

## Data Acquisition and Distributed IO Modules

### High Resolution Modbus RTU Protocol IO Modules for PLC, HMI, SCADA, etc.

A line of Modbus based IO modules (Modbus RTU slave) for data acquisition and other applications offering reliable low-cost solution for distributed IO applications to PLC's, HMI's and/or PC based SCADA systems. All modules have LED indicators for visualization of IO status (digital), fault diagnostic analysis and easy DIP Switch configuration for Modbus addressing from 1 to 127.

PC based configuration software, IO Studio, is provided and used for module configuration, viewing real time data and when necessary to check IO status. The optional IO Studio Plus, a data acquisition PC software allowing IO modules to be connected directly to a PC [RS232/485], provides Real Time Viewer to display real-time data in digital values, bar graphs, trends, etc. as well as a Historical Data Viewer; a maximum of 1024 tags.

**Connect IO Modules via Ethernet?** The PC-E Serial Modbus to Modbus TCP Ethernet converter provides an easy & cost effective manner to connect Serial Modbus devices to Ethernet TCP networks; for additional information refer to [PC-E sales brochure](#).



#### Digital Input & Output Modules

- **Digital Input Modules:**
  - 16 digital inputs & counters
  - 8 Digital inputs and counters
- **Digital Output Modules:**
  - 16 digital output (24VDC)
  - 4-relay output (form C)
- **Digital Input & Output Modules**
  - 8 Digital Input / 8 Digital Output (24VDC)

#### Analog Input & Output Modules

- **Analog Input Modules**
  - 8 Thermocouple Input & 0-50mV & 0-100
  - 6 RTD Input (PT100/1000, NI120/1000, etc.)
  - 8 Analog Input (mA & VDC Modules)

#### Analog Output Modules

- 8 Analog Outputs (mA & VDC modules)

#### Combined Analog & Digital I/O Module

- **Input:** Analog - 2 mA/VDC and 2 RTD  
Digital - 4 digital inputs (counter)
- **Output:** Analog - 1 mA/VDC  
Digital - 2 digital outputs (24VDC)



## COMMON MODULE SPECIFICATIONS

POWER: 12 to 24 VDC power (Logic); consumption varies by module type - refer to manual. Consumption @24VDC varies 14 to max of 58mA  
 Weight: 105 grams (0.23 lbs) Interface: 2-wire RS485 Modbus RTU Modbus Maximum Address: 127  
 Operating Temperature: -10C to +50C Baud Rate: 2400 – 115,200. Modbus Addressing: DIP Switch  
 Storage Temperature: -40C to +85C Parity: None, Even or Odd Stop Bits: 1 or 2  
 Dimensions [W x H x D]: 23 x 109 x 98mm Mounting: DIN Rail Data Bits: 8

## DIGITAL MODULES

### Common Specifications

Counter Resolution : 32-Bit Pulse Width: Min 500micro second Input filter: Maximum 6553 milliseconds  
 Counter Frequency: 1Khz Counter Mode: Up / Down Input Impedance: 2200 ohms  
 Digital Input 0 Level: 0 – 6.5VDC Digital Input 1 Level: 12 to 24VDC Note: 4-Relay Output Module is available with 24VDC input only.

<u>Type of Module:</u>	<u>16 Digital Input</u>	<u>16-Digital Output</u>	<u>4-Relay Output</u>	<u>8-Digital Input/Output</u>
Number of Counters	16	N/A	N/A	8
Status Indicator for each channel	Yes	N/A	N/A	Yes
Watchdog Timer (1-255 seconds)	Yes	Yes	Yes	Yes
Type of Digital Output (36VDC)	N/A	Open Collector	Form C Relay	Open Collector
Maximum Load Current (per channel)	N/A	100mA	0.5A(220VAC)/1A(28VDC)	100mA
Isolation [Field IO & Logic (module)]	1500 Vrms	1500 Vrms	1000 Vrms	1500 Vrms

## RTD & THERMOCOUPLE INPUT MODULES

<u>Module Type</u>	<u>6 RTD Inputs (2/3 wire)</u>	<u>8 Thermocouple Inputs</u>
Configurable Input Types	PT100, PT1000, Ni1120, 10-400 & 100-4000 ohms Ni11000 DIN, Ni1000 Landys & Gyr	J, K, E, T, N, B, S, R, C, D, G, mV
Sample Rate per Second	0.52	0.71
Isolation [Field IO & Logic (module)]	1500 Vrms	1500 Vrms
Isolation (channel to channel)	N/A	Optional: 350 V (P-P)
Accuracy	0.3C	Typical 0.3C/ CJC 0.5C: refer to manual
Resolution & Drift	All Models: Resolution 0.1C / Drift 100 ppm/C or 0.01% of span/C from reference 25C	

## ANALOG CURRENT & VOLTAGE INPUT MODULES

<u>Module Type (8-channels)</u>	<u>mA</u>	<u>VDC</u>	<u>mA Isolated</u>	<u>VDC Isolated</u>
Type	Single Ended	Single Ended	Differential	Differential
Input mA / VDC	0-20mA	0-10//0-5VDC	0-20mA	0-10/0-5VDC
Offset by Switch	4mA	2 / 1VDC	4mA	2 / 1VDC
Sample Rate per Second	12.5 samples	12.5 Samples	12.5 Samples	12.5 Samples
Impedance	250 ohms	20 K ohms	250 ohms	110 K ohms
Isolation [Field IO & Logic (module)]	1500 Vrms	1500 Vrms	1000 Vrms	1000 Vrms
Isolation (channel to channel)	N/A	N/A	350 V (P-P)	350 V (P-P)
Accuracy	All Models: 0.2% of Span			
Resolution & Drift	All models: Resolution 12-Bit (4,095) / Drift 50 ppm/C or 0.05% of span/C from reference 25C			

## ANALOG CURRENT & VOLTAGE OUTPUT MODULES

<u>Module Type (8-channels)</u>	<u>mA</u>	<u>VDC</u>
Input mA / VDC	0-20mA	0-10VDC
Offset by Switch	4mA	2 VDC
Resolution & Drift	All Models: Resolution 12-Bit (4,098) / Drift 100 ppm/C or 0.01% of span from reference 25C	
Accuracy	0.05% of Span	
Load	500 ohms @12VDC/1 K ohms @24VDC	2K minimum ohms
Isolation [Field IO & Logic (module)]	1500 Vrms	1500 Vrms

## Combination Module: Analog / Digital Input & Output

Analog Inputs - quantity 2: 0-20mA/0-10VDC; Resolution 12-Bit (4,098); Impedance: mA = 250 ohms, VDC = 190K ohms

Analog Outputs - quantity 1: 0(4)-20mA/0(2)-10VDC; Resolution 12-Bit; Drift 100 ppm/C; Accuracy 0.05% of span;

Load: mA = 1K ohms @24VDC; VDC = 2K ohms

Digital Inputs - quantity 4: Counter; 32-Bit, Frequency 50 Hz, Pulse Width 20ms, Input Voltage 10-26VDC

Digital Outputs - quantity 2: Open Collector, 36VDC maximum, 100mA/Output

RTD Inputs - quantity 2: Types PT100, PY1000, Ni120, Resolution 0.1C, Isolation 1500 V RMS

## Ordering Code

<u>Model Number</u>	<u>Description</u>	<u>Model Number</u>	<u>Description</u>
IO-16DI	16 Digital Input Module including Counters	IO-8AII	8 Analog Input 0-20mA / 4-20mA
IO-16DO	16 Digital Output Module	IO-8AIIS	8 Analog Input 0-20mA / 4-20mA; Isolated
IO-4RO	4 Relay Output Module	IO-8AIV	8 Analog Input 0-5/1-5/0-10/2-10VDC
IO-8DIO	8 Digital Input /8 Digital Output Module	IO-8AIVS	8 Analog Input 0-5/1-5/0-10/2-10VDC; Isolated
		IO-8AOI	8 Analog Output 0-20mA/4-20mA
		IO-8AOV	8 Analog Output 0-10/2-10VDC

IO-6RTD 6 RTD Input Module

IO-8TC 8 Thermocouple Input Module & 0-50mV and +/- 100mV

IO-8TCS 8 Thermocouple Input Module & 0-50mV and +/- 100mV; Isolated

IO-DAIO Combination Input/Output Module: 2 RTD & 2 Analog Inputs (mA/VDC), 1 Analog Output, 4 Digital Inputs & 2 Digital Outputs

IO-Studio Standard PC Software to set Module communication parameters, read IO status and when used for diagnosis force outputs

IO-Studio Plus Optional Data Acquisition Software connecting directly to IO Modules with maximum of 1,024 tags; available 2008.