

# CL1X4-D1C3 CC-Link/LT Remote I/O Module

## User's Manual

Please read this manual thoroughly before starting to use the product and handle the product properly.

MODEL	CL1X4-D1C3
MANUAL Number	JY997D10601J
Date	July 2018

CC-link/LT

### SAFETY PRECAUTIONS

(Read these precautions before using)

Please read this manual carefully and pay special attention to safety in order to handle this product properly. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the user's manual of the CPU module to use for a description of the PLC system safety precautions.

These SAFETY PRECAUTIONS classify the safety precautions into two categories: "WARNING" and "CAUTION".



Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

### DESIGN PRECAUTIONS



- Configure an interlock circuit in a sequence program so that the system operates on the safety side using the communication status information in the event the data link falls into a communication problem. Otherwise, erroneous output and malfunction may result in accidents.
- Remote input and output can not be switched ON or OFF when a problem occurs in the remote I/O modules. Therefore build an external monitoring circuit that will monitor any input signals that could cause a serious accident.



- Do not have control cables and connection cables bundled with or placed near by the main circuit and/or power cables. Wire those cables at least 100mm(3.94 inch) away from the main circuit and/or power cables. It may cause malfunction due to noise interference.
- Use the module and the connection cable without applying any force on them. Otherwise, such cables may be broken or fail.

### INSTALLATION PRECAUTIONS



- Use the module in an environment that meets the general specifications contained in this manual. Using this module in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Do not directly touch the module's conductive parts. Doing so could cause malfunction or trouble in the module.
- Tighten the module securely using DIN rail or installation screws within the specified torque range. If the screws are too loose, the module may drop from its installation position, short circuit, or malfunction. If the screws are too tight, the screws may be damaged, which may cause the module to drop from its installation position or short circuit.
- Install the module on a flat surface. If the mounting surface has concave and/or convex, an excessive force may be applied on the module, and nonconformity may be caused.

### WIRING PRECAUTIONS



- Perform installation and wiring after disconnecting the power supply at all phases externally. If the power is not disconnected at all phases an electric shock or product damage may result.



- Perform correct wiring for the module according to the product's rated voltage and terminal arrangement. Connecting to a power supply different from rating or miss-wiring may cause fire, product failure or malfunction.
- Make sure foreign objects do not get inside the module, such as dirt and wire chips. It may cause fire, product failure or malfunction.
- Attach a warning label (hazard symbol 417-IEC-5036) concerning the electric shock to the location.

### STARTING AND MAINTENANCE PRECAUTIONS



- Do not touch the terminals when the power is ON. It may cause an electric shock or malfunction.
- Perform cleaning the module or retightening of terminal screws after turning OFF the all external power supply for sure. Failure to do so may cause failure or malfunction of the modules



- Do not disassemble or modify the module. Doing so may cause failure, malfunction, injury, or fire.
- The module case is made of resin; do not drop it or subject it to strong shock. A module damage may result.
- Make sure to switch all phases of the external power supply OFF before installing or removing the module to/from the panel. Failure to do so may cause failure or malfunction of the modules.

### DISPOSAL PRECAUTIONS



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

### TRANSPORTATION AND MAINTENANCE PRECAUTIONS



- During transportation avoid the impact which exceeds a regulated value as the module is a precision instrument. Doing so could cause trouble in the module.
- It is necessary to check the operation of module after transportation, in case of any impact damage. Otherwise, causes the damage of the machine and the accident.

### Note Concerning the CE Marking

This note 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.

### Attention

This product is designed for use in industrial applications.

### Standards with which this product complies

Type : Programmable Controller (Open Type Equipment) Remote I/O module  
Models : Products manufactured from February 1st, 2004 to April 30th, 2006 are compliant with EN61000-6-4:2001 and EN61131-2:1994+A11:1996+A12:2000 after May 1st, 2006 are compliant with EN61131-2:2007

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. • Radiated electromagnetic field • Fast transient burst • Electrostatic discharge • Damped oscillatory wave
EN61131-2: 2007 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. <b>EMI</b> • Radiated Emission • Conducted Emission <b>EMS</b> • Radiated electromagnetic field • Fast transient burst • Electrostatic discharge • High-energy surge • Voltage drops and interruptions • Conducted RF • Power frequency magnetic field

For more details please contact the local Mitsubishi Electric sales site.

- Notes for compliance to EMC regulation.  
It is necessary to install the CL1 series module in a shielded metal control panel.

- Use this product in Zone A<sup>1</sup> as defined in EN61131-2.

<sup>1</sup> Zone defined in EN61131-2

Separation defined in EN61131-2 for EMC LVD regulation decided depending on condition in industrial setting.

Zone C = Factory mains which is isolated from public mains by dedicated transformers.

Zone B = Dedicated power distribution which is protected by secondary surge protection. (300V or less in the rated voltage is assumed.)

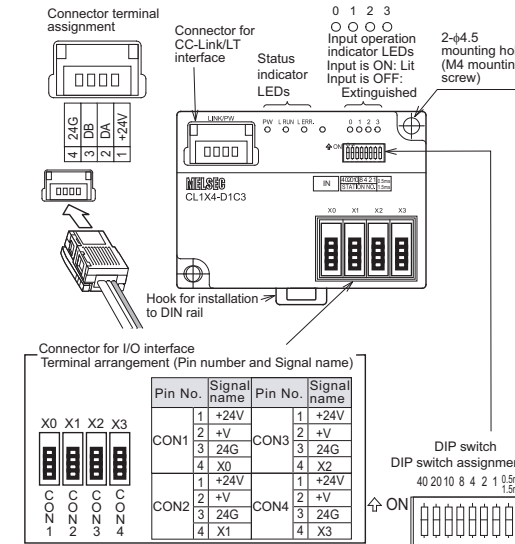
Zone A = Local power distribution which is isolated from dedicated power distribution by AC/DC converters, isolation transformers, etc. (120V or less in the rated voltage is assumed.)

### 1. Outline of Product

This product is an open sensor connector type input module connected to CC-Link/LT.

This product has four input points (24V DC).

### 2. Name and Setting of Each Part and Terminal Arrangement



Name	Description
Status indicator LED	PW ON while the power is supplied. L RUN ON while normal operation is executed.
Status indicator LED	L ERR. ON: When a communication error or DIP switch setting error occurred Fllickering at a constant interval: When the setting of the DIP switch was changed while the power was supplied (even while the LED is flickering, the operation continues. The new setting becomes valid when the power is turned OFF once, then ON again.) Fllickering at an intermittent interval: When a terminal resistor is not attached or when the module or a connection cable is affected by noise
Input operation indicator LED	ON while the input is ON. Extinguished while the input is OFF.
Interface	Connector for CC-Link/LT communication line/module power supply (24G/DB/DA/+24V)

Name	Description																					
Connector for I/O interface	sensor connector for connecting input signals The plug for the connector is an optional. The size of the acceptable electric wire is different according to the plug for the connector used.																					
DIP switch *	Set the 10's digit of the station No. using "STATION NO. 10", "STATION NO. 20" and "STATION NO. 40". Set the 1's digit of the station No. using "STATION NO. 1", "STATION NO. 2", "STATION NO. 4" and "STATION NO. 8". Factory default = All bits are OFF. Make sure to set the station No. in the range from 1 to 64. If any station No. outside the range from 1 to 64 is set, it is regarded as an error and the L ERR. LED lights. Example: When setting the station No. to "32", set the DIP switch as follows. <table border="1"> <thead> <tr> <th>Station No.</th> <th>10's digit</th> <th>1's digit</th> </tr> </thead> <tbody> <tr> <td>40</td> <td>20</td> <td>10</td> </tr> <tr> <td>32</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td></td> <td>ON</td> <td>OFF</td> </tr> <tr> <td></td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td></td> <td>OFF</td> <td>ON</td> </tr> <tr> <td></td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>	Station No.	10's digit	1's digit	40	20	10	32	OFF	ON		ON	OFF		OFF	OFF		OFF	ON		OFF	OFF
Station No.	10's digit	1's digit																				
40	20	10																				
32	OFF	ON																				
	ON	OFF																				
	OFF	OFF																				
	OFF	ON																				
	OFF	OFF																				
0.5ms 1.5ms	Sets the response speed. ON: 0.5 ms (fast response type) OFF: 1.5 ms (standard type)																					

\* Set up using a slotted screwdriver with a tip width of 0.9 mm or less.

### 3. Installation

The CL1X4-D1C3 can be installed to DIN rail or directly installed using mounting screws.

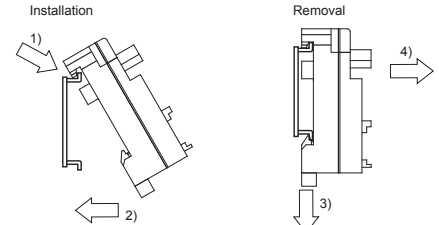
Each installation procedure is described below.

#### 3.1 Installation to DIN rail

When installing the module, align the upper DIN rail installation groove on the module with the DIN rail 1), and press the module on to the DIN rail 2). When removing the module, pull the hook downward for installation to DIN rail 3), then remove the module 4).

#### DIN rail mounting screw pitch

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



Applicable DIN rail	TH35-7.5Fe and TH35-7.5Al Width:35mm
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#### 3.2 Direct installation

Screw-tighten the module by attaching M4 screws to the upper and lower mounting holes (two holes in all) provided in the module.

Install the module so that the clearance of 1 to 2mm (0.04" to 0.08") is assured for each module.

Applicable screw	M4 × 0.7mm(0.03") × 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N-m)
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## 4. Wiring

### 4.1 Connecting and wiring of connector for I/O interface

Wire the connector for I/O interface (e-CON) according to the following procedure:

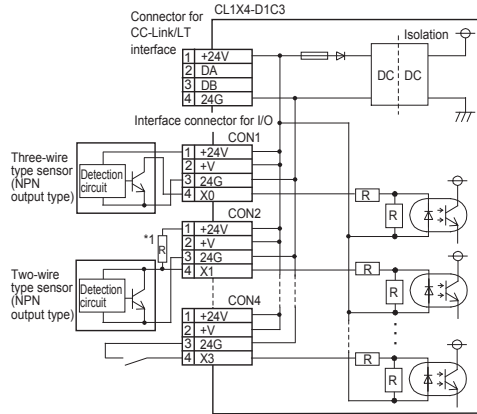
- Verify that the plug cover is installed in the plug unit.
  - Caution: Do not push the plug cover into the plug unit before the cable is inserted. Once a plug is pressure-displaced, it can no longer be reused.
- Insert the cable until it makes contact with the plug unit.
  - When inserting the cable, confirm that it has been inserted completely. If the cable is not inserted completely, it may cause contact failures.
  - If the cross section of the cable is not round, the cable cannot be inserted smoothly. Cut the cable tip using pliers, etc., and make it as round as possible, then insert it.
  - When inserting the cable, the cable may stick out from the front of the cover. In such a case, pull the cable backward so that the tip of the cable stays within the plug cover.
- Using a pliers or special tool, push the plug cover into the plug unit, and pressure-displace it. After performing pressure displacement, verify that the plug cover is securely attached to the plug unit, as shown in the figure at right.
  - While performing pressure displacement, the plug cover may rise because it is not latched against the plug unit correctly. This condition indicates that pressure displacement is incomplete. Push the plug cover until it is securely installed in the plug unit.

### 4.2 External wiring

Do the action of the input terminal of CL1X4-D1C3 by using the power supply supplied from the CC-Link/LT interface.

The sensor connected with the input terminal must use the one of the NPN opening collector transistor type.

#### External wiring

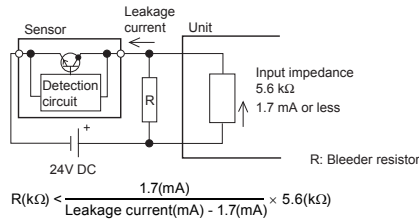


All 24G pin are connected within the module (common). The module power and external power supply for the input are supplied by the power adapter or the dedicated power supply.

#### Notes:

- Bleeder resistor  
When connecting a two-wire type sensor or input equipment containing a parallel resistor, select a sensor or equipment whose leakage current is 1.7mA or less.  
If the leakage current is more than 1.7mA, connect a bleeder resistor obtained in the following calculation formula.

Circuit image



The power capacity W of the bleeder resistor R is as follows:  
 $W = \frac{(\text{Input voltage})^2}{R}$

- Please set the response speed (DIP switch) according to the ON or OFF time of the input signal.  
When setting 1.5 ms:  
Set both the ON and OFF time of the input signal to 1.5 ms or more.  
When setting 0.5 ms:  
Set both the ON and OFF time of the input signal to 0.5 ms or more.

## 5. Specifications

### 5.1 General specifications

Item	Specification			
<b>Ambient working temperature</b>	0 to 55°C (32 to 131°F)			
<b>Ambient storage temperature</b>	-25 to 75°C (-13 to 167°F)			
<b>Ambient operating humidity</b>	5 to 95%RH: Dew condensation shall not be considered.			
<b>Ambient storage humidity</b>	5 to 95%RH: Dew condensation shall not be considered.			
<b>Vibration resistance (*1)</b>	When intermittent vibration is present	Number of times of sweep 10 times in each of X, Y and Z directions (for 80 min)		
	Frequency		Acceleration	Half amplitude
	10 to 57Hz		-	0.075mm
	57 to 150Hz		9.8m/s <sup>2</sup>	-
When continuous vibration is present	Frequency	Acceleration	Half amplitude	
10 to 57Hz	-	0.035mm		
57 to 150Hz	4.9m/s <sup>2</sup>	-		
<b>Impact resistance (*1)</b>	147 m/s <sup>2</sup> , 3 times in each of X, Y and Z directions			
<b>Operating atmosphere</b>	Corrosive gas shall not be present.			
<b>Operating altitude</b>	2,000m(6561'8") or less (*2)			
<b>Installation place</b>	Inside control panel (*3)			
<b>Over-voltage category</b>	II or less (*4)			
<b>Degree of contamination</b>	2 or less (*5)			

#### Notes:

- The criterion is shown in IEC61131-2.
- The module cannot be used in an environment pressurized above the atmospheric pressure which can be generated around the altitude of 0 m. If the module is used in such an environment, it may fail.
- The module can be used in any environment even outside the control panel as far as the requirements of the ambient operating temperature, the ambient operating humidity, etc. are satisfied.
- This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities.  
The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
- This index indicates the degree of conductive generating substances in the environment in which the module is used. The degree of contamination 2 indicates that contamination is caused by generation of only non-conductive substances.  
In this degree, however, temporary conduction may be caused by accidental condensation.

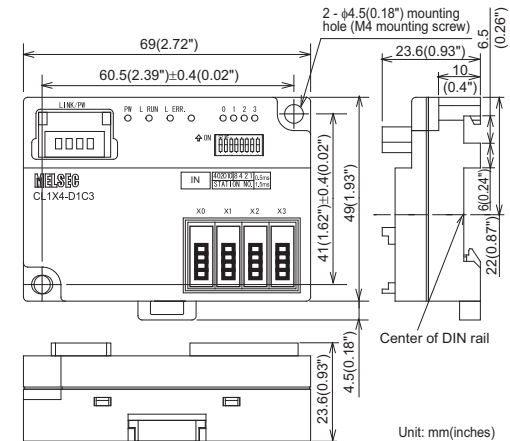
## 5.2 Input specifications

Item	Specification
<b>Input method</b>	DC input (Power supply supplied from CC-Link/LT interface)
<b>Number of inputs</b>	4 points
<b>Isolation method</b>	Isolation with photocoupler
<b>Rated input voltage</b>	24V DC
<b>Rated input current</b>	Approx. 4 mA
<b>Operating voltage range</b>	20.4 to 28.8V DC (24V DC -15% to +20%) Ripple ratio: Within 5%
<b>Max. simultaneous ON input points</b>	100% (at 24V DC)
<b>ON voltage/ON current</b>	19 V or more/3 mA or more
<b>OFF voltage/OFF current</b>	11 V or less/1.7 mA or less
<b>Input resistance</b>	5.6 kΩ
<b>Response time</b>	<b>OFF→ON</b> 0.5ms/1.5 ms or less (at 24V DC) Selected by DIP switch (default value = OFF/1.5ms).
	<b>ON→OFF</b> 0.5ms/1.5 ms or less (at 24V DC) Selected by DIP switch (default value = OFF/1.5ms).
<b>Common wiring method</b>	4 points/1 common (sensor connector 3-wire type)

### 5.3 Performance specifications

Item	Specification	
<b>Module power supply</b>	<b>Voltage</b>	20.4 to 28.8V DC (24V DC -15% to +20%) Ripple ratio: Within 5%
	<b>Current consumption</b>	35mA (when all points are ON)
	<b>Initial current</b>	70mA
	<b>Max. allowable momentary power failure period</b>	PS1:1ms
<b>Number of stations occupied</b>	4-, 8- or 16-point mode: 1 station	
<b>Noise durability</b>	500Vp-p Noise width: 1μs Cycle: 25 to 60 Hz (by noise simulator)	
<b>Withstand voltage</b>	500V AC for 1 min between primary area (external DC terminal) and secondary area (internal circuit)	
<b>Isolation resistance</b>	10 MΩ or higher between primary area (external DC terminal) and secondary area (internal circuit) by 500V DC insulation resistance tester	
<b>Protection class</b>	IP2X	
<b>I/O part connection method</b>	Connection with terminal block	
<b>Module installation method</b>	DIN rail installation, mounted by screws of type M4 × 0.7mm(0.03") × 16mm(0.63") or larger Can be installed in six directions	
<b>Mass (weight)</b>	0.04 kg (0.09 lbs)	

## 6. Outside Dimensions



## 「电器电子产品有害物质限制使用标识要求」的表示方式



Note: This symbol mark is for China only.

含有有害6物质的名称, 含有量, 含有部品  
本产品中所含有的有害6物质的名称, 含有量, 含有部品如下表所示。

### 产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
可编程 外壳	○	○	○	○	○	○
控制器 印刷基板	×	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。

- : 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
- ×: 表示该有害物质至少在在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

基于中国标准法的参考规格: GB/T15969.2

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

- Exclusion of loss in opportunity and secondary loss from warranty liability  
Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:  
(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.  
(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.  
(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.  
(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.



- 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 Electric.
- 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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Poland		Australia	

## MITSUBISHI ELECTRIC CORPORATION

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Specifications subject to change without notice.

