ICP DAS Remote I/O Modules

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2011/05/17

2011 Product Catalog

Vol. RIO 1.0.00 (2011.MAY.17)

RS-485

Ethernet

FRnet

DeviceNet

PROFIBUS

CANOpen

HART

Remote I/O Modules Product Catalog

2011 Product Catalog Vol. RIO 1.0.00 (2011.MAY.

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1.1. Overview

RS-485 Remote I/O Modules

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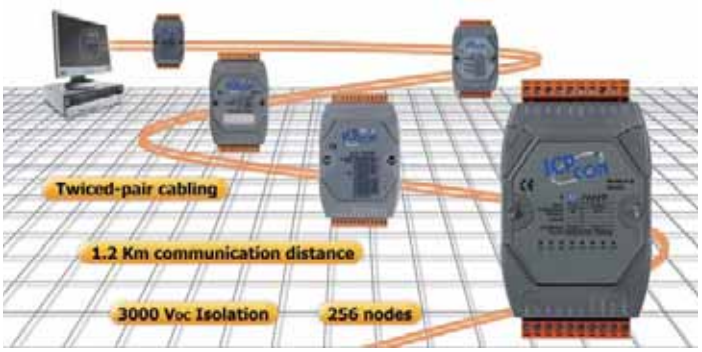
2.1. I-7000 and M-7000 Modules

• Introduction



I-7000 and M-7000 remote I/O modules provide cost-effective protection and conditioning for a wide range of valuable industrial control signals and system. The product line includes sensor-to-computer, computer-to-sensor, digital I/O, timer/ counter, RS-232 to RS-485 converter, USB to RS-485 converter, RS-485 repeater, RS-485 hub and RS-232/422/485 to Fiber Optics. The I-7000 support DCON protocol while the M-7000 modules support Modbus/RTU and DCON protocols. Most popular SCADA/ HMI software and PLC support Modbus/RTU protocol. Therefore, M-7000 is commonly used in industrial area.

• Application

Factory automation, machine automation, testing equipment, building automation, solar energy system, pollution monitoring system, heating chamber…etc

• Features

1. RS-485 Industrial Multi-Drop Network

The I-7000/M-7000 series modules use the industrial EIA RS-485 communication interface to transmit and receive data at high speed over long distance. All modules are designed to be easy to interface to the popular computer and controller. Internal surge protection circuitry is used on data lines to protect the modules from spikes.

2. I/O type and Range Programmable

The analog modules support several types and ranges. It is software programmable. The user selects the type and range remotely by issuing command from the host.

3. Easy Mounting and Connection

The user may mount the modules on a DIN rail or piggyback. The user can use the screw-terminal block to connect to the signals.

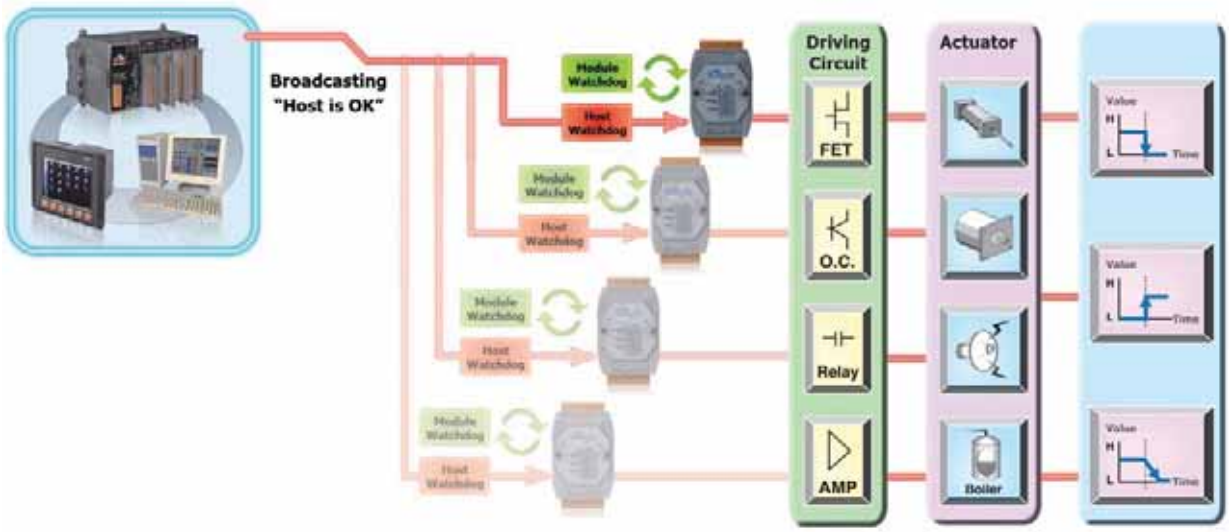
4. Rugged Industrial Environment

• Dual Watchdog Design

I-7000 and M-7000 modules provide module watchdog and host watchdog. The module watchdog is a hardware watchdog designed to automatically reset the micro-processor when the module hangs. The host watchdog is a software watchdog that monitors the communication status of the host conrtoller, such as PC, PLC and PAC. The output of module will go to the safe value state when the host fails to prevent any erroneous operations. With Dual Watchdog, the control system is more reliable and stable.

• Programmable Power on Value and Safe Value

The DO and AO I/O modules provide programmable power on value and safe value. When the host watchdog is active, the DO and AO output go to the pre-configured safe value.

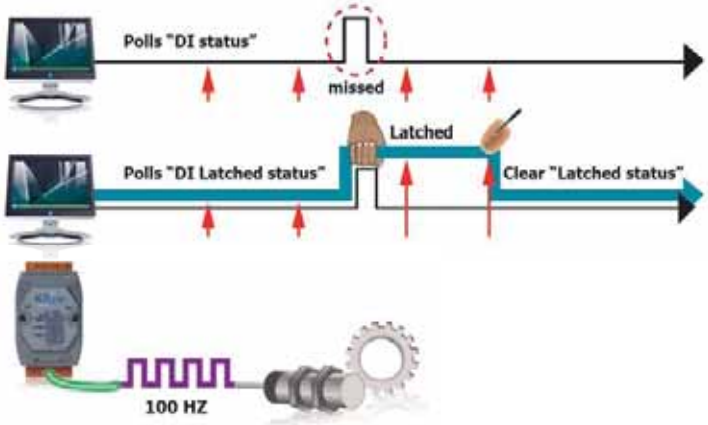


5. Advanced DI Functions

DI channel is not only for reading digital input status but also provides several advanced functions at meanwhile:

• DI Latch Function

All DI channels provide Latch function to keep the high/low events in the internal registers of the module. In general, the host controller polls modules one by one to get all DI status. Because RS-485 is a low speed field bus, the polling will take time and probably miss a short duration signal. With the DI latch function, the short duration (>=5ms) signal that can not be lost any more.



• Low Speed Counter

The DI module automatically counts the DI signal in the background. The signal that slower than 100Hz can be detected and counted.

6. Dual Communication Protocols

All I-7000 and M-7000 modules use a simple command /response protocol for communication. The module must be interrogated by the host to obtain data. The module can never initiate a command sequence. The M-7000 also supports the industrial standard Modbus/RTU protocol. The user can use high-level language, such as C, VB, Dephi, and others to write their application programs. Some famous package can control I-7000 and M-7000 directly, such as LabView, Indusoft, Tracemode, EZ datalogger, EZ Prog..etc.

I-7000: supports DCON portocol

M-7000: supports Modbus/RTU and DCON protocols

7. Self-Tuner Inside

"Self Tuner" is a patented ASIC. It can auto-tune the baud and data format in whole RS-485 network, and auto-handle the direction of the RS-485 communication line. Since the unique features of this ASIC, you can implement a very flexible remote I/O configuration via the RS-485 network.

8. Expandable Network

The I-7510 repeater is more than a pure isolated repeater. "Self Tuner" ASIC is built-in. It has some outstanding features, such as 3000V isolation, 115K max. speed, variable baud and data format. Each I-7510 repeater can let you add 256 I-7000 and M-7000 modules to the network or extend the network to another 4,000 ft long. Logically you can access 2,048 modules in one RS-232 port. Physically the user should consider the network length and the hardware loading effect. The user should use I-7510 to isolate different groups to avoid high voltage hitting the whole system through a single communication network.

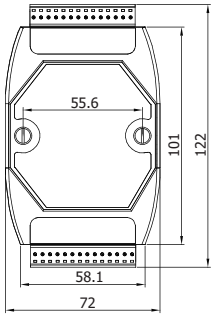
• Hardware

1. Installation

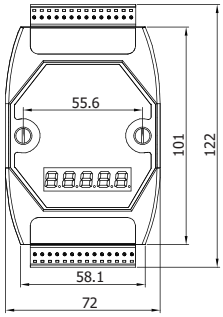
DIN-rail Mounting

Stack Mounting

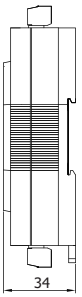
2. Mechanical



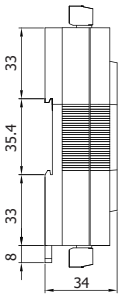
Front View



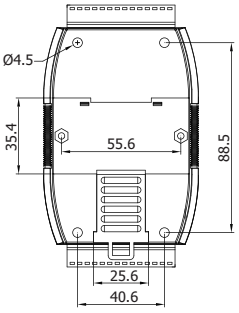
Front View



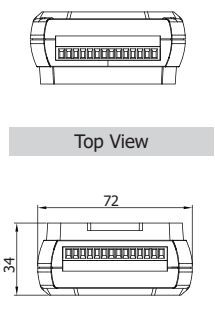
Left Side View



Right Side View

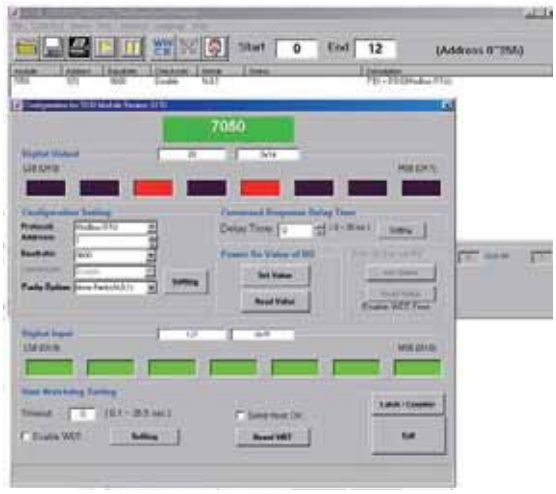


Rear View



• Software Support

Our free charge software utility and development kit include



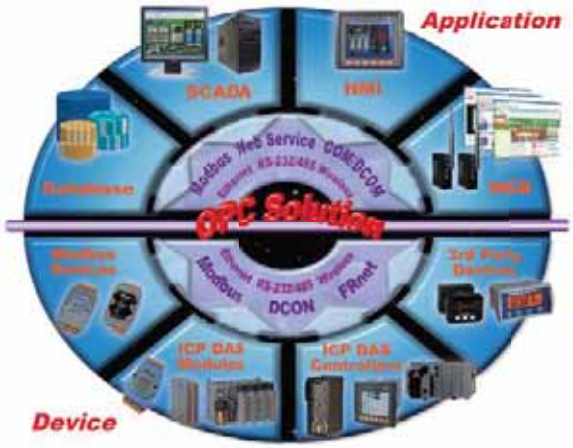
1. DCON Utility

DCON Utility is used to search, configure and simply test the I-7000 and M-7000 modules via the serial port (RS-232/485).

2. OPC Server

NAPOPC DA Server is a **free** OPC DA Server **(The "OPC" stands for "OLE for Process Control" and the "DA" stands for "Data Access")** for ICP DAS products. NAPOPC DA Server provides many benefits to users such as reduce time through lower system integration costs, integrate easily with plug-and-play SCADA/HMI/Database, connect and interoperate easily to custom applications, access to data by anyone in the automation hierarchy, reduce troubleshooting and maintenance cost, write to devices synchronously and asynchronously (not possible before OPC).

Using SCADA/HMI/Database software program, system contacts and obtains data from NAPOPC DA Server either on the same computer or on another computer. SCADA/HMI/Database makes a request and NAPOPC DA Server fulfills the request by gathering the data of ICP DAS modules **(License Free)** and third-party devices **(License Charge)** to SCADA/HMI/Database.



For different OS of PAC products, ICP DAS provides several professional DA Servers:

Version	NAPOPC_ST	NAPOPC_XPE	NAPOPC_CE5	NAPOPC_CE6
Platform	Desktop Windows	Windows XP Embedded	Windows CE5	Windows CE6
Price	Free/$	Free	Free	Free

For more Information please visit NAPOPC website: http://opc.icpdas.com

3. EZ Data Logger

EZ Data Logger is the software that ICP DAS provides for users to easily build a SCADA system on Windows 2000/XP/Vista. It comes with two versions, "Lite" & "Professional". The Lite version is not only full-functioned but free to all ICP DAS users!

EZ Data Logger is a small data logger software. It can be applied to small remote I/O system. With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.

4. Various Software Development Toolkits

Plenty of library functions and demo programs are provided to let user develop programs easily under Windows, Linux and DOS operating systems. We also provide LabVIEW driver, DASYLab driver and InduSoft driver for all I-7000 and M-7000 modules. The SDK includes:
DLL, ActiveX, Labview driver, Indusoft driver, Dasylab driver, Linux driver

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2.2. I-7000 and M-7000 Selection Guide

Classified Index		Model Name	Page
Analog Input	Voltage & Current Input	7012(D), 7012F(D), 7017, 7017F, 7017R, 7017C, 7017FC, 7017RC, 7017Z, 7017R-A5	2-2-2
	Thermocouple, Voltge & Current Input	7011(D), 7018, 7018Z, 7019R, 7019Z	2-2-5
	RTD Input	7013(D), 7015, 7015P, 7033(D)	2-2-7
	Thermistor Input	7005	2-2-9
	Transmitter Input	7014D	2-2-10
	Strain Gauge Input	7016(D), 7016P(D)	2-2-11
Analog Output		7021, 7021P, 7022, 7024, 7024R	2-2-13
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	Digital Input & Output	7044(D), 7050(D), 7050A(D), 7055(D), 7055(D)-NPN	2-2-18
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	Solid-State Relay Output	7063A(D), 7065A(D), 7063B(D), 7065B(D)	2-2-22
	PhotoMos Relay Output	7066(D)	2-2-24
Counter/Frequency/PWM		7080(D), 7080B(D), 7083(D), 7083B(D), 7088	2-2-25

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2.2-1. Analog Input

Voltage & Current Input Module (General Grade)							
Model Name		I-7012(D)	I-7012F(D)	I-7017 M-7017	I-7017F	I-7017C M-7017C	I-7017FC
Pictures							
Channel		1		8		8	
Wiring		Differential		Differential (Note 1)		Differential	
Input Range		+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA (requires optional external 125 Ω resistor)		+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA (requires optional external 125 Ω resistor)		+/-20 mA, 0~20 mA, 4~20 mA	
Resolution		16-bit	12/16-bit	16-bit	12/16-bit	16-bit	12/16-bit
Accuracy	Normal mode	0.1%		0.1%		0.1%	
	Fast mode	-	0.5%	-	0.5%	-	0.5%
Sampling Rate	Normal mode	10 Hz		10 Hz		10 Hz	
	Fast mode	-	100 Hz	-	60 Hz	-	60 Hz
Input Impedance		20 M		20 M		20 M	
Common Voltage Protection		+/-10 V_{DC}		+/-15 V_{DC}		+/-15 V_{DC}	
Individual Channel Configuration		-		-		-	
Overvoltage Protection		+/-15 V_{DC}		+/-35 V_{DC}		+/-35 V_{DC}	
System							
Dual Watchdog		Yes					
ESD (IEC 61000-4-2)		+/-2 kV		+/-2 kV for I-7017 +/-4 kV for M-7017	+/-2 kV	+/-2 kV	+/-4 kV
EFT (IEC 61000-4-4)		-		+/-4 kV for M-7017	-	+/-4 kV	
Intra-Module Isolation, Field-to-Logic		3000 V_{DC}					
Power Input		10 ~ 30 V_{DC}					
Power Consumption		1.3 W; 1.9 W for (D) version		1.3 W		1.7 W	1.3 W

Note1: I-7017 and I-7017F are 6-channel differential and 2-channel single-ended, or 8-channel differential. M-7017 is 8-channel differential.

Note2: I-7012(D) and I-7012F(D) both include 1 DI and 2 DO channels. The specification is as follows

Digital Input	
Channel	1
Contact	Dry
Sink/Source (NPN/PNP)	Source
On Voltage Level	Close to GND
Off Voltage Level	Open
Counter (50 Hz, 16-bit)	Yes
Input Impedance	3 kΩ
Overvoltage Protection	+/-30 V_{DC}

Digital Output	
Channel	2
Type	Open Collector
Sink/Source (NPN/PNP)	Sink
Load Voltage	3.5 ~ 30 V_{DC}
Max. Load Current	30 mA/Channel
Power-on Value	Yes
Safe Value	Yes

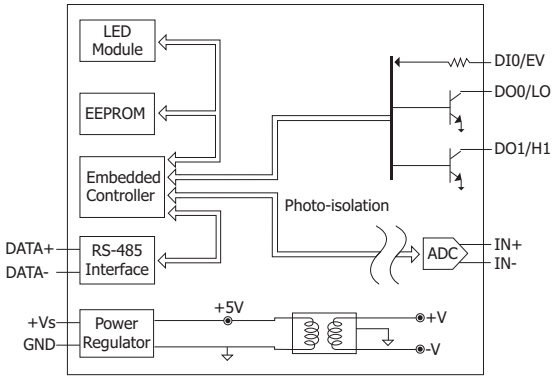
Voltage & Current Input Module (Industrial Grade)					
Model Name		I-7017R M-7017R	I-7017R-A5 M-7017R-A5	I-7017RC M-7017RC	I-7017Z M-7017Z
Pictures					
Channel		8		8	10/20 (Note 1)
Wiring		Differential		Differential	Diff./Single-Ended
Input Range		+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA (requires optional external 125 Ω resistor)	+/-50 V, +/-150 V	+/-20 mA, 0~20 mA, 4~20 mA	+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V +/-20 mA , 0 ~ 20 mA, 4 ~ 20 mA (Jumper selectable)
Resolution		12/16-bit		12/16-bit	
Accuracy	Normal mode	0.1%		0.1%	
	Fast mode	0.5%		0.5%	
Sampling Rate	Normal mode	10 Hz		10 Hz	
	Fast mode	60 Hz	50 Hz	60 Hz	
Input Impedance		2 M		2 M	
Common Voltage Protection		+/-200 V_{DC}		+/-200 V_{DC}	+/-200 V_{DC}
Individual Channel Configuration					Yes
Overvoltage Protection		240 V_{rms}	+/-200 V_{DC}	240 V_{rms}	240 V_{rms}
System					
Dual Watchdog		Yes			
ESD (IEC 61000-4-2)		+/-4 kV		+/-4 kV	
EFT (IEC 61000-4-4)		+/-4 kV		+/-4 kV	
Intra-Module Isolation, Field-to-Logic		3000 V_{DC}			
Power Input		10 ~ 30 V_{DC}			
Power Consumption		1.3 W		1.3 W	2.0 W

Note1: Differential wiring can be used for voltage input and current input.
Single-Ended wiring can be used for voltage input only.

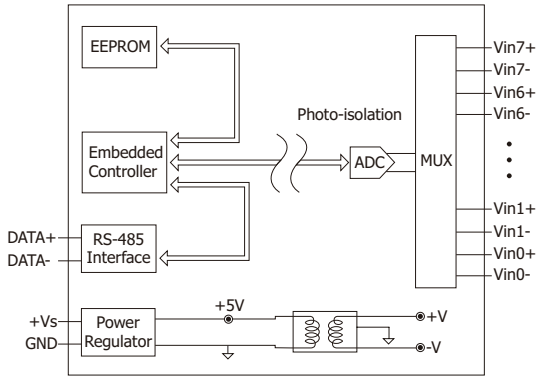
Note2: For high noisy industrial application, the user should choose I-7017Z, M-7017Z, I-7017R, M-7017R, I-7017R-A5, I-7017RC, M-7017RC.

Internal I/O Structure

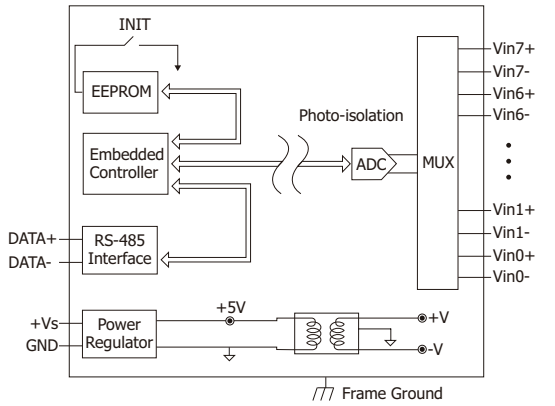
I-7012(D)/I-7012F(D)



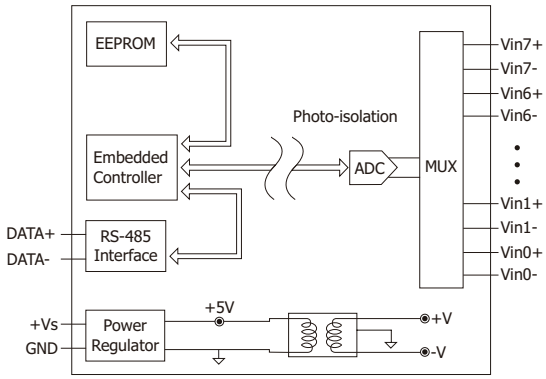
I-7017



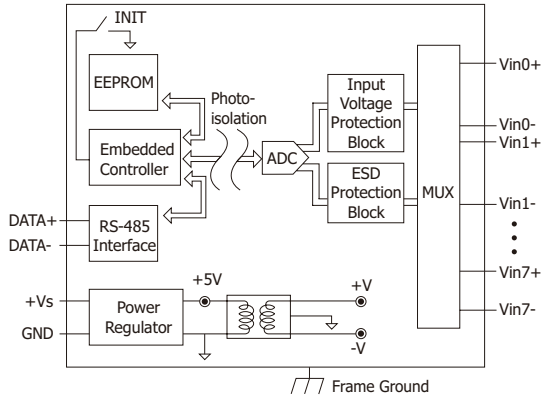
M-7017



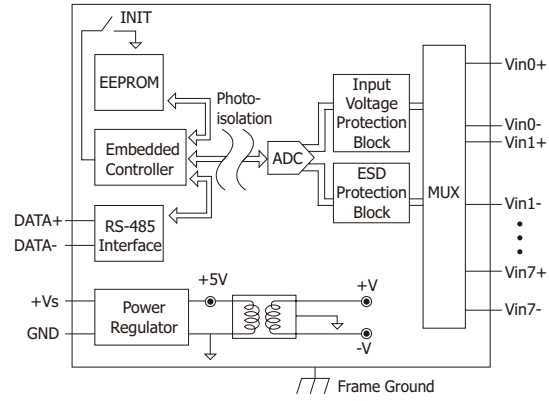
I-7017F



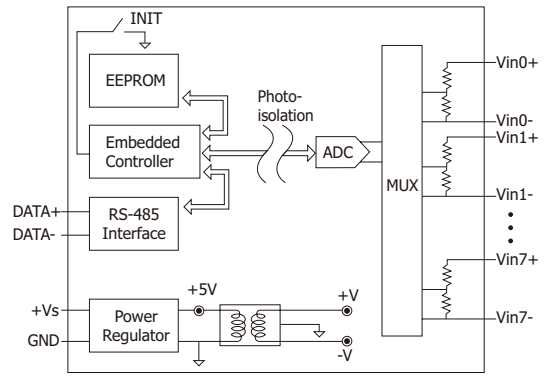
I-7017R



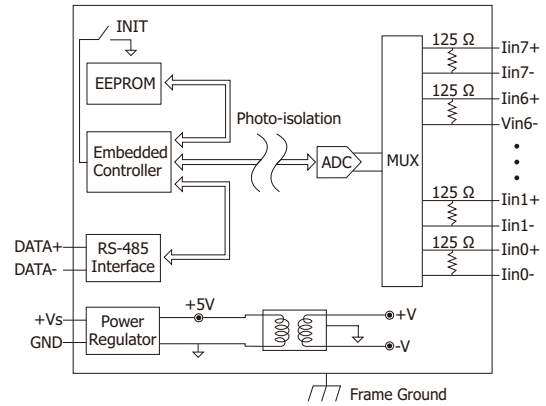
M-7017R



I-7017R-A5/M-7017R-A5



I-7017C/M-7017C



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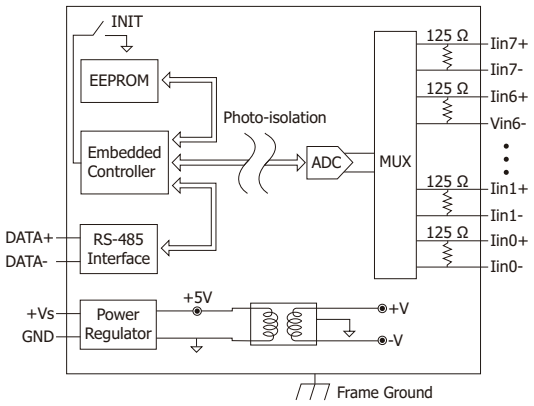
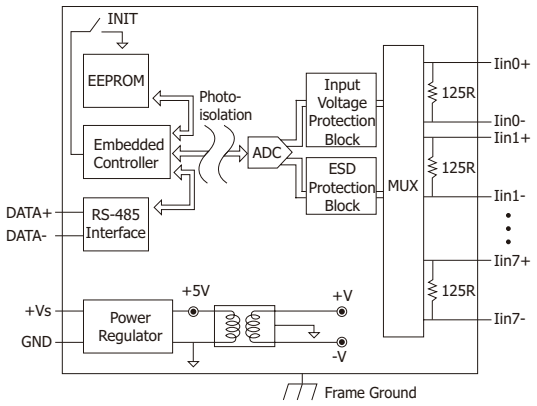
Internal I/O Structure

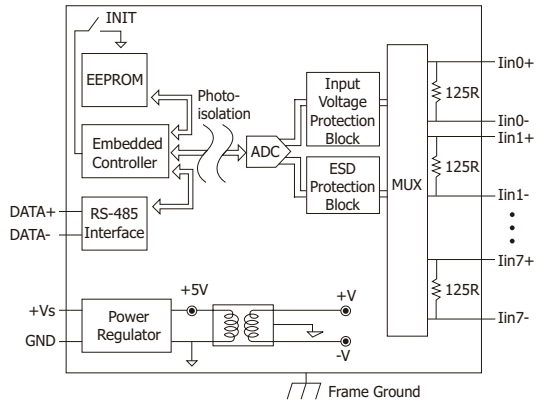
I-7017FC



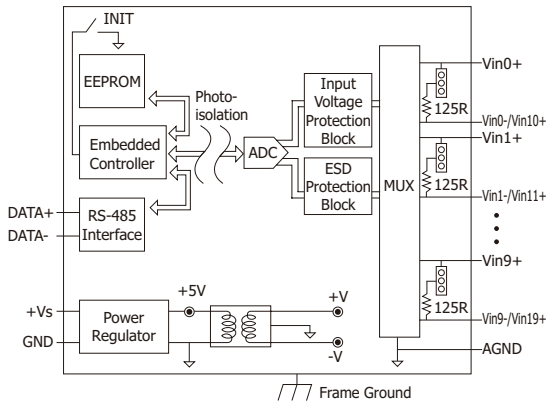
I-7017RC



M-7017RC



I-7017Z/M-7017Z



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Thermocouple Introduction

A thermocouple is a temperature sensor which consists of two wires of different conductors.
Based on the Seebeck effect in thermoelectricity, the temperature difference results voltage difference on the two wires.
Thermocouples are widely used in scientific and industrial applications because they're generally accurate and can operate over wide range of temperature.

Applications

Thermocouple, Voltge & Current Input Module (General Grade)			
Model Name		I-7011(D)	I-7018 M-7018
Pictures			
Channel		1	8
Wiring		Differential	
Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C	
	Voltage	+/-1 5 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, +/-2.5 V	
	Current	+/-20 mA (requires optional external 125 Ω resistor)	+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (requires optional external 125 Ω resistor)
Resolution		16-bit	
Accuracy		0.1%	
Sampling Rate		10 Hz	
Input Impedance		> 400 kΩ	
Common Voltage Protection		+/-5 VDC	+/-15 VDC
Individual Channel Configuration		-	
Overvoltage Protection		+/-5 VDC	+/-35 VDC
Open Wire Detection (for thermocouple only)		Yes	-
Temperature outputs consistency		-	
Stable temperature output in the field		-	
System			
Dual Watchdog		Yes	
ESD (IEC 61000-4-2)		-	
EFT (IEC 61000-4-4)		-	
Intra-Module Isolation, Field-to-Logic		3000 VDC	
Power Input		10 ~ 30 VDC	
Power Consumption		0.9 W; 1.5 W for (D) version	1.0 W

Note1: I-7011(D) and I-7011P(D) both include 1 DI and 2 DO channels. The specification is as following

Digital Input	
Channel	1
Contact	Dry
Sink/Source (NPN/PNP)	Source
On Voltage Level	Close to GND
Off Voltage Level	Open
Counter (50 Hz, 16-bit)	Yes
Input Impedance	3 kΩ
Overvoltage Protection	+/-30 VDC

Digital Output	
Channel	2
Type	Open Collector
Sink/Source (NPN/PNP)	Sink
Load Voltage	3.5 ~ 30 VDC
Max. Load Current	30 mA/Channel
Power-on Value	Yes
Safe Value	Yes

Thermocouple Type

Type	Range (°C)	Type	Range (°C)
J	-210 ~ +760	B	0 ~ +1820
K	-270 ~ +1372	N	-270 ~ 1300
T	-270 ~ +400	C	0 ~ 2320
E	-270 ~ +1000	L	-200 ~ +800
R	0 ~ +1768	M	-200 ~ +100
S	0 ~ +1768	L (DIN43710)	-200 ~ +900

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Thermocouple, Voltge & Current Input Module (Industrial Grade)					
Model Name		I-7018R M-7018R	I-7018Z M-7018Z	I-7019R M-7019R	M-7019Z
Pictures					
Channel		8	10	8	10
Wiring					
Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C, L, M, LDIN43710			
	Voltage	+/-1 5 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, +/-2.5 V		+/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, +/-10 V	
	Current	+/-20 mA (requires optional external 125 Ω resistor)		+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper selectable)	
Resolution		16-bit			
Accuracy		0.1%			
Sampling Rate		10 Hz		8 Hz	10 Hz
Input Impedance					
Common Voltage Protection		+/-200 V_{DC}		+/-200 V_{DC}	
Individual Channel Configuration			Yes	Yes	
Overvoltage Protection		240 V_{rms}		240 V_{rms}	
Open Wire Detection (for thermocouple only)		Yes		Yes	
Temperature outputs consistency		-	Yes	-	Yes
Stable temperature output in the field		-	Yes	-	Yes
System					
Dual Watchdog		Yes			
ESD (IEC 61000-4-2)		+/-4 kV			
EFT (IEC 61000-4-4)		+/-4 kV			
Intra-Module Isolation, Field-to-Logic		3000 V_{DC}			
Power Input		10 ~ 30 V_{DC}			
Power Consumption		1.0 W	1.1 W	1.2 W	1.8 W

Note1: We recommend to choose I-7018Z/M-7018Z and M-7019Z for accurate thermocouple measurement.

Thermocouple Type

Type	Range (°C)	Type	Range (°C)
J	-210 ~ +760	B	0 ~ +1820
K	-270 ~ +1372	N	-270 ~ 1300
T	-270 ~ +400	C	0 ~ 2320
E	-270 ~ +1000	L	-200 ~ +800
R	0 ~ +1768	M	-200 ~ +100
S	0 ~ +1768	L (DIN43710)	-200 ~ +900

Accessories for I-7018Z, M-7018Z and M-7019Z

I-7018Z-G/S =
I-7018Z-G Connects DB-1820 Directly

I-7018Z-G/2S =
I-7018Z-G Connect DN-1822 Directly
+1.8 m Cable

CD-2518D =
1.8 m Cable +
DB-1820

I-7018Z-G/S + CD-2518D

CD-25015 =
15 cm Cable + DB-1820

4PAPP-006-G

I-7018Z-G/S + CD-25015 + 4PAPP-006-G

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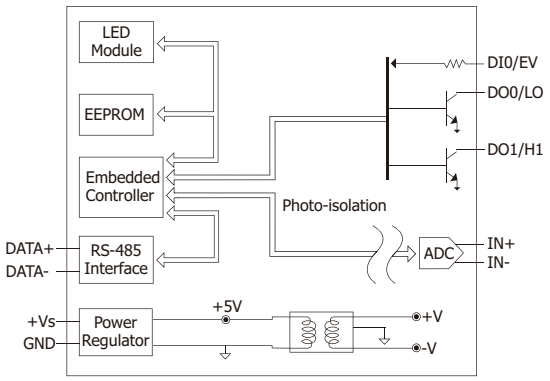
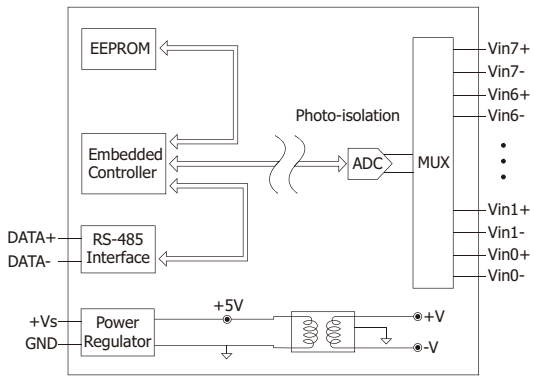
Internal I/O Structure

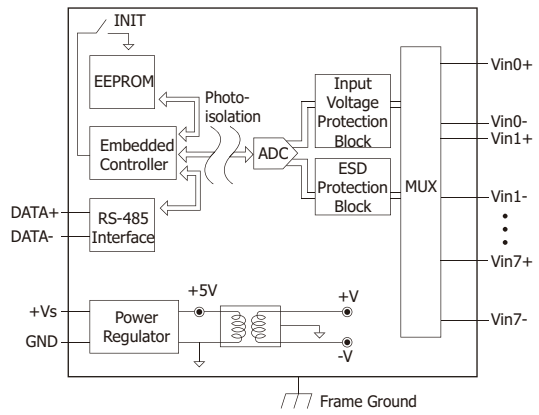
I-7011(D)



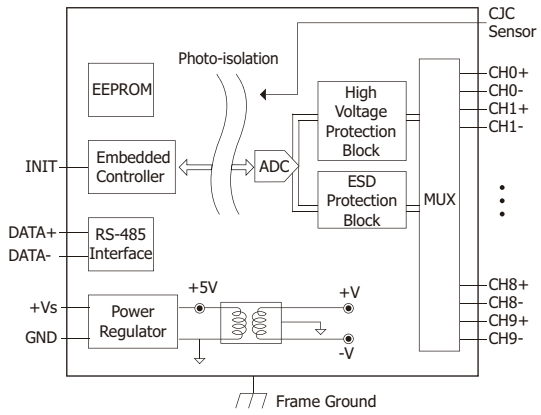
I-7018/M-7018



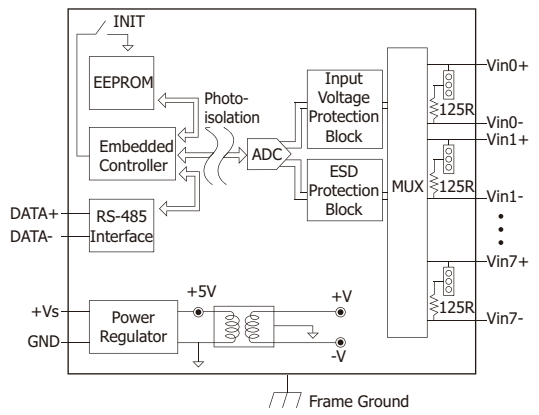
I-7018R/M-7018R



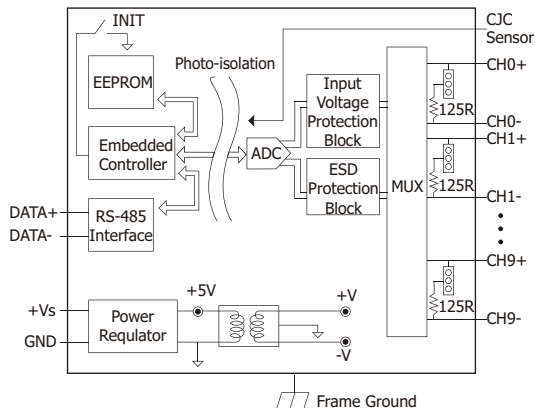
I-7018Z/M-7018Z



I-7019R/M-7019R



M-7019Z



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RTD Introduction

Resistance Temperature Detectors (RTD), as the name implies, are sensors used to measure temperature by correlating the resistance of the RTD element with temperature. Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material whose resistance at various temperatures has been documented. RTDs are also relatively immune to electrical noise and therefore well suited for temperature measurement in industrial environments, especially around motors, generators and other high voltage equipment.

Applications

RTD Input Module (General Grade)		
Model Name	I-7013(D)	I-7033(D) M-7033(D)
Pictures		
Channel	1	3
Wiring	2/3/4 wire	2/3/4 wire
Sensor Type	Pt100, Pt1000, Ni120	Pt100, Pt1000, Ni120
Resolution	16-bit	16-bit
Accuracy	+/-0.05%	+/-0.1%
Sampling Rate	10 Hz	15 Hz
Individual Channel Configuration	-	-
Overvoltage Protection	+/-5 V_{DC}	+/- 25 V_{DC}
Open Wire Detection	Yes	Yes
3-wire RTD lead resistance elimination	Yes	Yes
Resistance Measurement	3.2 KΩ Max.	
System		
Dual Watchdog	Yes	Yes
ESD (IEC 61000-4-2)	-	-
EFT (IEC 61000-4-4)	-	-
Intra-Module Isolation, Field-to-Logic	3000 V_{DC}	
Power Input	10 ~ 30 V_{DC}	
Power Consumption	0.7 W; 1.3 W for (D) version	1.0 W; 1.6 W for (D) version

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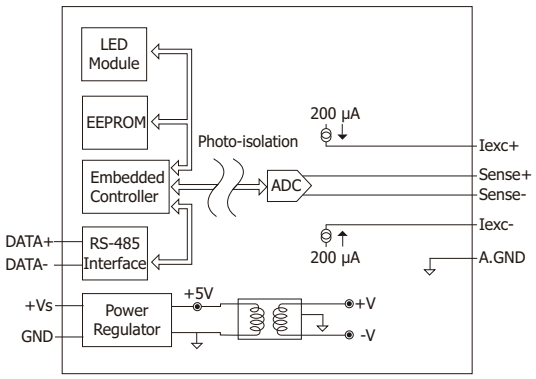
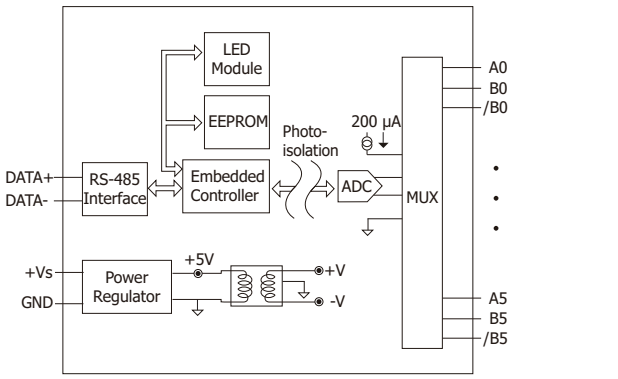
RTD Input Module (Industrial Grade)		
Model Name	I-7015 M-7015	I-7015P M-7015P
Pictures		
Channel	6	6
Wiring	2/3 wire	
Sensor Type	Pt100, Pt1000, Ni120, Cu100, Cu1000	
Resolution	16-bit	
Accuracy	+/-0.05%	
Sampling Rate	12 Hz	
Individual Channel Configuration	Yes	
Overvoltage Protection	120 VDC	
Open Wire Detection	Yes	
3-wire RTD lead resistance elimination	-	Yes
Resistance Measurement	3.2 KΩ Max.	
System		
Dual Watchdog	Yes	
ESD (IEC 61000-4-2)	+/-4 kV	
EFT (IEC 61000-4-4)	+/-4 kV	
Intra-Module Isolation, Field-to-Logic	3000 VDC	
Power Input	10 ~ 30 VDC	
Power Consumption	1.1 W	1.2 W

Internal I/O Structure

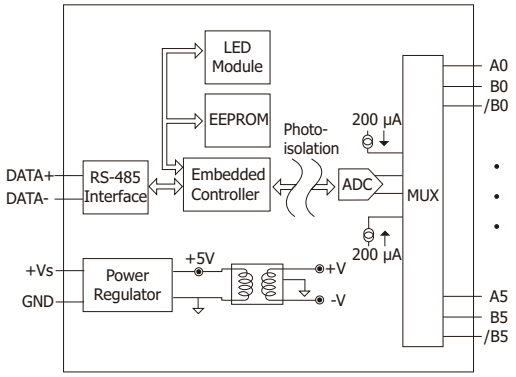
I-7013(D)



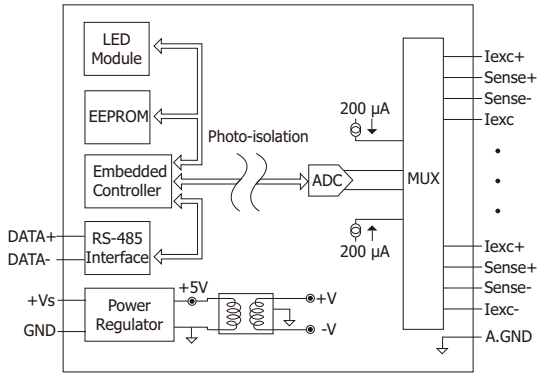
I-7015/M-7015



I-7015P/M-7015P

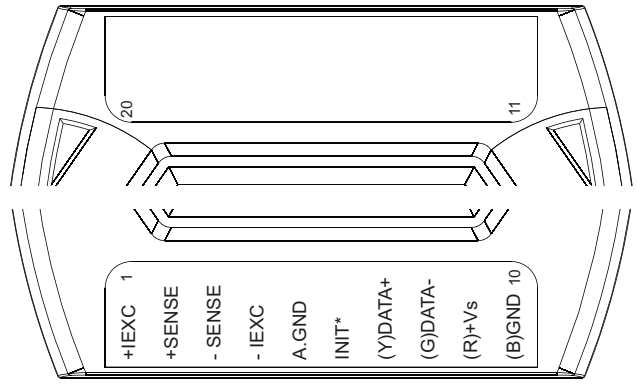


I-7033(D)/M-7033(D)

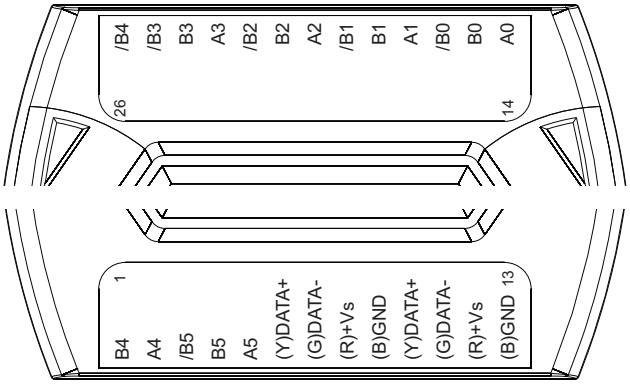


Pin Assignments

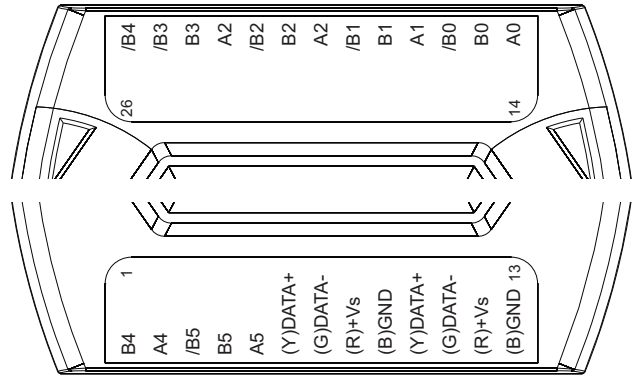
I-7013(D)



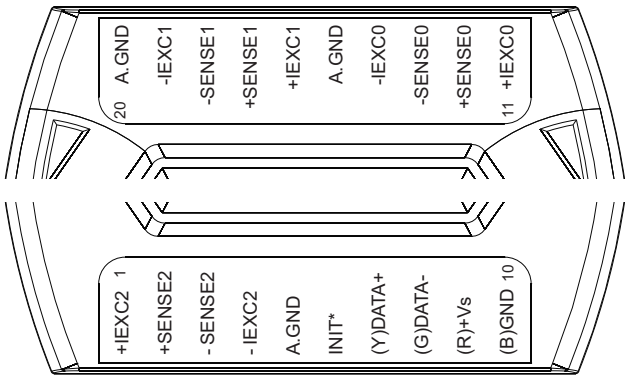
I-7015/M-7015



I-7015P/M-7015P



I-7033(D)/M-7033(D)



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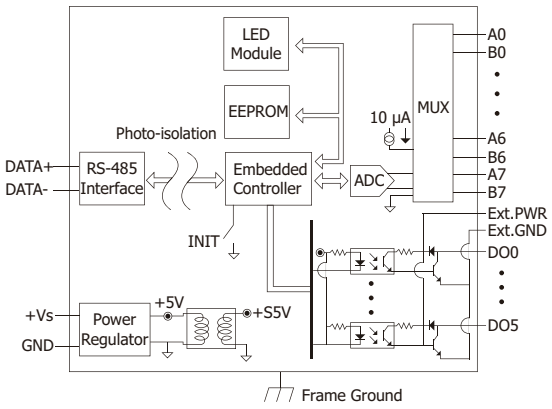
Thermistor Introduction

A **thermistor** is a type of resistor whose resistance varies significantly with temperature, more so than in standard resistors. The word is a portmanteau of *thermal* and *resistor.* Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements.
Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range (usually -90 °C ~ 130 °C).

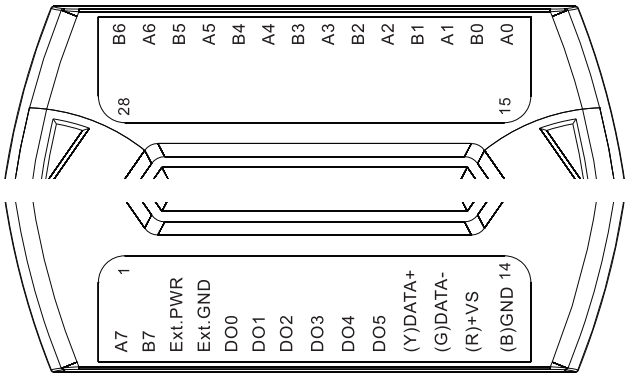
Applications

Thermistor Input Module (Industrial Grade)	
Model Name	I-7005
	M-7005
Pictures	
Thermistor Input	
Channel	8
Wiring	Differential
Sensor Type	Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined
Resolution	16-bit
Accuracy	+/-0.1%
Sampling Rate	8 Hz
Individual Channel Configuration	Yes
Overvoltage Protection	120 V_{DC}
Open Wire Detection	Yes
Resistance Measurement	200 KΩ Max.
Digital Output	
Channel	6
Type	Open Collector
Sink/Source (NPN/PNP)	Sink
Load Voltage	+3.5 ~ 50 V_{DC}
Max. Load Current	650 mA/Channel
Overvoltage Protection	60 V_{DC}
Overload Protection	1.4 A (with short-circuit protection)
Power-on Value	Yes
Safe Value	Yes
System	
Dual Watchdog	Yes
ESD (IEC 61000-4-2)	+/-4 kV
EFT (IEC 61000-4-4)	+/-4 kV
Intra-Module Isolation, Field-to-Logic	3000 V_{DC}
Power Input	10 ~ 30 V_{DC}
Power Consumption	1.3 W

Internal I/O Structure



Pin Assignments



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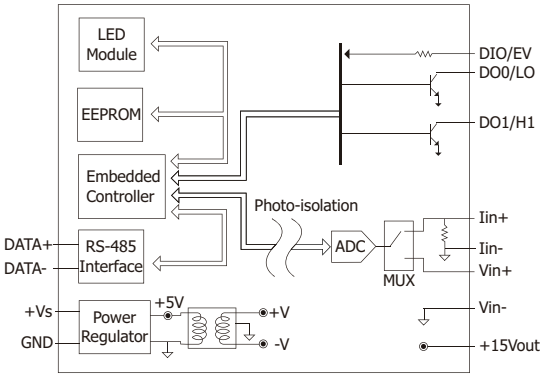
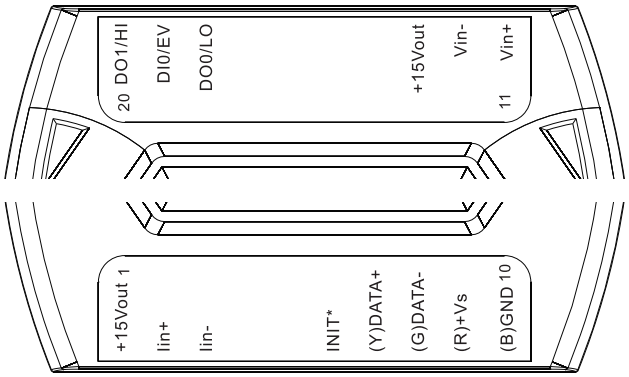
Transmitter Input Module (General Grade)	
Model Name	I-7014D
Pictures	
Transmitter Input	
Channel	1
Wiring	Differential
Sensor Type	+/- 150 mV, +/- 500 mV, +/- 1V, +/- 5 V, +/- 10 V, +/- 20 mA
Resolution	16-bit
Accuracy	+/-0.05%
Sampling Rate	10 Hz
Input Impedance	Voltage: 30 KΩ Currnet: 125 Ω
Isolated Loop Power	15 V_{DC}, 30 mA
Overvoltage Protection	+/- 15 V
Open Wire Detection	-
Digital Input	
Channel	1
Contact	Dry
Sink/Source (NPN/PNP)	Source
On Voltage Level	Close to GND
Off Voltage Level	Open
Counter (50 Hz, 16-bit)	Yes
Input Impedance	3 KΩ
Overvoltage Protection	+/-30 V_{DC}
Digital Output	
Channel	2
Type	Open Collector
Sink/Source (NPN/PNP)	Sink
Load Voltage	+3.5 ~ 50 V_{DC}
Max. Load Current	30 mA/Channel
Power-on Value	Yes
Safe Value	Yes
System	
Dual Watchdog	Yes
ESD (IEC 61000-4-2)	-
EFT (IEC 61000-4-4)	-
Intra-Module Isolation, Field-to-Logic	3000 V_{DC}
Power Input	10 ~ 30 V_{DC}
Power Consumption	1.9 W

Internal I/O Structure



Pin Assignments



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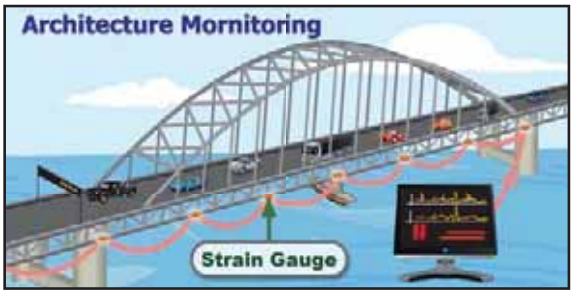
Strain Gauge Introduction

A strain gauge is a resistive sensor. The measurement of strain is usually made using a Wheatstone bridge circuit with excitation voltage. The variation in strain can be calculated based on the measured voltage. The resistance of the gauge varies when the gauge is compressed or stretched. With the characteristic, it can be applied to measure stress or the growth of the crack or movement in buildings, foundations, and other structures to ensure the safety.

Applications



Strain Gauge Input Module (General Grade)		
Model Name	I-7016(D) M-7016(D)	I-7016P(D)
Pictures		
Strain Gauge Input		
Channel	2	1
Wiring	4 wire	6 wire
Sensor Type	Full-Bridge	
Resolution	16-bit	
Accuracy	+/-0.05%	
Sampling Rate	2/10 Hz	10 Hz
Input Impedance	20 MΩ	
Individual Channel Configuration	-	
Overvoltage Protection	+/-5 VDC	
Open Wire Detection	-	
Long Distance Measurement	-	Yes
Excitation Voltage Output		
Channel	1	
Range	0 ~ 10 V	
Max. Load Current	40 mA	
Resolution	16-bit	
Accuracy	+/-0.05%	
Power-on Value	Yes	
Digital Input		
Channel	1	
Contact	Dry	
Sink/Source (NPN/PNP)	Source	
On Voltage Level	Close to GND	
Off Voltage Level	Open	
Counter (50 Hz, 16-bit)	Yes	
Input Impedance	3 KΩ	
Overvoltage Protection	+/-30 VDC	
Digital Output		
Channel	4	
Type	Open Collector	
Sink/Source (NPN/PNP)	Sink	
Load Voltage	+3.5 ~ 50 VDC	
Max. Load Current	30 mA/Channel	
Power-on Value	Yes	
Safe Value	Yes	
System		
Dual Watchdog	Yes	
ESD (IEC 61000-4-2)	-	
EFT (IEC 61000-4-4)	-	
Intra-Module Isolation, Field-to-Logic	3000 VDC	
Power Input	10 ~ 30 VDC	
Power Consumption	2.4 W; 3.0 W for (D) version	2.4 W; 3.0 W for (D) version

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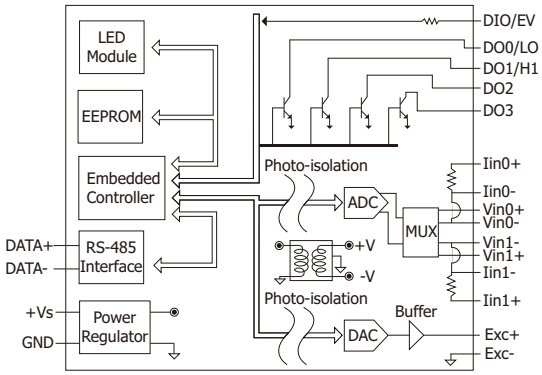
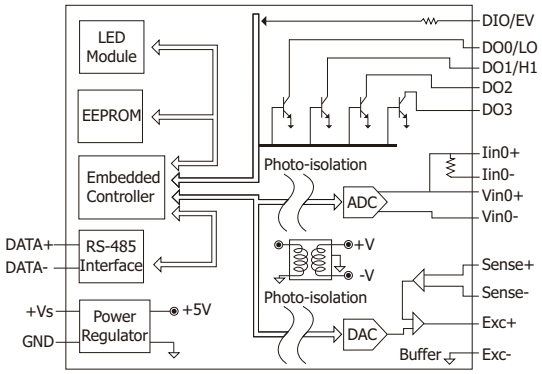
Internal I/O Structure

I-7016(D)/M-7016(D)

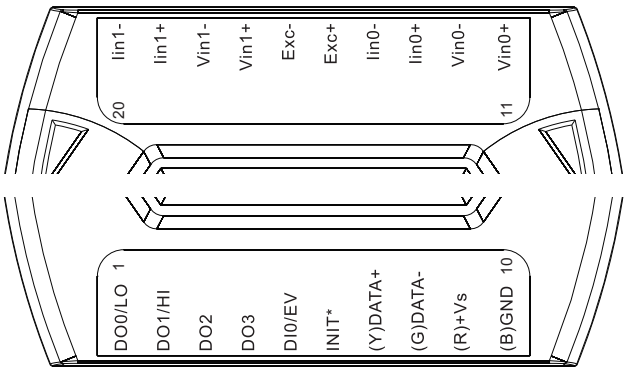


I-7016P(D)

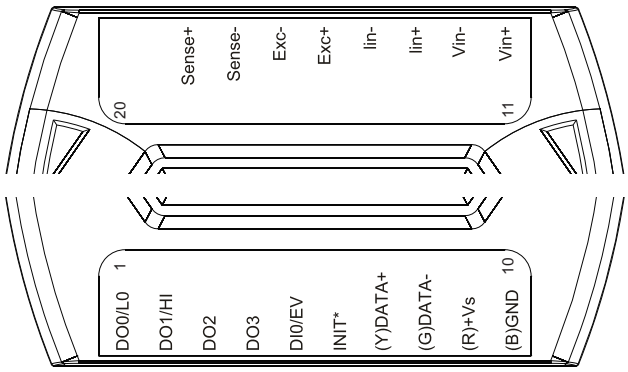


Pin Assignments

I-7016(D)/M-7016(D)



I-7016P(D)



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2.2-2. Analog Output

Analog Output Module (General Grade)				
Model Name	I-7021	I-7021P	I-7022 M-7022	I-7024 M-7024
Pictures				
Channel	1		2	4
Wiring	Unipolar		Unipolar	Bipolar/Unipolar
Range	0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA		0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA
Resolution	12-bit	16-bit	12-bit	14-bit
Accuracy	0.1%	0.02%	0.1%	0.1%
DA Output Response Time	10 ms		10 ms	10 ms
Open Wire Detection (for current only)	Yes		Yes	-
Channel to Channel Isolation	-		Yes	-
Power-on Value	Yes		Yes	Yes
Safe Value	Yes		Yes	Yes
Digital Input				
Channel	-			-
Contact	-			-
Sink/Source (NPN/PNP)	-			-
On Voltage Level	-			-
Off Voltage Level	-			-
Counter (50 Hz, 16-bit)	-			-
Input Impedance	-			-
Overvoltage Protection	-			-
System				
Dual Watchdog	Yes			Yes
ESD (IEC 61000-4-2)	+/-2 kV			+/-2 kV
EFT (IEC 61000-4-4)	-			-
RS (IEC 61000-4-3)	-			-
Intra-Module Isolation, Field-to-Logic	3000 VDC			3000 VDC
Power Input	10 ~ 30 VDC			
Power Consumption	1.8 W	1.8 W	3.0 W	2.4 W

Analog Output Module (Industrial Grade)	
Model Name	I-7024R
Pictures	
Channel	4
Wiring	Bipolar/Unipolar
Range	0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA
Resolution	14-bit
Accuracy	0.1%
DA Output Response Time	10 ms
Open Wire Detection (for current only)	-
Channel to Channel Isolation	-
Power-on Value	Yes
Safe Value	Yes
Digital Input	
Channel	5
Contact	Dry
Sink/Source (NPN/PNP)	Source
On Voltage Level	Close to GND
Off Voltage Level	Open
Counter (50 Hz, 16-bit)	Yes
Input Impedance	100 KΩ
Overvoltage Protection	+/-30 V_{DC}
System	
Dual Watchdog	Yes
ESD (IEC 61000-4-2)	+/-4 kV
EFT (IEC 61000-4-4)	+/-4 kV
RS (IEC 61000-4-3)	5 V/m, 80 MHz ~ 1 GHz
Intra-Module Isolation, Field-to-Logic	3000 V_{DC}
Power Input	10 ~ 30 V_{DC}
Power Consumption	3.2 W

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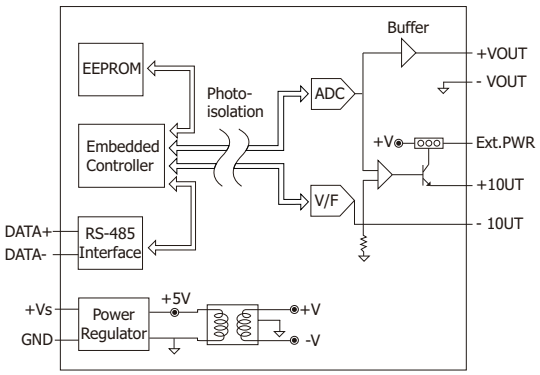
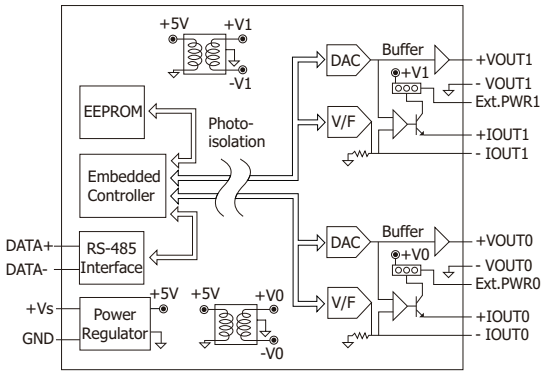
Internal I/O Structure

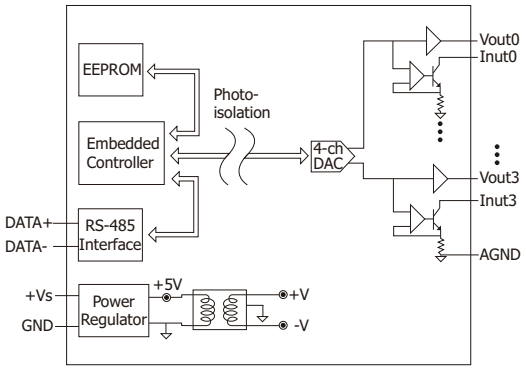
I-7021/I-7021P



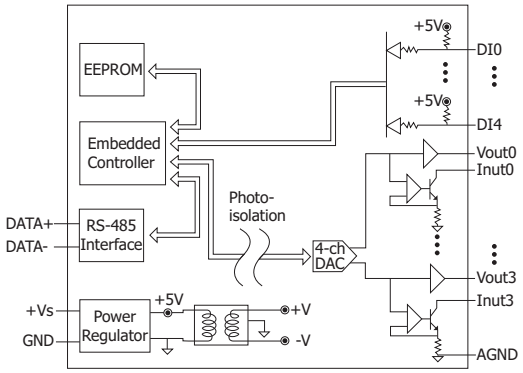
I-7022/M-7022



I-7024/M-7024

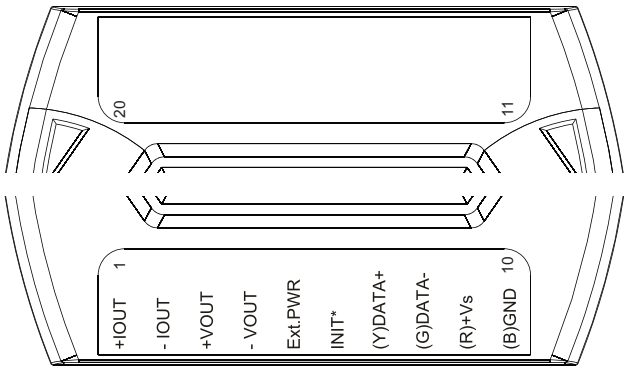


I-7024R

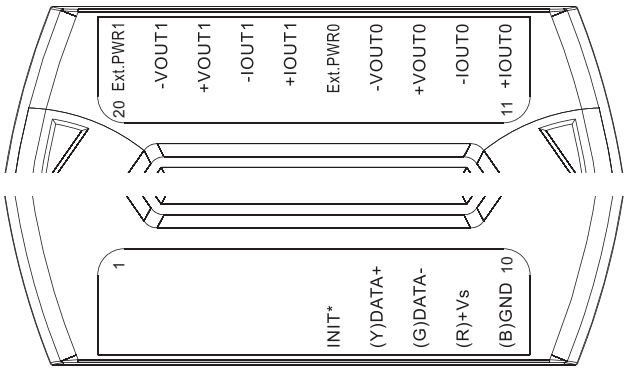


Pin Assignments

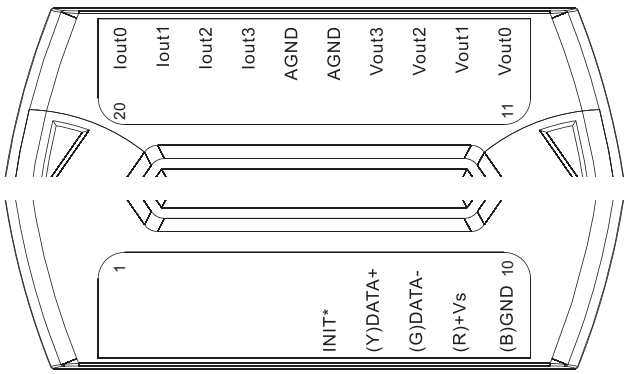
I-7021/I-7021P



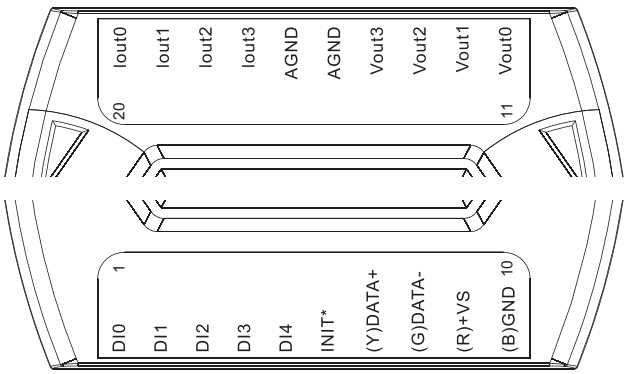
I-7022/M-7022



I-7024/M-7024



I-7024R



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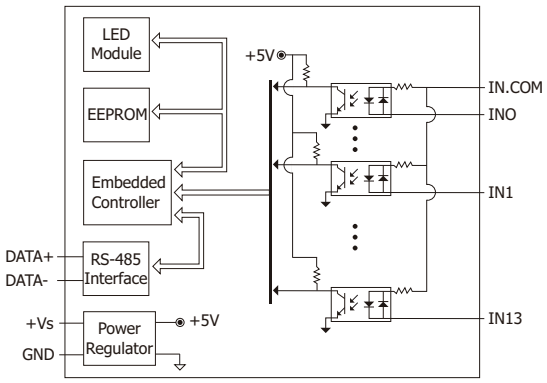
2.2-3. Digital I/O

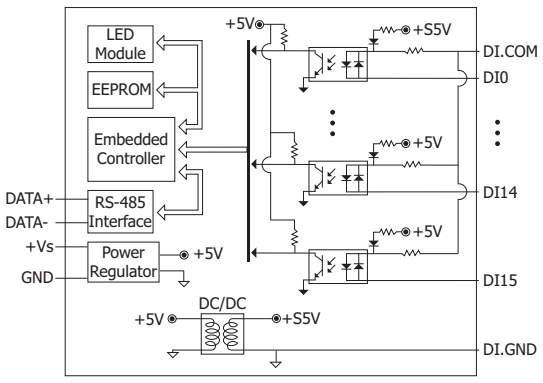
DC Digital Input Module						
Model Name		I-7041(D) M-7041(D)	I-7041P(D) M-7041P(D)	I-7051(D) M-7051(D)	I-7052(D) M-7052(D)	I-7053(D)_FG M-7053(D)
Pictures						
Channel		14		16	8	16
Contact		Wet		Dry + Wet	Wet	Dry
Sink/Source (NPN/PNP)		Sink/Source		Dry: Source Wet: Sink/Source	Sink/Source	Source
Wet Contact	On Voltage Level	+1 VDC Max.	+11 VDC Max.	+10 ~ 50 VDC	+4 ~ 30 VDC	-
	Off Voltage Level	+4 ~ 30 VDC	+19 ~ 30 VDC	+4 VDC Max.	+1 VDC Max.	-
Dry Contact	On Voltage Level	-		Close to GND	-	Open
	Off Voltage Level	-		Open	-	Close to GND
Counter (100 Hz, 16-bit)		Yes		Yes	Yes	Yes
Input Impedance		3 KΩ		10 KΩ	3 KΩ	-
Channel to Channel Isolation		-		-	Yes, +/-2 kV for differential only.	-
Overvoltage Protection		+/-35 VDC		+/-70 VDC	+/-35 VDC	-
System						
Dual Watchdog		Yes		Yes		Yes
ESD (IEC 61000-4-2)		+/-4 kV		+/-4 kV		-
EFT (IEC 61000-4-4)		+/-2 kV		+/-2 kV		-
Intra-Module Isolation, Field-to-Logic		3750 Vrms		3750 Vrms		-
Power Input		10 ~ 30 VDC				
Power Consumption		0.2 W; 0.9 W for (D) version	0.2 W; 0.9 W for (D) version	0.3 W; 1.1 W for (D) version	0.2 W; 0.6 W for (D) version	0.7 W; 0.9 W for (D) version

Internal I/O Structure

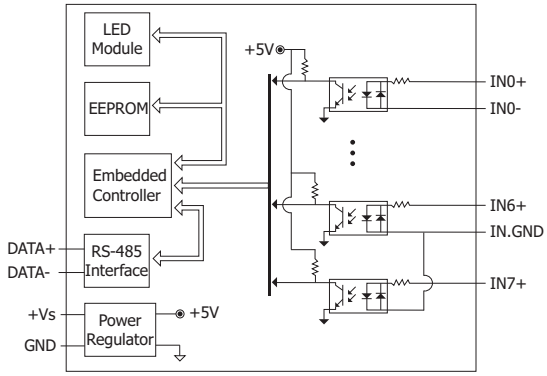
I-7041(D)/M-7041(D)/I-7041P(D)/M-7041P(D)



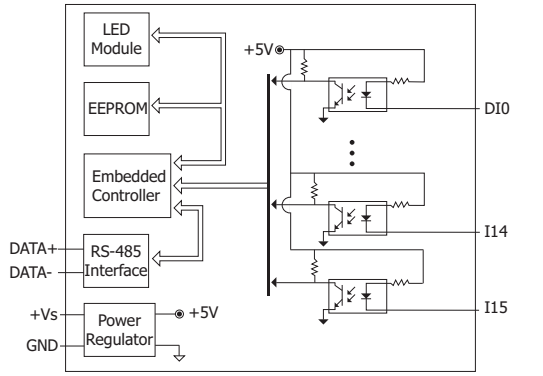
I-7051(D)/M-7051(D)



I-7052(D)/M-7052(D)



I-7053(D)_FG/M-7053(D)



Beta
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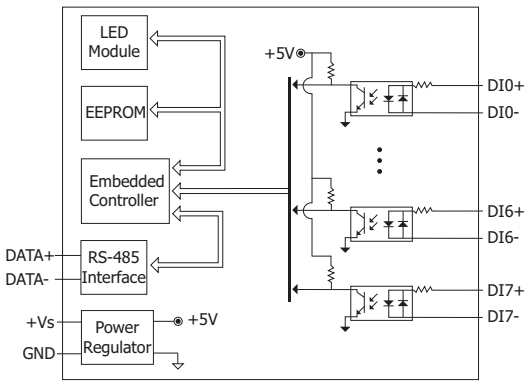
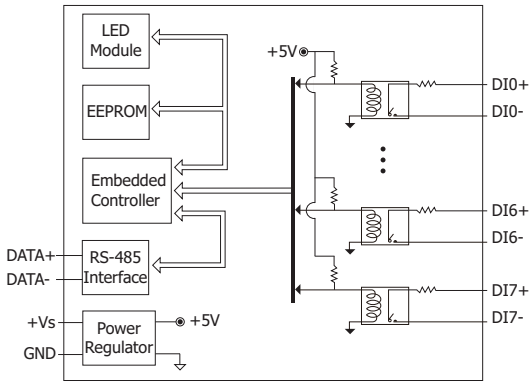
AC Digital Input Module		
Model Name	I-7058(D) M-7058(D)	I-7059(D) M-7059(D)
Pictures		
Channel	8	
Contact	Wet	
Sink/Source (NPN/PNP)	Differential	
On Voltage Level	80 ~ 250 V_{AC}	10 ~ 80 V_{AC}
Off Voltage Level	30 V_{AC} Max.	3 V_{AC} Max.
Counter (100 Hz, 16-bit)	Yes	
Input Impedance	68 KΩ	10 KΩ
Channel to Channel Isolation	Yes, +/-2 kV	
Overvoltage Protection	300 V_{AC}	120 V_{AC}
System		
Dual Watchdog	Yes	
ESD (IEC 61000-4-2)	+/- 4kV	
EFT (IEC 61000-4-4)	+/- 2kV	
Intra-Module Isolation, Field-to-Logic	5000 V_{rms}	
Power Input	10 ~ 30 V_{DC}	
Power Consumption	0.3 W; 0.7 W for (D) version	0.3 W; 0.7 W for (D) version

Internal I/O Structure

I-7058(D)/M-7058(D)

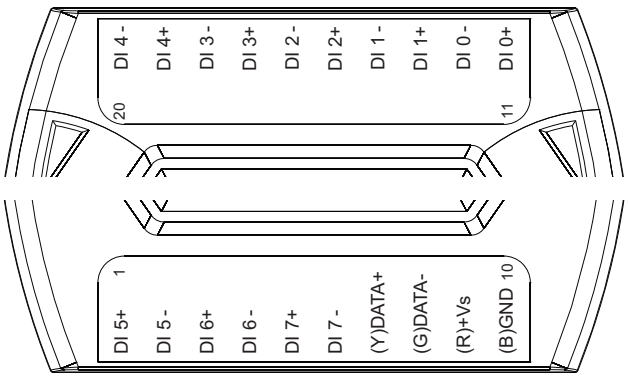


I-7059(D)/M-7059(D)

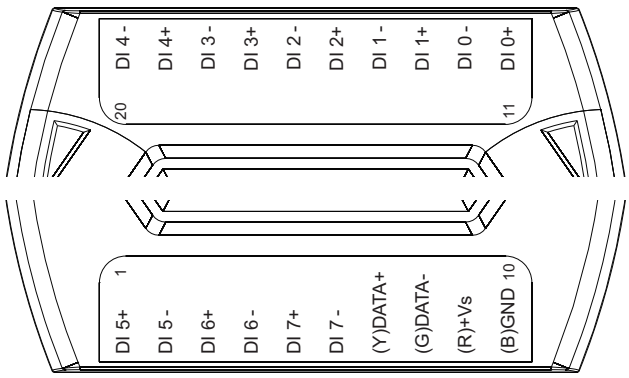


Pin Assignments

I-7058(D)/M-7058(D)



I-7059(D)/M-7059(D)



Beta
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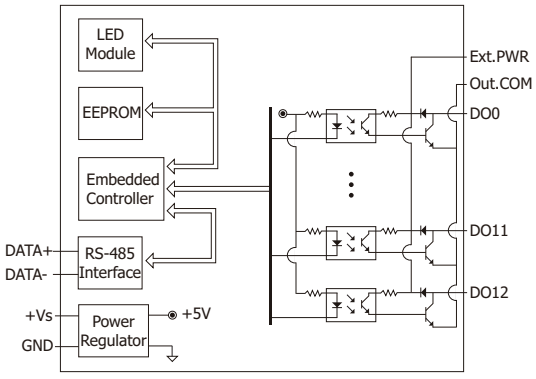
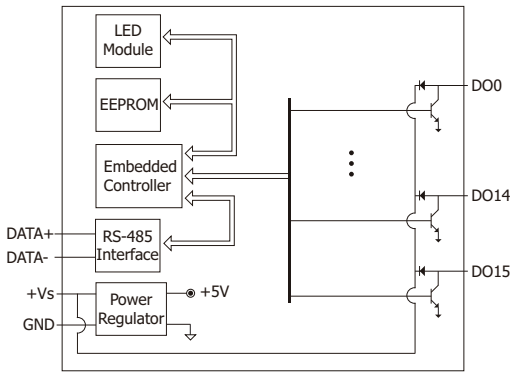
Digital Output Module				
Model Name	I-7042(D)	I-7043(D)	I-7045(D) M-7045(D)	I-7045(D)-NPN M-7045(D)-NPN
Pictures				
Channel	13		16	
Contact	Open Collector		MOSFET	
Sink/Source (NPN/PNP)	Sink		Source	Sink
Load Voltage	+3.5 ~ 30 V_{DC}		+3.5 ~ 30 V_{DC}	+3.5 ~ 50 V_{DC}
Max. Load Current	100 mA/Channel		650 mA/Channel	700 mA/Channel
Overvoltage Protection	-		47 V_{DC}	60 V_{DC}
Overload Protection	-		1.4 A (with short-circuit protection)	
Power-on Value	Yes		Yes	
Safe Value	Yes		Yes	
System				
Dual Watchdog	Yes		Yes	
ESD (IEC 61000-4-2)	+/-2 kV	-	+/-4 kV	
EFT (IEC 61000-4-4)	+/-2 kV	-	+/-4 kV	
Surge (IEC 61000-4-5)	-	-	-	+/-3 kV
Intra-Module Isolation, Field-to-Logic	3750 V_{rms}	-	3750 V_{rms}	
Power Input	10 ~ 30 V_{DC}			
Power Consumption	1.0 W; 1.7 W for (D) version	.4 W; 1.1 W for (D) version0	0.6 W; 1.5 W for (D) version	0.4 W; 1.2 W for (D) version

Internal I/O Structure

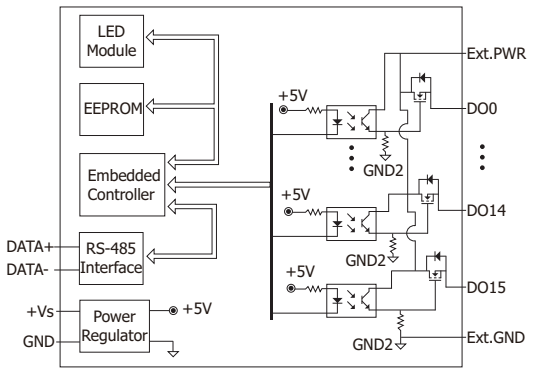
I-7042(D)



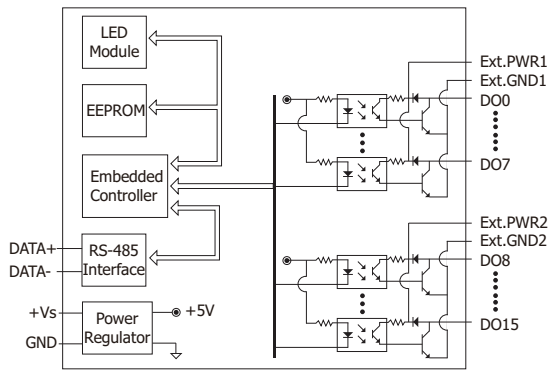
I-7043(D)



I-7045(D)/M-7045(D)



I-7045(D)-NPN/M-7045(D)-NPN



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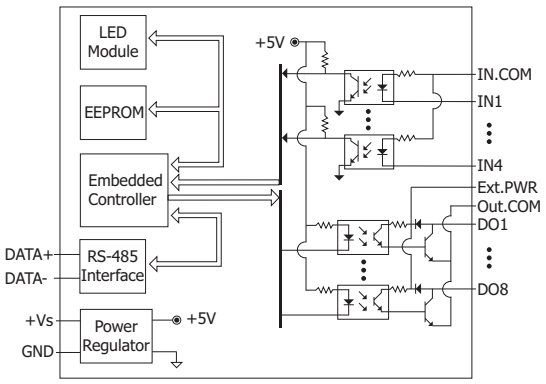
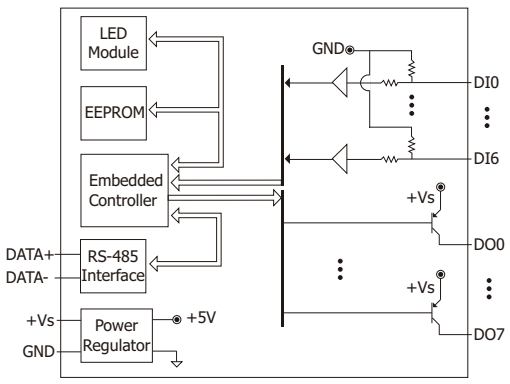
Digital Input & Output Module						
Model Name		I-7044(D)	I-7050(D) M-7050(D)	I-7050A(D)	I-7055(D) M-7055(D)	I-7055(D)-NPN M-7055(D)-NPN
Pictures						
Digital Input						
Channel		4	7		8	
Contact		Wet	Dry	Wet	Dry + Wet	
Sink/Source (NPN/PNP)		Sink/Source	Source	Sink	Dry: Source Wet: Sink/Source	
Wet Contact	On Voltage Level	+1 V_{DC} Max.	-	+4 ~ 30 V_{DC}	+10 ~ 50 V_{DC}	
	Off Voltage Level	+4 ~ 30 V_{DC}	-	+1 V_{DC} Max.	+4 V_{DC} Max.	
Dry Contact	On Voltage Level	-	Open	-	Close to GND	
	Off Voltage Level	-	Close to GND	-	Open	
Counter (100 Hz, 16-bit)		Yes	Yes		Yes	
Input Impedance		3 KΩ	100 KΩ		10 KΩ	
Overvoltage Protection		+/-35 V_{DC}	-		+/-70 V_{DC}	
Digital Output						
Channel		8				
Type		Open Collector	Open Collector	Open Emitter	MOSFET	
Sink/Source (NPN/PNP)		Sink	Sink	Source	Source	Sink
Load Voltage		+3.5 ~ 30 V_{DC}	+3.5 ~ 30 V_{DC}		+10 ~ 40 V_{DC}	+3.5 ~ 50 V_{DC}
Max. Load Current		375 mA/Channel	30 mA/Channel		650 mA/Channel	700 mA/Channel
Overvoltage Protection		-	-		47 V_{DC}	60 V_{DC}
Overload Protection		-	-		1.4 A (with short-circuit protection)	
Power-on Value		Yes				
Safe Value		Yes				
System						
Dual Watchdog		Yes				
ESD (IEC 61000-4-2)		+/-2 kV	-		+/-4 kV	
EFT (IEC 61000-4-4)		+/-2 kV	-		+/-4 kV	
Surge (IEC 61000-4-5)		-			-	+/-3 kV
Intra-Module Isolation, Field-to-Logic		3750 V_{rms}	-		3750 V_{rms}	
Power Input		10 ~ 30 V_{DC}				
Power Consumption		1.0 W; 1.7 W for (D) version	0.4 W; 1.1 W for (D) version	0.5 W; 1.2 W for (D) version	0.8 W; 1.6 W for (D) version	1.2 W; 2.2 W for (D) version

Internal I/O Structure

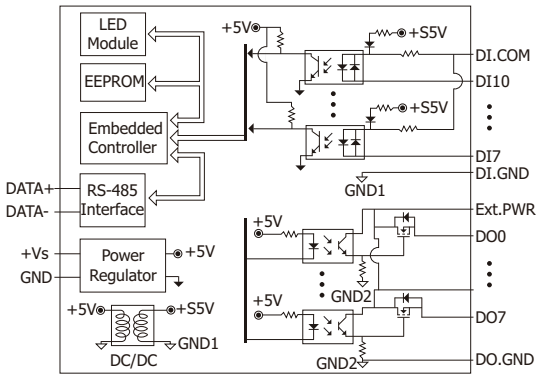
I-7044(D)



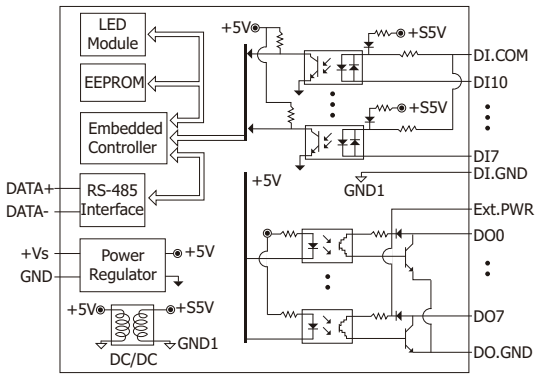
I-7050(D)/I-7050A(D)M-7050(D)



I-7055(D)/M-7055(D)

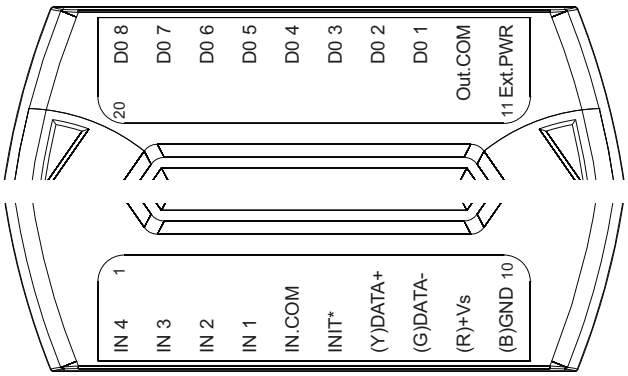


I-7055(D)-NPN/M-7055(D)-NPN

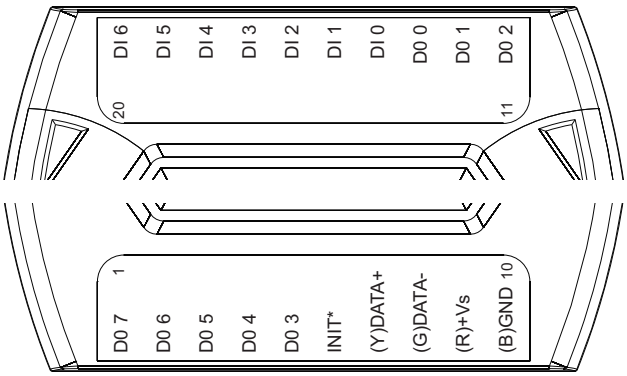


Pin Assignments

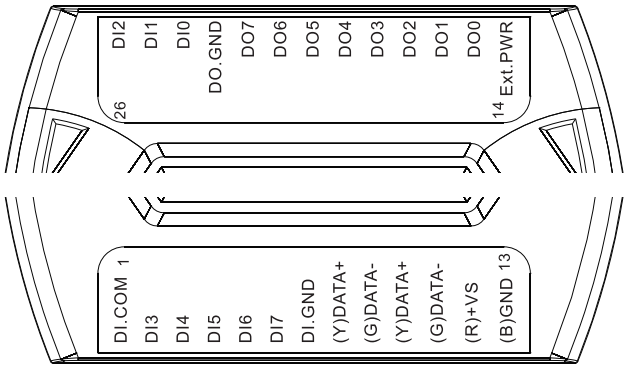
I-7044(D)



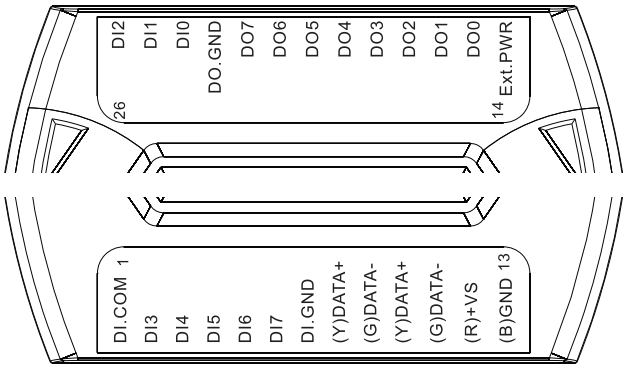
I-7050(D)/I-7050A(D)M-7050(D)



I-7055(D)/M-7055(D)



I-7055(D)-NPN/M-7055(D)-NPN



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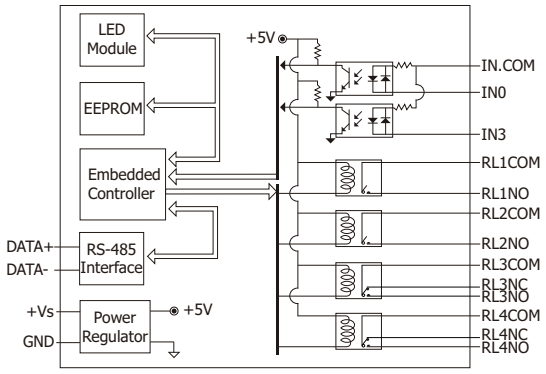
2.2-4. Relay I/O

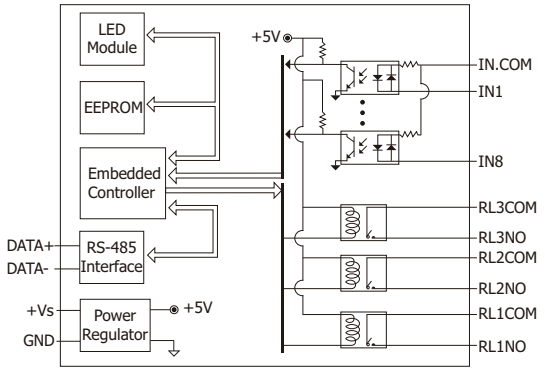
Module					
Model Name	I-7060(D) M-7060(D)	I-7063(D)	I-7065(D) M-7065(D)	I-7061(D) M-7061(D)	I-7067(D) M-7067(D)
Pictures					
Relay Output					
Channel	4	3	5	5	7
Type	Power Relay (Form A × 2, Form C × 2)	Power Relay (Form A)			
Contact Rating	0.6 A @ 125 VAC 2 A @ 30 VDC	5 A @ 250 VAC 5 A @ 30 VDC			0.5 A @ 120 VAC 1 A @ 24 VDC
Surge Strength	500 VDC	4000 VDC		3000 VDC	1500 VDC
Operate Time	3 ms	6 ms		2 ms	5 ms
Release Time	2 ms	3 ms		2 ms	2 ms
Mechanical Endurance	10^8 ops.	2×10^7 ops.			5×10^6 ops.
Electrical Endurance	5×10^5 ops.	10^5 ops.			
Power-on Value	Yes	Yes		Yes	Yes
Safe Value	Yes	Yes		Yes	Yes
Digital Input					
Channel	4	8	4	-	
Type	Wet				
Sink/Source (NPN/PNP)	Sink/Source				
On Voltage Level	+1 VDC Max.				
Off Voltage Level	+4 ~ 30 VDC				
Counter (100 Hz, 16-bit)	Yes				
Input Impedance	3 kΩ				
Overvoltage Protection	+/-35 VDC				
System					
Dual Watchdog	Yes				
ESD (IEC 61000-4-2)	+/-4 kV				
EFT (IEC 61000-4-4)	+/-2 kV			+/-4 kV	+/- 2 kV
Surge (IEC 61000-4-5)	-			+/- 3 kV	-
Intra-Module Isolation, Field-to-Logic	3750 Vrms				
Power Input	10 ~ 30 VDC				
Power Consumption	1.3 W; 1.9 W for (D) version	1.0 W; 1.5 W for (D) version	1.3 W; 2.2 W for (D) version	1.7 W; 2.3 W for (D) version	1.5 W; 2.2 W for (D) version

Internal I/O Structure

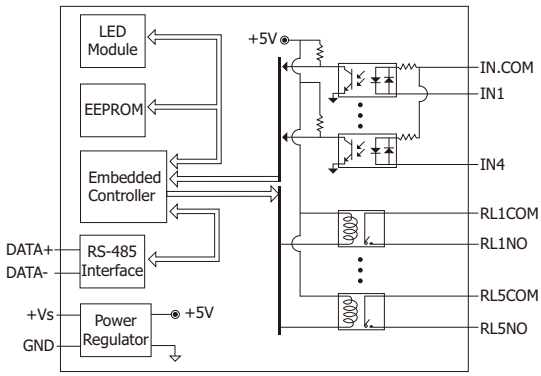
I-7060(D)/M-7060(D)



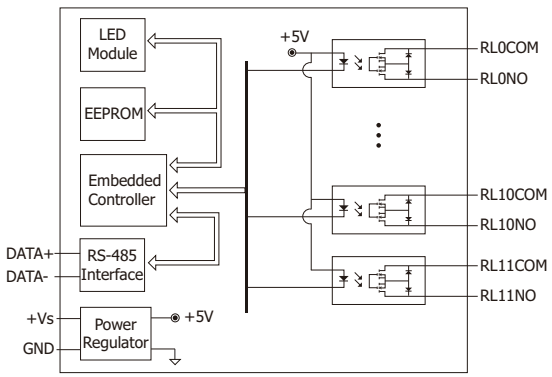
I-7063(D)



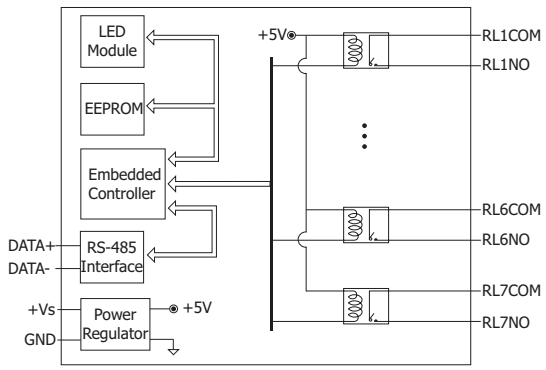
I-7065(D)/M-7065(D)



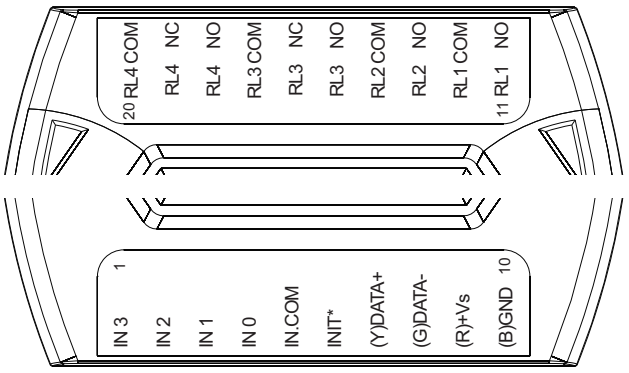
I-7061(D)/M-7061(D)



I-7067(D)/M-7067(D)

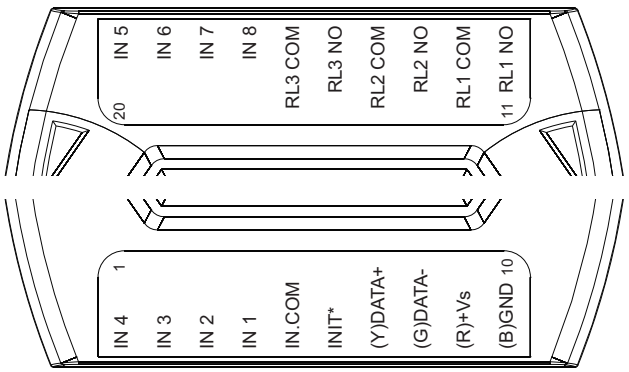


I-7060(D)/M-7060(D)

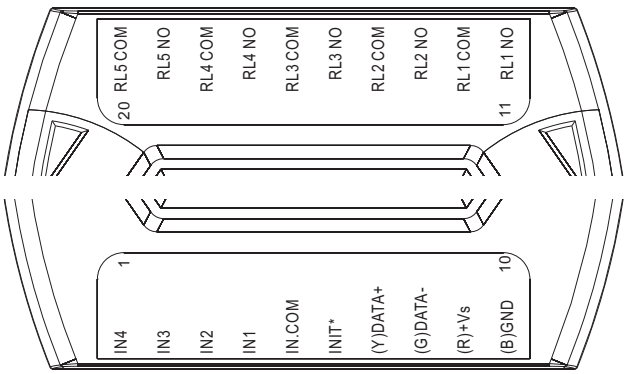


Pin Assignments

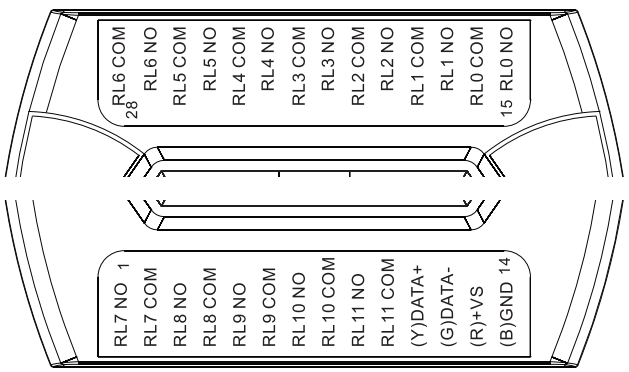
I-7063(D)



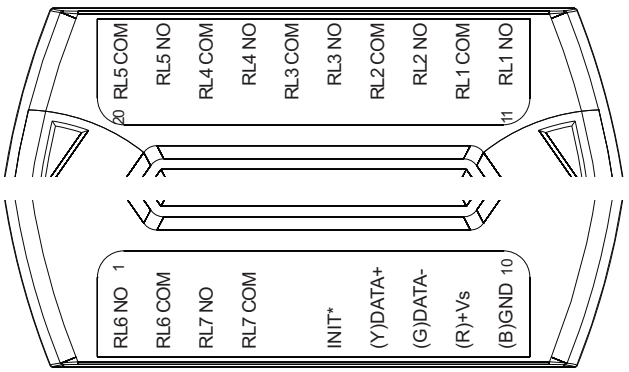
I-7065(D)/M-7065(D)



I-7061(D)/M-7061(D)



I-7067(D)/M-7067(D)



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Solid-State Relay Output Module				
Model Name	I-7063A(D)	I-7065A(D) M-7065A(D)	I-7063B(D)	I-7065B(D) M-7065B(D)
Pictures				
SSR Relay Output				
Channel	3	5	3	5
Type	AC-SSR (Form A)		DC-SSR (Form A)	
Operating Voltage Range	24 ~ 265 V_{rms}		3 ~ 30 V_{DC}	
Max. Load Current	1.0 A			
Leakage Current	1.5 mA		0.1 mA	
Min. Operate Time	1 ms			
Min. Release Time	1/2 cycle + 1 ms		1 ms	
Dielectric Strength	2500 V_{rms}			
Electrical Endurance	Long Life and No Spike			
Power-on Value	Yes			
Safe Value	Yes			
Digital Input				
Channel	8	4	8	4
Type	Wet			
Sink/Source (NPN/PNP)	Sink/Source			
On Voltage Level	+1 V_{DC} Max.			
Off Voltage Level	+4 ~ 30 V_{DC}			
Counter (100 Hz, 16-bit)	Yes			
Input Impedance	3 kΩ			
System				
Dual Watchdog	Yes			
ESD (IEC 61000-4-2)	+/-4 kV			
EFT (IEC 61000-4-4)	+/-2 kV			
Intra-Module Isolation, Field-to-Logic	3750 V_{rms}			
Power Input	10 ~ 30 V_{DC}			
Power Consumption	0.7 W; 1.5 W for (D) version	0.8 W; 1.6 W for (D) version	0.6 W; 1.4 W for (D) version	0.7 W; 1.5 W for (D) version

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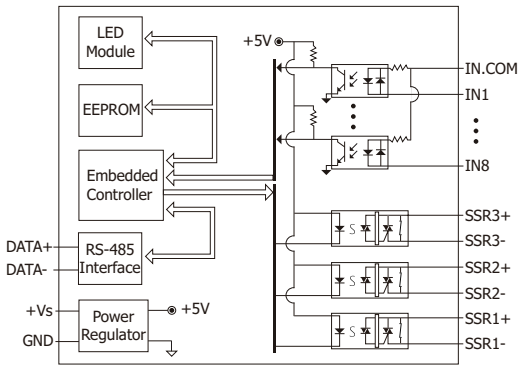
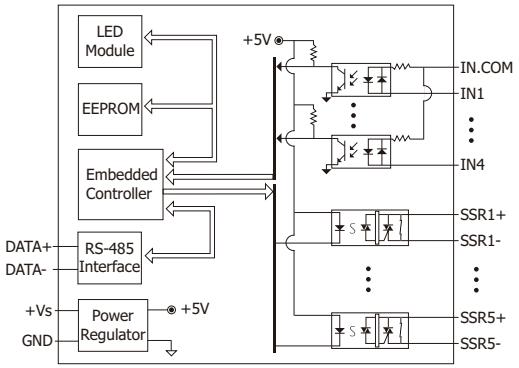
Internal I/O Structure

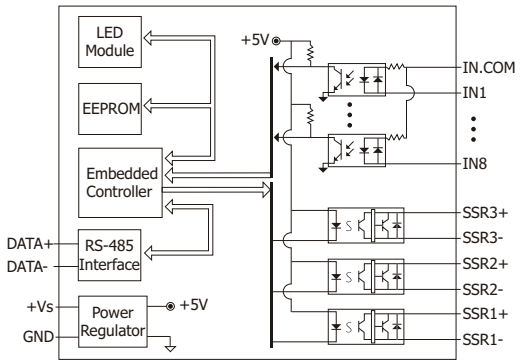
I-7063A(D)



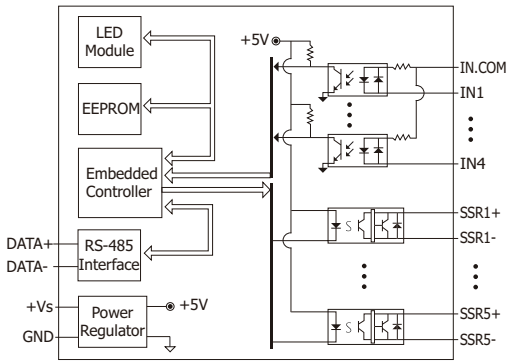
I-7065A(D)/M-7065A(D)



I-7063B(D)

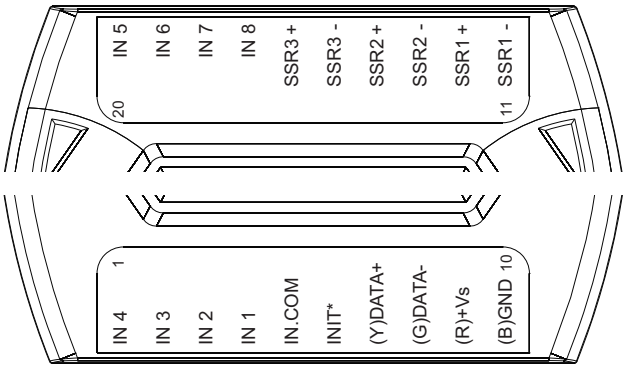


I-7065B(D)//M-7065B(D)

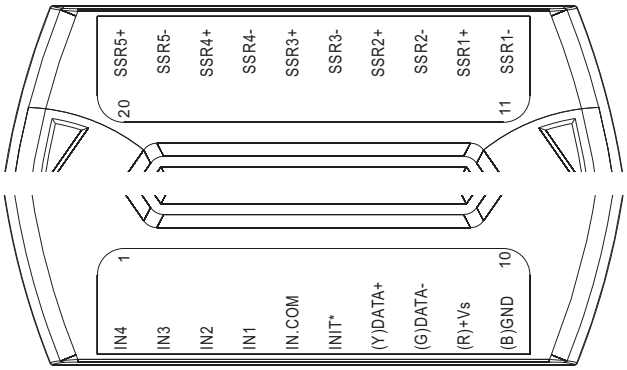


Pin Assignments

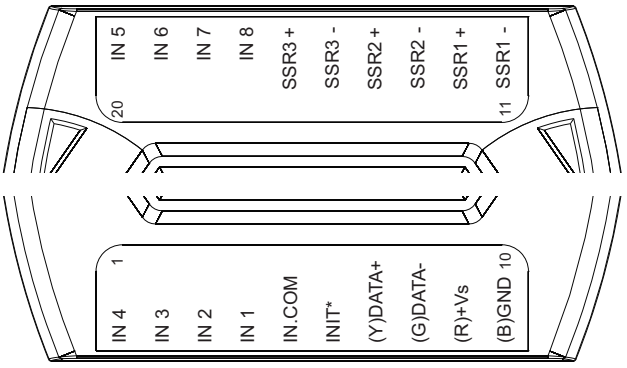
I-7063A(D)



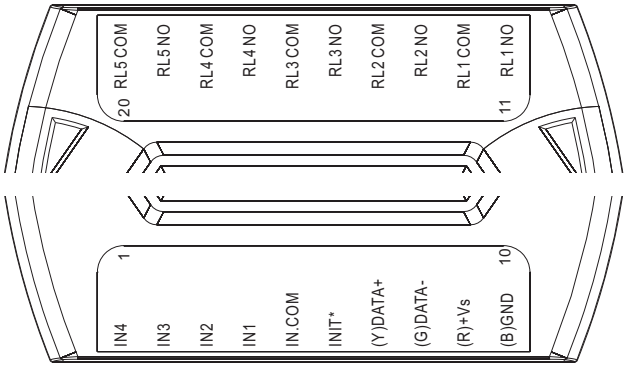
I-7065A(D)/M-7065A(D)



I-7063B(D)



I-7065B(D)//M-7065B(D)



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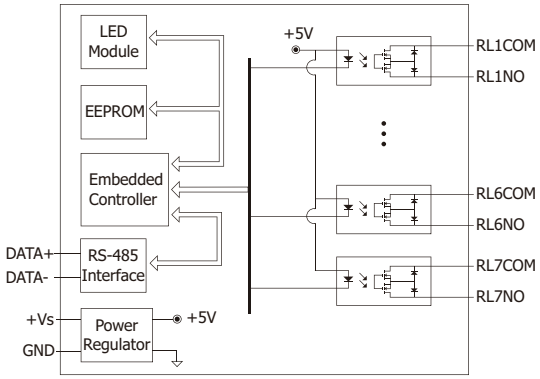
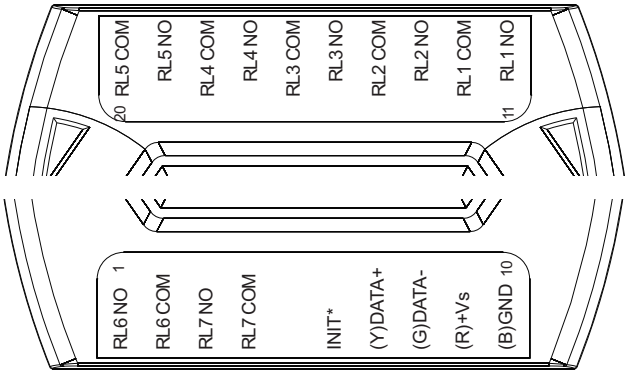
PhotoMos Relay Output Module	
Model Name	I-7066(D)
Pictures	
Channel	7
Type	PhotoMOS Relay (Form A)
Operating Voltage Range	350 V_{AC} or 350 V_{DC}
Max. Load Current	0.13 A
Operate Time	0.7 ms
Release Time	0.05 ms
Electrical Endurance	Long Life and No Spike
Power-on Value	Yes
Safe Value	Yes
System	
Dual Watchdog	Yes
ESD (IEC 61000-4-2)	+/-2 kV
EFT (IEC 61000-4-4)	+/-2 kV
Intra-Module Isolation, Field-to-Logic	5000 V_{rms}
Power Consumption	0.5 W; 0.8 W for (D) version

Internal I/O Structure



Pin Assignments



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2.2-5. Counter/Frequency/PWM

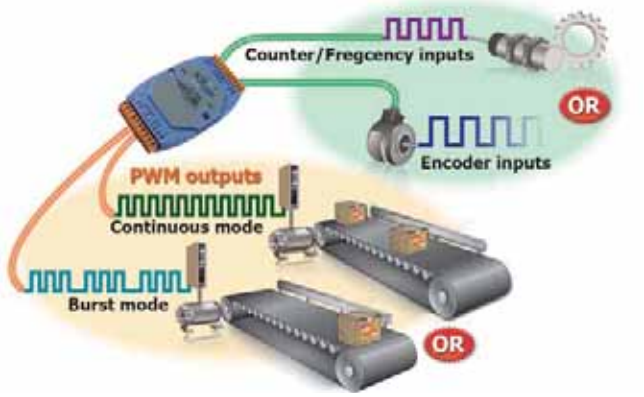
PWM Introduction

PWM (Pulse width modulation) is a powerful technique for controlling analog circuits. It uses digital outputs to generate a waveform with variant duty cycle and frequency to control analog circuits. I-8088W and I-87088W have 8 PWM output channels and 8 digital inputs. It can be used to develop powerful and cost effective analog control system.

PWM Features

- Automatic generation of PWM outputs by hardware,without software intervention.
- Software and hardware trigger mode for PWM output
- Individual and synchronous PWM output
- Burst mode PWM operation for standby
- DI channel can be configured as simple digital input channel or hardware trigger source of the PWM output.

Applications



Counter/Frequency/PWM Module						
Model Name		I-7080(D) M-7080(D)	I-7080B(D) M-7080B(D)	I-7083(D)	I-7083B(D)	I-7088 M-7088
Pictures						
Digital Input						
Channel		2		3		8
Contact		Wet				
Sink/Source (NPN/PNP)		Sink				
On Voltage Level		+3.5 ~ +30 V_{DC}		5 V: +3.5 ~ +5 V_{DC} 12 V with 1 kΩ external resistor: +5 ~ +12 V_{DC} 24 V with 2 kΩ external resistor: +7 ~ +24 V_{DC}		+3.5 ~ +5 V_{DC}
Off Voltage Level		+1 V_{DC} Max.		+2 V_{DC} Max.		+1 V_{DC} Max.
Programmable Filter		2 us to 65 ms		-		
Programmable Threshold Voltage		+0.1 ~ +5 V_{DC}		-		
Counter/Encoder Bits		32-bit				
Counter Mode		Up		-		Up
Encoder Mode		-		CW/CCW, Pulse/Dir., AB Phase		-
Frequency Mode		Yes		-		
Virtual Battery Backup		-	Yes	-	Yes	-
Frequency Accuracy		1 Hz or 10 Hz		-		
Max. Speed		100 KHz		1 MHz		
Digital Output						
Channel		2		-	8	
Type		Open Collector		-	PWM, TTL	
Sink/Source (NPN/PNP)		Sink		-	Sink	
Load Voltage		+3.5 ~ +30 V_{DC}		-	+3.5 ~ +5 V_{DC}	
Max. Load Current		30 mA/Channel		-	10 mA/Channel	
Power-on Value		Yes		-	-	
Safe Value		Yes		-	-	
PWM	Frequency	-		-	1 Hz ~ 500 KHz	
	Duty Cycle	-		-	0.1 ~ 99.9%	
	Mode	-		-	Burst, Continuous	
	Burst Count	-		-	1 ~ 65535	
	Trigger Start	-		-	Hardware or Software	
System						
Dual Watchdog		Yes				
ESD (IEC 61000-4-2)		+/-4 kV				
EFT (IEC 61000-4-4)		+/-4 kV				
Intra-Module Isolation, Field-to-Logic		3000 V_{DC}		2500 V_{rms}		2500 V_{rms}
Power Consumption		2 W; 2.2 W for (D) version		1 W; 1.5 W for (D) version		2.4 W

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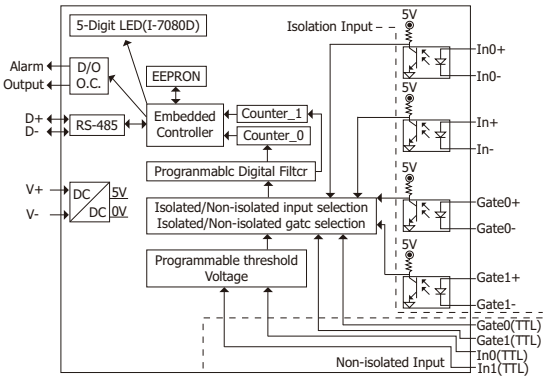
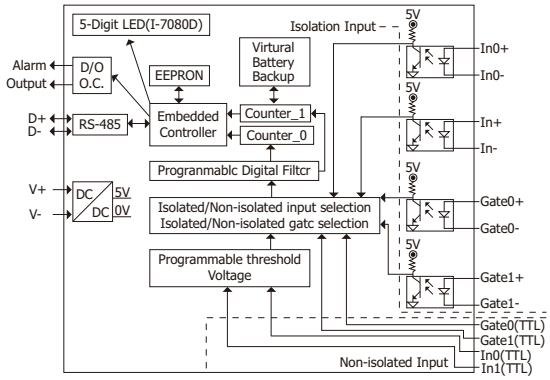
Internal I/O Structure

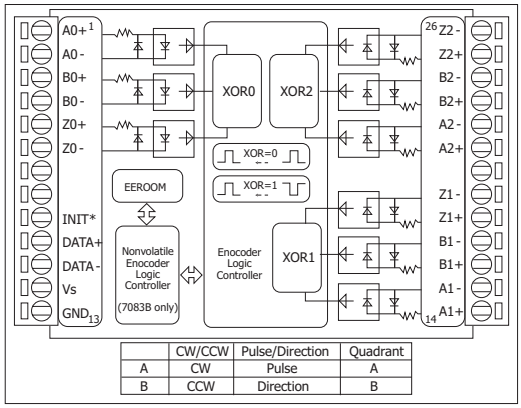
I-7080(D)/M-7080(D)



I-7080B(D)/M-7080B(D)

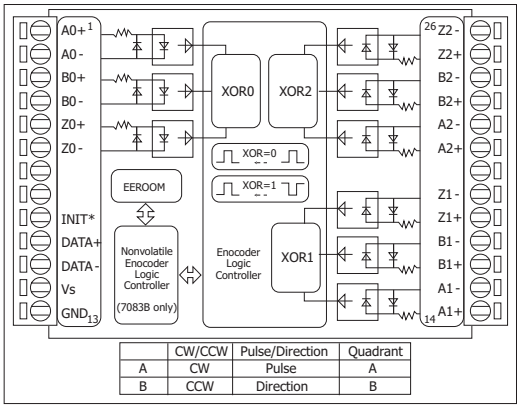


I-7083(D)



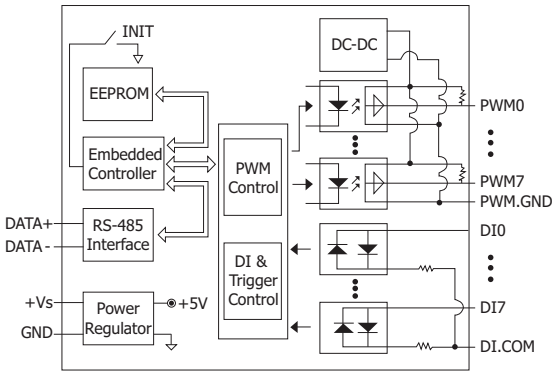
	CW/CCW	Pulse/Direction	Quadrant
A	CW	Pulse	A
B	CCW	Direction	B

I-7083B(D)



	CW/CCW	Pulse/Direction	Quadrant
A	CW	Pulse	A
B	CCW	Direction	B

I-7088(D)/M-7088(D)



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2.3. tM Series Modules

• Introduction

The tM series is a family of network data acquisition and control modules, providing digital I/O functions. The modules can be remotely controlled through an RS-485 serial bus by using DCON and Modbus RTU protocols. The selectable transmission speed of the RS-485 port is up to 115,200 bps. Modbus has become a de facto standard communications protocol in industry, and is now the most commonly available means of connecting industrial electronic devices. This makes the tM series perfect integration with the HMI, SCADA, PLC and other software systems.

The functionality of the tM series is the same as the M-7000 series. The tM series tiny RS-485 I/O modules support various I/O types, like photo-isolated digital input, relay contact, photoMOS relay, and open-collector output.

The tM series provides dual watchdog: module watchdog and host watchdog. The module watchdog is designed to automatically reset the microprocessor when the module hangs. The host watchdog monitors the host controller (PC or PLC), and the output of the module can go to predefined safe value state when the host fails.

For maximum space savings, the tM series is offered in an amazing tiny form-factor that makes it can be easily installed in anywhere, even directly embedded into a machine. It is equipped with two removable terminal block connectors for easy wiring.

• Application

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

• Selection Guide

t M - X(Y) Z(W)

X: Input Type
'P' = Photocoupler

Y: Number of Channels

Z: Output Type
'C' = Open Collector (NPN, Sink)
'A' = Open Collector (PNP, Source)
'R' = Relay

W: Number of Channels

tM Series Models					
Model Name	Bus	Protocols	I/O Isolation	DI	DO
tM-P8	RS-485	Modbus RTU DCON	Yes	8-ch (Sink/Source)	-
tM-C8				-	8-ch (NPN, Sink)
tM-P4C4				4-ch (Source)	4-ch (NPN, Sink)
tM-P4A4				4-ch (Sink)	4-ch (PNP, Source)
tM-P3R3				3-ch (Sink/Source)	3-ch Form A Relay

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tM Series

Tiny RS-485 I/O Modules

Features

- Cost-effective remote I/O modules
- Supports Modbus RTU and DCON protocols
- Photocoupler Isolation
- Isolated Digital Input and Output
- RS-485 bus supports baud rate up to 115200 bps
- All Channels Can Be Used As 16-bit Counters
- Dual-watchdog with power-on and safe value
- Terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- RoHs compliant & no Halogen
- Made from fire retardant materials (UL94-V0 Level)
- Easy DIN-Rail mounting

System Specifications

Model Name	tM-P8	tM-C8	tM-P4A4	tM-P4C4	tM-P3R3	tM-TH8	tM-AD8	tM-AD8C	tM-AD5	tM-AD5C
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_{DC}					2500 V_{rms}				
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_{DC}									
Consumption	0.5 W Max.					1.2 W			0.6 W	
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									

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I/O Specifications

Digitial Input/Output Module					
Model Name		tM-P4A4	tM-P4C4	tM-C8	tM-P8
Pictures					
Digital Input/Counter					
Input Channels		4		-	8
Type		Wet Contact (Sink)	Wet Contact (Source)	-	Wet Contact (Sink, Source)
On Voltage Level		+3.5 V_{DC} ~ 50 V_{DC}		-	+3.5 V_{DC} ~ 50 V_{DC}
Off Voltage Level		+1 V_{DC} Max.		-	+1 V_{DC} Max.
Input Impedance		10 KΩ, 0.66 W		-	10 KΩ, 0.66 W
Counters	Channels	4		-	8
	Max. Count	65535 (16-bit)		-	65535 (16-bit)
	Max. Input Frequency	100 Hz		-	100 Hz
	Min. Pulse Width	5 ms		-	5 ms
Overvoltage Protection		70 V_{DC}		-	70 V_{DC}
Digital Output					
Output Channels		4		8	
Type		Isolated Open Emitter (Source)	Isolated Open Collector (Sink)		
Max. Load Current		700 mA/channel			
Load Voltage		+10 V_{DC} ~ +40 V_{DC}	3.5 V_{DC} ~ 50 V_{DC}		
Overvoltage Protection		47 V_{DC}	60 V_{DC}		
Overload Protection		Yes, 1.4 A			
Short Circuit Protection		Yes			
Power-on Value		Yes, Programmable			
Safe Value		Yes, Programmable			

Relay Output Module		
Model Name		tM-P3R3
Pictures		
Digital Input/Counter		
Input Channels		3
Type		Wet Contact (Sink, Source)
On Voltage Level		+3.5 V_{DC} ~ 50 V_{DC}
Off Voltage Level		+1 V_{DC} 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_{DC}
Relay Output		
Output Channels		3
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 V_{AC} or 30 V_{DC}
Max. Load Current		5 A
Operate Time		6 ms
Release Time		3 ms
Electrical Life (Resistive load)	VDE	5 A @250 V_{AC} 30,000 ops (10 ops/minute) at 75°C
		5 A @30 V_{DC} 70,000 ops (10 ops/minute) at 75°C
	UL	5 A @250 V_{AC}/30 V_{DC} 6,000 ops
		3 A @250 V_{AC}/30 V_{DC} 100,000 ops
Mechanical Life		20,000,000 ops at no load (300 ops/minute)
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

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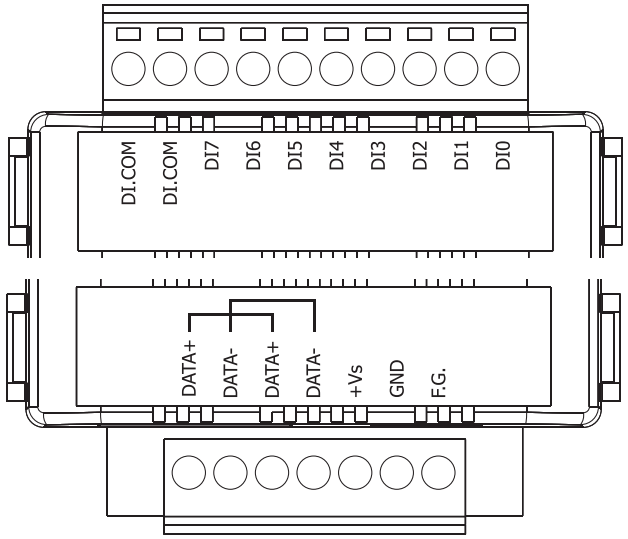
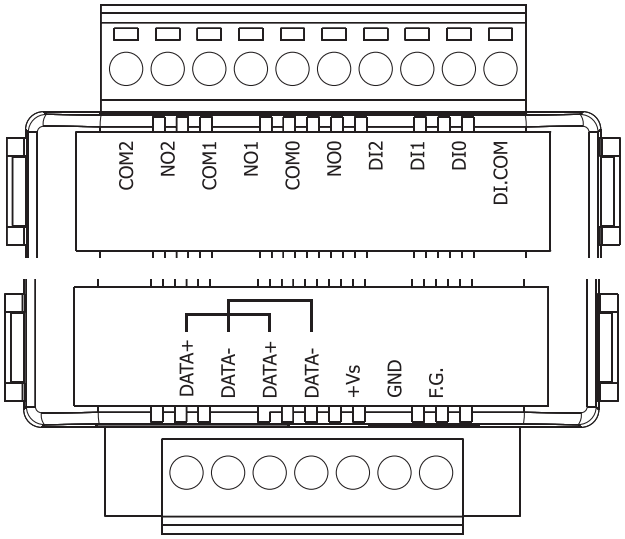
Analog Input Module						
Model Name		tM-TH8	tM-AD5	tM-AD5C	tM-AD8	tM-AD8C
Pictures						
Analog Input						
Channel		8	4		8	
Wiring		Single-ended	Differential		Single-ended	
Input Range		-	+/- 625 mV, +/- 1.25 V, +/- 2.5 V, +/- 5 V, +/- 10 V	+/- 20 mA, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 625 mV, 0 ~ 1.25 V, 0 ~ 2.5 V, 0 ~ 5 V, 0 ~ 10 V	0 ~ 20 mA, 4 ~ 20 mA
Thermistor Type		Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined	-			
Resolution		16	14/12			
Accuracy	Normal mode	0.5%	0.1%			
	Fast mode	-	0.5%			
Sampling Rate	Normal mode	8 Hz total	10 Hz total			
	Fast mode	-	20 Hz total			
Input Impedance		-	10 MΩ	125 Ω	20 MΩ	125 Ω
Overvoltage Protection		8	120 V_{DC}			
Open Wire Detection		Yes	-	Yes	-	Yes
Dual Watchdog		Yes				

Pin Assignments

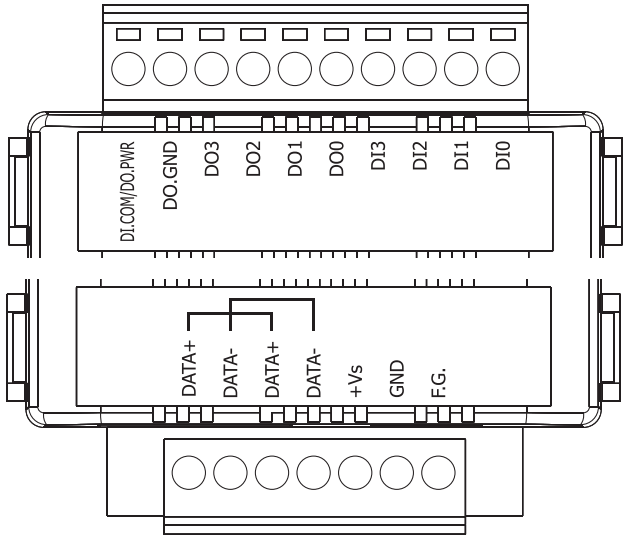
tM-P8



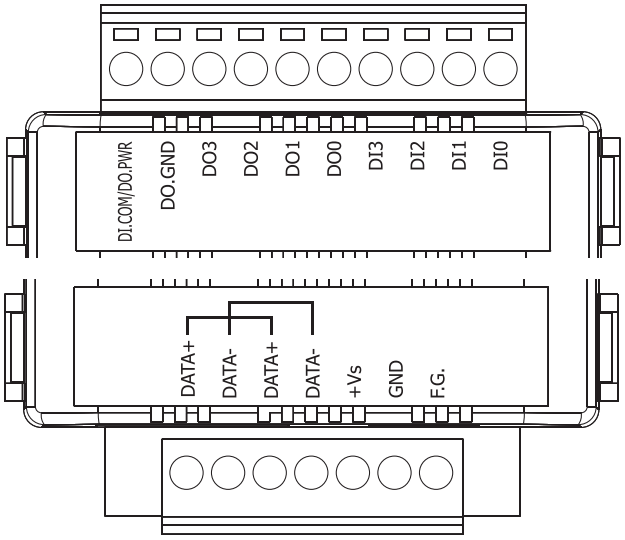
tM-P3R3



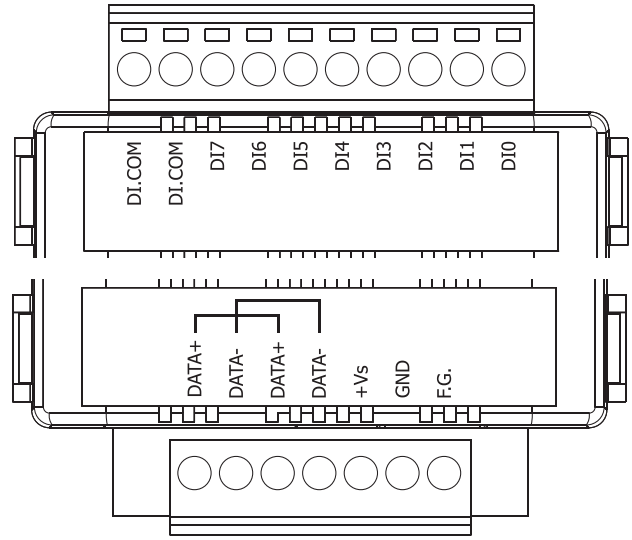
tM-P4A4



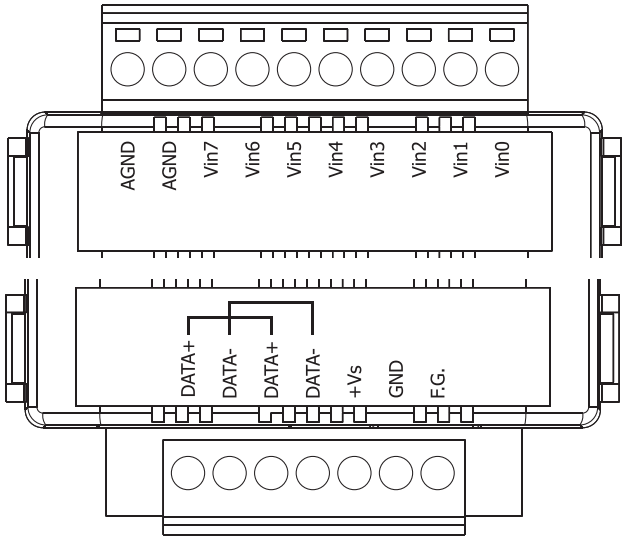
tM-P4C4



tM-C8

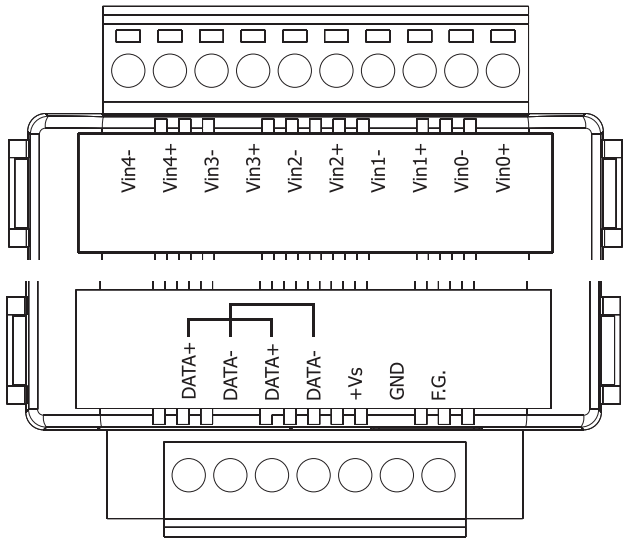


tM-TH8

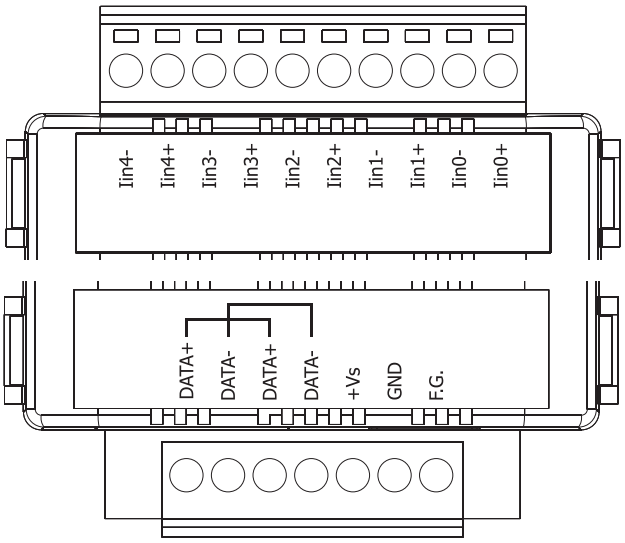


Pin Assignments

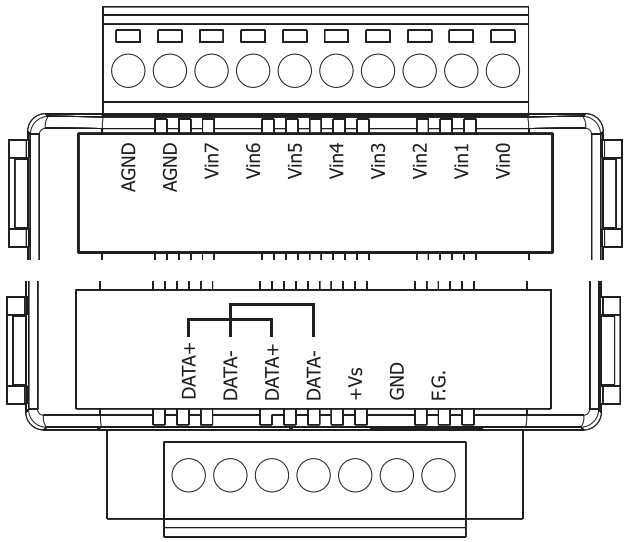
tM-AD5



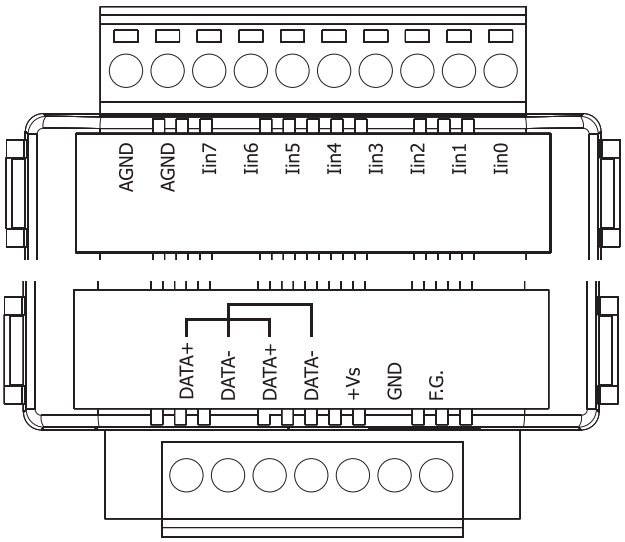
tM-AD5C



tM-AD8

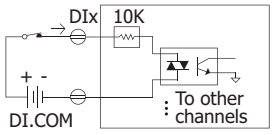
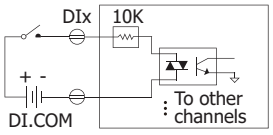
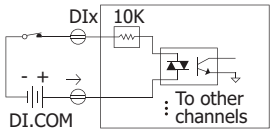
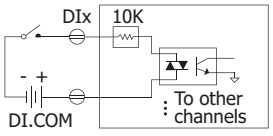


tM-AD8C

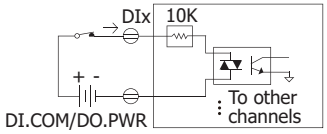
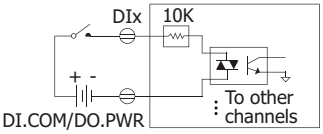


Digital Input Wiring

tM-P8/tM-P3R3

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

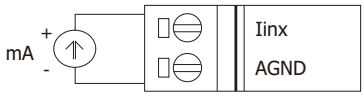
tM-P4C4/tM-P4A4

Digital Input/Counter	ON State Readback as 1	OFF State Readback as 0
	+3.5 ~ +50 VDC	OPEN or <1 VDC
Sink		

Analog Input Wiring

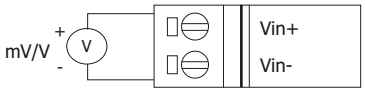
tM-TH8

Thermistor Input



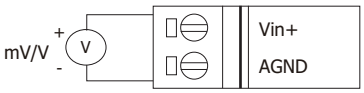
tM-AD5

Voltage Input (Differential Mode)



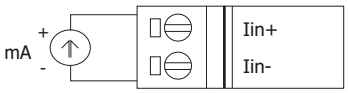
tM-AD8

Voltage Input (Single-ended Mode)



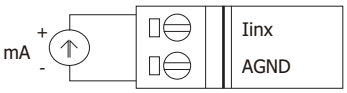
tM-AD5C

Current Input



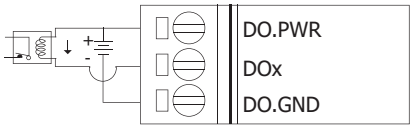
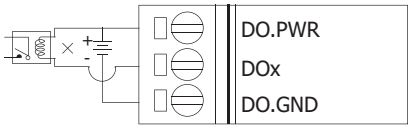
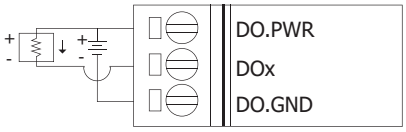
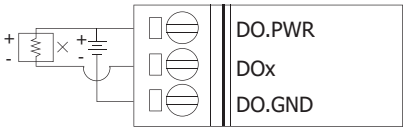
tM-AD8C

Current Input (Single-ended Mode)

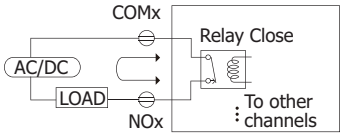
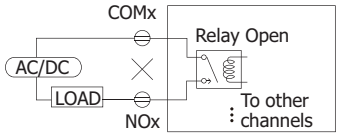


Digital Output Wiring

tM-P4C4/tM-P4A4/tM-C8

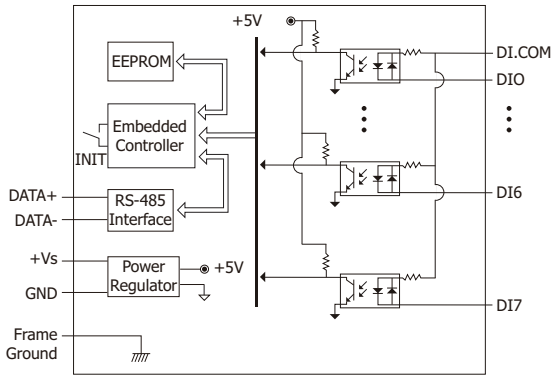
Output Type	ON State Readback as 1	OFF State Readback as 0
	Relay ON	Relay OFF
Drive Relay		
Resistance Load		

tM-P3R3

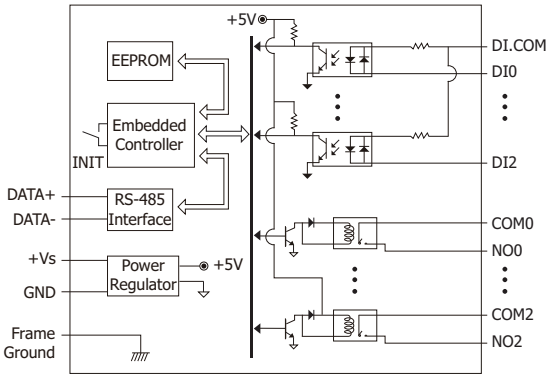
Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output		

Block Diagram

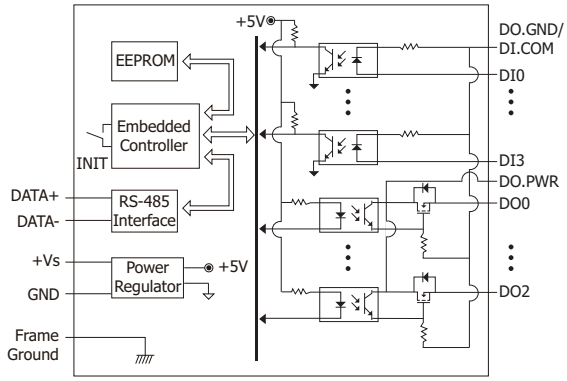
tM-P8



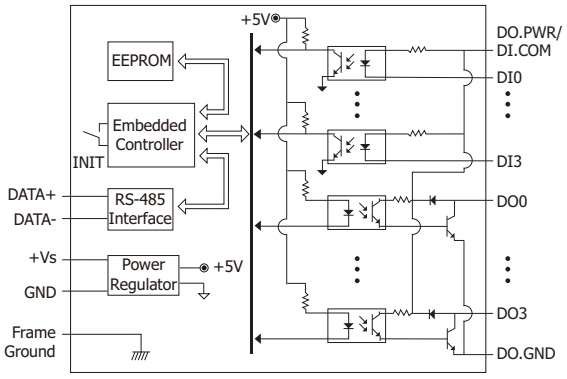
tM-P3R3



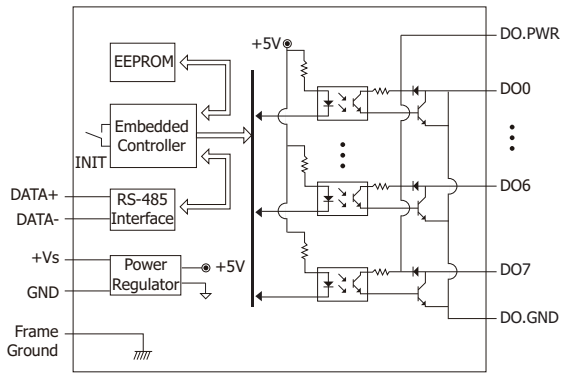
tM-P4A4



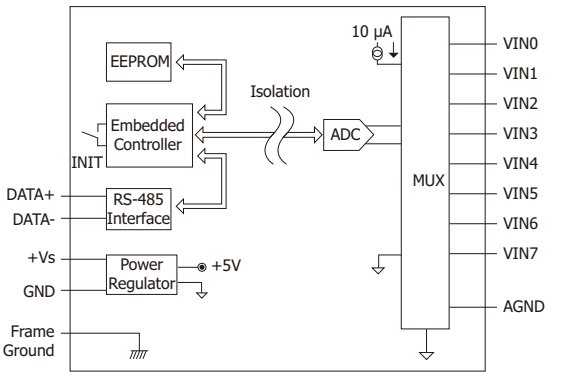
tM-P4C4



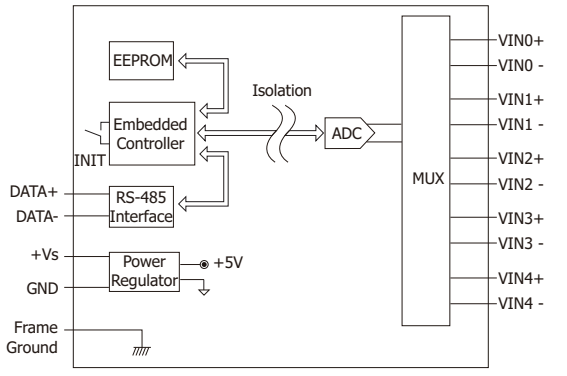
tM-C8



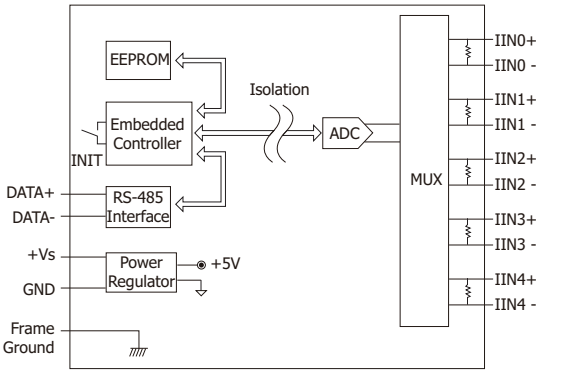
tM-TH8



tM-AD5



tM-AD5C



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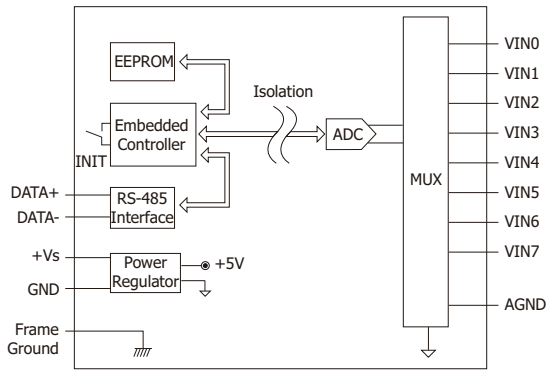
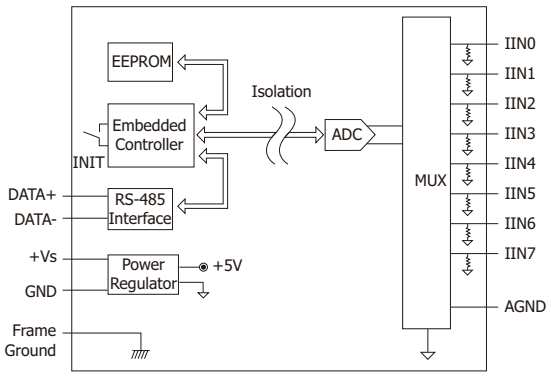
Block Diagram

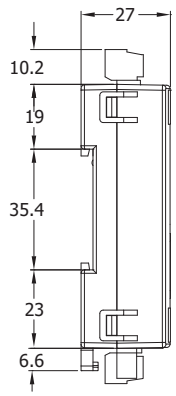
tM-AD8



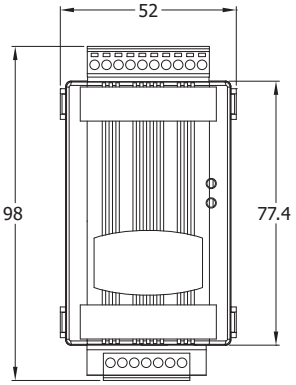
tM-AD8C



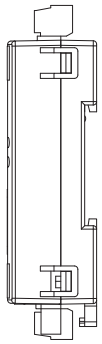
Dimensions (Units: mm)



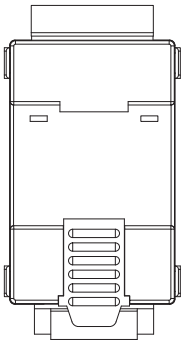
Left Side View



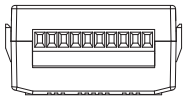
Front View



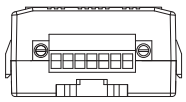
Right Side View



Rear View



Top View



Bottom View

Ordering Information

tM-P8 CR	8-channel Isolation Digital Input Module (RoHS)
tM-C8 CR	8-channel Isolation Digital Output Module (RoHS)
tM-P4C4 CR	4-channel Isolation Digital Input and 4-channel Isolation Digital Output Module (RoHS)
tM-P4A4 CR	4-channel Isolation Digital Input and 4-channel Source-type Isolated Digital Output Module (RoHS)
tM-P3R3 CR	3-channel Isolation Digital Input and 3-channel Relay Output Module (RoHS)
tM-AD5 CR	5-channel Isolation Analog Input Module with High Voltage Protection (RoHS)
tM-AD5C CR	5-channel Isolation Current Input Module (RoHS)
tM-AD8 CR	8-channel Isolation Analog Input Module with High Voltage Protection(RoHS)
tM-AD8C CR	8-channel Isolation Current Input Module (RoHS)
tM-TH8 CR	8-channel Isolation Thermidtor Input Module with High Voltage Protection(RoHS)

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)	

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Ethernet I/O Modules

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3.1. Overview

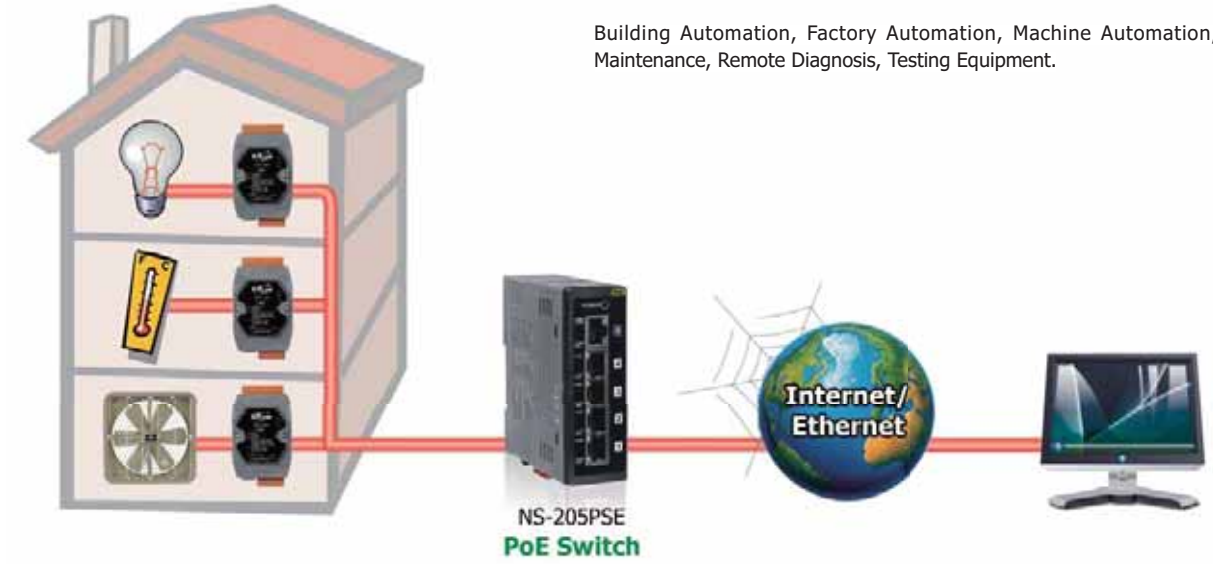
• Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

• Application



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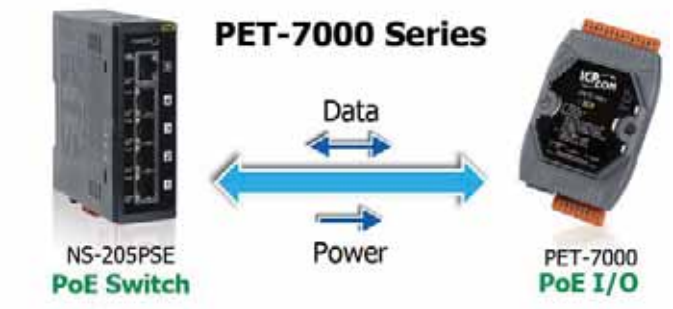
• Fautures

1. Power over Ethernet (PoE)

The PET-7000 series module can be powered by an IEEE802.3af compliant PoE switch. Both data and power can be carried by an Ethernet cable eliminating the need for additional wiring and power supply.



2. Built-In Web Server

Each ET-7000/PET-7000 module has a built-in web server that allows the users to easily configure, monitor and control the module from a remote location using a regular web browser.

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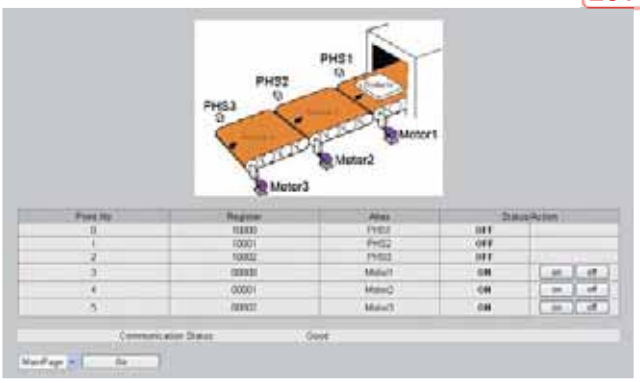
3. Web HMI

The Web HMI function allows the users to create dynamic and attractive web pages to monitor and control the I/O points. Users can upload specific I/O layout pictures (bmp, jpg, gif format) and define a description for each I/O point. No HTML or Java skills are needed to create the web pages.



4. Communication Security

Account and password are needed when logging into the ET-7000 web server. An IP address filter is also included, which can be used to allow or deny connections with specific IP addresses.

5. Modbus/TCP, Modbus/UDP Protocol

The Modbus/TCP, Modbus/UDP slave function on the Ethernet port can be used to provide data to remote SCADA software.

6. Built-In I/O

Various I/O components are mixed with multiple channels in a single module, which provides the most cost effective I/O usage and enhances performance of the I/O operations

7. Dual Watchdog

The Dual Watchdog is consists of a Module Watchdog and a Communication Watchdog. The action of AO,DO are also associated to the Dual Watchdog.

Module Watchdog is a built-in hardware circuit to monitor the operation of the module and will reset the CPU if a failure occurs in the hardware or the software. Then the Power-on Value of AO,DO will be loaded.

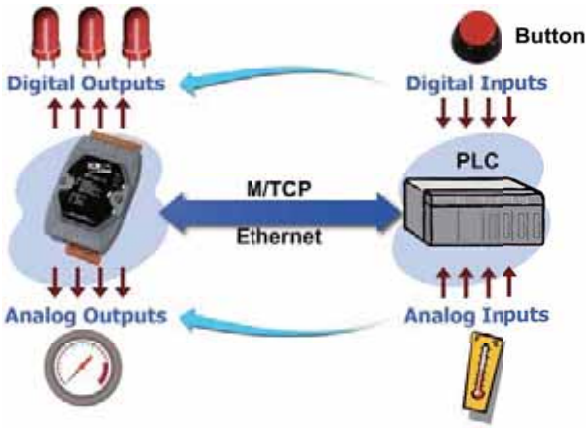
Communication Watchdog is a software function to monitor the communication between the host and the ET-7000/PET-7000 module. The timeout of the communication Watchdog is proprgrammable, when the ET-7000/PET-7000 doesn't receive commands from the host for a while, the watchdog forces the AO,DO to pre-programmed Safe Value to prevent unpredicatable damage of the connected devices.

8. Power-on Value and Safe Value

Besides setting by the set AO,DO commands, the AO,DO can be set under two other conditions.
Power-on Value: The Power-on Value is loaded into the AO,DO under 3 conditions: Power-on, reset by Module Watchdog, reset by reset command.
Safe Value: When the Communication Watchdog is enabled and a Communication Watchdog timeout occurs, the "safe value" is loaded into the AO,DO.

9. I/O Pair Connection

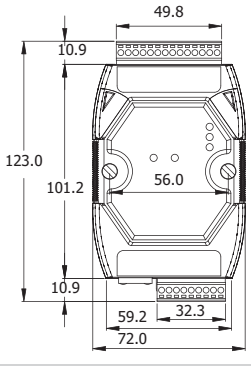
This function is used to create a AI/DI to AO/DO pair through the Ethernet. Once the configuration is completed, the ET-7000/PET-7000 module can poll the status of remote AI/DI devices and then use the Modbus/TCP protocol to continuously write to a local AO/DO channels in the background.



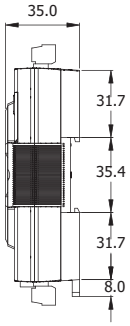
10. Highly Reliable Under Harsh Environmen

- Wide Operating Temperature Range: -25 °C ~ +75 °C
- Storage Temperature: -30 ~ +80 °C
- Humidity 10 ~ 90% RH (Non-condensing)

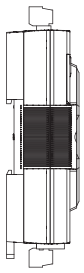
11. Mechanical



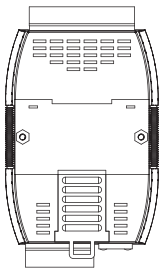
Front View



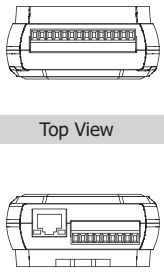
Left Side View



Right Side View



Rear View



Top View

Bottom View

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3.2. Ethernet Communication Modules

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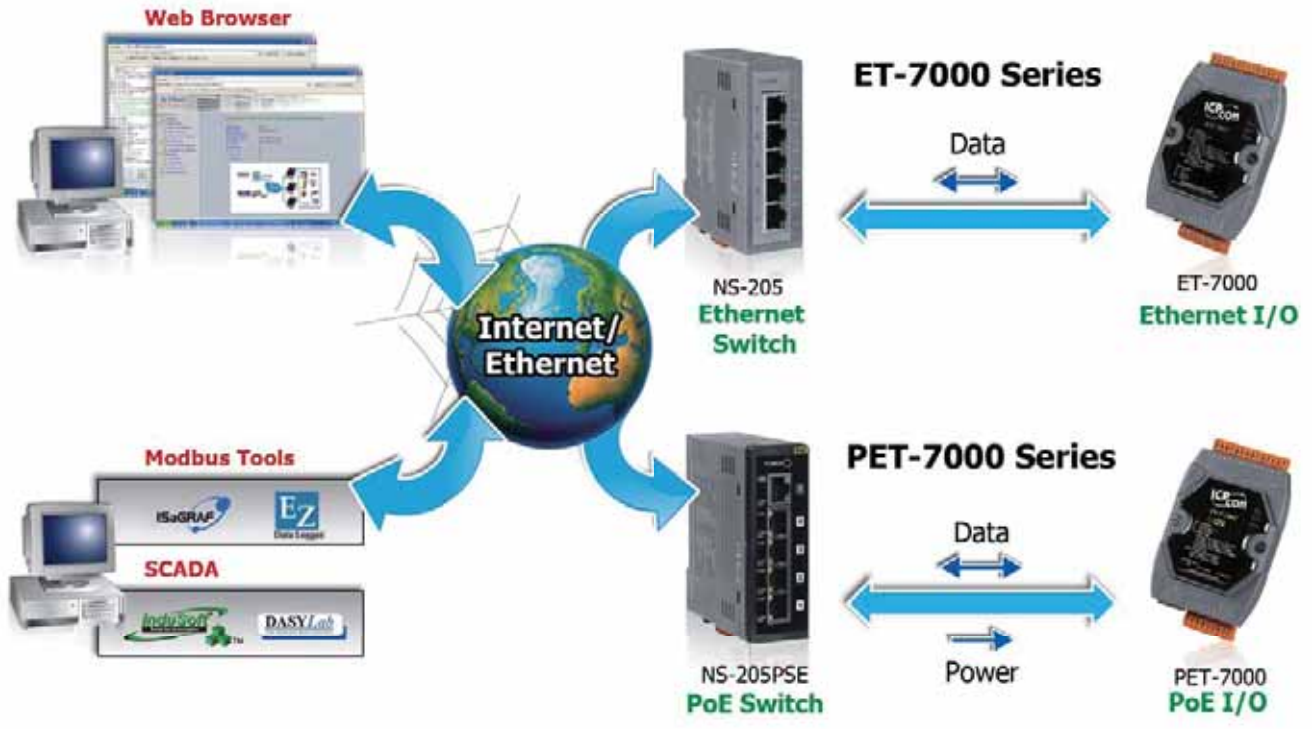
3.3. ET-7000/PET-7000 Series (Web based)

• Selection Guide



Analog Input Model

Model Name	AI			DO		
	Channel	Voltage and Current Input	Sensor Input	Channel	Type	Sink/Source
ET-7005 PET-7005	8	-	Thermistor	4	Open Collector	Sink
ET-7015 PET-7015	7	-	RTD: Pt100, Pt1000, Ni120, Cu100, Cu1000	-	-	-
ET-7017 PET-7017	8	+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 2 0mA	-	4	Open Collector	Sink
ET-7017-10 PET-7017-10	10/20	+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-	-	-	-
ET-7018Z PET-7018Z	10	+/-15 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, +/-2.5 V +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA	Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710	6	Open Collector	Sink
ET-7019 PET-7019	8	+/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V,+/-5 V, +/-10 V +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA	Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710	4	Open Collector	Sink
ET-7019Z	10			6		

Note: We recommend to choose ET-7018Z/PET-7018Z and ET-7019Z/PET-7019Z for accurate thermocouple measurement.

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Multifunction I/O

Model Name	AI			AO		DI/Counter		DO	
	Channel	Voltage and Current Input	Sensor Input	Channel	Voltage and Current Output	Channel	Type	Channel	Type
ET-7002 PET-7002	3	+/- 150 mV, +/- 500 mV, +/- 1 V, +/- 5 V, +/-10 V, + 0 mA ~ + 20 mA, +/- 20 mA, 4 ~ 20 mA	-	-	-	6	Wet (Sink,Source)	3	Power Relay (Form A)
ET-7016 PET-7016	2	+/- 15 mV, +/- 50 mV, +/- 100 mV, +/- 500 mV, +/- 1 V, +/- 2.5 V, 0 ~ 20 mA, +/- 20 mA, 4 ~ 20mA	Strain Gague, Load Cell, Full-Bridge, Half-Bridge, Quarter-Bridge	1	0 ~ 10V	2	Wet (Sink,Source)	2	Open Collector (Sink)
ET-7026 PET-7026	6	+/- 150 mV, +/- 500 mV, +/- 1 V, +/- 5 V, +/-10 V, 0 ~ 20 mA, +/- 20 mA, 4 ~ 20mA	-	2	0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA	2	Dry (Source), Wet (Sink,Source)	2	Open Collector (Sink)

Digital I/O

Model Name	DI/Counter			DO			
	Channel	Type	Sink/Source	Channel	Type	Sink/Source	Max. Load Current @ 25°C
ET-7042 PET-7042	-	-	-	16	Open Collector	Sink	100 mA/channel
ET-7044 PET-7044	8	Wet	Sink, Source	8	Open Collector	Sink	300 mA/channel
ET-7050 PET--7050	12	Wet	Sink, Source	6	Open Collector	Sink	100 mA/channel
ET-7051 PET-7051	16	Wet	Sink, Source	-	-	-	-
ET-7052 PET-7052	8	Wet	Sink, Source	8	Open Collector	Source	650 mA/channel
ET-7053 PET-7053	16	Dry	Source	-	-	-	-

Relay Output & Digital Input

Model Name	Relay Output				DI/Counter		
	Channel	Relay	Type	Max. Load Current @ 25°C	Channel	Type	Sink/Source
ET-7060 PET-7060	6	Power Relay	Form A (SPST N.O.)	5.0 A/channel	6	Wet	Sink, Source
ET-7065 PET-7065	6	PhotoMOS Relay	Form A (SPST N.O.)	1.0 A/channel	6	Wet	Sink, Source
ET-7066 PET-7066	8	PhotoMOS Relay	Form A (SPST N.O.)	1.0 A/channel	-	-	-
ET-7067 PET-7067	8	Power Relay	Form A (SPST N.O.)	5.0 A/channel	-	-	-

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ET-7002
Regular Ethernet Version

PET-7002
PoE Version

Multifunction Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 3 Channels
  - DI/Counter: 6 Channels
  - Power Relay: 3 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.
Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.
Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.
The ET-7002/PET-7002 is a multi-function module, there are 3-channel analog inputs, 6-channel digital inputs and 3-channel Relay outputs module.. It provides programmable input range on all analog inputs (+/- 150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA and 4~20 mA). Each analog input is allowed to configure an individual range and has 240Vrms high overvoltage protection. Jumper selectable for voltage or current of inputs, ET-7002/PET-7002 is fully RoHS-compliant and has qualification for 4 kV ESD protection as well as 2500 V_{DC} intra-module isolation.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7002	PET-7002
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 8 kV Air for Random Point	
EFT (IEC 61000-4-4)	+/-4 kV for Power	
Surge (IEC 61000-4-5)	+/-4 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	1.7 W	
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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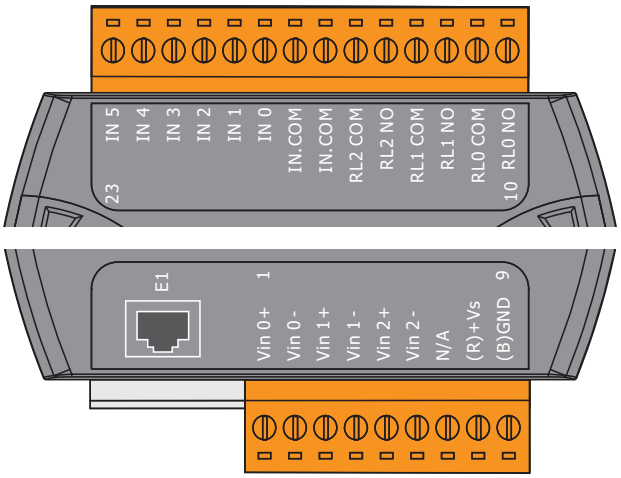
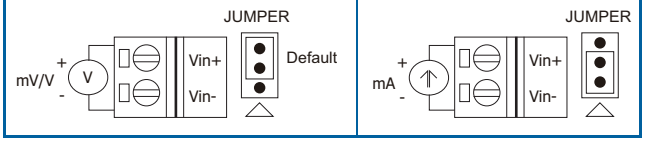
I/O Specifications

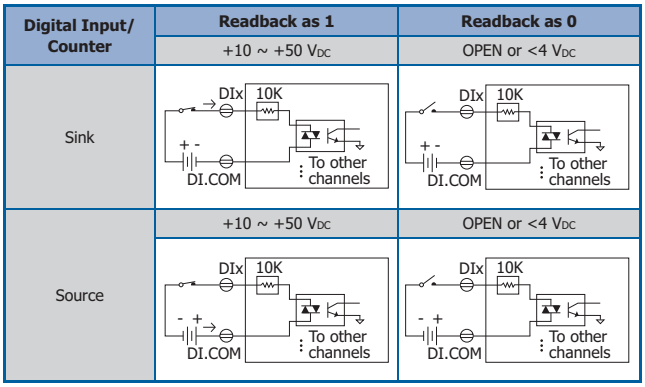
Analog Input		
Input Channels		3 (Differential)
Input Type		+/- 150 mV,+/- 500 mV, +/- 1V, +/- 5 V, +/-10 V + 0 mA ~ + 20 mA, +/- 20 mA, 4 ~ 20 mA (jumper selectable)
Individual Channel Configuration		Yes
Resolution	Normal Mode	16-bit
	Fast Mode	12-bit
Sampling Rate	Normal Mode	10 Samples/Sec. (Total)
	Fast Mode	60 Samples/Sec. (Total)
Accuracy	Normal Mode	+/-0.1%
	Fast Mode	+/-0.5% or better
Zero Drift		+/-20 uV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection		240 V_{rms}
Over Current Protection		Yes
Input Impedance	Voltage	2 MΩ
	Current	124 Ω
Common Mode Rejection		86 dB Min.
Normal Mode Rejection		100 dB
Digital Input/Counter		
Input Channels		6
Type		Wet Contact (Sink or Source)
On Voltage Level		+10 V_{DC} ~ +50 V_{DC}
Off Voltage Level		+4 V_{DC} max.
Input Impedance		10 KΩ, 0.5W
Counters	Channels	6
	Max. Count	4,294,967,285 (32-bit)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Overvoltage Protection		+50 V_{DC}
Power Relay		
Output Channels		3
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 V_{AC}/30 V_{DC}
Max. Load Current		5.0A/channel at 25 °C
Operate Time		6 ms (Typical)
Release Time		3 ms (Typical)
Electrical Life (Resistive load)	VDE:	5 A @ 250 V_{AC} 30,000 ops (10 ops/minute) at 75°C.
		5 A @ 30 V_{DC} 70,000 ops (10 ops/minute) at 75°C.
	UL:	5 A @ 250 V_{AC}/30 V_{DC} 6,000 ops.
		3 A @ 250 V_{AC}/30 V_{DC} 100,000 ops.
Mechanical Life		20,000,000 ops. at no load (300 ops./minute).
Intra-module Isolation, Field-to-Logic		3750 V_{DC}
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

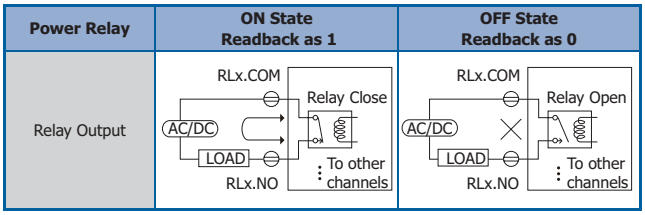
Pin Assignments



Wire Connections







Ordering Information

ET-7002 CR	3-channel analog inputs, 6-channel digital inputs and 3-channel Relay outputs module (RoHS)
PET-7002 CR	3-channel analog inputs, 6-channel digital inputs and 3-channel Relay outputs module PoE Module (RoHS)

Accessories

NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7005
Regular Ethernet Version

PET-7005
PoE Version

Thermistor Input and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - Thermistor Input: 8 Channels
  - DO: 4 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

ET-7005/PET-7005 is used for measuring temperature by the thermistor. It supports many kinds of thermistors and features individual channel configuration which means that eight of its input channels can individually be configured with different kind of thermistor and supports user-defined types by specifying the Steinhart coefficients to add other thermistors, if necessary. Besides, ET-7005/PET-7005 also has 4-channel digital outputs for alarm output with Short-circuit protection and overload protection. Adding 2500 V_{DC} intra-module isolation and 110 V_{DC}/V_{AC} overvoltage protection for thermistor on ET-7005/PET-7005 makes itself running with higher reliability.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7005	PET-7005
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.1 W	3.0 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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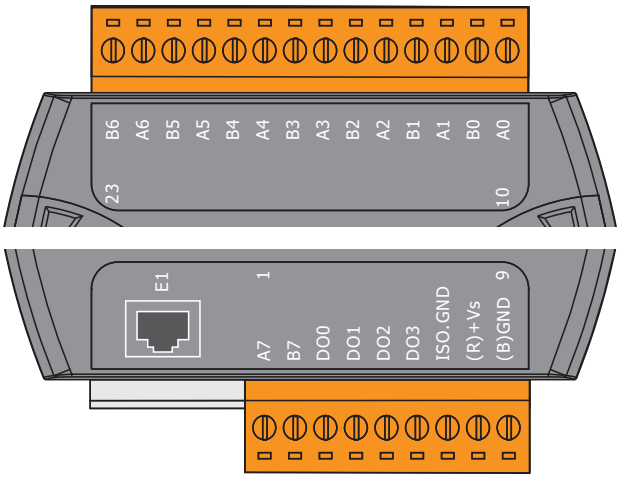
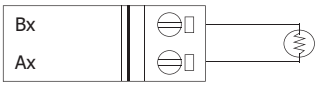
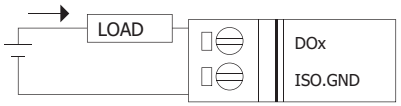
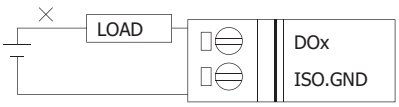
I/O Specifications

Thermistor Input	
Input Channels	8 (Differential)
Sensor Type	Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined
Individual Channel Configuration	Yes
Resolution	16-bit
Sampling Rate	10 Sample/Sec. (Total)
Accuracy	+/-0.1% or better
Zero Drift	+/-20 μV/°C
Span Drift	+/-25 ppm/°C
Overvoltage Protection	110 V_{DC}/V_{AC}
Common Mode Rejection	86 dB
Normal Mode Rejection	100 dB
Open Wire Detection	Yes
Digital Output	
Output Channels	4
Type	Isolated Open Collector (Sink)
Max. Load Current	700 mA/Channel
Load Voltage	5 V_{DC} ~ 50 V_{DC}
Overvoltage Protection	60 V_{DC}
Overload Protection	1.4 A
Short-circuit Protection	Yes
Power-on Value	Yes, Programmable
Safe Value	Yes, Programmable

Pin Assignments



Wire Connections

Thermistor Input		
		
Digital Output	**ON State Readback as 1**	**OFF State Readback as 0**
Open Collector (Sink)		

Ordering Information

ET-7005 CR	8-channel Thermistor Input and 4-channel Isolated Digital Output Module (RoHS)
PET-7005 CR	8-channel Thermistor Input and 4-channel Isolated Digital Output PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7015
Regular Ethernet Version

PET-7015
PoE Version

RTD Input Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - RTD Input: 7 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

ET-7015/PET-7015 is specifically designed for long-distance RTD measurement. It features automatic compensation for three-wire RTD so that it can measure right regardless of the length of wires and provide open wire detection for RTD measurement. ET-7015/PET-7015 offers 7 channels, each of which could be connected with different kinds of RTD (Pt100, Pt1000, Ni120, Cu100, Cu1000). Also, ET-7015/PET-7015 is fully RoHS-compliant and has qualification for 4 kV ESD protection as well as 2500 V_{DC} intra-module isolation.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7015	PET-7015
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.0 W	2.6 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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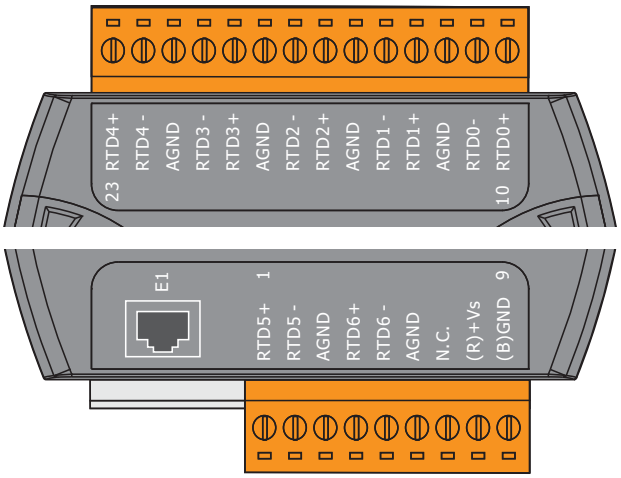
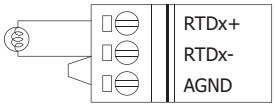
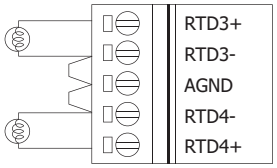
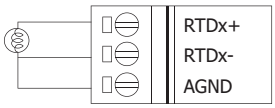
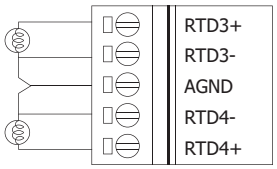
I/O Specifications

RTD Input	
Input Channels	7 (Differential)
Sensor Type	Pt100, Pt1000, Ni120, Cu100, Cu1000
Wire Connections	2/3 wire
Individual Channel Configuration	Yes
Resolution	16-bit
Sampling Rate	12 Samples/Sec. (Total)
Accuracy	+/-0.05%
Zero Drift	+/-0.5 μV/°C
Span Drift	+/-20 μV/°C
Common Mode Rejection	150 dB
Normal Mode Rejection	100 dB
Input Impedance	>1M Ω
Open Wire Detection	Yes
3-wire RTD Lead Resistance Elimination	Yes

Pin Assignments



Wire Connections

Open Collector (Sink)	CH0, 1, 2, 5 and 6	CH3 and CH4
2-wire of RTD		
3-wire of RTD		

Ordering Information

ET-7015 CR	7-channel RTD Input Module with 3-wire RTD Lead Resistance Elimination (RoHS)
PET-7015 CR	7-channel RTD Input Module with 3-wire RTD Lead resistance elimination PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 VDC Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 VDC Input (RoHS)
 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7016
Regular Ethernet Version

PET-7016
PoE Version

Strain Gauge Multifunction Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - Strain Gauge Input: 2 Channels
  - AO: 1 Channels
  - DI/Counter: 2 Channels
  - DO: 2 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The ET-7016/PET-7016 is a strain gauge module, there are 2-channel analog inputs, 1-channel excitation voltage output, 2-channel digital inputs and 2-channel digital outputs module. It provides programmable input range on all analog inputs (+/-1 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, and +/-2.5 V) and supports full-bridge, half-bridge, and quarter-bridge. Each analog input is allowed to configure an individual range. Excitation voltage outputs are 0 ~ 10 V range with 60 mA driving efficient. Digital outputs can be set alarm outputs.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7016	PET-7016
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 VDC	-
I/O	2500 VDC	2500 VDC
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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 VDC	Yes, 12 ~ 48 VDC
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	3.5 W	5.1 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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I/O Specifications

Strain Gauge Input		
Input Channels		2 (Differential)
Input Type		+/-15 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-20mA, 10 ~ 20 mA, 4 ~ 20 mA
Strain Gauge Type		Full-Bridge, Half-Bridge, and Quarter-Bridge
Individual Channel Configuration		Yes
Resolution		16-bit
Sampling Rate		10 Samples/Sec. (Total)
Accuracy		+/-0.05%
Zero Drift		+/-0.5 uV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection		30 VDC
Input Impedance		Voltage Input: >400 kΩ, Current Input: 125 Ω
Common Mode Rejection		150 dB min.
Normal Mode Rejection		100 dB
Excitation Voltage Output		
Output Channels		1
Output Range		0 ~ 10 V
Max. Output Load Current		60 mA
Accuracy		+/-0.05% of FSR
Drift		+/- 50 ppm/°C
Power-on Value		Yes
Digital Input/Counter		
Input Channels		2
Type		Wet (Sink or Source)
Off Voltage Level		+1 VDC Max.
On Voltage Level		+3.5 VDC ~ +50 VDC
Counters	Channels	2
	Max. Count	4,294,967,285 (32-bit)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Overvoltage Protection		70 VDC
Digital Output		
Output Channels		2
Type		Isolated Open Collector (Sink)
Max. Load Current		700 mA/Channel
Load Voltage		+ 5 VDC ~ + 50 VDC
Overvoltage Protection		60 VDC
Overload Protection		1.4 A
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Excitation Voltage

Strain Gauge	Quarter-Bridge	Half-Bridge	Full-Bridge
120R	7.0V	7.0V	3.5V
350R	10V	10V	10V

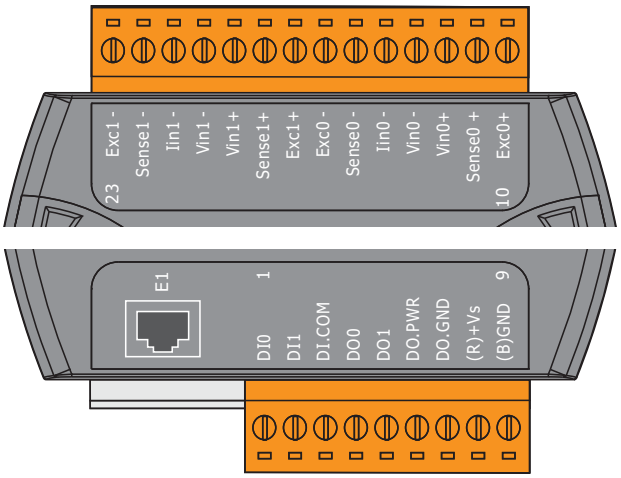
Ordering Information

ET-7016 CR	2-channel strain gauge, 2-channel digital input and 2-channel digital Output module (RoHS)
PET-7016 CR	2-channel strain gauge, 2-channel digital input and 2-channel digital Output PoE module (RoHS)

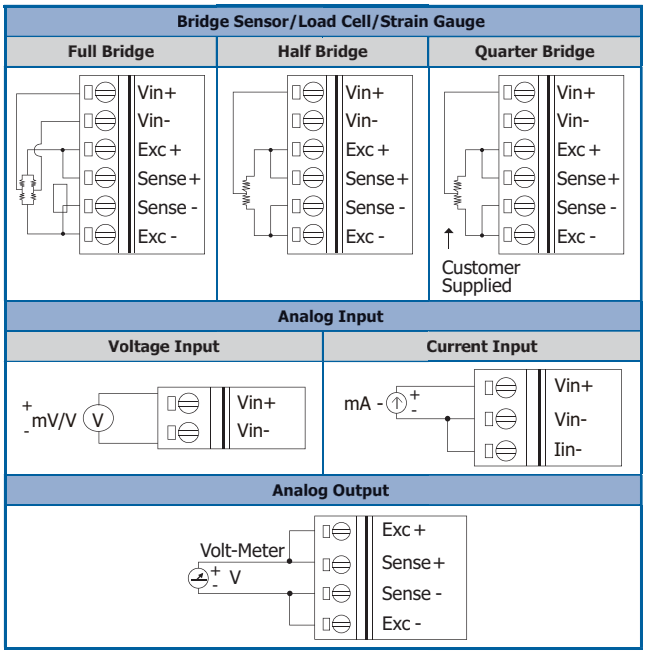
Accessories

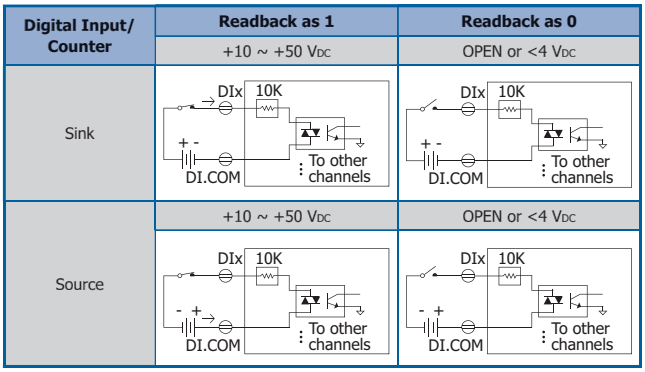
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; regiures 24 VDC Input (RoHS)
NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; regiures 48 VDC Input (RoHS)
NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; regiures 24 VDC Input (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

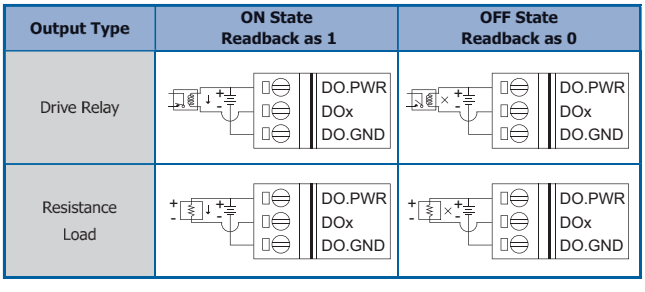
Pin Assignments



Wire Connections







Beta
2011/05/17

ET-7017
Regular Ethernet Version

PET-7017
PoE Version

AI and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 8 Channels
  - DO: 4 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The ET-7017/PET-7017 is a 16-bit, 8-channel differential analog inputs and 4-channel digital ouputs module that provides programmable input range on all analog channels (+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA and 4~20 mA) and digital output can be set alarm output with Short-circuit protection and overload protection. Each analog channel is allowed to configure an individual range and has 240 V_{rms} high overvoltage protection. Jumper selectable for voltage or current input. The sampling rate of ET-7017/PET-7017 is changeable; there are fast mode and normal mode for your consideration. ET-7017/PET-7017 also has qualification for 4 kV ESD protection as well as 3000 V_{DC} intra-module isolation.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7017	PET-7017
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.6 W	3.1 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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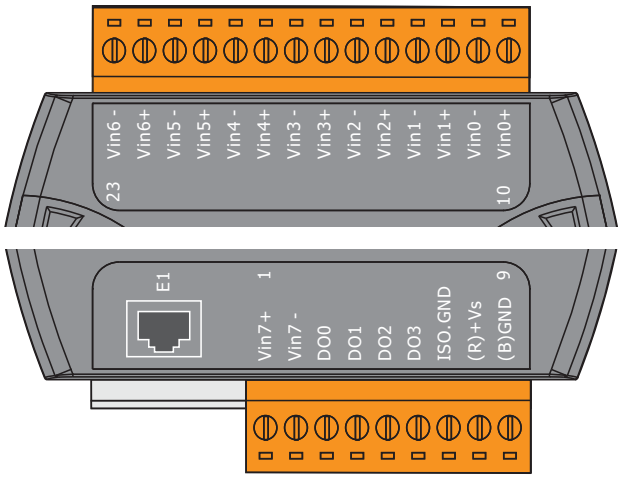
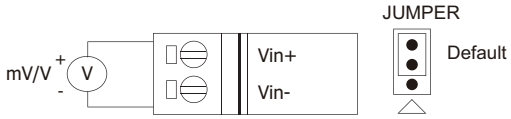
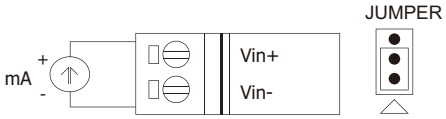
I/O Specifications

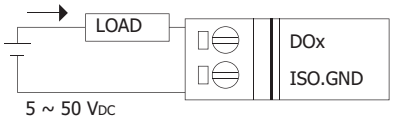
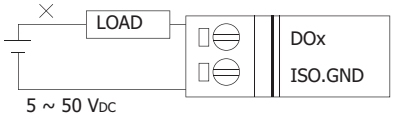
Analog Input		
Input Channels		8 (Differential)
Input Type		+/-150 mV, +/-500 mV, +/-1V, +/-5V, +/-10V +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper Selectable)
Individual Channel Configuration		Yes
Resolution	Normal Mode	16-bit
	Fast Mode	12-bit
Sampling Rate	Normal Mode	10 Samples/Sec. (Total)
	Fast Mode	60 Samples/Sec. (Total)
Accuracy	Normal Mode	+/-0.1%
	Fast Mode	+/-0.5% or better
Zero Drift		+/-20 uV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection		240 V_{rms}
Input Impedance	Voltage	2 MΩ
	Current	125 Ω
Common Mode Rejection		86 dB Min.
Normal Mode Rejection		100 dB
Digital Output		
Output Channels		4
Type		Isolated Open Collector (Sink)
Max. Load Current		700 mA/Channel
Load Voltage		5 V_{DC} ~ 50 V_{DC}
Overvoltage Protection		60 V_{DC}
Overload Protection		1.4 A
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Voltage Input	Current Input
	

Digital Output	ON State Readback as 1	OFF State Readback as 0
Open Collector (Sink)		

Ordering Information

ET-7017 CR	8-channel Analog Input with High Voltage Protection and 4-channel Isolated Digital Output Module (RoHS)
PET-7017 CR	8-channel Analog Input with High Voltage Protection and 4-channel Isolated Digital Output PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

Beta
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ET-7017-10
Regular Ethernet Version

PET-7017-10
PoE Version

AI Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 10/20 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The ET-7017-10 is a 16-bit, 10-channel differential or 20-channel single-ended analog inputs module that provides programmable input range on all analog channels (+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA and 4~20 mA). Each analog channel is allowed to configure an individual range and has 240 V_{rms} high overvoltage protection. Jumper selectable for voltage or current input. The sampling rate of ET-7017/PET-7017 is changeable; there are fast mode and normal mode for your consideration. ET-7017/PET-7017 also has qualification for 4 kV ESD protection as well as 3000 V_{DC} intra-module isolation.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7017-10	PET-7017-10
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.6 W	3.8 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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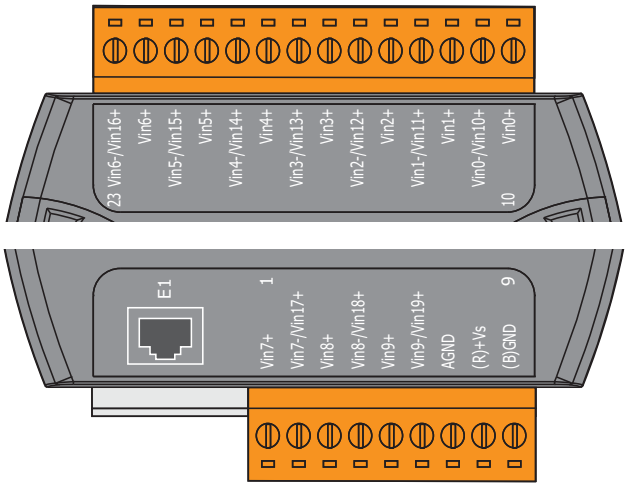
I/O Specifications

Analog Input		
Input Channels		10 differential or 20 single-ended (Note1), software selectable
Input Type		+/-150 mV, +/-500 mV, +/-1V, +/-5V, +/-10V +/-20 mA ,0 ~ 20 mA, 4 ~ 20 mA (Jumper Selectable)
Individual Channel Configuration		Yes
Resolution	Normal Mode	16-bit
	Fast Mode	12-bit
Sampling Rate	Normal Mode	10 Samples/Sec. (Total)
	Fast Mode	60 Samples/Sec. (Total)
Accuracy	Normal Mode	+/-0.1%
	Fast Mode	+/-0.5% or better
Zero Drift		+/-20 uV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection	Differential	240 V_{rms}
	Single-ended	150 V_{rms}
Input Impedance	Voltage	2 MΩ (Differential), 1 MΩ (Single-ended)
	Current	125 Ω
Common Mode Rejection		86 dB Min.
Normal Mode Rejection		100 dB

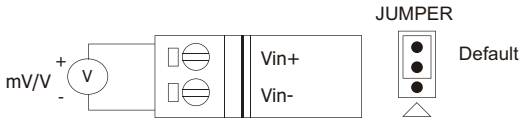
Note1: Differential mode can be used for voltage input and current input.
Single-Ended mode can be used for voltage input only.

Pin Assignments

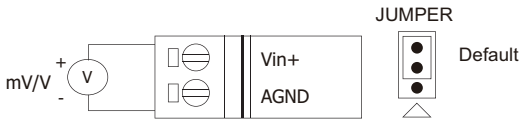


Wire Connections

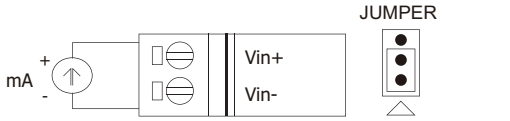
Voltage Input (Differential Mode)



Voltage Input (Single-ended Mode)



Current Input



Ordering Information

ET-7017-10	10/20-channel Analog Input Module with High Voltage Protection Module (RoHS)
PET-7017-10	10/20-channel Analog Input Module with High Voltage Protection PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

Beta
2011/05/17

ET-7018Z
Regular Ethernet Version

PET-7018Z
PoE Version

Thermocouple Input and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - Thermocouple Input: 10 Channels
  - DO: 6 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The "Z" version is another milestone in the development of thermocouple series and a testament to excellence by ICP DAS. ET-7018Z/PET-7018Z is specifically designed for extremely accurate thermocouple measurement. It features automatic cold-junction compensation for each channel to get temperature outputs consistency and stable temperature output in the field . Current input and voltage input are supported. Another feature is that ten of its input channels can individually be configured with different kinds of analog input. ET-7018Z/PET-7018Z also got open thermocouple detection and many protection mechanisms. The 6 digital output can be set alarm output with Short-circuit protection and overload protection.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7018Z	PET-7018Z
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 VDC	-
I/O	2500 VDC	2500 VDC
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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 VDC	Yes, 12 ~ 48 VDC
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.0 W	3.0 W
Mechanical		
Dimensions (W x L x H)	72 mm x 116 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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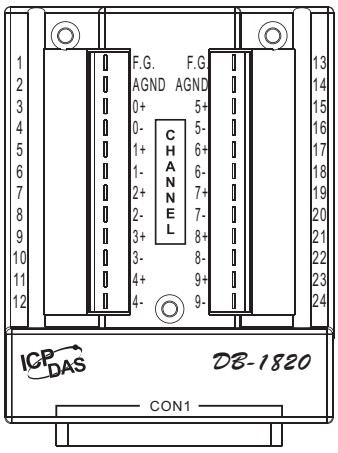
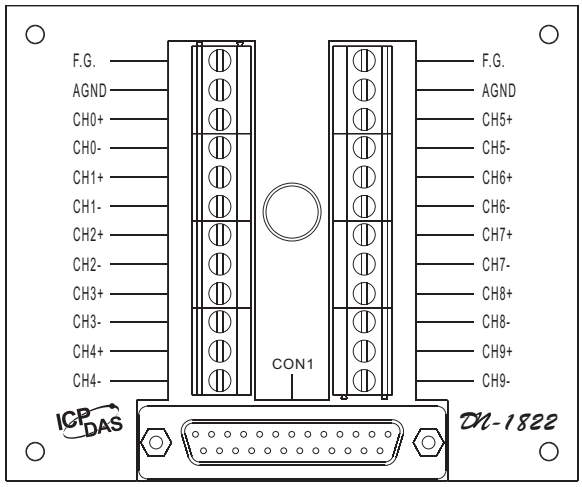
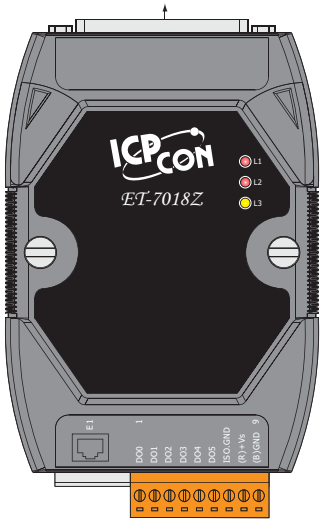
I/O Specifications

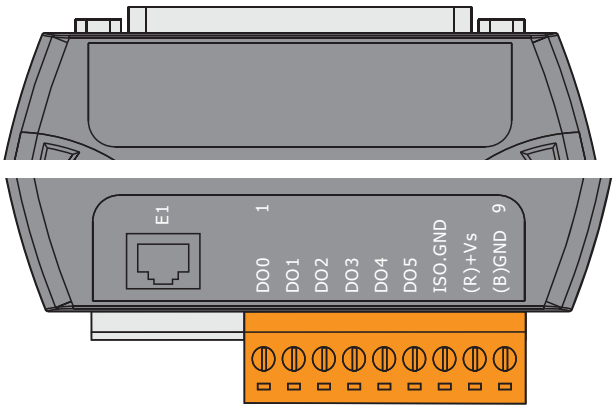
Thermocouple Input	
Input Channels	10 (Differential)
Sensor Type	+/-15 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, +/-2.5 V
	+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Requires Optional External 125 Ω Resistor)
	Thermocouple (J, K, T, E, R, S, B, N, C, L, M, LDIN43710)
Individual Channel Configuration	Yes
Resolution	16-bit
Sampling Rate	10 Samples/Sec. (Total)
Accuracy	+/-0.1% or better
Zero Drift	+/-0.5 uV/°C
Span Drift	+/-25 ppm/°C
Over Voltage Protection	240 V_{rms}
Input Impedance	>300 kΩ
Common Mode Rejection	150 dB Min.
Normal Mode Rejection	100 dB
Temperature Outputs Consistency	Yes
Stable Temperature Output in the Field	Yes
Open Wire Detection	Yes
Digital Output	
Output Channels	6
Type	Isolated Open Collector (Sink)
Max. Load Current	700 mA/Channel
Load Voltage	5 V_{DC} ~ 50 V_{DC}
Overvoltage Protection	60 V_{DC}
Overload Protection	1.4 A
Short-circuit Protection	Yes
Power-on Value	Yes, Programmable
Safe Value	Yes, Programmable

Pin Assignments









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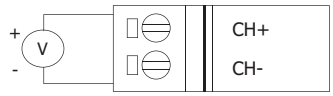
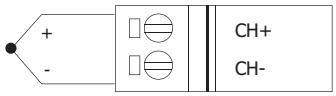
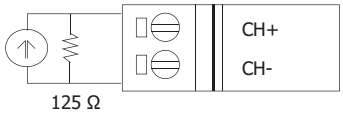
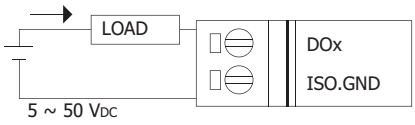
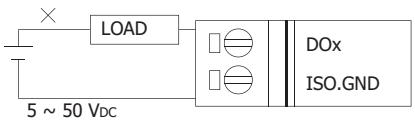
Wire Connections

Voltage Input (Default)	Thermocouple Input (Default)
	

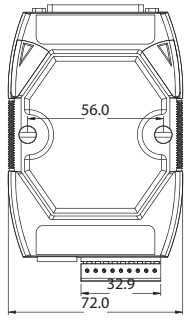
Current Input



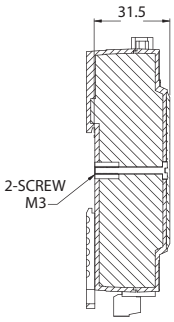
Note: When connecting to a current source, an optional external 125 Ω resistor is required.

Digital Output	ON State Readback as 1	OFF State Readback as 0
Open Collector (Sink)		

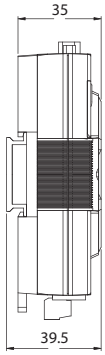
Dimensions (Units: mm)



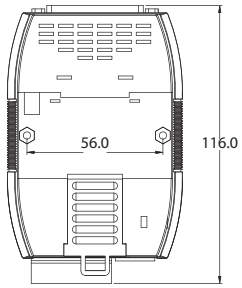
Front View



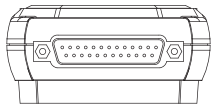
Right Side View

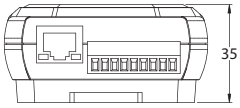


Din Rail MountingBracket



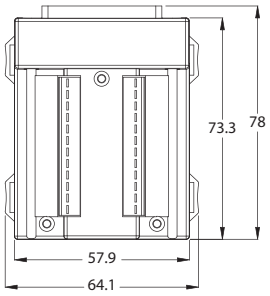
Rear View


Top View

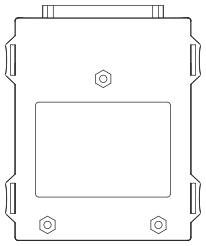


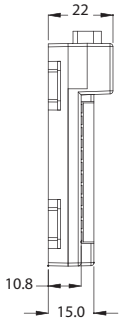
Bottom View

DN-1820

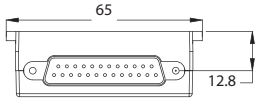


Front View

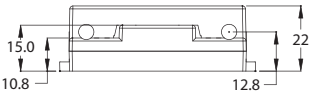

Rear View



Left Side View

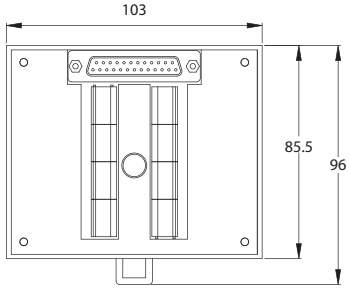


Top View

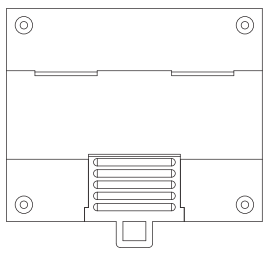


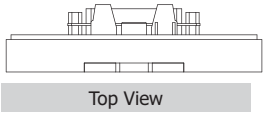
Bottom View

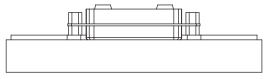
DN-1822

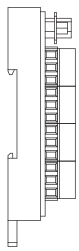


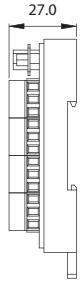
Front View


Rear View


Top View


Bottom View


Right Side View



Left Side View

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Ordering Information

ET-7018Z-G/S CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output Module (RoHS) Include ET-7018Z Module and DB-1820 Daughter Board
ET-7018Z-G/S2 CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output PoE Module (RoHS) Include ET-7018Z Module, DN-1822 Daughter Board and 1.8 m Cable
PET-7018Z-G/S CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output Module (RoHS) Include PET-7018Z Module and DB-1820 Daughter Board
PET-7018Z-G/S2 CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output PoE Module (RoHS) Include PET-7018Z Module, DN-1822 Daughter Board and 1.8 m Cable

Front Back

ET-7018Z-G/S = ET-7018Z Connects DB-1820 Directly
PET-7018Z-G/S = PET-7018Z Connects DB-1820 Directly

ET-7018Z-G/S2 = ET-7018Z Connect DN-1822 Directly
PET-7018Z-G/S2 = PET-7018Z Connect DN-1822 Directly

Accessories

NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
CD-2518D CR	25F-25M 1.8 m Cable with DIN-Rail Mount of DB-1820 (RoHS)
CD-25015 CR	25F-25M 15 cm Cable with DIN-Rail Mount of DB-1820 (RoHS)
4PAPP-006-G CR	Plastic Rack (RoHS)

CD-25015
15 cm Cable + DB-1820

4PAPP-006-G

PET-7018Z-G/S + CD-25015 + 4PAPP-006-G

CD-2518D
1.8 m Cable + DB-1820

PET-7018Z-G/S + CD-2518D

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2011/05/17

ET-7019
Regular Ethernet Version

PET-7019
PoE Version

Universal AI and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 8 Channels
  - DO: 4 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

ET-7019/PET-7019 features an extremely excellent protection mechanism where overvoltage protection is up to 240 V_{rms}. It has wider input range for voltage compared to ET-7017. ET-7019/PET-7019 measures voltage from +/- 15 mV ~ +/- 10 V. Its input type also includes current and thermocouple. An intuitive design is kept in this model; choosing to measure current or voltage is simply by a jumper. An external resistor is no longer needed. Eight of its inputs channels can individually be configured with different kinds of analog input. What's more, ET-7019/PET-7019 also got open thermocouple detection and many protection mechanisms. The 4 digital output can be set alarm output with Short-circuit protection and overload protection.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7019	PET-7019
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.4 W	3.4 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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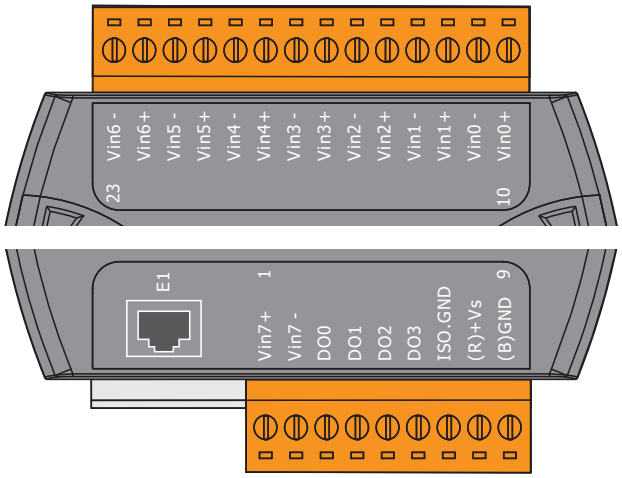
I/O Specifications

Analog Input		
Input Channels		8 (Differential)
Sensor Type		+/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA, 4~20 mA
		Thermocouple (J, K, T, E, R, S, B, N, C, L, M, LDIN43710)
Individual Channel Configuration		Yes
Resolution		16-bit
Sampling Rate		10 samples/Sec. total
Accuracy		+/-0.1 % or better
Zero Drift		+/-10 μV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection		240 V_{rms}
Input Impedance	Voltage	>1 MΩ
	Current	125 Ω
Common Mode Rejection		86 dB Min.
Normal Mode Rejection		100 dB
Open Wire Detection		Yes
Digital Output		
Output Channels		4
Type		Isolated Open Collector (Sink)
Max. Load Current		700 mA/Channel
Load Voltage		5 V_{DC} ~ 50 V_{DC}
Overvoltage Protection		60 V_{DC}
Overload Protection		1.4 A
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

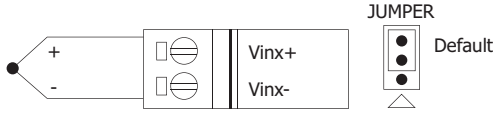
Note: We recommend to choose ET-7018Z for accurate thermocouple measurement.

Pin Assignment

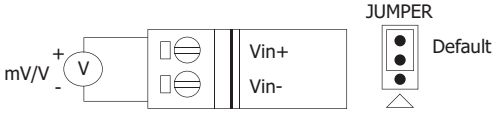


Wire Connections

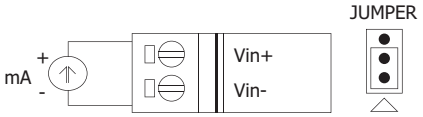
Thermocouple Input

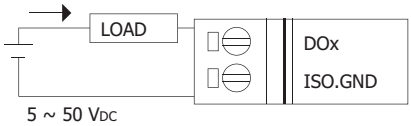
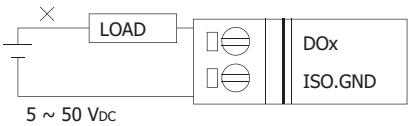


Voltage Input



Current Input



Digital Output	ON State Readback as 1	OFF State Readback as 0
Open Collector (Sink)		

Ordering Information

ET-7019 CR	8-channel Analog Input with High Voltage Protection and 4-channel Isolated Digital Output Module (RoHS)
PET-7019 CR	8-channel Analog Input with High Voltage Protection and 4-channel Isolated Digital Output PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7019Z
Regular Ethernet Version

PET-7019Z
PoE Version

Thermocouple Input and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 10 Channels
  - DO: 6 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The "Z" version is another milestone in the development of thermocouple series and a testament to excellence by ICP DAS. ET-7019Z/PET-7019Z is specifically designed for extremely accurate thermocouple measurement. It features automatic cold-junction compensation for each channel to get temperature outputs consistency and stable temperature output in the field . Current input and voltage input are supported. Another feature is that ten of its input channels can individually be configured with different kinds of analog input. Also got open thermocouple detection and many protection mechanisms. The 6 digital output can be set alarm output with Short-circuit protection and overload protection.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7019Z	PET-7019Z
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 VDC	-
I/O	2500 VDC	2500 VDC
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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 VDC	Yes, 12 ~ 48 VDC
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.5 W	3.5 W
Mechanical		
Dimensions (W x L x H)	72 mm x 116 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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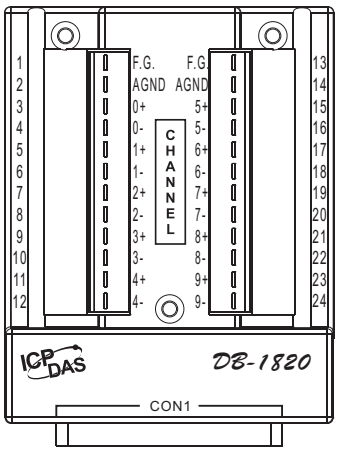
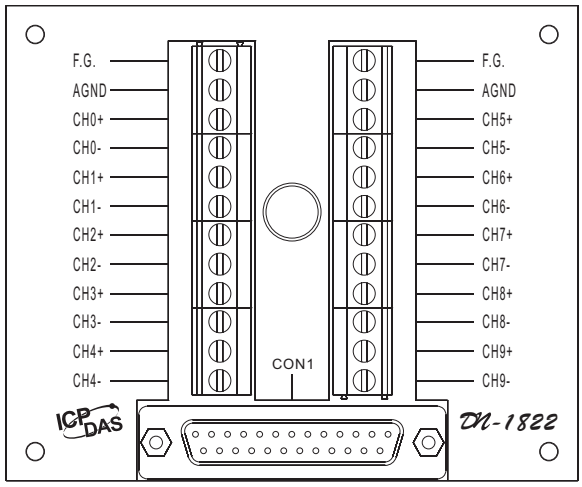
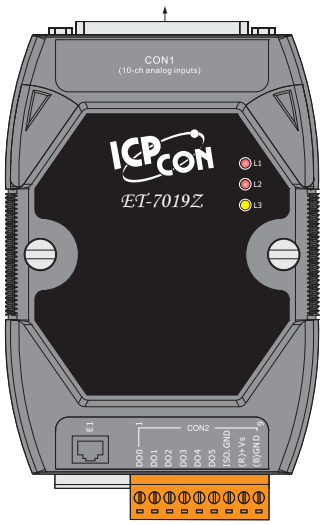
I/O Specifications

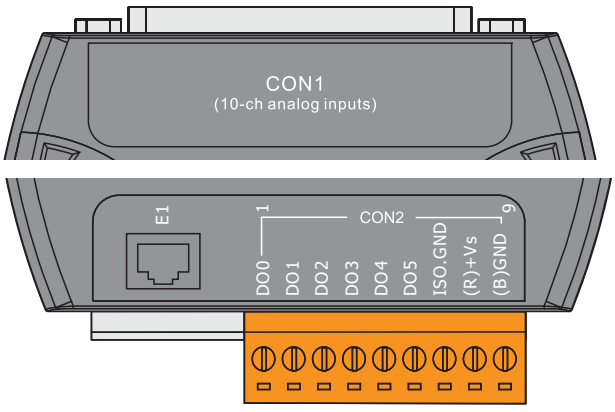
Analog Input	
Input Channels	10 (Differential)
Sensor Type	+/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, +/-10 V,
	+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper Selectable)
	Thermocouple (J, K, T, E, R, S, B, N, C, L, M, LDIN43710)
Individual Channel Configuration	Yes
Resolution	16-bit
Sampling Rate	10 Samples/Sec. (Total)
Accuracy	+/-0.1% or better
Zero Drift	+/-0.5 uV/°C
Span Drift	+/-25 ppm/°C
Over Voltage Protection	240 V_{rms}
Input Impedance	>300 kΩ
Common Mode Rejection	86 dB Min.
Normal Mode Rejection	100 dB
Temperature Outputs Consistency	Yes
Stable Temperature Output in the Field	Yes
Open Wire Detection	Yes
Digital Output	
Output Channels	6
Type	Isolated Open Collector (Sink)
Max. Load Current	700 mA/Channel
Load Voltage	5 V_{DC} ~ 50 V_{DC}
Overvoltage Protection	60 V_{DC}
Overload Protection	1.4 A
Short-circuit Protection	Yes
Power-on Value	Yes, Programmable
Safe Value	Yes, Programmable

Pin Assignments









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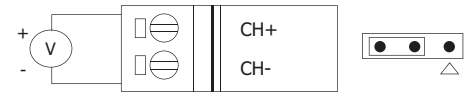
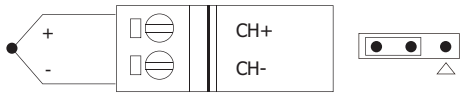
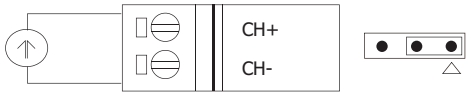
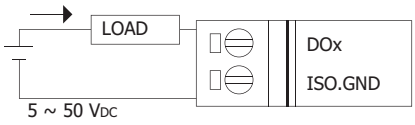
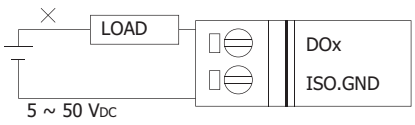
Wire Connections

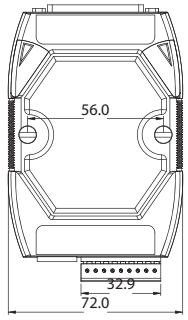
Voltage Input (Default)	Thermocouple Input (Default)
	

Current Input

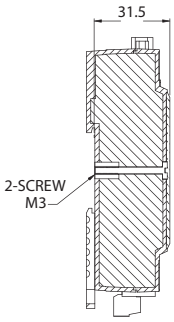


Digital Output	ON State Readback as 1	OFF State Readback as 0
Open Collector (Sink)		

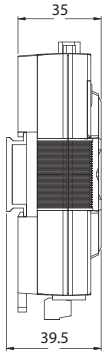
Dimensions (Units: mm)



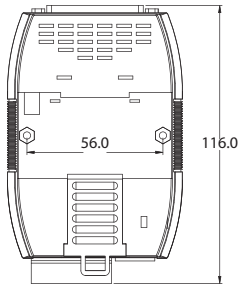
Front View



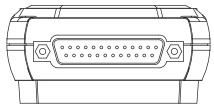
Right Side View

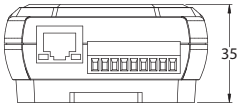


Din Rail MountingBracket



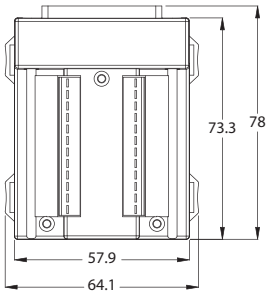
Rear View


Top View

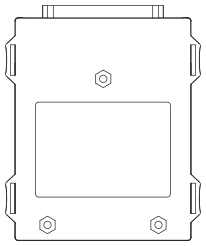


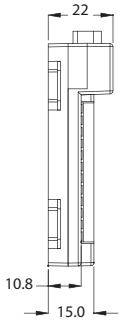
Bottom View

DN-1820

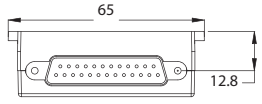


Front View

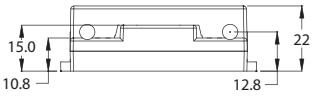

Rear View



Left Side View

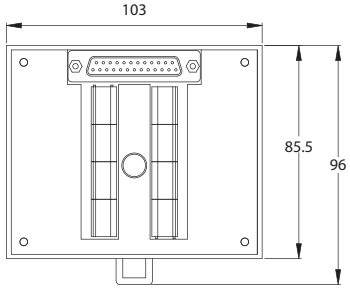


Top View

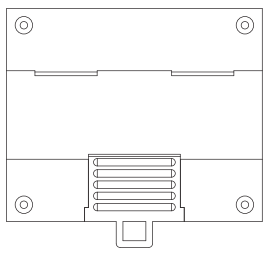


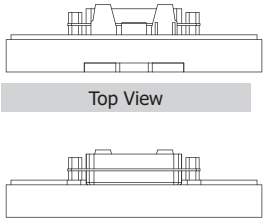
Bottom View

DN-1822

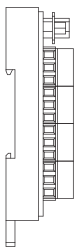


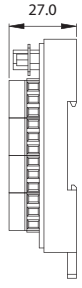
Front View


Rear View


Top View

Bottom View


Right Side View



Left Side View

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Ordering Information

ET-7019Z-G/S CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output Module (RoHS) Include ET-7019Z Module and DB-1820 Daughter Board
ET-7019Z-G/S2 CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output PoE Module (RoHS) Include ET-7019Z Module, DN-1822 Daughter Board and 1.8 m Cable
PET-7019Z-G/S CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output Module (RoHS) Include PET-7019Z Module and DB-1820 Daughter Board
PET-7019Z-G/S2 CR	10-channel Thermocouple Input with High Voltage Protection and 6-channel Isolated Digital Output PoE Module (RoHS) Include PET-7019Z Module, DN-1822 Daughter Board and 1.8 m Cable

Front Back

ET-7019Z-G/S = ET-7019Z Connects DB-1820 Directly
PET-7019Z-G/S = PET-7019Z Connects DB-1820 Directly

ET-7019Z-G/S2 = ET-7019Z Connect DN-1822 Directly
PET-7019Z-G/S2 = PET-7019Z Connect DN-1822 Directly

Accessories

NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
CD-2518D CR	25F-25M 1.8 m Cable with DIN-Rail Mount of DB-1820 (RoHS)
CD-25015 CR	25F-25M 15 cm Cable with DIN-Rail Mount of DB-1820 (RoHS)
4PAPP-006-G CR	Plastic Rack (RoHS)

CD-25015
15 cm Cable + DB-1820

4PAPP-006-G

PET-7019Z-G/S + CD-25015 + 4PAPP-006-G

CD-2518D
1.8 m Cable + DB-1820

PET-7019Z-G/S + CD-2518D

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ET-7026
Regular Ethernet Version

PET-7026
PoE Version

Multifunction Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - AI: 6 Channels
  - AO: 2 Channels
  - DI/Counter: 2 Channels
  - DO: 2 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

The ET-7026/PET-7026 is a multi-function module, there are 6-channel analog inputs, 2-channel analog output, 2-channel digital inputs and 2-channel digital outputs module. It provides programmable input range on all analog inputs (+/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA and 4~20 mA), analaog outputs are 12 bit with +/-5 V, +/-10 V, 0~20 mA and 4~20 mA and digital output can be set alarm output. Each analog input is allowed to configure an individual range and has 240 V_{rms} high overvoltage protection. Jumper selectable for voltage or current of inputs/outputs

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7026	PET-7026
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	2500 V_{DC}	2500 V_{DC}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal and 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_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	3.1 W	4.2 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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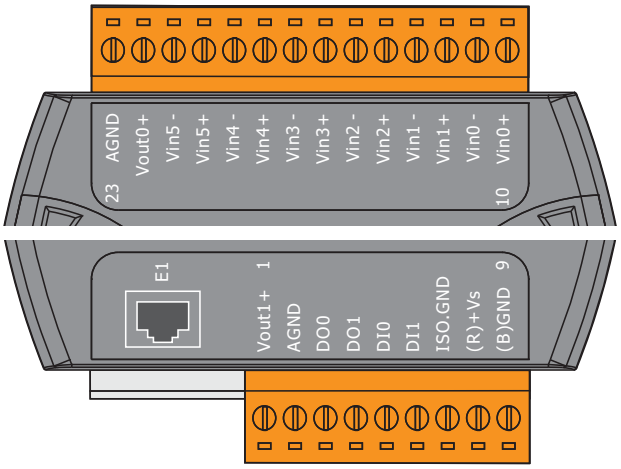
I/O Specifications

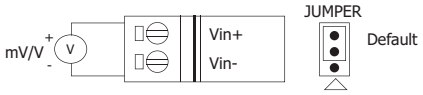
Analog Input		
Input Channels		6 (Differential)
Input Type		+/- 500 mV, +/- 1V, +/- 5 V, +/-10 V + 0 mA ~ + 20 mA, +/- 20 mA, 4 ~ 20 mA (Jumper Selectable)
Individual Channel Configuration		Yes
Resolution	Normal Mode	16-bit
	Fast Mode	12-bit
Sampling Rate	Normal Mode	10 Samples/Sec. (Total)
	Fast Mode	60 Samples/Sec. (Total)
Accuracy	Normal Mode	+/-0.1%
	Fast Mode	+/-0.5% or better
Zero Drift		+/-20 uV/°C
Span Drift		+/-25 ppm/°C
Overvoltage Protection		240 V_{rms}
Input Impedance		2 MΩ
Common Mode Rejection		86 dB Min.
Normal Mode Rejection		100 dB
Analog Output		
Output Channels		2
Output Type		+ 0 V_{DC} ~ + 5 V_{DC}, +/- 5 V_{DC}, + 0 V_{DC} ~ + 10 V_{DC}, +/- 10 V_{DC},+ 0 mA ~ + 20 mA, + 4 mA ~ + 20 mA (Jumper Selectable)
Individual Channel Configuration		Yes
Resolution		12-bit
Accuracy		+/- 0.1% of FSR
Voltage Output Capability		20 mA @ 10 V
Current Load Resistance		500 Ω
Open Wire Detection		Yes, for 4 ~ 20 mA only
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable
Digital Input/Counter		
Input Channels		2
Dry Contact (Source)	On Voltage Level	Close to GND
	Off Voltage Level	Open
	Effective Distance for Dry Contact	500M Max.
Wet contact (Sink/Source)	On Voltage Level	+ 1 V_{DC} Max.
	Off Voltage Level	+ 3.5 V_{DC} ~ + 30 V_{DC}
Counters	Channels	2
	Max. Count	4,294,967,285 (32-bit)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Overvoltage Protection		30 V_{DC}
Digital Output		
Output Channels		2
Type		Isolated Open Collector (Sink)
Max. Load Current		700 mA/Channel
Load Voltage		+ 5 V_{DC} ~ + 50 V_{DC}
Overvoltage Protection		60 V_{DC}
Overload Protection		1.4 A
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments

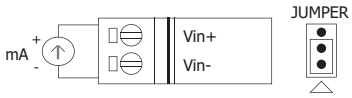


Wire Connections

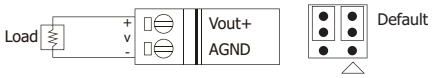
Voltage Input



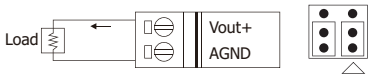
Current Input

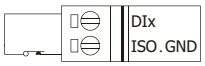
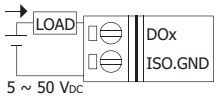
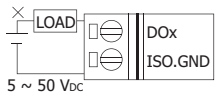


Voltage Output



Current Output



Digital Input/ Counter	ON State Readback as 1	OFF State Readback as 0
Dry Contact		
Digital Output	**ON State Readback as 1**	**OFF State Readback as 0**
Open Collector (Sink)		

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; requires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; requires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; requires 24 V_{DC} Input (RoHS)
 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

Ordering Information

ET-7026 CR	Multifunction Module (RoHS)
PET-7026 CR	Multifunction PoE Module (RoHS)

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ET-7042
Regular Ethernet Version

PET-7042
PoE Version

DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DO: 16 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7042	PET-7042
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.7 W	4.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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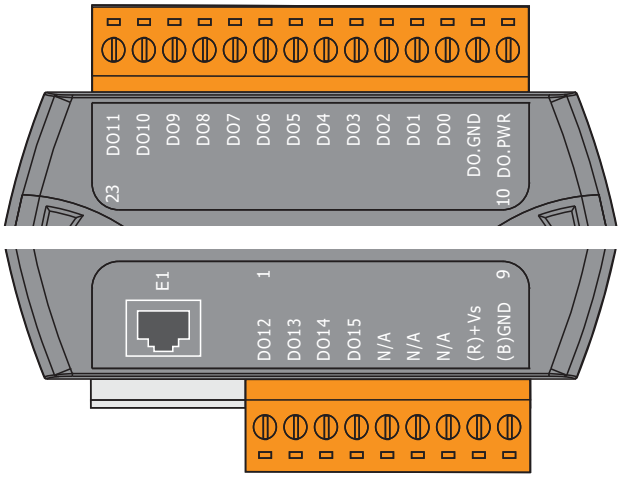
I/O Specifications

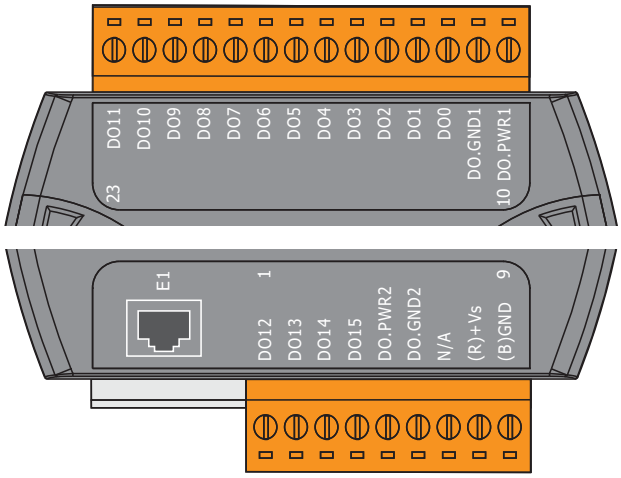
Models	ET-7042	PET-7042
Digital Output		
Output Channels	16	
Type	Isolated Open Collector (Sink)	
Max. Load Current	100 mA/channel at 25 °C Direct Drive Power Relay Module	
Load Voltage	+5 V_{DC} ~ +30 V_{DC}	
Overvoltage Protection	-	60 V_{DC}
Overload Protection	-	1.3 A
Short-circuit Protection	-	Yes
Power-on Value	Yes, Programmable	
Safe Value	Yes, Programmable	

Pin Assignments

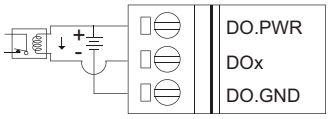
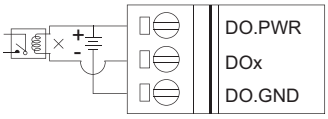
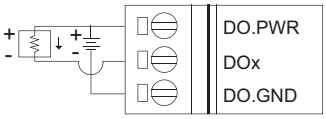
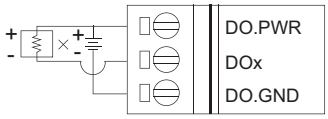
ET-7042



PET-7042



Wire Connections

Output Type	ON State Readback as 1	OFF State Readback as 0
Drive Relay		
Resistance Load		

Ordering Information

ET-7042 CR	16-channel Isolated Sink Type Open Collector Digital Output Module (RoHS)
PET-7042 CR	16-channel Isolated Sink Type Open Collector Digital Output PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7044
Regular Ethernet Version

PET-7044
PoE Version

DI and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 8 Channels
  - DO: 8 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7044	PET-7044
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.4 W	4.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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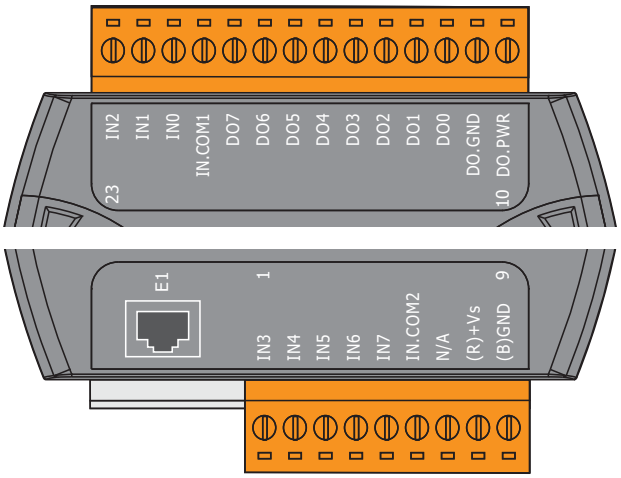
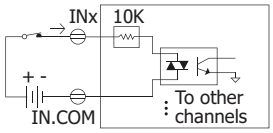
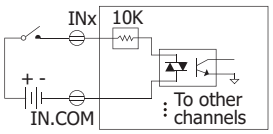
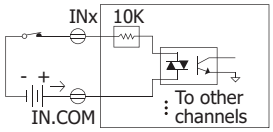
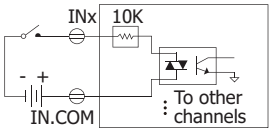
I/O Specifications

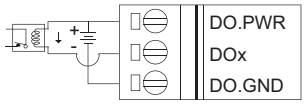
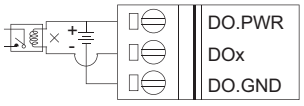
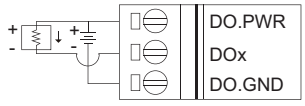
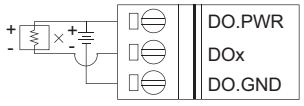
Digital Input/Counter		
Input Channels		8
Type		Wet Contact (Sink, Source)
On Voltage Level		+10 V_{DC} ~ +50 V_{DC}
Off Voltage Level		+4 V_{DC} Max.
Input Impedance		10 kΩ
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 V_{DC}
Digital Output		
Output Channels		8
Type		Isolated Open Collector (Sink)
Max. Load Current		300 mA/channel at 25 °C Direct Drive Power Relay Module
Load Voltage		+10 V_{DC} ~ +40 V_{DC}
Overvoltage Protection		60 V_{DC}
Overload Protection		1.1 A
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		
Source	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		

Output Type	ON State Readback as 1	OFF State Readback as 0
Drive Relay		
Resistance Load		

Ordering Information

ET-7044 CR	8-channel DI and 8-channel DO with 32-bit Counters Module (RoHS)
PET-7044 CR	8-channel DI and 8-channel DO with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7050
Regular Ethernet Version

PET-7050
PoE Version

DI and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 12 Channels
  - DO: 6 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7050	PET-7050
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.4 W	4.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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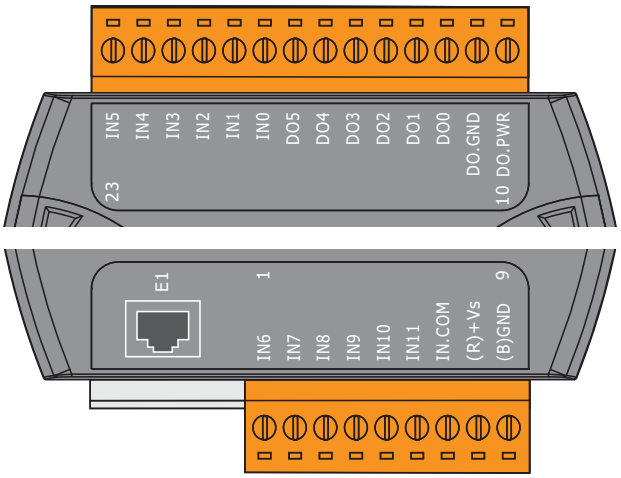
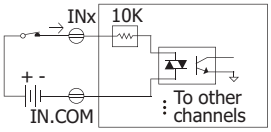
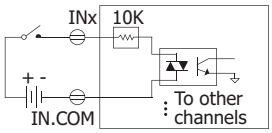
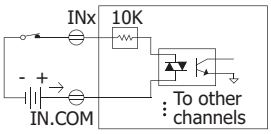
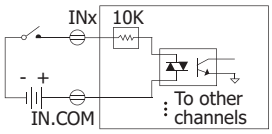
I/O Specifications

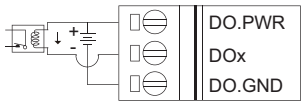
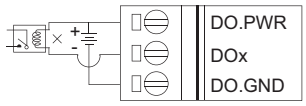
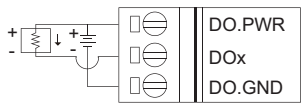
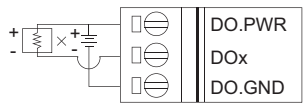
Models		ET-7050	PET-7050
Digital Input/Counter			
Input Channels		12	
Type		Wet Contact (Sink, Source)	
On Voltage Level		+10 VDC ~ +50 VDC	
Off Voltage Level		+4 VDC Max.	
Input Impedance		10 kΩ	
Counters	Max. Count	4,294,967,285 (32 bits)	
	Max. Input Frequency	500 Hz	
	Min. Pulse Width	1 ms	
Overvoltage Protection		+70 VDC	
Digital Output			
Output Channels		6	
Type		Isolated Open Collector (Sink)	
Max. Load Current		100 mA/channel at 25 °C Direct Drive Power Relay Module	
Load Voltage		+5 VDC ~ +30 VDC	
Overvoltage Protection		-	60 VDC
Overload Protection		-	1.3 A
Short-circuit Protection		-	Yes
Power-on Value		Yes, Programmable	
Safe Value		Yes, Programmable	

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 VDC	OPEN or <4 VDC
		
Source	+10 ~ +50 VDC	OPEN or <4 VDC
		

Output Type	ON State Readback as 1	OFF State Readback as 0
Drive Relay		
Resistance Load		

Ordering Information

ET-7050 CR	12-channel DI and 6-channel DO with 32-bit Counters (RoHS)
PET-7050 CR	12-channel DI and 6-channel DO with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 VDC Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 VDC Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7051
Regular Ethernet Version

PET-7051
PoE Version

DI Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 16 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7051	PET-7051
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.2 W	3.9 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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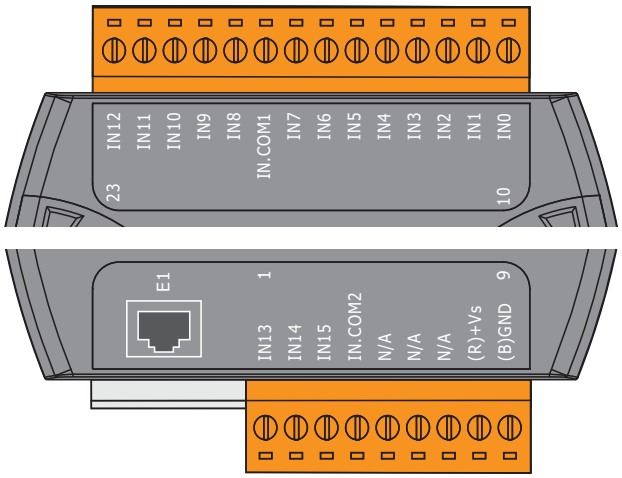
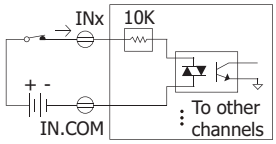
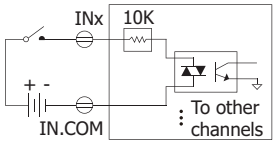
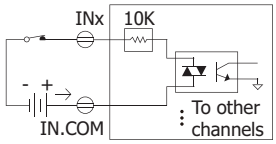
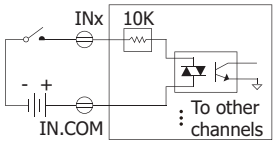
I/O Specifications

Digital Input/Counter		
Input Channels		16
Type		Wet Contact (Sink, Source)
On Voltage Level		+10 V_{DC} ~ +50 V_{DC}
Off Voltage Level		+4 V_{DC} Max.
Input Impedance		10 kΩ
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 V_{DC}

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		
Source	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		

Ordering Information

ET-7051 CR	16-channel Isolated Digital Input Module with 32-bit Counters Module (RoHS)
PET-7051 CR	16-channel Isolated Digital Input Module with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)
 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7052
Regular Ethernet Version

PET-7052
PoE Version

DI and DO Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 8 Channels
  - DO: 8 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7052	PET-7052
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.4 W	4.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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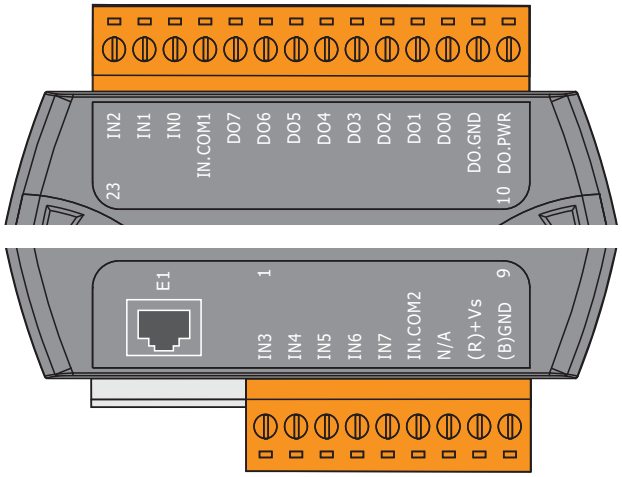
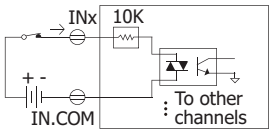
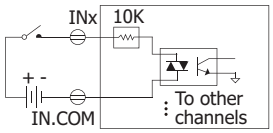
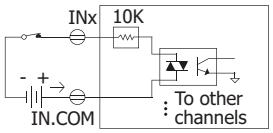
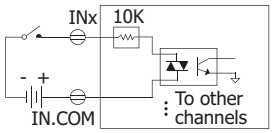
I/O Specifications

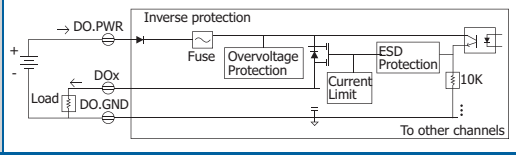
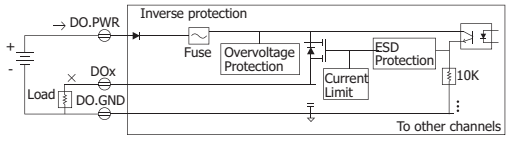
Digital Input/Counter		
Input Channels		8
Type		Wet Contact (Sink, Source)
On Voltage Level		+10 VDC ~ +50 VDC
Off Voltage Level		+4 VDC Max.
Input Impedance		10 kΩ
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 VDC
Digital Output		
Output Channels		8
Type		Open Collector (Source)
Max. Load Current		650 mA/channel at 25 °C
Load Voltage		+10 VDC ~ +40 VDC
Overvoltage Protection		47 VDC
Overload Protection		-
Short-circuit Protection		Yes
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 VDC	OPEN or <4 VDC
		
Source	+10 ~ +50 VDC	OPEN or <4 VDC
		

Digital Output	ON State Readback as 1	OFF State Readback as 0
Source		

Ordering Information

ET-7052 CR	8-channel DI and 8-channel DO with 32-bit Counters Module (RoHS)
PET-7052 CR	8-channel DI and 8-channel DO with 32-bit Counters Module PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 VDC Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 VDC Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7053
Regular Ethernet Version

PET-7053
PoE Version

DI Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 16 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7053	PET-7053
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3750 V_{rms}	3750 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.4 W	4.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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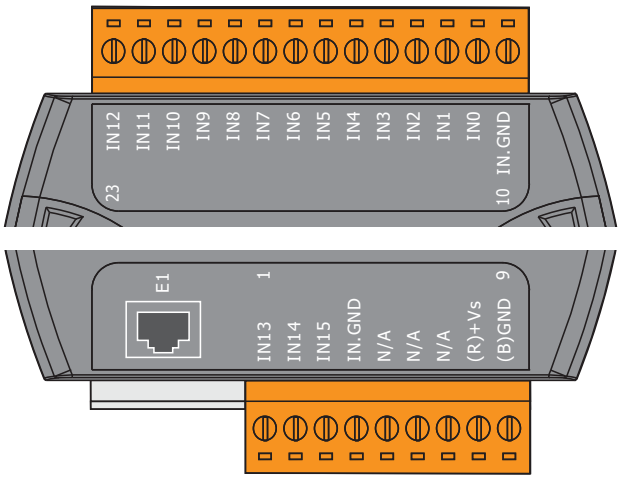
I/O Specifications

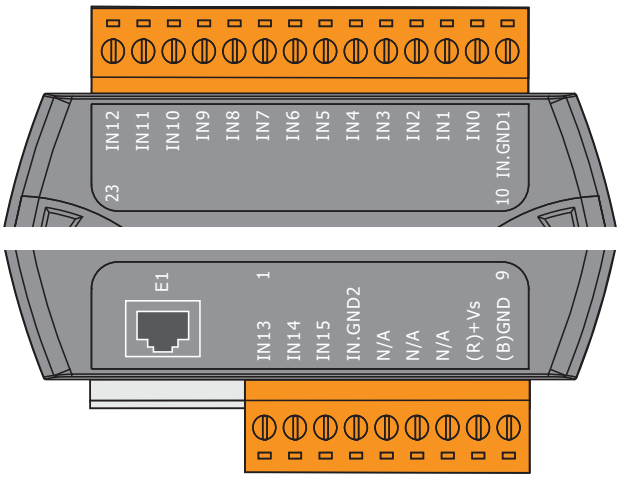
Digital Input/Counter		
Input Channels		16
Type		Dry Contact (Source)
On Voltage Level		Open
Off Voltage Level		Close to GND
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		-
Effective Distance		500 M Max.

Pin Assignments

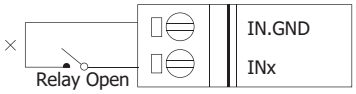
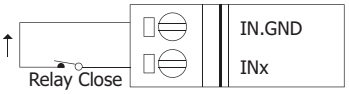
ET-7053



PET-7053



Wire Connections

Digital Input/Counter	ON State Readback as 1	OFF State Readback as 0
Dry Contact		

Ordering Information

ET-7053 CR	16-channel Isolated Digital Input Module with 32-bit Counters (RoHS)
PET-7053 CR	16-channel Isolated Digital Input Module with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7060
Regular Ethernet Version

PET-7060
PoE Version

Power Relay Output and DI Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 6 Channels
  - Power Relay: 6 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7060	PET-7060
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3000 V_{rms}	3000 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.9 W	4.8 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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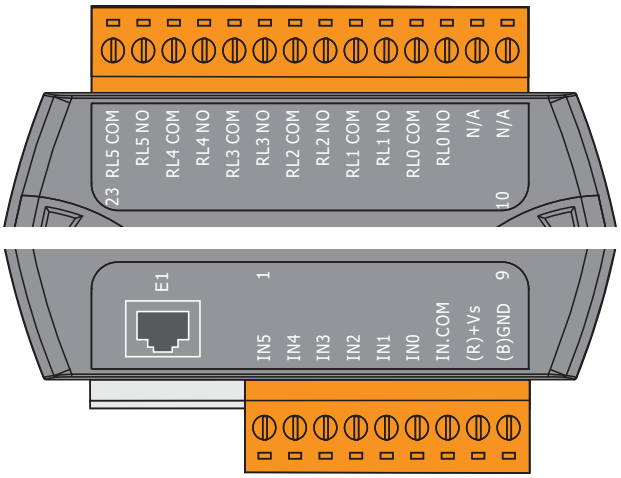
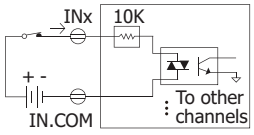
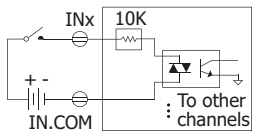
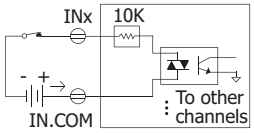
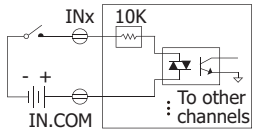
I/O Specifications

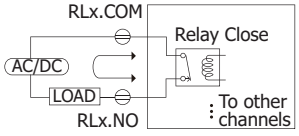
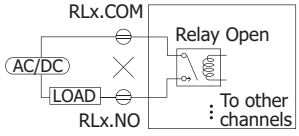
Digital Input/Counter		
Input Channels		6
Type		Wet Contact (Sink, Source)
On Voltage Level		+10 V_{DC} ~ +50 V_{DC}
Off Voltage Level		+4 V_{DC} Max.
Input Impedance		10 kΩ
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 V_{DC}
Power Relay		
Output Channels		6
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 V_{AC}/30 V_{DC}
Max. Load Current		5.0A/channel at 25 °C
Operate Time		6 ms (Typical)
Release Time		3 ms (Typical)
Electrical Life (Resistive Load)	VDE	5A 250 V_{AC} 30,000 ops (10 ops/minute) at 75 °C
		5A 30 V_{DC} 70,000 ops (10 ops/minute) at 75 °C
	UL	5A 250 V_{AC}/30 V_{DC} 6,000 ops.
		3A 250 V_{AC}/30 V_{DC} 100,000 ops.
Mechanical Life		20,000,000 ops. at no load (300 ops./minute)
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		
Source	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		

Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output		

Ordering Information

ET-7060 CR	6-channel Power Relay Output and 6-channel Isolation Digital Input Module with 32-bit Counters (RoHS)
PET-7060 CR	6-channel Power Relay Output and 6-channel Isolation Digital Input Module with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7065
Regular Ethernet Version

PET-7065
PoE Version

PhotoMOS Relay Output and DI Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - DI/Counter: 6 Channels
  - PhotoMOS Relay: 6 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

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Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7065	PET-7065
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3000 V_{rms}	3000 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.9 W	4.8 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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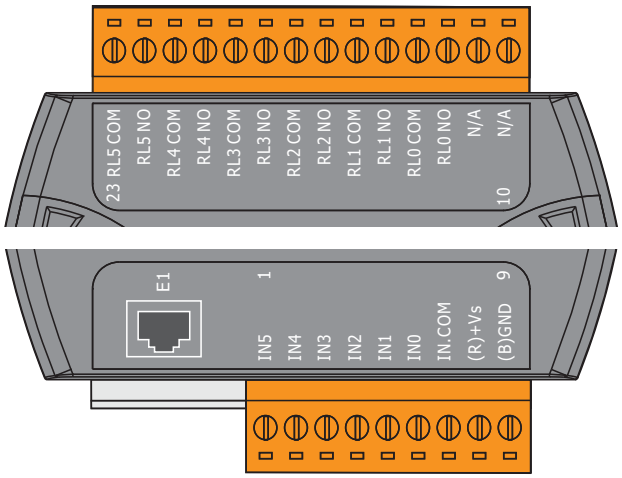
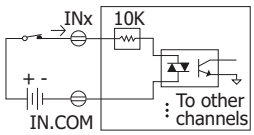
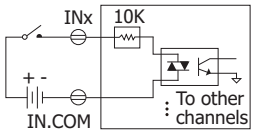
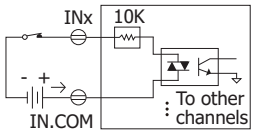
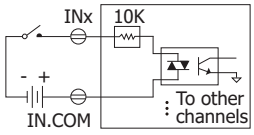
I/O Specifications

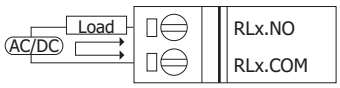
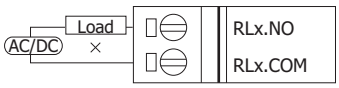
Digital Input/Counter		
Input Channels		6
Type		Wet Contact (Sink, Source)
On Voltage Level		+10 V_{DC} ~ +50 V_{DC}
Off Voltage Level		+4 V_{DC} Max.
Input Impedance		10 kΩ
Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 V_{DC}
PhotoMOS Relay		
Output Channels		6
Type		PhotoMOS Relay, Form A
Load Voltage		60 V_{DC}/V_{AC}
Max. Load Current		60V/1.0A (Operating Temperature -25 °C ~ +40 °C)
		60V/0.8A (Operating Temperature +40 °C ~ +60 °C)
		60V/0.7A (Operating Temperature +60 °C ~ +75 °C)
Operate Time		1.3 ms (Typical)
Release Time		0.1 ms (Typical)
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Digital Input/Counter	Readback as 1	Readback as 0
Sink	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		
Source	+10 ~ +50 V_{DC}	OPEN or <4 V_{DC}
		

PhotoMOS Relay	ON State Readback as 1	OFF State Readback as 0
Form A Relay Contact		

Ordering Information

ET-7065 CR	6-channel PhotoMOS Relay Output and 6-channel Isolated Digital Input Module with 32-bit Counters (RoHS)
PET-7065 CR	6-channel PhotoMOS Relay Output and 6-channel Isolated Digital Input Module with 32-bit Counters PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)

 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7066
Regular Ethernet Version

PET-7066
PoE Version

PhotoMOS Relay Output Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - PhotoMOS Relay: 8 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7066	PET-7066
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3000 V_{rms}	3000 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	2.9 W	5.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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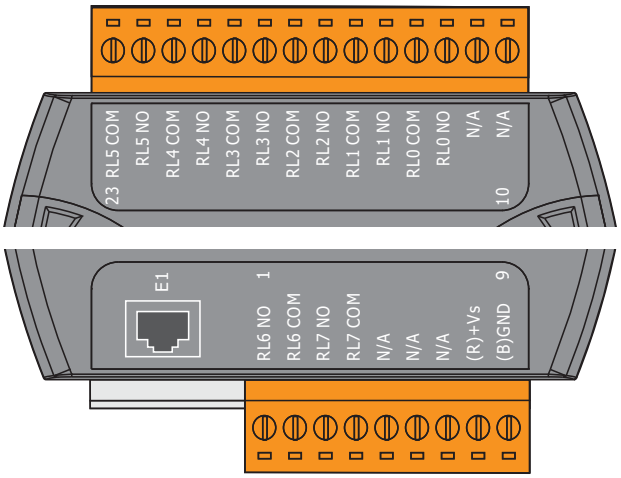
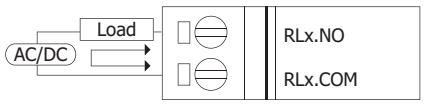
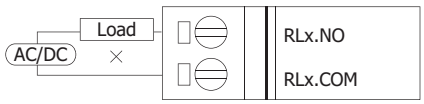
I/O Specifications

PhotoMOS Relay	
Output Channels	8
Type	PhotoMOS Relay, Form A
Load Voltage	60 V_{DC}/V_{AC}
Load Current	60V/1.0A (Operating Temperature -25 °C ~ +40 °C)
	60V/0.8A (Operating Temperature +40 °C ~ +60 °C)
	60V/0.7A (Operating Temperature +60 °C ~ +75 °C)
Operate Time	1.3 ms (Typical)
Release Time	0.1 ms (Typical)
Power-on Value	Yes, Programmable
Safe Value	Yes, Programmable

Pin Assignments



Wire Connections

PhotoMOS Relay	ON State Readback as 1	OFF State Readback as 0
Form A Relay Contact		

Ordering Information

ET-7066 CR	8-channel PhotoMOS Relay Output Module (RoHS)
PET-7066 CR	8-channel PhotoMOS Relay Output Module PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)
 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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ET-7067
Regular Ethernet Version

PET-7067
PoE Version

Power Relay Output Module

Features

- PoE and Regular Ethernet Options
- Built-In Web Server
- Web HMI
- Modbus/TCP, Modbus/UDP Protocol
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 °C ~ +75 °C
- I/O Pair Connection
- Built-In I/O
  - Power Relay: 8 Channels

Introduction

The ET-7000/PET-7000, a web-based Ethernet I/O module, features a built-in web server which allows configuration, I/O monitoring and I/O control by simply using a regular web browser. Remote control is as easy as surfing the Internet.

Besides, with the web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000 also supports Modbus/TCP protocol that makes perfect integration to SCADA software.

Furthermore, PET-7000 features "PoE" that not only data but also power is carried through an Ethernet cable. This feature makes installation of PET-7000 a piece of cake. Imagine that no more unnecessary wires, only an Ethernet cable takes care of everything in the field.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

System Specifications

Models	ET-7067	PET-7067
Software		
Built-In Web Server	Yes	
Web HMI	Yes	
I/O Pair Connection	Yes	
Communication		
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X	
Protocol	Modbus/TCP, Modbus/UDP	
Security	ID, Password and IP Filter	
Dual Watchdog	Yes, Module (0.8 seconds), Communication (Programmable)	
LED Indicators		
L1 (System Running)	Yes	
L2 (Ethernet Link/Act)	Yes	
L3 (Ethernet 10/100 M Speed)	Yes	
PoE Power	-	Yes
2 Way Isolation		
Ethernet	1500 V_{DC}	-
I/O	3000 V_{rms}	3000 V_{rms}
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power Requirements		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}	Yes, 12 ~ 48 V_{DC}
Powered from PoE	-	Yes, IEEE 802.3af, Class1
Consumption	3.2 W	5.3 W
Mechanical		
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-30 °C ~ +80 °C	
Humidity	10 ~ 90% RH, Non-condensing	

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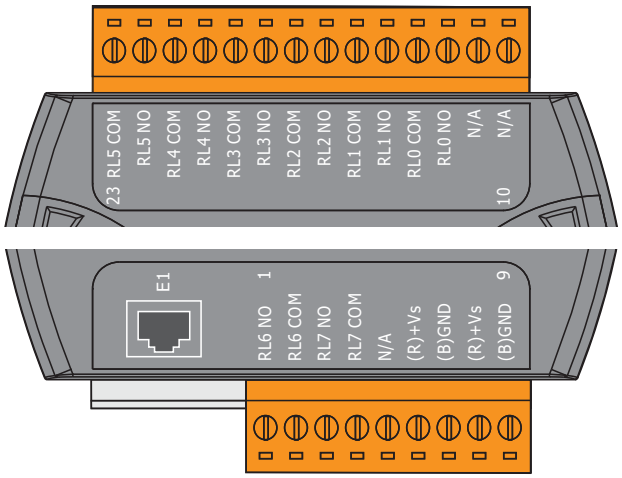
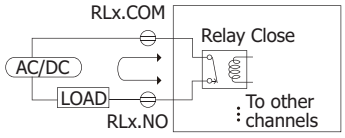
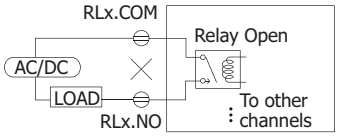
I/O Specifications

Power Relay		
Output Channels		8
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 V_{AC}/30 V_{DC}
Max. Load Current		5.0A/channel at 25 °C
Operate Time		6 ms (Typical)
Release Time		3 ms (Typical)
Electrical Life (Resistive Load)	VDE	5A 250 V_{AC} 30,000 ops (10 ops/minute) at 75 °C
		5A 30 V_{DC} 70,000 ops (10 ops/minute) at 75 °C
	UL	5A 250 V_{AC}/30 V_{DC} 6,000 ops.
		3A 250 V_{AC}/30 V_{DC} 100,000 ops.
Mechanical Life		20,000,000 ops. at no load (300 ops./minute)
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable

Pin Assignments



Wire Connections

Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output		

Ordering Information

ET-7067 CR	8-channel Power Relay Output Module (RoHS)
PET-7067 CR	8-channel Power Relay Output Module PoE Module (RoHS)

Accessories

 NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch; reguires 24 V_{DC} Input (RoHS)
 NS-205PSE CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 48 V_{DC} Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet switch with 4-PoE and 1 RJ45 uplink; reguires 24 V_{DC} Input (RoHS)
 MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

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FRnet I/O Modules

4

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4.1. Overview

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• Features

1. xxxxxxxxxxxxxxxxxx

xxxxxxxxxxxxxxx

2. xxxxxxxxxxxxxxxxxxxxx

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• Applicatoin

• Hardware

1. Installation

DIN-rail Mounting

2. Mechanical

Left View | Front View | Right View | Rear View | Bottom View | Top View

3. Appearance

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4.2-1. Analog Input Module

Analog Input Module			
Model Name			FR-2017iT
Pictures			
Channels			1 or 8/16
Wiring			Differential/Single-Ended
Voltage Input Range			+/-150 mV, +/- 500 mV, +/- 1V, +/-5 V, +/-10 V
Current Input Range			+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA; Requires optional external 125 Ω resistors
Resolution			16-bit(1 channel) or 12-bit (8/16 channels)
Accuracy			± 0.1% (1 channel) or ± 0.5% (8/16 channel) of FSR
Sampling Rate			10 Hz (1 channel) / 50 Hz (8/16 channels); for total channels
Input Impedance			2 MΩ (differential), 1 MΩ (sigle-ended)
Common Voltage Protection			200 V_{DC}
Individual Channel Configuration			Yes (by software, requires optional CA-0904 cable)
Overvoltage Protection			240 V_{rms} (differential), 150 V_{rms} (single-ended)
FRnet Communication			
Normal Speed	Update time	2.88 ms	Yes
	Baud rate	250 Kbps	
	Distance	400 m Max.	
High Speed	Update time	0.72 ms	Yes (default)
	Baud rate	1 Mbps	
	Distance	100 m Max.	
Power			
Input range			+10 ~ +30 V_{DC}
Power Consumption			2.4 W
Environment			
Operating Temperature			-25 ~ +75 °C
Storage Temperature			-30 ~ +85 °C
Relative Humidity			10 ~ 90 % RH (non-condensing)
Mechanical			
Installation			DIN-Rail Mounting
Dimensions (W x H x D)			32.5 mm x 110 mm x 102 mm
Optional Accessory			CA-0904

CA-0904

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4.2-2. Analog Output Module

Analog Output Module			
Model Name			FR-2024iT
Pictures			Available soon 
Channels			4
Wiring			Bipolar/Unipolar
Voltage Input Range			0 ~ 5V, +/-5 V, 0 ~ 10 V, +/-10 V
Current Input Range			0 ~ 20 mA, 4 ~ 20 mA
Resolution			12-bit
Accuracy			+/-0.1% of FSR
Output Capacity			Voltage: 10 V_{DC} @ 20 mA Current: External 24 V_{DC} @ 1050 Ω
Output Slew Rate			Immediately Output (default) or 0.0625 ~ 1024 V/second (by Software) Immediate Output (default) or 0.125 ~ 2048 mA/second (by Software)
Individual Channel Configuration			Yes (by software)
Channel to Channel Isolation			-
Common Voltage Protection			-
Overvoltage Protection			±35 V_{DC}
FRnet Communication			
Normal Speed	Update time	2.88 ms	Yes
	Baud rate	250 Kbps	
	Distance	400 m Max.	
High Speed	Update time	0.72 ms	Yes (default)
	Baud rate	1 Mbps	
	Distance	100 m Max.	
Power			
Input range			+10 ~ +30 V_{DC}
Power Consumption			2.88 W
Environment			
Operating Temperature			-25 ~ +75 °C
Storage Temperature			-30 ~ +85 °C
Relative Humidity			10 ~ 90 % RH (non-condensing)
Mechanical			
Installation			DIN-Rail Mounting
Dimensions (W x H x D)			32.5 mm x 110 mm x 102 mm
Optional Accessory			CA-0904

CA-0904

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4.2-3. Digital Input Module

Digital Input Module								
Model Name			FR-2053T	FR-2053HT	FR-2053TA	FR-2053HTA	FR-2053iT	FR-32P
Pictures								
Digital Input								
Channels			16					32
Type			Wet					Wet
Sink/Source (NPN/PNP)			Sink		Sink/Source			Sink/Source
Isolation			1500 V_{rms}		3750 V_{rms}			3750 V_{rms}
On Voltage Level			20 ~ 24 V_{DC}		3.5 ~ 30 V_{DC}		19 ~ 30 V_{DC}	3.5 ~ 30 V_{DC}
Off Voltage Level			3 V_{DC} Max.		1 V_{DC} Max.		11 V_{DC} Max.	1 V_{DC} Max.
Input Impedance			4.7 KΩ		3 KΩ		3.25 KΩ	3 KΩ
FRnet Communication								
Normal Speed	Update time	2.88 ms	Yes (default)	-	Yes (default)	-	Yes	Yes (default)
	Baud rate	250 Kbps						
	Distance	400 m Max.						
High Speed	Update time	0.72 ms	-	Yes (default)	-	Yes (default)	Yes (default)	-
	Baud rate	1 Mbps						
	Distance	100 m Max.						
Power								
Input range			+10 ~ +24 V_{DC}		+10 ~ +30 V_{DC}			
Power Consumption			2 W		2.4 W		2.4 W	3.36 W
Environment								
Operating Temperature			-25 ~ +75 °C					
Storage Temperature			-30 ~ +85 °C					
Relative Humidity			10 ~ 90 % RH (non-condensing)					
Mechanical								
Installation			DIN-Rail Mounting					
Dimensions (W x H x D)			32.5 mm x 110 mm x 102 mm					173 mm x 177 mm

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4.2-4. Digital Output Module

Digital Output Module								
Model Name			FR-2057T	FR-2057HT	FR-2057TA	FT-2057HTA	FR-2057TW	FR-32R
Pictures								
Channels			16					32
Type			Open Collector					Power Relay (Form A, SPST)
Sink/Source (NPN/PNP)			Source (PNP)		Source (PNP)		Sink (NPN)	-
Isolation			1500 V_{rms}					3000 V_{rms}
Load Voltage			24 V_{DC}		5 ~ 30 V_{DC}			3A/125 V_{DC}, 3A/270 V_{AC}
Max. Load Current			100 mA		100 mA		250 mA	
FRnet Communication								
Normal Speed	Update time	2.88 ms	Yes (default)	-	Yes (default)	-	Yes	Yes (default)
	Baud rate	250 Kbps						
	Distance	400 m Max.						
High Speed	Update time	0.72 ms	-	Yes (default)	-	Yes (default)	Yes (default)	-
	Baud rate	1 Mbps						
	Distance	100 m Max.						
Power								
Input range			+10 ~ +24 V_{DC}		+10 ~ +30 V_{DC}			
Power Consumption			2 W		2.4 W		2.4 W	3.36 W
Environment								
Operating Temperature			-25 ~ +75 °C					
Storage Temperature			-30 ~ +85 °C					
Relative Humidity			10 ~ 90 % RH (non-condensing)					
Mechanical								
Installation			DIN-Rail Mounting					
Dimensions (W x H x D)			32.5 mm x 110 mm x 102 mm					173 mm x 177 mm

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4.2-5. Digital Input/Output Module

Digital Input/Output Module			
Model Name			FR-2054T
Pictures			
Digital Input			
Channels			8
Type			Wet
Sink/Source (NPN/PNP)			Sink, Source
Isolation			3750 V_{rms}
On Voltage Level			19 ~ 30 V_{DC}
Off Voltage Level			11 V_{DC} Max.
Input Impedance			3.3 KΩ
Digital Output			
Channels			8
Type			Open-Collector
Sink/Source (PNP/NPN)			Sink (NPN)
Isolation			3750 V_{rms}
Load Voltage			5 ~ 30 V_{DC}
Max. Load Current			250 mA
FRnet Communication			
Normal Speed	Update time	2.88 ms	Yes
	Baud rate	250 Kbps	
	Distance	400 m Max.	
High Speed	Update time	0.72 ms	Yes (default)
	Baud rate	1 Mbps	
	Distance	100 m Max.	
Power			
Input range			+10 ~ +30 V_{DC}
Power Consumption			2 W
Environment			
Operating Temperature			-25 ~ +75 °C
Storage Temperature			-30 ~ +85 °C
Relative Humidity			10 ~ 90 % RH (non-condensing)
Mechanical			
Installation			DIN-Rail Mounting
Dimensions (W x H x D)			32.5 mm x 110 mm x 102 mm

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5

CAN Bus Remote I/O Modules

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5.1. Overview

The Controller Area Network (CAN) is a serial communication way, which efficiently supports distributed real-time control with a very high level of security. It provides the error process mechanisms and message priority concepts. These features can improve the network reliability and transmission efficiency. Furthermore, CAN supplies the multi-master capabilities, and is especially suited for networking "intelligent" devices as well as sensors and actuators within a system or sub-system.

ICP DAS has been developing various CAN (Controller Area Network) / DeviceNet / CANopen products for several years include PCI interface card, converter, PAC, gateway, and CAN remote I/O. We also provide complete CAN hardware solutions and useful tools for CAN design, analysis and testing of CAN bus / DeviceNet / CANopen applications.

• CANopen / DeviceNet Remote I/O

The CAN-2000C (CANopen) series and CAN-2000D (DeviceNet) slave modules are specially designed for the slave device of the CANopen and DeviceNet protocols. All of these CAN-2000C series modules follow the CANopen Spec DS-301 V4.02 and DS-401 V2.1. The CAN-2000D series follow the DeviceNet specification Volume I/II, Release 2.0.

• Features

1. Heartbeat Messaging

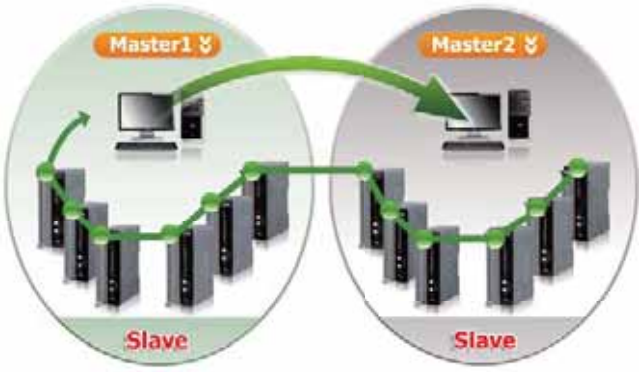
The heartbeat protocol is generally used to negotiate and monitor the availability of remote I/O devices. It is a message like the heartbeat sent by CANopen / DeviceNet remote I/O modules at a regular time. The users could use this mechanism to indicate the health of the remote I/O. The health information is the most important in the industrial applications. In ICP DAS, all the CANopen /DeviceNet remote I/O series has built-in the heartbeat protocol to increase the reliability of the remote data.

2. Safety & Arbitration

CAN bus provides five mechanisms for achieving the utmost safety of data transfer. There are powerful for error detection, signaling and self-checking are implemented in every CAN node. If two or more nodes start transmitting messages at the same time, the arbitration mechanism is applied to guarantee that one of these messages can be sent successfully according to the priority.

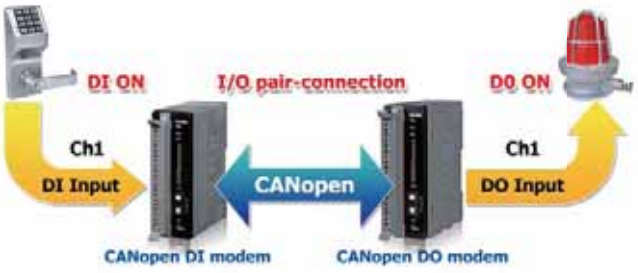
3. Multi-Master Network

A CAN bus network features a multi-master system that broadcasts transmissions to all of the nodes in the system. CANopen and DeviceNet may works in one CAN network.

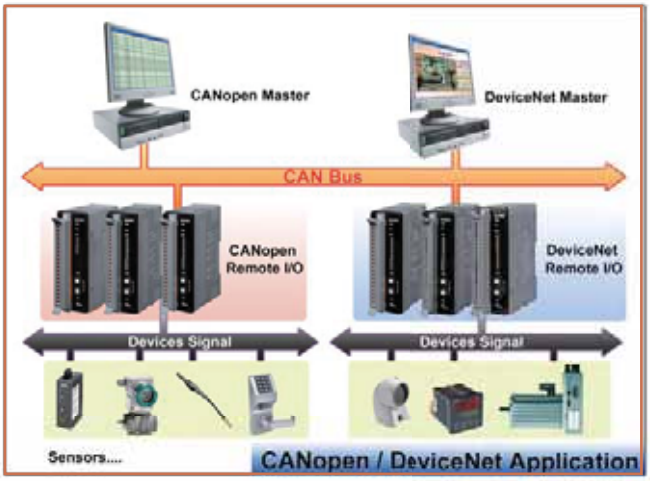


4. CANopen Digit I/O Pair-Connection

CANopen Digital I/O Pair-Connection is a special function for CANopen remote I/O. It can send the DI value that detected by the CANopen DI slave to other CANopen DO slaves through the CANopen network, and then these CANopen DO slaves will output the value. It is useful for users who need to detect a DI signal and output a DO alarm in time.



• Applicatoin

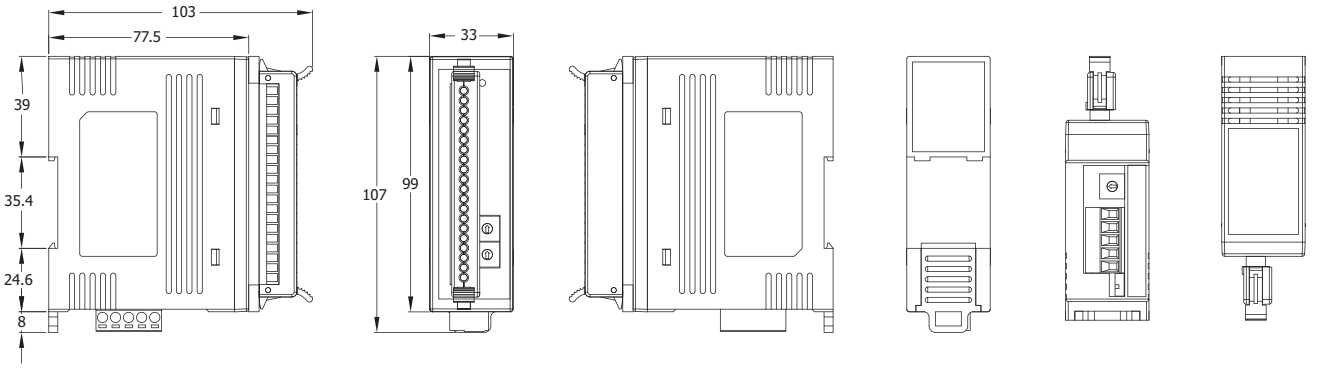


• Hardware

1. Installation

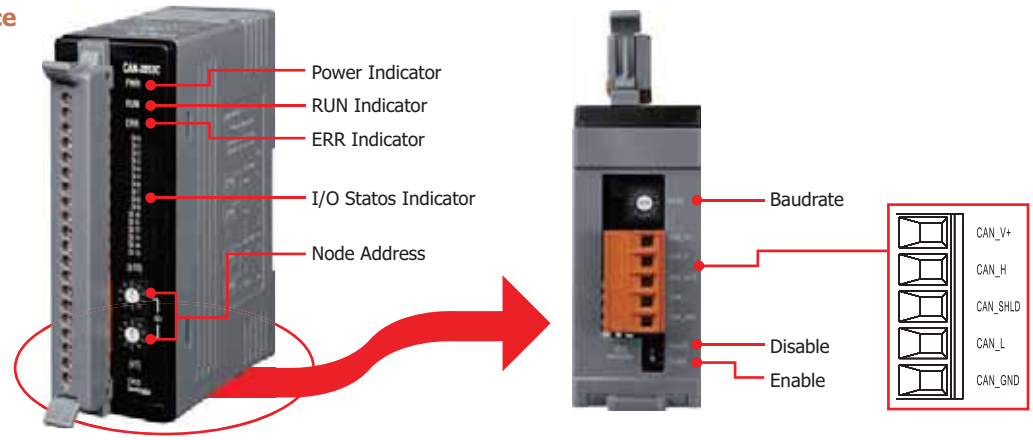
DIN-rail Mounting

2. Mechanical



Left View | Front View | Right View | Rear View | Bottom View | Top View

3. Appearance



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5.2-1. CANopen Digital I/O Modules

CANopen Digital I/O Modules				
Model Name	CAN-2053C	CAN-2054C	CAN-2057C	CAN-2088C
Pictures				
DI				
Channels	16	8	-	8
Isolation Voltage	3750 V_{rms}		-	2500 V_{rms}
Contact	Wet		-	Wet
Sink/Source(NPN/PNP)	Sink/Source		-	Sink/Source
ON Voltage Level	+3.5 ~ +30 V_{DC}		-	+5.5 ~ +30 V_{DC}
OFF Voltage Level	+1 V_{DC} Max.		-	+3.5 V_{DC} Max.
Counter	-		-	500 kHz, 32-bit
DO				
Channels	-	8	16	-
Isolation Voltage	-	3750 V_{rms}	3750 V_{rms}	-
Type	-	Open Collector	Open Collector	-
Sink/Source(NPN/PNP)	-	Sink	Sink	-
Load Voltage	-	+5 ~ +30 V_{DC}	+5 ~ +30 V_{DC}	-
Max. Load Current	-	700 mA/channel	100 mA/channel	-
Power on Value	-	Yes	Yes	-
Safe Value	-	Yes	Yes	-
Communication				
Connector	5-pin screwed terminal block (CAN_GND, CAN_L, CAN_SHLD, CAN_H, CAN_V+)			
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M			
Terminator Resistor	Switch for 120 Ω terminator resistor			
Node ID	1~99 selected by rotary switch			
Protocol	CANopen DS-301 ver4.02, DS-401 ver2.1			
No. of PDOs	10 Rx, 10 Tx (support dynamic PDO)			
PDO Mode	Event Triggered, Remotely requested, Cyclic and acyclic SYNC			
Error Control	Node Guarding protocol and Heartbeat Producer protocol			
Emergency Message	Yes			
System				
ESD Protection	4 kV Contact for each channel			
Isolation	3000 V_{DC} for DC-to-DC, 2500 V_{rms} for bus-to-logic			
Watchdog	Yes			
Power				
Input range	Unregulated +10 ~ +30 V_{DC}			
Power Consumption	1.5 W	1.5 W	1.5 W	2 W
Mechanism				
Installation	DIN-Rail			
Dimensions (W x L x H)	32.3 mm x 99 mm x 77.5 mm			
Environment				
Operating Temperature	-25 ~ +75 °C			
Storage Temperature	-30 ~ +80 °C			
Relative Humidity	10 ~ 90% RH, non-condensing			

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5.2-2. CANopen Analog Output Modules

CANopen Analog Output Modules		
Model Name	CAN-2024C	CAN-2028C
Pictures		Available soon 
Channels	4	8
Wiring	Bipolar/Unipolar	Unipolar
Voltage Output Range	0 ~ +5 V_{DC} -5 ~ +5 V_{DC} 0 ~ +10 V_{DC} -10 ~ +10 V_{DC}	-
Current Output Range	0 ~ 20 mA +4 ~ 20 mA	0 ~ 20 mA +4 ~ 20 mA
Resolution	14-bit	12-bit
Accuracy	Voltage : +/- 0.1 % of FSR Current : +/- 0.2 % of FSR	+/- 0.2 % of FSR
Output Capacity	Voltage : 10 V @ 5 mA Current : External +24 V : 1050 Ω	External +24 V : 1050 Ω
Power on Value	Yes	Yes
Safe Value	Yes	Yes
Communication		
Connector	5-pin screwed terminal block (CAN_GND, CAN_L, CAN_SHLD, CAN_H, CAN_V+)	
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M	
Terminator Resistor	Switch for 120 Ω terminator resistor	
Node ID	1~99 selected by rotary switch	
Protocol	CANopen DS-301 ver4.02, DS-401 ver2.1	
No. of PDOs	10 Rx, 10 Tx (support dynamic PDO)	
PDO Mode	Event Triggered, Remotely requested, Cyclic and acyclic SYNC	
Error Control	Node Guarding protocol and Heartbeat Producer protocol	
Emergency Message	Yes	
System		
ESD Protection	4 kV Contact for each channel	
Isolation	3000 V_{DC} for DC-to-DC, 3000 V_{rms} for bus-to-logic	
Watchdog	Yes	
Power		
Input range	Unregulated +10 ~ +30 V_{DC}	
Power Consumption	1.5 W	1.4 W
Mechanism		
Installation	DIN-Rail	
Dimensions (W x L x H)	32.3 mm x 99 mm x 77.5 mm	
Environment		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-30 ~ +80 °C	
Relative Humidity	10 ~ 90% RH, non-condensing	

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5.2-3. DeviceNet Digital I/O Modules

DeviceNet Digital I/O Modules				
Model Name	CAN-2053D	CAN-2054D	CAN-2057D	CAN-2088D
Pictures				
DI				
Channels	16	8	-	8
Isolation Voltage	3750 V_{rms}		-	2500 V_{rms}
Contact	Wet		-	Wet
Sink/Source(NPN/PNP)	Sink/Source		-	Sink/Source
ON Voltage Level	+3.5 ~ +30 V_{DC}		-	+5.5 ~ +30 V_{DC}
OFF Voltage Level	+1 V_{DC} Max.		-	+3.5 V_{DC} Max.
Counter	-		-	500 kHz, 32-bit
DO				
Channels	-	8	16	-
Isolation Voltage	-	3750 V_{rms}	3750 V_{rms}	-
Type	-	Open Collector	Open Collector	-
Sink/Source(NPN/PNP)	-	Sink	Sink	-
Load Voltage	-	+5 ~ +30 V_{DC}	+5 ~ +30 V_{DC}	-
Max. Load Current	-	700 mA/channel	100 mA/channel	-
Power on Value	-	Yes	Yes	-
Safe Value	-	Yes	Yes	-
Communication				
Connector	5-pin screwed terminal block (CAN_GND, CAN_L, CAN_SHLD, CAN_H, CAN_V+)			
Baud Rate (bps)	125 k, 250 k, 500 k			
Terminator Resistor	Switch for 120 Ω terminator resistor			
Node ID	0~63 selected by rotary switch			
Protocol	Volume I, Release 2.0 & Volume II, Release 2.0, Errata 5			
DeviceNet subscribe	Group 2 Only Server			
Explicit Connection	Yes			
Polled I/O Connection	Yes			
Bit-Strobe I/O Connection	Yes			
Heartbeat message	Yes			
Shutdown message	Yes			
System				
ESD Protection	4 kV Contact for each channel			
Isolation	3000 V_{DC} for DC-to-DC, 2500 V_{rms} for bus-to-logic			
Watchdog	Yes			
Power				
Input range	Unregulated +10 ~ +30 V_{DC}			
Power Consumption	1.5 W	1.5 W	1.5 W	2 W
Mechanism				
Installation	DIN-Rail			
Dimensions (W x L x H)	32.3 mm x 99 mm x 77.5 mm			
Environment				
Operating Temperature	-25 ~ +75 °C			
Storage Temperature	-30 ~ +80 °C			
Relative Humidity	10 ~ 90% RH, non-condensing			

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5.2-4. DeviceNet Analog Output Modules

DeviceNet Analog Output Modules		
Model Name	CAN-2024D	CAN-2028D
Pictures		Available soon 
Channels	4	8
Wiring	Bipolar/Unipolar	Unipolar
Voltage Output Range	0 ~ +5 V_{DC} -5 ~ +5 V_{DC} 0 ~ +10 V_{DC} -10 ~ +10 V_{DC}	-
Current Output Range	0 ~ 20 mA +4 ~ 20 mA	0 ~ 20 mA +4 ~ 20 mA
Resolution	14-bit	12-bit
Accuracy	Voltage : +/- 0.1 % of FSR Current : +/- 0.2 % of FSR	+/- 0.2 % of FSR
Output Capacity	Voltage : 10 V @ 5 mA Current : External +24 V : 1050 Ω	External +24 V : 1050 Ω
Power on Value	Yes	Yes
Safe Value	Yes	Yes
Communication		
Connector	5-pin screwed terminal block (CAN_GND, CAN_L, CAN_SHLD, CAN_H, CAN_V+)	
Baud Rate (bps)	125 k, 250 k, 500 k	
Terminator Resistor	Switch for 120 Ω terminator resistor	
Node ID	0~63 selected by rotary switch	
Protocol	Volume I, Release 2.0 & Volume II, Release 2.0, Errata 5	
DeviceNet subscribe	Group 2 Only Server	
Explicit Connection	Yes	
Polled I/O Connection	Yes	
Bit-Strobe I/O Connection	Yes	
Heartbeat message	Yes	
Shutdown message	Yes	
System		
ESD Protection	4 kV Contact for each channel	
Isolation	3000 V_{DC} for DC-to-DC, 3000 V_{rms} for bus-to-logic	
Watchdog	Yes	
Power		
Input range	Unregulated +10 ~ +30 V_{DC}	
Power Consumption	1.5 W	1.4 W
Mechanism		
Installation	DIN-Rail	
Dimensions (W x L x H)	32.3 mm x 99 mm x 77.5 mm	
Environment		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-30 ~ +80 °C	
Relative Humidity	10 ~ 90% RH, non-condensing	

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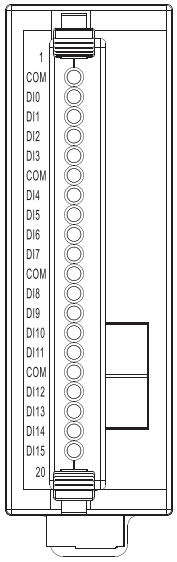
Pin Assignments

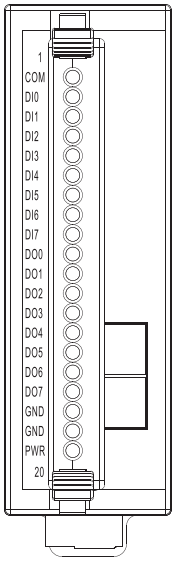
CAN-2053C/CAN-2053D

Pin Assignment	
Pin 1	COM
Pin 2	DIO
Pin 3	DI1
Pin 4	DI2
Pin 5	DI3
Pin 6	COM
Pin 7	DI4
Pin 8	DI5
Pin 9	DI6
Pin 10	DI7
Pin 11	COM
Pin 12	DI8
Pin 13	DI9
Pin 14	DI10
Pin 15	DI11
Pin 16	COM
Pin 17	DI12
Pin 18	DI13
Pin 19	DI14
Pin 20	DI15



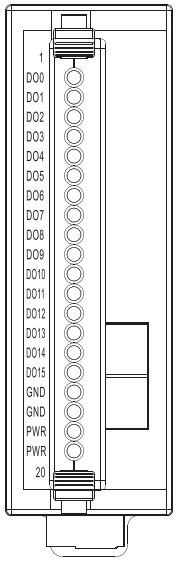
CAN-2054C/CAN-2054D

Pin Assignment	
Pin 1	COM
Pin 2	DIO
Pin 3	DI1
Pin 4	DI2
Pin 5	DI3
Pin 6	DI4
Pin 7	DI5
Pin 8	DI6
Pin 9	DI7
Pin 10	DO0
Pin 11	DO1
Pin 12	DO2
Pin 13	DO3
Pin 14	DO4
Pin 15	DO5
Pin 16	DO6
Pin 17	DO7
Pin 18	GND
Pin 19	GND
Pin 20	PWR



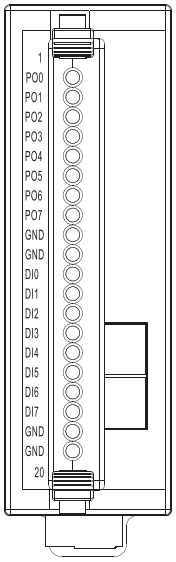
CAN-2057C/CAN-2057D

Pin Assignment	
Pin 1	DO0
Pin 2	DO1
Pin 3	DO2
Pin 4	DO3
Pin 5	DO4
Pin 6	DO5
Pin 7	DO6
Pin 8	DO7
Pin 9	DO8
Pin 10	DO9
Pin 11	DO10
Pin 12	DO11
Pin 13	DO12
Pin 14	DO13
Pin 15	DO14
Pin 16	DO15
Pin 17	GND
Pin 18	GND
Pin 19	PWR
Pin 20	PWR



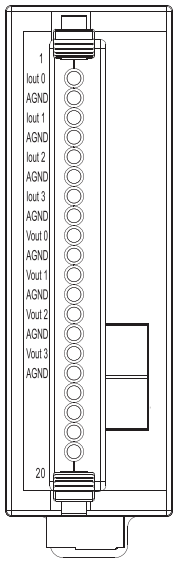
CAN-2088C/CAN-2088D

Pin Assignment	
Pin 1	PO0
Pin 2	PO1
Pin 3	PO2
Pin 4	PO3
Pin 5	PO4
Pin 6	PO5
Pin 7	PO6
Pin 8	PO7
Pin 9	GND
Pin 10	GND
Pin 11	DIO
Pin 12	DI1
Pin 13	DI2
Pin 14	DI3
Pin 15	DI4
Pin 16	DI5
Pin 17	DI6
Pin 18	DI7
Pin 19	GND
Pin 20	GND



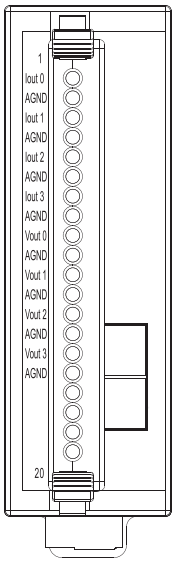
CAN-2024C/CAN-2024D

Pin Assignment	
Pin 1	Iout 0
Pin 2	AGND
Pin 3	Iout 1
Pin 4	AGND
Pin 5	Iout 2
Pin 6	AGND
Pin 7	Iout 3
Pin 8	AGND
Pin 9	Vout 0
Pin 10	AGND
Pin 11	Vout 1
Pin 12	AGND
Pin 13	Vout 2
Pin 14	AGND
Pin 15	Vout 3
Pin 16	AGND
Pin 17	
Pin 18	
Pin 19	
Pin 20	



CAN-2028C/CAN-2028D

Pin Assignment	
Pin 1	Iout 0
Pin 2	AGND
Pin 3	Iout 1
Pin 4	AGND
Pin 5	Iout 2
Pin 6	AGND
Pin 7	Iout 3
Pin 8	AGND
Pin 9	Iout 4
Pin 10	AGND
Pin 11	Iout 5
Pin 12	AGND
Pin 13	Iout 6
Pin 14	AGND
Pin 15	Iout 7
Pin 16	AGND
Pin 17	
Pin 18	
Pin 19	
Pin 20	



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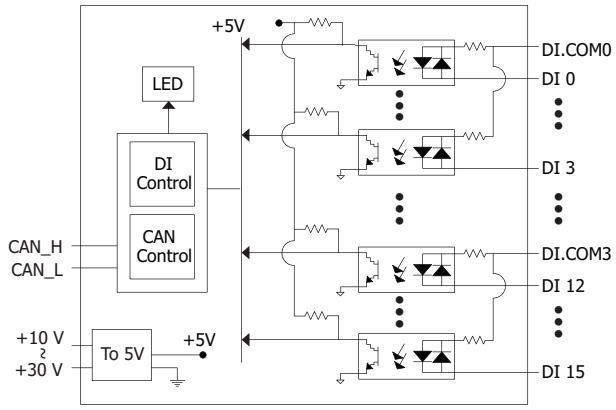
Block Diagram

CAN-2053C/CAN-2053D



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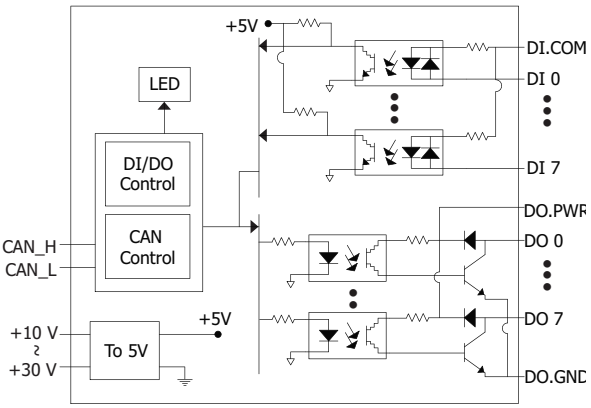

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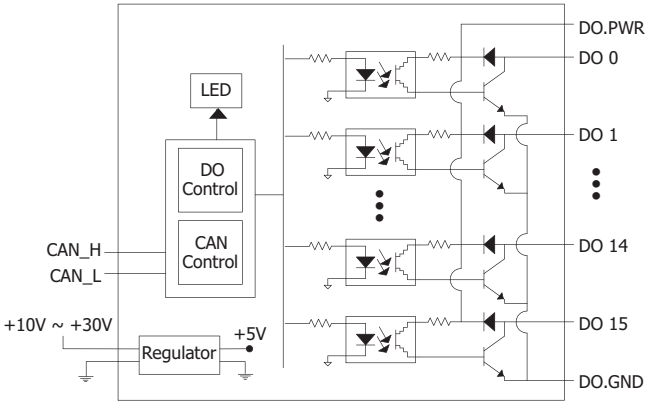

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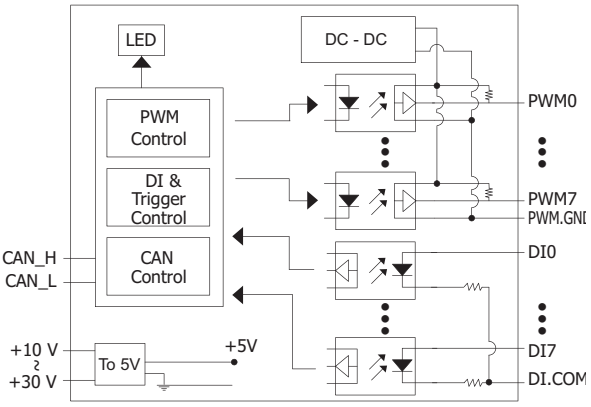
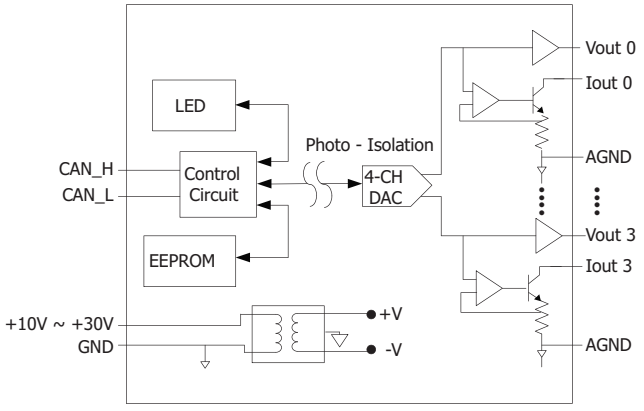
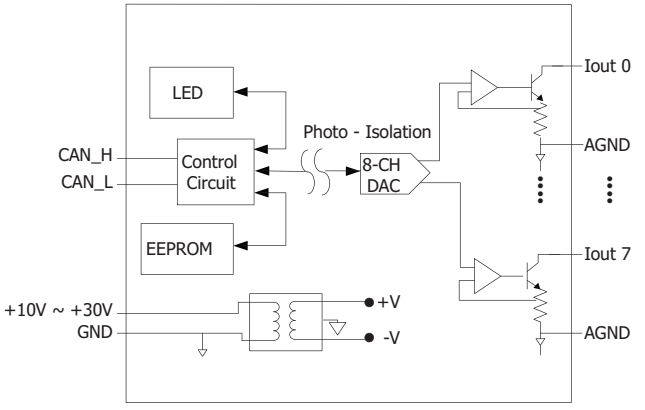


CAN-2024C/CAN-2024D



CAN-2028C/CAN-2028D

Available soon



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PROFIBUS Remote I/O Modules

6

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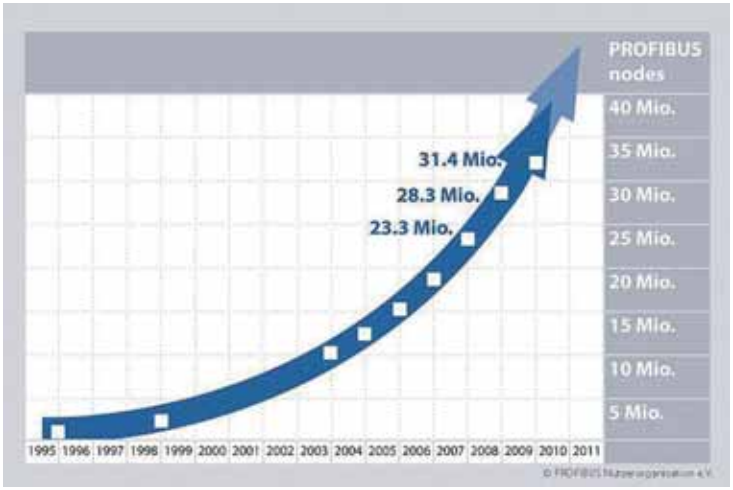
6.1. Overview

PROFIBUS (Process Field Bus) is a standard for fieldbus communication in automation technology and was first promoted (1989) by BMBF (German department of education and research). It is the world's most successful fieldbus, with more than 31 million devices installed by the end of 2009. Over 5.4 million of these were in the process industries.



There are two variations of PROFIBUS in use today. The most commonly used PROFIBUS DP, and the lesser used PROFIBUS PA.

➲ **PROFIBUS DP (Decentralized Peripherals)**
It is used to operate sensors and actuators via a centralized controller in production (factory) automation applications.

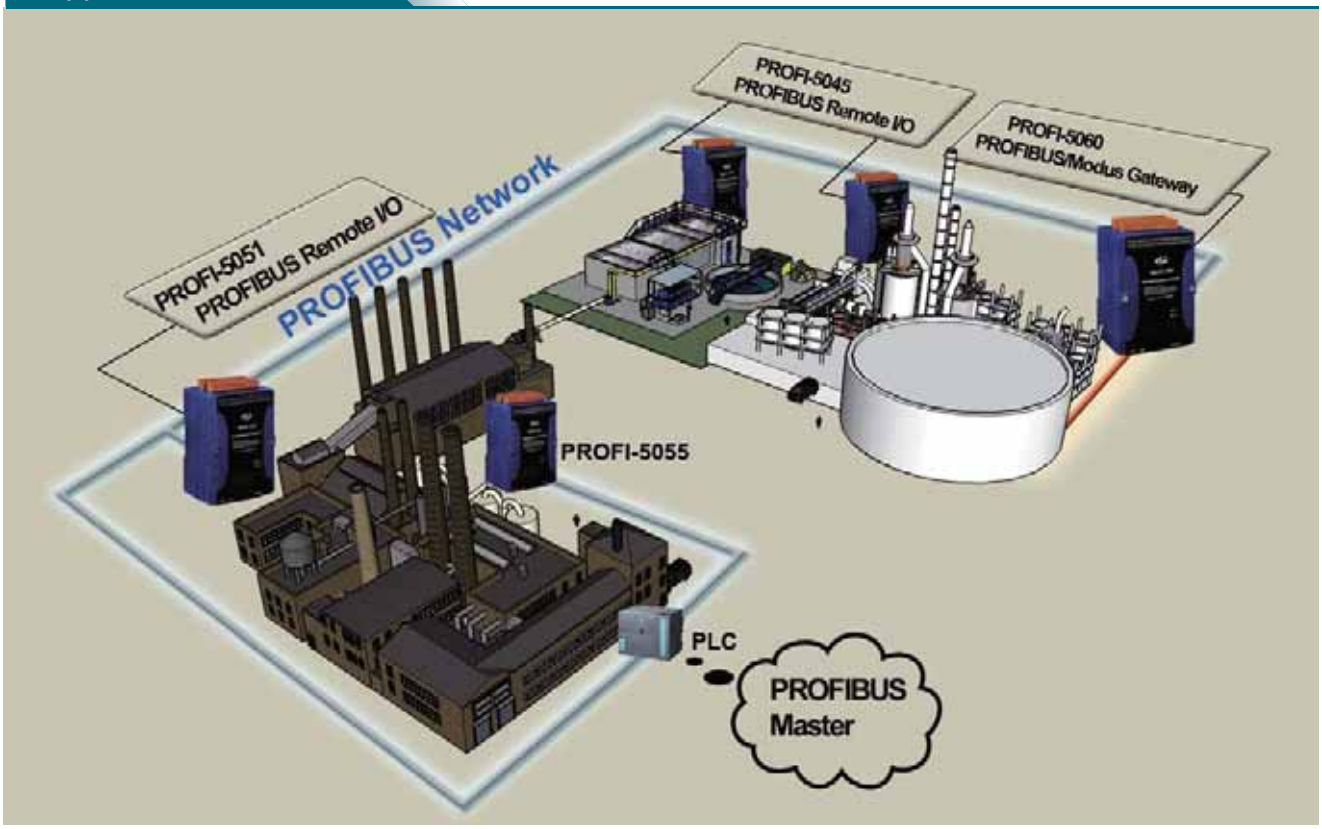
➲ **PROFIBUS PA (Process Automation)**
It is used to monitor measuring equipment via a process control system in process automation applications. This variant is designed for use in explosion/hazardous areas.

ICP DAS has been developing various PROFIBUS DP Slave products for several years. We offer converters, gateways, and remote I/O to our customers, and help them to resolve technology problems.

• Features

- Baudrate up to 12Mbit/s.
- Maximum 244 bytes input and 244 bytes output per slave.
- Slave configuration and parameters are set from the master side by GSD file.
- Allow Multi-master system.
- Fast Cyclic data communication between master and slave.
- 124 slaves can be put in Data Exchange.
- 32 stations on one segment.

• Applicatoin

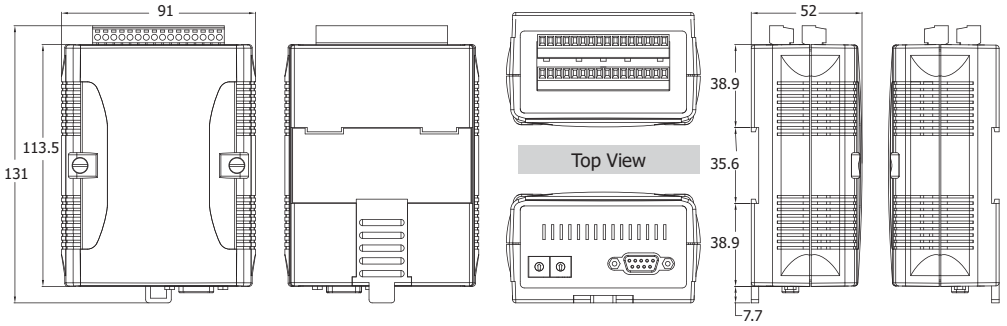


• Hardware

1. Installation

DIN-rail Mounting

2. Mechanical



Front View | Rear View | Bottom View | Left View | Right View

3. Appearance

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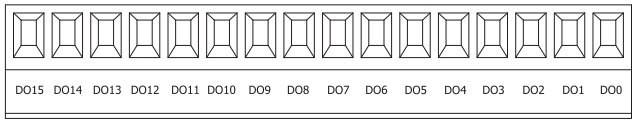
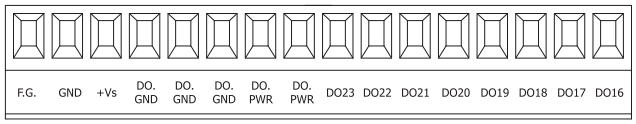
6.2-1. PROFIBUS Digital I/O Modules

PROFIBUS Digital I/O Modules							
Model Name	PROFI-5045	PROFI-5050	PROFI-5051	PROFI-5052	PROFI-5053	PROFI-5055	PROFI-5060
Pictures							
DI							
Channels	-	16	24	12	24	8	8
Isolation Voltage	-	-	3750 V_{rms}	5000V_{rms}	-	3750 V_{rms}	3750 V_{rms}
Contact	-	Dry	Wet	Wet	Dry	Wet	Wet
Sink/Source(NPN/PNP)	-	Sink/Source	Sink/Source	Sink/Source	-	Sink/Source	Sink/Source
ON Voltage Level	-	+4~ +30 V_{DC}	+10~ +50 V_{DC}	+4~ +30 V_{DC}	Open	+10~ +50 V_{DC}	+4~ +30 V_{DC}
OFF Voltage Level	-	+1 V_{DC} Max.	+4 V_{DC} Max.	+1 V_{DC} Max.	Close to IN.GND	+4 V_{DC} Max.	+1 V_{DC} Max.
Input Impedance	-	-	10 KΩ	3 KΩ	-	10 KΩ	3 KΩ
DO							
Channels	24	8	-	-	-	8	4
Isolation Voltage	3750 V_{rms}	-	-	-	-	3750 V_{rms}	-
Type	Open Collector	Open Collector	-	-	-	Open Collector	Relay (Form C)
Sink/Source(NPN/PNP)	Sink	Sink	-	-	-	Sink	-
Load Voltage	+10 ~ +40 V_{DC}	+10 ~ +30 V_{DC}	-	-	-	+10 ~ +40 V_{DC}	0 ~ 125 V_{AC} 0 ~ 30 V_{DC}
Max. Load Current	650mA/channel	30 mA/channel	-	-	-	650 mA/channel	0.6 A @ 125 V_{AC} 2 A @ 30 V_{DC}
Power on Value	-	-	-	-	-	-	-
Safe Value	-	-	-	-	-	-	-
Communication							
Connector	9-pin female D-Sub						
Baud Rate (bps)	9.6 k, 19.2 k, 45.45 k, 93.75 k, 187.5 k, 500 k, 1.5 M, 3 M, 6 M, 12 M						
Controller	Profichip VPCLS2						
Transceiver	ADI ADM2486						
Protocol	CDP-V0						
Node Address	0~99 selected by rotary switch						
System							
ESD Protection	4 kV Contact for each channel						
Isolation	3000 V_{DC} for DC-to-DC, 2500 V_{rms} for bus-to-logic						
Watchdog	Yes						
Power							
Input range	Unregulated +10 ~ +40 V_{DC}						
Power Consumption	1 W	1 W	1 W	1 W	1 W	1 W	2.1 W
Mechanism							
Installation	DIN-Rail						
Dimensions (W x L x H)	91 mm x 128 mm x 52 mm						
Environment							
Operating Temperature	-25 ~ +75 °C						
Storage Temperature	-30 ~ +80 °C						
Relative Humidity	10 ~ 90% RH, non-condensing						

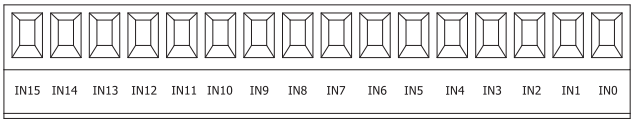
Pin Assignments

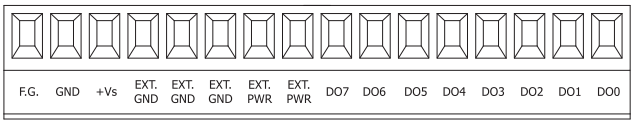
PROFI-5045





PROFI-5050





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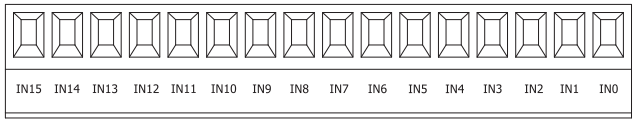

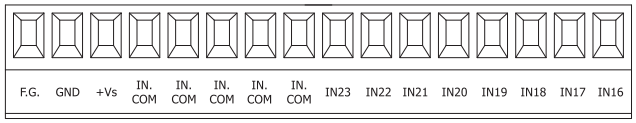

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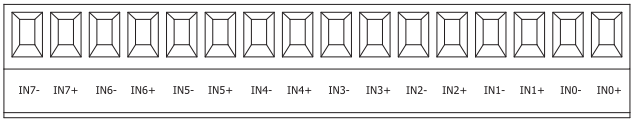

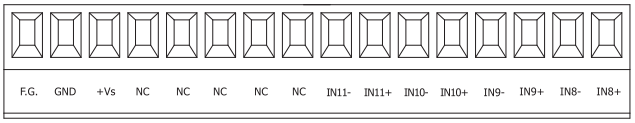

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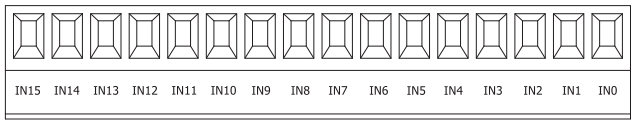

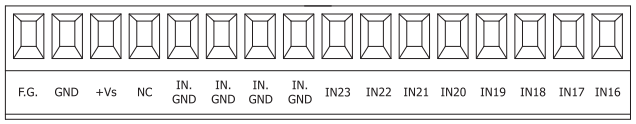

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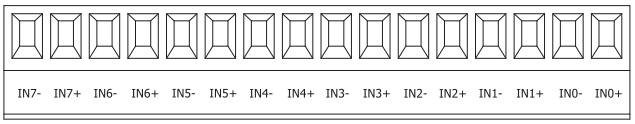
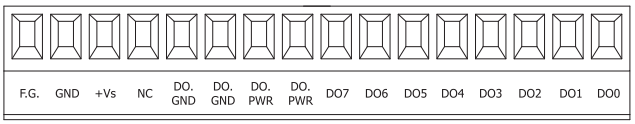
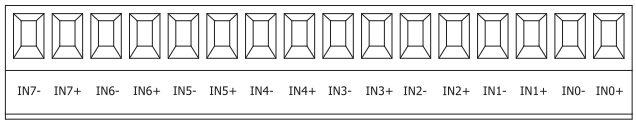
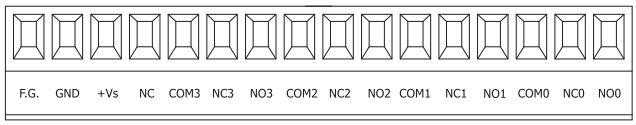




PROFI-5060





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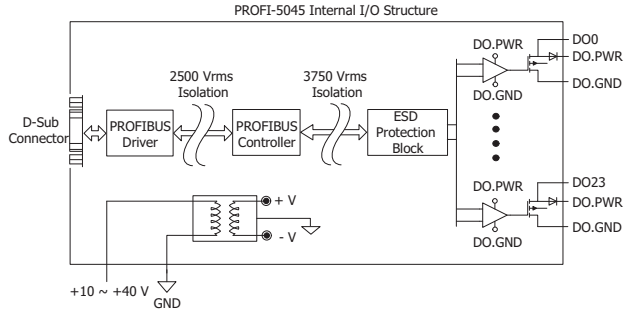
Block Diagram

PROFI-5045



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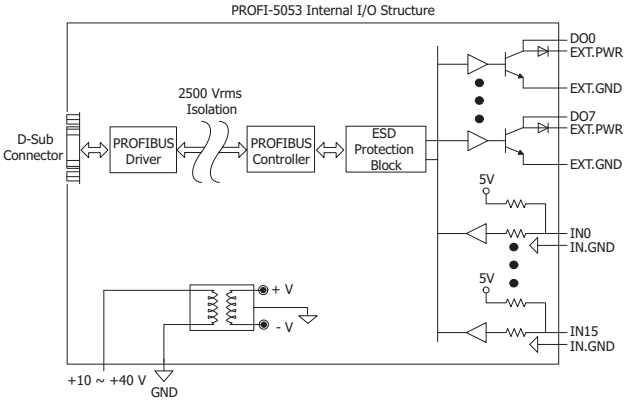

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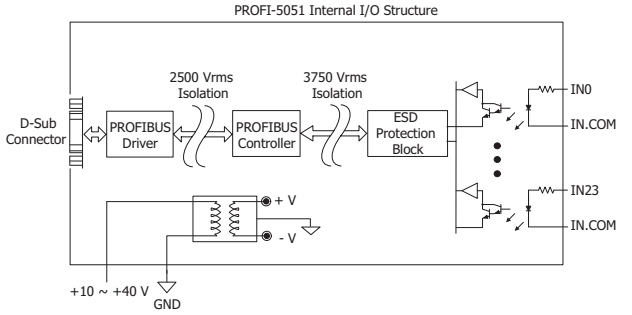

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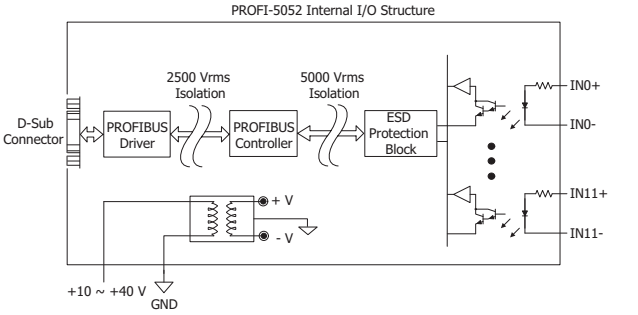

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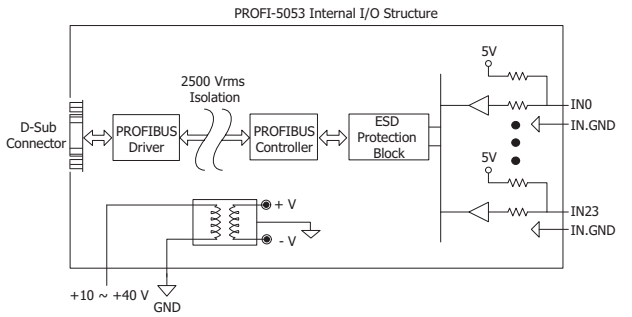

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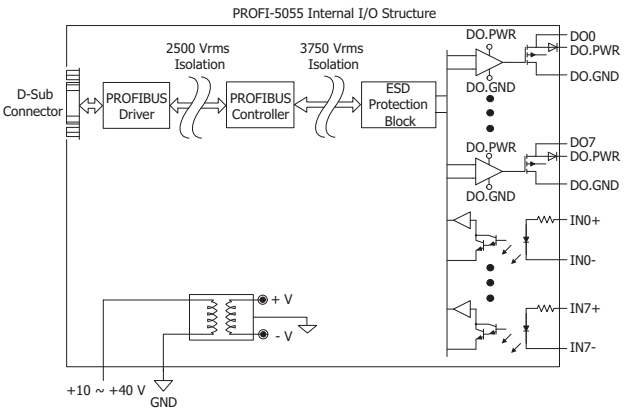
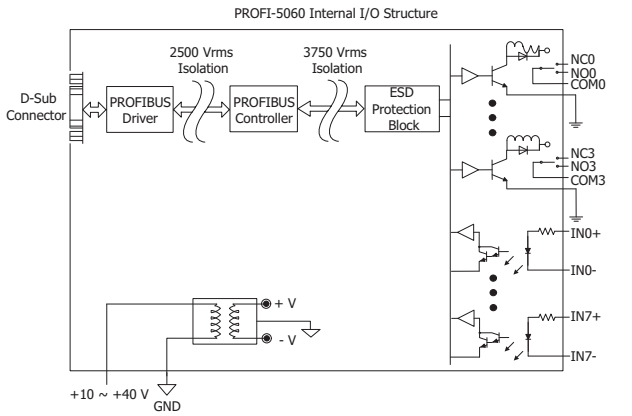


PROFI-5060



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7 Related Products

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7.1.Ethernet Modbus LED Displays

Available soon

EKAN-MD104-M

Ethernet Modbus LED Display

Features

- Supports RS-485 and Ethernet technology
- Simultaneously support Modbus RTU and Modbus TCP protocol
- Double Color
- Dynamic entry and exit effects
- User authentication, authorization
- Real-time pre-recorded message
- Built-in watchdog timer for harsh environment
- Programmable

Introduction

EKAN-MD104-M Modbus LED Display

Bigger, brighter, better! ICP DAS uses the full power of your IP connection. No custom protocols to learn or program. The EKAN-MD104-M LED display is based on RS-485 and Ethernet technology, supports the Modbus RTU/TCP Protocol, and can accept up to 26 Modbus TCP clients at the same time. So you can control your display anywhere you have a connection. This saves you time and money. Even if you don't currently use the Modbus TCP Protocol, we provide the EKAN-MD104-M Utility, the EZ Data Logger and the NAPOPC DA Server for easy system integrator. The user friendly feel of these programs will ensure that they can be seamlessly implemented into your facility's communications system. Using the EKAN-MD104-M Utility, you can create your "Message (Regular and Emergency)", and "Variable Value" with the ease of a text editor. Leverage the power of your data, and make it work for you. Using the Modbus TCP Protocol, a different message will appear when an event or condition occurs, and people will know immediately. Whether you are announcing company regulations, factory production flow control, restaurant order control or campus message displays, you can keep people "in the know" using the EKAN-MD104-M Modbus LED display. Let ICP DAS show you how powerful, useful, and flexible our displays can be for your application.

Display Message Easily

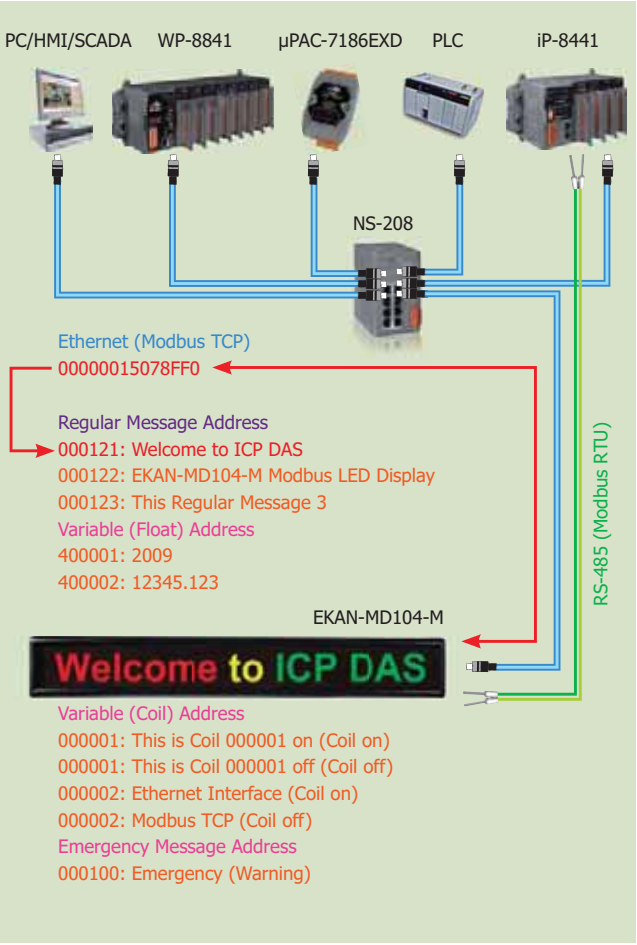
Prerecord a message and any variables including Boolean values, Integer values, and Float values in the EKAN-MD104-M Modbus LED display. And the message will be transmitted using the Modbus RTU/TCP Protocol.

The EKAN-MD104-M Display supports the Modbus TCP Protocol

The Modbus TCP protocol is a variation of the Modbus protocol. It was developed in 1999 to allow the Internet community to access Ethernet devices. Most of SCADA (Supervisor Control And Data Acquisition) and HMI software supports Modbus. For example: Citect, ICONICS, iFIX, InduSoft, Intouch, Entivity Studio, Entivity Live, Entivity VLC, Trace Mode, Wizcon, and Wonderware etc.

What are the benefits of using Modbus RTU and Modbus TCP

1. Open source, no license fees.
2. Widely supported by SCADA and HMI software
3. Easy to use
4. Easily integrate variant devices
5. Low development cost
6. Wide knowledge case



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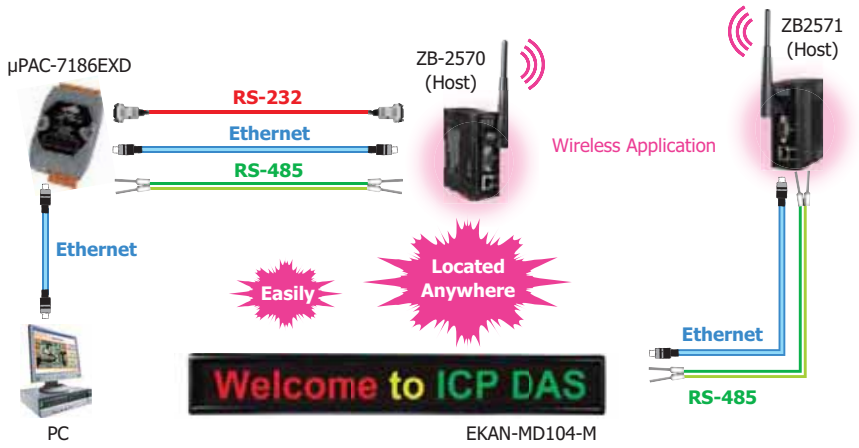
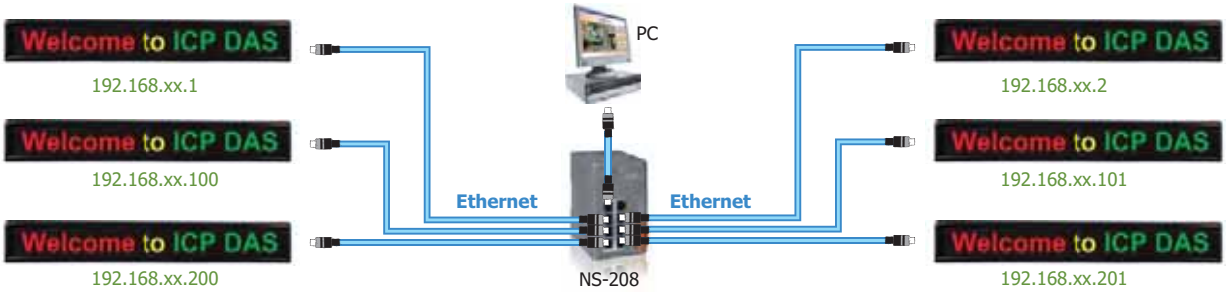
Applications

- Office Notification
- Factory production flow control
- ATM, Kiosk, Vending Machine Display
- Display for Data Acquisition Systems
- Game and Lottery machines
- Restaurant Notification
- Hotel Notification
- Fast food Notification
- Machinery & Equipment Display
- Transportation message Display
- Campus Message Display
- Company Regulation Announcements
- Manager messages to all employees
- Emergency Message Broadcast
- Productivity below target Announcement
- Quality result below standard Announcement
- Machine status and parts availability



EKAN-MD104-M Display revolutionizes the Factory Automation Industry

As a manager, it is not easy to effectively communicate with our employees, especially when the factory environment is so noisy and the working area is so large. Our EKAN-MD104-M display is an excellent choice for helping the manager to communicate with his/her employees in real time. The EKAN-MD104-M displays provide an Ethernet interface to connect with your manufacturing systems. It displays "Must Know" production information. Relevant and important mission critical data can be disseminated not just to employees at remote workstations, but also to the entire production line team. ICP DAS also provides the EKAN-MD104-M Utility, the EZ Data Logger, the NAPOPC DA Server for easy system integration. The user friendly feel of these programs will ensure that they can be seamlessly implemented into your facility's communications system.



Software For PC

ICP DAS provides the EKAN-MD104-M Utility, the EZ Data Logger, the NAPOPC DA Server to enable the user to control the EKAN-MD104-M.

EKAN-MD104-M Utility

The EKAN-MD104-M Utility is used to edit and upload messages to the EKAN-MD104-M as a pre-recorded message, download pre-recorded messages from the EKAN-MD104-M, and test the EKAN-MD104-M LED display. User could create the "Message (Regular/Emergency)" and "Variable(Float/Coil)" project file by EKAN-MD104-M Utility. User can create many different Message project files so that message content can be changed quickly.

EZ Data Logger

The EZ Data Logger is a small data logger utility. With its user-friendly interface, users can quickly and easily build a data logger application without needing any programming skills. Click the link below for more details regarding the EZ Data Logger.
(http://www.icpdas.com/products/Software/ez_data_logger/ez_data_logger.html)

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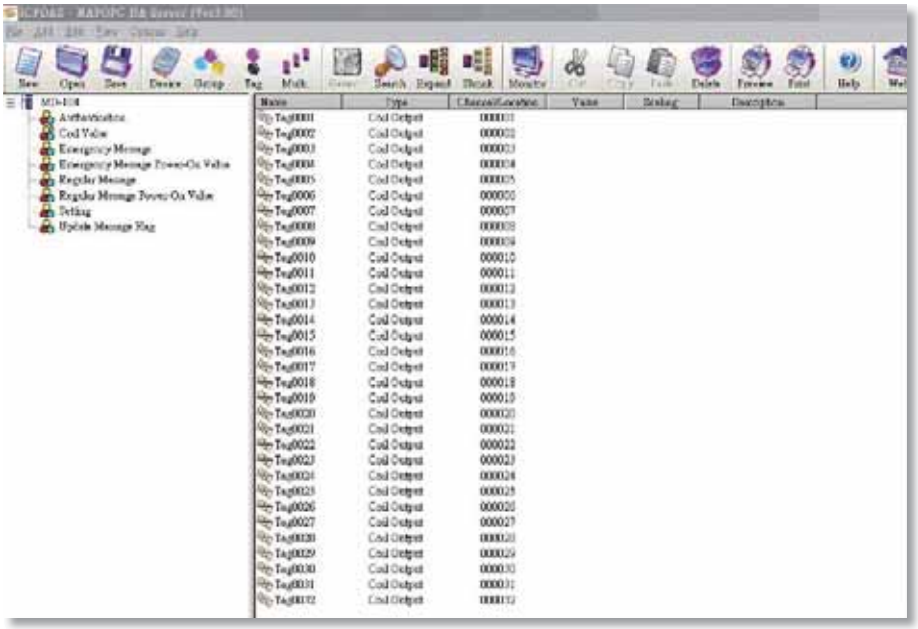
Specifications

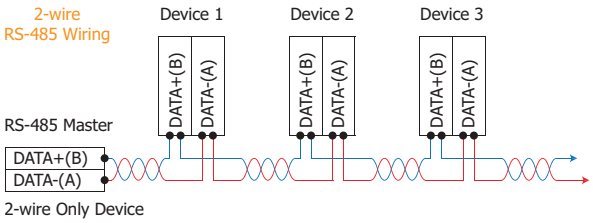
Models	EKAN-MD104-M
Communication Interface	
Ethernet	10/100 Base-TX, (Auto-negotiating, auto MDI/MDI-X, LED indicator)
COM0	RS-485 (D+, D-; self-tuner ASIC inside); non-isolated
COM 0 Settings	
Baud Rate	1200 ~ 115200 bps
Data Bit	8
Parity Check	Even, Odd, None
Stop Bit	1
Features	
Pixel Color	Basic Colors (Red, Green, Amber)
Pixel Size (Diameter)	0.4 cm
Center-to-Center Pixel Spacing	0.4 cm
Authentication	Password-based
Message Capacity	20/40 (Regular/Emergency) Messages and 32/64/64 (Coil/Float/Integer) Variable
Protocol	Modbus TCP/Modbus RTU
Power Requirements	
Input Voltage Range	+10 ~ 30 Vdc
Power consumption	5 ~ 15 W
Mechanical	
Housing (L x H x D)	630 mm x 116 mm x 43 mm
Display Area (L x H)	608 mm x 76 mm
Display Weight	2460 g
Display Array	16 rows x 128 columns
Environment	
Operating Temperature	-10 °C ~ +60 °C
Storage Temperature	-20 °C ~ +70 °C
Ambient Relative Humidity	10 ~ 90% RH, Non-condensing

NAPOPC DA Server

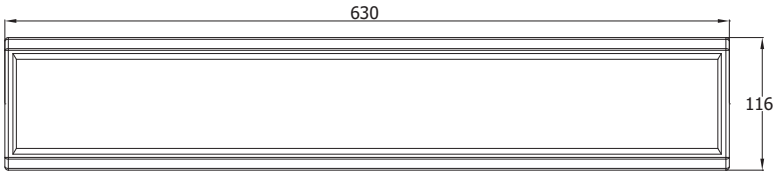
The NAPOPC DA Server uses an Explorer-style user interface to display a hierarchical tree of modules and groups with their associated tags. An individual group can be defined as a subdirectory containing one or more tags. Click the link below for more details regarding the NAPOPC DA Server. (http://www.icpdas.com/products/Software/NAPOPC/napopc.htm)



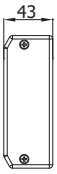
Wiring



Dimensions (Units: mm)



Front View



Right Side View

Bottom View

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7.2. Ethernet Web-Enabled LED Displays

NEW

EKAN-MD104-W

Ethernet Web-Enabled LED Display

Features

- 10/100 Ethernet included
- Web server installed with real-time remote access to the display
- Two-color LED
- Dynamic entry and exit effects
- Real-time messaging
- Built-in watchdog timer that helps minimize interruptions in harsh environments
- Display multiple languages

Introduction

EKAN-MD104-W Web-Enabled LED Display

Easy to install and easy to use, the ICP DAS EKAN-MD104 Web-enabled LED Display includes a built-in web server that allows you to embed on live message in a web page. Sign configuration is executed via a browser (Internet Explorer, Firefox, Chrome, etc.) where you can define IP settings, regular messages and an instant message, all without having to install any software. You can even send dynamic messages, so you can control your display from anywhere that has an internet connection, saving you both time and money.

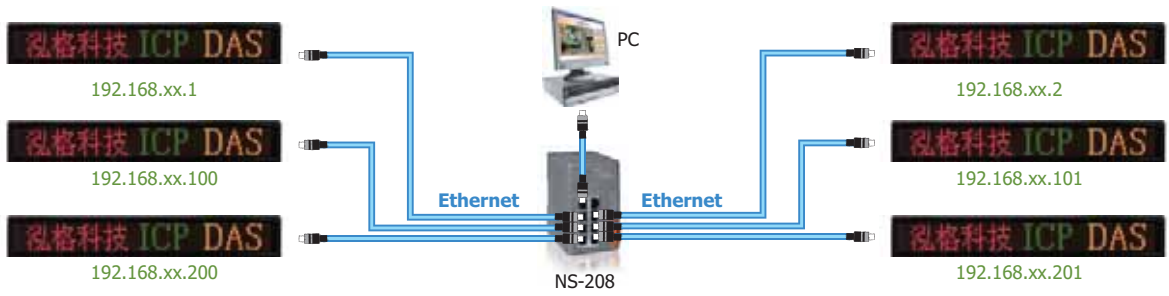
Built-in Web Server

Use web-based configuration to simplify the set process via the built-in web-server. Display your messages from a live source or from a central location.

Applications

EKAN-MD104-W Display revolutionizes the Factory Automation Industry

As a manager, it is not easy to effectively communicate with our employees, especially when the factory environment is so noisy and the working area is so large. Our EKAN-MD104-W display is an excellent choice for helping the manager to communicate with his employees in real time. The EKAN-MD104-W displays provide an Ethernet interface to connect with your manufacturing systems. It displays "Must Know" production information. Relevant and important mission critical data can be disseminated not just to employees at remote workstations, but also to the entire production line team.



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2011/05/17

Web Configuration Page

The EKAN-MD104-W Web-Enabled LED Display have a built-in Web configuration page with a friendly user interface; it is simple to configure the EKAN-MD104-W Web-Enabled LED Display with using the standard web browser.

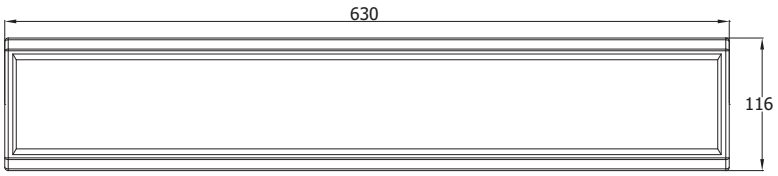
The web configuration page is optimized for Microsoft Internet Explorer 6.0 can work well.

No extra tools or utilities are needed to configure and control the EKAN-MD104-W Web-Enabled LED Display.

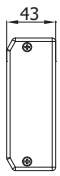
Specifications

Models	EKAN-MD104-W
Communication	
Ethernet	10/100 Base-TX (With Link and Activity LED Indicators) Automatic MDI/MDI-X 8-Pin RJ-45 x1
Features	
Pixel Color	Basic Colors (Red, Green, Amber)
Pixel Size (Diameter)	0.4 cm
Center-to-Center Pixel Spacing	0.4 cm
Power Requirements	
Input Voltage Range	+10 ~ 30 VDC
Power consumption	5 ~ 15 W
Mechanical	
Housing (L x H x D)	630 mm x 116 mm x 43 mm
Display Area (L x H)	608 mm x 76 mm
Display Weight	2460 g
Display Array	16 rows x 128 columns
Environment	
Operating Temperature	-10 °C ~ +60 °C
Storage Temperature	-20 °C ~ +70 °C
Ambient Relative Humidity	10 ~ 90% RH, Non-condensing

Dimensions (Units: mm)



Front View



Right Side View

Bottom View

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7.3. Power Meter

PM-2133 **PM-2134**

3-phase and 1-phase Power Meter

Features

- True RMS power measurements
- Energy Analysis for 3P4W, 3P3W, 1P2W, 1P3W
- Current measurements up to 200A with different CT ratio
- Voltage measurements up to 500V with different CT ratio
- Clip-On CT for easy installation
- kWh accuracy better than 1% (PF=1)
- Starting Current < 0.025A
- RS-485 or CAN bus communication interface
- Modbus/RTU, CANOpen or DeviceNet protocol
- LED pulse output for consumed kWh

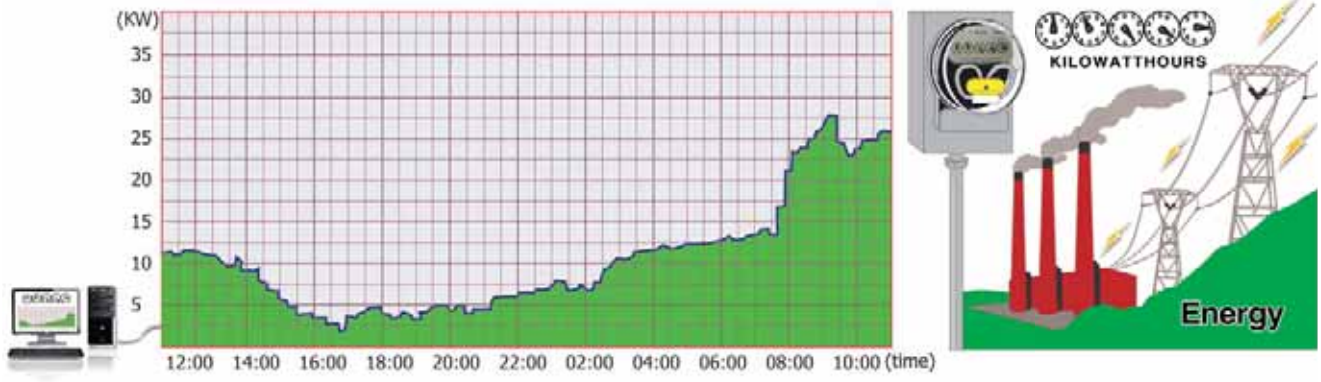
Introduction

It's always difficult but crucial to the supervisors to figure out how much energy is consumed. ICP DAS brings the most powerful, cost effective, advanced Compact Power Meters, PM-2133 and PM-2134, to the markets.

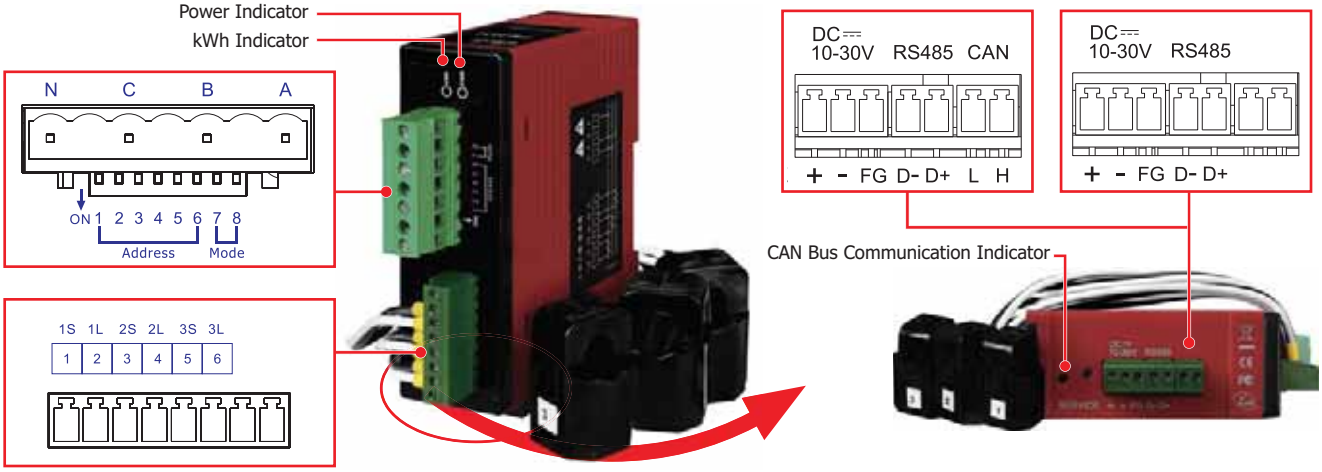
With its high accuracy (1%, PF=1), the PM-2133 and PM-2134 can be applied both on low voltage primary side and/or medium/high voltage secondary side and enable the users to obtain in real time the reliable and accurate energy consumption readings from the monitored equipments while in operation. These compact size and cost effective power meters are equipped with revolutionary wired clip-on CT (various types support input current up to 200A) and standard Modbus/RTU protocol over RS-485 for easy deployment. It works with input voltages ranging 10 ~ 500 V_{AC}, supporting a wide range of applications.

ICP DAS offers PM-2133 for 3-phase and PM-2134 for 1-phase power measuring. The products offer a rich feature set combined with easy-to-integrate communications.

Applications



Appearance



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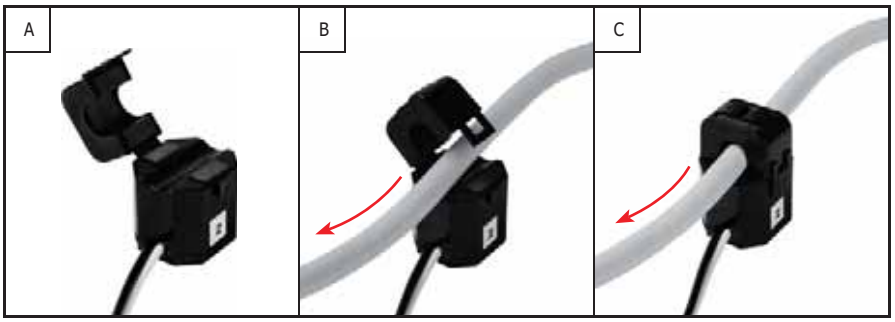
2011/05/17

Specifications

Models		PM-2133	PM-2134
Power Measurement			
Wiring		3P4W-3CT, 3P3W-3CT, 1P2W-1CT, 1P3W-2CT	1P4W-4CT
Input Voltage		10 ~ 500 V_{AC}	10 ~ 300 V_{AC}
Input Current		60 A, 100 A, 200 A; with different CT ratio	
Input Frequency		50/60 Hz	
kWh Accuracy		Better than 1% (PF=1)	
Starting Current		0.025A	
Power Parameter Measurement		true RMS voltage (Vrms), true RMS current (Irms), Active Power (kW), Active Energy (kWh), Apparent Power (kVA), Apparent Energy (kVAh), Reactive Power (kVAR), Reactive Energy (kVARh), Power Factor (PF),	
Communication			
RS-485	Protocol	Modbus/RTU	
	Baudrate	9600, 19200, 38400	
	Data format	N,8,1	
	Isolation	1000 Vrms	
CAN Bus	Protocol	CANOpen, DeviceNet or non-protocol	
	Baudrate	125K, 250K, 500K, 1M	
Power			
Input Range		+10 ~ 30 V_{DC}	
Consumption		2.4 W	
Mechanical			
Dimensions (W x L x H)		35 mm x 78 mm × 99 mm	
Module Installation		DIN-Rail Mounting	
CT Installation		Clip-On	
Environment			
Operating Temperature		-10 °C ~ +70 °C	
Storage Temperature		-25 °C ~ +85 °C	
Ambient Relative Humidity		10% ~ 90% RH, Non-condensing	

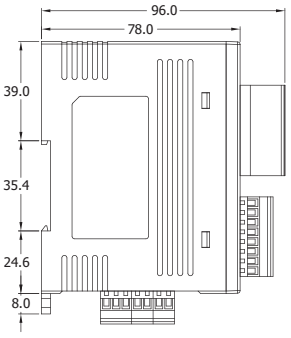
Installation

DIN-Rail Mounting

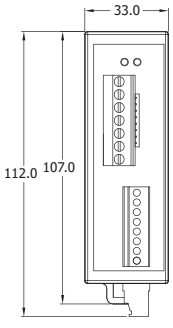


Clip-on CT Installation

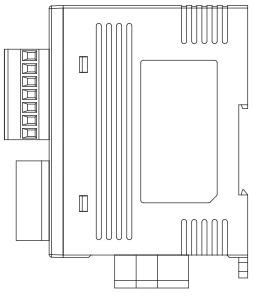
Module Dimensions (Units: mm)



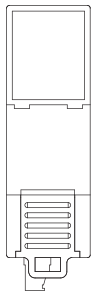
Left Side View



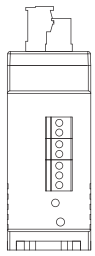
Front View



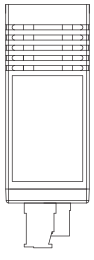
Right Side View



Rear View



Bottom View



Top View

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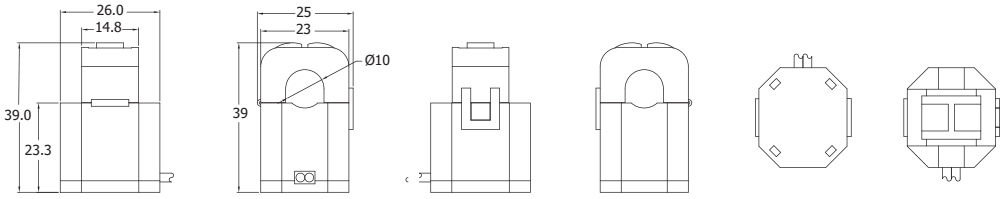
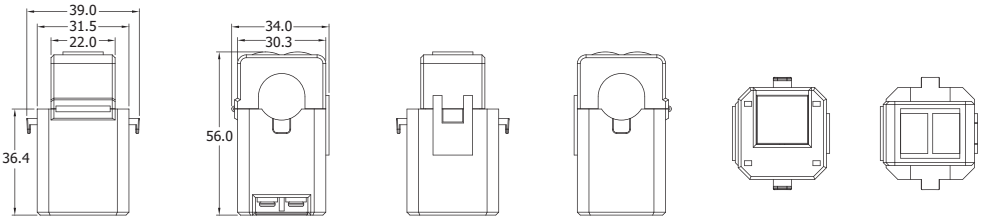
CT Dimensions (Units: mm)

100: CTΦ10mm (0~60A)



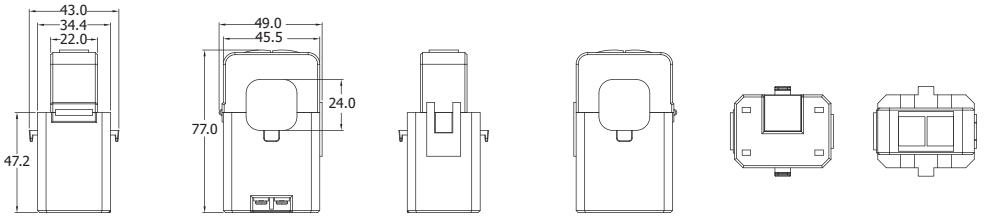
Left Side View | Front View | Right Side View | Rear View | Bottom View | Top View

160: CTΦ16mm (0~100A)



Left Side View | Front View | Right Side View | Rear View | Bottom View | Top View

240: CTΦ24mm (0~200A)



Left Side View | Front View | Right Side View | Rear View | Bottom View | Top View

Selection Guide

PM-213 **X** - **XXX** - **XXX**

Model
4: 4 Loop 1 Phase Compact Smart Meter *4CT's
3: 3 Phase Compact Smart Meter *3CT's

CT size (measurement)
100: CTΦ10mm (0 ~ 60A)
160: CTΦ16mm (0 ~ 100A)
240: CTΦ24mm (0 ~ 200A)

Communication
□: RS-485
CAN: CAN Bus
CPS: CANopen
DNS: DeviceNet

Ordering Information

RS-485 Series (NEW)	
PM-2133-100	RS-485 3-phase power meter with 3 CTs (ø10 mm, 60 A)
PM-2133-160	RS-4853-phase power meter with 3 CTs (ø16 mm, 100 A)
PM-2133-200	RS-4853-phase power meter with 3 CTs (ø24 mm, 200 A)
PM-2134-100	RS-4851-phase power meter with 4 CTs (ø10 mm, 60 A)
CAN Bus Series (NEW)	
PM-2133-100-CAN	CAN Bus 3-phase power meter with 3 CTs (ø10 mm, 60 A)
PM-2133-160-CAN	CAN Bus 3-phase power meter with 3 CTs (ø16 mm, 100 A)
PM-2133-200-CAN	CAN Bus 3-phase power meter with 3 CTs (ø24 mm, 200 A)
PM-2134-100-CAN	CAN Bus 1-phase power meter with 4 CTs (ø10 mm, 60 A)

CANopen Series (Available soon)	
PM-2133-100-CPS	CANopen 3-phase power meter with 3 CTs (ø10 mm, 60 A)
PM-2133-160-CPS	CANopen 3-phase power meter with 3 CTs (ø16 mm, 100 A)
PM-2133-200-CPS	CANopen 3-phase power meter with 3 CTs (ø24 mm, 200 A)
PM-2134-100-CPS	CANopen 1-phase power meter with 4 CTs (ø10 mm, 60 A)
DeviceNet Series (Available soon)	
PM-2133-100-DNS	DeviceNet 3-phase power meter with 3 CTs (ø10 mm, 60 A)
PM-2133-160-DNS	DeviceNet 3-phase power meter with 3 CTs (ø16 mm, 100 A)
PM-2133-200-DNS	DeviceNet 3-phase power meter with 3 CTs (ø24 mm, 200 A)
PM-2134-100-DNS	DeviceNet 1-phase power meter with 4 CTs (ø10 mm, 60 A)

Note: RS-485 is the basic communication interface for all power meters.

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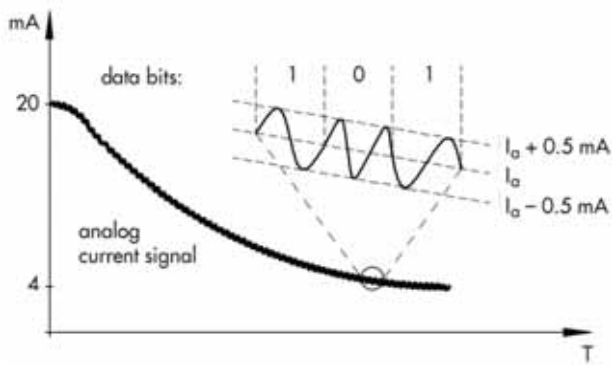
7.4. HART Introduction & Products

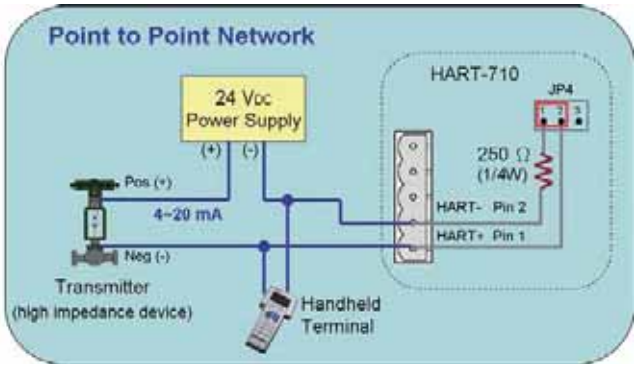
HART Field Communications Protocol extends this 4 ~ 20 mA standard to enhance communication with smart field instruments. The protocol preserves the 4 ~ 20 mA signal and enables two-way digital communications to occur without disturbing the integrity of the 4 ~ 20 mA signal. Unlike other communication technologies, the HART protocol can maintain compatibility with existing 4 ~ 20 mA systems with a uniquely backward compatible solution.

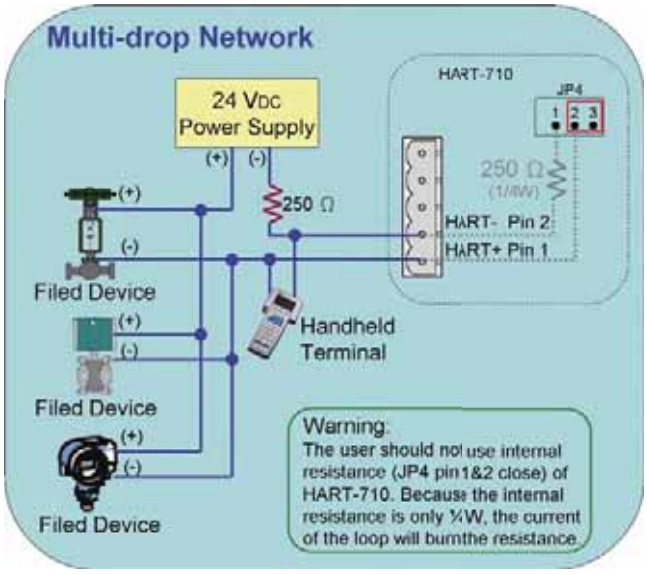
Here are two main operational modes of HART instruments: analog/digital mode, and multi-drop mode.



Peer-to-Peer mode

The analog and digital signals can be communicated in this mode. Here the digital signals are overlaid on the 4 ~ 20 mA loop current. Both the 4 ~ 20 mA current and the digital signal are valid output values from the instrument. The polling address of the instrument is set to "0". Only one instrument can be put on each instrument cable signal pair.





Multi-drop mode (digital)

In this mode, only the digital signals are used. The analog loop current is fixed at 4 mA. In multi-drop mode it is possible to have up to 15 instruments on one signal cable. The polling addresses of the instruments will be in the range 1 ~ 15. Each meter needs to have a unique address.

HART Features

- Relatively easy to understand and use, the HART protocol provides access to the wealth of additional information (variables, diagnostics, calibration, etc.)
- HART is a no risk solution for enhanced field communication.
- Compatibility with standard 4 ~ 20 mA wiring
- Simultaneous transmission of digital data
- Risk reduction through a highly accurate and robust protocol
- Increase Plant Availability
- Reduce Maintenance Costs
- Improve regulatory compliance

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HART Gateways

Modbus to HART Gateway

The HART-710 Gateway is specially designed for the master device of HART protocol. It allows the Modbus master device to access the HART slave devices. These HART devices may be a transmitter, an actuator, a current output device and so forth. In addition, we also provide the utility software for users to configure the HART-710.

NEW
HART-710 CR

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART Masters
- Work in point-to-point or multi-drop HART mode
- Connect up to 16 HART modules
- Support Modbus RTU and ASCII format
- Support Modbus Slave mode
- Isolated COM 1: RS-232/422/485
- Provide LED indicators
- Built-in Watchdog
- 4 kV ESD Protection

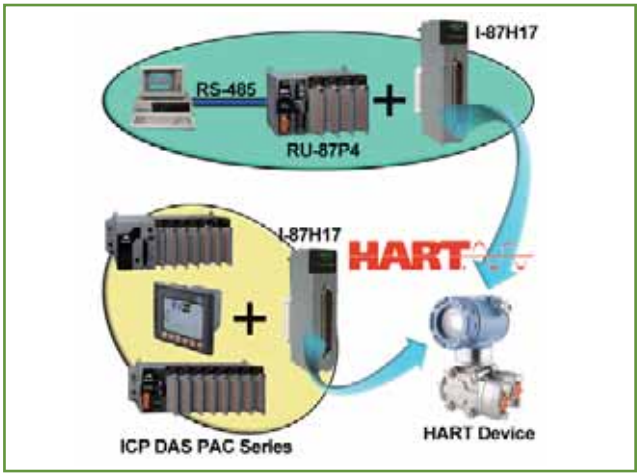
HART Module

HART module for PAC

The I-87H17W is a HART analog input module. It is a data acquisition and control modules, providing analog-to-digital, and Highway Addressable Remote Transducer. It can be remotely controlled via DCON protocol announced by ICP DAS. The I-87H17W also provides APIs for users' programs on PCs or PACs of ICP DAS.

Available soon
I-87H17W CR

- 8 Input Channels
- Support HART protocol
- 2- or 4-wire transmitters
- 60 Hz sarnpling rate
- Open wire detection
- 4 kV ESD protection
- 2500 V_{DC} intra-module isolation



HART Converter

USB to HART Converter

The I-75H0 is a USB to HART converter specially designed for the master device of HART protocol. It allows users to access the HART slave by using virtual COM-port. These HART slave devices may be a transmitter, an actuator, a current output device and so forth. In addition, we also provide the utility tool for users to configure the I-75H0.

Available soon
I-75H0 CR

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Work in point-to-point or multi-drop HART mode
- Connect up to 16 HART modules
- Provide utility tool for module configuration
- Provide Windows utility to configure modules
- No external power supply (powered by USB)
- Support firmware update via USB
- Provide PWR/RUN/ERR LED indicators
- 4 kV ESD Protection

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Temperature and Humidity Data Logger

Beta
2011/05/17

8.1. IP-67 Remote Temperature and Humidity Data Logger with LCD Display

NEW

DL-100T485

IP Remote Temperature and Humidity Data Logger with LCD Display

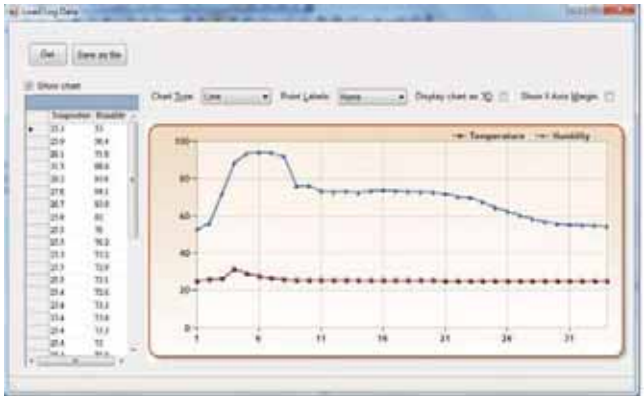
Features

- -20 ~ +60 °C (-31 ~ +176 °F) and 0 ~ 100% RHmeasurement ranges
- Accuracy: +/-0.4 °C (±1.0 °F) ; +/-3.0% RH
- LED Display shows temperature, humidity and module ID
- 10 ~ 30 V_{DC} powered
- IP67 water proof
- RS-485 communication interface
- DCON protocol
- Windows software induded

Introduction

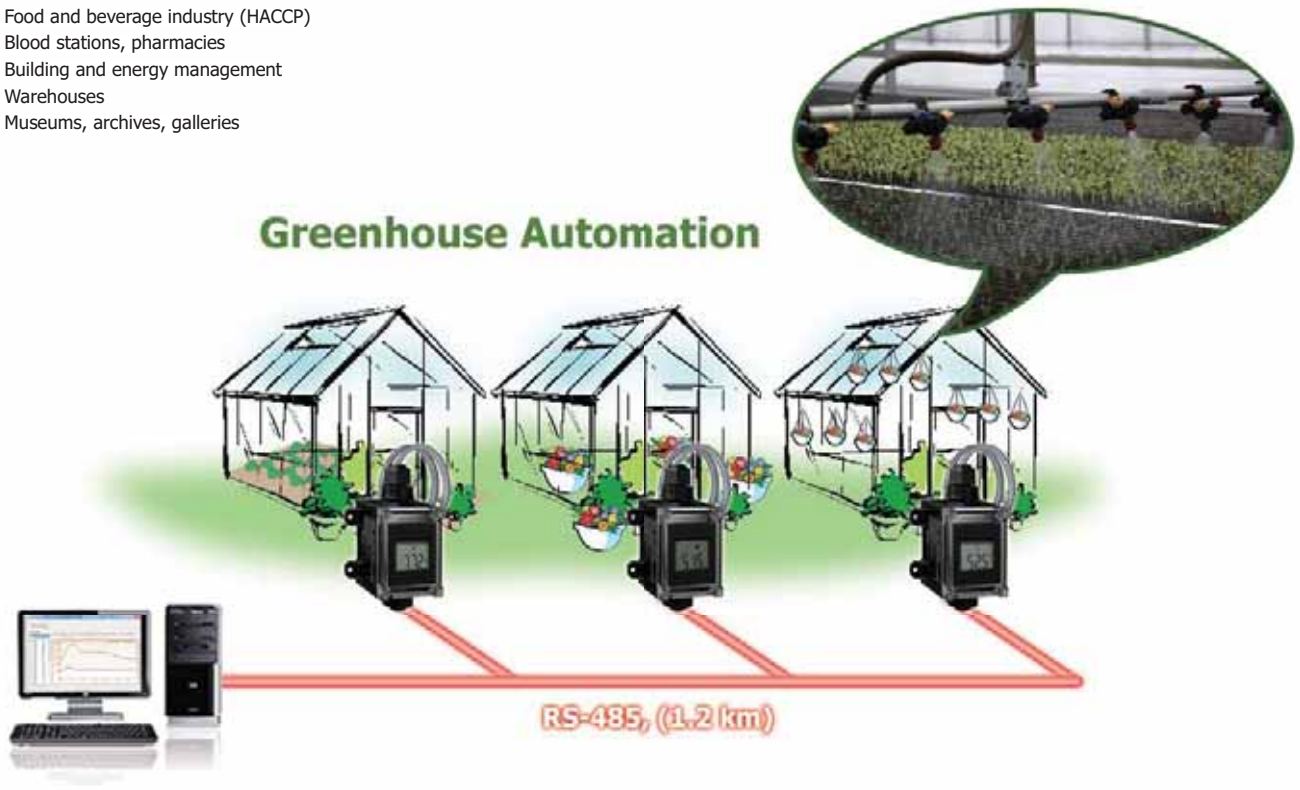
The DL-100T485 is a temperature and humidity data logger module. It contains a RS-485 communication interface and a LCD display to show a variety of temperature, humidity and module ID.

The Data Logger Utility is included to install, configure, retrieve and show reading data in powerful chart and export to Excel.



Applications

- Transport of food or pharmaceuticals
- Food and beverage industry (HACCP)
- Blood stations, pharmacies
- Building and energy management
- Warehouses
- Museums, archives, galleries



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Specifications

Models	DL-100T485
Temperature Sensor	
Measuring Range	-20 ~ +60 °C (-31 ~ +176 °F)
Resolution	0.1 °C
Accuracy	Typical: +/-0.4 °C; refer to figure 1 for details
Precision	+/- 0.1 °C
Humidity Sensor	
Measuring Range	0 ~ 100% RH
Resolution	0.1% RH
Accuracy	Typical: ±3% RH @ 20 ~ 80% RH; refer to figure 2 for details
Precision	+/- 0.1% RH
LCD Display	
Displayed Information	Temperature(°C and °F), Humidity (RH), Module ID
Displayed Mode	xxxxxxxx
Communication	
Interface	RS-485; non-isolated
Baudrate	9600 bps (fixed)
Data format	N,8,1
Protocol	DCON
Max. Modules on same bus	32
Power	
Input Range	+10 ~ 30 VDC
Power Consumption	0.15 W
Mechanical	
Dimensions (W x L x H)	86 mm x 128 mm x 52 mm
Waterproof Level	IP67
Installation	DIN-Rail; Wall mount
Environment	
Operating Temperature	-20 °C ~ +60 °C
Storage Temperature	-30 °C ~ +80 °C
Ambient Relative Humidity	5 ~ 95% RH, Non-condensing

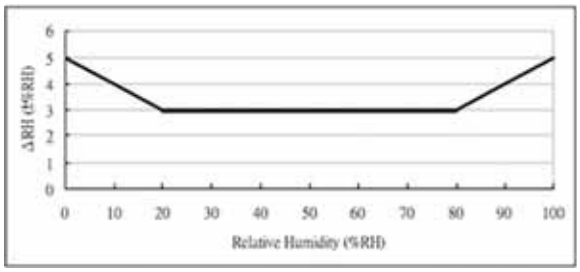


Figure 1: Maximum RH-tolerance at 25°C per sensor.

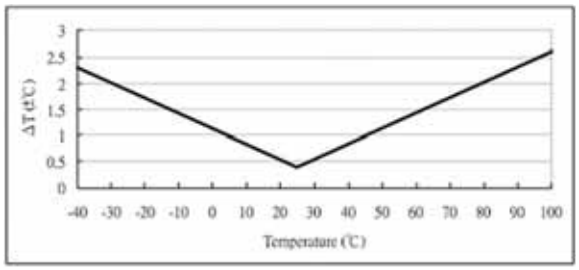


Figure 2: Maximum T-tolerance per sensor.

Installation

DIN-Rail Mounting

Wall mount

Appearance

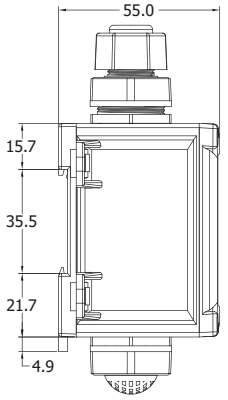
Humidity (RH)

Module ID

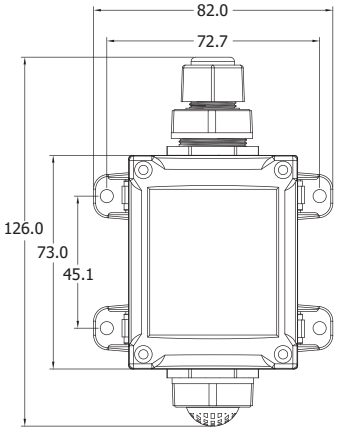
Temperature (°F)

Temperature (°C)

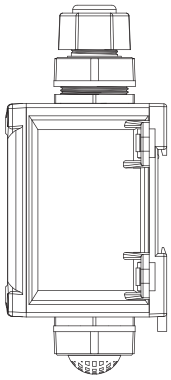
Dimensions (Units: mm)



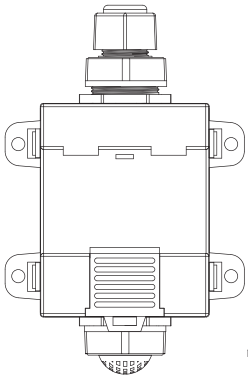
Left Side View



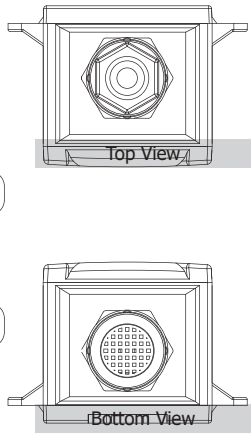
Front View



Right Side View



Rear View



Ordering Information

DL-100T485 CR	RS-485 Remote Temperature and Humidity Data Logger with LCD Display (RoHS)

Optional Accessories

tM-7561 CR	Isolated USB to RS-485 Converter (RoHS)
tM-7520U CR	Isolated RS-232 to RS-485 Converter (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)

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NEW

DL-50

Battery-Powered Temperature and Humidity Data Logger

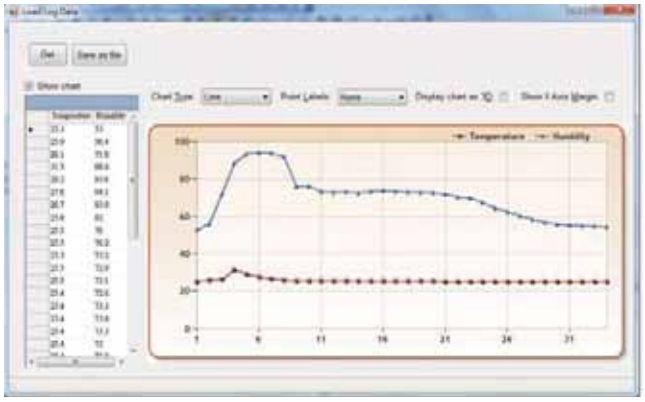
Features

- -20 ~ +60 °C (-31 ~ +176 °F) and 0 ~ 100% RH measurement ranges
- Accuracy: +/-0.4 °C (±1.0 °F) ; +/-3.0% RH
- Powered by long life lithium battery
- Data logger up to 4092 temperature and 4092 humidity records
- IP55
- Windows software induded
- USB interface for configuration and data download
- DCON protocol

Introduction

The DL-50 is a temperature and humidity data logger module. It is supplied complete with a long-life lithium battery. The data storage space can store up to 4092 temperature and 4092 humidity readings.

The Data Logger Utility is included to install, configure, retrieve and show logged data in powerful chart and export to Excel.



Applications

- Transport of food or pharmaceuticals
- Food and beverage industry (HACCP)
- Blood stations, pharmacies
- Building and energy management
- Warehouses
- Museums, archives, galleries

Cold chain transportation

Research Institute

Pharmacy

Museum

Labbratory

Specifications

Models	DL-50
Temperature Sensor	
Measuring Range	-20 ~ +60 °C
Resolution	0.1 °C
Accuracy	Typical: +/-0.4 °C; refer to figure 1 for details
Precision	+/- 0.1 °C
Humidity Sensor	
Measuring Range	0 ~ 100% RH
Resolution	0.1% RH
Accuracy	Typical: ±3% RH @ 20 ~ 80% RH; refer to figure 2 for details
Precision	+/- 0.1% RH
LED Indicators	
Running	Yes
Low Power	Yes, flashing when battery voltage < 2.6 V (cenergy < 20%)
Data Logger	
Time Interval	10 seconds to 1 day
Max. Records	4092 temperature and 4092 humidity records
Mode	Overwrite or stop logging when storage space is full
Overwrite Limitation	1,000,000 cycles
Communication	
Interface	USB 1.1 (client); for configuration and data download only.
Protocol	DCON
Power	
Lithium Battery	CR123A (3.0 V_{DC})
Power Consumption	xx
Mechanical	
Dimensions (W x L x H)	86 mm x 128 mm x 52 mm
Waterproof Level	IP55
Installation	DIN-Rail; Wall mount
Environment	
Operating Temperature	-20 °C ~ +60 °C
Storage Temperature	-30 °C ~ +80 °C
Ambient Relative Humidity	5 ~ 95% RH, Non-condensing

Installation

DIN-Rail Mounting

Wall mount

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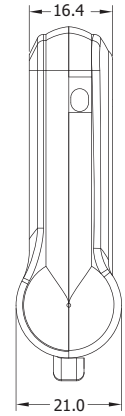
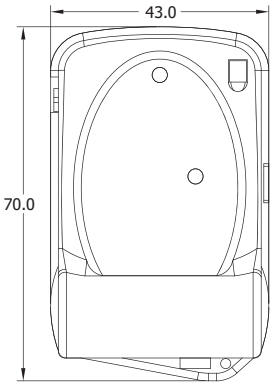
Appearance

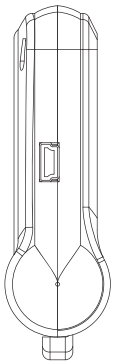
Dimensions (Units: mm)



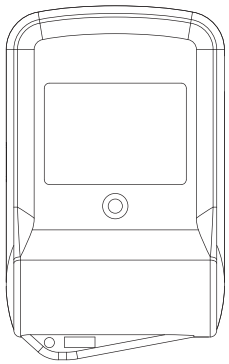
Left Side View



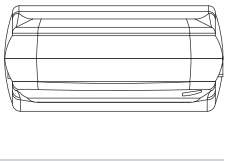
Front View



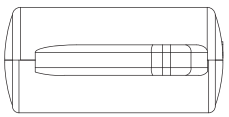
Right Side View



Rear View



Top View



Bottom View

Ordering Information

DL-50 CR	Battery-Powered Temperature and Humidity Data Logger (RoHS)

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9 Accessories

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9

Accessories

1

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MiniOS7 Based
µPAC-5000 Series
Windows CE 5.0 Based
WP-5000 Series
Linux 2.6 Based
LP-5000 Series

Ethernet/Internet
Embedded µPAC
µPAC-7186 Sreies

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M2M Mini-PAC
G-4500 Series

RS-485 Remote I/O
I-7000 Series (DCON Protocol)
M-7000 Series (Modbus Protocol)

Ethernet Remote I/O
ET-7000 Series
PET-7000 Series

FRnet Remote I/O
FR-2000 Series

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