

EC20 系列无电源 I/O 扩展模块

用户手册

感谢您购买迈特控制技术有限公司开发生产的可编程控制器（PLC），在使用我公司 EC20 系列 PLC 产品前，敬请您仔细阅读本手册，以便更清楚地掌握产品的特性，正确地进行安装使用。更安全地应用，充分利用本产品丰富的功能。

注意：

在开始使用之前，请仔细阅读操作指示、注意事项，以减少意外的发生。负责产品安装、操作的人员必须经严格培训，遵守相关行业的安全规范，严格遵守本手册提供的相关设备注意事项和特殊安全指示，按正确的操作方法进行设备的各项操作。

1 产品介绍

1.1 外形结构

EC20 系列无电源 I/O 扩展模块的外形结构如下图所示。

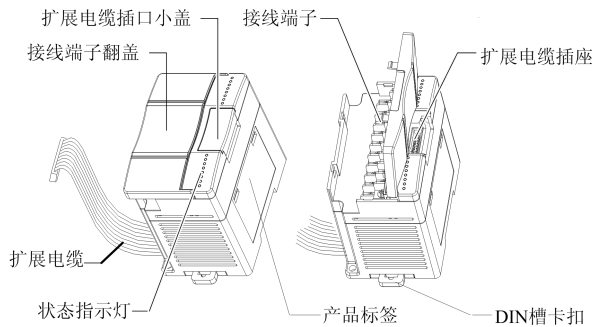


图 1-1 无电源 I/O 扩展模块的外形结构与部件

1.2 型号说明

产品型号说明如下图所示。

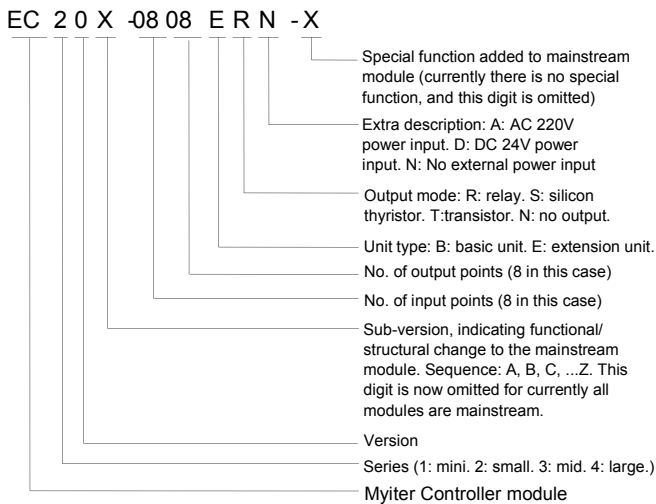


图 1-2 可编程控制器型号说明

1.3 外形端子图

EC20-0808ERN外型及端子图

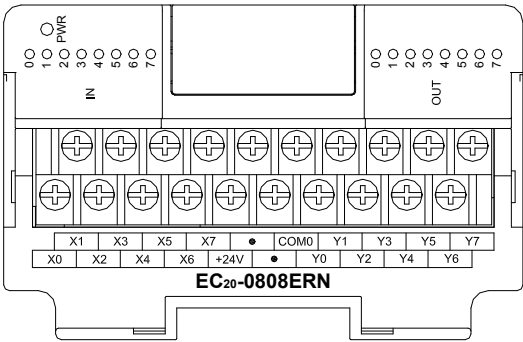


图 1-3 EC20-0808ERN 外型及端子图

EC20-0808ETN外型及端子图

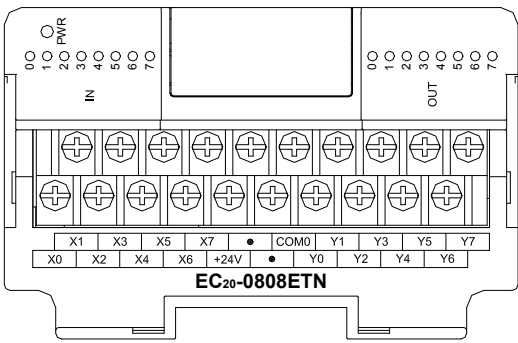


图 1-4 EC20-0808ETN 外型及端子图

EC20-0008ERN外型及端子图

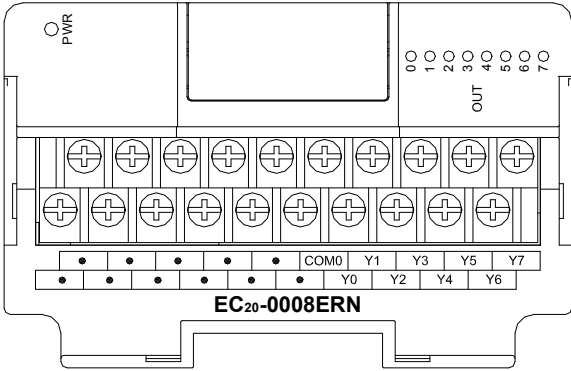


图 1-5 EC20-0008ERN 外型及端子图

EC20-0008ETN外型及端子图

{ EMBED Visio.Drawing.6 }图 1-6 EC20-0008ETN 外型及端子图

图 1-10 EC20-0016ETN 外型及端子图

表 3-3 无电源 I/O 扩展模块电源要求

型号	DC5V/GND	DC24V/GND	DC24V/COM
EC20-0800ENN	50mA	—	45mA
EC20-0008ERN	65mA	75mA	—
EC20-0008ETN	95mA	—	—
EC20-0808ERN	50mA	50mA	50mA
EC20-0808ETN	130mA	—	45mA
EC20-1600ENN	75mA	—	90mA
EC20-0016ERN	65mA	75mA	—
EC20-0016ETN	190mA	—	—

备注：

1. DC5V/GND：扩展模块的逻辑电路工作电源，由扩展母线提供。
2. DC24V/COM：输入状态检测电源，由 24V 端子引入。
3. DC24V/GND：扩展模块的继电器电路工作电源，由扩展母线提供。

扩展模块接入主模块前，必须计算扩展模块的各路电源所耗电流之和，保证各路电源电流小于主模块对应电源能提供的输出电流，避免主模块电源过载。

解决电源容量不足的方案是选用自带电源的扩展模块，它不仅可为自身供电，其 5Vdc、24Vdc/GND、24Vdc/COM 的输出可作为其后续扩展模块的电源。

4 输入特性

4.1 内部等效输入电路

扩展模块需外部接入用户开关状态检测电源（24Vdc），输入电路的内部等效电阻约 4.3k Ω ，信号的检测采用双向光耦，用户可采用源型或漏型，只需接入干接点开关信号即可，若要连接有源晶体管传感器的输出信号，需 OC 输出方式信号。IO 扩展模块的内部等效电源及输入信号接线与主模块输入电路相似，如下图所示。

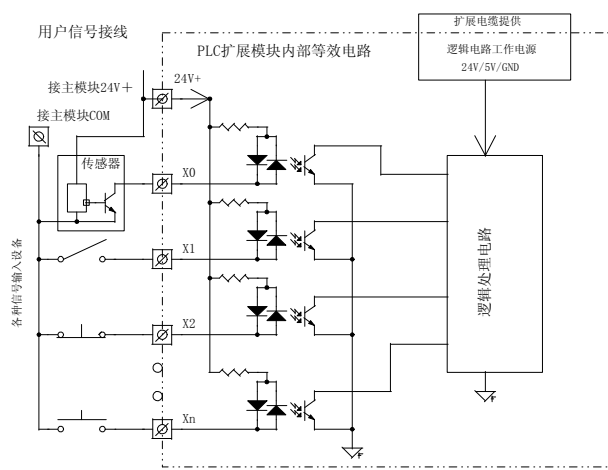


图 4-1 IO 扩展模块内部等效输入电路

4.2 输入输出信号状态指示

用户输入端子状态可通过输入端子状态 LED 灯指示，当输入端口闭合（ON 状态）时，指示灯点亮，否则指示灯熄灭。

输出端口的状态由输出状态 LED 指示，当输出端口为闭合

（ON）状态（Yn 与 COMn 之间呈闭合状态），指示灯点亮，否则熄灭，如下图。

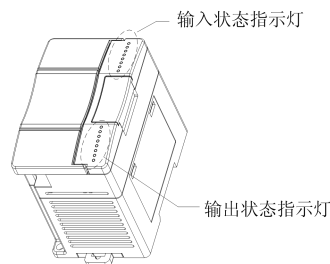


图 4-2 EC20 系列扩展模块状态指示灯

5 输出特性

5.1 继电器型输出端口电气规范

表 5-1 继电器型输出端口电气规范

项目	继电器输出端口
回路电源电压	250Vac，30Vdc 以下
电路绝缘	继电器机械绝缘
动作指示	继电器输出触点闭合 LED 点亮
开路时漏电流	/
最小负载	2mA/5Vdc
最大输出电流	电阻负载 2A/1 点；共 COM 端的 8 点总电流小于 8A
	感性负载 220Vac，80VA
	电灯负载 220Vac，100W
ON 响应时间	最大 20ms
OFF 响应时间	最大 20ms

5.2 晶体管型输出端口电气规范

表 5-2 晶体管型输出端口电气规范

项目	晶体管输出端口
回路电源电压	5~24Vdc
电路绝缘	光耦绝缘
动作指示	光耦被驱动时 LED 点亮
开路时漏电流	小于 0.1mA/30Vdc
最小负载	5mA（5~24Vdc）
最大输出电流	电阻负载 0.3A/1 点；0.8A/4 点；1.6A/8 点；8 点以上每增加 1 点允许总电流增加 0.1A
	电感负载 24Vdc，7.2W
	电灯负载 24Vdc，1.5W
ON 响应时间	最大 0.5ms（100mA/24Vdc）
OFF 响应时间	最大 0.5ms（100mA/24Vdc）

5.3 输出连接示例

图 5-1 所示为 EC20-3232BRA 加一个 EC20-0808ERN 的连接方式。不同的输出组可接入不同的信号电压回路，有的输出组（如 Y0-COM0）可连接在 +24Vdc 回路，且由本控制器的 24V/COM 供电；有的输出组（如 Y1-COM1）可连接在 +5Vdc 低电压信号回路；而其它输出组（如 Y2~Y7）可连接在 220Vac 交流电压信号回路。即不同的输出组可工作于不同的电压等级回路。

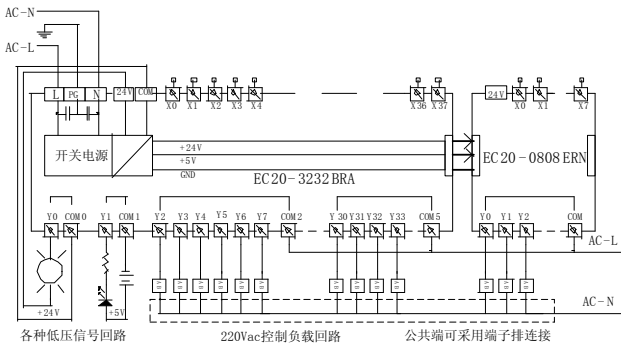


图 5-1 EC20—3232BRA 与 EC20—0808ERN 的电气连接示例

6 扩展连接

6.1 扩展母线连接

在主模块未通电的情况下，先卸下主模块右端的扩展电缆插口小盖板，再将扩展模块的母线电缆头插入插口内的电缆座。若接入多个扩展模块，可依次逐个连接。请注意扩展电缆插口小盖板为可脱落零件，拆卸时防止丢失。

扩展电缆插口小盖，连接电缆前卸下

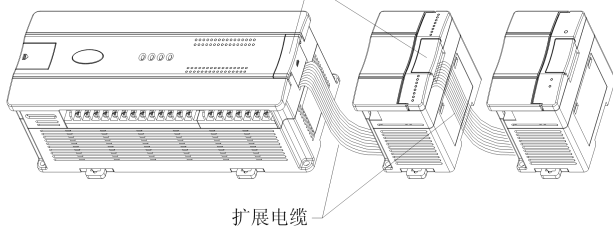


图 6-1 扩展模块级联方法

6.2 扩展模块编址

EC20 系列可编程控制器对接入的扩展模块可以自动辨识，自动顺序编址，无需用户干预。

自动编址操作在上电正常后即进行一次，此后运行中各扩展模块的地址保持不变。在可编程控制器运行期间，不可将 IO 扩展模块、特殊功能模块接入或拔掉，以免损坏可编程控制器，或导致运行异常。

自带电源扩展模块的电源必须与主模块电源同时上电，或在主模块上电之前供电，保证扩展模块可靠编址。

IO 点编号采用八进制编码方案，编号如：0，1，2，3，4，5，6，7，10，11，12，13，14，15，16，17，20，21，...，没有数字 8，9。

主模块及 IO 扩展模块的输入端口编号为：X0，X1，X2，...X7，X10，X11，...，输出端口编号为：Y0，Y1，Y2，...Y7，Y10，Y11，...，编号依此顺序排列。点数编号以 8 为一组，不足 8 点的部分将被空缺。

例如：EC20-2012BRA 模块，输入点数为 20 点，编号为 X0～X23，编号为 X24～X27 的端子将不存在，后续扩展模块的 X 端子从 X30 开始编号；同理，输出点数为 12 点，编号为 Y0～Y13，编号为 Y14～Y17 的端子将不存在，后续扩展模块的 Y 端子将从 Y20 开始编号。

IO 扩展模块依据与主模块的扩展连接电缆的连接顺序，对应 X 端子和 Y 端子依次递增编号。

主模块与扩展模块的端口逻辑编号示例如下：

{ EMBED Word.Picture.8 }

用户须知

1. 保修范围指可编程控制器本体。
2. **保修期为十八个月**，保修期内正常使用情况下，产品发生故障或损坏，我公司免费维修。
3. **保修期起始时间为产品制造出厂日期**，机器编码是判断保修期的唯一依据，无机器编码的设备按过保处理。
4. 即使在保修期内，如发生以下情况，将收取一定的维修费用：
 - 不按用户手册操作导致的机器故障；
 - 由于火灾、水灾、电压异常等造成的机器损坏；
 - 将可编程控制器用于非正常功能时造成的损坏。
5. 服务费按实际费用计算，如另有合同，以合同优先的原则处理。
6. 请您务必保留此卡，并在保修时出示给维修单位。
7. 如您有问题可与代理商联系，也可直接与我公司联系。

深圳市迈特控制技术有限公司

客户服务中心

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EC20 Series PLC Passive I/O Extension Module User Manual

Please allow us to congratulate you on choosing an Myiter programmable logic controller (PLC). Before using the EC20 series PLC product, please carefully read this book so as to fully understand its characteristics, use it safely and bring its functions into full play.

Note:

To reduce the chance of accident, please carefully read the operating instructions and safety precautions prior to use. Only adequately trained personnel shall install or operate this product. In operation, strict compliance with applicable safety rules in the industry, the operating instructions and safety precautions in this book is required.

1 General Description

1.1 Appearance

The appearance of EC20 series Passive I/O extension module is shown in the following figure.

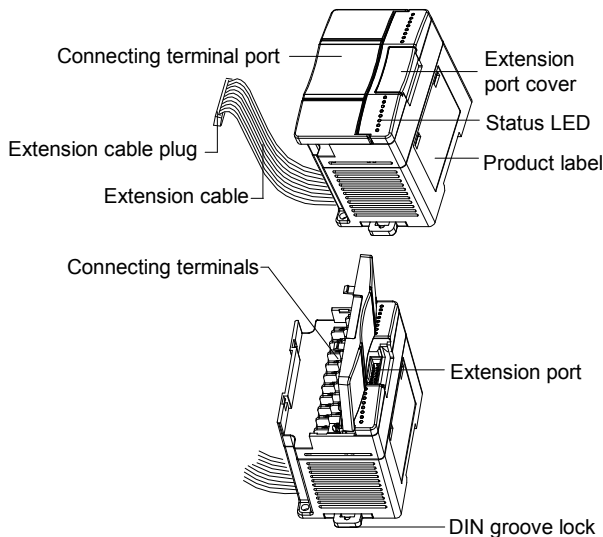


Figure 1-1 Appearance of extension module

1.2 Model Description

The model description is shown in the following figure.

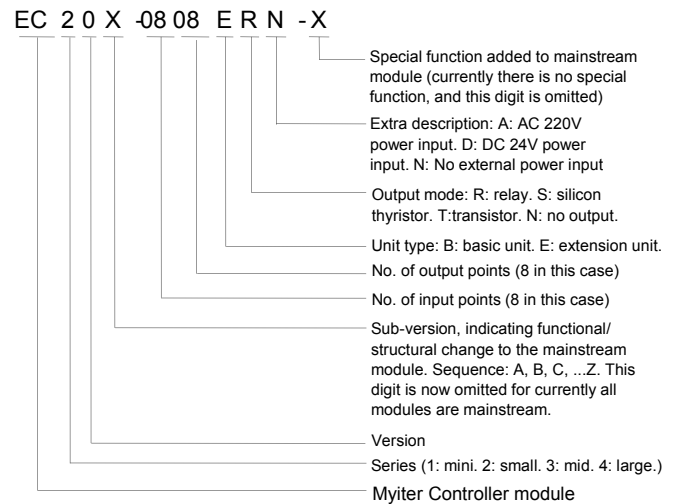


Figure 1-2 Model description

2 Installation

2.1 Sizes

There are eight passive I/O extension module models: EC20-0800ENN, EC20-1600ENN, EC20-0808ERN, EC20-0808ETN, EC20-0008ERN, EC20-0008ETN, EC20-0016ERN and EC20-0016ETN. The dimensions of the modules are shown below.

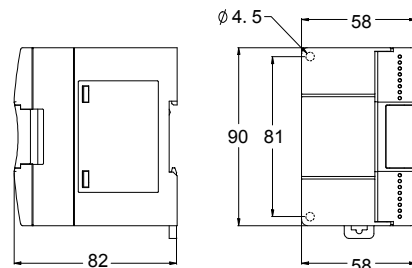


Figure 2-1 I/O extension module dimensions (unit: mm)

2.2 Installation

The installation method is the same as that of the basic module. For details, refer to *EC20 Series PLC User Manual*. See the following figures for the installation.

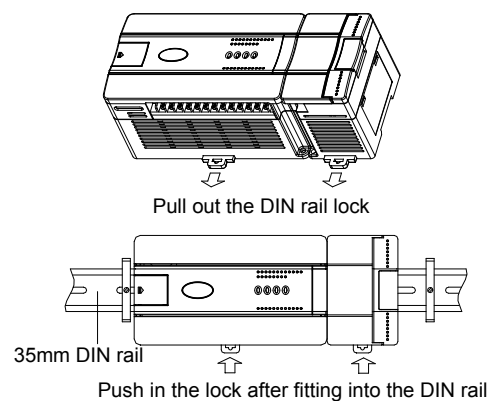


Figure 2-2 Fixing on DIN rail

3 Product Specification

Table 3-1 Extension module type and configuration

Type	Supply voltage Vac	Input/output points	Output type
EC20-0800ENN	/	8/0	/
EC20-0008ERN	/	0/8	Relay
EC20-0008ETN	/	0/8	Transistor
EC20-0808ERN	/	8/8	Relay
EC20-0808ETN	/	8/8	Transistor
EC20-1600ENN	/	16/0	/
EC20-0016ERN	/	0/16	Relay
EC20-0016ETN	/	0/16	Transistor

Table 3-2 Insulation specifications of EC20 series PLC

Name	Specifications
User output (relay mode) to extension bus	Able to withstand 50Hz, 2300Vac or equivalent DC voltage for one minute without breakdown or flashover and with leakage current not more than 30mA
User input to user output (relay mode)	Able to withstand 50Hz, 2300Vac or equivalent DC voltage for one minute without breakdown or flashover and with leakage current not more than 30mA
User input terminal to extension bus	SELV circuit requirements are met

Table 3-3 Power requirements of extension module

Model	DC5V/GND	DC24V/GND	DC24V/COM
EC20-0800ENN	50mA	/	45mA
EC20-0008ERN	65mA	75mA	/
EC20-0008ETN	95mA	/	/
EC20-0808ERN	50mA	50mA	50mA
EC20-0808ETN	130mA	/	45mA
EC20-1600ENN	75mA	/	90mA
EC20-0016ERN	65mA	75mA	/
EC20-0016ETN	190mA	/	/

Note:

1. DC5V/GND: The working power of the logical circuit of the extension module comes from the extension bus
2. DC24V/COM: The input status sensing power is led in through the "24V" terminal
3. DC24V/GND: The working power of the relay circuit of the extension module comes from the extension bus

Before connecting the extension module to the PLC, to prevent the basic module from being overloaded, you should:

1. Add up the current consumption of all power loops of the extension module.
2. Make sure the current consumption of each power loop of the extension module is smaller than the output current the corresponding power source of the basic module can provide.

The solution to insufficient power supply is to select an active extension module. Besides providing power for itself, it can provide power to the extension modules added later through its 5Vdc, 24Vdc/GND and 24Vdc/COM terminals.

4 Input Characteristics

4.1 Internal Equivalent Input Circuit

The extension module should be connected to external user switch status sensing power (24Vdc). The internal equivalent resistance of its input circuit is approximately 4.3kΩ. The signal sensing adopts bi-directional optical coupling, and the signal input can be source or sink type. You only need to connect dry contact switch signals. If you need to connect output signals of active transistor sensors, they should be OC output signals. The IO extension module's internal equivalent power and input signal connections resemble the mains module's input circuit, as shown in Figure 4-1.

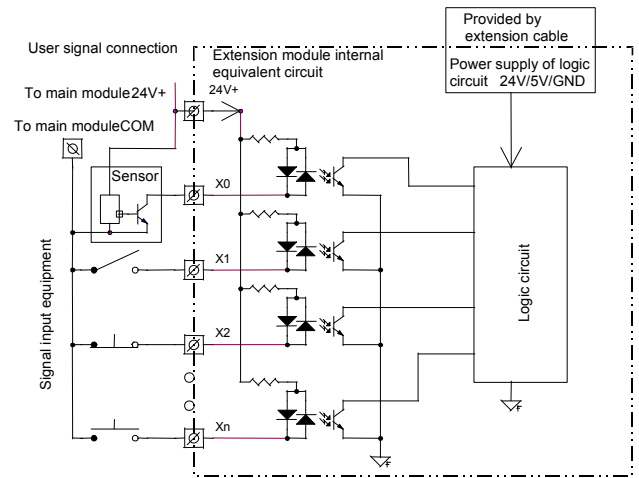


Figure 4-1 Internal equivalent input circuit

4.2 I/O Status Indication

The input status LEDs indicate the status of the user input port. It is on when the input port is closed (ON), and off otherwise.

The output status LEDs indicate the status of the output port. It is on when the output port is closed (ON, with pin Yn connected to pin COMn), and off otherwise. See the following figure.

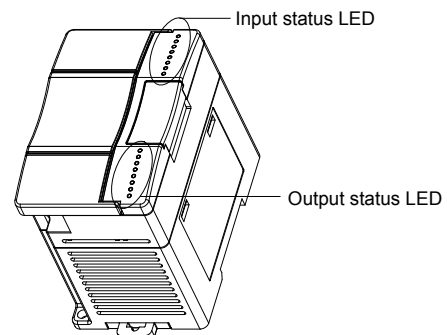


Figure 4-2 Status LEDs of EC20 series extension module

5 Output Characteristics

5.1 Electrical Specifications Of Relay Output Port

Table 5-1 Electrical specifications of relay output port

Item		Relay output port
Voltage		250Vac, below 30Vdc
Circuit insulation		Relay physical insulation
Action indication		LED turns on when the relay output contact is closed
Open circuit leakage current		/
Min. load		2mA/5Vdc
Max output current	Resistive load	2A/1 point. The total current of the 8 points sharing COM port should be smaller than 8A
	Inductive load	220Vac, 80VA
	Electric light load	220Vac, 100W
ON response time		20ms Max
OFF response time		20ms Max

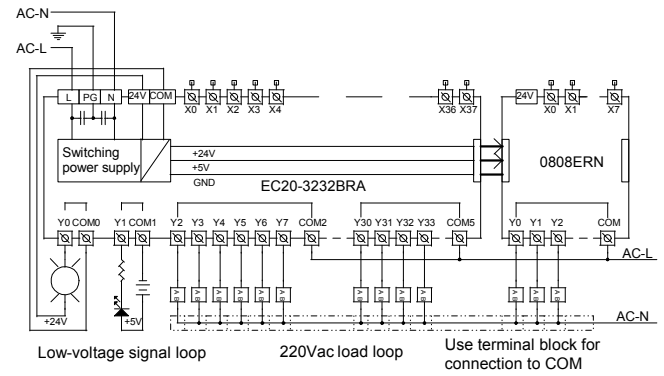
5.2 Electrical Specifications Of Transistor Output Port

Table 5-2 Electrical specifications of transistor output port

Item		Transistor output port
Voltage		5 ~ 24Vdc
Circuit insulation		Optical coupling insulation
Action indication		The LED turns on when the optical coupling is driven
Open circuit leakage current		< 0.1mA/30Vdc
Min. load		5mA (5 ~ 24Vdc)
Max output current	Resistive load	0.3A/1 point, 0.8A/4 points; 1.6A/8 points; above 8 points, each point can add 0.1A to total current
	Inductive load	24Vdc, 7.2W
	Electric light load	24Vdc, 1.5W
ON response time		[0.5ms (100mA/24Vdc)
OFF response time		[0.5ms (100mA/24Vdc)

5.3 Output Connection Example

Figure 5-1 shows the connection between EC20-3232BRA and EC20-0808ERN. Different output groups can connect to different signal voltage loops. Some output groups (like Y0-COM0) can connect to +24Vdc loop and can be supplied by 24V/COM of the EC20 PLC, some (like Y1-COM1) can connect to +5Vdc low voltage signal loop; while others (like Y2~Y7) can connect to 220Vac signal loop. That is to say, the output groups can work at different voltage levels.



Take the EC20-2012BRA module as an example, the input has 20 points, the coding is from X0 to X23, terminals from X24 to X27 do not exist, the X terminals of the extension modules added later start from X30; likewise, the output has 12 points, the coding is from Y0 to Y13, terminals from Y14 to Y17 do not exist, the Y terminals of the extension modules added later start from Y20.

The X and Y terminals of the IO extension modules are coded in the sequence they are added into the system.

Example of logic coding of the basic module's and extension module's ports:

EC20 - 2012BRA	0808ETN	1600ENN	4AD	4AD	4DA	0016ERN	4TC
X0 -X23	X30- X37	X40- X47	0	1	2	Y30 - Y37	3
Y0 -Y13	Y20- Y27	X50- X57				Y40- Y47	

Notice

1. The warranty range is confined to the PLC only.
2. **Warranty period is 18 months**, within which period Shengzhen Myiter Control Technology 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.

Shengzhen Myiter Control Technology Co.,Ltd

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