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Delta EtherCAT Gateway Slave Module R1-EC60X2 Digital Input Module Series User Guide

Preface

Thank you for purchasing this product. This user guide provides information about the R1-EC60X2 series EtherCAT remote control 16-channel DI expansion module.

This user guide includes:

- Product inspection and model explanation
- Specifications and product interface
- Wiring

Product features of the EtherCAT remote control expansion module

The R1-EC60X2 series digital input module supports the EtherCAT (Ethernet Control Automation Technology) protocol, which can be a high-performance distributed I/O system. The DI module provides the status reading interface for NPN and PNP load types. With the E-Bus power module, it can read the status of the EtherCAT master station remote digital signal, which can instantly acquire the data of the load status for multiple sets of slave modules within 1 ms.

The EtherCAT series products have a number of modules with different functions and features to meet different remote automation control requirements. This product is the optimal integration platform for reading the multi-point load status. It is easy to assemble with better stability and scalability. This is the one and only choice for industrial upgrading.

How to use this user guide

You can use this user guide as a reference while using the R1-EC60X2 series EtherCAT 16-channel DI expansion module, which contains the information related to the product installation, setting, as well as instructions on how to use and maintain this product.

Delta technical services

Please consult your Delta equipment distributor or Delta Customer Service Center if you encounter any problems.



EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

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Product Inspection and Model Explanation

1

This chapter provides the overview of the product inspection, model description, and instructions for using the R1-EC60X2 series product.



1.1	Product inspection	1-2
1.2	Model name explanation	1-2
1.3	Product instructions	1-2

1

1.1 Product inspection

Please check the following once you receive the product:

1. Packaging: make sure the product’s packaging is intact.
2. Bubble wrap: for protection of the product; make sure the stickers are securely attached to the bubble wrap.
3. R1-EC60X2: check if the product appearance is intact and all accessories are included.
4. Product installation instructions: check if an instruction sheet is included.

1.2 Model name explanation

$$\frac{R}{(1)} \frac{1}{(2)} - \frac{EC}{(3)} - \frac{6}{(4)} \frac{0}{(5)} \frac{X}{(6)} \frac{2}{(7)}$$

No.	Item	Description
(1)	Product type	R: remote
(2)	Product category	1: type 1 – slim
(3)	Product name	EC: EtherCAT
(4)	Module type	6: gateway digital input module
(5)	Module subtype 1	0: 3.50 mm terminal connector
(6)	Module subtype 2	0: general type / 24 V _{DC} / 100 μs
		1: general type / 24 V _{DC} / 1 ms
		2: general type / 24 V _{DC} / 2 ms
		3: general type / 24 V _{DC} / 3 ms
(7)	DI	2: 16 sets

1.3 Product instructions

- This series of products must be used with Delta’s R1-EC5500 series product.
- When the serial connected module exceeds the maximum current limit (2A) of R1-EC5500, it can be used with Delta’s R1-EC5512 series product instead.

Specifications and Product Interface

2

This chapter introduces the product specifications of the R1-EC60X2 series product, including electrical specifications, product diagram, dimensional specifications, and other detailed descriptions.

2.1	Electrical specifications	2-2
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2

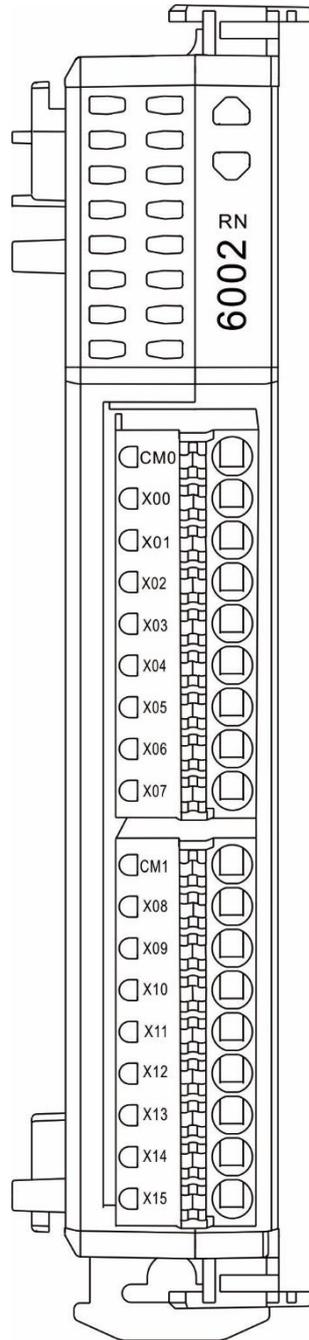
2.1 Electrical specifications

Item	R1-EC6002	R1-EC6012	R1-EC6022	R1-EC6032
Circuit type	Transistor			
Signal type	SINK (NPN) / SOURCE (PNP)			
Power usage	24 V _{DC}			
Port input current	4 mA			
Reaction time / Operation frequency	0.1 ms	1 ms	2 ms	3 ms
Active (Off > On)	> 16.5 V _{DC}			
Active (On > Off)	< 8 V _{DC}			
E-Bus current consumption	120 mA			
Electrical isolation	500 V _{rms} (E-Bus / signal voltage)			
Weight	55 g (0.12 lb)			
Operating environment	Operating temperature: 0°C to 50°C (32°F to 122°F); storage temperature: -20°C to +70°C (-4°F to +158°F)			
Installation	Sliding rail type			
Vibration resistance / Shock resistance	Conforms to EN 60068-2-6 / EN 60068-2-27/29			
Electromagnetic compatibility / Noise immunity	ESD (IEC 61131-2, IEC 61000-4-2) EFT (IEC 61131-2, IEC 61000-4-4) RS (IEC 61131-2, IEC 61000-4-3)			
Protection level	IP20			
Approvals	 			

2.2 Product diagram and dimensions

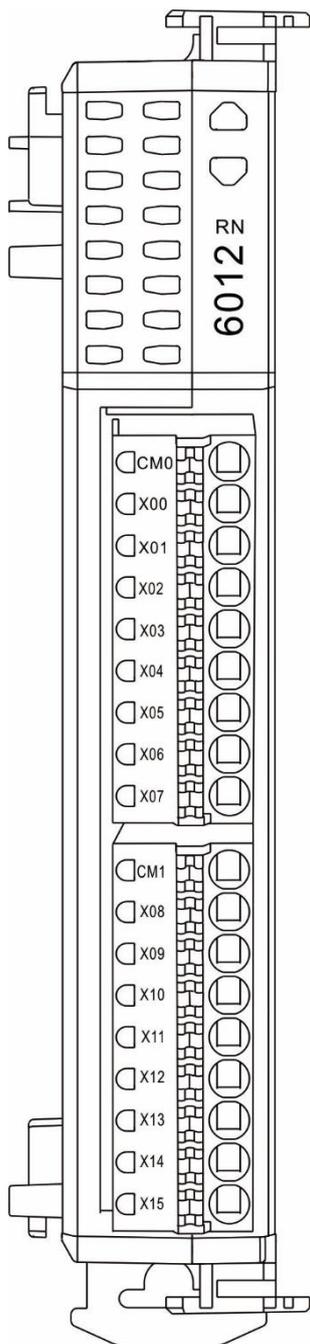
2.2.1 Product diagram

- Front view of R1-EC6002 input module panel (filter time: 100 μ s)

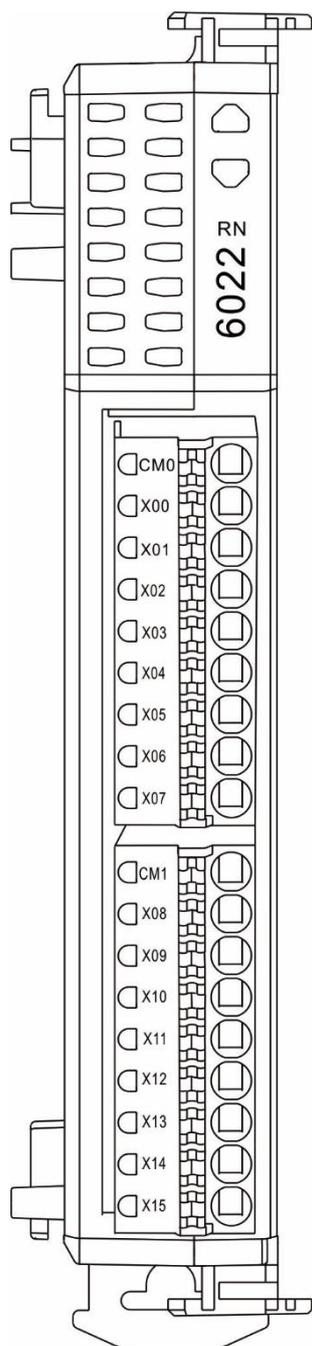


2

- Front view of R1-EC6012 input module panel (filter time: 1 ms)

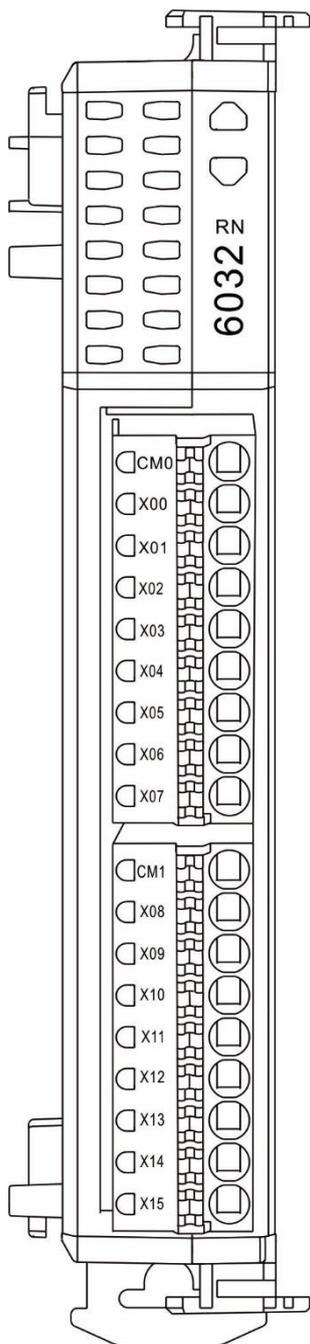


- Front view of R1-EC6022 input module panel (filter time: 2 ms)



2

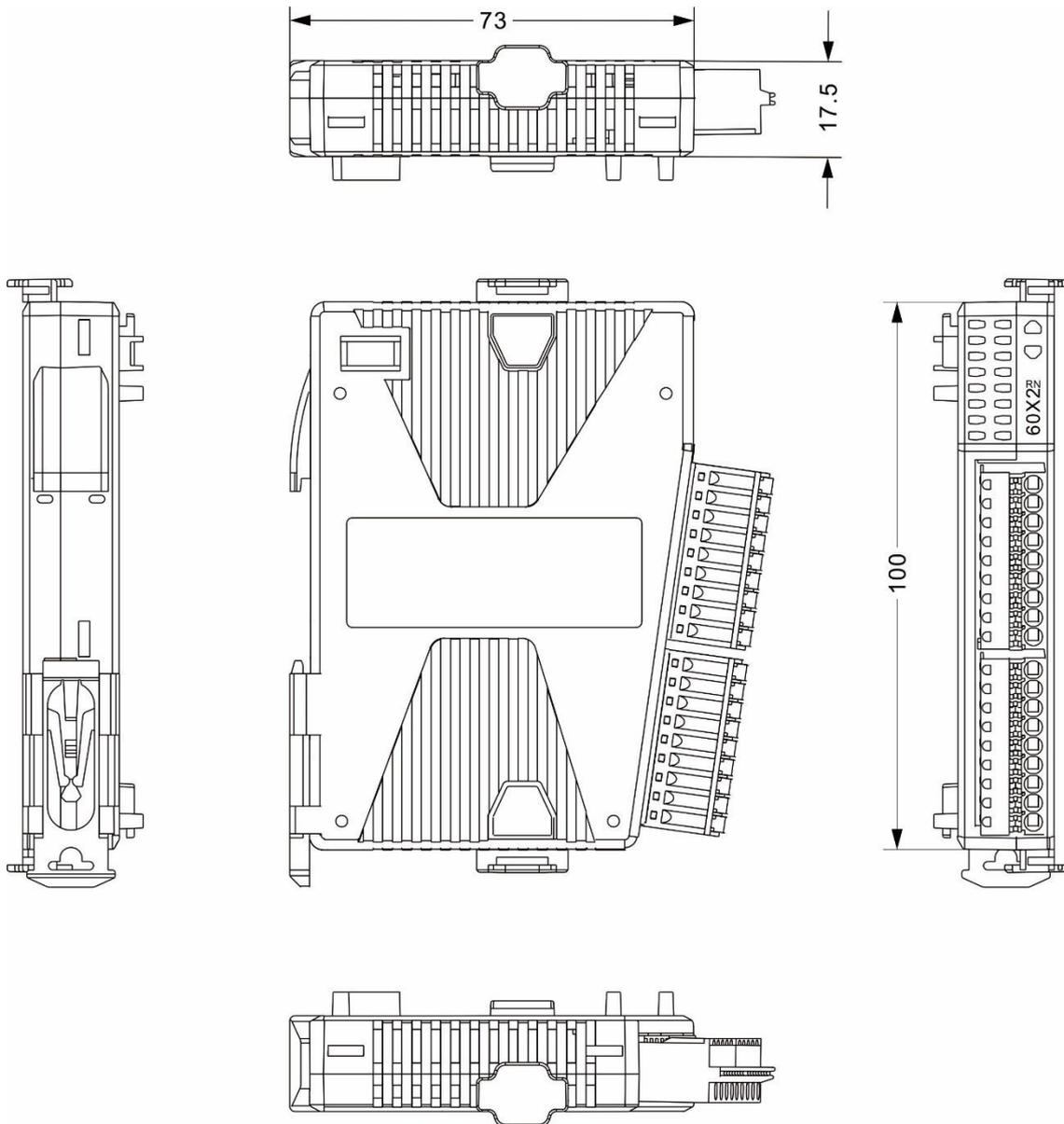
- Front view of R1-EC6032 input module panel (filter time: 3 ms)



2.2.2 Dimensions

- Module dimensional drawing

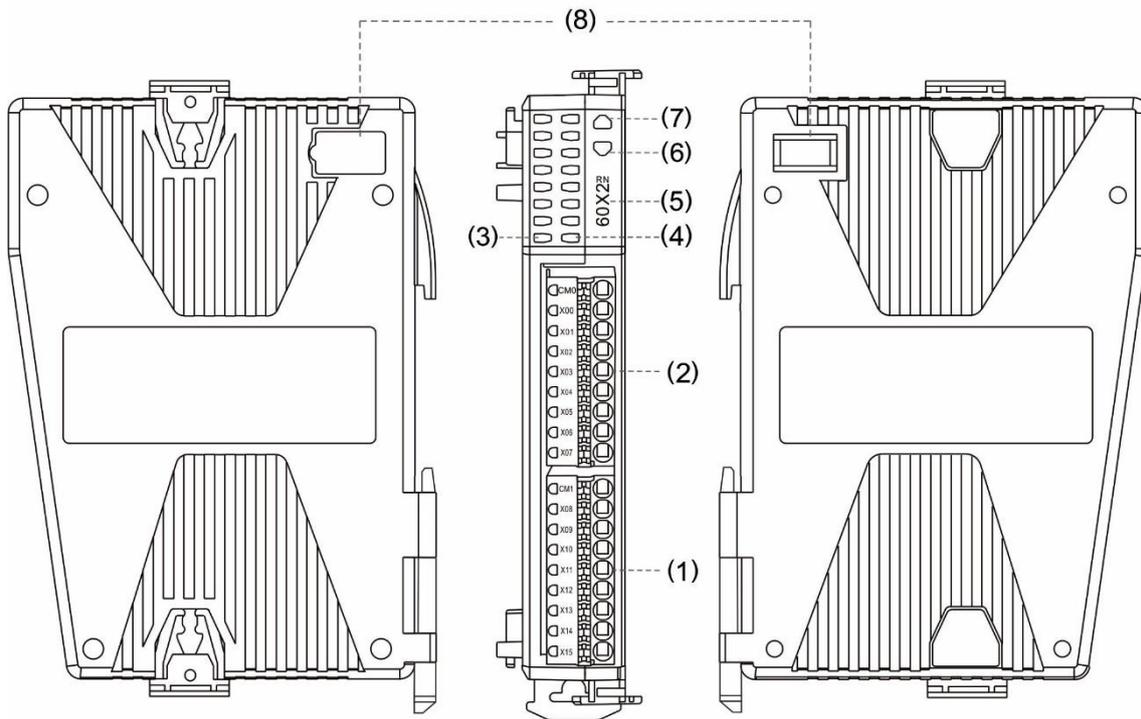
R1-EC60X2 series: 100 mm x 73 mm x 17.5 mm



2.3 Product diagram and interface

- Description of each part for R1-EC6002 / R1-EC6012 / R1-EC6022 / R1-EC6032

2

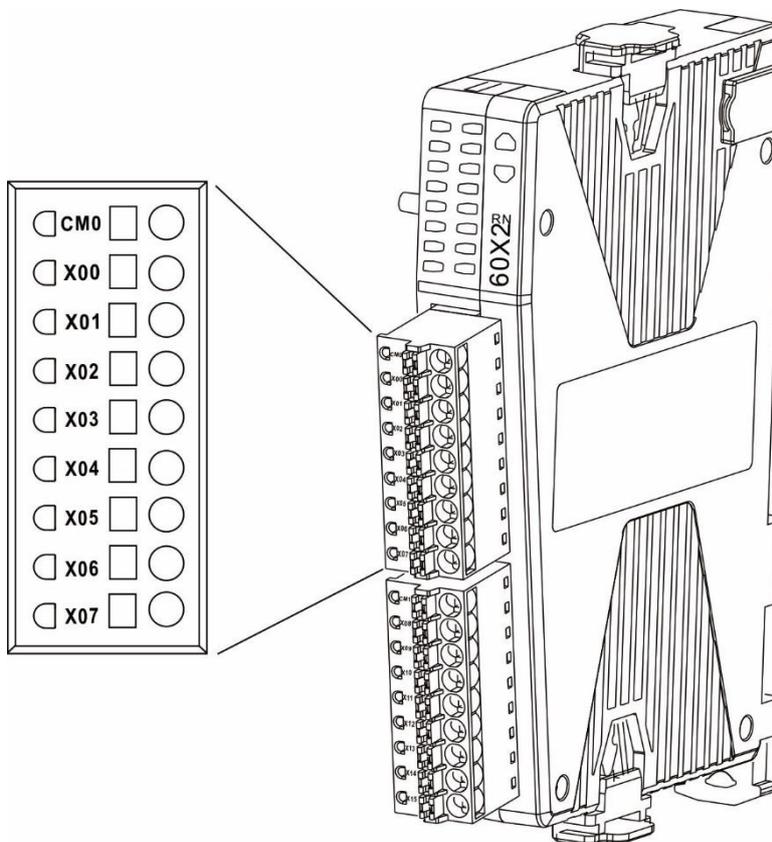


No.	Description
(1)	Port 1 I/O
(2)	Port 0 I/O
(3)	X00 – X07 I/O signal display for Port 0 (from top to bottom)
(4)	X08 – X15 I/O signal display for Port 1 (from top to bottom)
(5)	Product number (6002 / 6012 / 6022 / 6032)
(6)	Status indicator
(7)	Power indicator
(8)	E-Bus transmission port

2.4 R1-EC60X2 series port description

2.4.1 R1-EC60X2 Port 0 I/O ports

- Port 0 pin assignment of R1-EC6002 / R1-EC6012 / R1-EC6022 / R1-EC6032

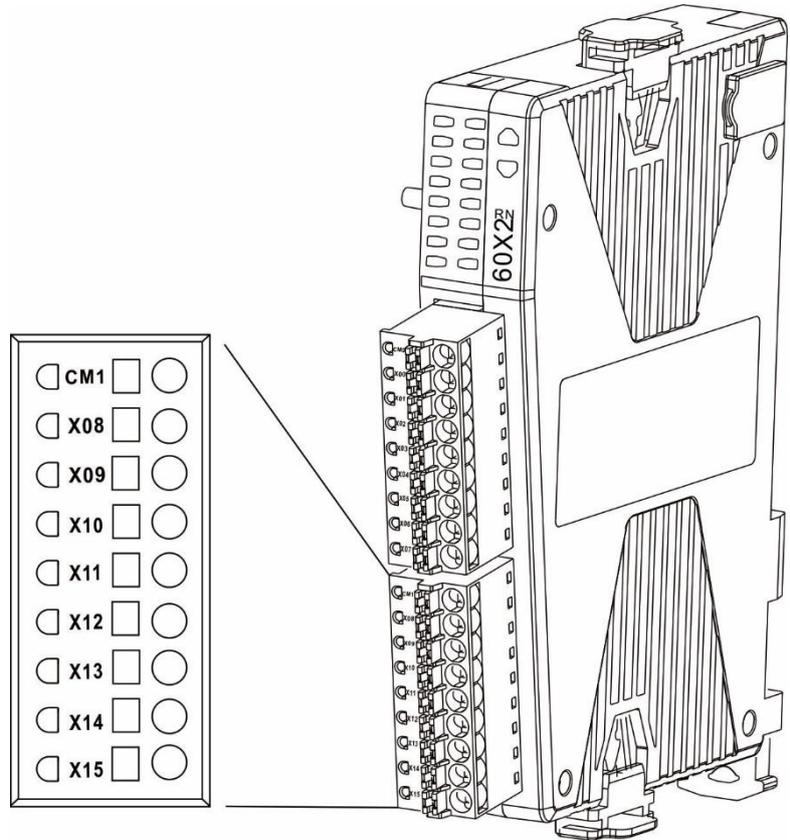


Mark	Description
CM0	Port 0 power / grounding common point (COM) type input
X00	1 st set of input of Port 0
X01	2 nd set of input of Port 0
X02	3 rd set of input of Port 0
X03	4 th set of input of Port 0
X04	5 th set of input of Port 0
X05	6 th set of input of Port 0
X06	7 th set of input of Port 0
X07	8 th set of input of Port 0

2.4.2 R1-EC60X2 Port 1 I/O ports

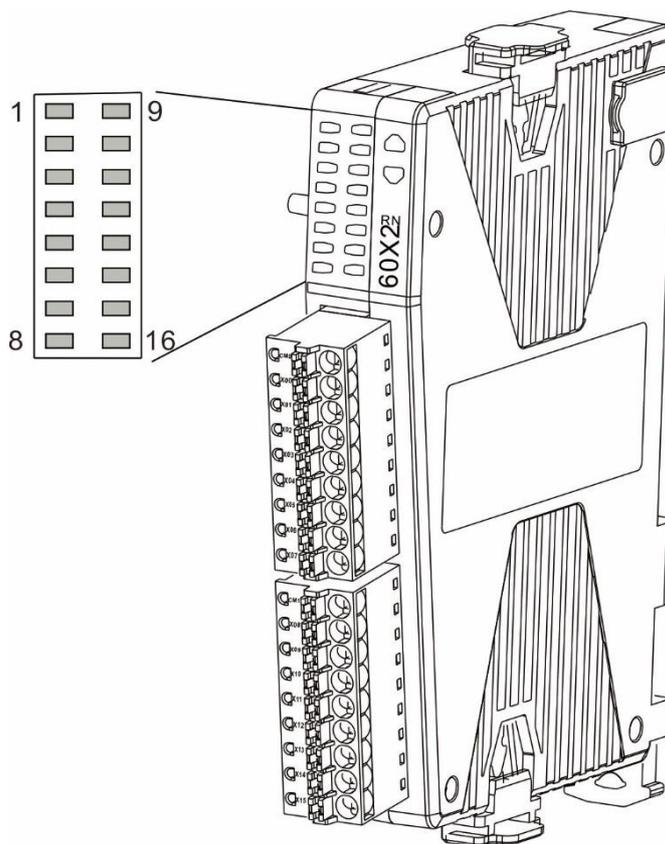
- Port 1 pin assignment of R1-EC6002 / R1-EC6012 / R1-EC6022 / R1-EC6032

2



Mark	Description
CM1	Port 1 power / grounding common point (COM) type input
X08	1 st set of input of Port 1
X09	2 nd set of input of Port 1
X10	3 rd set of input of Port 1
X11	4 th set of input of Port 1
X12	5 th set of input of Port 1
X13	6 th set of input of Port 1
X14	7 th set of input of Port 1
X15	8 th set of input of Port 1

2.4.3 R1-EC60X2 indicator light



2

Indicator mark	Description	Indicator mark	Description
1	X00	9	X08
2	X01	10	X09
3	X02	11	X10
4	X03	12	X11
5	X04	13	X12
6	X05	14	X13
7	X06	15	X14
8	X07	16	X15

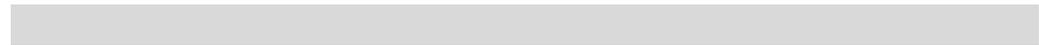
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2

Wiring

3

This chapter provides wiring instructions for the R1-EC60X2 series product, including wiring examples of the input port.



3.1	Input port wiring example	3-2
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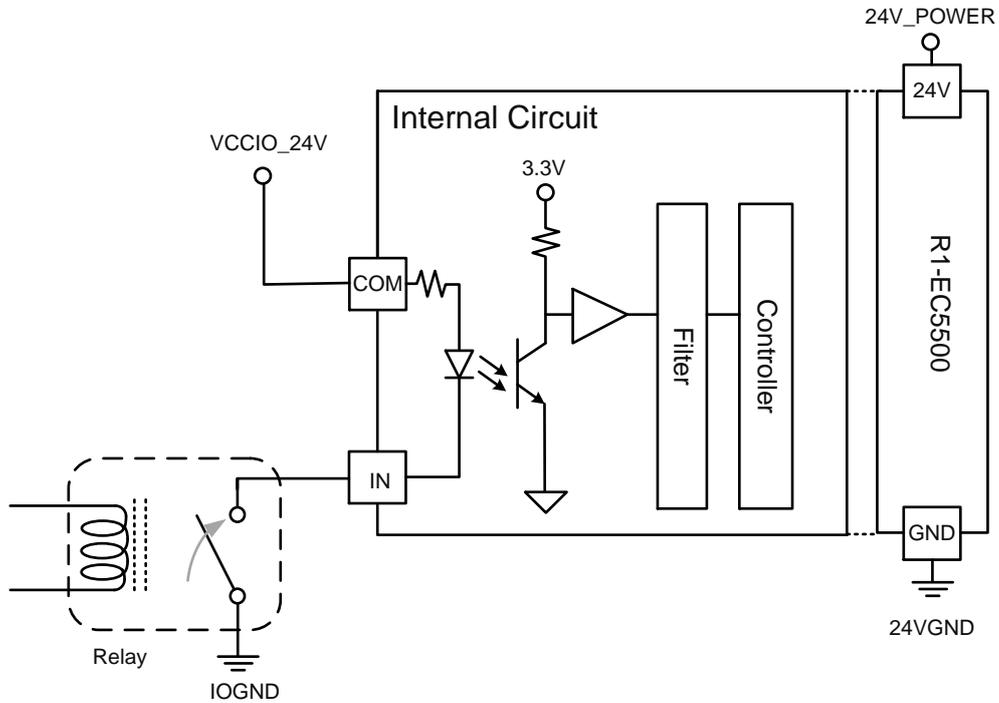
3

3.1 Input port wiring example

- R1-EC60X2 is connected to NPN (SINK) type load

VCCIO_24V / IOGND and 24V_POWER / 24VGND should be isolated power supply circuits.

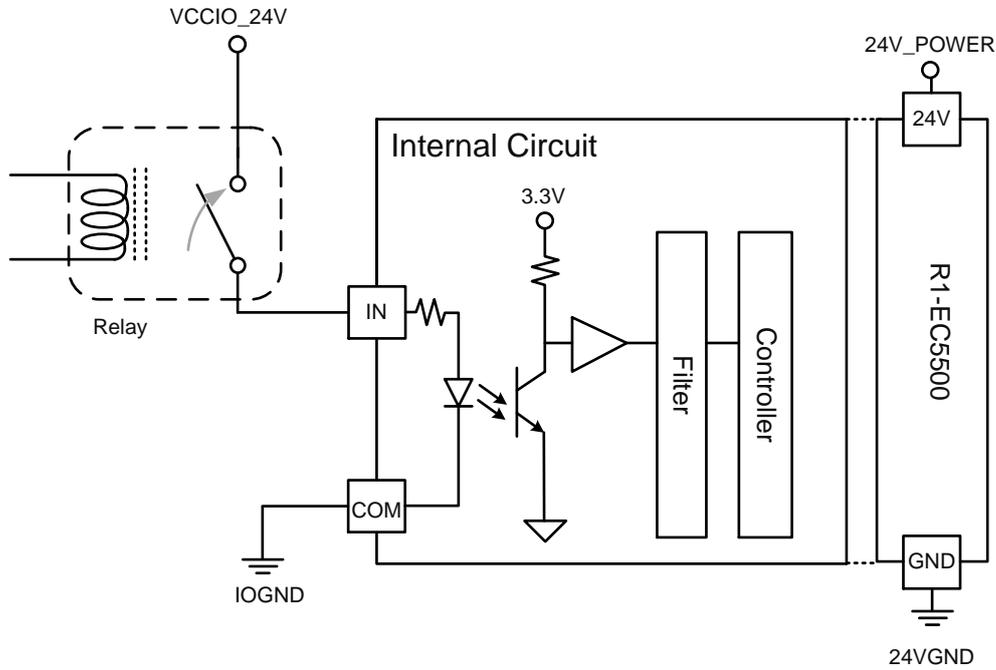
The example below shows a single point (X00) input schematic, and the other 15 sets (X01 - X15) have the same input structure. Port 0 / Port 1 can be different control types (NPN or PNP).



■ R1-EC60X2 is connected to PNP (SOURCE) type load

VCCIO_24V / IOGND and 24V_POWER / 24VGND should be isolated power supply circuits.

The example below shows a single point (X00) input schematic, and the other 15 sets (X01 - X15) have the same input structure. Port 0 / Port 1 can be different control types (NPN or PNP).



3

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3

Revision History

Release date	Version	Chapter	Revision contents
July, 2018	V1.0 (First edition)		

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