



## Tiny RS-485 Remote I/O Modules



### Introduction

The tM-P3R3 provides 3 channels for digital input and 3 channels for relay output, each of which features photocouple isolation. All output channels are form A type relays, while input is based on sink- or source-type using a wire connection. All input channels can be used as 16-bit counters. There are options for configuring power-on and safe digital output values. 4 kV ESD protection and 3750 V<sub>oc</sub> intra-module isolation are also provided.

### Applications

- All Kinds of On/Off Control
- Industrial Automation
- Industrial Machinery
- Building Automation
- Food and Beverage Systems
- Semiconductor Fabrication
- Control Systems

### System Specifications

Communication	
Interface	RS-485
Format	(N, 8, 1), (N, 8, 2), (O, 8, 1), (E, 8, 1)
Baud Rate	1200 ~ 115200 bps
Protocol	DCON, Modbus/RTU, Modbus/ASCII
Dual Watchdog	Yes, Module (2.3 seconds), Communication (Programmable)
LED Indicators	
Power	1 LED as Power Indicator
Isolation	
Intra-module Isolation, Field-to-Logic	3750 V <sub>oc</sub>
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal ±8 kV Air for Random Point
EFT (IEC 61000-4-4)	±4 kV for Power
Power Requirements	
Reverse Polarity Protection	Yes
Powered from Terminal Block	Yes, 10 ~ 30 V <sub>oc</sub>
Consumption	0.5 W Max.
Mechanical	
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 ~ +75 °C
Storage Temperature	-30 ~ +75 °C
Humidity	10 ~ 95% RH, Non-condensing

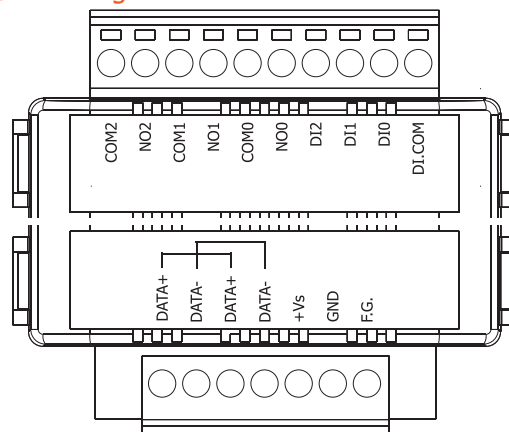
### Digital Input & Relay Output

#### Features

- Relay Outputs
- Source- or Sink-type Digital Inputs
- Photocouple Isolation
- All Channels Can Be Used As 16-bit Counters
- Dual Watchdog
- Configurable Power-on Value Settings
- Configurable Safe Value Settings
- Cost-effective
- Wide Operating Temperature Range: -25 °C ~ +75 °C



### Pin Assignments



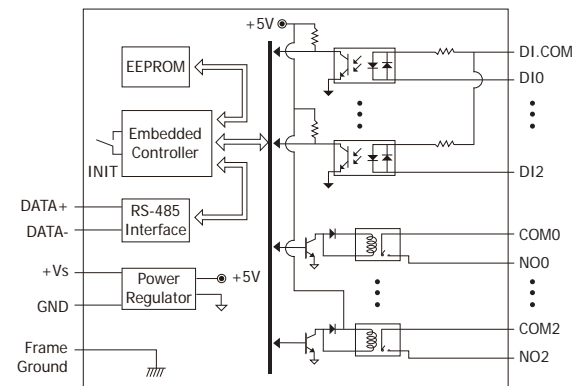
### I/O Specifications

Digital Input/Counter		
Input Channels		3
Type		Wet Contact (Sink, Source)
On Voltage Level		+3.5 V <sub>DC</sub> ~ 50 V <sub>DC</sub>
Off Voltage Level		+1 V Max.
Input Impedance		10 KΩ, 0.66 W
Counters	Channels	3
	Max. Count	65535 (16-bit)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Overvoltage Protection		70 V <sub>DC</sub>
Relay Output		
Output Channels		3
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 V <sub>AC</sub> or 30 V <sub>DC</sub>
Max. Load Current		5 A
Operating Time		6 ms
Release Time		3 ms
Electrical Life (Resistive load)	VDE	5 A @250 V <sub>AC</sub> 30,000 ops (10 ops/minute) at 75°C
		5 A @30 V <sub>DC</sub> 70,000 ops (10 ops/minute) at 75°C
	UL	5 A @250 V <sub>AC</sub> /30 V <sub>DC</sub> 6,000 ops
		3 A @250 V <sub>AC</sub> /30 V <sub>DC</sub> 100,000 ops
Mechanical Life		20,000,000 ops at no load (300 ops/minute)
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

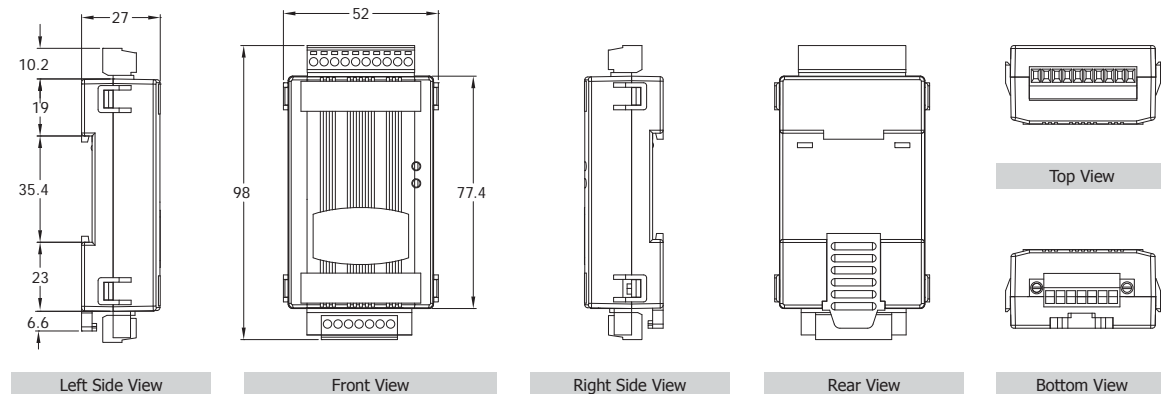
## Wire Connections

Digital Input/Counter	ON State Readback as 1	OFF State Readback as 0
	+3.5 ~ +50 Vdc	OPEN or <1 Vdc
Sink		
Source	+3.5 ~ +50 Vdc	OPEN or <1 Vdc
Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output		

## Block Diagram



## Dimensions (Units: mm)



## Ordering Information

tM-P3R3 CR	3-channel Isolation Digital Input and 3-channel Relay Output Module(RoHS)
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## Related Products

	tM-7561 CR	Isolated USB to RS-485 Converter (RoHS)
	tM-7520U CR	Isolated RS-232 to RS-485 Converter (RoHS)
	tM-7510U CR	Isolated RS-485 Repeater (RoHS)
	MDR-20-24 CR	24W Single Output Industrial DIN Rail Power Supply (RoHS)