CANopen System Integration Solutions

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Content

CH1 ICPDAS CANopen Product Solutions

ICPDAS has been a leader in CANopen technology for many years. We have developed various CANopen products, including master devices like PCI interface cards and PAC communication cards, slave devices such as plug-in I/O devices and distributed I/O Modules, and gateways connecting different communication systems. As a result, we can provide a wide range of CANopen solutions to meet our customers' needs. These solutions help address challenges related to data acquisition and processing, extended communication distances, network topology constraints, communication interface conversion, and noise suppression, enabling customers to successfully complete various CANopen application projects.

1.1 CANopen introduction and Advantages

CANopen is a standardized embedded network protocol based on the CAN bus, known for its flexibility, high security, and reliability. CANopen enhances real-time and synchronization capabilities and offers various sub-protocols for different device applications. This has expanded its application scope to include transportation vehicles and medical devices. Another advantage of the CANopen communication protocol is its simplified wiring, easy installation, which not only significantly reduces assembly time and costs but also eases the maintenance burden for operators.

Stable CAN bus
CANopen is a communication protocol based on the CAN bus, which is highly interferential and secure.

Wide Applications
CANopen use in Automatic Factory Hospitals and Transportation with a high demand for stability.

Object Dictionary Based
Object Dictionary is vital in CANopen, enabling the master controller to control devices by reading and writing data.

Wide Applications
CANopen is the standard communication protocol in automation technology, maintained by CAN in Automation.

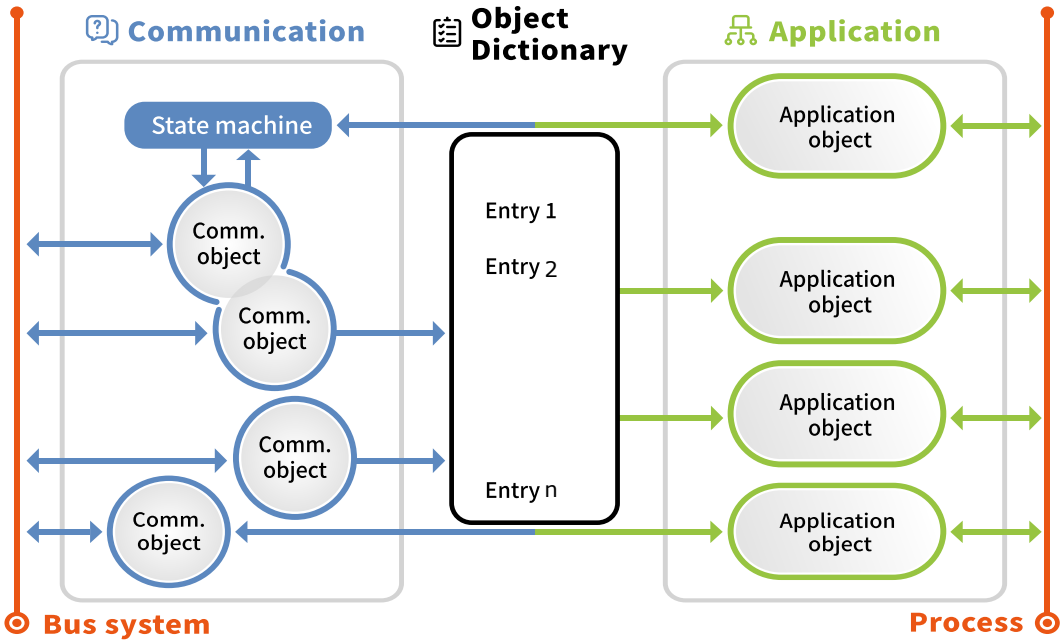
1.2 CANopen Protocols and Features

CANopen Specification and Agreement Framework :

1. Communication :
   Communication objects and functionality enable data transmission through the network.

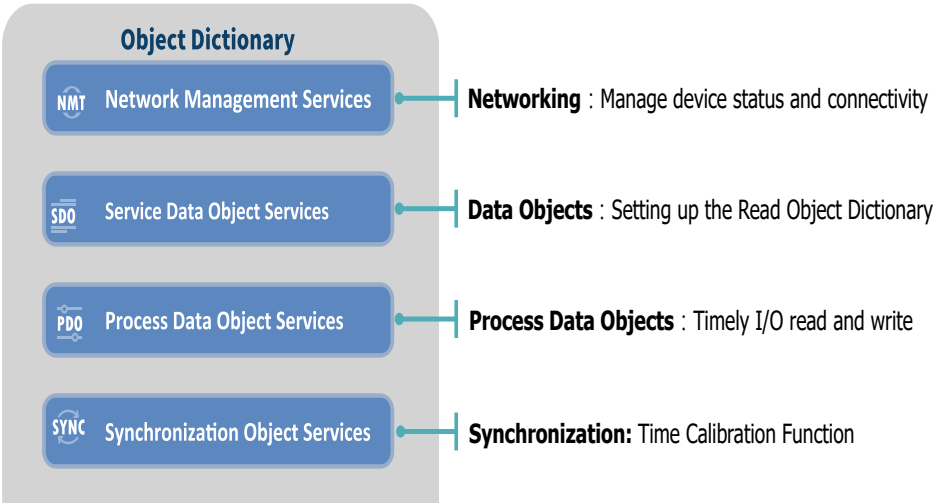
2. Object Dictionary :
   A 16-bit variable configures the device and matches measured data or device Output.

3. Application :
   Equipment functions that address mutual environmental impacts.



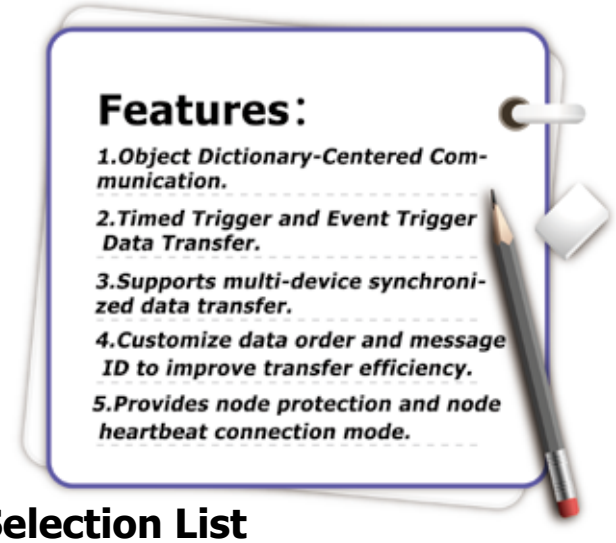
CANopen communication Objects

CANopen communication objects are functionally categorized and interconnected. For example, PDO objects are used for simple I/O read/write when dealing with device I/O status. Alternatively, devices can be configured to report Input status through PDO objects at set intervals using SDO settings. This, along with CAN bus arbitration, prioritizes and transmits critical data even in busy bus conditions. And SYNC synchronization functionality allows all network devices to process Output simultaneously. Combining these functions enhances CANopen's communication capabilities for flexibility and strength.



CANopen protocol features

CANopen is widely used in diverse applications due to its high reliability and cost-effectiveness. It's found in simple sensors like photoelectric switches to complex transportation systems. Its adoption is growing in automation and monitoring markets, with over 700 companies worldwide offering CANopen products and services through the CiA organization. This demonstrates its promising future support capabilities and potential for development.



1.3 CANopen Product Catalog and Selection List

CANopen I/O Module	
CAN-2015C	Module of 8-channel RTD Input
CAN-2017C	Module of 8-channel AI
CAN-2018C/S	Module of 8-channel Thermocouple Input
CAN-2019C/S	Module of 10-channel Universal AI
CAN-2024C	Module of 4-channel 14-bit AO
CAN-2026C	6 AI, 2 AO, 2DI and 1DO Module of CANopen Slave
CAN-2053C	Module of 16-channel Isolated (Wet) DI
CAN-2054C	8-ch DI & 8-ch DO Module of CANopen Slave
CAN-2055C	8 ch DI & 8 ch DO Module of CANopen Slave

CANopen I/O Module	
CAN-2057C	Module of 16-channel Isolated (Sink, NPN) DO
CAN-2060C	4 Ch DI & 4 Ch DO Relay Output CANopen Slave
CAN-2084C	Module of 4/8 channel Counter/ Frequency
CAN-2088C	Module of 8-channel PWM Output, 8-channel High Speed Counter Input
CAN-8123	Remote I/O Unit with 1 I/O Slot
CAN-8223	Remote I/O Unit with 2 I/O Slots
CAN-8423	Remote I/O Unit with 4 I/O Slots
CAN-8823	Remote I/O Unit with 8 I/O Slots

CANopen Gateway Module	
I-7232D	CANopen Slave / Modbus RTU Master Gateway
GW-7433D	Modbus TCP server/RTU Save to CANopen Master Gateway

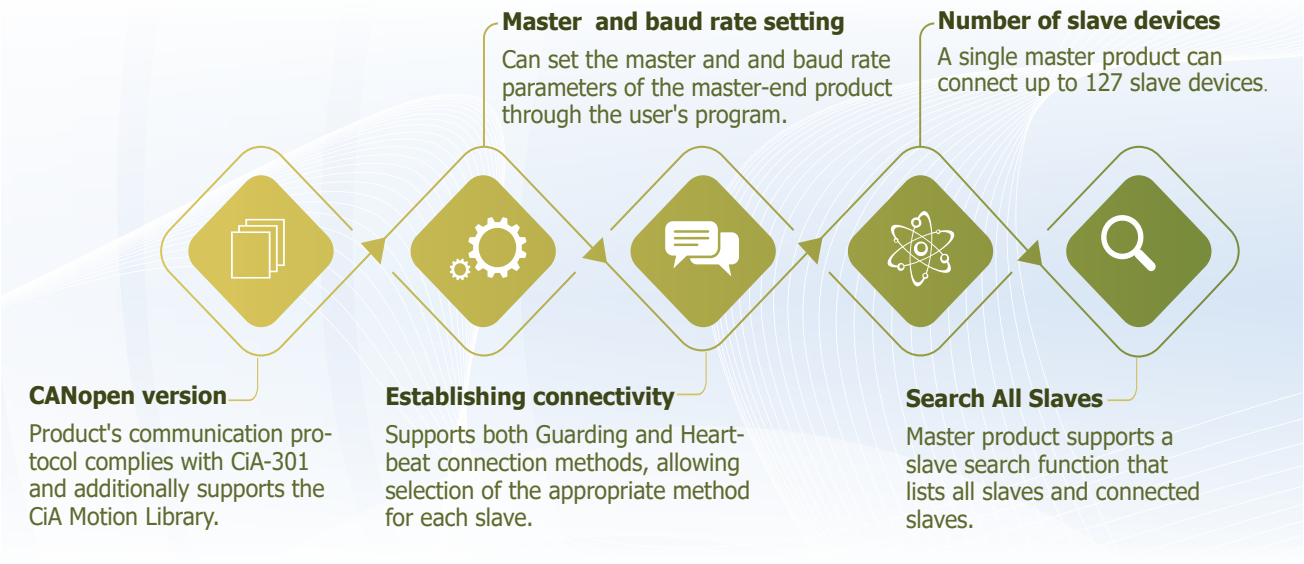
CANopen master devices	
PISO-CPM100U	1 Port Intelligent CANopen Master PCI Board
I-8123W	1 Port High Performance Intelligent CANopen Master Module
I-7565-CPM	USB to CANopen Master Converter

CH2 CANopen Master Series

2.1 Product Advantages of CANopen Master

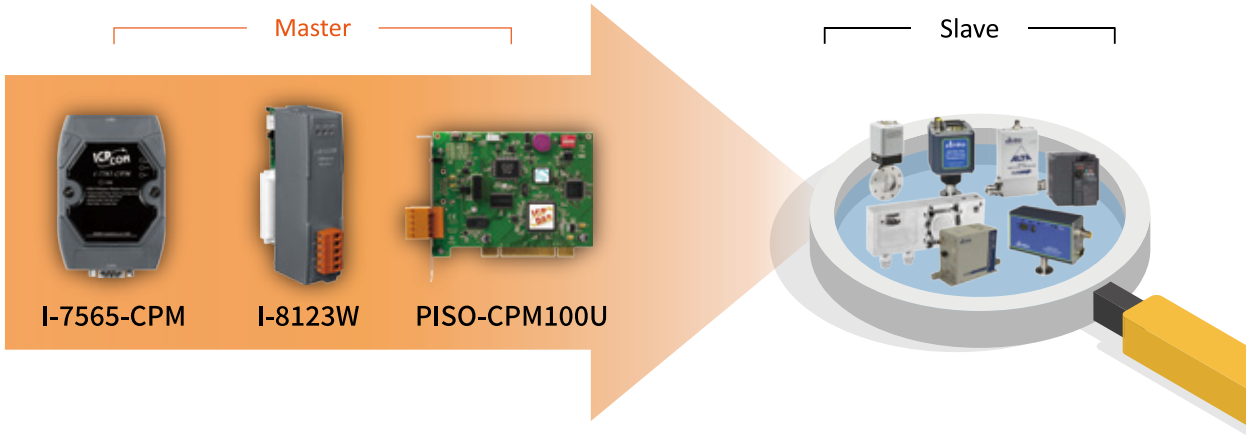
CANopen master station product series includes CPU and a compact operating system in all products. The intelligent design allows these products to operate as standalone CANopen master firmware, with a separate CPU for accelerated processing of a large volume of CANopen network packets. This enables real-time monitoring of all CANopen I/O slave data and immediate response to Output commands to I/O slaves, making real-time monitoring easily achievable. The independent CPU architecture effectively simplifies developers' complexity, reduces development time, and provides a highly efficient data exchange API.

Master Product Features



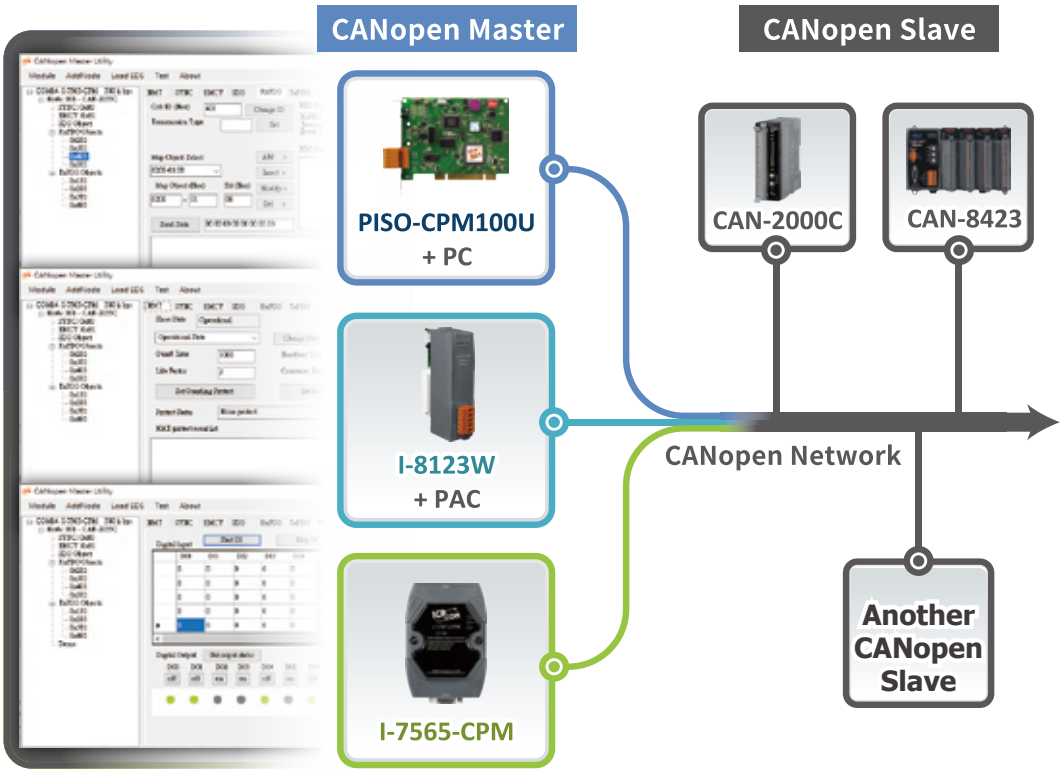
Scan CAN bus for CANopen devices

ICPDAS CANopen master series products feature network discovery, enabling users to quickly locate and connect devices without individually loading EDS files. This simplifies the setup of a CANopen monitoring network using the CPMUtility management software.



CANopen Management Software

CPMUtility is a free CANopen management software that simplifies the integration of industrial devices. It provides easy device management and read/write functions. The software scans all remote devices in the CANopen network and allows testing of each device. CPMUtility supports HORNER's CAN-2000C series and PM-CPS electric meter series devices. Its dedicated Module pages assist in testing and configuration. These features help streamline network setup and reduce development burdens.



Connect to CANopen devices in a few steps

With CPMUtility management software, users can quickly connect to remote devices, organize IO deployment, and read real-time status data with just three simple steps on their CANopen network. ICPDAS CANopen master series products include high-performance CPUs for efficient protocol handling, centralized IO management, and smooth, efficient control.

1 Search device

Scan CANopen Network Devices.

2 Start connecting

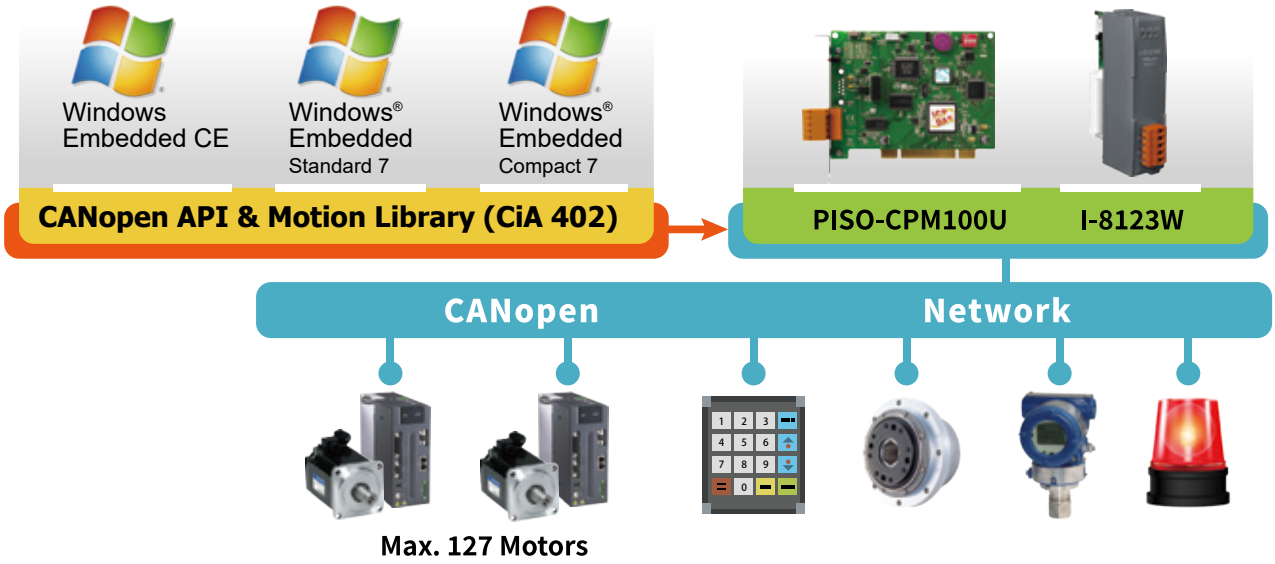
Add all devices to the master device.

3 Read and write data

Read and write remote real-time data.

Support CANopen Motion Library

ICP DAS CANopen master series products provide C language library Users only need to call the API functions to shorten the development time. Support CANopen master libraries, motion control libraries are also available, which follow the CiA 402 specification and can be used on Windows PC and PAC platforms. In addition to making the management of the CANopen motors easy, this communication protocol can reduce the wire connection between the controller and motors, and provide rapid troubleshooting functions. With the CANopen master and motion library, can do various motion control functions, such as position control, velocity control, torque control, and synchronous action without having the background knowledge of the complex and abstruse CANopen protocol. The CANopen motion library is able to link many CANopen motors so that the multi-axis motion control by one host becomes reachable. When you are using you can also use the APIs of the library to access CANopen remote I/O Modules which follows the CiA 401 at the same time. Therefore, building a motion application becomes easier and more convenient.



Max. 127 Motors

Flexible network topology expansion

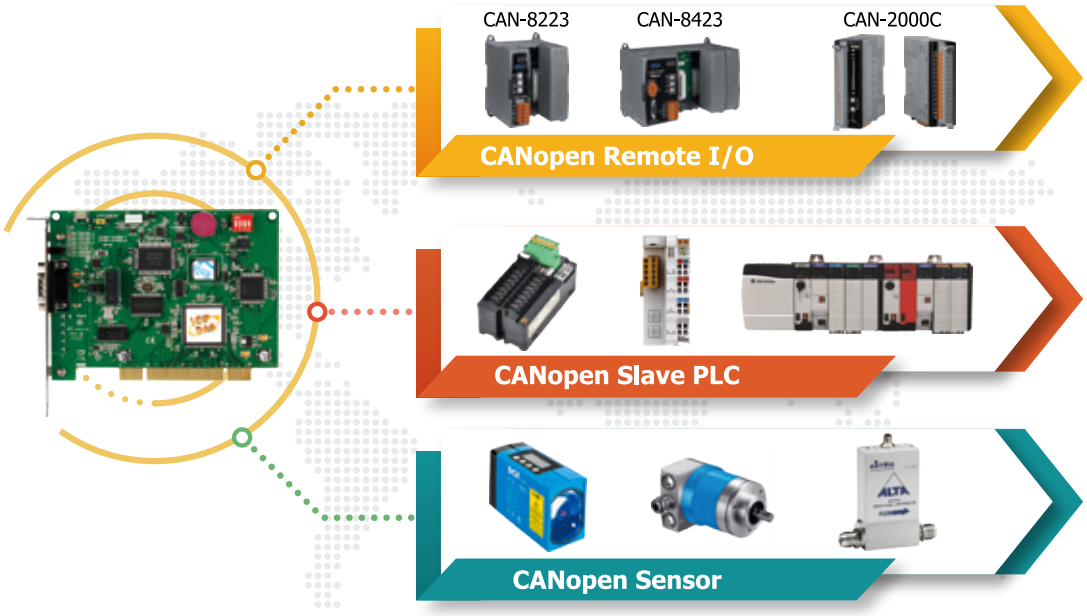
Module	Functional/Features	Applications
CAN Fieldbus Isolated I-7531-FD 	The I-7531-FD is a CAN/CAN FD signal repeater,which can connect two or more CAN networks with the same baud rate · users can use different numbers of Module to combine tree-shaped and star-shaped CAN network topology.	
CAN Fieldbus Bridge I-7532-FD 	I-7532M-FD is a CAN/CAN FD (CAN with Flexible Data-Rate) bridge · can extend communication distance, connect CAN/CAN FD networks with different baud rate.	

2.2 One Port Intelligent CANopen Master PCI Board

PISO-CPM100U

PISO-CPM100U is CANopen Master PCI card with a dedicated CPU with standalone CANopen firmware. It communicates with the PCI bus via DPRAM, significantly reducing system's overhead and providing a higher-performance control .It is suitable for real-time CANopen application architectures, supports the CANopen Motion Library, and serves as an intelligent CANopen master solution. It finds wide applications in factory automation, smart buildings allowing for the rapid development of CANopen control systems.

- Supports BoardID for multiple card recognition
- Support CANopen Motion Library
- Support both Node Guarding Protocol and Heartbeat Consumer Protocol
- Allow dynamic PDO mapping
- Provides SYNC signal timing function
- Supports message detection for device disconnections, EMCY messages, and more
- Support node id 1 ~ 127



Specification

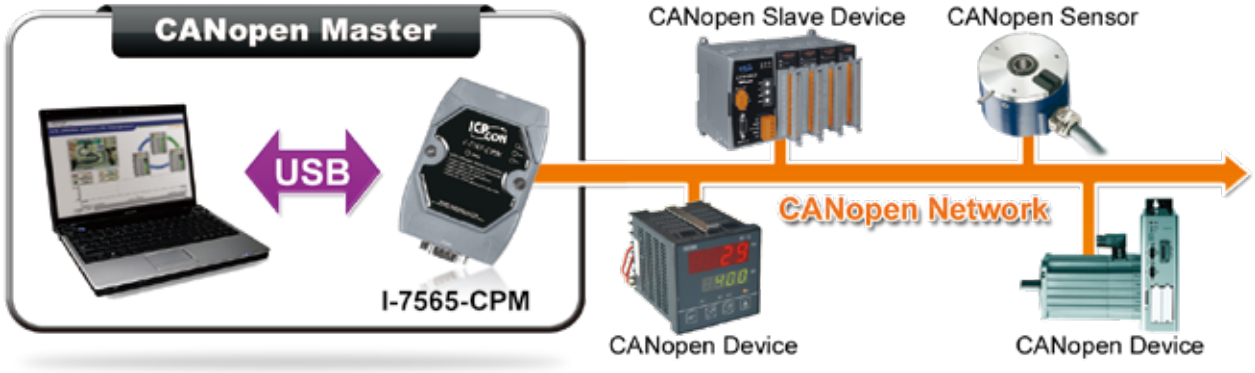
Model	PISO-CPM100U-D	PISO-CPM100U-T
Bus Interface	Support Universal PCI (33 MHz / 32-bit) 、By DIP switch Board No.	
CAN Bus Interface		
Channels	1	
CAN Transceiver	NXP 82C250	
Isolation/Terminal Resistor	2500 Vrms for photo-couple/Built-in 120 Ω terminal resistor	
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M	
Protocol	CANopen CiA-301 ver4.02	
Connector	9-pin male D-Sub (CAN_L, CAN_SHLD, CAN_H, N/A for others)	5-pin screwed terminal block (CAN_L, CAN_SHLD, CAN_H, N/A for others)
Software		
Driver	Windows XP / 7 / 8 / 10, Linux	
Library	VC++, C#.net, VB.net, Linux	

2.3 USB Interface CANopen Master Converter

I-7565-CPM

I-7565-CPM is a highly prominent CANopen application master solution, adhering to the CiA 301 specifications (such as SDO, PDO, NMT, SYNC, etc.). Furthermore, I-7565-CPM supports a variety of functions, including EDS file translation, Heartbeat, Guarding, Slave Boot-up, and EMCY event handling, making it particularly well-suited for portable diagnostic tools or master control units within CANopen networks.

- Support Node Guarding and Heartbeat protocol
- Support event trigger, such as EMCY event, Guarding event, Heartbeat event, and slave Boot-up events
- Support NMT, PDO, SDO, SYNC and EMCY protocol
- Provide dynamic PDO functions
- Provide SYNC signal timing function
- Support on-line adding and removing devices
- Support Auto-Search slave device functions
- Provide demos and utility
- Support EDS file
- Support node id 1 ~ 127
- Built-in 120Ω Terminal Resistor Jumper



Specification

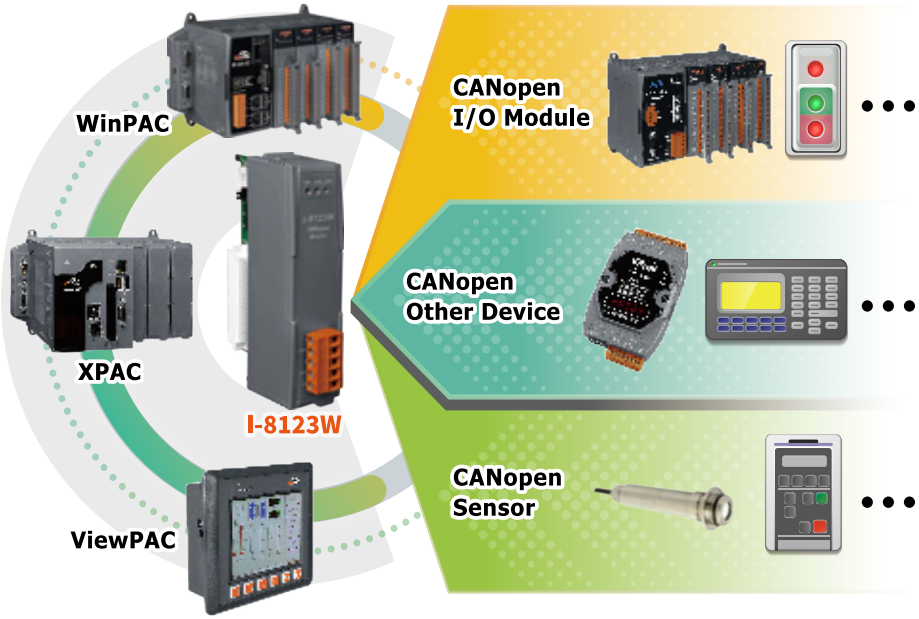
Model	I-7565-CPM
USB Interface	USB 1.1/2.0 Full Speed、921.6 kbps、Type B
CAN Bus Interface	
Channels	1
CAN Transceiver	NXP 82C250
Isolation/Terminal Resistor	2500 Vrms for photo-couple/Built-in 120 Ω terminal resistor
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M
Protocol	CANopen CiA-301 ver4.02
Connector	9-pin male D-Sub (CAN_L, CAN_SHLD,CAN_H, N/A for others)
Software	
Driver	Windows XP / 7 / 8 / 10, Linux
Library	VC++, C#.net, VB.net, Linux

2.4 High Performance Intelligent CANopen Master Module

I-8123W

I-8123W is a CANopen master expansion Module designed to work with XPAC, WinPAC, LinPAC, and other host series. It features a built-in CPU and connecting DPRAM and PCI bus with independent CANopen firmware, offering high-performance control for real-time CANopen applications. It supports CANopen Motion Library and finds wide applications in factory and building automation, as well as automated equipment for quick CANopen control system setup.

- Support CANopen Motion Library
- Support Node Guarding and Heartbeat Consumer error control. protocol
- Support event trigger, such as EMCY event, Guarding event, Heartbeat event, and Slave Boot-up events
- Support NMT, PDO, SDO, SYNC and EMCY protocol
- Provide Dynamic PDO
- Support SYNC protocol
- Support automatic search for slave devices
- Support node id 1 ~ 127
- Built-in 120Ω Terminal Resistor Switch



Specification

Model	I-8123W
CAN Bus Interface	
Channels	1
CAN Transceiver	NXP 82C250
Isolation/Terminal Resistor	2500 Vrms for photo-couple/Built-in 120 Ω terminal resistor
Baud Rate (bps)	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 M
Protocol	CANopen CiA-301 ver4.02
Connector	5-pin screwed terminal block（CAN_L, CAN_H, GND）
Software	
Driver	ViewPAC / WinPAC / XPAC
Library	CE6.0, CE7.0, WES7

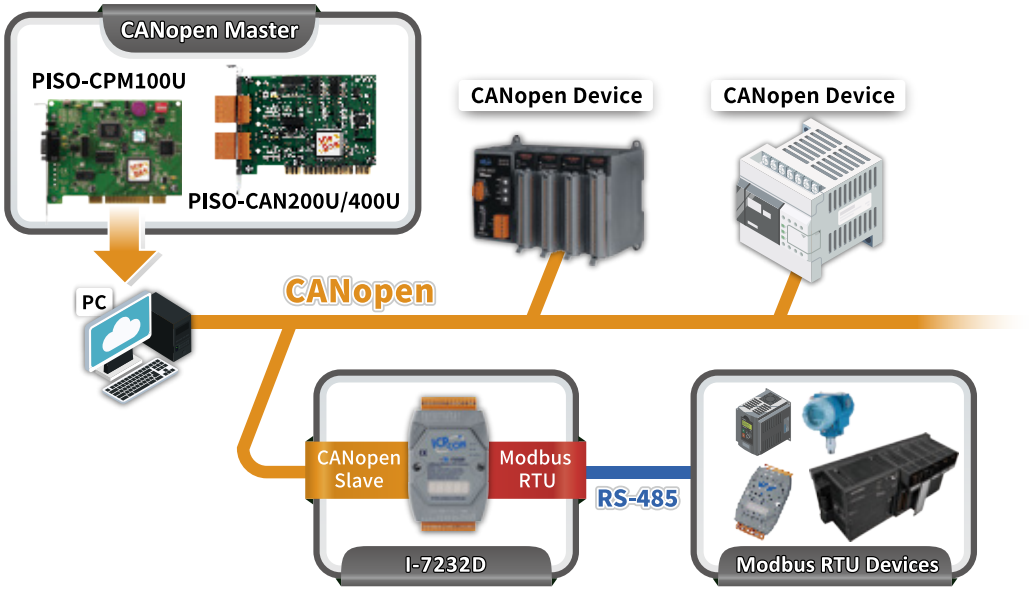
CH3 CANopen Protocol Gateway Series

3.1 CANopen Slave to Modbus RTU Master Gateway

I-7232D

I-7232D is a CANopen Slave (NMT Slave SDO PDO or User) Modbus RTU master gateway,enabling CANopen host devices to access Modbus Slave devices. I-7232D polls all default data from Modbus RTU slaves and simultaneously forwards control commands from the CANopen master to each Modbus Slave.I-7232D complies with CANopen CiA-301 v4.02 and CiA-401 v2.1 specifications, offering CANopen protocol features such as dynamic PDOs, EMCY safe,Cyclic, and Async cyclic. EDS files are provided through application tools, allowing users to easily apply I-7232D with standard CANopen master stations.

- PDO Modes : Event Triggered, Remotely requested, Cyclic and Acyclic SYNC
- Support Max 10 Modbus RTU series Modules
- Error Control: Node Guarding Protocol
- Emergency Message Support : Yes
- Produce EDS file Dynamically
- No. of SDOs: 1 Server, 0 Client
- NMT: Slave Modbus RTU Master



Specification

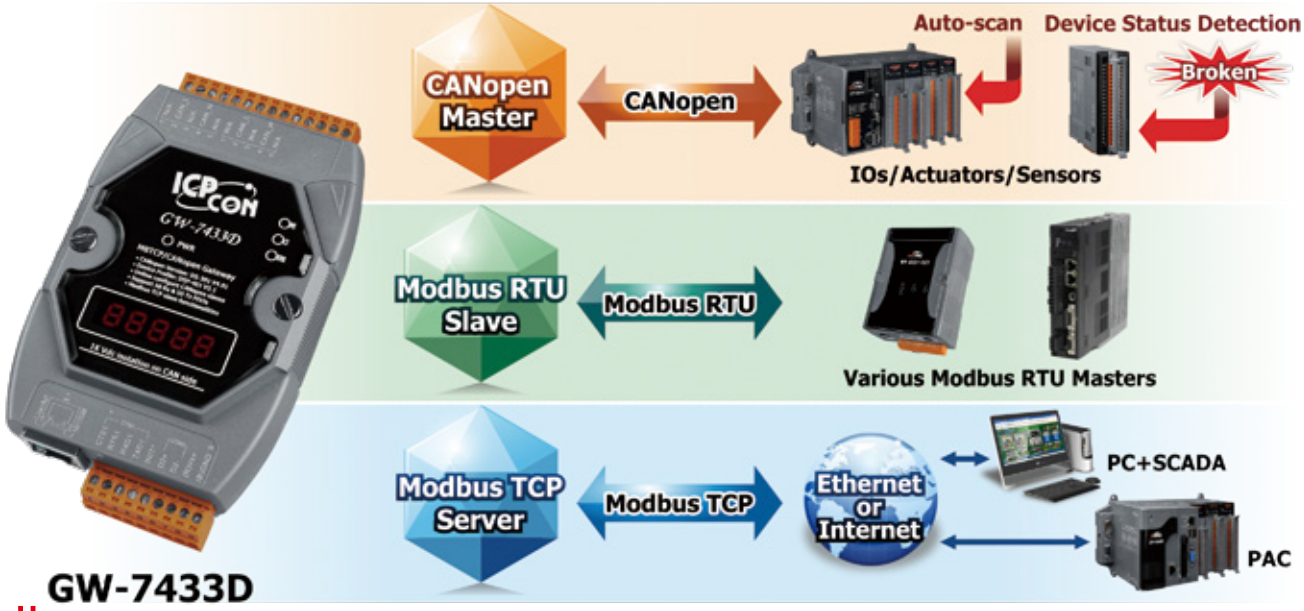
Model	I-7232D
Modbus Interface	
COM	RS-485 x 1, Modbus RTU Master
Baud Rate(bps)	1200 ~ 115200
CAN Bus Interface	
Channels	One CAN port, one crossover port
CAN Transceiver	NXP 82C250
Isolation/Terminal Resistor	2500 Vrms for photo-couple/Built-in 120Ω Terminal Resistor(Jumper Configurable)
Protocol	CANopen CiA-301 ver4.02
Power	
Power supply	+10 ~ +30 VDC, 3.0 W
Protection	Power reverse protection,Over-voltage brown-out protection

3.2 Modbus TCP/RTU Slave and CANopen Master Gateway

GW-7433D

GW-7433D is a solution designed to facilitate communication between Modbus and CANopen . Periodically consolidates messages from CANopen Slave and populates data into Modbus registers, awaiting inquiries from Modbus master. Modbus master can also send Output commands to the GW-7433D, which will then translate those Modbus Output commands into corresponding CANopen commands before forwarding them to the CANopen Slave devices. Also provides Modbus registers to record the operational status of the CANopen Slave , offering users a range of features for flexible application configuration.

- Allow Max 5 Modbus TCP clients to access GW-7433D
- Support up to 10 CANopen Slave devices
- Support more than 120 CANopen SDO/PDO commands
- Automatic connection with slaves
- PDO Modes: Event Triggered Cyclic and Acyclic
- Supporting Node Guarding and Heartbeat Consumer Agreements
- Supports NMT Master Commands
- Allow to get the CAN status by Modbus commands



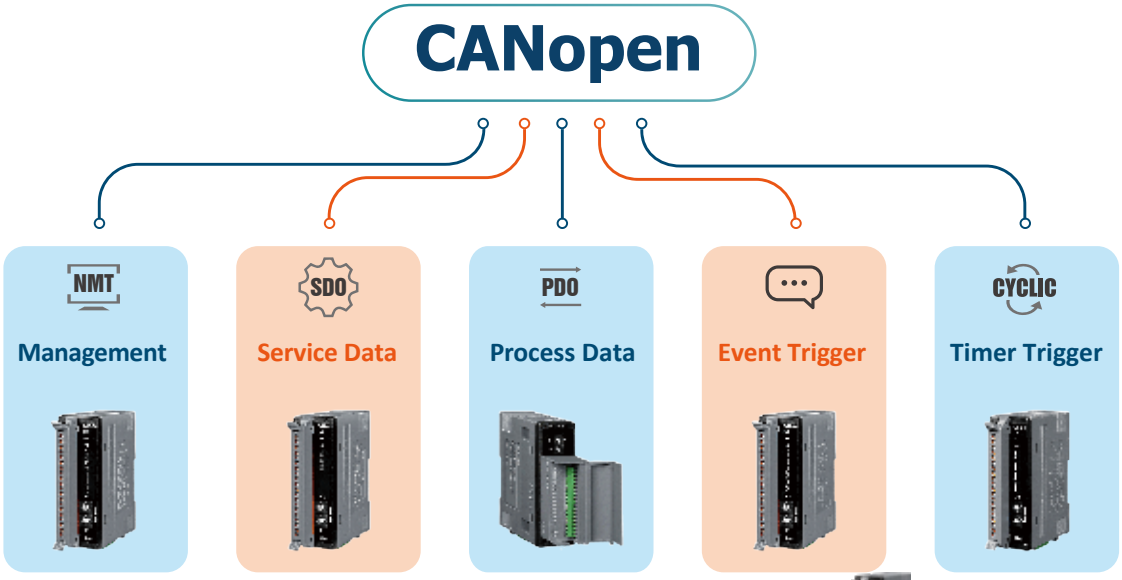
Specification

Model	GW-7433D
Modbus Interface	
Com Ports	RS-485 x 1, Modbus RTU Slave
Ethernet port	10/100 Base-Tx, Modbus TCP Server
Function Code	01, 02, 03, 04, 05, 06, 15, 16
CAN BusInterface	
Channels	One CAN port, one crossover port
CAN Transceiver	NXP 82C250
Isolation/Terminal Resistor	2500 Vrms for photo-couple/Built-in 120Ω Terminal Resistor (Jumpe Configurable)
Protocol	CANopen CiA-301 ver4.02
Power	
Power supply	+10 ~ +30 VDC, 2.5 W
Protection	Power reverse protection,Over-voltage brown-out protection

CH4 CANopen Remote IO Series

Advantages of CANopen I/O Modules

CAN-2xxxC and CAN-8x23 series are CANopen I/O Modules that adhere to the CANopen specifications CiA-301 and CiA-401. They allow the sensors or actuators (such as switches, relays, or valves) into a CANopen network. These I/O Modules offer Digital and Analog Input , can be combined with sensors for temperature, pressure, flow, etc. The Input data from CANopen I/O Modules can trigger events or Timer Trigger based on timers. Each I/O Module provides EDS files compliant with the CANopen master interface communication standard. These EDS files describe the CANopen communication objects supported by the I/O Module, including Object Dictionary, SDO, PDO SYNC, and more. CANopen masters to easily access the status of digital Input or Output channels.



4.1 Multifunction I/O Module

Model	Analog Input		Analog Output		Digital Input		Digital Output	
	Channels	Input Range	Channels	Output Range	Channels	Contact	Channels	Type
CAN-2026C	6	±10 V, ±5 V, ±1 V, ±500 mV, ±150 mV, ±20 mA (with external 125 Ω resistor)	2	0 ~ +5 V, ±5 V, 0 ~ +10 V, ±10 V	2	Wet, Sink	1	Open Collector, CAN-2026D DeviceNet Sink

4.2 Digital I/O Modules

Model	Digital Input			Digital Output		
	Channels	Contact	Sink/Source	Channels	Type	Sink/Source
CAN-2053C	16	wet	Sink/Source	-	-	-
CAN-2054C	8	wet	Sink/Source	8	Open Collector	Sink
CAN-2055C	8	wet	Sink/Source	8	Open Source	Source
CAN-2057C	-	-	-	16	Open Collector	Sink
CAN-2060C	4	wet/Dry	Sink/Source	4	Relay	Form A, 5A

4.3 Analog I/O Modules

Model	Analog Input			Output Input	
	Channels	Input Range	Sensor	Channels	Output Range
CAN-2015C	8	-	RTD (Pt100, Pt1000, Ni120, Cu100, Cu1000, Pt100)	-	-
CAN-2017C	8	±10 V, ±5 V, ±1 V, ±500 mV, ±150 mV, ±20 mA (with external 125 Ω resistor)	-	-	-
CAN-2018C/S	8	±2.5 V, ±1 V, ±500 mV, ±100 mV, ±50 mV, ±15 mV, ±20 mA (with external 125 Ω resistor)	Thermocouple (J, K, T, E. R. S, B, N, C)	-	-
CAN-2019C/S CAN-2019C/S2	10	±10 V, ±5 V, ±2.5 V, ±2 V, ±500 mV, ±100 mV, ±50 mV, ±15 mV, ±20 mA (with external 125 Ω resistor)	Thermocouple (J, K, T, E. R. S, B, N, C)	-	-
CAN-2024C	-	-	-	4	0 ~ +5 V, ±5 V, 0 ~ +10 V, ±10 V, 0 ~ 20 mA, 4 ~ 20 mA

4.4 Counter/PWM Modules

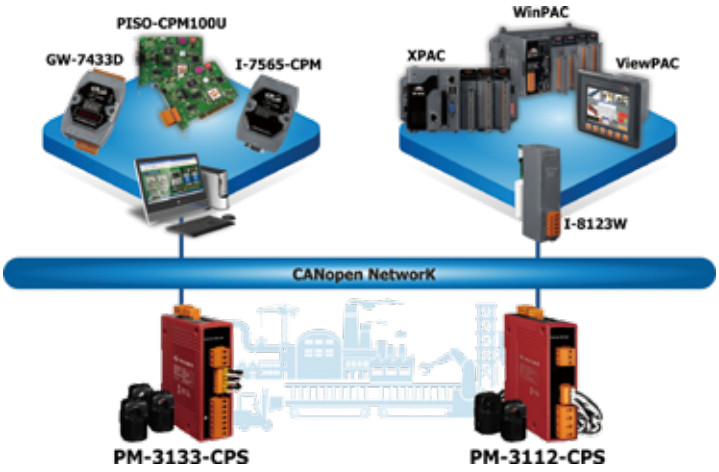
Model	Counter Input				PWM Output			
	Channels	Signal	Resolution	Speed	Channels	Load Current	Resolution	Speed
CAN-2084C	4 / 8	Up, Up/Down, Dir/Pulse, A/B phase, Frequency	32 bit	250 kHz	-	-	-	-
CAN-2088C	8	Up Counter	32 bit	500 kHz	8	1 mA	16 bit	500 kHz

4.5 Remote I/O Unit

Model	Product Description
CAN-8123-G	CANopen Remote I/O Unit with 1 I/O Slot
CAN-8223-G	CANopen Remote I/O Unit with 2 I/O Slots
CAN-8423-G	CANopen Remote I/O Unit with 4 I/O Slots
CAN-8823-G	CANopen Remote I/O Unit with 8 I/O Slots

4.6 CANopen Smart Power Meter

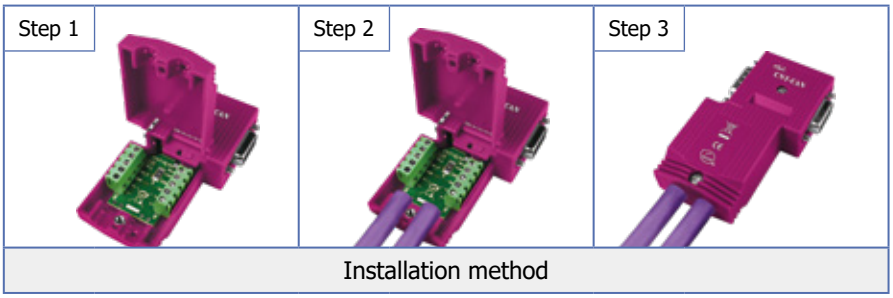
PM-3xxx-CPS series of smart electric meters, with high precision (<1%, PF=1), collect real-time power system data through the CANopen interface. They are suitable for low-voltage primary and medium/ high-voltage secondary sides, providing reliable energy consumption data for real-time equipment monitoring. The CANopen data mode supports both polling and automatic response, enhancing efficiency in large-scale power monitoring systems.



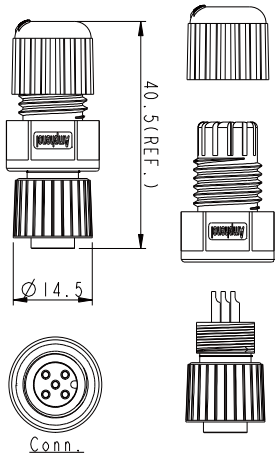
Model	Phase	Loop	Bi-dir. Energy	CT Included	Max. Voltage	Max. Current	Max. CT ID	Cable Length
PM-3112-xxx-CPS	Single	2	N/A	Yes	300 V	200 A	24 mm	1.8 m
PM-3114-xxx-CPS		4						
PM-3033-CPS	Three	1	Yes	N/A	500 V	5 A	N/A	N/A
PM-3133-xxx-CPS	Three	1	Yes	Yes	500 V	400 A	36 mm	1.8 m
PM-3133-xxxP-CPS								4 m
PM-3133-RCTxxxP-CPS	Three	1	Yes	Yes	500 V	4000 A	185 mm	4 m
PM-4324-xxxP-CPS	Phase	24/8	Yes	Yes	500 V	400 A	36 mm	4 m

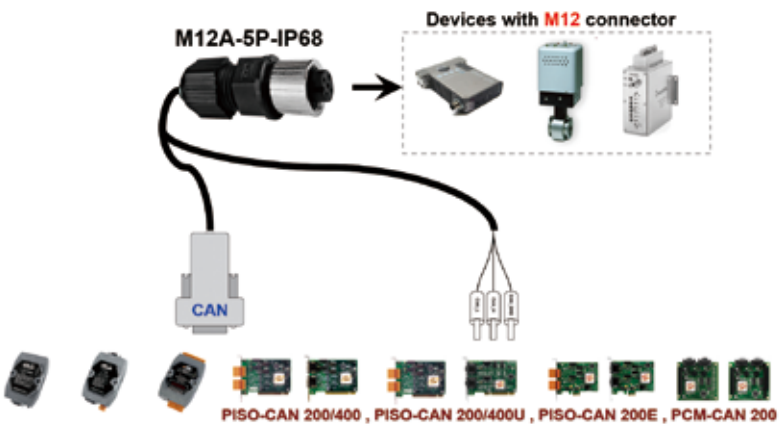
4.7 Accessories

Optional CAN bus connector : CNT-CAN



Optional CAN bus connector : M12A-5P-IP68





CH5 Applications

5.1 CANopen Motorized Surgical Table with Motion Control

In modern operating rooms, various surgical needs must be met with reliable medical equipment surgical procedures by healthcare professionals. Ergonomically surgical beds ensure comfort and safety during surgery. In addition to accommodating healthcare providers, can help assist patients in adjusting to various positions for the convenience of the procedure. Furthermore, they should feature emergency power-off brakes and protection against inadvertent movements due to high-voltage electric shock.

Features

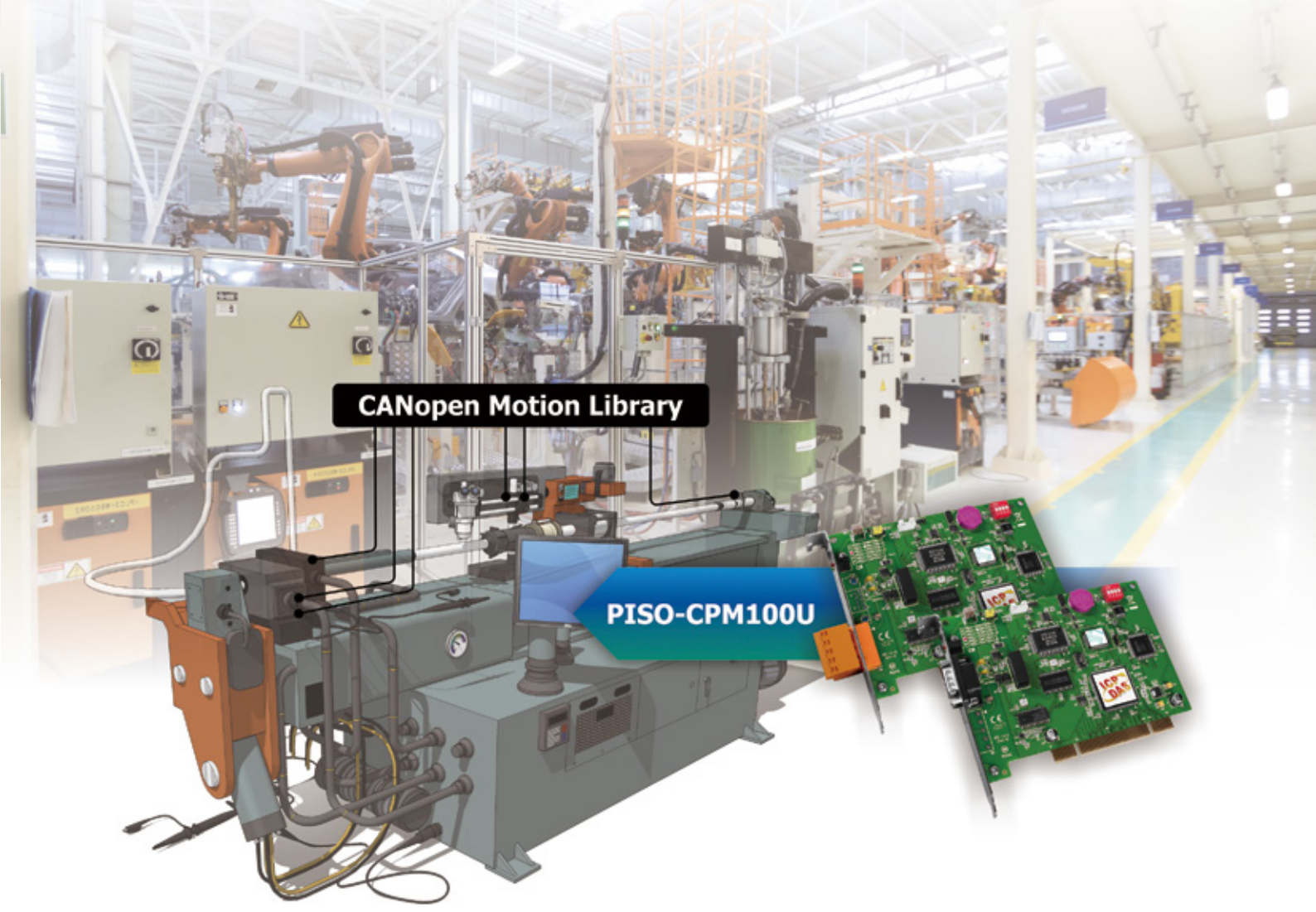
- I-7232D decodes RS-485 remote control commands and controls motor motion via CANopen, effectively mitigating noise interference to prevent motor errors.
- Supports position setting and motor synchronization, allowing surgical table to move while keeping specific patient areas steady. enables versatile scanning from various angles to examine the disease source.
- Achieving bed surface tilt at 0.8 degrees per second with precise 2mm positioning control.

5.2 Large Pipe Bending Equipment with CANopen Motion Control

With the trend towards precision machine design, metal processing demands higher accuracy and fewer defects. However, this comes with increased machine complexity and costs. The controller for this bending machine was originally designed with PLC, but now, with the adoption of an industrial computer-based control framework using PISO-CPM100U CANopen motion control, it has significantly reduced control complexity, enhancing the overall cost-effectiveness of the machine.

Features

- Machine motors utilize decentralized CANopen motion control.
- The system empowers the machine with the capability to extend control actions over longer and larger scales.
- The control software adapts flexibly to different axis configurations, reducing program variations among machine models and speeding up development.
- Simplifies maintenance and management of motion control projects.

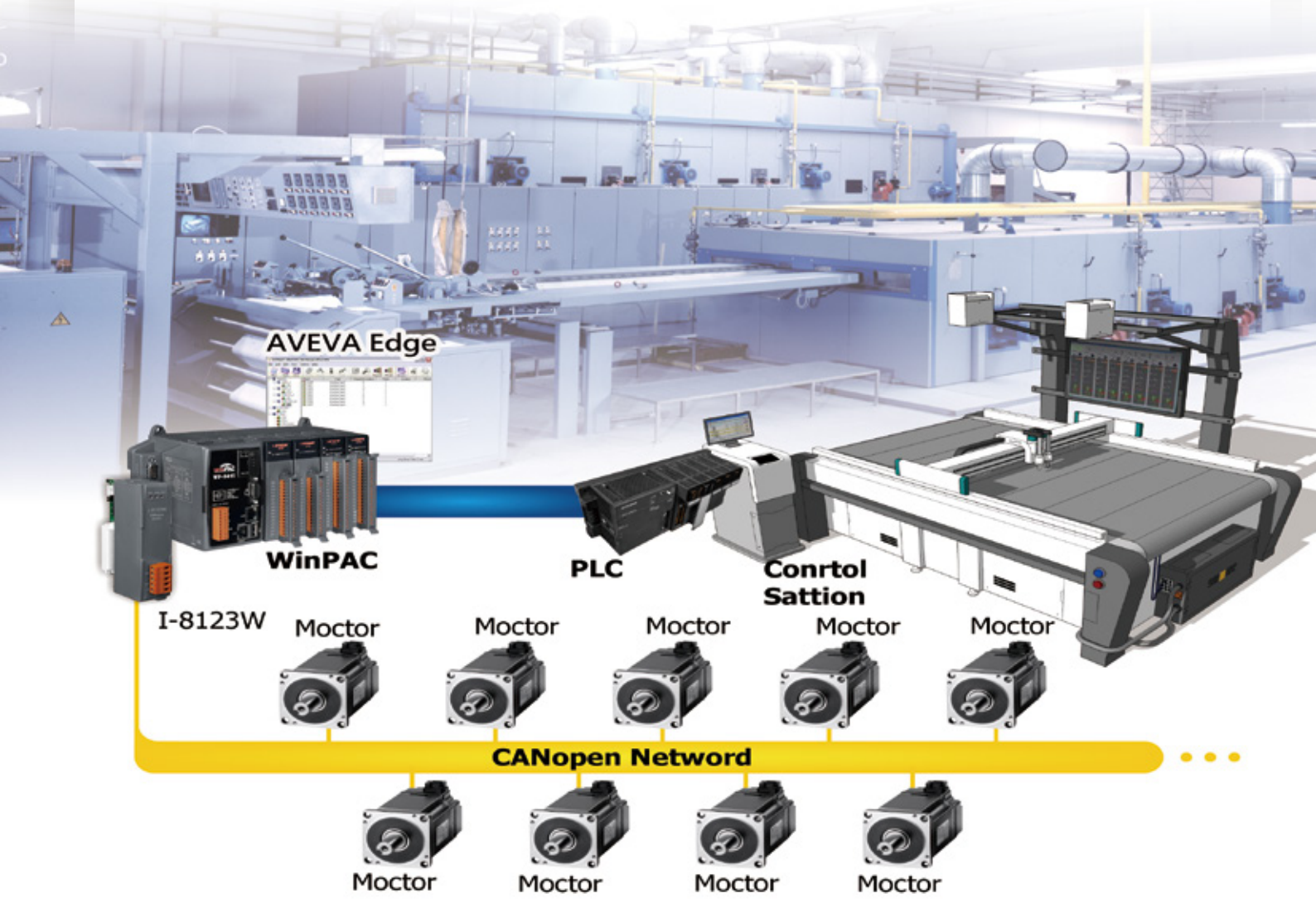


5.3 Corrugated paper cutting machine

In corrugated board production machinery, due to various requirements such as creasing and cutting lines, coupled with the fact that most factories handle orders for corrugated boards in multiple sizes and shapes, there are often dozens of motors that require precise control. While using servo motors in conjunction with axis cards can ensure fast and simultaneous motor movements to avoid collisions during blade operations, it comes at a correspondingly high cost and introduces complex wiring, making subsequent maintenance challenging. By adopting motors controlled via the CANopen protocol, it is possible to achieve the same synchronized motor movements while also considering cost reduction.

Features

- No need for axis cards, reducing setup costs.
- Simplified wiring and maintenance using a single CANopen Master port to connect multiple motors via two communication lines, CAN_H and CAN_L.
- Synchronized control enables all motors to move simultaneously without any time lag.

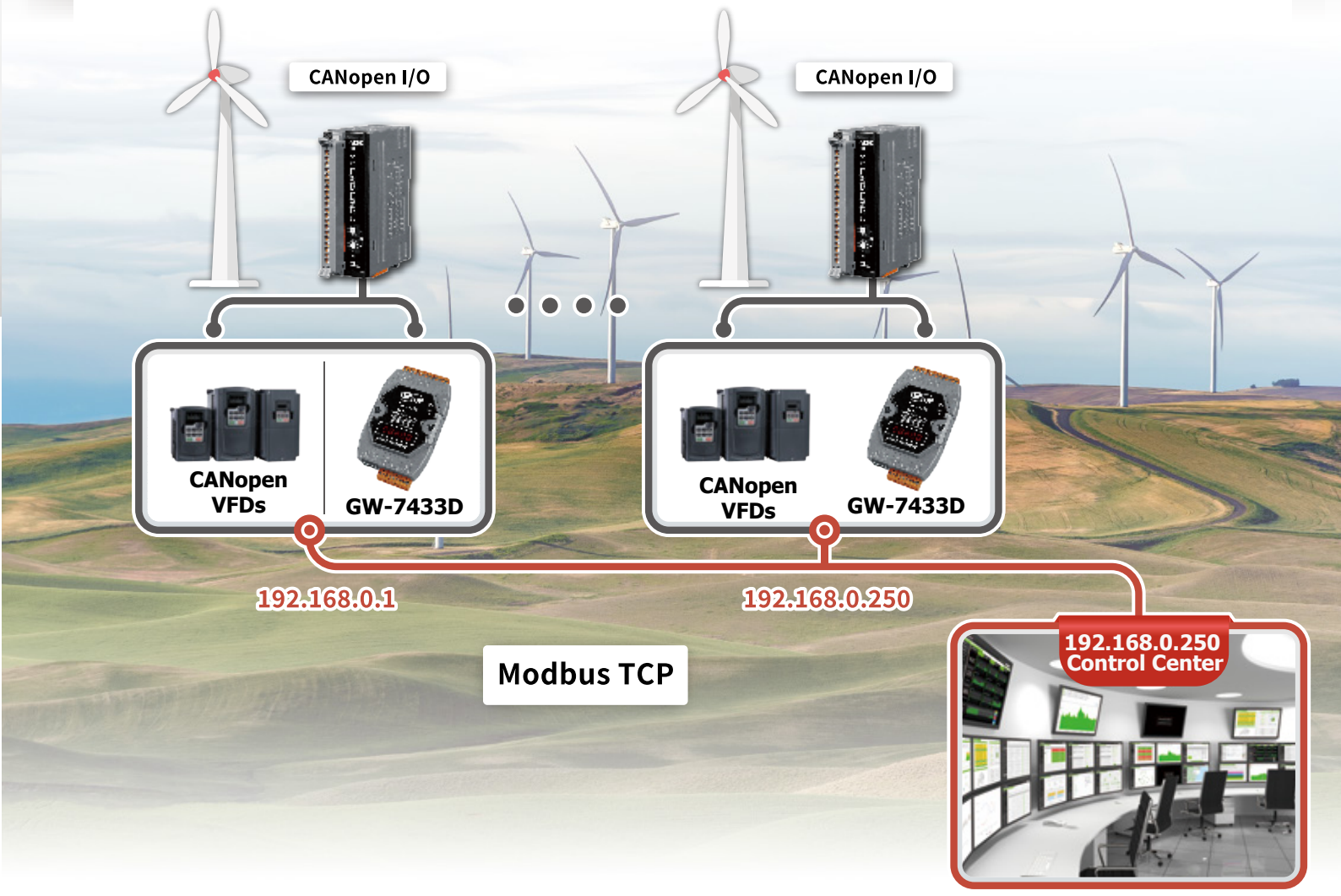


5.4 Wind Power Generation Control

After the greenhouse effect became increasingly evident, renewable energy technology has become a key focus of development for many countries. Among them, wind power generation, which offers a higher cost-effectiveness, is the preferred choice for most nations. However, due to the enormous generators in wind turbines, powerful electromagnetic interference is also generated during the electricity generation process. Monitoring a large number of wind turbines with strong interference remotely is a significant challenge.

Features

- Internal wind tower equipment, including variable frequency units, uses robust CANopen communication with strong interference resistance.
- Each wind tower is equipped with a GW-7433D gateway, allowing the control center to monitor the CANopen variable frequency units inside the wind tower using Modbus TCP commands.

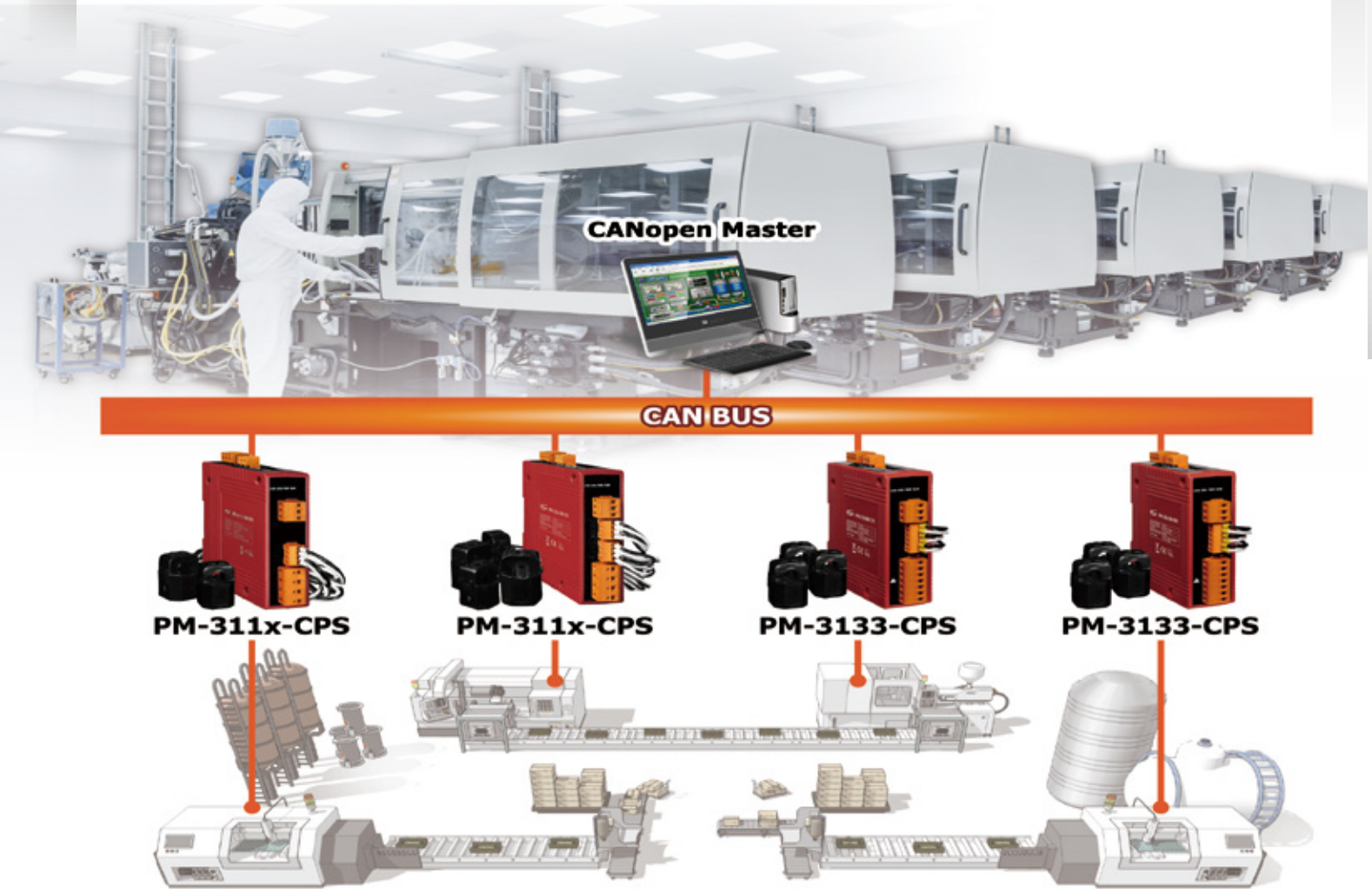


5.5 CANopen Smart Power Meter

The manufacturing industry is highly dependent on electrical energy, and as electricity costs continue to rise, the issue of energy conservation in factories becomes increasingly important. If we can monitor the power consumption of each machine in the factory and keep longterm records, we can identify which machines consume the most power and when energy is being wasted. This information allows businesses to determine where to focus their energy-saving efforts for an efficient conservation plan.

Features

- Installing the PM-3133-CPS meter Module to monitor real-time power usage in high-consumption machines.
- The CANopen Master accesses and collects extensive remote power-related data from the PM-3133-CPS meter Module.
- User can use this power data to gain understanding of the power consumption patterns of individual equipment, allowing for early intervention in machines with abnormal power consumption, thereby achieving energy-saving objectives.



Industrial Fieldbus

- BACnet
- EtherNet/IP
- PROFINET
- PROFIBUS
- CAN bus
- CANopen
- DeviceNet
- J1939
- HART
- M-Bus
- Wi-Fi

PC-based I/O Boards

- PCI Express Bus Data Acquisition Boards
- PCI Bus Data Acquisition Boards
- ISA Bus Data Acquisition Boards
- Special Function Card
- Wiring Terminal Blocks and Parts

Energy Management Solution

- InduSoft SCADA
- Power Meter Concentrator
- IIoT PMC with Display
- Three-phase Smart Power Meter
- Single-phase Smart Power Meter
- Multi-circuit Smart Power Meter
- True RMS Input Modul
- Smart Power Meter with LED Display

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