EC10 Series PLC Passive I/O Extension Module User Manual

Thank you for using Emerson programmable logic controller (PLC). Before using the EC10 series PLC product, please carefully read this booklet so as to better understand it, fully use it, and ensure safety.

Briefly introduced in this booklet are the hardware specs, features, and usage of EC10 series PLC extension module. For detailed PLC usage and composition of user program, please refer to our *EC10 Series PLC User Manual*, *ControlStar Programming Software User Manual,* and *EC20/EC10 Series PLC Programming Manual.* For ordering the above user manuals, contact your Emerson distributor.

1 Introduction

1.1 Appearance And Structure

The appearance and structure of I/O extension module are shown in the following figure.

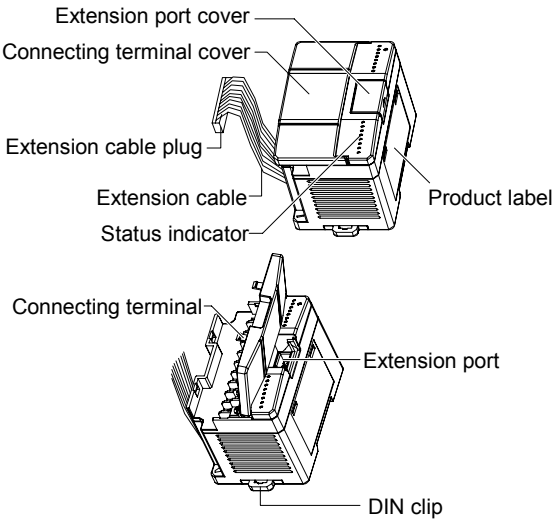

Figure 1-1 Appearance and structure

1.2 Model Designation

The model designation is shown in the following figure.

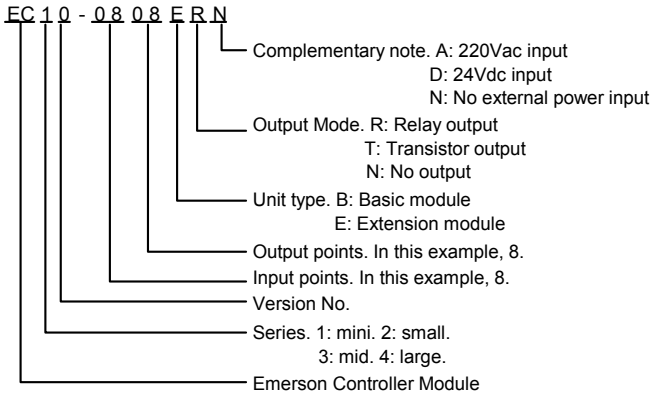

Figure 1-2 Model designation

1.3 Terminal Introduction

EC10-0808ERN, EC10-0808ETN

Pin	Function
S/S	Input mode selection: sink mode when connected with +24V, or source mode when connected with COM
	Null, for isolation. Leave it suspended
X0 ~ X7	Digital input, work with COM to generate input signal
Y0 ~ Y7, COM0	Digital output

EC10-0800ENN

Pin	Function
S/S	Input mode selection: sink mode when connected with +24V, or source mode when connected with COM
	Null, for isolation. Leave it suspended
X0 ~ X7	Digital input, work with COM to generate input signal

EC10-0008ERN, EC10-0008ETN

Pin	Function
S/S	Input mode selection: sink mode when connected with +24V, or source mode when connected with COM
	Null, for isolation. Leave it suspended
Y0 ~ Y7, COM0	Digital output

2 Power Supply

Table 2-1 I/O extension module type and configuration

Type	Power supply voltage Vac	Number of I/O channels	Output type
EC10-0800ENN	-	8/0	-
EC10-0808ERN	-	8/8	Relay
EC10-0808ETN	-	8/8	Transistor
EC10-0008ERN	-	0/8	Relay
EC10-0008ETN	-	0/8	Transistor

Table 2-2 I/O extension module insulation specifications

Name	Test condition
User output (relay) to extension bus	Capable of standing one minute of 2830Vac (50Hz) or RMS current with no breakdown or flashover. Leakage current ≤5mA
User input to user output (relay)	Capable of standing one minute of 2830Vac (50Hz) or RMS current with no breakdown or flashover. Leakage current ≤5mA
User input terminal and extension bus	Designed by following the SELV circuit requirements

Table 2-3 I/O extension module power requirement

Model	5Vdc/GND	24Vdc/GND	24Vdc/COM
EC10-0800ENN	85mA	0	50mA
EC10-0808ERN	70mA	50mA	50mA
EC10-0808ETN	170mA	0	50mA
EC10-0008ERN	70mA	50mA	0
EC10-0008ETN	170mA	0	0

Note:
1. 5Vdc/GND: working power for logic circuit of extension module, provided by the extension bus
2. 24Vdc/COM: input state detection power, through S/S terminal
3. 24Vdc/GND: working power for relay circuit of extension module, provided by the extension bus

Before connecting the extension module to the basic module, calculate the total current of all extension module circuits. Make sure that the currents are smaller than the capacity of the corresponding power supply at the basic module to avoid overloading the basic module.

3 Input Features

3.1 Internal Equivalent Input Circuit

The extension module needs external power supply (+24Vdc) for detecting user switch status. The internal equivalent resistance of the input circuit is about 4.3kΩ, and bi-directional photo coupler is used for signal detection. You can use either sink mode or source mode, so long as dry contact digital signal is input. To connect to the output of active transistor sensor, you need to use the open collector output mode. The wiring of I/O extension module internal equivalent power and inputs is the same as those of the basic module, as shown in Figure 3-1.

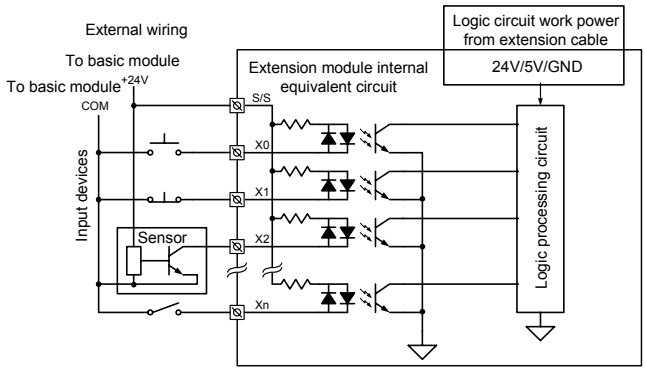

Figure 3-1 Internal equivalent input circuit

3.2 I/O Signal State Indicator

The input status indicator displays the status of input terminal. The indicator turns on when the input is in the ON state. Otherwise, the indicator is off.

The output status indicator displays the status of output terminal. The indicator turns on when the output is in the ON state (Yn is connected with COMn). Otherwise, the indicator is off. See Figure 3-2.

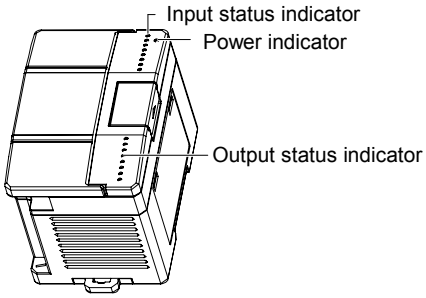

Figure 3-2 Status indicator

4 Output Features

4.1 Relay Output Electric Specifications

Table 4-1 Relay output terminal electric specifications

Item		Relay output terminal
External power		Below 250Vac, 30Vdc
Circuit isolation		By relay
Operation indication		Relay output contacts closed, LED on
Leakage current of open circuit		-
Min. load		2mA/5Vdc
Max. output current	Resistive load	2A/1 point, total current of 8 points (sharing one COM) < 8A
	Inductive load	220Vac, 80VA
	Illumination	220Vac, 100W
Response time	OFF→ON	Max.: 20ms
	ON→OFF	Max.: 20ms

4.2 Transistor Output Electric Specifications

Table 4-2 Transistor output electric specifications

Item		Transistor output terminal
External power		5 ~ 24Vdc
Circuit isolation		Photo coupler
Operation indication		LED is on when photo coupler is driven
Leakage current of open circuit		< 0.1mA/30Vdc
Min. load		5mA (5 ~ 24Vdc)
Max. output current	Resistive load	3A/1 point 8A/4 points 1.6A/8 points Above 8 points, total current increases 0.1A at each point increase
	Inductive load	24Vdc, 7.2W
	Illumination	24Vdc, 1.5W
Response time	OFF→ON	Max. 0.5ms (100mA/24Vdc)
	ON→OFF	Max. 0.5ms (100mA/24Vdc)

4.3 Output Connection Example

Connecting an EC10-0808ERN to an EC10-1614BRA is shown in Figure 4-1. Different output groups can be connected to different signal voltage circuits. For example, output group Y0-COM0 can be connected to the 24Vdc circuit, powered by the local 24V/COM; Y1-COM1, to the 5Vdc circuit; others, like Y2 ~ Y7, to the 220Vac circuit. That is, different output groups can work at circuits of different voltages.

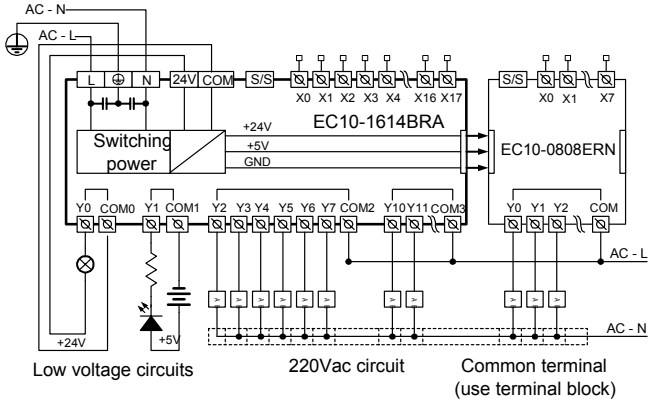

Figure 4-1 Connecting EC10-1614BRA & EC10-0808ERN

5 Extension Connection

5.1 Extension Bus Connection

Before power-on, remove the cover of the extension port at the right of the basic module. Insert the bus plug into the extension port. If there are more than one extension modules, connect them one by one. Note that the extension port cover is detachable. Do not have it lost.

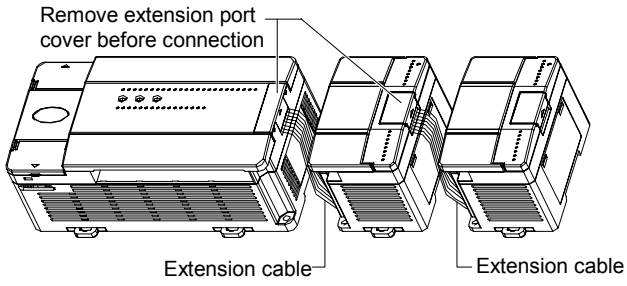

Figure 5-1 Cascade connection of extension module

5.2 Extension Module Addressing

EC10 series PLC can identify the connected extension module and address them by connection order automatically.

The extension module address is set upon the first power on and remains unchanged. Therefore do not insert or remove the extension module during operation, otherwise abnormalities may occur, or PLC may be damaged.

The addresses of I/O channels are in the octal system, numbered as 0, 1, . . . , 7, 10, 11 and so on, without numbers 8 and 9.

The input terminals of all modules (basic and extension) are numbered as X0, X1, X2, …X7, X10, X11 and so on, while the output terminals are numbered as Y0, Y1, Y2, …Y7, Y10, Y11 and so on. Every eight channels form one group. If the remaining channels are less than 8, the unused numbers will be left unassigned.

For example, in module EC10-1410BRA, its 14 input channels are numbered asX0 ~ X15, there will be no channels numbered as X16 or X17, because the input channels of the next extension module will start from X20. Likewise, if the module has 10 output channels that are numbered as Y0 ~ Y11, there will be no channels numbered as Y12 ~ Y17, because the output channels of the next extension module will start from Y20.

The extension modules' I/O channels are numbered in accordance with the module's connection order. See the following for a numbering example.

EC10-1410BRA	EC10-0808ETN	EC10-0008ERN	EC10-0800ENN	EC10-0008ETN
X0~X15	X20~X27		X30~X47	
Y0~Y11	Y20~Y27	Y30~Y37		Y40~Y47

6 Installation

6.1 Sizes

There are five I/O extension module models: EC10-0800ENN, EC10-0808ERN, EC10-0808ETN, EC10-0008ERN and EC10-0008ETN. Their sizes and installation holes are shown in Figure 6-1.

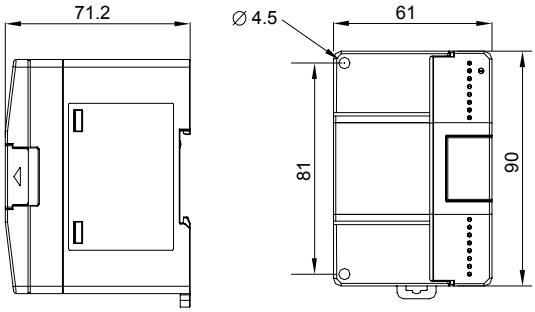

Figure 6-1 I/O extension module sizes and installation holes

6.2 Installation Method

The installation method of extension module is the same as that of the basic module. See *EC10 PLC User Manual* for details. See Figure 6-2 for the installation diagram.

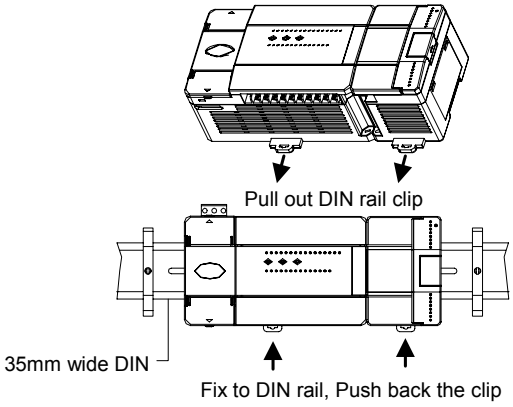

Figure 6-2 DIN rail mounting

Notice

1. The warranty range is confined to the PLC only.
2. **Warranty period is 18 months**, within which period Emerson Network Power conducts free maintenance and repairing to the PLC that has any fault or damage under the normal operation conditions.
3. **The start time of warranty period is the delivery date of the product**, of which the product SN is the sole basis of judgment. PLC without a product SN shall be regarded as out of warranty.
4. Even within 18 months, maintenance will also be charged in the following situations:
   - Damages incurred to the PLC due to mis-operations, which are not in compliance with the User Manual;
   - Damages incurred to the PLC due to fire, flood, abnormal voltage, etc;
   - Damages incurred to the PLC due to the improper use of PLC functions.
5. The service fee will be charged according to the actual costs. If there is any contract, the contract prevails.
6. Please keep this paper and show this paper to the maintenance unit when the product needs to be repaired.
7. If you have any question, please contact the distributor or our company directly.

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