



B ENGLISH CL1X4-D1S2

CC-Link/LT Remote I/O Module

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

handle the product properly

# User's Manual

### MODEL CL1X4-D1S2 CC-Link/LT MANUAL Number JY997D10801J Date November 2021

### **•SAFETY PRECAUTIONS•**

(Read these precautions before using) Please read this manual carefully and pay special attention to safely in order to handle this product properly. Also pay careful attention to safely 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 recentions.

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 <u>CCAUTION</u> 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. **IDESIGN PRECAUTIONS1** 

### 

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.
- the specified torque range. If the screws are too lose, 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.

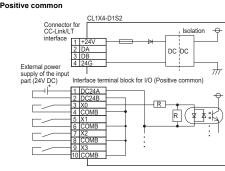
[WIRING PRECAUTIONS]

### WARNING

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

### 4.2 External wiring

The input terminals of the CL1X4-D1S2 can be wired as positive common or negative common depending on the used sensor

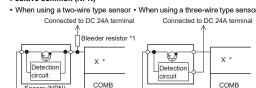


### Negative common



### 4.3 Connection to sensor

Positive common (NPN)



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. Fix I/O terminal block securing screws securely within the regulated torque. Loose I/O terminal block securing screws may cause fire and/or malfunction. Fix i/o terminal block securing screws security within the regulated torque.
 Loose I/O terminal block securing screws may cause fire and/or malfunction.
 If the I/O terminal block securing screws are too tight, it may cause short circuit, equipment failures, or eroneous operation due to damage of the screws.
 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.

The module case is made or result. 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 wastername

## [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 assident. act damage. , causes the damage of the machine and the accident. Oth

●Compliance with EC directive (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 directive of the entire mechanical module should be checked by the user / manufacturer.

Attention This product is designed for use in industrial applications

Circuit image

Sensor

Ø

24V DC

W =  $\frac{(\text{Input voltage})^2}{(\text{Input voltage})^2}$ 

of the input signal.

When setting 0.5 ms:

5. Specifications

Ambient working temperature

Ambient operating humidity

umidity

Ambient storage

nperature

Ambient storage

5.1 General specifications ltem

R

Leakage Unit

1.7(mA)

 $R(k\Omega) < \frac{1.7(11A)}{\text{Leakage current(mA)} - 1.7(mA)} \times 5.6(k\Omega)$ 

The power capacity W of the bleeder resistor R is as follows:

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 EN61000-64 and EN61131-2:1994+A11:1996+A12:2000 center Meru 4th 2006 are complicated in EN61432 (2002)

Electromagnetic Compatibility	Remark
Directive (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. EMI • Radiated Emission EMS • 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.

Input impedance

R: Bleeder resistor

1.7 mA or less

5.6 kΩ

Please set the response speed (DIP switch) according to the ON or OFF time

Specification

5 to 95%RH: Dew condensation shall not be considered.

5 to 95%RH: Dew condensation shall not be considered.

Number of times of

When setting 1.5 ms: Set both the ON and OFF time of the input signal to 1.5 ms or more.

Set both the ON and OFF time of the input signal to 0.5 ms or more

0 to 55°C (32 to 131°F)

-25 to 75°C (-13 to 167°F)

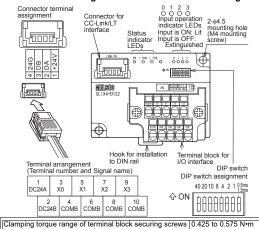
Use this product in Zone A<sup>\*1</sup> as defined in EN61131-2.

- Use this product in Zone A ' as defined in EN61131-2.
   \*1 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.)

  - ●Compliance with UKCA marking● s for compliance with UKCA marking are the same as that with

The requirements for comp EC directive (CE marking). **Outline of Product** 

This product is a spring clamp terminal block type input module connected to CC-Link/LT. This product has four input points (24V DC). Name and Setting of Each Part and Terminal Arrangement 2.



Name	Description										
	PW	••••••••••••••••••••••••••••••••••••••									
	L RUN	ON w	hile no	ormal	opera	ation i	s exe	ecut	ted.		
Status indicator ED	L ERR.	ON: When a communication error or DIP switch setting error occurred Flickering 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.) Flickering at a intermittent interval: When a terminal resistor is not attached or when the module or a connection cable is affected by noise							ged LED v ied		
nput operation ndicator LED	ON while the input is ON. Extinguished while the input is OFF. Input operation indicator							for			
nterface	Connector for CC-Link/LT communication line/module power supply (24G/DB/DA/+24V)										
erminal block or I/O interface	spring clamp terminal block for connecting input signals and I/O power supply										
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. 40', Set the 'STATION NO. 2', "STATION NO. 4" and "STATION NO. 8', "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.         Station       10's digit         132       0FF         32       0FF							he 10. 0 64.			

Description Name 0.5ms Sets the response speed. ON : 0.5 ms (fast response type) OFF : 1.5 ms (standard type) DIP switch

Set up using a slotted screwdriver with a tip width of 0.9 mm or less. 3. Installation

The CL1X4-D1S2 can be installed to DIN rail or directly installed using

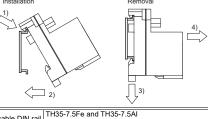
mounting screws. Each installation procedure is described below.

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. Installation



# Applicable DIN rail Width:35mm

### 3.2 Direct installation

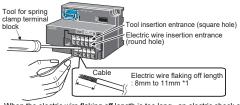
Screw-tighten the module by attaching M4 screws to the upper and lower mounting holes (two holes in all) provided in the module. Install the module so that the clearance of 1 to 2mm (0.04" to 0.08") is assured for each module.

 Applicable screw
 M4 × 0.7mm(0.03") × 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N·m)

### 4. Wiring

4.1 Wiring operation of cable

Installation of cable Insert the tool for spring clamp terminal block in the tool insertion entrance of CL1X4-D1S2 (square hole) up to the interior surely. Insert the electric wire in the electric wire insertion entrance (round hole) with the tool for spring clamp terminal block inserted, and pull out the tool. Confirm the light pull of the electric wire after the tool is pulled out, and clamping surely. 1)



\*1 When the electric wire flaking off length is too long, an electric shock or short-circuited between the adjoining terminals may result. It is likely not to come in contact surely when the electric wire flaking off length is too short.

2) Detaching of cable

Insert the tool for spring clamp terminal block in the tool insertion entrance of the detached terminal number (square hole) up to the interior surely, and pull out the electric wire. Accontable electric wir

3)	Acceptable	electric	wire

Item	Specification
Size of acceptable electric wire	0.3 to 1.5 mm <sup>2</sup> (AWG22 to 16)
Electric wire flaking off length	8(0.32") to 11(0.43") mm

Item		Specification		
Input method		DC input (External power supply of the input part)		
Number of inpu	its	4 points		
Isolation metho	d	Isolation with photocoupler		
Rated input vol	tage	24V DC		
Rated input cur	rent	Approx. 4 mA		
Operating voltage range		20.4 to 28.8V DC (24V DC -15% to +20%)		
		Ripple ratio: Within 5%		
Max. simultaneous ON		100% (at 24V DC)		
input points		100% (4(24) 00)		
ON voltage/ON	current	19 V or more/3 mA or more		
OFF voltage/OFF current		11 V or less/1.7 mA or less		
Input resistance		5.6 kΩ		
	OFF→ON	0.5ms/1.5 ms or less (at 24V DC)		
Response OFF→ON		Selected by DIP switch (default value = OFF/1.5ms).		

### 0.5ms/1.5 ms or less (at 24V DC) Selected by DIP switch (default value = OFF/1.5ms)

### points/1 common (2 points) Common wiring method (terminal block two-wire type)

### 5.3 Performance specifications

5.2 Input specification

	ltem	Specification				
	Voltage	20.4 to 28.8V DC (24V DC -15% to +20%) Ripple ratio: Within 5%				
Module power	consumption	40mA (when all points are ON)				
supply	Initial current	70mA				
заррту	Max. allowable momentary power failure period	PS1:1ms				
Number occupie	of stations d	4-, 8- or 16-point mode: 1 station				
Noise durability		500Vp-p Noise width: 1µs Cycle: 25 to 60 Hz (by noise simulator)				
Withstand voltage		500V AC for 1 min between primary area (external DC terminal) and secondary area (internal circuit)				
Isolation resistance		$10 \text{ M}\Omega$ or higher between primary area (external DC terminal) and secondary area (internal circuit) by 500V DC insulation resistance tester				
Protection class		IP2X				
I/O part connection method		Connection with spring clamp terminal block				
Module installation method		DIN rail installation, mounted by screws of type $M4 \times 0.7mm(0.03") \times 16mm(0.63")$ or larger Can be installed in six directions				
Mass (w	eight)	0.06 kg (0.13 lbs)				

# 「电器电子产品有害物质限制使用标识要求」的表示方式

Ð 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									
			有害物质						
部作	牛名称	铅         汞         镉         六价铬         多溴联苯         多溴           (Pb)         (Hg)         (Cd)         (Cr (VI))         (PBB)         二苯醚 (PBDE)							
可编程	外壳	0	0	0	0	0	0		
控制器	印刷基板	$\times$	0	0	0	0	0		
本表格依据SJ/T 11364的规定编制。									

〇: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

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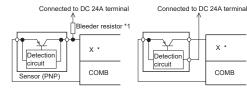


 When using a three-wire type sensor (when using the power supply for ensor other than 24V DC)

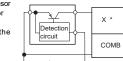
Ø X \* circuit COMB

### Negative common (PNP)

• When using a two-wire type sensor • When using a three-wire type sensor



When using a three-wire type sensor (when using the power supply for sensor other than 24V DC) Replace \* in the figure with the used input No.



### Notes:

\*1 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.

	Frequency	Acceleration	Half amplitude			
	10 to 57Hz	-	0.075mm			
Vibration resistance (*1)	57 to 150Hz	9.8m/s <sup>2</sup>	-	10 times in each of		
resistance ("1)	When contin	X, Y and Z directions				
	Frequency	Acceleration	Half amplitude	(for 80 min)		
	10 to 57Hz	-	0.035mm			
	57 to 150Hz	4.9m/s <sup>2</sup>	-			
Impact resistance (*1)	147 m/s <sup>2</sup> , 3 times in each of X, Y and Z directions					
Operating atmosphere	Corrosive gas shall not be present.					
Operating altitude	2,000m(6561'8") or less (*2)					
Installation place	Inside control panel (*3)					
Over-voltage category	II or less (*4)					
Degree of contamination	2 or less (*5)					

When intermittent vibration is present

\*1 The criterion is shown in IEC61131-2

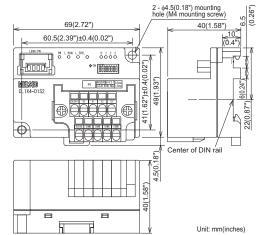
The module cannot be used in an environment pressurized above the atmospheric pressure which can be generated around the altitude of 0 m. If the module is used in such an environment, it may fail. \*2 The module

\*3 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.

- operating humidity, etc. are satisfied. \*4 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.
- \*5 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.

### 6. Outside Dimensions



### For safe use

Country USA

Brazil

UK

Italy

Spair

 CLS 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, and the product has been manufactured under strict quality control. when installing the product where major accidents or losses could occur if product fails, install appropriate backup or failsafe functions in the system. or losses could occur if the

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