

# FX0N-16NT

## SPECIAL FUNCTION BLOCK

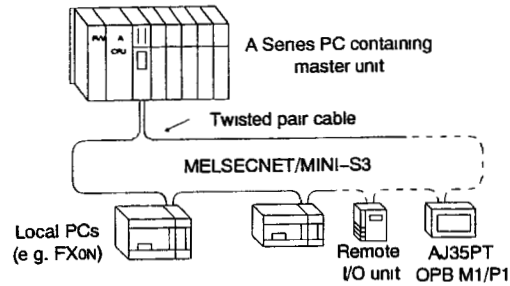
### USER'S GUIDE

JY992D48901A

This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of the FX0N-16NT special function block and should be read and understood before attempting to install or use the unit. Further information can be found in the FX PROGRAMMING MANUAL and FX0/FX0N SERIES HARDWARE MANUAL.

## 1 INTRODUCTION

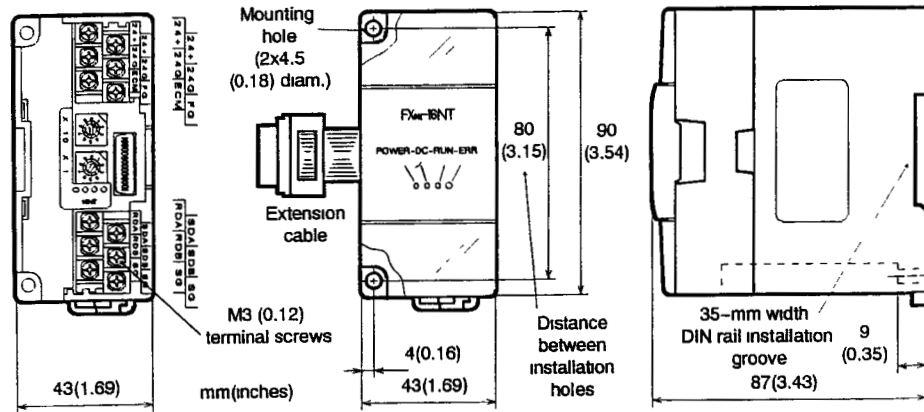
- The FX0N-16NT special function block connects the FX0N programmable controller to the MELSECNET/MINI-S3 network as a local station, or as a remote I/O unit of an A2C CPU.
- Use the AJ71PT32-S3 or A1SJ71PT32-S3 master unit or A2C CPU as the master station. Connect the local station to the master station using twisted pair cable.



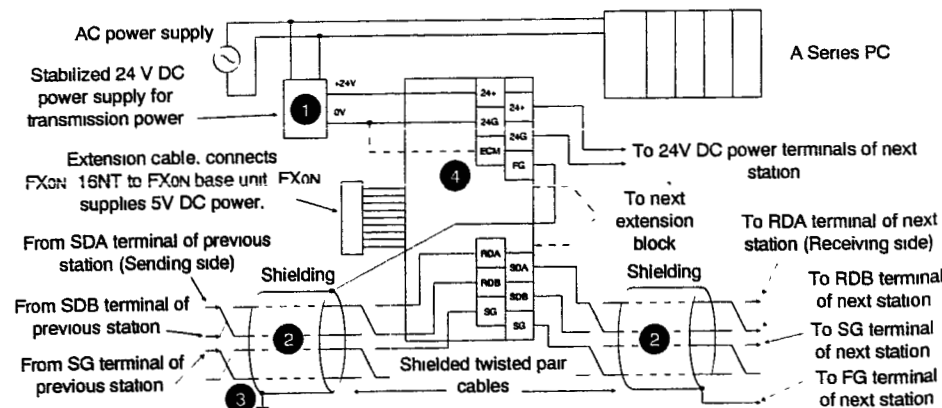
- 8 input points and 8 output points can be transmitted on the network.
- Number of occupied stations: 1 station (Number of stations: 64 maximum)
- Number of occupied input/output points: 8 input points and 8 output points of the FX0N PC
- Maximum distance for station-to-station transmission: 100 m

### 1.1 External dimensions

Weight: Approx. 0.2kg (0.44lbs). Accessory: I/O number labels.



## 2 TERMINAL LAYOUTS

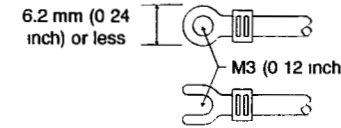


### 2.1 Key to numbered items on Terminal Layout diagram

- 24V DC transmission power for the network is supplied by the stabilized power supply.
- The shielded twisted pair cables connect the FX0N-16NT to the network. The SDA/SDB terminals of the previous station should be connected to the RDA/RDB terminals of this station. The SDA/SDB terminals of this station should be connected to the RDA/RDB terminals of the next station. **Keep these transmission cables away from all power cables. Do not allow power cables and transmission cables to share the same duct.**
- Use one-point grounding (Class 3 ground, 100 Ω or less) for the shielding of the twisted pair cable on the sending or receiving sides.
- See section 3.6 for use of the ECM (Emergency Clear Mode) terminal.

### 2.2 Use of crimp-style terminals

Use crimp-style terminals of the indicated dimensions. Tightening torque: 5 to 8 kgf.cm. Tighten the terminals carefully to avoid any malfunctions.



## 3 INSTALLATION NOTES AND USAGE

### 3.1 General specifications

Item	Specification
General specifications (excluding withstand voltage)	Same as those for the FX0N base unit
Withstand voltage	500 V AC for 1 minute (between grounding terminal and all the other terminals)

### 3.2 Performance Specifications

Item	Specification
Master station	AJ71PT32-S3, A1SJ71PT32-S3, A2C CPU
Cable	Shielded twisted pair cable: For detailed specifications, refer to following table. (Cross sectional area should be 0.2 to 0.5 mm <sup>2</sup> or more depending on the station-to-station distance)
Maximum station-to-station distance	50 m for 0.2 to 0.5 mm <sup>2</sup> , 100 m for 0.5 mm <sup>2</sup> or more

Connection to FX0N PC	Same as I/O extension blocks. Up to 2 unpowered blocks (including the FX0N-16NT) can be connected to each powered base or extension unit. <b>Max. I/O of system: 128 points.</b>	
Occupied station	1 station. MELSECNET/MINI-S3 can support up to 64 stations	
Input points	8 points: Allocated to FX0N extension I/O numbers, Xn0 to Xn7 8 points occupied during communication (A to FX0N)	
Output points	8 points: Allocated to extension I/O numbers of FX0N, Ym0 to Ym7 8 points occupied during communication (FX0N to A)	
LED indicators	POWER, DC, and RUN indicators are on during normal operation.	
	POWER	On when 5V DC power is supplied from the FX0N PC (internal power supply).
	DC	On when 24V DC power is supplied from the transmission power supply (external power supply)
	RUN	On during normal communication
ECM setting (set by terminal connections)	ERR	On when a communication error is detected.
	Controls the behavior of the FX0N-16NT if a communications error occurs. The error causes the master station to stop I/O refresh and a communications stoppage occurs. The last data received by the FX0N-16NT will either be kept or lost.	

### 3.3 Power supply specifications

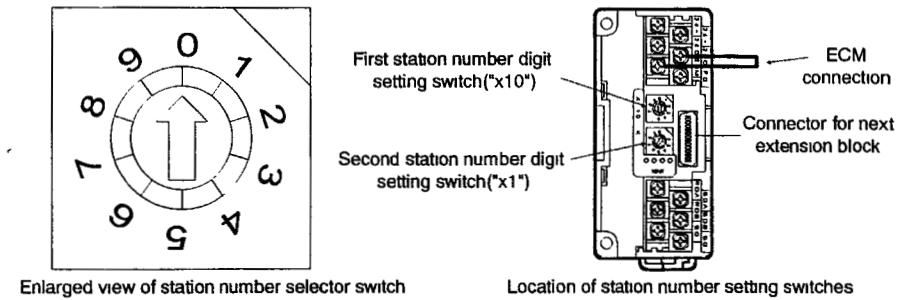
Item	Specification
Transmission power supply	24V DC +30% -35%, 60 mA (from the stabilized power supply)
Interface power supply	5V DC (internal power supply from FX0N) 24 and 5V DC are insulated inside the FX0N-16NT

### 3.4 Recommended specification of twisted pair cable

Item	Specification
Cable type	Shielded twisted pair cable
Number of pairs	2 pairs or more
Conductor resistance (20 deg. C)	88.0Ω/km or less
Capacitance (1 kHz)	60 nF/km or less
Characteristic impedance (100 kHz)	110+/-10Ω

### 3.5 Setting the station number

Remove the cover on top of the unit, and set the station number (#01 to #64) using the rotary switches. The FX0N-16NT can occupy only one station. The same station number is used for input and output.



### 3.6 ECM setting

ECM (Emergency Clear Mode) setting:

When the MELSECNET/MINI-S3 master station stops signal communication (I/O refresh) and is in STOP mode, the ECM terminal configuration can be selected. Set it as shown below.

ECM terminal connection	Effect
Unconnected	The data received just before a communication stoppage is retained
Connected to 24G terminal	The data is not retained. All the FX0N-16NT input points will reset.

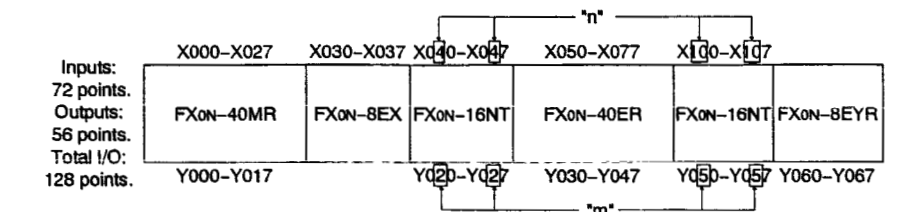
### 3.7 Allocation of input/output numbers (on the FX0N PC)

The FX0N-16NT enables bit device data to be sent and received between the FX0N and an A Series PC using 8 input points and 8 output points. For such operation, the input/output numbers should be allocated on the FX0N PC as shown below:

Communication direction	Description	Allocation of input/output numbers
A to FX0N (Input data)	The FX0N will only receive the data sent by the A Series PC which corresponds to its station number.	Xn0-Xn7
FX0N to A (Output data)	The data sent by the FX0N to the A Series PC is identified by the station number of the FX0N.	Ym0-Ym7

### 3.8 Example of I/O allocation

As with other extension blocks, the I/O numbers allocated to the FX0N system should be continuously numbered in octal beginning from the base unit. This is shown in the diagram below.



The FX0N-16NT block can be connected in any position desired. The number of blocks connected to each base or extension unit (input/output extension block(s) + FX0N-16NT block(s)) should be no more than 2 blocks.

**Note:** The total number of input/output points should be 128 points or less.

## 4 PROGRAM EXAMPLE

### 4.1 Example of input/output signal allocation and operation (master unit: AJ71PT32-S3 or A1SJ71PT32-S3)

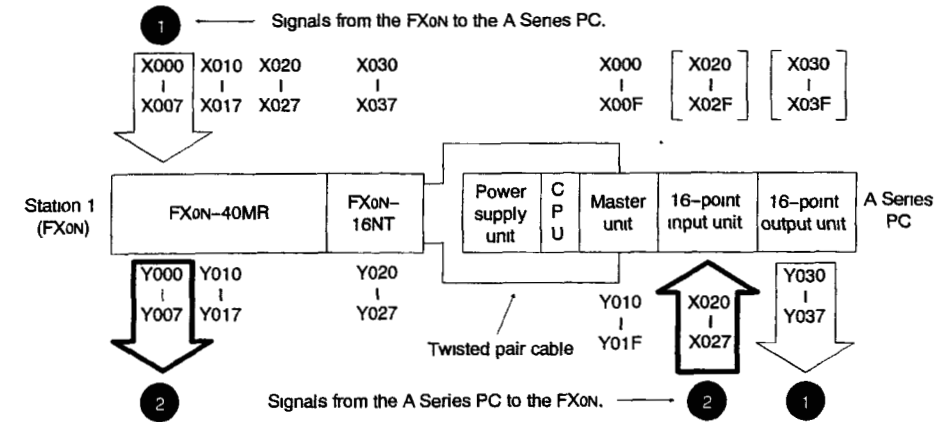
**Note:** This manual is not intended to explain how to program the A Series PC to operate a network. For a detailed description of A Series PC and A Series master unit programming, including buffer memory (BFM) assignments, please refer to the relevant A Series manuals.

**Operation:**

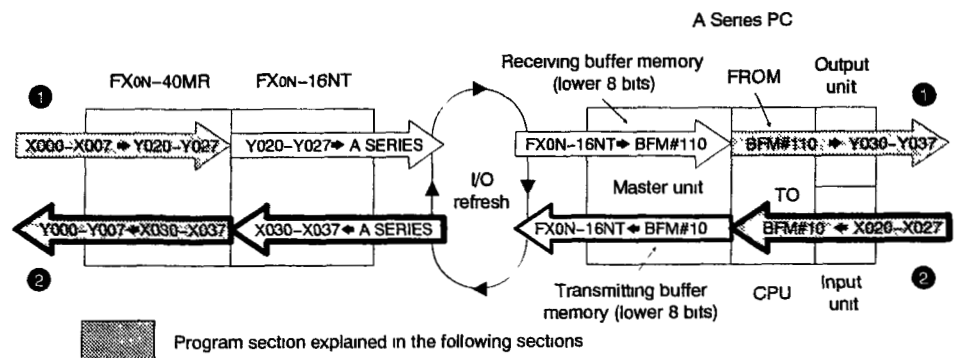
1. Input signals X000 through X007 of a FX0N-40MR will be output to Y030 through Y037 of an A Series PC.
2. Input signals X020 through X027 of the A Series PC will be output to Y000 through Y007 of the FX0N-40MR.

Please see the following diagrams for the system configuration and operation.

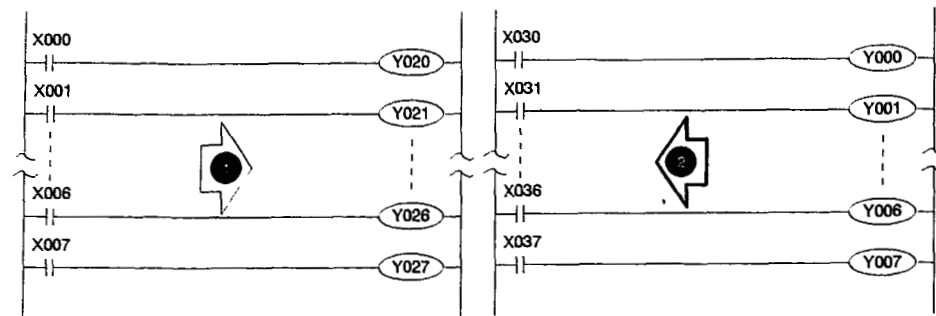
### 4.2 System configuration



### 4.3 Flow of signals through the network



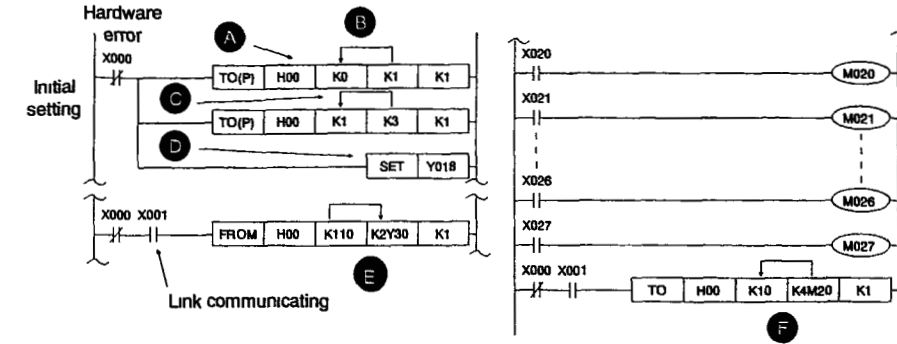
### 4.4 FX0N-40MR ladder program



Signals X000 through X007 of the FX0N PC will be sent to the A Series PC via Y020 to Y027 of the FX0N-16NT.

Signals X030 -X037 received from the A Series PC by the FX0N-16NT are output through Y000-Y007 of the FX0N.

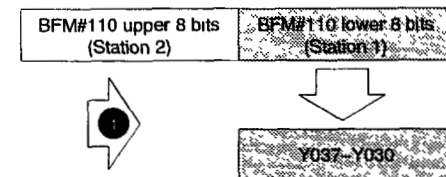
### 4.5 A Series PC ladder program



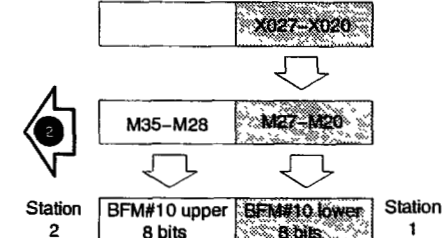
Ladder diagram for the A Series PC. Please see the next section for the explanation.

### 4.6 Key to the lettered items on the A Series PC ladder program

- A. First two digits of the first input of the master station.
- B. Total number of remote stations, K1, transferred to BFM#0.
- C. Number of retries, K3, transferred to BFM#1.
- D. Begin link communication.
- E. BFM#110: Data received from the FX0N PC.
- F. BFM#10: Data sent to the FX0N PC.



Data transfer FROM BFM#110 (data from FX0N inputs) to A Series outputs, Y030-Y037. See point E



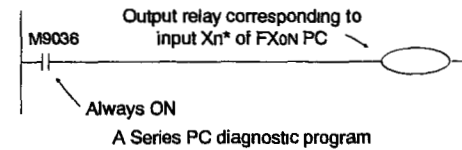
Data transfer TO BFM#10 (data from A Series inputs). This can then be sent to the FX0N-16NT. See point F.

## 5 DIAGNOSTICS

### 5.1 Communication error detection on the FX0N PC side

To detect a communication error (i.e. communications stoppage) at the FX0N, follow this procedure.

1. Connect the FX0N-16NT ECM terminal to the 24G terminal.
- Note:** If a communication error occurs, all the input points of the FX0N-16NT will reset.
2. Select one of the input signal points of the FX0N-16NT (Xn\*), and set the A Series program so that the selected input signal point is always ON.
3. On the FX0N side, Xn\* is on during normal communication. If a communication error is detected, Xn\* will be turned OFF. From this ON/OFF status change, a communication error can be detected.



**Guidelines for the safety of the user and protection of the FX0N-16NT special function block**

- This manual has been written to be used by trained and competent personnel. This is defined by the European directives for machinery, low voltage and EMC.
- If in doubt at any stage during the installation of the FX0N-16NT always consult a professional electrical engineer who is qualified and trained to the local and national standards. If in doubt about the operation or use of the FX0N-16NT please consult the nearest Mitsubishi Electric distributor.
- Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
- All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

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