

# CL1PSU-2A CC-Link/LT Dedicated Power Supply

Thank you very much for choosing this product.

Please read this manual thoroughly before starting to use or handling the product.

## User's Manual

MODEL	CL1PSU-2A
MANUAL Number	JY997D09801J
Date	November 2021

### 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. These precautions apply only to Mitsubishi equipment. Refer to the user's manual of the CPU module for a description of the PLC system safety precautions.  
If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.  
These SAFETY PRECAUTIONS are classified into two categories: "WARNING" and "CAUTION".

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

**CAUTION** 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 it may be accessible whenever necessary. Always forward this manual to the end user of the machine containing this product.

### DESIGN PRECAUTIONS

**WARNING**  
Depending on a failure in the remote I/O module, an output's status may be ON or OFF. For output signals which can lead to a severe accident, install a circuit to monitor the outputs outside of the module.

**CAUTION**  
Do not bind the control cable or the connection cable together with the main circuit and power cable. Keep such cables far from the main circuit and power cable. Assure a distance of 100mm (3.94") or more, otherwise a malfunction may occur due to excessive noise.

Use the dedicated power supply without applying any force on the connector of the CC-Link/LT interface and the connection cable. Otherwise, such cables may break or fail.

### INSTALLATION PRECAUTIONS

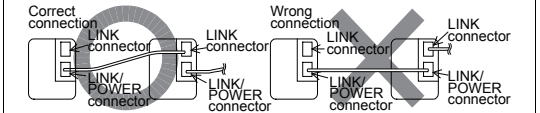
**CAUTION**  
Use the dedicated power supply within an environment described by the general specifications in this manual.  
If the dedicated power supply is used in any environment outside the range for the general specifications, electrical shock, fire, malfunction, product damage or product deterioration may occur.  
Do not directly touch the conductive area of the dedicated power supply.  
Malfunction or damage of the dedicated power supply may be caused by such touching.  
Securely fix the dedicated power supply with DIN rail or mounting screws. Securely tighten the mounting screws within the specified torque range. If the screws are insufficiently tightened, the dedicated power supply may drop, short-circuit or malfunction.  
If the screws are excessively tightened, the screws may be damaged, and the dedicated power supply may drop or short-circuit.  
Install the dedicated power supply on to a flat surface.  
If the mounting surface is concave and/or convex, and if excessive force is applied on the PC board, nonconformity may occur.

### WIRING PRECAUTIONS

**WARNING**  
Make sure to shut down all phases of the power supply outside the module before starting the installation or wiring work. If all phases are not shut down, electrical shock or product damage may be caused.  
The temperature rating of the cable should be 80°C or more.

### CAUTION

- Confirm the rated voltage and the terminal arrangement of the dedicated power supply, then correctly wire the dedicated power supply. If a power supply not conforming to the specification rating is connected or the dedicated power supply is wired incorrectly, fire, failure or malfunction may occur.
- Tighten the terminal screws within the specified torque range. If the terminal screws are insufficiently tightened, fire or malfunction may occur.
- If the terminal screws are excessively tightened, the screws may be damaged, and the module may short-circuit, equipment failures, or malfunction.
- Make sure that foreign objects such as cutting and wire chips do not enter the dedicated power supply. Fire, failure or malfunction may be caused by the foreign objects.
- When two or more dedicated power supply or power adapter (CL1PAD1) exist in a system, take care in connecting the first LINK/POWER connector to the second LINK connector as indicated below. If the LINK/POWER connector in the two adapters are connected to each other, the adapters may fail.



- Do not short-circuit the 24G terminal and +24V terminal of the LINK/POWER connector. Some remote I/O modules operate the inputs and outputs using the power supply for communication. Refer to the corresponding manuals for remote I/O modules and perform wiring correctly.
- If wiring is performed incorrectly, fire, failure or malfunction may occur.
- When the LINK connector is not in use, cover the opening by plugging a connector for communication (without any cable) or attaching a piece of tape to prevent dust or conductive foreign materials from getting inside. Such materials may cause failure or malfunction.
- Attach a warning label (hazard symbol 417-IEC-5036) concerning electric shock to the enclosure of the final system.

### STARTING AND MAINTENANCE PRECAUTIONS

- Do not touch the terminals while the power is being supplied. Electrical shock or malfunction may be caused by such touching.
- Shut down all phases of the power supply outside the dedicated power supply before cleaning or tightening the terminal screws. If all phases are not shut down, the dedicated power supply may fail or malfunction.
- For cleaning, perform dry wiping without using chemicals.
- If there is the possibility of touching the PLC inside a control panel in maintenance, make sure to discharge to avoid the influence of static electricity.

### CAUTION

- Do not disassemble or modify the dedicated power supply. Failure, malfunction, injury or fire may be caused by such disassembly or modification.
- The dedicated power supply case is made of a resin.
- The dedicated power supply may be damaged by dropping or strong impact.
- Shut down all external phases of the power supply before attaching or removing the dedicated power supply to/from the panel. If all phases are not shut down, the dedicated power supply may fail or malfunction.

### DISPOSAL PRECAUTIONS

When disposing of the product, treat it as an industrial waste.

### TRANSPORTATION AND MAINTENANCE PRECAUTIONS

- During transportation avoid the impact which exceeds a regulated value as the dedicated power supply is a precision instrument. It is necessary to check the operation of module after transportation, in case of any impact damage.
- If not checked, an accident or damage to the machine may result due to a damaged dedicated power supply.

### Compliance with EC directive (CE marking)

This marking 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.

### Standards with which this product complies

Type : Programmable Controller (Open Type Equipment)  
Electromagnetic Compatibility Directive (EMC):  
Models : Products manufactured:  
from April 1st, 2004 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 EN61131-2:2007.  
Low Voltage Directive (LVD):  
Models : Products manufactured:  
from November 1st, 2002 to April 30th, 2006 are compliant with EN61000-6-4 and EN61131-2:1994+A11:1996+A12:2000 from May 1st, 2006 to February 28th, 2018 are compliant with EN61131-2:2007 after March 1st, 2018 are compliant with EN61010-2-201:2013.  
\*1 For products manufactured after January 1 2018, there may be compliant cases.

### Electromagnetic Compatibility Directive (EMC)

Electromagnetic Compatibility 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. <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

### Low Voltage Directive (LVD)

Low Voltage Directive (LVD)	Remark
EN61131-2:1994/A11:1996 /A12:2000 :2007 Programmable controllers -Equipment requirements and tests	The equipment has been assessed as a component for fitting in a suitable control box which meets the requirements of EN61131-2:1994 + A11:1996 + A12:2000, :2007
EN61010-2-201:2013 Safety of electrical equipment for measurement, control, and test	The equipment has been assessed as a component for fitting in a suitable control box which meets the requirements of EN61010-2-201:2013

### Notes For compliance to EMC Directive and LVD

- It is necessary to install the CL1 series module in a shielded metal control panel. For more details, please contact the local Mitsubishi Electric sales site.
- Use this product in Zone A<sup>2</sup> as defined in EN61131-2.  
The terminal and the wiring for the power supply can be used in zone B<sup>2</sup>.  
\*2 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.)

- Do not wire two or more crimp terminals to one terminal. (If the wiring with two or more wire is needed, take an appropriate action such as adding an external terminal.)

### Installation in Enclosure

Please use the CL1 Series module while installed in conductive shielded control panels under a general industrial environment.  
Programmable controllers are open-type devices that must be installed and used within conductive control panels. Please secure the control panel lid to the control panel (for conduction). Installation within a control panel greatly affects the safety of the system and aids in shielding noise from the programmable controller.  
For the control panel, use the product having sufficient strength, fire protectiveness and shielding property to an installation environment.

### Compliance with UKCA marking

The requirements for compliance with UKCA marking are the same as that with EC directive (CE marking).

### Associated manuals

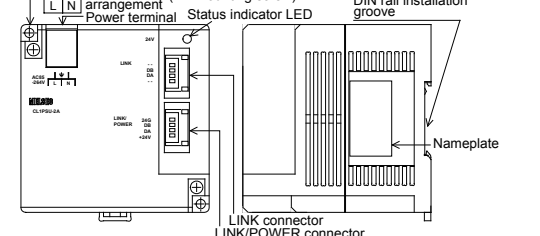
Manual name	Manual No. (Model code)	Description
CC-Link/LT Power Adapter - Dedicated Power Supply USER'S MANUAL (Detailed Volume)	JY997D0601 (09R712)	Explains specifications, wiring, handling regarding the dedicated power supply and dedicated power supply for CC-Link/LT

### Outline of Product

This product is a dedicated power supply connected to CC-Link/LT. This product supplies 24V DC power to the CC-Link/LT system.

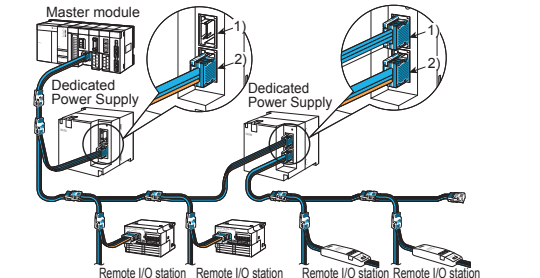
### Name of Each Part

#### 3.1 Name of each part and assignment



Name	Description
Status indicator LED	24V Lit while the power is supplied
Interface	LINK connector DB For communication
	24G DA For communication
Interface	LINK/POWER connector DB For communication (-)
	DA For communication (+24V) Power supply for communication (+)
Power terminal	L Supplies power from outside to dedicated power supply.
	N Input voltage: 100, 120, 200, 230, and 240V AC (Voltage allowable range: 85 to 264V AC) ⊕ shows a functional grounding terminal.
Nameplate printing	△ is a mark that instructs to use the cable with an appropriate temperature rating (80°C or more) for wiring

#### 3.2 Handling of LINK connector and LINK/POWER connector



- LINK connector Dedicated for communication only (does not supply power). Used when two or more dedicated power supply or power adapter (CL1PAD1) are used in the CC-Link/LT system.
- LINK/POWER connector Dedicated for communication, and supplies the power to the CC-Link/LT system.

### Specifications

#### 1) General specifications

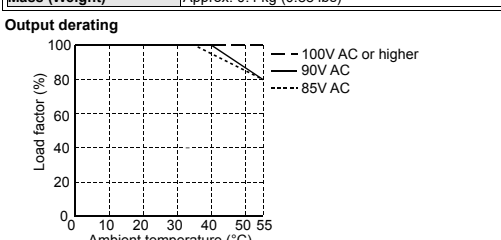
Item	Specification	
Ambient working temperature	0 to 55°C (32 to 131°F)	
Ambient storage temperature	-25 to 75°C (-13 to 167°F)	
Ambient operating humidity	5 to 95%RH: Dew condensation shall not be allowed.	
Ambient storage humidity	5 to 95%RH: Dew condensation shall not be allowed.	
Vibration resistance (*1)	Intermittent vibration is present	
	Frequency [Acceleration] [Half amplitude]	Number of sweep times
	10 to 57Hz - 0.075mm	10 times in each of X, Y and Z directions (80 min)
Impact resistance (*1)	Continuous vibration is present	
	Frequency [Acceleration] [Half amplitude]	
	10 to 57Hz - 0.035mm	
Operating atmosphere	147 m/s <sup>2</sup> , 3 times in each of X, Y and Z directions	
	Corrosive gas should not be present.	

Item	Specification
Operating altitude	2,000m(6561ft) or less (*2)
Installation place	Inside control panel (*5)
Over-voltage category	II or less (*3)
Degree of contamination	2 or less (*4)
Grounding	100Ω or less

- The criterion is shown in IEC61131-2. The module cannot be used in an environment pressurized above the atmospheric pressure at the altitude of 0 m. If the module is used in such an environment, it may fail.
- This category indicates in which area (inside the site) in relation to the category of wiring net the equipment is to be connected. Category II applies, for example, to equipment whose power is supplied from a fixed facility.
- The surge-resistant voltage of equipment whose rating is up to 300V is 2,500V. This index indicates the degree of conductive substances generated in the environment in which the module is used. The degree of contamination 2 indicates that contamination is caused by the generation of only non-conductive substances. In this degree, however, temporary conduction may be caused by accidental condensation.
- CC-Link/LT system is assumed to be installed in an environment equivalent to indoor.

#### 2) Performance specifications

Item	Specification
Rated voltage	100, 120, 200, 230, and 240V AC
Voltage allowable range	85 to 264V AC
Rated current	1.2A / 100V AC 0.7A / 200V AC
Power consumption	70W
Rated frequency	50 or 60Hz
Power fuse	3.15A
Inrush current	Max. 50A / 100V AC Max. 60A / 200V AC
Output voltage	24V DC +10 % -5 %
Output current	0.01A to 2A Derating occurs according to the ambient temperature and power voltage. (Use the module in a proper range so that the total current consumption of each module does not exceed 2A (except the period immediately after the power is turned on).)
Ripple noise	500mVp-p or below
Noise resistance	By noise simulator of 1000Vp-p in noise voltage, 1μs in noise width, and 25 to 60Hz in frequency
Withstand voltage	AC type 1500V AC for one min. DC type 500V AC for one min.
Allowable momentary power failure time	Operation continues after power failure for 10ms or less.
Insulation resistance	10 MΩ between the external terminals as a whole and the ground terminal by 500V DC insulation resistance tester
Protection class	IP1X
Protection function	Over-voltage protection Output interrupt Not automatically reset
Overcurrent protection	110 to 160% Drooping characteristic Automatically reset
External connection method	*Supplies power from outside to dedicated power supply. 3 points (M3 screws) on terminal block -To communicate and to supply power to CC-Link/LT system. Connector with 4 pins dedicated to CC-Link/LT (2 pcs.)
Mass (Weight)	Approx. 0.4 kg (0.88 lbs)



- The output current that can be used varies depending on the ambient temperature, therefore, refer to the output derating chart above and use the module within its proper range. (When load factor is at 100%, up to 2A current can be output. At 80%, up to 1.6A.)
- When the output current exceeds the specified value, an overcurrent protection circuit drives the output voltage down. When the overcurrent status or short circuit is cleared, the output voltage automatically returns to its normally operating value.
- When an output voltage exceeding the specified value is generated due to some defect inside the power supply, for instance, the output is interrupted so that the high voltage will not be output. The protection circuit may also be triggered when a reverse current is generated from the load circuit connected to the output terminal or when an external overvoltage is input.
- If the overvoltage protection circuit is triggered once, and the output is interrupted and does not return to normal automatically, please have the module checked and/or repaired.

### Construction Cautions

- At least one dedicated power supply is required per CC-Link/LT system. When constructing the system using only one dedicated power supply, the following three conditions should be satisfied.
- If the following four conditions are not satisfied, two or more dedicated power supplies or power adapters (CL1PAD1) in constructing the system.
- The current capacity of the dedicated power supply is 2A or less, therefore, total current consumption should be an equivalent to or less than 2A.
- Total current at start-up of each module + current consumption of the I/O equipment that receives power from a dedicated power supply ≤ Maximum output current (2.2A) of dedicated power supply
- In order to operate a stable system, the voltage drop should be equivalent to or less than 3.6V.
- The minimum operating voltage of each module is 20.4 V, therefore, supply voltage subtracted by the voltage drop should be equivalent to or more than 20.4 V.

#### 5.1 System power calculation method

##### 5.1.1 Current consumption calculation

$$\text{Current consumption in CC-Link/LT system} = \text{Total current consumption of each module in CC-Link/LT system} + \text{Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)} \leq 2A$$

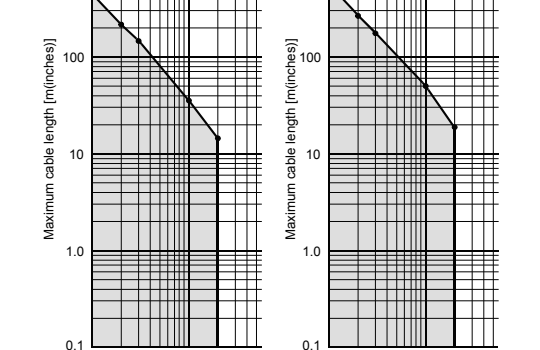
\*1 Some remote I/O modules for CC-Link/LT supply the power for I/O via the connection cable.

For the details, refer to the instruction manual of each remote I/O module.

##### 5.1.2 Voltage drop

Calculate the voltage drop based on the simplified graph or the calculation formula. (supply voltage: 24V DC, ambient temperature: 20°C)

##### 1) Selection based on the simplified graph



One dedicated power supply is allowed within the range shown in the graph above.

##### 2) Selection based on the calculation formula

When you use VCTF cable or High flexible cable or a combination of cables

$$\text{Voltage drop (V)} = \frac{\text{Maximum distance (m)} \times \text{Constant} \times \text{Total current consumption (A)}}{\text{Constant}} \leq 3.6V$$

When you use dedicated flat cable

$$\text{Voltage drop (V)} = \frac{\text{Maximum distance (m)} \times \text{Constant} \times \text{Total current consumption (A)}}{\text{Constant}} \leq 3.6V$$

Maximum distance: Furthest station from the dedicated power supply

$$\text{Total current consumption} = \text{Total current consumption of each module in CC-Link/LT system} + \text{Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)} \leq 2.2A$$

\*1 Some remote I/O modules for CC-Link/LT supply the power for I/O via the connection cable.

For the details, refer to the instruction manual of each remote I/O module. The simplified graph and the calculation formula concerning voltage drop calculations may not be accurate depending on the ambient temperature and the number of used connectors dedicated to CC-Link/LT. If the driving voltage (20.4V) cannot be assured in a used remote I/O module, add another dedicated power supply or power adapter (CL1PAD1).

##### 5.1.3 Start-up current calculation

Construct the system properly so that the calculated start-up current (when the power is turned on) does not exceed the maximum output current (2.2 A) of the dedicated power supply.

$$\text{Total current at start-up of each module of CC-Link/LT} + \text{Total current consumption of I/O equipment (such as sensors) (to which power is supplied via a connecting cable)} \leq \text{Maximum output current (2.2 A) of dedicated power supply}$$

Refer to "CC-Link/LT: Power Adapter - Dedicated Power Supply USER'S MANUAL (Detailed Volume)"

### Installation

The dedicated power supply can be installed to a DIN rail or directly installed with screws. Provide a space of 50mm (1.97 in.) or more between the dedicated power supply main unit and other equipment or structures. Keep the module as far away from high-voltage cables, high-voltage devices, or power-driven devices as possible. Each installation procedure is described below.

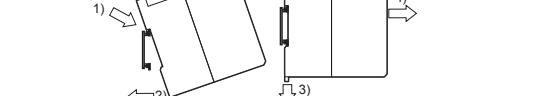
#### 6.1 Installation direction

Do not install the dedicated power supply on the floor surface, the ceiling surface or in the vertical direction. If the dedicated power supply is installed on such a surface or in such a direction, its temperature may rise.

Make sure to install the dedicated power supply on the wall horizontally.

#### 6.2 Installation to DIN rail

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



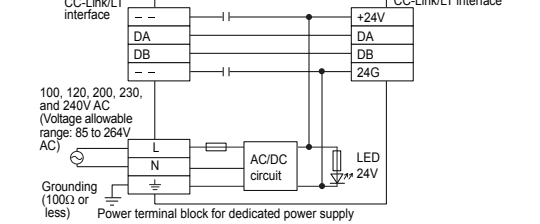
#### 6.3 Direct installation

Mount the dedicated power supply by tightening M4 screws to the upper and lower mounting holes (two holes in all) provided in the dedicated power supply.

Applicable DIN rail	TH35-7.5Fe and TH35-7.5Al (Width: 35mm (1.38"))
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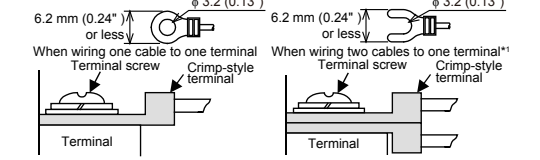
Applicable screw	M4 x 0.7mm(0.03") x 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N·m)
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### Power Wiring



#### Crimp-style terminal

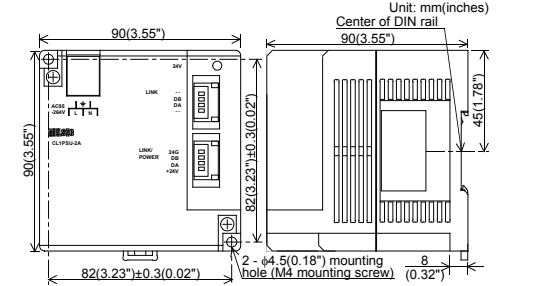
For the power wiring, use crimp-style terminals of the following dimensions. For the I/O wiring, use crimp-style terminals of the following dimensions.



- Use a power wire of 2mm<sup>2</sup> (0.08in.<sup>2</sup>) or more.
- Perform grounding (100Ω or less) with a wire of 2mm<sup>2</sup> (0.08in.<sup>2</sup>) or more to the grounding terminal. However, never perform common grounding with a high voltage system.
- Tighten the terminal screws (M3 screws) on the terminal block with a tightening torque of 0.42 to 0.58 N·m. Do not tighten terminal screws exceeding the specified torque. Failure to do so may cause short circuit, equipment failures, or malfunctions.

\*1 To adapt the low voltage command (EN61010-2-201:2013) of the EC command avoid the wiring with two wires to the built-in terminal, and take an appropriate action such as adding an external terminal.

### 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)
可编程控制器	○	○	○	○	○	○
印刷基板	×	○	○	○	○	○

本表格依据SJ/T 11364-1的规格制定。

- : 表示