



Changes for the Better

CC-Link/LT Master Block Model FX2N-64CL-M

Please read this manual thoroughly before using the product.

User's Manual (Hardware Volume)



MODEL	FX2N-64CL-M
MANUAL Number	JY997D05401F
Date	SEPTEMBER 2008

●SAFETY PRECAUTIONS●

This manual describes the name of each part, external dimensions and specifications of the CC-Link/LT master block for the Mitsubishi FX series Programmable Logic Controller (PLC).

For the design and construction of the CC-Link/LT system, refer to the CC-Link/LT Master Block Users Manual.

These ●SAFETY PRECAUTIONS● are classified into two categories: "DANGER" and "CAUTION".

DANGER Procedures which may lead to dangerous conditions or cause death or serious injury if not carried out properly.

CAUTION Procedures which may lead to dangerous conditions or cause minor to medium injury, or physical damage, if not carried out properly.

Depending on certain circumstances, procedures indicated by

CAUTION may also be linked to serious ramifications. It is important to follow the directions for usage.

[DESIGN PRECAUTIONS]

DANGER

- Construct an interlock circuit in the sequence program so that the system works correctly using the communication information when an error in the data link occurs. If such an interlock circuit is not provided, accidents may be caused by erroneous output or malfunction.

- When a remote I/O unit fails, inputs/outputs may randomly become ON or OFF, therefore build an external monitoring circuit that will monitor any input signals that could cause a serious accident. Accident may be caused by erroneous output or malfunction.

CAUTION

- Use the master block without applying any force on the master block and the CC-Link/LT connection cable. Otherwise, such cables may break or fail.

[INSTALLATION PRECAUTIONS]

DANGER

- Shut down all phases of the power supply outside the master block, then attach or remove the master block. If the power is not disconnected at all phases an electric shock or serious damage to the product may occur.

CAUTION

- Use the master block in the environment described in this manual. If the master block is used in an improper environment, then electrical shock, fire, malfunction, product damage or product deterioration may occur.
- Securely fix the master block with DIN rail or mounting screws. When using mounting screws, securely tighten them within the specified torque range. If the screws are too loose, the module may detach from its installed position, short circuit, or malfunction. If the screws are too tight, the screws may be damaged, which may cause the module to detach from its installed position or short circuit.

CAUTION

- Pay attention that foreign objects such as cuttings or wiring chips do not enter the master block. It may cause fire, product failure or malfunction.
- During installation and wiring works, adhere dust-proof sheets supplied together with the master block on the sides of the master block so that foreign objects such as cutting chips and wiring chips do not enter the inside. Otherwise, foreign objects may cause fire, failure or malfunction.
- Before operating the system, remove the dust-proof sheets so that heat can be released. It may cause fire, product failure or malfunction.

[WIRING PRECAUTIONS]

DANGER

- Shut down all power supplies, before starting the wiring work. If the power is not disconnected from all sources an electric shock or serious product damage may occur.

CAUTION

- CC-Link/LT network wiring uses the CC-Link/LT connection cable specified by CC-Link Partner Association (CLPA), and perform wiring in accordance with the specifications described in this manual. If any cable other than the connection cable is used or if wiring is performed in a method not conforming to the specifications, normal data transmission cannot be assured.
- Do not bind the CC-Link/LT connection cable together with major circuits or power cables. Keep the connection cable away from major circuits and power cables by 100 mm (3.93") or more. It may cause malfunction due to noise interference.
- Accommodate the CC-Link/LT connection cable inside a duct, or fix it with clamps. If the connection cable is loose or is pulled for movement or carelessness, the master block and the connection cable may be damaged or malfunction due to imperfect connection.
- Correctly wire the master block while confirming the rated voltage and terminal arrangement of the master block. It may cause fire or product failure.
- Hold the connector area when disconnecting the CC-Link/LT connection cable from the master block. If the cable area is pulled, the master block or the dedicated cable may be damaged or malfunction.

[STARTING AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminals when the power is ON. It may cause an electric shock or malfunction.
- Make sure to shut down all phases of the power supply outside the master block before starting cleaning. If all phases of the power supply are not shut down, the master block may be seriously damaged or malfunction.

CAUTION

- Do not disassemble or modify the master block. Doing so may cause failure, malfunction, injury, or fire.
- The case of the master block is made of resin. Do not drop or apply strong impacts to the master block.

[DISPOSAL PRECAUTIONS]

DANGER

- When disposing of this product, treat it as industrial waste.

●Notification of CE marking●

This notification does not guarantee that an entire mechanical module produced in accordance with the contents of the notification comply with the following standards. Compliance to EMC standards of the entire mechanical module should be checked by the user / manufacturer.

Standards with which this product complies

Type : Programmable Controller (Open Type Equipment)

Models : Products manufactured:
from February 1st, 2003 to April 30th, 2006 are compliant with
EN61000-6-4 and EN61131-2:1994+A11:1996+A12:2000
after May 1st, 2006 are compliant with EN61131-2:2003

Electromagnetic Compatibility Standards (EMC)	Remark
EN61000-6-4:2001 Electromagnetic compatibility -Generic standards - Emission standard for Industrial environment	Compliance with all relevant aspects of the standard. (Radiated Emissions and Mains Terminal Voltage Emissions)
EN61131-2:1994/A11:1996/A12:2000 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (RF Immunity, Fast transients, ESD and Damped oscillatory wave)

Electromagnetic Compatibility Standards (EMC)	Remark
EN61131-2: 2003 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (Radiated Emissions, Mains Terminal Voltage Emissions, RF immunity, Fast Transients, ESD, Surge, Voltage drops and interruptions, Conducted and Power magnetic fields)

For more details please contact the local Mitsubishi Electric sales site.
- Notes For compliance to EMC regulation.
The FX2N-64CL-M must be installed in a shielded metal control panel.

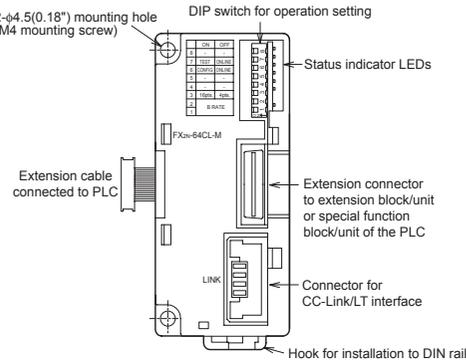
Associated Manuals

Manual name	Manual No.	Description
CC-Link/LT Master Block Model FX2N-64CL-M User's Manual (Detailed Volume)	JY997D08501	This manual explains the specifications, wiring, handling, etc. of the CC-Link/LT master block.

1. Product Outline

The CC-Link/LT master block FX2N-64CL-M can be connected to the FX Series PLC. By using this master block, a CC-Link/LT system can be constructed with the FX Series PLC as the master station.

2. Part Name and Setting



Name	Description
POWER	<ONLINE mode> ON: Power is being supplied OFF:Power is not being supplied
	<ONLINE mode> ON: Master block is operating normally OFF:Master block is abnormal Power has been interrupted EEPROM read error (sum mismatch) occurred
	<CONFIG mode> ON: Master block is operating normally OFF:Master block is abnormal Power has been interrupted
RUN	<TEST mode> ON: Master block is operating normally OFF:Master block is abnormal Power has been interrupted
	<ONLINE mode> ON: Communication speed setting error occurred EEPROM read error (sum mismatch) occurred Flickering:Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF:Master block is operating normally
	<CONFIG mode> ON: Communication speed setting error occurred EEPROM write error occurred Flickering:Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF:Master block is operating normally
ERR.	<TEST mode> ON: Communication speed setting error occurred Flickering:Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF:Master block is operating normally
	<ONLINE mode> ON: Communication speed setting error occurred Flickering:Power supplied for communication is abnormal DIP switch for operation setting was changed during operation
	<CONFIG mode> ON: Communication speed setting error occurred Flickering:Power supplied for communication is abnormal DIP switch for operation setting was changed during operation

Name	Description															
L RUN	<ONLINE mode> ON: Data link is being executed OFF:Data link is stopped <TEST mode> ON:Self-loop back Test finished normally OFF:Self-loop back Test finished abnormally (LED is OFF while the self-loop back Test is being executed)															
	<ONLINE mode> ON: Station number discrepancy (when BFM#32(20h) to #95(5Fh) is edited, the station numbers are checked.) Outside-control-range station error occurred Flickering: Stations are abnormal OFF:Data link is being executed normally <CONFIG mode> ON: Station number discrepancy (when BFM#32(20h) to #95(5Fh) is edited, the station numbers are checked.) Flickering: All stations are abnormal OFF:Data link is being executed normally <TEST mode> ON: Self-loop back Test finished abnormally OFF:Self-loop back Test finished normally (LED is OFF while the self-loop back Test is being executed)															
SD	<ONLINE mode> ON: Data is being sent															
RD.	<ONLINE mode> ON: Data is being received															
Interface																
CC-Link/LT connection cable connector (24G/DB/DA/+24 V)																
DIP switch for operation setting	1 B RATE Communication speed setting <table border="1"> <thead> <tr> <th>Communication speed</th> <th>SW1</th> <th>SW2</th> </tr> </thead> <tbody> <tr> <td>156 kbps</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>625 kbps</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>2.5 Mbps</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>Setting disabled</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>	Communication speed	SW1	SW2	156 kbps	OFF	OFF	625 kbps	ON	OFF	2.5 Mbps	OFF	ON	Setting disabled	ON	ON
	Communication speed	SW1	SW2													
	156 kbps	OFF	OFF													
	625 kbps	ON	OFF													
	2.5 Mbps	OFF	ON													
	Setting disabled	ON	ON													
	2															
	3 16pts/4pts	Point mode setting (Select the number of I/O points per station.) OFF : 4-point mode (4 input points and 4 output points in each station) ON : 16-point mode (16 input points and 16 output points in each station)														
4 --	Setting is disabled. (Make sure that this is OFF during operation.)															
5 --	Setting is disabled. (Make sure that this is OFF during operation.)															
6 CONFIG/ONLINE	CONFIG mode OFF : ONLINE mode (normal operation) ON : CONFIG mode (The information on connected stations is saved in the EEPROM.)															
7 TEST/ONLINE	TEST mode OFF : ONLINE mode (normal operation) ON : TEST mode (Self-loop back Test)															
8 --	Setting is disabled. (Make sure that this is OFF during operation.)															

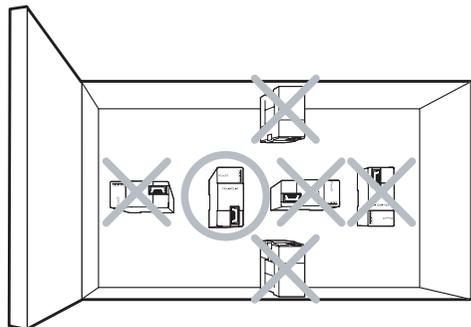
- Factory default, all bits of the DIP switch are set to OFF.
- Test mode is selected when both the CONFIG and TEST modes are set to ON simultaneously.
- For each setting, the status at time of power ON is valid. (If a setting is changed after the power is turned ON, the change is invalid.)
- CONFIGMODE
- BFM #32 (20h) to #95 (5Fh) changed value while online will cause a L ERR.
- If no remote modules are attached during power ON, no L ERR shown.
- If a remote module is removed during operation, no L ERR will be shown.

3. Handling Cautions

The master block can be mounted on a DIN rail or directly with screws. The installation procedure in each case is described below. Use the master block without applying any force on the cable.

3.1 Mounting direction

- Do not install the master block on the floor, ceiling or in the horizontal direction within the cabinet. If the master block is installed in such a way, its temperature may rise. Install the master block vertically on the back wall of the cabinet as shown in the figure below.
- Leave a space of 50 mm (1.96") or more between the master block and other equipment or structure. Keep the master block off high voltage cables, high voltage equipment and other power equipment as much as possible.

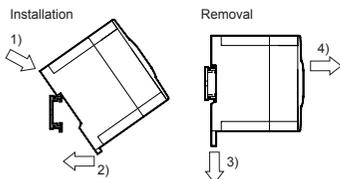


3.2 DIN rail mounting

Align the upper DIN rail installation groove in the module with the DIN rail 1), and press the module on to the DIN rail 2). When removing the module, pull the installation hook downwards 3), and remove the module 4).

DIN rail mounting screw pitch

When mounting the module on the DIN rail, tighten the mounting screws at a pitch of 200 mm (7.87") or less.



Applicable DIN rail TH35-7.5Fe and TH35-7.5Al

3.3 Direct mounting

Fix the master block on the panel surface by tightening the M4 screws inserted

in the two (upper and lower) mounting holes provided on the master block. Install the module so that a clearance of 1 to 2mm (0.04" to 0.08") is assured for each module.

Applicable screw M4 height: 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N·m)

4. Connection of External Equipment

Connect the master block to a remote I/O unit or power adapter using the connection cable and the dedicated CC-Link/LT connector.

- The connection order of the CC-Link/LT connection cable has no relevance to the station No.
- Make sure to install the master block on one side of the trunk line.
- In the CC-Link/LT system, terminating resistors should be connected to both ends of the trunk line. Connect the terminating resistor on the master block side within 200 mm (7.87") of the master block.
- For the CC-Link/LT connection cable point of contact, the connection cable connector and terminating resistors, refer to the homepage of the CC-Link Partner Association (CLPA) "http://www.cc-link.org".

5. Specifications

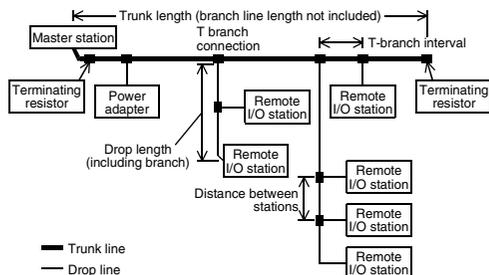
5.1 General specifications

Item	Specification	
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%RH (Condensation should not be allowed.)	
Vibration resistance	Direct mounting	
	Frequency	Acceleration
	10 to 57Hz	—
	57 to 150Hz	9.8m/s ²
Vibration resistance	DIN rail mounting	
	Frequency	Acceleration
	10 to 57Hz	—
	57 to 150Hz	4.9m/s ²
Shock resistance	147 m/s ² , working time: 11 ms, half sine wave, three times in the X, Y and Z directions	
	By noise simulator of noise voltage = 1,000 Vp-p, noise width = 1 μs, rising = 1 ns, cycle = 30 to 100 Hz	
Dielectric withstand voltage	500V AC for 1 min	In conformance to JEM-1021 Between case and PLC grounding terminal
Isolation resistance	5 MΩ or more by 500V DC megger	
Operating ambience	Do not use in environment with corrosive gas, flammable gas or conductive dusts.	
Working altitude	< 2000m ¹	
Grounding	Grounding resistance 100Ω or less (Common grounding with strong electrical systems is not allowed.)	

¹ Do not use the PLC under pressure higher than the atmospheric pressure. Doing so may damage the PLC.

5.2 Network wiring specifications

Item	Specification			Remarks
Communication speed	2.5Mbps	625kbps	156kbps	--
Distance between stations	No restriction			--
Maximum number of modules connected in 1 drop line	8 units			--
Maximum trunk length	35m (114' 9")	100m (328' 1")	500m (1640' 5")	Cable length between terminating resistors
T-branch interval	No restriction			--
Maximum drop length	4m (13' 1")	16m (52' 5")	60m (196' 10")	Cable length per branch
Cumulative drop line length	15m (49' 2")	50m (164' 0")	200m (656' 2")	Sum of all drop lines



5.3 Performance specifications

Item	Specification			
Applicable PLC	FX1N/FX2N/FX2NC/FX3U/FX3UC Series PLC (FX2NC-CNV-IF is required when FX2NC Series PLC is connected.) (FX2NC-CNV-IF or FX3UC-1PS-5V is required when an FX3UC Series PLC is connected.)			
Number of connectable master blocks	FX1N Series : Up to 4 ¹ FX2N/FX3U/FX3UC Series: Up to 8 ² *3 FX2NC Series: Up to 3 ²			
Applicable point mode	4-point mode and 16-point mode (selectable by DIP switch)			
Maximum number of link points	4-point mode	16-point mode		
	Connected to FX1N Series PLC: 128 points Connected to FX2N/FX2NC/FX3U/FX3UC Series PLC: 256 points (including I/O points in PLC in each case)			
Number of link points per station () shows the number of link points when composite I/O module is used.	4 points (8 points)	16 points (32 points)		
Link scan time	32 stations	2.5Mbps	0.7ms	1.0ms
		625kbps	2.2ms	3.8ms
	64 stations	156kbps	8.0ms	14.1ms
		2.5Mbps	1.2ms	2.0ms
625kbps	4.3ms	7.4ms		
156kbps	15.6ms	27.8ms		
Communication speed	2.5 Mbps, 625 kbps and 156 kbps (selectable by DIP switch)			
Protocol	BITR method (Broadcastpolling + Interval Timed Response)			
Network topology	T-branch			
Error control method	CRC			
Number of connected stations	64 stations maximum			
Remote station numbers	1 to 64			
Master station connection position	Connected at the end of the trunk line			
RAS function	Communication error detection, automatic return to system, slave station disconnection and internal loop back diagnosis			
	Connection cable	<ul style="list-style-type: none"> Dedicated flat cable (0.75 mm² x 4) VCTF cable (0.75 mm² x 4)⁴ High flexible cable (0.75 mm² x 4) 		
Number of occupied I/O points	8 points (fixed) + Number of connected remote I/O points			
Current consumption inside 5V DC	190 mA (Supplied from PLC via extension connector)			
24V DC power supply	Voltage	20.4V to 28.8V DC		
	Current consumption	25 mA		
	Initial current	35 mA		
Mass (weight)	0.15 kg (0.33 lbs)			

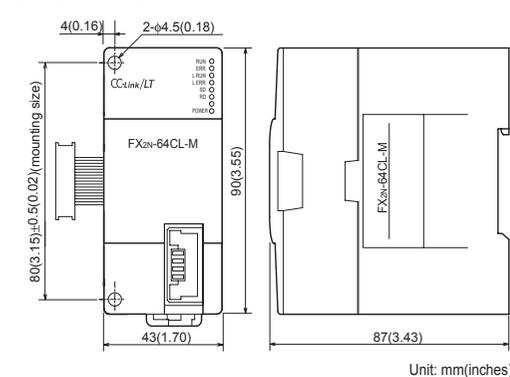
*1 When connected to the FX1N Series PLC, up to two FX2N-64CL-M units can be connected to the main unit and another two on the extension unit.

*2 FX2N-64CL-M draws 190mA from the 5V DC source. The total 5V consumption of all special function blocks connected to the main unit or extension unit must not exceed the 5V source capacity of the system. (Refer to the Hardware manual of the PLC)

*3 Up to 7 units can be connected to an FX3UC-32MT-LT PLC.

*4 For the VCTF cable specifications, refer to the FX2N-64CL-M USER'S MANUAL.

6. External Dimensions



Unit: mm(inches)

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

Country/Region	Sales office/Tel	Country/Region	Sales office/Tel
U.S.A.	Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway, Vernon Hills, IL 60061 U.S.A. Tel: +1-847-478-2100	Hong Kong	Mitsubishi Electric Automation (Hong Kong) Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, HongKong Tel: +852-2987-8870
Brazil	MELCO-TEC Av. Paulista 1439, conj.74, Bela Vista CEP: 01311-200 Sao Paulo-SP-Brazil Tel: +55-11-3285-1640	China	Mitsubishi Electric Automation (Shanghai) Ltd. 17F, ChuangXing Financial Center, No. 288 West Nanjing Road, Shanghai China 200003 Tel: +86-21-2322-3030
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		South Africa	Circuit Breaker Industries Ltd. Private Bag 2016, ZA-1600 Isando, South Africa Tel: +27-11-9282000

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HIMEJI WORKS : 840, CHIYODA CHO, HIMEJI, JAPAN

When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.



CC-Link/LT Master Block Model FX2N-64CL-M

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User's Manual (Hardware Volume)



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- DANGER** Procedures which may lead to dangerous conditions or cause death or serious injury if not carried out properly.
- CAUTION** Procedures which may lead to dangerous conditions or cause minor to medium injury, or physical damage, if not carried out properly.

Depending on certain circumstances, procedures indicated by CAUTION may also be linked to serious ramifications. It is important to follow the directions for usage.

DESIGN PRECAUTIONS

DANGER

- Construct an interlock circuit in the sequence program so that the system works correctly using the communication information when an error in the data link occurs. If such an interlock circuit is not provided, accidents may be caused by erroneous output or malfunction.
- When a remote I/O unit fails, inputs/outputs may randomly become ON or OFF, therefore build an external monitoring circuit that will monitor any input signals that could cause a serious accident. Accident may be caused by erroneous output or malfunction.

CAUTION

- Use the master block without applying any force on the master block and the CC-Link/LT connection cable. Otherwise, such cables may break or fail.

INSTALLATION PRECAUTIONS

DANGER

- Shut down all phases of the power supply outside the master block, then attach or remove the master block. If the power is not disconnected at this time, an electric shock or serious damage to the product may occur.

CAUTION

- Use the master block in the environment described in this manual. If the master block is used in an improper environment, then electrical shock, fire, malfunction, product damage or product deterioration may occur.
- Securely fix the master block with DIN rail or mounting screws. When using mounting screws, securely tighten them within the specified torque range. If the screws are too loose, the module may detach from its installed position, short circuit, or malfunction. If the screws are too tight, the screws may be damaged, which may cause the module to detach from its installed position or short circuit.

CAUTION

- Pay attention that foreign objects such as cuttings or wiring chips do not enter the master block. It may cause fire, product failure or malfunction.
- During installation and wiring works, adhere dust-proof sheets supplied together with the master block on the sides of the master block so that foreign objects such as cutting chips and wiring chips do not enter the inside. Otherwise, foreign objects may cause fire, failure or malfunction.
- Before operating the system, remove the dust-proof sheets so that heat can be released. It may cause fire, product failure or malfunction.

WIRING PRECAUTIONS

DANGER

- Shut down all power supplies, before starting the wiring work. If the power is not disconnected from all sources an electric shock or serious product damage may occur.

CAUTION

- CC-Link/LT network wiring uses the CC-Link/LT connection cable specified by CC-Link Partner Association (CLPA), and perform wiring in accordance with the specifications described in this manual. If any cable other than the connection cable is used or if wiring is performed in a method not conforming to the specifications, normal data transmission cannot be assured.
- Do not bind the CC-Link/LT connection cable together with major circuits or power cables. Keep the connection cable away from major circuits and power cables by 100 mm (3.93") or more. It may cause malfunction due to noise interference.
- Accommodate the CC-Link/LT connection cable inside a duct, or fix it with clamps. If the connection cable is loose or is pulled for movement or carelessness, the master block and the connection cable may be damaged or malfunction due to imperfect connection.
- Correctly wire the master block while confirming the rated voltage and terminal arrangement of the master block. It may cause fire or product failure.
- Hold the connector area when disconnecting the CC-Link/LT connection cable from the master block. If the cable area is pulled, the master block or the dedicated cable may be damaged or malfunction.

STARTING AND MAINTENANCE PRECAUTIONS

DANGER

- Do not touch the terminals when the power is ON. It may cause an electric shock or malfunction.
- Make sure to shut down all phases of the power supply outside the master block before starting cleaning. If all phases of the power supply are not shut down, the master block may be seriously damaged or malfunction.

CAUTION

- Do not disassemble or modify the master block. Doing so may cause failure, malfunction, injury, or fire.
- The case of the master block is made of resin. Do not drop or apply strong impacts to the master block.

DISPOSAL PRECAUTIONS

DANGER

- When disposing of this product, treat it as industrial waste.

Notification of CE marking

This notification does not guarantee that an entire mechanical module produced in accordance with the contents of the notification comply with the following standards. Compliance to EMC standards of the entire mechanical module should be checked by the user / manufacturer.

Standards with which this product complies
 Type : Programmable Controller (Open Type Equipment)
 Models : Products manufactured from February 1st, 2003 to April 30th, 2006 are compliant with EN61000-6-4 and EN61131-2:1994+A11:1996+A12:2000 after May 1st, 2006 are compliant with EN61131-2:2003

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EN61131-2:1994/A11:1996/A12:2000 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (RF Immunity, Fast transients, ESD and Damped oscillatory wave)

Electromagnetic Compatibility Standards (EMC)	Remark
EN61131-2: 2003 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (Radiated Emissions, Mains Terminal Voltage Emissions, RF immunity, Fast Transients, ESD, Surge, Voltage drops and interruptions, Conducted and Power magnetic fields)

For more details please contact the local Mitsubishi Electric sales site. - Notes For compliance to EMC regulation. The FX2N-64CL-M must be installed in a shielded metal control panel.

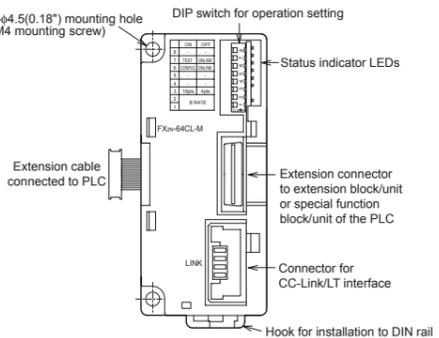
Associated Manuals

Manual name	Manual No.	Description
CC-Link/LT Master Block Model FX2N-64CL-M User's Manual (Detailed Volume)	JY997D08501	This manual explains the specifications, wiring, handling, etc. of the CC-Link/LT master block.

1. Product Outline

The CC-Link/LT master block FX2N-64CL-M can be connected to the FX Series PLC. By using this master block, a CC-Link/LT system can be constructed with the FX Series PLC as the master station.

2. Part Name and Setting



Name	Description
POWER	<ONLINE mode/CONFIG mode/TEST mode> ON: Power is being supplied OFF: Power is not being supplied
RUN	<ONLINE mode> ON: Master block is operating normally OFF: Master block is abnormal Power has been interrupted EEPROM read error (sum mismatch) occurred <CONFIG mode> ON: Master block is operating normally OFF: Master block is abnormal Power has been interrupted <TEST mode> ON: Master block is operating normally OFF: Master block is abnormal Power has been interrupted
ERR.	<ONLINE mode> ON: Communication speed setting error occurred EEPROM read error (sum mismatch) occurred Flickering: Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF: Master block is operating normally <CONFIG mode> ON: Communication speed setting error occurred EEPROM write error occurred Flickering: Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF: Master block is operating normally <TEST mode> ON: Communication speed setting error occurred Flickering: Power supplied for communication is abnormal DIP switch for operation setting was changed during operation OFF: Master block is operating normally

Name	Description
L RUN	<ONLINE mode/CONFIG mode> ON: Data link is being executed OFF: Data link is stopped <TEST mode> ON: Self-loop back Test finished normally OFF: Self-loop back Test finished abnormally (LED is OFF while the self-loop back Test is being executed)
L ERR.	<ONLINE mode> ON: Station number discrepancy (when BFM#32(20h) to #95(5Fh) is edited, the station numbers are checked.) Outside-control-range station error occurred Flickering: Stations are abnormal OFF: Data link is being executed normally <CONFIG mode> ON: Station number discrepancy (when BFM#32(20h) to #95(5Fh) is edited, the station numbers are checked.) Flickering: All stations are abnormal OFF: Data link is being executed normally <TEST mode> ON: Self-loop back Test finished abnormally OFF: Self-loop back Test finished normally (LED is OFF while the self-loop back Test is being executed)
SD	<ONLINE mode/CONFIG mode/TEST mode> ON: Data is being sent
RD	<ONLINE mode/CONFIG mode/TEST mode> ON: Data is being received
Interface	CC-Link/LT connection cable connector (24G/DB/DA+24 V)
Interface	Communication speed setting
B RATE	Communication speed setting
DIP switch for operation setting	Point mode setting (Select the number of I/O points per station.) OFF: 4-point mode (4 input points and 4 output points in each station) ON: 16-point mode (16 input points and 16 output points in each station)
DIP switch for operation setting	Setting is disabled. (Make sure that this is OFF during operation.)
DIP switch for operation setting	Setting is disabled. (Make sure that this is OFF during operation.)
DIP switch for operation setting	CONFIG mode OFF: ONLINE mode (normal operation) ON: CONFIG mode (The information on connected stations is saved in the EEPROM.)
DIP switch for operation setting	TEST mode OFF: ONLINE mode (normal operation) ON: TEST mode (Self-loop back Test)
DIP switch for operation setting	Setting is disabled. (Make sure that this is OFF during operation.)

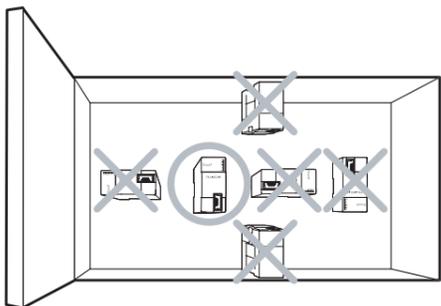
- Factory default, all bits of the DIP switch are set to OFF.
- Test mode is selected when both the CONFIG and TEST modes are set to ON simultaneously.
- For each setting, the status at time of power ON is valid. (If a setting is changed after the power is turned ON, the change is invalid.)
- CONFIGMODE
- BFM #32 (20h) to #95 (5Fh) changed value while online will cause a L ERR.
- If no remote modules are attached during power ON, no L ERR shown.
- If a remote module is removed during operation, no L ERR will be shown.

3. Handling Cautions

The master block can be mounted on a DIN rail or directly with screws. The installation procedure in each case is described below. Use the master block without applying any force on the cable.

3.1 Mounting direction

- Do not install the master block on the floor, ceiling or in the horizontal direction within the cabinet. If the master block is installed in such a way, its temperature may rise. Install the master block vertically on the back wall of the cabinet as shown in the figure below.
- Leave a space of 50 mm (1.96") or more between the master block and other equipment or structure. Keep the master block off high voltage cables, high voltage equipment and other power equipment as much as possible.

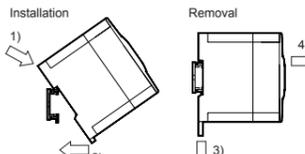


3.2 DIN rail mounting

Align the upper DIN rail installation groove in the module with the DIN rail 1), and press the module on to the DIN rail 2). When removing the module, pull the installation hook downwards 3), and remove the module 4).

DIN rail mounting screw pitch

When mounting the module on the DIN rail, tighten the mounting screws at a pitch of 200 mm (7.87") or less.



Applicable DIN rail TH35-7.5Fe and TH35-7.5Al

3.3 Direct mounting

Fix the master block on the panel surface by tightening the M4 screws inserted in the two (upper and lower) mounting holes provided on the master block. Install the module so that a clearance of 1 to 2 mm (0.04" to 0.08") is assured for each module.

Applicable screw M4 height: 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N.m)

4. Connection of External Equipment

- Connect the master block to a remote I/O unit or power adapter using the connection cable and the dedicated CC-Link/LT connector.
- The connection order of the CC-Link/LT connection cable has no relevance to the station No.
- Make sure to install the master block on one side of the trunk line.
- In the CC-Link/LT system, terminating resistors should be connected to both ends of the trunk line. Connect the terminating resistor on the master block side within 200 mm (7.87") of the master block.
- For the CC-Link/LT connection cable point of contact, the connection cable connector and terminating resistors, refer to the homepage of the CC-Link Partner Association (CLPA) "http://www.cc-link.org".

5. Specifications

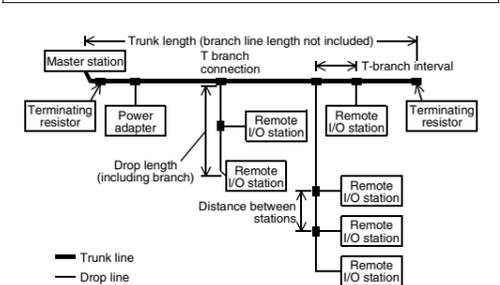
5.1 General specifications

Item	Specification
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%RH (Condensation should not be allowed.)
Vibration resistance	Direct mounting
	Frequency Acceleration Half amplitude
	10 to 57Hz - 0.075mm
DIN rail mounting	Frequency Acceleration Half amplitude
	10 to 57Hz - 0.035mm
	57 to 150Hz 4.9m/s ² -
Shock resistance	147 m/s ² , working time: 11 ms, half sine wave, three times in the X, Y and Z directions
Noise immunity	By noise simulator of noise voltage = 1,000 Vp-p, noise width = 1 μs, rising = 1 ns, cycle = 30 to 100 Hz
Dielectric withstand voltage	500V AC for 1 min In conformance to JEM-1021 Between case and PLC grounding terminal
Isolation resistance	5 MΩ or more by 500V DC megger
Operating ambience	Do not use in environment with corrosive gas, flammable gas or conductive dusts.
Working altitude	< 2000m ¹
Grounding	Grounding resistance 100Ω or less (Common grounding with strong electrical systems is not allowed.)

¹ Do not use the PLC under pressure higher than the atmospheric pressure. Doing so may damage the PLC.

5.2 Network wiring specifications

Item	Specification	Remarks
Communication speed	2.5Mbps 625kbps 156kbps	--
Distance between stations	No restriction	--
Maximum number of modules connected in 1 drop line	8 units	--
Maximum trunk length	35m (114' 9") 100m (328' 1") 500m (1640' 5")	Cable length between terminating resistors
T-branch interval	No restriction	--
Maximum drop length	4m (13' 1") 16m (52' 5") 60m (196' 10")	Cable length per branch
Cumulative drop line length	15m (49' 2") 50m (164' 0") 200m (656' 2")	Sum of all drop lines

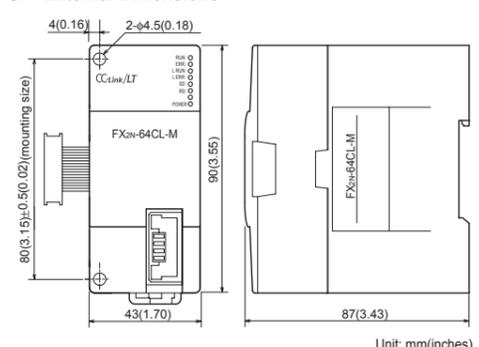


5.3 Performance specifications

Item	Specification
Applicable PLC	FX1N/FX2N/FX2NC/FX3U/FX3UC Series PLC (FX2NC-CNV-IF is required when FX2NC Series PLC is connected.) (FX2NC-CNV-IF or FX3UC-1PS-5V is required when an FX3UC Series PLC is connected.)
Number of connectable master blocks	FX1N Series : Up to 4 *1 FX2N/FX3U/FX3UC Series: Up to 8 *2 FX2NC Series: Up to 3 *2
Applicable point mode	4-point mode and 16-point mode (selectable by DIP switch)
Maximum number of link points	4-point mode
	16-point mode
Number of link points per station () shows the number of link points when composite I/O module is used.	Connected to FX1N Series PLC: 128 points Connected to FX2N/FX2NC/FX3U/FX3UC Series PLC: 256 points (including I/O points in PLC in each case)
Link scan time	32 stations
	625kbps
	156kbps
	64 stations
Communication speed	2.5Mbps
	625kbps
	156kbps
	2.5Mbps
Protocol	2.5 Mbps, 625 kbps and 156 kbps (selectable by DIP switch)
Network topology	BITR method (Broadcastpolling + Interval Timed Response)
Error control method	T-branch
Number of connected stations	CRC
Remote station numbers	64 stations maximum
Master station connection position	1 to 64
RAS function	Connected at the end of the trunk line
Connection cable	Communication error detection, automatic return to system, slave station disconnection and internal loop back diagnosis
	• Dedicated flat cable (0.75 mm ² x 4) • VCTF cable (0.75 mm ² x 4)*4 • High flexible cable (0.75 mm ² x 4)
Number of occupied I/O points	8 points (fixed) + Number of connected remote I/O points
Current consumption inside 5V DC	190 mA (Supplied from PLC via extension connector)
24V DC power supply	Voltage
	Current consumption
Initial current	20.4V to 28.8V DC 25 mA 35 mA
Mass (weight)	0.15 kg (0.33 lbs)

- *1 When connected to the FX1N Series PLC, up to two FX2N-64CL-M units can be connected to the main unit and another two on the extension unit.
- *2 FX2N-64CL-M draws 190mA from the 5V DC source. The total 5V consumption of all special function blocks connected to the main unit or extension unit must not exceed the 5V source capacity of the system. (Refer to the Hardware manual of the PLC)
- *3 Up to 7 units can be connected to an FX3UC-32MT-LT PLC.
- *4 For the VCTF cable specifications, refer to the FX2N-64CL-M USER'S MANUAL.

6. External Dimensions



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- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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