H Series PLC HITACHI
EH-150 series
EH-IOCH2 Instruction manual

Thank you for purchasing a Hitachi Programmable Logic Controller. To operate it safely, please read this instruction manual and all the user manuals carefully. Please be sure to use the latest versions of user manuals and keep them at hand of end users for future reference.

■ Warranty period and coverage

The warranty period is either 18 months after manufacturing date (MFG No) or 12 months after installation. Examination and repair within the warranty period is covered.
However within the warranty period, the warranty will be void if the fault is due to;
(1) Incorrect use from instructed in this manual and the application manual.
(2) Malfunction or failure of external other devices than this unit.
(3) Attempted repair by unauthorized personnel.
(4) Natural disasters.
The warranty is for the PLC only, any damage caused to third party equipment by malfunction of the PLC is not covered by the warranty.

■ Repair

Any examination or repair after the warranty period is not covered. And within the warranty period any repair and examination which results in information showing the fault was caused by any of the items mentioned above, the repair and examination cost are not covered. If you have any questions regarding the warranty or repair cost, please contact your supplier or the local Hitachi Distributor. (Depending on failure part, repair might be impossible.)

■ Ordering spare parts and inquiries

Please contact your local suppliers for ordering products/spare parts or any inquiries with providing the following information.
(1) Product name
(2) Manufacturing number (MFG No.)
(3) Details of failure

Safety precautions

■ Definitions and Symbols

DANGER — **Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.**

CAUTION — **Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage of product.**

: Indicates prohibition

: Indicates Compulsion

DANGER

- **Do not touch terminals during power ON. There is a danger of electric shock and/or injury.**
- **Be sure to install external safety devices outside of the PLC like emergency stop circuit or interlock circuit.**

CAUTION

- **Be sure that the rated voltage matches the power supply voltage of the unit. Otherwise, there is a danger of breakdown and/or injury and/or fire.**
- **Only qualified personnel shall carry out wiring work. Otherwise, there is a danger of breakdown and/or injury and/or fire.**

COMPULSION

- **Be sure to ground the unit. Otherwise, there is a danger of electric shock and/or malfunction.**

PROHIBITION

- **Do not attempt to modify nor disassemble the unit. There is a danger of breakdown and/or injury and/or fire.**

■ Mounting

- **Mount the PLC on a metal plate and install in a cabinet as follows.**
- **Be sure to ground the cabinet and the metal plate, otherwise there is a risk of malfunction.**
- **Install the PLC as described in user manual.**
- **Take appropriate measures when the PLC system installed in locations :**
  - **Influenced easily due to noise or static electricity or other forms of noise.**
  - **Under strong electromagnetic field.**
  - **Close to power supplies.**
- **Be sure to tighten mounting screws, terminal screws and connector screws.**
- **Be sure to check that devices with lock mechanism, such as an expansion cable and terminal blocks, are locked properly.**

NJI-440B(X)

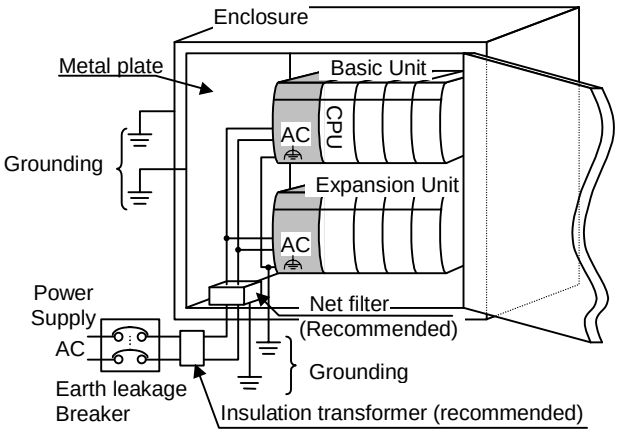


Figure 1 Power wiring example

Table1 Specifications of the net filter

Item		Spec.
Rated voltage		250 VAC
Rated current		5 A
Withstand voltage (V) (between Terminal and case)		1500 V
Insulation resistance (MΩ) (500VDC, 1 min., between terminal and case)		min. 100 MΩ
Attenuation Frequency range (MHz)	Differential mode, more than 40dB	0.5 - 30
	Common mode, more than 40dB	0.15 - 30

Reference : EMC filter ZAC2205-00U (TDK)

■ Power Wiring

- Appropriate emergency circuitry, interlock circuitry and similar safety measures should be added to the system.
- Appropriate safety measures should be included in the system for unexpected breaking of wire or malsignal caused from instantaneous power failure.
- Applied voltage must be in the range specified in the manual. Otherwise, there is a danger of breakdown and/or injury and/or fire.
- Install an external earth leakage breakers to avoid short circuit accident.
- In case of the following operations, turn off power. Otherwise, there is a danger of breakdown and/or injury and/or fire.
  - Mounting or dismounting CPU or I/O modules.
  - Assembling cabinet or machine including PLC.
  - Wiring.
- Install net filter specified in table-1 or similar. The input and output cable of the net filter should be separated as much as possible. Be sure to ground the net filter.
- A shielded and insulated transformer is recommended.
- The basic and expansion unit should be wired to a common power source and powered up together as shown in fig.1.
- In order to prevent damages on the equipment, installation of the lightening arrester is recommended in each power source circuit of PLC.

■ Wiring of expansion cable

Be sure to check if expansion cables are firmly locked. If it is not fully locked, output modules on expansion bases might be malfunction, which could cause wrong operation of connected devices.

■ I/O Wiring

- Be sure that the input/output voltage matches the specified voltage. Otherwise, there is a danger of breakdown and/or fire.
- Use shielded cable for relay outputs module, and connect shields to a functional ground for one side or both sides depending on applications.
- Route the AC power line and I/O lines separated as much as possible. Do not route both cables in a same duct.
- Route the I/O lines and data lines as close as possible to the grounded surfaces such as cabinet elements, metal bars and cabinets panels.

■ Common precautions

- Use proper cable ferrules for terminals. Using improper cable ferrules or connecting bare wires to terminals directly might result in fire.
- Do not turn on power, if the unit appears damaged.
- Be sure to check all the field wiring before PLC power on. Otherwise, there is a risk of fire.
- Do not attempt to disassemble, repair or modify any part of the PLC.
- Do not pull on cables or bend cables beyond their natural limit. Otherwise, there is a risk of breaking of wire.
- Keep PLC modules in their boxes during storage and transport.
- Check carefully your PLC program before operation.

Installation environment

Avoid the following locations to install the PLC.

- Excessive dusts, salty air, or conductive materials (iron powder, etc.)
- Direct sunlight.
- Temperature less than 0°C or more than 55°C.
- Humidity less than 20% or more than 90%.
- Dew condensation.
- Direct vibration or impact to the unit.
- Corrosive, explosive or combustible gases.
- Water, chemicals or oil splashing on the PLC.
- Close to noise emission devices.

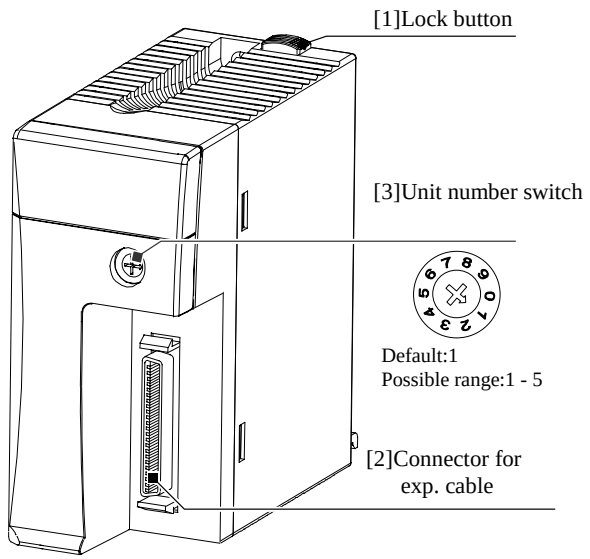
■ Reference Manual

Read the following application manual carefully to use the PLC safely and properly. Be sure to keep the latest version.

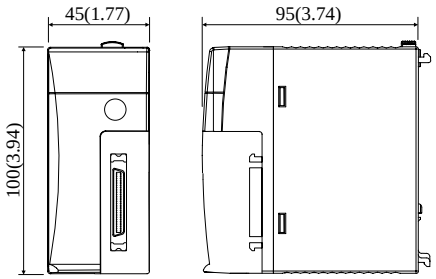
Manual name	Manual No.
EH-150 APPLICATION MANUAL	NJI-281* (X)
EHV CPU APPLICATION MANUAL	NJI-481 (X)

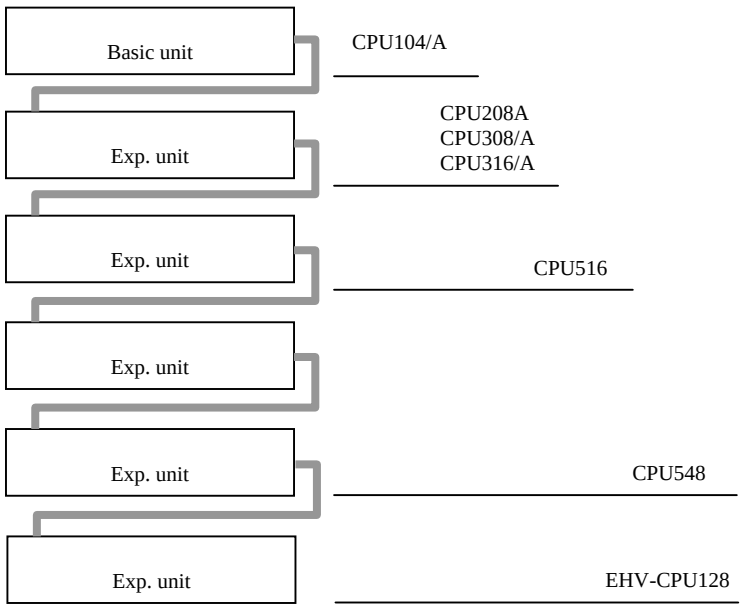
- : The alphabet between 281 and (X) means version (A,B…)

Name and function of each part



Type	EH-IOCH2
Weight	Approx. 0.14 kg
Current consumption	Approx. 80 mA
Dimensions (mm (ic.))	



No.	Name	Function
[1]	Lock button	When dismounting the module from a base unit, press this button and lift up the module. The module can be fixed firmly using a screw (M4, 10mm)
[2]	Connector for exp. cable	Connector for expansion cable.
[3]	Unit number switch	This is a rotary switch to set the unit number. Set the number 1 to 5 from the next unit to CPU module. Supported numbers of expansion unit are different according to CPU types as below figure. Be sure to set the switch without power since CPU is always reading unit number. If unit numbers are not set in order, this could cause malfunction. 

No.	Item	Details	Remarks
Function		The in/output controller sends output signal from CPU module to output modules on the exp. base, and reads input signals from input modules on the exp. base and sends back to the CPU module. This module is mounted on the next right to power supply module.	EH-CPU104 does not support expansion unit.

Caution

EH-IOCH2 has the upper compatibility with the past product(EH-IOCH,EH-IOC).

In case of using EH-CPU208A/316A/516/548:

EH-IOCH2 is used without limit at the CPU module's product specification.

In case of using EHV-CPU128:

Use EH-BS3A,5A,8A,11A for basic and exp. unit.

EH-IOCH and EH-IOCH2 can exist together. But use the EH-IOCH2 for Unit No.5.

Combination list with CPU

	Unit	EH-CPU208A/316A			EH-CPU516			EH-CPU548			EHV-CPU128		
	No.	IOC	IOCH	IOCH2	IOC	IOCH	IOCH2	IOC	IOCH	IOCH2	IOC	IOCH	IOCH2
EH-BS*A(1)	1	√	√	√	√	√	√	√	√	√	×	√	√
	2	×	×	×	×	√	√	×	√	√	×	√	√
	3	×	×	×	×	×	×	×	√	√	×	√	√
	4	×	×	×	×	×	×	×	√	√	×	√	√
	5	×	×	×	×	×	×	×	×	×	×	×	√
	6-9	×	×	×	×	×	×	×	×	×	×	×	×
EH-BS3,5,8	1	√	√	√	√	√	√	√	√	√	×	×	×
	2-9	×	×	×	×	×	×	×	×	×	×	×	×

√: Available combination. EH-IOCH and EH-IOCH2 can exist together.

×:Not available combination

(1) : EH-BS11A is only for EH-CPU516,548,EHV-CPU128.