

I/O Expansion Units



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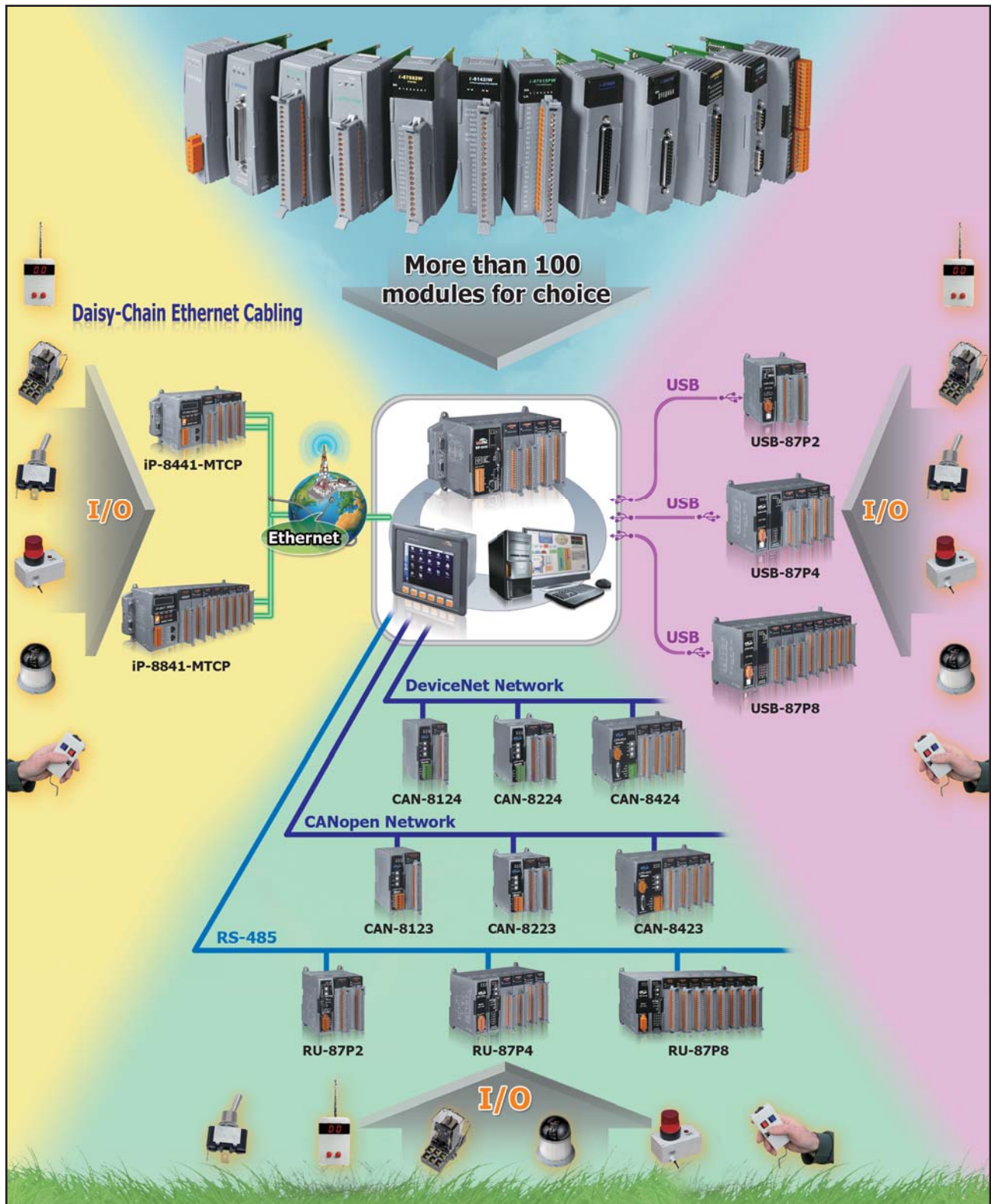
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6.1. I/O Expansion Units Overview

• Overview

ICP DAS launches a series of remote I/O unit for industrial monitoring and controlling applications. With the auto configuration and hot swap features, the unit can eliminate your nightmare of extensive labor on the set-up and maintenance of the automation system. The available I/O modules are also highly flexible and compatible for every kind of application to reduce your inventory of different types of I/O modules. Furthermore, there are various communication interface and protocols for choice in various remote I/O applications.



6.2. RS-485 I/O Expansion Unit



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 non-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.

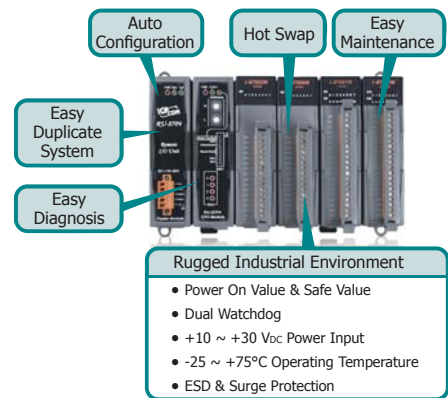
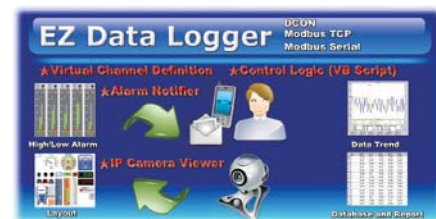
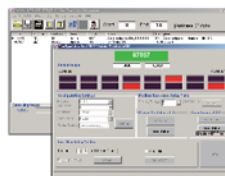
5. Communication

- 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.

6. Fully Software Support

The free charge software utility and development kits include

- A: DCON Utility: for configuration
- B: OPC Servers:
OPC is an industrial standard interface based on OLE technology. With the OPC server, I/O modules can be easily integrated to any software that has OPC client capability.
- C: EZ Data Logger
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.
- D: Various Software Develop Toolkits
DLL, ActiveX, Labview driver, Indusoft driver, DasyLab driver, Linux driver





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



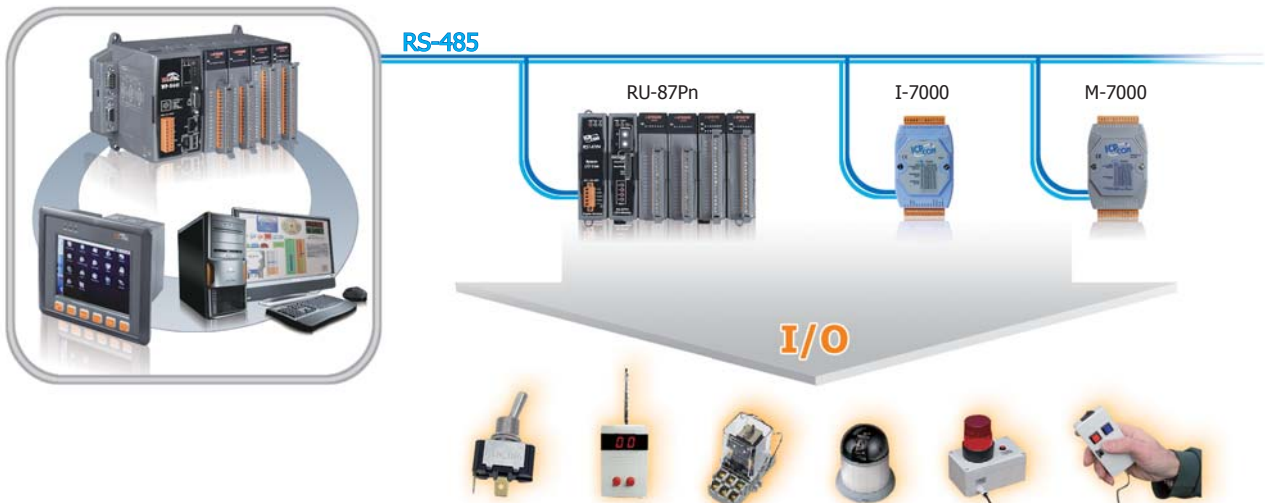
Introduction

RU-87Pn is an unit to expand I/O via the RS-485. 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). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: hot swap allowed, auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

There are more than 30 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules. We provide various software development kits (SDK) and demos, such as DLL, ActiveX, Labview driver, InduSoft driver, Linux driver, OPC server, etc. The I-87K series I/O modules plugged in the RU-87Pn can be easily integrated into variant software system.

Applications

Rich I/O Expansion Ability

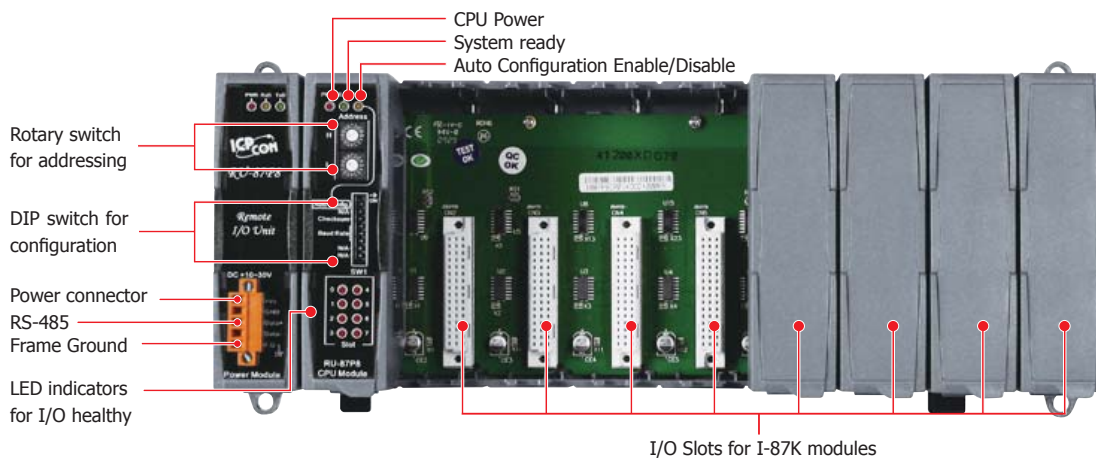


Specifications

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 V _{oc}			
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 x 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 V _{oc}			
Reverse Polarity Protection	Yes			
Isolation	1000 V _{oc}			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	30 W

Appearance

RU-87P8



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)

Accessories

DP-660	24 V _{oc} /2.5 A, 60 W and 5 V _{oc} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{oc} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{oc} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{oc} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)

6.3. Modbus TCP I/O Expansion Unit

• Introduction

Modbus is a communication protocol developed by Modicon in 1979 for linking devices with Modicon PLCs using a master/slave relationship. Different versions of Modbus today include Modbus RTU, Modbus ASCII and Modbus TCP. Where Modbus RTU and ASCII are based on serial communication like RS-232 and RS-485, and Modbus TCP is based on Ethernet communication. It's a standard, truly open and widely used in industrial automation field.

The iP-8000-MTCP series is an I/O unit with Modbus protocol. It supports most of high profile I-8K and I-87K series I/O modules. SCADA and HMI software can easily access variant I/O signals via the iP-8000-MTCP.

• Features

- Modbus TCP on two independent LAN ports
- Modbus RTU/ASCII on COM ports



- I/O Slots for high profile I-8K and I-87K series I/O modules

• Auto Configuration

The configurations of I/O modules are backed up in the EEPROM of the iP-8000-MTCP. The iP-8000-MTCP automatically checks and restores the configurations to each I/O modules during booting procedure. If one I/O module fails, the operator just needs to replace it with another one. And then check the LED indicators to know whether the auto configuration is performed correctly.



• Firmware Programmable

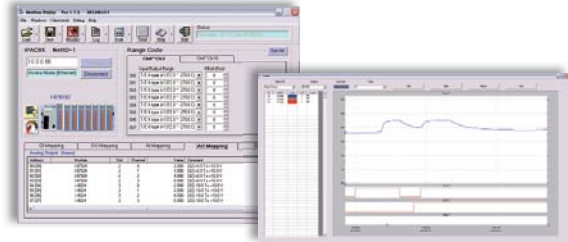
The iP-8000-MTCP is not just an I/O unit but also a programmable controller. Programmers can use the Modbus SDK to customize the firmware in C language.

• Modbus Utility

The Modbus Utility package is for Windows 98/2K/XP/7. It includes

• Modbus Utility

1. Configure I/O Modules and COM ports
2. Generate Modbus register mapping table of I/O modules
3. Online monitor
 - Control/Monitor I/O module
 - With trend line and table viewing
 - Automatically log I/O value to a .txt file

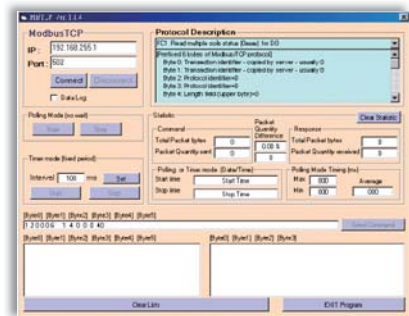


MBRTU

- Modbus RTU client (with source code in VB6) to diagnostic Modbus RTU slave devices.

MBTCP

- Modbus TCP client (with source code in VB6) to diagnostic Modbus TCP slave devices.



• Modbus SDK

We provide Modbus SDK to users. You can use it to integrate several serial devices.

	Modbus lib	nModbus dll	
Platform	MiniOS7	Windows 2k/XP/7	WinCE 5.0/6.0
Development Language	Borland C, Turbo C	C# .NET 2005/2008 VB .NET 2005/2008	
Purpose	To customize the firmware of iP-8000-MTCP	To develop a program on PC based controllers to access the iP-8000-MTCP	
Feature		Modbus RTU/ASCII: Master/Slave Modbus TCP/UDP: Master/Slave	



NEW IP-8441-MTCP

NEW IP-8841-MTCP

Features

- 80186, 80 MHz CPU
- 2 independent Ethernet ports
- Supports Modbus TCP
- Supports Modbus RTU/ASCII
- Supports Modbus TCP to RTU Gateway
- Auto Configuration
- 4/8 I/O Slots for I-8K and I-87K Series Modules
- Operating Temperature: -25 ~ +75°C



Introduction

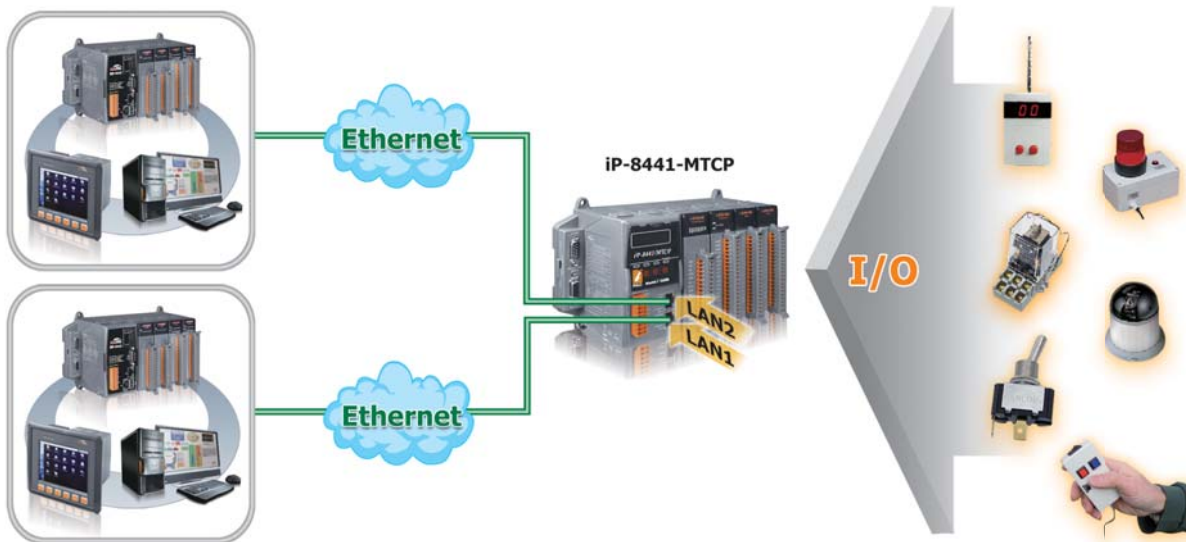
iP-8000-MTCP is an unit to expand I/O via the Ethernet. There are more than 50 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules.

It is designed to be used in harsh and noisy environment, so the hardware is manufactured with wide power input range (10 ~ 30 V_{DC}), isolated power input and can operate under wide temperature (-25 ~ +75°C). 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 built-in 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.

Further more, the iP-8000-MTCP is also a c language based programmable controller that equipped a DOS-like OS (MiniOS7). Programmers can use C compilers that can create 16 bit executable file (*.exe) to customize the Modbus firmware which preinstalled in the iP-8000-MTCP. The SDK provides rich functions for Modbus communication, such as Modbus TCP master/slave, Modbus RTU master/slave, Modbus ASCII master/slave, etc.

Applications



Specifications

Models	iP-8441-MTCP	iP-8841-MTCP
System Software		
OS	MiniOS7 (DOS-like embedded operating system)	
Program Download Interface	RS-232 (COM1) or Ethernet	
Programming Language	C language	
Compilers to create.exe Files	TC++ 1.01 TC 2.01 BC++3.1 ~ 5.2x MSC 6.0 MSVC++ (before version 1.5.2)	
CPU Module		
CPU	80186, 80 MHz	
SRAM	768 KB	
Flash	512 KB (100,000 erase/write cycles) with Flash protection switch	
Expansion Flash Memory	microSD socket (can support 1/2 GB microSD)	
Dual Battery Backup SRAM	512 KB; data valid up to 5 years	
EEPROM	16 KB	
NVRAM	31 bytes (battery backup, data valid up to 5 years)	
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year	
64-bit Hardware Serial Number	Yes, for Software Copy Protection	
Watchdog Timers	Yes (0.8 second)	
NET ID	8-pin DIP switch to assign NET ID as 1 ~ 255	
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 0	Internal communication with the high profile I-87K series modules in slots	
COM 1	RS-232 (to update firmware) (Rx/D, Tx/D and GND); non-isolated	
COM 2	RS-485 (Data+, Data-) with internal self-tuner ASIC; 3000 V _{DC} isolated	
COM 3	RS-232/RS-485 (Rx/D, Tx/D, CTS, RTS and GND for RS-232, Data+ and Data- for RS-485); non-isolated	
COM 4	RS-232 (Rx/D, Tx/D, CTS, RTS, DSR, DTR, CD, RI and GND); non-isolated	
SMMI		
LED Display	Yes, 5-Digit	
Programmable LED Indicators	3	
Push Buttons	4	
Buzzer	Yes	
I/O Expansion Slots		
Slot Number	4	8
	Note: For High Profile I-8K and I-87K Modules Only	
Data Bus	8/16 bits	
Address Bus Range	2 K for each slot	
Mechanical		
Dimensions (W x L x H)	231 mm x 132 mm x 111 mm	355 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 V _{DC}	
Isolation	1 kV	
Redundant Power Inputs	Yes, with one power relay (1 A @ 24 V _{DC}) for alarm	
Capacity	30 W	30 W
Consumption	6.7 W	7.2 W

Ordering Information

iP-8411-MTCP	4 slots I/O Expansion Unit with Modbus TCP protocol
iP-8841-MTCP	8 slots I/O Expansion Unit with Modbus TCP protocol

Accessories

DP-660	24 V _{DC} /2.5 A, 60 W and 5 V _{DC} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{DC} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
I-7560 CR	USB to RS-232 Converter (RoHS)
3LMSD-2000 CR	2 GB microSD card (RoHS)

6.4. USB I/O Expansion Unit



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

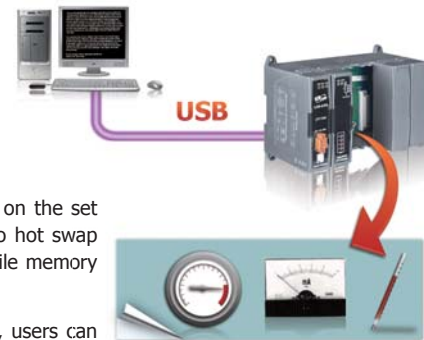
Introduction

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

- A CPU module with non-volatile memory to backup/restore I/O module configurations; LED indicators to diagnose the I/O module; and a USB port for 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 USB-87Pn. After hot-swapping a module, all settings are automatically loaded to recover.

Furthermore, with the USB 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 USB-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 USB-87Pn. When the USB-87Pn is power on or plugged in, the USB-87Pn will automatically checks and restores these configurations to each I-87K I/O modules on it.

3. Easy Diagnosis System

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

4. Easy Maintenance and Diagnosis

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 LED indicator design makes it easy for maintenance. There is no PC and Notebook needed.

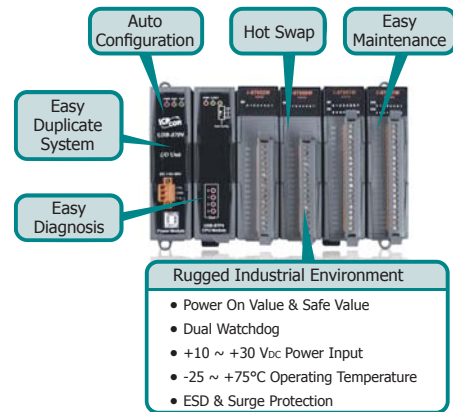
5. Communication

- **USB network**
The USB network connects the USB-87Pn to regular PC and notebook without any other media converter.
- **DCON protocol**
I-87K series I/O modules plugged in a USB-87Pn provides a simple command/response protocol (named DCON protocol) for communication. All command/response are in easy use ASCII format.

6. Fully Software Support

The free charge software utility and development kits include

- A: DCON Utility: for configuration
- B: OPC Servers:
OPC is an industrial standard interface based on OLE technology. With the OPC server, I/O modules can be easily integrated to any software that has OPC client capability.
- C: EZ Data Logger
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.
- D: Various Software Develop Toolkits
DLL, ActiveX, Labview driver, Indusoft driver, DasyLab driver, Linux driver





Features

- One USB Port
- Hot Swap Allowed
- Auto Configuration
- LED Indicators for Fault Detection
- DCON Protocol
- 1/2/4/8 I/O Slots for I-87K Modules
- Operating Temperature: -25 ~ +75°C



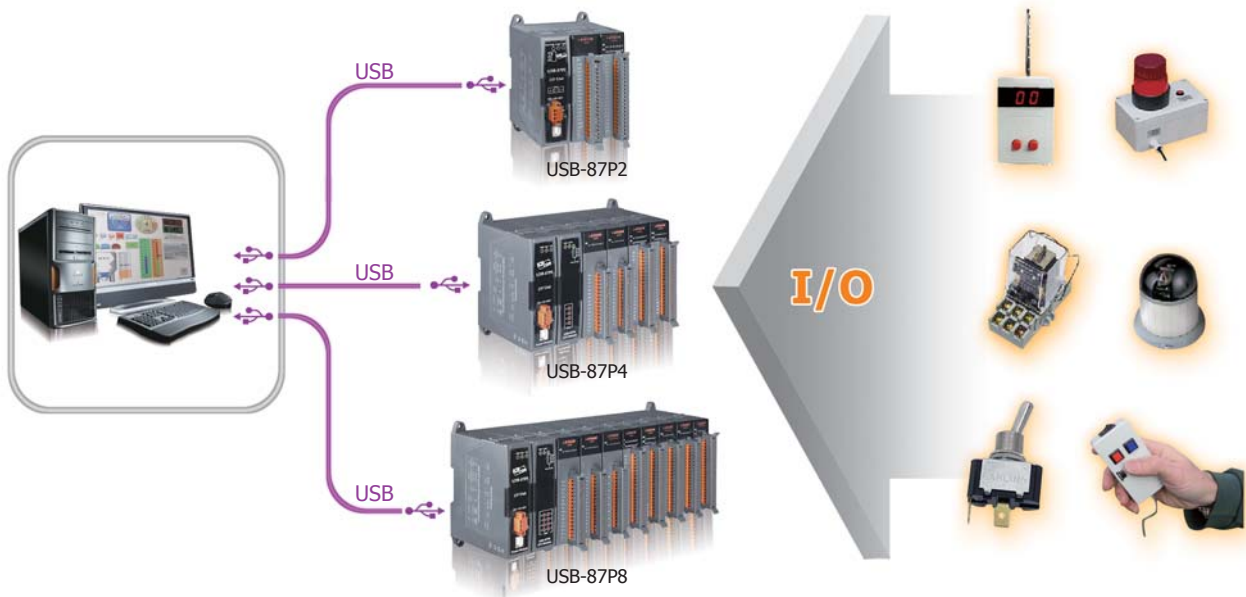
Introduction

USB-87Pn is an unit to expand I/O via the USB. 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). To simplify installation and maintenance of I/O modules, it provides many useful features, such as: hot swap allowed, auto configuration, LED indicators for fault detection, dual watchdog to keep alive, programmable power on and safe values for safety.

There are more than 30 I/O modules supported with the unit, including analog input/output, digital input/output, counter, frequency I/O modules. We provide various software development kits (SDK) and demos, such as DLL, ActiveX, Labview driver, InduSoft driver, Linux driver, OPC server, etc. The I-87K series I/O modules plugged in the USB-87Pn can be easily integrated into variant software system.

Applications

Rich I/O Expansion Ability

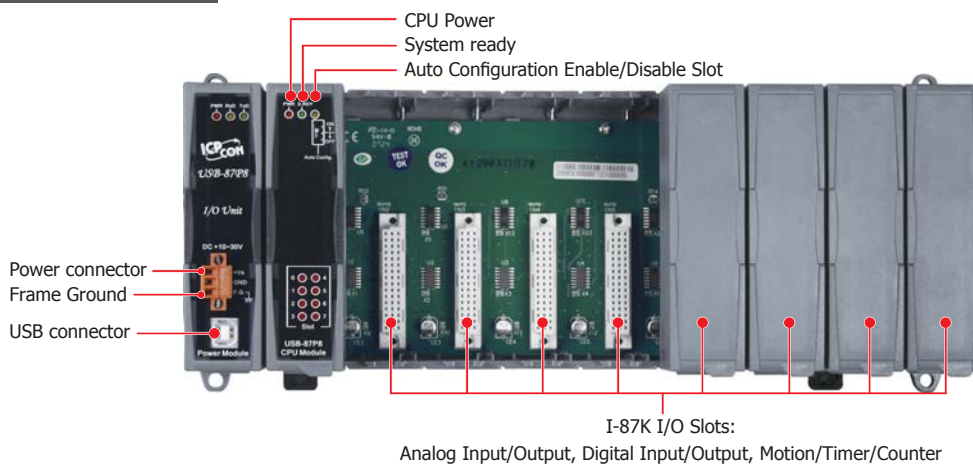


Specifications

Models	USB-87P1	USB-87P2	USB-87P4	USB-87P8
Interface Type (Full speed with USB 1.1 specifications)				
Cable	USB type A connector			
Baud Rate	115200 bps Default			
Isolation	3000 V _{dc}			
ESD Protection	+/-4 K Contact Discharge and +/-8 K Air Discharge			
Communication Protocol	DCON Protocol (ASCII Format)			
Switch				
DIP Switch	1-bit x 1, For auto configuration			
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 V _{dc}			
Reverse Polarity Protection	Yes			
Isolation	1000 V _{dc}			
Frame Ground	Yes			
Consumption	1 W	1 W	2 W	2.4 W
Power Board Driving	5 W	8 W	30 W	

Appearance

USB-87P8



Ordering Information

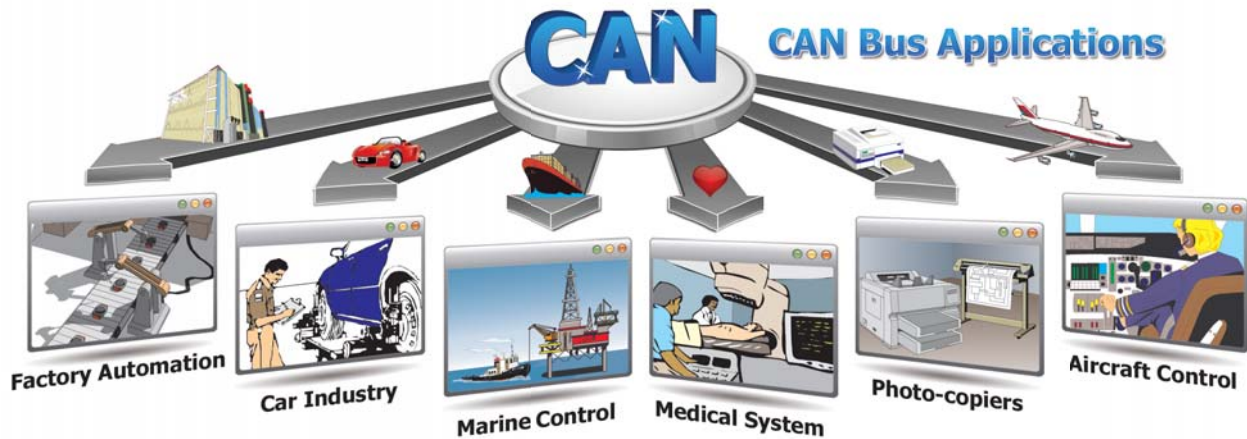
USB-87P1 CR	1 slot I/O Expansion Unit (RoHS)
USB-87P2 CR	2 slots I/O Expansion Unit (RoHS)
USB-87P4 CR	4 slots I/O Expansion Unit (RoHS)
USB-87P8 CR	8 slots I/O Expansion Unit (RoHS)

Accessories

DP-660	24 V _{dc} /2.5 A, 60 W and 5 V _{dc} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{dc} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{dc} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{dc} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)

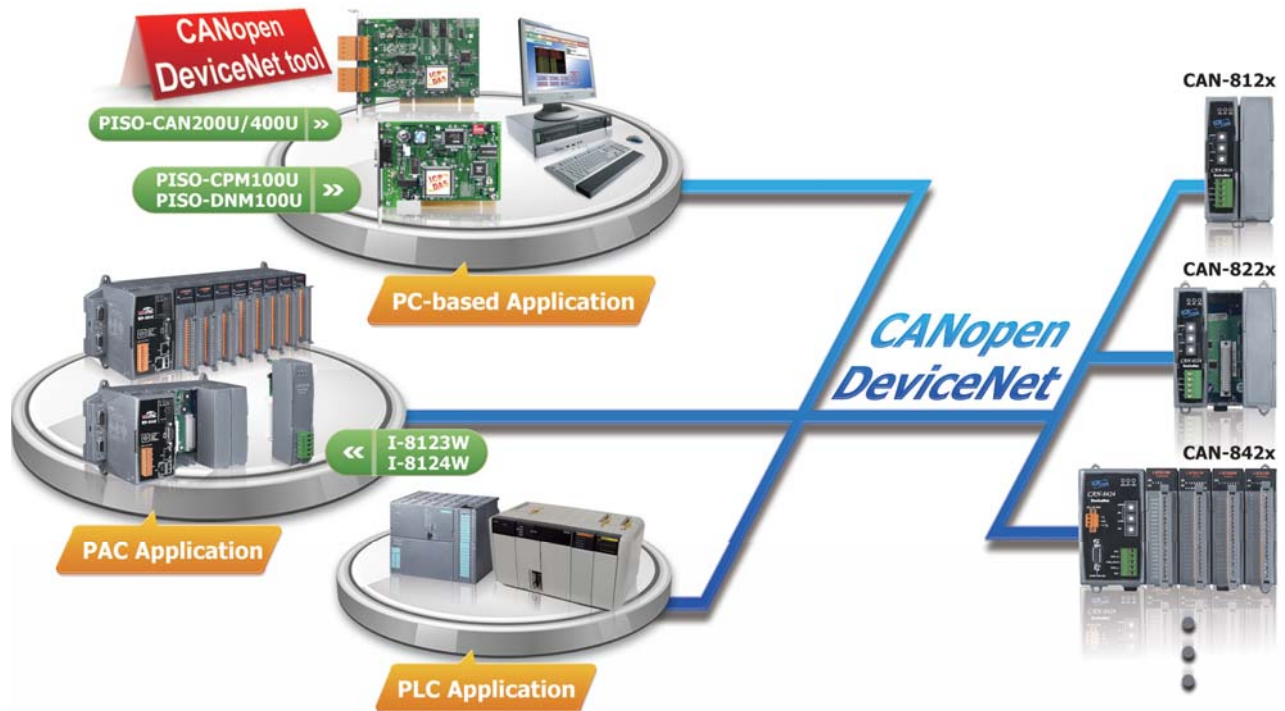
6.5. CAN Bus I/O Expansion Unit

• Introduction



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 CAN-based/CANopen/DeviceNet/J1939 protocol products for several years. The CAN-8000 series provide the CANopen and DeviceNet remote I/O solutions. CAN-8000 series can be chosen with 1,2 or 4 I/O slots. With the various I-8K or I-87K I/O modules in ICP DAS, they can be applied in PC-based, PAC-based or PLC-based CANopen or DeviceNet applications flexibly.

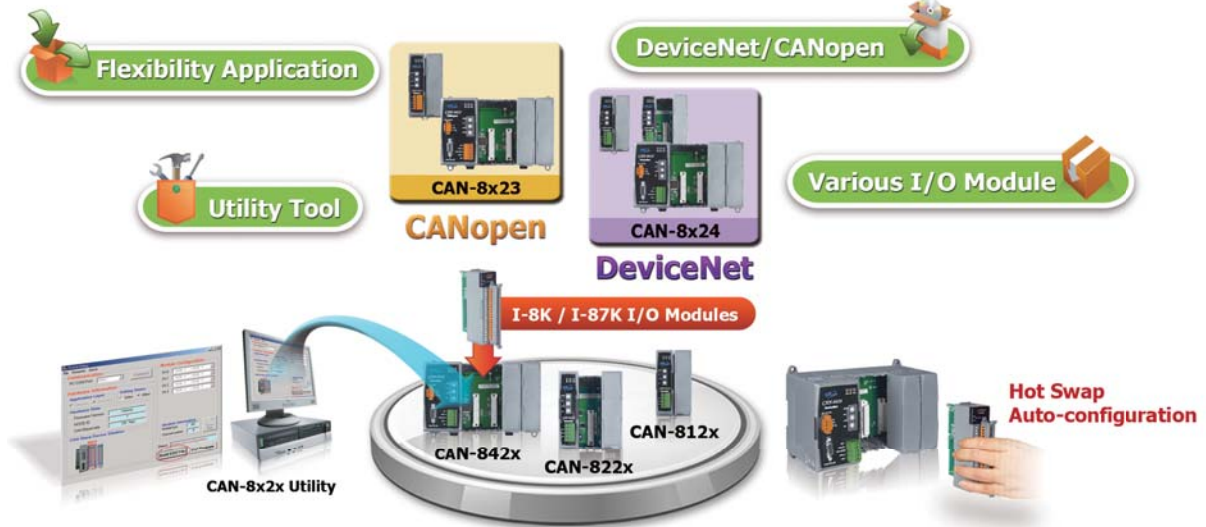


CANopen-CANopen is a CAN-based application layer protocol. It was developed as a standardized embedded network with highly flexible configuration capabilities. CANopen was designed for motion-oriented machine control networks, such as handling systems. By now it is used in many various fields, such as medical equipment, off-road vehicles, maritime electronics, public transportation, building automation, etc.

DeviceNet-DeviceNet based on the CAN bus is one of the world's leading device-level networks for industrial automation. The DeviceNet network is a flexible open and low-cost option which you can use to connect industrial devices to a network and to eliminate costly and time-consuming hardwiring. Direct connectivity improves communication and provides device-level diagnostics or easily accessible through hardwired I/O interfaces.

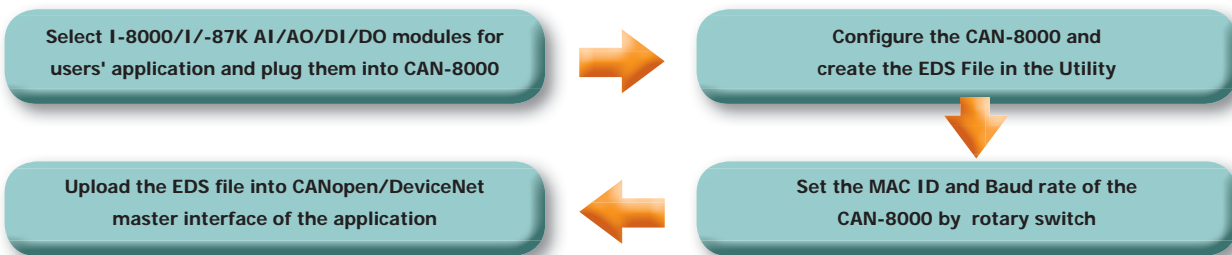
• Main features

CAN-8000 series are specially designed for the slave device of CANopen/DeviceNet protocol with 1/2/4 I/O expansion slots. There are various modules can be chosen to use. Also, these products support Hot-swap function for maintaining conveniently.



• Application Flowchart

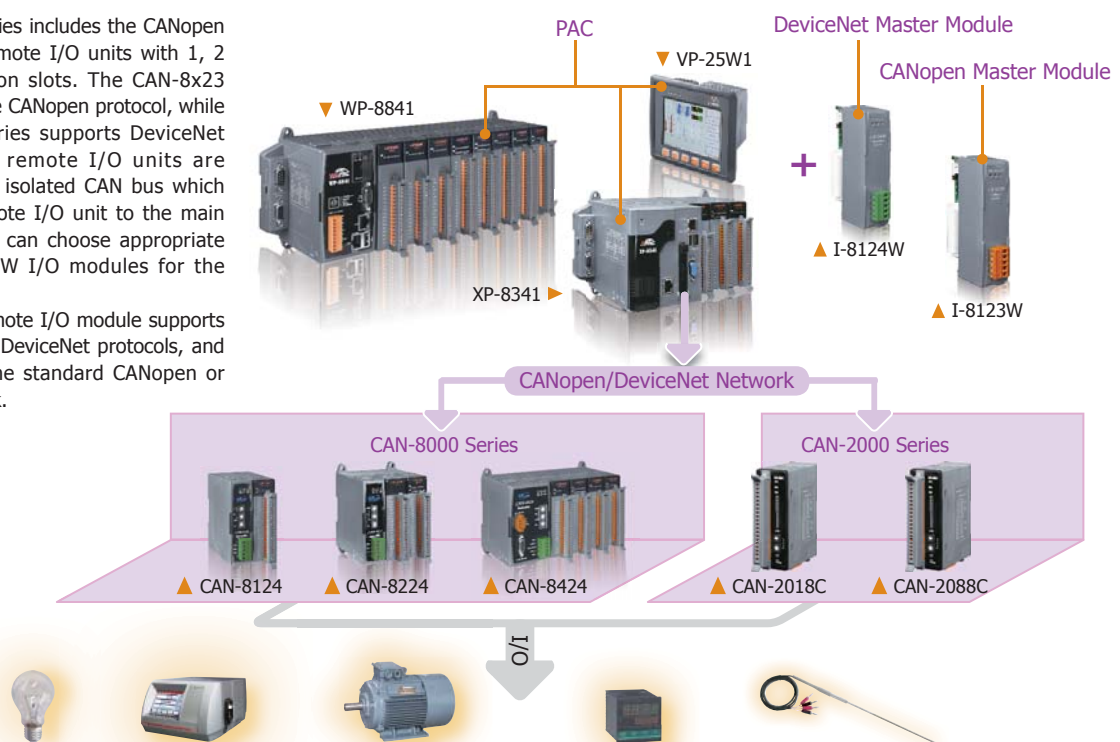
The following simple steps show how to use CAN-8000 in CANopen/DeviceNet systems



CAN Bus Remote I/O Unit

The CAN-8000 series includes the CANopen and DeviceNet remote I/O units with 1, 2 or 4 I/O expansion slots. The CAN-8x23 series supports the CANopen protocol, while the CAN-8x24 series supports DeviceNet protocol. Those remote I/O units are equipped with an isolated CAN bus which connects the remote I/O unit to the main control unit. User can choose appropriate I-8KW and I-87KW I/O modules for the CAN-8000 series.

The CAN-2000 remote I/O module supports the CANopen and DeviceNet protocols, and can be used in the standard CANopen or DeviceNet network.





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



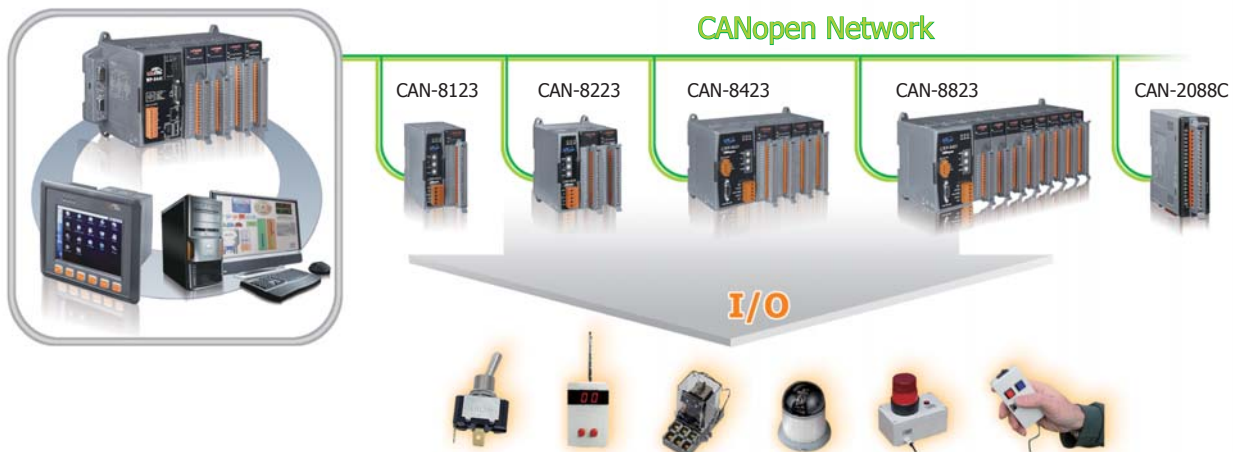
Introduction

CAN-8x23 is an unit to expand I/O via the CAN bus. Through the I-87K and I-8K I/O modules, controller can make it acquire the data of the various sensors and actuators, such as thermocouple, RTD, strain gauge, relay, heater, PWM driver ... and so forth. It features hot swap, auto configuration, CANopen standard LED indicators, programmable output power-on value and output safe value when host controller or communication fails. The CAN interface of CAN-8x23 follows CANopen DS 301 version 4.02 and DS 401 version 2.1. In order to deal with other CANopen master software, CAN-8x23 provides the required EDS file, depending on plug-in I-87K or I-8K modules.

CANopen Features	
NMT	Slave
Error Control	Heart beat to Node Guarding selectable
No. of PDOs	16Rx, 16Tx
PDO Modes	Event Triggered, Remotely requested, Cyclic and acyclic SYNC
PDO Mapping	Variable
No. of SDOs	1 server, 0 client
Emergency Message	Yes
CANopen Version	DS-301 v4.02
Device Profile	DSP-401 v2.0
Baud Rate Setting by Rotary Switch	10K, 20K, 50K, 125K, 250K, 500K, 800K, and 1Mbps
Produce EDS file Dynamically	Yes
CAN, ERR, and Tx/Rx LED	Yes

Applications

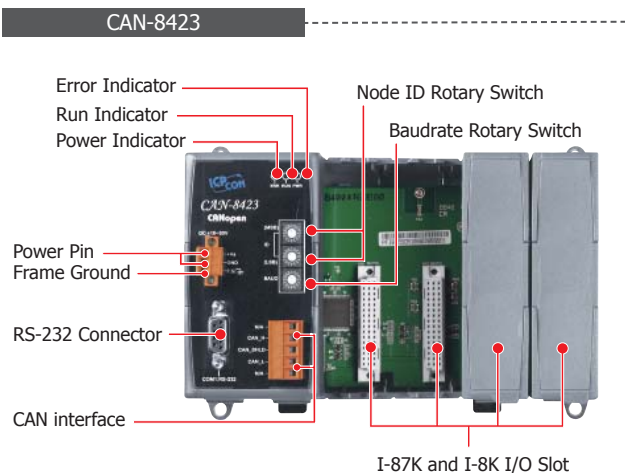
Rich I/O Expansion Ability



Specifications

Models	CAN-8123	CAN-8223	CAN-8423	CAN-8823
UART Interface				
COM 1	No		RS-232 (For configuration)	
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			
Hardware				
CPU	80186, 80 MHz			
SRAM/Flash/EEPROM	512 KB / 512 KB / 2 KB			
NVRAM	31 bytes (battery backup, data valid up to 10 years)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
Watchdog	CPU built-in			
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
LED				
Round LED	PWR LED, RUN LED, ERR LED			
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			

Appearance



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

Accessories

DP-660	24 V _{DC} /2.5 A, 60 W and 5 V _{DC} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{DC} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{DC} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{DC} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)



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



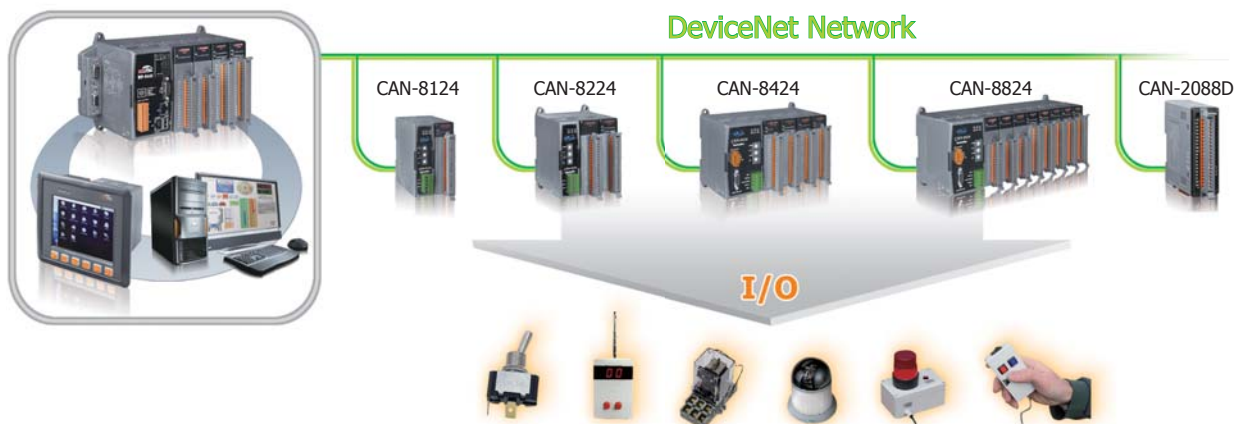
Introduction

CAN-8x24 is an unit to expand I/O via the CAN bus. Through the I-87K and I-8K I/O modules, controller can make it acquire the data of the various sensors and actuators, such as thermocouple, RTD, strain gauge, relay, heater, PWM driver ... and so forth. It features hot swap, auto configuration, DeviceNet standard LED indicators, programmable output power-on value and output safe value when host controller or communication fails. The CAN interface of CAN-8x24 follows DeviceNet Specification Volume I & II, Release 2.0 version. In order to deal with other DeviceNet master software, CAN-8x24 provides the required EDS file, depending on plug-in I-87K or I-8K modules.

DeviceNet features	
DeviceNet Version	DeviceNet Specification Volume I & II, Release 2.0
Number of Nodes	64(Max)
Baud Rate	125K, 250K, 500K
Support Message Groups	Group 2 only Server
UCMM	Not Support
I/O Operating Modes	Poll, Bit-Strobe, Change of State/ Cyclic
Device Heartbeat Message	Yes
Device Shutdown Message	Yes
Produce EDS file Dynamically	Yes
No. of Fragment I/O	128 Bytes (Max) (Input/ Output)
MAC ID Setting	Rotary Switch
Baud Rate Setting	Rotary Switch
DeviceNet Status LED	NET, MOD, PWR

Applications

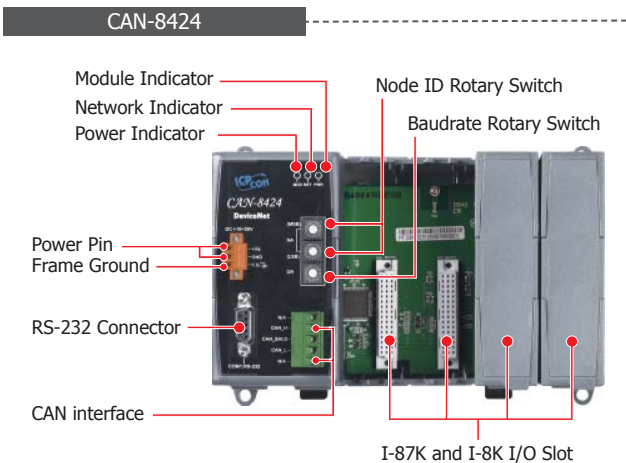
Rich I/O Expansion Ability



Specifications

Models	CAN-8124	CAN-8224	CAN-8424	CAN-8824
UART Interface				
COM 1	No		RS-232 (For configuration)	
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 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	DeviceNet Volume I ver2.0, Volumn II ver2.0 Predefined Master/Slave Connection set			
Hardware				
CPU	80186, 80 MHz			
SRAM/Flash/EEPROM	512 KB / 512 KB / 2 KB			
NVRAM	31 bytes (battery backup, data valid up to 10 years)			
RTC (Real Time Clock)	Provide second, minute, hour, date, day of week, month, year			
Watchdog	CPU built-in			
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
LED				
Round LED	PWR LED, NET LED, MOD LED			
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 V _{DC}			
Reverse Polarity Protection	Yes			
Frame Ground	No		Yes	
Consumption	1.7 W	2 W	2.5 W	3 W
Power Board Driving	20 W			

Appearance



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

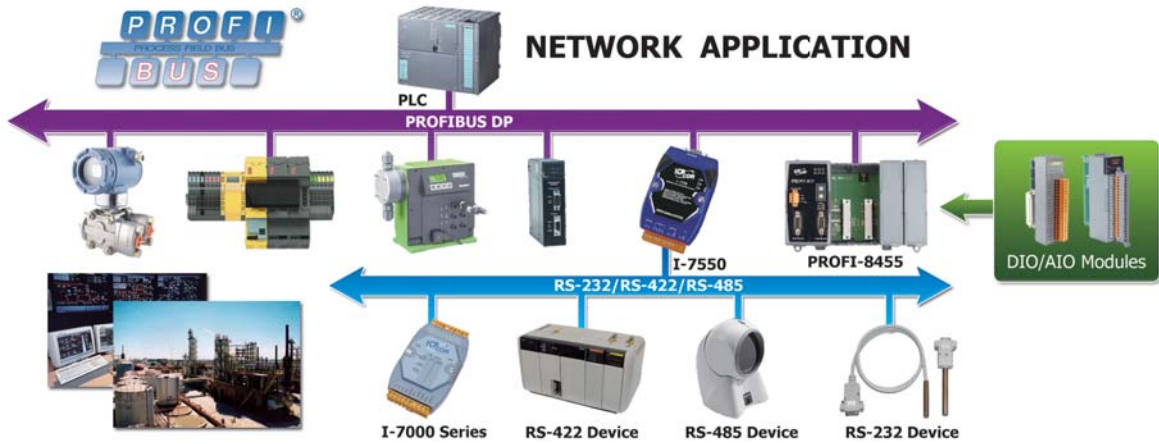
Accessories

DP-660	24 V _{DC} /2.5 A, 60 W and 5 V _{DC} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{DC} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{DC} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{DC} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
I-7560 CR	USB to RS-232 Converter (RoHS)

6.6 . PROFIBUS I/O Expansion Unit

• Introduction

PROFIBUS (PROCESS FIELD BUS) which is anchored in the international standards IEC 61158 and IEC 61784 is an open, digital communication system with a wide range of applications, particularly in the fields of factory and process automation. It is suitable for both fast, time-critical applications and complex communication tasks.

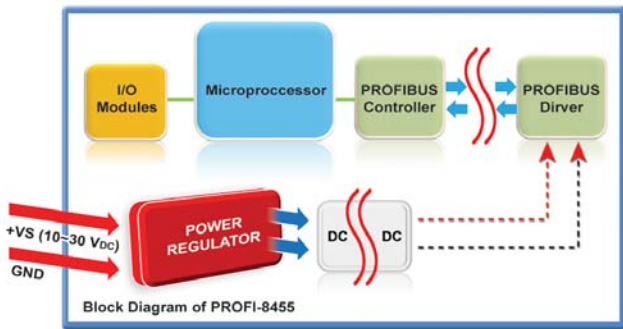


• Features

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

High protection hardware design

To apply these PROFIBUS I/O expansion units in various industrial environments, we design the isolation in power-in and communication sides to prevent the external noise disturbance. That can make PROFIBUS I/O expansion units robust and stably in the harsh applications.



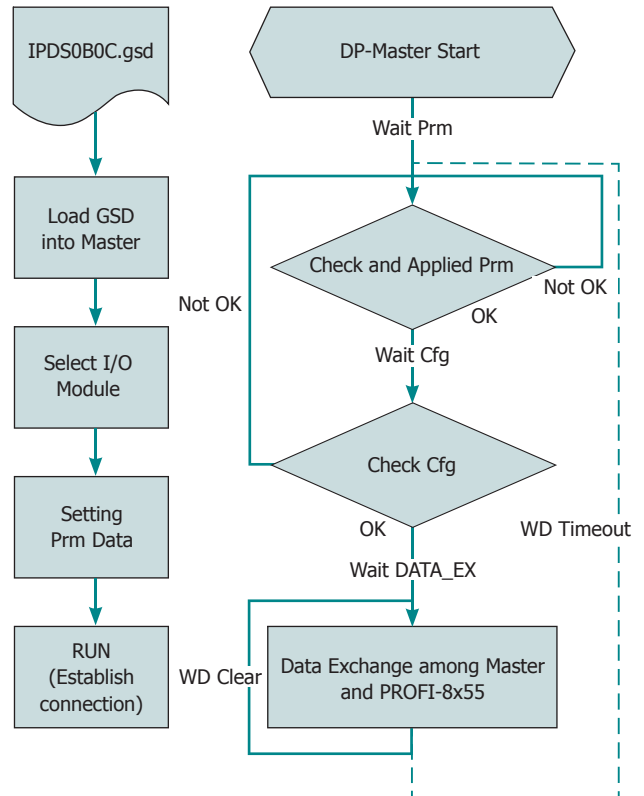
Hot-Swap in PROFIBUS remote I/O units (PROFIBUS I-8x55)

The Hot-Swap function of PROFIBUS I-8x55 is provided to maintain the system easily. Therefore, users can on-line diagnose the damaged I/O module and change the module.



Hot Swap, Auto Configuration (I-87K high profile modules)

• Flow chart





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 V_{dc} 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

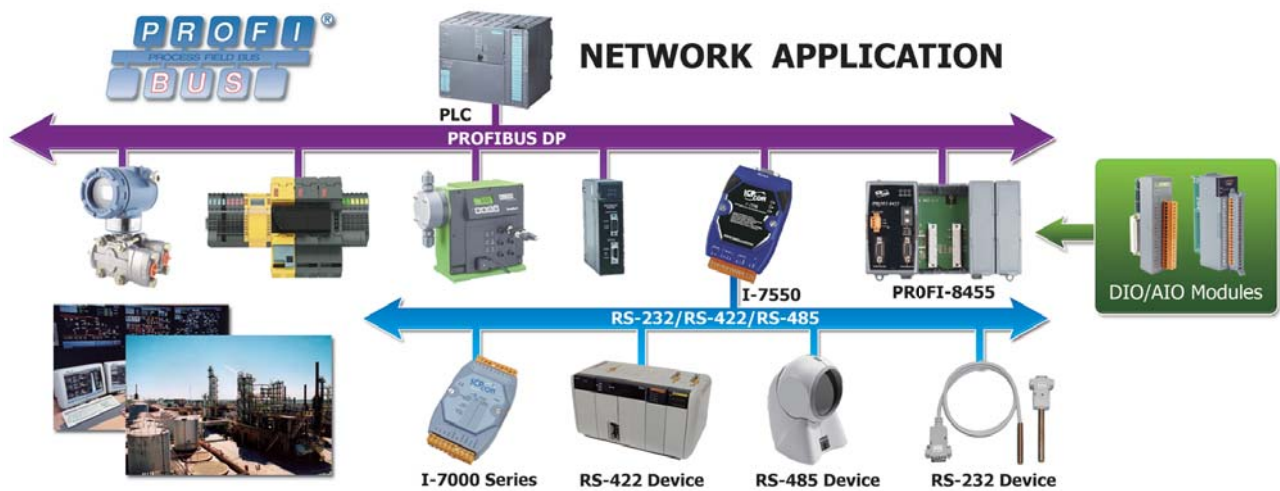
PROFIBUS (PROCESS FIELD BUS) which is anchored in the international standards IEC 61158 and IEC 61784 is an open, digital communication system with a wide range of applications, particularly in the fields of factory and process automation. It is suitable for both fast, time-critical applications and complex communication tasks.

To help user implement this powerful communication system more easily, ICP DAS provides various kinds of PROFIBUS DP products. Based upon many years experience in PROFIBUS DP, ICP DAS secures user's automation system safety and stability as mission

The PROFIBUS DP Remote I/O Unit is designed for the slave device of PROFIBUS DP protocol. It supports up to 1/2/4/8 slots for ICP DAS 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.

Applications

Solution for Fieldbus Communication



6
6
I/O Expansion Units

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 V _{DC} 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 V _{DC}			
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

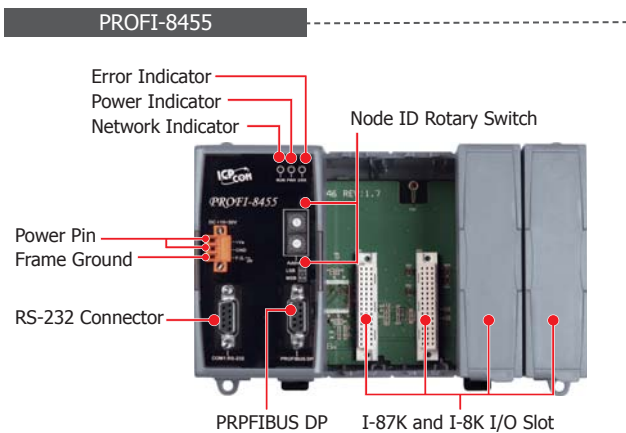
Note 1: CA-0904 : transform from 4-pin connector to 9-pin Female D-Sub connector.

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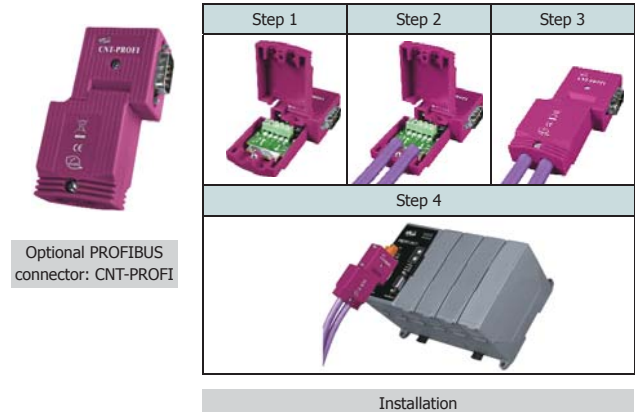
6

I/O Expansion Units

Appearance



Accessory



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)

Accessories

DP-660	24 V _{DC} /2.5 A, 60 W and 5 V _{DC} /0.5 A, 2.5 W Power Supply with DIN-Rail Mounting
DP-665	24 V _{DC} /2.7 A, 65 W Power Supply with DIN-Rail Mounting
DP-1200 CR	24 V _{DC} /5.0 A, 120 W Power Supply with DIN-Rail Mounting (RoHS)
MDR-20-24 CR	24 V _{DC} /1.0 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)