TIO Series Products

TIO9011–12 Channel Digital Input/Output Module

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Feature Overview

TIO9011 is a digital input/output module with a total of 12 channels. All channels can operate independently for outputting high and low levels, collecting high and low levels, outputting PWM, and collecting PWM.

Specification

Number of channels	12 (shared for input/output)
Operating voltage	12 V
Static power consumption	1.1 W
Relay type	Magnetic latching relay
Installation method	Module splicing

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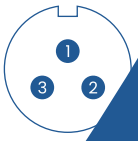
Pin	
Pin 2	
Pin 3	GND
Pin 7	GND
Pin 8	DI/DO 3
Pin 9	GND

V_Bat & V_Ref



Pin 1	
Pin 2	
Pin 3	

Optional Accessories

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TIO9015 – 8 Channel Analog Input/Output Module

Feature Overview

TIO9015 is an analog output/input module with a total of 8 independent input/output channels. Each channel supports voltage output, voltage acquisition, current output, and current acquisition functions. When operating in voltage mode, it also supports the function of feedback output voltage. The voltage output supports high voltage output from 0 to 60V, and the voltage acquisition supports a wide voltage range of 60V to +60V or 0 to +60V.

Specification

Number of channels	8 (shared for input/output)
Operating voltage	12 V
Static power consumption	4 W
Relay type	Magnetic latching relay
Installation method	Module splicing

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Voltage Output

Number of Channels	8
Output Range	0 V ~ +60 V
DAC Resolution	16 bit
Accuracy	Transient accuracy: ±(0.1 %+5 mV), Average accuracy: ±(0.1 %+5 mV) When outputting 0 V, there may be a voltage of up to 300 mV depending on the channel
Output Current	20 mA@4 channels, 10 mA@8 channels

Voltage Acquisition

Number of Channels	8
Measurement Range	-60 V ~ +60 V, 0 V ~ +60 V
Sampling Rate	250 KHz
Reporting Rate	1 kHz (active reporting) 4 kHz (polling)
ADC Resolution	20 bit
Accuracy	0 ~ 60 V acquisition mode: Transient accuracy: ±(0.1 %+20 mV) , Average accuracy: ±(0.1 %+5 mV) -60 ~ 60 V acquisition mode: Transient accuracy: ±25 mV, Average accuracy: ±5 mV
Input Impedance	300 KΩ

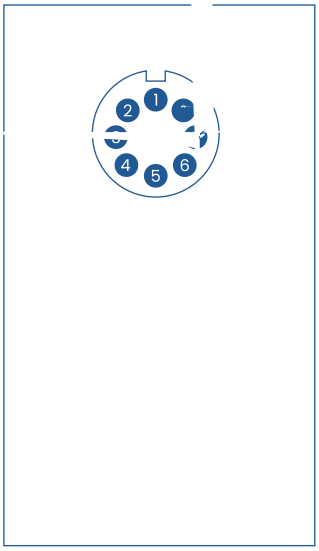
Current Output

Number of Channels	8
Output Range	0 mA ~ 25 mA
DAC Resolution	16 bit
Accuracy	Transient accuracy: ±(0.1 %+5 uA), Average accuracy: ±(0.1 %+5 uA)

Current Acquisition

Number of Channels	8
Measuring Range	0 mA ~ 25 mA
Sampling Rate	250 Hz
Reporting Rate	1 kHz (active reporting) 4 kHz (polling)
ADC Resolution	20 bit
Accuracy	Transient accuracy: ±(1 %+250 uA), Average accuracy: ±(1 %+10 uA)

Hardware Interface



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TIO9036 – 6 Channel Programmable Resistance Simulation Module

Feature Overview

TIO9036 is a resistance module with a total of 6 independent channels. Each channel can output resistance from 1 to 4194303Ω. In cases where the resolution or range is insufficient, the channels can also be used in parallel or series. The resistance module can be utilized in various signal systems and can simulate functions such as thermistors or resistive sensors.

Specification

Number of channels	6
Operating voltage	12 V
Static power consumption	2 W
Relay type	Magnetic latching relay
Installation method	Module splicing

Functional Data

Output Resistance Range	1 Ω ~ 4194303 Ω
Step Value	1 Ω
Resistance Accuracy	1 Ω ~ 500 Ω, accuracy ±0.5 Ω, 500 Ω ~ 4194303 Ω, accuracy ±0.1 %
Resistance Power	1/4 W

Note: When setting resistance values on the TIO9036, commands must be spaced at least 50 ms apart.

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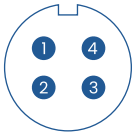
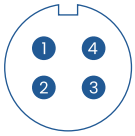
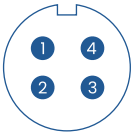
Hardware Interface

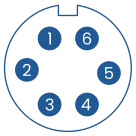
- 4 Pin LEMO connector interface:

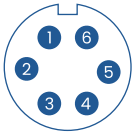
Res 1/2	
	
Pin 1	Res 1A
Pin 2	Res 2A
Pin 3	Res 2B
Pin 4	Res 1B

Res 3/4	
	
Pin 1	Res 3A
Pin 2	Res 4A
Pin 3	Res 4B
Pin 4	Res 3B

Res 5/6	
	
Pin 1	Res 5A
Pin 2	Res 6A
Pin 3	Res 6B
Pin 4	Res 5B

- 6 Pin LEMO connector interface:

OUT	
	
Pin 1	VIN
Pin 2	GND
Pin 3	Cfg 1
Pin 4	Cfg 2
Pin 5	CAN_Low
Pin 6	CAN_High

IN	
	
Pin 1	VIN
Pin 2	GND
Pin 3	Cfg 1
Pin 4	Cfg 2
Pin 5	CAN_Low
Pin 6	CAN_High

Scope of Delivery

- TIO9036 device
- TIO9036 LEMO interface connectors x 3
- TIO series general OUT IN cascade harness

Optional Accessories

- TIO9036 LEMO interface connector harness (this harness introduces approximately 0.5 Ω of line resistance)
- TIO series general IN harness
- TIO series general LEMO connector (with terminal resistor)

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TIO9045 – 18 Channel General-Purpose Relay Module

Feature Overview

TIO9045 is a general purpose relay module with 18 channels. Each channel is controlled by one relay, and each relay has three terminals (CH/NO/NC).

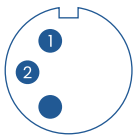
Specification

Number of channels:	18
Operating voltage	12 V
Static power consumption	0.5 W
Relay type	Power relay
Installation method	Module splicing

Functional Data

Channel Overcurrent Capacity	DC 40V 1.8A

Hardware Interface



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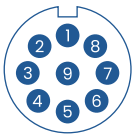
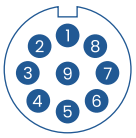
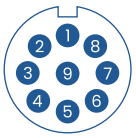
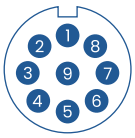
Hardware Interface

- 9 Pin LEMO connector interface:

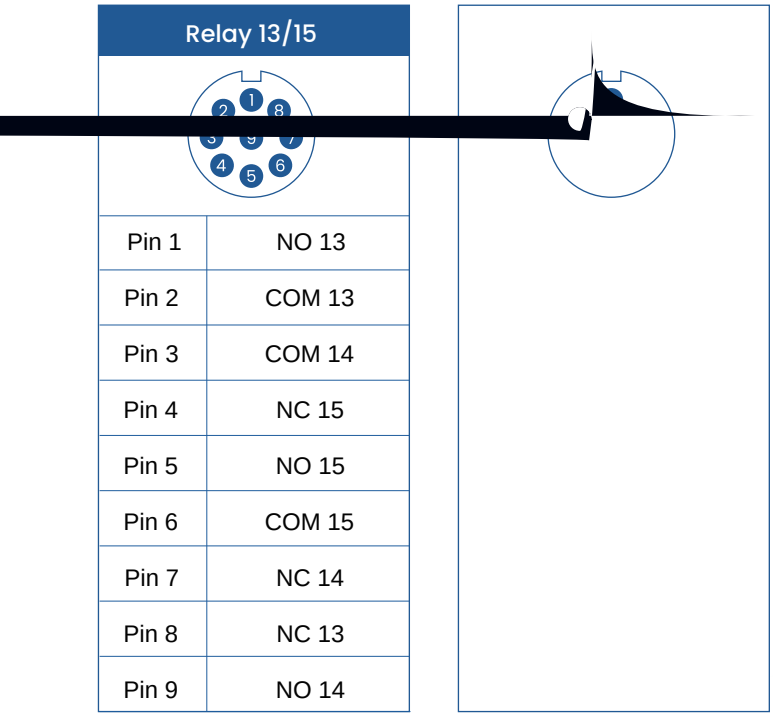
Relay 1/3	
	
Pin 1	NO 1
Pin 2	COM 1
Pin 3	COM 2
Pin 4	NC 3
Pin 5	NO 3
Pin 6	COM 3
Pin 7	NC 2
Pin 8	NC 1
Pin 9	NO 2

Relay 4/6	
	
Pin 1	NO 4
Pin 2	COM 4
Pin 3	COM 5
Pin 4	NC 6
Pin 5	NO 6
Pin 6	COM 6
Pin 7	NC 5
Pin 8	NC 4
Pin 9	NO 5

Relay 7/9	
	
Pin 1	NO 7
Pin 2	COM 7
Pin 3	COM 8
Pin 4	NC 9
Pin 5	NO 9
Pin 6	COM 9
Pin 7	NC 8
Pin 8	NC 7
Pin 9	NO 8

Relay 10/12	
	
Pin 1	NO 10
Pin 2	COM 10
Pin 3	COM 11
Pin 4	NC 12
Pin 5	NO 12
Pin 6	COM 12
Pin 7	NC 11
Pin 8	NC 10
Pin 9	NO 11

Relay 13/15	
Pin 1	NO 13
Pin 2	COM 13
Pin 3	COM 14
Pin 4	NC 15
Pin 5	NO 15
Pin 6	COM 15
Pin 7	NC 14
Pin 8	NC 13
Pin 9	NO 14



Scope of Delivery

- TIO9045 device
- TIO9045 LEMO interface connectors x 6
- TIO series general OUT IN cascade harness

Optional Accessories

- TIO9045 LEMO interface connector harness
- TIO series general IN harness
- TIO series general LEMO connector (with terminal resistor)

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