PROFINET Product Solution

PROFINET

Compliant with IEEE802.3U standard, compatible with future tense of IT & Ethernet



- High Market Share Protocol
- Precise I/O Structure
- Real Time Communication
- High Transfer Rate
- Support Standard Ethernet Topology

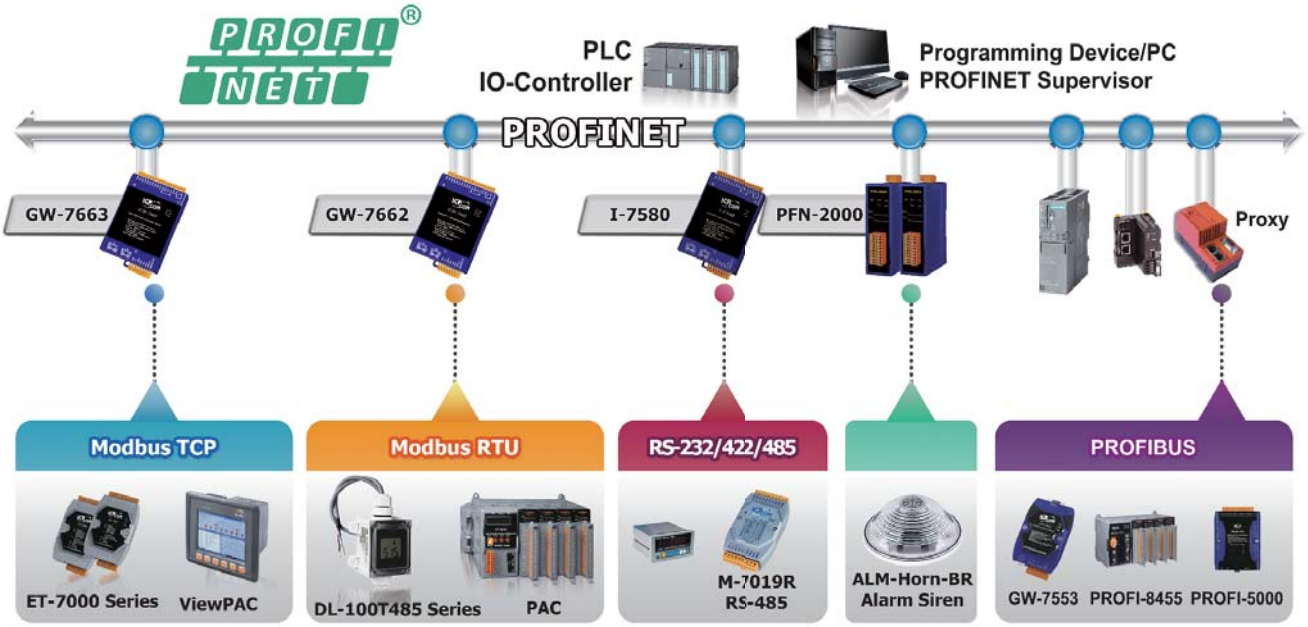


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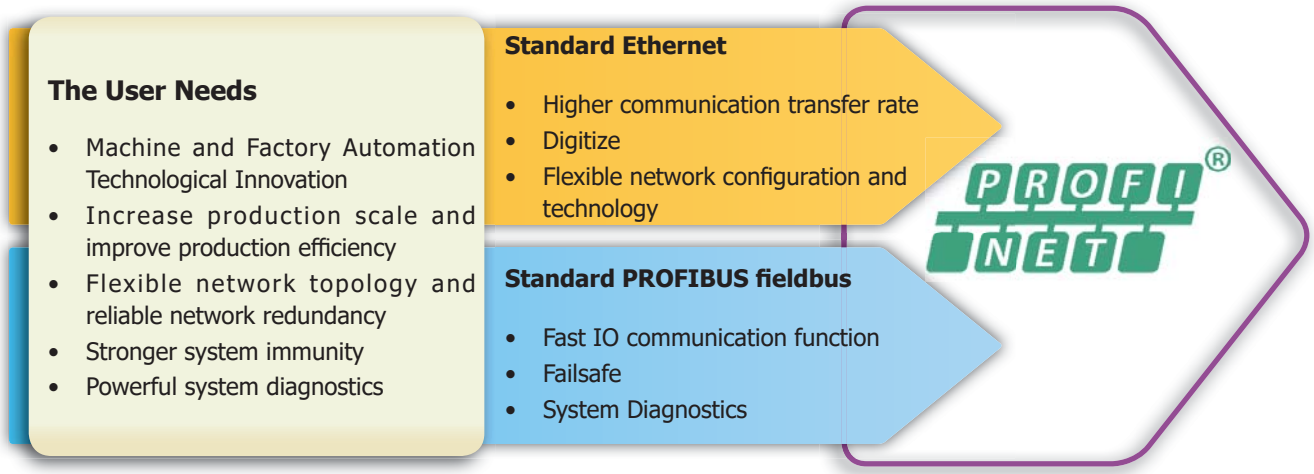
PROFINET Product Solutions

ICP DAS has been deeply involved in PROFINET technology for many years, and has developed a series of PROFINET products, including converters, gateways and remote I/O modules. We provide complete hardware solutions to meet various PROFINET applications, help you solve problems related to data acquisition, communication protocol conversion and communication interface conversion, etc., so that you can easily complete various PROFINET application projects.



PROFINET Introduction and Benefits

PROFINET is an open Industrial Ethernet solution based on international standards. It is a communication protocol designed to exchange data between controllers and devices in an automation setting. It was introduced by PROFIBUS International (PI) with four decisive advantages: openness, flexibility, high efficiency and high performance. PROFINET provides a complete network solution in the field of automation, which integrates applications such as Ethernet, motion control, distributed systems, process automation, and factory automation. In addition, it is compatible with Ethernet and various field bus systems, such as: PROFIBUS DP, PROFIBUS PA, Interbus, etc., without changing the field equipment.

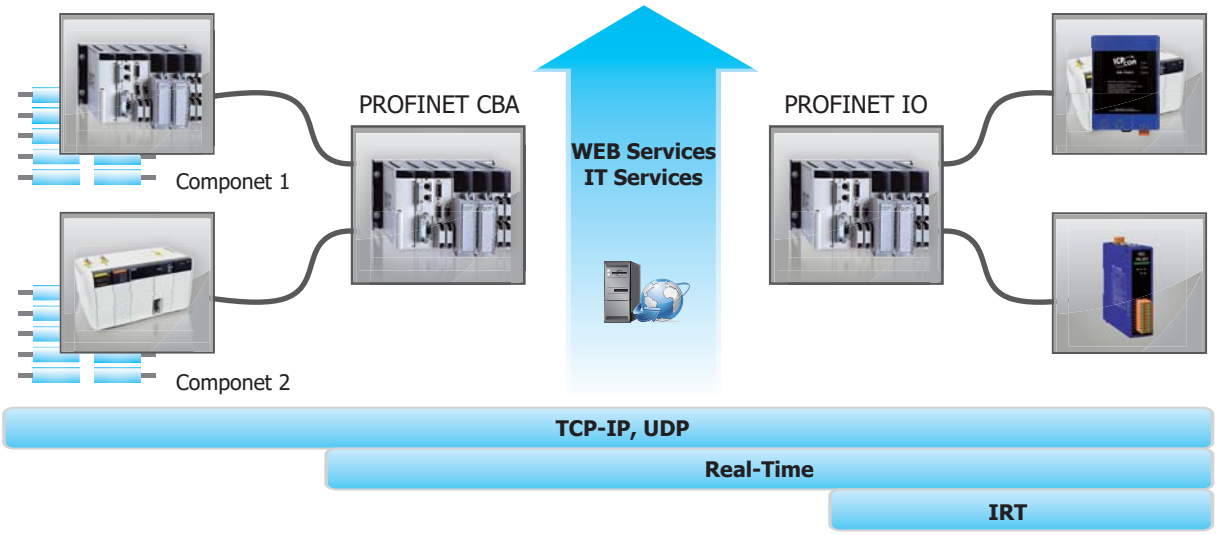


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PROFINET Component Model

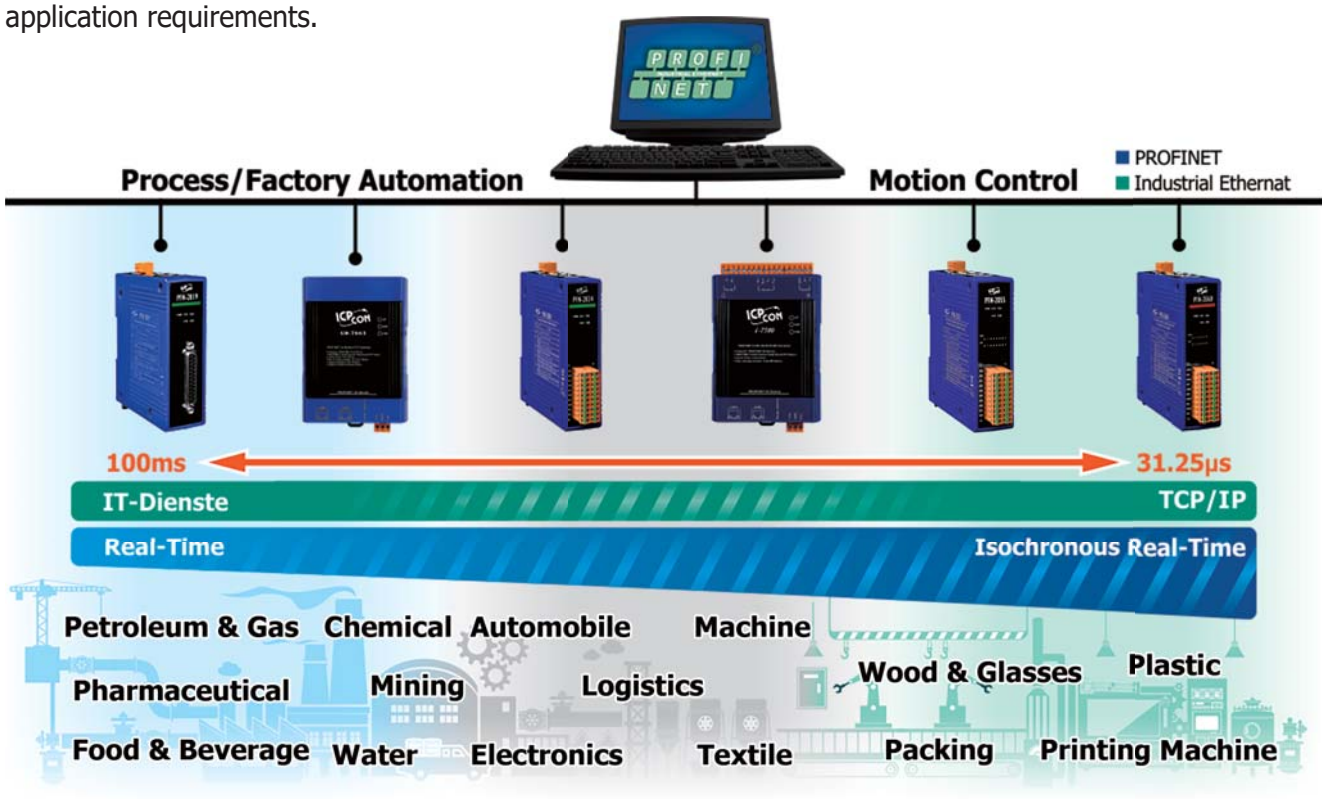
PROFINET is divided into two models:

- PROFINET CBA includes many automation components in the decentralized automation system, each component is connected through the PROFINET network, suitable for self-executing equipment or machine communication.
- PROFINET IO is suitable for the communication of peripheral devices such as IO and drives. ICP DAS PROFINET series products are classified as PROFINET IO devices.



PROFINET Communication Channels

PROFINET's combination of high performance and openness stems from its data channel design. It includes a reasonable design of three communication channels, which can realize the transmission of various data on one network cable and perform their respective functions effectively according to the application requirements.



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PROFINET Channel Description

PROFINET NRT (Non-Real-Time)

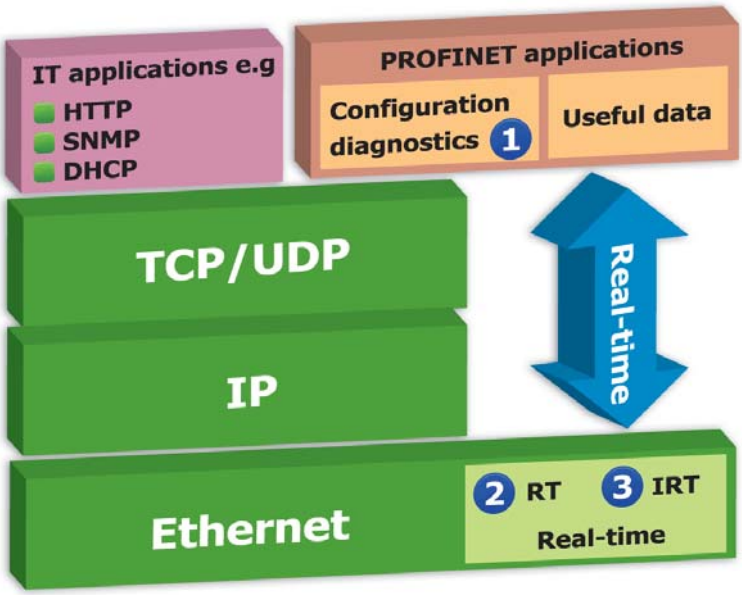
It uses standard protocols as UDP/IP. With response time approx. 100 ms PROFINET NRT targets for applications in process automation.

PROFINET RT (Real-Time)

For applications with higher requirements on cycle time like factory automation, it directly uses the Ethernet protocol to exchange I/O data, while diagnosis and configuration uses standard UDP/IP. PROFINET RT enables applications with response time approx. 10 ms.

PROFINET IRT (Isochronous Real-Time)

The highest requirements come from the control of complex industrial drive systems, like packaging machines or robotics. With applications with cycle time < 1 ms and jitter < 1 µs are possible.



1 TCP/IP

- Device parameterization and configuring
- Reading of diagnostic data
- Negotiating the useful data channel

2 Real-time RT

- Effective cyclic transmission of useful data
- Event-driven messages/alarms

3 Isochronous real-time IRT

- Useful data transfer in isochronous mode
- Hardware support through ERTEC
- Jitter < 1 µs

PROFINET Product Features

- Transfer protocol: PROFINET IO
- 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)
- Generic GSDML File Provided
- Automatic MDI / MDI-X Crossover for Plug-and-play

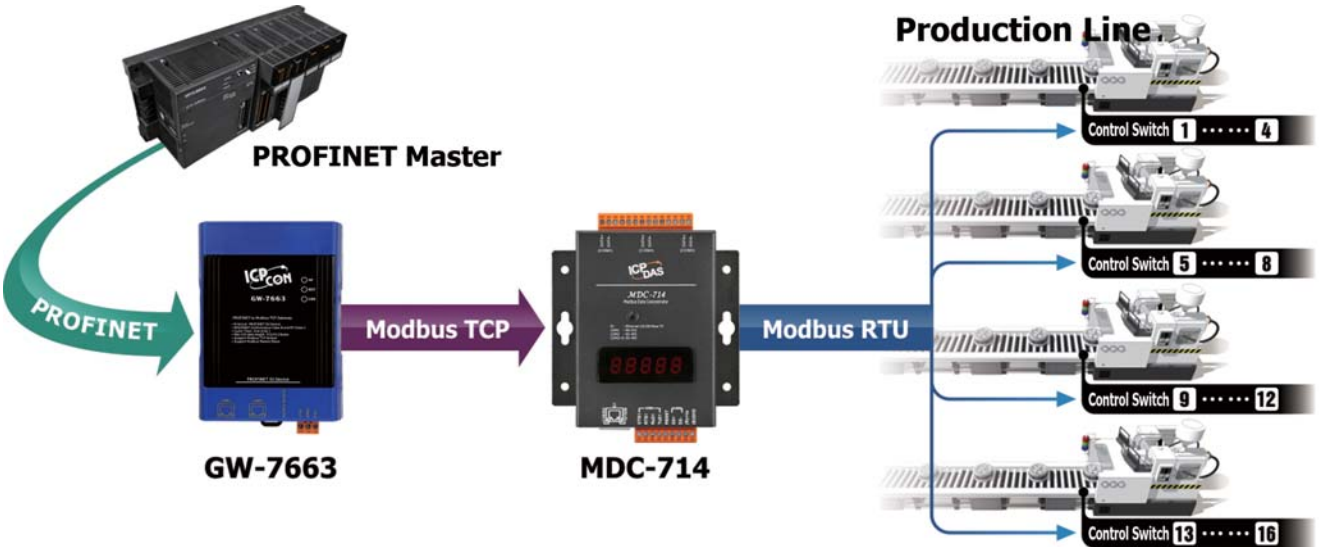
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PROFINET Product Selection Guide

Product		Description		
Converter	**I-7580**	PROFINET to RS-232/422/485 Converter		
Gateway	**GW-7662**	PROFINET to Modbus RTU/ASCII Gateway		
	GW-7663	PROFINET to Modbus TCP Gateway		
I/O Module	**PFN-2019**	10-Ch AI	**PFN-2024**	4-Ch AO
	PFN-2042	16-Ch DO	**PFN-2051**	16-Ch DI
	PFN-2052	8-Ch DI	**PFN-2053**	16-Ch DI
	PFN-2055	8-Ch DI, 8-Ch DO	**PFN-2060**	6-Ch DI, 6-Ch Relay

Application Case Description

In a factory that manufactures automobile wheel drums, it is necessary to quickly control the switch of the conveyor belt to ensure that the wheel drum stops in a fixed area for the convenience of operation. In this application case, the upper end adopts PROFINET PLC for drum production operation, and the lower end conveyor belt adopts Modbus support Control switch for RTU. It takes more time to control the conveyor belt switch one by one in a polling manner. Therefore, MDC-714 is selected for the lower conveyor belt, and all conveyor belt switches can be evenly allocated to the 4 COM Ports of MDC-714 to reduce the time required for round-robin. The resulting data can be integrated on the PROFINET PLC in a shorter time.



Application Features

- PROFINET Gateway allows users to quickly integrate Modbus devices
- Continuous communication with multiple communication ports to solve the delay problem of Modbus RTU simplex communication
- Maximum input/output data length: 512/512 bytes

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PROFINET Converter



I-7580

Features

- Protocol: PROFINET IO Device
- PROFINET Conformance Class B and RT Class 1
- Cyclic Time: 1ms (min)
- Generic GSDML File Provided (Version 2.25)
- Max length of input/output data is 512/384 Bytes
- 4 kV Contact ESD protection for any terminal

Introduction

The I-7580 is a PROFINET IO device with RT functionality that supports RS-232, RS-422 and RS-485 serial interfaces. Users can choose one of these serial communication interfaces to apply. It is easy to allow users to take almost serial device to a PROFINET network including serial remote I/O devices, sensors, actuators, HMI, barcode readers and RFID, etc.



Module Name	I-7580
WDT Timer	YES (CPU Built-in)
COM Port	RS-232 / 422 / 485 (Can not be used simultaneously)
Ethernet Services	ICMP / IGMP / ARP / DHCP / TELNET / TFTP / SNMP / VLAN Priority Tagging
PROFINET	
Conformance Classes	Class B
Services	RTC / RTA / CL-RPC / DCP / LLDP / I&M
Cycle Time	1ms(Min)
Protocol	PROFINET IO Device
System	
Power / Consumption	+10 ~ +30 VDC / 3.4W (Reverse polarity protection, Over-voltage brown-out Protection)
Dimensions / Installation	42mm x 76mm x 119mm (W x L x H), DIN-Rail
Environment	Operating Temp.: -25~75 °C, Storage Temp.: -30~80 °C, Humidity: 10 ~ 90%, Non-condensing

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PROFINET Protocol Gateways



GW-7662



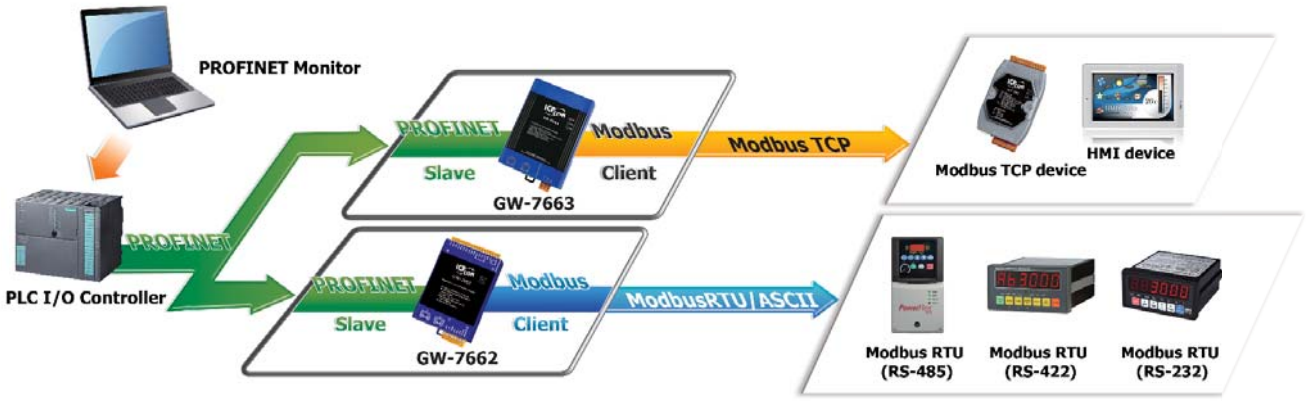
GW-7663

Features

- Protocol: PROFINET IO Device
- PROFINET Conformance Class B and RT Class 1
- Max length of input/output data is 512/512 Bytes
- Cyclic Time: 1ms(min)
- Support Modbus RTU or Modbus TCP Master and Slave Mode

Introduction

GW-7662 / GW-7663 specially designed for PROFINET IO device. It allows PROFINET controller to access Modbus RTU (GW-7662 only) or Modbus TCP (GW-7663 only) Master or Slave devices. These Modbus devices maybe a PLC, a sensor, ICPDAS M-7000 series modules and so forth. We also provide a utility software for users to configure GW-766x. By using this module, users can put their Modbus devices into PROFINET network easily.



Module Name		GW-7662	GW-7663
Description		PROFINET to Modbus RTU/ASCII Gateways	PROFINET to Modbus TCP Gateways
PROFINET	Protocol	IO Device	
	Conformance Classes	ClassB	
	Services	RTC, RTA, CL-RPC, DCP, LLDP, I&M	
	Cycle Time	1 ms	
Port	Type	RS-232/RS-422/RS-485	Ethernet(10/100 Base-TX)
	Protocol	Modbus RTU/ASCII Master/Slave	Modbus TCP Server/Client
System	Power / Consumption	+10 ~ +30 VDC / 3.4W (Reverse polarity protection, Over-voltage brown-out Protection)	
	Dimensions	42mm x 76mm x 119mm (W x L x H), DIN-Rail	
	Environment	Operating Temp.: -25~75 °C, Storage Temp.: -30~80 °C, Humidity: 10 ~ 90%, Non-condensing	

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The PFN-2000 series are PROFINET I/O modules, each PROFINET I/O module supports the PROFINET IO communication protocol, can be connected to the PROFINET IO controller, and provides ±4kV protection against electrostatic interference. ICP DAS currently provides several PROFINET analog and digital I/O modules, which users can choose according to their needs. And through the GSDML file, users can easily configure each PROFINET I/O module to any PROFINET engineering tool.

PROFINET I/O Analog Modules



PFN-2019



PFN-2024

Features

- Protocol: PROFINET IO Device
- PROFINET Conformance Class B and RT Class 1
- Generic GSDML File Provided (Version 2.25)
- Cyclic Time: 1ms (min)
- PFN-2019 provide 10-CH Universal Analog Input
- PFN-2024 provide 4-CH Isolated Analog Output

Module Name	PFN-2019	PFN-2024
Analog Input		
Channels	10 (Differential)	
Sensor Type	Thermocouple (J, K, T, E, R, S, B, N, C)	
Voltage Input Range (V)	±15m, ±50m, ±100m, ±500m, ±1, ±2.5, ±5, ±10	
Current Input Range (mA)	±20, 0~+20, +4~+20	
Resolution / Sample Rate	16 bit / 10Hz	
Accuracy	±0.1%(FSR)	
Analog Output		
Channels		4
Voltage Input Range (V)		0~5、±5、0~10、±10
Current Input Range (mA)		0~20、4~20
Resolution / Sample Rate		16 bit / ±0.1%(Single Channel)
Accuracy		Voltage : ±0.1% / Current : ±0.2%
PROFINET Interface		
Connector	RJ-45 x 2 (LED indicators), Integrated 2-Port Switch	
Protocol / Services	PROFINET IO / RTC, RTA, CL-RPC, DCP, LLDP, I&M	
Conformance Classes / RT	Class B / RT Class, 1 ms (min)	
System		
Power / Consumption	+10 ~ +30 VDC / 5W	+10 ~ +30 VDC / 7W
Dimensions	33mm x 93mm x 126mm (W x L x H), DIN-Rail	
Environment	Operating Temp.: -25~75 °C、Storage Temp.: -30~80 °C、Humidity: 10 ~ 90%, Non-condensing	

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PROFINET Digital I/O Modules



PFN-2042/2051/2052/2053/2055/2060

Features

- Protocol: PROFINET IO Device
- PROFINET Conformance Class B & RT Class 1
- Generic GSDML File Provided (Version 2.25)
- Cyclic Time: 1ms (min)
- 4 kV Contact ESD protection for any terminal

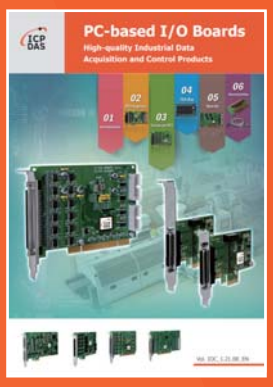
Module Name		PFN-2042	PFN-2051	PFN-2052	PFN-2053	PFN-2055	PFN-2060
Digital Input							
Channels			16	8	16	8	6
Contact			Dry + Wet	Wet	Dry	Dry + Wet	Dry + Wet
Sink / Source			Dry: Source Wet: Sink/Source	Sink/Source	Source	Dry: Source Wet: Sink/Source	Dry: Source Wet: Sink/Source
Wet Contact	On Voltage Level	--	+10~50VDC	+4~30VDC	--	+10~50VDC	+10~50VDC
	Off Voltage Level		+4VDC Max.	+1VDC Max.		+4VDC Max.	+4VDC Max.
Dry Contact on Voltage Level			Close to GND	--	Close to GND	Close to GND	Close to GND
Input Impedance			10kΩ,0.5W	3kΩ,0.3W	3KΩ, 0.3W	10kΩ,0.5W	10kΩ,0.5W
Digital Output							
Channels		16	--			8	6
Type		Open Collector				Open Collector	Power Relay
Sink / Source		Sink				Sink	Form A
Load Voltage		+3.5~50VDC				+3.5~50VDC	30VDC/125VAC
Max. Load Current		700mA / Ch				700mA / Ch	2A@30VDC 0.6A@125VAC
Overvoltage Protection		60VDC				60VDC	--
Overload Protection		Yes				Yes	
Power-On-Value		Yes				Yes	Yes
Safe Value		Yes				Yes	Yes
PROFINET							
Connector		RJ-45 x 2 (LED indicators), Integrated 2-Port Switch					
Protocol / Services		PROFINET IO / RTC, RTA, CL-RPC, DCP, LLDP					
Conformance Class / RT		Class B / RT Class, 1 ms (min)					
Power							
Power Supply		+10 ~ +30 VDC					
Consumption		4W	3.5W	3.5W	4W	4.5W	4.5W

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Industrial Fieldbus

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



PC-based I/O Boards

- PCI Express Bus Data Acquisition Boards
- PCI Bus Data Acquisition Boards
- ISA Bus Data Acquisition Boards



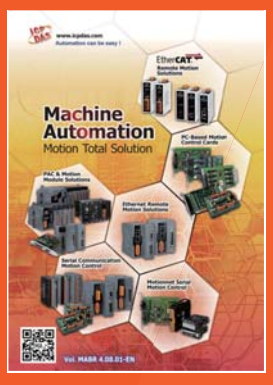
Energy Management Solution

- InduSoft SCADA Software
- Smart Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module
- TouchPAD Devices - VPD Series



IIoT Cloud Solution - UA SERIES : IIoT Communication Server

- Built-in OPC UA Server Service
- Built-in MQTT Broker Service
- Support Logic Control IFTTT
- Support IoT Cloud Platforms Connection and IoTstar Cloud Management
- IIoT Factory Application of MES
- Pumping Station IoT Application
- BA Smart Building IoT Application
- Robotic Arm Co-operation Application



Machine Automation

- Motionnet Solutions
- EtherCAT Motion Control Solutions
- Ethernet Motion Control Solutions
- Serial Communication Motion Control Solutions
- PC-based Motion Control Cards
- PAC Solutions - Motion Modules



Smart Building, Smart Home Automation

- Video Intercom & Access Control
- Touch HMI - TouchPAD Series
- Smart Lighting Control
- Energy Saving - PM/PMC Series
- Environmental - DL/CL Series
- Motion Detector - PIR Series
- Wi-Fi Wireless - WF Series
- Infrared Wireless - IR Series
- ZigBee Wireless - ZT Series
- IIoT Server & Concentrator
- LED Display - iKAN Series



Intelligent IIoT Edge Controller & I/O Module

- WISE IIoT Edge Controller & I/O Module
- Cloud Management
- Applications
- Product Specifi cation
- Intelligent Surveillance Solution



Wireless Solution

- WLAN Products
- Radio Modems
- 3G/4G Products
- NB-IoT Solution
- GPS Products
- Bluetooth LE Converters
- ZigBee Products
- Infrared Wireless Modules
- Wireless Modbus Data Concentrators
- WLS (Wireless Locating System)

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