Remote I/O Modules and I/O Expansion Units Products Catalog

Vol. RIO 2.0.00

ICP DAS

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Remote I/O Modules and I/O Expansion Units

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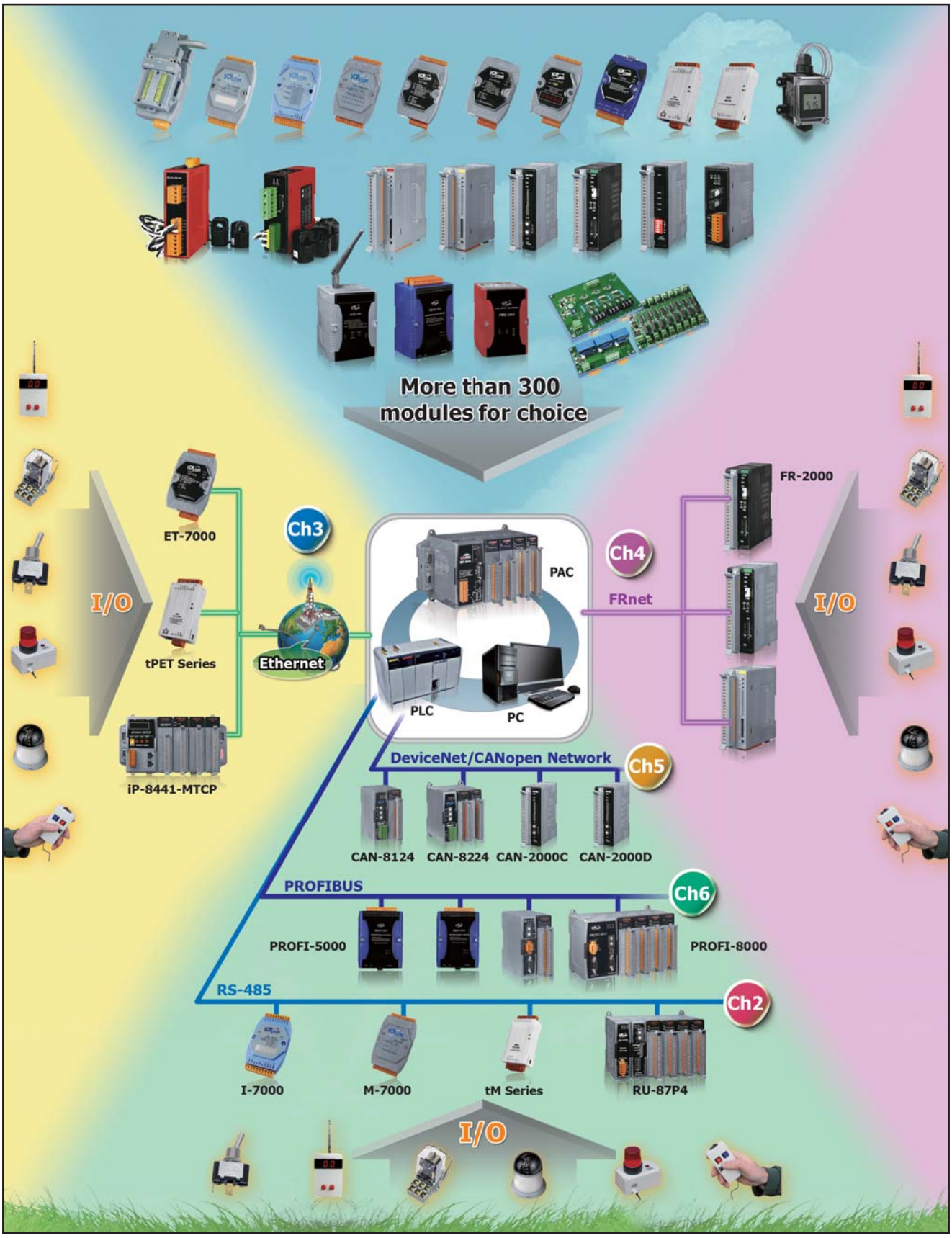
1.1. Overview

ICP DAS launches a series of remote I/O modules and I/O expansion units for industrial monitoring and controlling applications. The I/O modules are highly flexible and compatible , thus reduce your I/O modules inventory. Furthermore,various communication interfaces, such as **RS-485, Ethernet, EtherCAT, EtherNet/IP, Profinet, FRnet, CAN bus, Profibus and Hart** are available for PAC, PC and PLC.



1.2. Related PAC

The PAC family of ICP DAS is a modular network-based PAC with the capablity of connecting I/O either through its own dual backplane bus or alternatively through remote I/O units and remote I/O modules. This new exciting PAC family offers a flexible, versatile and economical solution to a wide range of applications from data acquisition, process control, test and measurement, motion control to energy and building management. Our PAC family includes XPAC, WinPAC, ViewPAC, LinPAC, iPAC, ViewPAC, Motion PAC and µPAC for different requirements in OS, CPU and development platform.

Compact PAC	XP-8000-Atom	XP-8000-Atom-CE6	XP-8000	XP-8000-CE6	WP-8000	iP-8000
Pictures						
CPU	Intel Atom Z520 (1.33 GHz)	Intel Atom Z510 (1.1 GHz)	AMD LX800 (500 MHz)	AMD LX800 (500 MHz)	Marvell PAX270 (500 MHz)	80186 (80 MHz)
OS	WES 2009	WinCE 6.0	WES 2009	WinCE 6.0	WinCE 5.0	MiniOS7
I/O Expansion	I/O Slots, RS-232/485, Ethernet					
Software Development Tool	VS .NET 2005/2008, VC6, CB6, Delphi, BCB	VS .NET 2005/2008 ISaGRAF, InduSoft	VS .NET 2005/2008, VC6, VB6, Delphi, BCB	VS .NET 2005/2008 ISaGRAF, InduSoft	VS .NET 2005/2008 ISaGRAF, InduSoft	C language, ISaGRAF

µPAC	WP-5000	LP-5000	µPAC-5000	I-7188E/uP-7186E	I-7188XA/B/C
Pictures					
CPU	Marvell PXA270 (520 MHz)		80186 (80 MHz)	80186 (80 MHz)	80186 (40 MHz)
OS	WinCE 5.0	Linux kernel 2.6	MiniOS7	MiniOS7	MiniOS7
I/O Expansion	XW-board, RS-232/485, Ethernet			X-board, RS-232/485, Ethernet	
Software Development Tool	VS .NET 2005/2008 ISaGRAF, InduSoft	C language	C language, ISaGRAF	C language, ISaGRAF	C language, ISaGRAF

For more details, refer to PAC Product Catalog

- XP-8000-Atom Series
- XP-8000 Series
- WP-8000 Series
- LP-8000 Series
- iP-8000 Series
- ViewPAC
- MotionPAC
- Industrial IO Modules for 8000 Series PAC and ViewPAC
- I/O Expansion Units
- µPAC-5000 Series
- WP-5000 Series
- LP-5000 Series
- 7188 7186 Series uPAC
- Redundant System

ViewPAC	VP-25W1	VP-23W1	VP-2111/VP-2117	TPD-430	TPD-280/283	VPD-130
Pictures						
CPU	Marvell PXA270 (520 MHz)		80186 (80 MHz)	32-bit RISC CPU		
OS	WinCE 5.0		MiniOS7	N/A		
LCD	5.7" TFT LCD with Touch Panel	3.5" TFT LCD w/o Touch Panel	128 x 64 Dot Matrix STN LCD	4.3" TFT LCD with Touch Panel	2.8" TFT LCD with Touch Panel	3.5" TFT LCD with Touch Panel
I/O Expansion	I/O Slots, RS-232/485, Ethernet		I/O Slots, RS-232/485, Ethernet	RS-485	RS-485 or Ethernet	RS-232/485
Software Development Tool	VS .NET 2005/2008 ISaGRAF, InduSoft		C language, ISaGRAF	C language, Ladder		

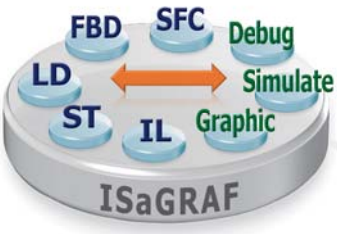
For more details of  **, refer to PAC Product Catalog** 

For more details of  **, refer to TouchPAD brochure** 

• Software Development Tool

1. ISaGRAF (SoftPLC Solution)

ISaGRAF is a powerful SoftLogic package on the industrial market. **ISaGRAF Workbench** is a PLC-like development software running on Windows 95/98/NT/2000/XP/Vista/7 and its **ISaGRAF Runtime** application programs can run on any **ISaGRAF PAC**s such as WP-8xx7, VP-2xx7, XP-8xx7-CE6, iP-8xx7, µPAC-7186(P)EG etc. Using ISaGRAF PACs, the control/monitor systems can easily implement industrial level of real-time data acquisition and data/devices control via wiring or wireless network in various industries.



2. InduSoft (SCADA Solution)

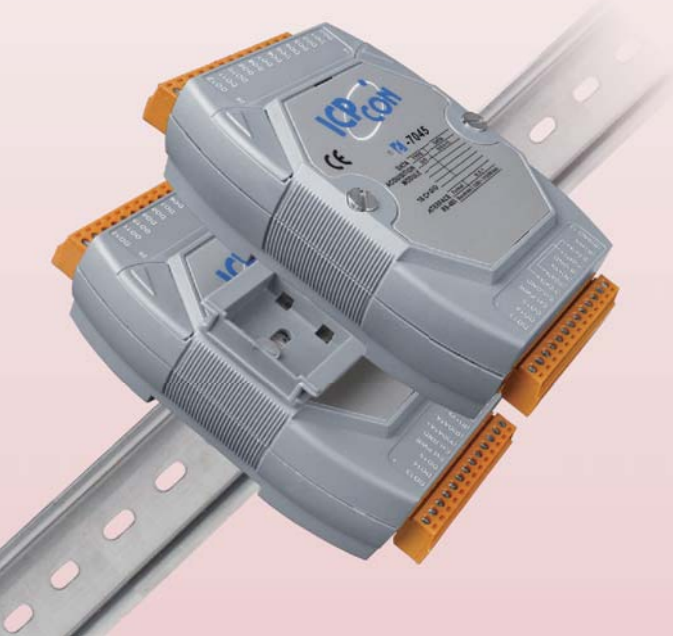
Introduction :

InduSoft Web Studio is a powerful, integrated collection of automation tools that includes all the building blocks needed to develop modern Human Machine Interfaces (HMI), Supervisory Control and Data Acquisition (SCADA) systems, and embedded instrumentation and control applications.

InduSoft Web Studio's application runs in native Windows NT, 2000, XP, CE and CE .NET environments and conforms to industry standards such as Microsoft .NET, OPC, DDE, ODBC, XML, and ActiveX. We provide the InduSoft bundled driver to integrate InduSoft software into ICP DAS products (IO Modules: I-7000, I-8000, I-87K ; PACs: WinPAC, WinPAC, XPAC) for SCADA system.

RS-485 I/O Products

2



2.1. Overview

Although RS-485 is a very old technology, it is still a good choice to establish a cost-effective remote I/O system. Our RS-485 remote I/O module supports DCON protocol, Modbus RTU/ASCII protocol. According to different application, we have developed various RS-485 I/O modules, such as palm-size I-7000/M-7000 series (Ch 2.2) and tiny-size tM series (Ch2.3). The module has diversified I/O interface, such as overvoltage-protection analog input module, relay output, digital input/output, counter, timer…etc.

The brief comparison is as the following table. Besides those regular RS-485 I/O modules, we can also provide some ODM modules.

Model Name		tM series	I-7000	M-7000
Pictures				
Communication				
Protocol		DCON, Modbus RTU, Modbus ASCII	DCON	DCON, Modbus RTU
Data Format		(N, 8, 1), (N, 8, 2), (O, 8, 1), (E, 8, 1)	(N,8,1)	
Max. Nodes		32	256	
Bias resistor		Yes, 10 KΩ	No (Note1)	
Dual Watchdog		Yes, Module (2.3 second), Communication (Programmable)	Yes, Module (1.6 second), Communication (Programmable)	
I/O				
DIO max. channel		8	16	
AIO	Resolution	12/14 bits	12/16 bits	
	Max. channel	8 (tM-AD8)	20 (I-7017Z, M-7017Z)	
	Individual Channel Configuration	-	Yes	
Display				
Power and Communication LED		Yes	Yes	
I/O Status LED		-	Yes (for D version only)	
7-Segment LED		-	Yes (for D version only)	
Mechanical				
Dimensions (W x L x D)		52 mm x 98 mm x 27 mm	72 mm x 123 mm x 35 mm	

Note1: The RS-485 master is required to provide the bias. Otherwise, the tM-SG4 or SG-785 should be added to provide the bias. All ICP DAS controllers and converters provide the bias.

Furthermore, we also developed RU-87Pn, a series of RS-485 remote I/O unit for compact and modular I/O expansion. It comprises a CPU, a power module and a backplane with a number of I/O slots for flexible I/O configuration. With its patented technology, namely auto configuration and hot swap, it saves lots of labor on the set up and maintenance of the automation systems. Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

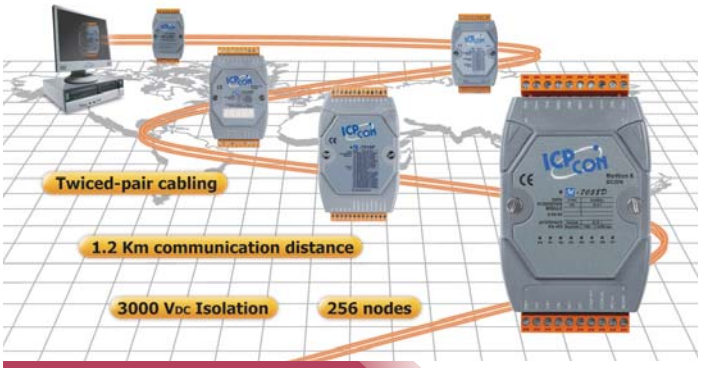
Features

- Hot Swap
- Auto Configuration
- Easy Duplicate System
- Easy Maintenance and Diagnosis
- DCON Protocol

For more details of, refer to **PAC Product Catalog**

2.2. 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 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. I-7000 supports DCON protocol, and M-7000 modules support Modbus RTU and DCON protocols. Many SCADA/HMI software and PLCs support Modbus RTU protocol. It is easy for them to integrate with M-7000 modules.

• Applications

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

• Features

RS-485 Industrial Multi-Drop Network

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 easy to integrate to the regular computer and controller. Internal surge protection circuitry is used on data lines to protect the modules from spikes.

I/O type and Range Programmable

The analog modules support several types and ranges which can be selected remotely by issuing command from the host.

Easy Mounting and Connection

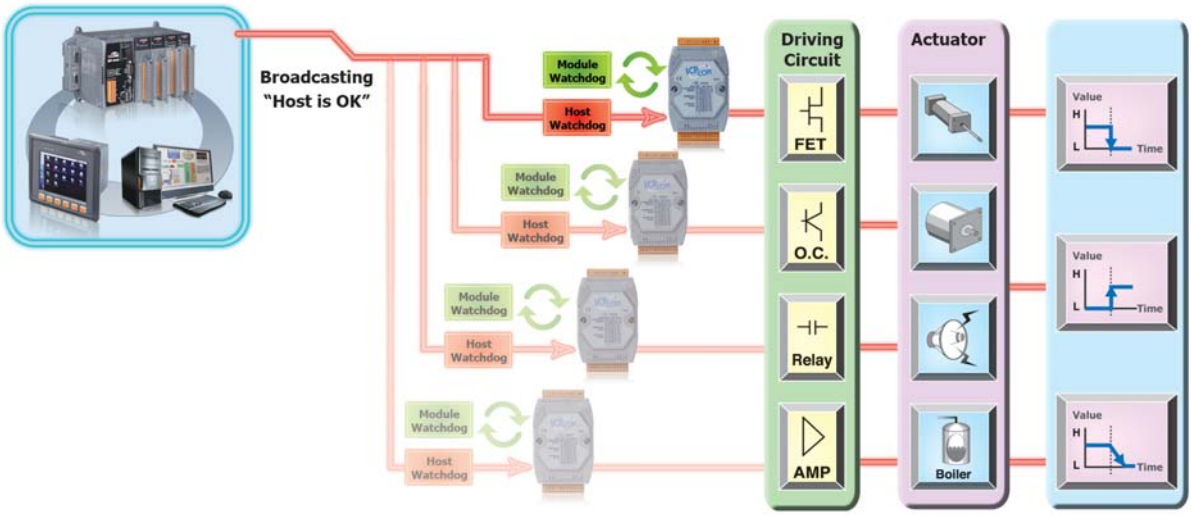
The user may mount the modules on a DIN rail or piggyback.

Rugged Industrial Environment

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 controller, 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. The Dual Watchdog design ensures higher reliability and stability.

- **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.

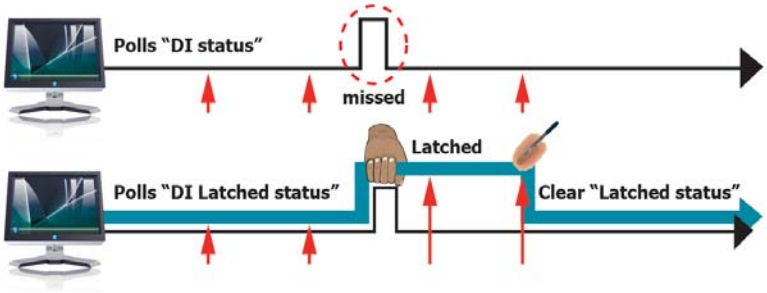


Advanced DI Functions

DI channel is not only for reading digital input status but also provides several advanced functions in the 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 will not be lost any more.

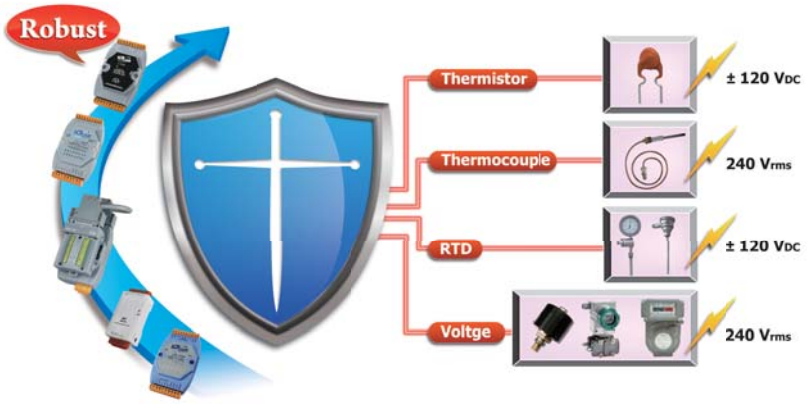


• Low Speed Counter

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

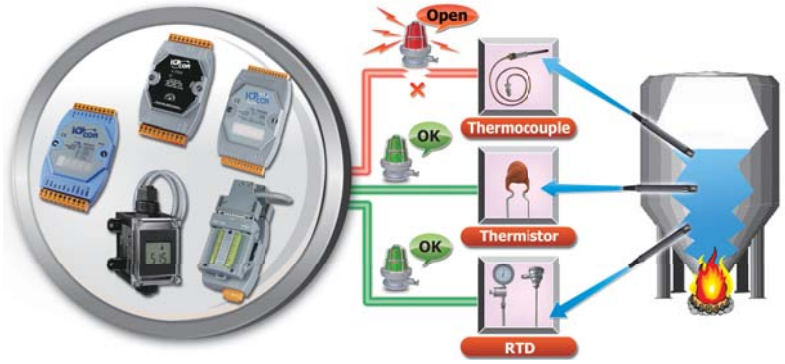
Overvoltage Protection

Many of our analog input modules provide high overvoltage protection for the analog input channels. When user picks wrong line accidentally or high voltage spike is applied to the analog input terminals, the module will not be broken and can still get the correct readings. This feature improves the reliability, reduces maintenance frequency, and makes the whole system more robust.



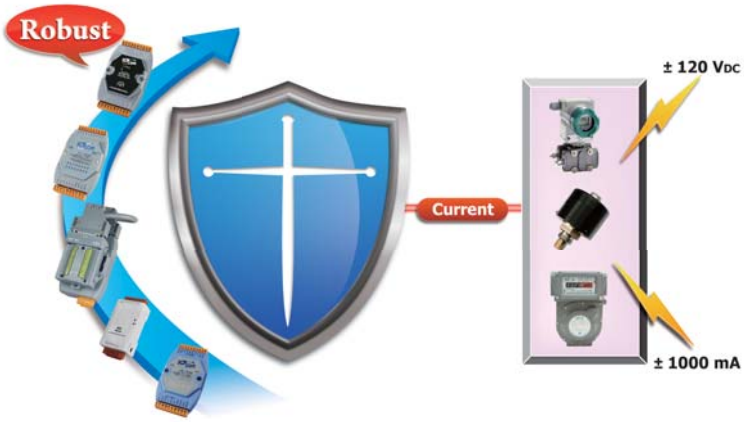
Open Wire Detection

The thermocouple, RTD and thermistor sensors are widely used in temperature control applications. If the system can not monitor the open wire status of the sensors, it may be very dangerous and cause large damage to life and property. When the wire of sensor is broken and the controller does not know the open wire status, the system may heat the boiler continuously and result in fire or explosion. Our thermocouple, RTD, thermistor modules provide open wire detection and make the system safer.



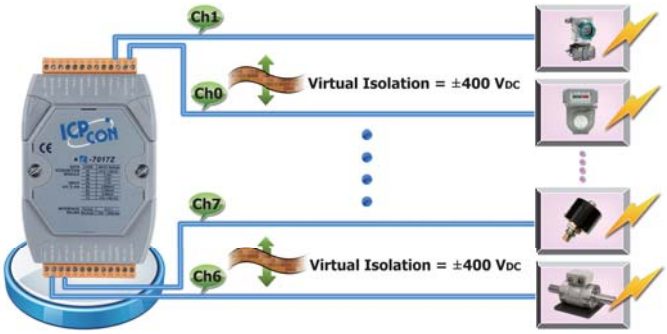
Over-current Protection

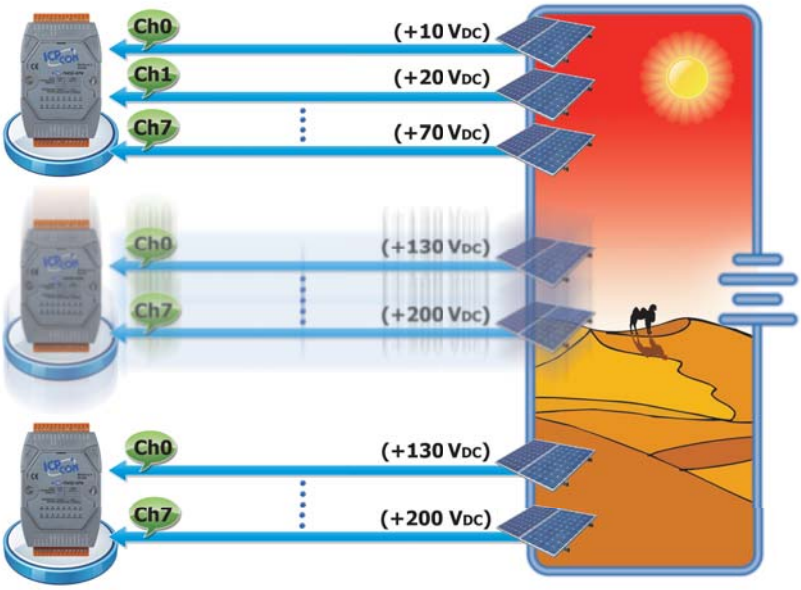
For the current measurement module, it may be damaged when there is high current or voltage introduced into the current loop. The protection for current measurement is improved to +/-120 VDC and +/-1000 mA.. A high current or voltage in the current loop will not damage the current measurement, so the whole system can work normally.



Virtual Channel to Channel Isolation

The "R" and "Z" version of analog input modules provide +/-400 VDC virtual channel to channel isolation to avoid the noise interference from adjacent channel in the industrial environment. To name a few of the modules, they are I-7017R, I-7017Z, I-7018R, I-7018Z, I-7019R, and I-7019Z. Though it is not real channel to channel isolation, there is only 1uA leakage current between two adjacent channels and the interference is very small and can be negligible.



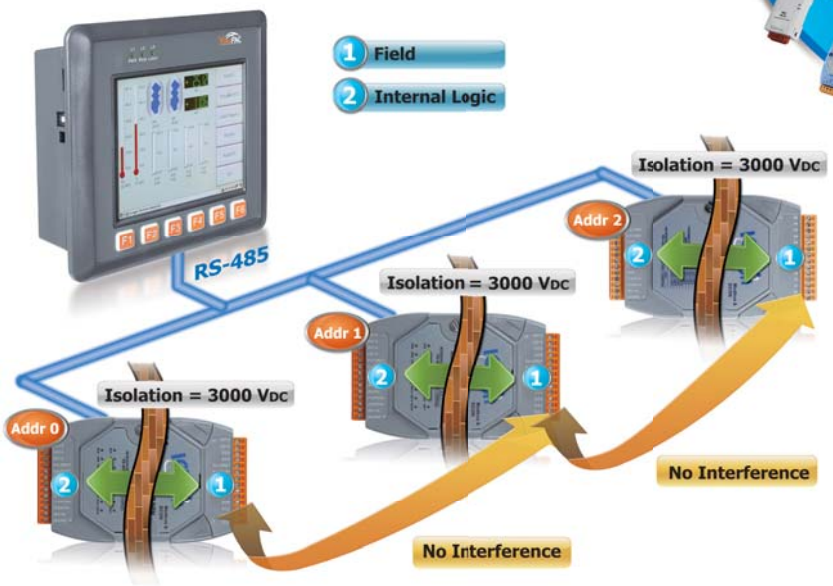


Common Voltage Protection

The typical application is to monitor the charging status of the batteries in series. The voltage of each battery is +10 VDC so the first battery is +10 VDC, the second battery is +20 VDC etc. The differential voltage of the 20th battery is only +10 VDC between vin+ and vin- terminal, while the common voltage is up to 200 VDC. If the common voltage of the analog input module is not large enough, then it can not measure the correct voltage of the battery in charging. ICP DAS analog input modules provide +/-200 VDC high common voltage for industrial applications.

ESD Protection

In the industrial environment there are many noise, spike, electrostatic etc. If the module is not strong enough, it is very easy to be damaged. The I-7K and M-7K modules all pass +/-4 KV ESD contact and +/-8 KV ESD air tests by static electricity gun in our laboratory. The test procedures follow the IEC 61000-4-2 standard. Our modules are immunity to the electrostatic discharges by using components that can clamp and resist to the high voltages defined by IEC 61000-4-2 standard.



3000 VDC Isolation

The I-7K and M-7K series have 3000 VDC isolation between the field and the internal logic. This isolation prevents the noise from the field to the internal logic that can damage the module. It is recommended to choose isolated modules that will be connected on RS-485 network. There will be no interference from the neighbor module because the noise from the neighbor module is isolated.

Dual Communication Protocols

All I-7000 and M-7000 modules use a simple command /response protocol for communication. M-7000 also supports the industrial standard Modbus RTU protocol. The user can use high-level language, such as C, VB, Delphi, and others to write their application programs. Some famous software package can control I-7000 and M-7000 directly, such as LabView, Indusoft, Tracemode, EZ data logger, EZ Prog..etc.
I-7000: supports DCON protocol
M-7000: supports Modbus RTU and DCON protocols

Self-Tuner Inside

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

Expandable Network

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 rate and data format. Each I-7510 repeater can let you extend the network to another 4,000 ft long. Actually the user should consider the network length and the hardware loading effect and use I-7510 to isolate different groups to avoid high voltage hitting the whole system through a single communication network.

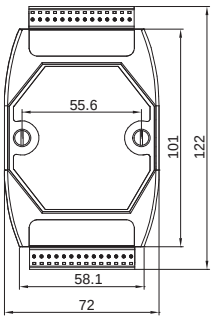
• Hardware

1. Installation

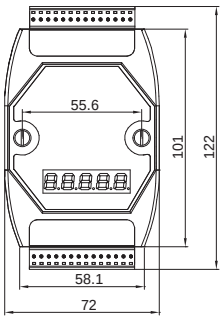
DIN-Rail Mounting

Stack Mounting

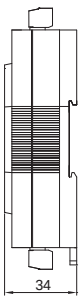
2. Dimensions (Units: mm)



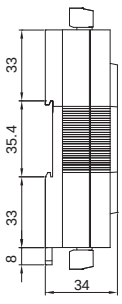
Front View



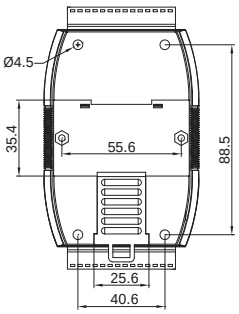
Front View



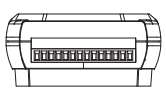
Left Side View



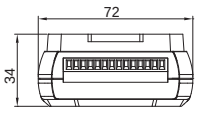
Right Side View



Rear View



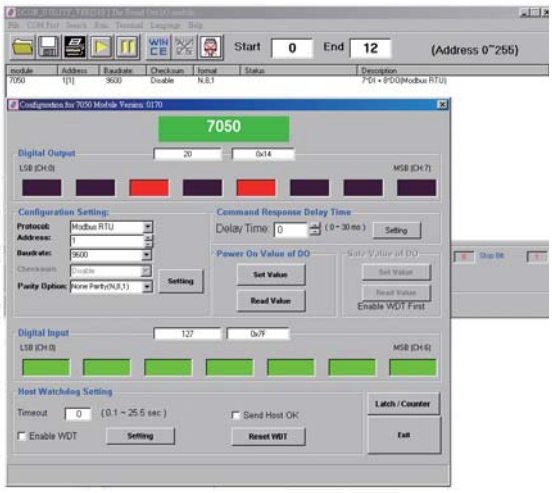
Top View



Bottom View

• Software Support

Our free charge software utility and development kit include



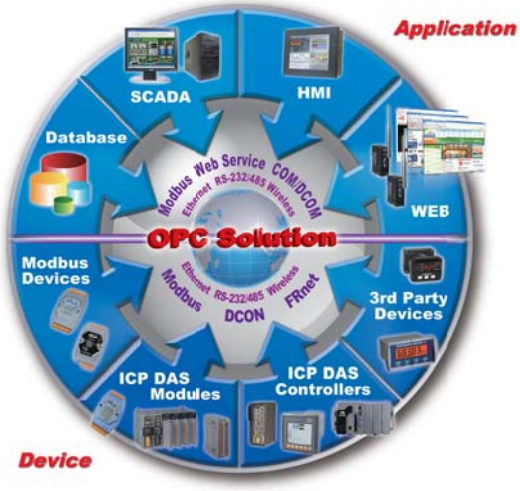
1. DCON Utility

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

2. OPC Server

NAPOPC_ST DA Server is a **free** OPC DA Server ("**OPC**" stands for "OLE for Process Control" and "**DA**" stands for "Data Access") for ICP DAS products. Based on Microsoft's OLE COM (component object model) and DCOM (distributed component object model) technologies, NAPOPC_ST DA Server defines a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate the interoperability.

Using NAPOPC_ST DA Server, system integrates data with SCADA/HMI/Database software on the same computer and others. SCADA/HMI/Database sends 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 http://opc.icpdas.com

3. EZ Data Logger

EZ Data Logger is the software that ICP DAS provides for users to easily build a small 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

• I-7000 and M-7000 Selection Guide

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	Digital Input & Output Module		I-7044(D), I-7050(D), I-7050A(D), I-7055(D), I-7055(D)-NPN	2-2-21
			M-7050(D), M-7055(D), M-7055(D)-NPN	
Relay Output Modules	Relay Output Module		I-7060(D), I-7063(D)I-7065(D), I-7061(D), I-7067(D)	2-2-22
			M-7060P(D), M-7060(D), M-7065(D), M-7061(D), M-7067(D)	
	Solid-State Relay Output Module		I-7063A(D), I-7065A(D), I-7063B(D), I-7065B(D)	2-2-23
			M-7065A(D), M-7065B(D)	
	PhotoMos Relay Output Module		I-7066(D)	2-2-24
			M-7066P(D)	
Counter/Frequency/PWM Modules			I-7080(D), I-7080B(D), I-7083(D), I-7083B(D), I-7088	2-2-25
			M-7080(D), M-7080B(D), M-7084, M-7088	

2.2.1. Voltage & Current Input Module

Voltage & Current Input Module									
Model Name		I-7012(D)	I-7012F(D)	I-7017 M-7017	I-7017F	M-7017H	M-7017HL	I-7017C M-7017C	I-7017FC
Pictures						Available soon 	Available soon 		
Channels		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)		±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA (requires optional external 125 Ω resistor)	±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	±20 mA, 0~20 mA, 4~20 mA	
Resolution		16-bit	12/16-bit	16-bit	12/16-bit	16-bit		16-bit	12/16-bit
★ Accuracy	Normal mode	0.1%		0.1%		0.1%		0.1%	
	Fast mode	-	0.5%	-	0.5%	0.2%		-	0.5%
★ Sampling Rate	Normal mode	10 Hz		10 Hz (Total)		40 Hz (Total)		10 Hz (Total)	
	Fast mode	-	100 Hz	-	60 Hz (Total)	800 Hz (Total)		-	60 Hz (Total)
Input Impedance		20 MΩ		20 MΩ		10 MΩ		20 MΩ	
Common Voltage Protection		±10 VDC		±15 VDC		±15 VDC	±5 VDC	±15 VDC	
★ Individual Channel Configuration		-		-		Yes		-	
★ Overvoltage Protection		±15 VDC		±120 VDC		±15 VDC	±5 VDC	±120 VDC	
Overcurrent Protection		-						Yes	
Virtual Channel to Channel Isolation		±30 VDC				±15 VDC	±5 VDC	±30 VDC	
System									
★ Dual Watchdog		Yes							
ESD (IEC 61000-4-2)		±2 kV		±2 kV for I-7017 ±4 kV for M-7017	±2 kV	±4 kV		±2 kV	±4 kV
EFT (IEC 61000-4-4)		-		±4 kV for M-7017	-	±4 kV		±4 kV	
Intra-Module Isolation, Field-to-Logic		3000 VDC				2500 VDC		3000 VDC	
Power Input		10 ~ 30 VDC							
Power Consumption		1.3 W; 1.9 W for (D) version		1.3 W		1.8 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.

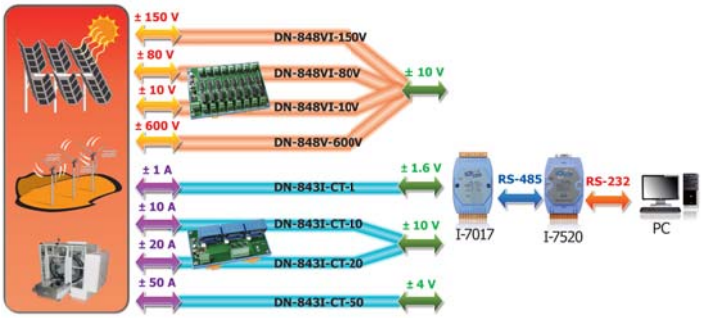
Note2: I-7012(D) and I-7012F(D) both include 1 DI and 2 DO channels. The specification is as follows

Digital Input	
Channels	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	
Channels	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

Accessories

 DN-843V-600V CR	3-channel 600 V voltage attenuator (RoHS)
 DN-848VI-80V CR	8-channel 80 V voltage attenuator (RoHS)
 DN-848VI-150V CR	8-channel 150 V voltage attenuator (RoHS)
 DN-843I-CT-1 CR	3-channel 1 A Current Transformer (RoHS)
 DN-843I-CT-50 CR	3-channel 50 A Current Transformer (RoHS)



Heavy Industrial Grade

To work well in heavy industrial environment, the hardware of module need special design to against noise, surge, EFT. For this purpose, we provide several heavy industrial grade analog modules.

1. Common Voltage Protection
2. Overvoltage Protection
3. ESD (IEC 61000-4-2)
4. EFT (IEC 61000-4-4)

Voltage & Current Input Module (Heavy Industrial Grade)

Model Name		M-7002	M-7003	I-7017R M-7017R	I-7017R-A5 M-7017R-A5	I-7017RC M-7017RC	I-7017Z M-7017Z
Pictures		NEW 	Available soon 				
Channels		4	8	8		8	10/20 (Note 1)
Wiring		Differential	5-channel differential and 3-channel single-ended	Differential		Differential	Diff./Single-Ended
Input Range		±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V ±20 mA , 0 ~ 20 mA, 4 ~ 20 mA (Jumper selectable)		±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		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 (Total)		10 Hz (Total)		10 Hz (Total)	
	Fast mode	60 Hz (Total)		60 Hz (Total)	50 Hz (Total)	60 Hz (Total)	
Input Impedance	Differential	2 MΩ	20 MΩ	2 MΩ	290 kΩ	2 MΩ	2 MΩ
	Single-ended	-	10 MΩ	-		-	1 MΩ
★ Common Voltage Protection		±200 VDC	±15 VDC	±200 VDC			
★ Individual Channel Configuration		Yes	-	-			Yes
★ Overvoltage Protection		240 Vrms	120 VDC	240 Vrms	±200 VDC	240 Vrms	240 Vrms
Overcurrent Protection		Yes	-			Yes	
Virtual Channel to Channel Isolation		±400 VDC	±30 VDC	±400 VDC			
System							
★ Dual Watchdog		Yes					
ESD (IEC 61000-4-2)		±4 kV					
EFT (IEC 61000-4-4)		±4 kV					
Surge (IEC 61000-4-5)		±3 kV		0.5 kV			
Intra-Module Isolation, Field-to-Logic		2500 VDC		3000 VDC			
Power Input		10 ~ 30 VDC					
Power Consumption		1.9 W	1.8 W	1.3 W		1.3 W	2.0 W

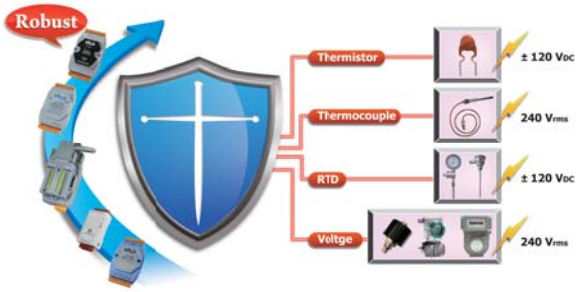
Note1: Differential wiring can be used for voltage input and current input. Single-Ended wiring can be used for voltage input only.

Digital Input for M-7002	
Channels	5
Contact	Wet
Sink/Source (NPN/PNP)	Sink/Source
On Voltage Level	3.5 ~ 30 VDC
Off Voltage Level	+1 VDC Max.
Counter (100Hz, 16-bit)	Yes
Input Impedance	10 kΩ
Overvoltage Protection	±70 VDC
Isolation Voltage	3750 Vrms

Relay Output for M-7002 and M-7003	
Channels	4
Type	Power Relay (Form A)
Contact Rating	5 A @ 250 VAC / 5 A @ 30 VDC
Surge Strength	3000 VDC
Operate Time	3 ms
Release Time	2 ms
Mechanical Endurance	2×10^7 ops.
Electrical Endurance	10^5 ops.
Power-on Value	Yes
Safe Value	Yes

Overvoltage Protection

Many of our analog input modules provide high overvoltage protection for the analog input channels. When user picks wrong line accidentally or high voltage spike is applied to the analog input terminals, the module will not be broken and can still get the correct readings. This feature improves the reliability, reduces maintenance frequency, and makes the whole system more robust.



2.2.2. Thermocouple, Voltge & Current Input Module

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			
Model Name		I-7011(D) M-7011(D)	I-7018 M-7018
Pictures			
Channels		1	8 (I-7018 is 6-channel differential and 2-channel single-ended, or 8-channel differential. M-7018 is 8-channel differential.)
Wiring		Differential	
★ Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C	
	Voltage	±15 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	10 Hz (Total)
Input Impedance		> 400 kΩ	
★ Common Voltage Protection		±5 VDC	±15 VDC
★ Individual Channel Configuration		-	
★ Overvoltage Protection		±5 VDC	±80 VDC
Overcurrent Protection		-	
Virtual Channel to Channel Isolation		-	±30 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 M-7011(D) both include 1 DI and 2 DO channels. The specification is as following

Digital Input	
Channels	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	
Channels	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

Heavy Industrial Grade

To work well in heavy industrial environment, the hardware of module need special design to against noise, surge, EFT. For this purpose, we provide several heavy industrial grade analog modules.

1. Common Voltage Protection
2. Overvoltage Protection
3. ESD (IEC 61000-4-2)
4. EFT (IEC 61000-4-4)

Thermocouple, Voltge & Current Input Module (Heavy Industrial Grade)

Model Name		I-7018R M-7018R	I-7018Z M-7018Z	I-7019R M-7019R	M-7019Z
Pictures					
Thermocouple, Voltge & Current Input					
Channels		8	10	8	10
Wiring		Differential			
Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C, L, M, LDIN43710			
	Voltage	±15 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 (Total)		8 Hz (Total)	10 Hz (Total)
Input Impedance		> 400 kΩ			
★ Common Voltage Protection		±200 VDC		±200 VDC	
★ Individual Channel Configuration		-	Yes	Yes	
★ Overvoltage Protection		240 Vrms		240 Vrms	
Overcurrent Protection		-			
Virtual Channel to Channel Isolation		±400 VDC			
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 VDC			
Power Input		10 ~ 30 VDC			
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 extremely 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

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

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

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

CD-25015 =
15 cm Cable + DB-1820

4PAPP-006-G

2.2.3. RTD Input Module

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		
Model Name	**I-7013(D)**	**I-7033(D)** **M-7033(D)**
Pictures		
RTD Input		
Channels	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 (Total)
★ Individual Channel Configuration	-	-
★ Overvoltage Protection	±5 VDC	±25 VDC
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 VDC	
Power Input	10 ~ 30 VDC	
Power Consumption	0.7 W; 1.3 W for (D) version	1.0 W; 1.6 W for (D) version

Over-current Protection

For the current measurement module, it may be damaged when there is high current or voltage introduced into the current loop. The protection for current measurement is improved to +/-120 VDC and +/-1000 mA.. A high current or voltage in the current loop will not damage the current measurement, so the whole system can work normally.

Heavy Industrial Grade

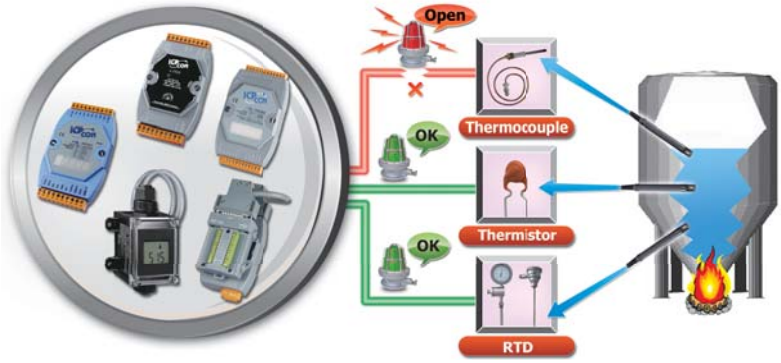
To work well in heavy industrial environment, the hardware of module need special design to against noise, surge, EFT. For this purpose, we provide several heavy industrial grade analog modules.

1. Common Voltage Protection
2. Overvoltage Protection
3. ESD (IEC 61000-4-2)
4. EFT (IEC 61000-4-4)

RTD Input Module (Heavy Industrial Grade)			
Model Name	**I-7015**		**I-7015P**
	M-7015	**M-7015-5**	**M-7015P**
Pictures		Available soon 	
RTD Input			
Channels	6	5	6
Wiring	2/3 wire		
★ Sensor Type	Pt100, Pt1000, Ni120, Cu100, Cu1000		
Resolution	16-bit		
★ Accuracy	±0.05%		
★ Sampling Rate	12 Hz (Total)		
★ Individual Channel Configuration	Yes		
★ Overvoltage Protection	120 VDC		
Open Wire Detection	Yes		
3-wire RTD Lead Resistance Elimination	-	Yes	Yes
Resistance Measurement	3.2 KΩ Max.		
Digital Output			
Channels	-	8	-
Type		Open Collector	
Sink/Source (NPN/PNP)		Sink	
Load Voltage		3.5 ~ 50 VDC	
Max. Load Current		700 mA/Channel	
Short Circuit Protection		Yes	
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 VDC		
Power Input	10 ~ 30 VDC		
Power Consumption	1.1 W	1.5 W	1.2 W

Open Wire Detection

The thermocouple, RTD and thermistor sensors are widely used in temperature control applications. If the system can not monitor the open wire status of the sensors, it may be very dangerous and cause large damage to life and property. When the wire of sensor is broken and the controller does not know the open wire status, the system may heat the boiler continuously and result in fire or explosion. Our thermocouple, RTD, thermistor modules provide open wire detection and make the system safer.



2.2.4. Thermistor Input Module

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 ~ 130°C).

Applications

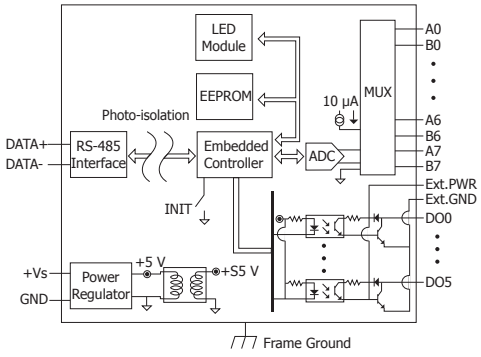
Heavy Industrial Grade

To survive in heavy industrial environments, the hardware needs ultra strong design to against noise, surge, ESD, EFT, etc. For the purpose, we provide heavy industrial grade analog modules. The following specifications are outstandingly enhanced

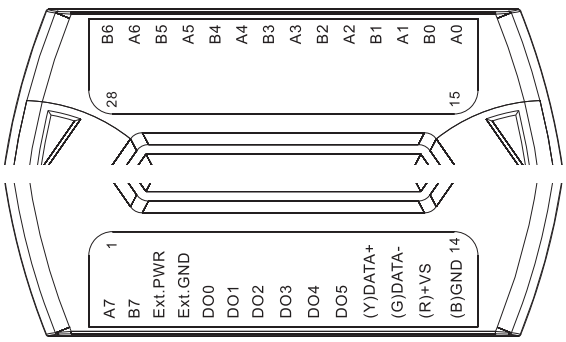
1. Common Voltage Protection
2. Overvoltage Protection
3. ESD (IEC 61000-4-2)
4. EFT (IEC 61000-4-4)

Thermistor Input Module (Heavy Industrial Grade)		
Model Name	**I-7005**	
	M-7005	
Pictures		
Thermistor Input		
Channels	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 (Total)	
★ Individual Channel Configuration	Yes	
★ Overvoltage Protection	120 VDC	
Open Wire Detection	Yes	
Resistance Measurement	200 KΩ Max.	
Digital Output		
Channels	6	
Type	Open Collector	
Sink/Source (NPN/PNP)	Sink	
Load Voltage	+3.5 ~ 50 VDC	
Max. Load Current	650 mA/Channel	
Overvoltage Protection	60 VDC	
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 VDC	
Power Input	10 ~ 30 VDC	
Power Consumption	1.3 W	

Internal I/O Structure



Pin Assignments

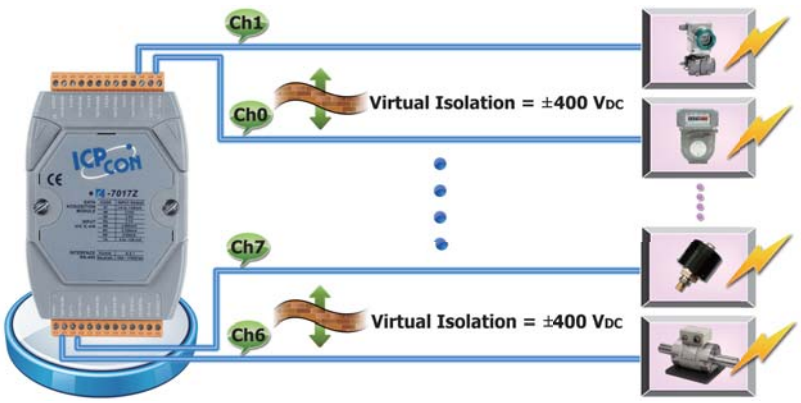


2.2.5. Transmitter Input Module

Transmitter Input Module	
Model Name	**I-7014D**
Pictures	
Transmitter Input	
Channels	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 VDC, 30 mA
★ Overvoltage Protection	±15 V
Open Wire Detection	-
Digital Input	
Channels	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	
Channels	2
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	1.9 W

Virtual Channel to Channel Isolation

The "R" and "Z" version of analog input modules provide +/-400 VDC virtual channel to channel isolation to avoid the noise interference from adjacent channel in the industrial environment. To name a few of the modules, they are I-7017R, I-7017Z, I-7018R, I-7018Z, I-7019R, and I-7019Z. Though it is not real channel to channel isolation, there is only 1uA leakage current between two adjacent channels and the interference is very small and can be negligible.

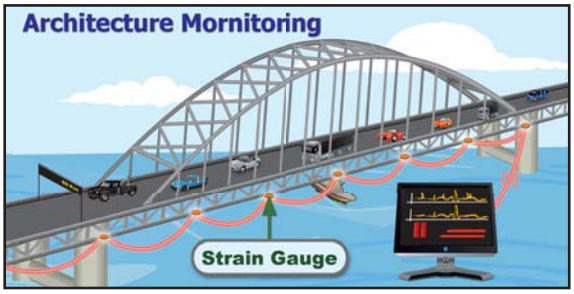


2.2.6. Strain Gauge Input Module

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



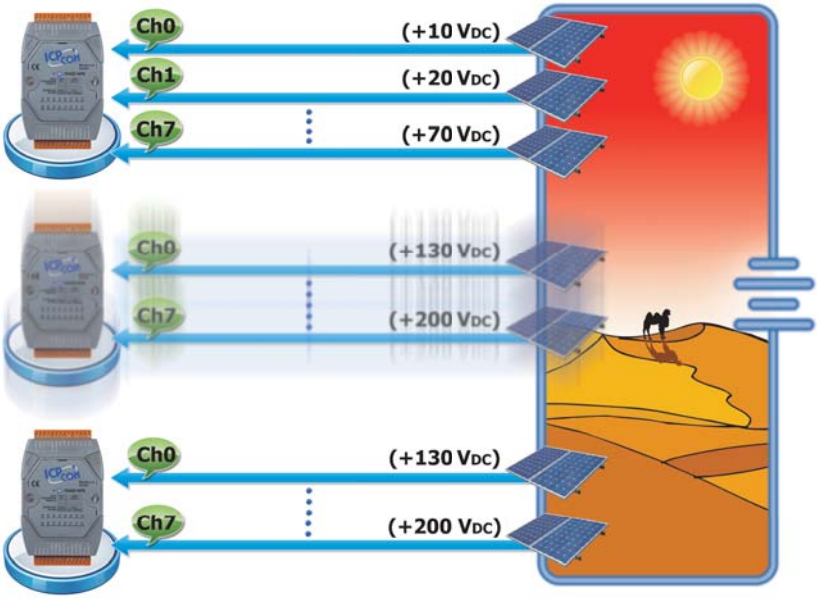
Strain Gauge Input Module			
Model Name	I-7016(D) M-7016(D)	I-7016P(D)	
Pictures			
Strain Gauge Input			
Channels	2	1	
Wiring	4 wire	6 wire	
★ Sensor Type	Full-Bridge		
Resolution	16-bit		
★ Accuracy	±0.05%		
★ Sampling Rate	2/10 Hz	10 Hz	
Input Impedance	20 MΩ		
★ Individual Channel Configuration	-		
★ Overvoltage Protection	±5 VDC		
Open Wire Detection	-		
Long Distance Measurement	-	Yes	
Excitation Voltage Output			
Channels	1		
Range	0 ~ 10 V		
Max. Load Current	40 mA		
Resolution	16-bit		
Accuracy	±0.05%		
Power-on Value	Yes		
Digital Input			
Channels	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			
Channels	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	

2.2.7. Analog Output Module

Analog Output Module				
Model Name	I-7021	I-7021P	I-7022 M-7022	I-7024 M-7024
Pictures				
Analog Output				
Channels	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				
Channels	-			-
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

Common Voltage Protection

The typical application is to monitor the charging status of the batteries in series. The voltage of each battery is +10 VDC so the first battery is +10 VDC, the second battery is +20 VDC etc. The differential voltage of the 20th battery is only +10 VDC between vin+ and vin- terminal, while the common voltage is up to 200 VDC. If the common voltage of the analog input module is not large enough, then it can not measure the correct voltage of the battery in charging. ICP DAS analog input modules provide +/-200 VDC high common voltage for industrial applications.



Heavy Industrial Grade

To work well in heavy industrial environment, the hardware of module need special design to against noise, surge, EFT. For this purpose, we provide several heavy industrial grade analog modules.

1. Common Voltage Protection
2. Overvoltage Protection
3. ESD (IEC 61000-4-2)
4. EFT (IEC 61000-4-4)
5. RS (IEC 61000-4-3)

Analog Output Module (Heavy Industrial Grade)			
Model Name	**I-7024R**		
	M-7024R		**M-7024U**
Pictures			
Analog Output			
Channels	4		
Range	0 ~ 5 V, ±5 V, 0 ~ 10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA		
Wiring of Current Output	Sink		Source
Resolution	14-bit		16-bit
★ Accuracy	0.1%		0.05%
DA Output Response Time	10 ms		
Open Wire Detection (for current only)	-		Yes
Channel to Channel Isolation	-		
★ Power-on Value	Yes		Yes
★ Safe Value	Yes		Yes
Digital Input			
Channels	5		6
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 VDC		
Digital Output			
Channels	-		4
Type			Open Collector
Sink/Source (NPN/PNP)			Sink
Load Voltage			+3.5 ~ 30 VDC
Max. Load Current			700 mA/Channel
Overvoltage Protection			Yes
Overload Protection			Yes
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		
RS (IEC 61000-4-3)	5 V/m, 80 MHz ~ 1 GHz		
Intra-Module Isolation, Field-to-Logic	3000 VDC		
Power Input	10 ~ 30 VDC		
Power Consumption	3.2 W		

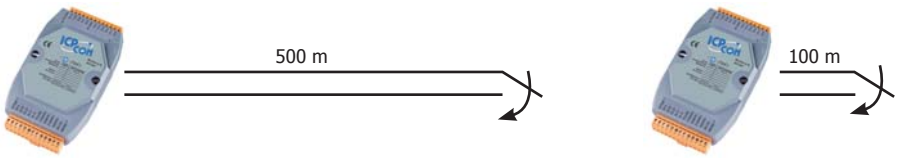
2.2.8. Digital I/O Module

DC Digital Input Module							
Model Name		I-7041(D) M-7041(D)	I-7041P(D) M-7041P(D)	 M-7041(D)-A5	I-7051(D) M-7051(D)	I-7052(D) M-7052(D)	I-7053(D)_FG M-7053(D)
Pictures				NEW 			
Digital Input							
Channels		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.	+48 VDC Max.	+10 ~ 50 VDC	+4 ~ 30 VDC	-
	Off Voltage Level	+4 ~ 30 VDC	+19 ~ 30 VDC	+68 ~ 150 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		50 KΩ	10 KΩ	3 KΩ	-
Channel to Channel Isolation		-			-	Yes, ±2 kV for differential only.	-
Overvoltage Protection		±35 VDC		±180 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			±4 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			0.3 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

■ **We suggest to choose "P" version of digital input module for industrial use, example : I-7041P, M-7041P ... etc.**

■ **Effective distance for dry contact of DI/DIO module**

In general, the effective distance for dry contact of DI module is 100 m. With the enhanced circuit design, the distance can be extended up to 500 m.

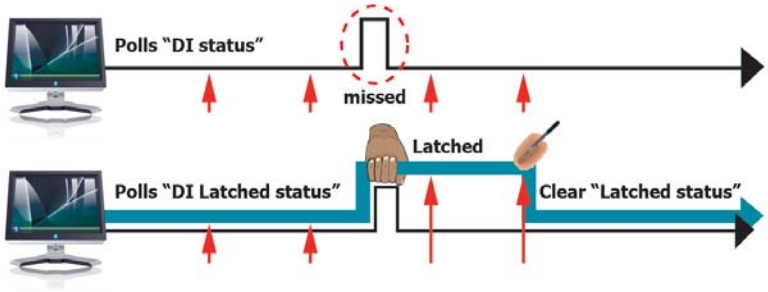


Advanced DI Functions

DI channel is not only for reading digital input status but also provides several advanced functions in the meanwhile.

• DI Latch Function

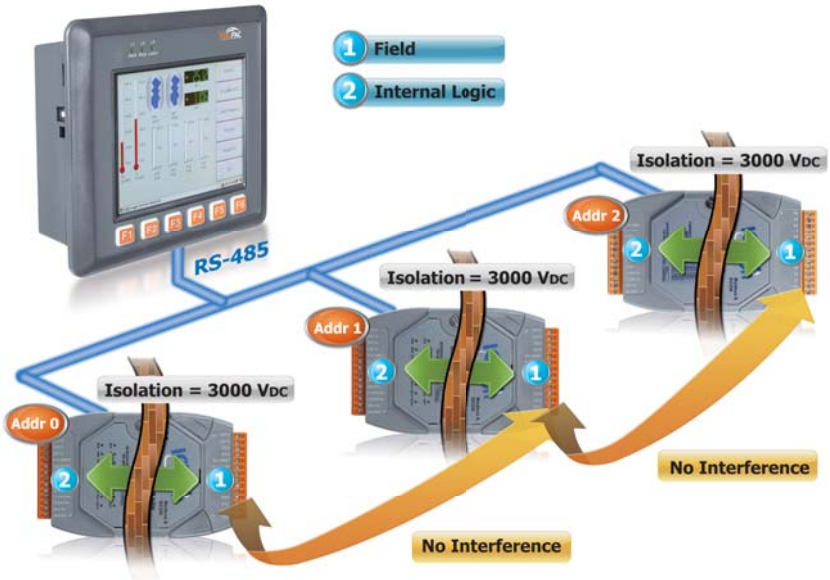
All DI channels provide Latch function to keep the high/low events in the internal registers of the module. In general, the host controller polls modules one by one to get all DI status. Because RS-485 is a low speed field bus, the polling will take time and probably miss a short duration signal. With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



• Low Speed Counter

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

AC Digital Input Module		
Model Name	**I-7058(D)** **M-7058(D)**	**I-7059(D)** **M-7059(D)**
Pictures		
Digital Input		
Channels	8	
Contact	Wet	
Wiring	Differential	
On Voltage Level	80 ~ 250 VAC	10 ~ 80 VAC
Off Voltage Level	30 VAC Max.	3 VAC Max.
★ Counter (100 Hz, 16-bit)	Yes	
Input Impedance	68 KΩ	10 KΩ
Channel to Channel Isolation	Yes, ±2 kV	
Overvoltage Protection	300 VAC	120 VAC
System		
★ Dual Watchdog	Yes	
ESD (IEC 61000-4-2)	±4 kV	
EFT (IEC 61000-4-4)	±4 kV	
Intra-Module Isolation, Field-to-Logic	5000 Vrms	
Power Input	10 ~ 30 VDC	
Power Consumption	0.3 W; 0.7 W for (D) version	0.3 W; 0.7 W for (D) version



3000 VDC Isolation

The I-7K and M-7K series have 3000 VDC isolation between the field and the internal logic. This isolation prevents the noise from the field to the internal logic that can damage the module. It is recommended to choose isolated modules that will be connected on RS-485 network. There will be no interference from the neighbor module because the noise from the neighbor module is isolated.

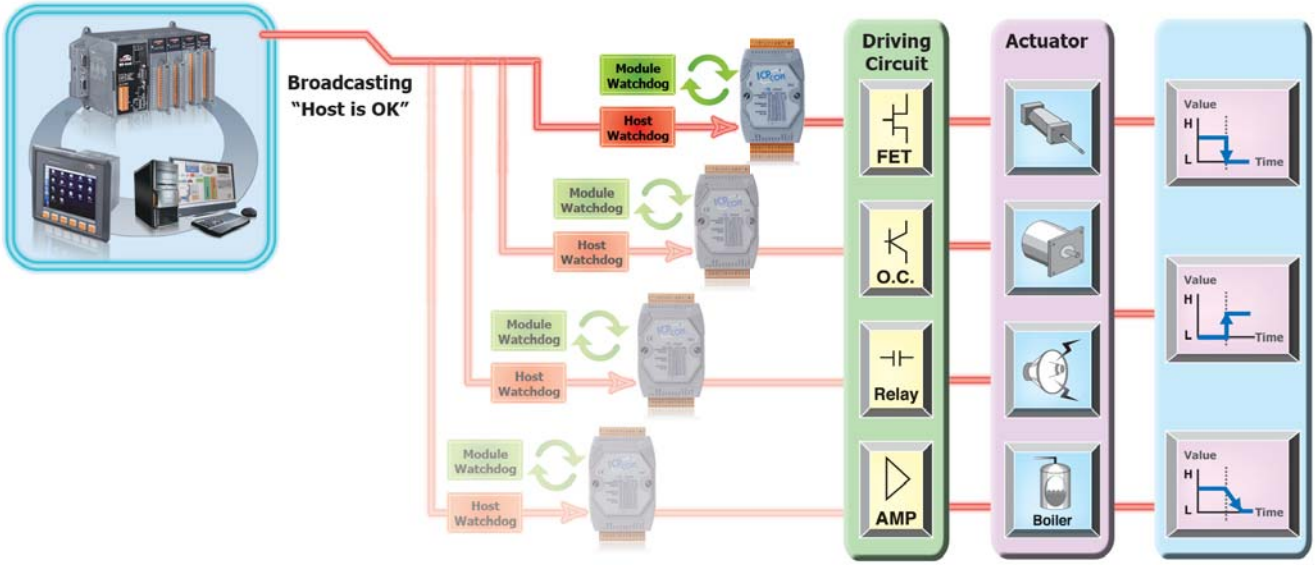
Digital Output Module				
Model Name	I-7042(D)	I-7043(D)	I-7045(D) M-7045(D)	I-7045(D)-NPN M-7045(D)-NPN
Pictures				
Digital Output				
Channels	13	16	16	
Type	Open Collector		MOSFET	
Sink/Source (NPN/PNP)	Sink		Source	Sink
Load Voltage	+3.5 ~ 30 VDC		+10 ~ 40 VDC	+3.5 ~ 50 VDC
Max. Load Current	100 mA/Channel		650 mA/Channel	700 mA/Channel
Overvoltage Protection	-		47 VDC	60 VDC
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 Vrms	-	3750 Vrms	
Power Input	10 ~ 30 VDC			
Power Consumption	1.0 W; 1.7 W for (D) version	0.4 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

Rugged Industrial Environment

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 controller, 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. The Dual Watchdog design ensures higher reliability and stability.

- **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.



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						
Channels		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 VDC Max.	-	+4 ~ 30 VDC	+10 ~ 50 VDC	
	Off Voltage Level	+4 ~ 30 VDC	-	+1 VDC Max.	+4 VDC 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 VDC	-		±70 VDC	
Digital Output						
Channels		8				
Type		Open Collector	Open Collector		MOSFET	
Sink/Source (NPN/PNP)		Sink	Sink	Source	Source	Sink
Load Voltage		+3.5 ~ 30 VDC	+3.5 ~ 30 VDC		+10 ~ 40 VDC	+3.5 ~ 50 VDC
Max. Load Current		375 mA/Channel	30 mA/Channel		650 mA/Channel	700 mA/Channel
Overvoltage Protection		-	-		47 VDC	60 VDC
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 Vrms	-		3750 Vrms	
Power Input		10 ~ 30 VDC				
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

ESD Protection

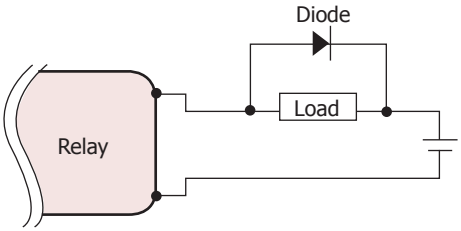
In the industrial environment there are many noise, spike, electrostatic etc. If the module is not strong enough, it is very easy to be damaged. The I-7K and M-7K modules all pass +/-4 KV ESD contact and +/-8 KV ESD air tests by static electricity gun in our laboratory. The test procedures follow the IEC 61000-4-2 standard. Our modules are immunity to the electrostatic discharges by using components that can clamp and resist to the high voltages defined by IEC 61000-4-2 standard.

2.2.9. Relay Output Module

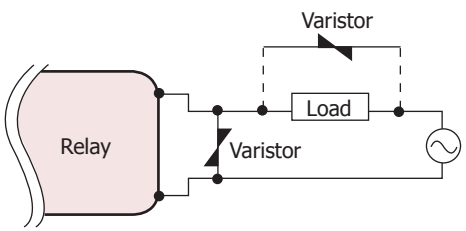
Electromagnetic Relay Output Module						
Model Name		**I-7060(D)**	**I-7063(D)**	**I-7065(D)**	**I-7061(D)**	**I-7067(D)**
	M-7060P(D)	**M-7060(D)**		**M-7065(D)**	**M-7061(D)**	**M-7067(D)**
Pictures						
Relay Output						
Channels	4		3	5	12	7
Type	Power Relay (Form A × 2, Form C × 2)		Power Relay (Form A)			
★ Contact Rating	Form A: 16 A@250 VAC 10A @ 30 VDC Form C: 10 A(NO)/ 6 A(NC) @ 250 VAC	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	2500 VDC	500 VDC	4000 VDC		3000 VDC	1500 VDC
Operate Time	15 ms	3 ms	6 ms		2 ms	5 ms
Release Time	5 ms	2 ms	3 ms		2 ms	2 ms
Mechanical Endurance	10^7 ops.	10^8 ops.	2×10^7 ops.			5×10^6 ops.
Electrical Endurance	5×10^4 ops.	5×10^5 ops.	10^5 ops.			
★ Power-on Value	Yes	Yes	Yes		Yes	Yes
★ Safe Value	Yes	Yes	Yes		Yes	Yes
Digital Input						
Channels	4		8	4	-	
Contact	Wet					
Sink/Source (NPN/PNP)	Sink/Source					
On Voltage Level	+10 ~50 VDC	+1 VDC Max.				
Off Voltage Level	+4 VDC Max.	+4 ~ 30 VDC				
★ Counter (100 Hz, 16-bit)	Yes					
Input Impedance	10 kΩ	3 kΩ				
Overvoltage Protection	±70 VDC	±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	-			±3 kV	-
Intra-Module Isolation, Field-to-Logic	3750 V_{rms}					
Power Input	10 ~ 30 VDC					
Power Consumption	1.7 W (M-7060P) 2.2 W (M-7060PD)	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

Note: When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads.

for DC loads



for AC loads



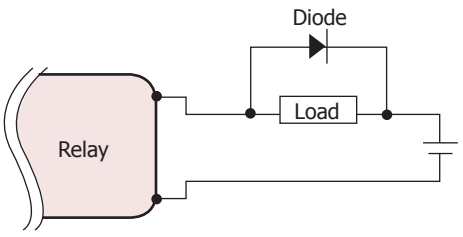
Varistor Selection

Operating Voltage	Varistor Voltage	Max. Peak Current
100 ~ 120 VAC	240 ~ 270 VAC	> 1000 A
200 ~ 240 VAC	440 ~ 470 VAC	> 1000 A

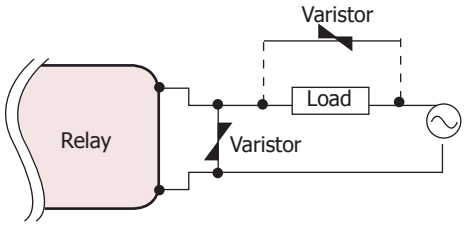
Solid-State Relay Output Module				
Model Name	I-7063A(D)	I-7065A(D) M-7065A(D)	I-7063B(D)	I-7065B(D) M-7065B(D)
Pictures				
SSR Relay Output				
Channels	3	5	3	5
Type	AC-SSR (Form A)		DC-SSR (Form A)	
Operating Voltage Range	24 ~ 265 Vrms		3 ~ 30 VDC	
★ Max. Load Current	1.0 A			
Leakage Current	1.5 mA		0.1 mA	
Min. Operate Time	1 ms			
Min. Release Time	1/2 cycle + 1 ms		1 ms	
Dielectric Strength	2500 Vrms			
Electrical Endurance	No arcing, no bounce and no switching			
★ Power-on Value	Yes			
★ Safe Value	Yes			
Digital Input				
Channels	8	4	8	4
Contact	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			
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 Vrms			
Power Input	10 ~ 30 VDC			
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

Note: When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads.

for DC loads



for AC loads



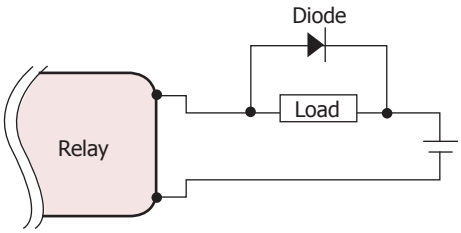
Varistor Selection

Operating Voltage	Varistor Voltage	Max. Peak Current
100 ~ 120 VAC	240 ~ 270 VAC	> 1000 A
200 ~ 240 VAC	440 ~ 470 VAC	> 1000 A

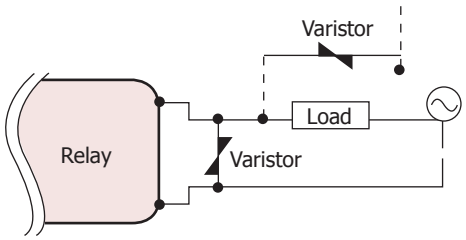
PhotoMos Relay Output Module		
Model Name	**I-7066(D)**	**M-7066P(D)**
Pictures		NEW 
Channels	7	
Type	PhotoMOS Relay (Form A)	
Operating Voltage Range	350 VAC or 350 VDC	80 VAC or 80 VDC
★ Max. Load Current	0.13 A	1 A
Operate Time	0.7 ms	5 ms
Release Time	0.05 ms	0.5 ms
Electrical Endurance	No arcing, no bounce and no switching	
★ 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
Intra-Module Isolation, Field-to-Logic	5000 Vrms	2000 VDC
Power Consumption	0.5 W; 0.8 W for (D) version	0.5 W; 0.8 W for (D) version

Note: When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads.

for DC loads



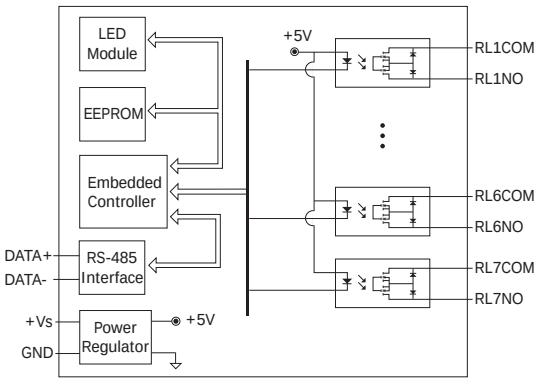
for AC loads



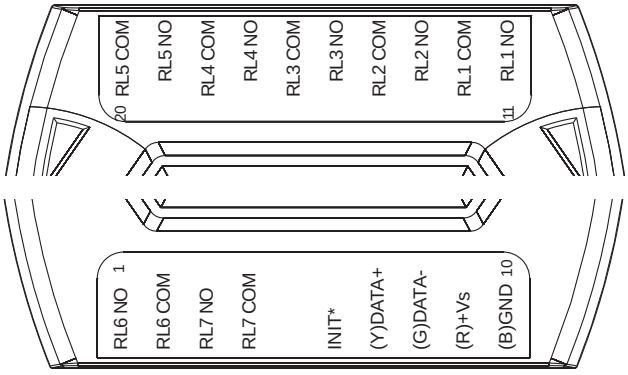
Varistor Selection

Operating Voltage	Varistor Voltage	Max. Peak Current
100 ~ 120 VAC	240 ~ 270 VAC	> 1000 A
200 ~ 240 VAC	440 ~ 470 VAC	> 1000 A

Internal I/O Structure



Pin Assignments



2.2.10. Counter/Frequency/PWM Module

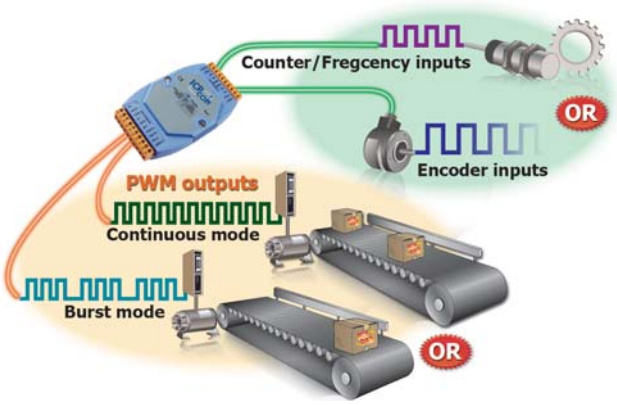
PWM Introduction

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 implement 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)	M-7084	I-7088 M-7088
Pictures						Available soon 	
Digital Input							
Channels		2		3		4 Up/Down Counter or 8 Up Counter	8
Contact		Wet					
Sink/Source (NPN/PNP)		Sink					
On Voltage Level	Isolated	+3.5 ~ +30 VDC		5 V: +3.5 ~ +5 VDC 12 V with 1 kΩ external resistor: +5 ~ +12 VDC 24 V with 2 kΩ external resistor: +7 ~ +24 VDC		+3.5 ~ +30 VDC	+3.5 ~ +5 VDC
	Non-isolated	+2.4 ~ +5 VDC		-		+2.4 ~ +5 VDC	-
Off Voltage Level		+1 VDC Max.		+2 VDC Max.		+1 VDC Max.	+1 VDC Max.
Programmable Filter		2 us to 65 ms		-		1 ~ 32767 us	-
Programmable Threshold Voltage		+0.1 ~ +5 VDC		-		-	-
Counter/Encoder Bits		32-bit					
★ Counter Mode		Up		-		Up, Up/Down	Up
★ Encoder Mode		-		CW/CCW, Pulse/Dir., AB Phase			-
★ Frequency Mode		Yes		-		Yes	-
★ Virtual Battery Backup		-	Yes	-	Yes	Yes	-
Frequency Accuracy		1 Hz or 10 Hz		-		0.4% of Input Frequency	-
Max. Speed		100 KHz		1 MHz		200 KHz	1 MHz
Digital Output							
Channels		2		-			8
Type		Open Collector					PWM, TTL
Sink/Source (NPN/PNP)		Sink					Sink
Load Voltage		+3.5 ~ +30 VDC					+3.5 ~ +5 VDC
★ 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 VDC		2500 Vrms			
Power Consumption		2 W; 2.2 W for (D) version		1 W; 1.5 W for (D) version		2.0 W	2.4 W

2.3. tM Series Modules

• Introduction

The tM series is a family of network data acquisition and control modules with digital or analog I/O functions. The modules can be remotely controlled through an RS-485 serial bus by using DCON and Modbus RTU/ASCII 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.

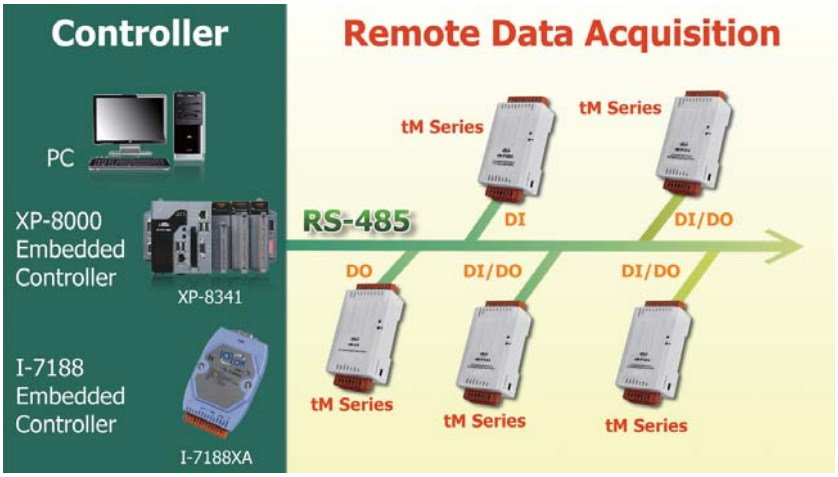
The tM series tiny RS-485 I/O modules support various I/O types, like photo-isolated digital input, power relay, photoMOS relay, open collector output, and analog input (voltage and current). Compared with the M-7000 series, the tM series is more cost-effective with low channel count design that is suitable for distributed I/O points applications.

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.

• Applications

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



• Features

- RS-485 Industrial Multi-Drop Network
- Programmable I/O Type and Range
- Easy Mounting and Connection
- Rugged Industrial Environment
- Dual Watchdog Design
- Programmable Power-on Value and Safe Value
- DI Latch Function
- Low Speed Counter
- Versatile Communication Protocols: DCON, Modbus RTU and Modbus ASCII
- Expandable Network
- Tiny Form Factor

• Selection Guide

tM - X(Y) Z(W)

X: Input Type
'P' = Photocoupler
'AD' = Analog Input
'TH' = Thermistor

Y: Number of Channels

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

W: Number of Channels

tM Series Models

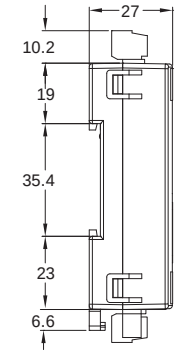
Model Name	Bus	Protocols	AI	AO	DI	DO
tM-AD5	RS-485	Modbus RTU Modbus ASCII DCON	5-ch (Differential, Voltage)	-	-	-
tM-AD5C			5-ch (Differential, Current)	-	-	-
tM-AD8			8-ch (Single-Ended, Voltage)	-	-	-
tM-AD8C			8-ch (Single-Ended, Current)	-	-	-
tM-AD4P2C2			2-ch (Single-Ended, Voltage) 2-ch (Single-Ended, Current)	-	2-ch (Source)	2-ch (NPN, Sink)
tM-DA1P1R1			-	1-ch (Single-Ended, Voltage)	1-ch (Sink/Source)	1-ch Form A Relay
tM-TH8			8-ch (Thermistor)	-	-	-
tM-P8			-	-	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
tM-R5			-	-	-	5-ch Form A Relay

• Hardware

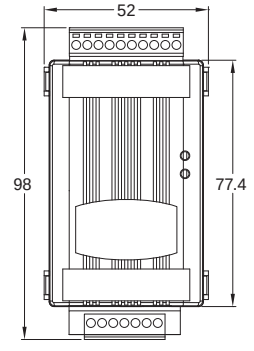
1. Installation

DIN-Rail Mounting

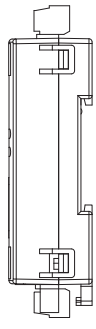
2. Dimensions (Units: mm)



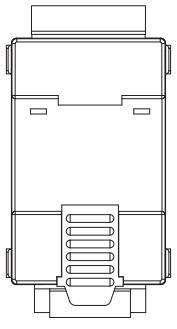
Left Side View



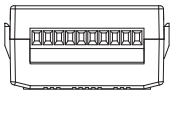
Front View



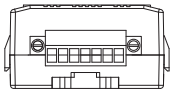
Right Side View



Rear View



Top View



Bottom View

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 DI 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 ~ +75°C
- RoHS Compliant and Halogen Free
- Made from Fire-retardant Materials (UL94-V0 Level)
- Easy DIN-Rail Mounting

System Specifications

Model Name	tM-AD5	tM-AD5C	tM-AD8	tM-AD8C	tM-TH8	tM-P8	tM-C8	tM-P4A4	tM-P4C4	tM-P3R3	tM-R5
	tM-AD4P2C2			tM-DA1P1R1							
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	2500 VDC					3750 VDC					
EMS Protection											
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal										
	±8 kV Air for Random Point										
EFT (IEC 61000-4-4)	±2 kV for Power										
Power Requirements											
Reverse Polarity Protection	Yes										
Powered from Terminal Block	Yes, 10 ~ 30 VDC										
Consumption	0.6 W		1.2 W			0.5 W Max.					
Mechanical											
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm										
Installation	DIN-Rail Mounting										
Environment											
Operating Temperature	-25 ~ +75°C										
Storage Temperature	-30 ~ +75°C										
Humidity	10 ~ 95% RH, Non-condensing										

I/O Specifications

Multi-function Module				
Model Name		**tM-AD4P2C2**		**tM-DA1P1R1**
Pictures				
Analog Input				
Channels		2	2	-
Wiring		Single-ended		
Input Range		±1 V, ±2.5 V, ±5 V, ±10 V	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	
Resolution		14/12		
Accuracy	Normal mode	0.1%		
	Fast mode	0.5%		
★ Sampling Rate	Normal mode	10 Hz total		
	Fast mode	200 Hz total		
Input Impedance		10 MΩ		
★ Overvoltage Protection		120 VDC		
Analog Output				
Channels		-		1
Wiring of Current Output				Sink
Range				0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
Resolution				12-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/Counter				
Input Channels		2		1
Contact		Wet Contact		
Sink/Source (NPN/PNP)		Source		Sink/Source
On Voltage Level		+3.5 VDC ~ 50 VDC		
Off Voltage Level		+1 VDC Max.		
Input Impedance		10 KΩ, 0.66 W		
Counters	Channels	4		
	Max. Count	65535 (16-bit)		
	Max. Input Frequency	100 Hz		
	Min. Pulse Width	5 ms		
Overvoltage Protection		70 VDC		
Digital Output				
Output Channels		2		-
Type		Isolated Open Emitter		
Sink/Source (NPN/PNP)		Sink		
Max. Load Current		700 mA/channel		
Load Voltage		3.5 VDC ~ 50 VDC		
Overvoltage Protection		60 VDC		
Overload Protection		Yes, 1.4 A		
Short Circuit Protection		Yes		
Power-on Value		Yes, Programmable		
Safe Value		Yes, Programmable		

Multi-function Module		
Model Name	**tM-AD4P2C2**	**tM-DA1P1R1**
Pictures		
Relay Output		
Output Channels	-	1
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 VAC or 30 VDC
Max. Load Current		16 A
Surge Strength		2500 VDC
Operate Time		15 ms
Release Time		5 ms
Electrical Endurance		10^7 ops.
Mechanical Endurance		5×10^4 ops.
★ Power-on Value		Yes, Programmable
★ Safe Value		Yes, Programmable

Analog Input Module						
Model Name		**tM-AD5**	**tM-AD5C**	**tM-AD8**	**tM-AD8C**	**tM-TH8**
Pictures						
Analog Input						
Channels		5		8		8
Wiring		Differential		Single-ended		Single-ended
Input Range		±1 V, ±2.5 V, ±5 V, ±10 V	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 500 mV, 0 ~ 1 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		14/12				16
Accuracy	Normal mode	0.1%				0.5%
	Fast mode	0.5%				-
★ Sampling Rate	Normal mode	10 Hz total				8 Hz total
	Fast mode	200 Hz total				-
Input Impedance		10 MΩ	125 Ω	20 MΩ	125 Ω	-
★ Overvoltage Protection		120 VDC				8
★ Open Wire Detection		-	Yes	-	Yes	Yes
★ Dual Watchdog		Yes				

Digital Input/Output Module					
Model Name		**tM-P4A4**	**tM-P4C4**	**tM-C8**	**tM-P8**
Pictures					
Digital Input/Counter					
Input Channels		4		-	8
Contact		Wet Contact	Wet Contact		Wet Contact
Sink/Source (NPN/PNP)		Sink	Source		Sink/Source
On Voltage Level		+3.5 VDC ~ 50 VDC			+3.5 VDC ~ 50 VDC
Off Voltage Level		+1 VDC Max.			+1 VDC 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 VDC			70 VDC
Digital Output					
Output Channels		4		8	-
Type		Isolated Open Emitter	Isolated Open Collector		
Sink/Source (NPN/PNP)		Source	Sink		
Max. Load Current		700 mA/channel			
Load Voltage		+10 VDC ~ +40 VDC	3.5 VDC ~ 50 VDC		
Overvoltage Protection		47 VDC	60 VDC		
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**	**tM-R5**
Pictures			NEW 
Digital Input/Counter			
Input Channels		3	-
Contact		Wet Contact	
Sink/Source (NPN/PNP)		Sink/Source	
On Voltage Level		+3.5 VDC ~ 50 VDC	
Off Voltage Level		+1 VDC 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 VDC	
Relay Output			
Output Channels		3	5
Type		Power Relay, Form A (SPST N.O.)	
Operating Voltage Range		250 VAC or 30 VDC	
Max. Load Current		5 A	
Operate Time		6 ms	
Release Time		3 ms	
Electrical Life (Resistive load)	VDE	5 A @250 VAC 30,000 ops (10 ops/minute) at 75°C	
		5 A @30 VDC 70,000 ops (10 ops/minute) at 75°C	
	UL	5 A @250 VAC/30 VDC 6,000 ops	
		3 A @250 VAC/30 VDC 100,000 ops	
Mechanical Life		20,000,000 ops at no load (300 ops/minute)	
★ Power-on Value		Yes, Programmable	
★ Safe Value		Yes, Programmable	

Ordering Information

tM-AD4P2C2 CR	4-channel Isolation Analog Input, 2-channel Isolation Digital Input and 2-channel Isolation Digital 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-DA1P1R1 CR	1-channel Isolation Analog Output, 2-channel Isolation Digital Input and 2-channel Relay Output Module (RoHS)
tM-TH8 CR	8-channel Isolation Thermistor Input Module with High Voltage Protection (RoHS)
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-R5 CR	5-channel Relay Output Module (RoHS)

Related Products

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

2.4. RS-485 I/O Expansion Unit

Patent

Taiwan	096134568
China	200710181138.6
USA	11/979,474
Germany	102007053078.3 pending

• Introduction

The RU-87Pn series, RS-485 remote I/O expansion unit, is designed to acquire and control remote I/O through RS-485 connections. It comprises

- A CPU module with none-volatile memory to backup/restore I/O module configurations; LED indicators to diagnose the I/O module; and a RS-485 port for 1.2 Km long distance communication.
- A power module
- A backplane with a number of I/O slots for flexible I/O configuration.

With its patented technologies, namely auto configuration and hot swap, it saves lots of labor on the set up and maintenance of the automation systems. Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

Furthermore, with the RS-485 network communication interface and more than 30 I/O modules for choice, users can apply the unit to nearly any automation system.

• Features

1. Hot Swap

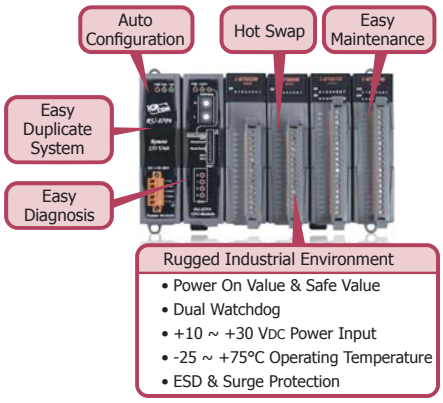
Reliable 3-piece construction enables users to hot swap modules during operation, without rewiring. All I/O module data are backed up in the non-volatile memory of the RU-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

2. Auto Configuration

The I-87K I/O modules can be pre-configured and backed up in the non-volatile memory of the RU-87Pn. When the RU-87Pn is power on or plugged in, the RU-87Pn will automatically checks and restores these configurations to each I-87K I/O modules on it.

3. Easy Duplicate System

Using the DCON Utility, you can easily make a backup of the I-87K module configurations and write to another RU-87Pn. This design can easily and quickly duplicate many RU-87Pn.



4. Easy Maintenance and Diagnosis

The basic configurations (includes station number, baudrate) are set by the rotary and DIP switches. The operator can use only one screwdriver to set the RU-87Pn. And there are several LED status indicators to show whether I-87K modules are configured and work properly.

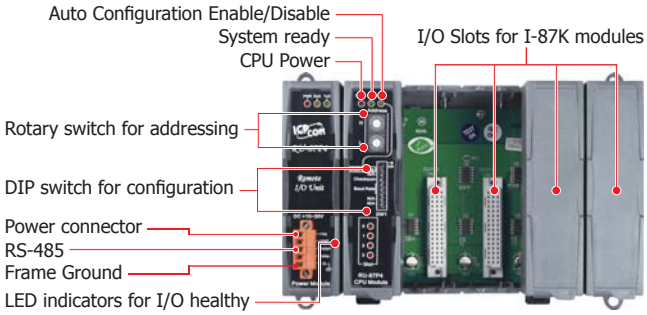
If one I-87K module fails, the operator just needs to replace it with one good I-87K module with the same item number. And then checks the LED indicators to know whether the replacement is performed correctly. The switch and LED design makes it easy for maintenance. There is no PC and Notebook needed.

5. Communication

- RS-485 industrial multi-drop network
  The RU-87Pn uses the industrial EIA RS-485 communication to transmit and receive data over long distance (1.2 Km).
- **DCON protocol**
  I-87K series I/O modules plugged in a RU-87Pn provides a simple command/response protocol (named DCON protocol) for communication. All command/response are in easy use ASCII format.

Appearance

RU-87P4



For more details, refer to **PAC Product Catalog**

RU-87P1 RU-87P4

RU-87P2 RU-87P8

Features

- One RS-485 Port for Multi-Drop Topology
- Hot Swap Allowed
- Auto Configuration
- LED Indicators for Fault Detection
- Switches to Configure Communication
- DCON Protocol
- 1/2/4/8 I/O Slots for I-87K Modules
- Operating Temperature: -25 ~ +75°C

Specifications

Models	RU-87P1	RU-87P2	RU-87P4	RU-87P8
Interface Type (RS-485)				
Baud Rate	115200 bps maximum			
Distance	1.2 km (4000 ft) maximum			
Isolation	3000 VDC			
ESD Protection	+/-4 K Contact Discharge and +/-8 K Air Discharge			
Communication Protocol	DCON Protocol (ASCII Format)			
Switch				
Rotary Switch	x2, For RS-485 address			
DIP Switch	8-bit × 1, For auto configuration, check sum and baud rate			
LED Indicators				
Power	Yes			
System Ready	Yes			
Auto Configuration	Yes			
Slot Status	Yes			
I/O Expansion Slots				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module only			
Slots Numbers	1	2	4	8
Mechanical				
Dimensions (W x L x H)	64 mm x 120 mm x 110 mm	95 mm x 132 mm x 111 mm	188 mm x 132 mm x 111 mm	312 mm x 132 mm x 111 mm
Installation	DIN-Rail or Wall Mounting			
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	+10 ~ +30 VDC			
Reverse Polarity Protection	Yes			
Isolation	1000 VDC			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	30 W

Ordering Information

RU-87P1 CR	1 slot I/O Expansion Unit (RoHS)
RU-87P2 CR	2 slots I/O Expansion Unit (RoHS)
RU-87P4 CR	4 slots I/O Expansion Unit (RoHS)
RU-87P8 CR	8 slots I/O Expansion Unit (RoHS)

2.5. Termination Resistor/DC Bias Voltage

tM-SG4

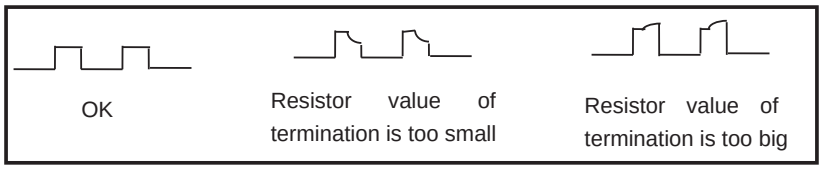
The RS-485 Bias and Termination Resistors Module

Features

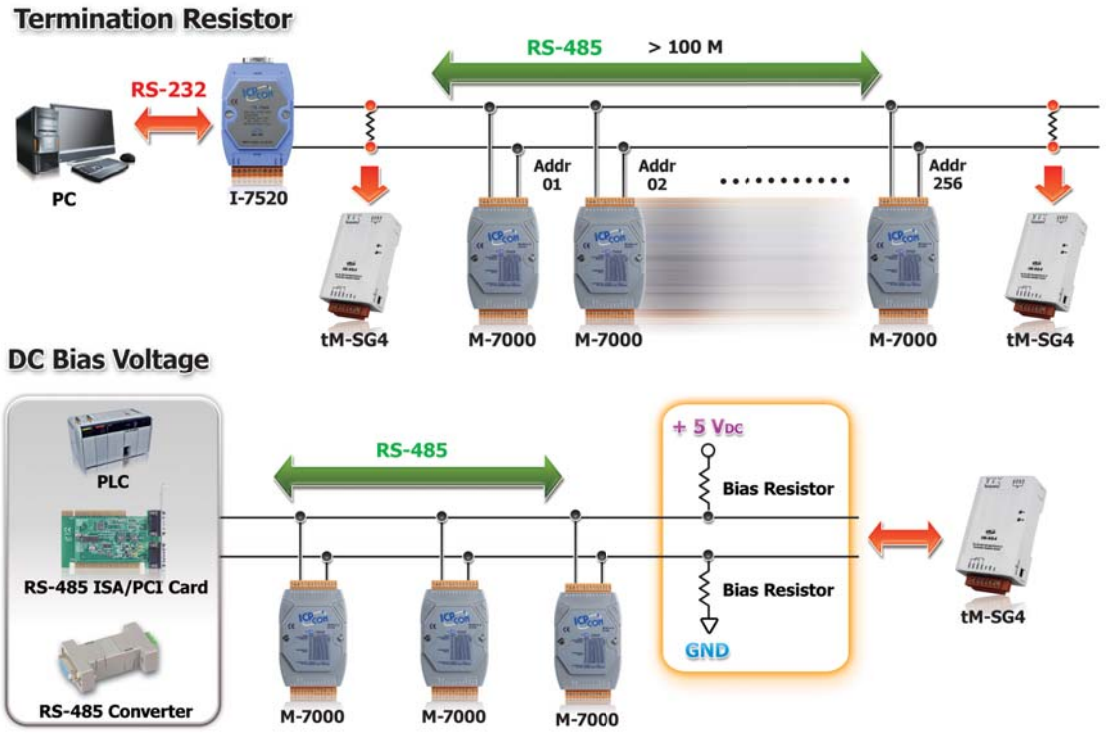
- Switch-selectable Bias Resistors
- 15-step Switch-selectable Termination Resistor
- LED Indicator for Power/Termination
- DIN-Rail Mountable
- Cost-effective
- Wide Operating Temperature Range: -25 ~ +75°C

Introduction

The tM-SG4 is an optional module that is used to improve the communication of RS-485 network. It provides switch selectable bias resistors on RS-485 network. It also has 15-step switch selectable termination resistor such that the user can select a proper termination resistor to be connected to the RS-485 network easily. If the RS-485 network is not over 100 meters, the termination resistors are not needed. Otherwise, it may be necessary to insert two termination resistors at both end of the RS-485 network. It is not easy to calculate the value of a termination resistor on the RS-485 network. The best way to do this is to use an oscilloscope to check the RS-485 signal directly. If the impedance match of RS-485 network is OK, the oscilloscope will show a very nice square wave. If these square wave signals are distorted, the user will need to insert two termination resistors at both end of the RS-485 network.



Applications



System Specifications

RS-485 Interface	
Bias Resistor	1 kΩ, 10 kΩ, 100 kΩ, Switch-selectable
Termination Resistor	15 Steps, 65 ~ 560 Ω
LED Indicators	
Power	1 Red LED as Power Indicator
Termination Resistor	1 Green LED as Termination Indicator
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal
Power Requirements	
Reverse Polarity Protection	Yes
Powered from Terminal Block	Yes, 10 ~ 30 V_{DC}
Consumption	0.5 W Max.
Mechanical	
Dimensions (W x L x H)	52 mm x 87 mm x 27 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-40 ~ +85°C
Humidity	10 ~ 90% RH, Non-condensing

Termination Resistor Settings

120R	330R	470R	560R	Termination Resistance (Ω)
ON	ON	ON	ON	65
ON	ON	ON	OFF	74
ON	ON	OFF	ON	76
ON	OFF	ON	ON	81
ON	OFF	OFF	ON	99
ON	OFF	ON	OFF	96
ON	ON	OFF	OFF	88
ON	OFF	OFF	OFF	120
OFF	OFF	ON	ON	144
OFF	ON	ON	OFF	193
OFF	ON	OFF	ON	207
OFF	ON	OFF	OFF	330
OFF	OFF	ON	ON	256
OFF	OFF	ON	OFF	470
OFF	OFF	OFF	ON	560

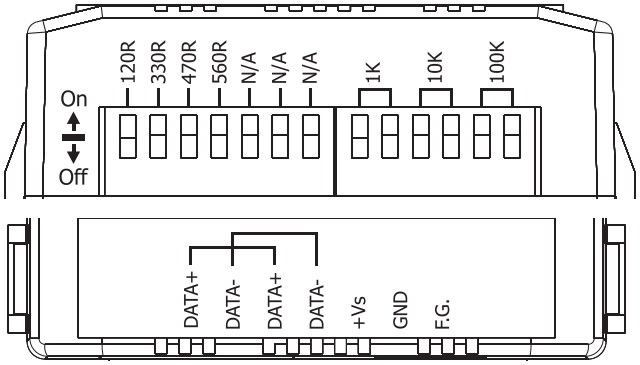
Termination Resistor On/Off Switch

OFF	Termination Resistor do NOT work.
ON	Termination Resistor is worked, and TR LED is light.

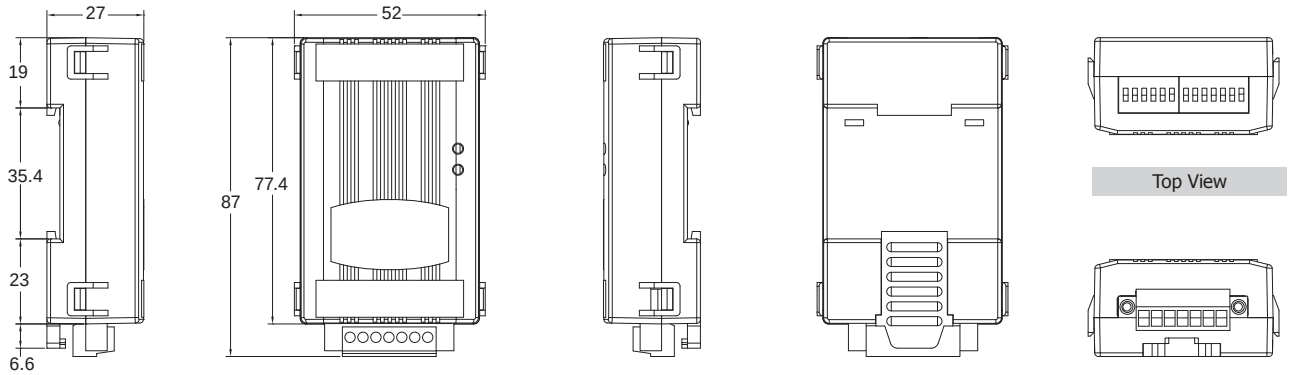
Bias Resistor Settings

1k	10k	100k	RS-485 Data Line Status
OFF	OFF	OFF	No bias resistor on RS-485 data line
ON	OFF	OFF	1k Ω bias resistor
OFF	ON	OFF	10k Ω bias resistor
OFF	OFF	ON	100k Ω bias resistor

Pin Assignments



Dimensions (Units: mm)



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

Ordering Information

tM-SG4 CR	RS-485 Bias and Termination Resistor Module (RoHS)

2.6. Converter/Repeater/Hub/Splitter

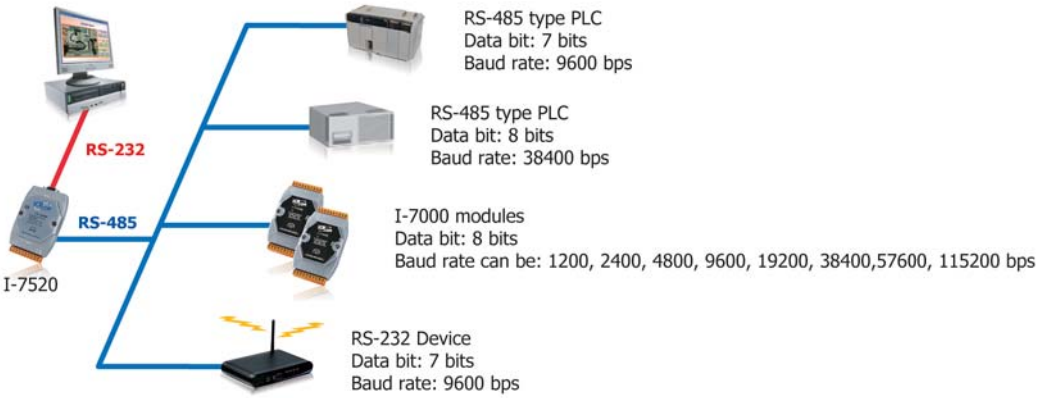
ICP DAS Self-Tuner ASIC Features:
- Multiple Baud Rate
- Multiple Data Format
- Automatic RS-485 Direction Control

▲ I-7520

"Self-Tuner"

A conventional RS-232 to RS-485 converter uses the DIP switch to select the baud rate and data format for the whole RS-485 network. All modules, devices and equipments in the network should be configured to the same baud rate and data format. Unfortunately most real world applications can't be implemented in such a simple way. The Self-Tuner is an innovative chip designed to solve this problem. Every converter contains a Self-Tuner chip. The chip automatically tunes the baud rate and data format to the whole network. Therefore the I-7520 can connect to modules, devices and equipments with different baud rates and data formats in a network.

Furthermore, the RS-485 is a 2-wire half-duplex network. To transmit and receive data via the twiced pair wire, a transmission direction control for the RS-485 is needed. In conventional designs, software has to switch a hardware handshaking signal such as RTS (Request To Send) to control the transmission direction. The Self-Tuner chip automatically detects and controls the direction of the transmission of the RS-485 network. So the application program does not have to care about the direction control.



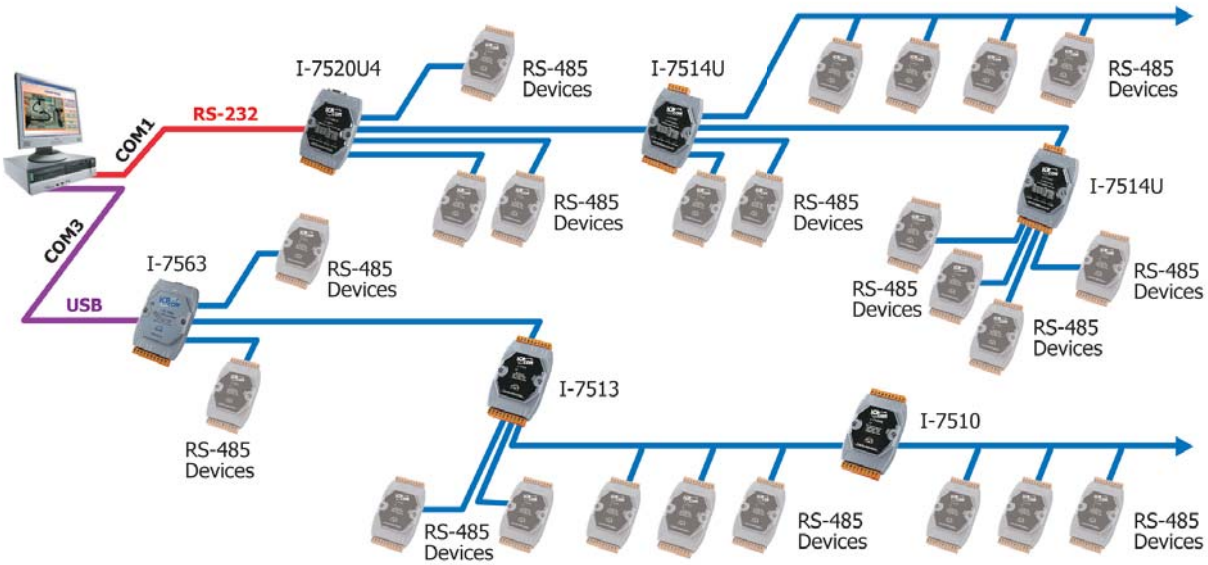
▲ I-7520U4

▲ I-7514U

High Quality Isolated RS-485 Repeater/Hub/Splitter

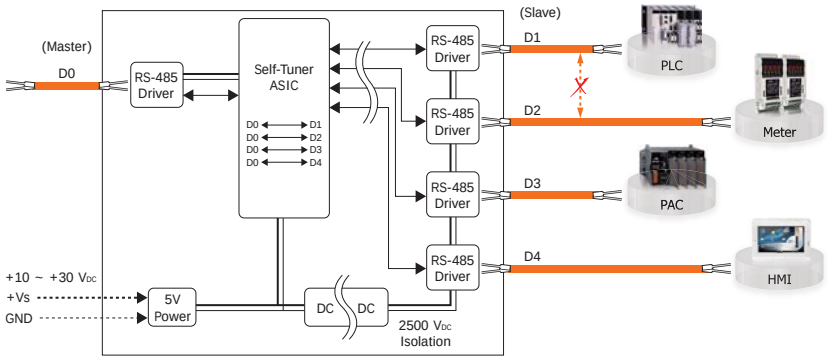
The maximum effective distance of RS-485 without repeater is 1200 meters (4000 feet) at baud rates up to 9.6 Kbps and up to 32 (256) nodes can be connected. With the professional design, the repeater I-7510 solves the problem of signal weakening and extends the maximum effective distance by 1200m and connects 32 (256) nodes more. And it has optical isolation design for lightning and surge protection. If the RS-485 topology is too complex to make the communicating well, a RS-485 hub or splitter is recommended.

I-7520U4 and I-7514U are multichannel RS-485 repeater/hub/splitter. Each channel is independent and has optical isolation, short circuit and open circuit protection. Thus when one channel fails, it will not affect another channel of the hub. The features make it perfect to star type or mixed type topology in complex and large scale RS-485 network.



The following block diagram shows how I-7514U was designed as independent channel. Data coming from the master input will be transmitted to all four RS-485 slave channels. But data coming from the slave channels will be returned to the master input only. Thus reduces the possibility of interference between each RS-485 slave loop and makes the RS-485 networks more robust and reliable.

▶ I-7514U Block Diagram



RS-232/422/485 Converter/Repeater

Model Name	tM-7520U	I-7520	I-7520R	I-7520A	I-7520AR	I-7551	tM-7510U	I-7510	I-7510A	I-7510AR
Pictures	NEW 						NEW 			
Function	Converter						Repeater			
Interface	RS-232 to RS-485			RS-232 to RS-422/485		RS-232 to RS-232	RS-485	RS-485	RS-422/485	
Isolation	2500 VDC RS-232 side	3000 VDC RS-232 side	3000 VDC RS-485 side	3000 VDC RS-232 side	3000 VDC RS-422/485 side	3000 VDC 3 ways	2500 VDC	3000 VDC		3000 VDC 3 ways
Operating Temperature	-25 ~ +75°C									

USB to RS-232/422/485 Converter

Model Name	I-7560	I-7561	tM-7561
Pictures			NEW 
Function	Converter	Converter	Converter
Interface	USB to RS-232	USB to RS-232/422/485	USB to RS-485
Isolation	-	3000 VDC	2500 VDC
Operating Temperature	-25 ~ +75°C		

USB RS-232/485 to RS-485 Hub

Model Name	I-7563	I-7513	I-7520U4	I-7514U
Pictures			NEW 	NEW 
Function	3-CH Hub/Splitter	3-CH Hub/Splitter/Repeater	4-CH Hub/Splitter	4-CH Hub/Splitter/Repeater
Interface	USB to 3-CH RS-485	RS-485 to 3-CH RS-485	RS-232 to 4-CH RS-485	RS-485 to 4-CH RS-485
Isolation	3000 VDC	3000 VDC 3 ways	2500 VDC RS-232 side	2500 VDC CH1-CH4 side
Operating Temperature	-25 ~ +75°C			

More products refer to Industrial Communication & Networking Products Catalog

- Multi-port Serial Cards
- Programmable Device Servers (Serial-to-Ethernet)
- Converters, Repeaters and Hubs
- Fieldbus Solutions
- Ethernet Switches

Ethernet I/O Products

3

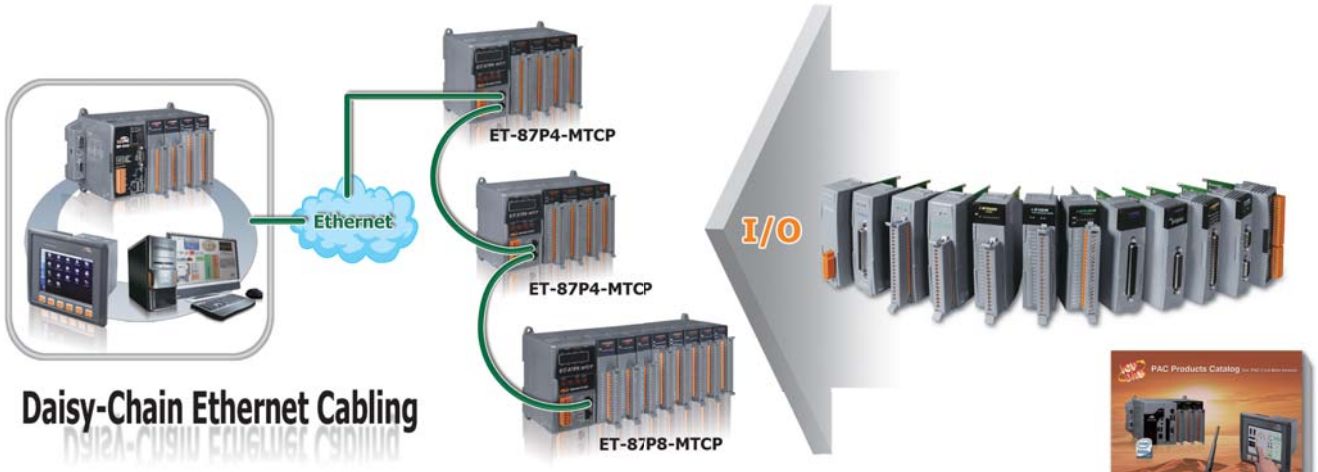
3.1. Overview

Although the RS-485 remote I/O module is still selling well, we found more and more demand of Ethernet based remote I/O modules. Our Ethernet remote I/O modules support Modbus TCP, Modbus UDP protocol. We also provide web HMI, Web server, OPC server, security mechanism..etc. According to different application, we have developed various Ethernet I/O units and modules, such as compact size ET-87Pn-MTCP (ch3.2), palm-size ET-7000/PET-7000/PET-7000-48V series (ch3.3), PET-7000/PEE-7000-48V series (ch3.4) and tiny-size tET/tPET series (Ch3.5). The module has diversified I/O interface, such as overvoltage-protection analog input module, relay output, digital input/output, counter, timer...etc.

The brief comparison is as the following table. Besides those regular Ethernet I/O modules, we will release EtherCAT, Ethernet/IP and PROFINET I/O modules.

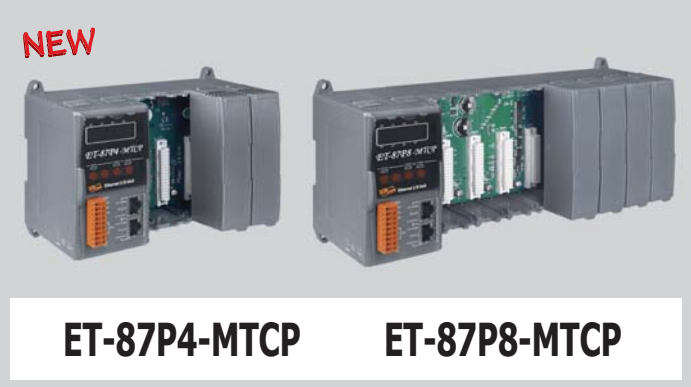
Model Name	tET/tPET Series	ET-7000 PET-7000 PET-7000-48V	PEE-7000 PEE-7000-48V
Pictures			
Communication			
Ethernet	10/100 M, RJ-45 x 1		10/100 M, RJ-45 x 2
Protocol	Modbus TCP, Modbus UDP		
Security	Web Password and IP Filter	ID, Password and IP Filter	
Max. Sockets	5	12	
Web Server	Yes	Yes	
User-defined Web pages	-	Yes (Web HMI)	
I/O			
I/O pins	10 pins	21 pins	26 pins
DI Counter	32-bit, 3.5 kHz	32-bit, 500 Hz	
Pair Connection	Yes (Polling/Push Mode)	Yes (Polling Mode)	
Mechanical			
Dimensions (W x L x D)	52 mm x 98 mm x 27 mm	72 mm x 123 mm x 35 mm	76 mm x 120 mm x 38 mm

Further more, we also developed ET-87Pn-MTCP, a series of Ethernet remote I/O unit for compact and modular I/O expansion. It comprises a CPU, a power module and a backplane with a number of I/O slots for flexible I/O configuration.



For more details of the available modules (I-87K series) for ET-87Pn-MTCP, refer to **PAC Product Catalog**

3.2. Modbus TCP I/O Expansion Unit



Features

- Two Ethernet Ports for Daisy-Chain Topology
- Supports Modbus TCP
- Supports Modbus RTU/ASCII
- Supports Modbus TCP to RTU Gateway
- Auto Configuration
- 4/8 I/O Slots for I-87K Series Modules
- Operating Temperature: -25 ~ +75 °C

Introduction

ET-87Pn-MTCP series is a Modbus TCP I/O expansion unit to expand I-87K series I/O modules over the Ethernet for industrial monitoring and controlling applications. It offers two Ethernet switch ports for daisy-chain topology. The daisy-chain feature allows ET-87Pn to connect in series to each other or other Ethernet devices. Users can easily simplify the cabling and save installation space with the feature.

It is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 VDC), isolated power input and can operate under wide temperature (-25 ~ +75°C). There are more than 50 I/O modules supported with the unit, including analog input/output, digital input/output, DI counter modules. To simplify installation and maintenance of I/O modules, it provides many useful features, such as: auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

Modbus is a very wide known protocol in the industrial manufacturing and environment monitoring fields. Many SCADA software, HMI and PLC has builtin driver to support Modbus devices. Besides, we also provide SDK on different platforms, such as Windows XP, Window CE 5.0/6.0, Linux, MiniOS7. Therefore, it is very easy to integrate remote I/O to customer's applications.

System Specifications

Models	ET-87P4-MTCP	ET-87P8-MTCP
Communication Ports		
Protocol	Modbus TCP Slave	
	Modbus RTU/ASCII Slave	
	Modbus TCP to RTU Gateway	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto negotiating, Auto MDI/MDI-X, LED indicators)	
COM 1	RS-232 (to update firmware) (RxD, TxD and GND); non-isolated	
SMMI		
LED Display	Yes, 5-Digit LED Display	
Push Buttons	4	
I/O Expansion Slots		
Slot Number	4	8
	Note: For High Profi I-87K Modules Only	
Mechanical		
Dimensions (W x H x D)	188 mm x 132 mm x 111 mm	312 mm x 132 mm x 111 mm
Installation	DIN-Rail or Wall Mounting	
Environmental		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-30 ~ +80 °C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 VDC	
Isolation	1 kV	
Redundant Power Inputs	Yes	
Capacity	30 W	
Consumption	2 W	2.4 W

3.3. ET-7000/PET-7000/PET-7000-48V Series (Web based)

• 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.

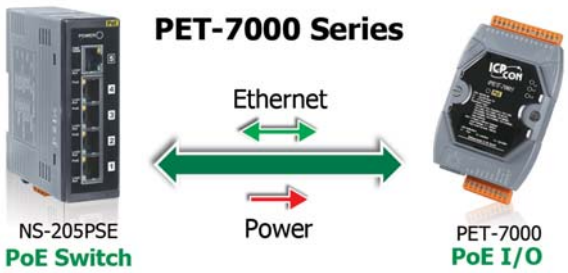
Besides Web HMI function, no more programming or HTML skills are required; creating dynamic and attractive web pages for I/O monitoring and I/O control would be fun to engineers ever after. The ET-7000/PET-7000 offers easy and safe access for users from anytime and anywhere! In addition, the ET-7000/PET-7000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

Furthermore, PET-7000 features "PoE" that not only Ethernet 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.

• Features

1. Power over Ethernet (PoE)

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



2. 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.

3. Support for both Modbus TCP and Modbus UDP Protocols

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

4. 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.

5. 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.

6. Highly Reliable UnderHarsh Environmen

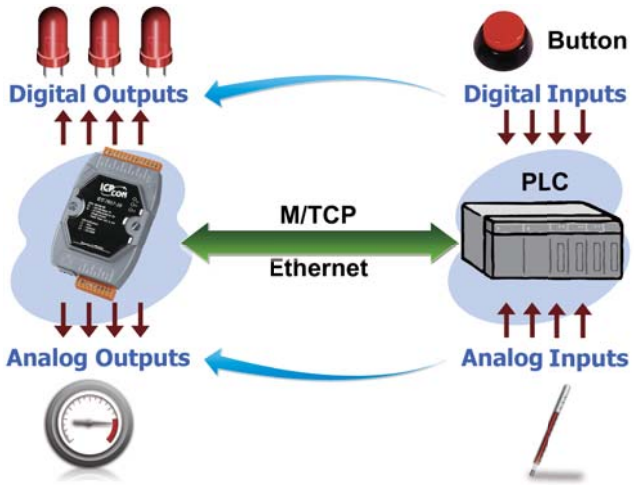
- Wide Operating Temperature Range: -25 ~ +75°C
- Storage Temperature: -30 ~ +80°C
- Humidity 10 ~ 90% RH (Non-condensing)

7. 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.



8. 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.

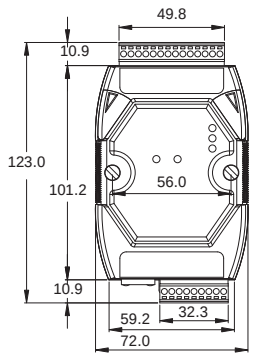
9. Web HMI

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.

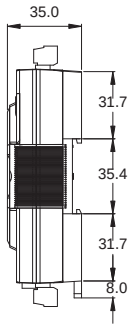
10. Built-in Web Server

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.

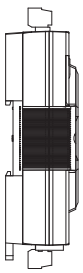
11. Dimensions (Units: mm)



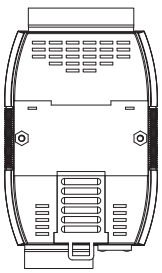
Front View



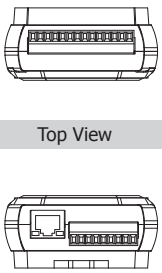
Left Side View



Right Side View



Rear View



Top View

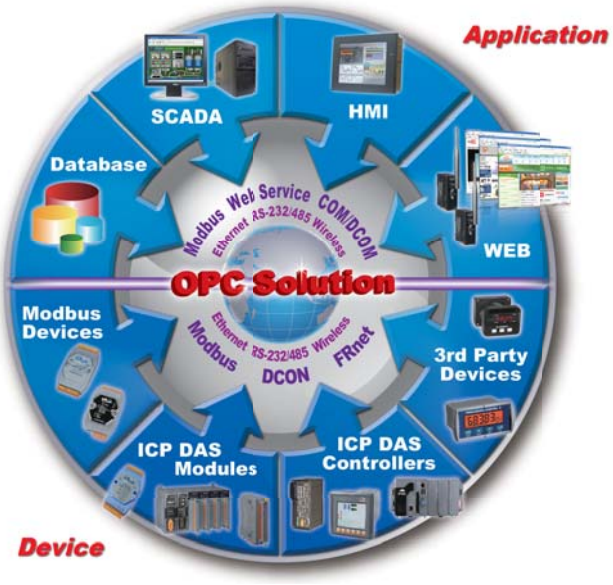
Bottom View

• Software Support

Our free charge software utility and development kit include

1. OPC Server

NAPOPC_ST DA Server is a **free** OPC DA Server ("**OPC**" stands for "OLE for Process Control" and "**DA**" stands for "Data Access") for ICP DAS products. Based on Microsoft's OLE COM (component object model) and DCOM (distributed component object model) technologies, NAPOPC_ST DA Server defines a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate the interoperability.
Using NAPOPC_ST DA Server, system integrates data with SCADA/HMI/Database software on the same computer and others. SCADA/HMI/Database sends 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 http://opc.icpdas.com

2. EZ Data Logger

EZ Data Logger is the software that ICP DAS provides for users to easily build a small 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!

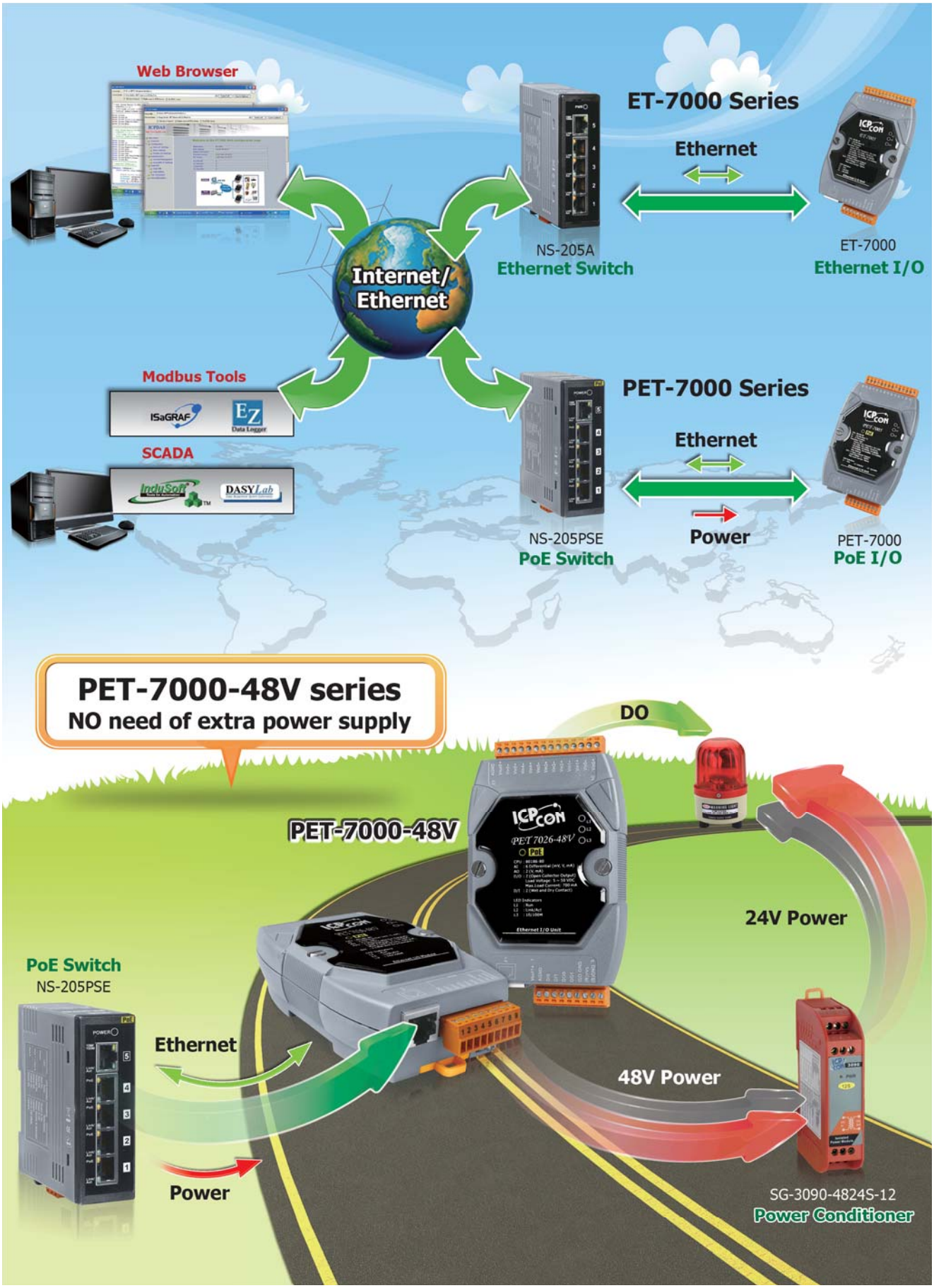
EZ Data Logger is a small data logger software. It can be applied to small remote I/O system. With its user-friendly interface, users can quickly and easily build a data logger software without any programming skill.

3. Modbus Software Development Toolkits

Plenty of library functions and demo programs are provided to let user develop programs easily under Windows, Linux and MiniOS7 operating systems.

OS	Development Language	SDK
MiniOS7	TC, BC	MBT7_xxx.lib, MBT8_xxx.lib and Demos
WinCE 5.0/6.0	VS .NET 2005/2008	nModbusCE.dll and Demos
WES 2009, Windows XP/Vista/7	VS .NET 2005/2008	nModbus.dll and Demos
	LabView	Demos
Linux	C	Libraries and Demos

• Difference between ET-7000, PET-7000 and PET-7000-48V



• Selection Guide

Analog Input Model

Model Name	AI			DO		
	Channel	Voltage and Current Input	Sensor Input	Channel	Type	Sink/Source
ET-7005 PET-7005 PET-7005-48V	8	-	Thermistor	4	Open Collector	Sink
ET-7015 PET-7015 PET-7015-48V	7	-	RTD: Pt100, Pt1000, Ni120, Cu100, Cu1000	-	-	-
ET-7017 PET-7017 PET-7017-48V	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 PET-7017-10-48V	10/20	+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-	-	-	-
ET-7018Z PET-7018Z PET-7018Z-48V	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, and $L_{DIN43710}$	6	Open Collector	Sink
ET-7019 PET-7019 PET-7019-48V	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, and $L_{DIN43710}$	4	Open Collector	Sink
ET-7019Z PET-7019Z PET-7019Z-48V	10			6		

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

Multi-function I/O

Model Name	AI			AO		DI/Counter		DO	
	Channel	Voltage and Current Input	Sensor Input	Channel	Voltage and Current Output	Channel	Contact	Channel	Type
ET-7002 PET-7002 PET-7002-48V	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 PET-7016-48V	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 (Note)	0 ~ 10V	2	Wet (Sink,Source)	2	Open Collector (Sink)
ET-7026 PET-7026 PET-7026-48V	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)

Note: The AO is configured as a volage excitation source for the strain gauge.

Digital I/O

Model Name	DI/Counter			DO			
	Channel	Contact	Sink/Source	Channel	Type	Sink/Source	Max. Load Current @ 25°C
ET-7042 PET-7042 PET-7042-48V	-	-	-	16	Open Collector	Sink	100 mA/channel
ET-7044 PET-7044 PET-7044-48V	8	Wet	Sink, Source	8	Open Collector	Sink	300 mA/channel
ET-7050 PET-7050 PET-7050-48V	12	Wet	Sink, Source	6	Open Collector	Sink	100 mA/channel
ET-7051 PET-7051 PET-7051-48V	16	Wet	Sink, Source	-	-	-	-
ET-7052 PET-7052 PET-7052-48V	8	Wet	Sink, Source	8	Open Collector	Source	650 mA/channel
ET-7053 PET-7053 PET-7053-48V	16	Dry	Source	-	-	-	-
ET-7055 PET-7055 PET-7055-48V	8	Dry, Wet	Sink, Source	8	Open Collector	Source	650 mA/channel

Relay Output & Digital Input

Model Name	Relay Output				DI/Counter		
	Channel	Relay	Type	Max. Load Current @ 25°C	Channel	Contact	Sink/Source
ET-7060 PET-7060 PET-7060-48V	6	Power Relay	Form A (SPST N.O.)	5.0 A/channel	6	Wet	Sink, Source
ET-7062 PET-7062 PET-7062-48V	2	Power Relay	Form C (SPDT)	5.0A, TV-5 rated/channel	6	Wet	Sink, Source
ET-7065 PET-7065 PET-7065-48V	6	PhotoMOS Relay	Form A	1.0 A/channel	6	Wet	Sink, Source
ET-7066 PET-7066 PET-7066-48V	8	PhotoMOS Relay	Form A	1.0 A/channel	-	-	-
ET-7067 PET-7067 PET-7067-48V	8	Power Relay	Form A (SPST N.O.)	5.0 A/channel	-	-	-

ET-7002 **PET-7002**
PET-7002-48V

3-channel Analog Input and DIO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - AI: 3 Channels with 240 V_{rms} Overvoltage Protection
  - DI/Counter: 6 Channels
  - Power Relay: 3 Channels

Introduction

The ET-7002/PET-7002/PET-7002-48V is a multi-function module with 3-channel analog inputs, 6-channel digital inputs and 3-channel relay outputs. It provides various programmable 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 a proper range with 240 V_{rms} high voltage protection. Each analog input/output can be programmed to accept current or voltage as input/output depending upon the position of corresponding jumper. The 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.

System Specifications

Models	ET-7002	PET-7002	PET-7002-48V
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		
★ PoE	-	Yes	
★ 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			
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	
Power Output	-	-	48 V_{DC}, 10 W
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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

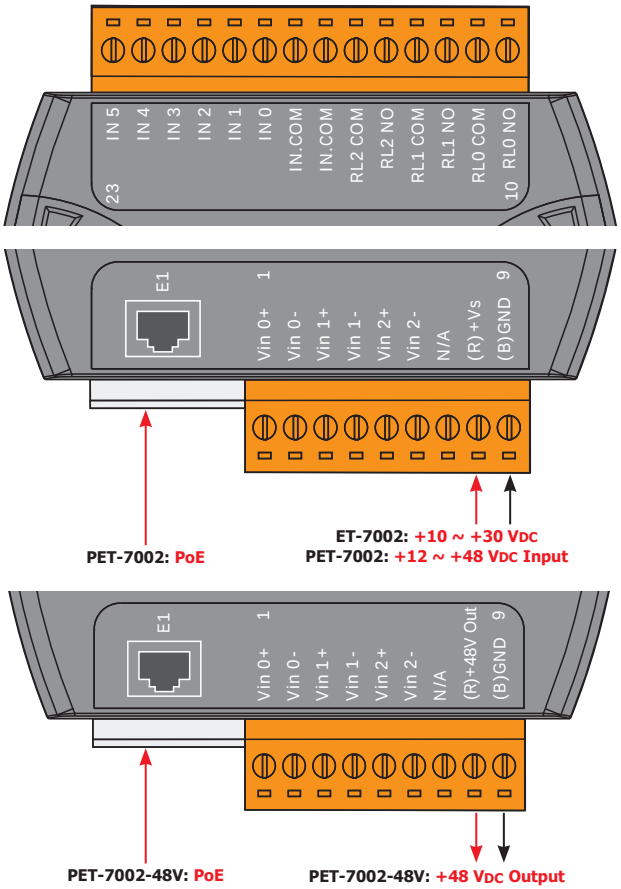
I/O Specifications

Analog Input			
	Channels		3 (Differential)
★	Type		+/-150 mV, +/-500 mV, +/-1 V, +/-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/Second (Total)
		Fast Mode	60 Samples/Second (Total)
	Accuracy	Normal Mode	+/-0.1%
		Fast Mode	+/-0.5% or better
	Zero Drift		+/-20 μV/°C
	Span Drift		+/-25 ppm/°C
★	Overvoltage Protection		240 Vrms
★	Overcurrent Protection		50 mA Max. at 110 VDC/VAC Max.
	Input Impedance	Voltage	2 MΩ
		Current	125 Ω
	Common Mode Rejection		86 dB Min.
	Normal Mode Rejection		100 dB
Digital Input/Counter			
	Channels		6
	Contact		Wet Contact
	Sink/Source (NPN/PNP)		Sink/Source
	On Voltage Level		+10 VDC ~ +50 VDC
	Off Voltage Level		+4 VDC 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 VDC
Power Relay			
	Channels		3
	Type		Power Relay, Form A (SPST N.O.)
	Operating Voltage Range		250 VAC/30 VDC
	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 VAC 30,000 ops (10 ops/minute) at 75°C.
			5 A @ 30 VDC 70,000 ops (10 ops/minute) at 75°C.
		UL:	5 A @ 250 VAC/30 VDC 6,000 ops.
			3 A @ 250 VAC/30 VDC 100,000 ops.
	Mechanical Life		20,000,000 ops. at no load (300 ops./minute).
	Intra-module Isolation, Field-to-Logic		3750 VDC
★	Power-on Value		Yes, Programmable
★	Safe Value		Yes, Programmable

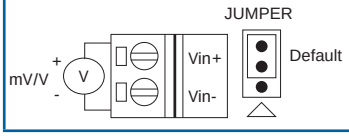
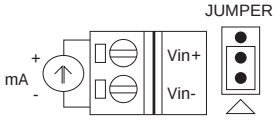
Accessories

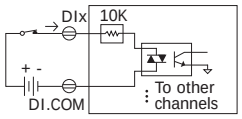
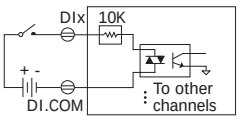
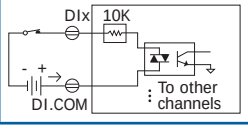
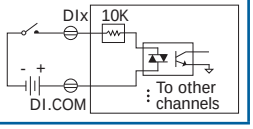
 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 24 VDC Input (RoHS)
 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)

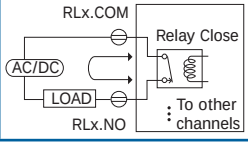
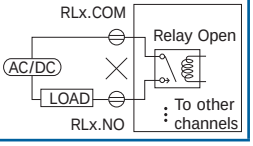
Pin Assignments



Wire Connections

Voltage Input	Current Input
	

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

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

Ordering Information

ET-7002 CR	3-channel Analog Input and DIO Module (RoHS)
PET-7002 CR	3-channel Analog Input and DIO Module with PoE (RoHS)
PET-7002-48V CR	3-channel Analog Input and DIO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7005 PET-7005 PET-7005-48V

8-channel Thermistor Input and DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - Thermistor Input: 8 Channels
  - DO: 4 Channels

Introduction

ET-7005/PET-7005/PET-7005-48V 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 VDC intra-module isolation and 110 VDC/VAC overvoltage protection for thermistor on ET-7005/PET-7005 makes itself running with higher reliability.

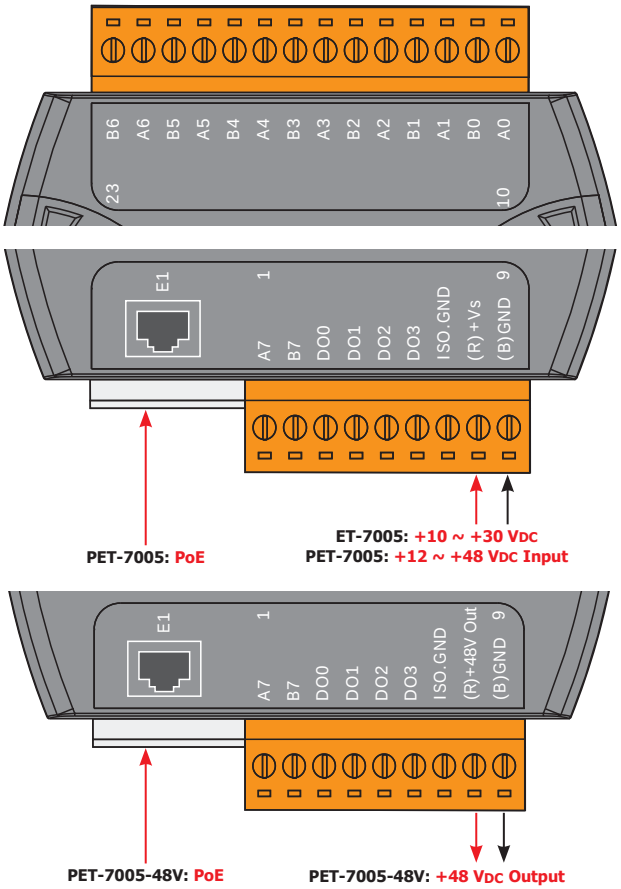
System Specifications

	Models	ET-7005	PET-7005	PET-7005-48V
	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		
★	PoE	-	Yes	
★	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			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

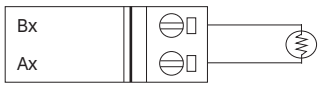
	Thermistor Input	
	Channels	8 (Differential)
★	Sensor Type (thermistor)	Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User-defined
★	Individual Channel Configuration	Yes
	Resolution	16-bit
	Sampling Rate	10 Sample/Second (Total)
	Accuracy	+/-0.1% or better
	Zero Drift	+/-20 μV/°C
	Span Drift	+/-25 ppm/°C
★	Overvoltage Protection	110 VDC/VAC
	Common Mode Rejection	86 dB
	Normal Mode Rejection	100 dB
	Open Wire Detection	Yes
	Digital Output	
	Channels	4
	Type	Isolated Open Collector
	Sink/Source (NPN/PNP)	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

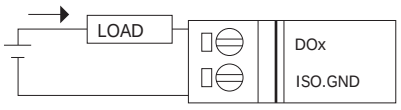
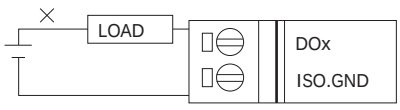
Pin Assignments



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 DO Module (RoHS)
PET-7005 CR	8-channel Thermistor Input and DO Module with PoE (RoHS)
PET-7005-48V CR	8-channel Thermistor Input and DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)


ET-7015 **PET-7015**
PET-7015-48V

7-channel RTD Input Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - RTD Input: 7 Channels

Introduction

ET-7015/PET-7015/PET-7015-48V is specifically designed for long-distance RTD measurement. It features automatic compensation for three-wire RTD regardless of the length of wires and provides 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 VDC intra-module isolation.

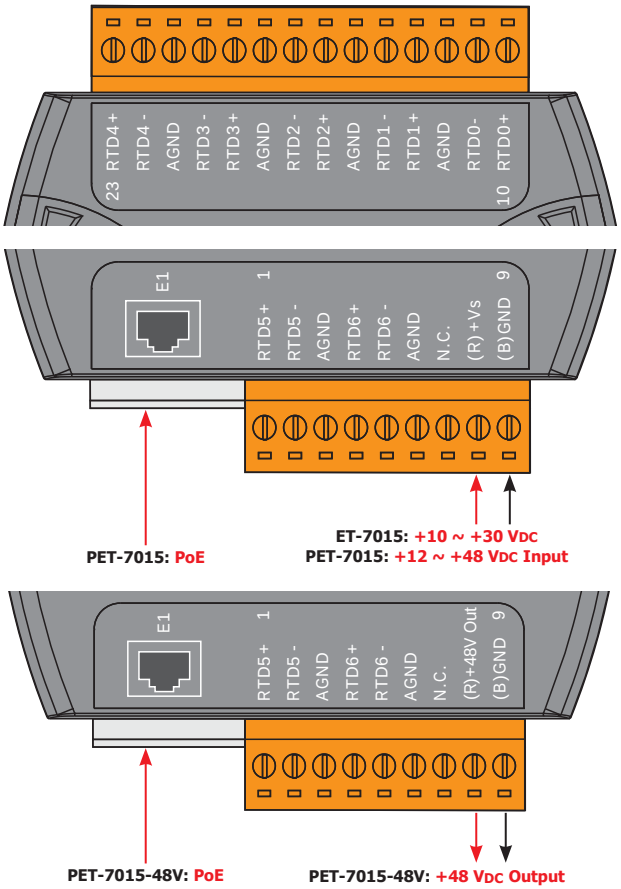
System Specifications

	Models	ET-7015	PET-7015	PET-7015-48V
	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		
★	PoE	-	Yes	
★	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			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

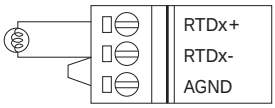
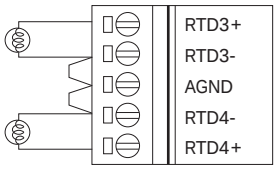
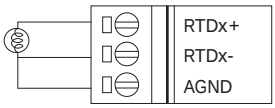
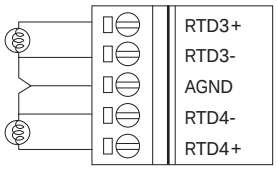
I/O Specifications

	RTD 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/Second (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		

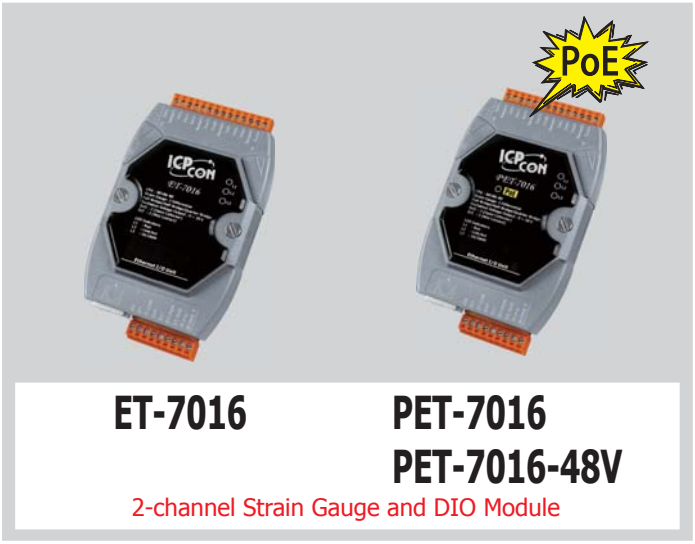
Ordering Information

ET-7015 CR	7-channel RTD Input Module (RoHS)
PET-7015 CR	7-channel RTD Input Module with PoE (RoHS)
PET-7015-48V CR	7-channel RTD Input Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)



ET-7016 PET-7016 PET-7016-48V

2-channel Strain Gauge and DIO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - Strain Gauge Input: 2 Channels
  - DI/Counter: 2 Channels
  - DO: 2 Channels

Introduction

The ET-7016/PET-7016/PET-7016-48V is a strain gauge module with 2 analog input channels, 1 excitation voltage output channel, 2 digital input channels and 2 digital output channels module. It provides various programmable analog input inputs (+/-1 mV, +/-50 mV, +/-100 mV, +/-500 mV, +/-1 V, and +/-2.5 V) and supports full-bridge, half-bridge, and quarter-bridge. The range for each analog input is allowed to be configured individually. Excitation voltage output can be in the range of 0 ~ 10 V with a 60 mA driving efficiency. Digital outputs can also be set as alarm outputs. The ET-7016/PET-1016 can also provide long-distance strain gauge measurement that compensates for the loss of voltage resulting from long-distance measurements.

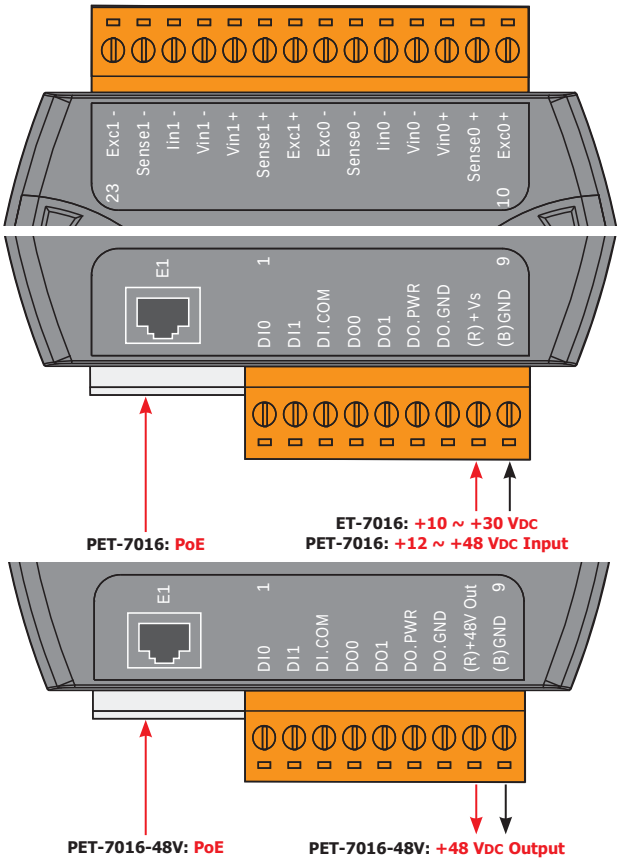
System Specifications

	Models	ET-7016	PET-7016	PET-7016-48V
	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		
★	PoE	-	Yes	
★	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			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	Consumption	4.2 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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

Strain Gauge Input		
	Channels	2 (Differential)
★	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/Second (Total)
	Accuracy	+/-0.05%
	Zero Drift	+/-0.5 μV/°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		
	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		
	Channels	2
	Contact	Wet
	Sink/Source (NPN/PNP)	Sink/Source
	Off Voltage Level	+1 VDC Max.
	On Voltage Level	+3.5 VDC ~ +50 VDC
★	Counters: Channels	2
★	Counters: Max. Count	4,294,967,285 (32-bit)
★	Counters: Max. Input Frequency	100 Hz
★	Counters: Min. Pulse Width	5 ms
	Overvoltage Protection	70 VDC
Digital Output		
	Channels	2
	Type	Isolated Open Collector
	Sink/Source (NPN/PNP)	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

Pin Assignments



Excitation Voltage

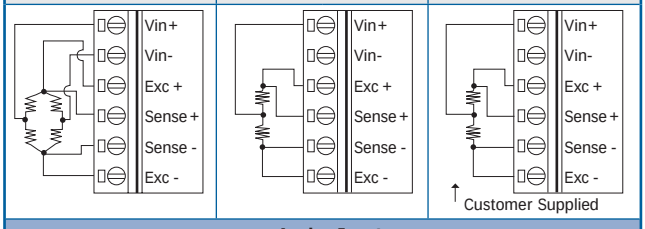
Strain Gauge	Quarter-Bridge	Half-Bridge	Full-Bridge
120 R	7.0 V	7.0 V	3.5 V
350 R	10 V	10 V	10 V

Ordering Information

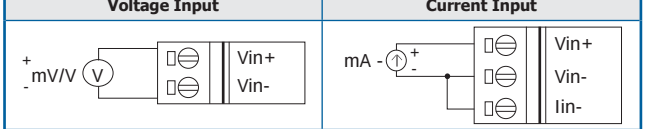
ET-7016 CR	2-channel Strain Gauge and DIO Module (RoHS)
PET-7016 CR	2-channel Strain Gauge and DIO Module with PoE (RoHS)
PET-7016-48V CR	2-channel Strain Gauge and DIO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Wire Connections

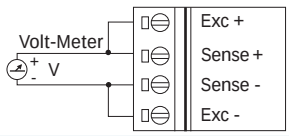
Bridge Sensor/Load Cell/Strain Gauge

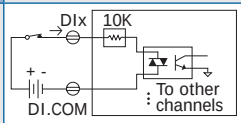
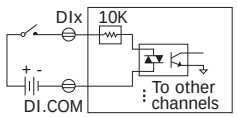
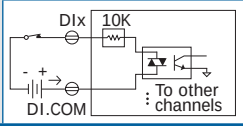
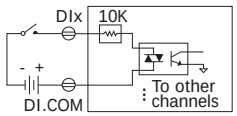


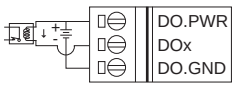
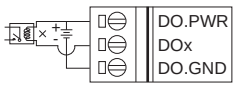
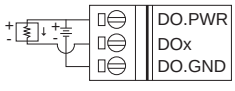
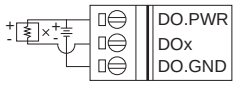
Analog Input



Analog Output



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

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

ET-7017 **PET-7017** **PET-7017-48V**

8-channel Analog Input and 4-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - AI: 8 Channels with 240 V_{rms} Overvoltage Protection
  - DO: 4 Channels

Introduction

The ET-7017/PET-7017/PET-7017-48V is a 16-bit module with 8-channel differential analog inputs and 4-channel digital ouputs. It 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. Each analog input can be programmed to accept voltage or current as input depending upon the position of corresponding jumper. 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.

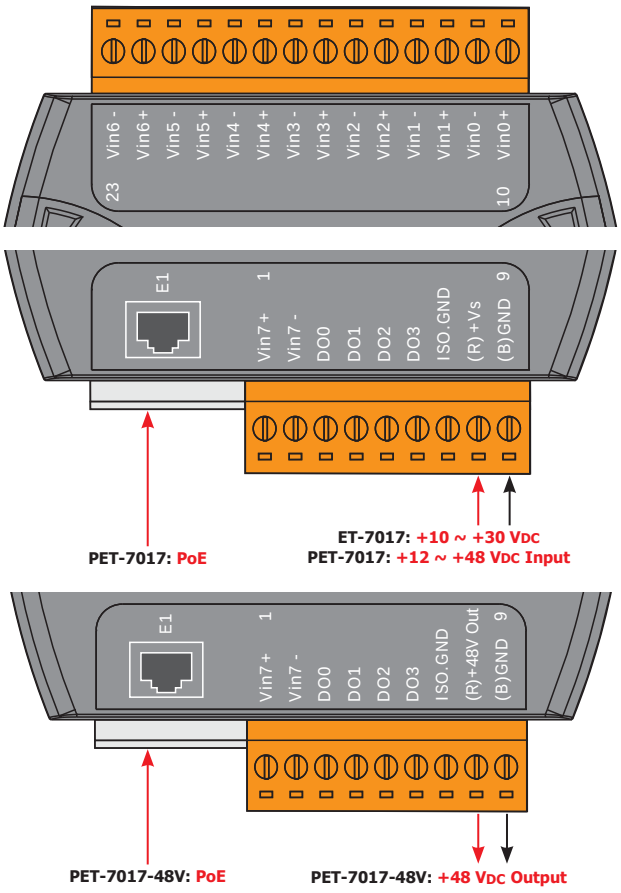
System Specifications

Models	ET-7017	PET-7017	PET-7017-48V
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		
★ PoE	-	Yes	
★ 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			
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	
Power Output	-	-	48 V_{DC}, 10 W
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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

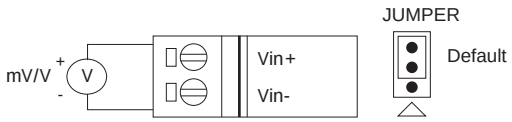
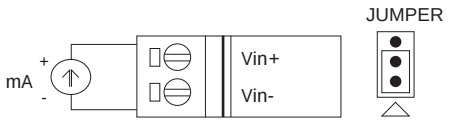
I/O Specifications

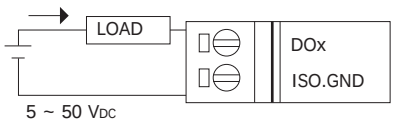
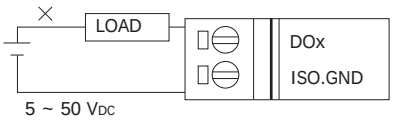
Analog Input			
	Channels		8 (Differential)
★	Type		+/-150 mV, +/-500 mV, +/-1V, +/-5V, +/-10V +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper Selectable)
★	Individual Channel Configuration		Yes
	Resolution	Normal Mode	16-bit
		Fast Mode	12-bit
★	Sampling Rate	Normal Mode	10 Samples/Second (Total)
		Fast Mode	60 Samples/Second (Total)
	Accuracy	Normal Mode	+/-0.1%
		Fast Mode	+/-0.5% or better
	Zero Drift		+/-20 μV/°C
	Span Drift		+/-25 ppm/°C
★	Overvoltage Protection		240 Vrms
	Input Impedance	Voltage	2 MΩ
		Current	125 Ω
	Common Mode Rejection		86 dB Min.
	Normal Mode Rejection		100 dB
Digital Output			
	Channels		4
	Type		Isolated Open Collector
	Sink/Source (NPN/PNP)		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

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 and 4-channel DO Module (RoHS)
PET-7017 CR	8-channel Analog Input and 4-channel DO Module with PoE (RoHS)
PET-7017-48V CR	8-channel Analog Input and 4-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)	

ET-7017-10 **PET-7017-10**
PET-7017-10-48V

10/20-channel Analog Input Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - AI: 10/20 Channels with 240 V_{rms} Overvoltage Protection

Introduction

The ET-7017-10 is a 16-bit, module with 10-channel differential or 20-channel single-ended analog inputs. It 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. Each analog input can be programmed to accept voltage or current as input depending upon the position of corresponding jumper. The sampling rate of ET-7017/PET-7017/PET-7017-48V has two modes; fast mode and normal mode for your consideration. ET-7017/PET-7017/PET-7017-48V also has qualification for 4 kV ESD protection as well as 3000 V_{DC} intra-module isolation.

System Specifications

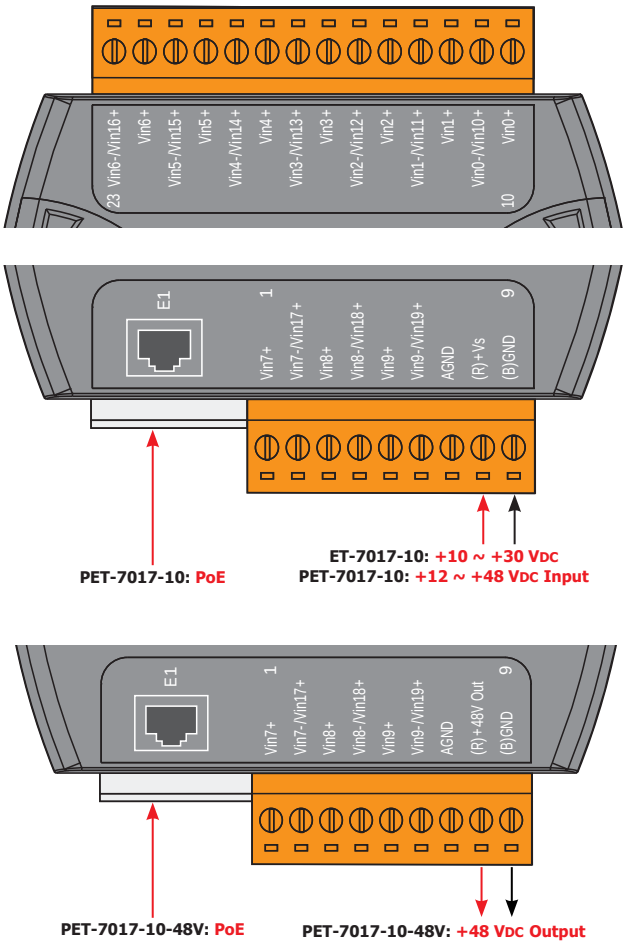
Models	ET-7017-10	PET-7017-10	PET-7017-10-48V
Software			
★ Built-in Web Server	Yes		
★ Web HMI	Yes		
★ I/O Pair Connection	Yes		
Communication			
Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X		
★ PoE	-	Yes	
★ Protocol	Modbus TCP, Modbus UDP		
★ Security	ID, Password and IP Filter		
★ Dual Watchdog	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			
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	
Power Output	-	-	48 V_{DC}, 10 W
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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

Analog Input			
	Channels		10 differential or 20 single-ended (Note1), software selectable
★	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/Second (Total)
		Fast Mode	60 Samples/Second (Total)
	Accuracy	Normal Mode	+/-0.1%
		Fast Mode	+/-0.5% or better
	Zero Drift		+/-20 μV/°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

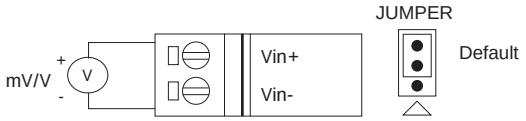
Note1: Differential mode can be used for voltage input and current input.
Single-Ended mode can be used for voltage input only.

Pin Assignments

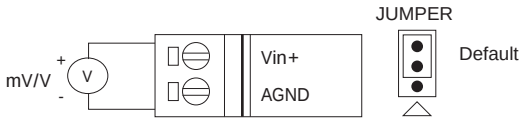


Wire Connections

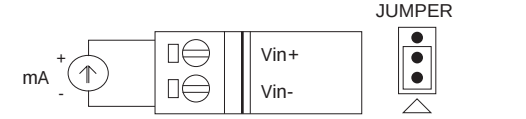
Voltage Input (Differential Mode)



Voltage Input (Single-ended Mode)



Current Input



Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

Ordering Information

ET-7017-10	10/20-channel Analog Input Module (RoHS)
PET-7017-10	10/20-channel Analog Input Module with PoE (RoHS)
PET-7017-10-48V	10/20-channel Analog Input Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7018Z
ET-7019Z
PET-7018Z
PET-7018Z-48V
PET-7019Z
PET-7019Z-48V

10-channel Thermocouple Input Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - Thermocouple Input:
    10 Channels (For ET-7018Z/PET-7018Z/PET-7018Z-48V)
  - AI: 10 Channels with 240 Vrms Overvoltage Protection
    (For ET-7019Z/PET-7019Z/PET-7019Z-48V)
  - DO: 6 Channels

Introduction

The "Z" version is another milestone in the development of the thermocouple series and is a testament to the excellence of ICP DAS products. The ET-7018Z/PET-7018Z/PET-7018Z-48V/ET-7019Z/PET-7019Z/PET-7019Z-48V is specifically designed for extremely accurate thermocouple measurement and features automatic cold-junction compensation for each channel to ensure temperature output consistency and stable temperature output in the field. Current input and voltage input are both supported. Another feature is that its ten input channels can be individually configured for different kinds of analog input. Open thermocouple detection and ESD/EFT/Surge protection mechanisms are also included. The six digital output channels can be set as alarm outputs with short-circuit protection and overload protection.

System Specifications

Models	ET-7018Z	ET-7019Z	PET-7018Z	PET-7019Z	PET-7018Z-48V	PET-7019Z-48V
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					
★ PoE	-		Yes			
★ 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					
Surge (IEC 61000-4-5)	-	+/-3 kV for Power	-	+/-3 kV for Power	-	+/-3 kV for Power
Power						
Reverse Polarity Protection	Yes					
Powered from Terminal Block	Yes, 10 ~ 30 VDC		Yes, 12 ~ 48 VDC		-	
Powered from PoE	-		Yes, IEEE 802.3af, Class1			
Power Output	-		-		48 VDC, 10 W	
Consumption	2.0 W	2.5 W	3.0 W	3.5 W	3.0 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 ~ +75°C					
Storage Temperature	-30 ~ +80°C					
Humidity	10 ~ 90% RH, Non-condensing					

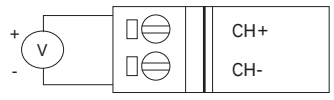
I/O Specifications

	Models	ET-7018Z PET-7018Z PET-7018Z-48V	ET-7019Z PET-7019Z PET-7019Z-48V
	Thermocouple Input		
	Channels	10 (Differential)	
★	Sensor Type	+/-15 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,
		+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Requires Optional External 125 Ω Resistor)	+/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper Selectable)
		Thermocouple (J, K, T, E, R, S, B, N, C, L, M, and $L_{DIN43710}$)	
★	Individual Channel Configuration	Yes	
	Resolution	16-bit	
	Sampling Rate	10 Samples/Second (Total)	
	Accuracy	+/-0.1% of FSR or better	
	Zero Drift	+/-0.5 μV/°C	
	Span Drift	+/-25 ppm/°C	
★	Over Voltage Protection	240 Vrms	
	Input Impedance	>300 kΩ	
	Common Mode Rejection	150 dB Min.	86 dB Min.
	Normal Mode Rejection	100 dB	
	Temperature Output Consistency	Yes	
	Stable Temperature Output in the Field	Yes	
★	Open Wire Detection	Yes	
	Digital Output		
	Channels	6	
	Type	Isolated Open Collector	
	Sink/Source (NPN/PNP)	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	

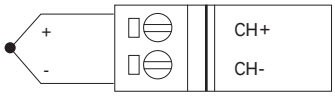
Wire Connections

ET-7018Z/PET-7018Z/PET-7018Z-48V

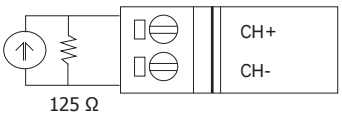
Voltage Input (Default)



Thermocouple Input (Default)



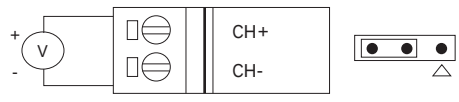
Current Input



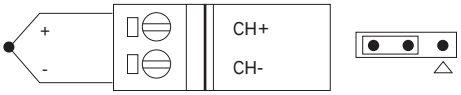
Note: When connecting to a current source, an optional external 125 Ω resistor is required.

ET-7019Z/PET-7019Z/PET-7019Z-48V

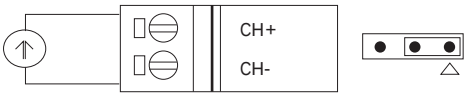
Voltage Input (Default)



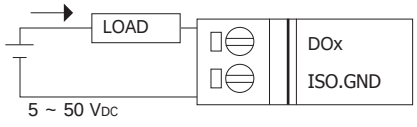
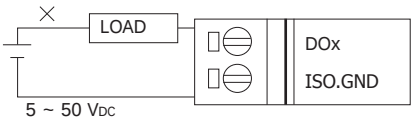
Thermocouple Input (Default)



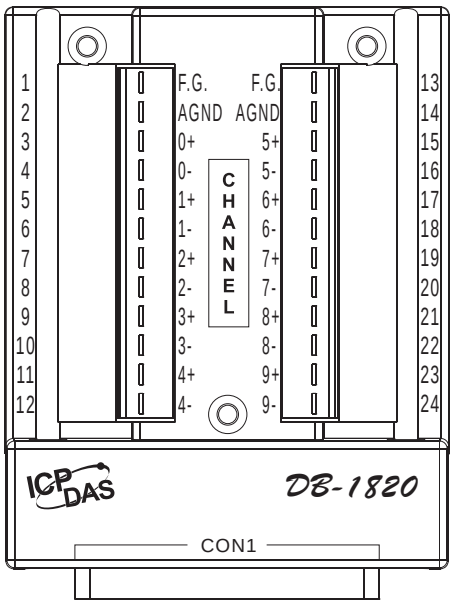
Current Input

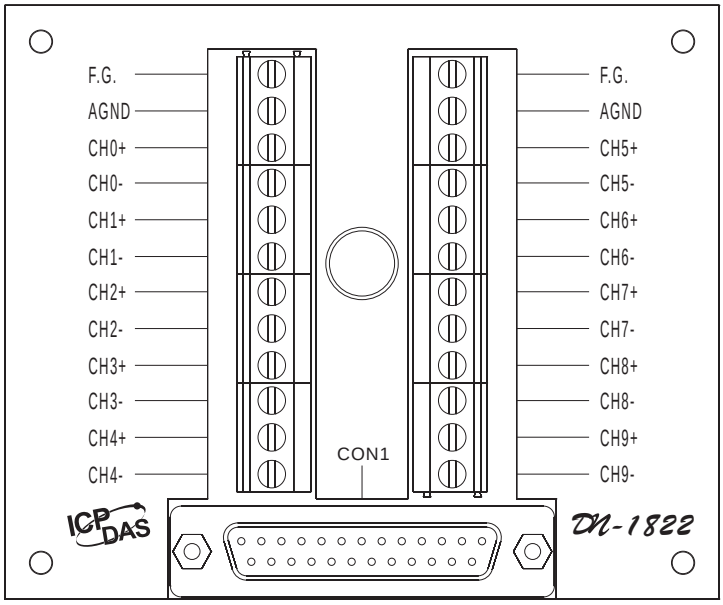


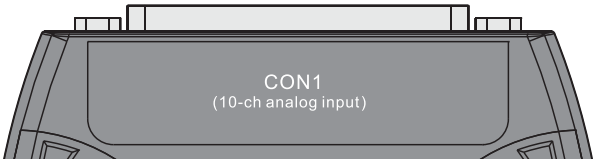
ET-7018Z/PET-7018Z/PET-7018Z-48V/ET-7019Z/PET-7019Z/PET-7019Z-48V

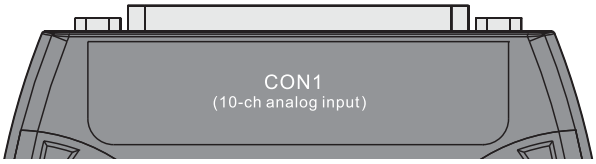
Digital Output	ON State Readback as 1	OFF State Readback as 0
Open Collector (Sink)		

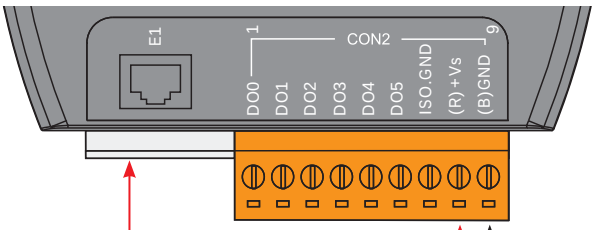
Pin Assignments





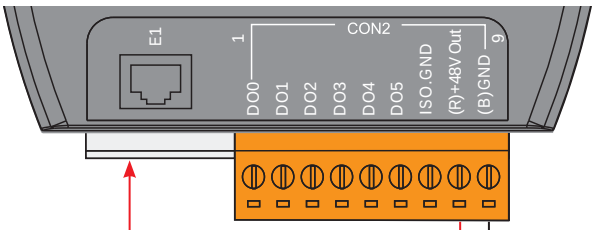






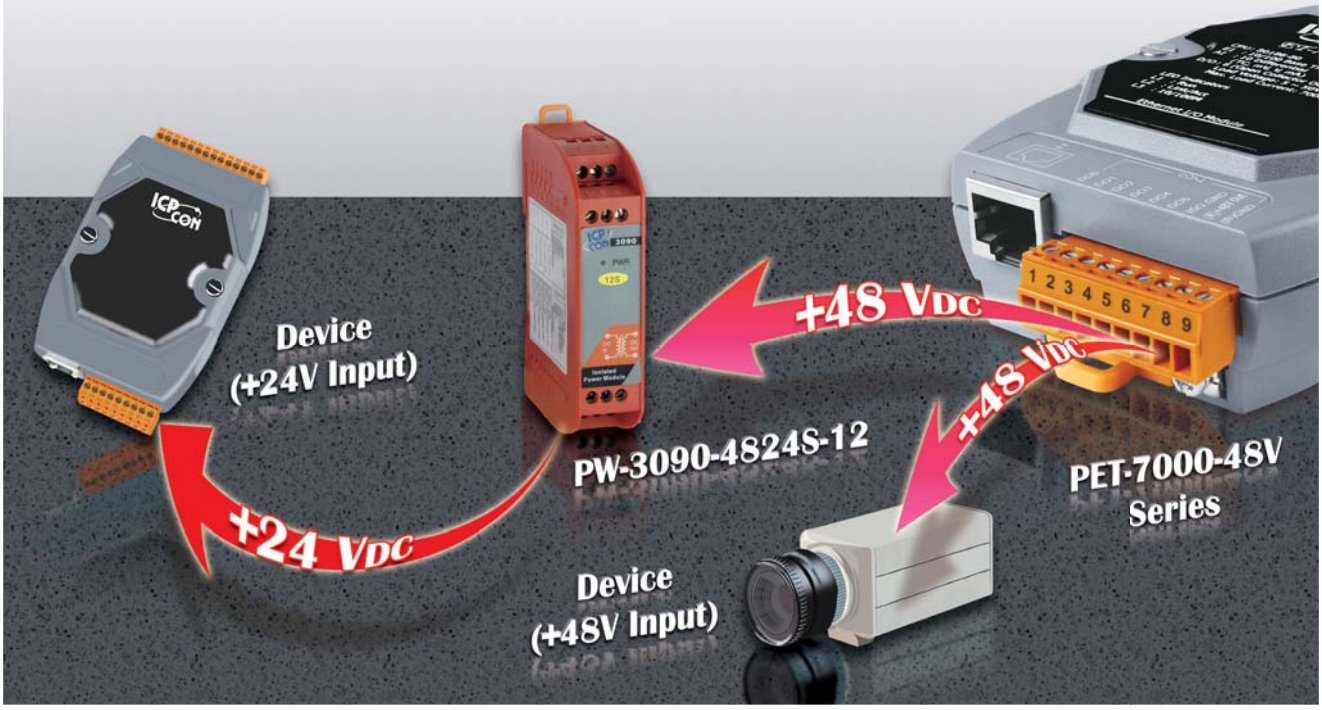
PET-7018Z: PoE
PET-7019Z: PoE

ET-7018Z: +10 ~ +30 VDC
PET-7018Z: +12 ~ +48 VDC Input
ET-7019Z: +10 ~ +30 VDC
PET-7019Z: +12 ~ +48 VDC Input



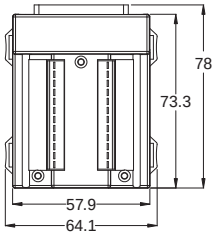
PET-7018Z-48V: PoE
PET-7019Z-48V: PoE

PET-7018Z-48V: +48 VDC Output
PET-7019Z-48V: +48 VDC Output

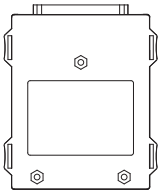


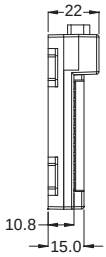
Dimensions (Units: mm)

DN-1820

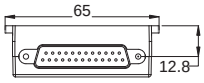


Front View

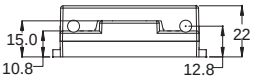

Rear View



Left Side View

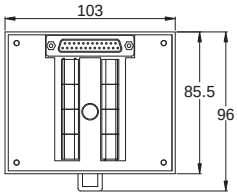


Top View

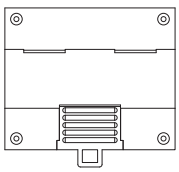


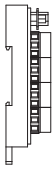
Bottom View

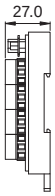
DN-1822



Front View

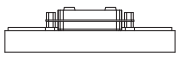

Rear View


Right Side View



Left Side View


Top View


Bottom View

Ordering Information

ET-7018Z/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board (RoHS)
PET-7018Z/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board with PoE (RoHS)
PET-7018Z-48V/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)
ET-7018Z/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable (RoHS)
PET-7018Z/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable with PoE (RoHS)
PET-7018Z-48V/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)
ET-7019Z/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board (RoHS)
PET-7019Z/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board with PoE (RoHS)
PET-7019Z-48V/S CR	10-channel Thermocouple Input Module with DB-1820 Daughter Board with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)
ET-7019Z/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable (RoHS)
PET-7019Z/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable with PoE (RoHS)
PET-7019Z-48V/S2 CR	10-channel Thermocouple Input Module with DN-1822 Daughter Board and a 1.8 m Cable with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Front

Rear

ET-7018Z/S = DB-1820 Connects to the ET-7018Z Directly
PET-7018Z/S = DB-1820 Connects to the PET-7018Z Directly
PET-7018Z-48V/S = DB-1820 Connects to the PET-7018Z-48V Directly
ET-7019Z/S = DB-1820 Connects to the ET-7019Z Directly
PET-7019Z/S = DB-1820 Connects to the PET-7019Z Directly
PET-7019Z-48V/S = DB-1820 Connects to the PET-7019Z Directly

ET-7018Z/S2 = DN-1822 Connects to the ET-7018Z Directly
PET-7018Z/S2 = DN-1822 Connects to the PET-7018Z Directly
PET-7018Z-48V/S2 = DN-1822 Connects to the PET-7018Z-48V Directly
ET-7019Z/S2 = DN-1822 Connects to the ET-7019Z Directly
PET-7019Z/S2 = DN-1822 Connects to the PET-7019Z Directly
PET-7019Z-48V/S2 = DN-1822 Connects to the PET-7019Z Directly

Accessories

CD-25015
15 cm Cable +DB-1820

4PAPP-006-G

PET-7018Z/S +CD-25015 +4PAPP-006-G
PET-7018Z-48V/S +CD-25015 +4PAPP-006-G
PET-7019Z/S +CD-25015 +4PAPP-006-G
PET-7019Z-48V/S +CD-25015 +4PAPP-006-G

PET-7018Z/S +CD-2518D
PET-7018Z-48V/S +CD-2518D
PET-7019Z/S +CD-2518D
PET-7019Z-48V/S +CD-2518D

CD-2518D
1.8 m Cable +DB-1820

ET-7019 PET-7019 PET-7019-48V

8-channel Analog Input and 4-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - AI: 8 Channels with 240 V_{rms} Overvoltage Protection
  - DO: 4 Channels

Introduction

The ET-7019/PET-7019/PET-7019-48V 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 built in this model, measuring current or voltage 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. Moreover, the ET-7019/PET-7019/PET-7019-48V also got open thermocouple detection and many protection mechanisms. The 4 digital output can be set as alarm output with Short-circuit protection and overload protection.

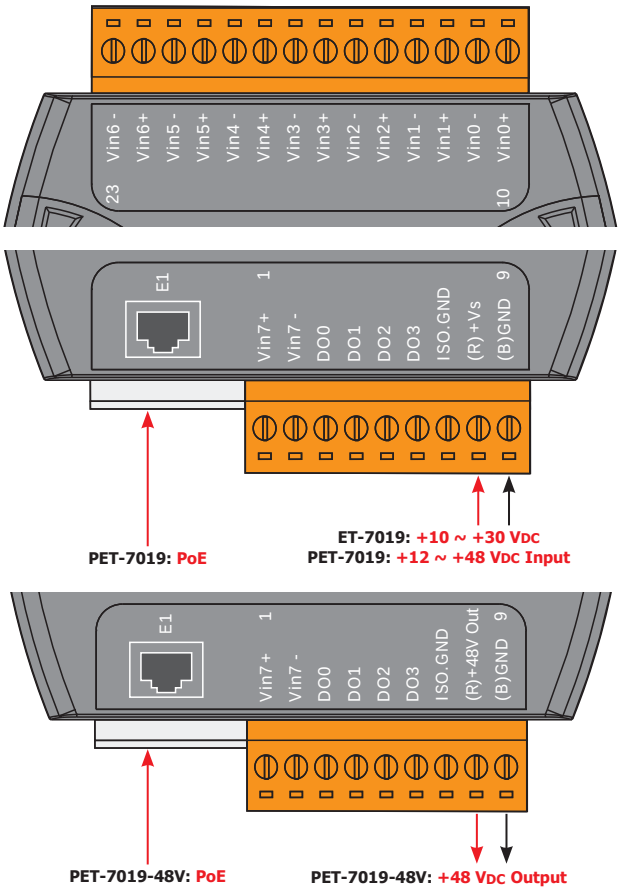
System Specifications

Models	ET-7019	PET-7019	PET-7019-48V
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		
★ PoE	-	Yes	
★ 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			
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	
Power Output	-	-	48 V_{DC}, 10 W
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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

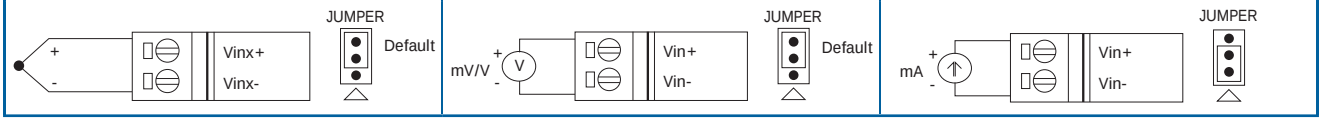
I/O Specifications

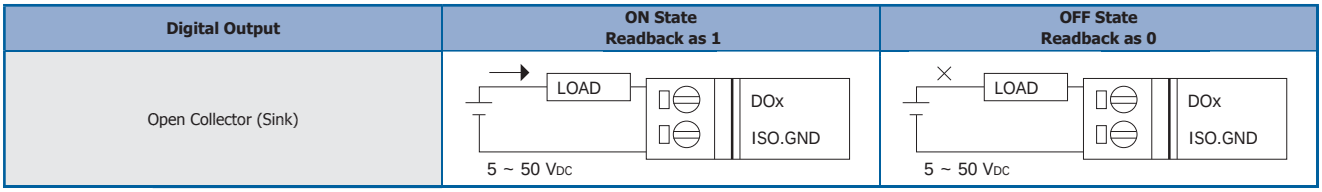
Analog Input			
	Channels		8 (Differential)
★	Sensor Type		+/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA, 4~20 mA
			Thermocouple (J, K, T, E, R, S, B, N, C, L, M, , and $L_{DIN43710}$)
★	Individual Channel Configuration		Yes
	Resolution		16-bit
	Sampling Rate		10 samples/Second total
	Accuracy		+/-0.1 % or better
	Zero Drift		+/-10 μV/°C
	Span Drift		+/-25 ppm/°C
★	Overvoltage Protection		240 Vrms
	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			
	Channels		4
	Type		Isolated Open Collector
	Sink/Source (NPN/PNP)		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
Note: We recommend to choose ET-7018Z for accurate thermocouple measurement.			

Pin Assignments



Wire Connections





Ordering Information

ET-7019 CR	8-channel Analog Input and 4-channel DO Module (RoHS)
PET-7019 CR	8-channel Analog Input and 4-channel DO Module with PoE (RoHS)
PET-7019-48V CR	8-channel Analog Input and 4-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)	

ET-7026 **PET-7026**
PET-7026-48V
Multi-function Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - AI: 6 Channels with 240 V_{rms} Overvoltage Protection
  - AO: 2 Channels
  - DI/Counter: 2 Channels
  - DO: 2 Channels

Introduction

The ET-7026/PET-7026/PET-7026-48V is a multi-function module with 6-channel analog inputs, 2-channel analog outputs, 2-channel digital inputs and 2-channel digital outputs. It provides various programmable analog inputs (+/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA and 4 ~ 20 mA), and analog outputs (+/-5 V, +/-10 V, 0 ~ 20 mA and 4 ~ 20 mA). Each analog input is allowed to configure a proper range with 240 V_{rms} high voltage protection. Each analog input/output can be programmed to accept current or voltage as input/output depending upon the position of corresponding jumper.

System Specifications

	Models	ET-7026	PET-7026	PET-7026-48V
	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		
★	PoE	-	Yes	
★	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			
	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	
	Power Output	-	-	48 V_{DC}, 10 W
	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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

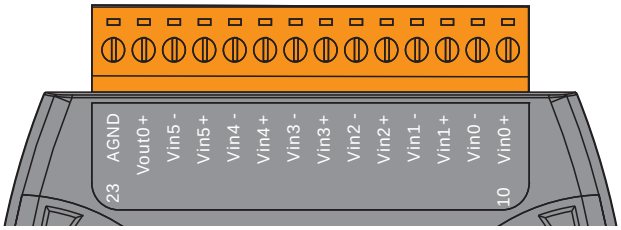
I/O Specifications

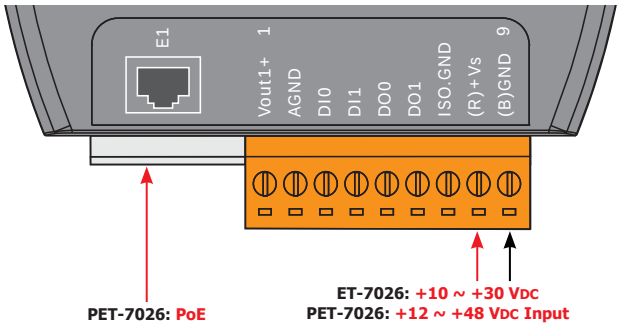
	Analog Input		
	Channels		6 (Differential)
★	Type		+/-500 mV, +/-1V, +/-5 V, +/-10 V +0 mA ~ +20 mA, +/-20 mA, 4 ~ 20 mA (Jumper Selectable)
★	Individual Channel Configuration		Yes
	Resolution	Normal Mode	16-bit
		Fast Mode	12-bit
★	Sampling Rate	Normal Mode	10 Samples/Second (Total)
		Fast Mode	60 Samples/Second (Total)
	Accuracy	Normal Mode	+/-0.1%
		Fast Mode	+/-0.5% or better
	Zero Drift		+/-20 μV/°C
	Span Drift		+/-25 ppm/°C
	Overvoltage Protection		240 Vrms
	Input Impedance	Voltage	2 MΩ
		Current	125 Ω
	Common Mode Rejection		86 dB Min.
	Normal Mode Rejection		100 dB
	Analog Output		
	Channels		2
★	Type		+0 VDC ~ +5 VDC, +/-5 VDC, +0 VDC ~ +10 VDC, +/-10 VDC,+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		
	Channels		2
	Dry Contact (Source)	On Voltage Level	Close to GND
		Off Voltage Level	Open
		Effective Distance for Dry Contact	500 M Max.
	Wet contact (Sink/Source)	On Voltage Level	+1 VDC Max.
		Off Voltage Level	+3.5 VDC ~ +30 VDC
	Counters	Channels	2
		Max. Count	4,294,967,285 (32-bit)
★		Max. Input Frequency	100 Hz
		Min. Pulse Width	5 ms
	Overvoltage Protection		30 VDC
	Digital Output		
	Channels		2
	Type		Isolated Open Collector
	Sink/Source (NPN/PNP)		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

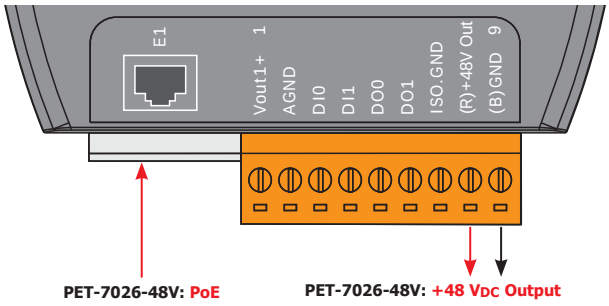
Ordering Information

ET-7026 CR	Multi-function Module (RoHS)
PET-7026 CR	Multi-function PoE Module (RoHS)
PET-7026-48V CR	Multi-function PoE Module and 48 VDC, 10 W output (RoHS) (Call Manufacture)

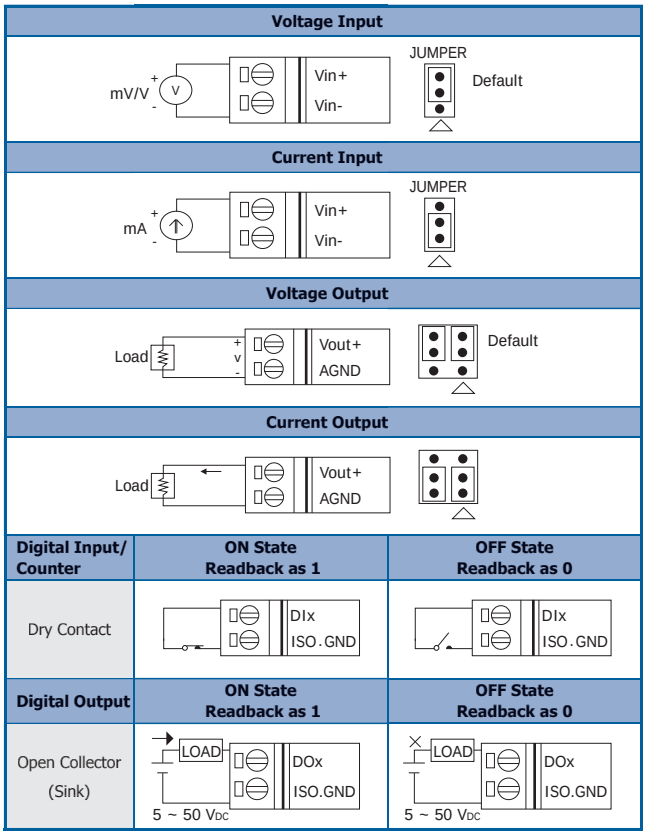
Pin Assignments







Wire Connections



ET-7042 **PET-7042**
PET-7042-48V

16-channel Isolated Digital Output Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DO: 16 Channels

Introduction

The ET-7042/PET-7042/PET-7042-48V provides 16 sink-type digital output channels. It features optical isolation for 3750 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. The power-on value and safe value of digital output channel are programmable. In some industrial applications, the user can connect the output channel of ET-7042/PET-7042/PET-7042-48V to the RM series relay module to switch inductive loads.

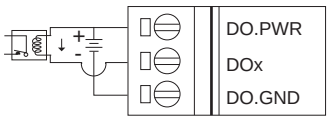
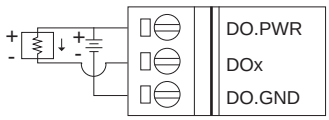
System Specifications

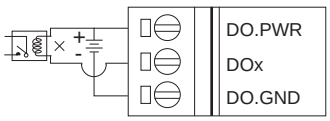
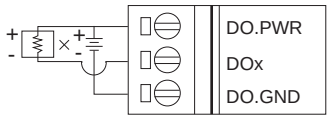
Models	ET-7042	PET-7042	PET-7042-48V
Software			
★ Built-in Web Server	Yes		
★ Web HMI	Yes		
★ I/O Pair Connection	Yes		
Communication			
★ Ethernet Port	10/100 Base-TX with Auto MDI/MDI-X		
★ PoE	-	Yes	
★ Protocol	Modbus TCP, Modbus UDP		
★ Security	ID, Password and IP Filter		
★ Dual Watchdog	Yes, 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	3750 Vrms	3750 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.7 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

	Models	ET-7042	PET-7042	PET-7042-48V
	Digital Output			
	Channels	16		
★	Type	Isolated Open Collector		
★	Sink/Source (NPN/PNP)	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		

Wire Connections

Output Type	ON State Readback as 1
Drive Relay	
Resistance Load	

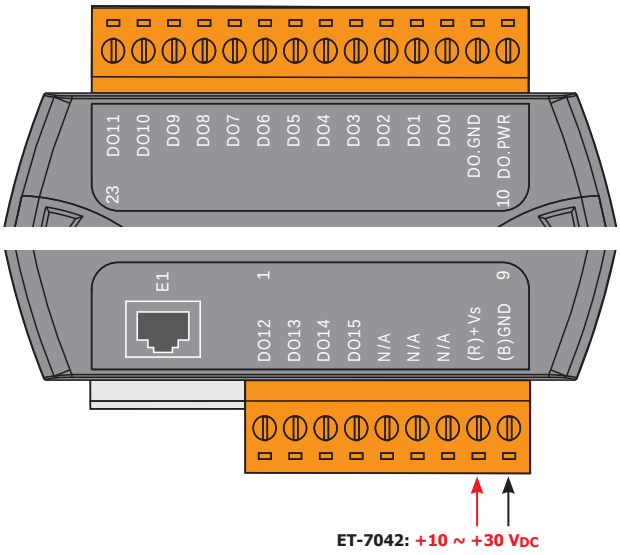
Output Type	OFF State Readback as 0
Drive Relay	
Resistance Load	

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

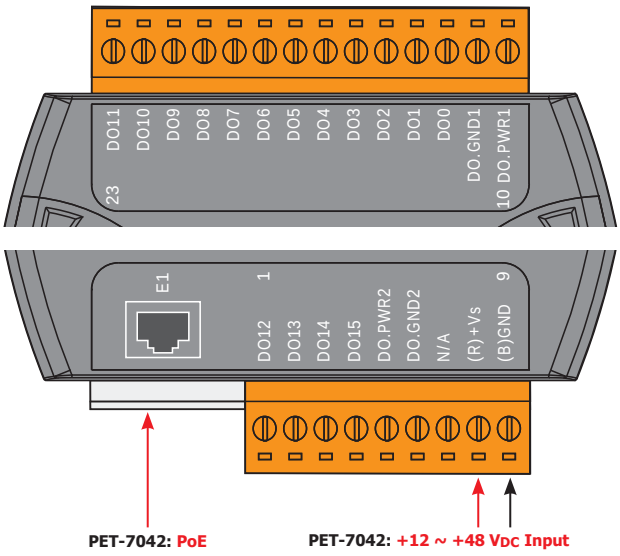
Pin Assignments

ET-7042



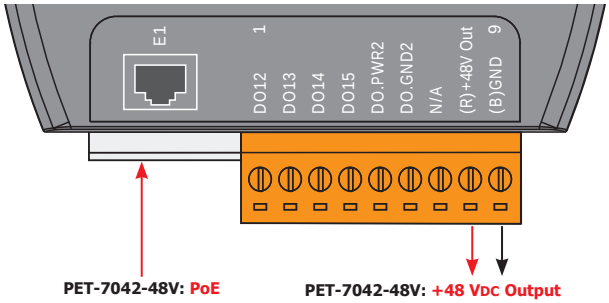
ET-7042: +10 ~ +30 VDC

PET-7042/PET-7042-48V



PET-7042: PoE

PET-7042: +12 ~ +48 VDC Input



PET-7042-48V: PoE

PET-7042-48V: +48 VDC Output

Ordering Information

ET-7042 CR	16-channel Isolated Digital Output Module (RoHS)
PET-7042 CR	16-channel Isolated Digital Output Module with PoE (RoHS)
PET-7042-48V CR	16-channel Isolated Digital Output Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7044 **PET-7044**
PET-7044-48V

8-channel DI and 8-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 8 Channels
  - DO: 8 Channels

Introduction

The ET-7044/PET-7044/PET-7044-48V provides 8 wet contact digital input channels and 8 sink-type digital output channels. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. Each input channel can be used as a 32-bit counter and each output channel can drive 300 mA load. The power-on value and safe value of digital output channel are programmable. It can safely be used in applications where hazardous voltages are present.

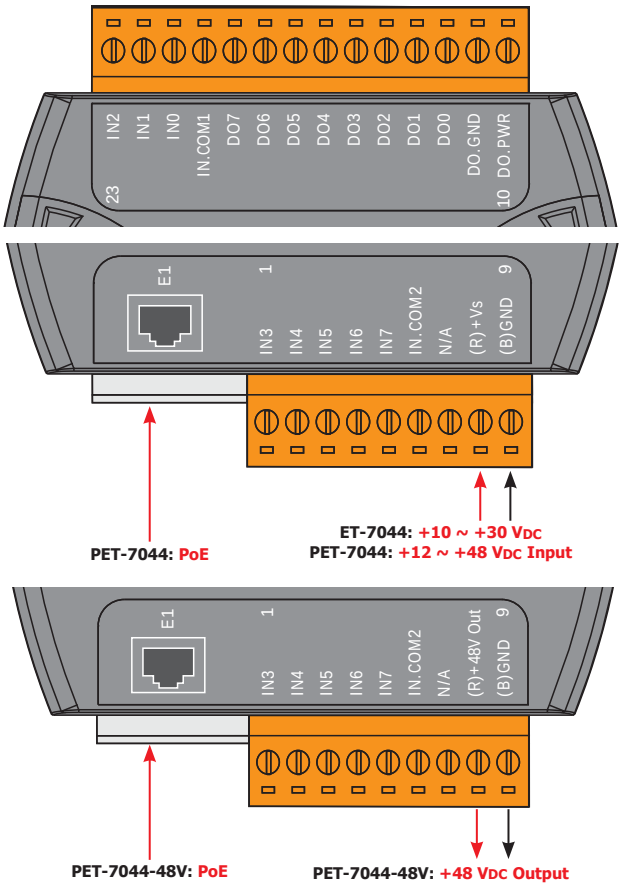
System Specifications

Models	ET-7044	PET-7044	PET-7044-48V
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		
★ PoE	-	Yes	
★ 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	3750 Vrms	3750 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.4 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

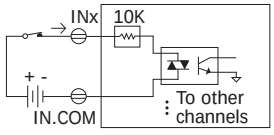
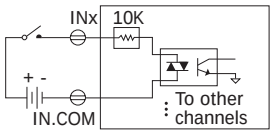
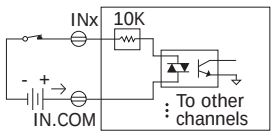
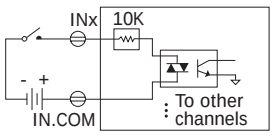
I/O Specifications

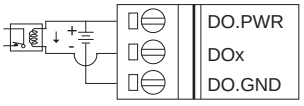
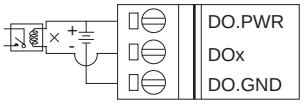
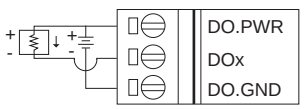
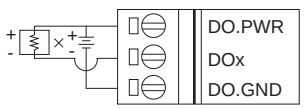
Digital Input/Counter		
Channels		8
Contact		Wet Contact
Sink/Source (NPN/PNP)		Sink/Source
On Voltage Level		+10 VDC ~ +50 VDC
Off Voltage Level		+4 VDC Max.
Input Impedance		10 kΩ
★ Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 VDC
Digital Output		
Channels		8
Type		Isolated Open Collector
Sink/Source (NPN/PNP)		Sink
Max. Load Current		300 mA/channel at 25°C Direct Drive Power Relay Module
Load Voltage		+10 VDC ~ +40 VDC
★ Overvoltage Protection		60 VDC
★ 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 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-7044 CR	8-channel DI and 8-channel DO Module (RoHS)
PET-7044 CR	8-channel DI and 8-channel DO Module with PoE (RoHS)
PET-7044-48V CR	8-channel DI and 8-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7050 **PET-7050**
PET-7050-48V

12-channel DI and 6-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 12 Channels
  - DO: 6 Channels

Introduction

The ET-7050/PET-7050/PET-7050-48V provides 12 wet contact digital input channels and 6 sink-type digital output channels. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. Each input channel can be used as a 32-bit counter and each output channel can drive 100 mA load. The power-on value and safe value of digital output channel are programmable. In some industrial applications, the user can connect the output channel of ET-7050/PET-7050/PET-7050-48V to the RM series relay module to switch inductive loads.

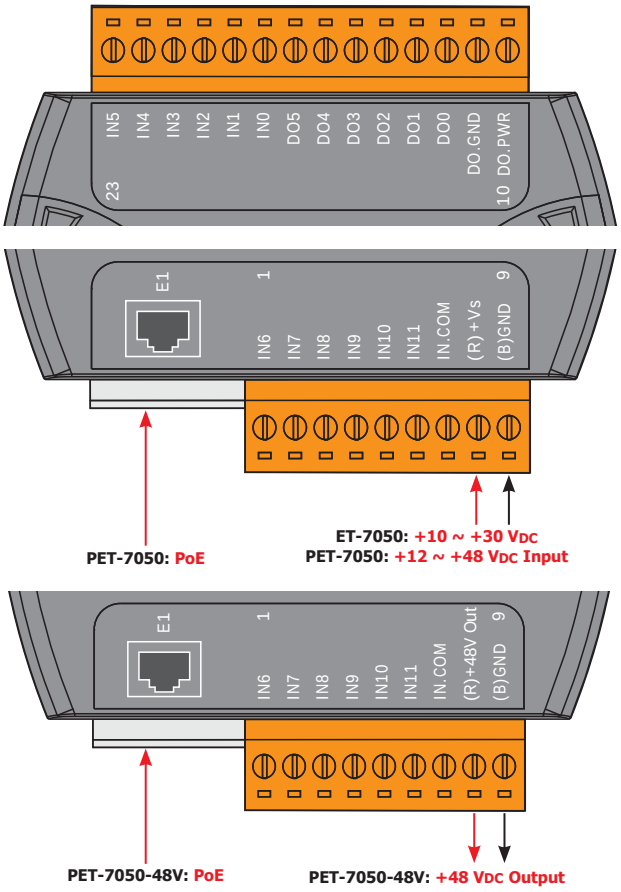
System Specifications

	Models	ET-7050	PET-7050	PET-7050-48V
	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		
★	PoE	-	Yes	
★	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	3750 Vrms	3750 Vrms	
	EMS Protection			
	ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
	EFT (IEC 61000-4-4)	+/-2 kV for Power		
	Power			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	Consumption	2.4 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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

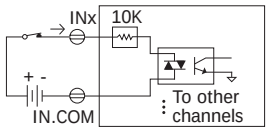
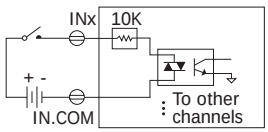
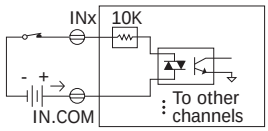
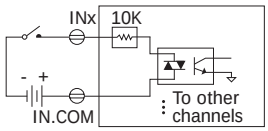
I/O Specifications

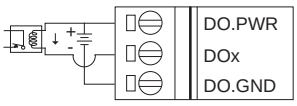
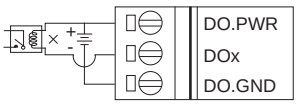
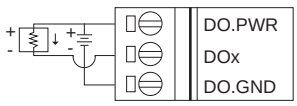
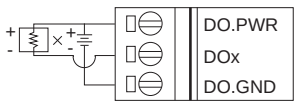
	Models		ET-7050	PET-7050	PET-7050-48V
	Digital Input/Counter				
	Channels		12		
	Contact		Wet Contact		
	Sink/Source (NPN/PNP)		Sink/Source		
	On Voltage Level		+10 VDC ~ +50 VDC		
	Off Voltage Level		+4 VDC Max.		
	Input Impedance		10 kΩ		
★	Counters	Max. Count	4,294,967,285 (32 bits)		
★		Max. Input Frequency	500 Hz		
		Min. Pulse Width	1 ms		
	Overvoltage Protection		+70 VDC		
	Digital Output				
	Channels		6		
	Type		Isolated Open Collector		
	Sink/Source (NPN/PNP)		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 Module (RoHS)
PET-7050 CR	12-channel DI and 6-channel DO Module with PoE (RoHS)
PET-7050-48V CR	12-channel DI and 6-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7051 **PET-7051**
PET-7051-48V

16-channel Isolated Digital Input Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 16 Channels

Introduction

The ET-7051/PET-7051/PET-7051-48V provides 16 wet contact digital input channels. Each input channel can be used as a 32-bit counter. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. It can safely be used in applications where hazardous voltages are present.

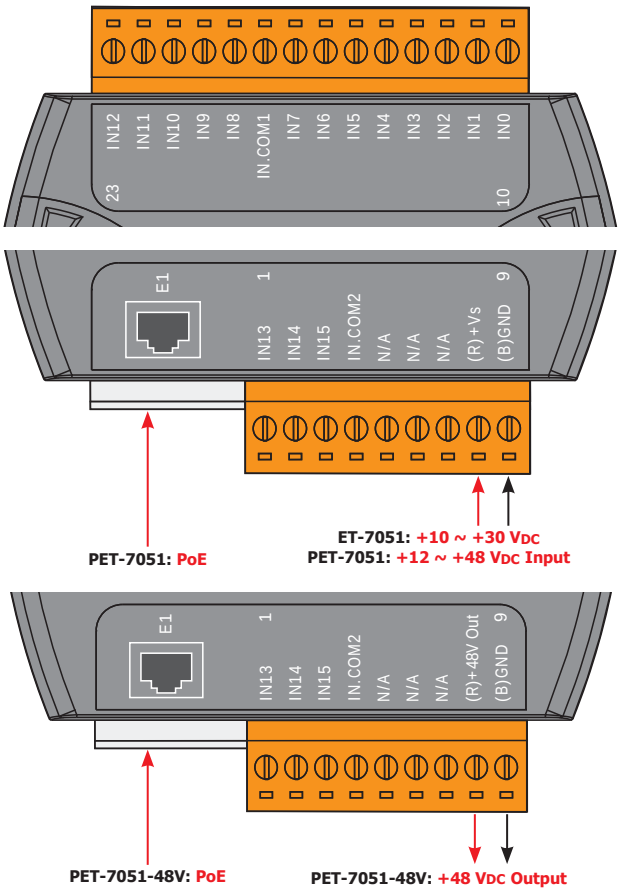
System Specifications

Models	ET-7051	PET-7051	PET-7051-48V
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		
★ PoE	-	Yes	
★ 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	3750 Vrms	3750 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.2 W	2.8 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

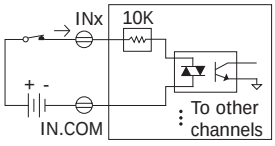
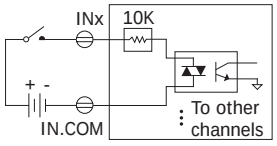
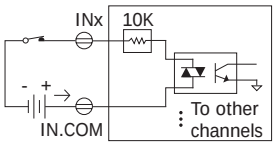
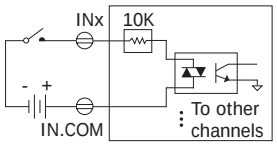
I/O Specifications

Digital Input/Counter		
Channels		16
Contact		Wet Contact
Sink/Source (NPN/PNP)		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

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
		

Ordering Information

ET-7051 CR	16-channel Isolated Digital Input Module (RoHS)
PET-7051 CR	16-channel Isolated Digital Input Module with PoE (RoHS)
PET-7051-48V CR	16-channel Isolated Digital Input Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

ET-7052 **PET-7052**
PET-7052-48V

8-channel DI and 8-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 8 Channels
  - DO: 8 Channels

Introduction

The ET-7052/PET-7052/PET-7052-48V provides 8 wet contact digital input channels and 8 source-type digital output channels. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. Each input channel can be used as a 32-bit counter and each output channel can drive 650 mA load. The power-on value and safe value of digital output channel are programmable. It can safely be used in applications where hazardous voltages are present.

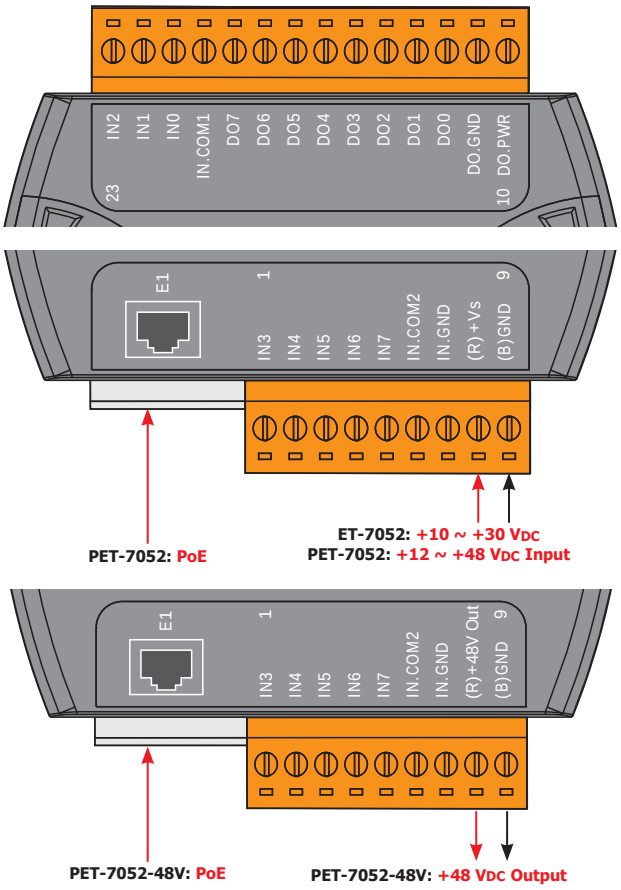
System Specifications

Models	ET-7052	PET-7052	PET-7052-48V
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		
★ PoE	-	Yes	
★ 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	3750 Vrms	3750 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.4 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

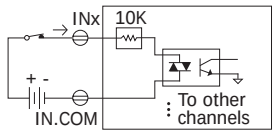
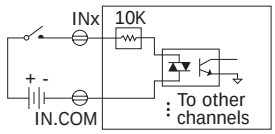
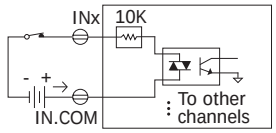
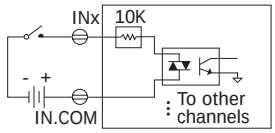
I/O Specifications

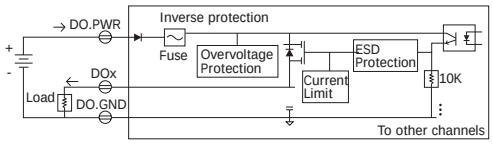
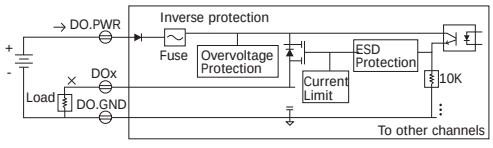
Digital Input/Counter			
	Channels		8
	Contact		Wet Contact
	Sink/Source (NPN/PNP)		Sink/Source
	On Voltage Level		+10 VDC ~ +50 VDC
	Off Voltage Level		+4 VDC Max.
	Input Impedance		10 kΩ
★	Counters	Max. Count	4,294,967,285 (32 bits)
★		Max. Input Frequency	500 Hz
		Min. Pulse Width	1 ms
	Overvoltage Protection		+70 VDC
Digital Output			
	Channels		8
	Type		Isolated Open Collector
	Sink/Source (NPN/PNP)		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
	+10 ~ +50 VDC	OPEN or <4 VDC
Sink		
	+10 ~ +50 VDC	OPEN or <4 VDC
Source		

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 Module (RoHS)
PET-7052 CR	8-channel DI and 8-channel DO Module with PoE (RoHS)
PET-7052-48V CR	8-channel DI and 8-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7053 **PET-7053**
PET-7053-48V

16-channel Isolated Digital Input Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 16 Channels

Introduction

The ET-7053/PET-7053/PET-7053-48V provides 16 dry contact digital input channels. Each input channel can be used as a 32-bit counter. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. It can safely be used in applications where hazardous voltages are present.

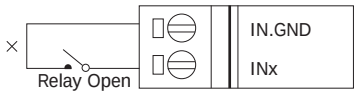
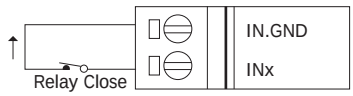
System Specifications

Models	ET-7053	PET-7053	PET-7053-48V
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		
★ PoE	-	Yes	
★ 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	3750 Vrms	3750 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.4 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

Digital Input/Counter		
Channels		16
Contact		Dry Contact
Sink/Source (NPN/PNP)		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.

Wire Connections

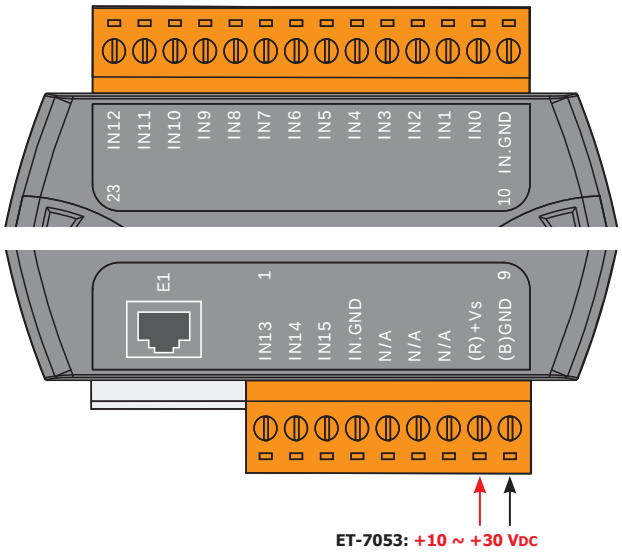
Digital Input/Counter	ON State Readback as 1	OFF State Readback as 0
Dry Contact		

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

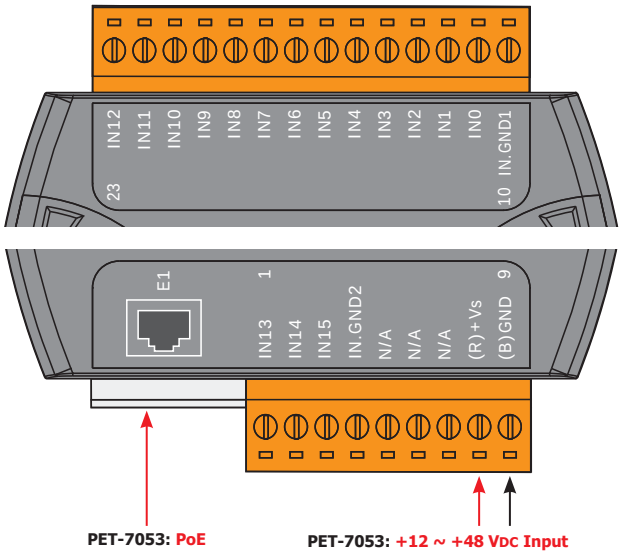
Pin Assignments

ET-7053



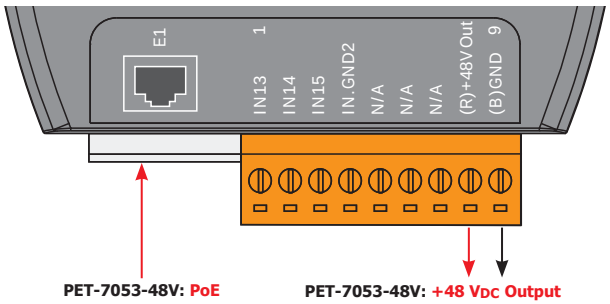
ET-7053: +10 ~ +30 VDC

PET-7053/PET-7053-48V



PET-7053: PoE

PET-7053: +12 ~ +48 VDC Input



PET-7053-48V: PoE

PET-7053-48V: +48 VDC Output

Ordering Information

ET-7053 CR	16-channel Isolated Digital Input Module (RoHS)
PET-7053 CR	16-channel Isolated Digital Input Module with PoE (RoHS)
PET-7053-48V CR	16-channel Isolated Digital Input Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Available soon

ET-7055 **PET-7055**
PET-7055-48V

8-channel DI and 8-channel DO Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 8 Channels
  - DO: 8 Channels

Introduction

The ET-7055/PET-7055/PET-7055-48V provides 8 wet contact digital input channels and 8 source-type digital output channels. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. Each input channel can be used as a 32-bit counter and each output channel can drive 650 mA load. The power-on value and safe value of digital output channel are programmable. It can safely be used in applications where hazardous voltages are present.

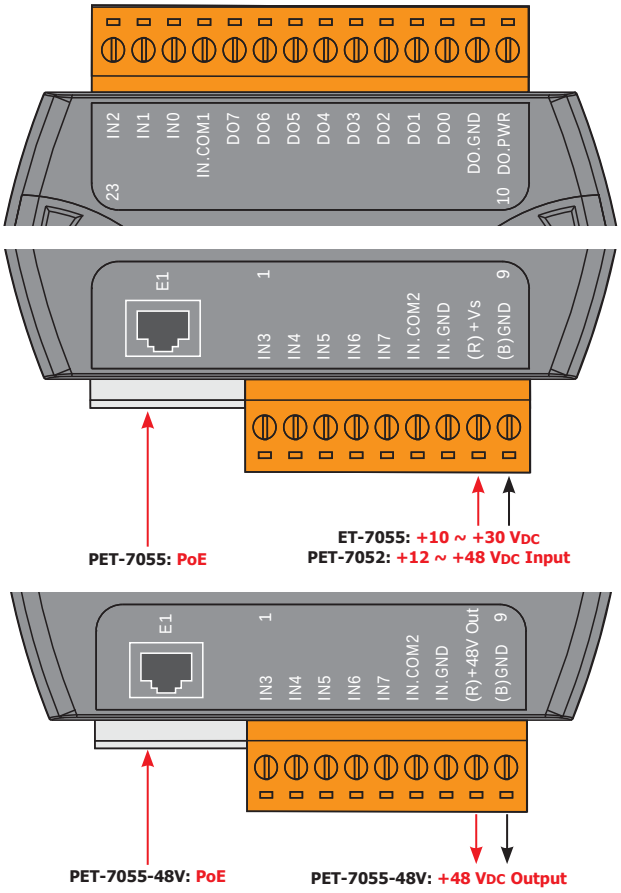
System Specifications

	Models	ET-7055	PET-7055	PET-7055-48V
	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		
★	PoE	-	Yes	
★	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	3750 Vrms	3750 Vrms	
	EMS Protection			
	ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
	EFT (IEC 61000-4-4)	+/-2 kV for Power		
	Power			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	Consumption	2.4 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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

I/O Specifications

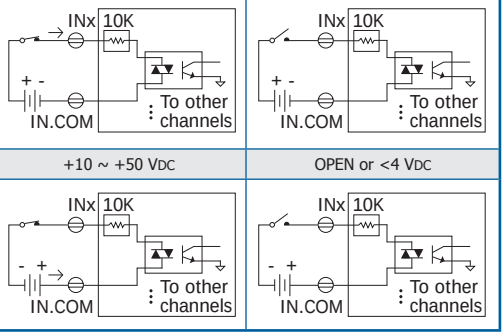
Digital Input/Counter		
Channels		8
Contact		Dry +Wet
Sink/Source (NPN/PNP)		Dry: Source Wet: Sink/Source
Wet Contact	On Voltage Level	+10 VDC ~ +50 VDC
	Off Voltage Level	+4 VDC Max.
Dry Contact	On Voltage Level	Close to GND
	Off Voltage Level	Open
Input Impedance		10 kΩ
★ Counters	Max. Count	4,294,967,285 (32 bits)
	Max. Input Frequency	500 Hz
	Min. Pulse Width	1 ms
Overvoltage Protection		+70 VDC
Digital Output		
Channels		8
Type		Isolated Open Collector
Sink/Source (NPN/PNP)		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

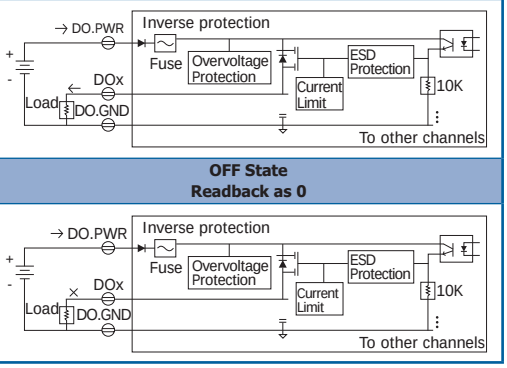


Wire Connections

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



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



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

Ordering Information

ET-7055 CR	8-channel DI and 8-channel DO Module (RoHS)
PET-7055 CR	8-channel DI and 8-channel DO Module with PoE (RoHS)
PET-7055-48V CR	8-channel DI and 8-channel DO Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

ET-7060 **PET-7060**
PET-7060-48V

6-channel Power Relay Output and 6-channel DI Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 6 Channels
  - Power Relay: 6 Channels

Introduction

The ET-7060/PET-7060/PET-7060-48V provides 6 wet contact digital input channels and 6 form A electromechanical relays. It features optical isolation for 3000 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. Each input channel can be used as a 32-bit counter. The power-on value and safe value of relay are programmable.

Note: When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads.

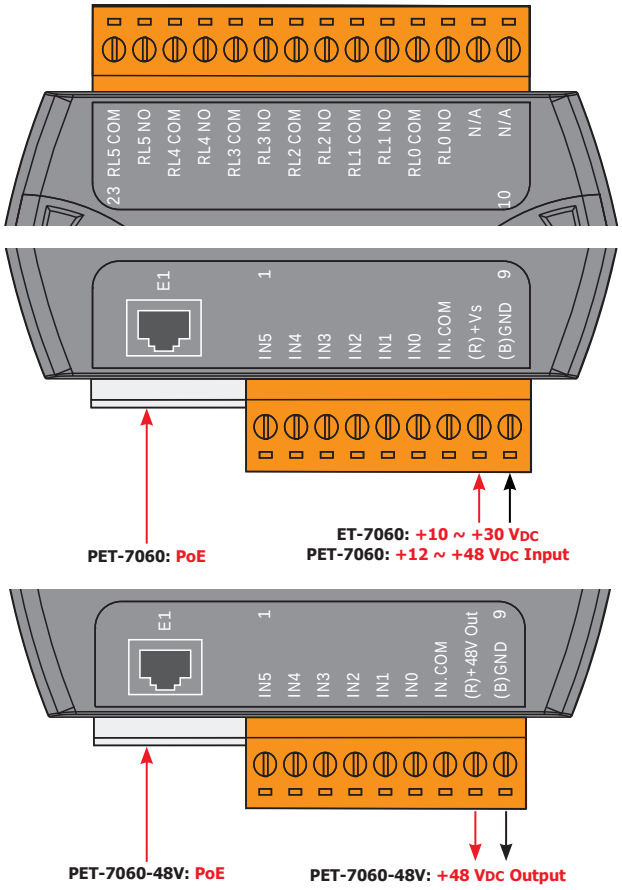
System Specifications

	Models	ET-7060	PET-7060	PET-7060-48V
	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		
★	PoE	-	Yes	
★	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	3000 Vrms	3000 Vrms	
	EMS Protection			
	ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
	EFT (IEC 61000-4-4)	+/-2 kV for Power		
	Power			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	Consumption	2.9 W	3.5 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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

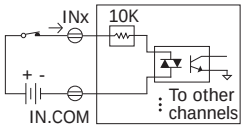
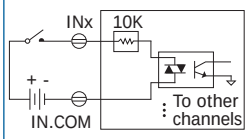
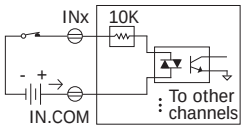
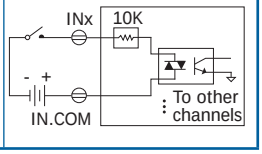
I/O Specifications

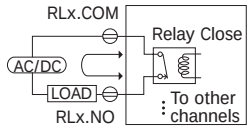
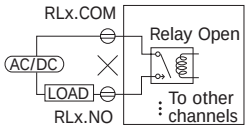
Digital Input/Counter			
Channels			6
Contact			Wet Contact
Sink/Source (NPN/PNP)			Sink/Source
On Voltage Level			+10 VDC ~ +50 VDC
Off Voltage Level			+4 VDC Max.
Input Impedance			10 kΩ
★	Counters	Max. Count	4,294,967,285 (32 bits)
★		Max. Input Frequency	500 Hz
		Min. Pulse Width	1 ms
Overvoltage Protection			+70 VDC
Power Relay			
Channels			6
Type			Power Relay, Form A (SPST N.O.)
Operating Voltage Range			250 VAC/30 VDC
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 VAC 30,000 ops (10 ops/minute) at 75°C
			5A 30 VDC 70,000 ops (10 ops/minute) at 75°C
		UL	5A 250 VAC/30 VDC 6,000 ops.
			3A 250 VAC/30 VDC 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 VDC	OPEN or <4 VDC
		
Source	+10 ~ +50 VDC	OPEN or <4 VDC
		

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

Ordering Information

ET-7060 CR	6-channel Power Relay Output and 6-channel DI Module (RoHS)
PET-7060 CR	6-channel Power Relay Output and 6-channel DI Module with PoE (RoHS)
PET-7060-48V CR	6-channel Power Relay Output and 6-channel DI Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)	

Available soon

ET-7062 **PET-7062**
PET-7062-48V

2-channel Power Relay Output and 6-channel DI Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 6 Channels
  - Power Relay: 2 Channels for switching inductive loads

Introduction

The ET-7062/PET-7062/PET-7062-48V provides 6 wet contact digital input channels and 2 power relay output channels. Each input channel can be used as a 32-bit counter. It features optical isolation for 3750 Vrms of transient overvoltage protection but doesn't provide channel-to-channel isolation. It can safely be used in applications where hazardous voltages are present.

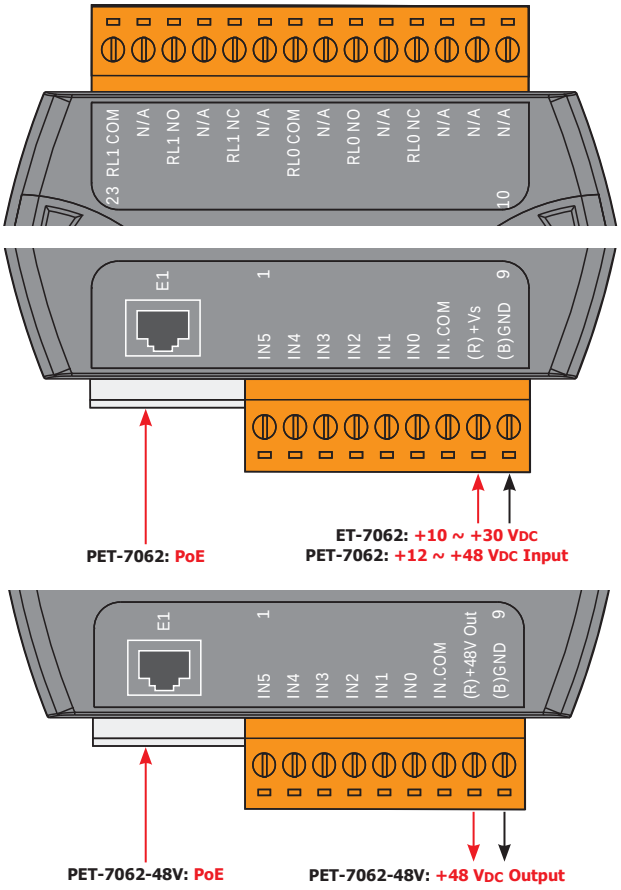
System Specifications

Models	ET-7062	PET-7062	PET-7062-48V
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		
★ PoE	-	Yes	
★ 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	3000 Vrms	3000 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.9 W	3.5 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

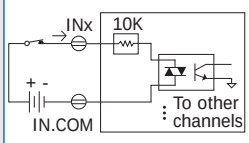
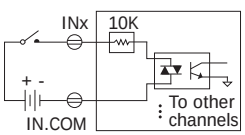
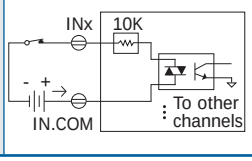
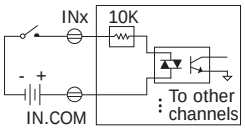
I/O Specifications

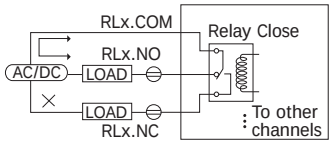
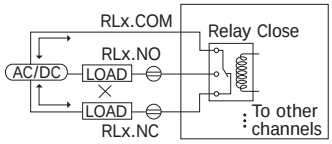
Digital Input/Counter				
Channels			6	
Contact			Wet Contact	
Sink/Source (NPN/PNP)			Sink/Source	
On Voltage Level			+10 VDC ~ +50 VDC	
Off Voltage Level			+4 VDC Max.	
Input Impedance			10 kΩ	
★ Counters	Max. Count		4,294,967,285 (32 bits)	
	Max. Input Frequency		500 Hz	
	Min. Pulse Width		1 ms	
Overvoltage Protection			+70 VDC	
Power Relay				
Channels			2	
Type			Power Relay, Form C	
Operating Voltage Range			250 VAC/30 VDC	
Max. Load Current			5.0A, TV-5 rated/channel at 25°C	
Operate Time (at nomi.volt)			15 ms Max.	
Release Time (at nomi.volt)			5 ms Max.	
Electrical Life (Resistive Load)	UL/CUL	1 Form A	TV-5 125 VAC 5A 125 VAC at 85°C 5A 250 VAC at 85°C 5A 30 VDC at 85°C	
		1 Form C	NO: 5 A 250 VAC NC: 5 A 250 VAC	
	TUV	1 Form A	5A 250 VAC 5A 30 VDC	
Mechanical Life			10,000,000 ops	
Electrical Life			50,000 ops	
Insulation resistance			1000 MΩ min. at 500 VDC	
★ 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
		

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

Ordering Information

ET-7062 CR	2-channel Power Relay Output and 6-channel DI Module (RoHS)
PET-7062 CR	2-channel Power Relay Output and 6-channel DI Module with PoE (RoHS)
PET-7062-48V CR	2-channel Power Relay Output and 6-channel DI Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)	

ET-7065 **PET-7065**
PET-7065-48V

6-channel PhotoMOS Relay Output and 6-channel DI Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 6 Channels
  - PhotoMOS Relay: 6 Channels

Introduction

The ET-7065/PET-7065/PET-7065-48V provides 6 wet contact digital input channels and 6 form A PhotoMOS relays. It features optical isolation for 3000 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. Each input channel can be used as a 32-bit counter. The power-on value and safe value of PhotoMOS relay are programmable. It can safely be used in applications where hazardous voltages are present.

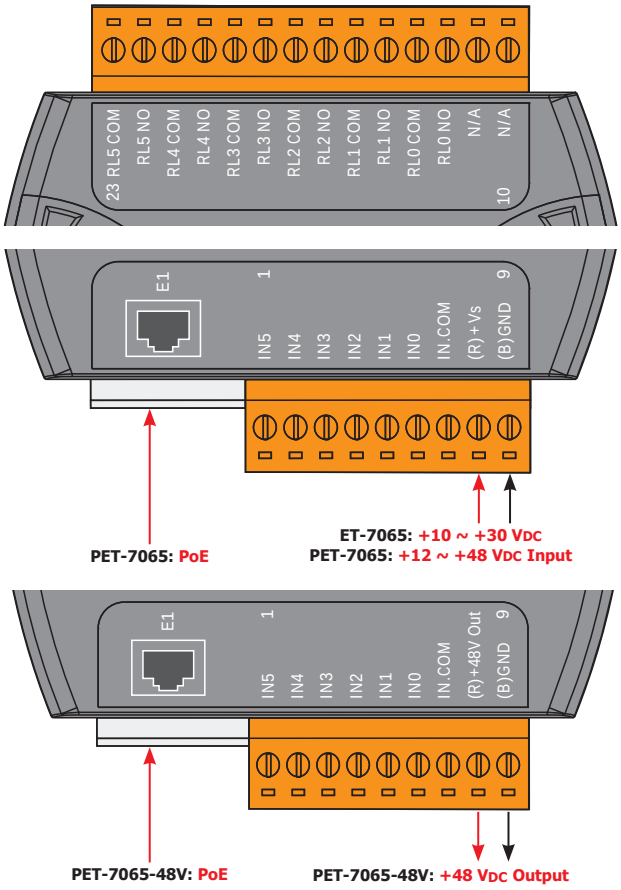
System Specifications

	Models	ET-7065	PET-7065	PET-7065-48V
	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		
★	PoE	-	Yes	
★	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	3000 Vrms	3000 Vrms	
	EMS Protection			
	ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
	EFT (IEC 61000-4-4)	+/-2 kV for Power		
	Power			
	Reverse Polarity Protection	Yes		
	Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
	Powered from PoE	-	Yes, IEEE 802.3af, Class1	
	Power Output	-	-	48 VDC, 10 W
	Consumption	2.9 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 ~ +75°C		
	Storage Temperature	-30 ~ +80°C		
	Humidity	10 ~ 90% RH, Non-condensing		

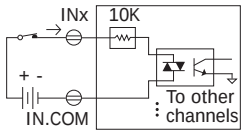
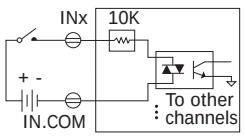
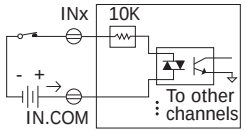
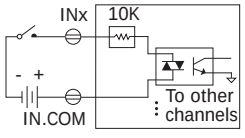
I/O Specifications

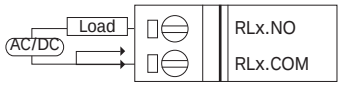
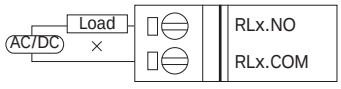
Digital Input/Counter			
	Channels		6
	Contact		Wet Contact
	Sink/Source (NPN/PNP)		Sink/Source
	On Voltage Level		+10 VDC ~ +50 VDC
	Off Voltage Level		+4 VDC Max.
	Input Impedance		10 kΩ
★	Counters	Max. Count	4,294,967,285 (32 bits)
★		Max. Input Frequency	500 Hz
		Min. Pulse Width	1 ms
	Overvoltage Protection		+70 VDC
PhotoMOS Relay			
	Channels		6
	Type		PhotoMOS Relay, Form A
	Load Voltage		60 VDC/VAC
	Max. Load Current		60V/1.0A (Operating Temperature -25 ~ +40°C)
			60V/0.8A (Operating Temperature +40 ~ +60°C)
			60V/0.7A (Operating Temperature +60 ~ +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 VDC	OPEN or <4 VDC
		
Source	+10 ~ +50 VDC	OPEN or <4 VDC
		

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

Ordering Information

ET-7065 CR	6-channel PhotoMOS Relay Output and 6-channel DI Module (RoHS)
PET-7065 CR	6-channel PhotoMOS Relay Output and 6-channel DI Module with PoE (RoHS)
PET-7065-48V CR	6-channel PhotoMOS Relay Output and 6-channel DI Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

	NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)	
	NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)	
	NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)	

ET-7066 **PET-7066**
PET-7066-48V

8-channel PhotoMOS Relay Output Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - PhotoMOS Relay: 8 Channels

Introduction

The ET-7066/PET-7066/PET-7066-48V provides 8 form A PhotoMOS relays. It features optical isolation for 3000 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. The power-on value and safe value of PhotoMOS relay are programmable. It can safely be used in applications where hazardous voltages are present.

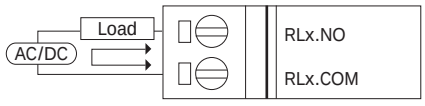
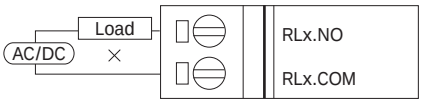
System Specifications

Models	ET-7066	PET-7066	PET-7066-48V
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		
★ PoE	-	Yes	
★ 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	3000 Vrms	3000 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	2.4 W	2.8 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

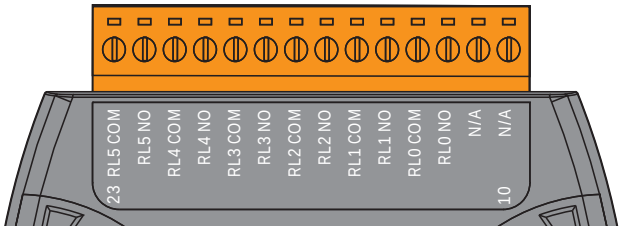
I/O Specifications

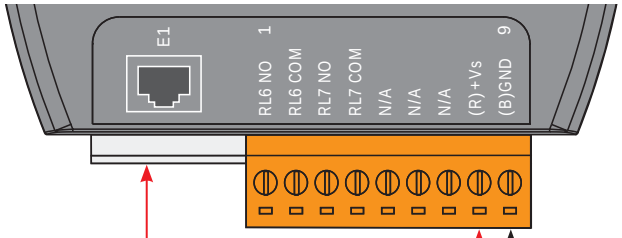
PhotoMOS Relay	
Channels	8
Type	PhotoMOS Relay, Form A
Load Voltage	60 VDC/VAC
★ Load Current	60V/1.0A (Operating Temperature -25 ~ +40°C)
	60V/0.8A (Operating Temperature +40 ~ +60°C)
	60V/0.7A (Operating Temperature +60 ~ +75°C)
Operate Time	1.3 ms (Typical)
Release Time	0.1 ms (Typical)
★ Power-on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

Wire Connections

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

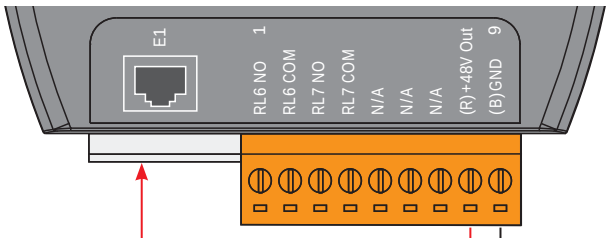
Pin Assignments





PET-7066: PoE

ET-7066: +10 ~ +30 VDC
PET-7066: +12 ~ +48 VDC Input



PET-7066-48V: PoE

PET-7066-48V: +48 VDC Output

Ordering Information

ET-7066 CR	8-channel PhotoMOS Relay Output Module (RoHS)
PET-7066 CR	8-channel PhotoMOS Relay Output Module with PoE (RoHS)
PET-7066-48V CR	8-channel PhotoMOS Relay Output Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

ET-7067 **PET-7067**
PET-7067-48V

8-channel Power Relay Output Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - Power Relay: 8 Channels

Introduction

The ET-7067/PET-7067/PET-7067-48V provides 8 form A electromechanical relays. It features optical isolation for 3000 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. The power-on value and safe value of relay are programmable. It can safely be used in applications where hazardous voltages are present. The user should choose ET-7063/PET-7063/PET-7063-48V to switch inductive loads instead of ET-7062/PET-7062/PET-7062-48V.

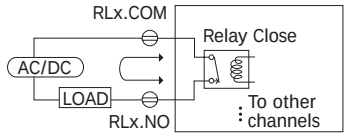
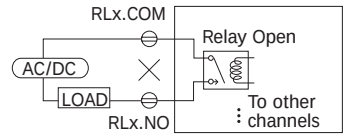
System Specifications

Models	ET-7067	PET-7067	PET-7067-48V
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		
★ PoE	-	Yes	
★ 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	3000 Vrms	3000 Vrms	
EMS Protection			
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal		
EFT (IEC 61000-4-4)	+/-2 kV for Power		
Power			
Reverse Polarity Protection	Yes		
Powered from Terminal Block	Yes, 10 ~ 30 VDC	Yes, 12 ~ 48 VDC	-
Powered from PoE	-	Yes, IEEE 802.3af, Class1	
Power Output	-	-	48 VDC, 10 W
Consumption	3.2 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 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Humidity	10 ~ 90% RH, Non-condensing		

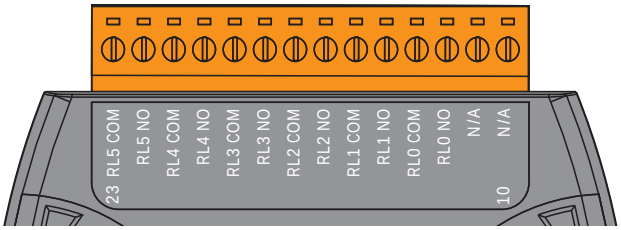
I/O Specifications

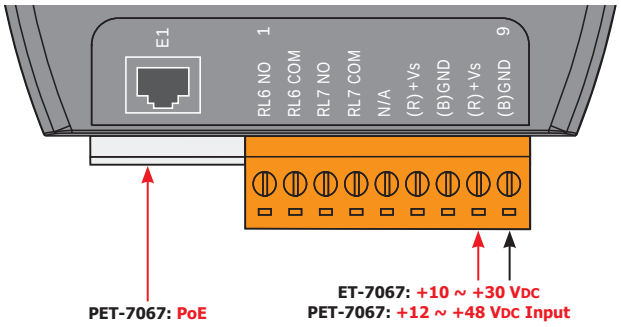
Power Relay		
Channels		8
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 VAC/30 VDC
Max. Load Current		5.0A/channel at 25°C
Operate Time		6 ms (Typical)
Release Time		3 ms (Typical)
Electrical Life (Resistive Load)	VDE	5A 250 VAC 30,000 ops (10 ops/minute) at 75°C
		5A 30 VDC 70,000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

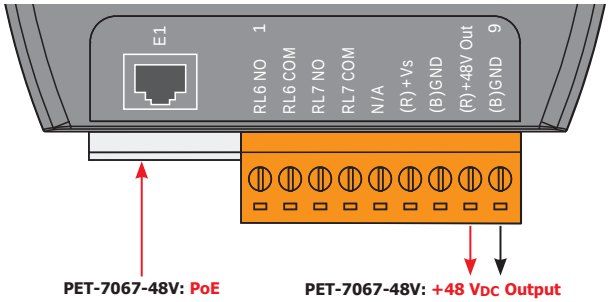
Wire Connections

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

Pin Assignments







Ordering Information

ET-7067 CR	8-channel Power Relay Output Module (RoHS)
PET-7067 CR	8-channel Power Relay Output Module with PoE (RoHS)
PET-7067-48V CR	8-channel Power Relay Output Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

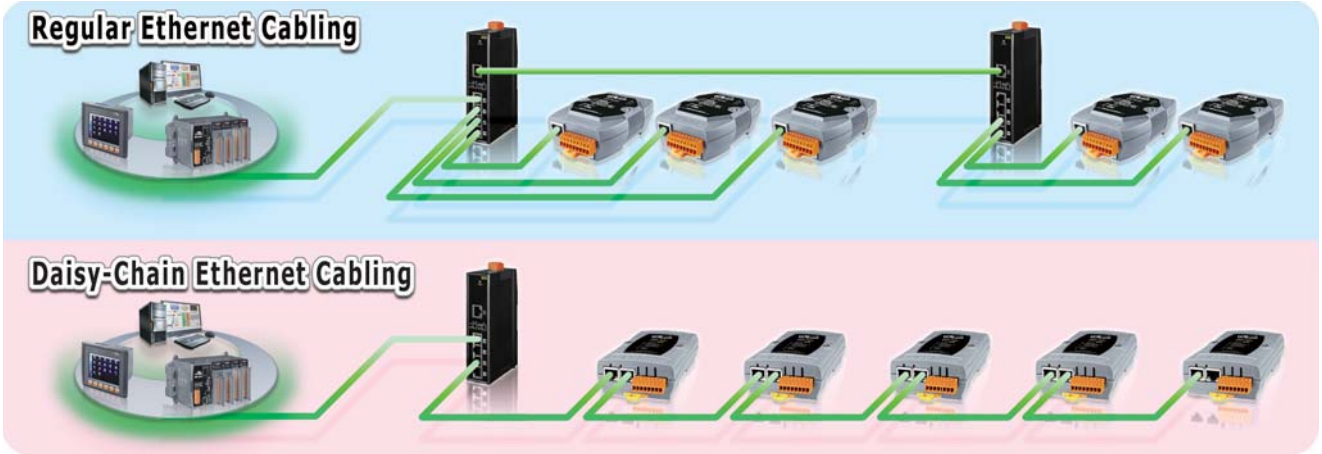
3.4. PEE-7000/PEE-7000-48V Series (Web based)

The functionality of the PEE-7000 series modules is almost the same as the PET-7000 series. The main difference is that the PEE-7000 series has a built-in two-port Ethernet switch to form a daisy-chain topology. Which allows PEE-7000 series to connect in series to each other or other Ethernet devices. Users can easily simplify the cabling and save installation space with the feature.

• Features

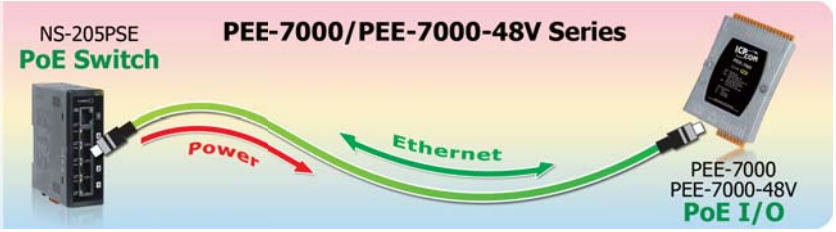
1. Daisy-Chain Ethernet Cabling

The PEE-7000 Series has a built-in two-port Ethernet switch to implement daisy-chain topology. The cabling is much easier and total costs of cable and switch are significantly reduced.

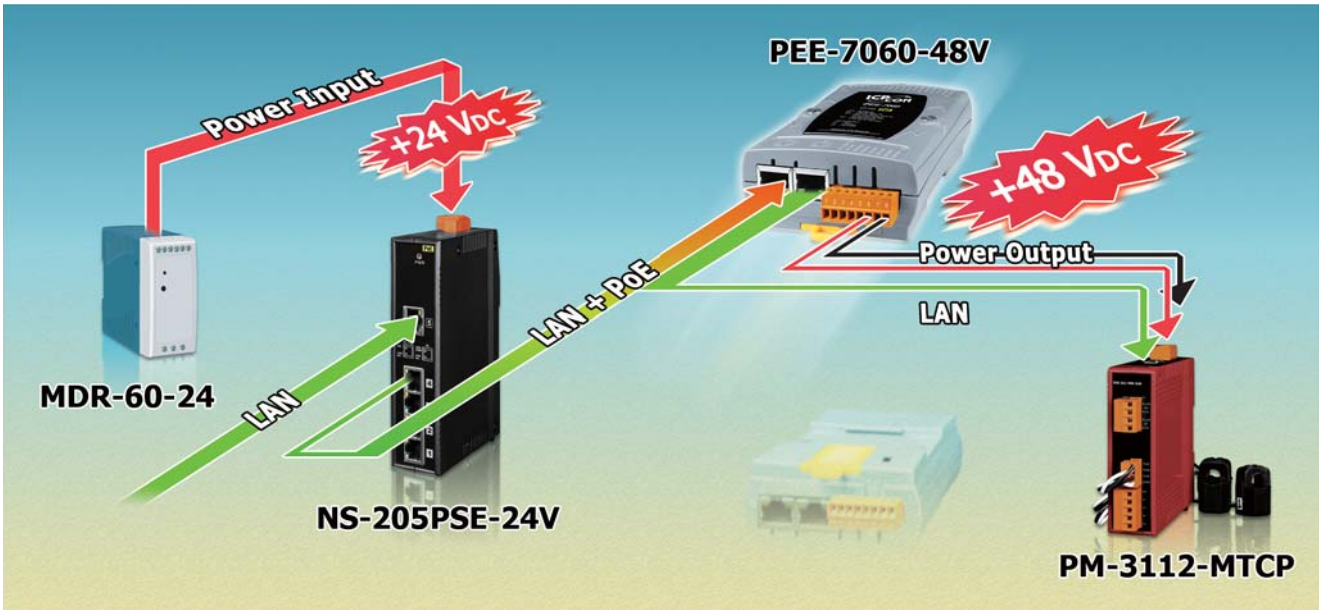


2. Power over Ethernet (PoE)

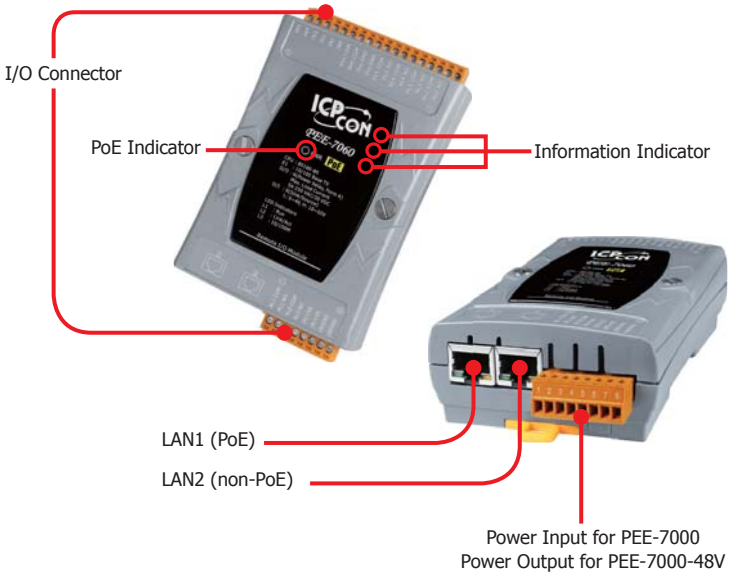
The PEE-7000 series module can be powered by an IEEE802.3af compliant PoE switch. Both Ethernet and power can be carried by an Ethernet cable eliminating the need for additional wiring and power supply.



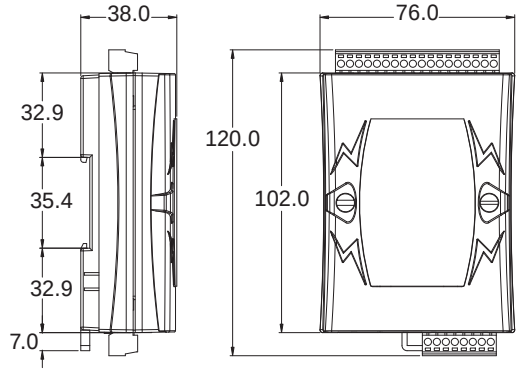
• PoE Splitter



• Appearance



• Dimensions (Units: mm)



Left Side View | Front View

• Selection Guide

Model Name	DI		DO	
	Channel	Contact	Channel	Type
PEE-7052 **PEE-7052-48V**	8	Wet (Sink,Source) Dry (Source)	8	Open Collector (Source), 650 mA/channel
PEE-7060 **PEE-7060-48V**	6	Wet (Sink,Source) Dry (Source)	6	Power Relay Form A (SPST N.O.), 5.0 A/channel
PEE-7067 **PEE-7067-48V**	-	-	8	Power Relay Form A (SPST N.O.), 5.0 A/channel

Note: The I/O configurations of PEE-7000/PEE-7000-48V series is the same as ET-7000/PET-7000/PET-7000-48V series.
Any comment, call manufacture.

PEE-7060 PEE-7060-48V

6-channel Power Relay Output and 6-channel DI Module

Features

- Built-in Web Server
- Web HMI
- Support for both Modbus TCP and Modbus UDP Protocols
- Communication Security
- Dual Watchdog
- Two Ethernet Ports for Daisy-Chain Topology
- Built-in PoE Splitter
- Wide Operating Temperature Range: -25 ~ +75°C
- I/O Pair Connection
- Built-in I/O
  - DI/Counter: 6 Channels
  - Power Relay: 6 Channels

Introduction

The PEE-7060/PEE-7060-48V provides 6 (wet, dry) contact digital input channels and 6 form A electromechanical relays. It features optical isolation for 3000 Vrms of transient overvoltage protection and doesn't have channel-to-channel isolation. Each input channel can be used as a 32-bit counter. The power-on value and safe value of relay are programmable.

It offers two Ethernet switch ports to form a daisy-chain topology. Which allows PEE-7060/PEE-7060-48V series to connect in series to each other or other Ethernet devices. Users can easily simplify the cabling and save installation space with the feature.

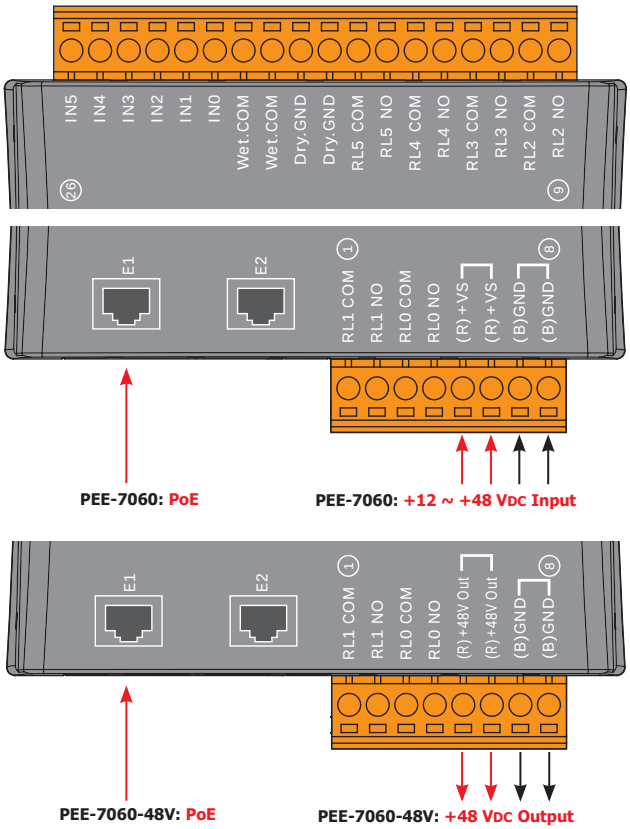
System Specifications

Models	PEE-7060	PEE-7060-48V
Software		
★ Built-in Web Server	Yes	
★ Web HMI	Yes	
★ I/O Pair Connection	Yes	
Communication		
★ Ethernet Port	2-Port 10/100 Base-TX Ethernet Switch, RJ-45 x 2 (Auto-negotiating, Auto-MDI/MDIX, LED indicator)	
★ PoE	Yes	Yes (PoE Splitter)
★ 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 Port 1 Link/Act)	Yes	
L3 (Ethernet Port 2 Link/Act)	Yes	
PoE Power	Yes	
2-Way Isolation		
Ethernet	-	
I/O	3000 Vrms	
EMS Protection		
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	+/-2 kV for Power	
Power		
Reverse Polarity Protection	Yes	
Powered from Terminal Block	Yes, 12 ~ 48 VDC	-
Powered from PoE	Yes, IEEE 802.3af, Class1	
Power Output	-	48 VDC, 10 W
Consumption	3.5 W	
Mechanical		
Dimensions (W x L x H)	76 mm x 120 mm x 38 mm	
Installation	DIN-Rail or Wall Mounting	
Environment		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Humidity	10 ~ 90% RH, Non-condensing	

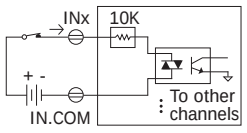
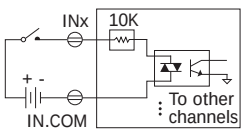
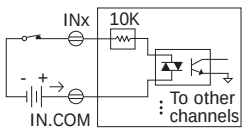
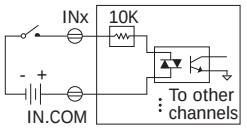
I/O Specifications

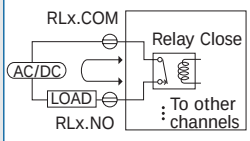
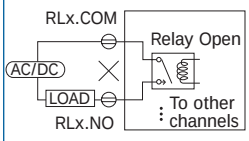
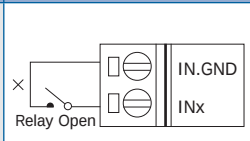
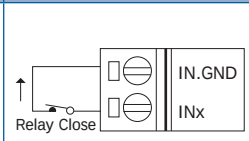
Digital Input/Counter			
Channels			6
Contact			Dry +Wet
Sink/Source (NPN/PNP)			Dry: Source Wet: Sink/Source
Wet Contact	On Voltage Level		+10 VDC ~ +50 VDC
	Off Voltage Level		+4 VDC Max.
Dry Contact	On Voltage Level		Close to GND
	Off Voltage Level		Open
Input Impedance			10 kΩ
★ Counters	Max. Count		4,294,967,285 (32 bits)
	Max. Input Frequency		500 Hz
	Min. Pulse Width		1 ms
Overvoltage Protection			+70 VDC
Power Relay			
Channels			6
Type			Power Relay, Form A (SPST N.O.)
Operating Voltage Range			250 VAC/30 VDC
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 VAC 30,000 ops (10 ops/minute) at 75°C
			5A 30 VDC 70,000 ops (10 ops/minute) at 75°C
	UL		5A 250 VAC/30 VDC 6,000 ops.
			3A 250 VAC/30 VDC 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 VDC	OPEN or <4 VDC
		
Source	+10 ~ +50 VDC	OPEN or <4 VDC
		

Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output		
Digital Input/ Counter	**ON State Readback as 1**	**OFF State Readback as 0**
Dry Contact		

Ordering Information

PEE-7060 CR	6-channel Power Relay Output and 6-channel DI Module with PoE (RoHS)
PEE-7060-48V CR	6-channel Power Relay Output and 6-channel DI Module with PoE and 48 VDC, 10 W output (RoHS) (Call Manufacture)

Accessories

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 48 VDC Input (RoHS)
 NS-205PSE-24V CR	Unmanaged Ethernet Switch with 4-PoE and 1 RJ45 uplink; requires a 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)

3.5. tET/tPET Series Modules (IP based)

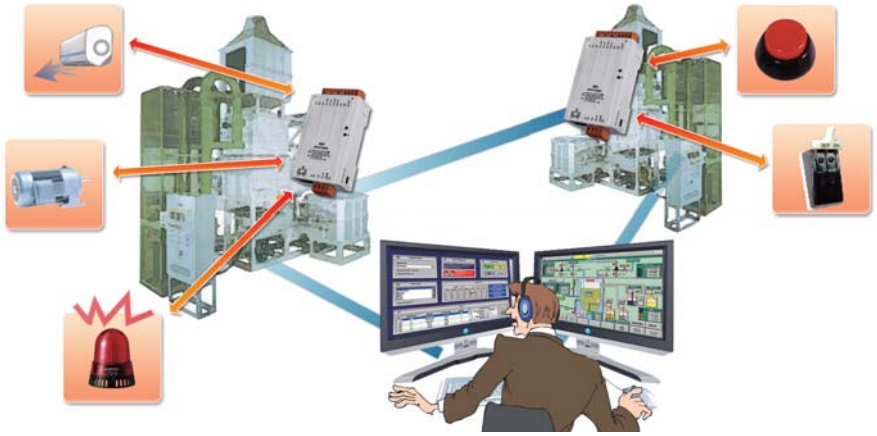
• Introduction

The functionality of the tET/tPET series modules is almost the same as the PET-7000. The major difference is that the PET-7000 module supports user-defined web HMI interface and more connections, while the tET/tPET series supports fixed web interface for configuration, higher speed of 32-bit DI counters, frequency measurement, PWM digital output and low power consumption. Especially the tET/tPET series features tiny form factor and low channel count that are suitable in distributed I/O points applications, such as room control and monitor... etc.

Push mode is a new way to transfer local DI status, immediately and automatically, to remote device or computer once the DI status changes. Without busy polling, push mode effectively reduces the network loading and improves the performance of the whole system. tET/tPET series supports both polling and push mode to transfer the I/O data over the network. No programming is required in the tET/tPET series, and the push mode can be easily enabled through the web configuration interface. The solution makes the user set up system easily and quickly, and the system work more efficient.

• Applications

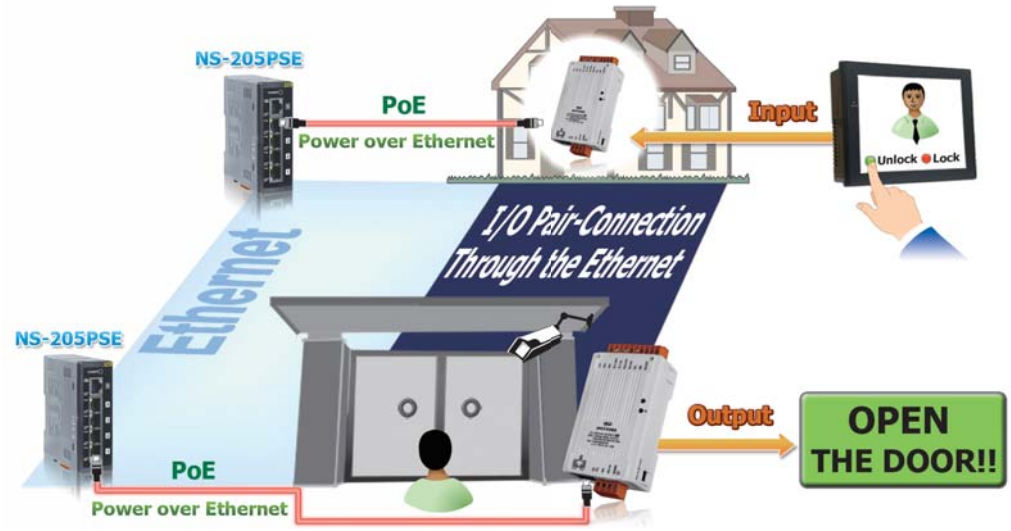
- Remote Maintenance
- Testing Equipment
- Building Automation
- Factory Automation
- Machine Automation



• Features

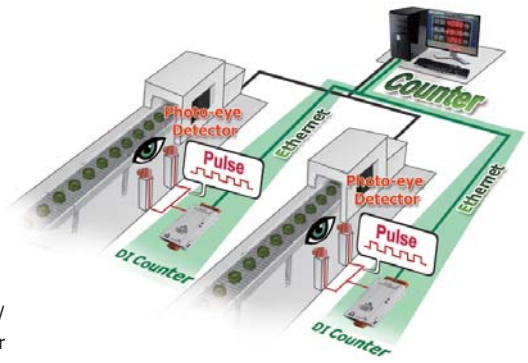
1. DIO Pair-Connection (Mirror)

The tET/tPET series Ethernet I/O modules support various I/O types, like photo-isolated digital input, power relay, PhotoMOS relay, and open collector output. The module can be used to create DI to DO pair-connection (mirror) through the Ethernet. Once the configuration is completed, the modules can automatically read the local DI status and write to remote DO channels via the Modbus TCP protocol in the background.



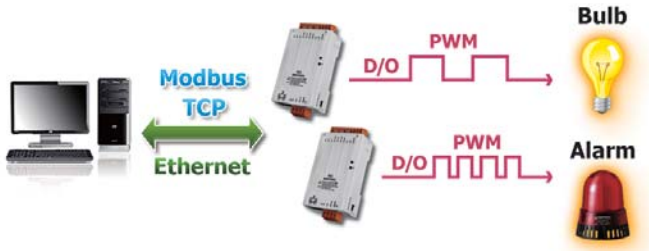
2. 32-bit High Speed Digital Counter

Polling the remote DI status back and then counting the ON/OFF changes in host computer may get quantity errors caused by communication delay. The tET/tPET series module has Built-in 32-bit counter function; it counts the DI ON/OFF changes in site to prevent counting errors caused by the communication latency. The 32-bit counter of the tET/tPET modules can count up to 4,294,967,295 and accept a frequency up to 3,500 Hz (without low pass filter), so it is suitable for more applications such as production counting, button or switch ON/OFF counting, event counting... etc.



3. Frequency Measurement

The tET/tPET module also supports frequency measurement function; it counts the DI ON/OFF changes in a certain time period and then calculates the frequency automatically. Rather than polling remote DI status back and then computing the frequency in the host PC, our module can directly count out the frequency in site. This reduces the frequency errors caused by communication latency between two ends, and also reduces the network loadings. In order to applying for more applications, this module provides 3 scan modes (0.1s, 1s and single-pulse) and 4 moving average levels for user to select the best way in their applications. This feature can be used for rotation and speed measurements... etc.



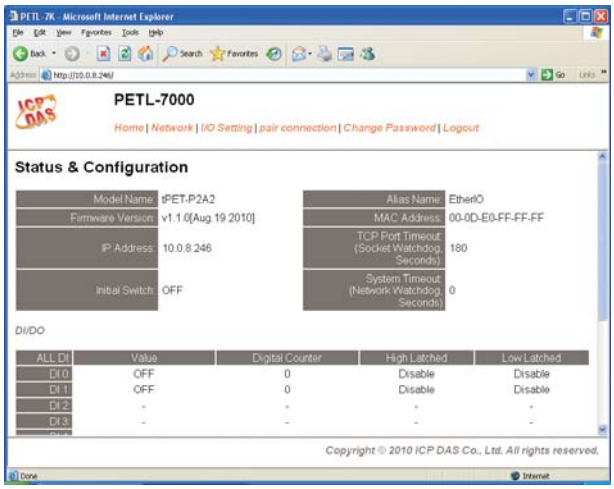
4. PWM (Pulse Width Modulation) Digital Output

The DOs on the tET/tPET series provide PWM (pulse width modulation) function that can be used in applications such as alarm light, flash light controls... etc. Once the configuration is finished, the module will automatically and continuously switch the DO output ON and OFF. This removes the busy control by remote host and also reduces the network loadings. Users can set different frequency and duty cycle for the PWM function in each digital output channel. In addition, the DO channels can work independently or simultaneously. This function reduces the complexity of the control system and enhances the timing accuracy of pulse output.

5. Easy Network Configuration

DHCP minimizes configuration errors caused by manual IP address configuration, such as address conflicts caused by the assignment of an IP address to more than one computer or device at the same time. The tET/tPET series module supports the DHCP client function, which allows the tET/tPET to easily obtain the necessary TCP/IP configuration information from a DHCP server. The module also contains a UDP responder that transmits its IP address information to a UDP search from the eSearch utility program, making local management more efficient.

The series of Ethernet I/O modules features a powerful 32-bit MCU to enable efficient handling of network traffic. It also has a Built-in web server that provides an intuitive web management interface to allow users to modify the settings of the module including DHCP/Static IP, gateway and mask.



6. Dual Watchdog with Power-on and Safe Value

The module provides dual watchdog: module watchdog (hardware function) and host watchdog (software function). The module watchdog automatically resets the module if the built-in firmware is operating abnormally, while the host watchdog sets the digital output with predefined safe-value when there is no communication between the module and the host (PC or PLC) for a period of time (watchdog timeout). The dual watchdog is an important feature that ensures the module operates continuously, even in harsh environments.

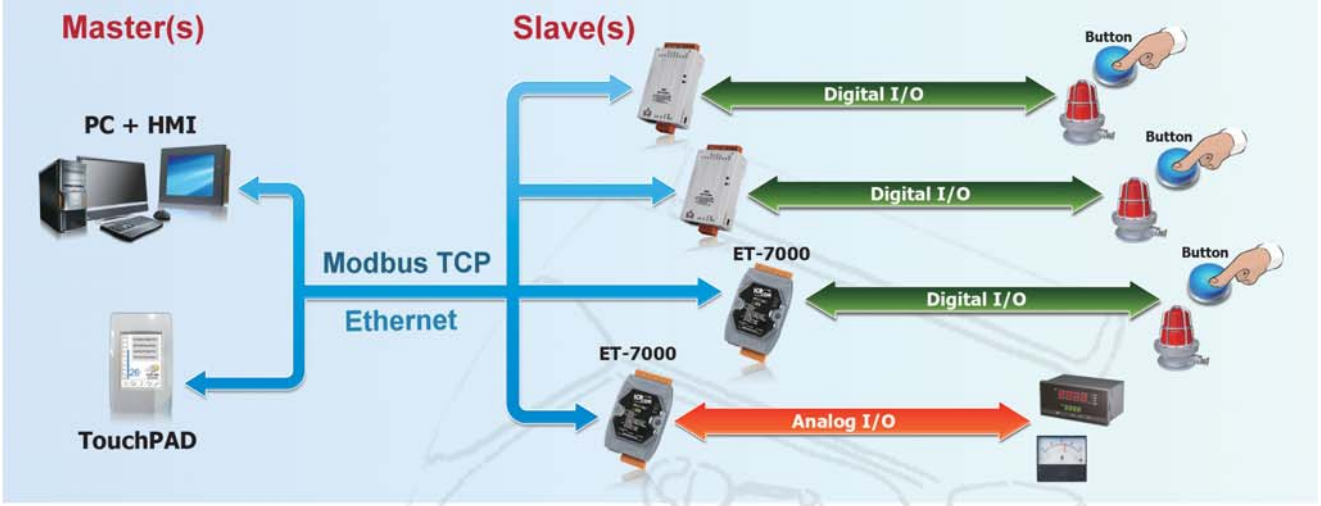
7. PoE (Power over Ethernet)

The tPET series module offers true IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) using a standard category 5 Ethernet cable to receive power from a PoE switch such as the NS-205PSE. If there is no PoE switch on site, the module will also accept power input from a DC adapter.

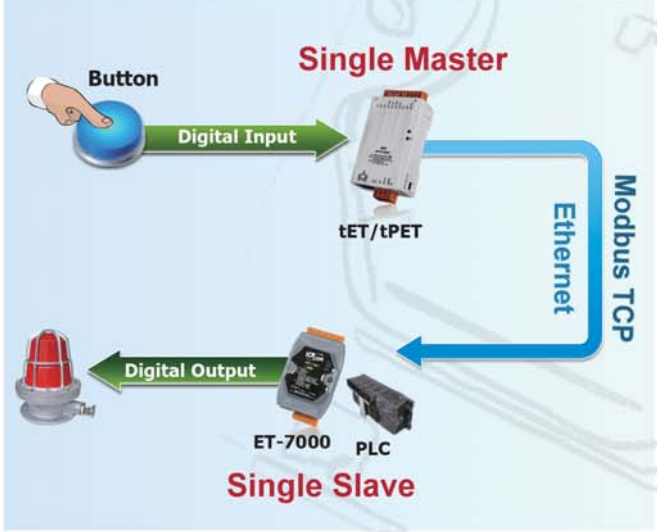
8. Low Power Consumption

The tET/tPET series is designed for ultra-low power consumption, reducing hidden costs from increasing fuel and electricity prices, especially when you have a huge amount of devices installed. Reducing the amount of electricity consumed by choosing energy-efficient equipment can have a positive impact on maintaining a green environment.
The module is equipped with removable terminal block connectors to allow easy wiring. For maximum space savings, the tET/tPET series is offered in an amazing tiny form-factor; this makes them can be easily installed in anywhere, even directly embedded into a machine.

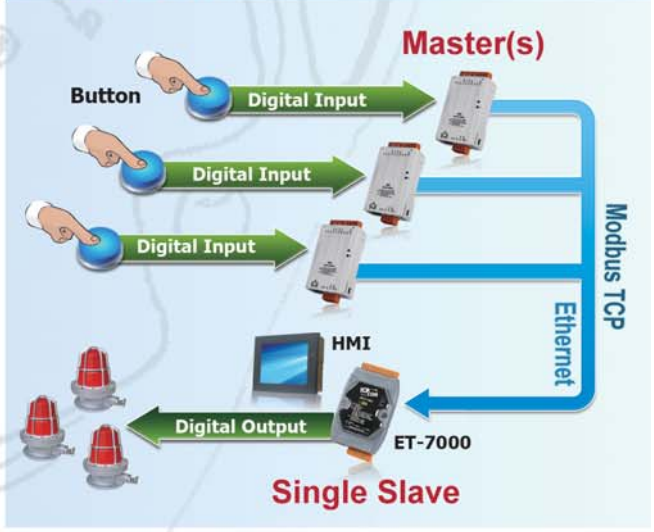
1 Polling: Masters poll tET/tPET DIO modules



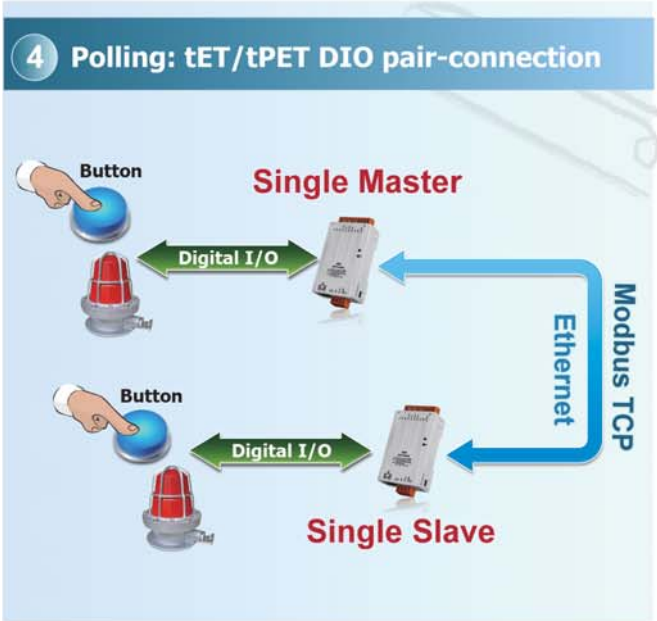
2 Push: tET/tPET module pushes DI to remote DO



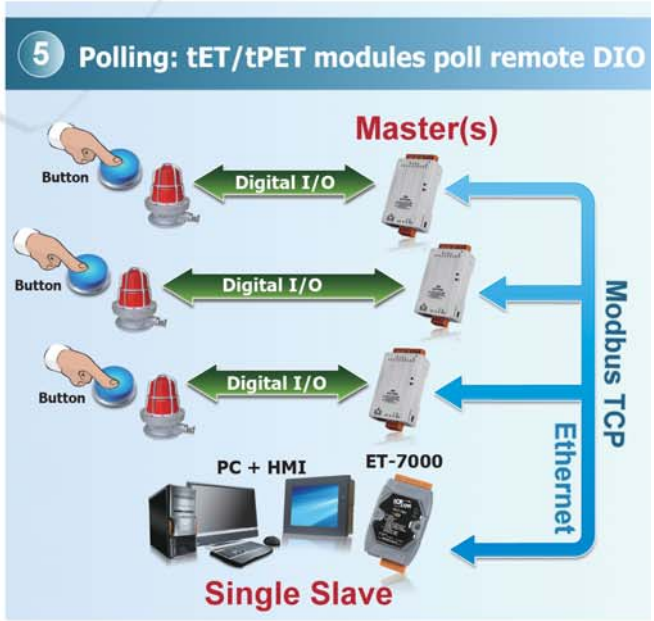
3 Push: tET/tPET modules push DI to remote DO



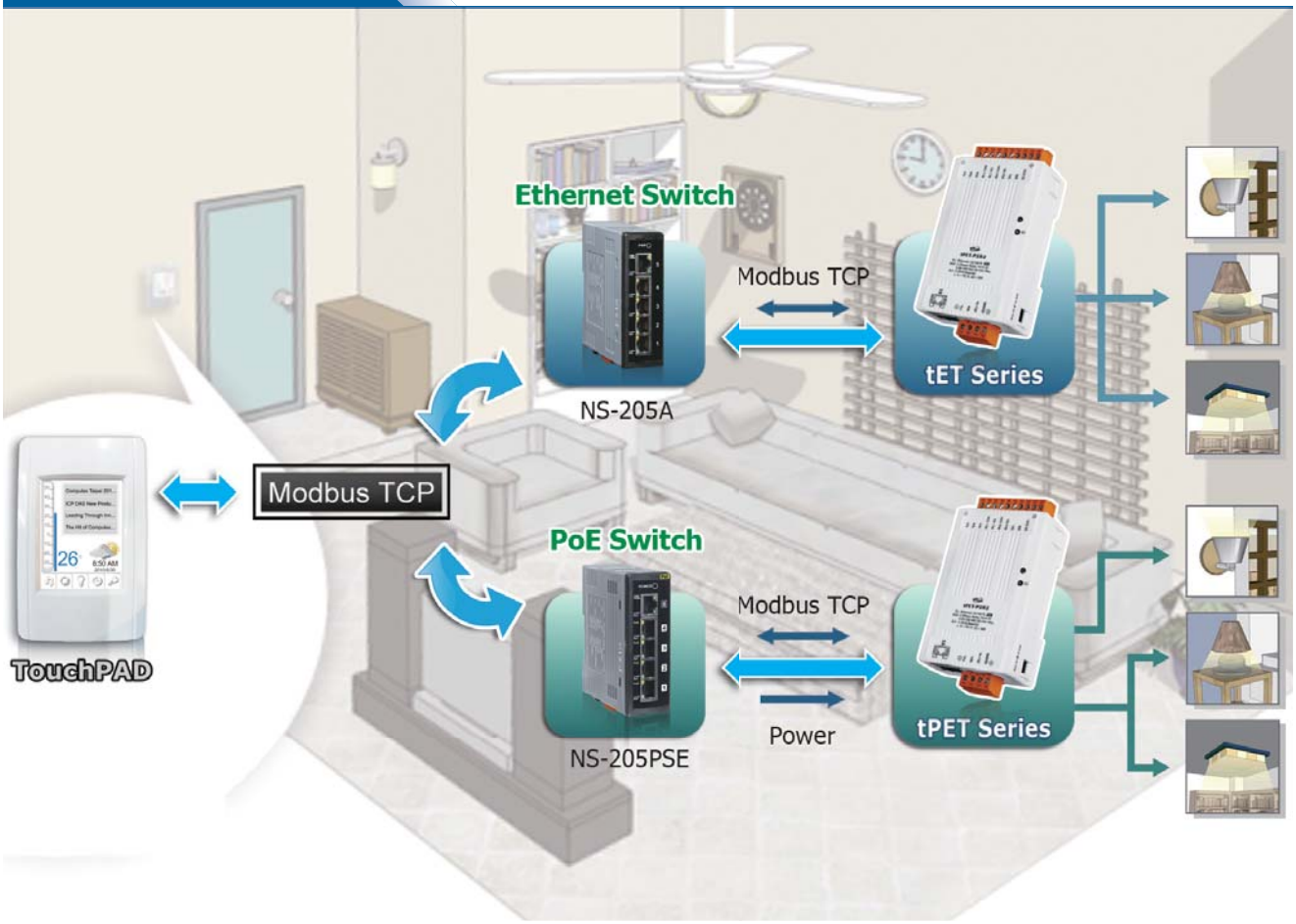
4 Polling: tET/tPET DIO pair-connection



5 Polling: tET/tPET modules poll remote DIO



• Selection Guide



tET/tPET Selection Guide

Digital I/O							
Model Name		DI			DO		
Ethernet	PoE	Channel	Contact	Sink/Source	Channel	Type	Sink/Source
tET-P6	**tPET-P6**	6	Wet	Sink/Source	-	-	-
tET-C4	**tPET-C4**	-	-	-	4	Open Collector	Sink/NPN
tET-A4	**tPET-A4**	-	-	-	4	Open Emitter	Source/PNP
tET-P2C2	**tPET-P2C2**	2	Wet	Sink/Source	2	Open Collector	Sink/NPN
tET-P2A2	**tPET-P2A2**	2	Wet	Sink/Source	2	Open Emitter	Source/PNP

Relay Output/Digital Input								
Model Name		Relay Output				DI		
Ethernet	PoE	Channel	Relay	Type	Max. Load Current	Channel	Contact	Sink/Source
tET-P2POR2	**tPET-P2POR2**	2	PhotoMOS Relay	Form A	1.0 A/channel	2	Wet	Sink/Source
tET-P2R2	**tPET-P2R2**	2	Power Relay	Form A (SPST N.O.)	5.0 A/channel	2	Wet	Sink/Source

NEW

tET/tPET Series

Tiny Ethernet I/O modules

Features

- Cost-effective Tiny Ethernet I/O Modules (Modbus TCP/UDP)
- 10/100 Base-TX Ethernet, RJ-45 x1
  (Auto-negotiating, Auto MDI/MDIX, LED Indicators)
- Contains a Powerful 32-bit MCU
- Includes Redundant Power Inputs: PoE and DC Input
- Supports UDP Responder for Device Discovery
- Supports Web Configuration and Firmware Update Via Ethernet
- Supports Latched DI, 32-bit DI Counters and Frequency Measurement
- Supports I/O Pair-connection Through the Ethernet
- Dual-watchdog with Power-on and Safe Value
- Made from Fire-retardant Materials (UL94-V0 Level)
- Low Power Consumption

System Specifications

Model Name	tET Series	tPET Series
Software		
Built-in Web Server	Yes	
I/O Pair Connection	Yes, Supports Polling and Push modes	
Communication		
Ethernet Port	10/100 Base-TX, 8-Pin RJ-45 x1 (Auto-negotiating, Auto-MDI/MDIX, LED indicators)	
Protocol	Modbus TCP, Modbus UDP, HTTP, DHCP, BOOTP and TFTP	
Security	IP filter (whitelist) and Password (web)	
Dual Watchdog	Yes, Module (2 seconds) and Host (programmable)	
LED Indicators		
S1	System Running (Red)	PoE (Green)
E1	Link/Act (Green), 10/100 M (Yellow)	
EMS Protection		
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal	
EFT (IEC 61000-4-4)	±2 kV for Power and Signal	
Mechanical		
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm	
Installation	DIN-Rail	
Power Requirements		
Powered from Terminal Block	Yes, +12 ~ 48 VDC (non-regulated)	
Powered from PoE	-	Yes, IEEE 802.3af, Class 1
Consumption	0.04 A @ 24 VDC Max. for tET-P2R2	0.03 A @ 48 VDC Max. for tPET-P2R2
Environment		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Humidity	10 ~ 90% RH, Non-condensing	

I/O Specifications

Digital Input/Output Series

Model Name	tET-C4/tPET-C4	tET-A4/tPET-A4
Pictures		
Digital Output		
Channels	4	
Type	Open Collector	Open Emitter
Sink/Source (NPN/PNP)	Sink	Source
Load Voltage	+5 VDC ~ +30 VDC	+10 VDC ~ +40 VDC
Max. Load Current	100 mA/channel	650 mA/channel
PWM	100 Hz Max. (High/Low duty cycle range = 5 ~ 65,535 ms)	
Overvoltage Protection	+60 VDC	+47 VDC
Short Circuit Protection	-	Yes
Isolation	3750 Vrms	

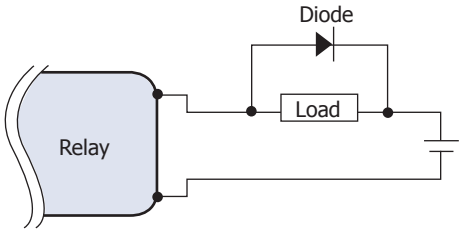
Model Name	tET-P6/tPET-P6	tET-P2C2/tPET-P2C2	tET-P2A2/tPET-P2A2
Pictures			
Digital Input			
Channels	6	2	
Contact	Wet Contact		
Sink/Source (NPN/PNP)	Sink/Source		
On Voltage Level	+10 VDC ~ +50 VDC		
Off Voltage Level	+4 VDC Max.		
Input Impedance	10 kΩ		
Counters	Max. Count: 4,294,967,285 (32 bits)		
	Max. Input Frequency: 3.5 kHz		
	Min. Pulse Width: 0.15 ms (without low pass filter)		
Overvoltage Protection	+70 VDC		
Isolation	3750 Vrms		
Digital Output			
Channels	-	2	
Type		Open Collector	Open Emitter
Sink/Source (NPN/PNP)		Sink	Source
Load Voltage		+5 VDC ~ +30 VDC	+10 VDC ~ +40 VDC
Max. Load Current		100 mA/channel	650 mA/channel
PWM		100 Hz Max. (High/Low duty cycle range = 5 ~ 65,535 ms)	
Overvoltage Protection		+60 VDC	+47 VDC
Short Circuit Protection		-	Yes
Isolation		3750 Vrms	

Digital Input/Relay Output Series

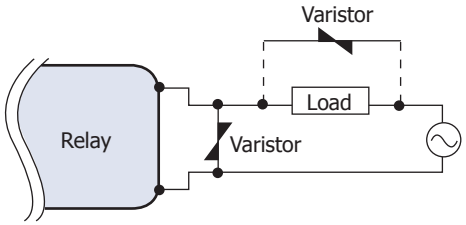
Model Name		tET-P2POR2/tPET-P2POR2	tET-P2R2/tPET-P2R2
Pictures			
PhotoMOS/Power Relay Output			
Channels		2	2
Type		PhotoMOS Relay, Form A (SPST N.O.)	Power Relay, Form A (SPST N.O.)
Load Voltage		60 VDC/VAC	250 VAC/30 VDC
Max. Load Current		60 V/1.0 A (Operating Temperature -25 ~ -40°C)	5.0 A/channel at 25°C
		60 V/0.8 A (Operating Temperature +40 ~ +60°C)	
		60 V/0.7 A (Operating Temperature +60 ~ +75°C)	
Operate Time		1.3 ms (Typical)	6 ms
Release Time		0.1 ms (Typical)	3 ms
PWM		50 Hz Max. (High/Low duty cycle range = 10 ~ 65,535 ms)	
Electrical Endurance (Resistive load)	VED	Long Life and No Spike	5 A 250 VAC 30,000 ops (10 ops/minute) at 75°C
			5 A 30 VDC 70,000 ops (10 ops/minute) at 75°C
	UL		5 A 250 VAC/30 VDC 6,000 ops
			3 A 250 VAC/30 VDC 100,000 ops
Mechanical Endurance		-	20,000,000 ops. At no load (300 ops./ minute)
Isolation		3000 Vrms	
Digital Input			
Channels		2	
Contact		Wet Contact	
Sink/Source (NPN/PNP)		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: 3.5 kHz	
		Min. Pulse Width: 0.15 ms (without low pass filter)	
Overvoltage Protection		+70 VDC	
Isolation		3750 Vrms	

Note: When inductive loads are connected to the relays, a large counter electromotive force may occur when the relay actuates because of the energy stored in the load. These flyback voltages can severely damage the relay contacts and greatly shorten the relay life. Limit these flyback voltages at your inductive load by installing a flyback diode for DC loads or a metal oxide varistor for AC loads.

for DC loads



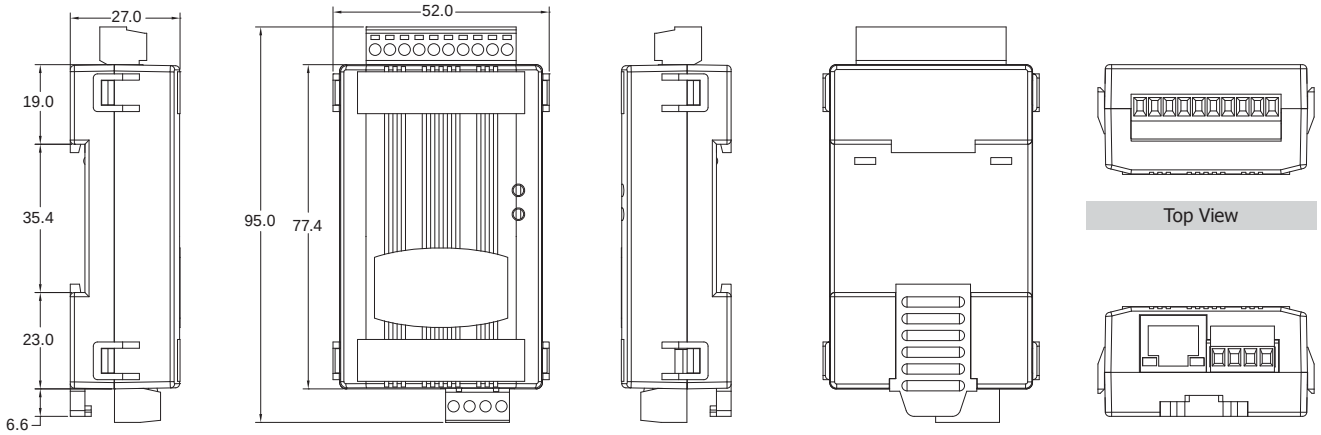
for AC loads



Varistor Selection

Operating Voltage	Varistor Voltage	Max. Peak Current
100 ~ 120 VAC	240 ~ 270 VAC	> 1000 A
200 ~ 240 VAC	440 ~ 470 VAC	> 1000 A

Dimensions (Units: mm)



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

Ordering Information

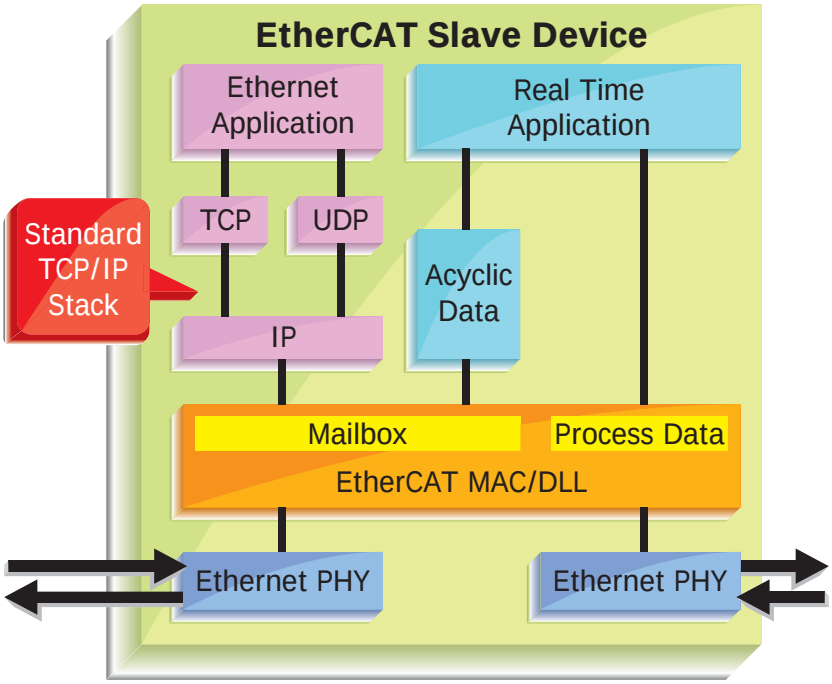
tET Series	
tET-P6 CR	Tiny Ethernet module with 6-channel DI (RoHS)
tET-C4 CR	Tiny Ethernet module with 4-channel DO (NPN, Sink) (RoHS)
tET-A4 CR	Tiny Ethernet module with 4-channel DO (PNP, Source) (RoHS)
tET-P2C2 CR	Tiny Ethernet module with 2-channel DI and 2-channel DO (NPN, Sink) (RoHS)
tET-P2A2 CR	Tiny Ethernet module with 2-channel DI and 2-channel DO (PNP, Source) (RoHS)
tET-P2POR2 CR	Tiny Ethernet module with 2-channel DI and 2-channel Form A PhotoMos relay (RoHS)
tET-P2R2 CR	Tiny Ethernet module with 2-channel DI and 2-channel Form A relay (RoHS)
tPET Series	
tPET-P6 CR	Tiny Ethernet module with PoE, and 6-channel DI (RoHS)
tPET-C4 CR	Tiny Ethernet module with PoE, and 4-channel DO (NPN, Sink) (RoHS)
tPET-A4 CR	Tiny Ethernet module with PoE, and 4-channel DO (PNP, Source) (RoHS)
tPET-P2C2 CR	Tiny Ethernet module with PoE, 2-channel DI and 2-channel DO (NPN, Sink) (RoHS)
tPET-P2A2 CR	Tiny Ethernet module with PoE, 2-channel DI and 2-channel DO (PNP, Source) (RoHS)
tPET-P2POR2 CR	Tiny Ethernet module with PoE, 2-channel DI and 2-channel Form A PhotoMos relay (RoHS)
tPET-P2R2 CR	Tiny Ethernet module with PoE, 2-channel DI and 2-channel Form A power relay (RoHS)

Related Products

 NS-205A CR	Unmanaged 5-port Industrial Ethernet Switch with Power Input +12 VDC ~ +56 VDC (RoHS)
 NS-205PSE CR	Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)
 NS-205PSE-24V CR	Unmanaged 5-Port 10/100 Mbps PoE (PSE) Ethernet Switch; 24 VDC Input (RoHS)
 DIN-KA52F CR	24 V/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
 DIN-KA52F-48 CR	48 V/0.52 A, 25 W Power Supply with Din-Rail Mounting (RoHS, for NS-205PSE)
 GPSU06U-6	24 V/0.25 A (max) Power Supply

3.6. EtherCAT Products

• Introduction

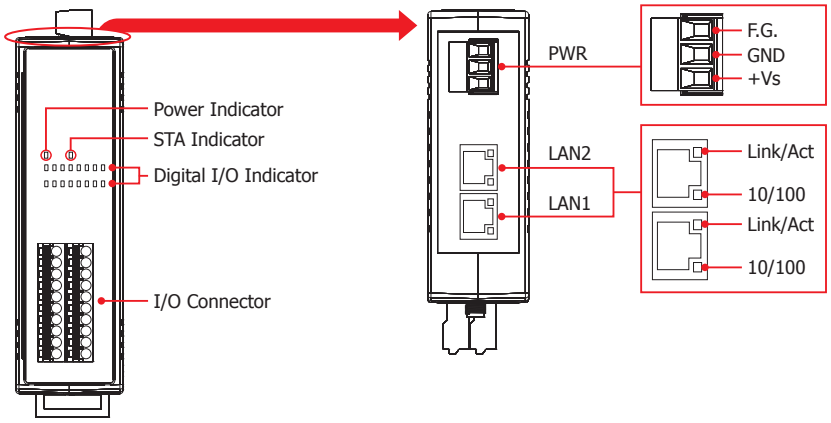


EtherCAT (Ethernet for Control Automation Technology) is an open, high-performance Ethernet-based fieldbus system that makes internet technologies available at the I/O level.

With EtherCAT, the controller can update the input and/or output information at the time when the data is needed.

The ECAT-2000 is an Industrial EtherCAT Remote I/O module series. It is equipped with the EtherCAT protocol, and allows daisy chain connection, making it possible to transfer data much faster during process control and other industrial automation applications. Daisy chain connectivity provides a more scalable system with fewer wires to help avoid interference common in factory settings.

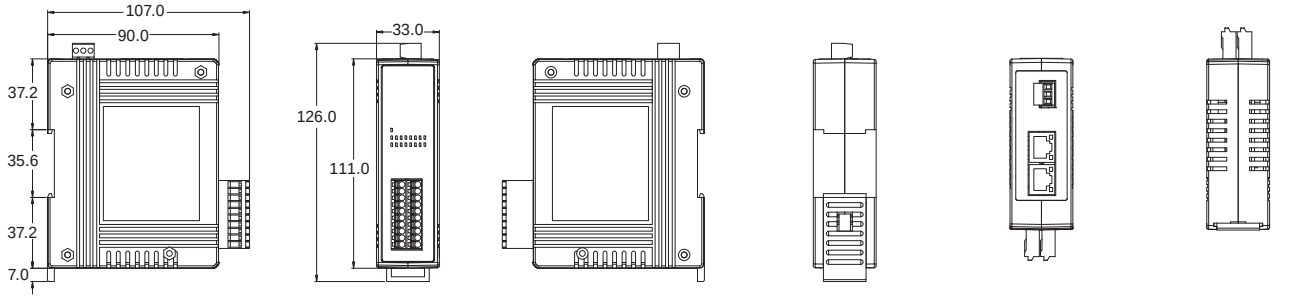
• Appearance



• Features

- Transfer protocol: EtherCAT
- Full compliance with Ethernet standards
- High efficiency & short refresh cycle
- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support Daisy Chain connection
- Removable terminal block connector
- LED display to indicate the I/O status
- Compact design saves space and simplifies installation

• Dimensions (Units: mm)



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

• Selection Guide

Product	Interface	Description
ECAT-2045	EtherCAT I/O device, 16 DOs	Isolated 16-channel DO EtherCAT I/O module
ECAT-2051	EtherCAT I/O device, 16 DIs	Isolated 16-channel DI EtherCAT I/O module
ECAT-2055	EtherCAT I/O device, 8 DIs, 8 DOs	Isolated 8-channel DI and 8-channel DO EtherCAT I/O module
ECAT-2060	EtherCAT I/O device, 6 DIs, 6 relay outputs	Isolated 6-channel DI and 6-channel relay output EtherCAT I/O module

Isolated 16-channel DO Module

Available soon

ECAT-2045

The ECAT-2045 is one of the ECAT-2000 Industrial EtherCAT Remote I/O module series. It provides 16-channel isolated digital outputs with 3750 Vrms field to logic isolation, and is comprehensively used in many applications.

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support Daisy Chain connection
- Removable terminal block connector
- Do load voltage: +10 ~ +40 VDC
- Do load current: 700 mA max.
- Provide short-circuit protection on DO channels
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 16-channel DI Module

Available soon

ECAT-2051

The ECAT-2051 is one of the ECAT-2000 Industrial EtherCAT Remote I/O module series. It provides 16-channel isolated digital inputs with wide range of input voltage, and is comprehensively used in many applications.

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support Daisy Chain connection
- Removable terminal block connector
- DI ON/OFF voltage level: +10 ~ +50 VDC / +4V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 8-channel DI & 8-channel DO Module

Available soon

ECAT-2055

The ECAT-2055 is one of the ECAT-2000 Industrial EtherCAT Remote I/O module series. It provides 8 digital inputs and 8 digital outputs, and is suited in various industrial applications

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support Daisy Chain connection
- Removable terminal block connector
- Do load voltage: +10 ~ +40 VDC
- Do load current: 700 mA max.
- Provide short-circuit protection on DO channels
- DI ON/OFF voltage level: +10 ~ +50 VDC / +4V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 6-channel DI & 6 Relay Output Module

Available soon

ECAT-2060

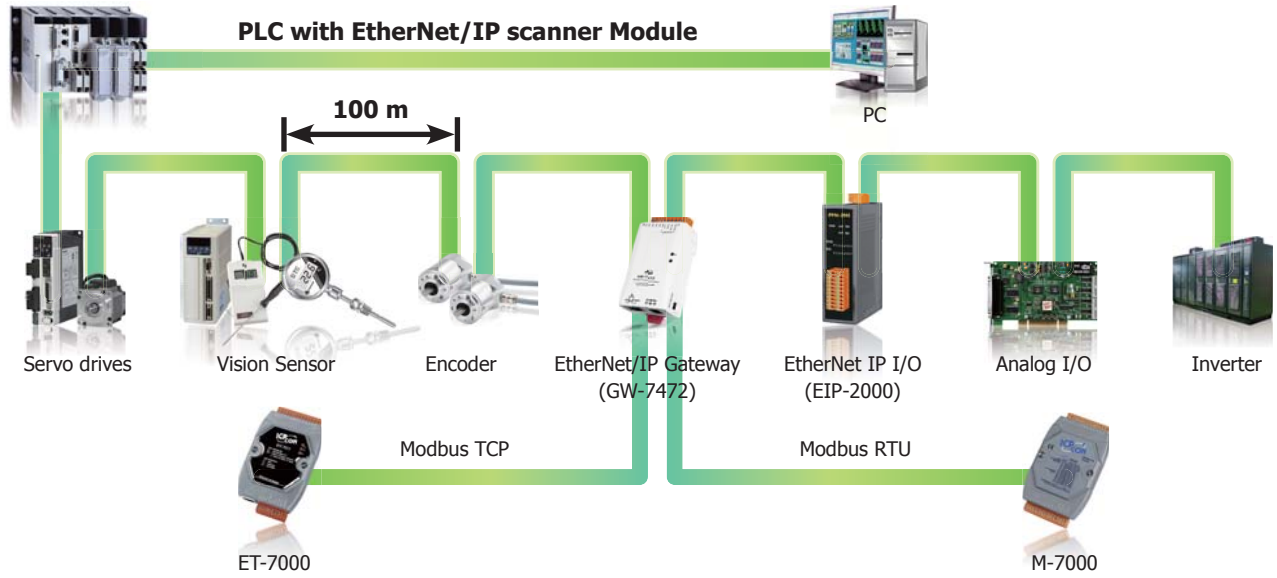
The ECAT-2060 is one of the ECAT-2000 Industrial EtherCAT Remote I/O module series. It provides 6 digital inputs and 6 relay outputs , and is suited in various industrial applications

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support Daisy Chain connection
- Removable terminal block connector
- Relay contact rating: 0.6 A @ 125 VAC, 2 A @ 30 VDC
- Relay operating time / release time: 3 ms / 2 ms (typical)
- Relay minimum life: 500,000 ops
- DI ON/OFF voltage level: +4 ~ +30 VDC / +1V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

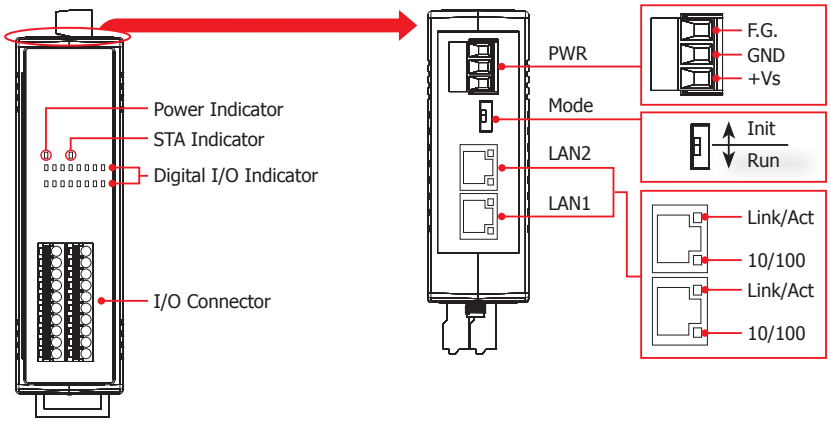
3.7. EtherNet/IP Products

• Introduction

EtherNet/IP is one of the open network standards; it uses all of the protocols of traditional Ethernet including the Transport Control Protocol (TCP), the Internet Protocol (IP) and the media access and signaling technologies. Building on standard Ethernet technologies means that Ethernet/IP will work transparently with all the standard Ethernet devices found today. The EIP-2000 is an Industrial EtherNet/IP Remote I/O module series. It is equipped with the EtherNet/IP protocol, and allows daisy chain connection, making it possible to transfer data much faster during process control and other industrial automation applications.



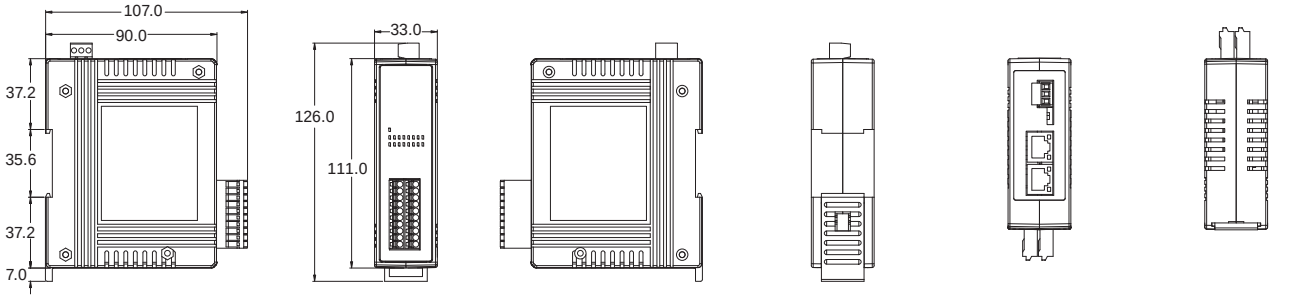
• Appearance



• Features

- Transfer protocol: EtherNet/IP
- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support ARP,TCP, UDP, ICMP, DHCP, BOOTP and TFTP protocols
- Support Daisy Chain connection
- Easy firmware update via Ethernet
- Removable terminal block connector
- RoHS compliant with Halogen-free
- LED display to indicate the I/O status

• Dimensions (Units: mm)



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

• Built-in Multi-function I/O

■ All Digital Output modules provide additional functions which can be configured by EIP-2000 Utility:

- Power-On-Value
  On boot up, DO status is set to the Power-On-Value for few seconds.
- Safe-Value and Safe-Delay
  If the EtherNet/IP connection disconnected, the DO status with remain the last status for certain seconds which is set by Safe Delay then set to Safe-Value.
- All-in-one Module
  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.

■ All Digital Input modules provide additional functions:

- DI counters
  Every DI channels can be used as DI status and 32-bit low speed (5kHz) counters. The counts can be transferred or set zero by EtherNet/IP.

• Selection Guide

Product	Interface	Description
EIP-2055	EtherNet/IP I/O device, 8 DIs, 8 DOs	Isolated 8-ch DI and 8-ch DO EtherNet/IP I/O module
EIP-2060	EtherNet/IP I/O device, 6 DIs, 6 relay outputs	Isolated 8-ch DI and 4-ch relay output EtherNet/IP I/O module

Isolated 8-channel DI & 8-channel DO Module

Available soon

EIP-2055

The EIP-2055 is one of the EIP-2000 Industrial EtherNet/IP Remote I/O module series. It provides 8 digital input and 8 digital output. The digital I/O of EIP-2055 supports built-in I/O functions such as DI counter and DO safe value...etc.

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support ARP,TCP, UDP, ICMP, DHCP, BOOTP and TFTP protocols
- Support Daisy Chain connection
- Easy firmware update via Ethernet
- LED display to indicate the I/O status
- Do load voltage: +10 ~ +40 VDC
- Do load current: 700 mA max.
- Provide short-circuit protection on DO channels
- DI ON/OFF voltage level: +10 ~ +50 VDC / +4V max.
- 4 kV Contact ESD protection for any terminal
- Built-in Multi-function I/O:
  - Power-On-Value.
  - Safe-Value and Safe-Delay.
  - DI counters.

Isolated 6-channel DI & 6 Relay Output Module

Available soon

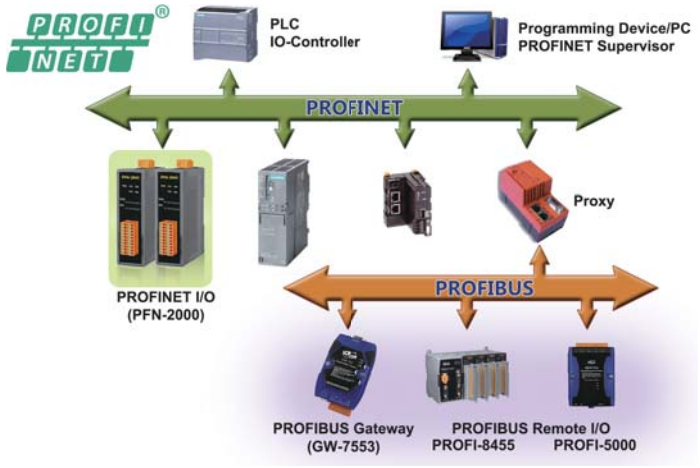
EIP-2060

The EIP-2060 is one of the EIP-2000 Industrial EtherNet/IP Remote I/O module series. It provides 6 digital input and 6 relay output. The digital I/O of EIP-2060 supports built-in I/O functions such as DI counter and DO safe value...etc.

- 10/100 Base-TX Ethernet, RJ-45 x 2
- Support ARP,TCP, UDP, ICMP, DHCP, BOOTP and TFTP protocols
- Support Daisy Chain connection
- Easy firmware update via Ethernet
- LED display to indicate the I/O status
- Relay contact rating: 0.6 A @ 125 VAC, 2 A @ 30 VDC
- Relay operating time / release time: 3 ms / 2 ms (typical)
- Relay minimum life: 500,000 ops
- DI ON/OFF voltage level: +4 ~ +30 VDC / +1V max.
- 4 kV Contact ESD protection for any terminal
- Built-in Multi-function I/O:
  - Power-On-Value.
  - Safe-Value and Safe-Delay.
  - DI counters.

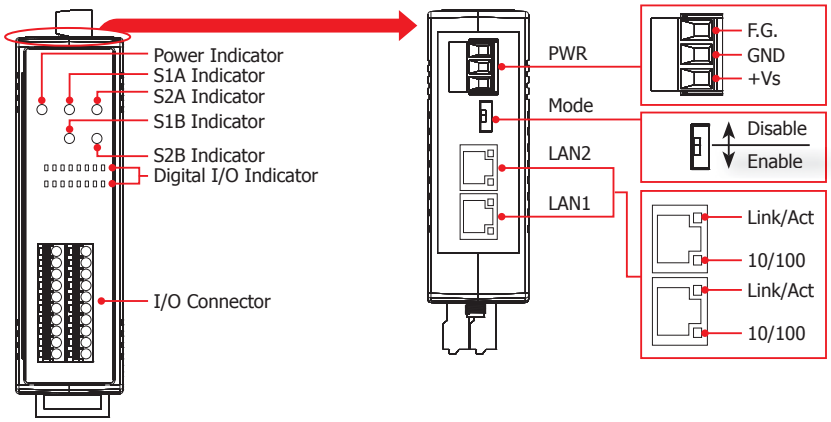
3.8. PROFINET Products

• Introduction



PROFINET is the Ethernet based Automation Standard of PROFIBUS & PROFINET International (PI). It satisfies all requirements of automation technology. It is fit for factory automation, process automation, safety applications and motion control applications, etc.
PROFINET allows existing field bus systems such as PROFIBUS DP, PROFIBUS PA, AS-Interface, INTERBUS and DeviceNet to be integrated without changes to existing field devices. It means the investments of field devices and applications are all protected.

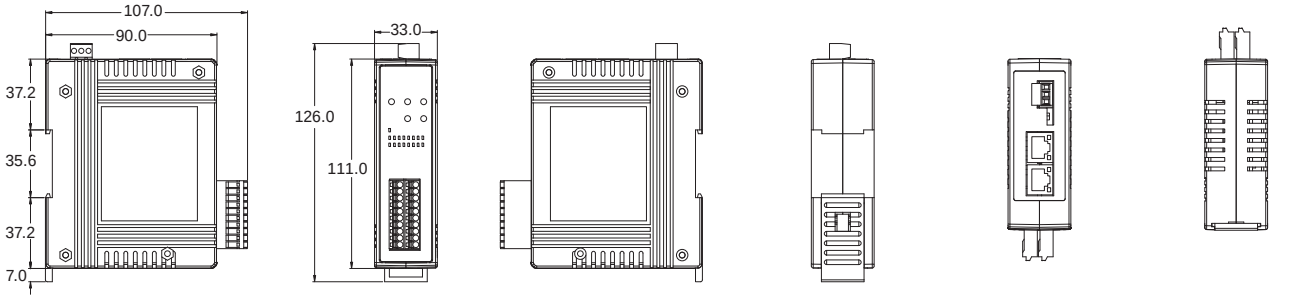
• Appearance



• Features

- Transfer protocol: PROFINET I/O
- 10/100 Base-TX Ethernet, RJ-45 x 2
- Supported Ethernet services: ICMP, IGMP, ARP, DHCP, TELNET, TFTP, SNMP, VLAN Priority Tagging
- Supported PROFINET services: RTC, RTA, CL-RPC, DCP, LLDP, I & M
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1ms (min)
- Alarm Type: Process, Diagnostic, Return of Sub Module
- Generic GSDML File Provided

• Dimensions (Units: mm)



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

• Selection Guide

Product	Interface	Description
PFN-2045	PROFINET I/O device, 16 DOs	Isolated 16-ch DO PROFINET I/O module
PFN-2051	PROFINET I/O device, 16 DIs	Isolated 16-ch DI PROFINET I/O module
PFN-2052	PROFINET I/O device, 8 DIs	Ch-to-ch Isolated 8-ch DI PROFINET I/O module
PFN-2053	PROFINET I/O device, 16 DIs	16-ch Dry Contact DI PROFINET I/O module
PFN-2055	PROFINET I/O device, 8 DIs, 8 DOs	Isolated 8-ch DI and 8-ch DO PROFINET I/O module
PFN-2060	PROFINET I/O device, 8 DIs, 4 relay outputs	Isolated 8-ch DI and 4-ch relay output PROFINET I/O module

Isolated 16-channel DO Module

Available soon

PFN-2045

The PFN-2045 is a DO device which follows the standard PROFINET I/O protocol. It provides 16-channel isolated digital outputs with 3750 Vrms field to logic isolation. You can be access and configure it by using the GSDML file in any standard PROFINET Engineering tool.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1 ms (min)
- Generic GSDML File Provided (Version 2.25)
- Do load voltage: +10 ~ +40 VDC
- Do load current: 700 mA max.
- Provide short-circuit protection on DO channels
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 16-channel DI Module

Available soon

PFN-2051

The PFN-2051 is specially designed for PROFINET I/O device. It provides 16-channel isolated digital inputs with wide range of input voltage, and is comprehensively used in many applications. Through the GSDML file, it is easy to communicate with any standard PROFINET I/O controller.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1 ms (min)
- Generic GSDML File Provided (Version 2.25)
- DI ON/OFF voltage level: +10 ~ +50 VDC / +4V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Channel-to-channel Isolated 8-channel DI Module

Available soon

PFN-2052

The PFN-2052 is specially designed for the I/O device of PROFINET protocol. There are 8-channel isolated digital inputs with 5000 Vrms field to logic isolation in the PFN-2052. The GSDML file of the PFN-2052 help you building the PROFINET network with the standard PROFINET I/O controller easily and quickly.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1 ms (min)
- Generic GSDML File Provided (Version 2.25)
- DI ON/OFF voltage level: +4 ~ +30 V / +1V max.
- 5000 Vrms isolation protection on each DI channel
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

16-channel DI Module

Available soon

PFN-2053

The PFN-2053 is a standard PROFINET I/O devices. It provide the GSDML file for standard PROFINET Engineering tool. There are 16-channel dry contact non-isolated digital inputs in the PFN-2053. This type of DI module is usually applied with the switch, such as limit switch, button, photo switch, and so forth.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1 ms (min)
- Generic GSDML File Provided (Version 2.25)
- DI ON/OFF voltage level: Open/close to IN.COM
- Input type: Dry Contact, Source
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 8-channel DI & 8-channel DO Module

Available soon

PFN-2055

The PFN-2055 is specially designed for PROFINET I/O device. It has 8-channel isolated digital inputs and 8-channel isolated digital outputs, and is suited in various industrial applications. You can access and configure it by using the GSDML file in any PROFINET Engineering tool.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1ms (min)
- Generic GSDML File Provided (Version 2.25)
- Do load voltage: +10 ~ +40 VDC
- Do load current: 700 mA max.
- Provide short-circuit protection on DO channels
- DI ON/OFF voltage level: +10 ~ +50 VDC/+4V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

Isolated 8-channel DI & 4 Relay Output Module

Available soon

PFN-2060

The PFN-2060 is a standard PROFINET I/O devices. Through the GSDML file, it can be easily applied with any standard PROFINET IO controller. It provides 8-channel isolated digital inputs and 4-channel relay outputs. Therefore, you don't need to install the additional relay by yourself. It saves not only the installation space, but the time for wiring.

- Protocol: PROFINET I/O Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1 ms (min)
- Generic GSDML File Provided (Version 2.25)
- Relay contact rating: 0.6 A @ 125 VAC, 2 A @ 30 VDC
- Relay operating time/release time: 3 ms/2 ms (typical)
- Relay minimum life: 500,000 ops
- DI ON/OFF voltage level: +4 ~ +30 VDC/+1V max.
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

3.9. Ethernet/Fiber Switch

Unmanaged Industrial PoE Ethernet Switch

Model Name	NS-105PSE	NS-105PSE-24V	NS-205PSE-24V	NSM-205PSE-24V	NSM-210PSE-24V	NSM-208PSE-M12
Pictures	Available soon 	Available soon 	NEW 	NEW 	Available soon 	NEW 
Speed	10/100 M					
Ethernet Port	1	1	1	1	2	-
Ethernet Port with PoE	4	4	4	4	8	8
Casing	Plastic			Metal with IP30		Metal with IP40
Operating Temperature	-40 ~ +75°C					
Power Input	+46 VDC~ +53 VDC	+18 VDC ~ +32 VDC				+46 VDC ~ +53 VDC
Dimensions (W x L x H) (Units: mm)	76 x 38 x 118	76 x 38 x 118	31 x 113 x 157	25 x 119 x 168	25 x 119 x 168	190 x 56 x 100

Unmanaged Industrial Ethernet Switch

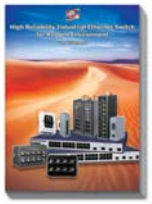
Model Name	NS-208-IP67	NS-205A	NS-105A	NS-208A	NSM-208A	NSM-208-M12
Pictures	NEW 	NEW 	Available soon 	NEW 	NEW 	NEW 
Speed	10/100 M					
Port	8	5	5	8	8	8
Casing	Plastic			Metal		Metal with IP40
Operating Temperature	-10 ~ +60°C	-40 ~ +75°C				
Power Input	+12 VDC ~ +53 VDC	+12 VDC ~ +56 VDC	+12 VDC ~ +48 VDC			+12 VDC ~ +53 VDC
Dimensions (W x L x H) (Units: mm)	190 x 155 x 104	33 x 78 x 107	76 x 38 x 118	31 x 113 x 157	25 x 119 x 168	190 x 56 x 100

Unmanaged Industrial 10/100 Base-T(X) with 100 Base-FX Fiber Switch

Model Name		NSM-205AFT-T	NSM-205AFC-T	NSM-205AFCS-T	NSM-206AFT-T	NSM-206AFC-T	NSM-206AFCS-T
Pictures		NEW 	NEW 	NEW 	NEW 	NEW 	NEW 
Fiber Port	Mode	Mulit-mode	Mulit-mode	Single-mode	Mulit-mode	Mulit-mode	Single-mode
	Connector	ST	SC	SC	ST	SC	SC
	Speed	100 M					
	Port	1			2		
Ethernet	Speed	10/100 M					
	Port	4					
Casing		Metal					
Operating Temperature		-30 ~ +75°C					
Power Input		+12 VDC ~ +48 VDC					
Dimensions (W x L x H) (Units: mm)		25 x 133 x 168					

High Reliability Industrial Ethernet Switch Catalog

- Managed Ethernet Switches
- Unmanaged Ethernet Switches PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technlolgy



FRnet Remote I/O Modules

4

4.1. Overview

FRnet is an innovative industrial field bus. It uses twisted pair cable as the transmission medium. Each FRnet port can link up to 128 DI and 128 DO channels. The whole I/O status are updated at a fixed cycle time (0.72 ms or 2.88 ms) no matter how many FRnet I/O modules are connected to the FRnet network. Furthermore, the update is done by the FRnet chip, there is no need for a communication protocol. Using FRnet, the user can easily and quickly implement high-speed distributed I/O control systems.

• Applicatoins

Building Automation, Machine Automation, Testing Equipment, etc

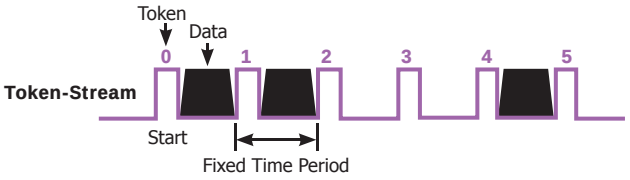
• Features

1. Token-Stream Communication

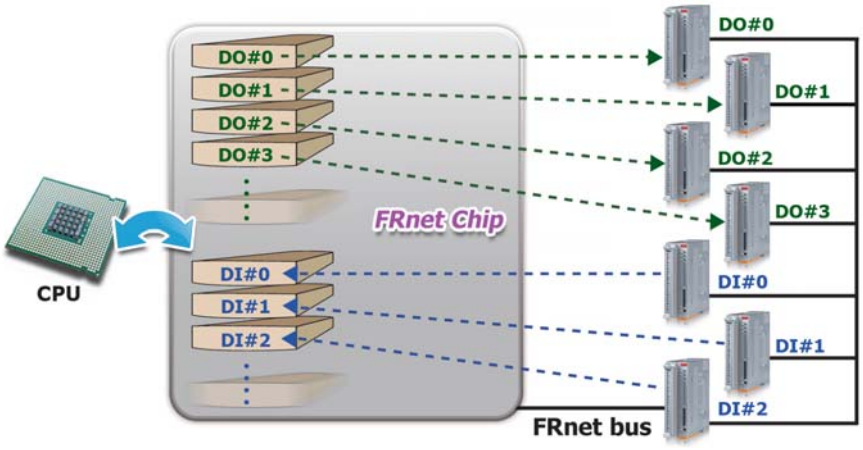
The FRnet chip uses a simple token-stream communication mechanism to provide a fast and fixed cycle time I/O-scanning capability. It doesn't need any special transmission protocol; the chip takes care of the data transfer for every device. The most significiant benefits of FRnet are:

- **Fixed cycle time:**
  The cycle time is fixed at 2.88/0.72 ms no matter how many devices connected in the network.

	Baudrate	Max. Distance	Fixed cycle time
High Speed	1 Mbps	100 m	0.72 ms
Normal Speed	250 kbps	400 m	2.88 ms



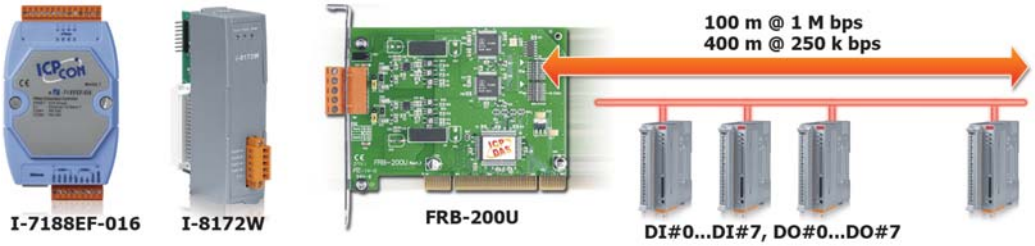
- **Memory-Mapped I/O:**
  The data transfer is automatically done by the FRnet chip. The CPU of the host (PC or PAC) doesn't need to take care of the communication protocol. All I/O status are mapped to the memory of the FRnet chip.



2. Multi-Drop networking

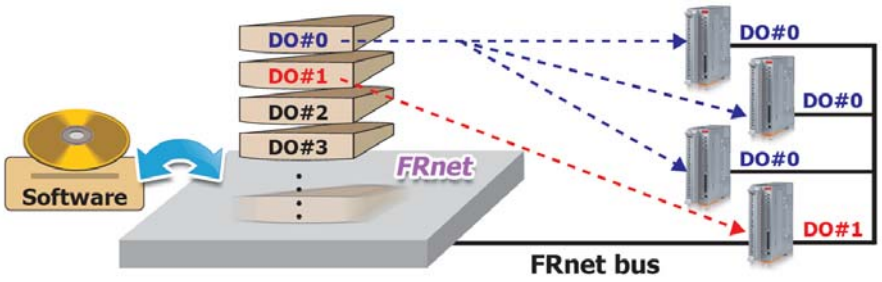
The physical connection is same as the standard RS-485 cabling to implement multi-drop networking. The maximum communication distance is up to 100/400 m at high/normal speed communication.

- **I/O expansion up to 128 DI and 128 DO channels**
  Each FRnet chip addresses 8 DI and 8 DO groups which each group contains 16 DI or DO channels



• **DO broadcasting**

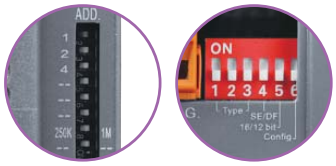
Due to the broadcasting algorithm adopted, the DO group address is not required to be unique. Therefore, it is easy to build a data delivery from one group (16-bit data) to a multi-group.



3. Easy to Diagnose

There are several LED indicators to diagnose whether FRnet I/O modules work properly. And the built-in FRnet terminator switch can be used to improve communication signal quality.

4. Easy to Configure



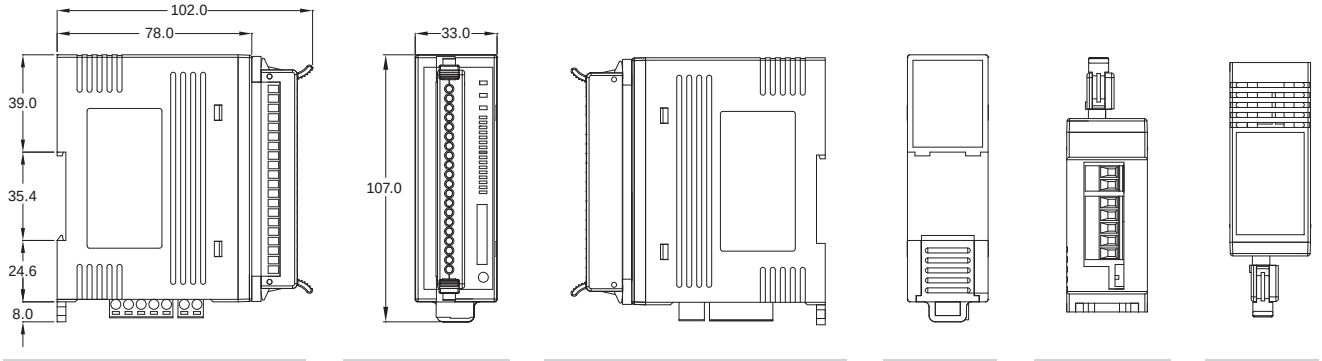
All basic configurations (address, speed and input/output range of AI/AO modules) are set by DIP switches. The operator can use only one screwdriver to complete the configuration.

• Hardware

1. Installation

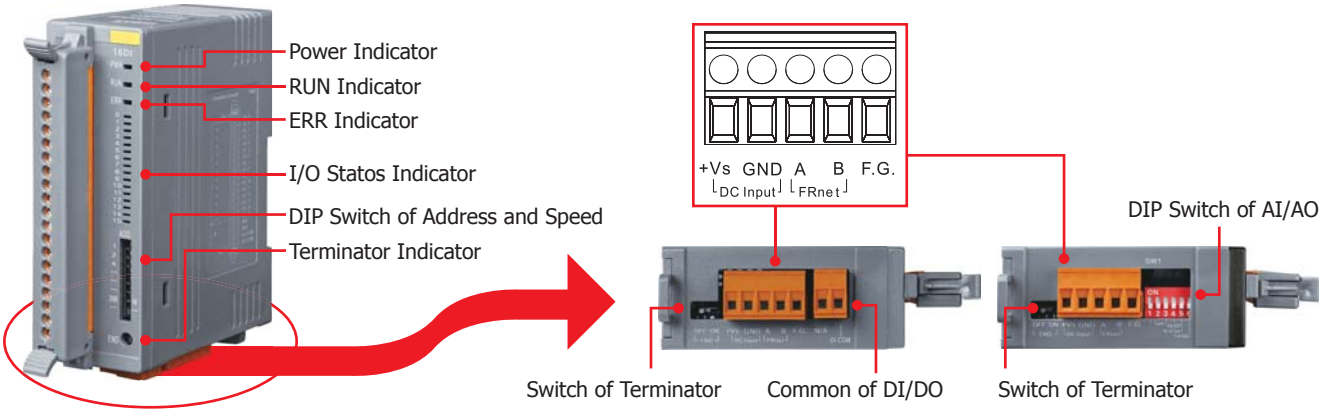
DIN-Rail Mounting

2. Dimensions (Units: mm)



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

3. Appearance



4.2. Selection Guide

4.2.1. Analog Input Module

Analog Input Module			
Model Name			**FR-2017iT**
Pictures			NEW 
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 VDC
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.	
LED Indicators			
Power			1 LED (Yellow)
Communication Run			1 LED (Green)
Communication Error			1 LED (Red)
Terminal Resistor			1 LED (Yellow)
Power			
Input range			+10 ~ +30 VDC
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)			33 mm x 107 mm x 102 mm
Optional Accessory			CA-0904

CA-0904

4.2.2. Analog Output Module

Analog Output Module			
Model Name			**FR-2024iT**
Pictures			
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 VDC @ 20 mA Current: External 24 VDC @ 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			±15 VDC
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.	
LED Indicators			
Power			1 LED (Yellow)
Communication Run			1 LED (Green)
Communication Error			1 LED (Red)
Terminal Resistor			1 LED (Yellow)
Power			
Input range			+10 ~ +30 VDC
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)			33 mm x 107 mm x 102 mm
Optional Accessory			CA-0904

CA-0904

4.2.3. Digital Input/Output Module

Digital Input Module								
Model Name			**FR-2053iT**	**FR-2053TA**	**FR-2053HTA**	**FR-2054T**	**FR-2057iT**	**FR-2057TW**	**FR-32R**
Pictures									
Digital Input									
Channels			16			8	-		-
Type			Wet			Wet	-		-
Sink/Source (NPN/PNP)			Sink/Source			Sink/Source	-		-
Isolation			3750 Vrms			3750 Vrms	-		-
On Voltage Level			19 ~ 30 VDC	3.5 ~ 30 VDC		19 ~ 30 VDC	-		-
Off Voltage Level			11 VDC Max.	1 VDC Max.		11 VDC Max.	-		-
Input Impedance			3.25 KΩ	3 KΩ		3.25 KΩ	-		-
Digital Output									
Channels			-			8	16		32
Type			-			Open Collector	Open Collector		Power Relay (Form A, SPST)
Sink/Source (PNP/NPN)			-			Sink (NPN)	Sink (NPN)		-
Isolation			-			3750 Vrms	3750 Vrms		3000 Vrms
Load Voltage			-			5 ~ 30 VDC	5 ~ 30 VDC		3A/125 VDC, 3A/270 VAC
Max. Load Current			-			250 mA	100 mA	250 mA	
FRnet Communication									
Normal Speed	Update time	2.88 ms	Yes	Yes	-	Yes	Yes	Yes	Yes (default)
	Baud rate	250 Kbps							
	Distance	400 m Max.							
High Speed	Update time	0.72 ms	Yes (default)	-	Yes	Yes (default)	Yes (default)	Yes (default)	Yes
	Baud rate	1 Mbps							
	Distance	100 m Max.							
LED Indicators									
Power			1 LED (Yellow)						
Communication Run			1 LED (Green)						
Communication Error			1 LED (Red)						
Terminal Resistor			1 LED (Yellow)						
I/O Status			16 DI LEDs (Green)			8 DO LEDs (Red) and 8 DI LEDs (Green)	16 DO LEDs (Red)	16 DO LEDs (Red)	32 DO LEDs (Red)
Power									
Input range			+10 ~ +30 VDC						
Power Consumption			2.4 W	2.4 W		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)			33 mm x 107 mm x 102 mm						173 mm x 177 mm

CAN Bus Products

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, including 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

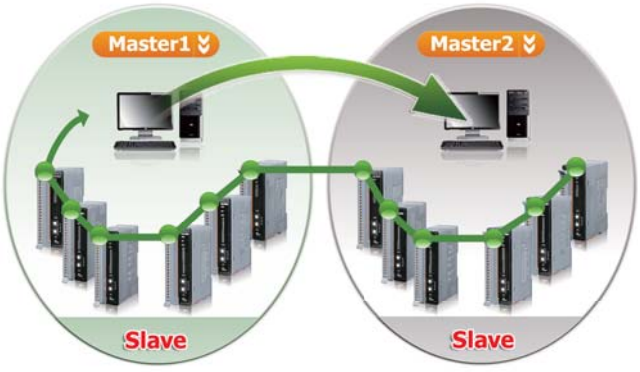
The heartbeat protocol is generally used to negotiate and monitor the availability of remote I/O devices. It is a message like the heartbeat sent by CANopen / DeviceNet remote I/O modules at a regular time. The users could use this mechanism to indicate the health of the remote I/O. The health information 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.

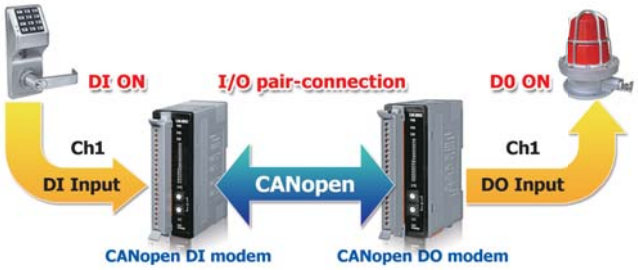
3. Multi-Master Network

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.

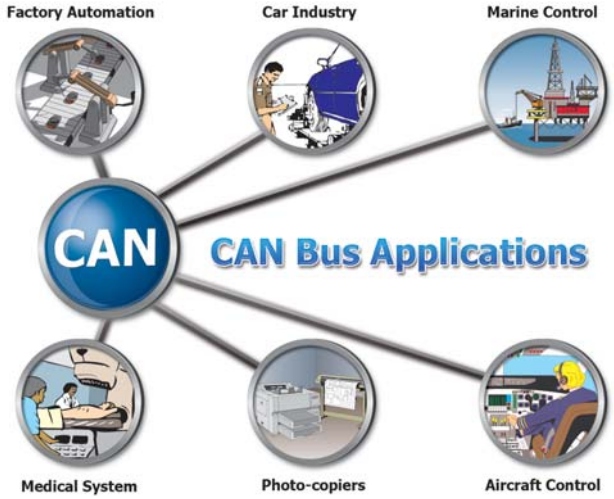


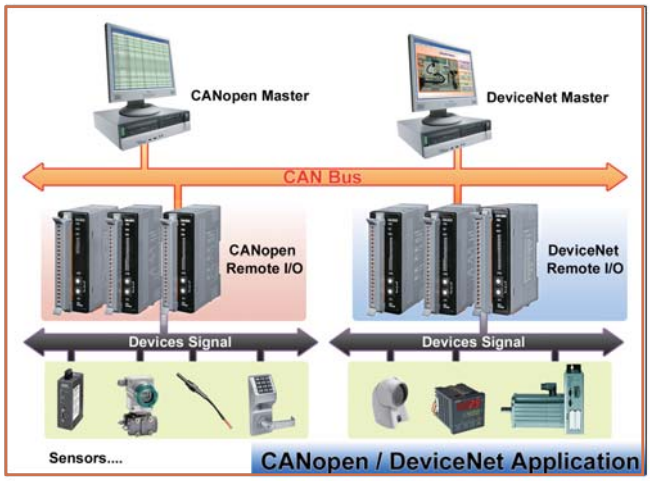
4. CANopen Digit I/O Pair-Connection

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.



• Applications



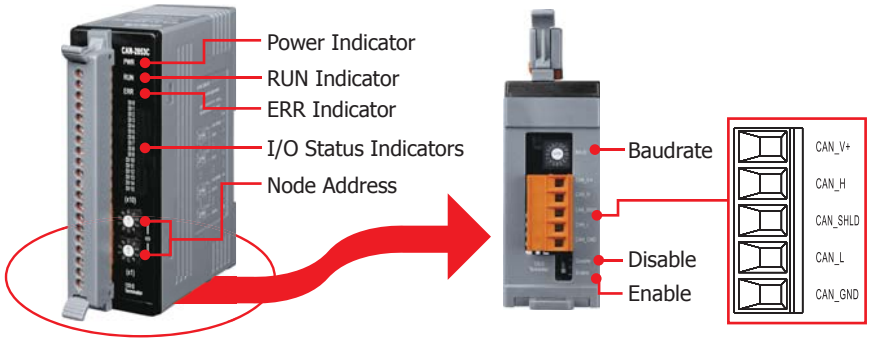


• Hardware

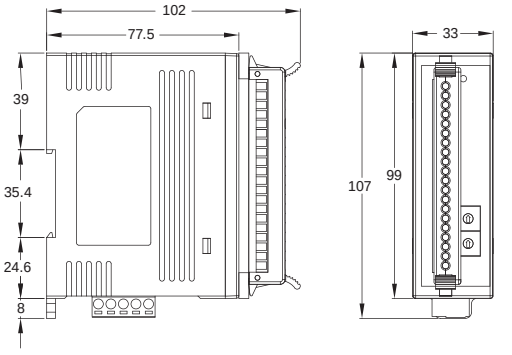
1. Installation

DIN-Rail Mounting

2. Appearance

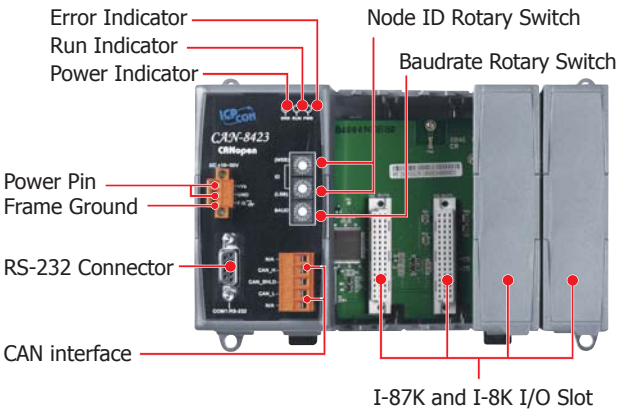


3. Dimensions (Units: mm)



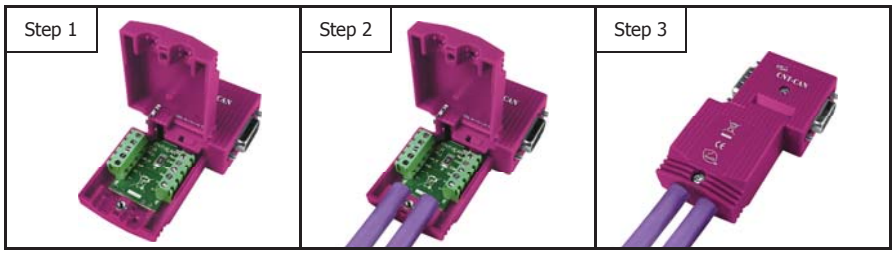
Left View | Front View

CAN-8423



4. Optional Accessory

Optional CAN bus connector: CNT-CAN



Installation

5.2. Selection Guide

5.2.1. CANopen Analog Input Modules

CANopen Analog Input Modules			
Model Name	**CAN-2015C**	**CAN-2017C**	**CAN-2018C**
Pictures	Available soon 		
Channels	8	8	8
Wiring	2/3 wire	Differential	Differential
Individual Channel	Yes	Yes	Yes
Sensor Type	**RTD** (Pt100, Pt1000, Ni120, Cu100, Cu1000, Pt100)	-	**Thermocouple** (J, K, T, E. R. S, B, N, C)
Voltage Input Range	-	±10 V ±5 V ±1 V ±500 mV ±150 mV	±2.5 V ±1 V ±500 mV ±100 mV ±50 mV ±15 mV
Current Input Range	-	±20 mA (Required External 125Ω Resistor)	±20 mA (Required External 125Ω Resistor)
Resolution	16-bit	16-bit	16-bit
Sampling Rate	10 Hz	10 Hz	10 Hz
Accuracy	±0.05 % of FSR	±0.1 % of FSR	±0.1 % of FSR
Zero Drift	±0.5 μV/ °C	±10 μV/ °C	±10 μV/ °C
Span Drift	±20 μV/ °C	±25 μV/ °C	±25 μV/ °C
Overvoltage Protection	240 Vrms	240 Vrms	240 Vrms
Input Impedance	20 MΩ	2 MΩ	400 kΩ
Common Mode Rejection	150 dB	86 dB	86 dB
Normal Mode Rejection	100 dB	100 dB	100 dB
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 VDC for DC-to-DC, 3000 Vrms for bus-to-logic		
Watchdog	Yes		
Power			
Input range	Unregulated +10 ~ +30 VDC		
Power Consumption	1.5 W	2 W	1.5 W
Mechanism			
Installation	DIN-Rail		
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm		
Environment			
Operating Temperature	-25 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Relative Humidity	10 ~ 90% RH, non-condensing		

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 ±5 V 0 ~ +10 V ±10 V	-
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)	33 mm x 107 mm x 102 mm	
Environment		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Relative Humidity	10 ~ 90% RH, non-condensing	

5.2.3. 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 Vrms			2500 Vrms
Contact	Wet			Wet
Sink/Source(NPN/PNP)	Sink/Source			Sink/Source
ON Voltage Level	+3.5 ~ +30 VDC			+5.5 ~ +30 VDC
OFF Voltage Level	+1 VDC Max.			+3.5 VDC Max.
Counter	-			500 kHz, 32-bit
DO				
Channels	-	8	16	-
Isolation Voltage		3750 Vrms	3750 Vrms	
Type		Open Collector	Open Collector	
Sink/Source(NPN/PNP)		Sink	Sink	
Load Voltage		+5 ~ +30 VDC	+5 ~ +30 VDC	
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 VDC for DC-to-DC, 2500 Vrms for bus-to-logic			
Watchdog	Yes			
Power				
Input range	Unregulated +10 ~ +30 VDC			
Power Consumption	1.5 W	1.5 W	1.5 W	2 W
Mechanism				
Installation	DIN-Rail			
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm			
Environment				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Relative Humidity	10 ~ 90% RH, non-condensing			

5.2.4. DeviceNet Analog Input Modules

DeviceNet Analog Input Modules			
Model Name	**CAN-2015D**	**CAN-2017D**	**CAN-2018D**
Pictures	Available soon 	Available soon 	
Channels	8	8	8
Wiring	2/3 wire	Differential	Differential
Individual Channel	Yes	Yes	Yes
Sensor Type	**RTD** (Pt100, Pt1000, Ni120, Cu100, Cu1000, Pt100)	-	**Thermocouple** (J, K, T, E. R. S, B, N, C)
Voltage Input Range	-	±10 V ±5 V ±1 V ±500 mV ±150 mV	±2.5 V ±1 V ±500 mV ±100 mV ±50 mV ±15 mV
Current Input Range	-	-20 ~ 20 mA (Required External 125Ω Resistor)	-20 ~ 20 mA (Required External 125Ω Resistor)
Resolution	16-bit	16-bit	16-bit
Sampling Rate	10 Hz	10 Hz	10 Hz
Accuracy	±0.05 % of FSR	±0.1 % of FSR	±0.1 % of FSR
Zero Drift	±0.5 μV/ °C	±10 μV/ °C	±10 μV/ °C
Span Drift	±20 μV/ °C	±25 μV/ °C	±25 μV/ °C
Overvoltage Protection	240 V_{rms}	240 V_{rms}	240 V_{rms}
Input Impedance	20 MΩ	2 MΩ	400 kΩ
Common Mode Rejection	150 dB	86 dB	86 dB
Normal Mode Rejection	100 dB	100 dB	100 dB
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	2 W	1.5 W
Mechanism			
Installation	DIN-Rail		
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm		
Environment			
Operating Temperature	-25 ~ +75°C		
Storage Temperature	-30 ~ +80°C		
Relative Humidity	10 ~ 90% RH, non-condensing		

5.2.5. 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 ±5 V 0 ~ +10 V ±10 V	-
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 VDC for DC-to-DC, 3000 Vrms for bus-to-logic	
Watchdog	Yes	
Power		
Input range	Unregulated +10 ~ +30 VDC	
Power Consumption	1.5 W	1.4 W
Mechanism		
Installation	DIN-Rail	
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm	
Environment		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Relative Humidity	10 ~ 90% RH, non-condensing	

5.2.6. 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 Vrms			2500 Vrms
Contact	Wet			Wet
Sink/Source(NPN/PNP)	Sink/Source			Sink/Source
ON Voltage Level	+3.5 ~ +30 VDC			+5.5 ~ +30 VDC
OFF Voltage Level	+1 VDC Max.			+3.5 VDC Max.
Counter	-			500 kHz, 32-bit
DO				
Channels	-	8	16	-
Isolation Voltage		3750 Vrms	3750 Vrms	
Type		Open Collector	Open Collector	
Sink/Source(NPN/PNP)		Sink	Sink	
Load Voltage		+5 ~ +30 VDC	+5 ~ +30 VDC	
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 VDC for DC-to-DC, 2500 Vrms for bus-to-logic			
Watchdog	Yes			
Power				
Input range	Unregulated +10 ~ +30 VDC			
Power Consumption	1.5 W	1.5 W	1.5 W	2 W
Mechanism				
Installation	DIN-Rail			
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm			
Environment				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Relative Humidity	10 ~ 90% RH, non-condensing			

5.3.CAN Bus I/O Unit

CAN-8123 CAN-8423

CAN-8223 CAN-8823

Features

- 80186, 80 MHz CPU
- One ISO-11898-2 High Speed CAN Port
- Hot Swap Allowed
- Auto Configuration
- Standard CANopen LED Indicator
- Rotary Switch For Baudrate and Node ID
- CANopen DS 301 Ver 4.02 Specification
- CANopen DS 401 Ver 2.1 Specification
- 1/2/4/8 I/O Slots for I-87K and I-8K Series Modules
- Operating Temperature: -25 ~ +75°C

Specifications

Models	CAN-8123	CAN-8223	CAN-8423	CAN-8823
CAN Interface				
Controller	NXP SJA1000T with 16 MHz clock			
Transceiver	NXP 82C250			
Connector	5-pin screwed terminal block (GND, CAN_L, CAN_SHLD, CAN_H, V+)		5-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)	9-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)
Node ID	1~127 (By rotary switch)			
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M (By rotary switch)			
Transmission Distance (m)	Depend on baud rate (for example, max. 1000 m at 50 kbps)			
Isolation	1000 V_{DC} for DC-to-DC, 2500 V_{rms} for photo-couple			
Terminator Resistor	Jumper for 120 Ω terminator resistor			
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B			
Protocol	CANopen DS 301 ver4.02, DS 401 ver2.1			
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module, low profile I-87K module and I-8K module			
Slots Numbers	1	2	4	8
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Installation	DIN-Rail Mounting	DIN-Rail or Wall Mounting		
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	20 W unregulated +10 ~ +30 V_{DC}			
Reverse Polarity Protection	Yes			
Frame Ground	No		Yes	
Consumption	1 W	2 W	2.5 W	3 W
Power Board Driving	20 W			

Ordering Information

CAN-8123-G	CANopen Embedded Device with 1 I/O Expansion Slot
CAN-8223-G	CANopen Embedded Device with 2 I/O Expansion Slots
CAN-8423-G	CANopen Embedded Device with 4 I/O Expansion Slots
CAN-8823-G	CANopen Embedded Device with 8 I/O Expansion Slots

Features

- 80186, 80 MHz CPU
- One ISO-11898-2 High Speed CAN Port
- Hot Swap Allowed
- Auto Configuration
- Standard DeviceNet LED Indicator
- Rotary Switch For Baudrate and Node ID
- DeviceNet Volume I Ver 2.0, Volumn II Ver 2.0
- Predefined Master/Slave Connection Set
- 1/2/4/8 I/O Slots for I-87K and I-8K Series Modules
- Operating Temperature: -25 ~ +75°C

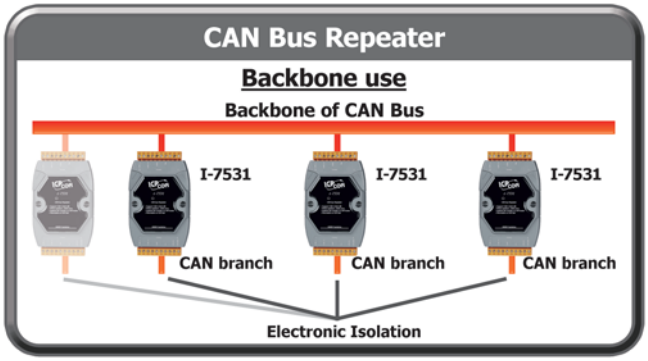
Specifications

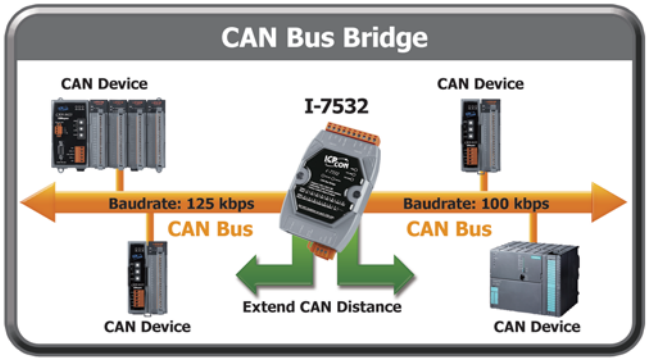
Models	CAN-8124	CAN-8224	CAN-8424	CAN-8824
CAN Interface				
Controller	NXP SJA1000T with 16 MHz clock			
Transceiver	NXP 82C250			
Connector	5-pin screwed terminal block (GND, CAN_L, CAN_SHLD, CAN_H, V+)		5-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)	9-pin screwed terminal block (N/A, CAN_L, CAN_SHLD, CAN_H, N/A)
Node ID	1~63 (By rotary switch)			
Baud Rate (bps)	125 k, 250 k, 500 k (By rotary switch)			
Transmission Distance (m)	Depend on baud rate (for example, max. 500 m at 125 kbps)			
Isolation	1000 VDC for DC-to-DC, 2500 Vrms for photo-couple			
Terminator Resistor	Jumper for 120 Ω terminator resistor			
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B			
Protocol	DeviceNet Volume I ver2.0, Volumn II ver2.0 Predefined Master/Slave Connection set			
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High profile I-87K module, low profile I-87K module and I-8K module			
Slots Numbers	1	2	4	8
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Installation	DIN-Rail Mounting	DIN-Rail or Wall Mounting		
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	Unregulated +10 ~ +30 VDC			
Reverse Polarity Protection	Yes			
Frame Ground	No		Yes	
Consumption	1.7 W	2 W	2.5 W	3 W
Power Board Driving	20 W			

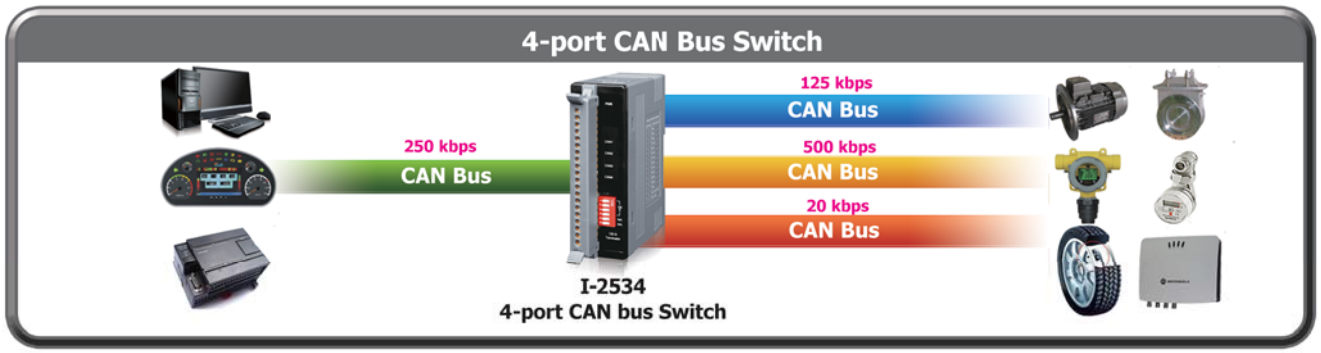
Ordering Information

CAN-8124-G	DeviceNet Embedded Device with 1 I/O Expansion Slot
CAN-8224-G	DeviceNet Embedded Device with 2 I/O Expansion Slots
CAN-8424-G	DeviceNet Embedded Device with 4 I/O Expansion Slots
CAN-8824-G	DeviceNet Embedded Device with 8 I/O Expansion Slots

5.4. CAN Bus Repeater/Bridge/Switch

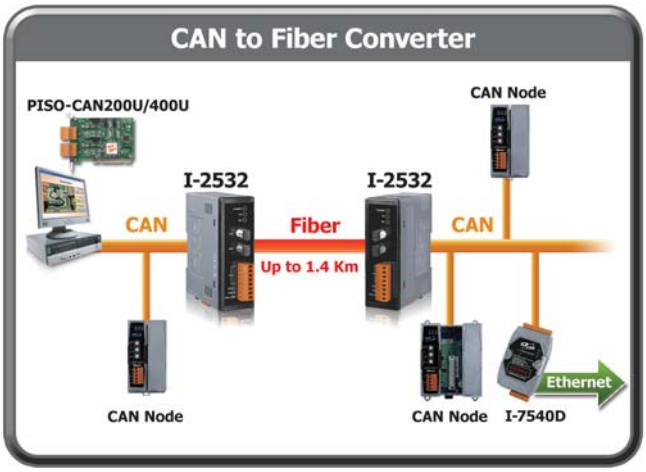


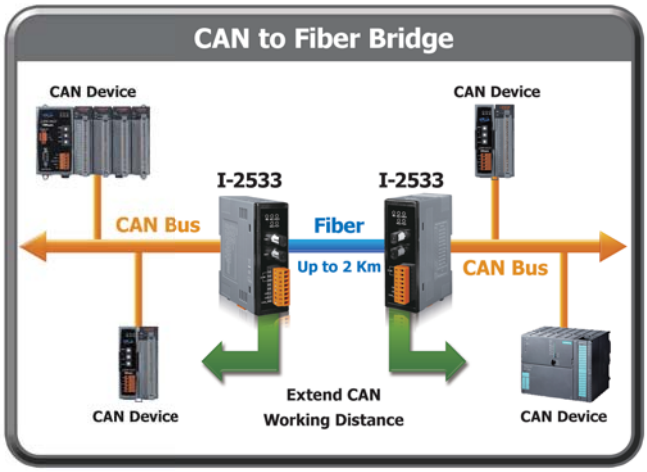




Model Name	I-7531	I-7532	I-2534	I-5534-M
Pictures				
CAN Interface				
Transceiver	NXP 82C250		NXP TJA1042	
Channel number	2		4	
Connector	3-pin screwed terminal block (CAN_GND, CAN_L, CAN_H)	4-pin screwed terminal block (CAN_GND, CAN_L, CAN_SHLD, CAN_H)	9-pin male D-Sub with CAN_GND, CAN_SHLD, CAN_H, CAN_L	
Transmission speed (bps)	5 k ~ 800 k with auto baud rate detection	5 k ~ 1 M selected by rotary switch or utility tool		
Transmission Distance (m)	Depends on the CAN baud rate	Duplicates the transmission distance depended on the CAN baud rate		
Propagation Delay	Max. 200ns (shortens the transmission distance by ~ 40 m)	Depends on the CAN baud rate (max. 134 us @ 1 Mbsp)	Depends on the CAN baud rate (max. 440 us @ 1 Mbsp)	
Terminator Resistor	Jumper for 120 Ω terminator resistor		DIP switch for the 120 Ω terminator resistor	Jumper for 120 Ω terminator resistor
Isolation	3000 VDC for DC-to-DC, 2500 Vrms for photo-couple			
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B			
LED				
Round LED	CAN Status LED	PWR LED, Rx LED, ERR LED	PWR LED, CAN1 LED, CAN2 LED, CAN3 LED, CAN4 LED	
Power				
Power supply	Unregulated +10 ~ +30 VDC			
Protection	Power reverse polarity protection, Over-voltage brown-out protection			
Power Consumption	2 W		3 W	
Mechanism				
Installation	DIN-Rail			
Casing	Plastic			Metal
Dimensions (W x L x H)	72 mm x 118 mm x 33 mm		32.3 mm x 99 mm x 77.5 mm	116.5 mm x 127 mm x 61.3 mm
Environment				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Relative Humidity	10 ~ 90% RH, non-condensing			

5.5. CAN to Fiber Converter/Bridge





Model Name	I-2532	I-2533
Pictures		
CAN Interface		
Transceiver	NXP 82C250	
Connector	8-pin screwed terminal block (CAN_GND, CAN_L, CAN_H, N/A for others)	Screwed terminal block (CAN_GND, CAN_L, CAN_H)
Baud Rate (bps)	10 k ~ 500 k with auto baud rate detection	10 k ~ 1 M selected by rotary switch or utility tool
Transmission Distance (m)	Depends on baud rate	Duplicates the transmission distance depended on baud rate
Propagation Delay	CAN to fiber or fiber to CAN: 125ns max. (125ns delay shortens bus line length by ~ 25 m)	CAN to fiber or fiber to CAN: depends on the CAN baud rate (max. 120 us @ 1 Mbsp)
Terminator Resistor	DIP switch for the 120 Ω terminator resistor	
Isolation	3000 VDC for DC-to-DC, 2500 Vrms for photo-couple	
Specification	ISO-11898-2, CAN 2.0A and CAN 2.0B	
Fiber Interface		
Connector	ST (Multi-mode)	
Wave Length	850 nm	
Fiber Cable	Multi-mode 50 / 125 µm , 62.5 / 125 µm, 100 / 140 µm (62.5 / 125µm is recommended)	
Transmission Distance (m)	Max. 1.4 km, depend on the CAN baud rate	Max. 2 km (no matter what CAN baud rate it is)
UART Interface		
COM1	-	RS-232 (for configuration)
COM 1 Connector	-	3-pin screwed terminal block (RxD, TxD, GND)
Transmission speed (bps)	-	
Data bit	-	8
Stop bit	-	1
Parity	-	None
LED		
Round LED	PWR LED, TD LED, RD LED	PWR LED, CAN_Tx LED, CAN_Rx LED, CAN_Err LED, FB_Err LED
Power		
Power supply	Unregulated +10 ~ +30 VDC	
Protection	Power reverse polarity protection, Over-voltage brown-out protection	
Power Consumption	0.5 W	3 W
Mechanism		
Installation	DIN-Rail	
Dimensions (W x L x H)	33 mm x 107 mm x 102 mm	
Environment		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Relative Humidity	10 ~ 90% RH, non-condensing	

5.6. CAN Bus Board/CAN Bus Software

• PC Based Solution

To access the CAN-2000 I/O modules, we provide communication boards for PC based solution and communication modules for PAC solution.

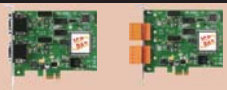
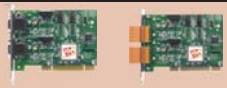
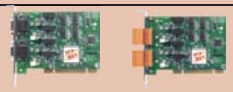
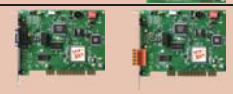
Communication Boards:
The following CAN bus communication boards are designed for different interface and different CAN port number.
All of them have the same features:

1. Compatible with CAN specification 2.0 parts A and B
2. Fully compatible with ISO-11898-2 standard
3. Support baudrate from 10 kbps to 1 Mbps
4. 3 kV galvanic isolated
5. Direct memory mapping to the CAN controller

Software Support:
ICP DAS provides following SDK for the PC based CAN bus communication boards

For Windows:
- LabView CAN Driver,
- DASYLab CAN Driver,
- RTX CAN Driver
- PISOCNX Active Object,
- NAPOPC.CAN DA Server

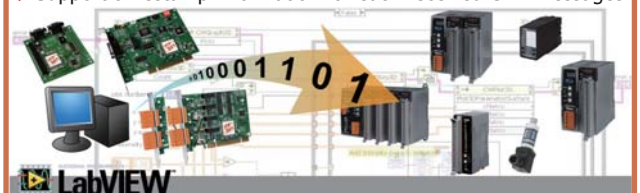
For Linux:
- SocketCAN Device Driver

Model Number	Description
 PEX-CAN200i-(D/T)	2-CAN PCI Express board (D-Sub/Terminal Connector)
 PISO-CAN200U-(D/T)	2-CAN Universal PCI board (D-Sub/Terminal Connector)
 PISO-CAN400U-(D/T)	4-CAN Universal PCI board (D-Sub/ Terminal Connector)
 PCM-CAN100-D	1-CAN PCI-104 board (D-Sub Connector)
 PCM-CAN200-D	2-CAN PCI-104 board (D-Sub Connector)
 PCM-CAN200P-D	2-CAN PCI-104 + board (D-Sub Connector)
 PISO-CM100U-(D/T)	1-CAN Programmable Universal PCI board (D-Sub/Terminal Connector)

LabVIEW CAN Driver

The LabVIEW driver includes a configuration utility to configure the ICP DAS's DeviceNet hardware in your PC. By means of this driver, you don't need to have the complex and abstruse technology of the DeviceNet protocol.

- OS environment: Windows 2000 / XP
- NI LabVIEW support version 8.0 or later
- Support CAN specification 2.0A and 2.0B
- Provide 3000-record Rx buffer for each CAN port
- Support functions for directly accessing SJA1000 register
- Support timestamp information for each received CAN messages



DASYLab CAN Driver

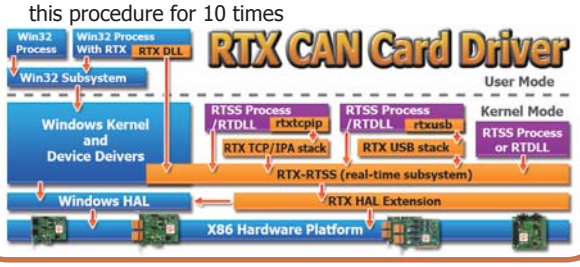
DASYLab is a kind of data acquisition software. It lets you interactively develop PC-based applications by simply attaching functional icons. DASYLab offers real-time analysis, control, and the ability to create custom graphical user interfaces. Besides, it can require weeks of training to master. This is useful in some application cases.

- OS environment: Windows 2000/XP
- Support DASYLab support version 8.0
- Support CAN specification 2.0A and 2.0B
- Support maximum 64 CAN ports
- Block size range is 1 ~ 4096
- Provide Intel mode and Motorola mode for remote CAN device
- Support two kinds of languages, German and English

RTX CAN Driver

The RTX CAN Drvier helps users to develop the hightly real-time CAN bus applications on Windows OS by PISO-CAN series in ICP DAS. The name and parameters of the APIs in the RTX driver are the same as in the Windows driver. Users don't need to pay more efforts to study how to use the APIs of the RTX driver.

- OS environment: Windows2000 SP4, and Windows XP SP2
- Support interrupt function if the PISO-CAN series CAN card can get the independent IRQ
- Direct I/O control and highly real-time feature
- Support RTX version 8.0 or late
- Provide VC 6.0 demos
- Real-time Test:
  - Platform: Windows XP SP2+PISO-CAN200E
  - Device: I-7186EXD-CAN with MiniOS7 (single tasking OS)
  - Send and receive 10000 CAN 2.0B 8-byte messages. Repeat this procedure for 10 times



NAPOPC.CAN DA Server

NAPOPC.CAN DA Server is a CAN OPC server to be as an expert bridge between ICP DAS CAN products and the OPC client of the third party software. Besides, it also provides the easy-to-use integral APIs to access the different CAN ports without through the OPC server.

- OS environment: Windows 2000 / XP
- Follow OPC 1.0, OPC 2.0 Data Access Standards
- Configure CAN hardware filter by the APIs of the Virtual CAN Driver
- Provide CAN Engine Utility to monitor the CAN messages
- Collect the data from the different CAN devices in one OPC server
- Provide the CAN devices and the virtual CAN port No. mapping table
- Load previous configuration or scan all CAN devices manually while the Virtual CAN Driver boots up
- Provide the APIs of the Virtual CAN Driver

PISOCANX ActiveX Object

PISOCANX uses ActiveX technology to simply the procedure while developing the application by using PISO-CAN series CAN card. The ActiveX object (OCX) can be not only used in general program development environment, but used in the SCADA software which supports the ActiveX technology.

- OS environment: Windows 2000 / XP
- Allow polling mode and interrupt mode
- Provide 3000-record Rx buffer for each CAN port
- Support functions for directly accessing SJA1000 register
- Allow users to read the card No. and relative information
- Support timestamp information for each received CAN messages
- VC6, VB demos are given

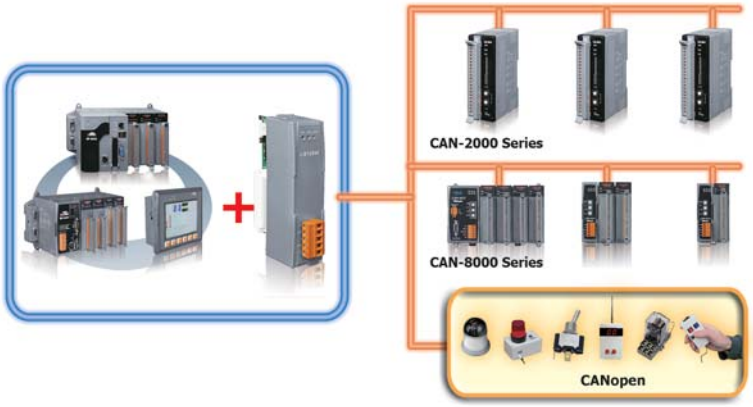
SocketCAN Device Driver

SocketCAN driver is a kind of device driver based on the Linux operating system, and it contains the implementation interface of the network stack and the hardware driver. The hardware manufacturers develop the hardware driver of SocketCAN driver for their hardware interface, and the network stack provides the standard BSD Socket APIs for users.

- OS environment: Linux kernel version 2.6.31~2.6.34 (x86 hardware platform only)
- Provide CANopen/DeviceNet master static library Standard interface for SocketCAN package. Users can use extended BSD socket APIs, you can program the CAN application as building a socket program
- Support Virtual CAN interface. Users can map several virtual CAN port into one physical CAN port. Each virtual CAN port has its own socket. Through these sockets, users can build the multi-thread application more easily
- Provide the RAW socket, CANopen master and DeviceNet master demos

• PAC Based Solution

These CAN bus communication modules are the solutions to the various CAN application requirements in PAC family with rich CAN bus protocols. The I-8123W, I-87123W, I-8124W, and I-87124W separately support CANopen and DeviceNet master protocols. Users can apply them in PAC to connect to CANopen and DeviceNet devices to reach various CANopen/DeviceNet systems easily.
For the especial CAN bus applications, the I-8120W and I-87120W are designed for users to apply in PAC series. The default firmware of I-8120W and I-87120W provides the transmission and reception of CAN bus messages in PAC. In addition, users can design the specific firmware in these modules to reduce the loading of the PAC in C language.



CAN/CANopen/DeviceNet Communication Module (Parallel/Serial Bus)						
Model Name	**I-8120W**	**I-87120**	**I-8123W**	**I-87123**	**I-8124W**	**I-87124**
Pictures						
Communication						
Interface	ISO 11898-2 CAN					
Port	1					
Terminator	120 Ω Selected By Jumper					
Max. Speed (K bps)	1000		1000		500	
Controller Chip	SJA1000T					
Transceiver Chip	82C250					
Protocol	CAN 2.0 A/2.0 B		CANopen DS-301 ver 4.02, DS-401 ver 2.1		DeviceNet Volumn I ver 2.0, Volumn II ver 2.0	
System						
Hot Swap	-	Yes	-	Yes	-	Yes
Data Communication	Parallel Interface	Serial Interface	Parallel Interface	Serial Interface	Parallel Interface	Serial Interface
User-defined Firmware	Yes		-		-	
Isolation	2500 V_{rms}					
Power Consumption	2 W					
Connector	5-pin Terminal Block					
Optional Accessories	CA-0904 Cable					


CA-0904

Model Name	**I-8120W**	**I-87120**	**I-8123W**	**I-87123**	**I-8124W**	**I-87124**
PAC Driver Support						
I-8000, iP-8000	-	BC, TC	-	BC, TC	-	BC, TC
VP-2111						
WP-8000	eVC++ 4.0, VB.Net 2005, C#.Net 2005					
VP-2000						
XP-8000-CE6, XP-8000-Atom-CE6	VB.Net 2005, C#.Net 2005, VC 2005					
XP-8000, XP-8000-Atom	VB.Net 2005, C#.Net 2005, VC 6					
LP-8000	-	GCC	-	GCC	-	GCC

More products refer to Industrial CAN Bus Products Catalog

- CAN bus series
- CANopen series
- DeviceNet series
- J1939 series

PROFIBUS Products

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.

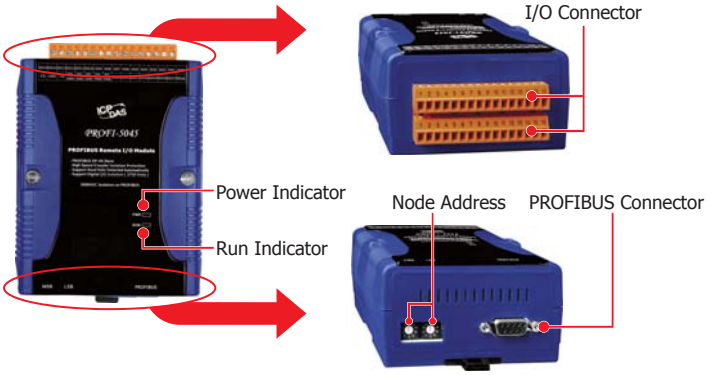
ICP DAS has been developing various PROFIBUS DP Slave products for several years. We offer converters, gateways, and remote I/O to our customers, and help them to solve technology problems.

• Features

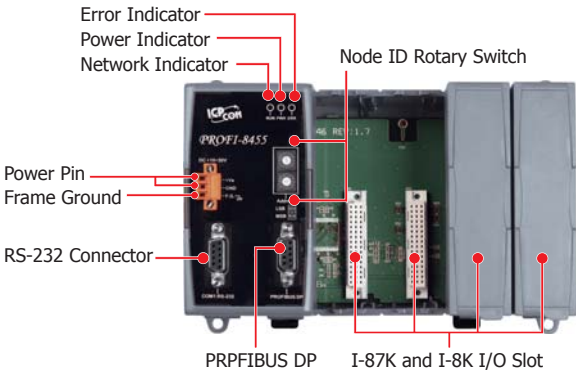
- Baudrate up to 12Mbit/s.
- Maximum 244 bytes input and 244 bytes output per slave.
- Fast Cyclic data communication between master and slave.
- Slave configuration and parameters are set from the master side by GSD file.
- Allow Multi-master system.
- 124 slaves can be put in Data Exchange.
- 32 stations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

• Appearance

PROFI-5000



PROFI-8455

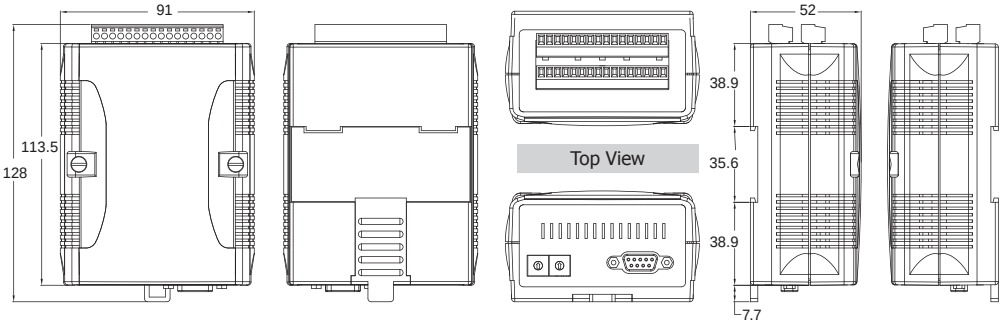


• Hardware

1. Installation

DIN-Rail Mounting

2. Dimensions (Units: mm)



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

• Selection Guide

Product		Interface	Description
PROFIBUS Converters & Repeaters	PROFI-2510	PROFIBUS DP <--> PROFIBUS DP	Isolated PROFIBUS repeater
	PROFI-2541	PROFIBUS DP <--> Fiber	PROFIBUS to fiber converter
	I-7550	PROFIBUS DP <--> RS-232/RS-485/RS-422	PROFIBUS DP slave to RS-232/RS-485/RS-422 converter
PROFIBUS Gateway	GW-7552	PROFIBUS DP <--> RS-232/RS-485/RS-422	PROFIBUS DP slave to Modbus RTU/ASCII gateway
	GW-7553	PROFIBUS DP <--> Ethernet/RS-232	PROFIBUS DP slave to Modbus TCP/RTU/ASCII gateway
	GW-7557	PROFIBUS DP <--> HART master	PROFIBUS DP slave to HART master gateway
PROFIBUS Remote I/O Modules	PROFI-5045	PROFIBUS DP, 24 DOs	Isolated 24-ch DO PROFIBUS slave module
	PROFI-5050	PROFIBUS DP, 16 DIs, 8 DOs	16-ch DI & 8-ch DO PROFIBUS slave module
	PROFI-5051	PROFIBUS DP, 24 DIs	Isolated 24-ch DI PROFIBUS slave module
	PROFI-5052	PROFIBUS DP, 12 DIs	Ch-to-ch Isolated 12-ch DI PROFIBUS slave module
	PROFI-5053	PROFIBUS DP, 24 DIs	24-ch DI PROFIBUS slave module
	PROFI-5055	PROFIBUS DP, 8 DIs, 8 DOs	Isolated 8-ch DI & 8-ch DO PROFIBUS slave module
	PROFI-5060	PROFIBUS DP, 8 DIs, 4 relay outputs	Isolated 8-ch DI & 4 relay output PROFIBUS slave module
	PROFI-5017	PROFIBUS DP, 8 voltage inputs	8-ch voltage input PROFIBUS slave module
	PROFI-5017C	PROFIBUS DP, 8 current inputs	8-ch current input PROFIBUS slave module
	PROFI-5024	PROFIBUS DP, 4 voltage/current outputs	4-ch voltage/current output PROFIBUS slave module
PROFIBUS Remote I/O units	PROFI-8155	PROFIBUS DP, 1 I/O expansion slot	1-slot PROFIBUS slave I/O unit
	PROFI-8255	PROFIBUS DP, 2 I/O expansion slots	2-slot PROFIBUS slave I/O unit
	PROFI-8455	PROFIBUS DP, 4 I/O expansion slots	4-slot PROFIBUS slave I/O unit
	PROFI-8855	PROFIBUS DP, 8 I/O expansion slots	8-slot PROFIBUS slave I/O unit
Accessories	CNT-PROFI	9-pin D-Sub male connector	PROFIBUS Connector

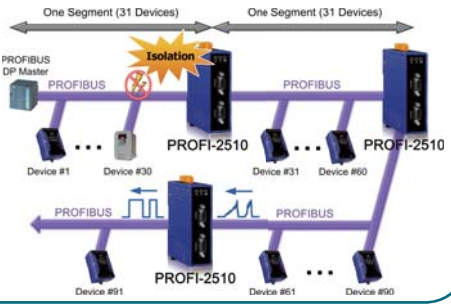
6.2. PROFIBUS Converter/Repeater

Isolated PROFIBUS Repeater

PROFI-2510 CR

Available soon

- Detect transmission rate (9.6 k ~ 12000 kbps) automatically
- No additional space needed in the cabinet
- Can be used as a bus extension or spur line
- Increases the number of nodes
- System expansion
- Provide status LEDs
- 2500 VDC isolation protection on PROFIBUS side
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (10 ~ 30 VDC) and operating temperature (-25 ~ +75°C)

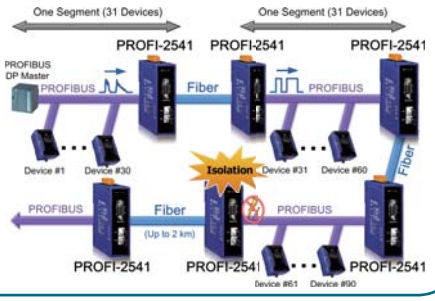


PROFIBUS to Fiber Converter

PROFI-2541 CR

Available soon

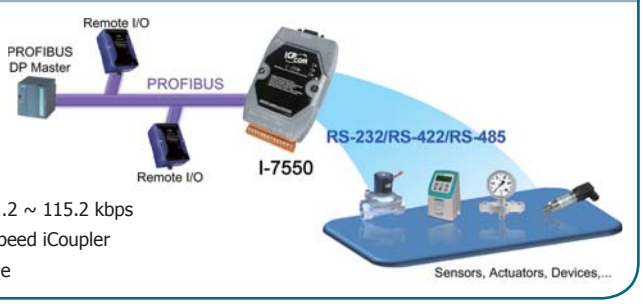
- Detect transmission rate (9.6 k ~ 3000 kbps) automatically
- Fiber Port: ST (Multi-mode)
- Wave Length: 850 nm
- Provide status LEDs
- Mount easily on DIN-rail
- 2500 VDC isolation protection on PROFIBUS side
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (10 ~ 30 VDC) and operating temperature (-25 ~ +75°C)



PROFIBUS to RS-232/RS-485/RS-422 Converter

I-7550 CR

- Protocol PROFIBUS DP-V0 slave
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically
- 128 bytes max. input data length
- 128 bytes max. output data length
- PROFIBUS address 0 ~ 126 set by DIP switch
- Support several kinds of baud for COM1 from 1.2 ~ 115.2 kbps
- Network isolation Protection: 2500 V_{rms} high speed iCoupler
- 3000 VDC isolation protection on PROFIBUS side



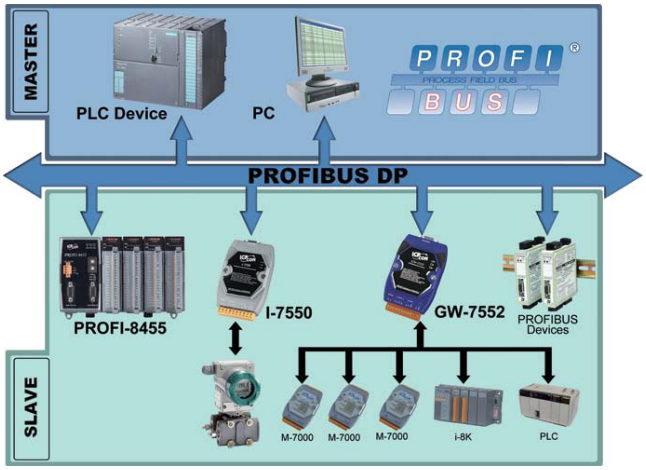
6.3. PROFIBUS Gateway

PROFIBUS Slave to Modbus RTU Gateway

GW-7552 CR

NEW

The GW-7552 gateway is a PROFIBUS DP slave. It allows the PROFIBUS master to access the Modbus RTU devices. In the Modbus network, the GW-7552 can be a master to access the Modbus slaves, or be a slave to provide the data from the PROFIBUS master. The flexible design lets the GW-7552 widely applying in the many applications.



- Protocol PROFIBUS DP-V0 Slave
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically
- 128 bytes max. input data length
- 131 bytes max. output data length
- Support Modbus master mode and slave mode
- PROFIBUS address 0 ~ 126 set by DIP switch
- Support several kinds of baud for COM1 from 2.4 ~ 115.2 kbps
- Network Isolation Protection: 2500 V_{rms} High Speed iCoupler
- 3000 V_{DC} isolation protection on PROFIBUS side

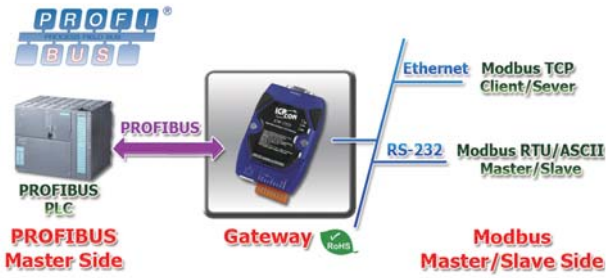
PROFIBUS Slave to Modbus TCP/RTU Gateway

GW-7553 CR

NEW

The GW-7553 is used for data-exchange between the Modbus TCP/RTU network and the PROFIBUS network. It provides not only the Modbus TCP client and server functions, but the Modbus RTU master and slave functions. Therefore, the GW-7553 can satisfy most of the applications of the data transfer between Modbus and PROFIBUS.

- Protocol PROFIBUS DP-V0 & DP-V1 slave
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically
- Support one 10/100 Base-TX Ethernet port
- Support one RS-232 port (3-wire or 5-wire)
- 240 bytes max. input data length
- 240 bytes max. output data length
- Support Modbus TCP/RTU/ASCII protocol
- PROFIBUS address 0 ~ 126 set by DIP switch
- Network isolation protection: 2500 V_{rms} high speed iCoupler
- 3000 V_{DC} isolation protection on PROFIBUS side



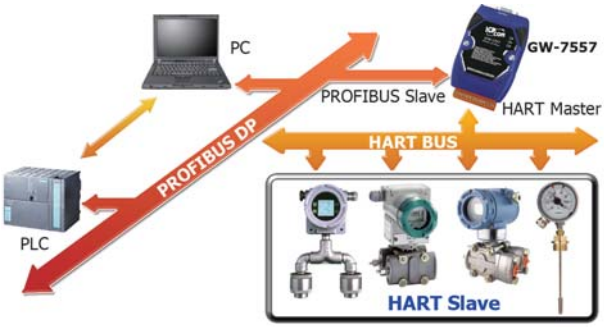
PROFIBUS Slave to HART Master Gateway

GW-7557 CR

NEW

The GW-7557 is designed for the slave device of PROFIBUS DP protocol. It allows the PROFIBUS master to access the HART slave devices. These HART devices may be a transmitter, an actuator, a current output device and so forth. Owing to the GW-7557, you can put the HART slave devices into PROFIBUS network very easily.

- Protocol: PROFIBUS DP-V0 slave
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically
- 240 bytes max. input data length
- 240 bytes max. output data length
- PROFIBUS address 0 ~ 126 set by DIP switch
- Support HART mode: point-to-point/multi-drop
- Support 4 HART channels, each for max. 15 HART modules
- Support HART Short/Long frame
- Network isolation protection: 2500 V_{rms} high speed iCoupler
- 3000 V_{DC} isolation protection on PROFIBUS side

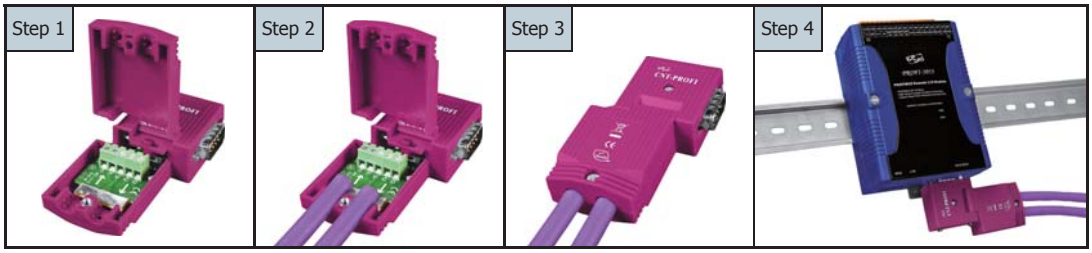


6.4. PROFIBUS Remote I/O Modules

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 Vrms	5000Vrms	-	3750 Vrms	3750 Vrms
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 VDC	+10~ +50 VDC	+4~ +30 VDC	Open	+10~ +50 VDC	+4~ +30 VDC
OFF Voltage Level	-	+1 VDC Max.	+4 VDC Max.	+1 VDC Max.	Close to IN.GND	+4 VDC Max.	+1 VDC Max.
Input Impedance	-	-	10 KΩ	3 KΩ	-	10 KΩ	3 KΩ
DO							
Channels	24	8	-	-	-	8	4
Isolation Voltage	3750 Vrms	-	-	-	-	3750 Vrms	-
Type	Open Collector	Open Collector	-	-	-	Open Collector	Relay (Form C)
Sink/Source(NPN/PNP)	Sink	Sink	-	-	-	Sink	-
Load Voltage	+10 ~ +40 VDC	+10 ~ +30 VDC	-	-	-	+10 ~ +40 VDC	0 ~ 125 VAC 0 ~ 30 VDC
Max. Load Current	650mA/channel	30 mA/channel	-	-	-	650 mA/channel	0.6 A @ 125 VAC 2 A @ 30 VDC
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	DP-V0						
Node Address	0~99 selected by rotary switch						
System							
ESD Protection	4 kV Contact for each channel						
Isolation	3000 VDC for DC-to-DC, 2500 Vrms for bus-to-logic						
Watchdog	Yes						
Power							
Input range	Unregulated +10 ~ +40 VDC						
Power Consumption	1 W	1 W	1 W	1 W	1 W	1 W	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						

Accessory

Optional PROFIBUS connector: CNT-PROFI



Installation

For more products refer to Industrial Fieldbus Catalog

- RS-485
- CAN bus
- J1939
- Ethernet/IP
- Industrial Ethernet
- CANopen
- PROFIBUS
- BACnet
- Profinet
- Devicenet
- HART

6.5. PROFIBUS I/O Unit

Features

- Protocol & hierarchy: DP-V0 & DP-V1 Slave
- Detect transmission Rate Automatically (Max.12 Mbps)
- Support Device-Related & Channel-Related Diagnosis
- Address 0 ~ 126 Set by Rotary Switches or SSA-Telegram
- Support Hot-Swap for I-87K High-Profile I/O Modules
- 3000 VDC Isolation Protection on PROFIBUS side
- 1/2/4/8 I/O Slots for I-87K and I-8K Series I/O Modules
- 4 KV ESD Protection (contacting for any terminal)
- Operating Temperature: -25 ~ +75°C

Introduction

The PROFI-8x55 Remote I/O Unit is designed for the slave device of PROFIBUS DP protocol. It supports up to 1/2/4/8 slots for ICPDAS I-8k, I-87k series I/O modules. In addition, we also provide hot-swap function for I-87k High Profiles series I/O modules. To setup network, users can choose and configure I/O modules by using the GSD file without any other setting tools.

System Specifications

Models	PROFI-8155	PROFI-8255	PROFI-8455	PROFI-8855
UART Interface				
COM 1	On-Board at JP1 (RS-232 for Update Firmware purpose). Note 1.		at Front Panel	
I/O Expansion Slot				
Hot Swap	Yes			
Auto Configuration	Yes			
Support Module Type	High/low profile I-8K & I-87K I/O module			High profile I-8K & I-87K I/O module
Slots Numbers	1	2	4	8
LED				
Round LED	PWR LED, RUN LED, ERR LED			
PROFIBUS Features				
Protocol & Hierarchy	DP-V0 & DP-V1 (Read/Write)		DP-V0 Slave	DP-V0 Slave
Address Setting	0~126 set by Rotary Switches or SSA-telegram set by DP-Master (Class 2)		0~126 set by Rotary switches	
Supports Transmission Rate (Kbps)	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000, 12000			
Transmission Rate Setting	detected automatically			
Indicators	PWR, ERR, and RUN LEDs			
I/O modules Configuration	Configured by GSD file			
Network Isolation Protection	High Speed iCoupler			
DC Isolation Protection	3000 VDC on PROFIBUS side			
Max. Input/Output Data Length	128 Bytes			240 Bytes
Number of Channel of Diag.	32		39	
Device-Related Diag. Type	Offline Detection			
Programmable Diag. period	Supported			
Mechanism				
Dimensions (W x L x H)	64 mm x 119 mm x 91 mm	95 mm x 132 mm x 91 mm	188 mm x 132 mm x 91 mm	312 mm x 132 mm x 91 mm
Environmental				
Operating Temperature	-25 ~ +75°C			
Storage Temperature	-30 ~ +80°C			
Humidity	10 ~ 90% RH (non-condensing)			
Power				
Input Range	Unregulated +10 ~ +30 VDC			
Reverse Polarity Protection	YES			
Frame Ground	YES			
Consumption	3 W	3 W	5 W	5.5 W
Power Board Driving	8 W	8 W	25 W	25 W

Note 1: CA-0904 : transform from 4-pin connector to 9-pin Female D-Sub connector.

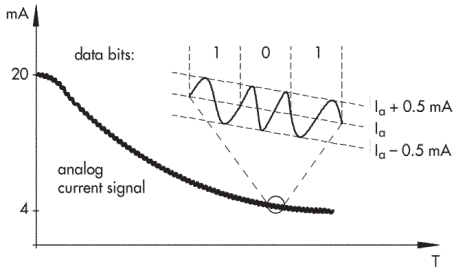
Ordering Information

PROFI-8155-G CR	PROFIBUS Remote I/O Unit with 1 Expansion Slot (RoHS)
PROFI-8255-G CR	PROFIBUS Remote I/O Unit with 2 Expansion Slots (RoHS)
PROFI-8455-G CR	PROFIBUS Remote I/O Unit with 4 Expansion Slots (RoHS)
PROFI-8855-G CR	PROFIBUS Remote I/O Unit with 8 Expansion Slots (RoHS)

HART Products

7.1. Overview

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.

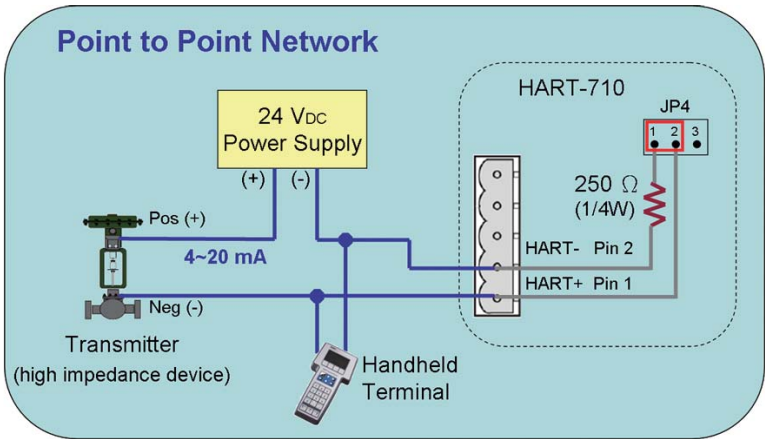


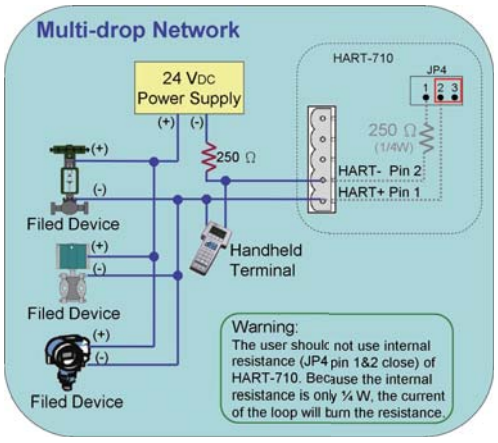
➤ Peer-to-Peer mode

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
- Improve regulatory compliance

• HART Series Selection Guide

Product		Interface	Description
HART Converters	I-7567	HART master <--> USB	USB to HART master converter
	I-7570	HART master <--> RS-232/RS485/RS422	HART to RS-232/RS-485/RS-422 converter
HART Gateways	HART-710	HART master <--> RS-232/RS485/RS422	HART master to Modbus RTU/ASCII slave gateway
	GW-7557	HART master <--> PROFIBUS DP slave	PROFIBUS slave to HART master gateway
HART Modules	I-87H17W	HART master, 8 current inputs	8-ch current input HART master module
	I-87H24W	HART master, 4 current outputs	4-ch current output HART master module

• HART Converters

USB to HART Master Converter

I-7567 CR

NEW

The USB interface is comprehensive applied in PCs and notebooks. In order to touch the users' requirements more closely, the I-7567 is presented. It is a USB to HART converter specially designed as the master device of HART protocol. Through it, users can easily to access the HART network via USB port which is implemented as a virtual COM port on PCs or notebooks. Because the I-7567 is powered by the USB interface, the external power is not necessary. Moreover, the I-7567 provides the Utility tool which is helpful for diagnosing and configuring the HART network. If you would like to develop a HART network, the I-7567 will be a good tool to reduce your setup costs.

Features

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Support the in point-to-point or multi-drop HART network mode
- Allow to connect with max. 15 HART modules
- Provide selectable 250 Ω load resistor
- Compatible with USB 1.1 and 2.0 standards
- Powered by USB (external power is not necessary)
- Support firmware update via USB
- Provide utility tool for module configuration
- Built-in watchdog
- 4 kV ESD protection
- 3000 VDC intra-module isolation

Utility Features

- Easily transmit/receive HART command for testing
- Provide HART device diagnostic information
- Provide module parameter configuration

HART to RS-232/RS-485/RS-422 Converter

I-7570 CR

NEW

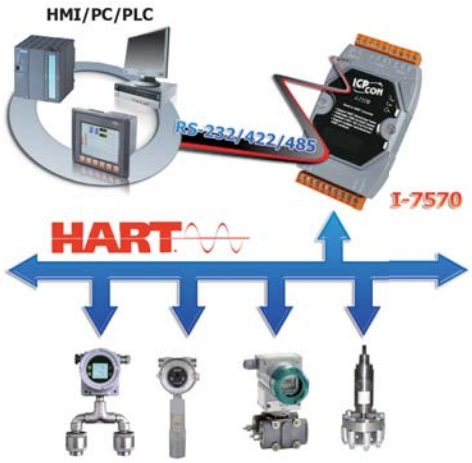
The I-7570 is a Serial to HART converter specially designed as the master device of HART protocol. By using I-7570, the HART devices, such transmitters, actuators, gauges, meters, and the current output devices, can be easily integrated into the HMI/PLC/PC devices via serial port which may be RS-232/RS-422/RS-485 interface. In order to diagnose and configure the HART network more easily, the I-7570 Utility tool with friendly configuration interface is given. It is helpful for diagnosing and configuring the HART network. Through it, you can build a HART network more easily and quickly.

Features

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Support the in point-to-point or multi-drop HART network mode
- Allow to connect with max. 15 HART modules
- Provide selectable 250 Ω load resistor
- Isolated COM 1: 3-wire RS-232/RS-422/RS-485
- Support firmware update via COM1
- Provide utility tool for module configuration
- Provide PWR/RUN/ERR LED indicators
- Built-in watchdog
- 4 kV ESD protection
- Mountable on DIN Rail

Utility Features

- Easily transmit/receive HART command for testing
- Provide HART device diagnostic information
- Provide module parameter configuration



• HART Gateways

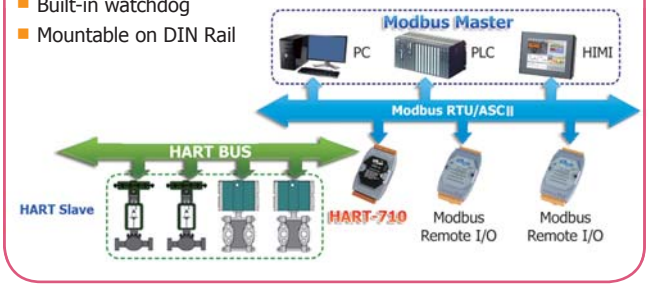
HART Master to Modbus RTU/ASCII Slave Gateway

HART-710 CR

NEW

The HART-710 is a HART master to Modbus slave gateway. It provides an economic solution for Modbus master device to access the HART slave devices. In order to diagnose and configure the HART network more easily, the HART-710 Utility tool with friendly configuration interface is given.

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Support the in point-to-point or multi-drop HART network mode
- Allow to connect with max. 15 HART modules
- Support Modbus RTU and ASCII format
- Modbus Function Code: 01, 02, 03, 04, 05, 06, 15 and 16
- Isolated COM 1: 3-wire RS-232/RS-422/RS-485
- Built-in watchdog
- Mountable on DIN Rail



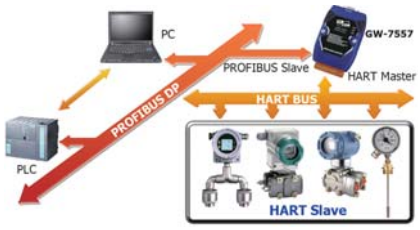
PROFIBUS Slave to HART Master Gateway

GW-7557 CR

NEW

The GW-7557 is designed for the slave device of PROFIBUS DP protocol. It allows the PROFIBUS master to access the HART slave devices. These HART devices may be a transmitter, an actuator, a current output device and so forth. Owing to the GW-7557, you can put the HART slave devices into PROFIBUS network very easily.

- Protocol: PROFIBUS DP-V0 slave
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically
- 240 bytes max. input data length
- 240 bytes max. output data length
- PROFIBUS address 0 ~ 126 set by DIP switch
- Support HART mode: point-to-point/multi-drop
- Support 4 HART channels, each for max. 15 HART modules
- Support HART Short/Long frame
- Network isolation protection: 2500 Vrms high speed iCoupler
- 3000 VDC isolation protection on PROFIBUS side



• HART Modules

8-ch Current Input HART Master Module

I-87H17W CR

NEW

The I-87H17W is an 8-ch HART analog input module. It can measure 4~20 mA current and act as a HART master, allowing communication with HART field devices. Users can measure current directly without any external resistor. The I-87H17W adopts DCON protocol and can be used in WinPAC, ViewPAC, XPAC, LinPAC and iPAC series PAC.

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Support the in point-to-point or multi-drop HART network mode
- Allow to connect with max. 15 HART modules
- Support 4 ~ 20 mA current input
- 2-wire or 4-wire transmitters of HART
- Support DCON protocol
- Open wire detection
- 4 kV ESD protection, and 2500 VDC intra-module isolation

4-ch Current Output HART Master Module

I-87H24W CR

Available soon

The I-87H24W is a 4-ch HART analog output module. It can output 4~20 mA current and be as a HART master, allowing communication with HART field devices. The I-87H24W supports DCON protocol defined by ICP DAS, and can be used in WinPAC, ViewPAC, XPAC, LinPAC and iPAC series PAC.

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART masters
- Support the in point-to-point or multi-drop HART network mode
- Allow to connect with max. 15 HART modules
- Support 4 ~ 20 mA current output
- 2-wire transmitters of HART
- Support DCON protocol
- Open wire detection
- 4 kV ESD protection, and 2500 VDC intra-module isolation

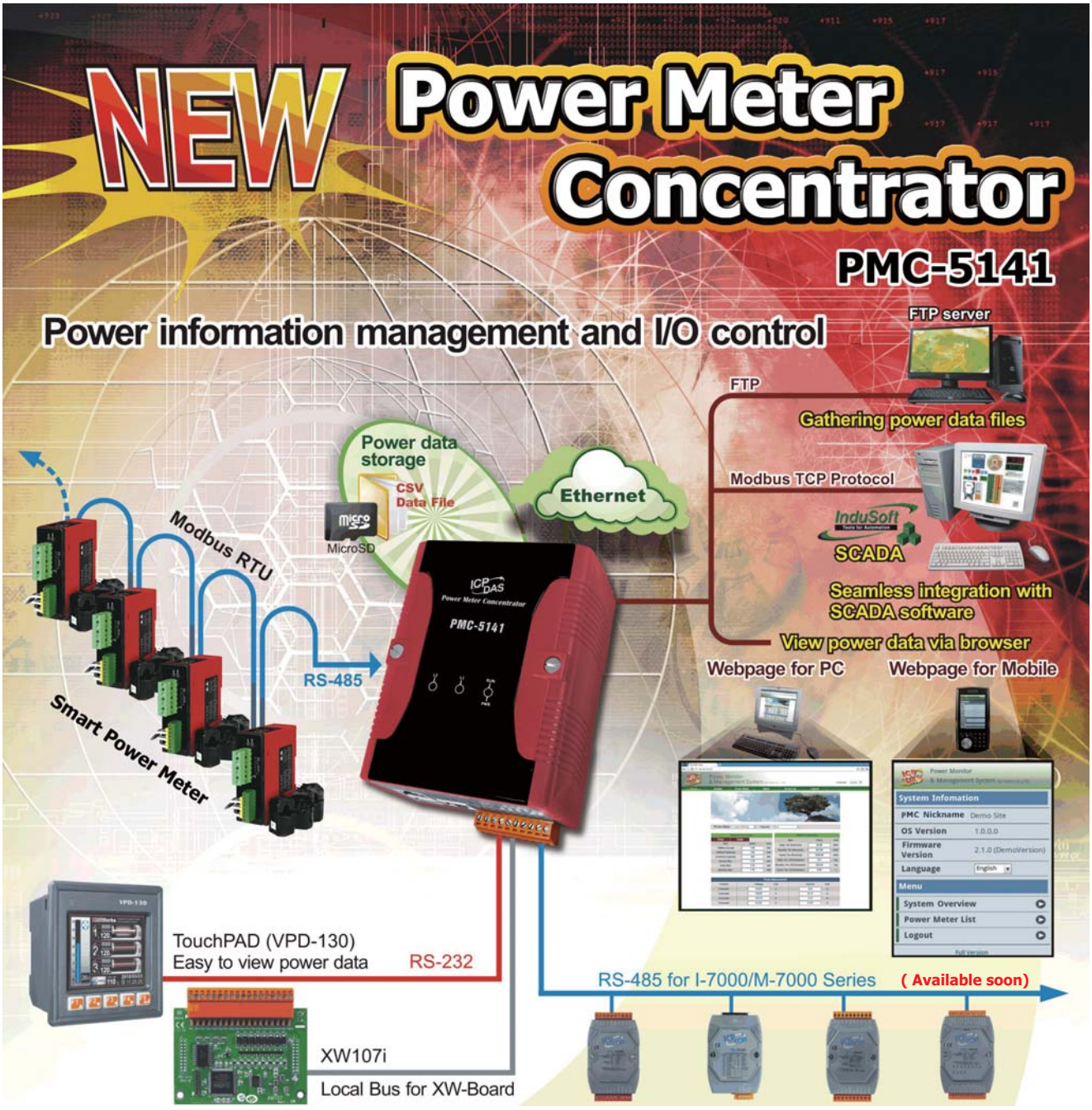
Power Monitor and Management Solution

8.1. Overview

For the resources of the earth are getting depleted faster in recent years, countries around the world and all walks of life all set off a wave of energy saving and carbon reduction in order to avoid the waste of resources and pursue living a sustainable life to extend earth's resources. Under the trend of energy saving and carbon reduction, power monitoring gradually becomes an important project for maximizing energy efficiency by power monitoring always contributing to significant energy savings no mater on the individual, corporate or national level. For a long time, ICP DAS has been engaged in the field of automation control and developed a series of PAC (programmable automation controller) and I/O modules. We intend to provide most cost-effective total solutions for industrial automation. With cumulative experience of years, the PMMS (Power Monitor & Management Solution) developed by ICP DAS integrates core technologies such as: PAC industrial controller, digital power meter, web server and database; it enables to easily build a fully-functioned power monitoring system and furthermore fulfill the aim to cut off energy consumption.

During the whole process of system development, no programming is required; it takes a few clicks on web page to complete settings and store the power data of the devices in the database for further analysis.

PMMS (Power Monitor & Management Solution) mainly consists of two parts: PMC-5141 (Power Meter Concentrator) and ICP DAS Smart Power Meters.



• Features

1. Built-in Web Server

2. Support data storage

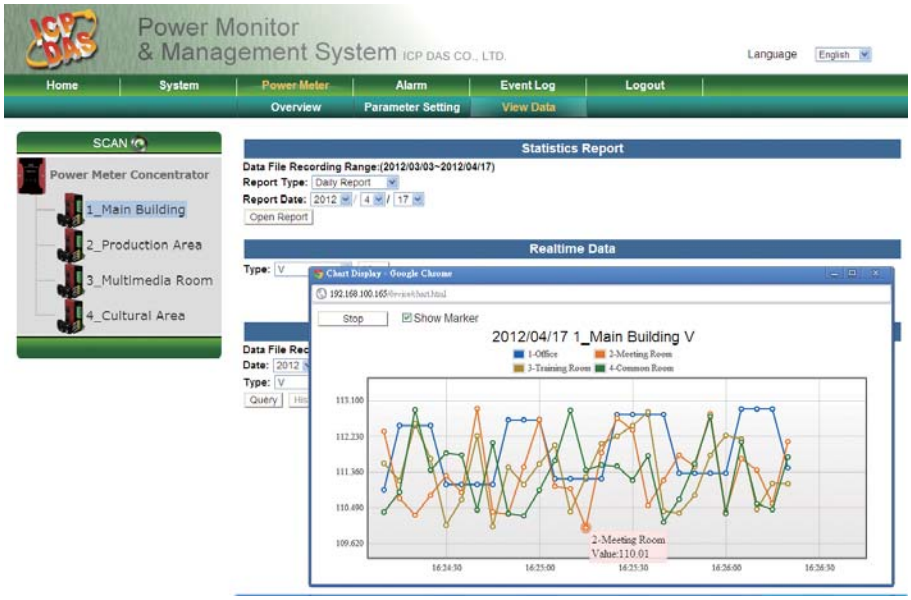
3. Support FTP Server and FTP Client for easy file management

4. Offer Modbus TCP Slave function that allows seamless integration with SCADA software

5. Allow to integrate with an internal I/O module (XW107i)

6. Support Remote I/O modules for I/O expansion (Available Soon)

7. Immediately display power data in real-time trend or historical trend



8. Offer Flash HMI Tools on Webpage

8.2. Power Meter Concentrator

PMC-5141/PMC-5141P

Power Meter Concentrator

Features

- Built-in Web Server allows to view power data via browser
- No extra software tool is required to perform configurations and operations of the power meters
- Immediately display in real-time trend or historical trend and power data storage
- Support FTP Server and FTP Client for easy file management
- Allow to recover Data Log files when the network is resumed after temporary network disconnection
- Offer power demand management and alarm notification functions
- Offer Modbus TCP Slave function that allows seamless integration with SCADA software
- Allow to integrate with ICP DAS I/O modules (XW107i)
- Offer Flash HMI Tools for easy HMI interface design
- Support PoE for PMC-5141P

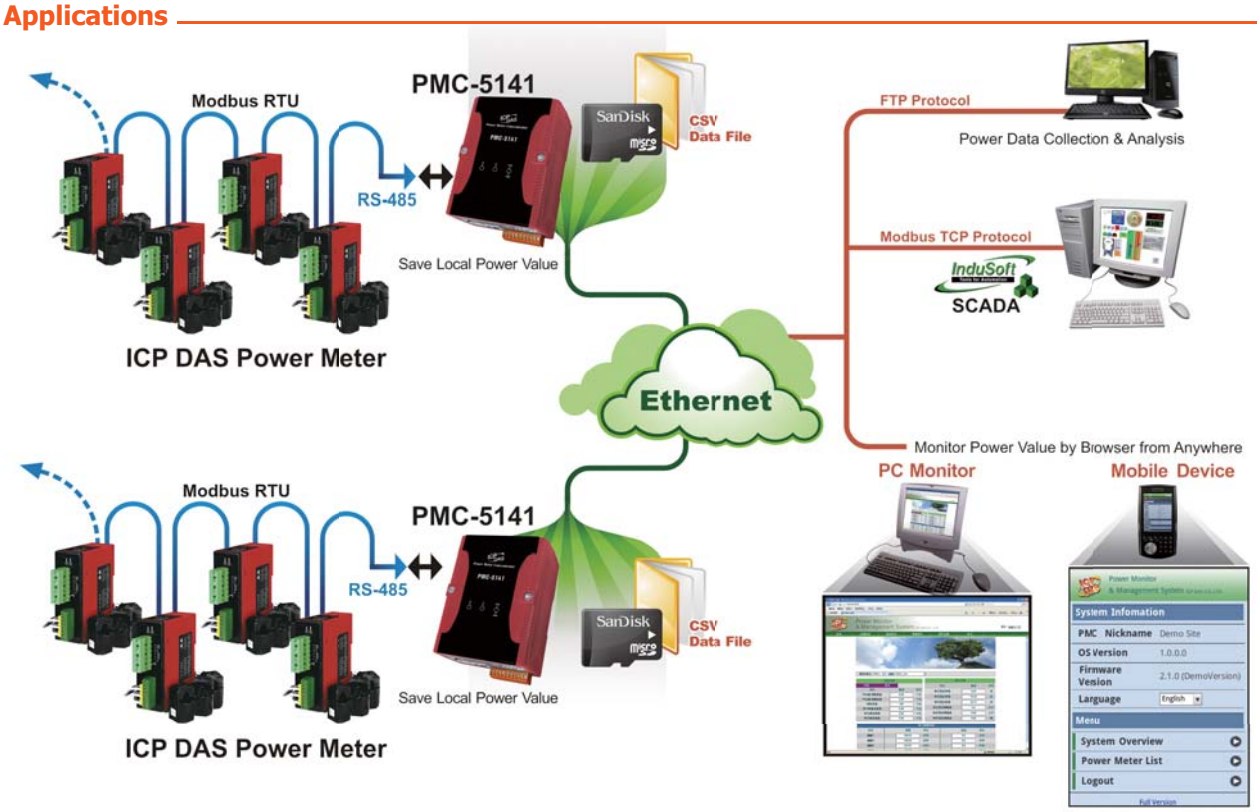
Introduction

PMMS (Power Monitor & Management Solution) is a power monitor & management solution developed by ICP DAS. PMMS solution consists of Power Meter Concentrator (PMC-5141), and Smart Power Meters(PM-XXXx).

PMC-5141 connects to ICP DAS smart power meters via Modbus RTU to read the power data of the devices; enables power monitoring and management functions. The power data can be saved in the microSD card and then being sent to the back-end FTP Server for further data integration or analysis.

PMC-5141 is equipped with built-in Web Server. It allows users to connect to the PMMS web page on PMC-5141 via browser to set up the parameters of the power meters. The users could view power data of the devices in real-time or in historical trend, and the power daily report or monthly report function also provides a quick review for power consumption analysis. In addition, PMC-5141 is equipped with built-in Modbus TCP Slave function that enables SCADA software to connect to PMC-5141 for data communication and interaction. PMC-5141 also provides alarm notification functions, it could send out email or SMS to notify the related personnel for real-time information of the power devices or the system status. During the whole process of system development, no programming is required; it takes only a few clicks on PMMS web page to complete settings and to display, store and manage the power data of the devices.

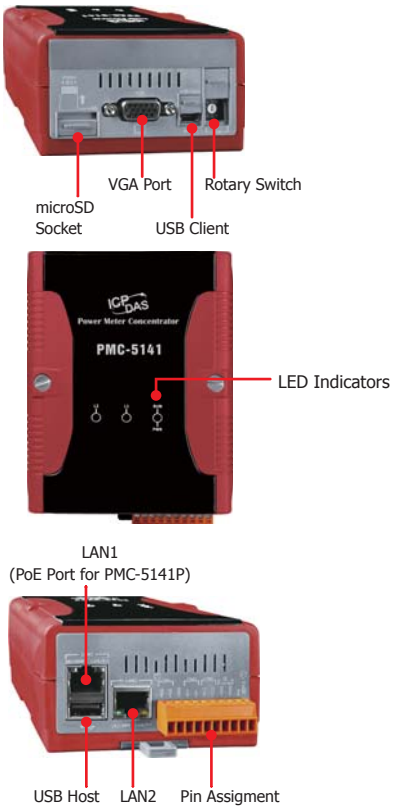
Applications

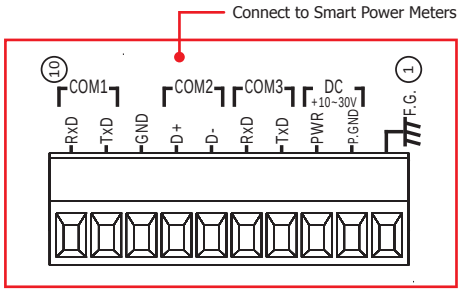


Specifications

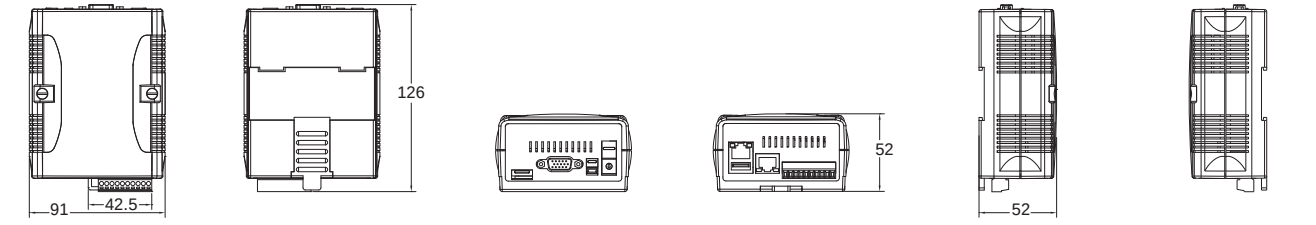
Model	PMC-5141	PMC-5141P
System Software		
OS	Windows CE 5.0 Core	
.Net Compact Framework	3.5	
Embedded Service	Web server, FTP server	
CPU Module		
CPU	PXA270 CPU (32-bit and 520 MHz)	
SDRAM	128 MB	
Flash	64 MB	
EEPROM	16 KB Data Retention: 40 years; 1,000,000 erase/write cycles	
Expansion Flash Memory	microSD socket with one 2 GB microSD card (support up to 16 GB microSDHC card)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
LED Indicator	1 LED for Power and Running	
Rotary Switch	Yes (0 ~ 9)	
VGA & Communication Ports		
VGA	Yes, Resolutions: 640 x 480/800 x 600	
Ethernet	RJ-45 x 2, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators) *Note: LAN1 is reserved for PMC-5141	
USB 1.1 (client)	1	
USB 1.1 (host)	1 *Note: Connect to GTM-201-USB for SMS Function	
COM 1	RS-232 (RxD, TxD and GND); non-isolated	
COM 2	RS-485 (D2+, D2-); 2500 VDC; isolated; *Note: Allow to connect to up to 16 Smart Power Meters (Modbus RTU Interface)	
COM 3	RS-232 (RxD, TxD and GND); non-isolated	
Mechanical		
Dimensions (W x L x H)	91 mm x 126 mm x 52 mm	
Installation	DIN-Rail Mounting	
Environmental		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-30 ~ +80 °C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	
Power		
Input Range	+10 ~ +30 VDC	+12 ~ +48 VDC
Isolation	1 kV	-
Consumption	4.8 W (0.2 A @ 24 VDC)	4.3 W (0.18 A @ 24 VDC)

Appearance





Dimensions (Units: mm)



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

Ordering Information

PMC-5141-EN CR	Power Meter Concentrator (English) (RoHS)	**PMC-5141P-EN CR**	PMC-5141 with PoE (English) (RoHS) (Available soon)
PMC-5141-TC CR	Power Meter Concentrator (Traditional Chinese) (RoHS)	**PMC-5141P-TC CR**	PMC-5141 with PoE (Traditional Chinese) (RoHS) (Available soon)
PMC-5141-SC CR	Power Meter Concentrator (Simplified Chinese) (RoHS)	**PMC-5141P-SC CR**	PMC-5141 with PoE (Simplified Chinese) (RoHS) (Available soon)

Accessories

Smart Power Meter	Currently support PM-2133-100, PM-2133-160, PM-2133-240, PM-311x-100, PM-311x-160, & PM-311x-240 (with RS-485 Interface)
DP-660	24 VDC/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 VDC/5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 VDC/1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 VDC/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
GTM-201-USB	Industrial Quad-band GPRS/GSM Modem with USB Interface (RoHS)
XW107i	Add-on I/O Expansion Board (8 DI and 8 DO)

8.3. Smart Power Meter

PM-2133

1 loop 3-phase Smart Power Meter

Features

- True RMS Power Measurements
- Energy Analysis for 3P4W, 3P3W
- Current Measurements Up to 200 A with Different CT Ratio
- Voltage Measurements Up to 500 V
- Clip-on CT for Easy Installation
- kWh Accuracy Better than 1% (PF=1)
- RS-485, Ethernet or CAN Bus Communication Interface
- Modbus RTU, Modbus TCP or CANopen Protocol

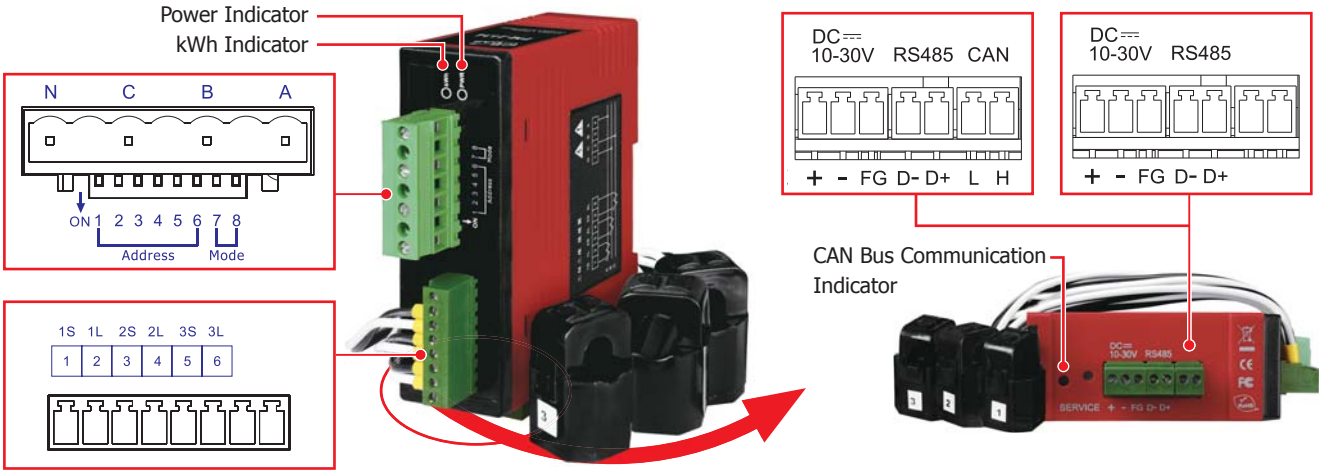
Introduction

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, to the markets. With its high accuracy (1%, PF=1), the PM-2133 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). It supports Modbus RTU, Modbus TCP or CANopen protocols for easy integration. It works with input voltages ranging 10 ~ 500 VAC, supports a wide range of applications.

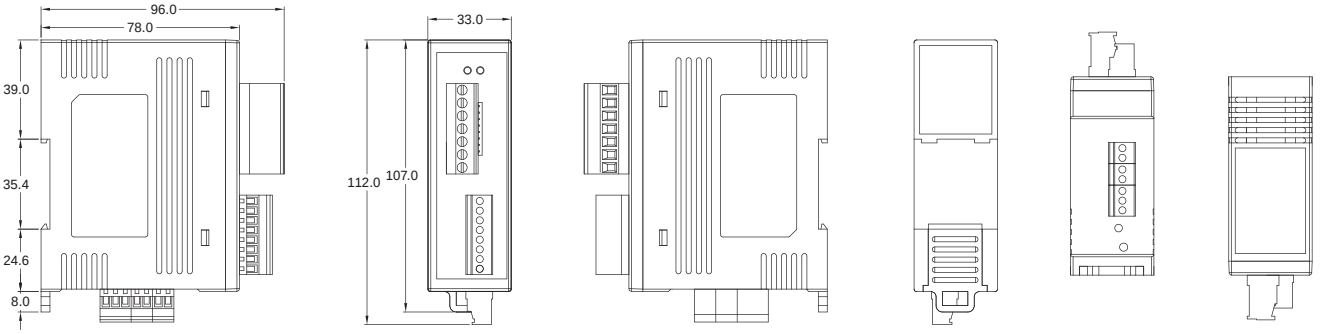
Specifications

Models		PM-2133	PM-2133-MTCP	PM-2133-CAN PM-2133-CPS
AC Power Measurement				
Wiring		3P4W-3CT, 3P3W-3CT		
Input Voltage		10 ~ 500 VAC		
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)		
Data Update Rate		1 Second		
Communication				
RS-485	Protocol	Modbus RTU	-	-
	Baudrate	9600, 19200 (Default), 38400	-	-
	Data format	N,8,1	-	-
	Isolation	1000 Vrms	-	-
Ethernet	Protocol	-	Modbus TCP	-
	Default IP	-	192.168.255.1.	-
CAN Bus	Protocol	-	-	CAN or CANopen
	Baudrate	-	-	125K (Default), 250K, 500K
Power				
Input Range		+10 ~ 30 VDC		
Power Consumption		2.4 W		
Mechanical				
Casing		Plastic		
Flammability		UL 94V-0 materials		
Dimensions (W x L x H)		33 mm x 96 mm × 112 mm		
Module Installation		DIN-Rail Mounting		
CT Installation		Clip-On		
Environment				
Operating Temperature		-10 ~ +70 °C		
Storage Temperature		-25 ~ +85 °C		
Ambient Relative Humidity		10% ~ 90% RH, Non-condensing		

Appearance



Dimensions (Units: mm)



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

Selection Guide

PM-2133 - XXX - XXX

CT size (measurement)
100: CTΦ10 mm (0 ~ 60 A)
160: CTΦ16 mm (0 ~ 100 A)
240: CTΦ24 mm (0 ~ 200 A)

Communication
□: RS-485
CAN: CAN Bus
CPS: CANopen
MTCP: Modbus TCP

Ordering Information

RS-485 Interface	
PM-2133-100	RS-485 with Modbus RTU protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (60 A)
PM-2133-160	RS-485 with Modbus RTU protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (100 A)
PM-2133-240	RS-485 with Modbus RTU protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (200 A)
CAN Bus Interface	
PM-2133-100-CAN	CAN Bus; 1 loop 3-phase Smart Power Meter with 3 CTs (60 A)
PM-2133-160-CAN	CAN Bus; 1 loop 3-phase Smart Power Meter with 3 CTs (100 A)
PM-2133-240-CAN	CAN Bus; 1 loop 3-phase Smart Power Meter with 3 CTs (200 A)

CANopen Interface (Available soon)	
PM-2133-100-CPS	CANopen; 1 loop 3-phase Smart Power Meter with 3 CTs (60 A)
PM-2133-160-CPS	CANopen; 1 loop 3-phase Smart Power Meter with 3 CTs (100 A)
PM-2133-240-CPS	CANopen; 1 loop 3-phase Smart Power Meter with 3 CTs (200 A)
Ethernet Interface (Available soon)	
PM-2133-100-MTCP	Ethernet with Modbus TCP protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (60 A)
PM-2133-160-MTCP	Ethernet with Modbus TCP protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (100 A)
PM-2133-240-MTCP	Ethernet with Modbus TCP protocol; 1 loop 3-phase Smart Power Meter with 3 CTs (200 A)

PM-3112/PM-3114

2/4 Loops single-phase Smart Power Meter

Features

- True RMS Power Measurements
- Energy Analysis for 1P2W, 1P4W
- Current Measurements Up to 200 A with Different CT Ratio
- Voltage Measurements Up to 300 V
- Clip-on CT for Easy Installation
- kWh Accuracy Better than 1% (PF=1)
- Supports RS-485, Ethernet or CAN bus/CANopen Interface
- Supports Modbus RTU, Modbus TCP or CAN Protocol
- Supports 2 Power Relay Output (Form A)
- Supports PoE (IEEE 802.3af, Class 1)

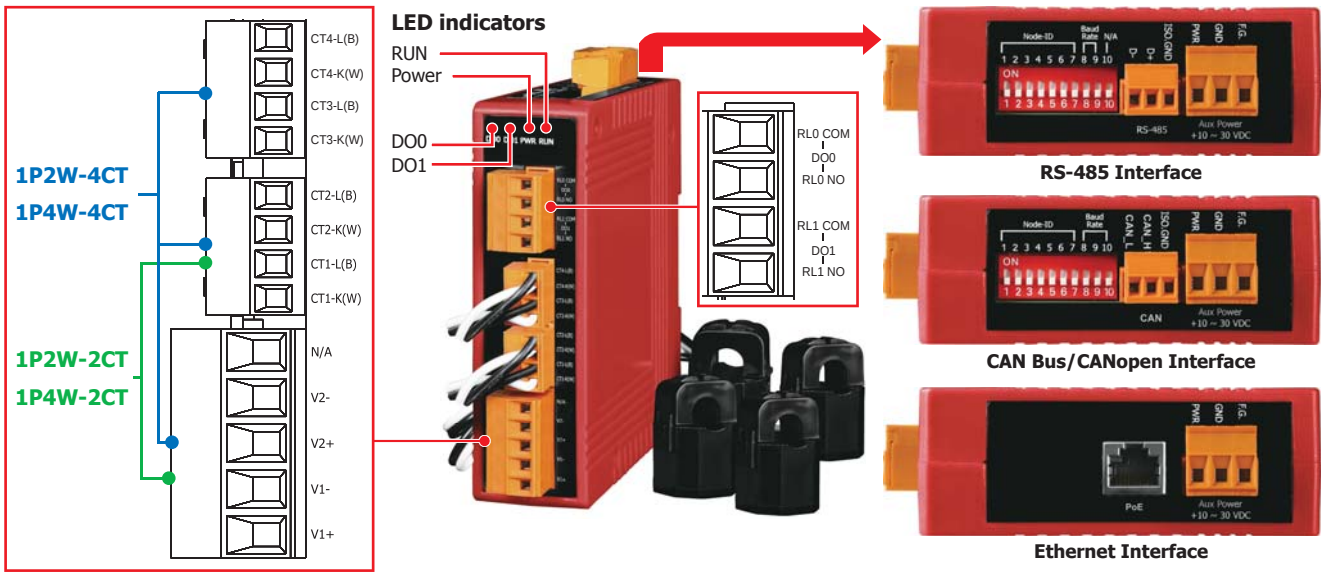
Introduction

ICP DAS brings the most powerful, cost-effective, advanced Smart Power Meters PM-3000 series that gives you access to real-time electric usage for single-phase power measurement. With its high accuracy (<1%, PF=1), the PM-3000 series can be applied to both low voltage primary side and/or medium/high voltage secondary side and enables the users to obtain reliable and accurate energy consumption readings from the monitored equipments in real time under operation. These compact size and cost-effective power meters are equipped with revolutionary wired clip-on CT (various types, support input current up to 200 A). It operates over a wide input voltages range 10 ~ 300 V_{AC} which allows worldwide compatibility. And with 2 channels relay outputs, it can be linked with sirens or lightings for alarm messages. It also supports Modbus RTU, Modbus TCP or CAN bus protocols for easy integration.

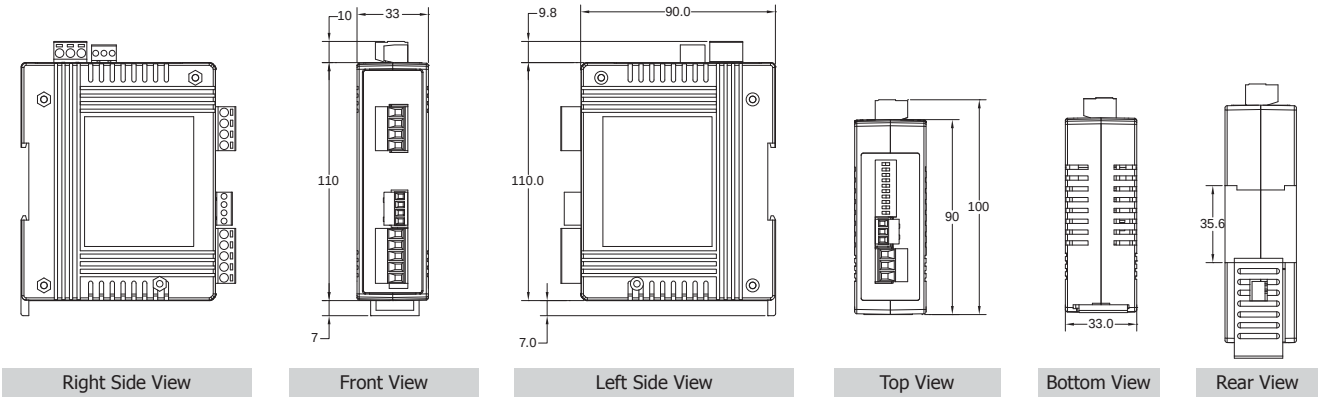
Specifications

Models		PM-3112	PM-3114	PM-3112-MTCP	PM-3114-MTCP	PM-3112-CAN PM-3112-CPS	PM-3114-CAN PM-3114-CPS
AC Power Measurement							
Wiring		1P2W/1P4W-2CT	1P2W/1P4W-4CT	1P2W/1P4W-2CT	1P2W/1P4W-4CT	1P2W/1P4W-2CT	1P2W/1P4W-4CT
Input Voltage		10 ~ 300 V					
Input Current		CTØ10 mm (60 A); CTØ16 mm (100 A); CTØ24 mm (200 A)					
Input Frequency		50/60 Hz					
kWh Accuracy		Better than 1% (PF=1)					
Starting Current		0.08A					
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)					
Data Update Rate		1 Second					
Communication							
RS-485	Protocol	Modbus-RTU		-		-	
	Baud rate	9600,19200 (default), 38400, 115200; DIP Switch Selectable		-		-	
	Data format	N,8,1		-		-	
	Isolation	2500 V_{DC}		-		-	
Ethernet	Protocol	-		Modbus TCP		-	
	PoE	-		Yes, IEEE 802.3af		-	
CAN Bus	Protocol	-		-		CAN Bus and CANopen	
	Baud rate	-		-		125 k (default), 250 k, 500 k, 1 M; DIP Switch Selectable	
Alarm Output							
Power Relay		Form A (Normal Open) x 2; Relay Contact Voltage Range: 5 A @ 250 V_{AC} (47 ~ 63Hz), 5 A @ 30 V_{DC}					
Power							
Input Range		+10 ~ 30 V_{DC}		+12 ~ 48 V_{DC}		+10 ~ 30 V_{DC}	
Power Consumption		2 W					
Mechanical							
Casing		Plastic (Flammability UL 94V-0)					
Dimensions (W x L x H)		127 mm x 105 mm x 33 mm					
Module Installation		DIN-Rail Mounting					
CT Installation		Clip-On					
Environment							
Operating Temperature		-10 ~ +70 °C					
Storage Temperature		-25 ~ +80 °C					
Ambient Relative Humidity		10% ~ 90% RH, Non-condensing					

Appearance



Dimensions (Units: mm)



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

Selection Guide

PM-311 [X] [X X X] - [X X X]

Channel
2: 2 Loops
4: 4 Loops

CT size (measurement)
100: CTΦ10 mm (0 ~ 60 A)
160: CTΦ16 mm (0 ~ 100 A)
240: CTΦ24 mm (0 ~ 200 A)

Communication
□: RS-485
CAN: CAN Bus
CPS: CANopen
MTCP: Modbus TCP

Ordering Information

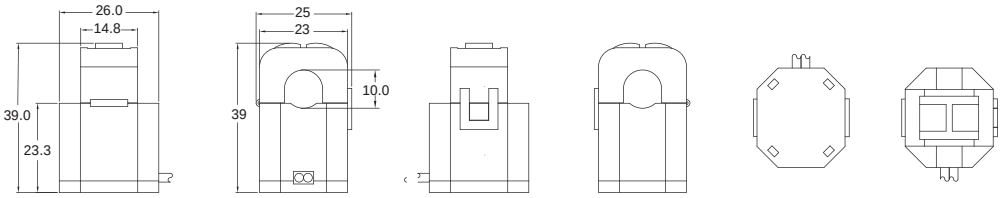
RS-485 Interface	
PM-3112-100	Modbus RTU; 2 loops single-phase Power Meter with 2 CTs (60 A)
PM-3112-160	Modbus RTU; 2 loops single-phase Power Meter with 2 CTs (100 A)
PM-3112-240	Modbus RTU; 2 loops single-phase Power Meter with 2 CTs (200 A)
Ethernet Interface (Available soon)	
PM-3112-100-MTCP	Modbus TCP; 2 loops single-phase Power Meter with 2 CTs (60 A)
PM-3112-160-MTCP	Modbus TCP; 2 loops single-phase Power Meter with 2 CTs (100 A)
PM-3112-240-MTCP	Modbus TCP; 2 loops single-phase Power Meter with 2 CTs (200 A)
CAN Bus Interface	
PM-3112-100-CAN	CAN Bus; 2 loops single-phase Power Meter with 2 CTs (60 A)
PM-3112-160-CAN	CAN Bus; 2 loops single-phase Power Meter with 2 CTs (100 A)
PM-3112-240-CAN	CAN Bus; 2 loops single-phase Power Meter with 2 CTs (200 A)
CANopen Interface (Available soon)	
PM-3112-100-CPS	CANopen; 2 loops single-phase Power Meter with 2 CTs (60 A)
PM-3112-160-CPS	CANopen; 2 loops single-phase Power Meter with 2 CTs (100 A)
PM-3112-240-CPS	CANopen; 2 loops single-phase Power Meter with 2 CTs (200 A)

RS-485 Interface (Available soon)	
PM-3114-100	Modbus RTU, 4 loops single-phase power meter (60 A)
PM-3114-160	Modbus RTU, 4 loops single-phase power meter (100 A)
PM-3114-240	Modbus RTU, 4 loops single-phase power meter (200 A)
Ethernet Interface (Available soon)	
PM-3114-100-MTCP	Modbus TCP, 4 loops single-phase power meter (60 A)
PM-3114-160-MTCP	Modbus TCP, 4 loops single-phase power meter (100 A)
PM-3114-240-MTCP	Modbus TCP, 4 loops single-phase power meter (200 A)
CAN Bus Interface (Available soon)	
PM-3114-100-CAN	CAN Bus, 4 loops single-phase power meter (60 A)
PM-3114-160-CAN	CAN Bus, 4 loops single-phase power meter (100 A)
PM-3114-240-CAN	CAN Bus, 4 loops single-phase power meter (200 A)
CANopen Interface (Available soon)	
PM-3114-100-CPS	CANOpen, 4 loops single-phase power meter (60 A)
PM-3114-160-CPS	CANOpen, 4 loops single-phase power meter (100 A)
PM-3114-240-CPS	CANOpen, 4 loops single-phase power meter (200 A)

• CT for Smart Power Meter

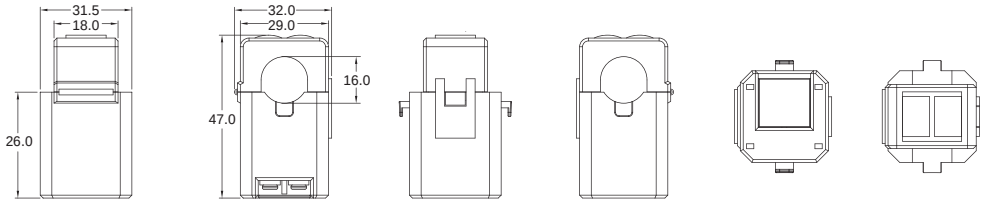
Dimensions (Units: mm)

100: CTΦ10mm (0~60A)



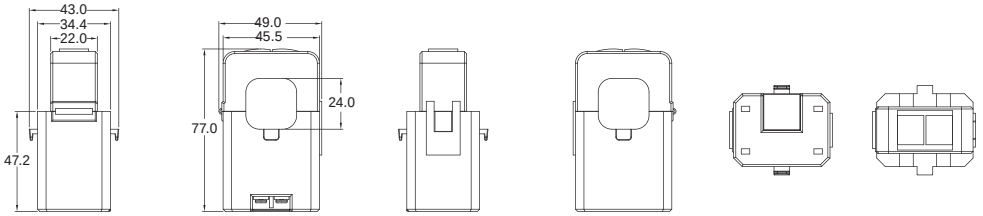
Left View | Front View | Right View | Rear View | Bottom View | Top View

160: CTΦ16mm (0~100A)



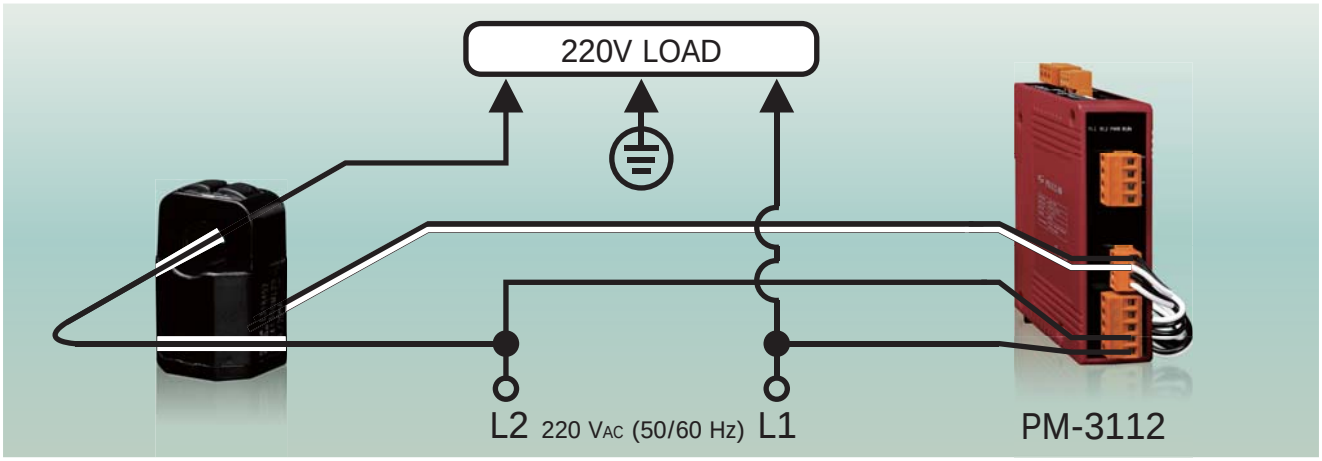
Left View | Front View | Right View | Rear View | Bottom View | Top View

240: CTΦ24mm (0~200A)



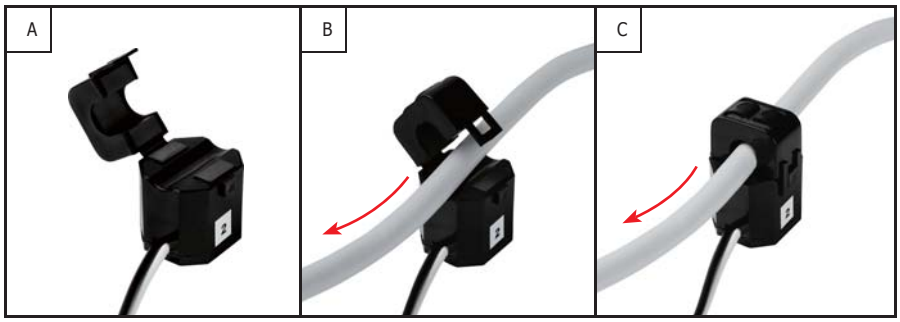
Left View | Front View | Right View | Rear View | Bottom View | Top View

Wiring for 220V with no neutral



Installation

DIN-Rail Mounting



Clip-on CT Installation

8.4. Voltage Attenuator

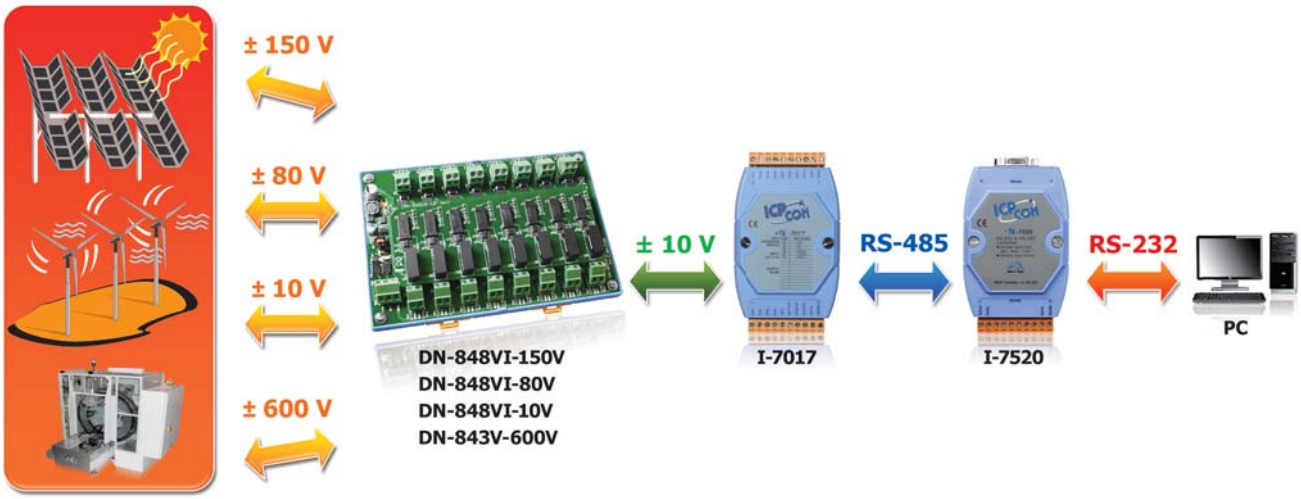
Features

- AC/DC Source Input
- High Voltage Input Measurement
- Linear Attenuation Ratio
- High Input Impedance
- Channel to Channel Isolation for DN-848VI-10V, DN-848VI-80V and DN-848VI-150V
- 4 kV ESD Protection
- 3 kV Surge Protection
- RoHS Compliance
- Operating Temperature: -25 ~ +75°C
- Easily Wire Connection

Introduction

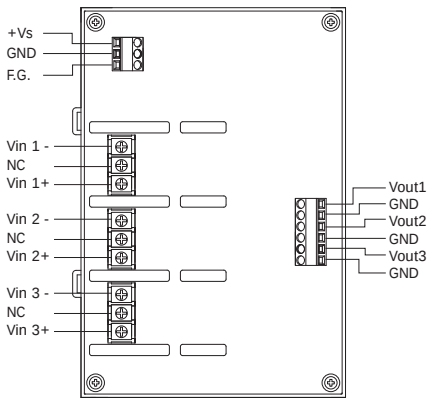
The DN-800V series are voltage input attenuator. The maximum input range is from ±80 V to ±600 V and can be attenuated to ±10 V. The "I" version provide 3000 VDC intra-modules isolation and 3000 VDC channel to channel isolation to avoid the noise interference from inputs to outputs or channel to channel. It can be used with the analog input modules such as I-7017 and I-87017 etc. to measure the high voltage.

Applications

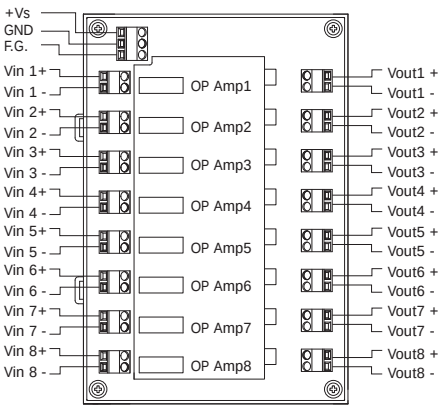


Appearance

DN-843V-600V



DN-848VI-10V/DN-848VI-80V/DN-848VI-150V

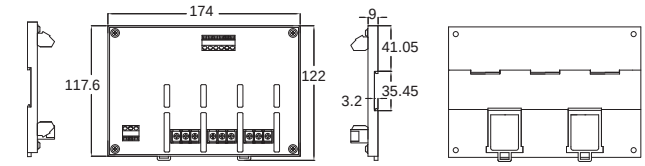


Specifications

Models	DN-848VI-10V	DN-848VI-80V	DN-848VI-150V	DN-843V-600V
General				
Channels	8	8	8	3
Input Type	AC/DC Voltage			
Input Range	+/-10 Vpp	+/-80 Vpp	+/-150 Vpp	+/-600 Vpp
Output Range	+/-10 Vpp			
Accuracy	1% of FSR			
Chanel to Channel Isolation	Yes, 3000 VDC			-
Bandwidth	30 KHz			100 KHz
Input Impedance	> 1 MΩ			
Intra-module Isolation, Input to Output	3000 VDC			-
EMS Protection				
ESD (IEC 61000-4-2)	+/-4 kV contact for power line, input and output channels , +/-8 kV air for random point			
Surge (IEC 61000-4-5)	+/-3 kV for power liner			
Power Input				
Input Range	+10 ~ +30 VDC			
Power Consumption	9.2 W	9.2 W	9.2 W	0.56 W
Mechanical				
Dimensions (W x L x H)	122 mm x 174 mm x 33 mm			122 mm x 174 mm x 24.5 mm
Installation	DIN-Rail Mounting			
Environment				
Operating Temperature	-25 ~ + 75°C			
Storage Temperature	-30 ~ +75°C			
Humidity	10 ~ 90% RH (non-condensing)			

Dimensions (Units: mm)

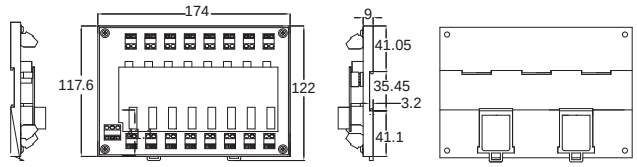
DN-843V-600V



Left View | Front View | Right View | Rear View

Top View | Bottom View

DN-848VI-10V/DN-848VI-80V/DN-848VI-150V



Left View | Front View | Right View | Rear View

Top View | Bottom View

Selection Guide

DN-84 X X X - X X X

Number of Channels
3: 3 channels
8: 8 channels

V: Voltage

I: Channel to channel Isolation

Input Voltage Range

Ordering Information

DN-848VI-10V CR	8-channel 10 V Voltage Attenuator (RoHS)
DN-848VI-80V CR	8-channel 80 V Voltage Attenuator (RoHS)
DN-848VI-150V CR	8-channel 150 V Voltage Attenuator (RoHS)
DN-843V-600V CR	3-channel 600 V Voltage Attenuator (RoHS)

Accessories

 MDR-20-24 CR	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 I-7017-G CR	8-channel Analog Input Module (RoHS)
 I-87017-G CR	8-channel Analog Input Module (RoHS)

8.5. Current Transformer

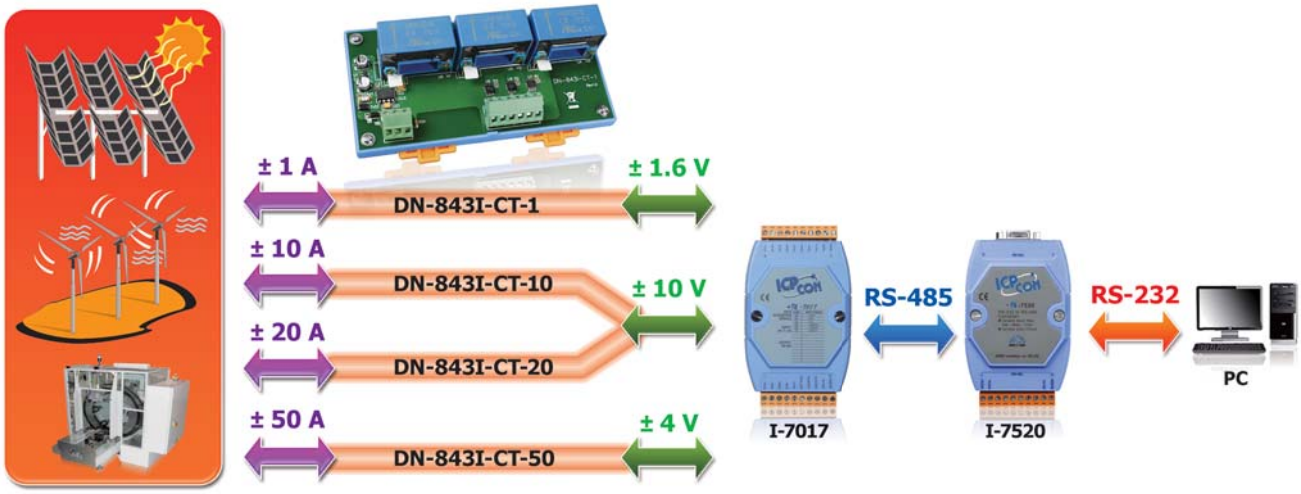
Features

- AC/DC Source Input
- Linear Attenuation Ratio
- High Current Input Measurement
- Isolation Input
- Channel to Channel Isolation
- 4 kV ESD Protection
- RoHS Compliance
- Operating Temperature: -25 ~ +75°C
- Easily Wire Connection

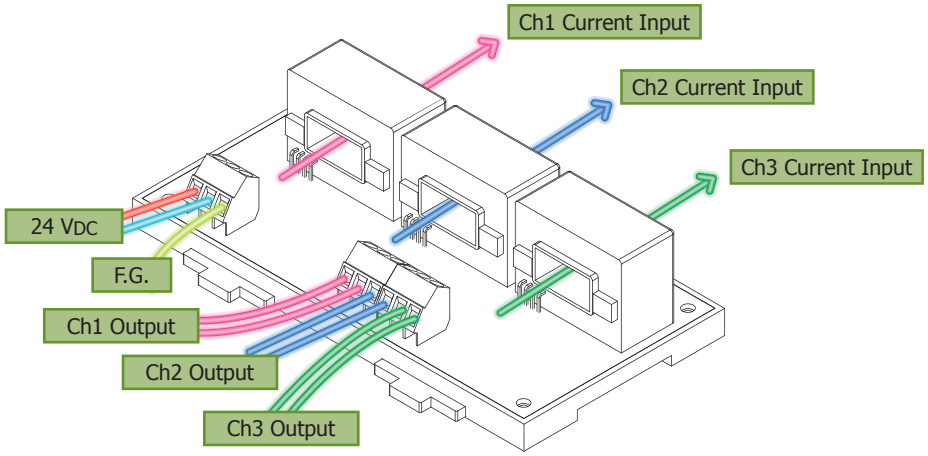
Introduction

The maximum input range is from ±1 A to ±50 A and can be attenuated to from ±1.6 V to ±10 V. The "I" version provide 3000 VDC intra-modules isolation and 3000 VDC channel to channel isolation to avoid the noise interference from inputs to outputs or channel to channel. It can be used with the analog input modules such as I-7017 and I-87017 etc. to measure the high current.

Applications



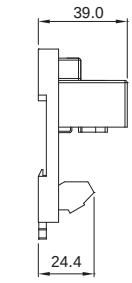
Installation



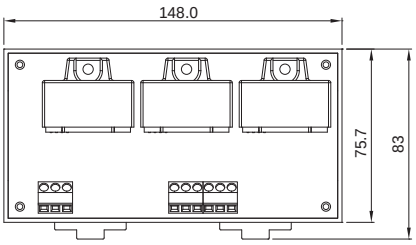
Specifications

Models	DN-843I-CT-1	DN-843I-CT-10	DN-843I-CT-20	DN-843I-CT-50
General				
Channels	3			
Input Type	AC/DC Current			
Input Range	+/-1 A	+/-10 A	+/-20 A	+/-50 A
Output Type	AC/DC Voltage			
Output Range	+/-1.6 Vpp	+/-10 Vpp	+/-10 Vpp	+/-4 Vpp
CT Type	Solid Core (closed)			
Accuracy	1% of FSR			
Chanel to Channel Isolation	Yes, 3000 Vrms			
Intra-module Isolation, Input to Output	3000 VDC			
Bandwidth	50 KHz			
Input Impedance	> 1 MΩ			
EMS Protection				
ESD (IEC 61000-4-2)	+/-4 kV contact for power line, input and output channels, +/-8 kV air for random point			
Power Input				
Input Range	+10 ~ +24 VDC			
Power Consumption	1.2 W			
Mechanical				
Dimensions (W x L x H)	148 mm x 83 mm x 39 mm			
Installation	DIN-Rail Mounting			
Environment				
Operating Temperature	-25 ~ + 75°C			
Storage Temperature	-30 ~ +75°C			
Humidity	10 ~ 90% RH (non-condensing)			

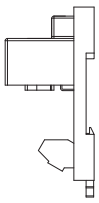
Dimensions (Units: mm)

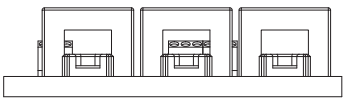


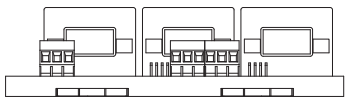
Left View



Front View


Right View


Top View


Bottom View

Selection Guide

DN-84 X X - X X - X

- **Number of Channels**: 3: 3 channels
- **I: Channel to channel Isolation**
- **CT: Current Transformer**
- **Input Current Range**

Ordering Information

DN-843I-CT-1 CR	3-channel 1 A Current Transformer (RoHS)
DN-843I-CT-10 CR	3-channel 10 A Current Transformer (RoHS)
DN-843I-CT-20 CR	3-channel 20 A Current Transformer (RoHS)
DN-843I-CT-50 CR	3-channel 50 A Current Transformer (RoHS)

Accessories

 MDR-20-24 CR	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
 I-7017-G CR	8-channel Analog Input Module (RoHS)
 I-87017-G CR	8-channel Analog Input Module (RoHS)

Temperature and Humidity Data Logger

9.1. IP66 Remote Temperature and Humidity Data Logger with LCD Display

NEW

DL-100T485P
DL-100TM485P

DL-100T485P-W
DL-100TM485P-W

DL-100T485P/DL-100TM485P
DL-100T485P-W/DL-100TM485P-W

IP66 Remote Temperature and Humidity Data Logger with LCD Display

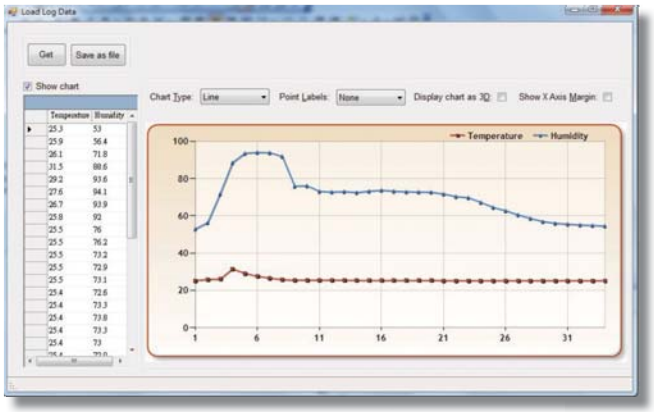
Features

- Measurement Ranges: -20 ~ +60°C (-31 ~ +176°F) and 0 ~ 100% RH
- Accuracy: +/-0.3°C; +/-1.8% RH
- LCD Display Shows Temperature, Humidity and Module ID
- 10 ~ 30 VDC Power Input
- IP66 Waterproof
- Data Logger Can Store Up to 4088 Temperature and Humidity Records
- RS-485 Communication interface
- DCON or Modbus RTU Protocol
- Windows Software Included

Introduction

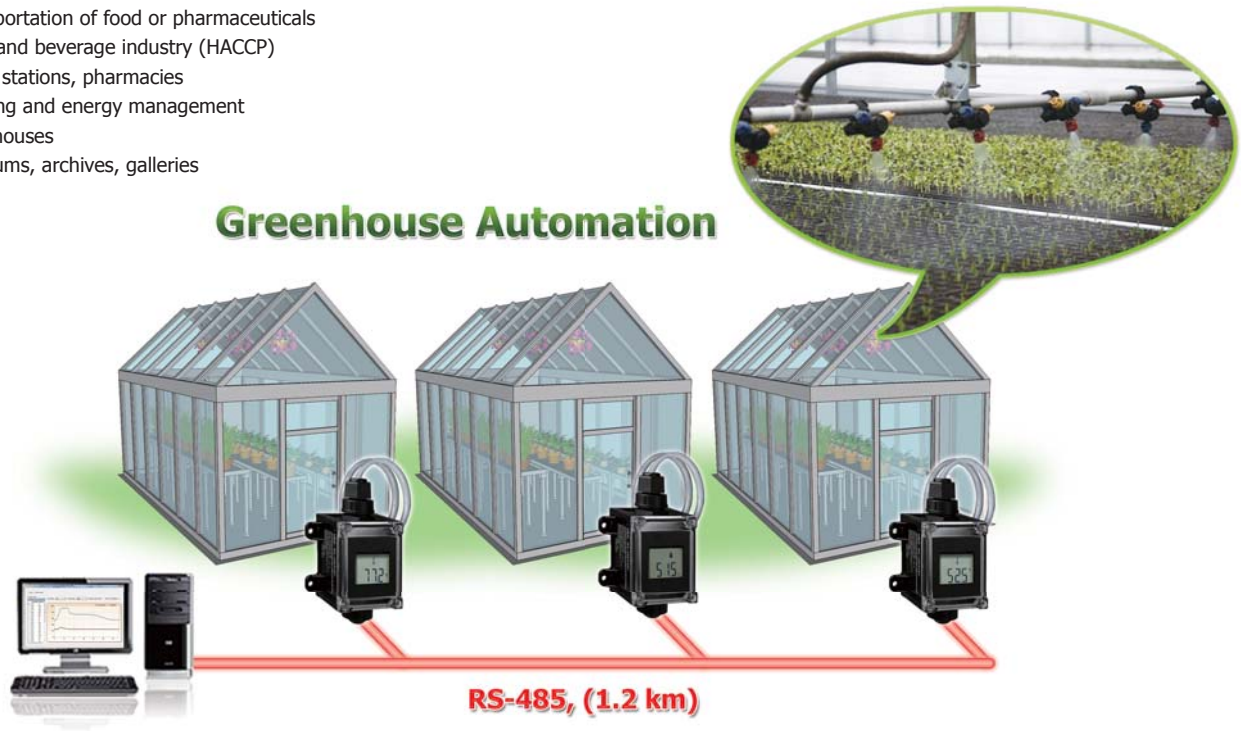
The DL-100T485P/DL-100T485P-W/DL-100TM485P/DL-100TM485P-W is a temperature and humidity data logger module. It contains an RS-485 communication interface and an LCD display to show a variety of temperature, humidity and module ID data. The data storage memory can store up to 4088 temperature and humidity records.

The Data Logger Utility is included to allow installation, configuration, retrieval and display of data in a powerful chart format that can be exported to Excel.



Applications

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



Specifications

Models	DL-100T485P	DL-100T485P-W	DL-100TM485P	DL-100TM485P-W
Temperature Sensor				
Measuring Range	-20 ~ +60°C (-31 ~ +176°F)			
Resolution	0.1°C			
Accuracy	Typical: +/-0.3°C; refer to figure 1 for details			
Precision	+/- 0.1°C			
Humidity Sensor				
Measuring Range	0 ~ 100% RH			
Resolution	0.1% RH			
Accuracy	Typical: ±1.8% 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			
Data Logger				
Time Interval	10 seconds to 1 day			
Max. Records	4088 temperature and humidity records			
Mode	Overwrite or stop logging when storage space is full			
Overwrite Limitation	1,000,000 cycles			
Communication				
Interface	RS-485; non-isolated			
Baudrate	1200 ~ 115200 bps			
Data format	N,8,1			
Protocol	DCON		Modbus RTU	
Max. Modules on same bus	32			
Power				
Input Range	+10 ~ 30 VDC			
Power Consumption	0.15 W			
Mechanical				
Dimensions (W x L x H)	82 mm x 126 mm x 55 mm			
Waterproof Level	IP66			
Installation	DIN-Rail; Wall mount			
Environment				
Operating Temperature	-20 ~ +60°C			
Storage Temperature	-30 ~ +80°C			
Ambient Relative Humidity	5 ~ 95% RH, Non-condensing			

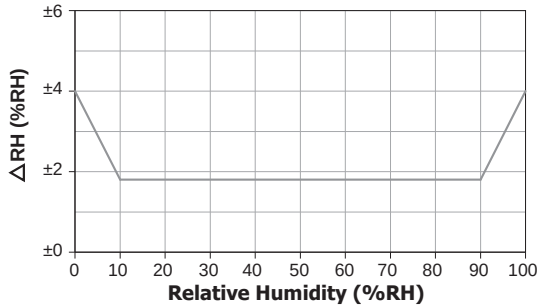


Figure 1: Maximum RH-tolerance at 25°C per sensor.

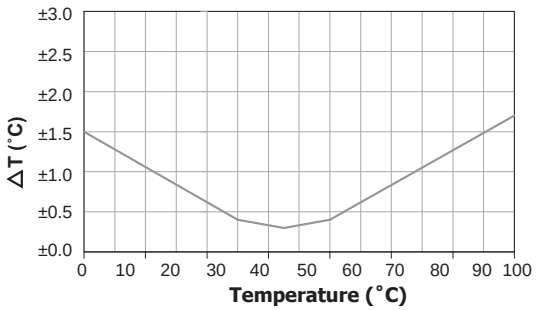


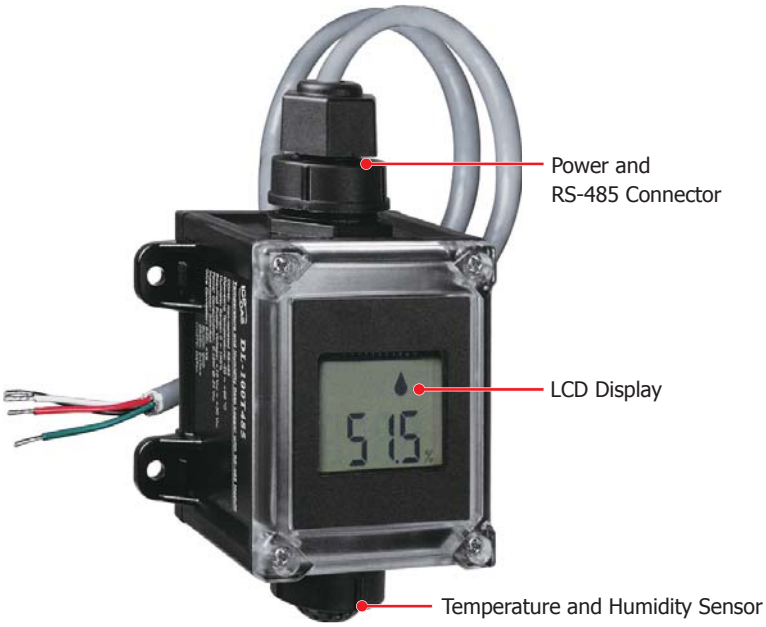
Figure 2: Maximum T-tolerance per sensor.

Installation

DIN-Rail Mounting

Wall mount

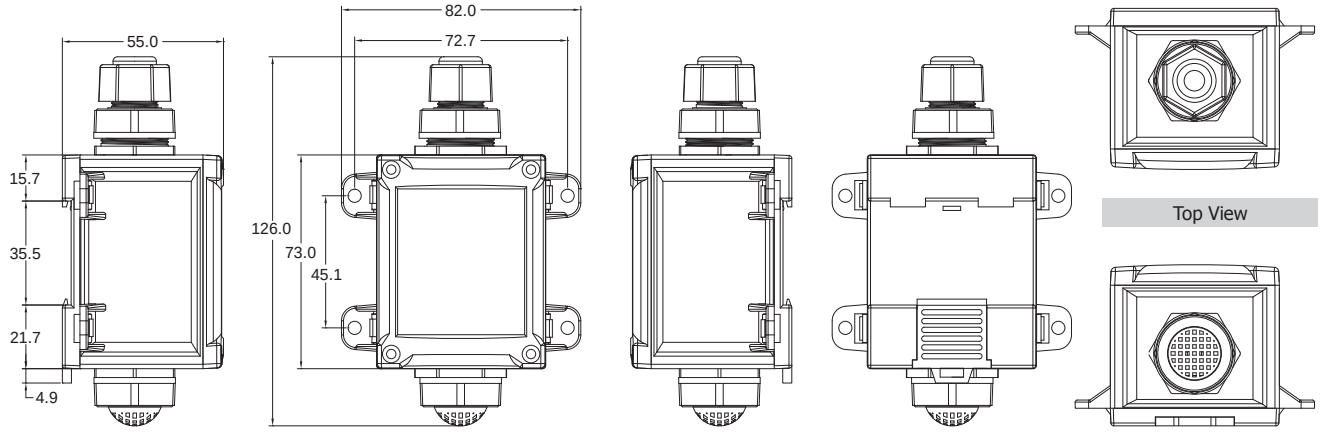
Appearance



Humidity (RH) | Module ID

Temperature (°F) | Temperature (°C)

Dimensions (Units: mm)



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

Ordering Information

DL-100T485P CR	DCON Protocol Based IP66 RS-485 Remote Temperature and Humidity Data Logger with LCD Display (Black Cover) (RoHS)
DL-100T485P-W CR	DCON Protocol Based IP66 RS-485 Remote Temperature and Humidity Data Logger with LCD Display (White Cover) (RoHS)
DL-100TM485P CR	Modbus RTU Protocol Based IP66 RS-485 Remote Temperature and Humidity Data Logger with LCD Display (Black Cover) (RoHS)
DL-100TM485P-W CR	Modbus RTU Protocol Based IP66 RS-485 Remote Temperature and Humidity Data Logger with LCD Display (White Cover) (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)

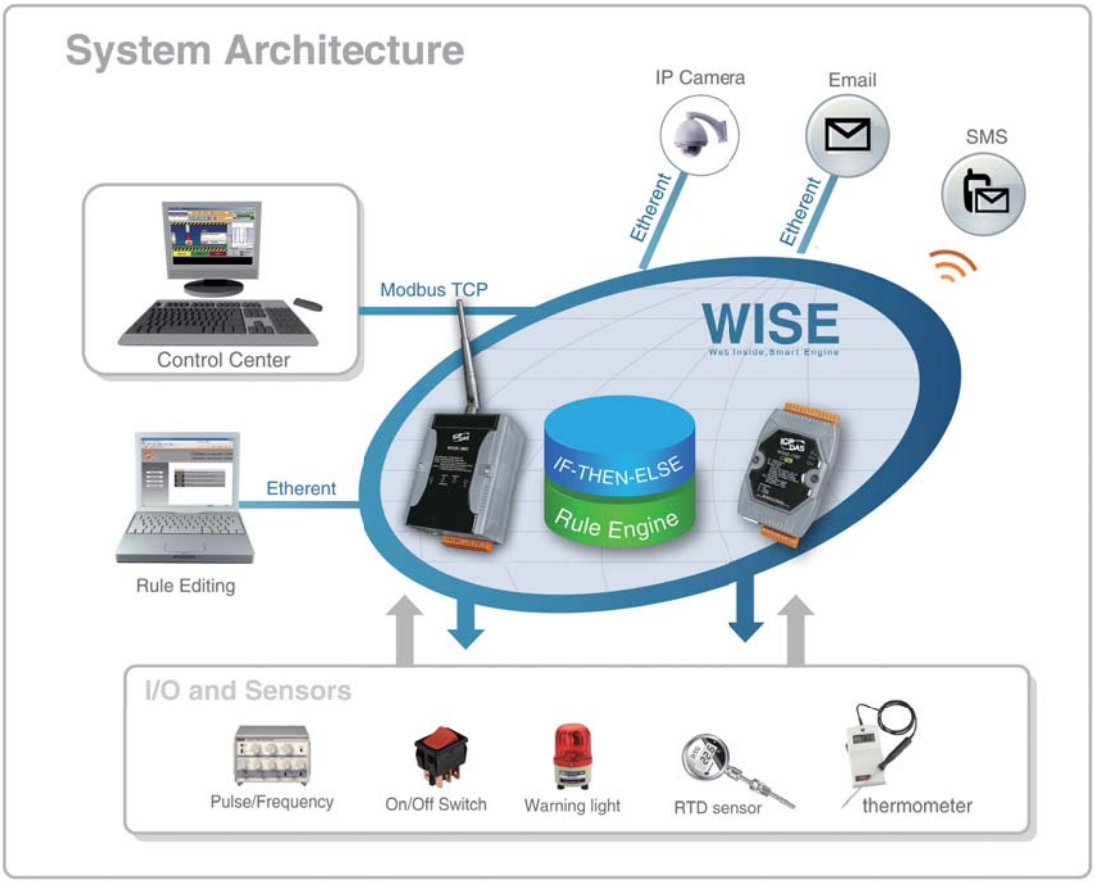
WISE I/O Modules

10

10.1. Overview

WISE (**W**eb **I**nside, **S**mart **E**ngine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

Through Web browser, users can access Web Server on WISE controllers to perform tasks such as logic rule edition and download. A Rule Engine will be set up to manage and deploy logic rules for controllers. The Rule Engine will check whether the rules are valid or not and determine the execution of actions under specific conditions, for examples: setting up I/O channel values, perform scheduled tasks, sending Email/SMS message or sending CGI command under a specific condition. With WISE Advanced P2P function, all WISE controllers (not apply to WISE-580x) in network can freely share their status such as AIO value, DIO value, DIO Counter value or Internal Register value to each others. This function greatly enhances the flexibility and boosts accuracy to the logic rule design and makes it easy to enable the interactions between the controllers. In addition, through Modbus TCP Protocol, SCADA package enables to control and monitor I/O channel or system status on WISE controller in real time.



▲ WISE System Architecture

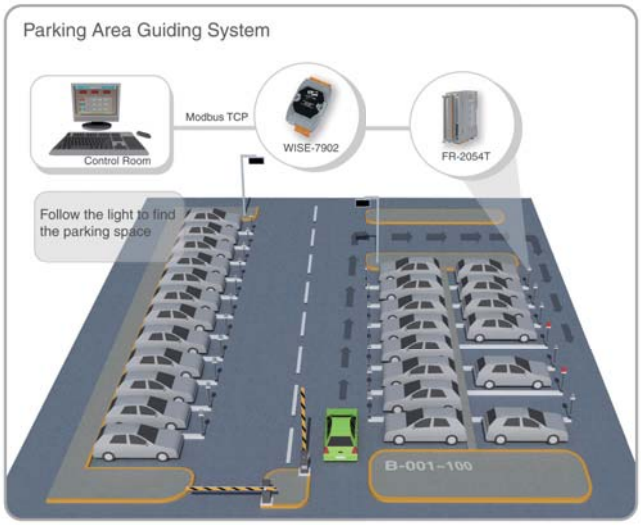
• Applications

- Building Automation
- Factory Automation
- Machine Automation
- Remote diagnosis
- Remote Maintenance
- Equipment Monitoring

• Application Stories

▶ Greenhouse Automation Solution

Greenhouse cultivation plays a very important role in modern agriculture. As the greenhouse usually equips with various high-tech equipments, management tend to be very complex. An automated greenhouse control system powered by WISE brings obvious benefit such as labor saving, but far more importantly, it enables improved quality of produce and information gathering that will make significant differences in profit earning.

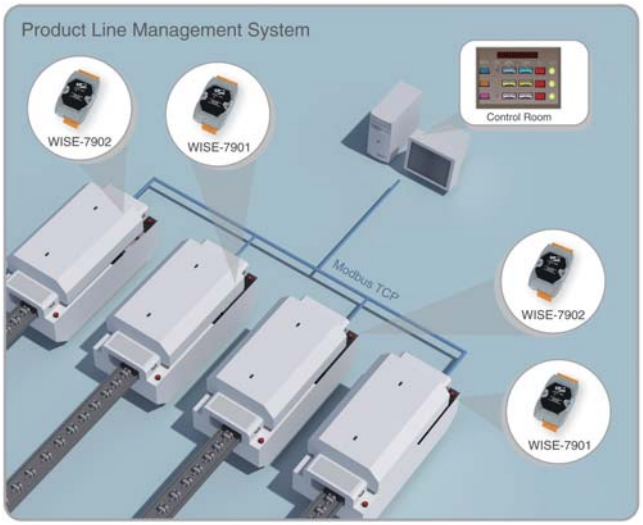


◀ Parking Area Guiding System

ICP DAS WISE-7902 controller, together with the high-speed FR-2054 FRnet modules distributed all over the parking facility, offer a total solution that is perfect for large-scale parking facilities. With help of sensors and lights installed on each space, the system will guide drivers directly to the vacant parking spaces signified by auto-lighting flashing light. WISE supports seamless integration with SCADA software that makes it easy to achieve real time monitoring and remote management for entire parking facility.

▶ Environment Management System

WISE is perfect for building an Environment Management System for it provides a variety of I/O modules to choose from to meet your specific requirements for your applications. WISE allows to sending Email/SMS to related personals for immediately response. In addition, through CGI command sending, WISE can communicate with Surveillance system and perform real time video recording for you to easily identify real-time emergency events and facilities status in the remote locations.



◀ Production Line Management System

Eliminating unnecessary machine downtime, ensuring maximum productivity and maintaining appropriate stock are keys to successful product line management. ICP DAS offers full-range I/O module that works with WISE controller, the system developer can easily set up logic rule for a single controller or interaction between controllers with Advanced P2P. WISE also provides seamless integration with the control center management system to makes real time monitoring the overall production line status more efficiently.

• Why WISE ?

- ✓ No programming is required. Dramatically reduce the labor and cost spent on system development.
- ✓ No extra software tool is required; all operations can be done through the Web browser.
- ✓ IF-THEN-ELSE logic rules execution ability.
- ✓ Extra Timer and Schedule function for periodic operation.
- ✓ Real Time message sending via SMS and Email.
- ✓ CGI command sending for interaction with Surveillance systems
- ✓ Recipe function provided for easy operations of Group Actions
- ✓ Advanced P2P function provided, WISE controllers in network can freely share their I/O status.
- ✓ Modbus TCP/RTU Protocol provided for seamless integration with SCADA package.
- ✓ Wide range of I/O modules provided allows users to find best solutions.
- ✓ PoE(Power over Ethernet) for simplifying system design, reducing cable and saving space.

• Features

1. IF-THEN-ELSE logic rules execution ability

WISE controller equips with an IF-THEN-ELSE logic Rule Engine, it offers up to 36 IF-THEN-ELSE rules for users to set up the logic content. After completing rule edition and downloading rules to the WISE controller, the Rule Engine will loop execute the rules in accordance with the execute order under specific conditions.

2. No extra software tool is required

WISE HMI interface runs on regular Web browsers. To edit control logic, it only requires a browser to connect to the Web server on WISE controller. No extra software tool installation is needed on the target PC.

3. No more programming

WISE provides user-friendly Web UI pages for editing control logic on the controllers. It enables to implement logic edition by a few clicks on the mouse to set up and deploy logic rules without writing a single line of code.

4. Recipe function for grouping a series of Actions

In addition to 3 THEN Actions and 3 ELSE Actions settings WISE provides for each Rule, Recipe function is provided for easily grouping a series of Actions. A series of actions can be stored and saved in a Recipe action and will be executed when the IF-THEN-ELSE condition is matched.

5. Provide Timer and Schedule operation

WISE features Timer and Schedule functions: It allows user to schedule specific date or time for control logic execution, or perform specific tasks such as time delay. With Calendar user interface provided, Schedule setting can be more efficient and flexible.

6. Remote monitoring and alarm via SMS or Email

WISE supports SMS and Email functions for real-time message communication. The sending action can be added to the logic edition as part of logic control to provide real-time message transmission function.

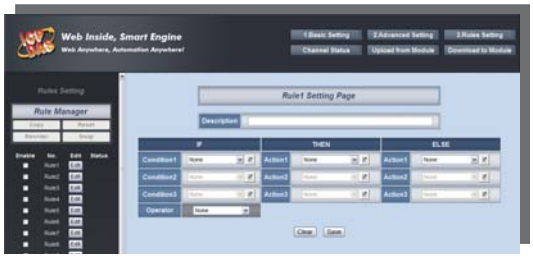
7. CGI Command Sending for Surveillance system integration

WISE provides CGI commands sending function. It provides integrated access to a wide variety of Web devices and Surveillance systems.

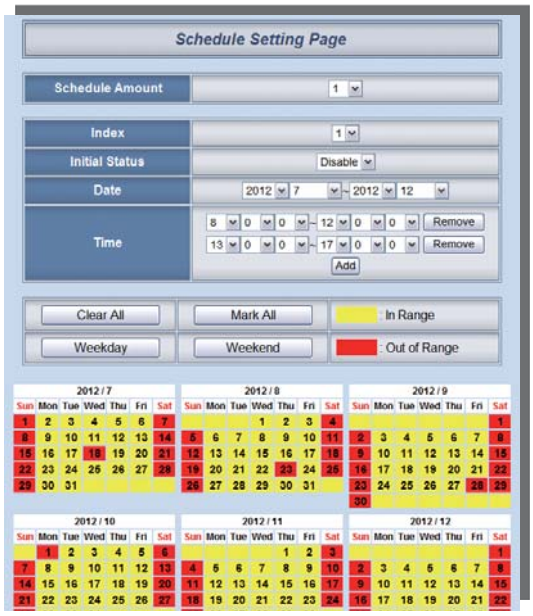
8. Data Logger function

WISE-580x provides Data Logger function to real-time record the I/O data of the controller and sends the data files by FTP or Email to the control center for further administration management or data analysis.

▲ WISE Web Page User Interface



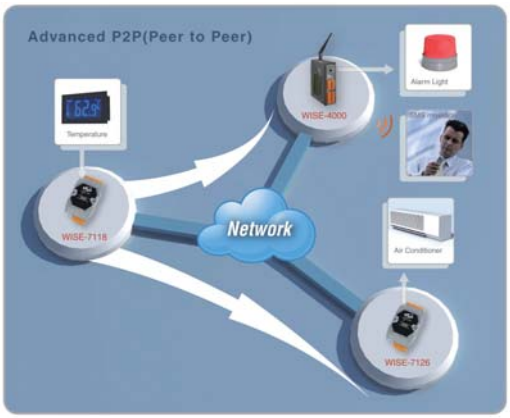
▲ Click and get done!



▲ WISE Schedule setting page

9. Advanced P2P for Controller's Resource Sharing

Each WISE controller can communicate with 8 remote WISE controllers. The Advanced P2P function provided by WISE is far more superior than the traditional P2P (DI-DO mapping) function, all WISE controllers can freely share their status such as AIO channel value, DIO channel value, DI/DO Counter value or Internal Register value to each others, therefore, greatly enhances the flexibility and boosts accuracy to the logic rule design and makes it easy to enable the interactions between the controllers. (Not apply to WISE-580x)



▲ WISE Advanced P2P operation

10. Offer various options for channel settings

WISE offers various options for channel settings; for example: noise filter for DI signals, deadband setting for AI signals, linear scale setting, temperature degree in Celsius or Fahrenheit setting, power on value setting for DO channel, pulse output setting and DI/DO counter setting, etc.

11. Seamless integration with SCADA

WISE supports Modbus TCP/RTU Protocol for users to perform real-time monitoring and control of the controllers. Through Modbus TCP/RTU, it allows SCADA package seamlessly integrate with WISE and enables total solutions for remote monitoring and control.

EZ Data Logger is an easy-to-use software to implement HMI and data logger on Windows 2K/XP/7 systems for I/O monitoring, controlling, and data logging. Through the Ethernet, WISE modules can be centralized to a single PC by Modbus TCP protocol. And each WISE module can cowork by the help of the VB Script Engine built-in the EZ Data Logger.

12. Real-time Control for the Emergency Status

With the built-in IF-THEN-ELSE rule engine inside WISE controller, it allows user to pre-define the WISE logic rules for immediately response to the emergency status (or condition), and allows to perform real-time control for safety. Compare to the traditional control system that all actions have to be based on commands (or responses) derived from SCADA; WISE provides a much more flexible and easy way to build a real-time control system.

IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
DI Counter	=, >, <, >=, <= (value), Change
DO Counter	
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
P2P	DI, AI, DI counter, DO counter, IR
Rule Status	Enable, Disable

WISE
IF-THEN-ELSE
Rule Engine

THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output
AO Channel	Change the value
Internal Register	
DI Counter	Reset
DO Counter	
Timer	Start, Reset
Schedule	Enable, Disable
SMS	Send
Email	
CGI Commands	
Recipe	Execute
P2P	DO (On/OFF), AO, IR
Data Logger	Start, Stop, One-Time Log
Rule Status	Enable, Disable

▲ IF-THEN-ELSE Rule Engine

10.2. Specifications

ICP DAS provides various WISE controllers for users to choose from to meet their demands for use in various industrial applications:

• Hardware

☑ WISE-71xx Intelligent I/O Controller

Model Name		WISE-7105	WISE-7115	WISE-7117	WISE-7118Z	WISE-7119	WISE-7126
Pictures							
OS		MiniOS7					
Built-in Software		WISE Firmware					
CPU		16-bit CPU					
Ethernet Port		10/100 Base-TX with PoE (Power over Ethernet)					
I/O Channel	DI	-	-	-	-	-	2
	DO	4	-	4	6	4	2
	AI	8	7	8	10	8	6
	AO	-	-	-	-	-	2
Over Voltage Protection		110 VDC/VAC	-	240 Vrms	240 Vrms	240 Vrms	240 Vrms
Note		* Support Thermistor	* Support RTD	-	* Also Support Thermocouple Input		-

Model Name		WISE-7144	WISE-7151	WISE-7152	WISE-7160	WISE-7167
Pictures						
OS		MiniOS7				
Built-in Software		WISE Firmware				
CPU		16-bit CPU				
Ethernet Port		10/100 Base-TX with PoE (Power over Ethernet)				
I/O Channel	DI	8	16	8	6	-
	DO	8 (Sink Type)	-	8 (Source Type)	6 (Power Relay)	8 (Power Relay)
Note		* DI for Sink & Source Type				-

☑ WISE-790x Extensible I/O Intelligent Controller
☑ WISE-4000 SMS Intelligent Controller
☑ WISE-580x Intelligent Data Logger Controller

Model Name	WISE-7901(D)	WISE-7902(D)	WISE-4000(D)	WISE-5800	WISE-5801
Pictures					
OS	MiniOS7				
Built-in Software	WISE Firmware				
CPU	16-bit CPU				
Ethernet Port	10/100 Base-TX with PoE (Power over Ethernet)		10/100 Base-TX		
GPRS/GSM	-		GPRS/GSM Quad-band 850/900/1800/1900 MHz for SMS	-	GPRS/GSM Quad-band 850/900/1800/1900 MHz for SMS
I/O Function	Support ICP DAS I/O expansion board (X-Board), X107, X109, X110, X111, X202, X203, X303, X304, X305, X308, X310, X324	Support ICP DAS FRnet remote I/O modules: FR-2053T, FR-2054T, FR-2057T	3 Digital inputs, 3 Digital outputs & 8 Analog inputs	Support ICP DAS I-7000 remote I/O modules (up to 16), Modbus RTU devices (up to 4), and I/O expansion board (XW-Board)	
Note	* WISE-790xD is WISE-790x with LED Display		* WISE-4000D is WISE-4000 with LCD Display	-	-

☑ I/O Expansion Boards (X-board) Ordering Information

DI, DO Expansion

Model Name	DI	DO
X107	6	7
X109	-	7
X110	14	-
X111	-	13

Note1: DI is Dry contact, Source type Note2: DO is Open Collector, Sink type

AI, AO, DI, DO Expansion

Model Name	AI (12-bit)		AO (12-bit)		DI	DO
	Ch	Range	Ch	Range		
X202	7	0 ~ 20 mA	-	-	-	-
X203	2	0 ~ 20 mA	-	-	2	6
X303	1	±5 VDC	1	±5 VDC	4	6
X304	3	±5 VDC	1	±5 VDC	4	4
X305	7	±5 VDC	1	±5 VDC	2	2
X308	4	0 ~ 10 VDC	-	-	-	6
X310	2	Ch0 : 0 ~ 20 mA Ch1 : 0 ~ 10 VDC	2	0 ~ 10 VDC	3	3
X324	-	-	4	0 ~ 5 VDC	-	4

☑ I/O Expansion Boards (XW-board) Ordering Information

DI, DO Expansion

Model Name	DI	DO	Isolation
XW107	8	8	-
XW107i			3750 Vrms
XW110i	16	-	3750 Vrms

AI, AO, DI, DO Expansion

Model Name	AI (12-bit)		AO (12-bit)		DI	DO	Isolation
	Ch	Range	Ch	Range			
XW304	6	±5 V	1	±5 V	4	4	-
XW310	4	±10 V	2	±10 V	3	3	
XW310C	4	0 ~ 20 mA	2	0 ~ 20 mA	3	3	

☑ I-7000 Remote I/O Module Ordering Information

AI/AO Module					
Model Name		AI	AO	DI	DO
Voltage/Current	I-7012	1	-	1	2
	I-7017	8	-	-	-
Thermocouple	I-7011	1	-	1	2
	I-7018	8	-	-	-
	I-7019	8	-	-	-
RTD	I-7013	1	-	-	-
	I-7015	6	-	-	-
	I-7033	3	-	-	-
Thermistor	I-7005	8	-	-	6
Thransmitter	I-7014	1	-	1	2
Analog Output	I-7021	-	1	-	-
	I-7022	-	2	-	-
	I-7024	-	4	-	-
	I-7024R	-	4	5	-

Others			
Model Name		DI Counter	DO
Counter/Frequency	I-7080	2	2
Model Name		DI	PWM Output
PWM	I-7088	8	8

DI/DO Module			
Model Name		DI	DO
Digital Input	I-7041	14	-
	I-7051	16	-
	I-7052	8	-
	I-7053	16	-
	I-7058	8	-
	I-7059	8	-
Digital Output	I-7042	-	13
	I-7043	-	16
	I-7045	-	16
Digital Input & Output	I-7044	4	8
	I-7050	7	8
	I-7055	8	8
Relay Output	I-7060	4	4
	I-7061	-	12
	I-7063	8	3
	I-7065	4	5
	I-7066	-	7
	I-7067	-	7

• Software function

Model Name	WISE-71xx	WISE-790x(D)	WISE-4000(D)	WISE-580x
Pictures				
I/O Function	Built-in	7901 With X-Board, 7902 With FRnet	Built-in	I-7000 modules (up to 16), Modbus RTU devices (up to 4), and XW-Board.
Rule Configuration Website	Yes	Yes	Yes	Yes
36 IF-THEN-ELSE Logic Rule	Yes	Yes	Yes	Yes
48 Internal Register	Yes	Yes	Yes	Yes
12 Timer/12 Email/12 Recipe/ 12 CGI Command Supported	Yes	Yes	Yes	Yes
Connect with SCADA or HMI	Yes (By Modbus TCP)	Yes (By Modbus TCP)	Yes (By Modbus TCP)	Yes (By Modbus TCP/RTU)
8 P2P Controllers Supported	Yes	Yes	Yes	-
12 Schedule Supported	-	Yes	Yes	Yes (More Powerful)
12 SMS Supported	-	-	Yes	Yes (WISE-5801) (Note1)
SNTP Time Synchronization	-	-	-	Yes
Data Logger Supported	-	-	-	Yes

Note1: WISE-5801 also provides SMS command receiving function.

For more information, refer to **http://wise.icpdas.com**

WISE-7901/WISE-7901D

User-defined I/O Expansion PoE Module

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Click and get done!
- Support I/O, Counter, Timer, Email, Recipe operations
- Modbus TCP Protocol for SCADA Software Seamless Integration
- IEEE 802.3af-compliant Power over Ethernet (PoE)
- 10/100 Base-TX Ethernet
- I/O Expansion Bus
- Support DI/DO X-Boards: X107, X109, X110, X111
- Support Multi-Function X-Boards: X202, X203, X303, X304, X305, X308, X310, X324

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

WISE-7901 follows IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs (Category 5 Ethernet cable). This feature provides greater flexibility and higher efficiency therefore simplifying systems design, saving space, reducing cables and eliminating the requirement for dedicated electrical outlets. Meanwhile, in case under a non-PoE environment, WISE-7901 will still be able to receive power from auxiliary power sources like AC adapters or battery, etc.

This module WISE-7901 supports Modbus/TCP protocol to make seamless integration with SCADA software available. It supports an I/O expansion bus to implement various I/O functions such as D/I, D/O, A/D, D/A based on the selected X-Board.

System Specifications

Models	WISE-7901	WISE-7901D
System		
CPU	16-bit CPU	
SRAM	512KB	
Flash Memory	512KB	
EEPROM	16KB	
NVRAM	31 Bytes	
OS	MiniOS7	
RTC (Real Time Clock)	Provide second, minute, hour, date of week, month and year	
64-bit Hardware Serial Number	Yes	
Watchdog	Yes	
Communication		
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
COM 1	Reserved	
COM 2	Reserved	
LED Indicators		
System LED	Yes (Red)	
LED Display	-	5-digit 7-segment LED display
Special Indicator	PoE LED (Green)	
Hardware Expansion		
I/O Expansion Bus	Yes	
Power Requirements		
Protection	Power Reverse Polarity Protection	
Frame Ground	Yes (for ESD Protection)	
Input Range	12 ~ 48 V_{DC}	
Power over Ethernet (PoE)	IEEE 802.3af Class 1	
Power Consumption	1.5 W	2.5 W
Mechanical		
Dimensions (W x H x D)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environmental		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +80 °C	
Humidity	5 ~ 90% RH, non-condensing	

Software Specifications

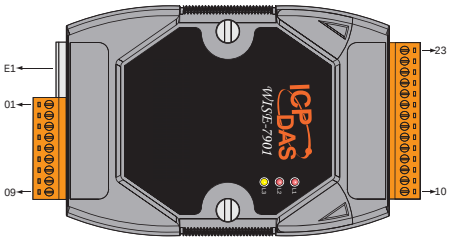
Functions	
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
36 IF-THEN-ELSE Logic Rules	3 IF conditions with AND or OR operators; 3 THEN actions and 3 ELSE actions
48 Internal Registers	Hold temporary variables and read/write data via Modbus/TCP address.
12 Timers	Delay / Timing functions.
12 Schedules	Setup prescheduled routine tasks.
12 Emails	Send Email messages to pre-set Email receivers.
12 CGI Commands	Send pre-set CGI commands.
12 Recipes	Set up THEN/ELSE action groups.
8 P2P remote modules	Set up the connection information for the remote WISE modules.
Modbus TCP Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
DI Counter	=, >, <, >=, <= (value), Change
DO Counter	
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
P2P	DI, AI, DI counter, DO counter, IR
Rule Status	Enable, Disable

THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output
AO Channel	Change the value
Internal Register	
DI Counter	Reset
DO Counter	
Timer	Start, Reset
Schedule	Enable, Disable
Email	Send
CGI Commands	
Recipe	Execute
P2P	DO (On/OFF), AO, IR
Rule Status	Enable, Disable

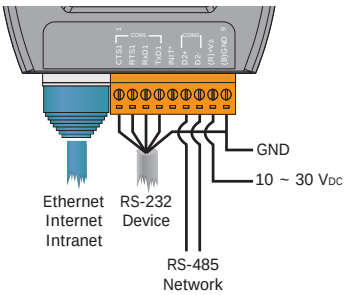
Pin Assignments

Terminal No.		Pin Assignment
E1		
COM1	01	CTS1
	02	RTS1
	03	RxD1
	04	TxD1
	05	INIT*
COM2	06	D2+
	07	D2-
	08	(R)+Vs
	09	(B)GND

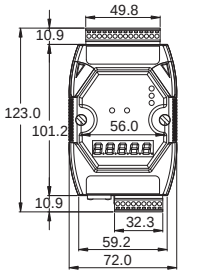


Terminal No.	Pin Assignment
23	-
22	-
21	-
20	-
19	-
18	-
17	-
16	-
15	-
14	-
13	-
12	-
11	-
10	-

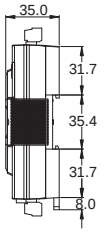
Wiring & Boarding



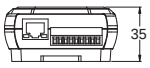
Dimensions (Unit:mm)



Front View



Left Side View



Bottom View

Ordering Information

WISE-7901	User-defined I/O Expansion PoE Module (RoHS)
WISE-7901D	User-defined I/O Expansion PoE Module with LED Display (RoHS)

Accessories

GPSU06U-6	24V/0.25A, 6W Power Supply
MDR-20-24	24V/1A, 24W Power Supply with DIN-Rail Mounting
NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged 5-Port Industrial PoE Ethernet Switch (RoHS)
I/O Expansion Boards	Other add-on expansion boards: X107, X109, X110, X111, X202, X203, X303, X304, X305, X308, X310, X324

WISE-7902/WISE-7902D

FRnet Remote I/O PoE Module

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Click and get done!
- Support I/O, Counter, Timer, Email, Recipe operations
- Modbus TCP Protocol for SCADA Software Seamless Integration
- IEEE 802.3af-compliant Power over Ethernet (PoE)
- 10/100 Base-TX Ethernet
- Support FRnet Modules: FR-2053T, FR-2054T, FR-2057T

CE FC PoE

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

WISE-7902 follows IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs (Category 5 Ethernet cable). This feature provides greater flexibility and higher efficiency therefore simplifying systems design, saving space, reducing cables and eliminating the requirement for dedicated electrical outlets. Meanwhile, in case under a non-PoE environment, WISE-7902 will still be able to receive power from auxiliary power sources like AC adapters or battery, etc.

This module WISE-7902 supports Modbus/TCP protocol to make seamless integration with SCADA software available. It supports an I/O expansion bus to implement various I/O functions such as D/I and D/O according to the using FRnet modules: FR-2053T, FR-2054T, and FR-2057T.

System Specifications

Models	WISE-7902	WISE-7902D
System		
CPU	16-bit CPU	
SRAM	512KB	
Flash Memory	512KB	
EEPROM	16KB	
NVRAM	31 Bytes	
OS	MiniOS7	
RTC (Real Time Clock)	Provide second, minute, hour, date of week, month and year	
64-bit Hardware Serial Number	Yes	
Watchdog	Yes	
Communication		
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
COM 1	Reserved	
COM 2	Reserved	
FRnet	Max. 1M	
LED Indicators		
System LED	Yes (Red)	
LED Display	-	5-digit 7-segment LED display
Special Indicator	PoE LED (Green)	
Power Requirements		
Protection	Power Reverse Polarity Protection	
Frame Ground	Yes (for ESD Protection)	
Input Range	12 ~ 48 V_{DC}	
Power over Ethernet (PoE)	IEEE 802.3af Class 1	
Power Consumption	1.5 W	2.5 W
Mechanical		
Dimensions (W x H x D)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall Mounting	
Environmental		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +80 °C	
Humidity	5 ~ 90% RH, non-condensing	

Software Specifications

Functions	
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
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12 Schedules	Setup prescheduled routine tasks.
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12 CGI Commands	Send pre-set CGI commands.
12 Recipes	Set up THEN/ELSE action groups.
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Modbus TCP Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

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DI Counter	=, >, <, >=, <= (value), Change
DO Counter	
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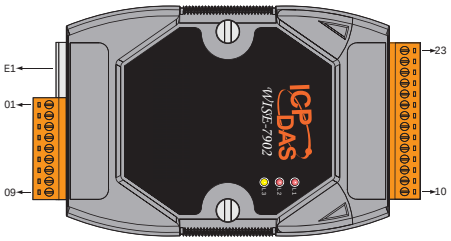
Schedule	In Range, Out of Range
P2P	DI, AI, DI counter, DO counter, IR
Rule Status	Enable, Disable

THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output
Internal Register	Change the value
DI Counter	Reset
DO Counter	
Timer	Start, Reset
Schedule	Enable, Disable
Email	Send
CGI Commands	
Recipe	Execute
P2P	DO (On/OFF), AO, IR
Rule Status	Enable, Disable

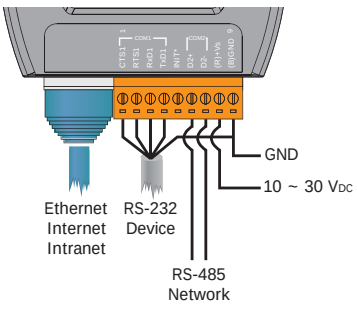
Pin Assignments

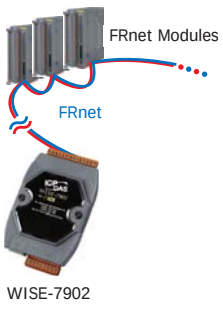
Terminal No.		Pin Assignment
E1		
COM1	01	CTS1
	02	RTS1
	03	RxD1
	04	TxD1
	05	INIT*
COM2	06	D2+
	07	D2-
	08	(R)+Vs
	09	(B)GND



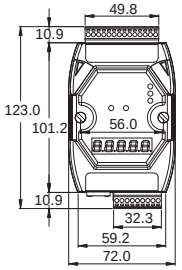
Terminal No.	Pin Assignment
23	-
22	-
21	-
20	-
19	-
18	-
17	FRnet Port A
16	FRnet Port A
15	FRnet Port B
14	FRnet Port B
13	-
12	-
11	-
10	-

Wiring

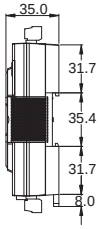




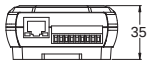
Dimensions (Unit:mm)



Front View



Left Side View



Bottom View

Ordering Information

WISE-7902	FRnet Remote I/O PoE Module
WISE-7902D	FRnet Remote I/O PoE Module with LED Display

Accessories

GPSU06U-6	24V/0.25A, 6W Power Supply	**FR-2053T**	16-channel Isolated Sink Digital Input Distributed I/O Module
MDR-20-24	24V/1A, 24W Power Supply with DIN-Rail Mounting	**FR-2054T**	8-Channel Digital Output and 8-Channel Digital Input Module
NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)	**FR-2057T**	16-Channel Isolated Sink Digital Output Distributed I/O Module
NS-205PSE CR	Unmanaged 5-Port Industrial PoE Ethernet Switch (RoHS)		

WISE-4000/WISE-4000D

3-channel Digital Input, 3-channel Digital Output, and 8-channel Analog Input SMS Module

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Just click and get done!
- Support IO, Counter, Timer, Email operations
- Modbus/TCP Protocol for SCADA Software Seamless Integration
- 10/100 Base-TX Ethernet
- Support SMS (GSM: Quad-band 850/900/1800/1900 MHz)
- I/O: 3 channels DI, 3 channels DO, 8 channels AI
- 128*64 dots LCM display (apply to WISE-4000D only)

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

The WISE-4000 is an embedded controller that is perfect for use in real-time industrial equipment monitoring and environment monitoring. It allows updated status information being sent to the backend monitoring system via Ethernet interface. WISE-4000 supports Modbus/TCP protocol that allows seamless integration with SCADA software. It features 3 digital inputs, 3 digital outputs and 8 analog inputs. WISE-4000 also features SMS sending function for alarm report. By integrating with IF-THEN-ELSE rule engine, WISE-4000 even provides more powerful functions such as Schedule, Send SMS, Send e-mail, Timer & I/O operation for use in various industrial applications.

System Specifications

Model		WISE-4000	WISE-4000D
System			
CPU		16-bit CPU	
SRAM		512KB	
Flash Memory		512KB	
EEPROM		16KB	
NVRAM		31 bytes	
RTC (Real Time Clock)		RTC Provide seconds, minutes, hours, dateof week/month; month and year, validfrom 1980 to 2079	
Communication			
COM ports		Reserved	
Ethernet Port		10/100 Base-TX Ethernet controller	
SMS Function			
Frequency Band		Quad-band 850/900/1800/1900 MHz	
Mode		Text and Unicode mode	
LCD Interface			
General	Effective display area	-	80.61 mm x 14.37 mm (W x H)
	Module Dimension	-	93 mm x 70 mm x 1.6 mm (W x H x T)
Life Time		-	Expected life is more than 100,000 hours under normal operation
LED Indicators			
System		Red	
Power Requirements			
Reverse Polarity Protection		Yes	
Frame Ground Protection		ESD, Surge, EFT, Hi-Pot	
Input Range		15W; Unregulated +10 VDC ~ +30 VDC	
Consumption		Idle: 75 mA @ 24 VDC Data Link: 150 ~ 400 mA (peak) @ 24 VDC	
Mechanical			
Dimensions (W x H x T)		47 mm x 142 mm x 168 mm	
Installation		DIN-Rail or Wall mounting	
Environment			
Operating Temperature		-20 °C ~ +70 °C	-15 °C ~ +55 °C
Storage Temperature		-40 °C ~ +80 °C	-20 °C ~ +70 °C
Humidity		5~ 90% RH, non-condensing	

I/O Specifications

Analog Input		
Input Channels		8
Input Range/Type		0~20 mA
Resolution		12-bit
Sampling Rate		1 KHz max. (Read one channel)
Accuracy		±2 LSB (+/-0.0097 mA)
Digital Input		
Input Channels		3
Input Type		Source(Dry Type), Common Ground
On Voltage Level		+3.5 VDC ~ +30 VDC
Off Voltage Level		+1VDC Max.
Isolated Voltag		Non-isolated
Counters	Max. Count	65535 (16 bits)
	Max. Input Frequency	50 Hz
	Min. Pulse Width	10 ms
Digital Output		
Output Channels		3
Output Type		Open Collector (Sink/NPN)
Load Voltage		+30 VDC MAX.
Load Current		100 mA MAX.
Isolated Voltag		Non-isolated
Counters	Max. Count	65535 (16 bits)
	Max. Input Frequency	50 Hz
	Min. Pulse Width	10 ms

Software Specifications

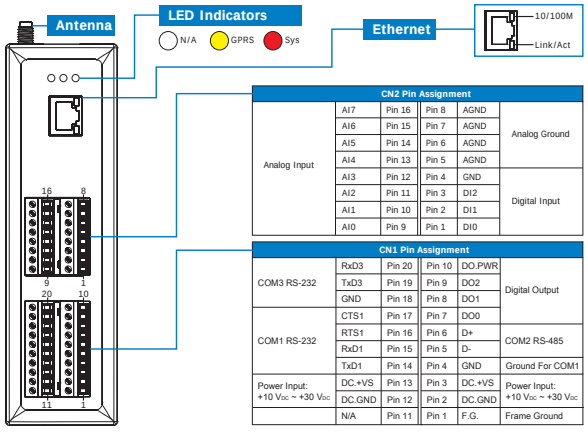
Functions	
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
36 IF-THEN-ELSE Logic Rules	3 IF conditions with AND or OR operators; 3 THEN actions and 3 ELSE actions
48 Internal Registers	Hold temporary variables and read/write data via Modbus/TCP address.
12 Timers	Delay / Timing functions.
12 Schedules	Setup prescheduled routine tasks.
12 SMS	Send SMS to pre-set mobile phone numbers.
12 Emails	Send Email messages to pre-set Email receivers.
12 CGI Commands	Send pre-set CGI commands.
12 Recipes	Set up THEN/ELSE action groups.
8 P2P remote modules	Set up the connection information for the remote WISE modules.
Modbus/TCP Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
DI Counter	=, >, <, >=, <= (value), Change
DO Counter	
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
P2P	DI, AI, DI counter, DO counter, IR
Rule Status	Enable, Disable

WISE IF-THEN-ELSE Rule Engine

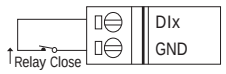
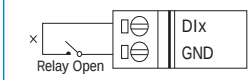
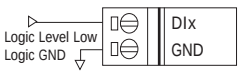
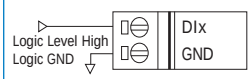
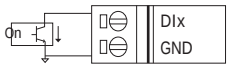
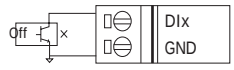
THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output
Internal Register	Change the value
DI Counter	Reset
DO Counter	
Timer	Start, Reset
Schedule	
SMS	Send
Email	
CGI Commands	
Recipe	Execute
P2P	DO (On/OFF), AO, IR
Rule Status	Enable, Disable

Pin Assignments

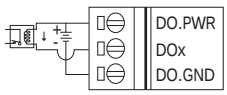
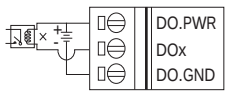
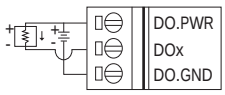
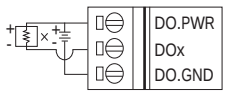


Wire Connections

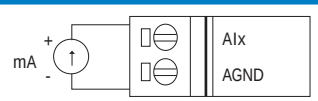
Digital Input Wire Connection

Input Type	DI Value as 0	DI Value as 1
Relay Contact	Relay On	Relay Off
		
TTL/CMOS Logic	Voltage < 1 V	Voltage > 3.5 V
		
Open Collector	Open Collector On	Open Collector Off
		

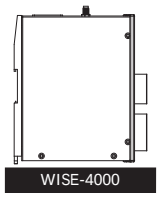
Digital Output Wire Connection

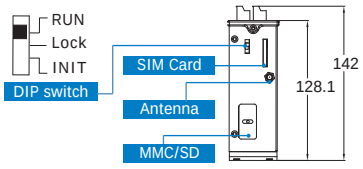
Output Type	DO Value as 0	DO Value as 1
Drive Relay	Relay On	Relay Off
		
Resistance Load		
		

Current Input Wire Connection

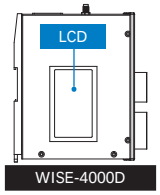
Input Type	
	

Dimensions (Unit:mm)

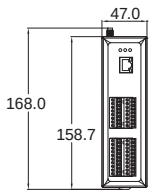




Top View



Right Side View



Front View

Ordering Information

WISE-4000	3-channel DI, 3-channel DO, and 8-channel AI WISE Controller with SMS Module (RoHS)
WISE-4000D	3-channel DI, 3-channel DO, and 8-channel AI WISE Controller with SMS Module and LCD Display (RoHS)

Accessories

ANT-421-01	3m external GPRS/GSM antenna

WISE-5800

User-defined I/O & Data Logger Module

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Click and get done!
- Support I/O, Counter, Timer, Email, Recipe operations
- Data logger and data files send back function supported
- Modbus TCP/RTU Protocol for SCADA Software Seamless Integration
- Support XW-Board
- Support I-7000 Remote I/O Modules(Up to 16)
- Support Modbus RTU Slave Devices(Up to 4)
- SNTP Time Synchronization Supported

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

WISE-5800 supports an I/O expansion bus to implement various I/O functions such as D/I, D/O, A/D and D/A according to the XW-Board. In addition, WISE-5800 also support ICP DAS I-7000 remote I/O modules and Modbus RTU slave devices. Based on the variety I/O module of I-7000 and the connection ability with Modbus RTU slave devices, WISE-5800 can provide user more flexibility in application field.

WISE-5800 supports Modbus TCP/RTU protocol to make seamless integration with SCADA software available. It include all advantages which WISE series controllers can provide. In addition, WISE-5800 provide data logger function with microSD card, it can record I/O channel value by event trigger or regular time period. The data files can be sent back by Email or FTP. All setting can be completed through browser.

System Specifications

System	
CPU	16-bit CPU
SRAM	768KB
Flash Memory	512KB
EEPROM	16 KB
NVRAM	31 Bytes
microSD Expansion	microSD socket with one 2 GB microSD card
RTC (Real Time Clock)	Provide second, minute, hour, date of week, month and year
Watchdog	Yes
Communication	
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X)
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.
COM 2	RS-485 (D2+, D2-), self-tuner ASIC inside, non-isolated, Speed: 115200 bps max.
LED Indicators	
System LED	Yes (Red)
Ethernet Link LED	Yes (Green: Ethernet link detected, Flashing Green: Ethernet packet received)
Hardware Expansion	
I/O Expansion Bus	Yes
Power Requirements	
Protection	Power Reverse Polarity Protection
Frame Ground	Yes (for ESD Protection)
Input Range	12 ~ 48 V_{DC}
Redundant Power Input	Yes
Power Consumption	2.0 W
Mechanical	
Dimensions (W x H x D)	91 mm x 132 mm x 52 mm
Installation	DIN-Rail
Environmental	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +80 °C
Humidity	10 ~ 90% RH, non-condensing

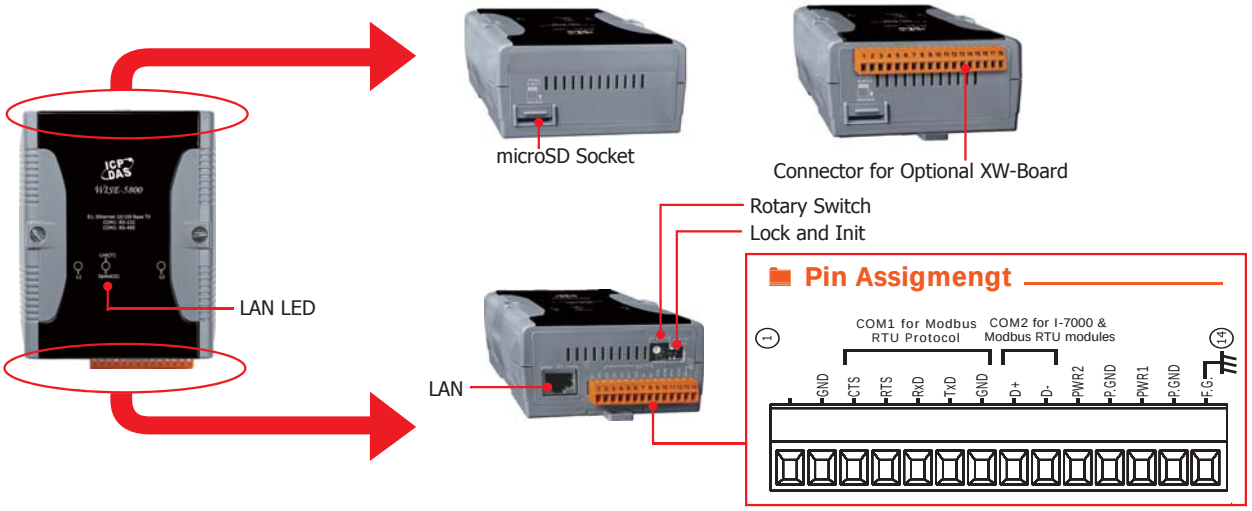
Software Specifications

Functions	
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
36 IF-THEN-ELSE Logic Rules	3 IF conditions with AND or OR operators; 3 THEN actions and 3 ELSE actions
48 Internal Registers	Hold temporary variables and read/write data via Modbus/TCP address.
12 Timers	Delay / Timing functions.
12 Schedules	Setup prescheduled routine tasks.
12 Emails	Send Email messages to pre-set Email receivers.
12 CGI Commands	Send pre-set CGI commands.
12 Recipes	Set up THEN/ELSE action groups.
Data Logger	Set up the Data Logger configuration, include the data record format, and data file sending operation.
Modbus TCP/RTU Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

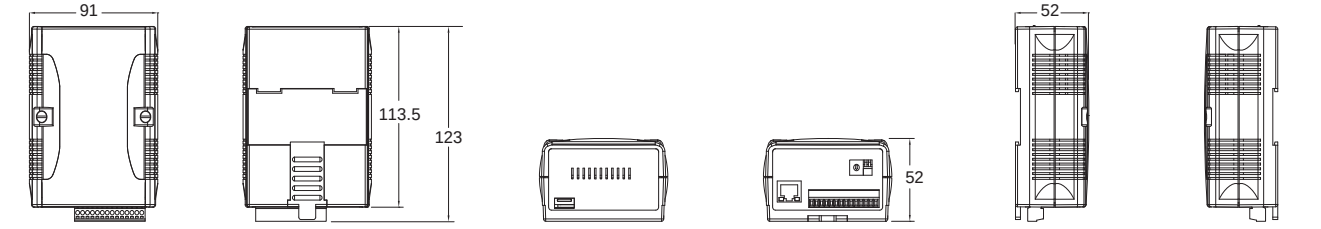
IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
DI Counter	=, >, <, >=, <= (value), Change
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
Rule Status	Enable, Disable

THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output (apply to XW-Board only)
AO Channel	Change the value
Internal Register	
DI Counter	Reset
Timer	Start, Reset
Schedule	Enable, Disable
Email	Send
CGI Commands	
Recipe	Execute
Data Logger	Start, Stop, One-Time Log
Rule Status	Enable, Disable

Appearance



Dimensions (Unit:mm)



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

Ordering Information

WISE-5800	User-defined I/O & Data Logger Module

Accessories

NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F CR	24V/1.04A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

WISE-5801

User-defined I/O & Data Logger Module with SMS Function

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Click and get done!
- Support I/O, Counter, Timer, Email, Recipe operations
- Data logger and data files send back function supported
- Modbus TCP/RTU Protocol for SCADA Software Seamless Integration
- Support XW-Board
- Support I-7000 Remote I/O Modules(Up to 16)
- Support Modbus RTU Slave Devices(Up to 4)
- SNTP Time Synchronization Supported
- Support SMS (GSM: Quad-band 850/900/1800/1900 MHz)

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

WISE-5801 supports an I/O expansion bus to implement various I/O functions such as D/I, D/O, A/D and D/A according to the XW-Board. In addition, WISE-5801 also support ICP DAS I-7000 remote I/O modules and Modbus RTU slave devices. Based on the variety I/O module of I-7000 and the connection ability with Modbus RTU slave devices, WISE-5801 can provide user more flexibility in application field.

WISE-5801 supports Modbus TCP/RTU protocol to make seamless integration with SCADA software available. It include all advantages which WISE series controllers can provide. In addition, WISE-5801 provide data logger function with microSD card, it can record I/O channel value by event trigger or regular time period. The data files can be sent back by Email or FTP. WISE-5801 also features SMS sending function for alarm report and SMS command receiving function. All setting can be completed through browser.

System Specifications

System	
CPU	16-bit CPU
SRAM	768KB
Flash Memory	512KB
microSD Expansion	microSD socket with one 2 GB microSD card
RTC (Real Time Clock)	Provide second, minute, hour, date of week, month and year
Watchdog	Yes
Communication	
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X)
COM 1	RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.
COM 2	RS-485 (D2+, D2-), self-tuner ASIC inside, non-isolated, Speed: 115200 bps max.
LED Indicators	
System LED	Yes (Red)
Ethernet Link LED	Yes (Green: Ethernet link detected, Flashing Green: Ethernet packet received)
Hardware Expansion	
I/O Expansion Bus	Yes
SMS Function	
Frequency Band	Quad-band 850/900/1800/1900 MHz
Mode	Text and Unicode mode
Power Requirements	
Protection	Power Reverse Polarity Protection
Frame Ground	Yes (for ESD Protection)
Input Range	12 ~ 48 VDC
Redundant Power Input	Yes
Power Consumption	Idle: 2.0 W; Data Link: 150 ~ 400 mA (peak) @ 24 VDC
Mechanical	
Dimensions (W x H x D)	91 mm x 132 mm x 52 mm
Installation	DIN-Rail
Environmental	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +80 °C
Humidity	10 ~ 90% RH, non-condensing

Software Specifications

Functions	
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
36 IF-THEN-ELSE Logic Rules	3 IF conditions with AND or OR operators; 3 THEN actions and 3 ELSE actions
48 Internal Registers	Hold temporary variables and read/write data via Modbus/TCP address.
12 Timers	Delay / Timing functions.
12 Schedules	Setup prescheduled routine tasks.
12 Emails	Send Email messages to pre-set Email receivers.
12 SMS	Send SMS to pre-set mobile phone numbers.
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Data Logger	Set up the Data Logger configuration, include the data record format, and data file sending operation.
Modbus TCP/RTU Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
DI Counter	=, >, <, >=, <= (value), Change
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
Rule Status	Enable, Disable

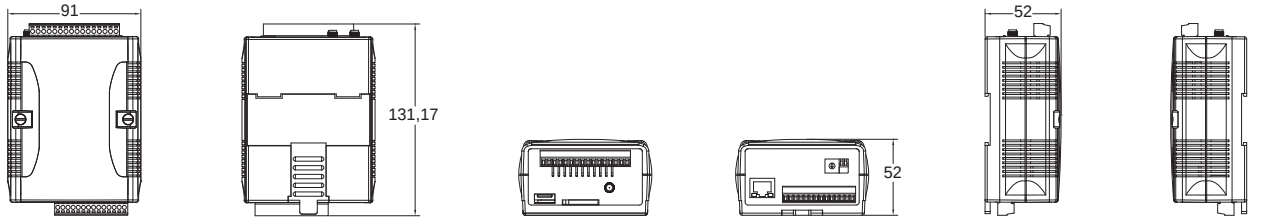
WISE
IF-THEN-ELSE
Rule Engine

THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output (apply to XW-Board only)
AO Channel	Change the value
Internal Register	
DI Counter	Reset
Timer	Start, Reset
Schedule	Enable, Disable
Email	Send
SMS	
CGI Commands	
Recipe	Execute
Data Logger	Start, Stop, One-Time Log
Rule Status	Enable, Disable

Appearance

Pin Assigmengt

Dimensions (Unit:mm)



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

Ordering Information

WISE-5801	User-defined I/O & Data Logger Module with SMS Function

Accessories

NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)
MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
DIN-KA52F CR	24V/1.04A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
ANT-421-01	GSM/GPRS Antenna with SMA male connector, 3 m cable length & magnetic mount base

Accessories

11.1. Signal Conditioning Modules (SG-3000 Series)

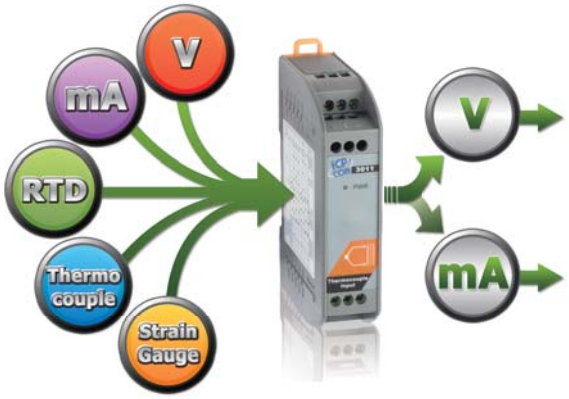
Introduction

SG-3000 series signal conditioning modules are used to accept wide range of input signals, such as voltage, current, temperature (thermocouple and RTD) and provide 0 ~ 10 VDC , 0 ~ 20 mA, 4 ~ 20 mA output signals.

It gives following good features for industrial applications

- 3-way (power/input/output) isolation (1000 VDC)
- Wide operating temperature (-25 ~ +75°C)
- DIN-Rail mounting
- Input and output connectors on the opposite side
- Signal range configureable by swtich

Applications



Description

Analog Conditioning Modules

Models	SG-3011	SG-3013	SG-3016	SG-3071	SG-3081
Pictures					
Analog Input					
Channel	1	1	1	1	1
Wiring	Differential	2/3/4 wires	Differential	Differential	Differential
Signal	Thermocouple	RTD	Strain Gauge	Voltage	Current
Type	Type J, K, T, E, R, S, B, N, C, L, M, L2	Pt100 α=0.00385, Pt100 α=0.003916, Ni 120, Pt1000 α=0.00385	±10 mV, ±20 mV, ±30 mV, ±50 mV, ±100 mV	±5 V, ±10 V	0 ~ 20 mA, 4 ~ 20 mA
Resolution	12-bit	12-bit	-	-	-
Accuracy	±0.2% of FSR	±0.1% of FSR	±0.1% of FSR	±0.1% of FSR	±0.1% of FSR
Input Impedance	1.8 MΩ	-	-	1.6 MΩ	250 Ω
Excitation Voltage	-	-	0 ~ 10 V	-	-
Analog Output					
Channel	1	1	1	1	1
Current Output	0 ~ 20 mA	0 ~ 20 mA, 4 ~ 2 0mA	0 ~ 20 mA	0 ~ 20 mA, 4 ~ 20 mA	0 ~ 20 mA, 4 ~ 20 mA
Voltage output	0 ~ 10 V	0 ~ 5 V, 0 ~ 10 V	±5 V, ±10 V, 0 ~ 5 V, 0 ~ 10 V	±5 V, ±10 V	0 ~ 5 V, 0 ~ 10 V
System					
3-way Isolation	1000 VDC				
Power Input	10 ~ 30 VDC				
Power Consumption	1.44 W	1.2 W	1.44 W	1.8 W	1.61 W
Operating Temperature	-25 ~ +75°C				
Dimensions (W x H x D)	25 mm x 114 mm x 71 mm				

Power Conditioning Modules

Models	PW-3090-24S	PW-3090-12S	PW-3090-5S	PW-3090-4824S-12
Pictures				Available soon 
Input	18 ~ 36 V (non-regulated)	18 ~ 36 V (non-regulated)	18 ~ 36 V (non-regulated)	48 V (non-regulated)
Output	24 V @ 0.4 A (Max.)	12 V @ 0.8 A (Max.)	5 V @ 2 A (Max.)	24V @ 0.5 A (Max.)
Isolation	1000 VDC			
Efficiency	83% Typical			
Operating Temperature	-25 ~ +75°C			
Dimensions (W x H x D)	25 mm x 114 mm x 71 mm			

11.2. Surge Protection Module (SG-770)

NEW

SG-770

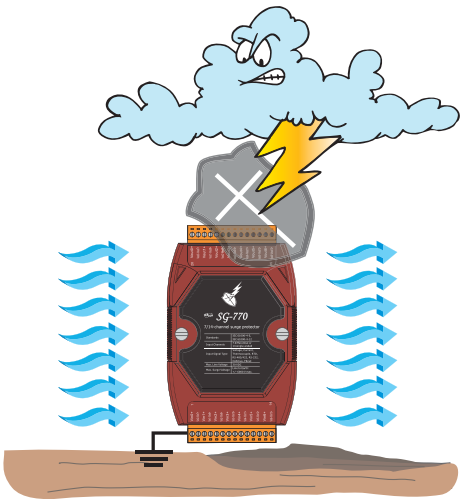
Features

- IEC 61000-4-5, IEC 61000-4-12
- 6 kV Surge Protection
- RoHS Compliance
- A Wide Range of Operating Temperature: -25 ~ +75°C
- Easy Wiring

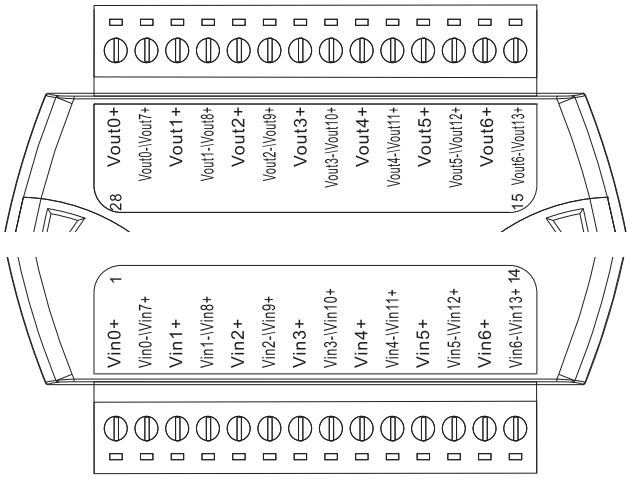
Introduction

SG-770 offers 7 differential or 14 single-ended for surge protection. SG-770 is approved with IEC 61000-4-5 and IEC 61000-4-12 standards. Each of channels supports 0 ~ ±30 VDC signal and each of channels is protected for surge achieves 6 kV.

Application



Pin Assignments



Specifications

Models	SG-770
General	
Input Channels	7 differential or 14 single-ended
Input Signal Type	Voltage, Current, Thermocouple, RTD, RS-485/RS-422/RS-232, CAN
Max. Line Voltage	30 VDC
Surge Protection Performance	
Standard	IEC 61000-4-5 IEC 61000-4-12
Max. Surge Voltage	Line to Earth: ±6000 VDC Max.
Environment	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-30 ~ +75°C
Humidity	5 ~ 95% RH, Non-condensing
Dimensions (W x H x D)	123 mm x 72 mm x 33 mm

Ordering Information

SG-770 CR	7 channel differential or 14 channel single-ended surge protector (RoHS)

11.3. Relay Modules

Models	DN-PR4	RM-104, RM-108, RM-116	RM-204, RM-208, RM-216
Pictures			
Relay	VE-24H5-K	FINDER - 40.61.7.024.0000	FINDER - 44.52.7.024.0000
Type	Power Relay		
Channel	4	RM-104: 4 channels RM-108: 8 channels RM-116: 16 channels	RM-204: 4 channels RM-208: 8 channels RM-216: 16 channels
Contact	Form C	Form C (SPDT)	Form C (DPDT)
Operating Voltage Range	250 VAC / 30 VDC	250 VAC	250 VAC
Max. Load Current	5 A	16 A	6 A
Operate Time	10 ms (Typical)	7 ms (Typical)	8 ms (Typical)
Release Time	5 ms (Typical)	3 ms (Typical)	5 ms (Typical)
LED Indicator	Yes (for Relay status)		
Mechanical			
Dimensions (W x L x D)	96 mm x 103 mm x 34 mm	RM-104: 79 mm x 87 mm x 63 mm RM-108: 135 mm x 87 mm x 63 mm RM-116: 270 mm x 87 mm x 63 mm	RM-204: 90 mm x 87 mm x 63 mm RM-208: 169 mm x 87 mm x 63 mm RM-216: 327 mm x 87 mm x 63 mm
Installation	DIN-Rail Mounting		

Models	DN-SSR4	DN-SSR4DC
Pictures		
Relay	A5P-204U	D3P-054
Type	Solid-State Relay	
Channel	4 channels	
Contact	Form A (SPST)	
Operating Voltage Range	250 VAC / 30 VDC	50 VDC
Max. Load Current	4 A	
Operate Time	1/2 Cycle + 1 ms and below	0.5 ms and below (Resistance load)
Release Time	1/2 Cycle + 1 ms and below	0.5 ms and below (Resistance load)
LED Indicator	Yes (for Relay status)	
Mechanical		
Dimensions (W x L x D)	101 mm x 77 mm x 66 mm	
Installation	DIN-Rail Mounting	

Models	RM-20.22	RM-22.22	RM-38.61	RM-48.61	RM-48.62
Pictures					
Relay	Finder 20.22.9.024.4000	Finder 22.22.9.024.4000	Finder 34.51.7.024.0010	FINDER - 40.61.7.024.0000	FINDER - 44.62.7.024.0000
Type	Step Relay		Power Relay		
Channel	1				
Contact	Form A (DPST)	Form A (DPST)	Form C (SPDT)	Form C (SPDT)	Form C (SPDT)
Operating Voltage Range	230 VAC	230 VAC	250 VAC	250 VAC	250 VAC
Max. Load Current	16 A	20 A	6 A	16 A	10 A
Operate Time	15 ms	15 ms	5 ms	7 ms	7 ms
Release Time	8 ms	8 ms	3 ms	3 ms	3 ms
LED Indicator	-				
Mechanical					
Dimensions (W x L x D)	17.5 mm x 84 mm x 62.7 mm		76.5 mm x 6.5 mm x 89 mm	75 mm x 15.5 mm x 78.5 mm	
Installation	DIN-Rail Mounting				

Note1: **RM-38.61:** 5 pcs in one package
RM-48.61: 4 pcs in one package
RM-48.62: 4 pcs in one package

Note2: **RM-38-093.20** is a 20-way jumper link for RM-38.61

11.4. Power Supplies

KA-52F
KA-52F-48

NEW

DIN-KA52F
DIN-KA52F-48

KA-52F/DIN-KA52F
KA52F-48/DIN-KA52F-48

Specifications

Models	KA-52F	DIN-KA52F	KA-52F-48	DIN-KA52F-48
Input				
Range	100 ~ 250 VAC			
Frequency	50 ~ 60 Hz			
Output				
Power	24 VDC/1.04 A Max., 25 W		48 VDC/0.52 A Max., 25 W	
Mechanical				
Dimensions (W x H x D, Units: mm)	54 x 93 x 36	68 x 107 x 50	54 x 93 x 36	68 x 107 x 50
Installation	No-mounting	DIN-Rail Mounting	No-mounting	DIN-Rail Mounting
Environmental				
Operating Temperature	0 ~ +50°C			
Storage Temperature	-20 ~ +85°C			

Ordering Information

KA-52F CR	24 VDC/1.04 A, 25 W Power Supply (RoHS)
DIN-KA52F CR	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)
KA-52F-48 CR	48 VDC/0.52 A, 25 W Power Supply (RoHS)
DIN-KA52F-48 CR	48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting (RoHS)

NEW

GPSU06U-6

GPSU06E-6 (2 pole EURO plug)

GPSU06U-6/GPSU06E-6

Specifications

Models	GPSU06U-6	GPSU06E-6
Input		
Range	100 ~ 240 VAC or 127 ~ 370 VDC	
Frequency	50 Hz ~ 60 Hz	
Output		
Power	24 VDC/0.25 A Max., 6 W	
Mechanical		
Dimensions (W x H x D)	32 mm x 66 mm x 68 mm	
Installation	No-mounting	
Environmental		
Operating Temperature	0 ~ +40°C	
Storage Temperature	-20 ~ +85°C	

Ordering Information

GPSU06U-6 CR	24 VDC/0.25 A, 6 W Power Supply (RoHS)
GPSU06E-6 CR	24 VDC/0.25 A, 6 W Power Supply (RoHS)

NEW

MDR-20-24 MDR-60-24/MDR-60-48

MDR-20-24
MDR-60-24
MDR-60-48

Specifications

Models	MDR-20-24	MDR-60-24	MDR-60-48
Input			
Range	100 ~ 250 VAC		
Frequency	50 ~ 60 Hz		
Output			
Power	24 VDC/1 A Max., 24 W	24 VDC/2.5 A Max., 60 W	48 VDC/1.25 A Max., 60 W
Mechanical			
Dimensions (W x H x D)	22.5 mm x 90 mm x 100 mm	40 mm x 90 mm x 100 mm	40 mm x 90 mm x 100 mm
Installation	DIN-Rail Mounting		
Environmental			
Operating Temperature	-20 ~ +70°C		
Storage Temperature	-20 ~ +85°C		

Ordering Information

MDR-20-24 CR	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-24 CR	24 VDC/2.5 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-60-48 CR	48 VDC/1.25 A, 60 W Power Supply with DIN-Rail Mounting (RoHS)

11.5. Enclosures and Mounting Kit

I-950-ENC

I-951-ENC

I-950-ENC/I-951-ENC

Specifications

Models	I-950-ENC	I-951-ENC
Includes		
Case Accessory		
2 x Polyamide cable glands		
4 x captive lid screws		
1 x DIN-Rail (20 cm)		
Mechanical		
Casing	Plastic	
Dimensions (W x H x D)	254 mm x 180 mm x 90 mm	254 mm x 180 mm x 111 mm
Environmental		
Temperature	0 ~ +50°C for Protection rating IP66	

Ordering Information

I-950-ENC CR	Industrial Enclosure (254 mm x 180 mm x 90 mm) (RoHS)
I-951-ENC CR	Industrial Enclosure (254 mm x 180 mm x 111 mm) (RoHS)

I-3625-ENC

Specifications

Models	I-3625-ENC
Includes	
Case Accessory	
2 x Polyamide cable glands	
6 x captive lid screws	
1 x DIN-Rail (35.8 cm)	
Mechanical	
Casing	Plastic
Dimensions (W x H x D)	360 mm x 254 mm x 165 mm
Environmental	
Temperature	0 ~ +50°C for Protection rating IP66

Ordering Information

I-3625-ENC CR	Industrial Enclosure (RoHS)

RK-3UD-R

19" Rack Mounting Kit, 3U

Specifications

Models	RK-3UD-R
Mechanical	
Dimensions (W x H x D)	481 mm x 132 mm x 125 mm

Ordering Information

RK-3UD-R	19" Rack Mounting Kit, 3U

11.6. Touch Panel Monitor

TPM-4100/TP-4100

10.4" Touch Panel Monitor

Features

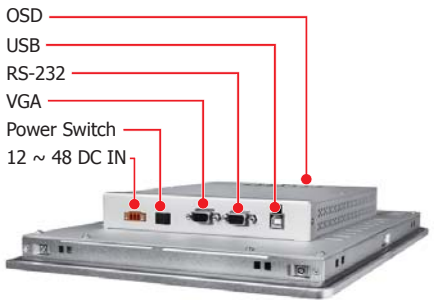
- 10.4" LCD supports 800 x 600 resolution
- Resistive Touch Panel
- Full-function OSD control
- Driver Support: Windows 2k/XP/Vista/7/WES WinCE 5.0/6.0
- LED backlight technology
- Aluminum Casing for TPM-4100
- IP65 Comlipant Front Panel
- Wide operating temperature: -25 ~ +75°C

Specifications

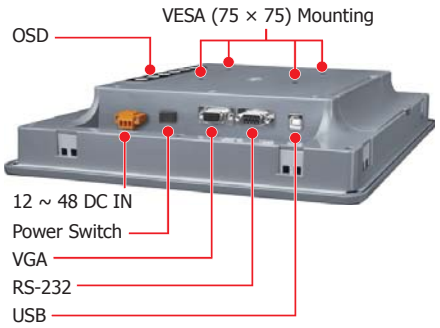
Models	TPM-4100	TP-4100
Display		
Size	10.4"	
Resolution	800 x 600	
Max. Color	16.7 M	
Brightness (cd/m2)	320	
Contrast Ratio	500 : 1	
Viewing Angle (H/V)	140/130	
Backlight Life (hrs)	50,000	
Touch Panel	4-wire	5-wire
	analog resistive, RS-232 or USB1.1 (Type B) interface	
Input Signal	VGA (Analog RGB)	
MMI (Man Machine Interface)		
OSD Control	Functions: Brightness, Contrast, Phase, Horizontal Position, Vertical Position and Sharpness	
Power Switch	Yes	
LED Indicators	Power, Display signal is detected	
Power		
Input Range	+12 ~ 48 VDC	
Power Consumption	8.5 W	
Mechanical		
Material	Aluminum	Plastic
Dimensions (W x L x H)	293 mm x 231 mm x 53 mm	290 mm x 228 mm x 53 mm
Installation	Panel Monuting	Panel Monuting, VESA (75 × 75) Mounting
Ingress Protection	Front panel: IP65	
Environmental		
Operating Temperature	-25 ~ +75°C	
Storage Temperature	-30 ~ +80°C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	

Appearance

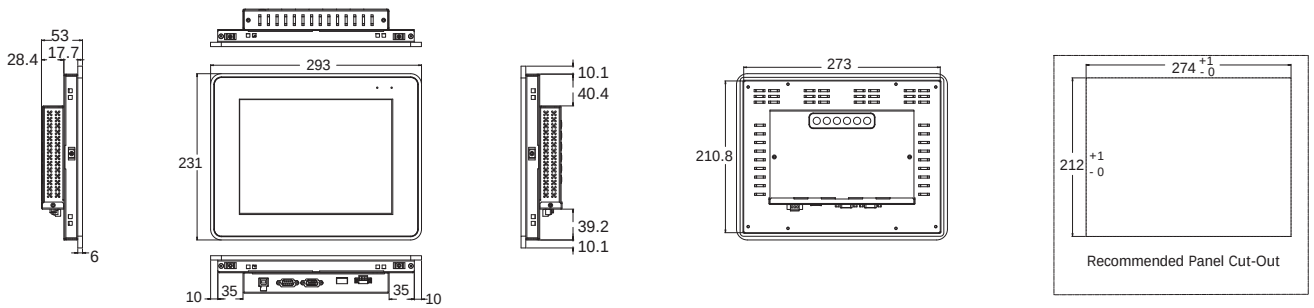
TPM-4100



TP-4100



TPM-4100 Dimensions (Units: mm)



Ordering Information

TP-4100	10.4" (800 x 600) resistive touch panel monitor with RS-232 or USB interface Accessories: Power supply, VGA cable, RS-232 cable, USB cable, Mounting clamps and screws
TPM-4100	TP-4100 with Aluminum Casing

Available soon

TP-3070

7" Touch Panel Monitor

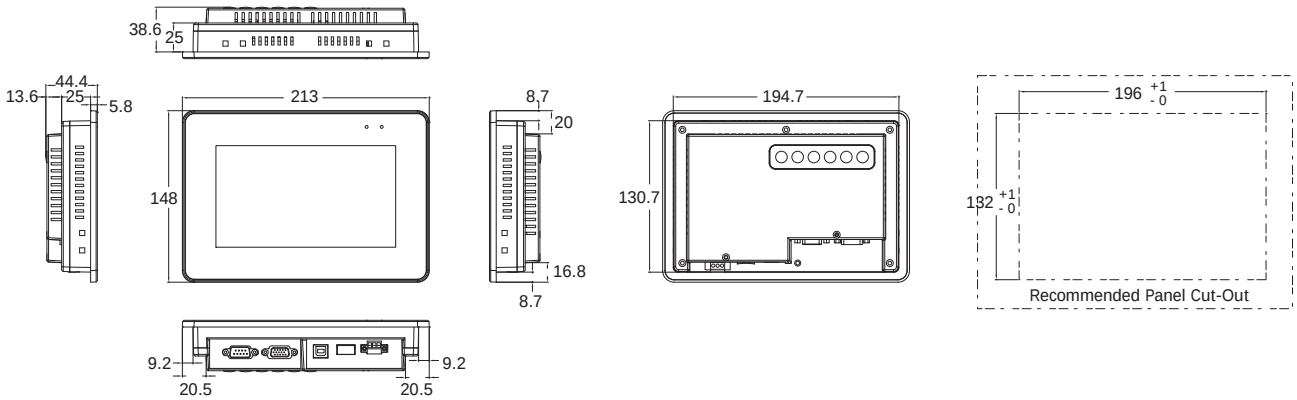
Features

- 7" LCD supports 800 x 480 resolution
- Resistive Touch Panel
- Full-function OSD control
- Driver Support: Windows 2k/XP/Vista/7/WES WinCE 5.0/6/0
- LED backlight technology
- IP65 Comlipant Front Panel
- Wide operating temperature: -20 ~ +70°C

Specifications

Models	TP-3070
Display	
Size	7"
Resolution	800 x 480
Brightness (cd/m2)	320
Contrast Ratio	500 : 1
Viewing Angle (H/V)	140/120
Backlight Life (hrs)	20,000
Touch Panel	4-wire, analog resistive, RS-232 or USB1.1 (TypeB) interface
Input Signal	VGA (Analog RGB)
MMI (Man Machine Interface)	
OSD Control	Functions: Brightness, Contrast, Clock, Phase, Horizontal Position, Vertical Position and Sharpness
Power Switch	Yes
LED Indicators	Power, Display signal is detected
Power	
Input Range	+12 ~ 48 VDC
Power Consumption	5 W
Mechanical	
Dimensions (W x L x H)	213 mm x 148 mm x 44 mm
Casing	Plastic
Ingress Protection	Front panel: IP65
Environmental	
Operating Temperature	-20 ~ +70°C
Storage Temperature	-30 ~ +80°C
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)

Dimensions (Units: mm)



Ordering Information

TP-3070	7" (800 x 480) resistive touch panel monitor with RS-232 or USB interface Accessories: Power supply, VGA cable, RS-232 cable, USB cable, Mounting clamps and screws

WiFi I/O Module

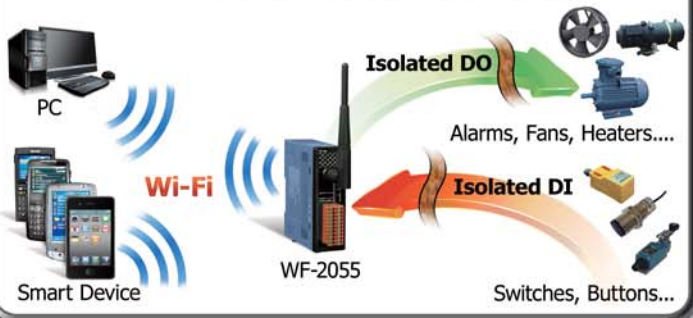
The WF-2000 series I/O modules have WLAN connection complied with the IEEE802.11b/g standards. With the popularity of 802.11 network infrastructure, the WF-2000 series I/O modules make an easy way to incorporate wireless connectivity into monitoring and control systems. They also support standard Modbus/TCP and UDP protocol and the network encryption configuration, which makes perfect integration to SCADA software and offer easy and safe access for users from anytime and anywhere.

Key Features

- Compatible with IEEE 802.11b/g standards
- Support infrastructure and ad hoc modes for wireless networks
- Support WEP, WPA and WPA2 wireless encryption
- Support Modbus/TCP and UDP protocols
- Support pair connection communication mode
- Support AO/DO power on value & safe value Mechanism
- Built-in Watchdog

Isolated 8 DI and 8 DO Module

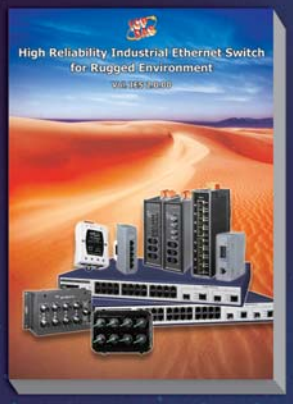
- DO Type: Sink
- DI Type: Sink / Source
- DO Output voltage: +3.5 ~ +50 VDC
- DO Output current: 700 mA (per channel)
- Counters Max. Input Frequency: 10K Hz
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)



Isolated 6 DI and 6 Relay Output Module

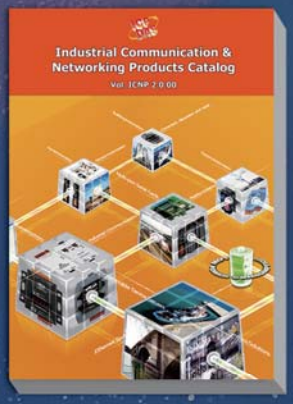
- Relay Type: Form A
- DI Type: Sink / Source
- Relay Contact Rating: 5A 250 VAC/ 5A 30 VAC
- Counters Max. Input Frequency: 10K Hz
- 4 kV Contact ESD protection for any terminal
- Wide range of power input (+10 ~ +30 VDC) and operating temperature (-25 ~ +75°C)

ICP DAS Catalogs & Brochure



High Reliability Industrial Ethernet Switch Catalog

- Managed Ethernet Switches
- Unmanaged Ethernet Switches
  PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technlolgy



Industrial Communication & Networking Products Catalog

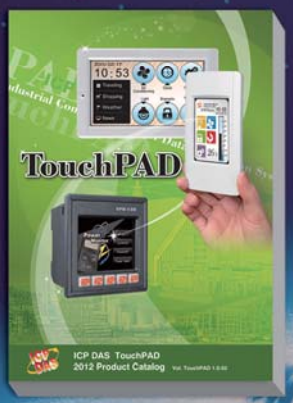
- Multi-port Serial Cards
- Programmable Device Servers (Serial-to-Ethernet)
- Converters, Repeaters and Hubs
- Fieldbus Solutions
- Ethernet Switches

PAC Products Catalog

- XP-8000-Atom Series
- XP-8000 Series
- WP-8000 Series
- LP-8000 Series
- iP-8000 Series
- ViewPAC Series
- MotionPAC Series
- I/O Expansion Units
- I/O Modules
- 5000 Series
- 7188/7186 Series

Industrial Fieldbus

- RS-485
- Industrial Ethernet
- Profinet
- CAN bus
- CANopen
- Devicenet
- J1939
- PROFIBUS
- HART
- Ethernet/IP
- BACnet



Touch HMI Devices Brochure

- TPD-430 Series
- TPD-280 Series
- VPD-130 Series

Industrial Wireless Communication Products Catalog

- Industrial Wireless series
- DSSS RF modems
- 2G/3G mini-PAC/Modules/Modems
- ZigBee converters & I/O modules
- GPS solutions

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