MITSUBISHI ELECTRIC

Side B

Side A JAPANESE

Side B ENGLISH

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

CC-Link/LT

MODEL	CL1PSU-2A
MANUAL Number	JY997D09801F
Date	April 2015

●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.
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.

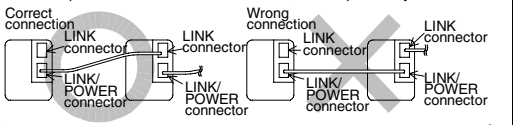
[WIRING PRECAUTIONS]

⚠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.

⚠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]

⚠WARNING

- 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.

⚠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]

⚠CAUTION

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

[TRANSPORTATION AND MAINTENANCE PRECAUTIONS]

⚠CAUTION

- 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.

●Note Concerning the 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 standards of the entire mechanical module should be checked by the user / manufacturer.

Attention

- This product is designed for use in industrial applications.

Note

- Authorized Representative in the European Community:
  Mitsubishi Electric Europe B.V.
  Gothaer Str. 8, 40880 Ratingen, Germany

Standards with which this product complies

Type : Programmable Controller (Open Type Equipment)
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

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)
EN61131-2: 2007 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (Radiated Emissions, Conducted Emissions, Radiated electromagnetic field, Fast transient burst, Electrostatic discharge, High-energy surge, Voltage drops and interruptions, Conducted RF and Power frequency magnetic field)
Low Voltage Standards (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 enclosure which meets the requirements of EN61131-2:1994 + A11:1996 + A12:2000, :2007

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

- Notes for compliance to EMC LVD regulation.
  It is necessary to install the CL1 series module in a shielded metal control panel.
- Use this product in Zone A*1 as defined in EN61131-2.
  The terminal and the wiring for the power supply can be used in zone B*1.
  *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.)

1. Associated manuals

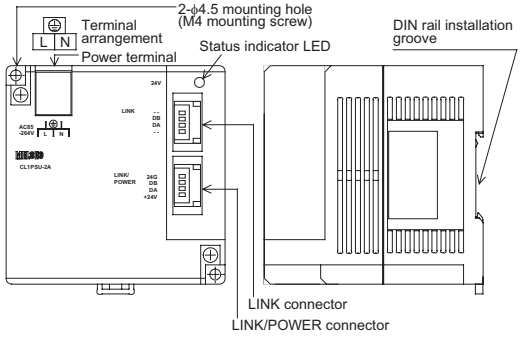
Manual name	Manual No. (Model code)	Description
CC-Link/LT: Power Adapter • Dedicated Power Supply USER'S MANUAL (Detailed Volume)	JY997D06601 (09R712)	Explains specifications, wiring, handling regarding the dedicated power supply and dedicated power supply for CC-Link/LT

2. 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.

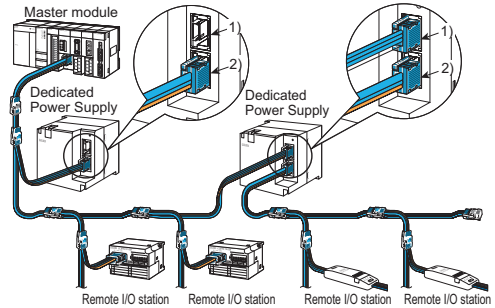
3. Name of Each Part

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
		DA	For communication
		24G	Power supply for communication (-)
		+24V	Power supply for communication (+)
Power terminal	L		Supplies power from outside to dedicated power supply. Input voltage: 100,120,200,230,and 240V AC (Voltage allowable range: 85 to 264V AC)
	N		
	⏚		

3.2 Handling of LINK connector and LINK/POWER connector



1) 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.
2) LINK/POWER connector
   Dedicated for communication, and supplies the power to the CC-Link/LT system.

4. Specifications

1) General specifications

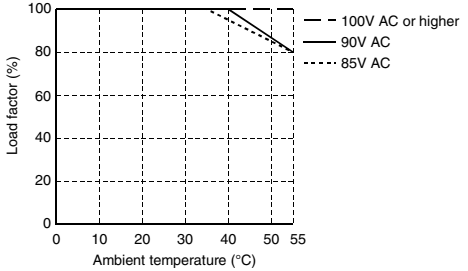
Item	Specification			
Ambient working temperature	0 to 55°C (32 to 131°F)			
Ambient storage temperature	-25 to 75°C (-13 to 167°F)			
Ambient operating humidity	5 to 95%RH: Dew condensation shall not be allowed.			
Ambient storage humidity	5 to 95%RH: Dew condensation shall not be allowed.			
Vibration resistance (*1)	Intermittent vibration is present			Number of sweep times
	Frequency	Acceleration	Half amplitude	10 times in each of X, Y and Z directions (80 min)
	10 to 57Hz	–	0.075mm	
	57 to 150Hz	9.8m/s^2	–	
	Continuous vibration is present			
	Frequency	Acceleration	Half amplitude	
	10 to 57Hz	–	0.035mm	
	57 to 150Hz	4.9m/s^2	–	
Impact resistance (*1)	147 m/s^2, 3 times in each of X, Y and Z directions			
Operating atmosphere	Corrosive gas should not be present.			
Operating altitude	2,000m(6561'8") or less (*2)			
Installation place	Inside control panel			
Over-voltage category	II or less (*3)			
Degree of contamination	2 or less (*4)			
Grounding	100Ω or less			

*1 The criterion is shown in IEC61131-2.
*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.
*3 This category indicates in which area (inside the site) in relation to the public 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.
*4 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.

2) Performance specifications

Item		Specification
Input	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
	Rated frequency	50 or 60Hz
	Power fuse	3.15A
	Inrush current	Max. 50A / 100V AC Max. 60A / 200V AC
Output	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 megger
Protection class		IP1X
Protection function	Over-voltage protection	27V to 33V 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)		0.4 kg (0.88 lbs)

Output derating



- 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.

5. Construction Cautions

Installation of dedicated power supply

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, use 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 2 A.
- 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 3.6 V.
- 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

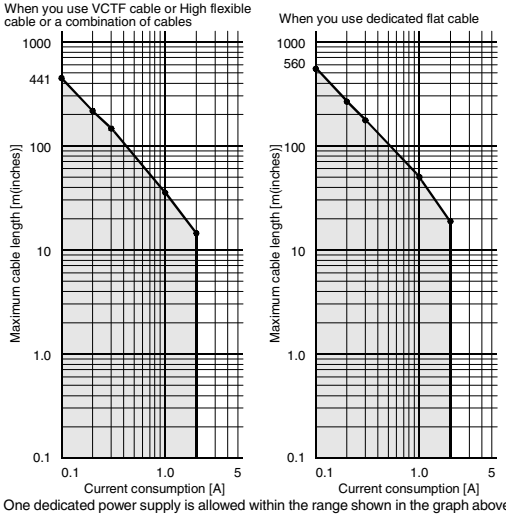
Current consumption in CC-Link/LT system = Total current consumption of each module in CC-Link/LT system + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)*1 ≤ 2A

*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

Voltage drop (V) = Maximum distance (m) + Constant: 9 × Constant : 0.08 × Total current consumption (A) ≤ 3.6V

• When you use dedicated flat cable

Voltage drop (V) = Maximum distance (m) + Constant: 11 × Constant : 0.06 × Total current consumption (A) ≤ 3.6V

Maximum distance = Furthest station from the dedicated power supply

Total current consumption = Total current consumption of each module in CC-Link/LT system + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)*1

*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.

Total current at start-up of each module of CC-Link/LT + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via a connecting cable) ≤ 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)"

6. Installation

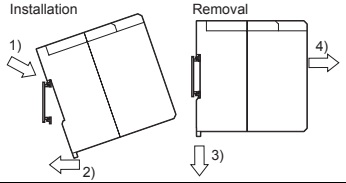
The dedicated power supply can be installed to a DIN rail or directly installed with screws.
Provide a space of 50mm (1.97 in.) or more between the dedicated power supply main unit and other equipment or structures. Keep the module as far away from high-voltage cables, high-voltage devices, or power-driven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



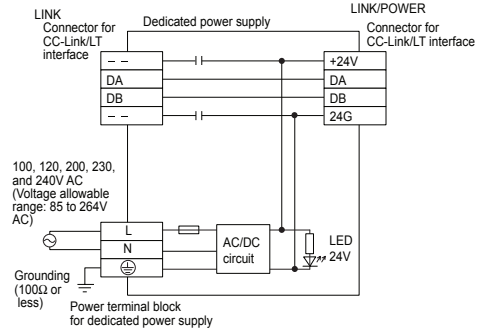
Applicable DIN rail	TH35-7.5Fe and TH35-7.5AI Width: 35mm (1.38")

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.

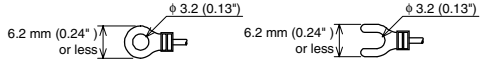
Applicable screw	M4 × 0.7mm(0.03") × 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N•m)

7. Power Wiring

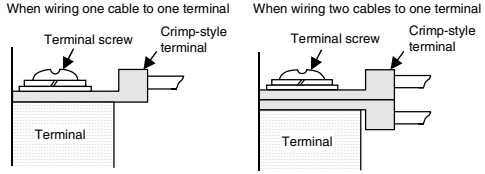


Crimp-style terminal

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.



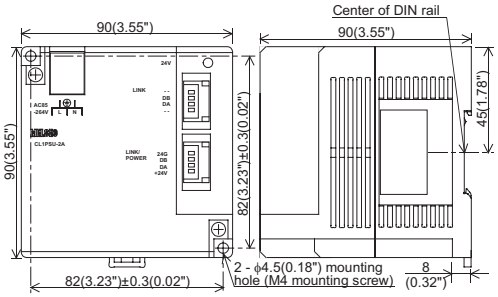
When wiring one cable to one terminal / When wiring two cables to one terminal



- Use a power wire of 2mm² (0.08in.²) or more.
- Perform grounding (100Ω or less) with a wire of 2 mm² (0.08in.²) 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.

8. Outside Dimensions

Unit: mm(inches)



Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage 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.

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USA	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, USA Tel : +1-847-478-2100
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MITSUBISHI ELECTRIC

Side B

Side A JAPANESE

Side B ENGLISH

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

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User's Manual

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Date	April 2015

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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.

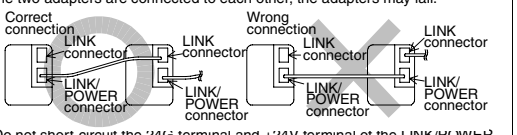
[WIRING PRECAUTIONS]

⚠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.

⚠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]

⚠WARNING

- 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.

⚠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]

⚠CAUTION

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

[TRANSPORTATION AND MAINTENANCE PRECAUTIONS]

⚠CAUTION

- 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.

●Note Concerning the 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 standards of the entire mechanical module should be checked by the user / manufacturer.

Attention

- This product is designed for use in industrial applications.

Note

- Authorized Representative in the European Community:
  Mitsubishi Electric Europe B.V.
  Gothaer Str. 8, 40880 Ratingen, Germany

Standards with which this product complies
Type : Programmable Controller (Open Type Equipment)
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

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)
EN61131-2: 2007 Programmable controllers -Equipment requirements and tests	Compliance with all relevant aspects of the standard. (Radiated Emissions, Conducted Emissions, Radiated electromagnetic field, Fast transient burst, Electrostatic discharge, High-energy surge, Voltage drops and interruptions, Conducted RF and Power frequency magnetic field)
Low Voltage Standards (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 enclosure which meets the requirements of EN61131-2:1994 + A11:1996 + A12:2000, :2007

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

- Notes for compliance to EMC LVD regulation.
  It is necessary to install the CL1 series module in a shielded metal control panel.
- Use this product in Zone A*1 as defined in EN61131-2.
  The terminal and the wiring for the power supply can be used in zone B*1.

*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.)

1. Associated manuals

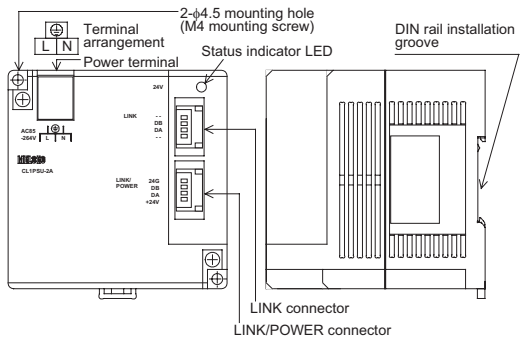
Manual name	Manual No. (Model code)	Description
CC-Link/LT: Power Adapter • Dedicated Power Supply USER'S MANUAL (Detailed Volume)	JY997D06601 (09R712)	Explains specifications, wiring, handling regarding the dedicated power supply and dedicated power supply for CC-Link/LT

2. 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.

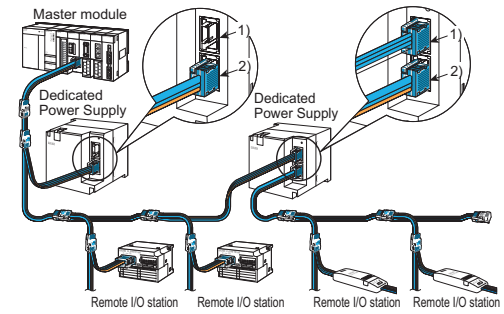
3. Name of Each Part

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
		DA	For communication
		24G	Power supply for communication (-)
		DB	For communication
		DA	For communication
		+24V	Power supply for communication (+)
Power terminal	L		Supplies power from outside to dedicated power supply. Input voltage: 100,120,200,230,and 240V AC (Voltage allowable range: 85 to 264V AC)
	N		
	⏚		

3.2 Handling of LINK connector and LINK/POWER connector



1) 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.
2) LINK/POWER connector
Dedicated for communication, and supplies the power to the CC-Link/LT system.

4. Specifications

1) General specifications

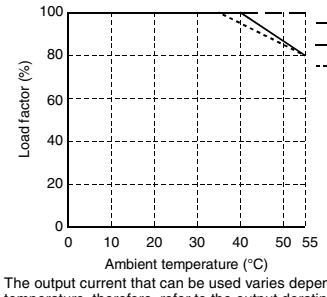
Item	Specification		
Ambient working temperature	0 to 55°C (32 to 131°F)		
Ambient storage temperature	-25 to 75°C (-13 to 167°F)		
Ambient operating humidity	5 to 95%RH: Dew condensation shall not be allowed.		
Ambient storage humidity	5 to 95%RH: Dew condensation shall not be allowed.		
Vibration resistance (*1)	Intermittent vibration is present		Number of sweep times
	Frequency	Acceleration	Half amplitude	10 times in each of X, Y and Z directions (80 min)
	10 to 57Hz	–	0.075mm	
	57 to 150Hz	9.8m/s²	–	
	Continuous vibration is present		
	Frequency	Acceleration	Half amplitude	
	10 to 57Hz	–	0.035mm	
	57 to 150Hz	4.9m/s²	–	
Impact resistance (*1)	147 m/s², 3 times in each of X, Y and Z directions		
Operating atmosphere	Corrosive gas should not be present.		
Operating altitude	2,000m(6561'8") or less (*2)		
Installation place	Inside control panel		
Over-voltage category	II or less (*3)		
Degree of contamination	2 or less (*4)		
Grounding	100Ω or less		

*1 The criterion is shown in IEC61131-2.
*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.
*3 This category indicates in which area (inside the site) in relation to the public 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.
*4 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.

2) Performance specifications

Item		Specification
Input	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
	Rated frequency	50 or 60Hz
	Power fuse	3.15A
	Inrush current	Max. 50A / 100V AC Max. 60A / 200V AC
Output	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 megger
Protection class		IP1X
Protection function	Over-voltage protection	27V to 33V 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)		0.4 kg (0.88 lbs)

Output derating



- 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.

5. Construction Cautions

Installation of dedicated power supply

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, use 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 2 A.
- 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 3.6 V.
- 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

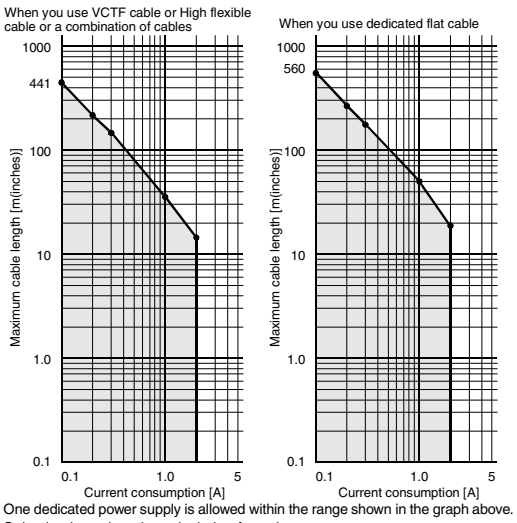
Current consumption in CC-Link/LT system = Total current consumption of each module in CC-Link/LT system + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)*1 ≤ 2A

*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

Voltage drop (V) = Maximum distance (m) + Constant: 9 × Constant : 0.08 × Total current consumption (A) ≤ 3.6V

- When you use dedicated flat cable

Voltage drop (V) = Maximum distance (m) + Constant: 11 × Constant : 0.06 × Total current consumption (A) ≤ 3.6V

Maximum distance = Furthest station from the dedicated power supply

Total current consumption = Total current consumption of each module in CC-Link/LT system + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via communication cable)*1

*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.

Total current at start-up of each module of CC-Link/LT + Total current consumption of I/O equipment (such as sensors) (to which power is supplied via a connecting cable) ≤ 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)"

6. Installation

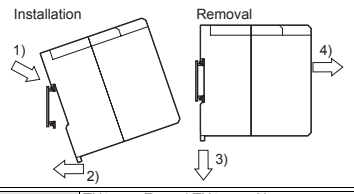
The dedicated power supply can be installed to a DIN rail or directly installed with screws.
Provide a space of 50mm (1.97 in.) or more between the dedicated power supply main unit and other equipment or structures. Keep the module as far away from high-voltage cables, high-voltage devices, or power-driven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



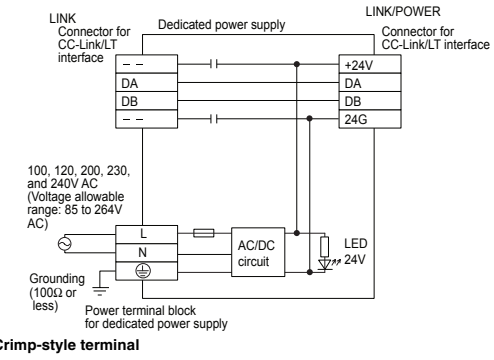
Applicable DIN rail	TH35-7.5Fe and TH35-7.5AI Width: 35mm (1.38")

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.

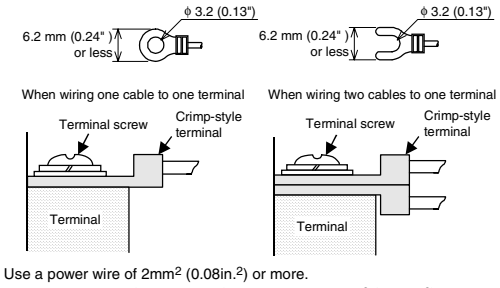
Applicable screw	M4 × 0.7mm(0.03") × 16mm(0.63") or more (Tightening torque range: 0.78 to 1.08 N•m)

7. 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 2mm² (0.08in.²) or more.
- Perform grounding (100Ω or less) with a wire of 2 mm² (0.08in.²) 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.

8. Outside Dimensions

Unit: mm(inches)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage 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.

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Specifications subject to change without notice.