sub> -4DA<br>4ch digital to analog converter block                                                            | Model: V1.00 ~<br>GSD file: V1.00 ~ |
|                         |                         | FX <sub>0N</sub> -3A<br>2ch analog to digital converter and<br>1ch digital to analog converter block                      | Model: V1.10 ~<br>GSD file: V1.10 ~ |
|                         |                         | FX <sub>2N</sub> -2AD<br>2ch analog to digital converter block                                                            |                                     |
|                         |                         | FX <sub>2N</sub> -4AD<br>4ch analog to digital converter block                                                            | Model: V1.00 ~<br>GSD file: V1.00 ~ |
|                         |                         | FX <sub>2N</sub> -4AD-PT<br>4ch Pt100 probe interface block                                                               |                                     |
|                         |                         | FX <sub>2N</sub> -4AD-TC<br>4ch Thermo-couple interface block                                                             |                                     |
| Special Function Blocks |                         | FX <sub>2N</sub> -8AD<br>8ch analog to digital converter block<br>(voltage input, current input and<br>temperature input) | Model: V2.10 ~<br>GSD file: V2.10 ~ |
|                         |                         | FX <sub>2N</sub> -2LC<br>2ch temperature control block                                                                    |                                     |
|                         |                         | FX <sub>2N</sub> -1HC<br>High speed counter block                                                                         | Model: V1.10 ~<br>GSD file: V1.10 ~ |
|                         |                         | FX <sub>2N</sub> -1PG<br>1 axis simple positioning control block<br>(maximum speed: 100kHz)                               | Model: V1.10 ~<br>GSD file: V1.10 ~ |
|                         |                         | FX <sub>2N</sub> -10PG<br>1 axis simple positioning control block<br>(maximum speed: 1MHz)                                | Model: V2.10 ~<br>GSD file: V2.10 ~ |
|                         |                         | FX <sub>2N</sub> -10GM<br>1 axis positioning control unit<br>(maximum speed: 200kHz)                                      | Model: V1.10 ~<br>GSD file: V1.10 ~ |
|                         |                         | FX <sub>2N</sub> -20GM<br>2 axis positioning control unit<br>(maximum speed: 200kHz)                                      |                                     |
|                         |                         | FX <sub>2N</sub> -232IF<br>No protocol RS-232C communication<br>interface block                                           |                                     |
|                         |                         | FX <sub>2N</sub> -32ASI-M<br>AS-interface master block                                                                    |                                     |

\*1 FX<sub>0N</sub>-8ER's Total I/O points is 8 points. However, this block's occupation I/O points is 16 points.

### 1.3.3 Configuration Rules

- 1) Total I/O points on the system  $\leq 256$  points  
The 256 I/O maximum point includes all the categories below in addition to the I/O of the extension module.
  - a) I/O points for the extension I/O units/blocks (including additional occupied points)  
Refer to Table 1.7 for I/O point allocation for each extension unit/block.
  - b) I/O points for the special function units/blocks  
A 32DP-IF can connect a Maximum of 8 special function units/blocks.  
Refer to Table 1.7 for I/O point allocation for each special function unit/block.
  - c) I/O points for FX<sub>2N</sub>-32ASI-M's active slaves
- 2) Supply 24V DC (total internal and service power supply) and 5V DC to the extension I/O blocks and special function units/blocks from the 32DP-IF or extension I/O unit.  
Use the same configuration rules for the FX<sub>2N</sub>-48ER-UA1/UL, FX<sub>2N</sub>-48ER-DS and FX<sub>2N</sub>-48ET-DSS as applies to the FX<sub>2N</sub>-48ER-ES/UL.  
If 24V DC and/or 5V DC is insufficient for the extension I/O units/blocks and special function units/blocks in this rule, the hardware configuration should include a powered extension I/O unit.  
For power consumption, refer to Table 1.5 ~ 1.14 and Figure 1.4 ~ 1.7. However, information concerning Table 1.11 ~ 1.14 is same as Figure 1.4 ~ 1.7.
  - a) Check the loading on the 5V DC bus supply. Consumption values for special function blocks can be found in Table 1.7. See the Table 1.4 for maximum available current.
  - b) Check the loading on the internal 24V DC supply for FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA.  
Consumption values for these blocks can be found in Table 1.7. See the Table 1.5 for maximum available current.  
Use the same configuration limits for the FX<sub>2N</sub>-48ER-UA1/UL, FX<sub>2N</sub>-48ER-DS and FX<sub>2N</sub>-48ET-DSS as applies to the FX<sub>2N</sub>-48ER-ES/UL.
  - c) Check the loading on the 24V DC service supply and internal 24V DC supply. Check the number of expansion I/O in Figure 1.4 ~ 1.7 or Table 1.11 ~ 1.14. Find the residual current.  
When using the FX<sub>2N</sub>-2AD, FX<sub>2N</sub>-2DA or FX<sub>0N</sub>-3A, 24V DC service power supply must retain the current consumption for those blocks' internal 24V DC supply. (Refer to Table 1.7)  
Use the same configuration rules for the FX<sub>2N</sub>-48ER-UA1/UL, FX<sub>2N</sub>-48ER-DS and FX<sub>2N</sub>-48ET-DSS as applies to the FX<sub>2N</sub>-48ER-ES/UL.

**Table 1.4: 24V and 5V DC Supply Capacity**

| Model                             | Power Supply               |                                                                           |
|-----------------------------------|----------------------------|---------------------------------------------------------------------------|
|                                   | Max. 5V DC Bus Supply (mA) | Total 24V DC Service Supply and Internal 24V DC Supply (mA) <sup>*1</sup> |
| FX2N-32DP-IF                      | 220                        | 500                                                                       |
| FX2N-32DP-IF-D                    | 220                        | 300 <sup>*2</sup>                                                         |
| FX2N-32ER-ES/UL, FX2N-32ET-ESS/UL | 690                        | 250                                                                       |
| FX2N-48ER-ES/UL, FX2N-48ET-ESS/UL | 690                        | 460                                                                       |
| FX2N-48ER-UA1/UL                  | 690                        | 0 <sup>*3</sup>                                                           |
| FX2N-48ER-DS, FX2N-48ET-DSS       | 690                        | 0 <sup>*3</sup>                                                           |

<sup>\*1</sup> When using the FX0N-3A, FX2N-2AD or FX2N-2DA, total internal 24V DC supply for those blocks is limited to the values listed in Table 1.5 below.

**Table 1.5: Limited Internal 24V DC Supply for FX0N-3A, FX2N-2AD and FX2N-2DA**

| Model            | Limited Internal 24V DC Supply for FX0N-3A, FX2N-2AD and FX2N-2DA (mA) |
|------------------|------------------------------------------------------------------------|
| FX2N-32DP-IF     | 300                                                                    |
| FX2N-32DP-IF-D   | 190                                                                    |
| FX2N-32E*-E**/UL | 190                                                                    |
| FX2N-48E*-*****  | 300                                                                    |

<sup>\*2</sup> The 24V DC power supply capacity for the FX2N-32DP-IF-D is used for only internal 24V DC power source because it does not have a 24V DC service power supply.

<sup>\*3</sup> Use the same configuration rules for the FX2N-48ER-UA1/UL, FX2N-48ER-DS and FX2N-48ET-DSS as applies to the FX2N-48ER-ES/UL.

- 3) Total exchange data length  $\leq 200$  bytes  
(or DP master's maximum exchange data length if  $\leq 200$  bytes)  
The following (a, b) exchange data must be a total of 200 bytes (or DP master's maximum exchange data length if  $\leq 200$  bytes) or less.  
For DP-master's maximum exchange data length, please see manual of DP-master.
- a) Total exchange data for extension I/O units/blocks.  
For exchange data for each extension I/O unit/block, refer to Table 1.9.
- b) Total exchange data for special function units/blocks.  
For exchange data for each special function unit/block, refer to Table 1.9.

4) Total user parameter length  $\leq 193$  bytes(or DP master's maximum user parameter length if  $\leq 193$  bytes)

The user parameter length must be a total of 200 bytes (or DP master's maximum exchange data length if  $\leq 193$  bytes) or less. For DP-master's maximum exchange data length, please see manual of DP-master.

There is the global user parameter and special function's parameter in user parameter.

For user parameter for each special function unit/block, refer to Table 1.9.

**Table 1.6: User Parameter Length**

| Item                                      | User parameter length                                                  |
|-------------------------------------------|------------------------------------------------------------------------|
| Global user parameter                     | 2 bytes                                                                |
| User parameter for special function block | For user parameter of special function unit/block, refer to Table 1.9. |

**Table 1.7: Power Consumption for Special Function Blocks**

| Model                          | Number of I/O points |                     | Power Consumption    |                       |                       |  |  |  |
|--------------------------------|----------------------|---------------------|----------------------|-----------------------|-----------------------|--|--|--|
|                                | Input                | Output              | Internal 5 V DC (mA) | Internal 24 V DC (mA) | External 24 V DC (mA) |  |  |  |
| FX2N-32ER-ES/UL <sup>*1</sup>  | 16                   | 16                  | -                    | -                     | -                     |  |  |  |
| FX2N-32ET-ESS/UL <sup>*1</sup> |                      |                     |                      |                       |                       |  |  |  |
| FX2N-48ER-ES/UL <sup>*1</sup>  | 24                   | 24                  |                      |                       |                       |  |  |  |
| FX2N-48ER-UA1/UL <sup>*2</sup> |                      |                     |                      |                       |                       |  |  |  |
| FX2N-48ET-ESS/UL <sup>*1</sup> |                      |                     |                      |                       |                       |  |  |  |
| FX2N-48ER-DS <sup>*3</sup>     |                      | 1250                |                      |                       |                       |  |  |  |
| FX2N-48ET-DSS <sup>*3</sup>    |                      |                     |                      |                       |                       |  |  |  |
| FX2N-16EX-ES/UL                | 16                   | -                   | -                    | -                     | 100 <sup>*4</sup>     |  |  |  |
| FX0N-16EX-ES/UL                |                      |                     |                      |                       |                       |  |  |  |
| FX2N-16EYR-ES/UL               | -                    | 16                  |                      | 150                   | -                     |  |  |  |
| FX0N-16EYR-ES/UL               |                      |                     |                      |                       |                       |  |  |  |
| FX2N-16EYT-ESS/UL              |                      |                     |                      |                       |                       |  |  |  |
| FX0N-16EYT-ESS/UL              |                      |                     |                      |                       |                       |  |  |  |
| FX0N-8EX-ES/UL                 | 8                    | -                   | -                    | -                     | 50 <sup>*4</sup>      |  |  |  |
| FX0N-8EX-UA1/UL                |                      |                     |                      | 50                    | -                     |  |  |  |
| FX0N-8EYR-ES/UL                | -                    | 8                   |                      | 75                    |                       |  |  |  |
| FX0N-8EYT-ESS/UL               |                      |                     |                      | 37.5                  |                       |  |  |  |
| FX0N-8ER-ES/UL                 | 4 (8) <sup>*5</sup>  | 4 (8) <sup>*5</sup> |                      | 37.5                  | 25 <sup>*4</sup>      |  |  |  |
| FX2N-2DA                       | 8                    |                     | 30                   | 85                    | -                     |  |  |  |
| FX2N-4DA                       | 8                    |                     | 30                   | -                     | 200                   |  |  |  |
| FX0N-3A                        | 8                    |                     | 30                   | 90                    | -                     |  |  |  |
| FX2N-2AD                       | 8                    |                     | 20                   | 50                    | -                     |  |  |  |
| FX2N-4AD                       | 8                    |                     | 30                   | -                     | 55                    |  |  |  |
| FX2N-4AD-PT                    | 8                    |                     | 30                   | -                     | 50                    |  |  |  |
| FX2N-4AD-TC                    | 8                    |                     | 30                   | -                     | 50                    |  |  |  |
| FX2N-8AD                       | 8                    |                     | 50                   | -                     | 80                    |  |  |  |
| FX2N-2LC                       | 8                    |                     | 70                   | -                     | 55                    |  |  |  |
| FX2N-1HC                       | 8                    |                     | 90                   | -                     | -                     |  |  |  |
| FX2N-1PG                       | 8                    |                     | 55                   | -                     | 40                    |  |  |  |
| FX2N-10PG                      | 8                    |                     | 120                  | -                     | <sup>*7</sup>         |  |  |  |
| FX2N-10GM                      | 8                    |                     | -                    | -                     | 5W                    |  |  |  |
| FX2N-20GM                      | 8                    |                     | -                    | -                     | 10W                   |  |  |  |
| FX2N-232IF                     | 8                    |                     | 40                   | -                     | 80                    |  |  |  |
| FX2N-32ASI-M                   | <sup>*6</sup>        |                     | 150                  | -                     | <sup>*8</sup>         |  |  |  |

**Note:**

- \*1 These extension I/O units can connect to FX<sub>2N</sub>-32DP-IF (AC power supply type).  
They cannot connect to FX<sub>2N</sub>-32DP-IF-D (DC power supply type).
- \*2 This extension I/O unit can connect to FX<sub>2N</sub>-32DP-IF-D (DC power supply type).  
It cannot connect to FX<sub>2N</sub>-32DP-IF (DC power supply type).
- \*3 These extension I/O units can connect to FX<sub>2N</sub>-32DP-IF-D (DC power supply type).  
They cannot connect to FX<sub>2N</sub>-32DP-IF (AC power supply type).
- \*4 When connecting FX<sub>2N</sub>-32DP-IF or extension I/O unit of AC power supply type (marked “\*1” module), those extension input blocks should be supplied from the FX<sub>2N</sub>-32DP-IF or extension I/O unit (marked “\*1” module).  
However, when connecting FX<sub>2N</sub>-32DP-IF-D or extension I/O unit of DC power supply type (marked “\*3” module), those extension input blocks should be supplied from same external DC power source as the FX<sub>2N</sub>-32DP-IF-D or extension I/O unit (marked “\*3” module).
- \*5 FX<sub>0N</sub>-8ER has 4 DC inputs and 4 Relay outputs. However, this block is counted 8 inputs and 8 outputs when counting total I/O points.
- \*6 This value =  $8 + 8 \times (\text{number of active slave})$
- \*7 FX<sub>2N</sub>-10PG's power consumption for the following terminals is shown below.

**Table 1.8: FX<sub>2N</sub>-10PG's Power Consumption from Extension Power Supply**

| Terminals |        | Power Consumption    |
|-----------|--------|----------------------|
| START     |        | ≤ 32 mA / 24V DC     |
| DOG       |        |                      |
| X0, X1    |        |                      |
| PG0       |        | ≤ 20 mA / 3 to 5V DC |
| VIN       | 5V DC  | ≤ 100 mA             |
|           | 24V DC | ≤ 70 mA              |

- \*8 An external 24 V DC power supply is not necessary. However, the external power consumption is 70mA from the AS-interface power supply.

**Table 1.9: Exchange Data Length**

| Module Type                            |                                      | Exchange Data Length (Bytes) |             |                |
|----------------------------------------|--------------------------------------|------------------------------|-------------|----------------|
|                                        |                                      | Input Data                   | Output Data | User Parameter |
| FX <sub>2</sub> N-32ER-ES/UL           |                                      | 2                            | 2           | -              |
| FX <sub>2</sub> N-32ET-ESS/UL          |                                      |                              |             | -              |
| FX <sub>2</sub> N-48ER-ES/UL           |                                      | 3                            | 3           | -              |
| FX <sub>2</sub> N-48ER-UA1/UL          |                                      |                              |             | -              |
| FX <sub>2</sub> N-48ET-ESS/UL          |                                      |                              |             | -              |
| FX <sub>2</sub> N-48ER-DS              |                                      |                              |             | -              |
| FX <sub>2</sub> N-48ET-DSS             |                                      |                              |             | -              |
| FX <sub>2</sub> N-16EX-ES/UL           |                                      | 2                            | -           | -              |
| FX <sub>2</sub> N-16EYR-ES/UL          |                                      | -                            | 2           | -              |
| FX <sub>2</sub> N-16EYT-ESS/UL         |                                      | -                            | 2           | -              |
| FX <sub>0</sub> N-8EX-UA1/UL           |                                      | 1                            | -           | -              |
| FX <sub>0</sub> N-8EX-ES/UL            |                                      | 1                            | -           | -              |
| FX <sub>0</sub> N-16EX-ES/UL           |                                      | 2                            | -           | -              |
| FX <sub>0</sub> N-8ER-ES/UL            |                                      | 1                            | 1           | -              |
| FX <sub>0</sub> N-8EYR-ES/UL           |                                      | -                            | 1           | -              |
| FX <sub>0</sub> N-8EYT-ESS/UL          |                                      | -                            | 1           | -              |
| FX <sub>0</sub> N-16EYR-ES/UL          |                                      | -                            | 2           | -              |
| FX <sub>0</sub> N-16EYT-ESS/UL         |                                      | -                            | 2           | -              |
| FX <sub>2</sub> N-2DA <sup>*1</sup>    |                                      | 0                            | 4           | 4              |
| FX <sub>2</sub> N-4DA <sup>*1</sup>    | Extended configuration <sup>*2</sup> | 0                            | 8           | 50             |
|                                        | Short configuration <sup>*2</sup>    |                              |             | 14             |
| FX <sub>0</sub> N-3A <sup>*1</sup>     |                                      | 4                            | 4           | 4              |
| FX <sub>2</sub> N-2AD <sup>*1</sup>    |                                      | 4                            | 0           | 4              |
| FX <sub>2</sub> N-4AD <sup>*1</sup>    | Extended configuration <sup>*2</sup> | 8                            | 0           | 41             |
|                                        | Short configuration <sup>*2</sup>    |                              |             | 11             |
| FX <sub>2</sub> N-4AD-PT <sup>*1</sup> | Extended configuration <sup>*2</sup> | 10                           | 0           | 24             |
|                                        | Short configuration <sup>*2</sup>    |                              |             | 12             |
| FX <sub>2</sub> N-4AD-TC <sup>*1</sup> | Extended configuration <sup>*2</sup> | 10                           | 0           | 30             |
|                                        | Short configuration <sup>*2</sup>    |                              |             | 18             |
| FX <sub>2</sub> N-8AD <sup>*1</sup>    |                                      | 20                           | 0           | 47             |
| FX <sub>2</sub> N-2LC <sup>*1</sup>    |                                      | 6                            | 6           | 70             |

**Table 1.9: Exchange Data Length**

| Module Type                             |                                      | Exchange Data Length (Bytes) |             |                |
|-----------------------------------------|--------------------------------------|------------------------------|-------------|----------------|
|                                         |                                      | Input Data                   | Output Data | User Parameter |
| FX <sub>2</sub> N-1HC <sup>*1</sup>     | Extended configuration <sup>*2</sup> | 4                            | 4           | 41             |
|                                         | Short configuration <sup>*2</sup>    | 16                           | 16          | 35             |
| FX <sub>2</sub> N-1PG <sup>*1</sup>     |                                      | 18                           | 18          | 70             |
| FX <sub>2</sub> N-10PG <sup>*1</sup>    |                                      | 20                           | 20          | 78             |
|                                         | 6 W-IF                               | 12                           | 12          | 58             |
| FX <sub>2</sub> N-10GM <sup>*1</sup>    |                                      | 12                           | 12          | 4              |
| FX <sub>2</sub> N-20GM <sup>*1</sup>    |                                      | 12                           | 12          | 4              |
| FX <sub>2</sub> N-232IF <sup>*1</sup>   |                                      | 6                            | 6           | 46             |
| FX <sub>2</sub> N-32ASI-M <sup>*1</sup> |                                      | 26                           | 26          | 33             |

<sup>\*1</sup> These special function blocks can exchange data with a DP-master by the simple communication interface<sup>\*2</sup>. The exchanged data length in simple communication interface mode is shown in the Table 1.10. For a detailed description of the simple communication interface, refer to chapter 6.

**Table 1.10: Exchange Data Length by Simple Communication Interface**

| Simple Communication Interface Type | Exchange Data Length (Bytes) |             |                |
|-------------------------------------|------------------------------|-------------|----------------|
|                                     | Input Data                   | Output Data | User Parameter |
| 3 words interface                   | 6                            | 6           | 4              |
| 6 words interface                   | 12                           | 12          | 4              |
| 9 words interface                   | 18                           | 18          | 4              |
| 12 words interface                  | 24                           | 24          | 4              |
| 15 words interface                  | 30                           | 30          | 4              |

<sup>\*2</sup> The extended configuration, short configuration and simple communication interface are name of the user parameter type for each extension units/blocks on the GX-Configurator-DP (or ProfiMap) application.

**Figure 1.4: 24V DC Service Supply Capacity After Connecting Extra I/O to FX2N-32DP-IF <AC Power Supply Type> (mA)**

|                                      |                  |     |     |                   |     |     |                       |     |     |     |      |
|--------------------------------------|------------------|-----|-----|-------------------|-----|-----|-----------------------|-----|-----|-----|------|
| Number of additional output (points) | > 32             |     |     |                   |     |     |                       |     |     |     |      |
|                                      | 32               | 200 | 150 | 100               | 50  | 0   | Invalid configuration |     |     |     |      |
|                                      | 24               | 275 | 225 | 175               | 125 | 75  |                       |     |     |     |      |
|                                      | 16 <sup>*1</sup> | 350 | 300 | 250 <sup>*1</sup> | 200 | 150 | 100                   | 50  | 0   |     |      |
|                                      | 8                | 425 | 375 | 325               | 275 | 225 | 175                   | 125 | 75  |     |      |
|                                      | 0                | 500 | 450 | 400               | 350 | 300 | 250                   | 200 | 150 | 100 |      |
|                                      |                  | 0   | 8   | 16 <sup>†</sup>   | 24  | 32  | 40                    | 48  | 56  | 64  | > 64 |
| Number of additional input (points)  |                  |     |     |                   |     |     |                       |     |     |     |      |

<sup>\*1</sup> For example; when connecting an FX2N-16EX and an FX2N-16EYR to the FX2N-32DP-IF, 24V DC service power supply capacity is 250mA.

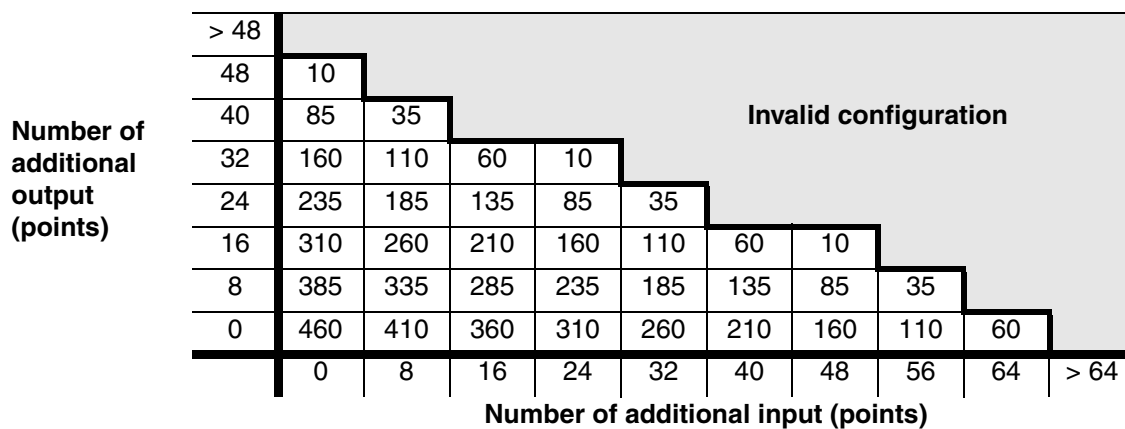
**Figure 1.5: 24V DC Service Supply Capacity After Connecting Extra I/O to FX2N-32DP-IF-D <DC Power Supply Type> (mA)**

|                                      |      |     |                       |     |     |     |    |    |      |
|--------------------------------------|------|-----|-----------------------|-----|-----|-----|----|----|------|
| Number of additional output (points) | > 32 |     |                       |     |     |     |    |    |      |
|                                      | 32   | 0   | Invalid configuration |     |     |     |    |    |      |
|                                      | 24   | 75  | 25                    |     |     |     |    |    |      |
|                                      | 16   | 150 | 100                   | 50  | 0   |     |    |    |      |
|                                      | 8    | 225 | 175                   | 125 | 75  | 25  |    |    |      |
|                                      | 0    | 300 | 250                   | 200 | 150 | 100 | 50 | 0  |      |
|                                      |      | 0   | 8                     | 16  | 24  | 32  | 40 | 48 | > 56 |
| Number of additional input (points)  |      |     |                       |     |     |     |    |    |      |

**Figure 1.6: 24V DC Service Supply Capacity After Connecting Extra I/O to FX2N-32E<sup>\*</sup>-\*\*\*/UL (mA)**

|                                      |      |     |                       |     |     |    |      |
|--------------------------------------|------|-----|-----------------------|-----|-----|----|------|
| Number of additional output (points) | > 24 |     |                       |     |     |    |      |
|                                      | 24   | 25  | Invalid configuration |     |     |    |      |
|                                      | 16   | 100 | 50                    | 0   |     |    |      |
|                                      | 8    | 175 | 125                   | 75  | 25  |    |      |
|                                      | 0    | 250 | 200                   | 150 | 100 | 50 |      |
|                                      |      | 0   | 8                     | 16  | 24  | 32 | > 32 |
| Number of additional input (points)  |      |     |                       |     |     |    |      |

**Figure 1.7: 24V DC Service Supply Capacity After Connecting Extra I/O to FX2N-48E\*-\*\*\*\*\* (mA)**



**Table 1.11: Connecting Extension I/O Blocks to the FX2N-32DP-IF <AC Power Supply Type>**

| Extension I/O Block |                  |                  | Possible use<br>Service Power<br>Supply (mA) |
|---------------------|------------------|------------------|----------------------------------------------|
| Total I/O           | Input            | Output           |                                              |
| 0                   | 0                | 0                | 500                                          |
| 8                   | 0                | 8                | 425                                          |
|                     | 4                | 4                | 437                                          |
|                     | 8                | 0                | 450                                          |
| 16                  | 0                | 16               | 350                                          |
|                     | 4                | 12               | 362                                          |
|                     | 8                | 8                | 375                                          |
|                     | 12               | 4                | 387                                          |
|                     | 16               | 0                | 400                                          |
| 24                  | 0                | 24               | 275                                          |
|                     | 4                | 20               | 287                                          |
|                     | 8                | 16               | 300                                          |
|                     | 12               | 12               | 312                                          |
|                     | 16               | 8                | 325                                          |
|                     | 20               | 4                | 337                                          |
|                     | 24               | 0                | 350                                          |
| 32                  | 0                | 32               | 200                                          |
|                     | 4                | 28               | 212                                          |
|                     | 8                | 24               | 225                                          |
|                     | 12               | 20               | 237                                          |
|                     | 16 <sup>*1</sup> | 16 <sup>*1</sup> | 250 <sup>*1</sup>                            |
|                     | 20               | 12               | 262                                          |
|                     | 24               | 8                | 275                                          |
|                     | 28               | 4                | 287                                          |
|                     | 32               | 0                | 300                                          |
| 40                  | 8                | 32               | 150                                          |
|                     | 12               | 28               | 162                                          |
|                     | 16               | 24               | 175                                          |
|                     | 20               | 20               | 187                                          |
|                     | 24               | 16               | 200                                          |
|                     | 28               | 12               | 212                                          |
|                     | 32               | 8                | 225                                          |

| Extension I/O Block |       |        | Service Power<br>Supply (mA) |
|---------------------|-------|--------|------------------------------|
| Total I/O           | Input | Output |                              |
| 40                  | 36    | 4      | 237                          |
|                     | 40    | 0      | 250                          |
| 48                  | 16    | 32     | 100                          |
|                     | 20    | 28     | 112                          |
|                     | 24    | 24     | 125                          |
|                     | 28    | 20     | 137                          |
|                     | 32    | 16     | 150                          |
|                     | 36    | 12     | 162                          |
|                     | 40    | 8      | 175                          |
|                     | 44    | 4      | 187                          |
| 56                  | 48    | 0      | 200                          |
|                     | 24    | 32     | 50                           |
|                     | 28    | 28     | 62                           |
|                     | 32    | 24     | 75                           |
|                     | 36    | 20     | 87                           |
|                     | 40    | 16     | 100                          |
|                     | 44    | 12     | 112                          |
|                     | 48    | 8      | 125                          |
| 64                  | 52    | 4      | 137                          |
|                     | 56    | 0      | 150                          |
|                     | 32    | 32     | 0                            |
|                     | 36    | 28     | 12                           |
|                     | 40    | 24     | 25                           |
|                     | 44    | 20     | 37                           |
|                     | 48    | 16     | 50                           |
|                     | 52    | 12     | 62                           |
| 72                  | 56    | 8      | 75                           |
|                     | 60    | 4      | 87                           |
|                     | 64    | 0      | 100                          |
|                     | 56    | 16     | 0                            |
|                     | 60    | 12     | 12                           |
|                     | 64    | 8      | 25                           |

\*1 For example; when connecting an FX<sub>2N</sub>-16EX and an FX<sub>2N</sub>-16EYR to the FX<sub>2N</sub>-32DP-IF, the 24V DC service power supply capacity is 250mA.

**Table 1.12: Connecting Extension I/O Blocks to the FX<sub>2N</sub>-32DP-IF-D  
<DC Power Supply Type>**

| Extension I/O Block |       |        | Possible use Internal Power Supply (mA) |
|---------------------|-------|--------|-----------------------------------------|
| Total I/O           | Input | Output |                                         |
| 0                   | 0     | 0      | 300                                     |
| 8                   | 0     | 8      | 225                                     |
|                     | 4     | 4      | 237                                     |
|                     | 8     | 0      | 250                                     |
| 16                  | 0     | 16     | 150                                     |
|                     | 4     | 12     | 162                                     |
|                     | 8     | 8      | 175                                     |
|                     | 12    | 4      | 187                                     |
|                     | 16    | 0      | 200                                     |
| 24                  | 0     | 24     | 75                                      |
|                     | 4     | 20     | 87                                      |
|                     | 8     | 16     | 100                                     |
|                     | 12    | 12     | 112                                     |
|                     | 16    | 8      | 125                                     |
|                     | 20    | 4      | 137                                     |
|                     | 24    | 0      | 150                                     |
| 32                  | 0     | 32     | 0                                       |
|                     | 4     | 28     | 12                                      |
|                     | 8     | 24     | 25                                      |
|                     | 12    | 20     | 37                                      |
|                     | 16    | 16     | 50                                      |
|                     | 20    | 12     | 62                                      |
|                     | 24    | 8      | 75                                      |
|                     | 28    | 4      | 87                                      |
|                     | 32    | 0      | 100                                     |
| 40                  | 24    | 16     | 0                                       |
|                     | 28    | 12     | 12                                      |
|                     | 32    | 8      | 25                                      |
|                     | 36    | 4      | 37                                      |
|                     | 40    | 0      | 50                                      |
| 48                  | 48    | 0      | 0                                       |

**Table 1.13: Connecting Extension I/O Blocks to the FX2N-48E\*-\*\*\*\*\***

| Extension I/O Block |       |        | Possible use<br>Service Power<br>Supply *1 (mA) |
|---------------------|-------|--------|-------------------------------------------------|
| Total I/O           | Input | Output |                                                 |
| 0                   | 0     | 0      | 460                                             |
| 8                   | 0     | 8      | 385                                             |
|                     | 4     | 4      | 397                                             |
|                     | 8     | 0      | 410                                             |
| 16                  | 0     | 16     | 310                                             |
|                     | 4     | 12     | 322                                             |
|                     | 8     | 8      | 335                                             |
|                     | 12    | 4      | 347                                             |
|                     | 16    | 0      | 360                                             |
| 24                  | 0     | 24     | 235                                             |
|                     | 4     | 20     | 247                                             |
|                     | 8     | 16     | 260                                             |
|                     | 12    | 12     | 272                                             |
|                     | 16    | 8      | 285                                             |
|                     | 20    | 4      | 297                                             |
|                     | 24    | 0      | 310                                             |
| 32                  | 0     | 32     | 160                                             |
|                     | 4     | 28     | 172                                             |
|                     | 8     | 24     | 185                                             |
|                     | 12    | 20     | 197                                             |
|                     | 16    | 16     | 210                                             |
|                     | 20    | 12     | 222                                             |
|                     | 24    | 8      | 235                                             |
|                     | 28    | 4      | 247                                             |
|                     | 32    | 0      | 260                                             |
| 40                  | 0     | 40     | 85                                              |
|                     | 4     | 36     | 97                                              |
|                     | 8     | 32     | 110                                             |
|                     | 12    | 28     | 122                                             |
|                     | 16    | 24     | 135                                             |
|                     | 20    | 20     | 147                                             |
|                     | 24    | 16     | 160                                             |
|                     |       |        |                                                 |

| Extension I/O Block |       |        | Service Power<br>Supply *1 (mA) |
|---------------------|-------|--------|---------------------------------|
| Total I/O           | Input | Output |                                 |
| 40                  | 28    | 12     | 172                             |
|                     | 32    | 8      | 185                             |
|                     | 36    | 4      | 197                             |
|                     | 40    | 0      | 210                             |
| 48                  | 0     | 48     | 10                              |
|                     | 4     | 44     | 22                              |
|                     | 8     | 40     | 35                              |
|                     | 12    | 36     | 47                              |
|                     | 16    | 32     | 60                              |
|                     | 20    | 28     | 72                              |
|                     | 24    | 24     | 85                              |
|                     | 28    | 20     | 97                              |
|                     | 32    | 16     | 110                             |
|                     | 36    | 12     | 122                             |
|                     | 40    | 8      | 135                             |
|                     | 44    | 4      | 147                             |
| 56                  | 48    | 0      | 160                             |
|                     | 24    | 32     | 10                              |
|                     | 28    | 28     | 22                              |
|                     | 32    | 24     | 35                              |
|                     | 36    | 20     | 47                              |
|                     | 40    | 16     | 60                              |
|                     | 44    | 12     | 72                              |
|                     | 48    | 8      | 85                              |
|                     | 52    | 4      | 97                              |
|                     | 56    | 0      | 110                             |
| 64                  | 48    | 16     | 10                              |
|                     | 52    | 12     | 22                              |
|                     | 56    | 8      | 35                              |
|                     | 60    | 4      | 47                              |
|                     | 64    | 0      | 60                              |

\*1 Using an FX<sub>2N</sub>-48ER-UA1/UL, FX<sub>2N</sub>-48ER-DS and FX<sub>2N</sub>-48ET-DSS, the is possible to use only internal 24V DC power source because it does not have a 24V DC service power supply.

**Table 1.14: Connecting Extension I/O Blocks to the FX<sub>2N</sub>-32E<sup>\*</sup>-\*\*\*/UL**

| Extension I/O Block |       |        | Possible use Service<br>Power Supply (mA) |
|---------------------|-------|--------|-------------------------------------------|
| Total I/O           | Input | Output |                                           |
| 0                   | 0     | 0      | 250                                       |
| 8                   | 0     | 8      | 175                                       |
|                     | 4     | 4      | 187                                       |
|                     | 8     | 0      | 200                                       |
| 16                  | 0     | 16     | 100                                       |
|                     | 4     | 12     | 112                                       |
|                     | 8     | 8      | 125                                       |
|                     | 12    | 4      | 137                                       |
|                     | 16    | 0      | 150                                       |
| 24                  | 0     | 24     | 25                                        |
|                     | 4     | 20     | 37                                        |
|                     | 8     | 16     | 50                                        |
|                     | 12    | 12     | 62                                        |
|                     | 16    | 8      | 75                                        |
|                     | 20    | 4      | 87                                        |
|                     | 24    | 0      | 100                                       |
| 32                  | 16    | 16     | 0                                         |
|                     | 20    | 12     | 12                                        |
|                     | 24    | 8      | 25                                        |
|                     | 28    | 4      | 37                                        |
|                     | 32    | 0      | 50                                        |

### 1.3.4 Example Configuration

Further information for configuration rules can be found in section 1.3.3.

**Table 1.15: Specifications of Example Configuration**

| Item                 | Description |
|----------------------|-------------|
| Digital DC input     | 64 points   |
| Relay output         | 40 points   |
| 12 bit analog input  | 1 channel   |
| 12 bit analog output | 3 channels  |

1) Check total I/O points.

See Table 1.16 for the calculation.

This example configuration does not have a problem about total I/O points.

**Table 1.16: Check Total I/O Points**

| Check Points                                            | Result                         |
|---------------------------------------------------------|--------------------------------|
| I/O points for the extension I/O units/blocks           | 104 points (64 + 40)           |
| Occupation I/O points for special function units/blocks | 16 points (8 + 8)              |
| I/O points for FX2N-32ASI-M's active slaves             | 0 points                       |
| <b>Total I/O Points</b>                                 | <b>124 Points ≤ 256 points</b> |

## 2) Check power consumption of the 24V DC and 5V DC power supply

## a) Check 5V DC power consumption for special function units/blocks.

See Table 1.17 for the calculation.

This example configuration does not have a problem concerning 5V DC power consumption.

For 5V DC power consumption of each special function unit/block, refer to table 1.4 and 1.7

**Table 1.17: Check 5V DC Power Consumption**

| Specifications                    | Module   | 5V DC Power Consumption (mA) |
|-----------------------------------|----------|------------------------------|
| 12 bit analog input × 1 channel   | FX2N-2AD | 20                           |
| 12 bit analog output × 3 channels | FX2N-4DA | 30                           |
| <b>Total Power Consumption</b>    |          | <b>50 mA ≤ 220 mA</b>        |

b) Check internal 24V DC power consumption for the FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA.

See Table 1.18 for the calculation.

This example configuration does not have a problem concerning 24V DC power consumption for the FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA.

For 24V DC power consumption of the FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA, refer to table 1.5 and 1.7

**Table 1.18: Check Internal 24V DC Power Consumption for FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA**

| Module                         | Number of Blocks | 24V DC power consumption (mA) |
|--------------------------------|------------------|-------------------------------|
| FX <sub>0N</sub> -3A           | Not used         | 0                             |
| FX <sub>2N</sub> -2AD          | 1                | 50                            |
| FX <sub>2N</sub> -2DA          | Not used         | 0                             |
| <b>Total Power Consumption</b> |                  | <b>50 mA ≤ 300 mA</b>         |

## c) Check 24V DC power consumption for connecting extension I/O blocks to 32DP-IF.

When checking this configuration, it is necessary to consider the following points.

- The 24V DC service power supply of the FX<sub>2N</sub>-32DP-IF must retain **50mA** for FX<sub>2N</sub>-2AD's internal 24V DC power supply.
- It is necessary to use the extension I/O unit for connecting to FX<sub>2N</sub>-32DP-IF as understood from Table 1.11. (Input: 64 points, Relay Output: 40 points)

For the 2 configurations (Figure 1.8 and 1.9) consider these points.  
For 24V DC power consumption of each extension I/O block, refer to table 1.11 ~ 1.14 or Figure 1.4 ~1.7.

**Figure 1.8: Example Configuration Case 1**

|              |          |          |           |           |            |           |                 |           |
|--------------|----------|----------|-----------|-----------|------------|-----------|-----------------|-----------|
| FX2N-32DP-IF | FX2N-2AD | FX2N-4DA | FX2N-16EX | FX2N-16EX | FX2N-16EYR | FX0N-8EYR | FX2N-32ER-ES/UL | FX2N-16EX |
|--------------|----------|----------|-----------|-----------|------------|-----------|-----------------|-----------|

**Table 1.19: 24V DC Power Consumption for Example Configuration Case 1**

| Units                                                  |                                                           | I/O Points                                                                                                                     |              |                   |
|--------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|
| 32DP-IF Module                                         | Connected Extension I/O Units/Blocks                      | Input                                                                                                                          | Relay Output | Transistor Output |
| FX2N-32DP-IF                                           |                                                           | 0                                                                                                                              | 0            | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                                             | 0            | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                                             | 0            | 0                 |
|                                                        | FX2N-16EYR                                                | 0                                                                                                                              | 16           | 0                 |
|                                                        | FX0N-8EYR                                                 | 0                                                                                                                              | 8            | 0                 |
|                                                        | <b>Total I/O points for connecting to FX2N-32DP-IF</b>    | <b>32</b>                                                                                                                      | <b>24</b>    | <b>0</b>          |
|                                                        | <b>24V DC power consumption for FX2N-32DP-IF</b>          | <b>When checking on Figure 1.4 or Table 1.11, 75 mA can be used for the FX2N-2AD (50 mA) and service power supply (25 mA).</b> |              |                   |
|                                                        | FX2N-32ER-ES/UL                                           | 16                                                                                                                             | 16           | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                                             | 0            | 0                 |
|                                                        | <b>Total I/O points for connecting to FX2N-32ER-ES/UL</b> | <b>32</b>                                                                                                                      | <b>16</b>    | <b>0</b>          |
|                                                        | <b>24V DC power consumption for FX2N-32ER-ES/UL</b>       | <b>When checking on Figure 1.6 or Table 1.14, 150 mA can be used for the service power supply.</b>                             |              |                   |
| <b>Total I/O points for this example configuration</b> |                                                           | <b>64</b>                                                                                                                      | <b>40</b>    | <b>0</b>          |

**Figure 1.9: Example Configuration Case 2**

|              |          |          |           |           |           |            |                 |           |
|--------------|----------|----------|-----------|-----------|-----------|------------|-----------------|-----------|
| FX2N-32DP-IF | FX2N-2AD | FX2N-4DA | FX2N-16EX | FX2N-16EX | FX2N-16EX | FX2N-16EYR | FX2N-32ER-ES/UL | FX0N-8EYR |
|--------------|----------|----------|-----------|-----------|-----------|------------|-----------------|-----------|

**Table 1.20: 24V DC Power Consumption for Example Configuration Case 2**

| Units                                                  |                                                           | I/O Points                                                                                         |              |                   |
|--------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------|-------------------|
| 32DP-IF/ Connected Extension I/O units                 | Connected Extension I/O Blocks                            | Input                                                                                              | Relay Output | Transistor Output |
| FX2N-32DP-IF                                           |                                                           | 0                                                                                                  | 0            | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                 | 0            | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                 | 0            | 0                 |
|                                                        | FX2N-16EX                                                 | 16                                                                                                 | 0            | 0                 |
|                                                        | FX2N-16EYR                                                | 0                                                                                                  | 16           | 0                 |
|                                                        | <b>Total I/O points for connecting to FX2N-32DP-IF</b>    | <b>48</b>                                                                                          | <b>16</b>    | <b>0</b>          |
|                                                        | <b>24V DC power consumption for FX2N-32DP-IF</b>          | <b>When checking on Figure 1.4 or Table 1.11, 50 mA can be used for the FX2N-2AD.</b>              |              |                   |
|                                                        | FX2N-32ER-ES/UL                                           | 16                                                                                                 | 16           | 0                 |
|                                                        | FX0N-8EYR                                                 | 0                                                                                                  | 8            | 0                 |
|                                                        | <b>Total I/O points for connecting to FX2N-32ER-ES/UL</b> | <b>16</b>                                                                                          | <b>24</b>    | <b>0</b>          |
|                                                        | <b>24V DC power consumption for FX2N-32ER-ES/UL</b>       | <b>When checking on Figure 1.6 or Table 1.14, 175 mA can be used for the service power supply.</b> |              |                   |
| <b>Total I/O points for this example configuration</b> |                                                           | <b>64</b>                                                                                          | <b>40</b>    | <b>0</b>          |

## 3) Check exchange data length

See Table 1.13 for the calculation.

This example configuration does not have a problem concerning total exchange data length.  
For exchange data length of each unit/block, refer to table 1.9.

**Table 1.21: Check Exchange Data Length**

| Check Points                                           | Result (bytes)                                              |
|--------------------------------------------------------|-------------------------------------------------------------|
| Exchange data length for extension I/O units/blocks    | 13<br>( $4 + 2 \times 3 + 2 + 1 = 13$ , refer to table 1.9) |
| Exchange data length for special function units/blocks | 12 (4 + 8, refer to table 1.9)                              |
| Total exchange data length                             | 25 bytes $\leq$ 200 bytes                                   |

## 4) Check user parameter length

See Table 1.22 for the calculation.

This example configuration does not have a problem concerning total user parameter length.

For exchange data length of each unit/block, refer to table 1.6 and 1.9.

**Table 1.22: Check User Parameter Length**

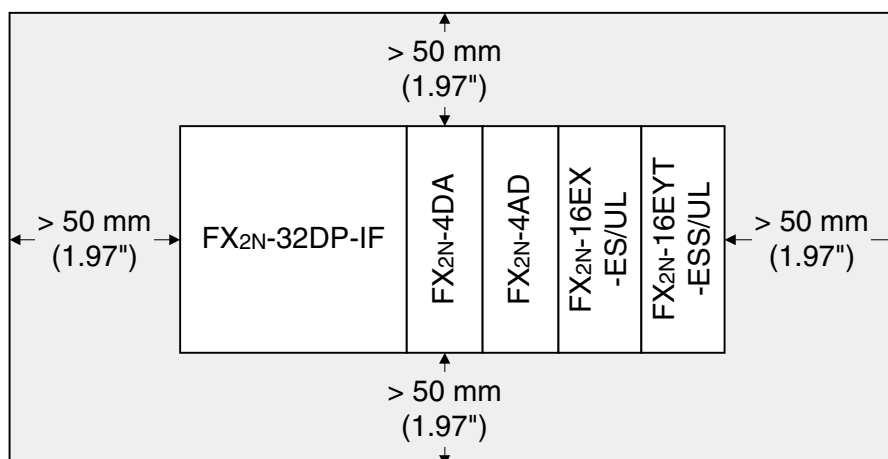
| Check Points                                            |          | Result (bytes)            |                              |
|---------------------------------------------------------|----------|---------------------------|------------------------------|
|                                                         |          | Using short configuration | Using extended configuration |
| User parameter for global                               |          | 2 (Refer to Table 1.6)    | 2 (Refer to Table 1.6)       |
| User parameter length for special function units/blocks | FX2N-2DA | 4 (Refer to Table 1.9)    | 4 (Refer to Table 1.9)       |
|                                                         | FX2N-4DA | 14 (Refer to Table 1.9)   | 50 (refer to Table 1.9)      |
| Total exchange data length                              |          | 20 bytes $\leq$ 193 bytes | 56 bytes $\leq$ 193 bytes    |

## 2. Mounting

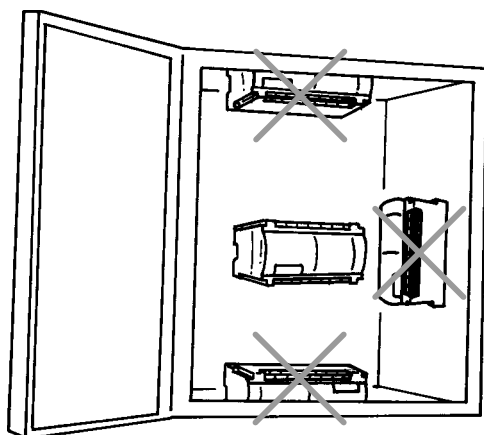
### 2.1 Mounting Arrangements

To prevent a rise in temperature, mount the units to the back walls. Never mount them to the floor, ceiling or side wall of an enclosure.

**Figure 2.1: Mounting Location**



**Figure 2.2: Mounting Arrangement**



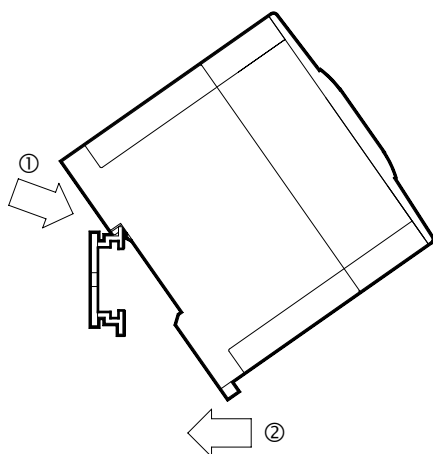
## 2.2 Mounting

Mounting method for the 32DP-IF is DIN rail mounting or direct wall mounting.

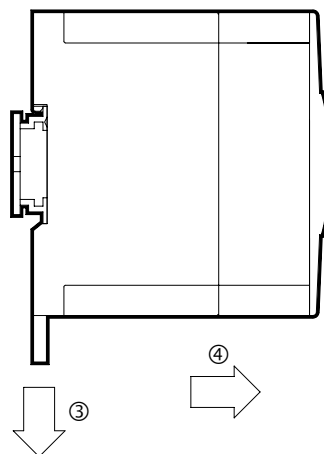
### 2.2.1 DIN Rail Mounting

- Align the upper side of the DIN rail mounting groove of the 32DP-IF with a DIN rail\*1 (①), and push it on the DIN rail(②). See Figure 2.3.
- When removing the 32DP-IF from the DIN rail, the hook for DIN rail is pulled (③), and the 32DP-IF is removed (④). See Figure 2.4.

**Figure 2.3: Attach to DIN Rail**



**Figure 2.4: Remove from DIN Rail**



\*1 Uses DIN 46277 <35mm (1.38")>

### 2.2.2 Direct Mounting to Back Walls

The 32DP-IF can be mounted with M4 screws by using the direct mounting holes.

An interval space between each unit of 1 ~ 2 mm is necessary.

For mounting hole position of 32DP-IF, refer to section 1.2. Further information about extension I/O units/blocks can be found in the FX2N Hardware Manual. Further information about special function units/blocks can be found in each manual.

### 3. Wiring

#### 3.1 Caution for Wiring



- 1) Do not lay signal cable near to either high voltage power cabling or cabinet housing along the same trunking duct. Effects of noise or surge induction may occur. Keep signal cables of more than 100 mm (3.94") from these power cables.
- 2) Ground the shield wire or the shield of a cable at one point on the module. Do not, however, ground at the same point as high voltage lines.
- 3) Cut off all phases of power source before installation or performing wiring work in order to avoid electric shock or damage to the product.
- 4) Replace the provided terminal cover before supplying power and operating the unit after installation or wiring work, in order to avoid electric shock.
- 5) To connect the 32DP-IF to a Profibus-DP network should be used only the Profibus connectors and shielded twisted-pair cable complying with EN50170.
- 6) The power supply of the extension units/blocks and the special function units/blocks should be starting-up at the same time or earlier than it with 32DP-IF.
- 7) DO NOT use "●" terminal in 32DP-IF.
- 8) "24+" and "24-" terminal are not reversible.  
If "24+" and "24-" terminal are reversed, the units/block may be serious damaged.
- 9) The terminal tightening torque is 0.5 to 0.8 N•m. Tighten securely to avoid malfunction.

- 10) The terminal screws of FX<sub>2N</sub>-32DP-IF is M3.5 (0.14"). However, the terminal screws of the FX<sub>0N</sub>, FX<sub>2N</sub> Series extension I/O units/blocks and special function units/blocks are M3 (0.12"). The crimp style terminal (see drawing) suitable for use with these screws should be fitted to the cable for wiring.

When installing 1 or 2 crimp terminal to a terminal, see each explanation below. However, 3 crimp terminals or more cannot be installed to a single terminal.

- a) Handle the crimp terminal of the following size as and when 1 wire is used per terminal. Refer to Figure 3.3 for installation instructions.

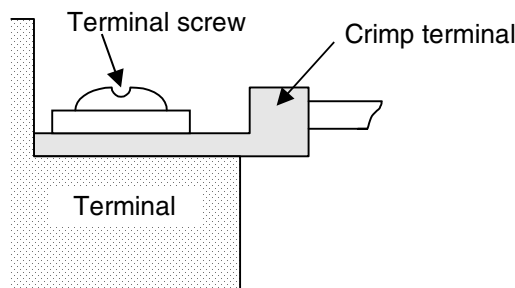
**Figure 3.1: Crimp Terminal for M3.5 Screws**



**Figure 3.2: Crimp Terminal for M3 Screws**

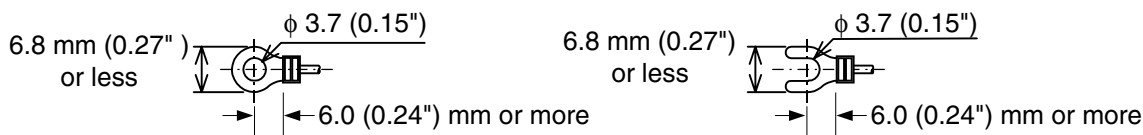


**Figure 3.3: Installing 1 wire Per Terminal**

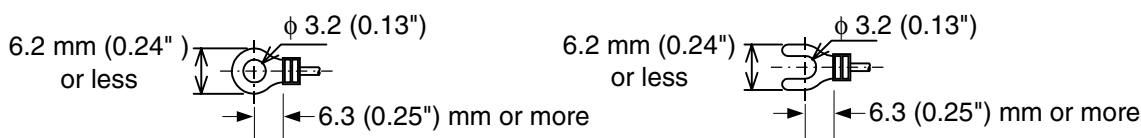


- b) Handle the crimp terminal of the following size as and when 2 wires are used per terminal. Refer to Figure 3.6 for installation instructions.

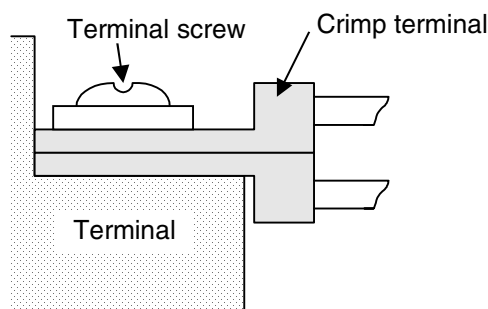
**Figure 3.4: Crimp Terminal for M3.5 Screws**



**Figure 3.5: Crimp Terminal for M3 Screws**



**Figure 3.6: Installing 2 Wires Per Terminal**



### 3.2 Power Supply

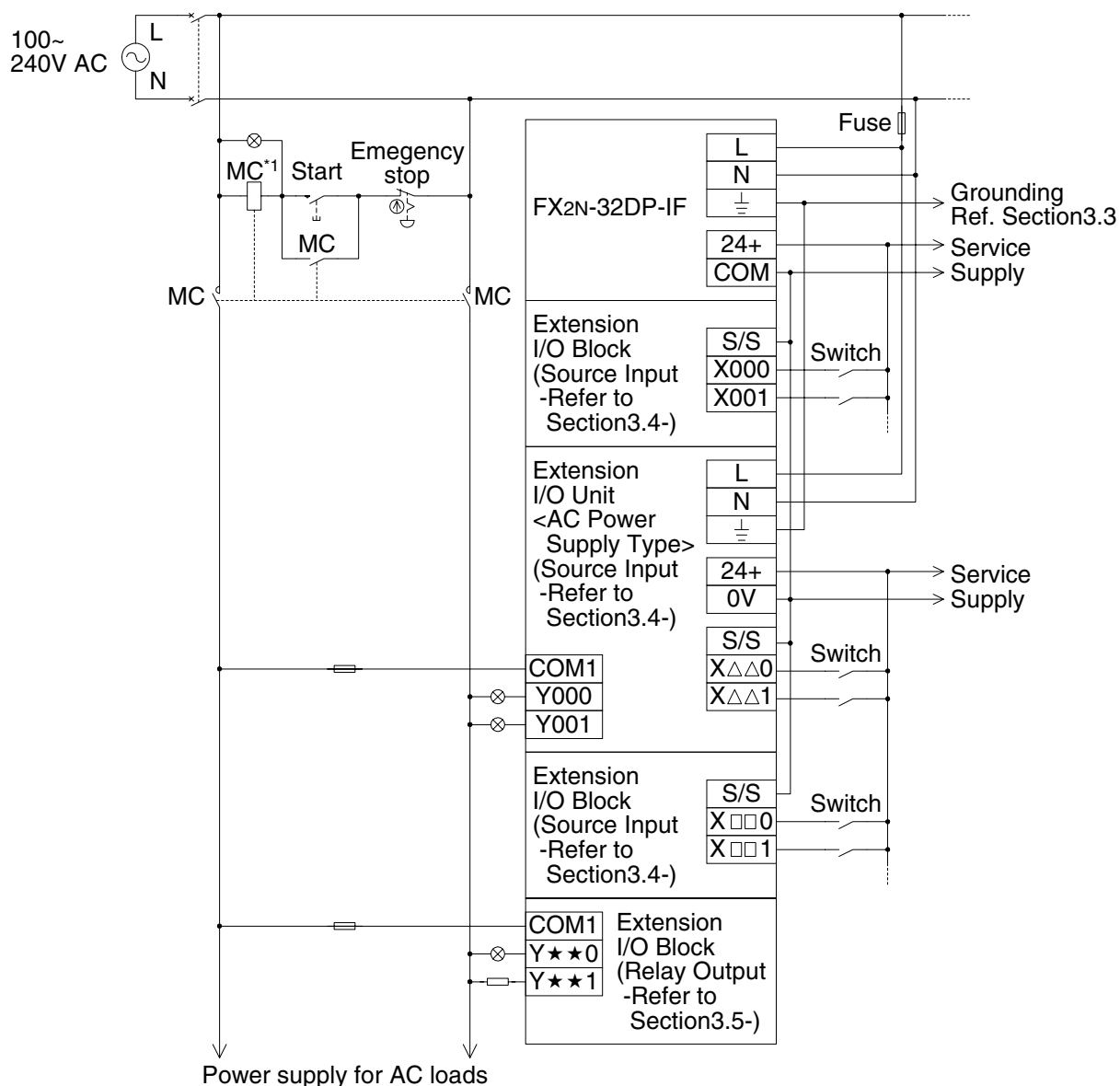
Further information for the extension unit's wiring can be found in the FX<sub>2N</sub> Series Hardware Manual. Further information for special function units/blocks can be found in their respective manual. For wiring of grounding, refer to Section 3.3.

### 3.2.1 AC Power Supply Type: FX<sub>2N</sub>-32DP-IF

When wiring a 32DP-IF and extension I/O units/blocks, the connection method is identical to an FX<sub>2N</sub> series PLC. Further information can be found in the FX<sub>2N</sub>-32DP-ID User's Manual and FX<sub>2N</sub> Series Hardware Manual.

- Supply both FX<sub>2N</sub>-32DP-IF-D and extension I/O units from the same AC power source.
- Connect “COM” terminal on the 32DP-IF to the “0V” terminal on the extension unit.
- For ground wiring, refer to Section 3.3.

**Figure 3.7: AC Power Supply Type: FX<sub>2N</sub>-32DP-IF**



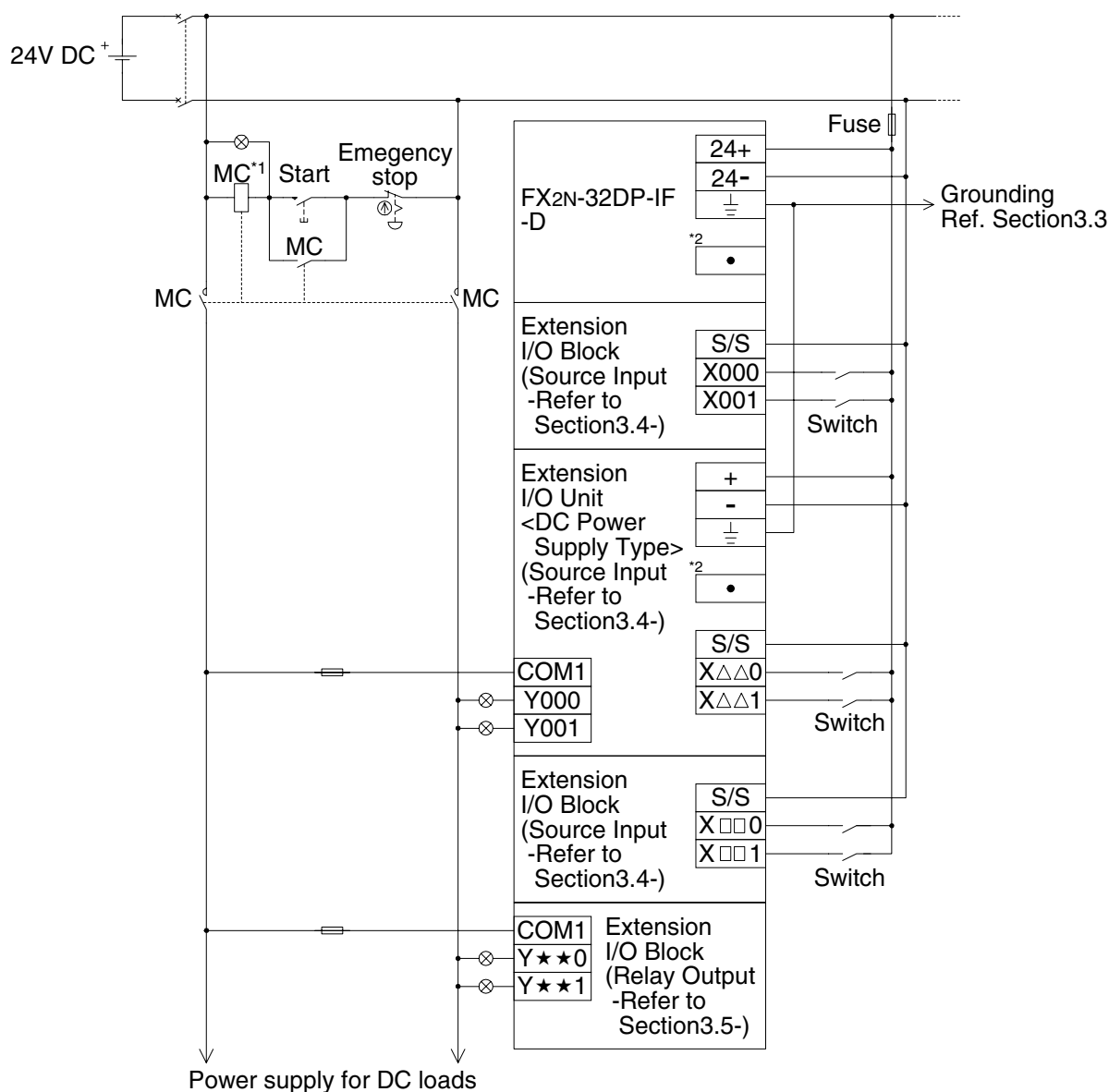
\*1 Magnetic contact safety circuit

### 3.2.2 DC Power Supply Type: FX<sub>2N</sub>-32DP-IF-D

When wiring a 32DP-IF and extension I/O units/blocks, the connection method is identical to a FX<sub>2N</sub> series PLC. Further information can be found in the FX<sub>2N</sub>-32DP-ID User's Manual and FX<sub>2N</sub> Series Hardware Manual.

- Supply both FX<sub>2N</sub>-32DP-IF-D and extension I/O units/blocks from same DC power source.
- For ground wiring, refer to Section 3.3.

**Figure 3.8: DC Power Supply Type: FX<sub>2N</sub>-32DP-IF-D**



\*1 Magnetic contact safety circuit

\*2 DO NOT connect wire to this terminal.

### 3.3 Profibus-DP Network

To connect the 32DP-IF to a Profibus-DP network should be used only the Profibus connectors and shielded twisted-pair cable complying with EN50170.

Please use terminating resistors and Profibus connectors as shown in the DP-master manual and Profibus connector manual.

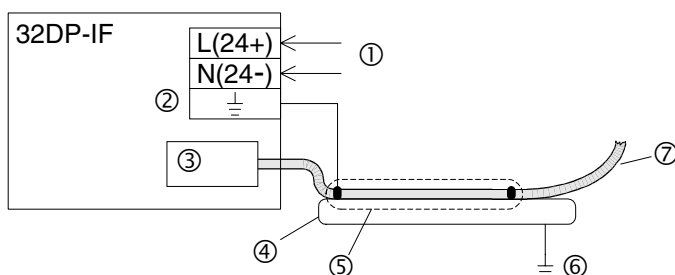
The 32DP-IF does not have a terminating resistance built-in.



#### Note: Noise Prevention

For noise prevention please attach at least 50mm (1.97") of the shielded twisted-pair cable along the grounding plate to which the ground terminal is connected.

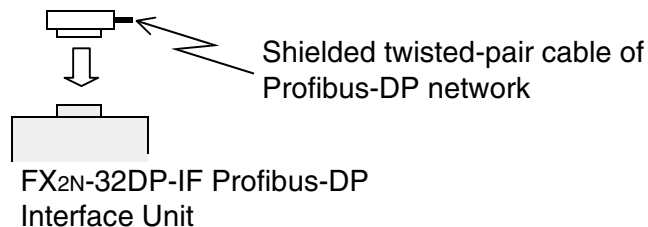
**Figure 3.9: Connect to Profibus-DP Network**



**Table 3.1: Connect to Profibus-DP Network**

| Ref. | Description                                                                                                                                                      |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①    | Power source for 32DP-IF (Refer to section 3.2)                                                                                                                  |
| ②    | Grounding terminal in 32DP-IF                                                                                                                                    |
| ③    | Profibus connector (Refer to Figure 3.10)                                                                                                                        |
| ④    | Grounding plate                                                                                                                                                  |
| ⑤    | For noise Prevention please attach at least 50mm (1.97") of the shielded twisted-pair cable along the grounding plate to which the ground terminal is connected. |
| ⑥    | Grounding resistance of 100Ω or less                                                                                                                             |
| ⑦    | Shielded twisted-pair cable complying with EN50170 to Profibus-DP network                                                                                        |

**Figure 3.10: Profibus Connector**



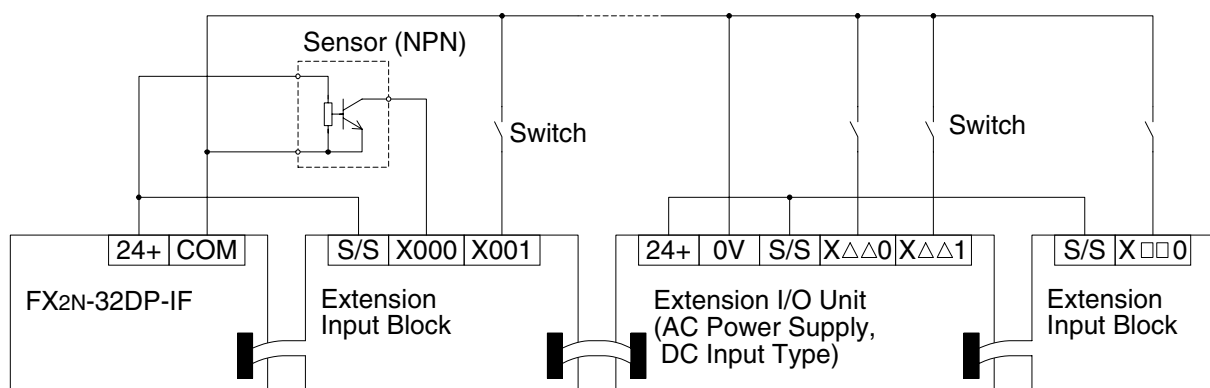
### 3.4 Input in Extension Units/Blocks

Wiring for sink and source input is decided by the wiring method for the S/S terminal on the extension I/O units/blocks. Further information can be found in the FX2N Hardware Manual.

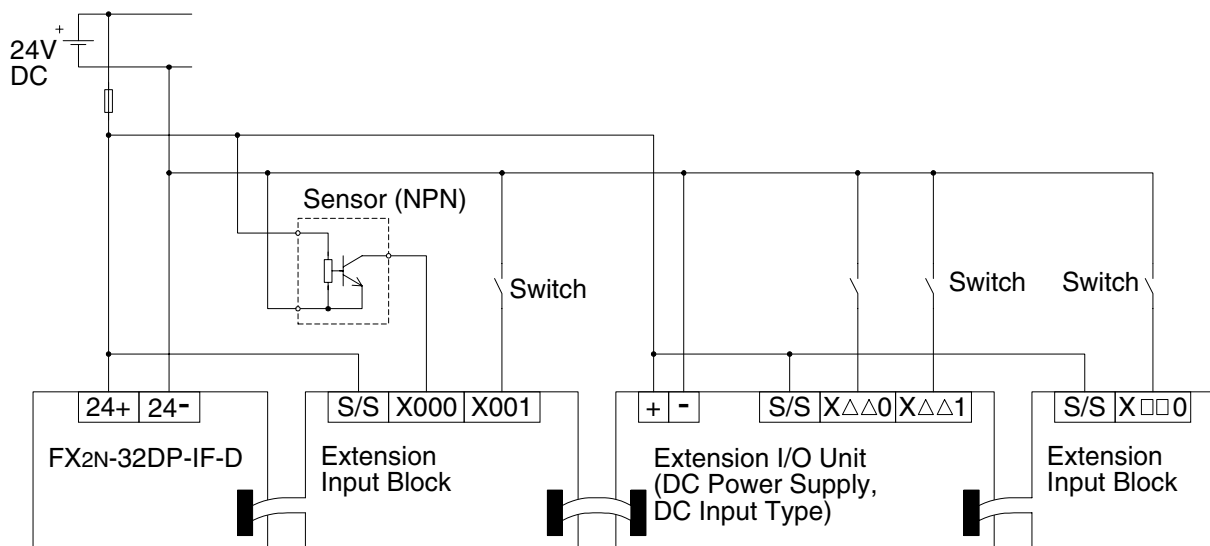
#### 3.4.1 DC Sink Input

When wiring sink input, 0V must be supplied to S/S terminal on the extension I/O units/blocks as Figure 3.11 and 3.12. In this case, this unit/block uses only sink input. Further information can be found in FX2N Hardware Manual.

**Figure 3.11: Sink (negative input connection, positive S/S), FX2N-32DP-IF**



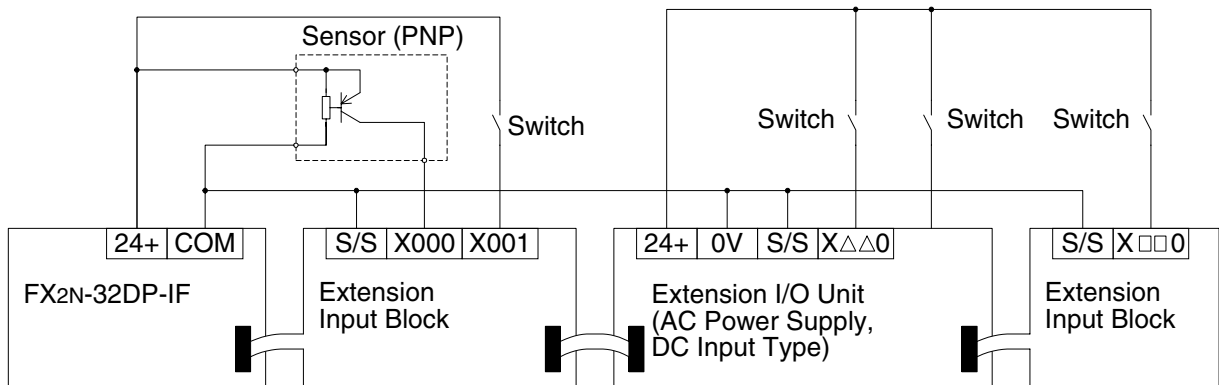
**Figure 3.12: Sink (negative input connection, positive S/S), FX2N-32DP-IF-D**



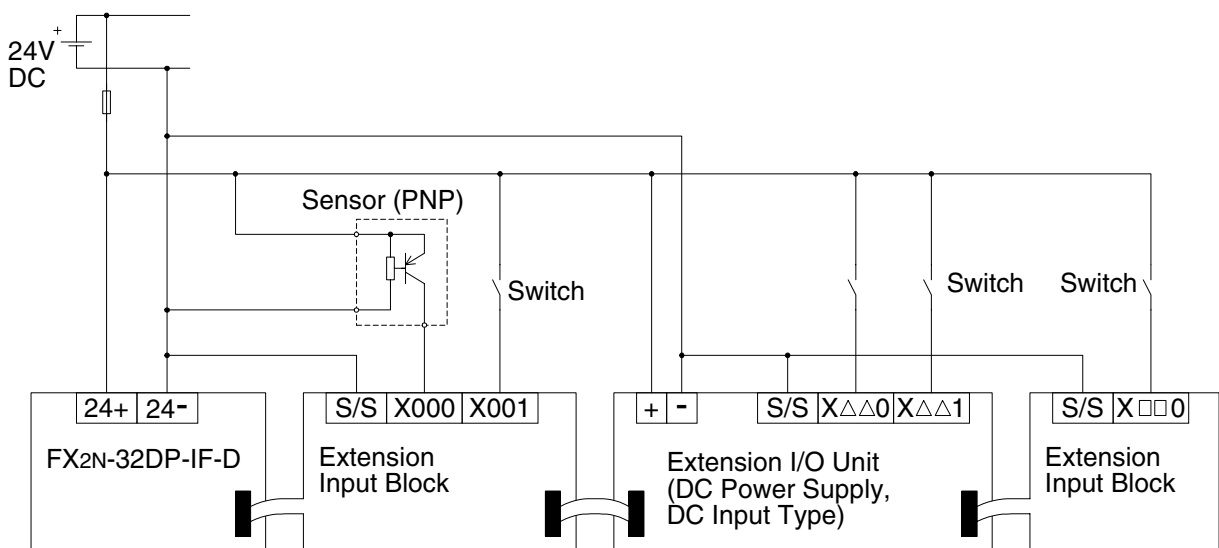
### 3.4.2 DC Source Input

When wiring source input, 24V must be supplied to S/S terminal on the extension I/O units/blocks as Figure 3.13 and 3.14. In this case, this unit/block uses only source input. Further information can be found in the FX2N Hardware Manual.

**Figure 3.13:Source (positive input connection, negative S/S), FX<sub>2N</sub>-32DP-IF**



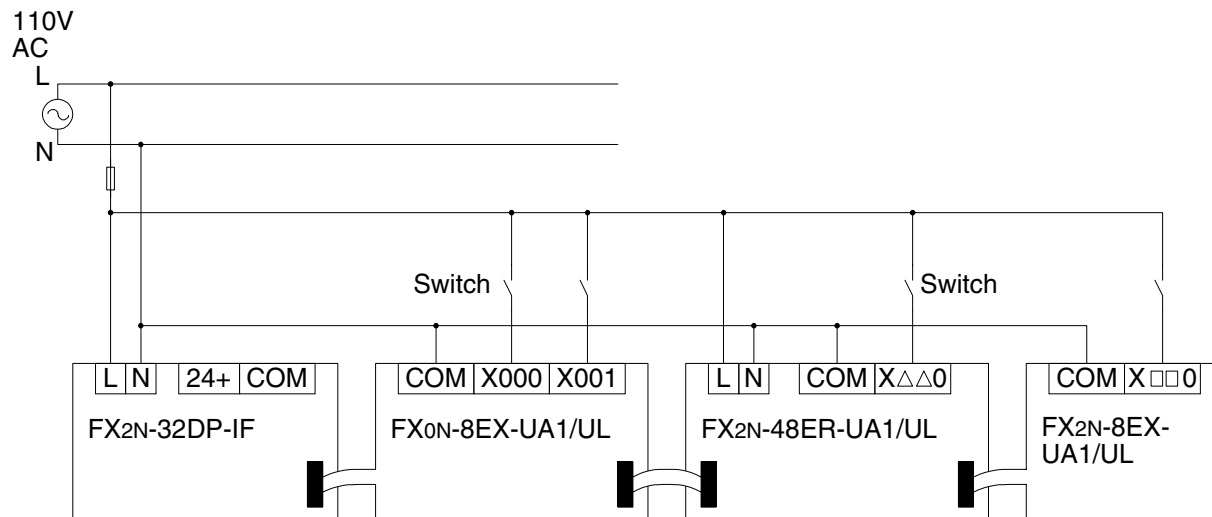
**Figure 3.14:Source (positive input connection, negative S/S), FX<sub>2N</sub>-32DP-IF-D**



### 3.4.3 AC Input

Further information can be found in the FX<sub>2N</sub> Hardware Manual.

**Figure 3.15: AC Input Wiring, FX<sub>2N</sub>-32DP-IF**



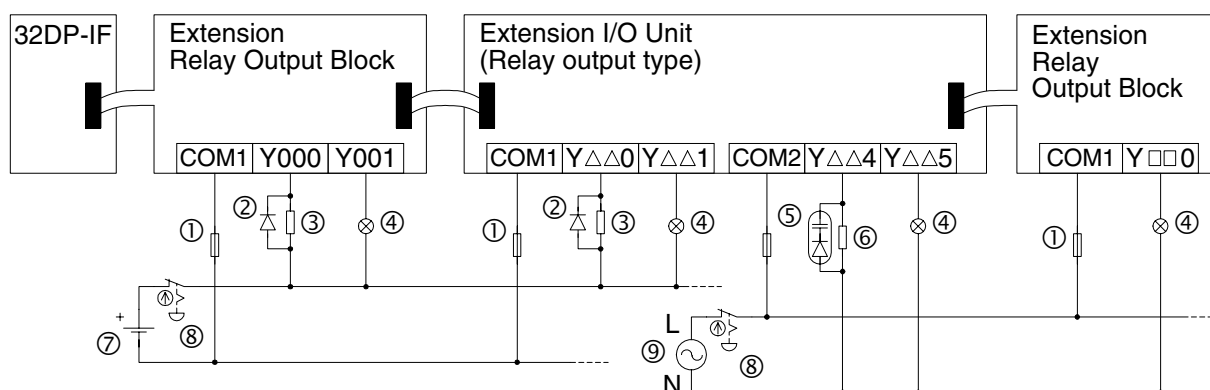
### 3.5 Output in Extension Units/Blocks

Further information can be found in the FX<sub>2N</sub> Hardware Manual.

#### 3.5.1 Relay Output

Further information can be found in the FX<sub>2N</sub> Hardware Manual.

**Figure 3.16: Relay Output Wiring**



**Table 3.2: Relay Output Wiring**

| Ref. | Description                                                   |
|------|---------------------------------------------------------------|
| ①    | Fuse                                                          |
| ②    | Surge absorbing diode                                         |
| ③    | Solenoid                                                      |
| ④    | Lamp                                                          |
| ⑤    | Noise suppressor - Capacitor (0.1μF) + resistor (100 to 120W) |
| ⑥    | Contactor                                                     |
| ⑦    | DC power supply; ≤ 30V DC                                     |
| ⑧    | Emergency stop                                                |
| ⑨    | AC power supply, ≤ 240V AC                                    |

### 3.5.2 Transistor Output

Further information can be found in the FX<sub>2N</sub> Hardware Manual.

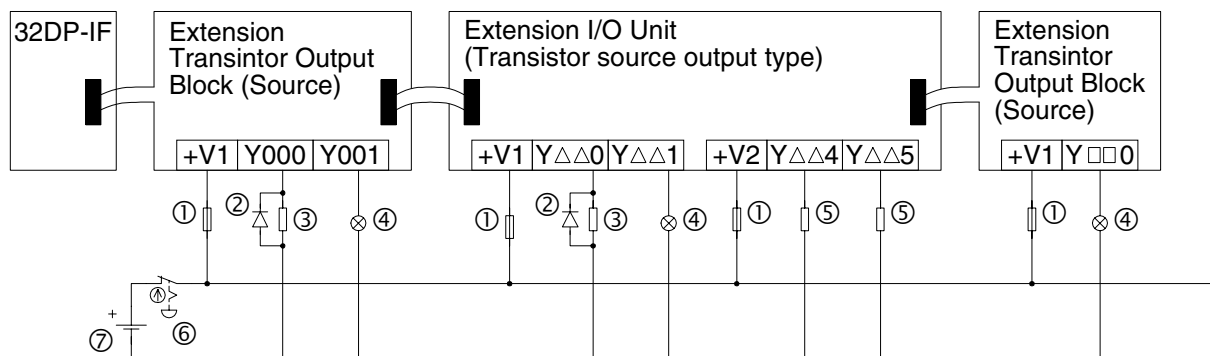


#### Note

“+V\*” terminal on the extension units/blocks must be supplied +5 to +30V.

If “+V\*” terminal is supplied 0V, the units/block maybe seriously damaged.

**Figure 3.17: Transistor Output Wiring**



**Table 3.3: Transistor Output Wiring**

| Ref. | Description               |
|------|---------------------------|
| ①    | Fuse                      |
| ②    | Surge absorbing diode     |
| ③    | Solenoid                  |
| ④    | Lamp                      |
| ⑤    | Resistance load           |
| ⑥    | Emergency stop            |
| ⑦    | DC power supply; ≤ 30V DC |

### 3.6 Special Function Units/Blocks

When wiring a 32DP-IF and special function block, the connection method is identical to an FX<sub>2N</sub> series PLC. For special function block's wiring, refer to their respective manual.

## 4. Specifications

### 4.1 General Specifications

**Table 4.1: General Specifications**

| Item                                        |                                          | Description                                                                                                                                                                 |
|---------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature                       |                                          | 0 to 55 °C (32 to 131 °F)                                                                                                                                                   |
| Storage Temperature                         |                                          | -20 to 70 °C (-4 to 158 °F)                                                                                                                                                 |
| Operating Humidity                          |                                          | 35 to 85% Relative Humidity, No condensation                                                                                                                                |
| Storage Humidity                            |                                          | 35 to 90% Relative Humidity, No condensation                                                                                                                                |
| Vibration Resistance<br>- Direct Mounting   |                                          | Conforms to EN68-2-6; 10 - 57 Hz: 0.075 mm Half Amplitude<br>57 - 150 Hz: 9.8 m/s <sup>2</sup> Acceleration<br>Sweep Count for X, Y, Z: 10 times (80 min in each direction) |
| Vibration Resistance<br>- DIN rail Mounting |                                          | Conforms to EN68-2-6; 10 - 57 Hz: 0.035 mm Half Amplitude<br>57 - 150 Hz: 4.9 m/s <sup>2</sup> Acceleration<br>Sweep Count for X, Y, Z: 10 times (80 min in each direction) |
| Shock Resistance                            |                                          | Conforms to EN68-2-27: 147m/s <sup>2</sup> Acceleration, Action Time: 11 ms<br>3 times in each direction X, Y, and Z                                                        |
| Noise Immunity                              |                                          | 1,000 Vp-p, 1microsecond, 30 - 100 Hz, tested by noise simulator                                                                                                            |
| Dielectric Withstand Voltage                | FX2N-32DP-IF<br>(AC Power Supply Type)   | 1,500 V AC > 1 min, tested between all points, terminals and ground                                                                                                         |
|                                             | FX2N-32DP-IF-D<br>(DC Power Supply Type) | 500 V AC > 1 min, tested between all points, terminals and ground                                                                                                           |
| Insulation Resistance                       |                                          | 5 MΩ > at 500 V DC, tested between all points, terminals and ground                                                                                                         |
| Grounding                                   |                                          | Grounding resistance is 100 Ω or less                                                                                                                                       |
| Complies with                               |                                          | UL508                                                                                                                                                                       |

## 4.2 Power Supply Specifications

**Table 4.2: Power Supply Specifications**

| Item                                          | Description                                                                              |                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                               | FX2N-32DP-IF<br>(AC Power Supply Type)                                                   | FX2N-32DP-IF-D<br>(DC Power Supply Type)                                             |
| Power Supply                                  | 100 ~ 240 V AC +10% -15%,<br>50/60 Hz                                                    | 24 V DC +20% -30%                                                                    |
| Max. Allowable Momentary Power Failure Period | 10 ms at 100 V AC<br>(< 10 ms, 32DP-IF = RUN continue,<br>> 10 ms, 32DP-IF = power down) | 5 ms at 24 V DC<br>(< 5 ms, 32DP-IF = RUN continue,<br>> 5 ms, 32DP-IF = power down) |
| Fuse (size) Rating                            | 3 A<br><φ 5 × 20 mm (0.2 × 0.79 inches),<br>Time lag fuse>                               | 1 A<br><φ 5 × 20 mm (0.2 × 0.79 inches),<br>Time lag fuse>                           |
| In-rush Current                               | 100 V AC Max. 40 A < 5 ms,<br>200 V AC Max. 60 A < 5 ms                                  | 24V DC Max. 30mA < 5ms                                                               |
| Power Consumption                             | 30 VA                                                                                    | 14W                                                                                  |
| 24 V DC Service Supply                        | 500 mA                                                                                   | -                                                                                    |
| Max. 5 V DC Bus Supply                        | 220 mA                                                                                   |                                                                                      |

## 4.3 Performance Specifications

**Table 4.3: Performance Specifications**

| Items                                                |                             | Specifications                                                                                                     |
|------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------|
| Maximum Number of Controllable I/O Points            |                             | Maximum 256 points (see section 1.3)                                                                               |
| Transmission data<br>(Maximum exchanged data length) |                             | Max.200 bytes, total of sent and received during one bus cycle.<br>(input: Max. 200 bytes, output: Max. 200 bytes) |
| Transmission Type                                    |                             | Bus network                                                                                                        |
| Connector                                            | 9 pin D-SUB                 | Connector for Profibus-DP network                                                                                  |
|                                                      | 8 pin mini DIN              | Connector for FX-20P-E or personal computer (MELSEC MEDOC PLUS)                                                    |
| Supported Baud Rates (bps) and Bus Length            | 9.6k, 19.2k, 45.45k, 93.75k | 1,200 m (3,937')                                                                                                   |
|                                                      | 187.5k                      | 1,000 m (3,281')                                                                                                   |
|                                                      | 500k                        | 400 m (1,312')                                                                                                     |
|                                                      | 1.5M                        | 200 m (656')                                                                                                       |
|                                                      | 3M, 6M, 12M                 | 100 m (328')                                                                                                       |
| LED Indicators                                       | POWER LED                   | ON when AC power is supplied.                                                                                      |
|                                                      | RUN LED                     | ON when 32DP-IF is exchanging data with extension I/O blocks/units and special function blocks.                    |
|                                                      | BF LED                      | ON when a communication error is detected. (No data exchange)                                                      |
|                                                      | DIA LED                     | ON when notice of diagnostic data is detected.                                                                     |

## 5. Advanced Devices

### 5.1 Data Registers

**Table 5.1: Supported Data Register List**

| Items       | Description                              |
|-------------|------------------------------------------|
| D0 ~ D99    | Input (sent) data to DP-master *1        |
| D100 ~ D199 | Output (received) data from DP-master *2 |
| D200 ~ D299 | Parameter data *3                        |

\*1 If the 32DP-IF is in data exchange mode, the sent data to a DP-master can be monitored by reading data registers D0 ~ D99 in the programming tool.  
For example of allocating device, refer to section 5.1.1.

\*2 If the 32DP-IF is in data exchange mode, the received data from a DP-master can be monitored by reading data registers D100 ~ D199 in the programming tool.  
For example of allocating device, refer to section 5.1.1.

\*3 The data registers D200 ~ D299 contain the user parameter data which sent by the DP-master. After power on, when the 32DP-IF is in the search baud rate state or the wait parameter state, these data register contain the default parameter data.  
For user parameter, refer to chapter 7.

### 5.1.1 Example of Allocating Device

**Figure 5.1: Example of Allocating Device**

|              |                    |                 |                                   |                 |                  |
|--------------|--------------------|-----------------|-----------------------------------|-----------------|------------------|
|              | X0 ~ X3<br>Y0 ~ Y3 | X10 ~ X27       | Using Ch1 ~ Ch4<br>(average data) | Using Ch1 ~ Ch4 | Y10 ~ Y17        |
| FX2N-32DP-IF | FX0N-8ER-ES/UL     | FX2N-16EX-ES/UL | FX2N-4AD                          | FX2N-4DA        | FX0N-8EYT-ESS/UL |

**Table 5.2: Example of Allocating Device**

| Device No.  |               | Description                                                |
|-------------|---------------|------------------------------------------------------------|
| D0 to D3    |               | FX <sub>2N</sub> -4AD's input data (BFM #5 ~ #8)           |
| D4          | Lower 8 bits  | FX <sub>0N</sub> -8ER-ES/UL's X0 ~ X3 (bit 4 ~ 7 not used) |
|             | Higher 8 bits | FX <sub>2N</sub> -16EX-ES/UL's X10 ~ X17                   |
| D5          | Lower 8 bits  | FX <sub>2N</sub> -16EX-ES/UL's X20 ~ X27                   |
|             | Higher 8 bits | These device areas are not used.                           |
| D6 ~ D99    |               |                                                            |
| D100 ~ D103 |               | FX <sub>2N</sub> -4DA's output data (BFM #1 ~ #4)          |
| D104        | Lower 8 bits  | FX <sub>0N</sub> -8ER-ES/UL's Y0 ~ Y3 (bit 4 ~ 7 not used) |
|             | Higher 8 bits | FX <sub>0N</sub> -8EYT-ESS/UL's Y10 ~ Y17                  |
| D105 ~ D199 |               | These device areas are not used.                           |



**Note:**

In configuring 32DP-IF GSD file, first assign special function blocks, second extension I/O units/blocks' input data, and finally extension I/O units/blocks' output data. If the parameter in DP-master is not the same as an actual configuration, the 32DP-IF will not operate correctly.

## 5.2 Diagnostic Devices (Special Devices)



### Unsettable Devices:

Any device of type M or D that is marked with a “(✕)” or “(✎)” cannot be set by the programming tool. In the case of M devices this means the associated coil cannot be driven but all devices can be monitored. For data devices D, new values cannot be written to the register by a user but the register contents can be monitored.

### Symbol Summary:

- ✕ automatically written to by the 32DP-IF
- ✎ automatically written to by the DP-master
- ➔ 32DP-IF send an extended diagnosis message to DP-master if marking device is ON.  
For diagnostic message, refer to chapter 7.

### 5.2.1 32DP-IF Status (M8000 ~ M8009 and D8000 ~ D8009)

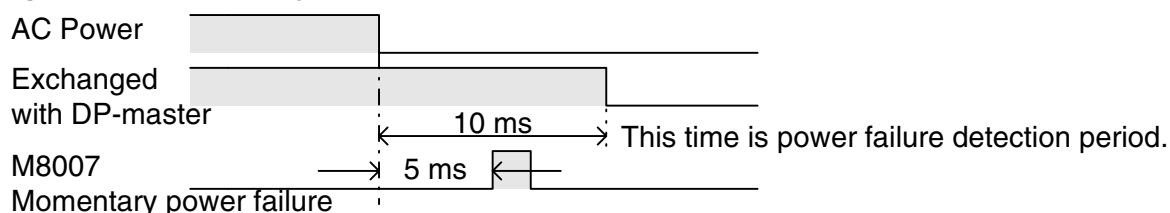
**Table 5.3: Special Auxiliary Relays (M8000 ~ M8009)**

| Diagnostic Device             | Name                    | Description                                                                                                          |
|-------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|
| M8000 (✕)                     | RUN LED monitor         | ON when 32DP-IF is exchanging data with extension I/O blocks/units and special. This device operate same as RUN LED. |
| M8001 ~ M8003                 | Reserved                |                                                                                                                      |
| M8004 (✕)<br>(ref. D8004)     | Error occurrence        | ON when one or more error flags (M8060 to M8068) is ON. If this bit is ON, error number is written in D8004.         |
| M8005, M8006                  | Reserved                |                                                                                                                      |
| M8007 (✕) (→)<br>(ref. D8007) | Momentary power failure | See Figure 5.2.                                                                                                      |
| M8008, M8009                  | Reserved                |                                                                                                                      |

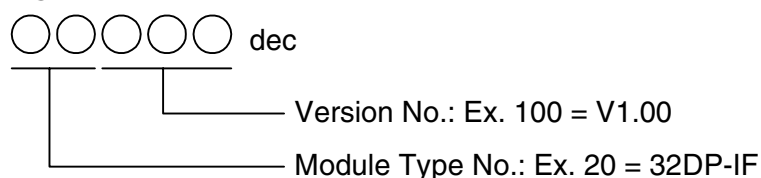
**Table 5.4: Special Data Registers (D8000 ~ D8009)**

| Diagnostic Device | Name                               | Description                                                                                                     |
|-------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| D8000             | Reserved                           |                                                                                                                 |
| D8001 (✕)         | 32DP-IF version                    | This value is 32DP-IF version code. See Figure 5.3.                                                             |
| D8002, D8003      | Reserved                           |                                                                                                                 |
| D8004 (✕) (→)     | Error number<br>M☆☆☆☆              | The contents of this register ☆☆☆☆ identifies which error flag is active, i.e. if ☆☆☆☆ = 8061, identifies M8061 |
| D8005, D8006      | Reserved                           |                                                                                                                 |
| D8007 (✕) (→)     | Number of momentary power failures | This value is counted when M8007 is ON. This value is reset on full power OFF.                                  |
| D8008 (✕)         | Power failure detection period     | Power failure detection period is 10 ms.                                                                        |
| D8009             | Reserved                           |                                                                                                                 |

**Figure 5.2: Momentary Power failures**



**Figure 5.3: 32DP-IF Version**



### 5.2.2 Clock Devices (D8010 ~ D8019)

**Table 5.5: Special Data Registers (M8010 ~ M8019)**

| Diagnostic Device | Name     | Operation |
|-------------------|----------|-----------|
| M8010 ~ M8019     | Reserved |           |

**Table 5.6: Special Data Registers (D8010 ~ D8019)**

| Diagnostic Device | Name              | Operation                                         |
|-------------------|-------------------|---------------------------------------------------|
| D8010 (✕)         | Present scan time | Current operation cycle time in units of 0.1 msec |
| D8011 (✕)         | Minimum scan time | Minimum cycle time in units of 0.1 msec           |
| D8012 (✕)         | Maximum scan time | Maximum cycle time in units of 0.1 msec           |
| D8013 ~ D8019     | Reserved          |                                                   |

### 5.2.3 Profibus-DP Network Status (M8020 ~ M8039 and D8020 ~ D8039)

**Table 5.7: Special Auxiliary Relays (M8020 ~ M8039)**

| Diagnostic Device | Name               | Description                                                                                                                                                                                                          |
|-------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M8020             | Setting parameter  | When this bit is changed from OFF to ON, the parameter D200 ~ D299 (made by the programming tool) is written to special function blocks' BFM. After the write is completed, this bit is turned automatically to OFF. |
| M8021 ~ M8033     | Reserved           |                                                                                                                                                                                                                      |
| M8034             | All output disable | All physical switch gear for activating outputs is disabled. However, for debugging purposes the logical state of these outputs (D100 ~ D199) can be set, but remain disabled in the actual module.                  |
| M8035 ~ M8039     | Reserved           |                                                                                                                                                                                                                      |

**Table 5.8: Special Data Registers (D8020 ~ D8039)**

| Diagnostic Device | Name                                     | Description                                                                                                                                                                                                       |
|-------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D8020 (🔍)         | Data exchange status                     | Data register D8020 contains a status bit for data exchange. If this is "1", 32DP-IF is in data exchange mode. If this is "0", 32DP-IF is not in data exchange mode.                                              |
| D8021 (🔍)         | Swap byte order                          | See note 1.                                                                                                                                                                                                       |
| D8022 (🔍)         | Length of input (sent) data in byte      | The values held in these devices are copied from the input data length and output data length setting in the DP-master.                                                                                           |
| D8023 (🔍)         | Length of output (received) data in byte |                                                                                                                                                                                                                   |
| D8024 (🔍)         | Baud rate                                | See note 2.                                                                                                                                                                                                       |
| D8025 (🔍)         | Communication status                     | See note 3.                                                                                                                                                                                                       |
| D8026 (✖)         | Profibus module ID (PNO ID code)         | PNO-Nr.F232 (Hex)<br>(This number contains the Profibus module ID number for the 32DP-IF.)                                                                                                                        |
| D8027 (✖)         | Slave address                            | The slave address is set only by the 32DP-IF's DIP switches. The slave address value is 0 to 126. The address change by a Profibus-DP Class 2 master via the network or by a programming device is not supported. |
| D8028             | Reserved                                 |                                                                                                                                                                                                                   |
| D8029 (✖) (➔)     | Error status                             | See note 4.                                                                                                                                                                                                       |

**Note 1: Swap byte order**

Some DP-masters handle lower bytes and higher bytes of a word in a reverse order than the 32DP-IF. To enable the module to communicate with these masters, bit 0 of data register D8021 can be set. If bit 0 is “1”, the low order byte and the high order byte of each user data word and of the user specific diagnosis will be swapped. Bit 0 of D8021 can also be set or reset by the second user defined parameter byte received from a master. The default value after power up is “0”.

**Note 2: Baud rate**

This device shows the current baud rate of the Profibus-DP network. The baud rate depends on the DP-master settings. The following table shows the supported baud rates and the value of D8024. If the module is in baud search mode, this value frequently changes until the module has found a supported baud rate as follows.

**Table 5.9: Baud Rate in D8024**

| Values in D8024<br>(Hex) | Baud Rate (bps) |
|--------------------------|-----------------|
| 96E2 H                   | 9,600           |
| 19E3 H                   | 19.2k           |
| 45E3 H                   | 45.45k          |
| 93E3 H                   | 93.75k          |
| 18E4 H                   | 187.5k          |

| Values in D8024<br>(Hex) | Baud Rate (bps) |
|--------------------------|-----------------|
| 05E5 H                   | 500k            |
| 15E5 H                   | 1.5M            |
| 03E6 H                   | 3M              |
| 06E6 H                   | 6M              |
| 12E6 H                   | 12M             |

**Note 3: Communication status**

This device is the 32DP-IF's communication status. According to the status of 32DP-IF the bits are set and reset as follows.

**Table 5.10: Communication Status in D8025**

| Bit No.    | Description                  | 1 (ON)                                     | 0 (OFF)                            |
|------------|------------------------------|--------------------------------------------|------------------------------------|
| Bit 0      | Module on-line/off-line      | Module on-line                             | Module off-line                    |
| Bit 1      | Reserved                     |                                            |                                    |
| Bit 2      | Diagnosis flag               | New diagnosis not yet fetched by DP-master | New diagnosis fetched by DP-master |
| Bit 3      | Reserved                     |                                            |                                    |
| Bit 4, 5   | DP-status                    | (bit 5, 4) = (0, 0)                        | Wait parameter state               |
|            |                              | (bit 5, 4) = (0, 1)                        | Wait configuration state           |
|            |                              | (bit 5, 4) = (1, 0)                        | Data exchange state                |
|            |                              | (bit 5, 4) = (1, 1)                        | Not possible                       |
| Bit 6, 7   | DP-watchdog state            | (bit 7, 6) = (0, 0)                        | Baud search state                  |
|            |                              | (bit 7, 6) = (0, 1)                        | Baud control state                 |
|            |                              | (bit 7, 6) = (1, 0)                        | DP search state                    |
|            |                              | (bit 7, 6) = (1, 1)                        | Not possible                       |
| Bit 8      | Reserved                     |                                            |                                    |
| Bit 9      | Clear data global control *1 | Clear data command received                | No clear data command received     |
| Bit 10     | Unfreeze global control *2   | Unfreeze command received                  | No unfreeze command received       |
| Bit 11     | Freeze global control *3     | Freeze command received                    | No freeze command received         |
| Bit 12     | Unsync global control *4     | Unsync command received                    | No unsync command received         |
| Bit 13     | Sync global control *5       | Sync command received                      | No sync command received           |
| Bit 14, 15 | Reserved                     |                                            |                                    |

\*1 Clear data global control: When this command is received, the 32DP-IF set to "0" the output data (D100 ~ D199) of extension units/blocks connected it.

\*2 Unfreeze global control: The UNFREEZE control command stops freeze control mode. The input data (D0 ~ D99) of extension units/blocks connected to the 32DP-IF is immediately sent to the DP-master.

\*3 Freeze global control: The DP-master sends a FREEZE control command to a group of DP-slaves to hold their current input status. The input data (D0 ~ D99) of extension units/blocks connected to the 32DP-IF are withheld until the next FREEZE/UNFREEZE control command is received.

\*4 Unsync global control: The UNSYNC command stops SYNC control mode. The output data (D100 ~ D199) send from the DP-master is immediately transmitted to extension units/blocks connected to the 32DP-IF.

\*5 Sync global control: The DP-master sends a SYNC control command to a group of DP-slaves to synchronize their current output states. The output data (D100 ~ D199) of extension units/blocks connected to the 32DP-IF remains constant until the next SYNC/UNSYNC command is received.

**Note 4: Error status**

Data register D8029 reflects the error status of the 32DP-IF. In case of a general error (bit 0 = ON) the module tries to send a static diagnosis to the DP-master. In this case normal data exchange is not possible. If bit 0 returns to the Off state, the static diagnosis message is also reset.

The definition of the error bit is shown in the table below.

**Table 5.11: Error status in D8029**

| Bit No.                     | Description               | 0 (OFF)                            | 1 (ON)                                                                                                                                       |
|-----------------------------|---------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Bit 0                       | general error             | No general error                   | This bit is ON if one or more error bits (bit 2, 6, 7) are ON. Check Bit 2, 6 and 7 in D8029.                                                |
| Bit 1                       | Reserved                  |                                    |                                                                                                                                              |
| Bit 2                       | External 24 V power error | Power supply is normal             | DC 24 V power supply failure                                                                                                                 |
| Bit 3 ~ 5                   | Reserved                  |                                    |                                                                                                                                              |
| Bit 6<br>(ref. Table 4.11)  | I/O bus error             | No I/O bus error                   | I/O bus error occurred. Check extension bus cable for I/O extension units/blocks and error code in D8060.                                    |
| Bit 7<br>(ref. Table 4.11)  | Operation error           | No operation error                 | Operation error occurred. Check extension bus cable for special function blocks, and DP-master parameter, and error code in D8067 and D8068. |
| Bit 8, 9                    | Reserved                  |                                    |                                                                                                                                              |
| Bit 10<br>(ref. Table 4.11) | configuration error       | Configuration data valid           | Invalid configuration data received. Check configuration for 32DP-IF in the DP-master and D8040 ~ D8055.                                     |
| Bit 11<br>(ref. Table 4.11) | Parameter error           | Parameter data valid               | Invalid parameter data received. Check parameter for 32DP-IF in the DP-master and D200 ~ D299, and error code in D8064 and D8068.            |
| Bit 12 ~ 14                 | Reserved                  |                                    |                                                                                                                                              |
| Bit 15                      | RUN/STOP status           | RUN/STOP switch is in RUN position | RUN/STOP switch is in STOP position                                                                                                          |

#### 5.2.4 Configuration Status (M8040 ~ M8059 and D8040 ~ D8059)

M8040 ~ M8059 are reserved. The configuration bytes in D8040 ~ D8059 define the amount of data which is exchanged between the corresponding I/O units/blocks, special function blocks and the DP-master.

**Table 5.12: Special Data Registers (D8040 ~ D8059)**

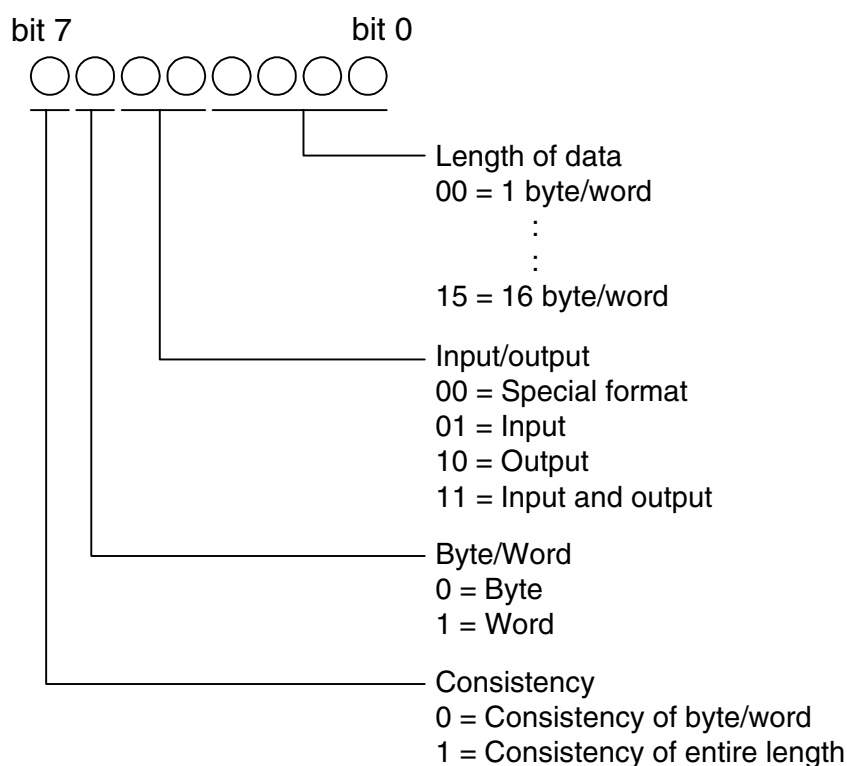
| Diagnostic Device |              | Name                     | Description                                                                                                                                                                                                                                             |
|-------------------|--------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D8040 (✖)         | Lower 8 bits | Configuration data 1 *1  | The data registers D8040~D8055 display the actual configuration of the node station. After power on, when the 32DP-IF is in the search baud rate state or in the wait configuration state, these data registers contain the default configuration data. |
|                   | Higher 8bits | Configuration data 2 *1  |                                                                                                                                                                                                                                                         |
| D8041 (✖)         | Lower 8 bits | Configuration data 3 *1  |                                                                                                                                                                                                                                                         |
|                   | Higher 8bits | Configuration data 4 *1  |                                                                                                                                                                                                                                                         |
| D8042 (✖)         | Lower 8 bits | Configuration data 5 *1  |                                                                                                                                                                                                                                                         |
|                   | Higher 8bits | Configuration data 6 *1  |                                                                                                                                                                                                                                                         |
| ⋮                 |              | ⋮                        |                                                                                                                                                                                                                                                         |
| D8055 (✖)         | Lower 8 bits | Configuration data 31 *1 |                                                                                                                                                                                                                                                         |
|                   | Higher 8bits | Configuration data 32 *1 |                                                                                                                                                                                                                                                         |
| D8056 ~ D8059     |              | Reserved                 |                                                                                                                                                                                                                                                         |

\*3 This value shows as following Figure.

Ex.1 10 hex = 1 byte (8 bit) inputs not consistent

Ex.2 63 hex = 4 word outputs not consistent

**Figure 5.4: Configuration Data**



### 5.2.5 Error Status (M8060 ~ M8069 and D8060 ~ D8069)

**Table 5.13: Special Auxiliary Relays (M8060 ~ M8069)**

| Diagnostic Device                    | Name                                | Check Points                                                                                             |
|--------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------|
| M8060 (✕) (→)<br>(ref. D8060, D8061) | I/O configuration error             | If this flag is ON, check error code in D8060, D8061 and extension cable.                                |
| M8061 (✕) (→)<br>(ref. D8060, D8061) | 32DP-IF hardware error              | If this bit is ON, check error code in D8061.                                                            |
| M8062, M8063                         | Reserved                            |                                                                                                          |
| M8064 (✕) (→)<br>(ref. D8064)        | Parameter error                     | If this flag is ON, check error code in D8064 and DP-master setting.                                     |
| M8065, M8066                         | Reserved                            |                                                                                                          |
| M8067 (✕) (→)<br>(ref. D8067)        | Operation error                     | If this flag is ON, check error code in D8067 and D8068, DP-master parameter, and the extension cable.   |
| M8068 (✕)<br>(ref. D8068)            | Parameter error and operation error | If M8064 or M8067 is ON, this bit would be set to ON. This bit is cleared by resetting the power supply. |
| M8069                                | Reserved                            |                                                                                                          |

**Table 5.14: Special Data Registers (D8060 ~ D8069)**

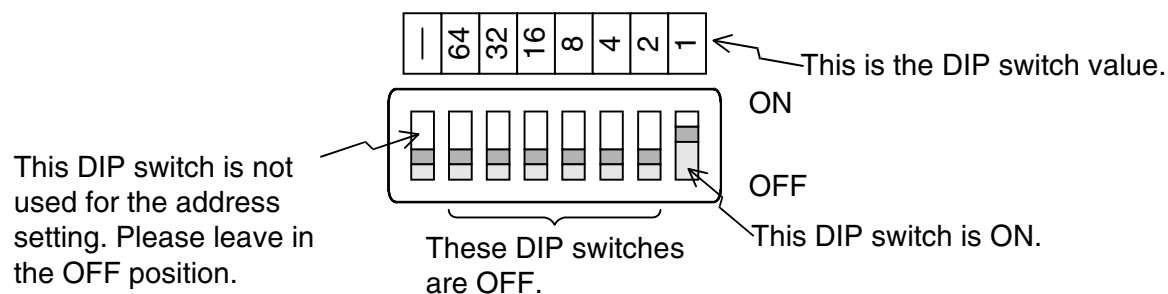
| Diagnostic Device | Name                                | Error code                                                                                                     | Description                                                                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D8060 (✕) (→)     | I/O configuration error             | This device contains the lowest device address that caused the error. Check D8061                              |                                                                                                                                                                                                                                                                                                             |
| D8061 (✕) (→)     | 32DP-IF hardware error              | 0                                                                                                              | No error                                                                                                                                                                                                                                                                                                    |
|                   |                                     | 6102                                                                                                           | Operation circuit error: Please contact a service representative.                                                                                                                                                                                                                                           |
|                   |                                     | 6103                                                                                                           | I/O bus error: Check extension cable for Extension I/O units/blocks.                                                                                                                                                                                                                                        |
|                   |                                     | 6129                                                                                                           | BFM #29 (error status) of a connected special function block shows a value that is different from “0”. Please check the diagnosis message at the DP-master.                                                                                                                                                 |
| D8062, D8063      | Reserved                            |                                                                                                                |                                                                                                                                                                                                                                                                                                             |
| D8064 (✕) (→)     | Parameter error                     | 0                                                                                                              | No error                                                                                                                                                                                                                                                                                                    |
|                   |                                     | 6406                                                                                                           | Parameter error for extension units/blocks: Check error code in D8068, and parameter in the DP-master.                                                                                                                                                                                                      |
|                   |                                     | 6407                                                                                                           | Parameter length error: Parameter data too long, check parameter’s length in the DP-master.                                                                                                                                                                                                                 |
|                   |                                     | 6408                                                                                                           | Configuration error for extension units/blocks: Check error code in D8068, and parameter in the DP-master.                                                                                                                                                                                                  |
|                   |                                     | 6410                                                                                                           | DIP switch error: DIP switch error refer to the address setting DIP switch on the 32DP-IF module: DIP switch position does not decided ON or OFF when the power of 32DP-IF is turned ON. Check position of DIP switch. If the position of DIP switch is ON or OFF, please contact a service representative. |
| D8065,D8066       | Reserved                            |                                                                                                                |                                                                                                                                                                                                                                                                                                             |
| D8067 (✕) (→)     | Operation error                     | 0                                                                                                              | No error                                                                                                                                                                                                                                                                                                    |
|                   |                                     | 6708                                                                                                           | Operation error: Operation error for transmitting special function block occurs, check error code in D8068, and DP-master parameter, and extension cable.                                                                                                                                                   |
| D8068 (✕) (→)     | Parameter error and operation error | This device contains the lowest special function block’s address that caused the error. Check D8064 and D8067. |                                                                                                                                                                                                                                                                                                             |
| D8069             | Reserved                            |                                                                                                                |                                                                                                                                                                                                                                                                                                             |

## 6. Address Setting

### 6.1 Setting the Address

The slave address of 32DP-IF for Profibus network is set by the ON/OFF configuration of DIP switches. Slave address setting range is 0 ~ 126. When 32DP-IF's power supply is turned ON, the slave address is the sum total of these DIP switch values.

**Figure 6.1: DIP Switches**



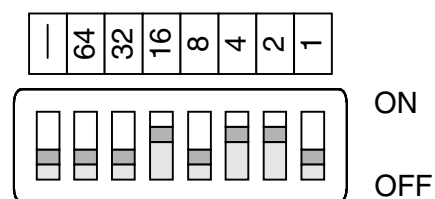
**Note:**

If the address of 32DP-IF is changed, the 32DP-IF must be turned OFF and ON again in order to activate the new address.

### 6.2 Example Address Setting

If slave address of 32DP-IF is set to "22", the DIP switches are as shown below.

**Figure 6.2: Address Setting**



## MEMO

## 7. User Parameter

### 7.1 User Parameter Rules

Some bytes of input data and output data exchanged with the DP-master (the 32DP-IF's configuration) must be defined by user parameter. Also defined by user parameters are how the exchanged data should be distributed between the available I/O points and special function blocks. Some applications require initial settings, like gain and offset of analog blocks. For these purposes, the 32DP-IF requires a set of parameter data, which must be determined by the user parameter.

For default user parameter, refer to section 7.2.



**Note:**

User parameter data become valid for 32DP-IF and special function blocks (ex. FX2N-4AD, FX2N-4DA).

**Table 7.1: User Parameter Configuration**

|                                                    | Byte No.                              |
|----------------------------------------------------|---------------------------------------|
| User parameter for 32DP-IF (Global user parameter) | 0                                     |
|                                                    | 1                                     |
| User parameter for first special function block    | 2                                     |
|                                                    | :                                     |
|                                                    | :                                     |
|                                                    | $1 + (2 + m_1^{*1})$                  |
| User parameter for second special function block   | $1 + (2 + m_1^{*1}) + 1$              |
|                                                    | :                                     |
|                                                    | :                                     |
|                                                    | $1 + (2 + m_1^{*1}) + (2 + m_2^{*1})$ |
| :                                                  | :                                     |
| :                                                  | :                                     |

\*1  $m_1, m_2$ : Total length of parameter data for this special function block.

Figure 7.1: User Parameter Rules

| For 32DP-IF |                      |                                                                                                                                                  |
|-------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Byte No.    | 0                    | 1 <sup>*1</sup><br>Bit 0 ~ Bit 7                                                                                                                 |
| Meaning     | Not used (must be 0) | This byte is used for setting the Swap data, Swap parameter, Checking I/O block status, and Special function block's error status. <sup>*1</sup> |
| Description |                      |                                                                                                                                                  |

| For first special function block |                                                                         |                                                                          |                                                                   |                                                   |
|----------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------|
| Byte No.                         | 2 <sup>*3</sup>                                                         | 3                                                                        | 4                                                                 | 5                                                 |
| Meaning                          | Type code of special function block, lower byte of BFM 30 <sup>*4</sup> | Type code of special function block, higher byte of BFM 30 <sup>*4</sup> | Total length m of parameter data for this special function block. | Number (n) of BFM for data exchange <sup>*7</sup> |
| Description                      |                                                                         |                                                                          | $m = 2 + n + 3 \times b$ <sup>*6</sup>                            |                                                   |

| First special function block |                                                   |                                               |       |                                             |
|------------------------------|---------------------------------------------------|-----------------------------------------------|-------|---------------------------------------------|
| Byte No.                     | 6                                                 | 7                                             | ..... | 5 + n                                       |
| Meaning                      | First BFM address for data exchange <sup>*7</sup> | Second BFM address for exchange <sup>*7</sup> | ....  | n th BFM address for exchange <sup>*7</sup> |
| Description                  |                                                   |                                               |       |                                             |

| First special function block |                                                            |                                    |                                            |                                             |
|------------------------------|------------------------------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------|
| Byte No.                     | 5 + n + 1                                                  |                                    | 5 + n + 2                                  | 5 + n + 3 × 1                               |
|                              | Bit 7                                                      | Bit 0 ~ 6                          |                                            |                                             |
| Meaning                      | Writing flag                                               | BFM address adjusted <sup>*8</sup> | Lower byte of parameter data <sup>*8</sup> | Higher byte of parameter data <sup>*8</sup> |
| Description                  | If this BFM is adjusted, this bit is ON (1). <sup>*8</sup> |                                    |                                            |                                             |

| First special function block |                                                            |                                    |                                            |                                             |
|------------------------------|------------------------------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------|
| Byte No.                     | 5 + n + 3 × 1 + 1                                          |                                    | 5 + n + 3 × 1 + 2                          | 5 + n + 3 × 2                               |
|                              | Bit 7                                                      | Bit 0 ~ 6                          |                                            |                                             |
| Meaning                      | Writing flag                                               | BFM address adjusted <sup>*8</sup> | Lower byte of parameter data <sup>*8</sup> | Higher byte of parameter data <sup>*8</sup> |
| Description                  | If this BFM is adjusted, this bit is ON (1). <sup>*8</sup> |                                    |                                            |                                             |

| For first special function block |       |                                             | For second special function block                                       |       |
|----------------------------------|-------|---------------------------------------------|-------------------------------------------------------------------------|-------|
| Byte No.                         | ..... | (5 + n + 3 × b) <sup>*9</sup>               | (5 + n + 3 × b) + 1 <sup>*10</sup>                                      | ..... |
| Meaning                          |       | Higher byte of parameter data <sup>*8</sup> | Type code of special function block, lower byte of BFM 30 <sup>*4</sup> |       |
| Description                      |       |                                             |                                                                         |       |

\*1 This byte is used for setting the Swap data, Swap parameter, Checking I/O block status, and Special function block's error status. See the following table.

**Table 7.2: Swap Data, Swap Parameter, Checking I/O Block Status, and Special Function Block's Status**

| Bit No.          | Meaning                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b0 <sup>*2</sup> | Swap data (Motorola/Intel)                    | This bit is used for swapping the byte data within the word data of special function block's BFMs.<br>1) When this bit is OFF (0), byte data is Intel format within the word data. (Not swapped)<br>2) When this bit is ON (1), byte data is Motorola format within the word data. (Swapped)                                                                                                                                                                                                                                       |
| b1               | Cyclic status check of I/O units              | This bit is used for checking status of I/O block.<br>1) When this bit is OFF (0), the status check of the I/O units/blocks is not performed.<br>2) When this bit is ON (1), the status check of the I/O units/blocks is performed in every cycle.                                                                                                                                                                                                                                                                                 |
| b2               | Error check of special function units/blocks  | This bit is used for checking the error status (BFM #29) of special function blocks.<br>1) When this bit is OFF (0), error status (BFM #29) in all connected special function blocks is not checked.<br>2) When this bit is ON (1), error status (BFM #29) in all connected special function blocks is checked in every cycle.<br>However, the following modules are not checked.<br><ul style="list-style-type: none"> <li>• FX2N-10GM</li> <li>• FX2N-20GM</li> <li>• FX2N-2AD</li> <li>• FX2N-2DA</li> <li>• FX0N-3A</li> </ul> |
| b3 <sup>*2</sup> | Swap word parameter for BFMs (Motorola/Intel) | This bit is used for swapping byte data within the word parameter.<br>1) When this bit is OFF (0), byte data is Intel format within the word parameter. (Not swapped)<br>2) When this bit is ON (1), byte data is Motorola format within the word parameter. (Swapped)                                                                                                                                                                                                                                                             |
| b4 ~ b7          | Not used (These bits are always OFF.)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

\*2 These bit settings are different depending upon the connected master module.

- a) When connecting the A and Q series (MITSUBISHI) master module, these bits set to OFF (Intel format).
- b) When connecting other master module, please check these points in the master module's manual.

\*3 This byte number is the first parameter data of first special function block.

- \*4 Type code of special function block is as following table. This code in the parameter must be written first in the Lower byte and second in the higher byte.

**Table 7.3: Type Code of Special Function Blocks**

| Model                  | Type Code |          |
|------------------------|-----------|----------|
|                        | Dec.      | Hex      |
| FX2N-4AD               | K2010     | 07DA Hex |
| FX2N-4AD-TC            | K2030     | 07EE Hex |
| FX2N-4AD-PT            | K2040     | 07F8 Hex |
| FX2N-4DA               | K3020     | 0BCC Hex |
| FX2N-2AD <sup>*5</sup> | K1        | 0001 Hex |
| FX2N-2DA <sup>*5</sup> |           |          |
| FX0N-3A <sup>*5</sup>  |           |          |
| FX2N-1HC               | K4010     | 0FAA Hex |
| FX2N-1PG               | K5110     | 13F6 Hex |
| FX2N-10GM              | K5310     | 14BE Hex |
| FX2N-20GM              | K5210     | 145A Hex |
| FX2N-32ASI-M           | K7070     | 1B9E Hex |
| FX2N-232IF             | K7030     | 1B76 Hex |

\*5 These types do not have a type code inside the special function blocks.

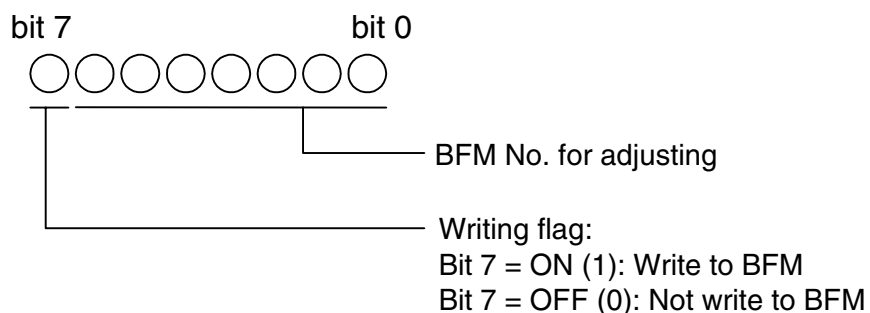
\*6 b: This value is number of BFM's that are adjusted by this parameter set.

\*7 Number of exchanged BFM for input or output data ( $n = 0 \sim 32$ ) defines how many words are reserved for data exchange with the DP-master. The following bytes define the BFM addresses of those words.

For example K3 K1 K2 K5 defines 3 words of input data, read from BFM #1, BFM #2 and BFM #5 of the corresponding special function block or written to BFM #1, BFM #2 and BFM #5.

\*8 The format of this parameter byte is "bit 7 = write flag" and "bit 6 ~ bit 0 = BFM address". If "bit 7 = ON (1)", the data of the following two bytes are written to the BFM specified in bit 6 ~ bit 0. If bit 7 = 0, the following two bytes will be ignored. This mechanism is used to write all parameter data from the GSD file or D200 ~ D299 to the BFM of the special function block.

**Figure 7.2: Order BFM No. for adjusting BFM's**



- \*9 This byte number is the last parameter data of first special function block.
- \*10 This byte number is the first parameter data of second special function block.  
If 32DP-IF uses 4 special function blocks, user parameter must be made 4 patterns (byte No. "2" ~ " $5 + n + 3 \times b$ ").

## 7.2 Default User Parameter

32DP-IF communicates with the master by this default parameter at the following.

- From power on until parameter received from master.
- Using simple communication (3 word interface, 6 word interface and 15 word interface, etc.) with GX-Configurator (or ProfiMap).
- Using FX0N-3A, FX2N-2AD, FX2N-2DA, FX2N-10GM and FX2N-20GM with GX-Configurator (or ProfiMap).
- Using this parameter with configuration software such as GX-Configurator (or ProfiMap).

**Figure 7.3: Default User Parameter**

| User Parameter for 32DP-IF |             |                                                                                                                                                  |  |  |
|----------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Byte No.                   | 0           | 1                                                                                                                                                |  |  |
|                            |             | Bit 0 ~ Bit 7                                                                                                                                    |  |  |
| Meaning                    | Not used    | This byte is used for setting the Swap data, Swap parameter, Checking I/O block status, and Special function block's error status. <sup>*1</sup> |  |  |
| Description                | (must be 0) |                                                                                                                                                  |  |  |

| User Parameter for First Special Function Block |                                                                         |                                                                          |                                                                   |                                                                             |
|-------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Byte No.                                        | 3                                                                       | 4                                                                        | 5                                                                 | 6                                                                           |
| Meaning                                         | Type code of special function block, lower byte of BFM 30 <sup>*3</sup> | Type code of special function block, higher byte of BFM 30 <sup>*3</sup> | Total length m of parameter data for this special function block. | Contains n = 0, as BFM addresses will be assigned dynamically <sup>*5</sup> |
| Description                                     |                                                                         |                                                                          | m = 2 <sup>*4</sup>                                               |                                                                             |

| User Parameter for Last (y <sup>*6</sup> th) Special Function Block |       |                                                                         |       |                                                                             |
|---------------------------------------------------------------------|-------|-------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------|
| Byte No.                                                            | ..... | $2 + 4 \times (y^{*6} - 1) + 1$                                         | ....  | $2 + 4 \times y^{*6}$                                                       |
| Meaning                                                             | ..... | Type code of special function block, lower byte of BFM 30 <sup>*1</sup> | ..... | Contains n = 0, as BFM addresses will be assigned dynamically <sup>*5</sup> |
| Description                                                         |       |                                                                         |       |                                                                             |

\*1 This byte is used for setting the Swap data, Swap parameter, Checking I/O block status, and Special function block's error status. See the following table.

**Table 7.4: Swap Data, Swap Parameter, Checking I/O Block Status, and Special Function Block's Status**

| Bit No.          | Meaning                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b0 <sup>*2</sup> | Swap data (Motorola/Intel)                    | This bit is used for swapping the byte data within the word data of special function block's BFMs.<br>1) When this bit is OFF (0), byte data is Intel format within the word data. (Not swapped)<br>2) When this bit is ON (1), byte data is Motorola format within the word data. (Swapped)                                                                                                                                                                                                                                       |
| b1               | Cyclic status check of I/O units              | This bit is used for checking status of I/O block.<br>1) When this bit is OFF (0), the status check of the I/O units/blocks is not performed.<br>2) When this bit is ON (1), the status check of the I/O units/blocks is performed in every cycle.                                                                                                                                                                                                                                                                                 |
| b2               | Error check of special function units/blocks  | This bit is used for checking the error status (BFM #29) of special function blocks.<br>1) When this bit is OFF (0), error status (BFM #29) in all connected special function blocks is not checked.<br>2) When this bit is ON (1), error status (BFM #29) in all connected special function blocks is checked in every cycle.<br>However, the following modules are not checked.<br><ul style="list-style-type: none"> <li>• FX2N-10GM</li> <li>• FX2N-20GM</li> <li>• FX2N-2AD</li> <li>• FX2N-2DA</li> <li>• FX0N-3A</li> </ul> |
| b3 <sup>*2</sup> | Swap word parameter for BFMs (Motorola/Intel) | This bit is used for swapping byte data within the word parameter.<br>1) When this bit is OFF (0), byte data is Intel format within the word parameter. (Not swapped)<br>2) When this bit is ON (1), byte data is Motorola format within the word parameter. (Swapped)                                                                                                                                                                                                                                                             |
| b4 ~ b7          | Not used (These bits are always OFF.)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

\*2 These bit settings are different depending upon the connected master module.

- a) When connecting the A and Q series (MITSUBISHI) master module, these bits set to OFF (Intel format).
- b) When connecting other master module, please check these points in the master module's manual.

\*3 Type code of special function block is as following table. This code in the parameter must be written first Lower byte and second Higher byte

**Table 7.5: Type Code of Special Function Blocks**

| Model        | Type Code |          |
|--------------|-----------|----------|
|              | Dec.      | Hex      |
| FX2N-4AD     | K2010     | 07DA Hex |
| FX2N-4AD-TC  | K2030     | 07EE Hex |
| FX2N-4AD-PT  | K2040     | 07F8 Hex |
| FX2N-4DA     | K3020     | 0BCC Hex |
| FX2N-2AD     | K1        | 0001 Hex |
| FX2N-2DA     |           |          |
| FX0N-3A      |           |          |
| FX2N-8AD     | K2050     | 0802 Hex |
| FX2N-2LC     | K2060     | 080C Hex |
| FX2N-1HC     | K4010     | 0FAA Hex |
| FX2N-10PG    | K5120     | 1400 Hex |
| FX2N-1PG     | K5110     | 13F6 Hex |
| FX2N-10GM    | K5310     | 14BE Hex |
| FX2N-20GM    | K5210     | 145A Hex |
| FX2N-32ASI-M | K7070     | 1B9E Hex |
| FX2N-232IF   | K7030     | 1B76 Hex |

\*4 After power on, the default setting of this parameter for every special function block is 2.

\*5 After power on, the default setting of this parameter is 0, as the BFM addresses for reading/writing command are not coded in the parameter data, but are sent together with the Profibus data. For exchanged data, refer to section 7.2.1.

\*6 “y” is number of connected special function blocks to 32DP-IF. (y = 1 ~ 8)

### 7.2.1 Exchanged Data by Default User Parameter

After power on, the bus node does not know about the I/O features of the connected special function blocks. So each special function block is assigned to one reading command and one writing command. The exchanged data is as follows:

**Table 7.6: Exchanged Data**

| Data word | Output area (send)                                                                                         | Input area (receive)                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1st       | Special function block's BFM address is written for input data (Reading from 32DP-IF) (Bit15 = write flag) | This value is BFM's data read from special function block.                              |
| 2nd       | This data is written to special function block's BFM for output data.                                      | This value was written to special function block's BFM.<br>(Written value is read back) |
| 3rd       | Special function block's BFM address is written for output data (writing to 32DP-IF) (Bit15 = write flag)  | This value was special function block's BFM address.<br>(Written value is read back)    |

#### Example

Reading BFM #17 and writing K1000 to BFM #9 in the special function block.

**Table 7.7: Example Exchanged Data**

| Data word | Output Data                                             | Input Data                             |
|-----------|---------------------------------------------------------|----------------------------------------|
| 1st       | 8011hex = 11hex (17 dez = BFM #17) + 8000 hex (bit15=1) | nnnn = hex value of BFM #17            |
| 2nd       | 03E8 hex = (1000 dez)                                   | 03E8 hex = hex value of BFM #9         |
| 3rd       | 8009 hex = 09 hex (9 dez = BFM #9) + 8000 hex (bit15=1) | 8009 hex = verification of BFM address |

Basically this parameter block is only for the case when reaching the limits of the parameter data memory or Profibus I/O data memory. It is possible to use this block for every special function block listed above, but it is more comfortable to use the extended or short parameter settings of a special function block. The high address BFM area of some Special Function Block's (Ex- FX<sub>2N</sub>-232IF) is only accessible by using this communication format.

#### Communication procedure:

For further explanation, the first word of the cyclical send data is called the "FROM ADDRESS", the second word is called the "TO DATA" and the third "TO ADDRESS". According to this "FROM DATA", "TO DATA (read back)" and "TO ADDRESS (read back)" describes the first, second and third word of the cyclically received data. The most significant bit (MSB) of the "FROM ADDRESS" and the "TO ADDRESS" is a flag which is used to request a FROM/TO instruction inside the FX<sub>2N</sub>-32DP-IF. If this bit is 0, the contents of the "FROM ADDRESS" and the "TO ADDRESS" are transmitted to the FX<sub>2N</sub>-32DP-IF but no read/write command is executed. If the MSB is set to 1, the BFM specified by bit 0 - 14 is addressed.

Example- if the "TO ADDRESS" is 8000 Hex, the content of "TO DATA" is written to BFM 0.

## Write Operation (TO):

Possible special function block BFM addresses: 0 to 32767

First write the data to send to the BFM into "TO DATA", then write the BFM number + MSB = 1 into the "TO ADDRESS". If the "TO ADDRESS" is the same as the "TO ADDRESS (read back)" and "TO DATA" is the same as "TO DATA (read back)", the write operation is executed correctly.

Before write the next data into "TO DATA", please reset "TO ADDRESS" to 0 or reset at least the MSB of "TO ADDRESS". Otherwise the new data is written to the old BFM.

**Table 7.8: Write Operation (TO)**

| Data word | data to be send in every cycle  | data received in every cycle |
|-----------|---------------------------------|------------------------------|
| 1st       | FROM ADDRESS (bit 15 MUST be 0) | FROM DATA in this case 0     |
| 2nd       | TO DATA                         | TO DATA (read back)          |
| 3rd       | TO ADDRESS (bit 15 MUST be 1)   | TO ADDRESS (read back)       |

## Read Operation (FROM):

Possible special function block BFM addresses: 0 to 32767

To read a BFM, please write its number + MSB=1 into "FROM ADDRESS".

The data of the BFM will be received in "FROM DATA".

Two possible ways to make sure that the FROM data is valid:

- After  $1 \times$  Profibus cycle (master  $\rightarrow$  slave) +  $1 \times$  FX2N-32DP-IF cycle +  $1 \times$  Profibus cycle (slave  $\rightarrow$  master) it is possible to read the value of the selected BFM out of "FROM DATA". If FX2N-32DP-IF has a Firmware 1.10 or above, the cycle time is listed in BFM8010 (current), BFM8011 (min), BFM8012 (max).
- It is possible to use a feature similar to the write operation verify (Firmware 1.10 or above). If no write instruction is executed (MSB of "TO ADDRESS"=0), the data will be received in "FROM DATA" and the "FROM ADDRESS" is mapped to the "TO ADDRESS (read back)" by the FX2N-32DP-IF.

**Table 7.9: Read Operation (FROM)**

| Data word | data to be send in every cycle | data received in every cycle                                 |
|-----------|--------------------------------|--------------------------------------------------------------|
| 1st       | FROM ADDRESS                   | FROM DATA                                                    |
| 2nd       | not used                       | TO DATA (read back) in this case 0                           |
| 3rd       | not used (bit 15 MUST be 0)    | TO ADDRESS (read back) in this case FROM ADDRESS (read back) |

## Read and Write Operation:

To execute both a read and a write operation at the same time, keep the following order:

- Write the BFM number to read + MSB = 1 into "FROM ADDRESS"
- Write the data to write into "TO DATA"
- Write the BFM number to write to +MSB=1 into "TO ADDRESS"

If this procedure is performed, the "FROM DATA" is valid and the write operation is complete when the read back values become the same as "TO DATA" and "TO ADDRESS". Please take care of the MSB of "TO ADDRESS" before writing new data into "TO DATA" (see Write operation (TO)).

Ex- Profimap "Input CPU Device" = D0, "Output CPU Device" = D20

**Table 7.10: Example Configuration**

| configuration             |                    | 32DP-IF | FX2N-4DA<br>(Extension<br>Configuration) | FX2N-4DA<br>(Short<br>Configuration) | FX2N-4AD<br>(Short<br>Configuration) | FX2N-4AD<br>(Simple<br>Communication<br>3W-IF) |
|---------------------------|--------------------|---------|------------------------------------------|--------------------------------------|--------------------------------------|------------------------------------------------|
| parameter                 | size               | 2 byte  | 50 byte                                  | 11 byte                              | 11 byte                              | 4 byte                                         |
| cyclic<br>read data       | size               | 0 byte  | 0 byte                                   | 0 byte                               | 8 byte                               | 6 byte (3 words)                               |
|                           | Data<br>register*1 | -       | -                                        | -                                    | D0 ~ D3                              | D4 ~ D6                                        |
| cyclic<br>written<br>data | size               | 0 byte  | 8 byte                                   | 8 byte                               | 0 byte                               | 6 byte (3 words)                               |
|                           | Data<br>register*1 | -       | D20 ~ D23                                | D24 ~ D27                            | -                                    | D28 ~ D30                                      |

\*1 This data register is in 32DP-IF module.

To read BFM 5 of special function block 3 (FX2N-4AD in simple communication 3W-IF):

- Write 8005hex (MSB=1 + BFM 5 address) to D28.  
After  $2 \times$  Profibus cycle time +  $1 \times$  FX2N-32DP-IF cycle time (see D8010, D8011, D8012)  
D4 will contain the value of BFM5.
- Write 8005hex (MSB=1 + BFM 5 address) to D28. MSB of D30 must be 0.  
If D6 = D28 the operation is complete and D4 contains the value of BFM5.

To set the number of samples for channel 2 (BFM2) of SFB 3 to the value 10:

Write first 10 to D29 then 8002hex (MSB = 1 + BFM 2 address) to D30. The write operation has been completed successfully if D5 is the same as D29 and D6 the same as D30.

### 7.2.2 Exchanged Data Process by Simple Communication Interface

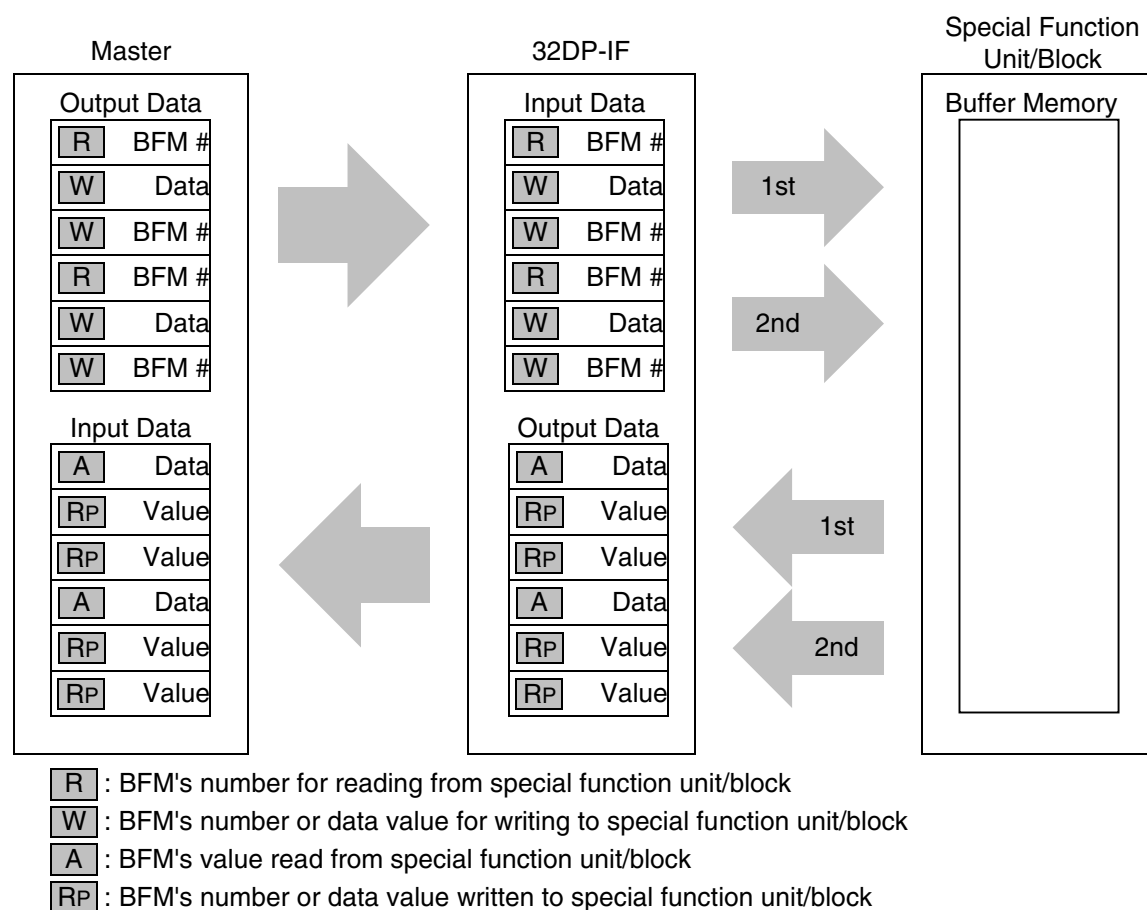
The Simple Communication Interface is a method to exchange data from the master to the 32DP-IF by the default user parameter. There are 3 word, 6 word, 9 word, 12 word and 15 word interface.

The Simple Communication Interface basically uses the Default Parameter one or more times (Refer to the table below and Figure 7.4).

**Table 7.11: Repeatedly a Frequency and Exchange Data Length**

| Items                      | Use Frequency | Exchange Data Length |                     |
|----------------------------|---------------|----------------------|---------------------|
|                            |               | Input Data (Bytes)   | Output Data (Bytes) |
| 3 word Interface (3W-IF)   | 1             | 6                    | 6                   |
| 6 word Interface (6W-IF)   | 2             | 12                   | 12                  |
| 9 word Interface (9W-IF)   | 3             | 18                   | 18                  |
| 12 word Interface (12W-IF) | 4             | 24                   | 24                  |
| 15 word Interface (15W-IF) | 5             | 30                   | 30                  |

**Figure 7.4: Simple Communication 6W-IF Case**



## 7.3 Configuring Slave Parameter



### Caution:

The user parameter data and configuration of the 32DP-IF must always be consistent. To ensure that the user parameter data and the configuration of the 32DP-IF are matching each other, the user parameter data set should always be constructed by using the GSD file that has been delivered with the 32DP-IF.

### 7.3.1 Configuring Slave Parameter by GSD file

The parameter setting of the 32DP-IF can be entirely defined using the GSD file that comes on the disk together with 32DP-IF. For an easy adjustment of all user parameter data, the MELSOFT GX-Configurator-DP (or Mitsubishi ProfiMap Software V2.x or later) (hereafter called “GX-Configurator-DP”) or a configuration software from another vendor which is supporting extended parameter setting should be used.

For example configuring slave parameter with ProfiMap, refer to appendix A and C.

For example configuring slave parameter with GX-Configurator-DP, refer to appendix B and C.



### Note:

In configuring 32DP-IF GSD file, first assign special function blocks, second extension I/O units/blocks input data, and finally extension I/O units/blocks output data. The physical placement of the modules does not have to correspond with the GSD file order. However, the special function blocks must be configured in the same order as they are connected physically to the unit.

## MEMO

## 8. Diagnostic Message

### 8.1 Diagnostic Message Frame

When a diagnostic error occurs in the 32DP-IF, a diagnostic message is sent from the 32DP-IF to the DP-master as shown in Figure 8.1. Refer to section 5.2 for the diagnostic message description.



#### Note:

If the DP-master receives a diagnostic message, make provisions for the system to act safely in accordance with the error message.

**Figure 8.1: Diagnostic message Frame**

| Byte No.    | 0                                                         | 1                                      | 2                                       | 3                                                        |
|-------------|-----------------------------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------------------------|
| Description | Total length of diagnostic message data is 9 (09 Hex)     | First diagnostic message               |                                         | Second diagnostic message                                |
|             |                                                           | Lower byte of D8029                    | Higher byte of D8029                    | Lower byte of D8004                                      |
| Byte No.    | 4                                                         | 5                                      | 6                                       | 7                                                        |
| Description | Second diagnostic message                                 | Third diagnostic message               |                                         | Lower byte of last diagnostic message data <sup>*2</sup> |
|             | Higher byte of D8004                                      | Lower byte of diagnostic <sup>*1</sup> | Higher byte of error code <sup>*1</sup> |                                                          |
| Byte No.    | 8                                                         |                                        |                                         |                                                          |
| Description | Higher byte of last diagnostic message data <sup>*2</sup> |                                        |                                         |                                                          |

<sup>\*1</sup> This diagnostic message shows either the number of momentary power failures or the error code relating to the contents of D8004 (byte No. 3, 4). For error code, refer to section 5.2.4 or 9.3.3.

<sup>\*2</sup> This diagnostic message is either "0" or the contents of D8068.

### 8.2 Diagnostic Message Contents List

**Table 8.1: Diagnostic Message List**

| Item                                    | Third diagnostic message                                   | Last diagnostic message |
|-----------------------------------------|------------------------------------------------------------|-------------------------|
| 32DP-IF status is STOP                  | This value is "0".                                         | This value is "0".      |
| Momentary power failure                 | This value is number of momentary power failures in D8007. |                         |
| Power down                              |                                                            |                         |
| I/O bus error                           | This value is error code in D8061.                         | This value is in D8068. |
| Parameter error/<br>Configuration error | This value is error code in D8064.                         |                         |
| Operation error                         | This value is error code in D8067.                         |                         |

## MEMO

## 9. Diagnostics

### 9.1 Preliminary Checks

- 1) Check "POWER LED". If this is OFF, please see section 9.2.
- 2) Check power supply for special function blocks and extension I/O units/blocks.  
If this can not be supplied, 32DP-IF will not operate correctly.
- 3) Check that the slave addresses are the same at the 32DP-IF and in the DP-master configuration. If the slave addresses are not the same in the 32DP-IF and in the DP-master, change these addresses to match in both modules.
- 4) Check that the parameter data of 32DP-IF are set correctly in the DP-master.  
If the parameter data of the 32DP-IF are not set correctly in the DP-master, communication over the Profibus-DP network may be affected.
- 5) Check whether the network wiring and/or the cables for the extension blocks/units are properly connected to the 32DP-IF.
- 6) Check that the system configuration rules have not been exceeded, i.e. the number of special function blocks does not exceed 8 and control I/O of 32DP-IF is 256 or less.
- 7) Put RUN/STOP switch on the 32DP-IF into RUN.

## 9.2 Check the Status of the LEDs of the 32DP-IF

If the 32DP-IF does not seem to operate normally, check the following items.

1) Check the status of the “POWER LED”.

**Table 9.1: POWER LED Check**

| Status | Description                                                       |
|--------|-------------------------------------------------------------------|
| Lit    | Power source is OK.                                               |
| Unlit  | Possible AC power failure, check the power line and power source. |

2) Check the status of the “RUN LED”

**Table 9.2: RUN LED Check**

| Status | Description                                                                                                                                                                                                                                                                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lit    | The 32DP-IF will exchange data with extension units/blocks and special function blocks.                                                                                                                                                                                            |
| Unlit  | The 32DP-IF will exchange only input data with extension units/blocks. Check position of the RUN/STOP switch. If the switch is in the STOP position, change to RUN. If this switch is RUN position, check power supply for special function blocks and extension I/O units/blocks. |

3) Check the status of the “BF LED”

**Table 9.3: BF LED Check**

| Status | Description                                                                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lit    | Check D8024. If D8024 does not show a stable baud rate (i.e. always changing) then check DP-network cables.<br>Check M8004. If M8004 is ON, refer to Table 9.6. |
| Unlit  | 32DP-IF will exchange data with Profibus-DP network.                                                                                                            |

4) Check the status of the “DIA LED”

**Table 9.4: DIA LED Check**

| Status | Description                                                                          |
|--------|--------------------------------------------------------------------------------------|
| Lit    | Check status of M8004, and DP-master setting.<br>If M8004 is ON, refer to Table 9.6. |
| Unlit  | Diagnostic data is not detected.                                                     |

### 9.3 Check Error Status of the 32DP-IF

#### 9.3.1 Error Status in D8029

**Table 9.5: Error Status in D8029**

| Bit No.     | Description         | 0 (OFF)                            | 1 (ON)                                                                                                                                      |
|-------------|---------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Bit 0       | general error       | No general error                   | This bit is ON if one or more error bits (bit 2, 6, 7) are ON. Check bit 2, 6 and 7 in D8029.                                               |
| Bit 1       | Reserved            |                                    |                                                                                                                                             |
| Bit 2       | Power fail          | Power supply is normal             | Power supply failure                                                                                                                        |
| Bit 3 ~ 5   | Reserved            |                                    |                                                                                                                                             |
| Bit 6       | I/O bus error       | No I/O bus error                   | I/O bus error occurred. Check extension bus cable of I/O extension units/blocks and error code in D8060.                                    |
| Bit 7       | Operation error     | No operation error                 | Operation error occurred. Check extension bus cable of special function blocks, and DP-master parameter, and error code in D8067 and D8068. |
| Bit 8, 9    | Reserved            |                                    |                                                                                                                                             |
| Bit 10      | configuration error | Configuration data valid           | Invalid configuration data received. Check configuration of 32DP-IF in the DP-master and D8040 ~ D8055.                                     |
| Bit 11      | Parameter error     | Parameter data valid               | Invalid parameter data received. Check parameter of 32DP-IF in the DP-master and D200 ~ D299, and error code in D8064 and D8068.            |
| Bit 12 ~ 14 | Reserved            |                                    |                                                                                                                                             |
| Bit 15      | RUN/STOP status     | RUN/STOP switch is in RUN position | RUN/STOP switch is in STOP position                                                                                                         |

### 9.3.2 Error Flags

**Table 9.6: Error Flags**

| Diagnostic Device            | Name                                | Check Points                                                                                                 |
|------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------|
| M8004<br>(ref. D8004)        | Error occurrence                    | ON when one or more error flags (M8060 to M8068) is ON. If this bit is ON, error number is written in D8004. |
| M8060<br>(ref. D8060, D8061) | I/O configuration error             | If this flag is ON, check error code in D8060, D8061 and extension cable.                                    |
| M8061<br>(ref. D8060, D8061) | 32DP-IF hardware error              | If this bit is ON, check error code in D8061.                                                                |
| M8064<br>(ref. D8064)        | Parameter error                     | If this flag is ON, check error code in D8064 and DP-master setting.                                         |
| M8067<br>(ref. D8067)        | Operation error                     | If this flag is ON, check error code in D8067 and D8068, DP-master parameter, and the extension cable.       |
| M8068<br>(ref. D8068)        | Parameter error and operation error | If M8064 or M8067 is ON, this bit would be set to ON. This bit is cleared by resetting the power supply.     |

## 9.3.3 Error Code

Table 9.7: Error Code

| Diagnostic Device | Name                                | Error code                                                                                                       | Description                                                                                                                                                    |
|-------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D8004             | Error number M☆☆☆☆                  | The contents of this register ☆☆☆☆ identifies which error flag is active, i.e. if ☆☆☆☆ = 8061, identifies M8061. |                                                                                                                                                                |
| D8060             | I/O configuration error             | This device contains the lowest device address that caused the error. Check D8061                                |                                                                                                                                                                |
| D8061             | 32DP-IF hardware error              | 0                                                                                                                | No error                                                                                                                                                       |
|                   |                                     | 6102                                                                                                             | Operation circuit error: Please contact a service representative.                                                                                              |
|                   |                                     | 6103                                                                                                             | I/O bus error: Check extension cable for Extension I/O units/blocks.                                                                                           |
|                   |                                     | 6129                                                                                                             | BFM #29 (error status) of a connected special function block shows a value that is different from "0". Please check the diagnosis message at the DP-master.    |
| D8064             | Parameter error                     | 0                                                                                                                | No error                                                                                                                                                       |
|                   |                                     | 6406                                                                                                             | Parameter error for extension units/blocks: Check error code in D8068, and parameter in the DP-master.                                                         |
|                   |                                     | 6407                                                                                                             | Parameter length error: Parameter data too long, check parameter's length in the DP-master.                                                                    |
| D8067             | Operation error                     | 0                                                                                                                | No error                                                                                                                                                       |
|                   |                                     | 6407                                                                                                             | Operation error: Operation error for transmitting special function block is occurred, check error code in D8068, and DP-master parameter, and extension cable. |
| D8068             | Parameter error and operation error | This device contains the lowest special function block's address that caused the error. Check D8064 and D8067.   |                                                                                                                                                                |

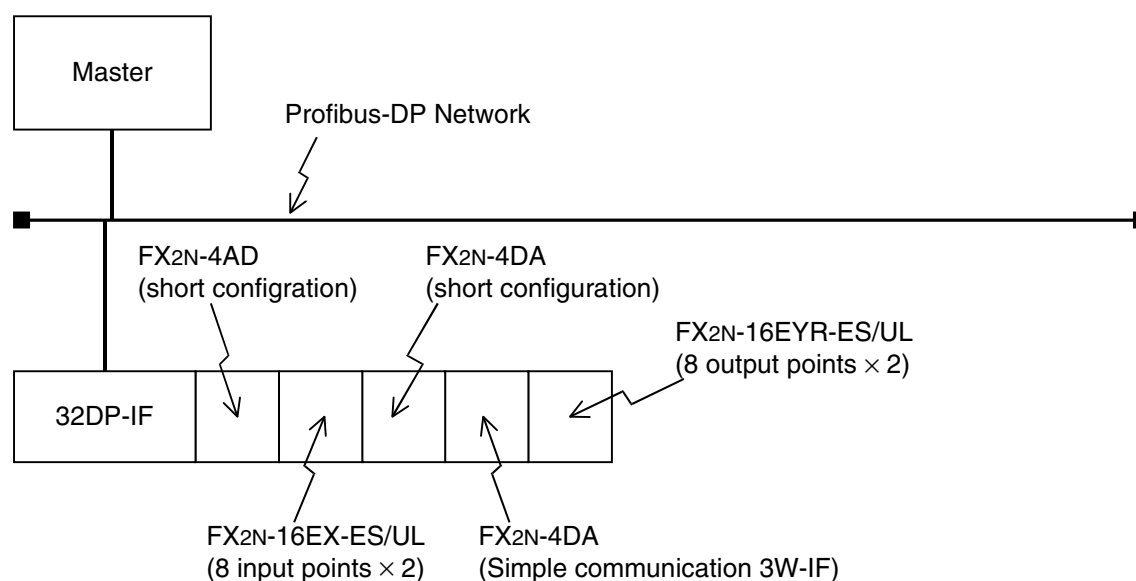
## MEMO

## Appendix A: Example Parameter and Configuration on ProfiMap

This example parameter and configuration is written in ProfiMap V3.0. For further information on the operation of ProfiMap, please see the MELSEC ProfiMap Configuration System for Open Networks Software Manual. For an explanation of each special function block, please see the appropriate special function block manual.

### A-1: System Configuration

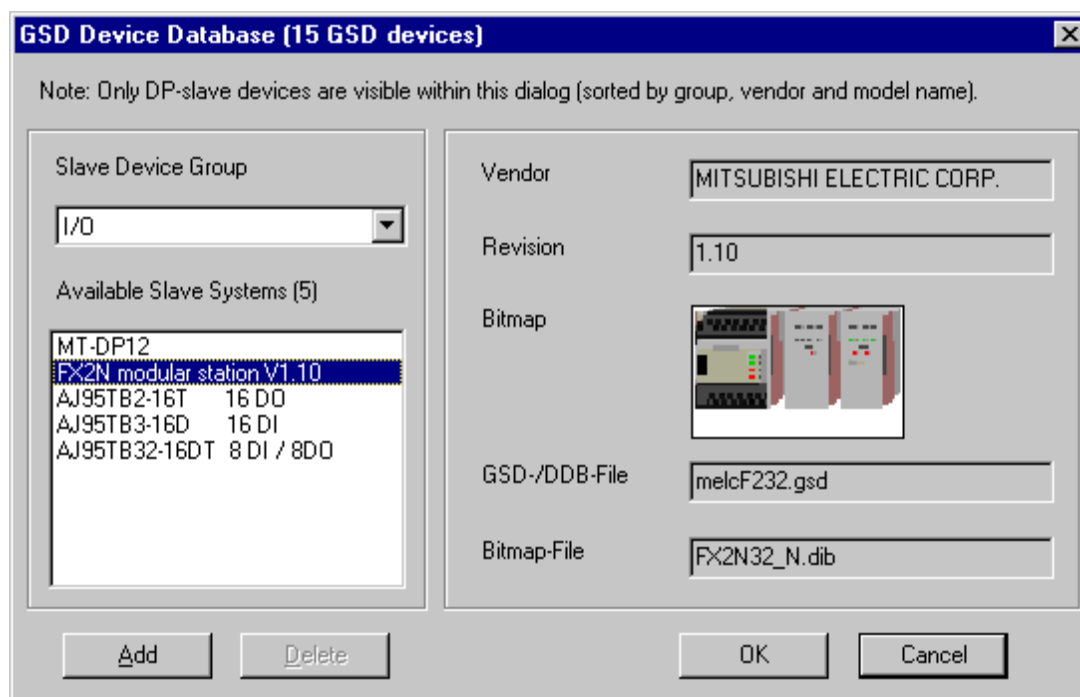
**Figure A-1: Example System Configuration of 32DP-IF**



**A-2: Set System Configuration with ProfiMap**

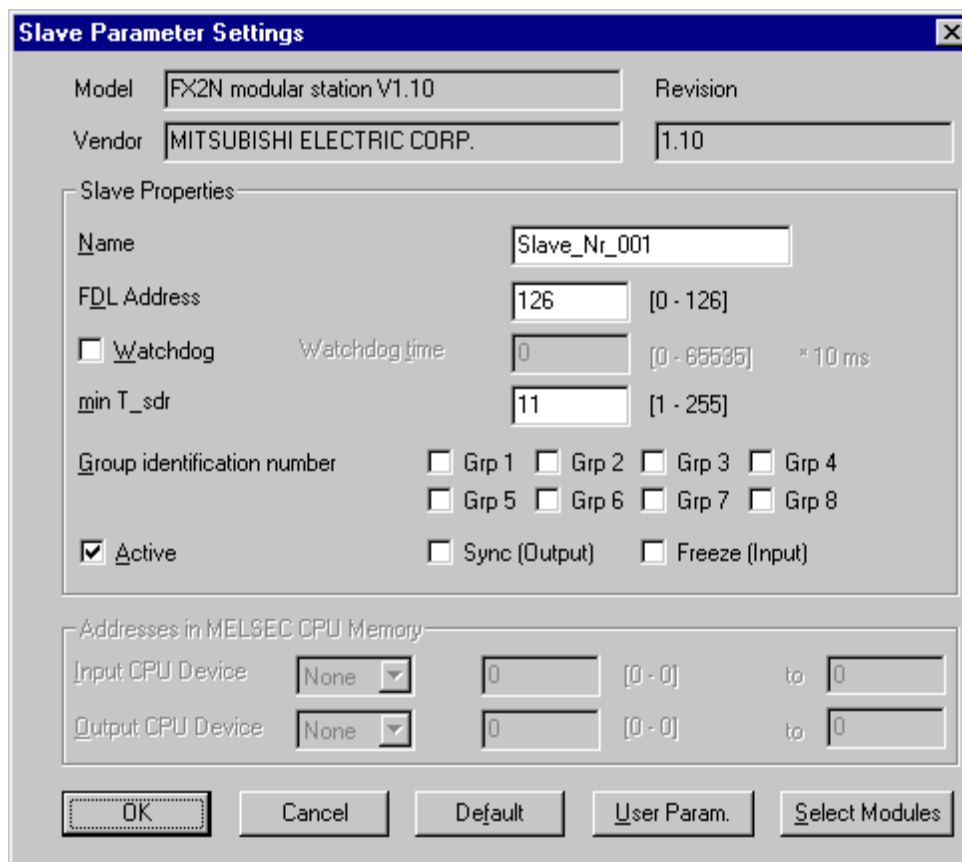
Move the cursor to the place where the slave can be arranged with the Network Configuration dialog box, then right-click. The GSD Database dialog box opens when “Insert DP-Slave” is selected.

**Figure A-2: GSD Device Database Dialog Box**



In the GSD Device Database dialog box, please choose “FX2N modular V\*.\*\*\*” in the Available Slave Systems and “I/O” in the Slave Device Group. See picture above.

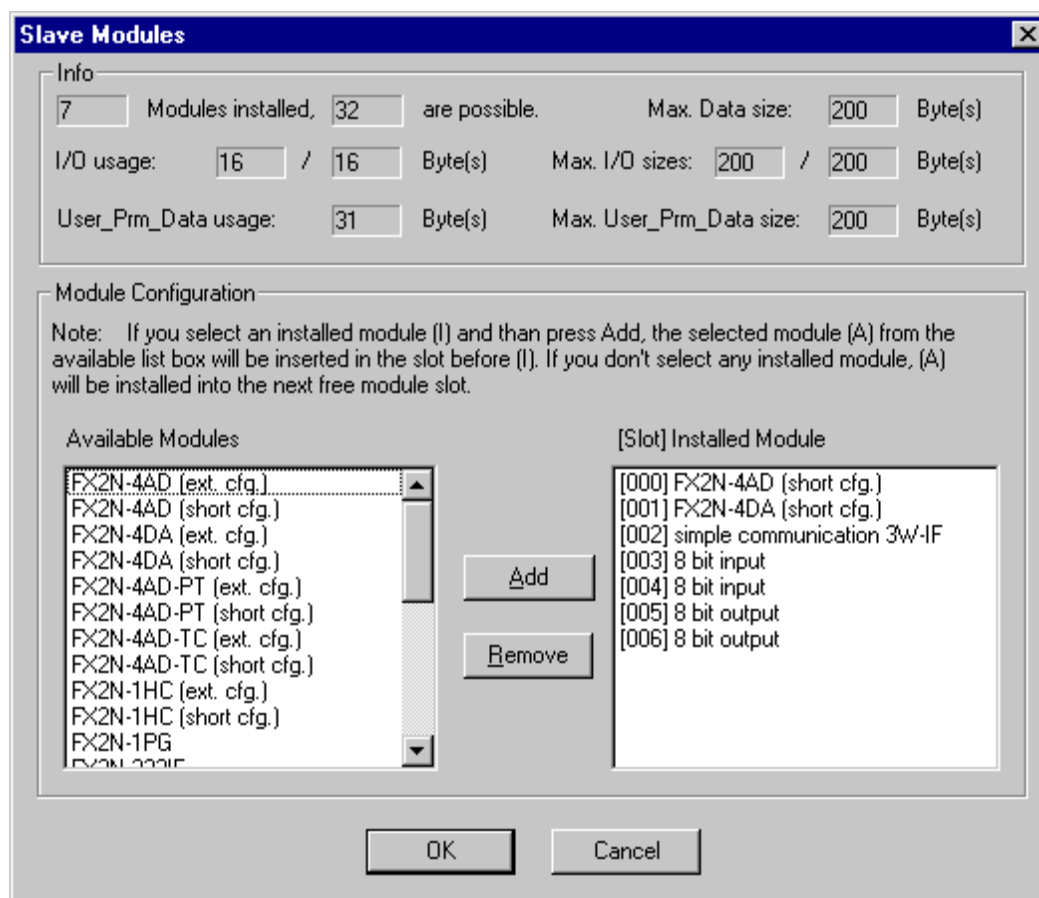
The Slave Parameter Settings dialog box will open when the OK button is clicked.

**Figure A-3: Slave Parameter Settings Dialog Box**


The dialog box is titled "Slave Parameter Settings" and contains the following fields and controls:

- Model:** FX2N modular station V1.10
- Revision:** 1.10
- Vendor:** MITSUBISHI ELECTRIC CORP.
- Slave Properties:**
  - Name:** Slave\_Nr\_001
  - FDL Address:** 126 [0 - 126]
  - Watchdog:** ☐ Watchdog time: 0 [0 - 65535] \* 10 ms
  - min T\_sdr:** 11 [1 - 255]
  - Group identification number:**
    - ☐ Grp 1 ☐ Grp 2 ☐ Grp 3 ☐ Grp 4
    - ☐ Grp 5 ☐ Grp 6 ☐ Grp 7 ☐ Grp 8
  - Active:** ☒ Sync (Output) ☐ Freeze (Input)
- Addresses in MELSEC CPU Memory:**
  - Input CPU Device:** None [0] [0 - 0] to [0]
  - Output CPU Device:** None [0] [0 - 0] to [0]
- Buttons:** OK, Cancel, Default, User Param., Select Modules

- The Slave Module dialog box opens when “Select Modules” is clicked.
- The Extended User Parameter dialog box opens when “User Param” is clicked.

**Figure A-4: Slave Modules Dialog Box**

The Slave Modules dialog box shows the Available Modules and the installed Modules. Use the Add and Remove buttons to configure the system as required. Please see section 6.3.1 for information on the correct order to install the modules.

Click OK to return to the Slave Parameter Setting dialog box (Figure A-3).

### A-3: Set User Parameter with ProfiMap

Extended User Parameters dialog box opens when “User Param” is clicked in the Slave Parameter Setting dialog box. Choose the settings from the pull down menu in the Value Setting column. Please refer to Figure A-6 through A-9 for an example set up sequence.

**Figure A-5: Extended User Parameters Dialog Box**

**Extended User Parameters**

Parameter Location

Module Slot Number: --

User\_Prm\_Data Offset: 0

User\_Prm\_Data Size: 2 ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name                   | Value Setting                   | Comment          |
|-----|----------------------------------|---------------------------------|------------------|
| 00: | swap data (Intel/Motorola)       | no swap (Intel)                 | sel. value = (0) |
| 01: | cyclic status check of I/O units | no I/O bus error check          | sel. value = (0) |
| 02: | err. check of sp. fct. units     | no err. check of sp. fct. block | sel. value = (0) |

Globals / FX2N-4AD (short cfg.) / FX2N-4DA (short cfg.) / simple communication

Edit Hex OK Cancel Default

**Figure A-6: Setting Global Parameter**

**Extended User Parameters**

Parameter Location

Module Slot Number: --

User\_Prm\_Data\_Offset: 0

User\_Prm\_Data\_Size: 2 ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr.   | Parameter Name                   | Value Setting                                                                                         | Comment          |
|-------|----------------------------------|-------------------------------------------------------------------------------------------------------|------------------|
| 00:   | swap data (Intel/Motorola)       | no swap (Intel)                                                                                       | sel. value = (0) |
| 01:   | cyclic status check of I/O units | no I/O bus error check                                                                                | sel. value = (0) |
| 02: ▶ | err. check of sp. fct. units     | no err. check of sp. fct. blocks<br>no err. check of sp. fct. blocks<br>err. check of sp. fct. blocks | sel. value = (0) |

◀ ▶ \Globals / FX2N-4AD (short cfg.) / FX2N-4DA (short cfg.) / simple communication

Edit Hex OK Cancel Default

**Figure A-7: Setting User Parameter of FX<sub>2N</sub>-4AD (Short Configuration)**

**Extended User Parameters**
✕

Parameter Location

Module Slot Number

User\_Prm\_Data Offset

User\_Prm\_Data\_Size


☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr.                                                                                                                                                                                                                                  | Parameter Name               | Value Setting                                                                                                                                                                                                                        | Comment                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 00:                                                                                                                                                                                                                                  | channel 1 input              | averaged input value ch1                                                                                                                                                                                                             | sel. value = (5)                                                                                                         |
| 01:                                                                                                                                                                                                                                  | channel 2 input              | averaged input value ch2                                                                                                                                                                                                             | sel. value = (6)                                                                                                         |
| 02:                                                                                                                                                                                                                                  | channel 3 input              | direct input value ch3                                                                                                                                                                                                               | sel. value = (11)                                                                                                        |
| 03:                                                                                                                                                                                                                                  | channel 4 input              | direct input value ch4                                                                                                                                                                                                               | sel. value = (12)                                                                                                        |
| 04:                                                                                                                                                                                                                                  | Next parameter uses EEPROM.. | write parameter to EEPROM                                                                                                                                                                                                            | sel. value = (1)                                                                                                         |
| 05:                                                                                                                                                                                                                                  | ..channel 1 input range      | preset range -10V to +10V                                                                                                                                                                                                            | sel. value = (0)                                                                                                         |
| 06:                                                                                                                                                                                                                                  | ..channel 2 input range      | preset range -10V to +10V                                                                                                                                                                                                            | sel. value = (0)                                                                                                         |
| 07:                                                                                                                                                                                                                                  | ..channel 3 input range      | channel OFF                                                                                                                                                                                                                          | sel. value = (3)                                                                                                         |
| 08: ▶                                                                                                                                                                                                                                | ..channel 4 input range      | <div style="border: 1px solid black; padding: 2px;">                     preset range -10V to +10V ▼                 </div>                                                                                                          | sel. value = (0)                                                                                                         |
|                                                                                                                                                                                                                                      |                              | <div style="border: 1px solid black; padding: 2px;">                     preset range -10V to +10V                 </div>                                                                                                            |                                                                                                                          |
| <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">◀ ▶</div> <div style="border: 1px solid black; padding: 2px;">                         \Globals\ FX2N-4AD (short                     </div> </div> |                              | <div style="border: 1px solid black; padding: 2px;">                         preset range +4mA to +20mA<br/>                         preset range -20mA to +20mA<br/>                         channel OFF                     </div> | <div style="border: 1px solid black; padding: 2px;">                         simple communica                     </div> |

Edit Hex

OK

Cancel

Default

**Figure A-8: Setting User Parameter of FX<sub>2N</sub>-4DA (Short Configuration)**

**Extended User Parameters**

Parameter Location

Module Slot Number

User\_Prm\_Data Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name               | Value Setting                                                                                                                                     | Comment          |
|-----|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 00: | Next parameter uses EEPROM.. | write parameter to EEPROM                                                                                                                         | sel. value = (1) |
| 01: | ..channel 1 output range     | preset range -10V to +10V                                                                                                                         | sel. value = (0) |
| 02: | ..channel 2 output range     | preset range -10V to +10V                                                                                                                         | sel. value = (0) |
| 03: | ..channel 3 output range     | preset range -10V to +10V                                                                                                                         | sel. value = (0) |
| 04: | ..channel 4 output range     | <div> <p>preset range -10V to +10V</p> <p>preset range -10V to +10V</p> <p>preset range +4mA to +20mA</p> <p>preset range 0mA to +20mA</p> </div> | sel. value = (0) |

**Figure A-9: Setting User Parameter of FX<sub>2N</sub>-4DA by Simple Communication 3W-IF**

**Extended User Parameters**

Parameter Location

Module Slot Number

User\_Prm\_Data\_Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr.   | Parameter Name | Value Setting                                                                                                                                   | Comment             |
|-------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 00: ▶ | SFB ID         | <div> <div>FX2N-4AD</div> <div> simple analog modules<br/> FX2N-4AD<br/> FX2N-4AD-TC<br/> FX2N-4AD-PT<br/> FX2N-4DA<br/> FX2N-1HC </div> </div> | sel. value = (2010) |

◀ ▶ / FX2N-4DA (short cfg.) / simple communication 3W-IF /

## MEMO

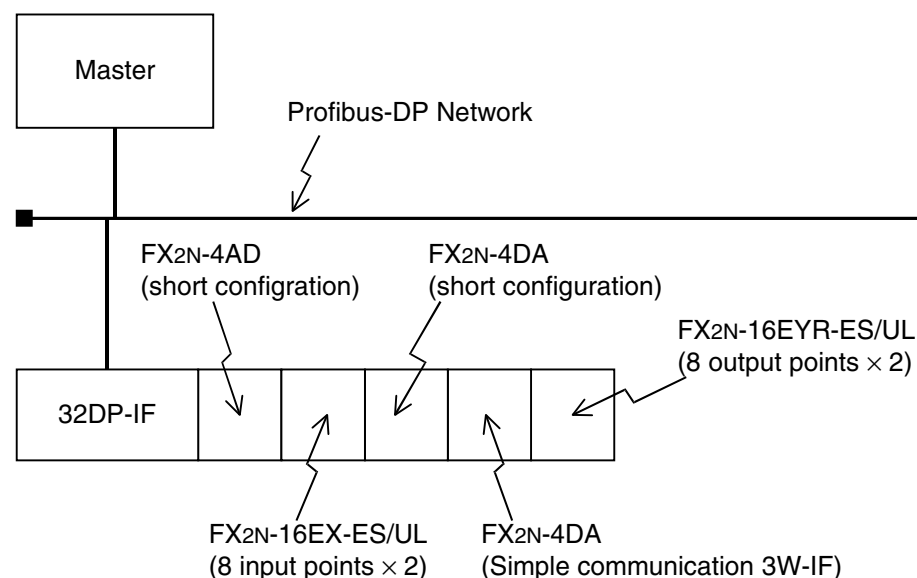
## Appendix B:

### Example Parameter and Configuration on GX-Configurator-DP

This example parameter and configuration is written in GX-Configurator-DP V4.0. For further information on the operation of GX-Configurator-DP, please see the MELSOFT GX-Configurator-DP Configuration System for Open Networks Software Manual. For an explanation of each special function block, please see the appropriate special function block manual.

#### B-1: System Configuration

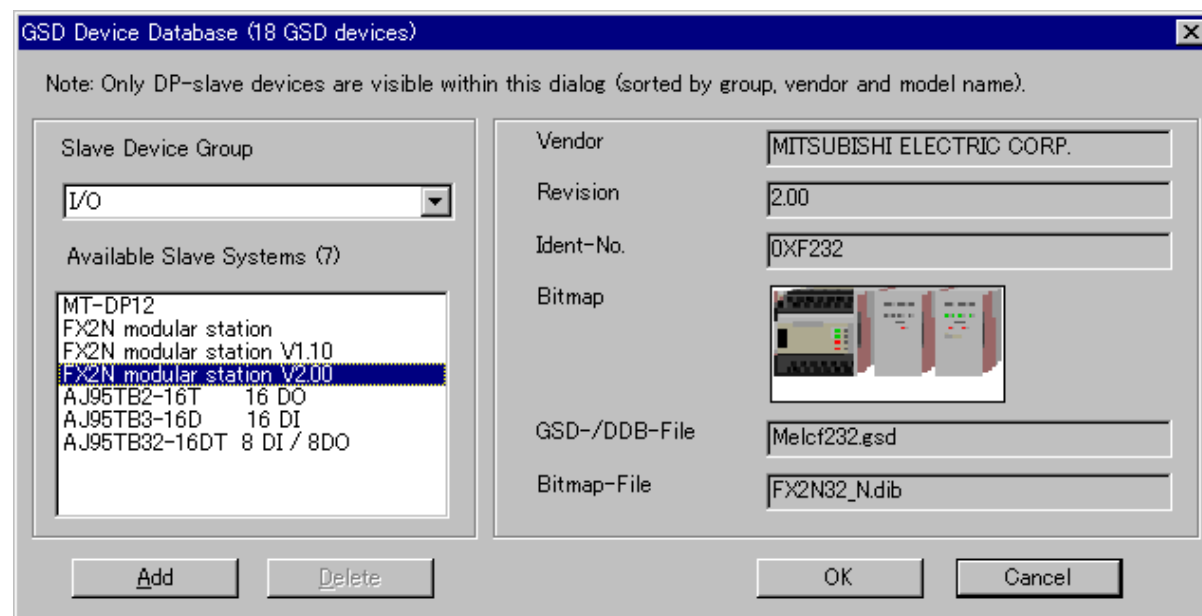
**Figure B-1: Example System Configuration of 32DP-IF**



**B-2: Set System Configuration with GX-Configurator-DP**

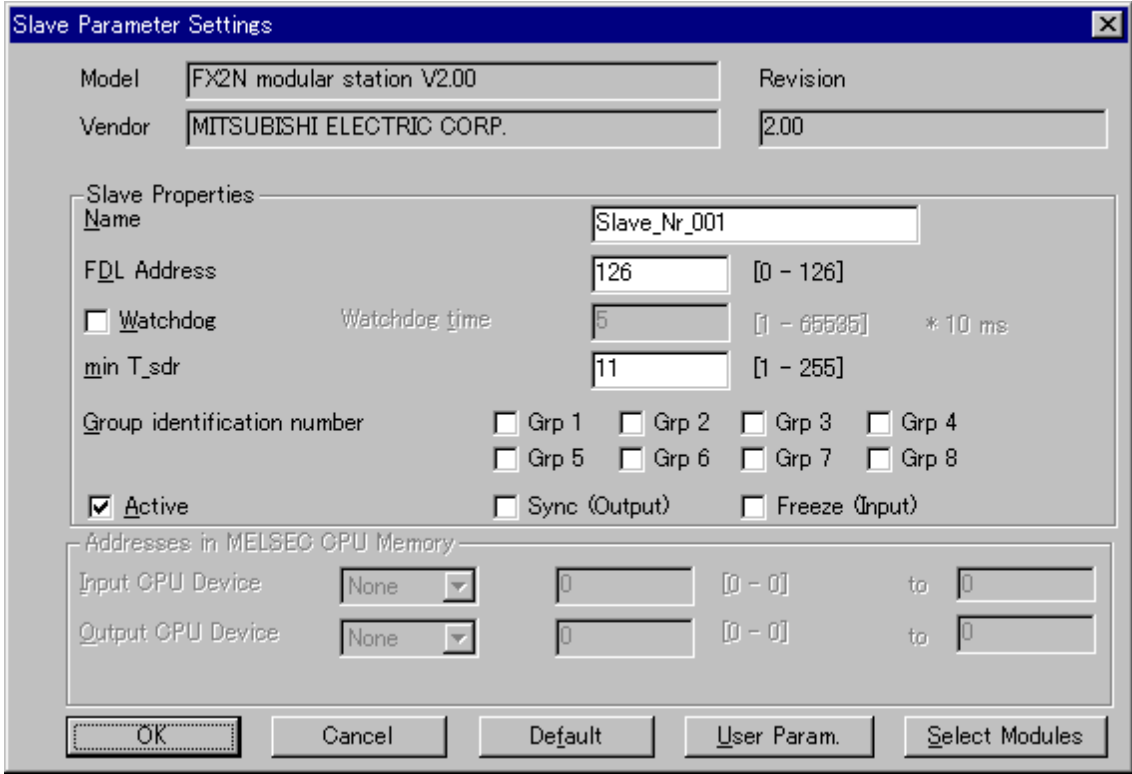
Move the cursor to the place where the slave can be arranged with the graphical network editor window, then right-click. The GSD Database dialog box opens when “Insert DP-Slave” is selected.

**Figure B-2: GSD Device Database Dialog Box**



In the GSD Device Database dialog box, please choose “FX2N modular V\*.\*\*” in the Available Slave Systems and “I/O” in the Slave Device Group. See picture above.

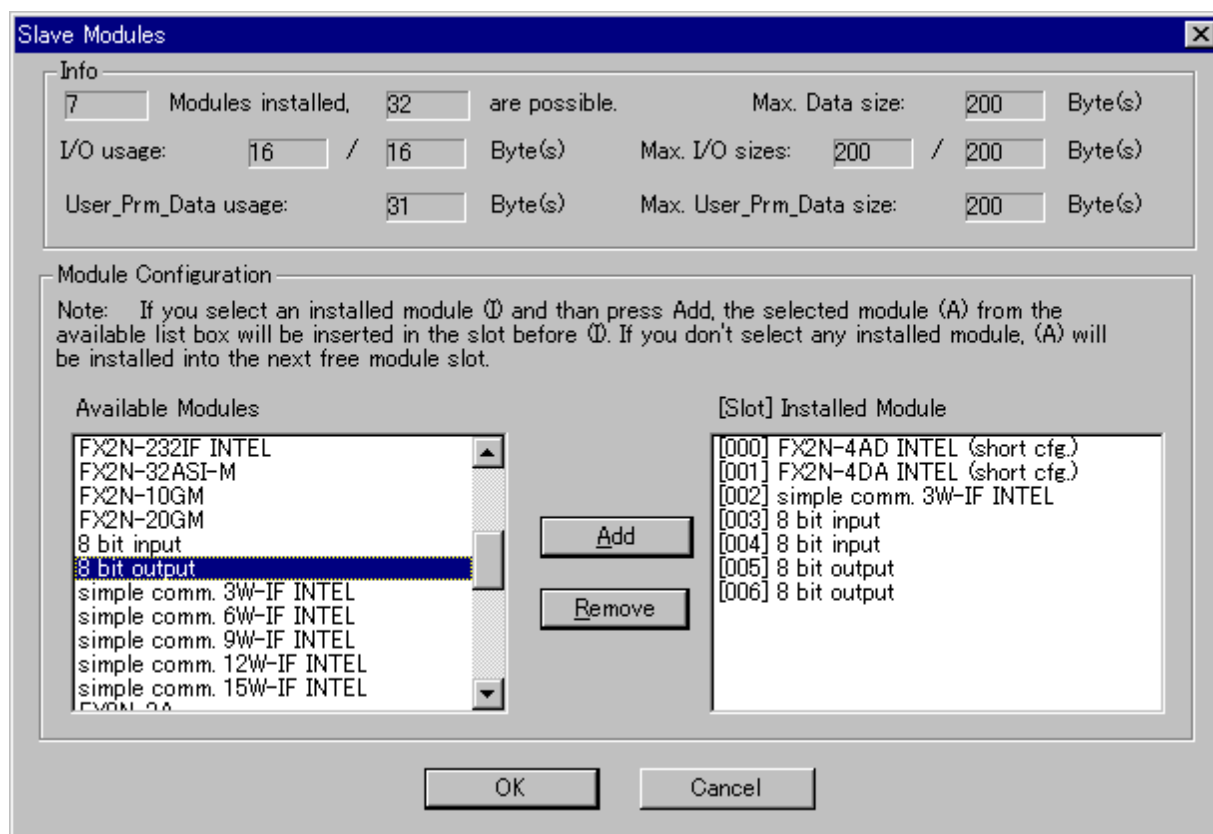
The Slave Parameter Settings dialog box will open when the OK button is clicked.

**Figure B-3: Slave Parameter Settings Dialog Box**


The dialog box is titled "Slave Parameter Settings" and contains the following fields and controls:

- Model:** FX2N modular station V2.00
- Vendor:** MITSUBISHI ELECTRIC CORP.
- Revision:** 2.00
- Slave Properties:**
  - Name:** Slave\_Nr\_001
  - FDL Address:** 126 [0 - 126]
  - Watchdog:** ☐ Watchdog time: 5 [1 - 65535] \* 10 ms
  - min T\_sdr:** 11 [1 - 255]
  - Group identification number:**
    - ☐ Grp 1 ☐ Grp 2 ☐ Grp 3 ☐ Grp 4
    - ☐ Grp 5 ☐ Grp 6 ☐ Grp 7 ☐ Grp 8
  - ☒ Active ☐ Sync (Output) ☐ Freeze (Input)
- Addresses in MELSEC CPU Memory:**
  - Input CPU Device:** None [0] [0 - 0] to [0]
  - Output CPU Device:** None [0] [0 - 0] to [0]
- Buttons:** OK, Cancel, Default, User Param., Select Modules

- The Slave Module dialog box opens when "Select Modules" is clicked.
- The Extended User Parameter dialog box opens when "User Param" is clicked.

**Figure B-4: Slave Modules Dialog Box**

The Slave Modules dialog box shows the Available Modules and the installed Modules. Use the Add and Remove buttons to configure the system as required. Please see section 6.3.1 for information on the correct order to install the modules.

Click OK to return to the Slave Parameter Setting dialog box (Figure A-3).

**B-3: Set User Parameter with GX-Configurator-DP**

Extended User Parameters dialog box opens when “User Param” is clicked in the Slave Parameter Setting dialog box. Choose the settings from the pull down menu in the Value Setting column. Please refer to Figure A-6 through A-9 for an example set up sequence.

**Figure B-5: Extended User Parameters Dialog Box**

**Extended User Parameters**

Parameter Location

Module Slot Number: --

User\_Prm\_Data Offset: 0

User\_Prm\_Data Size: 2 ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name                   | Value Setting                   | Comment          |
|-----|----------------------------------|---------------------------------|------------------|
| 00: | swap data (Intel/Motorola)       | no swap (Intel)                 | sel. value = (0) |
| 01: | cyclic status check of I/O units | no I/O bus error check          | sel. value = (0) |
| 02: | err. check of sp. fct. units     | no err. check of sp. fct. block | sel. value = (0) |

Globals / FX2N-4AD (short cfg.) / FX2N-4DA (short cfg.) / simple communication

Edit Hex OK Cancel Default

**Figure B-6: Setting Global Parameter**

**Extended User Parameters**

Parameter Location

Module Slot Number

User\_Prm\_Data Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name                   | Value Setting                    | Comment          |
|-----|----------------------------------|----------------------------------|------------------|
| 00: | swap data (Intel/Motorola)       | no swap (Intel)                  | sel. value = (0) |
| 01: | cyclic status check of I/O units | no I/O bus error check           | sel. value = (0) |
| 02: | err. check of sp. fct. units     | no err. check of sp. fct. blocks | sel. value = (0) |
| 03: | swap word parameter for BFMs     | word parameter Intel Format      | sel. value = (0) |
|     |                                  | word parameter Intel Format      |                  |
|     |                                  | word parameter Motorola Format   |                  |

Globals ☒ FX2N-4AD INTEL (short cfg.) ☒ FX2N-4DA INTEL (short cfg.) ☒ simple comm. 3W-IF

Edit Hex OK Cancel Default

**Figure B-7: Setting User Parameter of FX<sub>2N</sub>-4AD (Short Configuration Intel format)**

Extended User Parameters

Parameter Location

Module Slot Number

User\_Prm\_Data Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name               | Value Setting                                                                                                                         | Comment           |
|-----|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 00: | channel 1 input              | direct input value ch1                                                                                                                | sel. value = (9)  |
| 01: | channel 2 input              | direct input value ch2                                                                                                                | sel. value = (10) |
| 02: | channel 3 input              | direct input value ch3                                                                                                                | sel. value = (11) |
| 03: | channel 4 input              | direct input value ch4                                                                                                                | sel. value = (12) |
| 04: | Next parameter uses EEPROM.. | DON'T write parameter to EEP                                                                                                          | sel. value = (0)  |
| 05: | ..channel 1 input range      | preset range -10V to +10V                                                                                                             | sel. value = (0)  |
| 06: | ..channel 2 input range      | preset range -10V to +10V                                                                                                             | sel. value = (0)  |
| 07: | ..channel 3 input range      | preset range -10V to +10V                                                                                                             | sel. value = (0)  |
| 08: | ..channel 4 input range      | <div> <p>preset range -10V to +10V</p> <p>preset range +4mA to +20mA</p> <p>preset range -20mA to +20mA</p> <p>channel OFF</p> </div> | sel. value = (0)  |

Globals FX2N-4AD INTEL (short cfg.) simple comm. 3VW-IF

Edit Hex OK Cancel Default

**Figure B-8: Setting User Parameter of FX<sub>2N</sub>-4DA (Short Configuration Intel format)**

**Extended User Parameters**

Parameter Location

Module Slot Number

User\_Prm\_Data Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name               | Value Setting                                                                                                                                                                               | Comment          |
|-----|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 00: | Next parameter uses EEPROM.. | DON'T write parameter to EEP                                                                                                                                                                | sel. value = (0) |
| 01: | ..channel 1 output range     | preset range -10V to +10V                                                                                                                                                                   | sel. value = (0) |
| 02: | ..channel 2 output range     | preset range -10V to +10V                                                                                                                                                                   | sel. value = (0) |
| 03: | ..channel 3 output range     | preset range -10V to +10V                                                                                                                                                                   | sel. value = (0) |
| 04: | ..channel 4 output range     | <div> <div> <div>preset range -10V to +10V</div> <div> <div>preset range -10V to +10V</div> <div>preset range +4mA to +20mA</div> <div>preset range 0mA to +20mA</div> </div> </div> </div> | sel. value = (0) |

Globals FX2N-4AD INTEL (short cfg.) **FX2N-4DA INTEL (short cfg.)** simple comm. 3V-IF

Edit Hex OK Cancel Default

**Figure B-9: Setting User Parameter of FX<sub>2N</sub>-4DA by Simple Communication 3W-IF (Intel format)**

Extended User Parameters

Parameter Location

Module Slot Number

User\_Prm\_Data\_Offset

User\_Prm\_Data\_Size  ☐ Edit Unsigned as hex

Parametrize DP Slave/Module

| Nr. | Parameter Name | Value Setting         | Comment             |
|-----|----------------|-----------------------|---------------------|
| 00: | SFB ID         | FX2N-4AD              | sel. value = (2010) |
|     |                | simple analog modules |                     |
|     |                | FX2N-4AD              |                     |
|     |                | FX2N-4AD-TC           |                     |
|     |                | FX2N-4AD-PT           |                     |
|     |                | FX2N-4DA              |                     |
|     |                | FX2N-1HC              |                     |
|     |                | FX2N-1PG              |                     |
|     |                | FX2N-20GM             |                     |

FX2N-4AD INTEL (short cfg.) / FX2N-4DA INTEL (short cfg.) / **simple comm. 3W-IF INTEL**

Edit Hex OK Cancel Default

## MEMO

## Appendix C: User Parameter

The following user parameter is used by GSD File V2.10 of 32DP-IF on the configuration software.

Further information for user parameter can be found in the chapter 6. Further information for the special function block's BFM's can be found in each module's manual.

### C-1: General Parameter (Global User Parameter)

The first two bytes of user parameter is general parameter. This parameter influence the communication of the FX2N-32DP-IF.

First byte is "Not used", so it is always 0. For second byte, see the following table.

**Table C-1: General Parameter (Global User Parameter) [Second byte]**

| Nr.         | Parameter Name                            | Value Setting List               | Description                                                                                                                                                                                          |
|-------------|-------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | swap data for BFM's<br>(Intel/Motorola)*1 | no swap (Intel)                  | Default setting.<br>Byte data is Intel format within the word data of special function block's BFM's.(Not swapped)<br>1st: Low byte<br>2nd: High byte                                                |
|             |                                           | swap (Motorola)                  | Byte data is Motorola format within the word data of special function block's BFM's.(Swapped)<br>1st: High byte<br>2nd: Low byte                                                                     |
| 01<br>(2nd) | cyclic status check of I/O units          | no I/O bus error check           | Default setting.<br>The status check of the I/O units/blocks is not performed.                                                                                                                       |
|             |                                           | cyclic I/O bus error check       | The status check of the I/O units/blocks is performed in every cycle                                                                                                                                 |
| 02<br>(3rd) | error check of special function units     | no err. check of sp. fct. blocks | Default setting.<br>Error status (BFM #29) in all connected special function blocks is not checked.                                                                                                  |
|             |                                           | err. check of sp. fct. blocks    | Error status (BFM #29) in all connected special function blocks is checked in every cycle.<br>However, the following modules are not checked.<br>• FX2N-10GM, FX2N-20GM, FX2N-2AD, FX2N-2DA, FX0N-3A |
| 03<br>(4th) | swap word parameter for BFM's*2           | word parameter Intel Format      | Default setting.<br>Byte data is Intel format within the word parameter.<br>(Not swapped)<br>1st: Low byte<br>2nd: High byte                                                                         |
|             |                                           | word parameter Motorola Format   | Byte data is Motorola format within the word parameter.<br>(Swapped)<br>1st: High byte<br>2nd: Low byte                                                                                              |

For information of Note, please see next page.

- \*1 These bit settings are different depending upon the connected master module.
- a) When connecting the A and Q series (MITSUBISHI) master module, both units are set to Intel format.
  - b) When connecting other master module, please check the settings in the master module's manual.

## C-2: User Parameter for Special function block

“Short configuration”, “extension configuration” and “simple communication” is prepared in the user parameter for a special function block with a special function block.

Further information for user parameter can be found in the chapter 6. Further information for the special function block's BFM's can be found in each module's manual.

### C-2-1: FX2N-4AD Extension Configuration (Intel Format)



#### Requirements:

- Cyclic data is 4 word inputs in every cycle.

**Table C-2: Cyclic Data of FX<sub>2N</sub>-4AD Extension Configuration (Intel Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Choose between direct and averaged value ch1 |
| 2nd |           | Choose between direct and averaged value ch2 |
| 3rd |           | Choose between direct and averaged value ch3 |
| 4th |           | Choose between direct and averaged value ch4 |

- Parameter is 41 bytes.

**Table C-3: FX<sub>2N</sub>-4AD Extension Configuration (Intel Format)**

| Nr.           | Parameter Name                   | Value Setting List              | Description                                                                                   |
|---------------|----------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Channel 1 input                  | direct input value ch1          | Select input value type for channel 1 from the available options (BFM #9 or BFM #5).          |
|               |                                  | averaged input value ch1        |                                                                                               |
| 01<br>(2nd)   | Channel 2 input                  | direct input value ch2          | Select input value type for channel 2 from the available options (BFM #10 or BFM #6).         |
|               |                                  | averaged input value ch2        |                                                                                               |
| 02<br>(3rd)   | Channel 3 input                  | direct input value ch3          | Select input value type for channel 3 from the available options (BFM #11 or BFM #7).         |
|               |                                  | averaged input value ch3        |                                                                                               |
| 03<br>(4th)   | Channel 4 input                  | direct input value ch4          | Select input value type for channel 4 from the available options (BFM #12 or BFM #8).         |
|               |                                  | averaged input value ch4        |                                                                                               |
| 04<br>(5th)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 6th parameter uses EEPROM. Select “writing to EEPROM” setting from the available options. |
|               |                                  | write parameter to EEPROM       |                                                                                               |
| 05<br>(6th)   | ..O/G setting prohibit/permit    | permit offset/gain setting      | Select prohibit/permit setting of offset/gain from the available options (BFM #21).           |
|               |                                  | prohibit offset/gain setting    |                                                                                               |
| 06<br>(7th)   | RESET/INIT. MODULE TO DEFAULT    | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                        |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                               |
| 07*1<br>(8th) | VERIFY RESET/ INITIALISE COMMAND | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                        |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                               |

**Table C-3: FX<sub>2N</sub>-4AD Extension Configuration (Intel Format)**

| Nr.                        | Parameter Name                  | Value Setting List              | Description                                                                                         |
|----------------------------|---------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|
| 08* <sup>2</sup><br>(9th)  | A/D conversion speed            | normal speed (15ms/ch)          | Select conversion speed from the available options (BFM #15).                                       |
|                            |                                 | high speed (6ms/ch)             |                                                                                                     |
| 09<br>(10th)               | Next parameter uses EEPROM.     | DON'T write parameter to EEPROM | The 11th ~13th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|                            |                                 | write parameter to EEPROM       |                                                                                                     |
| 10* <sup>3</sup><br>(11th) | ..channel 1 input range         | preset range -10V to +10V       | Select input range for channel 1 from the available options (BFM #0).                               |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                     |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                     |
|                            |                                 | channel OFF                     |                                                                                                     |
| 11* <sup>3</sup><br>(12th) | ..channel 2 input range         | preset range -10V to +10V       | Select input range for channel 2 from the available options (BFM #0).                               |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                     |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                     |
|                            |                                 | channel OFF                     |                                                                                                     |
| 12* <sup>3</sup><br>(13th) | ..channel 3 input range         | preset range -10V to +10V       | Select input range for channel 3 from the available options (BFM #0).                               |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                     |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                     |
|                            |                                 | channel OFF                     |                                                                                                     |
| 13* <sup>3</sup><br>(14th) | ..channel 4 input range         | preset range -10V to +10V       | Select input range for channel 4 from the available options (BFM #0).                               |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                     |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                     |
|                            |                                 | channel OFF                     |                                                                                                     |
| 14<br>(15th)               | data BFM 1 (No. of samples ch1) | Default: 8                      | Set the number of samples for averaged results in channel 1 (BFM #1).<br>Setting range: 1 to 4096   |
| 15<br>(16th)               | data BFM 2 (No. of samples ch2) |                                 | Set the number of samples for averaged results in channel 2 (BFM #2).<br>Setting range: 1 to 4096   |
| 16<br>(17th)               | data BFM 3 (No. of samples ch3) |                                 | Set the number of samples for averaged results in channel 3 (BFM #3).<br>Setting range: 1 to 4096   |
| 17<br>(18th)               | data BFM 4 (No. of samples ch4) |                                 | Set the number of samples for averaged results in channel 4 (BFM #4).<br>Setting range: 1 to 4096   |
| 18<br>(19th)               | data BFM 23 (offset)            | Default: 0                      | Set offset value (BFM #23).<br>Setting range: -20000 to +20000                                      |
| 19* <sup>4</sup><br>(20th) | data BFM 24 (gain)              | Default: 5000                   | Set gain value (BFM #24).<br>Setting: -20000 to +20000                                              |

**Table C-3: FX<sub>2N</sub>-4AD Extension Configuration (Intel Format)**

| Nr.          | Parameter Name              | Value Setting List              | Description                                                                                          |
|--------------|-----------------------------|---------------------------------|------------------------------------------------------------------------------------------------------|
| 20<br>(21st) | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 22th ~ 25th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|              |                             | write parameter to EEPROM       |                                                                                                      |
| 21<br>(22nd) | ..channel 1 (offset/gain)   | no offset/gain setting          | Select gain/offset adjust setting for channel 1 from the available options (BFM #22).                |
|              |                             | change offset                   |                                                                                                      |
|              |                             | change gain                     |                                                                                                      |
|              |                             | change gain & offset            |                                                                                                      |
| 22<br>(23rd) | ..channel 2 (offset/gain)   | no offset/gain setting          | Select gain/offset adjust setting for channel 2 from the available options (BFM #22).                |
|              |                             | change offset                   |                                                                                                      |
|              |                             | change gain                     |                                                                                                      |
|              |                             | change gain & offset            |                                                                                                      |
| 23<br>(24th) | ..channel 3 (offset/gain)   | no offset/gain setting          | Select gain/offset adjust setting for channel 2 from the available options (BFM #22).                |
|              |                             | change offset                   |                                                                                                      |
|              |                             | change gain                     |                                                                                                      |
|              |                             | change gain & offset            |                                                                                                      |
| 24<br>(25th) | ..channel 4 (offset/gain)   | no offset/gain setting          | Select gain/offset adjust setting for channel 2 from the available options (BFM #22).                |
|              |                             | change offset                   |                                                                                                      |
|              |                             | change gain                     |                                                                                                      |
|              |                             | change gain & offset            |                                                                                                      |

- \*1 To RESET the special function block, set both parameters (6&7) to "reset module". While processing a RESET command, no other parameter will be accepted by the special function block.  
As mentioned in the FX<sub>2N</sub>-4AD users guide the EEPROM access takes 300ms. So it is not possible to RESET the special function block to defaults and set the BFM's 0 to 24 to a value different to the default value with the same parameter data block.  
However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.
- \*2 In this case the default value of the GSD file (high speed) differs from the hardware default value (normal speed).
- \*3 The changes of BFM # 0 are written to EEPROM memory. Keep a delay of 300ms between setting the input range and other write accesses to the EEPROM.  
Ex.- changing the gain/offset values

\*4 If it is necessary to set different offset/gain values for every input channel, send the parameter data in multiple segments to the slave range

Ex.- ch1: offset=100/gain=6000; ch2:100/7000; ch3:200/4000; ch4:no changes

**Table C-4: Ex.- ch1: offset=100/gain=6000; ch2:100/7000; ch3:200/4000; ch4:no changes**

|                     | Parameter No. | Setting                          |
|---------------------|---------------|----------------------------------|
| 1st parameter block | 18th          | 100                              |
|                     | 19th          | 6000                             |
|                     | 20th          | change offset & gain (channel 1) |
|                     | 21th          | change offset (channel 2)        |
|                     | 22th          | no adjustment (channel 3)        |
|                     | 23th          | no adjustment (channel 4)        |
| 2nd parameter block | 18th          | 200                              |
|                     | 19th          | 4000                             |
|                     | 20th          | no adjustment (channel 1)        |
|                     | 21th          | no adjustment (channel 2)        |
|                     | 22th          | change offset & gain (channel 3) |
|                     | 23th          | no adjustment (channel 4)        |
| 3rd parameter block | 18th          | System does not use this data.   |
|                     | 19th          | 7000                             |
|                     | 20th          | no adjustment (channel 1)        |
|                     | 21th          | change gain (channel 2)          |
|                     | 22th          | no adjustment (channel 3)        |
|                     | 23th          | no adjustment (channel 4)        |

**C-2-2: FX2N-4AD Extension Configuration (Motorola Format)****Requirements:**

- Cyclic data is 4 word inputs in every cycle.

**Table C-5: Cyclic Data of FX2N-4AD Extension Configuration (Motorola Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Choose between direct and averaged value ch1 |
| 2nd |           | Choose between direct and averaged value ch2 |
| 3rd |           | Choose between direct and averaged value ch3 |
| 4th |           | Choose between direct and averaged value ch4 |

- Parameter is 41 bytes.

**Table C-6: FX2N-4AD Extension Configuration (Motorola Format)**

| Nr.           | Parameter Name                   | Value Setting List              | Description                                                                                         |
|---------------|----------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Channel 1 input                  | direct input value ch1          | Select input value type for channel 1 from the available options (BFM #9 or BFM #5).                |
|               |                                  | averaged input value ch1        |                                                                                                     |
| 01<br>(2nd)   | Channel 2 input                  | direct input value ch2          | Select input value type for channel 2 from the available options (BFM #10 or BFM #6).               |
|               |                                  | averaged input value ch2        |                                                                                                     |
| 02<br>(3rd)   | Channel 3 input                  | direct input value ch3          | Select input value type for channel 3 from the available options (BFM #11 or BFM #7).               |
|               |                                  | averaged input value ch3        |                                                                                                     |
| 03<br>(4th)   | Channel 4 input                  | direct input value ch4          | Select input value type for channel 4 from the available options (BFM #12 or BFM #8).               |
|               |                                  | averaged input value ch4        |                                                                                                     |
| 04<br>(5th)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 6th parameter uses EEPROM. Select "writing to EEPROM" setting from the available options.       |
|               |                                  | write parameter to EEPROM       |                                                                                                     |
| 05<br>(6th)   | ..O/G setting prohibit/permit    | permit offset/gain setting      | Select prohibit/permit setting of offset/gain from the available options (BFM #21).                 |
|               |                                  | prohibit offset/gain setting    |                                                                                                     |
| 06<br>(7th)   | RESET/INIT. MODULE TO DEFAULT    | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 07*1<br>(8th) | VERIFY RESET/ INITIALISE COMMAND | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 08*2<br>(9th) | A/D conversion speed             | normal speed (15ms/ch)          | Select conversion speed from the available options (BFM #15).                                       |
|               |                                  | high speed (6ms/ch)             |                                                                                                     |
| 09<br>(10th)  | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 11th ~13th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                                  | write parameter to EEPROM       |                                                                                                     |

**Table C-6: FX<sub>2N</sub>-4AD Extension Configuration (Motorola Format)**

| Nr.                        | Parameter Name                  | Value Setting List              | Description                                                                                          |
|----------------------------|---------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------|
| 10 <sup>*3</sup><br>(11th) | ..channel 3 input range         | preset range -10V to +10V       | Select input range for channel 3 from the available options (BFM #0).                                |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                      |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                      |
|                            |                                 | channel OFF                     |                                                                                                      |
| 11 <sup>*3</sup><br>(12th) | ..channel 4 input range         | preset range -10V to +10V       | Select input range for channel 4 from the available options (BFM #0).                                |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                      |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                      |
|                            |                                 | channel OFF                     |                                                                                                      |
| 12 <sup>*3</sup><br>(13th) | ..channel 1 input range         | preset range -10V to +10V       | Select input range for channel 1 from the available options (BFM #0).                                |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                      |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                      |
|                            |                                 | channel OFF                     |                                                                                                      |
| 13 <sup>*3</sup><br>(14th) | ..channel 2 input range         | preset range -10V to +10V       | Select input range for channel 2 from the available options (BFM #0).                                |
|                            |                                 | preset range +4mA to +20mA      |                                                                                                      |
|                            |                                 | preset range -20mA to +20mA     |                                                                                                      |
|                            |                                 | channel OFF                     |                                                                                                      |
| 14<br>(15th)               | data BFM 1 (No. of samples ch1) | Default: 8                      | Set the number of samples for averaged results in channel 1 (BFM #1).<br>Setting range: 1 to 4096    |
| 15<br>(16th)               | data BFM 2 (No. of samples ch2) |                                 | Set the number of samples for averaged results in channel 2 (BFM #2).<br>Setting range: 1 to 4096    |
| 16<br>(17th)               | data BFM 3 (No. of samples ch3) |                                 | Set the number of samples for averaged results in channel 3 (BFM #3).<br>Setting range: 1 to 4096    |
| 17<br>(18th)               | data BFM 4 (No. of samples ch4) |                                 | Set the number of samples for averaged results in channel 4 (BFM #4).<br>Setting range: 1 to 4096    |
| 18 <sup>*4</sup><br>(19th) | data BFM 23 (offset)            | Default: 0                      | Set offset value (BFM #23).<br>Setting range: -20000 to +20000                                       |
| 19 <sup>*4</sup><br>(20th) | data BFM 24 (gain)              | Default: 5000                   | Set gain value (BFM #24).<br>Setting: -20000 to +20000                                               |
| 20<br>(21st)               | Next parameter uses EEPROM.     | DON'T write parameter to EEPROM | The 22th ~ 25th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|                            |                                 | write parameter to EEPROM       |                                                                                                      |

**Table C-6: FX<sub>2N</sub>-4AD Extension Configuration (Motorola Format)**

| Nr.          | Parameter Name                | Value Setting List     | Description                                                                           |
|--------------|-------------------------------|------------------------|---------------------------------------------------------------------------------------|
| 21<br>(22nd) | ..channel 1 (offset/<br>gain) | no offset/gain setting | Select gain/offset adjust setting for channel 1 from the available options (BFM #22). |
|              |                               | change offset          |                                                                                       |
|              |                               | change gain            |                                                                                       |
|              |                               | change gain & offset   |                                                                                       |
| 22<br>(23rd) | ..channel 2 (offset/<br>gain) | no offset/gain setting | Select gain/offset adjust setting for channel 2 from the available options (BFM #22). |
|              |                               | change offset          |                                                                                       |
|              |                               | change gain            |                                                                                       |
|              |                               | change gain & offset   |                                                                                       |
| 23<br>(24th) | ..channel 3 (offset/<br>gain) | no offset/gain setting | Select gain/offset adjust setting for channel 2 from the available options (BFM #22). |
|              |                               | change offset          |                                                                                       |
|              |                               | change gain            |                                                                                       |
|              |                               | change gain & offset   |                                                                                       |
| 24<br>(25th) | ..channel 4 (offset/<br>gain) | no offset/gain setting | Select gain/offset adjust setting for channel 2 from the available options (BFM #22). |
|              |                               | change offset          |                                                                                       |
|              |                               | change gain            |                                                                                       |
|              |                               | change gain & offset   |                                                                                       |

\*1 To RESET the special function block, set both parameters (6&7) to “reset module”. While processing a RESET command, no other parameter will be accepted by the special function block.

As mentioned in the FX<sub>2N</sub>-4AD users guide the EEPROM access takes 300ms. So it is not possible to RESET the special function block to defaults and set the BFM 0 to 24 to a value different to the default value with the same parameter data block.

However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.

\*2 In this case the default value of the GSD file (high speed) differs from the hardware default value (normal speed).

\*3 The changes of BFM # 0 are written to EEPROM memory. Keep a delay of 300ms between setting the input range and other write accesses to the EEPROM.  
Ex.- changing the gain/offset values

\*4 If it is necessary to set different offset/gain values for every input channel, send the parameter data in multiple segments to the slave range

Ex.- ch1: offset=100/gain=6000; ch2:100/7000; ch3:200/4000; ch4:no changes

**Table C-7: Ex.- ch1: offset=100/gain=6000; ch2:100/7000; ch3:200/4000; ch4:no changes**

|                     | Parameter No. | Setting                          |
|---------------------|---------------|----------------------------------|
| 1st parameter block | 18th          | 100                              |
|                     | 19th          | 6000                             |
|                     | 20th          | change offset & gain (channel 1) |
|                     | 21th          | change offset (channel 2)        |
|                     | 22th          | no adjustment (channel 3)        |
|                     | 23th          | no adjustment (channel 4)        |
| 2nd parameter block | 18th          | 200                              |
|                     | 19th          | 4000                             |
|                     | 20th          | no adjustment (channel 1)        |
|                     | 21th          | no adjustment (channel 2)        |
|                     | 22th          | change offset & gain (channel 3) |
|                     | 23th          | no adjustment (channel 4)        |
| 3rd parameter block | 18th          | Don't care                       |
|                     | 19th          | 7000                             |
|                     | 20th          | no adjustment (channel 1)        |
|                     | 21th          | change gain (channel 2)          |
|                     | 22th          | no adjustment (channel 3)        |
|                     | 23th          | no adjustment (channel 4)        |

**C-2-3: FX2N-4AD Short Configuration (Intel Format)****Requirements:**

- Cyclic data is 4 word inputs in every cycle.

**Table C-8: Cyclic Data of FX2N-4AD Short Configuration (Intel Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Choose between direct and averaged value ch1 |
| 2nd |           | Choose between direct and averaged value ch2 |
| 3rd |           | Choose between direct and averaged value ch3 |
| 4th |           | Choose between direct and averaged value ch4 |

- Parameter is 11 bytes.

**Table C-9: FX2N-4AD Short Configuration (Intel Format)**

| Nr.           | Parameter Name              | Value Setting List              | Description                                                                                       |
|---------------|-----------------------------|---------------------------------|---------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Channel 1 input             | direct input value ch1          | Select input value type for channel 1 from the available options (BFM #9 or BFM #5).              |
|               |                             | averaged input value ch1        |                                                                                                   |
| 01<br>(2nd)   | Channel 2 input             | direct input value ch2          | Select input value type for channel 2 from the available options (BFM #10 or BFM #6).             |
|               |                             | averaged input value ch2        |                                                                                                   |
| 02<br>(3rd)   | Channel 3 input             | direct input value ch3          | Select input value type for channel 3 from the available options (BFM #11 or BFM #7).             |
|               |                             | averaged input value ch3        |                                                                                                   |
| 03<br>(4th)   | Channel 4 input             | direct input value ch4          | Select input value type for channel 4 from the available options (BFM #12 or BFM #8).             |
|               |                             | averaged input value ch4        |                                                                                                   |
| 04<br>(5th)   | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 6th ~9th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                             | write parameter to EEPROM       |                                                                                                   |
| 05*1<br>(6th) | ..channel 1 input range     | preset range -10V to +10V       | Select input range for channel 1 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |
| 06*1<br>(7th) | ..channel 2 input range     | preset range -10V to +10V       | Select input range for channel 2 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |
| 07*1<br>(8th) | ..channel 3 input range     | preset range -10V to +10V       | Select input range for channel 3 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |

**Table C-9: FX<sub>2N</sub>-4AD Short Configuration (Intel Format)**

| Nr.                       | Parameter Name          | Value Setting List          | Description                                                           |
|---------------------------|-------------------------|-----------------------------|-----------------------------------------------------------------------|
| 08 <sup>*1</sup><br>(9th) | ..channel 4 input range | preset range -10V to +10V   | Select input range for channel 4 from the available options (BFM #0). |
|                           |                         | preset range +4mA to +20mA  |                                                                       |
|                           |                         | preset range -20mA to +20mA |                                                                       |
|                           |                         | channel OFF                 |                                                                       |

\*1 The changes of BFM # 0 are written to EEPROM memory. Keep a delay of 300ms between setting the input range and other write accesses to the EEPROM.  
Ex.- changing the gain/offset values

**C-2-4: FX2N-4AD Short Configuration (Motorola Format)****Requirements:**

- Cyclic data is 4 word inputs in every cycle.

**Table C-10: Cyclic Data of FX2N-4AD Short Configuration (Motorola Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Choose between direct and averaged value ch1 |
| 2nd |           | Choose between direct and averaged value ch2 |
| 3rd |           | Choose between direct and averaged value ch3 |
| 4th |           | Choose between direct and averaged value ch4 |

- Parameter is 11 bytes.

**Table C-11: FX2N-4AD Short Configuration (Motorola Format)**

| Nr.           | Parameter Name              | Value Setting List              | Description                                                                                       |
|---------------|-----------------------------|---------------------------------|---------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Channel 1 input             | direct input value ch1          | Select input value type for channel 1 from the available options (BFM #9 or BFM #5).              |
|               |                             | averaged input value ch1        |                                                                                                   |
| 01<br>(2nd)   | Channel 2 input             | direct input value ch2          | Select input value type for channel 2 from the available options (BFM #10 or BFM #6).             |
|               |                             | averaged input value ch2        |                                                                                                   |
| 02<br>(3rd)   | Channel 3 input             | direct input value ch3          | Select input value type for channel 3 from the available options (BFM #11 or BFM #7).             |
|               |                             | averaged input value ch3        |                                                                                                   |
| 03<br>(4th)   | Channel 4 input             | direct input value ch4          | Select input value type for channel 4 from the available options (BFM #12 or BFM #8).             |
|               |                             | averaged input value ch4        |                                                                                                   |
| 04<br>(5th)   | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 6th ~9th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                             | write parameter to EEPROM       |                                                                                                   |
| 05*1<br>(6th) | ..channel 3 input range     | preset range -10V to +10V       | Select input range for channel 3 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |
| 06*1<br>(7th) | ..channel 4 input range     | preset range -10V to +10V       | Select input range for channel 4 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |
| 07*1<br>(8th) | ..channel 1 input range     | preset range -10V to +10V       | Select input range for channel 1 from the available options (BFM #0).                             |
|               |                             | preset range +4mA to +20mA      |                                                                                                   |
|               |                             | preset range -20mA to +20mA     |                                                                                                   |
|               |                             | channel OFF                     |                                                                                                   |

**Table C-11: FX<sub>2N</sub>-4AD Short Configuration (Motorola Format)**

| Nr.                       | Parameter Name          | Value Setting List          | Description                                                           |
|---------------------------|-------------------------|-----------------------------|-----------------------------------------------------------------------|
| 08 <sup>*1</sup><br>(9th) | ..channel 2 input range | preset range -10V to +10V   | Select input range for channel 2 from the available options (BFM #0). |
|                           |                         | preset range +4mA to +20mA  |                                                                       |
|                           |                         | preset range -20mA to +20mA |                                                                       |
|                           |                         | channel OFF                 |                                                                       |

\*1 The changes of BFM # 0 are written to EEPROM memory. Keep a delay of 300ms between setting the input range and other write accesses to the EEPROM.  
Ex.- changing the gain/offset values

**C-2-5: FX2N-4DA Extension Configuration (Intel Format)****Requirements:**

- Cyclic data is 4 word outputs in every cycle.

**Table C-12: Cyclic Data of FX2N-4DA Extension Configuration (Intel Format)**

|     | Send Data          | Receive Data |
|-----|--------------------|--------------|
| 1st | Data for channel 1 | None         |
| 2nd | Data for channel 2 |              |
| 3rd | Data for channel 3 |              |
| 4th | Data for channel 4 |              |

- Parameter is 50 bytes.
- For the FX2N-4DA the GSD-File is using a setting which is different to the default of the FX2N-4DA. The BFM #5 is set to 1111hex which will reset the analog outputs to the offset value if there is no further FROM/TO instruction.  
The reason for this setting is the behavior of the FX2N-32DP-IF, according to the Profibus specification it will set the cyclic output data to '0' if the Slave detects an internal watchdog error (Profibus down). In the case of the FX2N-4DA ext. & short configuration, an internal watchdog error will set the analog output data of channel 1,2,3 and 4 to 0 which means offset value.
- To hold the last output value, please use 'simple communication', because this communication style is accessing the BFMs indirectly. In the case of a watchdog error of the FX2N-32DP-IF, access to the FX2N-4DA will be stopped but the last output data will be held if BFM #5 is set to 0 for the corresponding channel.

**Table C-13: FX2N-4DA Extension Configuration (Intel Format)**

| Nr.           | Parameter Name                   | Value Setting List              | Description                                                                                         |
|---------------|----------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 2nd parameter use EEPROM. Select "writing to EEPROM" setting from the available options.        |
|               |                                  | write parameter to EEPROM       |                                                                                                     |
| 01<br>(2nd)   | ..O/G setting prohibit/permit    | permit offset/gain setting      | Select prohibit/permit setting of offset/gain from the available options (BFM #21).                 |
|               |                                  | prohibit offset/gain setting    |                                                                                                     |
| 02<br>(3rd)   | RESET/INIT. MODULE TO DEFAULT    | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 03*1<br>(4th) | VERIFY RESET/ INITIALISE COMMAND | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 04<br>(5th)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 6th to 9th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                                  | write parameter to EEPROM       |                                                                                                     |

**Table C-13: FX<sub>2N</sub>-4DA Extension Configuration (Intel Format)**

| Nr.                        | Parameter Name              | Value Setting List              | Description                                                                                            |
|----------------------------|-----------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------|
| 05 <sup>*1</sup><br>(6th)  | ..channel 1 output range    | preset range -10V to +10V       | Select output range for channel 1 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range -0mA to +20mA      |                                                                                                        |
| 06 <sup>*1</sup><br>(7th)  | ..channel 2 output range    | preset range -10V to +10V       | Select output range for channel 2 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 07 <sup>*1</sup><br>(8th)  | ..channel 3 output range    | preset range -10V to +10V       | Select output range for channel 3 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 08 <sup>*1</sup><br>(9th)  | ..channel 4 output range    | preset range -10V to +10V       | Select output range for channel 4 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 09 <sup>*2</sup><br>(10th) | data BFM10<br>(offset ch1)  | Default: 0                      | Set offset value for channel 1 (BFM #10).<br>Setting range: -20000 to +20000                           |
| 10 <sup>*2</sup><br>(11th) | data BFM 11<br>(gain ch1)   | Default: 5000                   | Set gain value for channel 1 (BFM #11).<br>Setting: -20000 to +20000                                   |
| 11 <sup>*2</sup><br>(12th) | data BFM 12<br>(offset ch2) | Default: 0                      | Set offset value for channel 2 (BFM #12).<br>Setting range: -20000 to +20000                           |
| 12 <sup>*2</sup><br>(13th) | data BFM 13<br>(gain ch2)   | Default: 5000                   | Set gain value for channel 2 (BFM #13).<br>Setting: -20000 to +20000                                   |
| 13 <sup>*2</sup><br>(14th) | data BFM 14<br>(offset ch3) | Default: 0                      | Set offset value for channel 3 (BFM #14).<br>Setting range: -20000 to +20000                           |
| 14 <sup>*2</sup><br>(15th) | data BFM 15<br>(gain ch3)   | Default: 5000                   | Set gain value for channel 3 (BFM #15).<br>Setting: -20000 to +20000                                   |
| 15 <sup>*2</sup><br>(16th) | data BFM 16<br>(offset ch4) | Default: 0                      | Set offset value for channel 4 (BFM #16).<br>Setting range: -20000 to +20000                           |
| 16 <sup>*2</sup><br>(17th) | data BFM 17<br>(gain ch4)   | Default: 5000                   | Set gain value for channel 4 (BFM #17).<br>Setting: -20000 to +20000                                   |
| 17 <sup>*2</sup><br>(18th) | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 19th and 20th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|                            |                             | write parameter to EEPROM       |                                                                                                        |

**Table C-13: FX<sub>2N</sub>-4DA Extension Configuration (Intel Format)**

| Nr.                        | Parameter Name                 | Value Setting List                 | Description                                                                                                     |
|----------------------------|--------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 18* <sup>2</sup><br>(19th) | ..channel 1 (offset/<br>gain)  | no offset/gain setting             | Select gain/offset adjust setting for channel 1 from the available options (BFM #8).                            |
|                            |                                | change offset                      |                                                                                                                 |
|                            |                                | change gain                        |                                                                                                                 |
|                            |                                | change gain & offset               |                                                                                                                 |
| 19* <sup>2</sup><br>(20th) | ..channel 2 (offset/<br>gain)  | no offset/gain setting             | Select gain/offset adjust setting for channel 2 from the available options (BFM #8).                            |
|                            |                                | change offset                      |                                                                                                                 |
|                            |                                | change gain                        |                                                                                                                 |
|                            |                                | change gain & offset               |                                                                                                                 |
| 20* <sup>2</sup><br>(21st) | Next parameter<br>uses EEPROM. | DON'T write parameter to<br>EEPROM | The 22nd and 23rd parameter use<br>EEPROM. Select "writing to<br>EEPROM" setting from the available<br>options. |
|                            |                                | write parameter to EEPROM          |                                                                                                                 |
| 21* <sup>2</sup><br>(22nd) | ..channel 3 (offset/<br>gain)  | no offset/gain setting             | Select gain/offset adjust setting for<br>channel 3 from the available options<br>(BFM #9).                      |
|                            |                                | change offset                      |                                                                                                                 |
|                            |                                | change gain                        |                                                                                                                 |
|                            |                                | change gain & offset               |                                                                                                                 |
| 22* <sup>2</sup><br>(23rd) | ..channel 4 (offset/<br>gain)  | no offset/gain setting             | Select gain/offset adjust setting for<br>channel 4 from the available options<br>(BFM #9).                      |
|                            |                                | change offset                      |                                                                                                                 |
|                            |                                | change gain                        |                                                                                                                 |
|                            |                                | change gain & offset               |                                                                                                                 |

\*1 To RESET the special function block, set both parameters (2&3) to "reset module".

While processing a RESET command, no other parameter will be accepted by the special function block. As mentioned in the FX<sub>2N</sub>-4DA user's guide the EEPROM access takes 3s. It is not possible to RESET the special function block to defaults and to set the BFM's 0 to 21 to a non-default value within the same parameter data block.

However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.

\*2 When changing offset and gain setting value for one or more channels, please set the values for every channel.

**C-2-6: FX2N-4DA Extension Configuration (Motorola Format)****Requirements:**

- Cyclic data is 4 word outputs in every cycle.

**Table C-14: Cyclic Data of FX2N-4DA Extension Configuration (Motorola Format)**

|     | Send Data          | Receive Data |
|-----|--------------------|--------------|
| 1st | Data for channel 1 | None         |
| 2nd | Data for channel 2 |              |
| 3rd | Data for channel 3 |              |
| 4th | Data for channel 4 |              |

- Parameter is 50 bytes.
- For the FX2N-4DA the GSD-File is using a setting which is different to the default of the FX2N-4DA. The BFM #5 is set to 1111hex which will reset the analog outputs to the offset value if there is no further FROM/TO instruction.  
The reason for this setting is the behavior of the FX2N-32DP-IF, according to the Profibus specification it will set the cyclic output data to '0' if the Slave detects an internal watchdog error (Profibus down). In the case of the FX2N-4DA ext. & short configuration, an internal watchdog error will set the analog output data of channel 1,2,3 and 4 to 0 which means offset value.
- To hold the last output value, please use 'simple communication', because this communication style is accessing the BFMs indirectly. In the case of a watchdog error of the FX2N-32DP-IF, access to the FX2N-4DA will be stopped but the last output data will be held if BFM #5 is set to 0 for the corresponding channel.

**Table C-15: FX2N-4DA Extension Configuration (Motorola Format)**

| Nr.           | Parameter Name                   | Value Setting List              | Description                                                                                         |
|---------------|----------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 2nd parameter use EEPROM. Select "writing to EEPROM" setting from the available options.        |
|               |                                  | write parameter to EEPROM       |                                                                                                     |
| 01<br>(2nd)   | ..O/G setting prohibit/permit    | permit offset/gain setting      | Select prohibit/permit setting of offset/gain from the available options (BFM #21).                 |
|               |                                  | prohibit offset/gain setting    |                                                                                                     |
| 02<br>(3rd)   | RESET/INIT. MODULE TO DEFAULT    | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 03*1<br>(4th) | VERIFY RESET/ INITIALISE COMMAND | no reset/initialisation         | Select initialize module setting from the available options (BFM #20).                              |
|               |                                  | RESET/INITIALISE MODULE         |                                                                                                     |
| 04<br>(5th)   | Next parameter uses EEPROM.      | DON'T write parameter to EEPROM | The 6th to 9th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                                  | write parameter to EEPROM       |                                                                                                     |

**Table C-15: FX<sub>2N</sub>-4DA Extension Configuration (Motorola Format)**

| Nr.                        | Parameter Name              | Value Setting List              | Description                                                                                            |
|----------------------------|-----------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------|
| 05* <sup>1</sup><br>(6th)  | ..channel 3 output range    | preset range -10V to +10V       | Select output range for channel 3 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range -0mA to +20mA      |                                                                                                        |
| 06* <sup>1</sup><br>(7th)  | ..channel 4 output range    | preset range -10V to +10V       | Select output range for channel 4 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 07* <sup>1</sup><br>(8th)  | ..channel 1 output range    | preset range -10V to +10V       | Select output range for channel 1 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 08* <sup>1</sup><br>(9th)  | ..channel 2 output range    | preset range -10V to +10V       | Select output range for channel 2 from the available options (BFM #0).                                 |
|                            |                             | preset range +4mA to +20mA      |                                                                                                        |
|                            |                             | preset range 0mA to +20mA       |                                                                                                        |
| 09* <sup>2</sup><br>(10th) | data BFM10 (offset ch1)     | Default: 0                      | Set offset value for channel 1 (BFM #10).<br>Setting range: -20000 to +20000                           |
| 10* <sup>2</sup><br>(11th) | data BFM 11 (gain ch1)      | Default: 5000                   | Set gain value for channel 1 (BFM #11).<br>Setting: -20000 to +20000                                   |
| 11* <sup>2</sup><br>(12th) | data BFM 12 (offset ch2)    | Default: 0                      | Set offset value for channel 2 (BFM #12).<br>Setting range: -20000 to +20000                           |
| 12* <sup>2</sup><br>(13th) | data BFM 13 (gain ch2)      | Default: 5000                   | Set gain value for channel 2 (BFM #13).<br>Setting: -20000 to +20000                                   |
| 13* <sup>2</sup><br>(14th) | data BFM 14 (offset ch3)    | Default: 0                      | Set offset value for channel 3 (BFM #14).<br>Setting range: -20000 to +20000                           |
| 14* <sup>2</sup><br>(15th) | data BFM 15 (gain ch3)      | Default: 5000                   | Set gain value for channel 3 (BFM #15).<br>Setting: -20000 to +20000                                   |
| 15* <sup>2</sup><br>(16th) | data BFM 16 (offset ch4)    | Default: 0                      | Set offset value for channel 4 (BFM #16).<br>Setting range: -20000 to +20000                           |
| 16* <sup>2</sup><br>(17th) | data BFM 17 (gain ch4)      | Default: 5000                   | Set gain value for channel 4 (BFM #17).<br>Setting: -20000 to +20000                                   |
| 17* <sup>2</sup><br>(18th) | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 19th and 20th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|                            |                             | write parameter to EEPROM       |                                                                                                        |

**Table C-15: FX<sub>2N</sub>-4DA Extension Configuration (Motorola Format)**

| Nr.                        | Parameter Name               | Value Setting List              | Description                                                                                            |
|----------------------------|------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------|
| 18* <sup>2</sup><br>(19th) | ..channel 2<br>(offset/gain) | no offset/gain setting          | Select gain/offset adjust setting for channel 2 from the available options (BFM #8).                   |
|                            |                              | change offset                   |                                                                                                        |
|                            |                              | change gain                     |                                                                                                        |
|                            |                              | change gain & offset            |                                                                                                        |
| 19* <sup>2</sup><br>(20th) | ..channel 1<br>(offset/gain) | no offset/gain setting          | Select gain/offset adjust setting for channel 1 from the available options (BFM #8).                   |
|                            |                              | change offset                   |                                                                                                        |
|                            |                              | change gain                     |                                                                                                        |
|                            |                              | change gain & offset            |                                                                                                        |
| 20* <sup>2</sup><br>(21st) | Next parameter uses EEPROM.  | DON'T write parameter to EEPROM | The 22nd and 23rd parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|                            |                              | write parameter to EEPROM       |                                                                                                        |
| 21* <sup>2</sup><br>(22nd) | ..channel 4<br>(offset/gain) | no offset/gain setting          | Select gain/offset adjust setting for channel 4 from the available options (BFM #9).                   |
|                            |                              | change offset                   |                                                                                                        |
|                            |                              | change gain                     |                                                                                                        |
|                            |                              | change gain & offset            |                                                                                                        |
| 22* <sup>2</sup><br>(23rd) | ..channel 3<br>(offset/gain) | no offset/gain setting          | Select gain/offset adjust setting for channel 3 from the available options (BFM #9).                   |
|                            |                              | change offset                   |                                                                                                        |
|                            |                              | change gain                     |                                                                                                        |
|                            |                              | change gain & offset            |                                                                                                        |

\*1 To RESET the special function block, set both parameters (2&3) to "reset module".

While processing a RESET command, no other parameter will be accepted by the special function block. As mentioned in the FX<sub>2N</sub>-4DA user's guide the EEPROM access takes 3s. It is not possible to RESET the special function block to defaults and to set the BFM's 0 to 21 to a non-default value within the same parameter data block.

However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.

\*2 When changing offset and gain setting value for one or more channels, please set the values for every channel.

**C-2-7: FX2N-4DA Short Configuration (Intel Format)****Requirements:**

- Cyclic data is 4 word outputs in every cycle.

**Table C-16: Cyclic Data of FX2N-4DA Short Configuration (Intel Format)**

|     | Send Data          | Receive Data |
|-----|--------------------|--------------|
| 1st | Data for channel 1 | None         |
| 2nd | Data for channel 2 |              |
| 3rd | Data for channel 3 |              |
| 4th | Data for channel 4 |              |

- Parameter is 14 bytes.
- For the FX2N-4DA the GSD-File is using a setting which is different to the default of the FX2N-4DA. The BFM #5 is set to 1111hex which will reset the analog outputs to the offset value if there is no further FROM/TO instruction.  
The reason for this setting is the behavior of the FX2N-32DP-IF, according to the Profibus

specification it will set the cyclic output data to '0' if the Slave detects an internal watchdog error (Profibus down). In the case of the FX<sub>2N</sub>-4DA ext. & short configuration, an internal watchdog error will set the analog output data of channel 1,2,3 and 4 to 0 which means offset value.

- To hold the last output value, please use 'simple communication', because this communication style is accessing the BFMs indirectly. In the case of a watchdog error of the FX<sub>2N</sub>-32DP-IF, access to the FX<sub>2N</sub>-4DA will be stopped but the last output data will be held if BFM #5 is set to 0 for the corresponding channel.

**Table C-17: FX<sub>2N</sub>-4DA Short Configuration (Intel Format)**

| Nr.           | Parameter Name              | Value Setting List              | Description                                                                                         |
|---------------|-----------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Next parameter uses EEPROM. | DON'T write parameter to EEPROM | The 2nd to 5th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
|               |                             | write parameter to EEPROM       |                                                                                                     |
| 01*1<br>(2nd) | ..channel 1 output range    | preset range -10V to +10V       | Select output range for channel 1 from the available options (BFM #0).                              |
|               |                             | preset range +4mA to +20mA      |                                                                                                     |
|               |                             | preset range -0mA to +20mA      |                                                                                                     |
| 02*1<br>(3rd) | ..channel 2 output range    | preset range -10V to +10V       | Select output range for channel 2 from the available options (BFM #0).                              |
|               |                             | preset range +4mA to +20mA      |                                                                                                     |
|               |                             | preset range 0mA to +20mA       |                                                                                                     |
| 03*1<br>(4th) | ..channel 3 output range    | preset range -10V to +10V       | Select output range for channel 3 from the available options (BFM #0).                              |
|               |                             | preset range +4mA to +20mA      |                                                                                                     |
|               |                             | preset range 0mA to +20mA       |                                                                                                     |
| 04*1<br>(5th) | ..channel 4 output range    | preset range -10V to +10V       | Select output range for channel 4 from the available options (BFM #0).                              |
|               |                             | preset range +4mA to +20mA      |                                                                                                     |
|               |                             | preset range 0mA to +20mA       |                                                                                                     |

For information of Note, please see next page.

- \*1 To RESET the special function block, set both parameters (2&3) to "reset module". While processing a RESET command, no other parameter will be accepted by the special function block. As mentioned in the FX<sub>2N</sub>-4DA user's guide the EEPROM access takes 3s. It is not possible to RESET the special function block to defaults and to set the BFMs 0 to 21 to a non-default value within the same parameter data block. However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.

**C-2-8: FX2N-4DA Short Configuration (Motorola Format)****Requirements:**

- Cyclic data is 4 word outputs in every cycle.

**Table C-18: Cyclic Data of FX2N-4DA Short Configuration (Motorola Format)**

|     | Send Data          | Receive Data |
|-----|--------------------|--------------|
| 1st | Data for channel 1 | None         |
| 2nd | Data for channel 2 |              |
| 3rd | Data for channel 3 |              |
| 4th | Data for channel 4 |              |

- Parameter is 14 bytes.
- For the FX2N-4DA the GSD-File is using a setting which is different to the default of the FX2N-4DA. The BFM #5 is set to 1111hex which will reset the analog outputs to the offset value if there is no further FROM/TO instruction.  
The reason for this setting is the behavior of the FX2N-32DP-IF, according to the Profibus

specification it will set the cyclic output data to '0' if the Slave detects an internal watchdog error (Profibus down). In the case of the FX<sub>2N</sub>-4DA ext. & short configuration, an internal watchdog error will set the analog output data of channel 1,2,3 and 4 to 0 which means offset value.

- To hold the last output value, please use 'simple communication', because this communication style is accessing the BFMs indirectly. In the case of a watchdog error of the FX<sub>2N</sub>-32DP-IF, access to the FX<sub>2N</sub>-4DA will be stopped but the last output data will be held if BFM #5 is set to 0 for the corresponding channel.

**Table C-19: FX<sub>2N</sub>-4DA Short Configuration (Motorola Format)**

| Nr.           | Parameter Name              | Value Setting List                                                                    | Description                                                                                         |
|---------------|-----------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 00<br>(1st)   | Next parameter uses EEPROM. | DON'T write parameter to EEPROM<br>write parameter to EEPROM                          | The 2nd to 5th parameter use EEPROM. Select "writing to EEPROM" setting from the available options. |
| 01*1<br>(2th) | ..channel 3 output range    | preset range -10V to +10V<br>preset range +4mA to +20mA<br>preset range -0mA to +20mA | Select output range for channel 3 from the available options (BFM #0).                              |
| 02*1<br>(3th) | ..channel 4 output range    | preset range -10V to +10V<br>preset range +4mA to +20mA<br>preset range 0mA to +20mA  | Select output range for channel 4 from the available options (BFM #0).                              |
| 03*1<br>(4th) | ..channel 1 output range    | preset range -10V to +10V<br>preset range +4mA to +20mA<br>preset range 0mA to +20mA  | Select output range for channel 1 from the available options (BFM #0).                              |
| 04*1<br>(5th) | ..channel 2 output range    | preset range -10V to +10V<br>preset range +4mA to +20mA<br>preset range 0mA to +20mA  | Select output range for channel 2 from the available options (BFM #0).                              |

For information of Note, please see next page.

- \*1 To RESET the special function block, set both parameters (2&3) to "reset module". While processing a RESET command, no other parameter will be accepted by the special function block. As mentioned in the FX<sub>2N</sub>-4DA user's guide the EEPROM access takes 3s. It is not possible to RESET the special function block to defaults and to set the BFMs 0 to 21 to a non-default value within the same parameter data block. However, it is possible to send a parameter block to RESET any special function block that supports the RESET function and afterwards to send a second parameter block to set the module/s to the desired parameter values.

**C-2-9: FX<sub>2N</sub>-4AD-PT Extension Configuration****Requirements:**

- Cyclic data is 5 word inputs in every cycle.

**Table C-20: Cyclic Data of FX<sub>2N</sub>-4AD-PT Extension Configuration**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 24 bytes.

**Table C-21: FX<sub>2N</sub>-4AD-PT Extension Configuration**

| Nr.         | Parameter Name                  | Value Setting List           | Description                                                                                       |
|-------------|---------------------------------|------------------------------|---------------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input                 | average temperature in 0.1°C | Select input value type for channel 1 from the available options.<br>(BFM #9, #5, #17, #13)       |
|             |                                 | present temperature in 0.1°C |                                                                                                   |
|             |                                 | average temperature in 0.1°F |                                                                                                   |
|             |                                 | present temperature in 0.1°F |                                                                                                   |
| 01<br>(2th) | channel 2 input                 | average temperature in 0.1°C | Select input value type for channel 2 from the available options.<br>(BFM #10, #6, #18, #14)      |
|             |                                 | present temperature in 0.1°C |                                                                                                   |
|             |                                 | average temperature in 0.1°F |                                                                                                   |
|             |                                 | present temperature in 0.1°F |                                                                                                   |
| 02<br>(3th) | channel 3 input                 | average temperature in 0.1°C | Select input value type for channel 3 from the available options.<br>(BFM #11, #7, #19, #15)      |
|             |                                 | present temperature in 0.1°C |                                                                                                   |
|             |                                 | average temperature in 0.1°F |                                                                                                   |
|             |                                 | present temperature in 0.1°F |                                                                                                   |
| 03<br>(4th) | channel 4 input                 | average temperature in 0.1°C | Select input value type for channel 4 from the available options.<br>(BFM #12, #8, #20, #16)      |
|             |                                 | present temperature in 0.1°C |                                                                                                   |
|             |                                 | average temperature in 0.1°F |                                                                                                   |
|             |                                 | present temperature in 0.1°F |                                                                                                   |
| 04<br>(5th) | data BFM 1 (No. of samples ch1) | Default: 8                   | Set the number of samples for averaged results in channel 1 (BFM #1).<br>Setting range: 1 to 4096 |
| 05<br>(6th) | data BFM 2 (No. of samples ch2) | Default: 8                   | Set the number of samples for averaged results in channel 2 (BFM #2).<br>Setting range: 1 to 4096 |

**Table C-21: FX<sub>2N</sub>-4AD-PT Extension Configuration**

| Nr.         | Parameter Name                  | Value Setting List                      | Description                                                                                       |
|-------------|---------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------|
| 06<br>(7th) | data BFM 3 (No. of samples ch3) | Default: 8                              | Set the number of samples for averaged results in channel 3 (BFM #3).<br>Setting range: 1 to 4096 |
| 07<br>(8th) | data BFM 4 (No. of samples ch4) | Default: 8                              | Set the number of samples for averaged results in channel 4 (BFM #4).<br>Setting range: 1 to 4096 |
| 08<br>(9th) | clear error register            | perform nothing<br>reset error register | Select clear error register from the available options. (BFM #28)                                 |

C-2-10: FX<sub>2N</sub>-4AD-PT Short Configuration

## Requirements:

- Cyclic data is 4 word inputs in every cycle.

Table C-22: Cyclic Data of FX<sub>2N</sub>-4AD-PT Short Configuration

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 12 bytes.

Table C-23: FX<sub>2N</sub>-4AD-PT Short Configuration

| Nr.         | Parameter Name       | Value Setting List           | Description                                                                               |
|-------------|----------------------|------------------------------|-------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input      | average temperature in 0.1°C | Select input value type for channel 1 from the available options. (BFM #9, #5, #17, #13)  |
|             |                      | present temperature in 0.1°C |                                                                                           |
|             |                      | average temperature in 0.1°F |                                                                                           |
|             |                      | present temperature in 0.1°F |                                                                                           |
| 01<br>(2th) | channel 2 input      | average temperature in 0.1°C | Select input value type for channel 2 from the available options. (BFM #10, #6, #18, #14) |
|             |                      | present temperature in 0.1°C |                                                                                           |
|             |                      | average temperature in 0.1°F |                                                                                           |
|             |                      | present temperature in 0.1°F |                                                                                           |
| 02<br>(3th) | channel 3 input      | average temperature in 0.1°C | Select input value type for channel 3 from the available options. (BFM #11, #7, #19, #15) |
|             |                      | present temperature in 0.1°C |                                                                                           |
|             |                      | average temperature in 0.1°F |                                                                                           |
|             |                      | present temperature in 0.1°F |                                                                                           |
| 03<br>(4th) | channel 4 input      | average temperature in 0.1°C | Select input value type for channel 4 from the available options. (BFM #12, #8, #20, #16) |
|             |                      | present temperature in 0.1°C |                                                                                           |
|             |                      | average temperature in 0.1°F |                                                                                           |
|             |                      | present temperature in 0.1°F |                                                                                           |
| 04<br>(5th) | clear error register | perform nothing              | Select clear error register from the available options. (BFM #28)                         |
|             |                      | reset error register         |                                                                                           |

**C-2-11: FX2N-4AD-TC Extension Configuration (Intel Format)****Requirements:**

- Cyclic data is 5 word inputs in every cycle.

**Table C-24: Cyclic Data of FX2N-4AD-TC Extension Configuration (Intel Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 30 bytes.

**Table C-25: FX2N-4AD-TC Extension Configuration (Intel Format)**

| Nr.         | Parameter Name  | Value Setting List           | Description                                                                               |
|-------------|-----------------|------------------------------|-------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input | average temperature in 0.1°C | Select input value type for channel 1 from the available options. (BFM #9, #5, #17, #13)  |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 01<br>(2th) | channel 2 input | average temperature in 0.1°C | Select input value type for channel 2 from the available options. (BFM #10, #6, #18, #14) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 02<br>(3th) | channel 3 input | average temperature in 0.1°C | Select input value type for channel 3 from the available options. (BFM #11, #7, #19, #15) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 03<br>(4th) | channel 4 input | average temperature in 0.1°C | Select input value type for channel 4 from the available options. (BFM #12, #8, #20, #16) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 04<br>(5th) | channel 1       | thermocouple type K          | Select thermocouple type for channel 1 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |
| 05<br>(6th) | channel 2       | thermocouple type K          | Select thermocouple type for channel 2 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |

**Table C-25: FX<sub>2N</sub>-4AD-TC Extension Configuration (Intel Format)**

| Nr.          | Parameter Name                  | Value Setting List   | Description                                                                                      |
|--------------|---------------------------------|----------------------|--------------------------------------------------------------------------------------------------|
| 06<br>(7th)  | channel 3                       | thermocouple type K  | Select thermocouple type for channel 3 from the available options. (BFM #0)                      |
|              |                                 | thermocouple type J  |                                                                                                  |
|              |                                 | not used             |                                                                                                  |
| 07<br>(8th)  | channel 4                       | thermocouple type K  | Select thermocouple type for channel 4 from the available options. (BFM #0)                      |
|              |                                 | thermocouple type J  |                                                                                                  |
|              |                                 | not used             |                                                                                                  |
| 08<br>(9th)  | clear error register            | perform nothing      | Select clear error register from the available options. (BFM #28)                                |
|              |                                 | reset error register |                                                                                                  |
| 09<br>(10th) | data BFM 1 (No. of samples ch1) | Default: 8           | Set the number of samples for averaged results in channel 1 (BFM #1).<br>Setting range: 1 to 256 |
| 10<br>(11th) | data BFM 2 (No. of samples ch2) | Default: 8           | Set the number of samples for averaged results in channel 2 (BFM #2).<br>Setting range: 1 to 256 |
| 11<br>(12th) | data BFM 3 (No. of samples ch3) | Default: 8           | Set the number of samples for averaged results in channel 3 (BFM #3).<br>Setting range: 1 to 256 |
| 12<br>(13th) | data BFM 4 (No. of samples ch4) | Default: 8           | Set the number of samples for averaged results in channel 4 (BFM #4).<br>Setting range: 1 to 256 |

**C-2-12: FX<sub>2N</sub>-4AD-TC Extension Configuration (Motorola Format)****Requirements:**

- Cyclic data is 5 word inputs in every cycle.

**Table C-26: Cyclic Data of FX<sub>2N</sub>-4AD-TC Extension Configuration (Motorola Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 30 bytes.

**Table C-27: FX<sub>2N</sub>-4AD-TC Extension Configuration (Motorola Format)**

| Nr.         | Parameter Name  | Value Setting List           | Description                                                                               |
|-------------|-----------------|------------------------------|-------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input | average temperature in 0.1°C | Select input value type for channel 1 from the available options. (BFM #9, 5, 17, 13)     |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 01<br>(2th) | channel 2 input | average temperature in 0.1°C | Select input value type for channel 2 from the available options. (BFM #10, #6, #18, #14) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 02<br>(3th) | channel 3 input | average temperature in 0.1°C | Select input value type for channel 3 from the available options. (BFM #11, #7, #19, #15) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 03<br>(4th) | channel 4 input | average temperature in 0.1°C | Select input value type for channel 4 from the available options. (BFM #12, #8, #20, #16) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 04<br>(5th) | channel 3       | thermocouple type K          | Select thermocouple type for channel 3 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |
| 05<br>(6th) | channel 4       | thermocouple type K          | Select thermocouple type for channel 4 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |

**Table C-27: FX<sub>2N</sub>-4AD-TC Extension Configuration (Motorola Format)**

| Nr.          | Parameter Name                  | Value Setting List   | Description                                                                                      |
|--------------|---------------------------------|----------------------|--------------------------------------------------------------------------------------------------|
| 06<br>(7th)  | channel 1                       | thermocouple type K  | Select thermocouple type for channel 1 from the available options. (BFM #0)                      |
|              |                                 | thermocouple type J  |                                                                                                  |
|              |                                 | not used             |                                                                                                  |
| 07<br>(8th)  | channel 2                       | thermocouple type K  | Select thermocouple type for channel 2 from the available options. (BFM #0)                      |
|              |                                 | thermocouple type J  |                                                                                                  |
|              |                                 | not used             |                                                                                                  |
| 08<br>(9th)  | clear error register            | perform nothing      | Select clear error register from the available options. (BFM #28)                                |
|              |                                 | reset error register |                                                                                                  |
| 09<br>(10th) | data BFM 1 (No. of samples ch1) | Default: 8           | Set the number of samples for averaged results in channel 1 (BFM #1).<br>Setting range: 1 to 256 |
| 10<br>(11th) | data BFM 2 (No. of samples ch2) | Default: 8           | Set the number of samples for averaged results in channel 2 (BFM #2).<br>Setting range: 1 to 256 |
| 11<br>(12th) | data BFM 3 (No. of samples ch3) | Default: 8           | Set the number of samples for averaged results in channel 3 (BFM #3).<br>Setting range: 1 to 256 |
| 12<br>(13th) | data BFM 4 (No. of samples ch4) | Default: 8           | Set the number of samples for averaged results in channel 4 (BFM #4).<br>Setting range: 1 to 256 |

**C-2-13: FX2N-4AD-TC Short Configuration (Intel Format)****Requirements:**

- Cyclic data is 5 word inputs in every cycle.

**Table C-28: Cyclic Data of FX2N-4AD-TC Short Configuration (Intel Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 18 bytes.

**Table C-29: FX2N-4AD-TC Short Configuration (Intel Format)**

| Nr.         | Parameter Name  | Value Setting List           | Description                                                                               |
|-------------|-----------------|------------------------------|-------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input | average temperature in 0.1°C | Select input value type for channel 1 from the available options. (BFM #9, #5, #17, #13)  |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 01<br>(2th) | channel 2 input | average temperature in 0.1°C | Select input value type for channel 2 from the available options. (BFM #10, #6, #18, #14) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 02<br>(3th) | channel 3 input | average temperature in 0.1°C | Select input value type for channel 3 from the available options. (BFM #11, #7, #19, #15) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 03<br>(4th) | channel 4 input | average temperature in 0.1°C | Select input value type for channel 4 from the available options. (BFM #12, #8, #20, #16) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 04<br>(5th) | channel 1       | thermocouple type K          | Select thermocouple type for channel 1 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |
| 05<br>(6th) | channel 2       | thermocouple type K          | Select thermocouple type for channel 2 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |

**Table C-29: FX<sub>2N</sub>-4AD-TC Short Configuration (Intel Format)**

| Nr.         | Parameter Name       | Value Setting List   | Description                                                                 |
|-------------|----------------------|----------------------|-----------------------------------------------------------------------------|
| 06<br>(7th) | channel 3            | thermocouple type K  | Select thermocouple type for channel 3 from the available options. (BFM #0) |
|             |                      | thermocouple type J  |                                                                             |
|             |                      | not used             |                                                                             |
| 07<br>(8th) | channel 4            | thermocouple type K  | Select thermocouple type for channel 4 from the available options. (BFM #0) |
|             |                      | thermocouple type J  |                                                                             |
|             |                      | not used             |                                                                             |
| 08<br>(9th) | clear error register | perform nothing      | Select clear error register from the available options. (BFM #28)           |
|             |                      | reset error register |                                                                             |

**C-2-14: FX<sub>2N</sub>-4AD-TC Short Configuration (Motorola Format)****Requirements:**

- Cyclic data is 5 word inputs in every cycle.

**Table C-30: Cyclic Data of FX<sub>2N</sub>-4AD-TC Short Configuration (Motorola Format)**

|     | Send Data | Receive Data                                 |
|-----|-----------|----------------------------------------------|
| 1st | None      | Channel 1: present; average value in °C; °F  |
| 2nd |           | Channel 2: present; average value in °C; °F  |
| 3rd |           | Channel 3: present; average value in °C; °F  |
| 4th |           | Channel 4: present; average value in °C; °F  |
| 5th |           | Value of BFM #28 "digital range error latch" |

- Parameter is 18 bytes.

**Table C-31: FX<sub>2N</sub>-4AD-TC Short Configuration (Motorola Format)**

| Nr.         | Parameter Name  | Value Setting List           | Description                                                                               |
|-------------|-----------------|------------------------------|-------------------------------------------------------------------------------------------|
| 00<br>(1st) | channel 1 input | average temperature in 0.1°C | Select input value type for channel 1 from the available options. (BFM #9, #5, #17, #13)  |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 01<br>(2th) | channel 2 input | average temperature in 0.1°C | Select input value type for channel 2 from the available options. (BFM #10, #6, #18, #14) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 02<br>(3th) | channel 3 input | average temperature in 0.1°C | Select input value type for channel 3 from the available options. (BFM #11, #7, #19, #15) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 03<br>(4th) | channel 4 input | average temperature in 0.1°C | Select input value type for channel 4 from the available options. (BFM #12, #8, #20, #16) |
|             |                 | present temperature in 0.1°C |                                                                                           |
|             |                 | average temperature in 0.1°F |                                                                                           |
|             |                 | present temperature in 0.1°F |                                                                                           |
| 04<br>(5th) | channel 3       | thermocouple type K          | Select thermocouple type for channel 3 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |
| 05<br>(6th) | channel 4       | thermocouple type K          | Select thermocouple type for channel 4 from the available options. (BFM #0)               |
|             |                 | thermocouple type J          |                                                                                           |
|             |                 | not used                     |                                                                                           |

**Table C-31: FX<sub>2N</sub>-4AD-TC Short Configuration (Motorola Format)**

| Nr.         | Parameter Name       | Value Setting List   | Description                                                                 |
|-------------|----------------------|----------------------|-----------------------------------------------------------------------------|
| 06<br>(7th) | channel 1            | thermocouple type K  | Select thermocouple type for channel 1 from the available options. (BFM #0) |
|             |                      | thermocouple type J  |                                                                             |
|             |                      | not used             |                                                                             |
| 07<br>(8th) | channel 2            | thermocouple type K  | Select thermocouple type for channel 2 from the available options. (BFM #0) |
|             |                      | thermocouple type J  |                                                                             |
|             |                      | not used             |                                                                             |
| 08<br>(9th) | clear error register | perform nothing      | Select clear error register from the available options. (BFM #28)           |
|             |                      | reset error register |                                                                             |

## C-2-15: FX2N-1HC Extension Configuration



## Requirements:

- Cyclic data is 2 word inputs and 2 word outputs in every cycle.

Table C-32: Cyclic Data of FX2N-1HC Extension Configuration

|     | Send Data                | Receive Data              |
|-----|--------------------------|---------------------------|
| 1st | Up/down command (BFM #1) | Compare results (BFM #26) |
| 2nd | Command (BFM #4)         | Terminal status (BFM #27) |

- Parameter is 41 bytes.

Table C-33: FX2N-1HC Extension Configuration

| Nr.         | Parameter Name                 | Value Setting List              | Description                                                                                                                                   |
|-------------|--------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | Counter mode                   | 2-ph. input 1 edge count 32 bit | Select counter mode from the available options. (BFM #0)                                                                                      |
|             |                                | 2-ph. input 1 edge count 16 bit |                                                                                                                                               |
|             |                                | 2-ph. input 2 edge count 32 bit |                                                                                                                                               |
|             |                                | 2-ph. input 2 edge count 16 bit |                                                                                                                                               |
|             |                                | 2-ph. input 4 edge count 32 bit |                                                                                                                                               |
|             |                                | 2-ph. input 4 edge count 16 bit |                                                                                                                                               |
|             |                                | 1-ph. 2-input +/- pls. 32 bit   |                                                                                                                                               |
|             |                                | 1-ph. 2-input +/- pls. 16 bit   |                                                                                                                                               |
|             |                                | 1-ph. 1-inp. HW UP/DOWN 32 bit  |                                                                                                                                               |
|             |                                | 1-ph. 1-inp. HW UP/DOWN 16 bit  |                                                                                                                                               |
|             |                                | 1-ph. 1-inp. SW UP/DOWN 32 bit  |                                                                                                                                               |
|             |                                | 1-ph. 1-inp. SW UP/DOWN 16 bit  |                                                                                                                                               |
| 01<br>(2nd) | ring length lower word         | Default: 0 (0000Hex)            | Set lower word value for ring length (BFM #2)<br>Setting range (BFM #2, #3): 2 ~ 65535 (00002 ~ 10000Hex)                                     |
| 02<br>(3rd) | ring length upper word         | Default: 1 (0001Hex)            | Set upper word value for ring length (BFM #3)<br>Setting range (BFM #3, #2): 2 ~ 65535 (00002 ~ 10000Hex)                                     |
| 03<br>(4th) | counter curr. value lower word | Default: 0 (0000Hex)            | Set lower word for counter current value. (BFM #20)<br>Setting range (BFM #21, #20): -2,147,483,648 ~ +2,147,483,647 (00000000 ~ FFFFFFFFHex) |
| 04<br>(5th) | counter curr. value upper word | Default: 0 (0000Hex)            | Set upper word for counter current value. (BFM #21)<br>Setting range (BFM #21, #20): -2,147,483,648 ~ +2,147,483,647 (00000000 ~ FFFFFFFFHex) |
| 05<br>(6th) | preset data lower word         | Default: 0 (0000Hex)            | Set lower word for preset data. (BFM #10)<br>Setting range (BFM #11, #10): -2,147,483,648 ~ +2,147,483,647 (00000000 ~ FFFFFFFFHex)           |

**Table C-33: FX<sub>2N</sub>-1HC Extension Configuration**

| Nr.          | Parameter Name              | Value Setting List       | Description                                                                                                                                    |
|--------------|-----------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 06<br>(7th)  | preset data upper word      | Default: 0 (0000Hex)     | Set upper word for preset data. (BFM #11)<br>Setting range (BFM #11, #10):<br>-2,147,483,648 ~ +2,147,483,647<br>(00000000 ~ FFFFFFFFHex)      |
| 07<br>(8th)  | YH compare value lower word | Default: 32767 (7FFFHex) | Set lower word for YH compare value. (BFM #12)<br>Setting range (BFM #13, #12):<br>-2,147,483,648 ~ +2,147,483,647<br>(00000000 ~ FFFFFFFFHex) |
| 08<br>(9th)  | YH compare value upper word | Default: 0 (0000Hex)     | Set upper word for YH compare value. (BFM #13)<br>Setting range (BFM #13, #12):<br>-2,147,483,648 ~ +2,147,483,647<br>(00000000 ~ FFFFFFFFHex) |
| 09<br>(10th) | YS compare value lower word | Default: 32767 (7FFFHex) | Set lower word for YS compare value. (BFM #14)<br>Setting range (BFM #15, #14):<br>-2,147,483,648 ~ +2,147,483,647<br>(00000000 ~ FFFFFFFFHex) |
| 10<br>(11th) | YS compare value upper word | Default: 0 (0000Hex)     | Set upper word for YS compare value. (BFM #15)<br>Setting range (BFM #15, #14):<br>-2,147,483,648 ~ +2,147,483,647<br>(00000000 ~ FFFFFFFFHex) |

**C-2-16: FX2N-1HC Short Configuration****Requirements:**

- Cyclic data is 8 word inputs and 8 word outputs in every cycle.

**Table C-34: Cyclic Data of FX2N-1HC Short Configuration**

|     | Send Data                             | Receive Data                               |
|-----|---------------------------------------|--------------------------------------------|
| 1st | Preset data lower word (BFM #10)      | Compare results (BFM #26)                  |
| 2nd | Preset data upper word (BFM #11)      | Terminal status (BFM #27)                  |
| 3rd | YH compare value lower word (BFM #12) | Current counter value lower word (BFM #20) |
| 4th | YH compare value upper word (BFM #13) | Current counter value upper word (BFM #21) |
| 5th | YS compare value lower word (BFM #14) | Maximum counter value lower word (BFM #22) |
| 6th | YS compare value upper word (BFM #15) | Maximum counter value upper word (BFM #23) |
| 7th | Up/down command (BFM #1)              | Minimum counter value lower word (BFM #24) |
| 8th | Command (BFM #4)                      | Minimum counter value upper word (BFM #25) |

- Parameter is 35 bytes.

**Table C-35: FX<sub>2N</sub>-1HC Short Configuration**

| Nr.         | Parameter Name                 | Value Setting List              | Description                                                                                                                                      |
|-------------|--------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | Counter mode                   | 2-ph. input 1 edge count 32 bit | Select counter mode from the available options. (BFM #0)                                                                                         |
|             |                                | 2-ph. input 1 edge count 16 bit |                                                                                                                                                  |
|             |                                | 2-ph. input 2 edge count 32 bit |                                                                                                                                                  |
|             |                                | 2-ph. input 2 edge count 16 bit |                                                                                                                                                  |
|             |                                | 2-ph. input 4 edge count 32 bit |                                                                                                                                                  |
|             |                                | 2-ph. input 4 edge count 16 bit |                                                                                                                                                  |
|             |                                | 1-ph. 2-input +/- pls. 32 bit   |                                                                                                                                                  |
|             |                                | 1-ph. 2-input +/- pls. 16 bit   |                                                                                                                                                  |
|             |                                | 1-ph. 1-inp. HW UP/DOWN 32 bit  |                                                                                                                                                  |
|             |                                | 1-ph. 1-inp. HW UP/DOWN 16 bit  |                                                                                                                                                  |
|             |                                | 1-ph. 1-inp. SW UP/DOWN 32 bit  |                                                                                                                                                  |
|             |                                | 1-ph. 1-inp. SW UP/DOWN 16 bit  |                                                                                                                                                  |
| 01<br>(2nd) | ring length lower word         | Default: 0 (0000Hex)            | Set lower word value for ring length (BFM #2)<br>Setting range (BFM #2, #3):<br>2 ~ 65535 (00002 ~ 10000Hex)                                     |
| 02<br>(3rd) | ring length upper word         | Default: 1 (0001Hex)            | Set upper word value for ring length (BFM #3)<br>Setting range (BFM #3, #2):<br>2 ~ 65535 (00002 ~ 10000Hex)                                     |
| 03<br>(4th) | counter curr. value lower word | Default: 0 (0000Hex)            | Set lower word for counter current value. (BFM #20)<br>Setting range (BFM #21, #20):<br>-2,147,483,648 ~ +2,147,483,647 (00000000 ~ FFFFFFFFHex) |
| 04<br>(5th) | counter curr. value upper word | Default: 0 (0000Hex)            | Set upper word for counter current value. (BFM #21)<br>Setting range (BFM #21, #20):<br>-2,147,483,648 ~ +2,147,483,647 (00000000 ~ FFFFFFFFHex) |

**C-2-17: FX<sub>2N</sub>-1PG (Intel Format)****Requirements:**

- Cyclic data is 9 word inputs and 9 word outputs in every cycle.

**Table C-36: Cyclic Data of FX<sub>2N</sub>-1PG (Intel Format)**

|     | Send Data                                         | Receive Data                                  |
|-----|---------------------------------------------------|-----------------------------------------------|
| 1st | Set the lower word for current position (BFM #26) | Lower word for position (I) (BFM #17)         |
| 2nd | Set the upper word for current position (BFM #27) | Upper word for position (I) (BFM #18)         |
| 3rd | Set the lower word for position (I) (BFM #17)     | Lower word for operation speed (I) (BFM #19)  |
| 4th | Set the upper word for position (I) (BFM #18)     | Upper word for operation speed (I) (BFM #20)  |
| 5th | Set the lower word for position (II) (BFM #21)    | Lower word for position (II) (BFM #21)        |
| 6th | Set the upper word for position (II) (BFM #22)    | Upper word for position (II) (BFM #22)        |
| 7th | Set the operation command (BFM #25)               | Lower word for operation speed (II) (BFM #23) |
| 8th | Status and error flags (BFM #28)                  | Upper word for operation speed (II) (BFM #24) |
| 9th | Error code No. (BFM #29)                          | Operation command (BFM #25)                   |

- Parameter is 70 bytes.

**Table C-37: FX<sub>2N</sub>-1PG (Intel Format)**

| Nr.          | Parameter Name               | Value Setting List                 | Description                                                                                                          |
|--------------|------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st)  | pulse rate value             | Default: 2000 (07D0Hex)            | Set pulse rate. (BFM #0).<br>Setting range: 1 ~ 32767<br>(0001 ~ 7FFFHex)>                                           |
| 01<br>(2nd)  | feed rate lower word         | Default: 1000 (03E8Hex)            | Set lower word for feed rate.<br>(BFM #2).<br>Setting range (BFM #2, #1):<br>1 ~ 999999<br>(00000001 ~ 000F423FHex)> |
| 02<br>(3rd)  | feed rate upper word         | Default: 0 (0000Hex)               | Set upper word for feed rate.<br>(BFM #1).<br>Setting range (BFM #2, #1):<br>1 ~ 999999<br>(00000001 ~ 000F423FHex)> |
| 03<br>(4th)  | System of units              | Motor system                       | Select system of units from the available options. (BFM #3)                                                          |
|              |                              | Machine system                     |                                                                                                                      |
|              |                              | Combined system                    |                                                                                                                      |
| 04<br>(5th)  | position data multiplication | multiplicator = 1                  | Select magnification of positioning data from the available options. (BFM #3)                                        |
|              |                              | multiplicator = 10                 |                                                                                                                      |
|              |                              | multiplicator = 100                |                                                                                                                      |
|              |                              | multiplicator = 1000               |                                                                                                                      |
| 05<br>(6th)  | pulse output format          | forward/reverse pulses             | Select pulse output format from the available options. (BFM #3)                                                      |
|              |                              | pulse/direction                    |                                                                                                                      |
| 06<br>(7th)  | rotation direction           | CP value increases with a FP       | Select rotation direction from the available options. (BFM #3)                                                       |
|              |                              | CP value decreases with a FP       |                                                                                                                      |
| 07<br>(8th)  | home position ret. dir.*1    | CP value dec. during ret. home     | Select the home position return direction from the available options. (BFM #3)                                       |
|              |                              | CP value inc. during ret. home     |                                                                                                                      |
| 08<br>(9th)  | DOG input polarity           | DOG signal active high             | Select the polarity of DOG signal from the available options. (BFM #3)                                               |
|              |                              | DOG signal active low              |                                                                                                                      |
| 09<br>(10th) | count start timing           | count z.p.sig.*2 while DOG is act. | Select the count start timing from the available options. (BFM #3)                                                   |
|              |                              | count z.p.sig.*2 after DOG impulse |                                                                                                                      |
| 10<br>(11th) | STOP input polarity          | STOP operation if input is on      | Select the polarity of STOP signal from the available options. (BFM #3)                                              |
|              |                              | STOP operation if input is off     |                                                                                                                      |
| 11<br>(12th) | STOP input mode              | remaining distance                 | Select STOP operation from the available options. (BFM #3)                                                           |
|              |                              | next position                      |                                                                                                                      |

**Table C-37: FX<sub>2N</sub>-1PG (Intel Format)**

| Nr.          | Parameter Name                          | Value Setting List       | Description                                                                                                                                           |
|--------------|-----------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12<br>(13th) | maximum speed lower word                | Default: 34464 (86A0Hex) | Set lower word for maximum speed from the available options. (BFM #4)<br>Setting range (BFM #5, #4):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)      |
| 13<br>(14th) | maximum speed upper word                | Default: 1 (0001Hex)     | Set upper word for maximum speed from the available options. (BFM #5)<br>Setting range (BFM #5, #4):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)      |
| 14<br>(15th) | Bias speed value                        | Default: 0 (0000Hex)     | Set bias speed. (BFM #6)<br>Setting range: 0 ~ 10000<br>(0000 ~ 2710Hex)                                                                              |
| 15<br>(16th) | JOG speed lower word                    | Default: 10000 (2710Hex) | Set lower word for JOG speed. (BFM #7)<br>Setting range (BFM #8, #7):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)                                     |
| 16<br>(17th) | JOG speed upper word                    | Default: 0 (0000Hex)     | Set upper word for JOG speed. (BFM #8)<br>Setting range (BFM #8, #7):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)                                     |
| 17<br>(18th) | home pos. ret. hi.sp.lower word         | Default: 50000 (C350Hex) | Set lower word for the home position return speed (high speed). (BFM #9)<br>Setting range (BFM #10, #9):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)  |
| 18<br>(19th) | home pos. ret. hi.sp.upper word         | Default: 0 (0000Hex)     | Set upper word for the home position return speed (high speed). (BFM #10)<br>Setting range (BFM #10, #9):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex) |
| 19<br>(20th) | home pos. ret. creep speed              | Default: 1000 (03E8Hex)  | Set lower word for home position return speed (creep speed). (BFM #11)<br>Setting range: 10 ~ 10000<br>(0000 ~ 2710Hex)                               |
| 20<br>(21st) | No. of zero pt.sig. <sup>*3</sup> value | Default: 10 (000AHex)    | Set the number of zero point signals for home position return. (BFM #12)<br>Setting range: 0 ~ 32767<br>(0000 ~ 7FFFHex)                              |

**Table C-37: FX<sub>2N</sub>-1PG (Intel Format)**

| Nr.          | Parameter Name              | Value Setting List   | Description                                                                                                                      |
|--------------|-----------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 21<br>(22nd) | home position<br>lower word | Default: 0 (0000Hex) | Set lower word for home position.<br>(BFM #13)<br>Setting range (BFM #14, #13):<br>-999999 ~ +999999<br>(FFF0BDC1 ~ 000F423FHex) |
| 22<br>(23rd) | home position<br>upper word | Default: 0 (0000Hex) | Set upper word for home position.<br>(BFM #14)<br>Setting range (BFM #14, #13):<br>-999999 ~ +999999<br>(FFF0BDC1 ~ 000F423FHex) |
| 23<br>(24th) | acc/dec time value          | Default: 100 (64Hex) | Set acceleration/deceleration time.<br>(BFM #15)<br>Setting range: 50 ~ 5000<br>(0032 ~ 1388Hex)                                 |

\*1 home position ret. dir. = home position return direction

\*2 Z.P.sig = Zero point signal

\*3 zero pt.sig. = zero point signal

**C-2-18: FX<sub>2N</sub>-1PG (Motorola Format)****Requirements:**

- Cyclic data is 9 word inputs and 9 word outputs in every cycle.

**Table C-38: Cyclic Data of FX<sub>2N</sub>-1PG (Motorola Format)**

|     | Send Data                                         | Receive Data                                  |
|-----|---------------------------------------------------|-----------------------------------------------|
| 1st | Set the lower word for current position (BFM #26) | Lower word for position (I) (BFM #17)         |
| 2nd | Set the upper word for current position (BFM #27) | Upper word for position (I) (BFM #18)         |
| 3rd | Set the lower word for position (I) (BFM #17)     | Lower word for operation speed (I) (BFM #19)  |
| 4th | Set the upper word for position (I) (BFM #18)     | Upper word for operation speed (I) (BFM #20)  |
| 5th | Set the lower word for position (II) (BFM #21)    | Lower word for position (II) (BFM #21)        |
| 6th | Set the upper word for position (II) (BFM #22)    | Upper word for position (II) (BFM #22)        |
| 7th | Set the operation command (BFM #25)               | Lower word for operation speed (II) (BFM #23) |
| 8th | Status and error flags (BFM #28)                  | Upper word for operation speed (II) (BFM #24) |
| 9th | Error code No. (BFM #29)                          | Operation command (BFM #25)                   |

- Parameter is 70 bytes.

**Table C-39: FX<sub>2N</sub>-1PG (Motorola Format)**

| Nr.          | Parameter Name                        | Value Setting List                                                                               | Description                                                                                                       |
|--------------|---------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st)  | pulse rate value                      | Default: 2000 (07D0Hex)                                                                          | Set pulse rate. (BFM #0).<br>Setting range: 1 ~ 32767<br>(0001 ~ 7FFFHex)>                                        |
| 01<br>(2nd)  | feed rate lower word                  | Default: 1000 (03E8Hex)                                                                          | Set lower word for feed rate. (BFM #2).<br>Setting range (BFM #2, #1):<br>1 ~ 999999<br>(00000001 ~ 000F423FHex)> |
| 02<br>(3rd)  | feed rate upper word                  | Default: 0 (0000Hex)                                                                             | Set upper word for feed rate. (BFM #1).<br>Setting range (BFM #2, #1):<br>1 ~ 999999<br>(00000001 ~ 000F423FHex)> |
| 03<br>(4th)  | pulse output format                   | forward/reverse pulses<br>pulse/direction                                                        | Select pulse output format from the available options. (BFM #3)                                                   |
| 04<br>(5th)  | rotation direction                    | CP value increases with a FP<br>CP value decreases with a FP                                     | Select rotation direction from the available options. (BFM #3)                                                    |
| 05<br>(6th)  | home position ret. dir.* <sup>1</sup> | CP value dec. during ret. home<br>CP value inc. during ret. home                                 | Select the home position return direction from the available options. (BFM #3)                                    |
| 06<br>(7th)  | DOG input polarity                    | DOG signal active high<br>DOG signal active low                                                  | Select the polarity of DOG signal from the available options. (BFM #3)                                            |
| 07<br>(8th)  | count start timing                    | count z.p.sig.* <sup>2</sup> while DOG is act.<br>count z.p.sig.* <sup>2</sup> after DOG impulse | Select the count start timing from the available options. (BFM #3)                                                |
| 08<br>(9th)  | STOP input polarity                   | STOP operation if input is on<br>STOP operation if input is off                                  | Select the polarity of STOP signal from the available options. (BFM #3)                                           |
| 09<br>(10th) | STOP input mode                       | remaining distance<br>next position                                                              | Select STOP operation from the available options. (BFM #3)                                                        |
| 10<br>(11th) | System of units                       | Motor system<br>Machine system<br>Combined system                                                | Select system of units from the available options. (BFM #3)                                                       |
| 11<br>(12th) | position data multiplication          | multiplicator = 1<br>multiplicator = 10<br>multiplicator = 100<br>multiplicator = 1000           | Select magnification of positioning data from the available options. (BFM #3)                                     |

**Table C-39: FX<sub>2N</sub>-1PG (Motorola Format)**

| Nr.          | Parameter Name                          | Value Setting List       | Description                                                                                                                                           |
|--------------|-----------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12<br>(13th) | maximum speed lower word                | Default: 34464 (86A0Hex) | Set lower word for maximum speed from the available options. (BFM #4)<br>Setting range (BFM #5, #4):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)      |
| 13<br>(14th) | maximum speed upper word                | Default: 1 (0001Hex)     | Set upper word for maximum speed from the available options. (BFM #5)<br>Setting range (BFM #5, #4):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)      |
| 14<br>(15th) | Bias speed value                        | Default: 0 (0000Hex)     | Set bias speed. (BFM #6)<br>Setting range: 0 ~ 10000<br>(0000 ~ 2710Hex)                                                                              |
| 15<br>(16th) | JOG speed lower word                    | Default: 10000 (2710Hex) | Set lower word for JOG speed. (BFM #7)<br>Setting range (BFM #8, #7):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)                                     |
| 16<br>(17th) | JOG speed upper word                    | Default: 0 (0000Hex)     | Set upper word for JOG speed. (BFM #8)<br>Setting range (BFM #8, #7):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)                                     |
| 17<br>(18th) | home pos. ret. hi.sp.lower word         | Default: 50000 (C350Hex) | Set lower word for the home position return speed (high speed). (BFM #9)<br>Setting range (BFM #10, #9):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex)  |
| 18<br>(19th) | home pos. ret. hi.sp.upper word         | Default: 0 (0000Hex)     | Set upper word for the home position return speed (high speed). (BFM #10)<br>Setting range (BFM #10, #9):<br>10 ~ 100000<br>(00000000A ~ 000186A0Hex) |
| 19<br>(20th) | home pos. ret. creep speed              | Default: 1000 (03E8Hex)  | Set lower word for home position return speed (creep speed). (BFM #11)<br>Setting range: 10 ~ 10000<br>(0000 ~ 2710Hex)                               |
| 20<br>(21st) | No. of zero pt.sig. <sup>*3</sup> value | Default: 10 (000AHex)    | Set the number of zero point signals for home position return. (BFM #12)<br>Setting range: 0 ~ 32767<br>(0000 ~ 7FFFHex)                              |

**Table C-39: FX<sub>2N</sub>-1PG (Motorola Format)**

| Nr.          | Parameter Name           | Value Setting List   | Description                                                                                                                   |
|--------------|--------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 21<br>(22nd) | home position lower word | Default: 0 (0000Hex) | Set lower word for home position. (BFM #13)<br>Setting range (BFM #14, #13):<br>-999999 ~ +999999<br>(FFF0BDC1 ~ 000F423FHex) |
| 22<br>(23rd) | home position upper word | Default: 0 (0000Hex) | Set upper word for home position. (BFM #14)<br>Setting range (BFM #14, #13):<br>-999999 ~ +999999<br>(FFF0BDC1 ~ 000F423FHex) |
| 23<br>(24th) | acc/dec time value       | Default: 100 (64Hex) | Set acceleration/deceleration time. (BFM #15)<br>Setting range: 50 ~ 5000<br>(0032 ~ 1388Hex)                                 |

\*1 home position ret. dir. = home position return direction

\*2 Z.P.sig = Zero point signal

\*3 zero pt.sig. = zero point signal

#### C-2-19: FX<sub>2N</sub>-232IF (Intel Format)



#### Requirements:

- Cyclic data is 3 word inputs and 3 word outputs in every cycle. These data is used "Simple Communication 3W-IF". Further information of the simple communication 3W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-40: Cyclic Data of FX<sub>2N</sub>-232IF (Intel Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |

- Parameter is 46 bytes.

**Table C-41: FX<sub>2N</sub>-232IF (Intel Format)**

| Nr.         | Parameter Name  | Value Setting List       | Description                                             |
|-------------|-----------------|--------------------------|---------------------------------------------------------|
| 00<br>(1st) | data length (1) | 7 data bit<br>8 data bit | Select data length from the available options. (BFM #0) |
| 01<br>(2nd) | parity (3)      | none<br>odd<br>even      | Select parity from the available options. (BFM #0)      |
| 02<br>(3rd) | stop bit (0)    | 1 stop bit<br>2 stop bit | Select stop bit from the available options. (BFM #0)    |

**Table C-41: FX<sub>2N</sub>-232IF (Intel Format)**

| Nr.          | Parameter Name                  | Value Setting List              | Description                                                                                                                                                                                 |
|--------------|---------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03<br>(4th)  | baud rate (8)                   | 300 baud                        | Select baud rate from the available options. (BFM #0)                                                                                                                                       |
|              |                                 | 600 baud                        |                                                                                                                                                                                             |
|              |                                 | 1200 baud                       |                                                                                                                                                                                             |
|              |                                 | 2400 baud                       |                                                                                                                                                                                             |
|              |                                 | 4800 baud                       |                                                                                                                                                                                             |
|              |                                 | 9600 baud                       |                                                                                                                                                                                             |
|              |                                 | 19200 baud                      |                                                                                                                                                                                             |
| 04<br>(5th)  | control line                    | not used                        | Select control line from the available options. (BFM #0)                                                                                                                                    |
|              |                                 | standard RS-232C                |                                                                                                                                                                                             |
|              |                                 | RS-232C interlink connect. mode |                                                                                                                                                                                             |
| 05<br>(6th)  | addition of CR and LF           | not added                       | Select the addition of CR and LF from the available options. (BFM #0)                                                                                                                       |
|              |                                 | CR only                         |                                                                                                                                                                                             |
|              |                                 | CR & LF                         |                                                                                                                                                                                             |
| 06<br>(7th)  | check sum & ASCII/HEX conv.     | not available                   | Select the check sum & ASCII/HEX from the available options. (BFM #0)                                                                                                                       |
|              |                                 | ASCII/HEX conversion available  |                                                                                                                                                                                             |
|              |                                 | check sum available             |                                                                                                                                                                                             |
|              |                                 | check sum & ASCII/HEX conv. av. |                                                                                                                                                                                             |
| 07<br>(8th)  | send/receive buffer data length | 16 bit                          | Select the send/receive buffer data length from the available options. (BFM #0)                                                                                                             |
|              |                                 | 8 bit                           |                                                                                                                                                                                             |
| 08<br>(9th)  | receive upper limit byte count  | Default:0                       | Set the upper limit byte for receive data (BFM #2)<br>Setting range:<br><ul style="list-style-type: none"> <li>16 bit data length: 1 to 512</li> <li>8 bit data length: 1 to 256</li> </ul> |
| 09<br>(10th) | receive time-out time x10ms     | Default:0                       | Set the time-out time for receiving data. (BFM #3)<br>Setting range: 1 to 32767 (×10ms)                                                                                                     |
| 10<br>(11th) | Send header lower 2 bytes       | Default:0                       | Set the lower 2 bytes for sending header. (BFM #4)                                                                                                                                          |
| 11<br>(12th) | Send header higher 2 bytes      | Default:0                       | Set the higher 2 bytes for sending header. (BFM #5)                                                                                                                                         |
| 12<br>(13th) | Send term. lower 2 bytes        | Default:0                       | Set the lower 2 bytes for sending terminator. (BFM #6)                                                                                                                                      |
| 13<br>(14th) | Send term. higher 2 bytes       | Default:0                       | Set the higher 2 bytes for sending terminator. (BFM #7)                                                                                                                                     |
| 14<br>(15th) | Receive header lower 2 bytes    | Default:0                       | Set the lower 2 bytes for receiving header. (BFM #4)                                                                                                                                        |
| 15<br>(16th) | Receive header higher 2 bytes   | Default:0                       | Set the higher 2 bytes for receiving header. (BFM #5)                                                                                                                                       |

**Table C-41: FX<sub>2N</sub>-232IF (Intel Format)**

| Nr.          | Parameter Name                         | Value Setting List | Description                                                                                          |
|--------------|----------------------------------------|--------------------|------------------------------------------------------------------------------------------------------|
| 16<br>(17th) | Receive term. lower<br>2 bytes         | Default:0          | Set the lower 2 bytes for receiving terminator. (BFM #6)                                             |
| 17<br>(18th) | Receive term.<br>higher 2 bytes        | Default:0          | Set the higher 2 bytes for receiving terminator. (BFM #7)                                            |
| 18<br>(19th) | rec. susp. waiting<br>time x10ms       | Default:0          | Set the waiting time for receiving suspension. (BFM #12)<br>Setting range: 0 to 32767 (×10ms)        |
| 19<br>(20th) | Time CS ON to<br>send start x10ms      | Default:0          | Set the time for CS ON to send start. (BFM #20)<br>Setting range: 0 ~ 32767 (×10ms)                  |
| 20<br>(21st) | Time<br>transm.comp.to RS<br>OFF x10ms | Default:0          | Set the time from completion of actual send to RS OFF. (BFM #21)<br>Setting range: 0 ~ 32767 (×10ms) |

**C-2-20: FX<sub>2N</sub>-232IF (Motorola Format)****Requirements:**

- Cyclic data is 3 word inputs and 3 word outputs in every cycle. These data is used "Simple Communicatio 3W-IF". Further information of the simple communication 3W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-42: Cyclic Data of FX<sub>2N</sub>-232IF (Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |

- Parameter is 46 bytes.

**Table C-43: FX<sub>2N</sub>-232IF (Motorola Format)**

| Nr.         | Parameter Name                     | Value Setting List              | Description                                                                     |
|-------------|------------------------------------|---------------------------------|---------------------------------------------------------------------------------|
| 00<br>(1st) | control line                       | not used                        | Select control line from the available options. (BFM #0)                        |
|             |                                    | standard RS-232C                |                                                                                 |
|             |                                    | RS-232C interlink connect. mode |                                                                                 |
| 01<br>(2nd) | addition of CR and LF              | not added                       | Select the addition of CR and LF from the available options. (BFM #0)           |
|             |                                    | CR only                         |                                                                                 |
|             |                                    | CR & LF                         |                                                                                 |
| 02<br>(3rd) | check sum & ASCII/<br>HEX conv.    | not available                   | Select the check sum & ASCII/HEX from the available options. (BFM #0)           |
|             |                                    | ASCII/HEX conversion available  |                                                                                 |
|             |                                    | check sum available             |                                                                                 |
| 03<br>(4th) | send/receive buffer<br>data length | check sum & ASCII/HEX conv. av. | Select the send/receive buffer data length from the available options. (BFM #0) |
|             |                                    | 16 bit                          |                                                                                 |
|             |                                    | 8 bit                           |                                                                                 |

**Table C-43: FX<sub>2N</sub>-232IF (Motorola Format)**

| Nr.          | Parameter Name                 | Value Setting List | Description                                                                                                                                                                                 |
|--------------|--------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04<br>(5th)  | data length (1)                | 7 data bit         | Select data length from the available options. (BFM #0)                                                                                                                                     |
|              |                                | 8 data bit         |                                                                                                                                                                                             |
| 05<br>(6th)  | parity (3)                     | none               | Select parity from the available options. (BFM #0)                                                                                                                                          |
|              |                                | odd                |                                                                                                                                                                                             |
|              |                                | even               |                                                                                                                                                                                             |
| 06<br>(7th)  | stop bit (0)                   | 1 stop bit         | Select stop bit from the available options. (BFM #0)                                                                                                                                        |
|              |                                | 2 stop bit         |                                                                                                                                                                                             |
| 07<br>(8th)  | baud rate (8)                  | 300 baud           | Select baud rate from the available options (BFM #0)                                                                                                                                        |
|              |                                | 600 baud           |                                                                                                                                                                                             |
|              |                                | 1200 baud          |                                                                                                                                                                                             |
|              |                                | 2400 baud          |                                                                                                                                                                                             |
|              |                                | 4800 baud          |                                                                                                                                                                                             |
|              |                                | 9600 baud          |                                                                                                                                                                                             |
|              |                                | 19200 baud         |                                                                                                                                                                                             |
| 08<br>(9th)  | receive upper limit byte count | Default:0          | Set the upper limit byte for receive data (BFM #2)<br>Setting range:<br><ul style="list-style-type: none"> <li>16 bit data length: 1 to 512</li> <li>8 bit data length: 1 to 256</li> </ul> |
| 09<br>(10th) | receive time-out time x10ms    | Default:0          | Set the time-out time for receiving data. (BFM #3)<br>Setting range: 1 to 32767 (×10ms)                                                                                                     |
| 10<br>(11th) | Send header lower 2 bytes      | Default:0          | Set the lower 2 bytes for sending header. (BFM #4)                                                                                                                                          |
| 11<br>(12th) | Send header higher 2 bytes     | Default:0          | Set the higher 2 bytes for sending header. (BFM #5)                                                                                                                                         |
| 12<br>(13th) | Send term. lower 2 bytes       | Default:0          | Set the lower 2 bytes for sending terminator. (BFM #6)                                                                                                                                      |
| 13<br>(14th) | Send term. higher 2 bytes      | Default:0          | Set the higher 2 bytes for sending terminator. (BFM #7)                                                                                                                                     |
| 14<br>(15th) | Receive header lower 2 bytes   | Default:0          | Set the lower 2 bytes for receiving header. (BFM #4)                                                                                                                                        |
| 15<br>(16th) | Receive header higher 2 bytes  | Default:0          | Set the higher 2 bytes for receiving header. (BFM #5)                                                                                                                                       |
| 16<br>(17th) | Receive term. lower 2 bytes    | Default:0          | Set the lower 2 bytes for receiving terminator. (BFM #6)                                                                                                                                    |
| 17<br>(18th) | Receive term. higher 2 bytes   | Default:0          | Set the higher 2 bytes for receiving terminator. (BFM #7)                                                                                                                                   |
| 18<br>(19th) | rec. susp. waiting time x10ms  | Default:0          | Set the waiting time for receiving suspension. (BFM #12)<br>Setting range: 0 to 32767 (×10ms)                                                                                               |

**Table C-43: FX<sub>2N</sub>-232IF (Motorola Format)**

| Nr.          | Parameter Name                   | Value Setting List | Description                                                                                          |
|--------------|----------------------------------|--------------------|------------------------------------------------------------------------------------------------------|
| 19<br>(20th) | Time CS ON to send start x10ms   | Default:0          | Set the time for CS ON to send start. (BFM #20)<br>Setting range: 0 ~ 32767 (×10ms)                  |
| 20<br>(21st) | Time transm.comp.to RS OFF x10ms | Default:0          | Set the time from completion of actual send to RS OFF. (BFM #21)<br>Setting range: 0 ~ 32767 (×10ms) |

**C-2-21: FX<sub>2N</sub>-32ASI-M****Requirements:**

- Cyclic data is 13 word inputs and 13 word outputs in every cycle.

**Table C-44: Cyclic Data of FX<sub>2N</sub>-32ASI-M**

|      | Send Data                               | Receive Data                                  |
|------|-----------------------------------------|-----------------------------------------------|
| 1st  | HI flg. send data TO slv. 1to3 (BFM #0) | EC Flags rec. data FROM slave 1 to 3 (BFM #0) |
| 2nd  | Send data TO slave 4 to 7 (BFM #1)      | Receive data FROM slave 4 to 7 (BFM #1)       |
| 3rd  | Send data TO slave 8 to 11 (BFM #2)     | Receive data FROM slave 8 to 11 (BFM #2)      |
| 4th  | Send data TO slave 12 to 15 (BFM #3)    | Receive data FROM slave 12 to 15 (BFM #3)     |
| 5th  | Send data TO slave 16 to 19 (BFM #4)    | Receive data FROM slave 16 to 19 (BFM #4)     |
| 6th  | Send data TO slave 20 to 23 (BFM #5)    | Receive data FROM slave 20 to 23 (BFM #5)     |
| 7th  | Send data TO slave 24 to 27 (BFM #6)    | Receive data FROM slave 24 to 27 (BFM #6)     |
| 8th  | Send data TO slave 28 to 31 (BFM #7)    | Receive data FROM slave 28 to 31 (BFM #7)     |
| 9th  | Don't use                               | EC-Flags (BFM #8)                             |
| 10th | Don't use                               | Module error status (BFM #29)                 |
| 11th | Command buffer data word 0 (BFM #21)    | Command buffer data word 0 (BFM #21)          |
| 12th | Command buffer data word 1 (BFM #22)    | Command buffer data word 1 (BFM #22)          |
| 13th | Command buffer (BFM #20)                | Command buffer (BFM #20)                      |

- Parameter is 33 bytes.

**Table C-45: FX<sub>2N</sub>-32ASI-M**

| Nr.         | Parameter Name      | Value Setting List | Description                                                     |
|-------------|---------------------|--------------------|-----------------------------------------------------------------|
| 00<br>(1st) | Watchdog time x10ms | Default: 20        | Set watchdog time. (BFM #9)<br>Setting range: 0 ~ 65535 (x10ms) |

**C-2-22: FX<sub>0N</sub>-3A****Requirements:**

- Cyclic data is 2 word inputs and 2 word outputs in every cycle.

**Table C-46: Cyclic Data of FX<sub>0N</sub>-3A**

|     | Send Data                        | Receive Data                                  |
|-----|----------------------------------|-----------------------------------------------|
| 1st | data for analog output (BFM #16) | Data of analog input1 (BFM #0 <sup>*1</sup> ) |
| 2nd | not used                         | Data of analog input2 (BFM #0 <sup>*1</sup> ) |

\*1 The channel selection is done automatically

- Parameter is 4 bytes.

**C-2-23: FX<sub>2N</sub>-2AD****Requirements:**

- Cyclic data is 2 word inputs in every cycle.

**Table C-47: Cyclic Data of FX<sub>2N</sub>-2AD**

|     | Send Data | Receive Data                                                 |
|-----|-----------|--------------------------------------------------------------|
| 1st | None      | Data of analog input1, 12 bit (BFM #0,BFM #1 <sup>*1</sup> ) |
| 2nd |           | Data of analog input2, 12 bit (BFM #0,BFM #1 <sup>*1</sup> ) |

\*1 The channel selection and assembling of lower 8 and upper 4 bit is done automatically.

- Parameter is 4 bytes.

**C-2-24: FX<sub>2N</sub>-2DA****Requirements:**

- Cyclic data is 2 word outputs in every cycle.

**Table C-48: Cyclic Data of FX<sub>2N</sub>-2DA**

| Nr.         | Send Data                                               | Receive Data |
|-------------|---------------------------------------------------------|--------------|
| 00<br>(1st) | Data of analog output1, 12 bit (BFM #16 <sup>*1</sup> ) | None         |
| 01<br>(2nd) | Data of analog output2, 12 bit (BFM #16 <sup>*1</sup> ) |              |

\*1 The channel selection and assembling of lower 8 and upper 4 bit is done automatically.

- Parameter is 4 bytes.

**C-2-25: FX2N-10GM, FX2N-20GM****Requirements:**

- Cyclic data is 6 word inputs and 6 word outputs in every cycle. These data is used "Simple Communicatio 6W-IF". Further information of the simple communication 6W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-49: Cyclic Data of FX2N-232IF (Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |
| 4th | FROM address | FROM data              |
| 5th | TO data      | TO data (read back)    |
| 6th | TO address   | TO address (read back) |

- Parameter is 4 bytes.

When accessing a 32bit value, please access first the low word and then the high word of the value.

**Table C-50: Ex.- Read Access to BFM # 9162/9163 Index Register Z7**

| Nr.         | Send Data                             | Receive Data                 |
|-------------|---------------------------------------|------------------------------|
| 00<br>(1st) | FROM address<br>A3CA (Bit15=1 + 9162) | FROM data<br>Low word of Z7  |
| 01<br>(2nd) | TO data                               | TO data (read back)          |
| 02<br>(3rd) | TO address                            | TO address (read back)       |
| 03<br>(4th) | FROM address<br>A3CB (Bit15=1 + 9163) | FROM data<br>High word of Z7 |
| 04<br>(5th) | TO data                               | TO data (read back)          |
| 05<br>(6th) | TO address                            | TO address (read back)       |

**C-2-26: FX<sub>2</sub>N-2LC (Intel Format)****Requirements:**

- Cyclic data is 3 word inputs and 3 word outputs in every cycle. This data is used for “Simple Communication 3W-IF”. Further information for the simple communication 3W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-51: Cyclic Data of FX<sub>2</sub>N-2LC (Intel Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |

- Parameter is 70 bytes.

**Table C-52: FX<sub>2</sub>N-2LC (Intel Format)**

| Nr.         | Parameter Name                                                               | Value Setting List                      | Description                                                                                                                                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | clear error register                                                         | perform nothing<br>reset error register | Select error reset command from the available options. (BFM #10).                                                                                                                                                                                                                                                                |
| 01<br>(2nd) | Input Type channel 1 (BFM #70)                                               | Default: 2                              | Set input type for channel 1. (BFM #70)<br>Setting range: 0 to 42                                                                                                                                                                                                                                                                |
| 02<br>(3rd) | Input Type channel 2 (BFM #71)                                               | Default: 2                              | Select input type for channel 1. (BFM #71)<br>Setting range: 0 to 42                                                                                                                                                                                                                                                             |
| 03<br>(4th) | Set Alarm 1 mode<br>Set Alarm 2 mode<br>Set Alarm 3 mode<br>Set Alarm 4 mode | alarm function OFF                      | <ul style="list-style-type: none"> <li>Select mode of Alarm 1 from the available options. (BFM #72)</li> <li>Select mode of Alarm 2 from the available options. (BFM #73)</li> <li>Select mode of Alarm 3 from the available options. (BFM #74)</li> <li>Select mode of Alarm 4 from the available options. (BFM #75)</li> </ul> |
| 04<br>(5th) |                                                                              | upper limit input value alarm           |                                                                                                                                                                                                                                                                                                                                  |
| 05<br>(6th) |                                                                              | lower limit input value alarm           |                                                                                                                                                                                                                                                                                                                                  |
| 06<br>(7th) |                                                                              | upper limit deviation alarm             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lower limit deviation alarm             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower limit deviation             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | range alarm                             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit in.value alarm + wait         |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit in.value alarm + wait         |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit deviation alarm + wait        |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit deviation alarm + wait        |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower lim. dev.+ wait             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit dev. alarm + re-wait          |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit dev. alarm + re-wait          |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower lim. dev.+ re-wait          |                                                                                                                                                                                                                                                                                                                                  |
| 07<br>(8th) | ALARM1 value for channel 1.                                                  | Default: 0                              | Set channel 1's value for Alarm 1. (BFM #13)<br>Setting range: -32768 to 32767                                                                                                                                                                                                                                                   |

**Table C-52: FX<sub>2N</sub>-2LC (Intel Format)**

| Nr.          | Parameter Name                  | Value Setting List              | Description                                                                                           |
|--------------|---------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------|
| 08<br>(9th)  | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 1.<br>(BFM #22)<br>Setting range: -32768 to 32767                     |
| 09<br>(10th) | ALARM2 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 2.<br>(BFM #14)<br>Setting range: -32768 to 32767                     |
| 10<br>(11th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 2.<br>(BFM #23)<br>Setting range: -32768 to 32767                     |
| 11<br>(12th) | ALARM3 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 3.<br>(BFM #15)<br>Setting range: -32768 to 32767                     |
| 12<br>(13th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 3.<br>(BFM #24)<br>Setting range: -32768 to 32767                     |
| 13<br>(14th) | ALARM4 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 4.<br>(BFM #16)<br>Setting range: -32768 to 32767                     |
| 14<br>(15th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 4.<br>(BFM #25)<br>Setting range: -32768 to 32767                     |
| 15<br>(16th) | discon. ALARM val. channel 1.   | Default: 0                      | Set channel 1's value for the heater disconnection alarm. (BFM #17)<br>Setting range: -32768 to 32767 |
| 16<br>(17th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for the heater disconnection alarm. (BFM #26)<br>Setting range: -32768 to 32767 |
| 17<br>(18th) | operation mode channel 1        | monitor                         | Select operation mode for channel 1 from the available options. (BFM #32)                             |
|              |                                 | monitor + temp. alarm           |                                                                                                       |
|              |                                 | monitor + temp. alarm + control |                                                                                                       |
| 18<br>(19th) | operation mode channel 2        | monitor                         | Select operation mode for channel 2 from the available options. (BFM #51)                             |
|              |                                 | monitor + temp. alarm           |                                                                                                       |
|              |                                 | monitor + temp. alarm + control |                                                                                                       |
| 19<br>(20th) | control response par. channel 1 | slow                            | Select the control response parameter for channel 1 from the available options. (BFM #36)             |
|              |                                 | medium                          |                                                                                                       |
|              |                                 | fast                            |                                                                                                       |
| 20<br>(21st) | control response par. channel 2 | slow                            | Select the control response parameter for channel 2 from the available options. (BFM #55)             |
|              |                                 | medium                          |                                                                                                       |
|              |                                 | fast                            |                                                                                                       |
| 21<br>(22nd) | temp. rise comp. soak time      | Default: 0                      | Set the temperature rise completion soak time. (BFM #80)<br>Setting range 0 to 3600                   |

**C-2-27: FX<sub>2N</sub>-2LC (Motorola Format)****Requirements:**

- Cyclic data is 3 word inputs and 3 word outputs in every cycle. This data is used for “Simple Communication 3W-IF”. Further information for the simple communication 3W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-53: Cyclic Data of FX<sub>2N</sub>-2LC (Intel Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |

- Parameter is 70 bytes.

**Table C-54: FX<sub>2N</sub>-2LC (Motorola Format)**

| Nr.         | Parameter Name                                                               | Value Setting List                      | Description                                                                                                                                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | clear error register                                                         | perform nothing<br>reset error register | Select error reset command from the available options. (BFM #10).                                                                                                                                                                                                                                                                |
| 01<br>(2nd) | Input Type channel 1 (BFM #70)                                               | Default: 2                              | Set input type for channel 1. (BFM #70)<br>Setting range: 0 to 42                                                                                                                                                                                                                                                                |
| 02<br>(3rd) | Input Type channel 2 (BFM #71)                                               | Default: 2                              | Select input type for channel 2. (BFM #71)<br>Setting range: 0 to 42                                                                                                                                                                                                                                                             |
| 03<br>(4th) | Set Alarm 1 mode<br>Set Alarm 2 mode<br>Set Alarm 3 mode<br>Set Alarm 4 mode | alarm function OFF                      | <ul style="list-style-type: none"> <li>Select mode of Alarm 1 from the available options. (BFM #72)</li> <li>Select mode of Alarm 2 from the available options. (BFM #73)</li> <li>Select mode of Alarm 3 from the available options. (BFM #74)</li> <li>Select mode of Alarm 4 from the available options. (BFM #75)</li> </ul> |
| 04<br>(5th) |                                                                              | upper limit input value alarm           |                                                                                                                                                                                                                                                                                                                                  |
| 05<br>(6th) |                                                                              | lower limit input value alarm           |                                                                                                                                                                                                                                                                                                                                  |
| 06<br>(7th) |                                                                              | upper limit deviation alarm             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lower limit deviation alarm             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower limit deviation             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | range alarm                             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit in.value alarm + wait         |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit in.value alarm + wait         |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit deviation alarm + wait        |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit deviation alarm + wait        |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower lim. dev.+ wait             |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | up. limit dev. alarm + re-wait          |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | lo. limit dev. alarm + re-wait          |                                                                                                                                                                                                                                                                                                                                  |
|             |                                                                              | upper/lower lim. dev.+ re-wait          |                                                                                                                                                                                                                                                                                                                                  |
| 07<br>(8th) | ALARM1 value for channel 1.                                                  | Default: 0                              | Set channel 1's value for Alarm 1. (BFM #13)<br>Setting range: -32768 to 32767                                                                                                                                                                                                                                                   |

**Table C-54: FX<sub>2N</sub>-2LC (Motorola Format)**

| Nr.          | Parameter Name                  | Value Setting List              | Description                                                                                           |
|--------------|---------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------|
| 08<br>(9th)  | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 1.<br>(BFM #22)<br>Setting range: -32768 to 32767                     |
| 09<br>(10th) | ALARM2 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 2.<br>(BFM #14)<br>Setting range: -32768 to 32767                     |
| 10<br>(11th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 2.<br>(BFM #23)<br>Setting range: -32768 to 32767                     |
| 11<br>(12th) | ALARM3 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 3.<br>(BFM #15)<br>Setting range: -32768 to 32767                     |
| 12<br>(13th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 3.<br>(BFM #24)<br>Setting range: -32768 to 32767                     |
| 13<br>(14th) | ALARM4 value for channel 1.     | Default: 0                      | Set channel 1's value for Alarm 4.<br>(BFM #16)<br>Setting range: -32768 to 32767                     |
| 14<br>(15th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for Alarm 4.<br>(BFM #25)<br>Setting range: -32768 to 32767                     |
| 15<br>(16th) | discon. ALARM val. channel 1.   | Default: 0                      | Set channel 1's value for the heater disconnection alarm. (BFM #17)<br>Setting range: -32768 to 32767 |
| 16<br>(17th) | .. and for channel 2            | Default: 0                      | Set channel 2's value for the heater disconnection alarm. (BFM #26)<br>Setting range: -32768 to 32767 |
| 17<br>(18th) | operation mode channel 1        | monitor                         | Select operation mode for channel 1 from the available options.<br>(BFM #32)                          |
|              |                                 | monitor + temp. alarm           |                                                                                                       |
|              |                                 | monitor + temp. alarm + control |                                                                                                       |
| 18<br>(19th) | operation mode channel 2        | monitor                         | Select operation mode for channel 2 from the available options.<br>(BFM #51)                          |
|              |                                 | monitor + temp. alarm           |                                                                                                       |
|              |                                 | monitor + temp. alarm + control |                                                                                                       |
| 19<br>(20th) | control response par. channel 1 | slow                            | Select the control response parameter for channel 1 from the available options. (BFM #36)             |
|              |                                 | medium                          |                                                                                                       |
|              |                                 | fast                            |                                                                                                       |
| 20<br>(21st) | control response par. channel 2 | slow                            | Select the control response parameter for channel 2 from the available options. (BFM #55)             |
|              |                                 | medium                          |                                                                                                       |
|              |                                 | fast                            |                                                                                                       |
| 21<br>(22nd) | temp. rise comp. soak time      | Default: 0                      | Set the temperature rise completion soak time. (BFM #80)<br>Setting range 0 to 3600                   |

**C-2-28: FX<sub>2N</sub>-8AD (Intel Format)****Requirements:**

- Cyclic data is 10 word inputs in every cycle.

**Table C-55: Cyclic Data of FX<sub>2N</sub>-8AD (Intel Format)**

|      | Send Data | Receive Data                                                 |
|------|-----------|--------------------------------------------------------------|
| 1st  | None      | Channel 1: present; average value in V, mA, °C; °F (BFM #10) |
| 2nd  |           | Channel 2: present; average value in V, mA, °C; °F (BFM #11) |
| 3rd  |           | Channel 3: present; average value in V, mA, °C; °F (BFM #12) |
| 4th  |           | Channel 4: present; average value in V, mA, °C; °F (BFM #13) |
| 5th  |           | Channel 5: present; average value in V, mA, °C; °F (BFM #14) |
| 6th  |           | Channel 6: present; average value in V, mA, °C; °F (BFM #15) |
| 7th  |           | Channel 7: present; average value in V, mA, °C; °F (BFM #16) |
| 8th  |           | Channel 8: present; average value in V, mA, °C; °F (BFM #17) |
| 9th  |           | Scale over status (BFM #28)                                  |
| 10th |           | Error code (BFM #29)                                         |

- Parameter is 47 bytes.

**Table C-56: FX<sub>2N</sub>-8AD (Intel Format)**

| Nr.         | Parameter Name                                                                                                                                                           | Value Setting List                                           | Description                                                                                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | Next parameter uses EEPROM..                                                                                                                                             | DON'T write parameter to EEPROM<br>write parameter to EEPROM | The 2nd to 5th parameter is written to EEPROM. Select "don't write" or "write to EEPROM".                                                                                                                                                            |
| 01<br>(2nd) | <ul style="list-style-type: none"> <li>..channel 1 input mode</li> <li>..channel 2 input mode</li> <li>..channel 3 input mode</li> <li>..channel 4 input mode</li> </ul> | -10 to 10V res. 10V/16000                                    | <ul style="list-style-type: none"> <li>Select input mode for channel 1 (BFM #0).</li> <li>Select input mode for channel 2 (BFM #0).</li> <li>Select input mode for channel 3 (BFM #0).</li> <li>Select input mode for channel 4 (BFM #0).</li> </ul> |
| 02<br>(3rd) |                                                                                                                                                                          | -10 to 10V res. 10V/4000                                     |                                                                                                                                                                                                                                                      |
| 03<br>(4th) |                                                                                                                                                                          | -10 to 10V direct ADC value                                  |                                                                                                                                                                                                                                                      |
| 04<br>(5th) |                                                                                                                                                                          | 4mA to 20mA res. 20mA/8000                                   |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | 4mA to 20mA res. 20mA/4000                                   |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | 4mA to 20mA direct ADC value                                 |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | -20mA to 20mA res. 20mA/8000                                 |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | -20mA to 20mA res. 20mA/4000                                 |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | -20mA to 20mA direct ADC value                               |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | K type thermocouple in °C                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | J type thermocouple in °C                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | T type thermocouple in °C                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | K type thermocouple in °F                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | J type thermocouple in °F                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | T type thermocouple in °F                                    |                                                                                                                                                                                                                                                      |
|             |                                                                                                                                                                          | channel unused                                               |                                                                                                                                                                                                                                                      |

**Table C-56: FX<sub>2N</sub>-8AD (Intel Format)**

| Nr.                                                                   | Parameter Name                                                                                                                                                      | Value Setting List              | Description                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05<br>(6th)                                                           | Next parameter uses EEPROM..                                                                                                                                        | DON'T write parameter to EEPROM | The 2nd to 5th parameter is written to EEPROM. Select “writing to EEPROM” setting from the available options.                                                                                                                                                                                                                                                   |
|                                                                       |                                                                                                                                                                     | write parameter to EEPROM       |                                                                                                                                                                                                                                                                                                                                                                 |
| 06<br>(7th)<br><br>07<br>(8th)<br><br>08<br>(9th)<br><br>09<br>(10th) | <ul style="list-style-type: none"><li>..channel 5 input mode</li><li>..channel 6 input mode</li><li>..channel 7 input mode</li><li>..channel 8 input mode</li></ul> | -10 to 10V res. 10V/16000       | <ul style="list-style-type: none"><li>Select input mode for channel 5 from the available options. (BFM #1).</li><li>Select input mode for channel 6 from the available options. (BFM #1).</li><li>Select input mode for channel 7 from the available options. (BFM #1).</li><li>Select input mode for channel 8 from the available options. (BFM #1).</li></ul> |
|                                                                       |                                                                                                                                                                     | -10 to 10V res. 10V/4000        |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -10 to 10V direct ADC value     |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA res. 20mA/8000      |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA res. 20mA/4000      |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA direct ADC value    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA res. 20mA/8000    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA res. 20mA/4000    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA direct ADC value  |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | K type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | J type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | T type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | K type thermocouple in °F       |                                                                                                                                                                                                                                                                                                                                                                 |
| J type thermocouple in °F                                             |                                                                                                                                                                     |                                 |                                                                                                                                                                                                                                                                                                                                                                 |
| T type thermocouple in °F                                             |                                                                                                                                                                     |                                 |                                                                                                                                                                                                                                                                                                                                                                 |
| channel unused                                                        |                                                                                                                                                                     |                                 |                                                                                                                                                                                                                                                                                                                                                                 |
| 10<br>(11th)                                                          | channel 1 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 1. (BFM #2)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 11<br>(12th)                                                          | channel 2 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 2. (BFM #3)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 12<br>(13th)                                                          | channel 3 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 3. (BFM #4)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 13<br>(14th)                                                          | channel 4 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 4. (BFM #5)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 14<br>(15th)                                                          | channel 5 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 5. (BFM #6)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |

**Table C-56: FX<sub>2N</sub>-8AD (Intel Format)**

| Nr.          | Parameter Name                 | Value Setting List | Description                                                                                             |
|--------------|--------------------------------|--------------------|---------------------------------------------------------------------------------------------------------|
| 15<br>(16th) | channel 6 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 6.<br>(BFM #7)<br>Setting range: 1 to 4096 |
| 16<br>(17th) | channel 7 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 7.<br>(BFM #8)<br>Setting range: 1 to 4096 |
| 17<br>(18th) | channel 8 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 8.<br>(BFM #9)<br>Setting range: 1 to 4096 |

C-2-29: FX<sub>2N</sub>-8AD (Motorola Format)

## Requirements:

- Cyclic data is 10 word inputs in every cycle.

Table C-57: Cyclic Data of FX<sub>2N</sub>-8AD (Motorola Format)

|      | Send Data | Receive Data                                                 |
|------|-----------|--------------------------------------------------------------|
| 1st  | None      | Channel 1: present; average value in V, mA, °C; °F (BFM #10) |
| 2nd  |           | Channel 2: present; average value in V, mA, °C; °F (BFM #11) |
| 3rd  |           | Channel 3: present; average value in V, mA, °C; °F (BFM #12) |
| 4th  |           | Channel 4: present; average value in V, mA, °C; °F (BFM #13) |
| 5th  |           | Channel 5: present; average value in V, mA, °C; °F (BFM #14) |
| 6th  |           | Channel 6: present; average value in V, mA, °C; °F (BFM #15) |
| 7th  |           | Channel 7: present; average value in V, mA, °C; °F (BFM #16) |
| 8th  |           | Channel 8: present; average value in V, mA, °C; °F (BFM #17) |
| 9th  |           | Scale over status (BFM #28)                                  |
| 10th |           | Error code (BFM #29)                                         |

- Parameter is 47 bytes.

Table C-58: FX<sub>2N</sub>-8AD (Motorola Format)

| Nr.         | Parameter Name                                                                                                                                                      | Value Setting List                                           | Description                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | Next parameter uses EEPROM..                                                                                                                                        | DON'T write parameter to EEPROM<br>write parameter to EEPROM | The 2nd to 5th parameter is written to EEPROM. Select “don't write” or “write to EEPROM”.                                                                                                                                                       |
| 01<br>(2nd) | <ul style="list-style-type: none"><li>..channel 3 input mode</li><li>..channel 4 input mode</li><li>..channel 1 input mode</li><li>..channel 2 input mode</li></ul> | -10 to 10V res. 10V/16000                                    | <ul style="list-style-type: none"><li>Select input mode for channel 3 (BFM #0).</li><li>Select input mode for channel 4 (BFM #0).</li><li>Select input mode for channel 1 (BFM #0).</li><li>Select input mode for channel 2 (BFM #0).</li></ul> |
| 02<br>(3rd) |                                                                                                                                                                     | -10 to 10V res. 10V/4000                                     |                                                                                                                                                                                                                                                 |
| 03<br>(4th) |                                                                                                                                                                     | -10 to 10V direct ADC value                                  |                                                                                                                                                                                                                                                 |
| 04<br>(5th) |                                                                                                                                                                     | 4mA to 20mA res. 20mA/8000                                   |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | 4mA to 20mA res. 20mA/4000                                   |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | 4mA to 20mA direct ADC value                                 |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | -20mA to 20mA res. 20mA/8000                                 |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | -20mA to 20mA res. 20mA/4000                                 |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | -20mA to 20mA direct ADC value                               |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | K type thermocouple in °C                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | J type thermocouple in °C                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | T type thermocouple in °C                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | K type thermocouple in °F                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | J type thermocouple in °F                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | T type thermocouple in °F                                    |                                                                                                                                                                                                                                                 |
|             |                                                                                                                                                                     | channel unused                                               |                                                                                                                                                                                                                                                 |

**Table C-58: FX<sub>2N</sub>-8AD (Motorola Format)**

| Nr.                                                                   | Parameter Name                                                                                                                                                      | Value Setting List              | Description                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05<br>(6th)                                                           | Next parameter uses EEPROM..                                                                                                                                        | DON'T write parameter to EEPROM | The 2nd to 5th parameter is written to EEPROM. Select “writing to EEPROM” setting from the available options.                                                                                                                                                                                                                                                   |
|                                                                       |                                                                                                                                                                     | write parameter to EEPROM       |                                                                                                                                                                                                                                                                                                                                                                 |
| 06<br>(7th)<br><br>07<br>(8th)<br><br>08<br>(9th)<br><br>09<br>(10th) | <ul style="list-style-type: none"><li>..channel 7 input mode</li><li>..channel 8 input mode</li><li>..channel 5 input mode</li><li>..channel 6 input mode</li></ul> | -10 to 10V res. 10V/16000       | <ul style="list-style-type: none"><li>Select input mode for channel 7 from the available options. (BFM #1).</li><li>Select input mode for channel 8 from the available options. (BFM #1).</li><li>Select input mode for channel 5 from the available options. (BFM #1).</li><li>Select input mode for channel 6 from the available options. (BFM #1).</li></ul> |
|                                                                       |                                                                                                                                                                     | -10 to 10V res. 10V/4000        |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -10 to 10V direct ADC value     |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA res. 20mA/8000      |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA res. 20mA/4000      |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | 4mA to 20mA direct ADC value    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA res. 20mA/8000    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA res. 20mA/4000    |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | -20mA to 20mA direct ADC value  |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | K type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | J type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | T type thermocouple in °C       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | K type thermocouple in °F       |                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                       |                                                                                                                                                                     | J type thermocouple in °F       |                                                                                                                                                                                                                                                                                                                                                                 |
| T type thermocouple in °F                                             |                                                                                                                                                                     |                                 |                                                                                                                                                                                                                                                                                                                                                                 |
| channel unused                                                        |                                                                                                                                                                     |                                 |                                                                                                                                                                                                                                                                                                                                                                 |
| 10<br>(11th)                                                          | channel 1 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 1. (BFM #2)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 11<br>(12th)                                                          | channel 2 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 2. (BFM #3)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 12<br>(13th)                                                          | channel 3 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 3. (BFM #4)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 13<br>(14th)                                                          | channel 4 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 4. (BFM #5)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |
| 14<br>(15th)                                                          | channel 5 number of samples                                                                                                                                         | Default: 1                      | Set the number of samples for averaged results in channel 5. (BFM #6)<br>Setting range: 1 to 4096                                                                                                                                                                                                                                                               |

**Table C-58: FX<sub>2N</sub>-8AD (Motorola Format)**

| Nr.          | Parameter Name                 | Value Setting List | Description                                                                                             |
|--------------|--------------------------------|--------------------|---------------------------------------------------------------------------------------------------------|
| 15<br>(16th) | channel 6 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 6.<br>(BFM #7)<br>Setting range: 1 to 4096 |
| 16<br>(17th) | channel 7 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 7.<br>(BFM #8)<br>Setting range: 1 to 4096 |
| 17<br>(18th) | channel 8 number<br>of samples | Default: 1         | Set the number of samples for<br>averaged results in channel 8.<br>(BFM #9)<br>Setting range: 1 to 4096 |

**C-2-30: FX<sub>2N</sub>-10PG (Intel Format)****Requirements:**

- Cyclic data is 10 word inputs and 10 word output in every cycle.

**Table C-59: Cyclic Data of FX<sub>2N</sub>-10PG (Intel Format)**

|      | Send Data                                              | Receive Data                                   |
|------|--------------------------------------------------------|------------------------------------------------|
| 1st  | Set the low word for target address I (BFM #13)        | Low word for current address (BFM #24)         |
| 2nd  | Set the upper word for target address I (BFM #14)      | Upper word for current address (BFM #25)       |
| 3rd  | Set the low word for operation speed I (BFM #15)       | Low word for the target address I (BFM #13)    |
| 4th  | Set the upper word for operation speed I (BFM #16)     | Upper word for the target address I (BFM #14)  |
| 5th  | Set the low word for the target address II (BFM #17)   | Low word for the target address II (BFM #17)   |
| 6th  | Set the upper word for the target address II (BFM #18) | Upper word for the target address II (BFM #18) |
| 7th  | Set the low word for operation speed II (BFM #19)      | Terminal information (BFM #38)                 |
| 8th  | Set the upper word for operation speed II (BFM #20)    | Status information (BFM #28)                   |
| 9th  | Set the operation pattern (BFM #27)                    | Error code (BFM #37)                           |
| 10th | Set the operation command (BFM #26)                    | Operation command (BFM #26)                    |

- Parameter is 78 bytes.

**Table C-60: FX<sub>2N</sub>-10PG (Intel Format)**

| Nr.         | Parameter Name        | Value Setting List       | Description                                                                                                             |
|-------------|-----------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | pulse rate lower word | Default: 2000 (07D0 Hex) | Set the lower word for pulse rate. (BFM #32)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 01<br>(2nd) | pulse rate upper word | Default: 0 (0000 Hex)    | Set the upper word for pulse rate. (BFM #33)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 02<br>(3rd) | feed rate lower word  | Default: 2000 (07D0 Hex) | Set the lower word for feed rate. (BFM #34)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)  |

**Table C-60: FX<sub>2N</sub>-10PG (Intel Format)**

| Nr.          | Parameter Name                 | Value Setting List               | Description                                                                                                                                                                                                                   |
|--------------|--------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03<br>(4th)  | feed rate upper word           | Default: 0 (0000 Hex)            | Set the upper word for feed rate. (BFM #35)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)                                                                                                        |
| 04<br>(5th)  | System of units                | Motor system                     | Select the unit system from the available options. (BFM #36)                                                                                                                                                                  |
|              |                                | Machine system                   |                                                                                                                                                                                                                               |
|              |                                | Combined system                  |                                                                                                                                                                                                                               |
| 05<br>(6th)  | position data multiplication   | multiplier = 1                   | Select magnification of position data from the available options. (BFM #36)                                                                                                                                                   |
|              |                                | multiplier = 10                  |                                                                                                                                                                                                                               |
|              |                                | multiplier = 100                 |                                                                                                                                                                                                                               |
|              |                                | multiplier = 1000                |                                                                                                                                                                                                                               |
| 06<br>(7th)  | pulse output format            | forward/reverse pulses           | Select pulse output format from the available options. (BFM #36)                                                                                                                                                              |
|              |                                | pulse/direction                  |                                                                                                                                                                                                                               |
| 07<br>(8th)  | rotation direction             | CP value increases with a FP     | Select rotation direction from the available options. (BFM #36)                                                                                                                                                               |
|              |                                | CP value decreases with a FP     |                                                                                                                                                                                                                               |
| 08<br>(9th)  | home position ret. dir.        | CP value dec. during ret. home   | Select home return direction from the available options. (BFM #36)                                                                                                                                                            |
|              |                                | CP value inc. during ret. home   |                                                                                                                                                                                                                               |
| 09<br>(10th) | Acceleration/Deceleration mode | trapezoidal control              | Select acceleration/deceleration mode from the available options. (BFM #36)                                                                                                                                                   |
|              |                                | approx. S-shape control          |                                                                                                                                                                                                                               |
| 10<br>(11th) | DOG input polarity             | DOG signal active high           | Select polarity for DOG input signal from the available options. (BFM #36)                                                                                                                                                    |
|              |                                | DOG signal active low            |                                                                                                                                                                                                                               |
| 11<br>(12th) | count start timing             | count z.p.sig. while DOG is act. | Select the count start timing from the available options. (BFM #36)                                                                                                                                                           |
|              |                                | count z.p.sig. after DOG impulse |                                                                                                                                                                                                                               |
| 12<br>(13th) | STOP input mode                | remaining distance               | Select STOP mode from the available options. (BFM #36)                                                                                                                                                                        |
|              |                                | next position                    |                                                                                                                                                                                                                               |
| 13<br>(14th) | maximum speed lower word       | Default: 41248 (A120 Hex)        | Set lower word of maximum speed. (BFM #0)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (00000001 to 000F4240 Hex). |

**Table C-60: FX<sub>2N</sub>-10PG (Intel Format)**

| Nr.          | Parameter Name                    | Value Setting List        | Description                                                                                                                                                                                                                                   |
|--------------|-----------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14<br>(15th) | maximum speed<br>upper word       | Default: 7 (0007 Hex)     | Set upper word of maximum speed. (BFM #1)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)        |
| 15<br>(16th) | bias speed                        | Default: 0 (0000 Hex)     | Set bias speed. (BFM #2)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value<br>is 0 to 30000 Hz (0000 to 7530<br>Hex)                                                                                   |
| 16<br>(17th) | Jog speed lower<br>word           | Default: 10000 (2710 Hex) | Set lower word of JOG speed.<br>(BFM #3)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)         |
| 17<br>(18th) | Jog speed upper<br>word           | Default: 0 (0000 Hex)     | Set lower word of JOG speed.<br>(BFM #4)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)         |
| 18<br>(19th) | zero ret. hi. speed<br>lower word | Default: 41248 (A120 Hex) | Set lower word of the home position<br>return speed. (BFM #5)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to<br>7FFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex) |
| 19<br>(20th) | zero ret. hi. speed<br>upper word | Default: 7 (0007 Hex)     | Set upper word of the home<br>position return speed. (BFM #6)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to<br>7FFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex) |

**Table C-60: FX<sub>2N</sub>-10PG (Intel Format)**

| Nr.          | Parameter Name                | Value Setting List       | Description                                                                                                                                                                                                        |
|--------------|-------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20<br>(21st) | zero ret. creep speed         | Default: 1000 (03EB Hex) | Set creep speed of home position return. (BFM #7)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                     |
| 21<br>(22nd) | zero point signal number      | Default: 1 (0001 Hex)    | Set number of zero point signal. (BFM #8)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)                                                                                                                       |
| 22<br>(23rd) | zero point address lower word | Default: 0 (0000 Hex)    | Set lower word of home position address. (BFM #9)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                    |
| 23<br>(24th) | zero point address upper word | Default: 0 (0000 Hex)    | Set upper word of home position address. (BFM #10)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                   |
| 24<br>(25th) | acceleration time             | Default: 100 (0064 Hex)  | Set acceleration time. (BFM #11)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |
| 25<br>(26th) | deceleration time             | Default: 100 (0064 Hex)  | Set deceleration time. (BFM #12)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |

**C-2-31: FX<sub>2N</sub>-10PG (Motorola Format)****Requirements:**

- Cyclic data is 10 word inputs and 10 word output in every cycle.

**Table C-61: Cyclic Data of FX<sub>2N</sub>-10PG (Motorola Format)**

|      | Send Data                                              | Receive Data                                   |
|------|--------------------------------------------------------|------------------------------------------------|
| 1st  | Set the low word for target address I (BFM #13)        | Low word for current address (BFM #24)         |
| 2nd  | Set the upper word for target address I (BFM #14)      | Upper word for current address (BFM #25)       |
| 3rd  | Set the low word for operation speed I (BFM #15)       | Low word for the target address I (BFM #13)    |
| 4th  | Set the upper word for operation speed I (BFM #16)     | Upper word for the target address I (BFM #14)  |
| 5th  | Set the low word for the target address II (BFM #17)   | Low word for the target address II (BFM #17)   |
| 6th  | Set the upper word for the target address II (BFM #18) | Upper word for the target address II (BFM #18) |
| 7th  | Set the low word for operation speed II (BFM #19)      | Terminal information (BFM #38)                 |
| 8th  | Set the upper word for operation speed II (BFM #20)    | Status information (BFM #28)                   |
| 9th  | Set the operation pattern (BFM #27)                    | Error code (BFM #37)                           |
| 10th | Set the operation command (BFM #26)                    | Operation command (BFM #26)                    |

- Parameter is 78 bytes.

**Table C-62: FX<sub>2N</sub>-10PG (Motorola Format)**

| Nr.         | Parameter Name        | Value Setting List       | Description                                                                                                             |
|-------------|-----------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | pulse rate lower word | Default: 2000 (07D0 Hex) | Set the lower word for pulse rate. (BFM #32)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 01<br>(2nd) | pulse rate upper word | Default: 0 (0000 Hex)    | Set the upper word for pulse rate. (BFM #33)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 02<br>(3rd) | feed rate lower word  | Default: 2000 (07D0 Hex) | Set the lower word for feed rate. (BFM #34)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)  |

**Table C-62: FX<sub>2N</sub>-10PG (Motorola Format)**

| Nr.          | Parameter Name                     | Value Setting List                                                                     | Description                                                                                                                                                                                                                    |
|--------------|------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03<br>(4th)  | feed rate upper word               | Default: 0 (0000 Hex)                                                                  | Set the upper word for feed rate. (BFM #35)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)                                                                                                         |
| 04<br>(5th)  | pulse output format                | forward/reverse pulses<br>pulse/direction                                              | Select pulse output format from the available options. (BFM #36)                                                                                                                                                               |
| 05<br>(6th)  | rotation direction                 | CP value increases with a FP<br>CP value decreases with a FP                           | Select rotation direction from the available options. (BFM #36)                                                                                                                                                                |
| 06<br>(7th)  | home position ret. dir.            | CP value dec. during ret. home<br>CP value inc. during ret. home                       | Select home return direction from the available options. (BFM #36)                                                                                                                                                             |
| 07<br>(8th)  | Acceleration/<br>Deceleration mode | trapezoidal control<br>approx. S-shape control                                         | Select acceleration/deceleration mode from the available options. (BFM #36)                                                                                                                                                    |
| 08<br>(9th)  | DOG input polarity                 | DOG signal active high<br>DOG signal active low                                        | Select polarity for DOG input signal from the available options. (BFM #36)                                                                                                                                                     |
| 09<br>(10th) | count start timing                 | count z.p.sig. while DOG is act.<br>count z.p.sig. after DOG impulse                   | Select the count start timing from the available options. (BFM #36)                                                                                                                                                            |
| 10<br>(11th) | STOP input mode                    | remaining distance<br>next position                                                    | Select STOP mode from the available options. (BFM #36)                                                                                                                                                                         |
| 11<br>(12th) | System of units                    | Motor system<br>Machine system<br>Combined system                                      | Select unit system from the available options. (BFM #36)                                                                                                                                                                       |
| 12<br>(13th) | position data multiplication       | multiplicator = 1<br>multiplicator = 10<br>multiplicator = 100<br>multiplicator = 1000 | Select magnification of position data from the available options. (BFM #36)                                                                                                                                                    |
| 13<br>(14th) | maximum speed lower word           | Default: 41248 (A120 Hex)                                                              | Set lower word of maximum speed. (BFM #0)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex). |

**Table C-62: FX<sub>2N</sub>-10PG (Motorola Format)**

| Nr.          | Parameter Name                    | Value Setting List        | Description                                                                                                                                                                                                                       |
|--------------|-----------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14<br>(15th) | maximum speed<br>upper word       | Default: 7 (0007 Hex)     | Set upper word of maximum speed. (BFM #1)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)  |
| 15<br>(16th) | bias speed                        | Default: 0 (0000 Hex)     | Set bias speed. (BFM #2)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                                                             |
| 16<br>(17th) | Jog speed lower<br>word           | Default: 10000 (2710 Hex) | Set lower word of JOG speed. (BFM #3)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)      |
| 17<br>(18th) | Jog speed upper<br>word           | Default: 0 (0000 Hex)     | Set lower word of JOG speed. (BFM #4)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)      |
| 18<br>(19th) | zero ret. hi. speed<br>lower word | Default: 41248 (A120 Hex) | Set lower word of the home position return speed. (BFM #5)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to 7FFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex) |
| 19<br>(20th) | zero ret. hi. speed<br>upper word | Default: 7 (0007 Hex)     | Set upper word of the home position return speed. (BFM #6)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to 7FFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex) |

**Table C-62: FX<sub>2N</sub>-10PG (Motorola Format)**

| Nr.          | Parameter Name                | Value Setting List       | Description                                                                                                                                                                                                        |
|--------------|-------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20<br>(21st) | zero ret. creep speed         | Default: 1000 (03EB Hex) | Set creep speed of home position return. (BFM #7)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                     |
| 21<br>(22nd) | zero point signal number      | Default: 1 (0001 Hex)    | Set number of zero point signal. (BFM #8)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)                                                                                                                       |
| 22<br>(23rd) | zero point address lower word | Default: 0 (0000 Hex)    | Set lower word of home position address. (BFM #9)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                    |
| 23<br>(24th) | zero point address upper word | Default: 0 (0000 Hex)    | Set upper word of home position address. (BFM #10)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                   |
| 24<br>(25th) | acceleration time             | Default: 100 (0064 Hex)  | Set acceleration time. (BFM #11)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |
| 25<br>(26th) | deceleration time             | Default: 100 (0064 Hex)  | Set deceleration time. (BFM #12)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |

**C-2-32: FX2N-10PG (Intel Format) - Using 6W-IF -****Requirements:**

- Cyclic data is 6 word inputs and 6 word outputs in every cycle. This data is used for “Simple Communication 6W-IF”. Further information for the simple communication 6W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-63: Cyclic Data of FX2N-10PG 6W-IF (Intel Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |
| 4th | FROM address | FROM data              |
| 5th | TO data      | TO data (read back)    |
| 6th | TO address   | TO address (read back) |

- Parameter is 58 bytes.

**Table C-64: FX2N-10PG 6W-IF (Intel Format)**

| Nr.         | Parameter Name               | Value Setting List       | Description                                                                                                             |
|-------------|------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | pulse rate lower word        | Default: 2000 (07D0 Hex) | Set the lower word for pulse rate. (BFM #32)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 01<br>(2nd) | pulse rate upper word        | Default: 0 (0000 Hex)    | Set the upper word for pulse rate. (BFM #33)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 02<br>(3rd) | feed rate lower word         | Default: 2000 (07D0 Hex) | Set the lower word for feed rate. (BFM #34)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)  |
| 03<br>(4th) | feed rate upper word         | Default: 0 (0000 Hex)    | Set the upper word for feed rate. (BFM #35)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)  |
| 04<br>(5th) | System of units              | Motor system             | Select unit system from the available options. (BFM #36)                                                                |
|             |                              | Machine system           |                                                                                                                         |
|             |                              | Combined system          |                                                                                                                         |
| 05<br>(6th) | position data multiplication | multiplicator = 1        | Select magnification of position data from the available options. (BFM #36)                                             |
|             |                              | multiplicator = 10       |                                                                                                                         |
|             |                              | multiplicator = 100      |                                                                                                                         |
|             |                              | multiplicator = 1000     |                                                                                                                         |

**Table C-64: FX<sub>2N</sub>-10PG 6W-IF (Intel Format)**

| Nr.          | Parameter Name                     | Value Setting List                                                   | Description                                                                                                                                                                                                                    |
|--------------|------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 06<br>(7th)  | pulse output format                | forward/reverse pulses<br>pulse/direction                            | Select pulse output format from the available options. (BFM #36)                                                                                                                                                               |
| 07<br>(8th)  | rotation direction                 | CP value increases with a FP<br>CP value decreases with a FP         | Select rotation direction from the available options. (BFM #36)                                                                                                                                                                |
| 08<br>(9th)  | home position ret. dir.            | CP value dec. during ret. home<br>CP value inc. during ret. home     | Select home return direction from the available options. (BFM #36)                                                                                                                                                             |
| 09<br>(10th) | Acceleration/<br>Deceleration mode | trapezoidal control<br>approx. S-shape control                       | Select acceleration/deceleration mode from the available options. (BFM #36)                                                                                                                                                    |
| 10<br>(11th) | DOG input polarity                 | DOG signal active high<br>DOG signal active low                      | Select polarity for DOG input signal from the available options. (BFM #36)                                                                                                                                                     |
| 11<br>(12th) | count start timing                 | count z.p.sig. while DOG is act.<br>count z.p.sig. after DOG impulse | Select the count start timing from the available options. (BFM #36)                                                                                                                                                            |
| 12<br>(13th) | STOP input mode                    | remaining distance<br>next position                                  | Select STOP mode from the available options. (BFM #36)                                                                                                                                                                         |
| 13<br>(14th) | maximum speed lower word           | Default: 41248 (A120 Hex)                                            | Set lower word of maximum speed. (BFM #0)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex). |
| 14<br>(15th) | maximum speed upper word           | Default: 7 (0007 Hex)                                                | Set upper word of maximum speed. (BFM #1)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)  |
| 15<br>(16th) | bias speed                         | Default: 0 (0000 Hex)                                                | Set bias speed. (BFM #2)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                                                          |
| 16<br>(17th) | Jog speed lower word               | Default: 10000 (2710 Hex)                                            | Set lower word of JOG speed. (BFM #3)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)      |

**Table C-64: FX<sub>2N</sub>-10PG 6W-IF (Intel Format)**

| Nr.          | Parameter Name                 | Value Setting List        | Description                                                                                                                                                                                                                       |
|--------------|--------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17<br>(18th) | Jog speed upper word           | Default: 0 (0000 Hex)     | Set lower word of JOG speed. (BFM #4)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex)      |
| 18<br>(19th) | zero ret. hi. speed lower word | Default: 41248 (A120 Hex) | Set lower word of the home position return speed. (BFM #5)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to 7FFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex) |
| 19<br>(20th) | zero ret. hi. speed upper word | Default: 7 (0007 Hex)     | Set upper word of the home position return speed. (BFM #6)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to 7FFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex) |
| 20<br>(21st) | zero ret. creep speed          | Default: 1000 (03EB Hex)  | Set creep speed of home position return. (BFM #7)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                                    |
| 21<br>(22nd) | zero point signal number       | Default: 1 (0001 Hex)     | Set number of zero point signal. (BFM #8)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)                                                                                                                                      |
| 22<br>(23rd) | zero point address lower word  | Default: 0 (0000 Hex)     | Set lower word of home position address. (BFM #9)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)                                                                                |
| 23<br>(24th) | zero point address upper word  | Default: 0 (0000 Hex)     | Set upper word of home position address. (BFM #10)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)                                                                               |

**Table C-64: FX<sub>2N</sub>-10PG 6W-IF (Intel Format)**

| Nr.          | Parameter Name    | Value Setting List      | Description                                                                                                                                                                                                        |
|--------------|-------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24<br>(25th) | acceleration time | Default: 100 (0064 Hex) | Set acceleration time. (BFM #11)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |
| 25<br>(26th) | deceleration time | Default: 100 (0064 Hex) | Set deceleration time. (BFM #12)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |

**C-2-33: FX<sub>2N</sub>-10PG (Motorola Format) - Using 6W-IF -****Requirements:**

- Cyclic data is 6 word inputs and 6 word outputs in every cycle. This data is used for "Simple Communication 6W-IF". Further information for the simple communication 6W-IF can be found in section 7.2.1 and 7.2.2.

**Table C-65: Cyclic Data of FX<sub>2N</sub>-10PG 6W-IF (Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |
| 4th | FROM address | FROM data              |
| 5th | TO data      | TO data (read back)    |
| 6th | TO address   | TO address (read back) |

- Parameter is 58 bytes.

**Table C-66: FX<sub>2N</sub>-10PG 6W-IF (Motorola Format)**

| Nr.         | Parameter Name        | Value Setting List       | Description                                                                                                             |
|-------------|-----------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 00<br>(1st) | pulse rate lower word | Default: 2000 (07D0 Hex) | Set the lower word for pulse rate. (BFM #32)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 01<br>(2nd) | pulse rate upper word | Default: 0 (0000 Hex)    | Set the upper word for pulse rate. (BFM #33)<br>Setting range (BFM #33, #32):<br>1 to 999999 (00000001 to 000F423F Hex) |
| 02<br>(3rd) | feed rate lower word  | Default: 2000 (07D0 Hex) | Set the lower word for feed rate. (BFM #34)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)  |

**Table C-66: FX<sub>2N</sub>-10PG 6W-IF (Motorola Format)**

| Nr.          | Parameter Name                     | Value Setting List                                                                     | Description                                                                                                                                                                                                                    |
|--------------|------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 03<br>(4th)  | feed rate upper word               | Default: 0 (0000 Hex)                                                                  | Set the upper word for feed rate. (BFM #35)<br>Setting range (BFM #35, #34):<br>1 to 999999 (00000001 to 000F423F Hex)                                                                                                         |
| 04<br>(5th)  | pulse output format                | forward/reverse pulses<br>pulse/direction                                              | Select pulse output format from the available options. (BFM #36)                                                                                                                                                               |
| 05<br>(6th)  | rotation direction                 | CP value increases with a FP<br>CP value decreases with a FP                           | Select rotation direction from the available options. (BFM #36)                                                                                                                                                                |
| 06<br>(7th)  | home position ret. dir.            | CP value dec. during ret. home<br>CP value inc. during ret. home                       | Select home return direction from the available options. (BFM #36)                                                                                                                                                             |
| 07<br>(8th)  | Acceleration/<br>Deceleration mode | trapezoidal control<br>approx. S-shape control                                         | Select acceleration/deceleration mode from the available options. (BFM #36)                                                                                                                                                    |
| 08<br>(9th)  | DOG input polarity                 | DOG signal active high<br>DOG signal active low                                        | Select polarity for DOG input signal from the available options. (BFM #36)                                                                                                                                                     |
| 09<br>(10th) | count start timing                 | count z.p.sig. while DOG is act.<br>count z.p.sig. after DOG impulse                   | Select the count start timing from the available options. (BFM #36)                                                                                                                                                            |
| 10<br>(11th) | STOP input mode                    | remaining distance<br>next position                                                    | Select STOP mode from the available options. (BFM #36)                                                                                                                                                                         |
| 11<br>(12th) | System of units                    | Motor system<br>Machine system<br>Combined system                                      | Select unit system from the available options. (BFM #36)                                                                                                                                                                       |
| 12<br>(13th) | position data multiplication       | multiplicator = 1<br>multiplicator = 10<br>multiplicator = 100<br>multiplicator = 1000 | Select magnification of position data from the available options. (BFM #36)                                                                                                                                                    |
| 13<br>(14th) | maximum speed lower word           | Default: 41248 (A120 Hex)                                                              | Set lower word of maximum speed. (BFM #0)<br>Setting range (BFM #1, #0):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value is 1 to 1,000,000 Hz (000000001 to 000F4240 Hex). |

**Table C-66: FX<sub>2N</sub>-10PG 6W-IF (Motorola Format)**

| Nr.          | Parameter Name                    | Value Setting List        | Description                                                                                                                                                                                                                                   |
|--------------|-----------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14<br>(15th) | maximum speed<br>upper word       | Default: 7 (0007 Hex)     | Set upper word of maximum speed. (BFM #1)<br>Setting range (BFM #1, 0#):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)        |
| 15<br>(16th) | bias speed                        | Default: 0 (0000 Hex)     | Set bias speed. (BFM #2)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value<br>is 0 to 30000 Hz (0000 to 7530<br>Hex)                                                                                   |
| 16<br>(17th) | Jog speed lower<br>word           | Default: 10000 (2710 Hex) | Set lower word of JOG speed.<br>(BFM #3)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)         |
| 17<br>(18th) | Jog speed upper<br>word           | Default: 0 (0000 Hex)     | Set lower word of JOG speed.<br>(BFM #4)<br>Setting range (BFM #4, #3):<br>-2,147,483,648 to 2,147,483,467<br>(00000000 to FFFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex)         |
| 18<br>(19th) | zero ret. hi. speed<br>lower word | Default: 41248 (A120 Hex) | Set lower word of the home position<br>return speed. (BFM #5)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to<br>7FFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex) |
| 19<br>(20th) | zero ret. hi. speed<br>upper word | Default: 7 (0007 Hex)     | Set upper word of the home<br>position return speed. (BFM #6)<br>Setting range (BFM #6, #5):<br>1 to 2,147,483,467 (00000001 to<br>7FFFFFFF Hex)<br>The range of pulse-converted value<br>is 1 to 1,000,000 Hz (000000001 to<br>000F4240 Hex) |

**Table C-66: FX<sub>2N</sub>-10PG 6W-IF (Motorola Format)**

| Nr.          | Parameter Name                | Value Setting List       | Description                                                                                                                                                                                                        |
|--------------|-------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20<br>(21st) | zero ret. creep speed         | Default: 1000 (03EB Hex) | Set creep speed of home position return. (BFM #7)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)<br>The range of pulse-converted value is 0 to 30000 Hz (0000 to 7530 Hex)                                     |
| 21<br>(22nd) | zero point signal number      | Default: 1 (0001 Hex)    | Set number of zero point signal. (BFM #8)<br>Setting range:<br>0 to 32767 (0000 to 7FFF Hex)                                                                                                                       |
| 22<br>(23rd) | zero point address lower word | Default: 0 (0000 Hex)    | Set lower word of home position address. (BFM #9)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                    |
| 23<br>(24th) | zero point address upper word | Default: 0 (0000 Hex)    | Set upper word of home position address. (BFM #10)<br>Setting range (BFM #10, #9):<br>-2,147,483,648 to 2,147,483,467 (00000000 to FFFFFFFF Hex)                                                                   |
| 24<br>(25th) | acceleration time             | Default: 100 (0064 Hex)  | Set acceleration time. (BFM #11)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |
| 25<br>(26th) | deceleration time             | Default: 100 (0064 Hex)  | Set deceleration time. (BFM #12)<br>Setting range:<br><ul style="list-style-type: none"> <li>Trapezoidal control; 1 to 5000 (0001 to 1388 Hex)</li> <li>S-shaped control; 64 to 5000 (0040 to 1388 Hex)</li> </ul> |

**C-2-34: Simple Communication 3W-IF (Intel Format/Motorola Format)**

Further information of the simple communication 3W-IF can be found in section 7.2.1 and 7.2.2.

**Requirements:**

- Cyclic data is 3 word inputs and 3 word outputs in every cycle.

**Table C-67: Cyclic Data of Simple Communication 3W-IF (Intel Format/Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |

- Parameter is 4 bytes.

**Table C-68: Simple Communication 3W-IF (Intel Format/Motorola Format)**

| Nr.         | Parameter Name | Value Setting List                  | Description                    |
|-------------|----------------|-------------------------------------|--------------------------------|
| 00<br>(1st) | SFB ID         | simple analog modules* <sup>1</sup> | Special function block ID code |
|             |                | FX2N-4AD* <sup>2</sup>              |                                |
|             |                | FX2N-4AD-TC* <sup>2</sup>           |                                |
|             |                | FX2N-4AD-PT* <sup>2</sup>           |                                |
|             |                | FX2N-4DA* <sup>2</sup>              |                                |
|             |                | FX2N-1HC* <sup>2</sup>              |                                |
|             |                | FX2N-1PG* <sup>2</sup>              |                                |
|             |                | FX2N-20GM* <sup>2</sup>             |                                |
|             |                | FX2N-10GM* <sup>2</sup>             |                                |
|             |                | FX2N-232IF* <sup>2</sup>            |                                |
|             |                | FX2N-32ASI-M* <sup>2</sup>          |                                |

\*<sup>1</sup> Simple analog modules are FX<sub>0</sub>N-3A, FX<sub>2</sub>N-2AD and FX<sub>2</sub>N-2DA.

\*<sup>2</sup> These products are listed as shown when using the Intel format. When using the Motorola format, the order of the products listed will change slightly.

**C-2-35: Simple Communication 6W-IF (Intel Format/Motorola Format)**

Further information of the simple communication 6W-IF can be found in section 7.2.1 and 7.2.2.

**Requirements:**

- Cyclic data is 6 word inputs and 6 word outputs in every cycle.

**Table C-69: Cyclic Data of Simple Communication 6W-IF (Intel Format/Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |
| 4th | FROM address | FROM data              |
| 5th | TO data      | TO data (read back)    |
| 6th | TO address   | TO address (read back) |

- Parameter is 4 bytes.

**Table C-70: Simple Communication 6W-IF (Intel Format/Motorola Format)**

| Nr.         | Parameter Name | Value Setting List                  | Description                    |
|-------------|----------------|-------------------------------------|--------------------------------|
| 00<br>(1st) | SFB ID         | simple analog modules <sup>*1</sup> | Special function block ID code |
|             |                | FX2N-4AD <sup>*2</sup>              |                                |
|             |                | FX2N-4AD-TC <sup>*2</sup>           |                                |
|             |                | FX2N-4AD-PT <sup>*2</sup>           |                                |
|             |                | FX2N-4DA <sup>*2</sup>              |                                |
|             |                | FX2N-1HC <sup>*2</sup>              |                                |
|             |                | FX2N-1PG <sup>*2</sup>              |                                |
|             |                | FX2N-20GM <sup>*2</sup>             |                                |
|             |                | FX2N-10GM <sup>*2</sup>             |                                |
|             |                | FX2N-232IF <sup>*2</sup>            |                                |
|             |                | FX2N-32ASI-M <sup>*2</sup>          |                                |

<sup>\*1</sup> Simple analog modules are FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA.

<sup>\*2</sup> These products are listed as shown when using the Intel format. When using the Motorola format, the order of the products listed will change slightly.

**C-2-36: Simple Communication 9W-IF (Intel Format/Motorola Format)**

Further information of the simple communication 9W-IF can be found in section 7.2.1 and 7.2.2.

**Requirements:**

- Cyclic data is 9 word inputs and 9 word outputs in every cycle.

**Table C-71: Cyclic Data of Simple Communication 9W-IF (Intel Format/Motorola Format)**

|     | Send Data    | Receive Data           |
|-----|--------------|------------------------|
| 1st | FROM address | FROM data              |
| 2nd | TO data      | TO data (read back)    |
| 3rd | TO address   | TO address (read back) |
| 4th | FROM address | FROM data              |
| 5th | TO data      | TO data (read back)    |
| 6th | TO address   | TO address (read back) |
| 7th | FROM address | FROM data              |
| 8th | TO data      | TO data (read back)    |
| 9th | TO address   | TO address (read back) |

- Parameter is 4 bytes.

**Table C-72: Simple Communication 9W-IF (Intel Format/Motorola Format)**

| Nr.         | Parameter Name | Value Setting List                  | Description                    |
|-------------|----------------|-------------------------------------|--------------------------------|
| 00<br>(1st) | SFB ID         | simple analog modules <sup>*1</sup> | Special function block ID code |
|             |                | FX2N-4AD <sup>*2</sup>              |                                |
|             |                | FX2N-4AD-TC <sup>*2</sup>           |                                |
|             |                | FX2N-4AD-PT <sup>*2</sup>           |                                |
|             |                | FX2N-4DA <sup>*2</sup>              |                                |
|             |                | FX2N-1HC <sup>*2</sup>              |                                |
|             |                | FX2N-1PG <sup>*2</sup>              |                                |
|             |                | FX2N-20GM <sup>*2</sup>             |                                |
|             |                | FX2N-10GM <sup>*2</sup>             |                                |
|             |                | FX2N-232IF <sup>*2</sup>            |                                |
|             |                | FX2N-32ASI-M <sup>*2</sup>          |                                |

<sup>\*1</sup> Simple analog modules are FX<sub>0</sub>N-3A, FX<sub>2</sub>N-2AD and FX<sub>2</sub>N-2DA.

<sup>\*2</sup> These products are listed as shown when using the Intel format. When using the Motorola format, the order of the products listed will change slightly.

**C-2-37: Simple Communication 12W-IF (Intel Format/Motorola Format)**

Further information of the simple communication 12W-IF can be found in section 7.2.1 and 7.2.2.

**Requirements:**

- Cyclic data is 12 word inputs and 12 word outputs in every cycle.

**Table C-73: Cyclic Data of Simple Communication 12W-IF  
(Intel Format/Motorola Format)**

|      | Send Data    | Receive Data           |
|------|--------------|------------------------|
| 1st  | FROM address | FROM data              |
| 2nd  | TO data      | TO data (read back)    |
| 3rd  | TO address   | TO address (read back) |
| 4th  | FROM address | FROM data              |
| 5th  | TO data      | TO data (read back)    |
| 6th  | TO address   | TO address (read back) |
| 7th  | FROM address | FROM data              |
| 8th  | TO data      | TO data (read back)    |
| 9th  | TO address   | TO address (read back) |
| 10th | FROM address | FROM data              |
| 11th | TO data      | TO data (read back)    |
| 12th | TO address   | TO address (read back) |

- Parameter is 4 bytes.

**Table C-74: Simple Communication 12W-IF (Intel Format/Motorola Format)**

| Nr.         | Parameter Name | Value Setting List                  | Description                    |
|-------------|----------------|-------------------------------------|--------------------------------|
| 00<br>(1st) | SFB ID         | simple analog modules <sup>*1</sup> | Special function block ID code |
|             |                | FX2N-4AD <sup>*2</sup>              |                                |
|             |                | FX2N-4AD-TC <sup>*2</sup>           |                                |
|             |                | FX2N-4AD-PT <sup>*2</sup>           |                                |
|             |                | FX2N-4DA <sup>*2</sup>              |                                |
|             |                | FX2N-1HC <sup>*2</sup>              |                                |
|             |                | FX2N-1PG <sup>*2</sup>              |                                |
|             |                | FX2N-20GM <sup>*2</sup>             |                                |
|             |                | FX2N-10GM <sup>*2</sup>             |                                |
|             |                | FX2N-232IF <sup>*2</sup>            |                                |
|             |                | FX2N-32ASI-M <sup>*2</sup>          |                                |

<sup>\*1</sup> Simple analog modules are FX<sub>0N</sub>-3A, FX<sub>2N</sub>-2AD and FX<sub>2N</sub>-2DA.

<sup>\*2</sup> These products are listed as shown when using the Intel format. When using the Motorola format, the order of the products listed will change slightly.

**C-2-38: Simple Communication 15W-IF (Intel Format/Motorola Format)**

Further information of the simple communication 15W-IF can be found in section 7.2.1 and 7.2.2.

**Requirements:**

- Cyclic data is 15 word inputs and 15 word outputs in every cycle.

**Table C-75: Cyclic Data of Simple Communication 15W-IF  
(Intel Format/Motorola Format)**

|      | Send Data    | Receive Data           |
|------|--------------|------------------------|
| 1st  | FROM address | FROM data              |
| 2nd  | TO data      | TO data (read back)    |
| 3rd  | TO address   | TO address (read back) |
| 4th  | FROM address | FROM data              |
| 5th  | TO data      | TO data (read back)    |
| 6th  | TO address   | TO address (read back) |
| 7th  | FROM address | FROM data              |
| 8th  | TO data      | TO data (read back)    |
| 9th  | TO address   | TO address (read back) |
| 10th | FROM address | FROM data              |
| 11th | TO data      | TO data (read back)    |
| 12th | TO address   | TO address (read back) |
| 13th | FROM address | FROM data              |
| 14th | TO data      | TO data (read back)    |
| 15th | TO address   | TO address (read back) |

- Parameter is 4 bytes.

**Table C-76: Simple Communication 15W-IF (Intel Format/Motorola Format)**

| Nr.         | Parameter Name | Value Setting List                  | Description                    |
|-------------|----------------|-------------------------------------|--------------------------------|
| 00<br>(1st) | SFB ID         | simple analog modules* <sup>1</sup> | Special function block ID code |
|             |                | FX2N-4AD* <sup>2</sup>              |                                |
|             |                | FX2N-4AD-TC* <sup>2</sup>           |                                |
|             |                | FX2N-4AD-PT* <sup>2</sup>           |                                |
|             |                | FX2N-4DA* <sup>2</sup>              |                                |
|             |                | FX2N-1HC* <sup>2</sup>              |                                |
|             |                | FX2N-1PG* <sup>2</sup>              |                                |
|             |                | FX2N-20GM* <sup>2</sup>             |                                |
|             |                | FX2N-10GM* <sup>2</sup>             |                                |
|             |                | FX2N-232IF* <sup>2</sup>            |                                |
|             |                | FX2N-32ASI-M* <sup>2</sup>          |                                |

\*1 Simple analog modules are FX0N-3A, FX2N-2AD and FX2N-2DA.

\*2 These products are listed as shown when using the Intel format. When using the Motorola format, the order of the products listed will change slightly.

**C-2-39: 8 Bit Input****Requirements:**

- Cyclic data is 1 byte input in every cycle.
- Parameter is 0 bytes.

**C-2-40: 8 Bit Output****Requirements:**

- Cyclic data is 1 byte output in every cycle.

Parameter is 0 bytes.

## MEMO

## Appendix D:

### Update History of FX<sub>2N</sub>-32DP-IF and GSD File

**Table D-1: Update History of FX<sub>2N</sub>-32DP-IF and GSD File**

| Version          |          | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 32DP-IF Hardware | GSD File |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| V1.00            | V1.00    | First Product<br>Supports the following. <ul style="list-style-type: none"> <li>Special function blocks: FX<sub>2N</sub>-4AD, FX<sub>2N</sub>-4AD-TC, FX<sub>2N</sub>-4AD-PT, FX<sub>2N</sub>-4DA</li> <li>Extension units: FX<sub>2N</sub>-32ER-ES/UL, FX<sub>2N</sub>-32ET-ESS/UL, FX<sub>2N</sub>-48ER-ES/UL, FX<sub>2N</sub>-48ET-ESS/UL, FX<sub>2N</sub>-48ER-UA1/UL</li> <li>Extension blocks: FX<sub>2N</sub>-16EX-ES/UL, FX<sub>2N</sub>-16EYR-ES/UL, FX<sub>2N</sub>-16EYT-ESS/UL, FX<sub>0N</sub>-8EX-UA1/UL, FX<sub>0N</sub>-8EX-ES/UL, FX<sub>0N</sub>-8ER-ES/UL, FX<sub>0N</sub>-8EYR-ES/UL, FX<sub>0N</sub>-8EYT-ESS/UL, FX<sub>0N</sub>-16EX-ES/UL, FX<sub>0N</sub>-16EYR-ES/UL, FX<sub>0N</sub>-16EYT-ESS/UL</li> </ul> |
| V1.10            | V1.10    | Supports FX <sub>0N</sub> -3A, FX <sub>2N</sub> -2AD, FX <sub>2N</sub> -2DA, FX <sub>2N</sub> -1HC, FX <sub>2N</sub> -1PG, FX <sub>2N</sub> -10GM, FX <sub>2N</sub> -20GM, FX <sub>2N</sub> -32ASI-M and FX <sub>2N</sub> -232IF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| V2.00            | V2.00    | Supports the swap parameter (Second byte bit 4 in the global user parameter). (This content is written in the Section 7.1 and 7.2.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| V2.10            | V2.10    | Supports the following <ul style="list-style-type: none"> <li>Profibus-DP Interface unit: FX<sub>2N</sub>-32DP-IF-D</li> <li>Specical function blocks: FX<sub>2N</sub>-8AD, FX<sub>2N</sub>-2LC, FX<sub>2N</sub>-10PG.</li> <li>Extension units: FX<sub>2N</sub>-48ER-DS, FX<sub>2N</sub>-48ET-DSS</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |

## MEMO

## Appendix E:

### Further Information Manual Lists

**Table E-1: Further Information Manual Lists**

| Manual name                                                                       | Manual No.  | Description                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FX <sub>2N</sub> Series Programmable Controllers Hardware Manual                  | JY992D66301 | This manual contains explanations for wiring, installation and specification, etc. about FX <sub>2N</sub> Series programmable controller.                                                                                     |
| FX <sub>0</sub> /FX <sub>0N</sub> Series Programmable Controllers Hardware Manual | JY992D47501 | This manual contains explanations for wiring, installation and specification, etc. about FX <sub>0</sub> and FX <sub>0N</sub> Series programmable controllers.                                                                |
| FX <sub>2N</sub> -32DP-IF Profibus-DP Interface Unit Hardware Manual              | JY992D79401 | This manual contains explanations for wiring, installation, specification, etc. about FX <sub>2N</sub> -32DP-IF Profibus-DP Interface Unit.<br>However, the hardware manual's text is already contained in the user's manual. |
| FX <sub>2N</sub> -2DA special Function Block User's Guide                         | JY992D74901 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -2DA special function block.                                                                        |
| FX <sub>2N</sub> -2AD Special Function Block User's Guide                         | JY992D74701 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -2AD special function block.                                                                        |
| FX <sub>0N</sub> -3A Special Function Block User's Guide                          | JY992D49001 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>0N</sub> -3A special function block.                                                                         |
| FX <sub>2N</sub> -4DA Special Function Block User's Guide                         | JY992D65901 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -4DA special function block.                                                                        |
| FX <sub>2N</sub> -4AD Special Function Block User's Guide                         | JY992D65201 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -4AD special function block.                                                                        |
| FX <sub>2N</sub> -4AD-PT Special Function Block User's Guide                      | JY992D65601 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -4AD-PT special function block.                                                                     |
| FX <sub>2N</sub> -4AD-TC Special Function Block User's Guide                      | JY992D65501 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -4AD-TC special function block.                                                                     |
| FX <sub>2N</sub> -8AD Special Function Block User's Manual                        | JY992D86001 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -8AD special function block.                                                                        |
| FX <sub>2N</sub> -2LC Special Function Block User's Manual                        | JY992D85801 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -2LC special function block.                                                                        |
| FX <sub>2N</sub> -1HC Special Function Block User's Guide                         | JY992D65401 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -1HC special function block.                                                                        |
| FX-1PG/FX <sub>2N</sub> -1PG Pulse Generation Unit User's Manual                  | JY992D65301 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX-1PG/FX <sub>2N</sub> -1PG Pulse Generation Unit.                                                                  |

**Table E-1: Further Information Manual Lists**

| Manual name                                                                                   | Manual No.  | Description                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FX <sub>2N</sub> -10PG<br>Pulse Generation Unit<br>User's Manual                              | JY992D93401 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -10PG Pulse Generation Unit.                                                |
| FX <sub>2N</sub> -10GM User's Guide                                                           | JY992D77701 | This manual contains explanations for specification about FX <sub>2N</sub> -10GM Positioning Control Unit. However, the user's guide's text is already contained in the hardware/programming manual.  |
| FX <sub>2N</sub> -20GM User's Guide                                                           | JY992D77601 | This manual contains explanations for specification about FX <sub>2N</sub> -20GM Positioning Control Unit. However, the user's guide's text is already contained in the hardware/programming manual.  |
| FX <sub>2N</sub> -10GM, FX <sub>2N</sub> -20GM<br>Hardware/Programming<br>Manual              | JY992D77801 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -10GM, FX <sub>2N</sub> -20GM unit.                                         |
| FX <sub>2N</sub> -32ASI-M<br>AS-interface Master Block<br>User's Manual                       | JY992D76901 | This manual contains explanations for wiring, installation, specification and BFM allocation, etc. about FX <sub>2N</sub> -32ASI-M AS-interface master block.                                         |
| FX <sub>2N</sub> -232IF<br>RS232C Interface Block<br>User's Manual                            | JY992D73501 | This manual contains explanations for wiring, installation and specification about FX <sub>2N</sub> -232IF RS232C interface block.                                                                    |
| FX Communication<br>(RS232C, RS485)<br>User's Manual                                          | JY992D69901 | This manual contains explanations for N:N network, parallel link and computer link no protocol communication (RS instruction and FX <sub>2N</sub> -232IF RS232C interface block) about FX family PLC. |
| MELSEC ProfiMap<br>Configuration System for<br>Open Networks Software<br>Manual               | -           | This manual contains explanations for operation of MELSEC ProfiMap Configuration System for Open Networks Software.                                                                                   |
| MELSOFT<br>GX-Configurator-DP<br>Configuration System for<br>Open Networks Software<br>Manual | -           | This manual contains explanations for operation of MELSOFT GX-Configurator-DP Configuration System for Open Networks Software.                                                                        |



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