![ICP DAS logo]

# Industrial Communication
# Product Brochure

www.icpdas.com

Vol. ICPC 1.07.03

# Total Solutions

## M2M


WISE-5800


MQ-7200    PIR/RPIR Series


iCAM series

SMS series
(GT-500 series)

RTU series
(GT-540/G-4500)

GRP series
(GRP-500 series)

G-4500 series    GTM-20x series    RMV series
(M2M-700 series)

## Building Automation

HMI & ViewPAC
(SV-2201-CE7/VP-25W1/VP-4131)

Tiny I/O Series

IR-310-RM

LC series

IR-210/IR-712A    TouchPAD

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Windows xp Embedded
Windows CE

UniDAQ    VxComm Driver/Utility    Visual Studio.NET    WISE    VCEP    eLogger    EzDataLogger    SMS_DB

ware

PC Card

Communication

Gateway    Converter    RF    GSM/GPRS    ZigBee    Wi-Fi

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## WIRED

Ethernet    CAN    PROFIBUS PROFINET    USB    EtherCAT    BACnet    EtherNet/IP    HART    WISE

## WIRELESS

3G/4G    ZigBee (ZT Series)    IR    Wi-Fi

# ICP DAS

ICP DAS was established in 1993 and is strongly focused on innovation and the enhancement of industrial automation technology. ICP DAS continuously endeavors to develop a comprehensive selection of products ranging from remote I/O controllers, distributed I/O modules, I/O data acquisition boards, programmable automation controllers, industrial communication modules, web-related products, motion control systems, SCADA/HMI software to automation solutions for applications critical to energy management, motion automation, smart factories, intelligent buildings, and smart cities. Our ambition is to provide a wide range of high-quality products and versatile applications, together with prompt and efficient service, that can be implemented to assist in the continued success of our clients worldwide.



*Taiwan Headquarters & 1st Factory (Hsinchu)*

## Our Intelligent Solutions and Comprehensive Service, Your Key to Success.

The inevitable trend toward the implementation of the Internet of Things (IoT) and Industry 4.0 currently leads global cooperation and technology development, and the future demands and business opportunities in this area are potentially unlimited. We believe that one of the key success factors in the advancement of the automation industry is intelligence. Now, however, the evolution of the industry has entered into a phase of intelligent automation, ranging from a single domain with a limited scale to encompassing multiple domains on a significantly expanded scale. Consequently, ICP DAS has transformed itself from simply a hardware provider to a provider of total automation solutions and service integration. As a result, our role in this industry has also been constantly evolving.

When looking back on our past development, we have come to realize that ICP DAS has already been intrinsically involved in the world of IoT and Industry 4.0.The integrated solutions provided by ICP DAS are a combination of both tangible products and intangible services which cover a variety of integrated application services and industry-oriented fields, including:

|  |  |  |
|---|---|---|
| ▶ M2M /IOT | ▶ Machine Automation | ▶ Panel Solutions |
| ▶ Energy Management | ▶ Building Automation | ▶ SCADA, InduSoft Solutions |

In addition to our close cooperation with worldwide distributors, ICP DAS has forged strong partnerships with those clients who have domain knowledge. We integrate the expertise of our clients with our ability for customization to offer products and services in line with needs. ICP DAS helps our customers to achieve success and that is both our goal and our passion.

At ICP DAS, we are committed to leveraging our considerable experience, our highly professional R&D capabilities, and our innovative products, as well as our dedication to service, in order to work together with you to seize the unquestionable future business opportunities that will arise from the increasing adoption of both IoT and Industry 4.0.



*Taiwan 2nd Factory (Hsinchu)*



*China Training Center (Wuhan)*

# *Industrial Communication*

# 1. Multiport Serial Cards

## Overview:

The VXC/VEX multiport card is the foremost choice for PC-based communication solutions, ensuring smooth communication in both time-critical applications and industrial fields. Installing a VXC/VEX multiport card increases the number of serial ports available on the PC, meaning that it is much easier to integrate a PC with a large number of external devices, such as PLCs, meters, controllers, laboratory instruments, modems, card readers, serial printers, RFID readers, bar code readers, and sensors, etc.

## Selection Guide:

### ☑ PCI Express

| Model Name | COM-Selector | RS-232 | RS-422/485 | Self-Tuner | Isolation ($V_{DC}$) | ESD Protection | Max. Speed (bps) | FIFO Size (bytes) | Connector |
|---|---|---|---|---|---|---|---|---|---|
| VEX-112 | Yes | 2 | – | – | – | – | 115.2 k | 128 | Male DB-9 |
| VEX-112i | Yes | 2 | – | – | 2.5 k | ±4 kV | 115.2 k | 128 | Male DB-9 |
| VEX-142 | Yes | – | 2 | Yes | – | – | 115.2 k | 128 | Male DB-9 |
| VEX-142i | Yes | – | 2 | Yes | 2.5 k | ±4 kV | 115.2 k | 128 | Male DB-9 |
| VEX-114 | Yes | 4 | – | – | – | – | 115.2 k | 128 | Female DB-37 |
| VEX-114i | Yes | 4 | – | – | 2.5 k | ±4 kV | 115.2 k | 128 | Female DB-37 |
| VEX-144 | Yes | – | 4 | Yes | – | – | 115.2 k | 128 | Female DB-37 |
| VEX-144i | Yes | – | 4 | Yes | 2.5 k | ±4 kV | 115.2 k | 128 | Female DB-37 |
| PCIe-S118 | – | 8 | – | – | – | – | 921.6 K | 256 | Female DB-62 |
| PCIe-S148 | – | – | 8 | Yes | – | – | 921.6 K | 256 | Female DB-62 |

### ☑ Universal PCI

| Model Name | COM-Selector | RS-232 | RS-422/485 | Self-Tuner | Isolation ($V_{DC}$) | ESD Protection | Max. Speed (bps) | FIFO Size (bytes) | Connector |
|---|---|---|---|---|---|---|---|---|---|
| VXC-112AU | Yes | 2 | – | – | – | – | 115.2 k | 128 | Male DB-9 |
| VXC-112iAU | Yes | 2 | – | – | 2.5 k | ±4 kV | 115.2 k | 128 | Male DB-9 |
| VXC-142AU | Yes | – | 2 | Yes | – | – | 115.2 k | 128 | Male DB-9 |
| VXC-142iAU | Yes | – | 2 | Yes | 2.5 k | ±4 kV | 115.2 k | 128 | Male DB-9 |
| VXC-182iAU | Yes | 1 | 1 | Yes | 2.5 k | ±4 kV | 115.2 k | 128 | Male DB-9 |
| VXC-114U | Yes | 4 | – | – | – | – | 115.2 k | 128 | Female DB-37 |
| VXC-114iAU | Yes | 4 | – | – | 2.5 k | ±4 kV | 115.2 k | 128 | Female DB-37 |
| VXC-144U | Yes | – | 4 | Yes | – | – | 115.2 k | 128 | Female DB-37 |
| VXC-144iU | Yes | – | 4 | Yes | 2.5 k | ±4 kV | 115.2 k | 128 | Female DB-37 |
| VXC-118U | – | 8 | – | – | – | – | 115.2 k | 256 | Female DB-62 |
| VXC-148U | – | – | 8 | Yes | – | – | 115.2 k | 256 | Female DB-62 |

## Optional Accessories:

| | | | | | |
|---|---|---|---|---|---|
| CA-0910F | | 9-Pin Female-Female D-Sub Cable 1 m | CA-9-3715D | | Male DB-37 to 4-port Male DB-9 Cable, 1.5 M (180°) |
| CA-0915 | | 9-Pin Male-Female D-Sub Cable, 1.5 m | CA-9-3705 | | Male DB-37 to 4-port Male DB-9 Cable, 0.3 M (90°) |
| CA-PC09F | | 9-Pin Female D-Sub Connector with Plastic Cover | CA-9-6210 | | Male DB-62 to 8-port Male DB-9 Cable, 1.0 M |
| CA-4002 | | 37-Pin Male D-Sub Connector with Plastic Cover | DN-09-2F | | I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Header. Includes CA-0910F × 2 (9-Pin Female-Female D-Sub Cable 1 m) |

# 2. Serial Device Server

## Overview:

The ICP DAS Programmable Device Server is designed to bring network connectivity to your serial devices. The programmable features allow developers to quickly build custom applications that turn "dull" serial devices into "intelligent" devices right away without modifying their hardware or software configuration.

With extensive experience accumulated over many years, a great number of serial devices such as PLCs, bar code readers, RFID readers, meters and motion controllers, etc., have been widely used in various applications. As the advances in communication technologies in recent years, continue to drive optimization of data accessibility and remote operation ability, a wide variety of industries have begun to feel the urge to upgrade their latency serial communications to Ethernet network connections. The ICP DAS PDS series of products are your best choice for implementing this scenario in a robust, reliable and cost-effective way.



Remote Kiosk Information Station Management

The VxComm Driver creates virtual COM port(s) on 32-bit and 64-bit Windows XP/2012/7/10 systems and maps them to the remote serial port(s) of the PDS/DS series. The user's serial client programs need to only be changed to the virtual COM port access the serial devices that are allocated on the Internet or Ethernet network via the PDS/DS series.

### Easy Serial Device Networking with "transparency"

The most intuitive and easiest way to remotely control serial devices is to access those devices transparently via a network with no software modification required. The ICP DAS PDS product line offers two transparent applications:

■ **Socket Connections:**

Using a TCP/IP socket connection, client programs can exchange information with specific PDS/DS serial ports and talk to serial devices directly. For example, simply create a socket connection to the TCP/IP port 10001 (default) of the PDS/DS device and you can then access Port1 of the PDS/DS remotely. This is an OS-independent method and works well on most OS (operating systems) that provide socket functions.

■ **Virtual COM Ports:**

ICP DAS developed a specific function called "Virtual COM" that simulates PDS serial ports as fixed PC COM ports. Virtual COM ports appear to the system and applications as real ports. Once established, users can immediately enjoy the convenience that networking provides.



### DynaCOM Technology

ICP DAS Virtual COM also supports an exclusive function - Dynamic Virtual COM Mapping (DynaCOM); if the system can only access limited or fixed numbers of COM Ports, specific PDS serial ports can be dynamically assigned to the corresponding COM port numbers.

## Selection Guide:

### Comparison Table of Device Server and Modbus Gateway

| Features | iDS | PPDS | PDS | DS | tDS | tGW |
|---|---|---|---|---|---|---|
| Picture | | | | | | |
| PoE | Yes | Yes | – | – | Yes | Yes |
| Programmable | Yes | Yes | Yes | – | – | – |
| Virtual COM | Yes | Yes | Yes | Yes | Yes | – |
| Modbus Gateway | – | Yes | – | – | – | Yes |
| Multi-client | Yes | Yes | Yes | Yes | – | Yes |
| SNMP | Yes | – | – | – | – | – |
| Application Mode | Virtual COM<br>TCP Server<br>TCP Client<br>UDP<br>Pair Connection<br>RFC2217<br>Telnet<br>Modem Emulator | Virtual COM<br>TCP Server<br>TCP Client<br>Pair Connection<br>Modbus TCP Slave | Virtual COM<br>TCP Server<br>TCP Client<br>Pair Connection | Virtual COM<br>TCP Server<br>TCP Client<br>Pair Connection | Virtual COM<br>TCP Server<br>TCP Client<br>Pair Connection | Modbus TCP Master<br>Modbus TCP Slave<br>Modbus UDP Master<br>Modbus UDP Slave<br>Pair Connection |
| Remarks | Intelligent | Professional | Powerful | Isolation<br>for DS-715 | Cost-effective,<br>Entry-level | Cost-effective,<br>Entry-level |

### ✔ iDS Series – Intelligent Device Server

| Series | Ethernet | Virtual COM | Virtual I/O | Programmable | Modbus | Case |
|---|---|---|---|---|---|---|
| iDS-700 | 10/100 M, PoE | Yes | – | Yes | Yes | Plastic |
| iDS-700M | | | | | | Metal |

### ✔ PPDS Series – Programmable Device Server and Modbus Gateway with PoE

| Series | Ethernet | Virtual COM | Virtual I/O | Programmable | Modbus | Case |
|---|---|---|---|---|---|---|
| PPDS-700-MTCP | 10/100 M, PoE | Yes | Yes | Yes | Yes | Plastic |
| PPDSM-700-MTCP | | | Yes | | Yes | Metal |
| PPDS-700-IP67 | | | – | | – | IP67 Waterproof Plastic |

### ✔ PDS Series – Programmable Device Server

| Series | Ethernet | Virtual COM | Virtual I/O | Programmable | Modbus | Case |
|---|---|---|---|---|---|---|
| PDS-700 | 10/100 M | Yes | Yes | Yes | – | Plastic |
| PDSM-700 | | | | | | Metal |
| PDS-220Fx | 100 Base-FX, Fiber | | – | | | Plastic |
| PDS-5000-MTCP | 10/100 M Ethernet Switch | | | | Yes | Plastic |

### ✔ DS, tDS & tGW Series – Non-Programmable Device Server and Modbus Gateway

| Series | Ethernet | Virtual COM | Virtual I/O | Multi-client | Modbus | Casing | Remarks |
|---|---|---|---|---|---|---|---|
| tDS-700 | 10/100 M, PoE | Yes | – | – | – | Plastic | Cost-effective |
| tGW-700 | | – | | Yes | Yes | | |

# 2.1 Intelligent Serial-to-Ethernet Device Servers

## iDS-700
## iDS-400

Intelligent Serial-to-Ethernet Device Servers

CE | FC | RoHS | (crossed-out wheelie bin) | PoE

iDS-718-D          iDS-745M-T          iDS-448iM-D

### Features:

- Simple setup, factory floor devices can be connected to SCADA systems in minutes
- Serial Devices can be monitored and controlled via the Ethernet
- Supports 1/2/4-port RS-232, RS-422 and RS-485 communications
- Web-based configuration and PC Utility
- Supports RS-485 Data Direction Control with Self-Tuner Technology
- Provides Virtual COM (COM port redirection), TCP Server/ Client (Max. 32 connections), UDP, Serial Tunnel (Pair connection), Modem Emulator, and RFC2217 application modes.
- Reset button for restoring the factory configuration

- Supports SNMP V1, V2c, V3, Trap and MIB-II protocols for network management
- Built-in Hardware-selectable Pull High/Low resistors and Terminal resistors for RS-422/485 ports
- Serial ESD protection
- Includes a Smart Ethernet Port that recognizes both straight and crossover Ethernet Cables
- Built-in Buzzer, RTC, and Watchdog
- RoHS Compliant
- Wide operating temperature range: -25 to +75°C

### Introduction:

**Introducing the All-new Device Server**
Cost, Performance and Reliability in Total Alignment

- Surge Protection
- Wide Operating Temperature
- IT-Friendly Design

iDS Product

- 720 MHz CPU 256 MB RAM
- High Connection Capacity
- Complete Serial-To-Ethernet Service

The iDS product range is the 3rd generation of Device Servers from ICP DAS. It is designed for rugged, industrial-level applications, and provides high performance, high reliability and high capacity.

The iDS product range provides a complete Ethernet service, as well as 1-, 2-, and 4-port RS-232/RS-422/RS-485 interfaces that allow any existing serial devices to be connected to an Ethernet network.

**Industry 4.0 is Coming** Serial-to-Ethernet services have become more critical than ever before
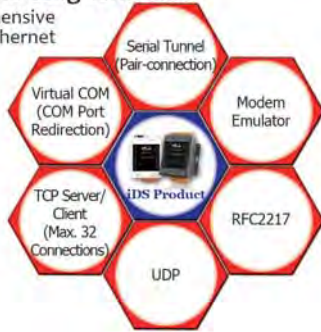
iDS Product

| ICP DAS iDS Product | 32 TCP connections |
| Traditional Device Server | 8 TCP Connections |

More connections mean greater connectivity for integration with the Internet of Things

**Taking the Long-term View**
A comprehensive serial-to-Ethernet Service

**We Know Time is Everything**
Quick and Easy Installation

- 3-IN-1 COM PORT, RS-232/422/485
- Dual COM Port Selection Method (Hardware and Software)
- PoE and Daisy Chain Design
- Web Configuration and PC Utility

## Powerful Data Transparent Solution: Zero Data Loss

The iDS product range is equipped with an ARM-based high-performance CPU and large capacity RAM in order to accomplish the goal of "Zero Data Loss" when attempting to transfer a critical data stream. If a failure occurs on the Ethernet connection, the serial data will be queued and will be resent once the Ethernet is reconnected. Each device port provides 32 TCP connections that can be used to share the same information across the network from a single serial device.

| COM1 | M1 | M0 | DIP Switch |
|------|-----|-----|------------|
| RS-232 | ON | OFF | ON 1 2 3 4 5 6 7 8 |
| RS-422 | OFF | ON | ON 1 2 3 4 5 6 7 8 |
| RS-485 | OFF | OFF | ON 1 2 3 4 5 6 7 8 |
| Software | ON | ON | ON 1 2 3 4 5 6 7 8 |

## Industrial–grade Design

The iDS product range provides a wide range of built-in features designed for easy deployment of the device into existing operating environments.

1. Dual Power Supply: DC and PoE
2. DIN-Rail Mounting
3. Serial Port Surge Protection
4. Adjustable RS-485 Terminal Resistor and Pull High/Low Resistor
5. RS-485 Direction Control via the embedded ICP DAS Self-Tuner
6. Hardware/Software-selectable RS-232, RS-422 or RS-485 Interfaces
7. Hardware Reset button and LED Indicator.
8. 64-bit Hardware Serial Number

## Easy web-based Configuration

The built-in web server allows the iDS product to be accessed and configured using a standard web browser, such as Internet Explorer or Google Chrome. The configurations include parameters of serial ports, SNMP, the mode of Serial-To-Ethernet service. In addition, the onboard Flash memory provides the capacity for future software upgrades.
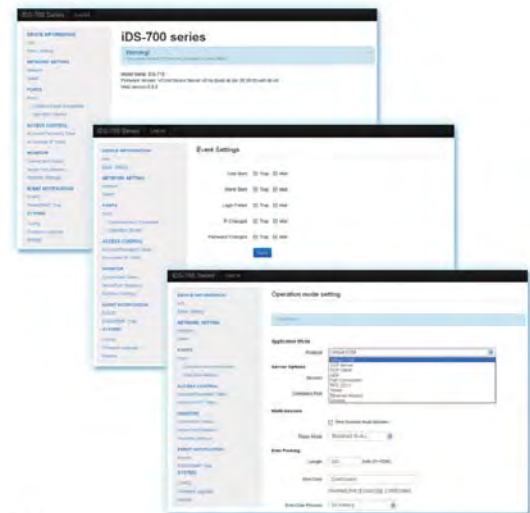
## IT-friendly Management

All devices in the iDS product range support the SNMP protocol, which is a popular method within the IT industry for monitoring a device over the Ethernet. The iDS device can be configured to send SNMP-Trap alerts to the SNMP manager if user-defined errors or events are encountered. For example, alerts can be triggered by a warm/cold start events, or a password change, etc. An email alert and web-based event log page is also provided.

**Perfect Harmony**
Making the right decision leads to lazy days on the beach

- Remote Configuration and Upgrades
- Embedded Watchdog prevents System Freeze
- Event and Alarm Logs with Timestamp
- Event alert: SNMP Trap, E-mail

## Ordering Information:

| Model No. | Description |
|-----------|-------------|
| iDS-718i-D CR | Intelligent Device Server with 1 RS-232/422/485 (Isolated, RoHS, DB9) |
| iDS-718iM-D CR | Intelligent Device Server with 1 RS-232/422/485 (Isolated, Metal Case, RoHS, DB9) |
| iDS-728i-T CR | Intelligent Device Server with 2 RS-232/422/485 (RoHS, Terminal block) |
| iDS-728iM-T CR | Intelligent Device Server with 2 RS-232/422/485 (Metal Case, RoHS, Terminal block) |
| iDS-448iM-D CR | Intelligent Device Server with 4 RS-232/422/485 (Metal Case, RoHS, DB9) |

# 2.2 Palm-size Programmable Serial-to-Ethernet Device Server

## PDS-720(D)
## PPDS-720(D)-MTCP

Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Fiber ports

CE | FC | RoHS | ☒ | PoE

## PDS-782-25/D6
## PDS-782D-25/D6

Programmable Device Server with 7 RS-232 ports and 1 RS-485 port

CE | FC | RoHS | ☒

## PDS(M)-700(D) Series
## PPDS(M)-700(D)-MTCP Series

Programmable Device Server with 1 RS-232 port and 1 RS-485 port

CE | FC | RoHS | ☒ | PoE | IP67

PPDS-720D-MTCP    PDS-720

PPDS-700D-MTCP series    PDSM-700D series

## Features:

- Incorporates serial devices in an Ethernet network
- Operation Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/2012/7/10
- Supports Modbus TCP to RTU/ASCII Gateway (for MTCP versions)
- Powerful programmable device server with lib and sample programs
- Built-in high performance MiniOS7 from ICP DAS
- Built-in watchdog timer suitable for use in harsh environments
- Built-in Self-Tuner on RS-485 Ports (automatic direction control)
- Supports ±4 kV ESD protection on serial ports
- Power reverse polarity protection and low power consumption
- 10/100 Base-TX Ethernet, RJ-45 Port (Auto-negotiating, auto MDI/MDI-X, LED indicator)
- Supports PoE (Power over Ethernet, for PPDS versions)
- Built-in 7-Segment 5-digit LED display (for D versions)
- Supports D/I, latched D/I and counter functions (for models with DIO)
- Supports Virtual I/O technology (for models with DIO)
- Supports IP filter (White List) for security control
- Supports multi-client and data sharing function
- Palm-size form factor with multiple serial ports and DIN-Rail mounting
- RoHS Compliant & no Halogen
- OEM/ODM service is available

## Selection Guide:

| Model Name | RS-232 | RS-485 | RS-422/ RS-485 | DI/DO | Ethernet | COM1 | COM2 | COM3 | COM4 | COM5 | COM6 | COM7 | COM8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDS-720(D) PPDS-720(D)-MTCP | 1 | 1 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | – | – | – | – | – | – |
| PDS(M)-721(D) PPDS(M)-721(D)-MTCP | 1 | 1 | - | 6/7 | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | – | – | – | – | – | – |
| PDS(M)-732(D) PPDS(M)-732(D)-MTCP | 2 | 1 | - | 4/4 | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 5 Wire RS-232 | – | – | – | – | – |
| PDS(M)-734(D) PPDS(M)-734(D)-MTCP | 1 | 1 | 1 | 4/4 | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | RS-422/ RS-485 | – | – | – | – | – |
| PDS(M)-742(D) PPDS(M)-742(D)-MTCP | 3 | 1 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 5 Wire RS-232 | 9 Wire RS-232 | – | – | – | – |
| PDS(M)-743(D) PPDS(M)-743(D)-MTCP | 3 | 1 | - | 4/4 | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 3 Wire RS-232 | 3 Wire RS-232 | – | – | – | – |
| PDS(M)-752(D) PPDS(M)-752(D)-MTCP | 4 | 1 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 5 Wire RS-232 | 5 Wire RS-232 | 5 Wire RS-232 | – | – | – |
| PDS(M)-755(D) PPDS(M)-755(D)-MTCP | 1 | 4 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 2 Wire RS-485 | 2 Wire RS-485 | 2 Wire RS-485 | – | – | – |
| PDS(M)-762(D) PPDS(M)-762(D)-MTCP | 5 | 1 | - | 1/2 | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | – | – |
| PDS(M)-782(D) PPDS(M)-782(D)-MTCP | 7 | 1 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 |
| PDS-782(D)-25/D6 | 7 | 1 | - | - | 10/100 M | 5 Wire RS-232 | 2 Wire RS-485 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 | 3 Wire RS-232 |

Note:
1. The D version modules have a built-in 7-Seg. LED Display.
2. The M version modules use metal case.
3. The PPDS-700-MTCP series modules support PoE (Power over Ethernet) and Modbus Gateway.

# 2.3 Palm-size Serial-to-Ethernet Device Server

## DS-712

Serial-to-Ethernet Device Server with 1 RS-232 port

## DS-715

Serial-to-Ethernet Device Server with 1 RS-422/RS-485 port

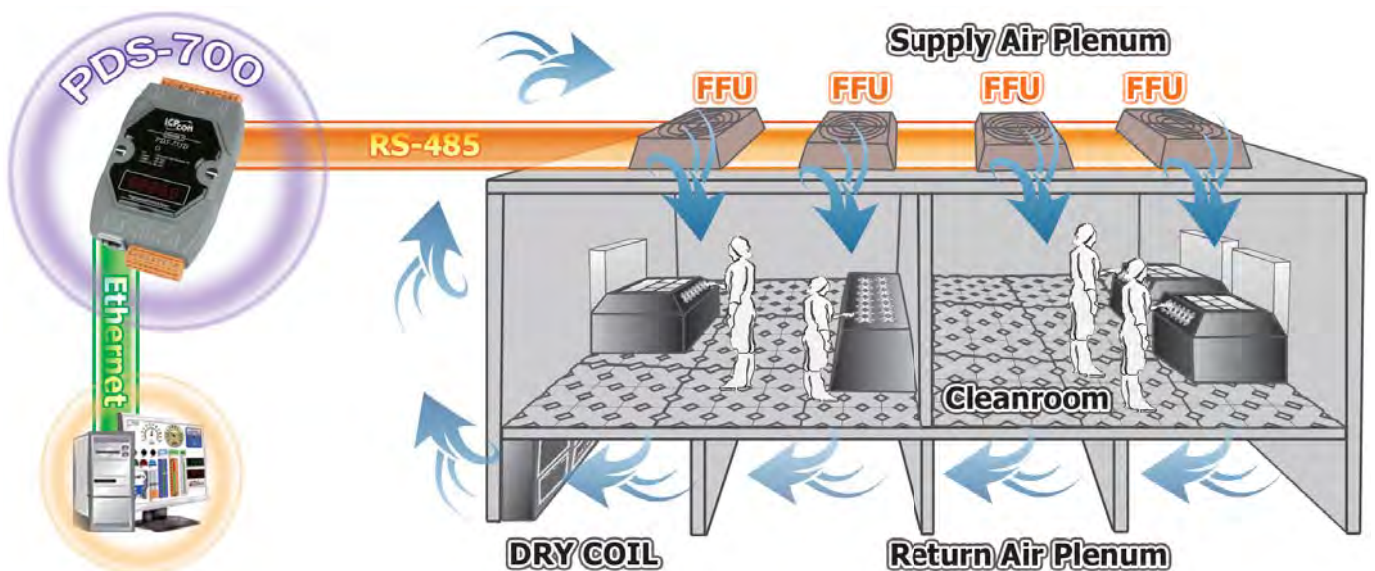DS-712     DS-715
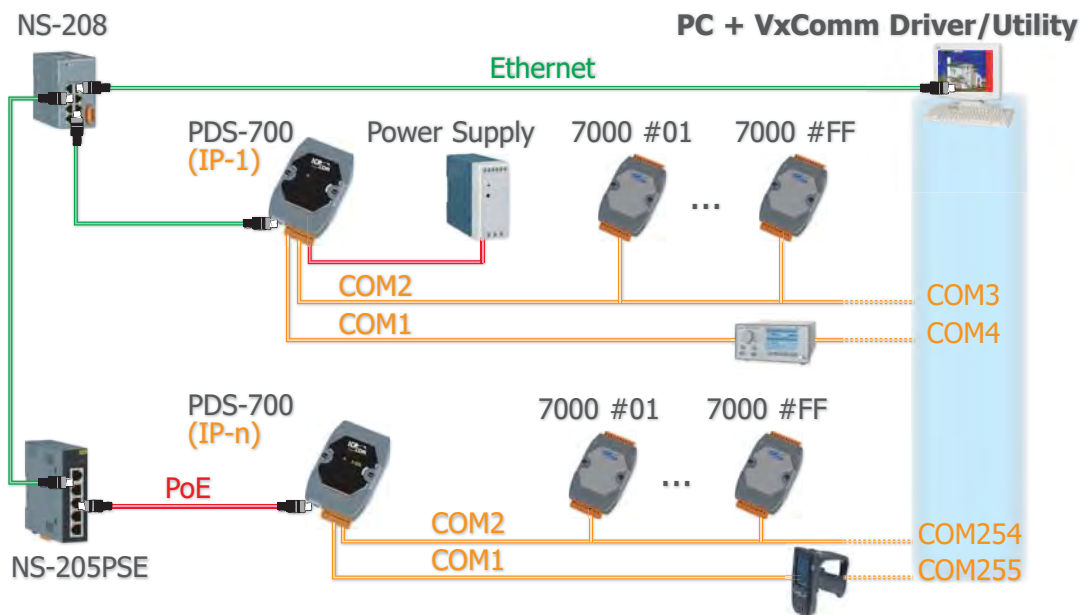
CE  FC  RoHS  ☒  PoE  IP67

## Features:

- Incorporate Serial Devices in an Ethernet network
- Operation Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/2012/7/10
- Watchdog Timer suitable for use in harsh environments
- 10/100 Base-TX, RJ-45 Port
  (Auto-negotiating, auto MDI/MDI-X, LED indicator)
- Built-in High Performance MiniOS7 from ICP DAS

- High Performance Device Server
- Power Reverse Polarity Protection
- RoHS Compliant & no Halogen
- Serial Port ±4 kV ESD Protection Circuit
- Low power consumption
- Palm-Size with DIN-Rail Mounting
- Male DB-9 Connector

## Introduction:

The DS-700 is a series of Serial-to-Ethernet Device Servers that are designed for linking RS-232/422/485 devices to an Ethernet network. By using the VxComm Driver/Utility, the built-in COM port of the DS-700 series can be virtualized to a standard PC COM port in Windows. By virtue of its protocol independence, a small size and flexibility, the DS-700 series meets the demands of virtually any network-enabled application.

The DS-712 is equipped with a male DB-9 connector and supports a 5 Wire RS-232 port, while the DS-715 is equipped with a removable terminal block connector and supports a 4 Wire RS-422 port or a 2 Wire RS-485 port with 2000 $V_{rms}$ isolation.



## Ordering Information:

| Model No. | Description |
|-----------|-------------|
| DS-712 CR | Device Server with 1 RS-232 port (RoHS) |
| DS-715 CR | Device Server with 1 Isolated RS-422/RS-485 port (RoHS) |

# 2.4 IP67 Programmable Serial-to-Ethernet Device Server

## PPDS-741-IP67 *Available soon*
## PPDS-742-IP67
## PPDS-743-IP67 *Available soon*

Programmable Device Server with 4 RS-232 or RS-485 ports, PoE and IP67 Casing

CE  FC  RoHS  ☒  PoE  IP67

IP67

## Features:

- Incorporate Serial Devices in an Ethernet network
- Virtual COM for 32-bit and 64-bit Windows XP/2012/7/10
- Watchdog Timer suitable for use in harsh environments
- 10/100 Base-TX, RJ-45 Port
  (Auto-negotiating, auto MDI/MDI-X, LED indicator)
- Built-in High Performance MiniOS7 from ICP DAS
- Self-Tuner ASIC Controller on the RS-485 Port
- Powerful Programmable Device Server

- Rugged RJ-45 Connector for anti-vibration and shock
- Plastic Casing with IP67 Waterproof
- Power Reverse Polarity Protection
- RoHS Compliant & no Halogen
- Serial Port ±4 kV ESD Protection Circuit
- Low power consumption
- Supports PoE (IEEE 802.3af, Class 1)
- ODM Service is available

## Introduction:

The PPDS-700-IP67 series is a family of Programmable Device Servers, also known as "Serial-to-Ethernet gateway", that are designed for linking RS-232/422/485 devices to an Ethernet network. The user-friendly VxComm Driver/Utility allows users to easily turn the built-in COM ports of the PPDS-700-IP67 series into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the PPDS-700-IP67 series is able to meet the demands of every network-enabled application.

The PPDS-700-IP67 series includes a powerful and reliable Xserver programming structure that allows you to design your robust Ethernet applications in one day. The built-in, high-performance MiniOS7 boots the PPDS-700-IP67 up in just one second and gives you fastest responses.

**The PPDS-700-IP67 is a special design for the toughest applications. It can be directly mounted to any machine or convenient flat surface. The rugged packaging and IP67 connectors are rated to protect against water, oil, dust, vibration, and much more.**

The PPDS-700-IP67 supports PoE (Power over Ethernet) function that allows power and data to be carried over a single Ethernet cable, so a device can operate solely from the power it receives through the data cable. This innovation allows greater flexibility in office design, higher efficiency in systems design, and faster turnaround time in set-up and implementation. When there is no PoE switch on site, the PPDS-700-IP67 accepts power input from a +12 $V_{DC}$ ~ +48 $V_{DC}$ adapter.

When using PoE devices such as the PPDS-700-MTCP, PPDS-700-IP67 and PET-7000 (Ethernet I/O module with PoE), you can select the ICP DAS "PoE" switch – "NS-205PSE" – as the power source. The NS-205PSE automatically detects whether the connected devices are PoE devices or not. This mechanism ensures that the NS-205PSE will work with both PoE and non-PoE devices simultaneously.

As a power source for PoE devices, the NS-205PSE requires a power input ranging from +46 $V_{DC}$ ~ +55 $V_{DC}$.

## Ordering Information:

| Model No. | Description |
|---|---|
| **PPDS-741-IP67 CR** | Programmable Device Server with 1 RS-232 port, 3 RS-485 ports, PoE and IP67 Casing (RoHS) |
| **PPDS-742-IP67 CR** | Programmable Device Server with 2 RS-232 ports, 2 RS-485 ports, PoE and IP67 Casing (RoHS) |
| **PPDS-743-IP67 CR** | Programmable Device Server with 3 RS-232 ports, 1 RS-485 port, PoE and IP67 Casing (RoHS) |

# 2.5 Programmable Serial-to-Fiber Device Server

## PDS-220Fx

Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Fiber ports

CE  FC  RoHS  ☒  PoE

PDS-220FT

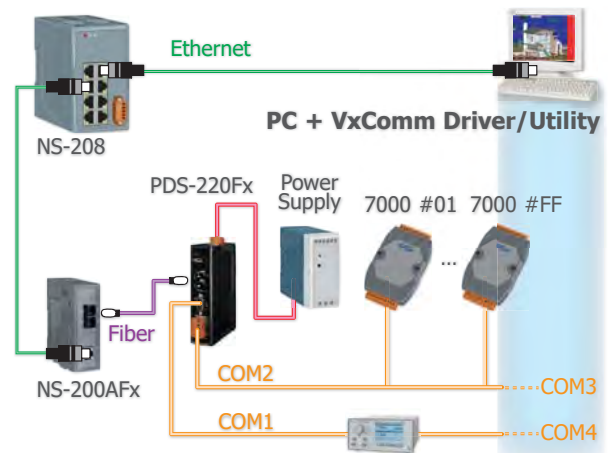PDS-220FC
PDS-220FCS
PDS-220FCS-60

## Features:

- Adds optical fiber connectivity to serial devices
- Virtual COM for 32-bit and 64-bit Windows XP/2012/7/10
- Watchdog Timer suitable for use in harsh environments
- Serial Port ±4 kV ESD Protection Circuit
- RoHS Compliant & no Halogen
- 100 Base-FX (SC/ST connector)
- Low power consumption

- "Virtual COM" extends PC COM ports
- Powerful Programmable Device Server
- Power Reverse Polarity Protection
- Self-tuner ASIC Controller on the RS-485 port
- Built-in high performance MiniOS7 from ICP DAS
- ODM Service is available

## Introduction:

The PDS-220Fx series is a family of Programmable Device Servers, also known as "Serial-to-Fiber gateway", that are designed for adding optical fiber connectivity to RS-232/422/485 devices.

**The fiber-optic communications permits transmission over longer distances than other forms of communications because of the signals travel along them with less loss and no crosstalk. It has following important features:**

- **Immunity to electromagnetic interference (EMI) — Motors, relays, welders and other industrial equipment generate a tremendous amount of electrical noise that can cause major problems with copper cabling.**
- **High electrical resistance, making it safe to use near high voltage equipment or between areas with different earth potentials.**
- **No sparks — important in flammable or explosive gas environments.**
- **Not electromagnetically radiating, and difficult to tap without disrupting the signal — important in high-security environments.**

Because of these reasons, optical fibers have largely replaced copper wire communications in core networks in the developed world.
The user-friendly VxComm Driver/Utility allows users to easily turn the built-in COM ports of the PDS-220Fx series into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the PDS-220Fx series is able to meet the demands of every network-enabled application.
The PDS-220Fx series includes a powerful and reliable Xserver programming structure that allows you to design your robust Ethernet applications in one day. The built-in, high-performance MiniOS7 boots the PDS-220Fx up in just one second and gives you fastest responses.

The PDS-220Fx is equipped with 1 RS-232 port and 1 RS-422/485 port. The removable onboard terminal block connector is designed for easy and robust wiring in industrial situations.

## Ordering Information:

| Model No. | Description |
|---|---|
| **PDS-220FT CR** | Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Multi-mode ST Fiber Port (RoHS) |
| **PDS-220FC CR** | Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Multi-mode SC Fiber Port (RoHS) |
| **PDS-220FCS CR** | Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Single-mode SC Fiber Port (RoHS) |
| **PDS-220FCS-60 CR** | Programmable Device Server with 1 RS-232, 1 RS-422/485 and 1 Single-mode SC Fiber Port (RoHS) |

# 2.6 Tiny Serial-to-Ethernet Device Server & Modbus Gateway

## tDS-700/tDS-2200 Series

tDS-712    tDS-700 series    tDSM-712    tDS-2200 series

Tiny Serial-to-Ethernet Device Server

CE  FC  RoHS  ☒  PoE

## Features:

- Incorporates any RS-232/422/485 serial device in Ethernet
- Contains a 32-bit MCU that efficiently handles network traffic
- Operation Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/2012/7/10
- Data Packing Modes: Length, Delimiter, timeout, Char-timeout
- Supports pair-connection (serial-bridge, serial-tunnel) applications
- Supports UDP responder for device discovery (UDP Search)
- Tiny Web server for serial and network configuration (HTTP)
- Easy firmware update via the Ethernet (BOOTP, TFTP)
- Static IP or DHCP network configuration
- Allows automatic RS-485 direction control

- tDS-700/tDSM-712: 10/100 Base-TX Ethernet, RJ-45 × 1
- tDS-2200: 2-port Ethernet Switch
  (LAN Bypass for Daisy-Chain Wiring)
- Includes redundant power inputs: PoE and DC jack
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption

## Introduction:

The tDS-700 is a series of Serial-to-Ethernet device servers designed to add Ethernet and Internet connectivity to any RS-232 and RS-422/485 device, and to eliminate the cable length limitation of legacy serial communication. By using the VxComm Driver/Utility, the built-in COM port of the tDS-700 series can be virtualized to a standard PC COM port in Windows. Therefore, users can transparently access or monitor serial devices over the Internet/Ethernet without software modification.
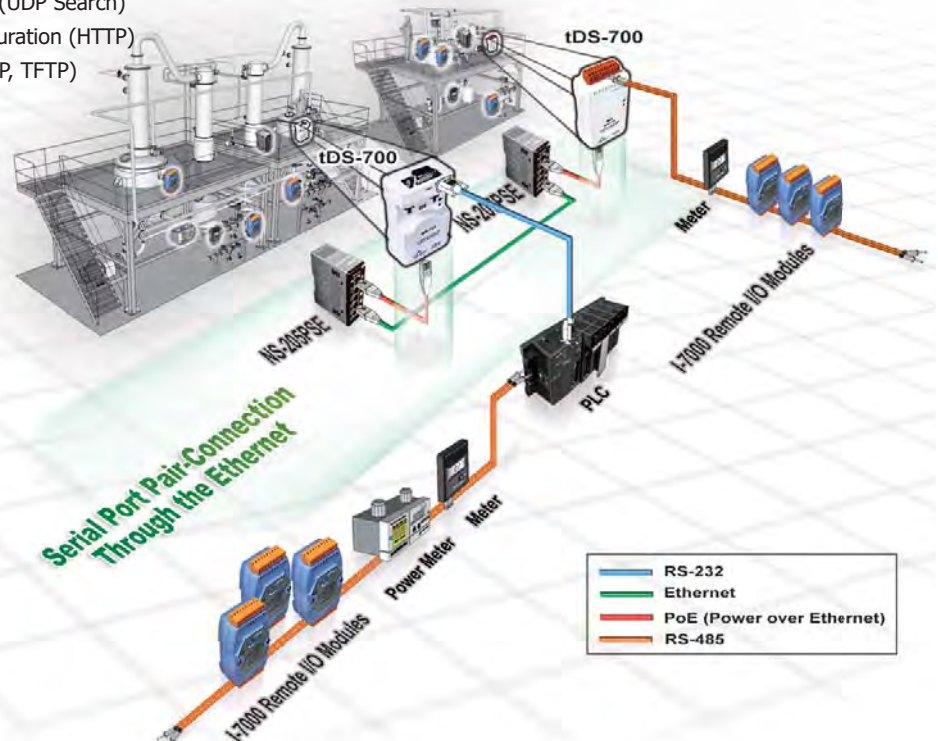


## Ordering Information:

| tDS-700/tDS-2200  Series (Tiny Device Server with PoE and DC jack) : Includes one CA-002 cable. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model (Non-Isolated) | Model (Isolated) | Case | COM Port | Ethernet | Isolation | ESD Protection | Power Input |
| tDS-712 CR | ▶tDS-712i CR | Plastic | 1 × RS-232 | 1-Port, 10/100 M | 3000 V$_{DC}$ for "**i**" version | ±4 kV | +12 ~ 48 V$_{DC}$ (Includes 1 × CA-002 cable) or PoE (IEEE 802.3af, Class 1) |
| tDSM-712 CR | - | Metal | | | | | |
| tDS-722 CR | ▶tDS-722i CR | Plastic | 2 × RS-232 | | | | |
| tDS-732 CR | ▶tDS-732i CR | Plastic | 3 × RS-232 | | | | |
| tDS-715 CR | tDS-715i CR | Plastic | 1 × RS-422/RS-485 | | | | |
| tDS-725 CR | tDS-725i CR | Plastic | 2 × RS-485 | | | | |
| tDS-735 CR | tDS-735i CR | Plastic | 3 × RS-485 | | | | |
| tDS-718 CR | ▶tDS-718i CR | Plastic | 1 × RS-232 or RS-422/485 | | | | |
| tDS-724 CR | ▶tDS-724i CR | Plastic | 1 × RS-485 1 × RS-232 | | | | |
| tDS-734 CR | ▶tDS-734i CR | Plastic | 1 × RS-485 2 × RS-232 | | | | |
| ▶tDS-2212 CR | - | Plastic | 1 × RS-422/RS-485 | 2-Port Switch, 10/100 M | - | ±4 kV | +12 ~ 48 V$_{DC}$ or PoE (IEEE 802.3af, Class 1) |
| ▶tDS-2215 CR | - | Plastic | 1 × RS-485 | | | | |
| ▶tDS-2225 CR | - | Plastic | 2 × RS-485 | | | | |
| ▶tDS-2235 CR | - | Plastic | 3 × RS-485 | | | | |
| ▶tDS-2218 CR | - | Plastic | 1 × RS-232 or RS-422/ 485 | | | | |

Note: ▶ Available soon

# tGW-700/tGW-2200 Series

Tiny Modbus/TCP to RTU/ASCII Gateway

[CE] [FC] [RoHS] [X] [PoE]

tGW-712    tGW-700 series    tGW-2200 series

## Features:

- Supports Modbus TCP/UDP master and slave
- Supports Modbus RTU/ASCII master and slave
- Read-cache ensures faster Modbus TCP/UDP response
  Supports UDP responder for device discovery (UDP Search)
- Tiny Web server for serial and network configuration (HTTP)
- Easy firmware update via the Ethernet (BOOTP, TFTP)

- tGW-700: 10/100 Base-TX Ethernet, RJ-45 × 1
- tGW-2200: 2-port Ethernet Switch (LAN Bypass for Daisy-Chain Wiring
- Includes redundant power inputs: PoE and DC jack
- Allows automatic RS-485 direction control
- Male DB-9 or terminal block connector for easy wiring

## Introduction:

The tGW-700/tGW-2200 sereis module is a Modbus gateway that enables a Modbus TCP/UDP host to communicate with serial Modbus RTU/ASCII devices through an Ethernet network, and eliminates the cable length limitation of legacy serial communication devices. The module can be used to create a pair-connection application, and can then route data over TCP/IP between two serial Modbus RTU/ASCII devices, which is useful when connecting mainframe computers, servers or other serial devices that use Modbus RTU/ASCII protocols and do not themselves have Ethernet capability.

The tGW-700 series provide 1-port Ethernet and tiny form-factor, while the tGW-2200 series provide 2-port Ethernet Switch and permits the daisy chain connection. These modules achieve maximum space savings that allows it to be flexibility and easily installed anywhere.
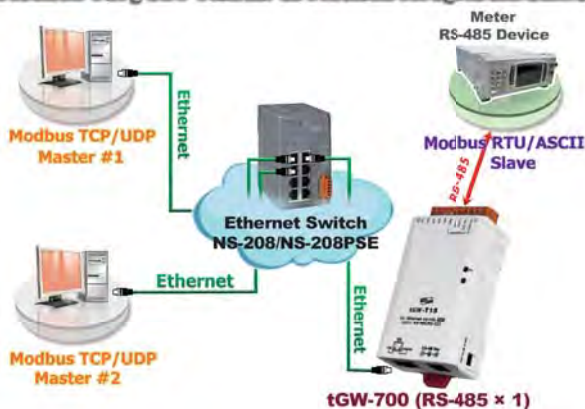


## Ordering Information:

| Model (Non-Isolated) | Model (Isolated) | COM Port | Max. TCP Connections (Masters) | Ethernet | Isolation | ESD Protection | Power Input |
|---|---|---|---|---|---|---|---|
| tGW-712 CR | ▶tGW-712i CR | 1 × RS-232 | 32 | 1-Port, 10/100 M | 3000 V$_{DC}$ for "i" version | ±4 kV | +12 ~ 48 V$_{DC}$ (Includes 1 × CA-002 cable) or PoE (IEEE 802.3af, Class 1) |
| tGW-722 CR | ▶tGW-722i CR | 2 × RS-232 | 16 | | | | |
| tGW-732 CR | ▶tGW-732i CR | 3 × RS-232 | 10 | | | | |
| tGW-715 CR | tGW-715i CR | 1 × RS-422/RS-485 | 32 | | | | |
| tGW-725 CR | tGW-725i CR | 2 × RS-485 | 16 | | | | |
| tGW-735 CR | tGW-735i CR | 3 × RS-485 | 10 | | | | |
| tGW-718 CR | ▶tGW-718i CR | 1 × RS-232 or RS-422/485 | 32 | | | | |
| tGW-724 CR | ▶tGW-724i CR | 1 × RS-485 1 × RS-232 | 16 | | | | |
| tGW-734 CR | ▶tGW-734i CR | 1 × RS-485 2 × RS-232 | 10 | | | | |
| ▶tGW-2212 CR | - | 1 × RS-422/RS-485 | 32 | 2-Port Switch, 10/100 M | - | ±4 kV | +12 ~ 48 V$_{DC}$ or PoE (IEEE 802.3af, Class 1) |
| ▶tGW-2215 CR | - | 1 × RS-485 | 32 | | | | |
| ▶tGW-2225 CR | - | 2 × RS-485 | 16 | | | | |
| ▶tGW-2235 CR | - | 3 × RS-485 | 10 | | | | |
| ▶tGW-2218 CR | - | 1 × RS-232 or RS-422/485 | 32 | | | | |

Note: ▶ Available soon

# tSH-700 Series   NEW

tSH-700 series

## Tiny Serial Port Sharer

CE  FC  RoHS  ☒  PoE

## Features:

- Supports baud rate conversion application
- Supports two masters sharing one slave port
- Read-cache ensures faster response
- Redundant power inputs: PoE and DC jack
- Tiny form-factor and low power consumption

- Supports Modbus RTU/ASCII protocol conversion
- Raw data mode for most query-response protocols
- Built-in web server for easy configuration (HTTP)
- Allows automatic RS-485 direction control

## Introduction:

The tSH-700 module provides a number of functions, including "Baud Rate Conversion", "Modbus RTU/ASCII Conversion" and "Two Masters Share One Slave". The built-in web server provides easy configuration interface, and no console commands are required.

### ● Baud Rate Conversion:

This function allows a single master device to communicate with slave devices using different baud rates and data formats. Most query-response protocols (half-duplex), e.g. DCON, are supported in the raw data mode. Full-duplex communication should also work when the data size is smaller than the built-in 512 bytes buffer on each serial port.

### ● Modbus RTU/ASCII Conversion:

This function allows a single Modbus RTU/ASCII master device to communicate with Modbus RTU/ASCII slave devices using different protocols, baud rates and data formats.

### ● Two Masters Share One Slave:

This function allows two master devices connected to different serial ports to share slave devices. The queries from the masters are queued in the tSH-700 module and then processed one-by-one. Modbus mode can be used to convert the Modbus RTU/ASCII protocols, while raw data mode can be used for DCON or other query-response protocols. Different baud rates and data formats can also be used on the different serial ports.

### ● Read-Cache Function:

The built-in read-cache function is used to store previous requests and responses of the Modbus messages in the memory buffer of the tSH-700 module. When other HMI/SCADA master controllers requiring the same information from the same salve RTU device, the cached response is returned immediately. This feature dramatically reduces the loading on the slave serial port communication, ensures faster responses to the master, and improves the stability of the entire system.

Raw data communication

Protocol conversion
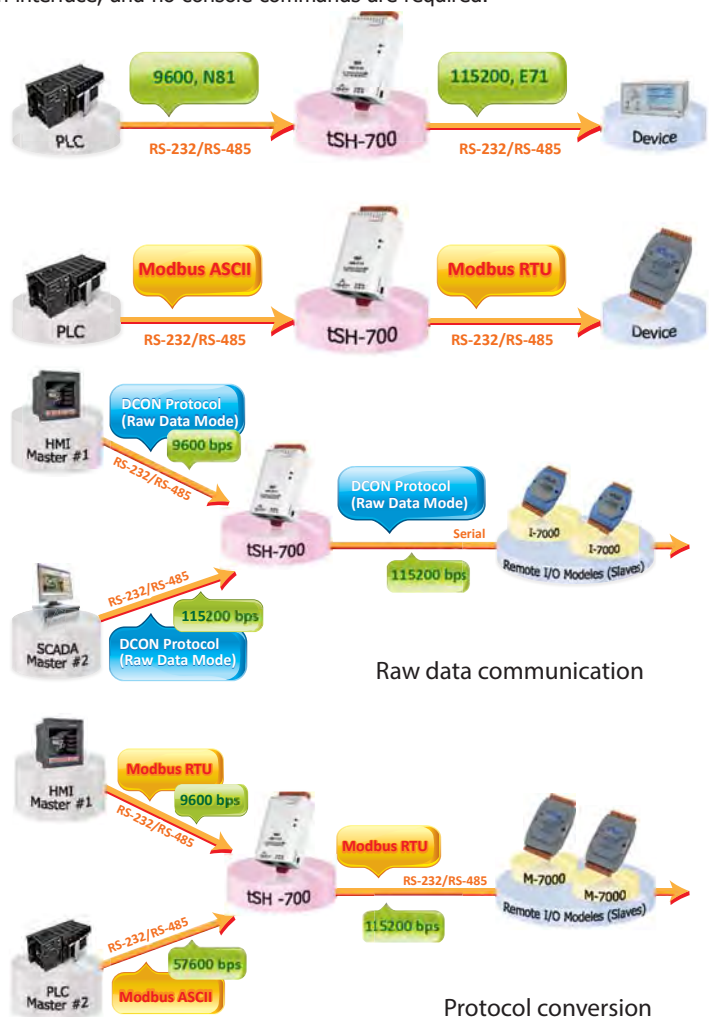
## Ordering Information:

| tSH-700 Series (Tiny Serial Port Converter/Sharer with PoE and DC jack) : Includes one CA-002 cable. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model (Non-Isolated) | Model (Isolated) | RS-232 | RS-485 | Application | COM1 | COM2 | COM3 |
| tSH -722 CR | ▶tSH -722i CR | 2 | – | Converter | 3-wire RS-232 | 3-wire RS-232 | – |
| tSH -725 CR | tSH -725i CR | – | 2 | | 2-wire RS-485 | 2-wire RS-485 | – |
| tSH -724 CR | ▶tSH -724i CR | 1 | 1 | | 2-wire RS-485 | 3-wire RS-232 | – |
| tSH -732 CR | ▶tSH -732i CR | 3 | – | Sharer | 3-wire RS-232 | 3-wire RS-232 | 3-wire RS-232 |
| tSH -735 CR | tSH -735i CR | – | 3 | | 2-wire RS-485 | 2-wire RS-485 | 2-wire RS-485 |
| tSH-734 CR | ▶tSH -734i CR | 2 | 1 | | 2-wire RS-485 | 3-wire RS-232 | 3-wire RS-232 |

**Note: ▶ Available soon**

# 2.7 Programmable Serial Device Server with LAN Switch

## PDS-5105D-MTCP

Programmable Device Server with 10 RS-485 Ports, 2-port LAN Switch and LED Display

CE · FC · RoHS

### Features:

- Integrates any RS-485 serial device in an Ethernet Network
- Virtual COM extends the PC COM ports
- Virtual COM supports 32-bit and 64-bit Windows XP/2012/7/10
- Provides 10 RS-485 ports with Self-Tuner (Auto-direction control)
- ±2 kV ESD protection on serial ports
- RoHS compliant & no halogen
- 2-port 10/100 Base-TX Ethernet Switch with LAN Bypass

- Powerful programmable device server
- Watchdog timer suitable for use in harsh environments
- Power reverse polarity protection
- Built-in high performance MiniOS7 from ICP DAS
- ODM service is available
- Low power consumption

## Introduction:

The PDS-5105D-MTCP is a Programmable Device Server, also known as a "Serial-to-Ethernet gateway" that is designed to allow Ethernet connectivity to be added to RS-232/485 devices.

The user-friendly VxComm Driver/Utility allows users to easily turn the built-in COM ports of the PDS-5105D-MTCP series into standard COM ports on a PC. By virtue of its protocol independence, specialized OS and high flexibility, the PDS-5105D-MTCP series is able to meet the demands of any network-enabled application.

The PDS-5105D-MTCP series includes a powerful and reliable Xserver programming structure that allows you to quickly develop custom robust Ethernet applications. The built-in, high-performance MiniOS7 boots the PDS-5105D-MTCP up in just one second and gives you the fastest response.
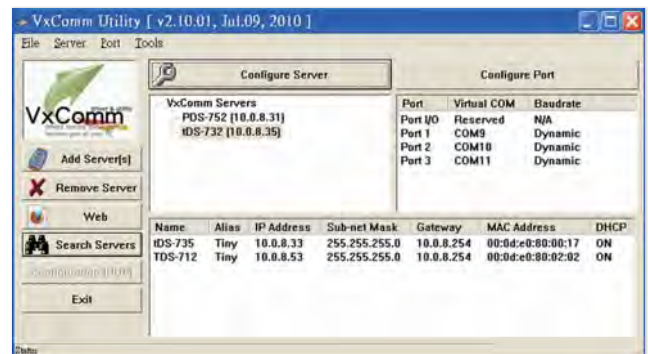
### 2-port Ethernet Switch with LAN Bypass

**The PDS-5105D-MTCP is equipped with a 2-port 10/100Base-Tx Ethernet switch that simplifies network wiring by cascading Ethernet devices. Furthermore, the module features a LAN Bypass function allowing network traffic to be continued between two network segments (Ethernet port1 and port2).** In cases where the module is offline due to of software, hardware or power failure, the LAN Bypass function will be automatically activated, and the essential communications on the network can continue operating without interruption.

**LAN Bypass Feature**

Bypassing

Ethernet  Ethernet      Ethernet  Ethernet
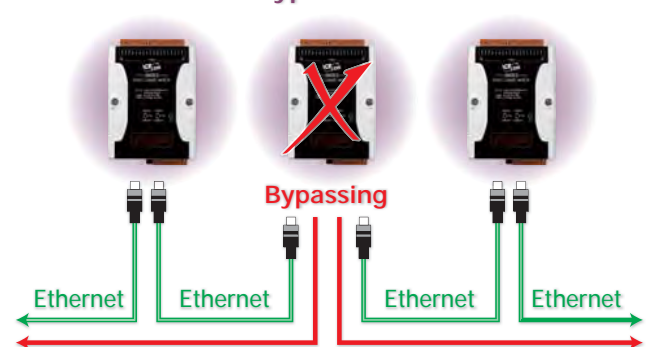
## Ordering Information:

| Model No. | Description |
| --- | --- |
| PDS-5105D-MTCP CR | Programmable Device Server with 10 RS-485 Ports, 2-port LAN Switch and LED Display. (RoHS) |

# 2.8 Programmable Modbus to Ethernet Gateway

## µPAC-7186EX(D)-MTCP

µPAC-7186EX-MTCP    µPAC-7186EXD-MTCP

Modbus/RTU to Modbus/TCP Gateway

## Features:

- Incorporate Serial Devices in an Ethernet network
- Supports Modbus/TCP and Modbus/RTU
- "Virtual COM" extends PC COM ports
- 10/100 Base-TX (Auto-negotiating, auto MDI/MDI-X, LED indicator)
- Self-Tuner ASIC Controller on the RS-485 Port
- 5-digit LED Display (for versions with a display)
- Built-in High Performance MiniOS7 from ICP DAS

- Virtual COM for 32-bit and 64-bit Windows XP/2012/7/10
- Programmable Internet/Ethernet Controller
- Watchdog Timer suitable for use in harsh environments
- Power Reverse Polarity Protection Circuit
- RS-485 Port ESD Protection Circuit
- RoHS Compliant & no Halogen
- Low power consumption

## Introduction:

The Modbus communications protocol has become the de facto industry standard, and is now the most commonly available means of connecting industrial electronic devices.

Modbus allows for communication between many devices connected to the same network, for example a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.

The µPAC-7186EX(D)-MTCP uses a default firmware to become a single Modbus/TCP to multiple Modbus/RTU converter. You can simply use the Modbus Utility to configure the device and then set the connection between the SCADA or HMI software and the µPAC-7186EX(D)-MTCP.

The µPAC-7186EX(D)-MTCP can also link to legacy serial devices that don't support Modbus/RTU. To use this function, you need to install the VxComm driver on the host PCs and create virtual COM ports for the remote serial ports on the µPAC-7186EX(D)-MTCP. You can then directly access the remote serial devices via the virtual COM ports.

Using the Modbus SDK, users can develop their own custom Modbus firmware, allowing extra functions and integration of serial devices. In this way, the µPAC-7186EX(D)-MTCP becomes a powerful controller.

The µPAC-7186EX(D)-MTCP contains a built-in operating system, the MiniOS7, which offers a stable and high performance environment that is similar to DOS. The MiniOS7 can boot up the µPAC-7186EX(D)-MTCP within just one second, with the added benefit of no virus problems and a small footprint. Furthermore, the µPAC-7186EX(D)-MTCP is designed for low power consumption, maintenance elimination (no hard disk and no fan), and is constructed from fire-retardant materials (UL94-V0 level) with a robust case.

### I/O Expansion Bus and Expansion Board

**The µPAC-7186EX(D)-MTCP supports a single I/O expansion bus for plugging with a X-board. ICP DAS provides many optional X-boards for the µPAC-7186EX(D)-MTCP, which offers various I/O functions, such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, battery backup SRAM and AsicKey... etc.**

## Ordering Information:

| Model No. | Description |
|---|---|
| **µPAC-7186EX-MTCP CR** | µPAC-7186EX with Default Modbus/TCP Firmware (RoHS) |
| **µPAC-7186EXD-MTCP CR** | µPAC-7186EXD with Default Modbus/TCP Firmware (RoHS) |
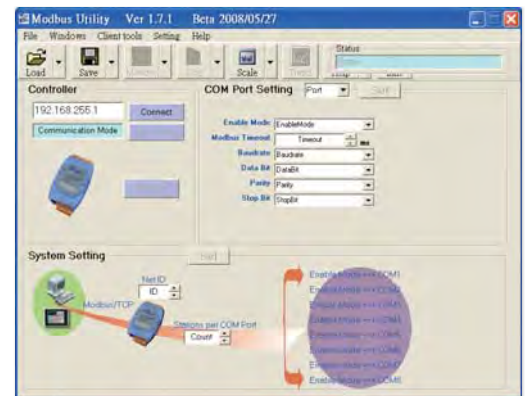
# 2.9 Modbus Data Concentrator, MDC-700 series

## MDC-711

Modbus data concentrator with 1 × Ethernet and 1 × RS-232, 1 × RS-485

## MDC-714

Modbus data concentrator with 1 × Ethernet and 1 × RS-232, 4 × RS-485

## MDC-741

Modbus data concentrator with 1 × Ethernet, 4 × RS-232, 1 × RS-485

MDC-711   MDC-714

MDC-741

## Features:

- Modbus Data Concentrator
- Great Capability of Shared Memory
- Config.CSV to Ease Hard Work of Editing a lot of Definition
- Web Sever to Ease the Operating and Show Clear Information

## Introduction:

MDC-700 series is a Modbus Data Concentrator that has ability to perform up to 200 Modbus/RTU commands to read/write from/to Modbus slave devices via RS-232/485 and allows up to 8 Modbus/TCP masters to get the polled data via the Ethernet.

MDC-700 series provide a built-in web server to ease the configuring and provide clear information for the performed results of each Modbus/RTU command on the RS-232/485.

### Modbus Data Concentrator

The MDC performs the pre-defined Modbus/RTU commands to read/write data from/to the Modbus/RTU slave devices via the RS-232/485. It mirrors the data of the slave devices to its own shared memory. And it accepts up to 8 Modbus/TCP masters to directly read/write data form/to the shared memory instead of polling each Modbus/RTU slave device one by one.

This way not only makes the data on the RS-232/485 sharable to multiple Modbus/TCP master but also shorten the time to read/write data from/to multiple Modbus/RTU slave devices.

### Great Capability of Shared Memory

The MDC can perform up to 200 polling definitions. And the internal shared memory has four tables to store the polled AI, AO, DI and DO data. Each table can store up to 4000 registers.

### Config.CSV to Ease Hard Work of Editing a lot of Definition

The Modbus polling definition is defined in a Config.CSV file. Editing/checking a lot of polling definitions is a hard work and may have chance to make a mistake. A CSV format file can ease the work by using Excel. Furthermore, the built-in web server allows users import/export the Config.CSV via a simple mouse-click action.

### Web Sever to Ease the Operating and Show Clear Information

The IP address, configuration file, Config.CSV can be simply configured via the Web server. And the performed results of all Modbus polling definition are shown on the web page. It is very easy to debug which Modbus/RTU device has communication problem. And the MDC firmware will skip the abnormal Modbus polling definition for a while to smoothly perform the whole polling without distribution.
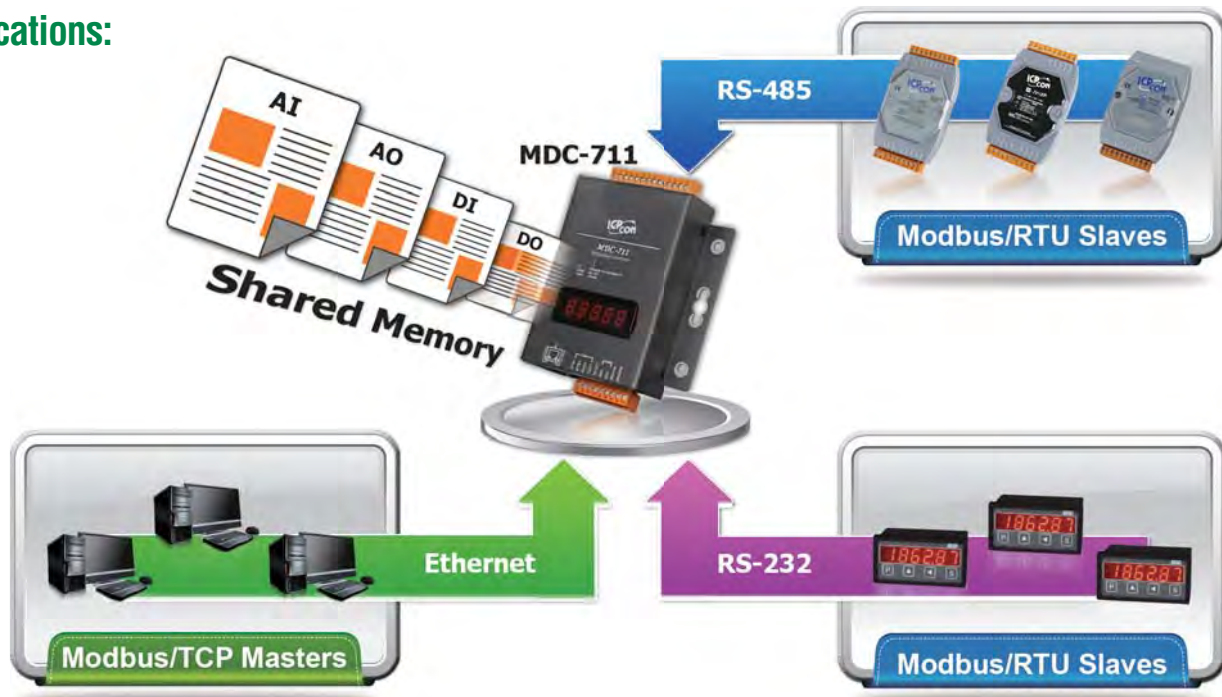
## Applications:



## System Specifications:

| Model Name | MDC-711 | MDC-714 | MDC-741 |
|---|---|---|---|
| **Ethernet** | | | |
| Port | x1, 10/100 Base-TX | | |
| Protocol | Modbus/TCP Slave | | |
| Max. connection | 8 | | |
| **COM port** | | | |
| RS-232 | x1, (TXD, RXD, RTS, CTS, GND) | | x4, (TXD, RXD, RTS, CTS, GND) |
| RS-485 | x1, (Data+, Data-) | x4, (Data+, Data-) | x1, (Data+, Data-) |
| Baudrate | 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 | | |
| Data Format | N81, E81, O81 | | |
| Protocol | Modbus/RTU Master | | |
| Max. Node | 32 nodes for each RS-485 port | | |
| Polling Definition | 200 definitions for all RS-232/485 ports | | |
| Shared Memory | 4000 registers for each of AI, AO, DI and DO data | | |
| **System** | | | |
| 5-Digit 7 Segment LED Display | Yes, to display IP address | | |
| System LED Indicator | Yes, to display hear beat | | |
| **Mechanical** | | | |
| Dimension (W × H × D) | 102 mm × 125 mm × 28 mm | | |
| Installation | Wall Mount | | |
| **Power** | | | |
| Required Supply Voltage | +10 V$_{DC}$ ~ +30 V$_{DC}$ (non-regulated) | | |
| Power Consumption | 2.5 W | | |
| **Environment** | | | |
| Operating Temperature | -25°C ~ +75°C | | |
| Storage Temperature | -40°C ~ +80°C | | |
| Humidity | 5 ~ 95% RH, non-condensing | | |

## Ordering Information:

| Model No. | Description |
|---|---|
| **MDC-711 CR** | Modbus data concentrator with 1 × Ethernet and 1 × RS-232, 1 × RS-485 (RoHS) |
| **MDC-714 CR** | Modbus data concentrator with 1 × Ethernet and 1 × RS-232, 4 × RS-485 (RoHS) |
| **MDC-741 CR** | Modbus Data Concentrator with 1 × Ethernet and 4 × RS-232, 1 × RS-485 (RoHS) |

# 3. Converter/Repeater/Hub/Splitter
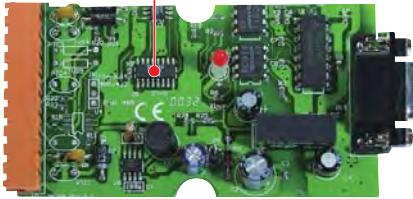
**ICP DAS Self-Tuner ASIC Features:**
- Multiple Baud Rate
- Multiple Data Format
- Automatic RS-485 Direction Control

Self-Tuner Chip



▲ 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 twisted 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.



## 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 1200 m 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.



▲ I-7520U4          ▲ I-7514U
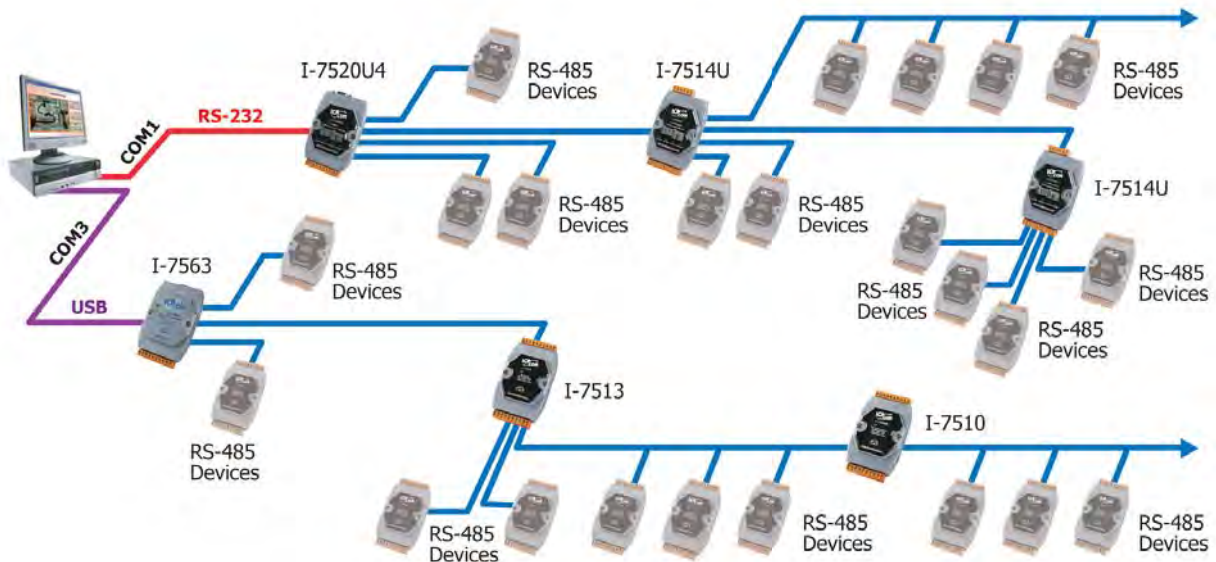
The following block diagram shows how I-7514U was designed as independent channel. Data coming from the master input will be transmitted to all four RS-485 slave channels. But data coming from the slave channels will be returned to the master input only. Thus reduces the possibility of interference between each RS-485 slave loop and makes the RS-485 networks more robust and reliable.

▶ I-7514U Block Diagram
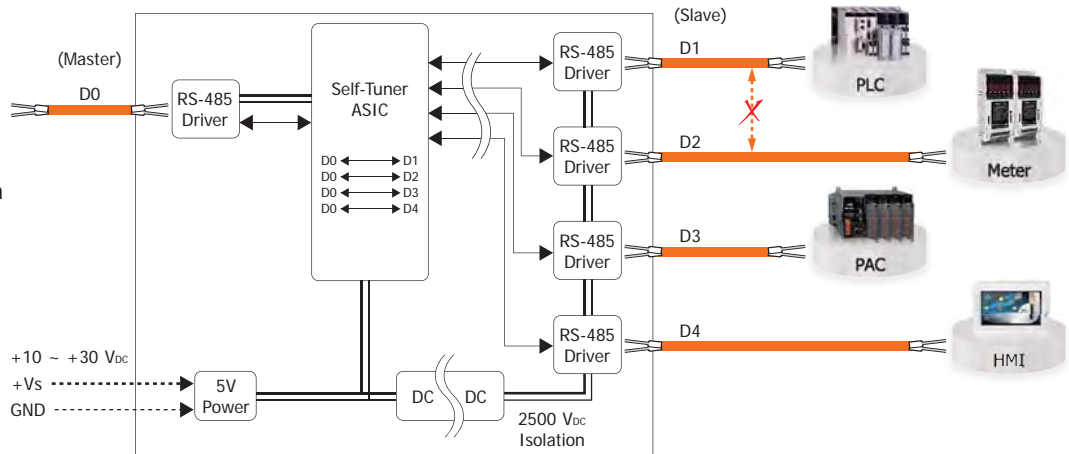
## ✓ RS-232/422/485 Converter/Repeater

| Model Name | tM-7520U | I-7520 | I-7520R | I-7520A | I-7520AR | I-7551 | tM-7510U | I-7510 | I-7510A | I-7510AR |
|---|---|---|---|---|---|---|---|---|---|---|
| Pictures | | | | | | | | | | |
| 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 | 3000 $V_{DC}$ RS-232 side | 3000 $V_{DC}$ RS-232 side | 3000 $V_{DC}$ RS-485 side | 3000 $V_{DC}$ RS-232 side | 3000 $V_{DC}$ RS422/485 side | 3000 $V_{DC}$ 3 ways | 3000 $V_{DC}$ | 3000 $V_{DC}$ | | 3000 $V_{DC}$ 3 ways |
| Operating Temperature | -25 ~ +75°C | | | | | | | | | |

## ✓ USB to RS-232/422/485 Converter

| Model Name | I-7560U | USB-2514 | I-7561U | tM-7561 |
|---|---|---|---|---|
| Pictures | | | | |
| Function | Converter | Converter | Converter | Converter |
| Interface | USB to RS-232 | USB to 4-Port RS-232 | USB to RS-232/422/485 | USB to RS-485 |
| Isolation | - | - | 3000 $V_{DC}$ | 3000 $V_{DC}$ |
| Operating Temperature | -25 ~ +75°C | | | |

## ✓ USB RS-232/485 to RS-485 Hub

| Model Name | I-7563U | I-7513 | I-7520U4 | I-7514U |
|---|---|---|---|---|
| Pictures | | | | |
| 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 $V_{DC}$ | 3000 $V_{DC}$ 3 ways | 3000 $V_{DC}$ RS-232 side | 3000 $V_{DC}$ Ch1-Ch4 side |
| Operating Temperature | -25 ~ +75°C | | | |

# 4. Termination Resistor/DC Bias Voltage

## tM-SG4
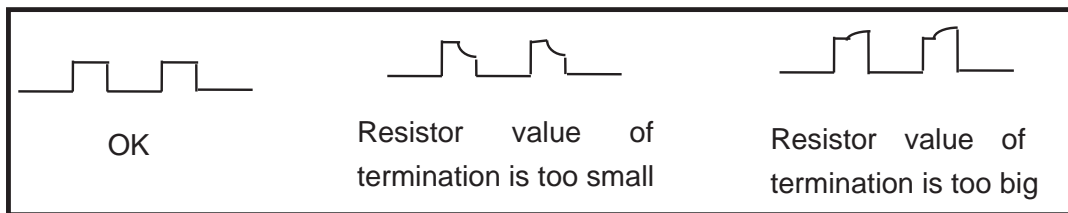
The RS-485 Bias and Termination Resistors Module

### 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.



| OK | Resistor value of termination is too small | Resistor value of termination is too big |

### Applications:
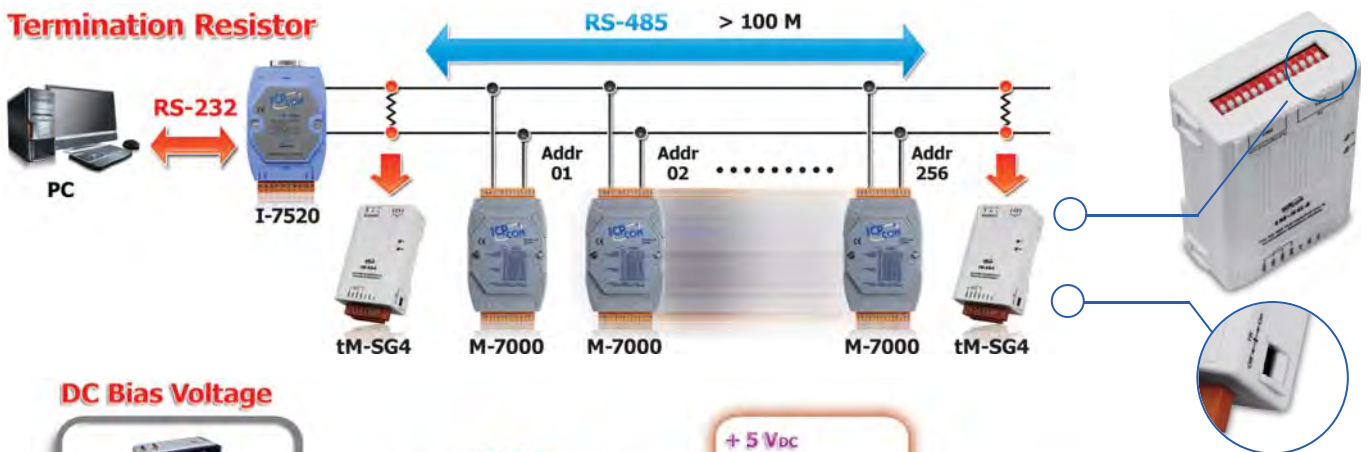
# 5. Ethernet Switch

## ✅ Unmanaged Ethernet Switch

| Model Name | Speed | Port | Power Input | Housing |
|---|---|---|---|---|
| NS-105A | 10/100 M | 5 | +12 ~ 53 VDC | Plastic |
| NS-205-IP67 | 10/100 M | | +10 ~ 30 VDC, isolated | Plastic with IP67 |
| NS-205AG | 10/100/1000 M | | +12 ~ 48 VDC | Plastic |
| NS-208AG/NSM-208AG | 10/100M/1000 M | 8 | +12 ~ 48 VDC | Plastic/Metal |
| NS-208A/NSM-208A | 10/100 M | | +12 ~ 48 VDC | Plastic/Metal |
| NS-208-IP67 | | | +12 ~ 53 VDC | Plastic with IP67 |
| NSM-208-M12 | | | +12 ~ 53 VDC | Metal with M12 connector |
| NSM-208-M12-IP67 | | | +12 ~ 53 VDC | Plastic with M12 connector and IP67 |
| NSM-216 | 10/100 M | 16 | +12 ~ 48 VDC | Metal |
| NSM-316G | 10/100/1000 M | | +12 ~ 48 VDC | Metal |

## ✅ Unmanaged PoE Ethernet Switch

| Model Name | Speed | Port | PoE Type (IEEE 802.3at) | Power Input | Housing |
|---|---|---|---|---|---|
| NS-105PSE | 10/100 M | 5 | PSE x4 | +46 ~ 55 VDC | Plastic |
| NS-205PSE-IP67 | 10/100 M | | | +46 ~ 53 VDC | Plastic with IP67 |
| NSM-205GP | 10/100/1000 M | | | +18 ~ 55 VDC | Metal |
| NS-208PSE/NSM-208PSE | 10/100 M | 8 | PSE x8 | +46 ~ 55 VDC | Plastic/Metal |
| NSM-208PSE-24V | | | | +18 ~ 55 VDC | Metal |
| NSM-208PSE-M12 | | | | +46 ~ 53 VDC | Metal |
| NS-208PSE-M12-IP67 | | | | +46 ~ 53 VDC | Plastic with M12 connector and IP67 |
| NS-208PSE-IP67 | | | | +46 ~ 53 VDC | Plastic with IP67 |

## Appearance:



**IP67**

PoE ports for NS-208PSE-IP67

Plastic casing with IP67

DIN-Rail

Screw hole for wall mounting kit

Power input

▲ NS-208-IP67
NS-208PSE-IP67



**IP67**

PoE ports for NS-205PSE-IP67

Plastic casing with IP67

LED indicators

Power input

Screw hole for wall mounting kit

▲ NS-205-IP67
NS-205PSE-IP67



**IP67**

▲ NS-208PSE-M12-IP67



▲ NSM-208PSE-M12
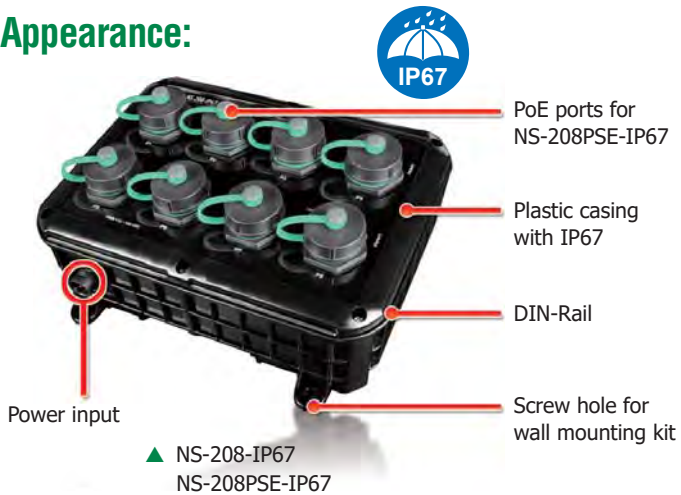
## ☑ Real-time Redundant Ring Switch

Network topology refers to the way in which the network of switches and other network nodes is connected. In a Cyber-Ring network, every switch or network node has two adjacent neighbors for communication purposes. Cyber-Ring supports a variety of ring network topologies including Single Ring, Ring Coupling and Double Ring Coupling with fault-tolerant capability. The following sections describe in more detail the benefit of those topologies.

## Features:

- 20 ms (typical) to detect and recover from a Ethernet link failure
- Automatic MDI / MDI-X crossover for plug-and-play
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Redundant Power Inputs with power failure alarm by relay out

- Store-and-forward architecture
- 3.2 Gbps high performance memory bandwidth
- 1 Mbit Frame buffer memory
- 1024/2048 MAC addresses

### Dual Ring

The Dual Ring topology can connect separate Cyber-Ring network together (refer to figure 2). It is ideal for two-floor application scene. The Dual Ring topology not only construct individual Cyber-Ring network for each floor but also provide backup path to each other. It is a cost-effective solution to coupling ring topology.
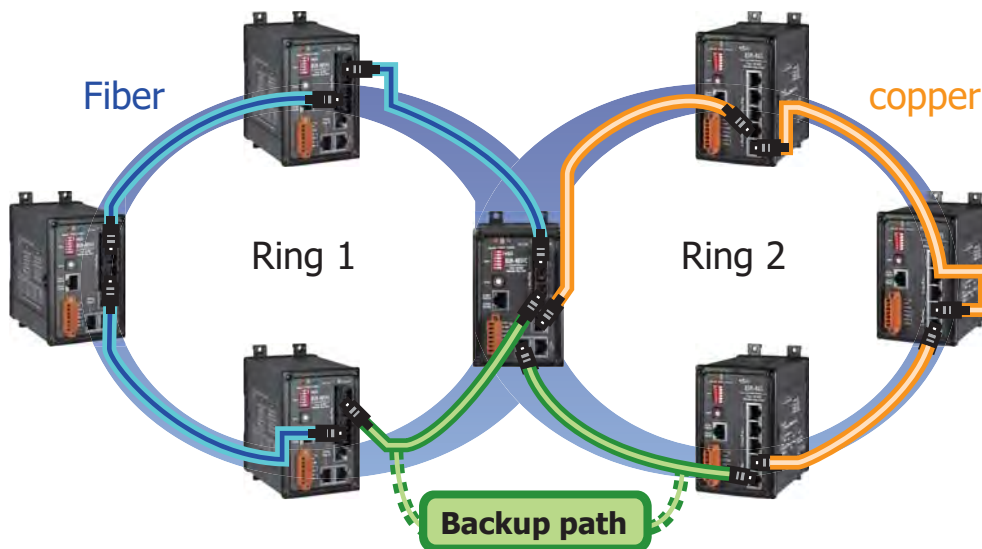


### Solo Ring

A solo Ring network topology based on Cyber-Ring technology is a cost-effective solution to meet the requirements for link-loss backup in redundant network applications (refer to figure 4). Compared with other ring topology, Solo Ring is composed of ONE ring switch and unmanaged switches (NS series), there is some limit of this topology - longer recovery time and the ring switch is used to close ring topology only. The Solo Ring is most cost-effective redundant topology of Cyber-Ring technology.
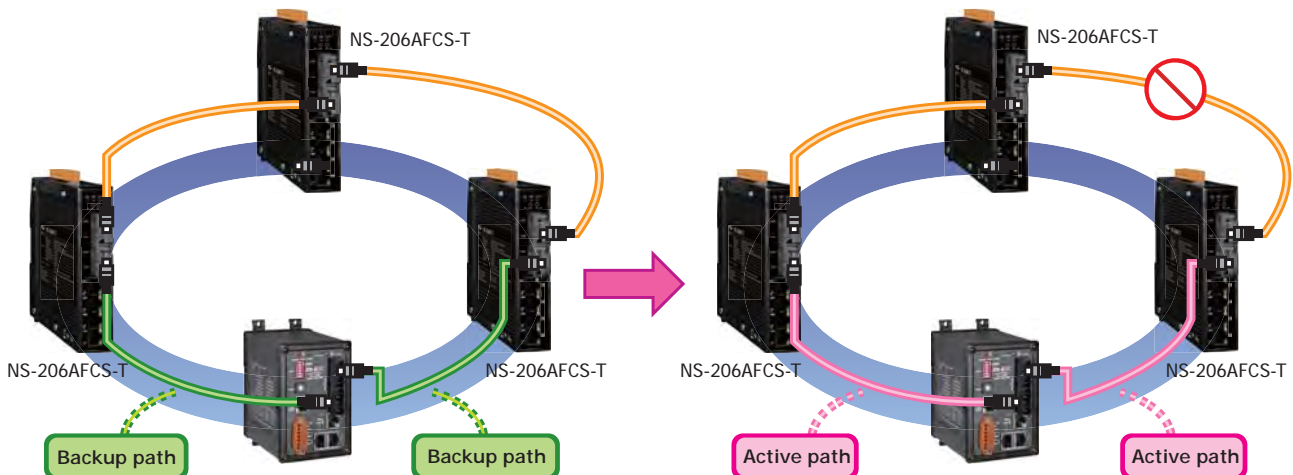
## Single Ring

A Single Ring network topology based on Cyber-Ring technology is an effective solution to meeting the requirements for link-loss backup in industrial field applications. In normal operations, traffic on the backup path is either blocked or ignored, so that if there is a failure in any of the network nodes or within a cable segment on the active path, Cyber-Ring will automatically redirect the disrupted traffic to the backup path. After the affected path is repaired, the network will again be reconfigured to normal operational status



Backup path          Active path          Brokrn

## ✓ Real-time Redundant Ring Ethernet/Fiber Port Switch

| Model Name | | Ethernet | | Fiber Port | | Power Input | Housing |
|---|---|---|---|---|---|---|---|
| | | Speed | Port | Speed | Port | | |
| **RS-405/RSM-405** | | 10/100 Mbps | 5 | – | – | +10 ~ 30 VDC | Plastic/Metal |
| **RS-408/RSM-408** | | 10/100 Mbps | 8 | – | – | +10 ~ 30 VDC | Plastic/Metal |
| **RS-405F/RSM-405F Series** | | 10/100 Mbps | 3 | 100 Mbps | 2 | +10 ~ 30 VDC | Plastic/Metal |
| **RSM-405-R** | | 10/100 Mbps | 5 | – | – | +12 ~ 48 VDC | Metal |

## ✅ Managed Ethernet/Fiber Switch

| Model Name | Ethernet | | Fiber Port | | | | Power Input | Housing |
|---|---|---|---|---|---|---|---|---|
| | Speed | Port | Mode | Connector | Speed | Port | | |
| **MSM-508** | 10/100 Mbps | 8 | – | – | – | – | +12 ~ 48 V$_{DC}$ | Metal |
| **MSM-508F Series** | 10/100 Mbps | 6 | – | – | 100 Mbps | 2 | +12 ~ 48 V$_{DC}$ | Metal |
| **FSM-510G-2F** | 10/100/1000 Mbps | 8 | SFP cage | LC | 100/1000 Mbps | 2 | +12 ~ 48 V$_{DC}$ | Metal |
| **FSM-510G-4F** | 10/100/1000 Mbps | 6 | SFP cage | LC | 100/1000 Mbps | 4 | +12 ~ 48 V$_{DC}$ | Metal |
| **FSM-6228G-DC** | 10/100/1000 Mbps | 24 | SFP cage | LC | 100/1000 Mbps | 4 | +12 ~ 48 V$_{DC}$ | Metal |
| **FSM-6228G-AC** | 10/100/1000 Mbps | 24 | SFP cage | LC | 100/1000 Mbps | 4 | 100 ~ 240 V$_{AC}$ | Metal |

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## 8-port Industrial Ethernet Layer 2 Managed Switch

### MSM-508

The MSM-508 is an 8-port Industrial Ethernet (10/100 Base-TX) Layer 2 Managed Switch. MSM-508 supports 10/100M auto negotiation feature and auto MDI/MDI-X function.

- 3.2 Gbps high performance memory bandwidth
- Redundant Power Inputs +12 V$_{DC}$ ~ +48 V$_{DC}$
- Each port supports both 10/100 Mbps speed auto negotiation
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Operating temperature range: -40°C ~ +75°C
- Store-and-forward architecture
- Frame buffer memory: 1 Mbit
- Supports 2K MAC Addresses
- Power failure alarm by relay output

---

## 8-port Industrial Ethernet Layer 2 Managed Switch with 2-Fiber Port

### MSM-508F Series

The MSM-508F series is an 8-port Industrial Ethernet Layer 2 Managed Switch with 2-Fiber Port that secures data transmission by using fiber optic transmission to provide immunity from EMI/RFI interference.

- 3.2 Gbps high performance memory bandwidth
- Redundant Power Inputs +12 V$_{DC}$ ~ +48 V$_{DC}$
- Each port supports both 10/100 Mbps speed auto negotiation
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Operating temperature range: -30°C ~ +75°C
- Store-and-forward architecture
- Frame buffer memory: 1 Mbit
- Supports 2K MAC Addresses
- Power failure alarm by relay output

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**NEW**

## 6-Port 10/100/1000 Base-T + 4 SFP Port L2 Managed Switch
## 8-Port 10/100/1000 Base-T + 2 SFP Port L2 Managed Switch

### FSM-510G Series

FSM-510G-4F is a L2 Managed Switch that meets all IEEE 802.3ab/u/x/z Gigabit, Gigabit Ethernet and Ethernet specifications. It provides 6 gigabit Ethernet ports (10/100/1000 Mbps TP) 4 SFP ports.

The switch can be managed through RS-232 serial port via direct connection, or through Ethernet port using Telnet or Web-Based management unit, associated with SNMP agent. With the SNMP agent, the network administrator can logon the switch to monitor, configure and control each port activity in a friendly way. The overall network management is enhanced and the network efficiency is also improved to accommodate high bandwidth applications. In addition, the switch features comprehensive and useful function such as DHCP Option 82, QoS (Quality of Service), Spanning Tree, VLAN, Port Trunking, Bandwidth Control, Port Security, SNMP/RMON

- Network redundant Ring fail-over protection (< 20 ms)
- Multicasting support IGMP v1/v2, proxy & snooping
- L2+ features provide better manageability, security, QoS, and performance
- IEEE 802.3ab 1000BASE-T Gigabit Ethernet
- Multicast/Broadcast/Flooding Storm Control

**NEW**

## 24-port Ethernet + 4 SFP Layer 2 Gigabit Managed Switch

### FSM-6228G-AC
### FSM-6228G-DC

FSM-6228G is a L2 Managed Switch that meets all IEEE 802.3ab/u/x/z Gigabit, Gigabit Ethernet and Ethernet specifications. It provides 24 gigabit Ethernet ports (10/100/1000 Mbps TP) 4 SFP ports.

The switch can be managed through RS-232 serial port via direct connection, or through Ethernet port using Telnet or Web-Based management unit, associated with SNMP agent. With the SNMP agent, the network administrator can logon the switch to monitor, configure and control each port activity in a friendly way. The overall network management is enhanced and the network efficiency is also improved to accommodate high bandwidth applications. In addition, the switch features comprehensive and useful function such as QoS (Quality of Service), Spanning Tree, VLAN, Port Trunking, Bandwidth Control, Port Security, SNMP/RMON.

- Network redundant Ring fail-over protection (< 20 ms)
- Multicasting support IGMP v1/v2/v3, proxy & snooping
- L2+ features provide better manageability, security, QoS, and performance
- IEEE 802.3ab 1000BASE-T Gigabit Ethernet
- Multicast/Broadcast/Flooding Storm Control

### Accessories

| | |
|---|---|
| **SFP-1G85M-SX** | Multi-mode 850 nm, 0.5 km SFP module |
| **SFP-1G13M-SX2** | Multi-mode 1310 nm, 2 km SFP module |
| **SFP-1G13S-LX** | Single-mode 1310 nm, 10 km SFP module |
| **SFP-1G13S-LX20** | Single-mode 1310 nm, 20 km SFP module |
| **SFP-1G13S-LHX** | Single-mode 1310 nm, 40 km SFP module |
| **SFP-1G15S-XD** | Single-mode 1550 nm, 60 km SFP module |

## ☑ PoE Splitter/Injector

A PoE splitter makes the exact invert operation: by the means of a PoE splitter, the power and the data received on the Ethernet cable are split. The power can then be used to power any other electrical device present in the application.

A PoE injector enables the powering of a PoE compatible device over Ethernet in spite of a non PoE capable Ethernet Switch. The PoE injector, placed between the Ethernet switch and the PoE powered device, merges both data (Ethernet Port) and voltage (power connector) on the Ethernet cable.

| Model Name | Speed | Input | Output | Housing |
|---|---|---|---|---|
| **NS-200PS** | 10/100/1000 Mbps | PoE | Ethernet + 24 V$_{DC}$ | Plastic |
| **tNS-200IN** | 10/100 Mbps | Ethernet + 48 V$_{DC}$ | PoE | Plastic |
| **tNS-200IN-24V** | 10/100 Mbps | Ethernet + 24 V$_{DC}$ | PoE | Plastic |

## Industrial Media Converters & WDM Media Converter

A Media Converter is a simple and low-cost networking device which allows connect two dissimilar media types such as an Ethernet cable with fiber optic, even though transmission speed are different. It is a perfect add-on to an Ethernet switch when combining copper and fiber within the Ethernet Network. Multiple cabling types such as coax, twisted pair, multi-mode and single-mode fiber optics are supported.



▼ NSM-200SX2
◄ NS-200FCS
▲ NS-200FT
▲ NSM-200SX
▲ NS-200WDM
▲ NSM-200G-SFP

| Model Name | Fiber Port | | Ethernet | | Operation temperature | Power Input | Housing |
|---|---|---|---|---|---|---|---|
| | Speed | Port | Speed | Port | | | |
| NS-200F series | 100 M | 1 | 10/100 M | 1 | 0 ~ +70°C | +10 ~ 30 VDC | Plastic |
| NS-200WDM | 100 M | 1 | 10/100 M | 1 | 0 ~ +70°C | +12 ~ 48 VDC | Plastic |
| NS-200AF series | 100 M | 1 | 10/100 M | 1 | -30 ~ +75°C | +12 ~ 48 VDC | Plastic |
| NSM-200G-SFP NSM-200SX/SX2/LX | 1000 M | 1 | 10/100/1000 M | 1 | -30 ~ +75°C | +12 ~ 48 VDC | Metal |

## Unmanaged Ethernet Switch with Fiber Ports

An unmanaged industrial Ethernet switch with fiber port(s) provides both Ethernet switch functionality (up to 8 RJ45 ports) and media converter (up to 2 fiber ports) for safe and fast local and long distance (max 60 km) transmissions. Each switch is plug and play, can be installed on DIN-Rail, and supports wide operating temperature range.



▼ NSM-206AFT-T
▼ NSM-206AFC-T
NS-209FT ►
NS-209FC ►
▲ NSM-209FT
▲ NSM-209FC
NSM-210C ►
▲ NS-205PFT
▲ NS-205AFC-T
◄ NSM-205AFT-T
▲ NS-206AFT-T
▲ NSM-205PFC

| Model Name | Fiber | | Ethernet | | | Power Input | Housing |
|---|---|---|---|---|---|---|---|
| | Speed | Port | Speed | Port | PSE (IEEE 802.3af) | | |
| NS-205AF Series NSM-205AF Series | 100 M | 1 | 10/100 M | 4 | - | +12 ~ 48 VDC | Plastic/Metal |
| NS-205PF Series NSM-205PF Series | 100 M | 1 | 10/100 M | 4 | 4 | +12 ~ 48 VDC | Plastic/Metal |
| NS-206AF Series NSM-206AF Series | 100 M | 1 | 10/100 M | 4 | - | +12 ~ 48 VDC | Plastic/Metal |
| NS-209F Series NSM-209F Series | 100 M | 1 | 10/100 M | 8 | - | +12 ~ 48 VDC | Plastic/Metal |
| NSM-210C | 1000 M RJ-45/SFP combo ports | 2 | 100/100 M | 8 | - | +12 ~ 48 VDC | Metal |

# 6. Fieldbus Solution

## 6.1 EtherNet/IP Gateways

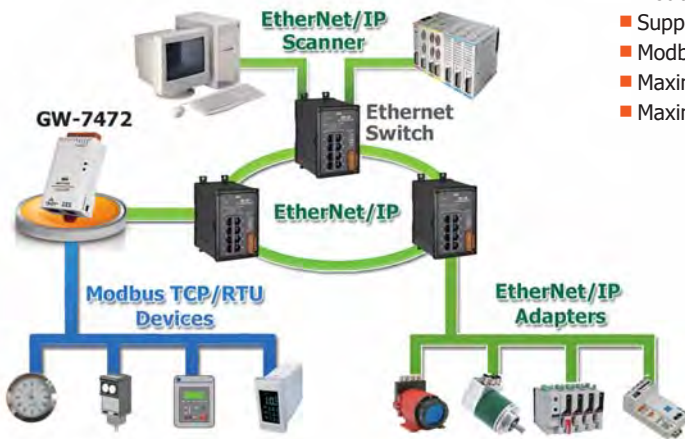| Model Name | | Description |
|---|---|---|
| **EtherNet/IP Gateways** | GW-7472 | Ethernet/IP Adapter to Modbus TCP/RTU Master Gateway |
| | GW-7473 | Modbus TCP/RTU Slave to EtherNet/IP Scanner Gateway |

**NEW**

### EtherNet/IP Adapter to Modbus TCP/RTU Master Gateway

**GW-7472**

The GW-7472 (EtherNet/IP adapter to Modbus TCP/RTU Master Gateway) is helpful for data-exchanging between the Modbus RTU Network, Modbus TCP Network, and the EtherNet/IP Network. It reads the register data from the Modbus RTU slaves as well as Modbus TCP servers and publishes these data to the input register data of the EtherNet/IP scanner. The output data transmitted by the EtherNet/IP scanner are updated to the register data of Modbus TCP/RTU slaves via the GW-7472.

#### Modbus Features ►►►

- Maximum support 8 Modbus commands for each one Modbus TCP server
- Modbus Input/Output command data size: maximum 500 bytes
- Supported Modbus Function Code 01, 02, 03, 04, 05, 06, 15, and 16
- Modbus Protocol: Modbus TCP/RTU master protocols
- Maximum support 30 Modbus RTU commands
- Maximum support 10 Modbus TCP servers

#### EtherNet/IP Features ►►►

- Ethernet Protocol: EtherNet/IP adapter
- Maximum number of connections for Explicit Messages: 6
- Maximum number of connections for Implicit Messages: 1
- EtherNet/IP Input/Output command data size: maximum 500 bytes
- Supported I/O connection methods:
  - ★ Transport and trigger: Exclusive-Owner, Cyclic
  - ★ Originator to Target Type: POINT2POINT
  - ★ Target to Originator Type: POINT2POINT, MULTICAST

**NEW**

### Modbus TCP/RTU Slave to EtherNet/IP Scanner Gateway

**GW-7473**

The GW-7473 (Modbus TCP/RTU Slave to EtherNet/IP Scanner Gateway) is helpful for data-exchanging between Modbus Master and EtherNet/IP adapter. It reads the register data from the EtherNet/IP adapter and publishes these data to the input register data of the Modbus TCP client as well as Modbus RTU Master. The output data transmitted by the Modbus TCP/RTU Master are updated to the register data of EtherNet/IP adapter.

#### Modbus Features ►►►

- Modbus Protocol: Modbus TCP Server/RTU Slave protocols
- Supported Modbus Function Code 01, 02, 03, 04, 05, 06, 15, and 16
- Maximum support 5 Modbus TCP clients
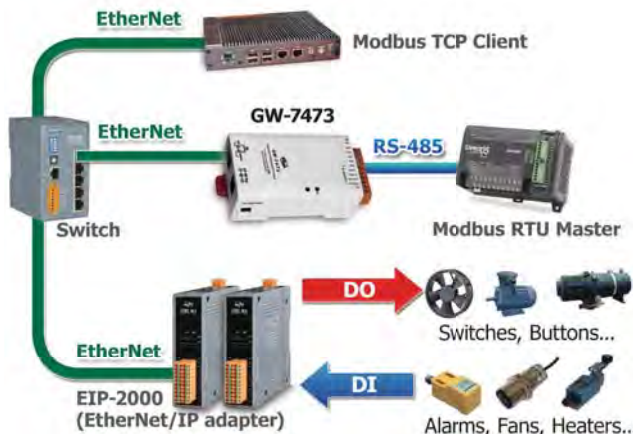
#### EtherNet/IP Features ►►►

- Supported Objects according to CIP Standard
  - ★ Assembly Object
  - ★ Connection Manager Object
  - ★ Ethernet Link Object
  - ★ Message Router Object
  - ★ TCP/IP Interface Object
- Ethernet Protocol: EtherNet/IP Scanner
  - ★ Class 1 (connected) I/O Server and Client
  - ★ Maximum support 5 EtherNet/IP adapter connections
  - ★ EtherNet/IP I/O command data size: 200 bytes

# 6.2 BACnet Gateways

| Model Name | | Description |
|---|---|---|
| **BACnet/IP Gateway** | GW-5492 | BACnet/IP Server to Modbus RTU Master Gateway |
| | GW-5493 | BACnet/IP Server to Modbus TCP Client Gateway |
| **BACnet/IP I/O Modules** | BNET-5304 | BACnet/IP I/O Module with 6-Ch AI, 1-Ch AO, 4-Ch DI, 4-Ch DO |
| | BNET-5310 | BACnet/IP I/O Module with 4-Ch AI, 2-Ch AO, 3-Ch DI, 3-Ch DO |

## BACnet/IP Server to Modbus Master Gateway

**GW-5492**
**GW-5493**

GW-5492 and GW-5493 is a fully configurable universal BACnet/IP to Modbus RTU/TCP gateway. The GW-549x includes BACnet/IP Server and Modbus RTU Master (GW-5492) or TCP Client (GW-5493) which is used to make Modbus devices accessible on a BACnet network. BACnet (Building Automation and Control Networking) protocol has been designed specifically to meet the communication needs of building automation and control systems for applications such as heating, ventilating. The GW-549x contains a large number of BACnet objects gives you flexibility in mapping Modbus registers to any combination of BACnet objects. Multiple BIBBs are supported. All the data transfer is configurable using a standard Web browser.

## BACnet/IP I/O Module with 6-Ch AI, 1-Ch AO, 4-Ch DI, 4-Ch DO
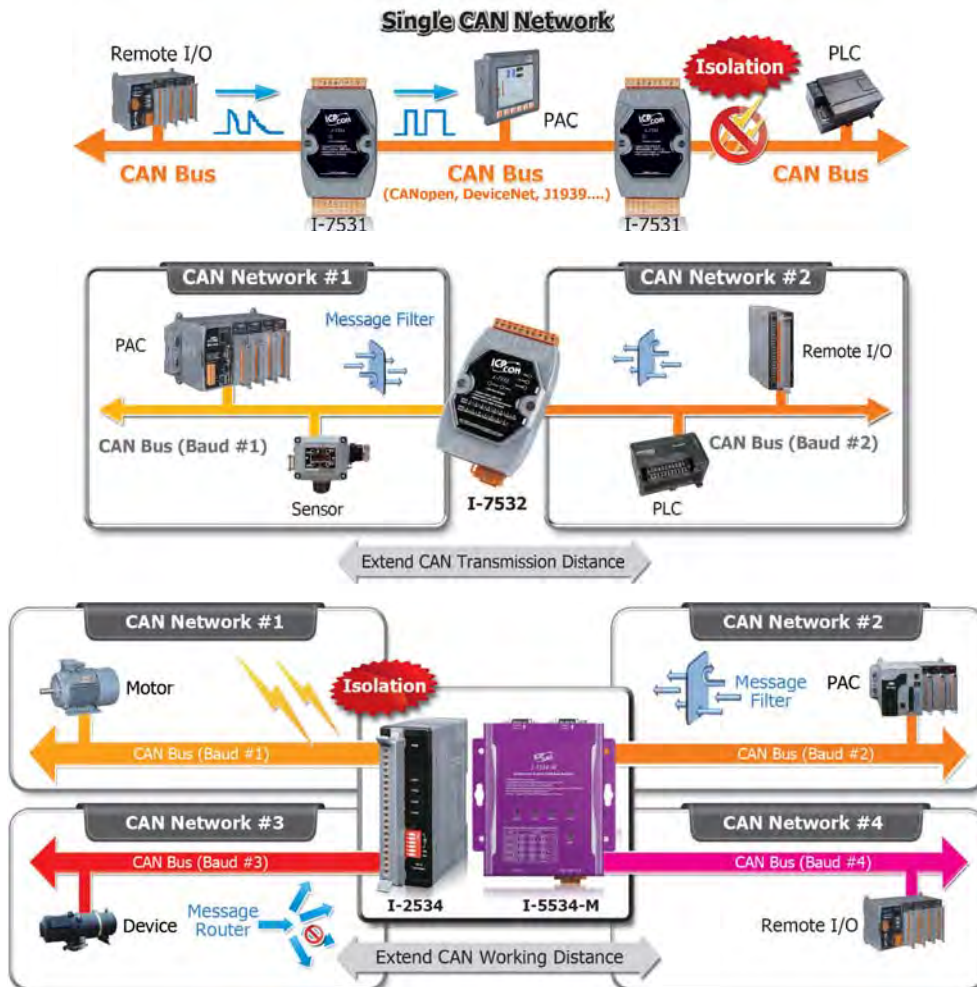
**BNET-5304**

The BNET-5304 is a multi-function BACnet/IP module with 6 AI channels, 1 AO channel, 4 DI channels and 4 DO channels. The module contains number of BACnet objects including Device, AI, AO, BI, and BO with multiple BIBBS (DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM, DS-COV-B…etc.) supported. The modules also feature a built-in web server which allows remote configuration by using a regular web browser for an easy and safe access at any time anywhere.

## BACnet/IP I/O Module with 4-Ch AI, 2-Ch AO, 3-Ch DI, 3-Ch DO

**BNET-5310**

The BNET-5310 is a multi-function BACnet/IP module with 4 AI channels, 2 AO channel, 3 DI channels and 3 DO channels. The module contains number of BACnet objects including Device, AI, AO, BI, and BO with multiple BIBBS (DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM, DS-COV-B…etc.) supported. The modules also feature a built-in web server which allows remote configuration by using a regular web browser for an easy and safe access at any time anywhere.

| Model Name | | BNET-5304 | BNET-5310 |
|---|---|---|---|
| | | Multi-function BACnet/IP Module | Multi-function BACnet/IP Module |
| Pictures | | | |
| | | | |
| Communication | Ethernet | 10/100 Base-TX | |
| | Security | ID and Password | |
| Protocol | BACnet | BACnet/IP | |
| | BACnet Object | 1 Device, 6 AI, 1 AO, 4 BI, 4 BO | 1 Device, 4 AI, 2 AO, 3 BI, 3 BO |
| | BIBB | DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B, DS-COV-B, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-TS-B, DM-UTC-B, DM-RD-B | |
| Analog Input | Channel | 6, single-ended | 4, differential |
| | Range | ±5 V, 0 ~ 5 V | ±10 V |
| Analog Output | Channel | 1 | 2 |
| | Range | ±5 V | ±10 V |
| Digital Input | Channel | 4, Dry Contact | 3, Dry Contact |
| Digital Output | Channel | 4, Open Collect, Sink | 3, Open Collect, Sink |

# 6.3 CAN Bus Repeater/Bridge/Switch

The CAN Bus Repeater/Bridge/Switch is used to enhance the signal quality, extend the communication distance, isolate CAN Bus network. ICP DAS provides following products.

| Model Name | I-7531 | I-7532 | I-2534 | I-5534-M |
|---|---|---|---|---|
| Pictures | Isolated CAN Bus Repeater | Isolated Two-channel CAN Bus Bridge | 4-Port CAN Bus Switch | 4-Port CAN Bus Switch with Metal Casing |
| **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. 200 ns (shortens the transmission distance by ~ 40 m) | Depends on the CAN baud rate (Max. 134 us @ 1 Mbps) | Depends on the CAN baud rate (Max. 440 us @ 1 Mbps) | |
| Terminator Resistor | Jumper for 120 Ω terminator resistor | | DIP switch for the 120 Ω terminator resistor | Jumper for 120 Ω terminator resistor |
| Isolation | 3000 V$_{DC}$ for DC-to-DC, 2500 Vrms for photo-couple | | | |
| Specification | ISO 11898-2, CAN 2.0A and CAN 2.0B | | | |

# 6.4 USB to CAN Converters

The I-7565 series is the USB to CAN converter with a maximum of two independent CAN channels that supports CAN protocols 2.0A and 2.0B. It becomes very convenient and easy to access and control the CAN devices via the USB port of the PC.

| Model Name | I-7565 | I-7565-H1 | I-7565-H2 | I-7565M-HS | I-7565-CPM | I-7565-DNM |
|---|---|---|---|---|---|---|
| Pictures | 1-Port Cost Effective USB to CAN Converter | 1-Port High Performance USB to CAN Converter | 2-Port High Performance USB to CAN Converter | 2-Port High Performance USB to CAN Converter | Intelligent USB to CANopen Converter | Intelligent USB to DeviceNet Converter |
| **USB Interface** | | | | | | |
| Connector | USB Type B | | | | | |
| Compatibility | USB 1.1 and 2.0 standard | | | | | |
| **Compatibility** | | | | | | |
| Cannel | 1 | 1 | 2 | 2 | 1 | 1 |
| Transceiver | Philips 82C250 | NXP TJA1042 | | | NXP 82C250 | NXP 82C250 |
| Connector | 9-pin male D-Sub | | 10-pin terminal block | 8-pin terminal block | 9-pin male D-Sub | |
| Baud Rate (bps) | 10 k, 20 k, 50 k, 100 k, 125 k, 250 k, 500 k, 800 k, 1M | | | | 125 k, 250 k, 500 k | |
| Isolation | 3000 Vrms | | | | 3000 VDC | |
| Terminator Resistor | Selectable 120 Ω terminator resistor by a jumper | | | | | |
| Protocol | CAN 2.0A/2.0B | | | | CiA 301 V4.02 | DeviceNet Volume I ver2.0, Volume II ver2.0 |
| Receive Buffer (frame) | 1000 | 256 | 128 for each CAN port | 256 for each CAN port | 1000 | 256 |
| Max. Data Flow (fps) | 250 | 3000 | 1500 fps for each CAN port | 10000 fps for each CAN port | - | - |

# 6.5 CAN to Fiber Converter/Bridge

| Models | I-2532 | I-2533 | I-2533CS | I-2533CS-60 | I-2533CS-A/I-2533CS-B |
|---|---|---|---|---|---|
| Pictures | CAN to Multi-mode Fiber Converter | | CAN to Single-mode Fiber Bridge | | |
| **CAN Interface** | | | | | |
| Connector | Screwed terminal block (CAN_GND, CAN_L, CAN_H) | | | | |
| Baud Rate (bps) | 10 k ~ 500 k | 10 k ~ 1 M | | | |
| Transmission Distance (m) | Depends on baud rate | | | | |
| Propagation Delay | Max 125 ns | Max. 125 μs (depends on the CAN baud rate) | | | |
| 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 Type | | SC Duplex (Single-mode) | | SC Type |
| Wave Length (nm) | 850 | | 1300 or 1310 | | TX: 1310, RX: 1550 for I-2533CS-A TX: 1550, RX: 1310 for I-2533CS-B |
| Fiber Cable (μm) | Multi-mode 50/125, 62.5/125 or 100/140 | | Single-mode 8.3/125, 8.7/125, 9/125 or 10/125 | | |
| Transmission Distance | Max. 1.4 km | Max. 2 km | Max. 30 km | Max. 60 km | Max. 15 km |
| **UART Interface** | | | | | |
| COM1 | – | RS-232 (for configuration) | | | |
| COM 1 Connector | – | 3-pin screwed terminal block (RxD, TxD, GND) | | | |
| Transmission Speed (bps) | – | 115200 | | | |
| Data bit | – | 8 | | | |
| Stop bit | – | 1 | | | |
| Parity | – | None | | | |

# 6.6 Ethernet/Wi-Fi to CAN Converters

| Model Name | | Description |
|---|---|---|
| **Ethernet/Wi-Fi to CAN Converter** | I-7540D-MTCP | Modbus TCP to CAN Converter |
| | ECAN-240 | Modbus TCP Client/Server to two CAN ports Gateway |
| | I-7540D | Ethernet to CAN Converter |
| | I-7540D-WF | Wi-Fi to CAN Converter |

## Modbus TCP to CAN Converter

**I-7540D-MTCP**

Inheriting to the most of all features of the I-7540D, the I-7540D-MTCP enables CAN networks to be combined with the Internet/Ethernet. It can be used to not only access the CAN network via the Ethernet, but can also realize Ethernet transparent transmission on the CAN network. In order to connect the PLCs, HMIs and SCADAs with the CAN devices more easily and conveniently, the I-7540D-MTCP supports the Modbus TCP and Modbus RTU communication protocol. This module can act as a Modbus TCP server, and wait for the commands from the Modbus TCP client. When the controller is a Modbus RTU master, the I-7540D-MTCP is able to be the Modbus RTU slave, and transfer the Modbus RTU commands to the CAN messages. These features mean that users can setup their applications more flexibly and conveniently.

- Compatible with CAN specification 2.0 parts A and B
- Fully compatible with the ISO 11898-2 standard
- Supports a range of baud rates from 10 kbps ~ 1 Mbps
- Support maximum 24 Ethernet clients connection
- Support 30 specific CAN IDs in the Modbus TCP/RTU mode

- Provide the transparent communication between the CAN devices via Ethernet
- Provides one channel each for CAN, RS-232, RS-485 and 10/100 Base-T Ethernet



## Modbus TCP Client/Server to two CAN ports Gateway

**NEW**

**ECAN-240**

ECAN-240 is a Ethernet to CAN two ports Gateway. Users can communicate with different CAN networks at the same time. In order to be used more easily in industry, the ECAN-240 supports Modbus TCP client and Modbus TCP server function. Users can choose one of them for fitting their application.

Furthermore, the two CAN ports have different purposes according to their usages. For example: In pair connection mode, the different CAN networks can be communicated with each other via module configuration.

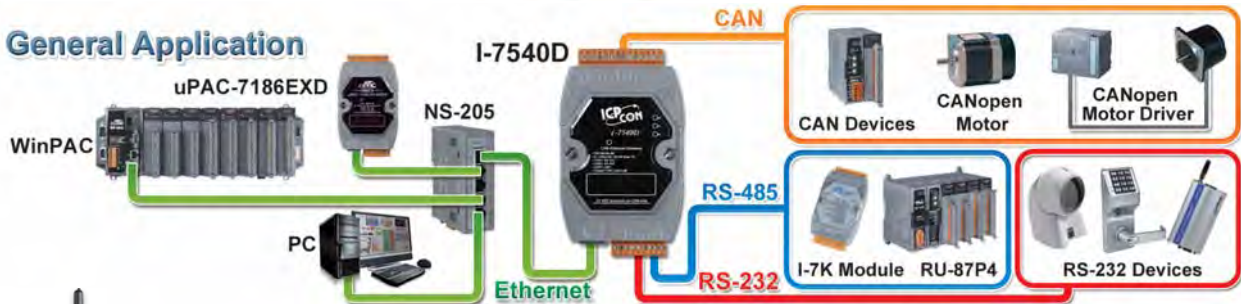# Ethernet to CAN Converter

## I-7540D

The I-7540D is a CAN to Ethernet converter, and is usually applied as an Ethernet to CAN/RS-232/485 Device Server. It supports socket access functions and virtual COM port technology which helps users to get the CAN, RS-232, RS-485 data via virtual COM port. The I-7540D also provides transparent mode, which enables CAN networks to be coupled together over the Internet/Ethernet, whereby remote monitoring and control is possible. By the features of tiny operating system, protocol independence, small casing and flexibility, it is able to widely fit various RS-232, RS-485 and CAN applications, which may be based on private RS-232 protocol, private CAN protocol, Modbus RTU protocol, CANopen protocol, DeviceNet protocol or J1939 protocol.

- Provide the transparent communication between the CAN devices via Ethernet
- Provide one channel each for CAN, RS-232, RS-485 and Ethernet
- Provides connections for a maximum of 25 Ethernet clients
- Supports a range of baud rates from 10 kbps ~ 1 Mbps
- Jumper for the 120 Ω terminator resistor of the CAN bus
- Compatible with CAN specification 2.0 parts A and B
- 2500 Vrms photocoupler isolation on the CAN side
- Fully compatible with the ISO 11898-2 standard
- Supports the Virtual COM technology
- 10/100 Base-T Ethernet port



# Wi-Fi to CAN Converter

## I-7540D-WF

The I-7540D-WF supports the wireless transmission of CAN data between a CAN network and a WLAN network according to the 802.11b/g standard. It provides CAN to WLAN converter functionality together with wireless transparent transmission on the CAN network. The I-7540D-WF is highly suitable for connecting mobile (e.g., vehicles or machines) or stationary CAN networks and is often used in short ranges up to 100 m. Using an appropriately configured router, CAN data can be determined to pass or filter from the CAN networks to the Ethernet. The wireless connection that is established between two I-7540D-WF units can be used instead of a cable, and enab les the connection of CAN networks that would otherwise be difficult to link such as rotational machineries.
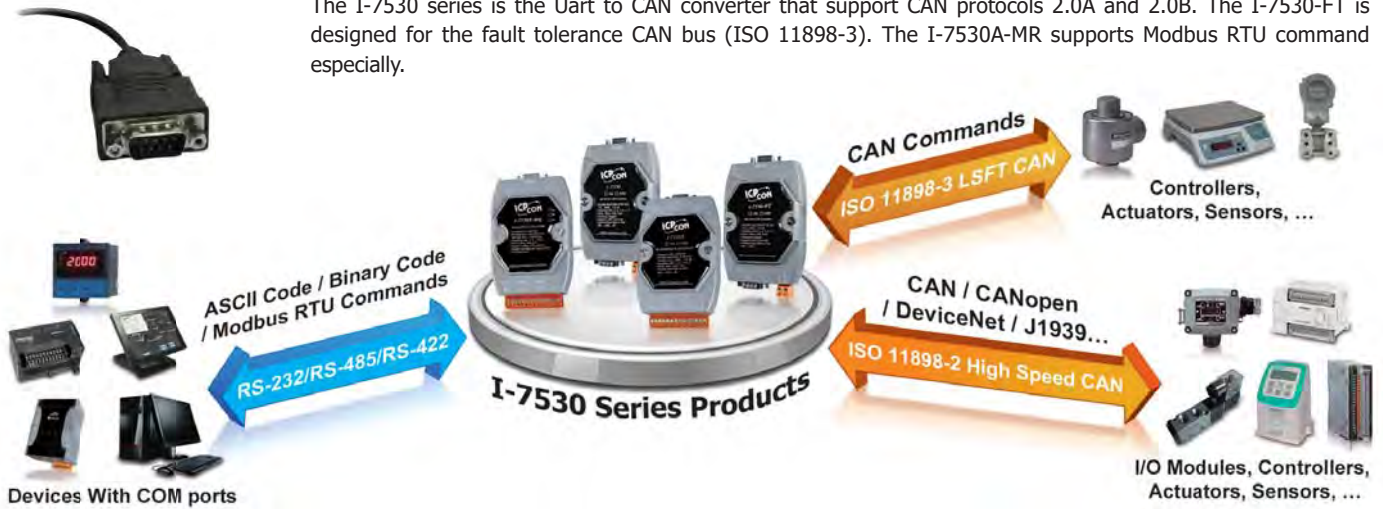
- IEEE 802.11 b/g compliant
- Wireless data transmission via WLAN
- Connects CAN networks via a WLAN bridge
- Compatible with CAN specification 2.0 parts A and B
- Wireless transmission distance: up to 100 meters
- Two different operation modes: infrastructure and ad-hoc
- Supports WEP, WPA and WPA2 encryption for wireless LAN
- Point to point or point to multi-point connection via wireless LAN
- Communication efficiency (peak value): one-way is up to 700 fps (client->server, server->client), two-way 350 fps (client<=>server)

# 6.7 Uart to CAN Converters

The I-7530 series is the Uart to CAN converter that support CAN protocols 2.0A and 2.0B. The I-7530-FT is designed for the fault tolerance CAN bus (ISO 11898-3). The I-7530A-MR supports Modbus RTU command especially.

| Models | I-7530-FT | I-7530 | I-7530T | I-7530A | I-7530A-MR | tM-7530 | tM-7530A |
|---|---|---|---|---|---|---|---|
| Pictures | RS-232 to Fault-Tolerance CAN Converter | RS-232 to CAN Converter | | RS-232/422/485 to CAN Converter | Modbus RTU to CAN Converter | Tiny RS-232 to CAN Converter | RS-232/RS-485/RS-422 to CAN Converter |
| **CAN Interface** | | | | | | | |
| Transceiver | AMIS 41682 | NXP 82C250 | TJA1042 | NXP 82C250 | | NXP TJA1042 | |
| Connector | 9-pin male D-sub | | | | | 3 pins spring type terminal block | 7-pin terminal block |
| Baud Rate | 10 k, 20 k, 50 k ,125 k bps | 10 k, 20 k, 50 k ,125 k, 250 k, 500 k, 800 k, 1 Mbps | | | | | |
| Protocol | ISO 11898-3 (low speed fault tolerance), CAN 2.0A and CAN 2.0B | ISO 11898-2, CAN 2.0A and CAN 2.0B | | | | | |
| Receiver Buffer | 1000 data frames | | | | | 256 data frames | |
| Isolation | – | 3000 V$_{DC}$ for DC-to-DC | | | | 1000 V$_{DC}$ for DC-to-DC | |
| **UART Interface** | | | | | | | |
| Type | RS-232 | | | RS-232/422/485 | | RS-232 | RS-232/422/485 |
| Protocol | – | | | | Modbus RTU slave | – | |
| Connector | 9-pin female D-sub | | | 14-pin terminal block | | 9-pin female D-sub | 10-pin terminal block |
| Baud Rate (bps) | 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 | | | | 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 | | |
| Receiver Buffer | 900 data frames | | | | | 256 bytes | |
| **System** | | | | | | | |
| Power Consumption | 1 W | | | | | | |
| Power Input | +10 V$_{DC}$ ~ +30 V$_{DC}$ | | | | | | |
| Dimensions (W × L × H) | 72 × 118 × 33 (mm) | | | | | 52 × 98 × 27 (mm) | 52 × 93 × 27 (mm) |
| Operating Temperature | -25°C ~ +75°C | | | | | | |
| Storage Temperature | -30°C ~ +80°C | | | | | | |

# 6.8 CANopen Gateways

| Model Name | | Description |
|---|---|---|
| CANopen Gateway | I-7232D | CANopen Slave to Modbus RTU Master Gateway |
| | GW-7433D | Modbus TCP/RTU Slave to CANopen Master Gateway |
| | GW-7553-CPM | PROFIBUS DP Slave to CANopen Master Gateway |

## CANopen Slave to Modbus RTU Master Gateway

**I-7232D**

The I-7232D is a CANopen slave to Modbus RTU master gateway, and allows a CANopen master to have ability to access the Modbus slave devices. In the CANopen network, the I-7232D is a NMT slave, SDO server, PDO producer, and PDO consumer. From the view of the Modbus network, it is a Modbus RTU master which polls all the predefined data of the Modbus RTU slaves, and bypass the CANopen control commands to the Modbus slaves. The I-7232D follows the CANopen specification CiA-301 v4.02 and CiA-401 v2.1, and supplies many features of CANopen protocols, such as dynamic PDO, EMCY object, error output value, SYNC cyclic and acyclic. An EDS file is also provided by the utility tool. Users can easily apply the I-7232D in the standard CANopen master with the EDS file.
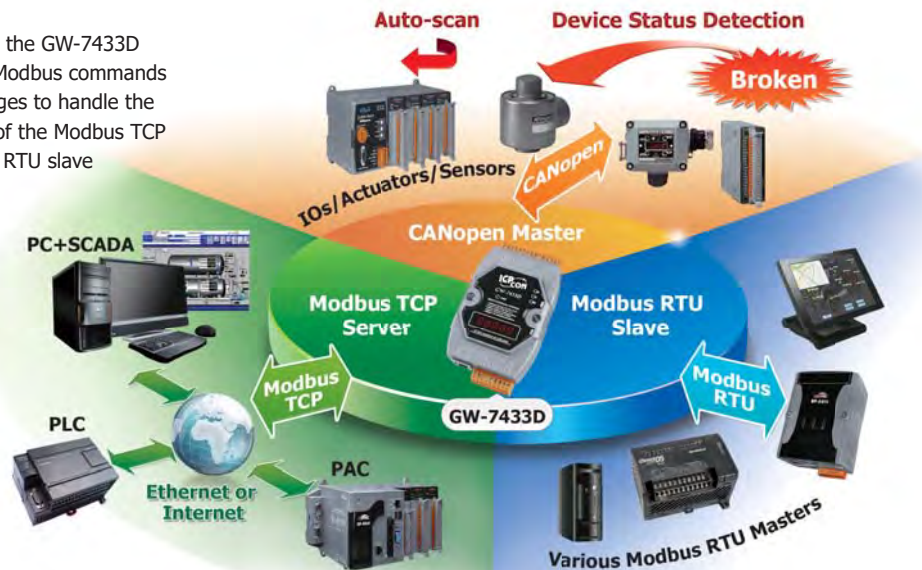


## Modbus TCP/RTU Slave to CANopen Master Gateway

**GW-7433D**

The GW-7433D is communication transformation mechanisms between the Modbus protocol and the CANopen protocol. This module is able to collect the information of the CANopen slaves periodically, and returns these data to the Modbus TCP client or Modbus RTU master while receiving the Modbus commands. When the Modbus TCP client or Modbus RTU master needs to output data to the CANopen slaves, the GW-7433D transfers the received Modbus commands to the CANopen messages to handle the CANopen slaves. Both of the Modbus TCP server and the Modbus RTU slave functions can work on the GW-7433D simultaneously. The GW-7433D also offers the Modbus registers for recording the life statuses of the CANopen slaves.



## PROFIBUS DP Slave to CANopen Master Gateway

**NEW**

**GW-7553-CPM**

The GW-7553-CPM is designed for the slave device of PROFIBUS DP protocol. It allows PROFIBUS master to access CANopen slave devices. These CANopen slave device may be a sensor, actuators, ICPDAS CAN-2000 series modules and so forth. In addition, we also provide the utility software for users to configure the GW-7553-CPM.
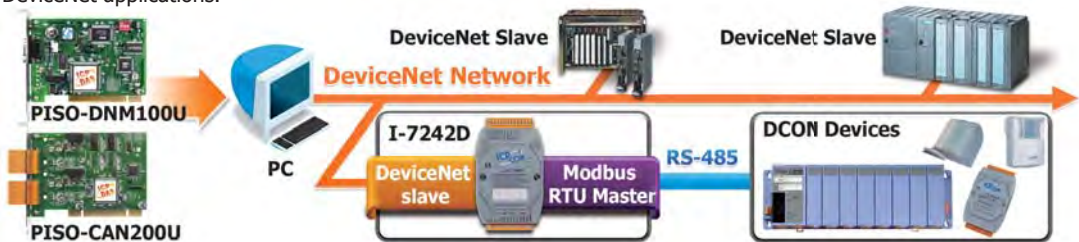
# 6.9 DeviceNet Gateways

| Model Name | | Description |
|---|---|---|
| **DeviceNet Gateway** | I-7242D | DeviceNet Slave to Modbus RTU Master Gateway |
| | GW-7243D | DeviceNet Slave to Modbus TCP/RTU/ASCII Master Gateway |
| | GW-7434D | Modbus TCP/RTU Slave to DeviceNet Master Gateway |

## DeviceNet Slave to Modbus RTU Master Gateway

**I-7242D**

The I-7242D allows a master located on a DeviceNet network to enter into a dialogue with the slaves on a Modbus RTU network. It's a "Group 2 Only Slave" device in the DeviceNet network, and supports "Predefined Master/Slave Connection Set". From the view of the Modbus network, it is a Modbus RTU master which polling all the predefined data of the Modbus RTU slaves, and bypass the DeviceNet control commands to the Modbus slaves. This device is widely used in the application of building automation, remote data acquisition, environment control and monitoring, laboratory equipment & research, factory automation, etc. The I-7242D also has the utility tool which is used to configure the I-7242D's parameters and build the EDS file. Through the EDS file, it is easy to apply the Modbus RTU devices in DeviceNet applications.
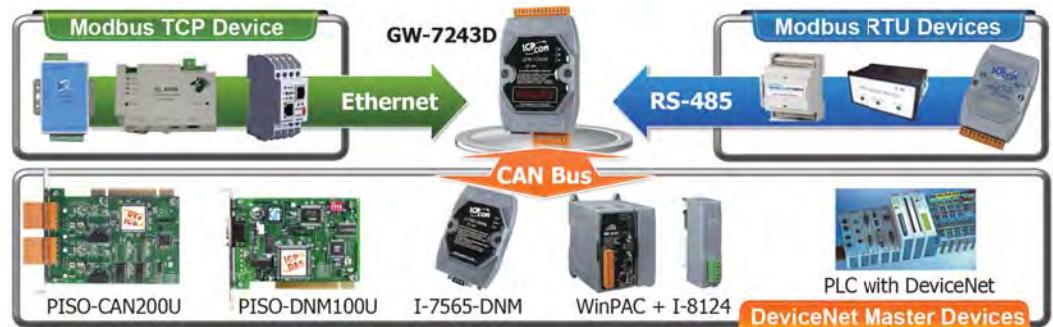


## DeviceNet Slave to Modbus TCP/RTU/ASCII Master Gateway

**GW-7243D**

The GW-7243D offers the DeviceNet slave and Modbus mater functions, and enables the DeviceNet master to access the Modbus slave devices. In the DeviceNet network, the module acts as a Group 2 Only Server device, and waits to build the connection with the DeviceNet master. In the Modbus network, the GW-7243D is a master device, and cyclically sends the commands to access the Modbus slave devices. Both the Modbus TCP client and Modbus RTU/ASCII master interfaces of the GW-7243D can work simultaneously. This feature means that users are able to integrate different kinds of Modbus slave devices together into the DeviceNet network no matter these devices provide Ethernet, RS-232 or RS-485 communication interfaces. In order to simplify the use of the GW-7243D, the GW-7243D Utility tool for configuration and EDS file production is given to build the applications easily and quickly.



## Modbus TCP/RTU Slave to DeviceNet Master Gateway

**GW-7434D**

The GW-7434D is a communication protocol transformation between the DeviceNet protocol and the Modbus TCP protocol. This module solves the problem to connect an existing DeviceNet network to the Ethernet-based PLC, HMI or SCADA for setting up a control or monitoring system. Different to the GW-7243D, the GW-7434D offers the Predefined Master connection Set function and Group 2 only Server function as a DeviceNet master, and enables accessing the DeviceNet slaves automatically and cyclically. If the PLC, HMI or SCADA would like to access the DeviceNet slaves and simultaneously communicate with the Modbus slaves or COM-based devices connected with the RS-232 or RS-485 ports of the GW-7434D, the GW-7434D can be the Modbus TCP server or VxComm server to exchange the data with those devices.
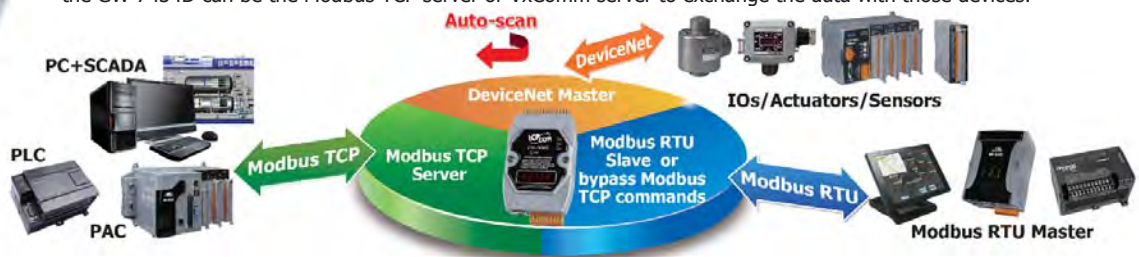
# 6.10 J1939 Gateways

J1939 is the vehicle bus standard used for communication and diagnostics among vehicle components, originally by the car and heavy duty truck industry in the United States. Because of the success of applying in vehicles, J1939 has become the accepted industry standard and the vehicle network technology of choice for off-highway machines in applications such as construction, material handling, and forestry machines. It is a higher-layer protocol based on Controller Area Network (CAN), which provides serial data communications between microprocessor systems (ECU) in any kind of heavy duty vehicles.

| Model Name | | Description |
|---|---|---|
| **J1939 Gateway** | GW-7228 | Modbus RTU Slave to J1939 Gateway |
| | GW-7238D | Modbus TCP/RTU Slave to J1939 Gateway |

## Modbus RTU Slave to J1939 Gateway

**GW-7228**

The GW-7228 enables the Modbus RTU master to exchange the data with the devices in the J1939 network. This module provides the Modbus slave functions on the RS-232, RS-422, and RS-485 ports so that the Modbus RTU master can easily control and monitor the J1939-based devices. If users use one of the communication ports for application, the other two ports can be used to monitor the Modbus communication situations between the Modbus master and the GW-7228. This feature is helpful for diagnosis while setting up an application system. For J1939 CAN networks, the GW-7228 supports PDU1, PDU2, broadcast and destination specific type of J1939 messages, and is widely applied in the Diesel power-train, in-vehicle networks for trucks and buses or where the Modbus RTU and J1939 protocols transformation is needed.

- Transmission and reception of all types of J1939 messages, including PDU1, PDU2, broadcast and destination specific
- Support Modbus RTU slave protocol with function codes 03, 04, 06 and 16
- Support BAM of Connection Management message
- Provide PWR/J1939/MODBUS indication LED
- Support RS-232, RS-485 and RS-422 interfaces
- Built-in jumper to select 120 Ω terminal resister



## Modbus TCP/RTU Slave to J1939 Gateway

**GW-7238D**

Similar to the GW-7228, the GW-7238D is a J1939 to Modbus master gateway. The main difference is that the GW-7238D has an Ethernet port as the Modbus TCP server, and allows connecting with up to 5 Modbus TCP clients. The GW-7238D also offers an RS-232 and RS-485 ports which are the Modbus RTU slaves and enable the Modbus RTU master to exchange the data with the devices in the J1939 network. Both the Modbus TCP server and the Modbus RTU slave functions of the GW-7238D can work simultaneously. This feature means that users can apply the GW-7238D in their applications more flexibly and more economically. For J1939 CAN networks, the GW-7238D supports PDU1, PDU2, broadcast and destination specific type of J1939 messages, and is widely applied in the various J1939-based applications.

- Transmission and reception of all types of J1939 messages, including PDU1, PDU2, broadcast and destination specific
- Support Modbus TCP server/RTU slave protocol with function code 03, 04, 06 and 16
- Communication support both Modbus TCP/RTU to J1939 at the same time
- Support BAM of Connection Management message
- Provide PWR/J1939/MODBUS/ERR indication LEDs
- Support RS-232, RS-485 and Ethernet interfaces
- Built-in jumper to select 120 Ω terminal resister
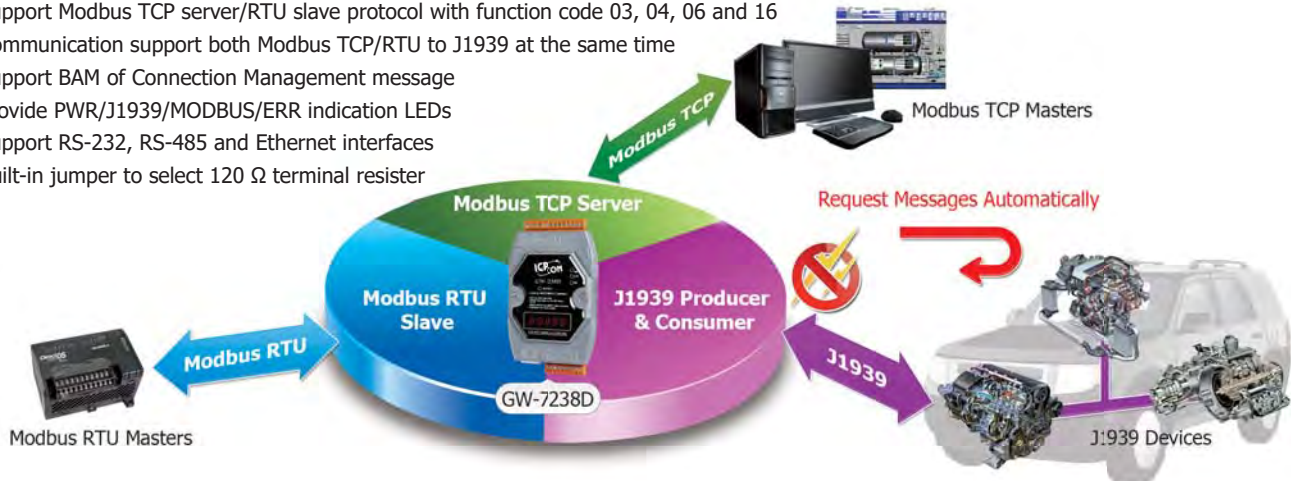
# 6.11 CAN Bus Data Logger

The CAN bus data logging device serves for logging of communication over the CAN data bus. Each received data packet is given a specific time mark, which shows the precise arrival time of data. The actual time mark is obtained from the internal real time clock (RTC), therefore it is independent of the global system time. Data logging on a common SD card allows further analysis and system monitoring on a PC. The CAN-Logger100/200 device by ICP DAS is the result of extensive CAN bus testing and CAN bus programming and is suited for all type of CAN bus application.

| Models | CAN-Logger100 | CAN-Logger200 |
|---|---|---|
| Pictures | NEW | NEW |
| **CAN Interface** | | |
| Transceiver | NXP TJA1042 | |
| Channel Number | 1 | 2 |
| Connector | 5-Pin male M12 × 1 (Pin 1: F.G., Pin 2: +Vs, Pin 3: GND, Pin 4: CAN_H Pin 5: CAN_L) | 5-Pin male M12 × 2 (Pin 1: F.G., Pin 2: +Vs, Pin 3: GND, Pin 4: CAN_H Pin 5: CAN_L) |
| Transmission Speed (bps) | 10 k, 20 k, 50 k, 100 k, 125 k, 250 k, 500 k, 800 k, 1 M and user-defined baud rate | |
| Terminator Resistor | DIP switch for the 120 Ω terminator resistor | |
| Isolation | 3000 V$_{DC}$ for DC-to-DC, 2500 V$_{rms}$ for photocoupler | |
| Specification | ISO-11898-2, CAN 2.0A and CAN 2.0B | |
| CAN Filter | Utility tool | |
| **USB Interface** | | |
| Connector | USB Type B × 1 | |
| Compatibility | USB 2.0 High Speed | |
| Max. Data flow | Transmit: 4000 fps ; Receive: 1000 fps | |
| Software Driver | Windows 2K/XP/7/8 | |
| **Data Logger Capability** | | |
| Storage Media | SDHC type flash – support 4 to 32 GB | |
| Recording Format | Binary | |
| Time Stamp Resolution | 10 us | |
| Configuration | Utility tool | |
| Trigger | Log continuously | |
| Data Logger | Maximum message rate, receive: 15000 msgs/s | |
| **LED** | | |
| Round LED | Power, MS, SD, CAN1, CAN2, CAN_ST LEDs | Power, MS, SD, CAN_Rx, CAN_Tx, CAN_ST LEDs |
| **Power** | | |
| Power Supply | USB power or CAN bus power (Unregulated +10 ~ +30 V$_{DC}$) delivery | |
| Protection | Power reverse polarity protection, Over-voltage brown-out protection | |
| Power Consumption | 0.1 @ 24 V$_{DC}$ | |
| **Mechanical** | | |
| Installation | DIN-Rail | |
| Casing | Metal | |
| Dimensions (W × L × H) | 102 mm × 102 mm × 44 mm | |
| **Environment** | | |
| Operating Temperature | -25°C ~ +75°C | |
| Storage Temperature | -30°C ~ +80°C | |
| Relative Humidity | 10 ~ 90% RH, Non-condensing | |

## USB to 1-port CAN bus data logger device

### CAN-Logger100

The CAN-Logger100 is a high-performance intelligent CAN bus data logger device with one CAN port that can help to make data collection and to process on a CAN bus network easier and quicker. The powerful CPU of the CAN-Logger100 provides the accurately time-stamp for each CAN message and supports storage media like MMC, SD or SDHC type flash for saving these CAN messages that is useful to analysis and diagnostic the CAN network. In order to enhance the portability of the CAN-Logger100, this module is powered by the USB interface or a M12 connector of CAN bus interface. The CAN-Logger100 uses the standard USB driver of the Windows system. Operating systems supported include Windows 2K/XP/7/8.

- Provides one CAN port
- Power by the USB port or CAN port
- 3 kV galvanic isolation for the CAN port
- Full compatible with the ISO 11898-2 standard
- 2500 Vrms photocoupler isolation on the CAN side
- Supports CAN bus acceptance filter configuration

- Compatible with CAN specification 2.0 parts A and B
- Programmable CAN bus baud rate from 10 kbps ~ 1 Mbps
- Built-in jumper for the 120 Ω terminal resistor of the CAN side
- Supports 4 to 32 GB SDHC type flash for saving CAN messages
- CAN messages are time-stamped with 10 microseconds resolution
- Provides a configuration utility that can be used to transmit/receive CAN messages

## USB to 2-port CAN bus data logger device

### CAN-Logger200

The CAN-Logger200 is a high-performance intelligent CAN bus data logger device with two CAN port that can help to make data collection and to process on a CAN bus network easier and quicker. The powerful CPU of the CAN-Logger200 provides the accurately time-stamp for each CAN message and supports storage media like MMC, SD or SDHC type flash for saving these CAN messages that is useful to analysis and diagnostic the CAN network. In order to enhance the portability of the CAN-Logger200, this module is powered by the USB interface or M12 connectors of CAN bus interface. The CAN-Logger200 uses the standard USB driver of the Windows system. Operating systems supported include Windows 2K/XP/7/8.

- Provides two CAN port
- Power by the USB port or CAN port
- 3 kV galvanic isolation for the CAN port
- Full compatible with the ISO 11898-2 standard
- Supports CAN bus acceptance filter configuration
- 2500 Vrms photocoupler isolation on the CAN side

- Compatible with CAN specification 2.0 parts A and B
- Programmable CAN bus baud rate from 10 kbps ~ 1 Mbps
- Built-in jumper for the 120 Ω terminal resistor of the CAN side
- Supports 4 to 32 GB SDHC type flash for saving CAN messages
- CAN messages are time-stamped with 10 microseconds resolution
- Provides a configuration utility that can be used to transmit/receive CAN messages

# 6.12 PC-based CAN Bus Boards

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

**Communication Boards:**

The following CAN bus communication boards are designed for different interface and different CAN port number. The common features are:

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

**Software Support:**

▸ For Windows:
- ✓ LabVIEW CAN Driver
- ✓ DASYLab CAN Driver
- ✓ RTX CAN Driver
- ✓ PISOCNX Active Object
- ✓ NAPOPC.CAN DA Server
- ✓ InduSoft Driver
- ✓ Power Meter Driver

▸ For Linux:
- ✓ SocketCAN Device Driver

## PC-based CAN Communication Boards

| Model Name | PEX-CAN200i | PISO-CAN100U | PISO-CAN200U | PISO-CAN400U | PISO-CAN800U |
|---|---|---|---|---|---|
| Pictures |  |  |  |  |  |
| | | | | | |
| CAN Channel | 2 | 1 | 2 | 4 | 8 |
| Bus Interface | X1 PCI Express | Universal PCI | | | |
| On-board CPU | - | | | | |
| Baud Rate | Programmable transfer rate up to 1 Mbps | | | | |
| Terminator Resistor | Jumper for 120 Ω terminator resistor | | | | |
| Galvanic Isolation | 2 kV | | | | |
| PC APIs | API for VB, VC, BCB, VB.Net, C#.Net | | | | |
| RTX Driver | Yes | | | | - |
| LabVIEW Driver | Yes | | | | |
| InduSoft Driver | Yes | | | | |
| OPC Server | Yes | | | | |
| OCX | Yes | | | | |
| SocketCAN Driver | Yes | | | | - |
| Device Driver | Windows XP/7/8.1/10, Linux | | | | Windows XP/7 |

| Model Name | PCM-CAN100 | PCM-CAN200 | PCM-CAN200P |
|---|---|---|---|
| Pictures |  |  |  |
| | | | |
| CAN Channel | 1, and the other for bypass | 2 | |
| Bus Interface | PCI-104 | | PC/104-Plus |
| On-board CPU | - | | |
| Baud Rate | Programmable transfer rate up to 1 Mbps | | |
| Terminator Resistor | Jumper for 120 Ω terminator resistor | | |
| Galvanic Isolation | 2 kV | | |
| PC APIs | API for VB, VC, BCB, VB.Net, C#.Net | | |
| RTX Driver | Yes | | |
| LabVIEW Driver | Yes | | |
| InduSoft Driver | Yes | | |
| OPC Server | Yes | | |
| OCX | Yes | | |
| SocketCAN Driver | Yes | | |
| Device Driver | Windows XP/7/8.1/10, Linux | | |

| Model Name | PISO-CM100U | PISO-CM200U | PCM-CM100 | PISO-DNM100U | PISO-DNS100U | PISO-CPM100U | PCM-CPM100 |
|---|---|---|---|---|---|---|---|
| Pictures | | | | | | | |
| CAN Channel | 1 | 2 | 1 | | | | |
| Bus Interface | **Universal PCI** | | **PCI-104** | **Universal PCI** | | | **PCI-104** |
| On-board CPU | Yes | | | | | | |
| On-board CPU OS | MiniOS7 | - | MiniOS7 | | | | |
| On-board CPU APIs | C/C++ | - | C/C++ | - | | | |
| Default Firmware | **CAN 2.0A/2.0B** | | | **DeviceNet Master** | **DeviceNet Slave** | **CANopen Master** | |
| EDS File Support | - | | | | Yes | | |
| Baud Rate | Programmable transfer rate up to 1 Mbps | | | 125 k, 250 k, and 500 kbps | | 10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 800 k, 1 Mbps | |
| Terminator Resistor | Jumper for 120 Ω terminator resistor | | | | | | |
| Galvanic Isolation | 2 kV | 3 kV | 2 kV | | | | |
| PC APIs | API for VB, VC++, BCB, Delphi | API for VB.Net, C#.Net, VC++.Net | API for VB, VC++, BCB, Delphi | API for VB, VC++, VB.Net, C#.Net | | | |
| LabVIEW Driver | - | | | Yes | | - | |
| InduSoft Driver | Yes | - | Yes | | - | Yes | |
| Power Meter Driver | Yes | - | Yes | - | | Yes | |
| Device Driver | Windows XP/7/8.1/10, Linux | Windows XP/7/8.1/10 | Windows XP/7/8.1/10, Linux | | | | |

**Connector Types: -T/-D**

Each CAN bus board provide two type of connectors and, DB9 and Terminal Block.

PISO-xxxxx-**D**          PISO-xxxxx-**T**

## Accessory:

**Optional Cable for PISO-CAN800U**

| **CA-9-3705**: | **CA-9-3715D**: |
|---|---|
| DB-37 Male (D-sub) to 4-Port DB-9 Male (D-sub) cable. 0.3 M (90°) | DB-37 Male (D-sub) to 4-Port DB-9 Male (D-sub) cable. 1.5 M (180°) |

Optional CAN bus connector: **CNT-CAN**          **CA-0910-C**

Installation

Step 1          Step 2          Step 3
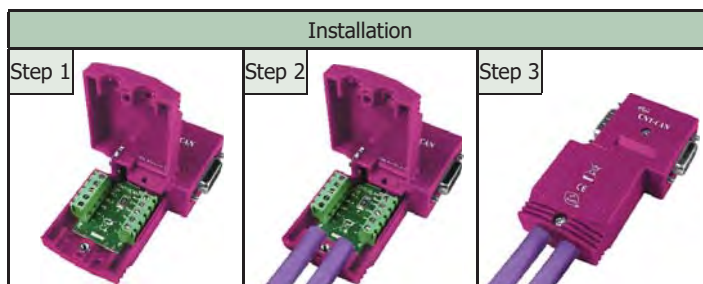
●D-Sub 9-pin Connector
●Screwed Terminal connector

## CAN bus boards

The PCI and PCI Express CAN bus boards use the new CAN controller Phillips SJA1000T and transceiver TJA1042, which provide bus arbitration, error detection with auto correction and re-transmission function. It can be installed in a 5V or 3.3V PCI slot and supported truly "Plug & play".
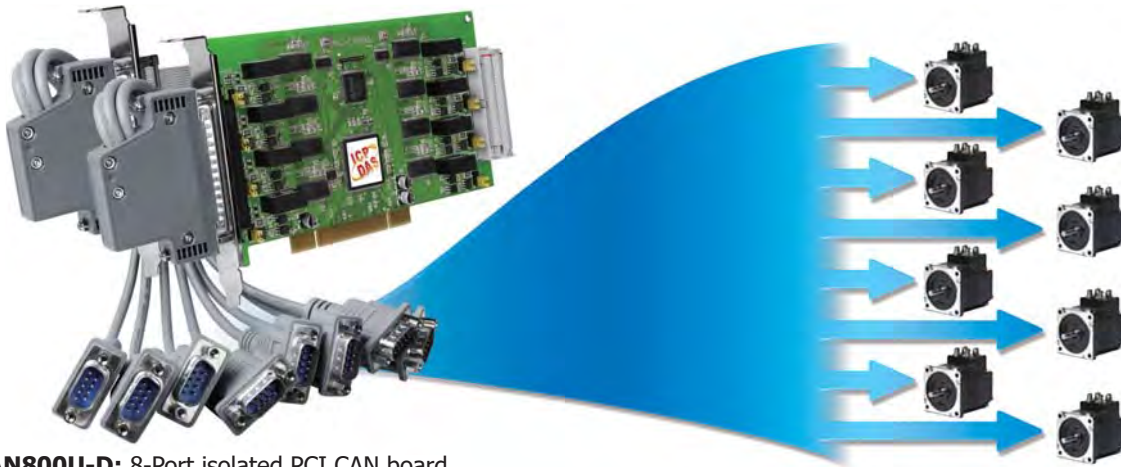
**PISO-CAN800U-D:** 8-Port isolated PCI CAN board

## Common Features:

- Universal PCI card, supports both the 5 V and the 3.3 V PCI bus
- Compatible with CAN specification 2.0 parts A and B
- Fully compatible with the ISO 11898 -2 standard
- Support a range of baud rates from 10 kbps ~ 1 Mbps
- VB, VC++, Delphi, and Borland C++ builder demos are provided
- Built-in jumper for the 120 Ω terminator resistor of the CAN bus

- 2500 Vrms photocoupler isolation on the CAN side
- Provide 1/2/4/8 independent CAN channels
- 2 kV galvanic isolation for each CAN port
- Direct memory mapping to the CAN controller
- Supports LabVIEW and DASYLab drivers

---

## PISO-CM100U, PCM-CM100: CAN board with built-in programmable CPU

As a stand-alone CAN controller, the PISO-CM100U/PCM-CM100 represents a powerful and economic solution. It has an internal 16-bit 80186 compactable CPU for the complex protocol interpretations and implementations. Owing to the real-time DOS-like OS, MiniOS7, the PISO-CM100U/PCM-CM100 can cover most of all time-critical CAN-based applications, such as self-define CAN protocol, CANopen, DeviceNet, J1939, and so forth. Therefore, when users develop their projects, the PISO-CM100U/PCM-CM100 is helpful to handle the process of the CAN messages, and share the CPU loading of the PC or embedded system. Besides, the PISO-CM100U/PCM-CM100 allows users designing the firmware of the PISO-CM100U/ PCM-CM100. Through the library and demos, it is easy to finish the user-defined firmware to satisfy the users' requirements.
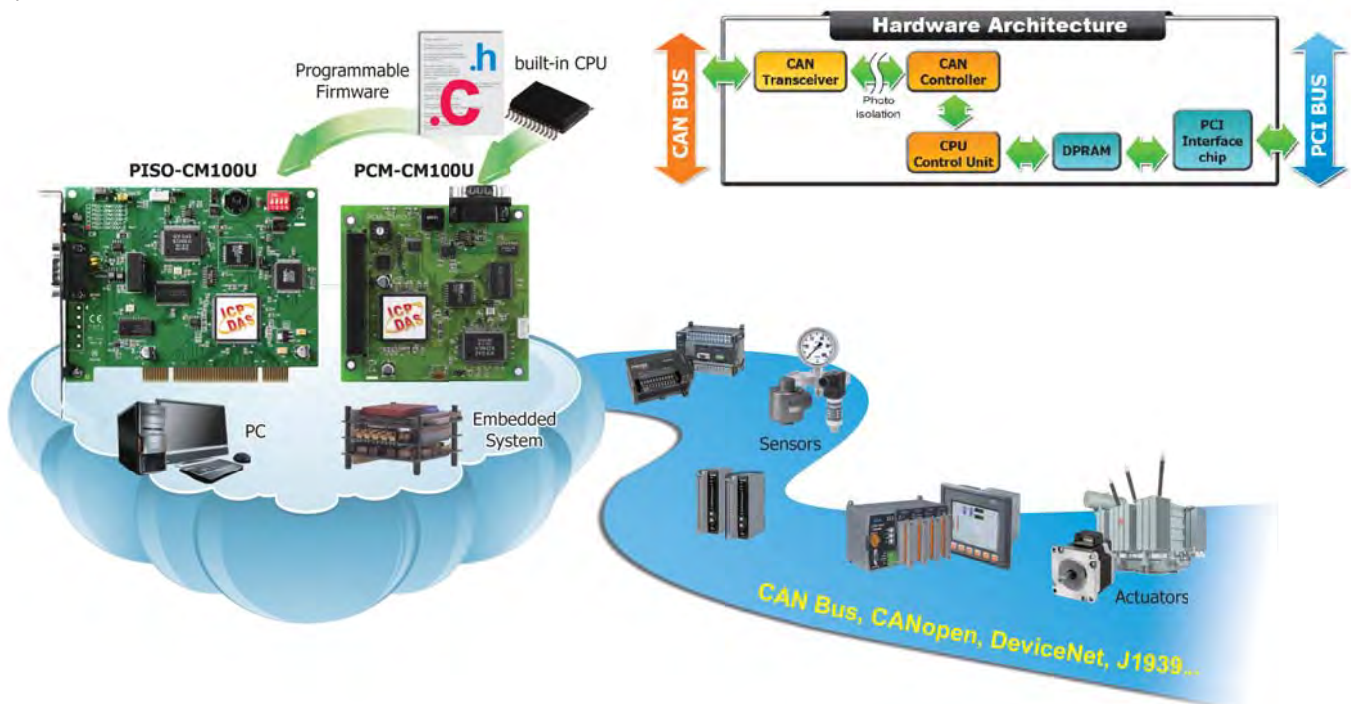
# 6.13 Palm-size Programmable CAN Controllers

The palm size PACs (Programmable Automation Controller) includes I-7188XBD-CAN, uPAC-7186EXD-CAN and μPAC-5001D-CAN2. With abundant and various peripherals and communication ports, the PAC can integrate different communication interface, like CAN bus, RS-232, RS-485, Ethernet and so on. In order to increase the modules openness and applications flexibility, the PAC provides MiniOS7, a DOS-like real-time single-task operation system for adapting to all kinds of needs. Users can develop application programs via C/C++ compiler.
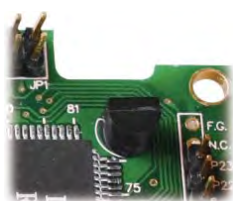


**Unique 64-bit Hardware Serial Number**



**Built-in RTC - Real Time Clock**
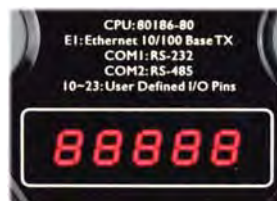


**5-Digit 7-Segment LED Display**



**microSD expansion**

| Model Name | I-7188XBD-CAN | uPAC-7186EXD-CAN | uPAC-5001D-CAN2 |
|---|---|---|---|
| Pictures | | | |
| **System Software** | | | |
| OS | MiniOS7 (DOS-like embedded operating system) | | |
| **Development Software** | | | |
| Download Interface | RS-232 (COM1) or Ethernet | | |
| Language | C language | | |
| Compilers | TC++ 1.01, TC 2.01, BC++3.1 ~ 5.2x, MSC 6.0, MSVC++ (before version 1.5.2) | | |
| **CPU Module** | | | |
| CPU | 80188, 40 MHz or compatible | 80186, 80 MHz or compatible | |
| SRAM | 512 KB | 512 KB | 512 KB |
| Flash | 512 KB | 512 KB | 512 KB |
| microSD Expansion | - | | Up to 2 GB |
| EEPROM | 2 KB | 16 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 | | |
| 64-bit Hardware Serial Number | Yes, for Software Copy Protection | | |
| Watchdog Timers | Yes (0.8 second) | | |
| **Communication Ports** | | | |
| Ethernet | - | 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators) | |
| COM 1 | RS-232 (TxD, RxD, RTS, CTS, GND) or RS-485 (Data+, Data-), non-isolated | RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated | |
| COM 2 | RS-485 (Data+, Data-) with internal self-tuner ASIC; non-isolated | | |
| CAN | 1 channel | 1 channel | 2 channels |
| **LED Indicator** | | | |
| 7-Segment LED | Yes | | |
| Programmable LED Indicators | 4 | | 5 |
| **Mechanical** | | | |
| Dimension (W × L × H) | 72 mm × 122 mm × 33 mm | | 91 mm × 123 mm × 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 V$_{DC}$ | | 12 ~ 48 V$_{DC}$ |
| Redundant Power Inputs | - | | Yes |
| Power Consumption | 3 W | | |

# 6.14 PAC-based CAN Modules

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.
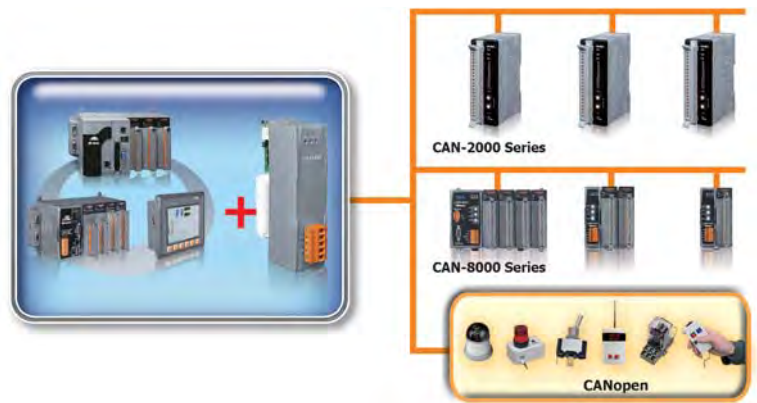
## CAN/CANopen/DeviceNet Communication Module (Parallel/Serial Bus)

| 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 CiA 301 ver 4.02, CiA 401 ver 2.1 | | DeviceNet Volume I ver 2.0, Volume 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 Vrms | | | | | |
| 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 |

# 6.15 PROFIBUS Converters & Gateways

The PROFIBUS repeater is used to solve the issues of the PROFIBUS segment, transmission distance and disturbance when setting up a PROFIBUS network. If it is necessary to integrate the different communication interface, the PROFIBUS converter is helpful. The application architectures as following figures provide the examples to show when and how to apply these products.

| Model Name | | Description |
|---|---|---|
| **Converters** | I-7550 | PROFIBUS to RS-232/422/485 Converter |
| | I-7550E | PROFIBUS to Ethernet Converter |
| | PROFI-2510 | Isolated PROFIBUS Repeater |
| | PROFI-2541 | PROFIBUS to Fiber (ST connector) Converter |
| | PROFI-2541-SC | PROFIBUS to Fiber (SC connector) Converter |
| | PROFI-2542-SC | PROFIBUS to Single mode Fiber (SC connector) Converter |
| **Gateway** | GW-7552 | PROFIBUS DP Slave to Modbus RTU Master Gateway |
| | GW-7553 | PROFIBUS DP Slave to Modbus TCP/RTU Master Gateway |
| | GW-7553-CPM | PROFIBUS DP Slave to CANopen Master Gateway |
| | GW-7557 | PROFIBUS DP Slave to HART Master Gateway |

| Model Name | I-7550 | I-7550-E | PROFI-2510 | PROFI-2541 | PROFI-2541-SC | PROFI-2542-SC |
|---|---|---|---|---|---|---|
| Pictures | PROFIBUS to RS-232/422/485 Converter | PROFIBUS to Ethernet Converter | Isolated PROFIBUS Repeater | PROFIBUS to Fiber Converter | | |
| PROFIBUS Channel | 1 | | 2 | 1 | | |
| PROFIBUS Baud Rate (bps) | 9.6 k ~ 12 M | | | 9.6 k ~ 3 M | | 9.6 k ~ 12 M |
| PROFIBUS Protocol | DP-V0 Slave | | DP-V0/DP-V1/DP-V2 | | | |
| PROFIBUS Address | 0~126 set by DIP switch | | - | | | |
| PROFIBUS Transmission Distance (m) | Depend on baud rate | | | | | |
| COM 1 | RS-232/RS-485/RS-422 | RS-232 | - | | | |
| COM 1 Baud Rate (bps) | 1.2 K ~ 115.2 K | 115.2 K | - | | | |
| Fiber Channel | | | | 1 | | |
| Fiber Connector | - | | | ST (Multi-mode) | SC (Multi-mode) | SC (Single-mode) |
| Fiber Transmission Distance (m) | | | | 1.4 km Max. (in 62.5/125 μm fiber cable) | | 10 km (in 9/125 um fiber cable) |
| Ethernet Speed | - | 10/100M | - | | | |
| Ethernet Protocol | - | TCP/UDP Server/Client | - | | | |

## PROFIBUS DP Slave to Modbus TCP/RTU Gateway

### GW-7552

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
- 132 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
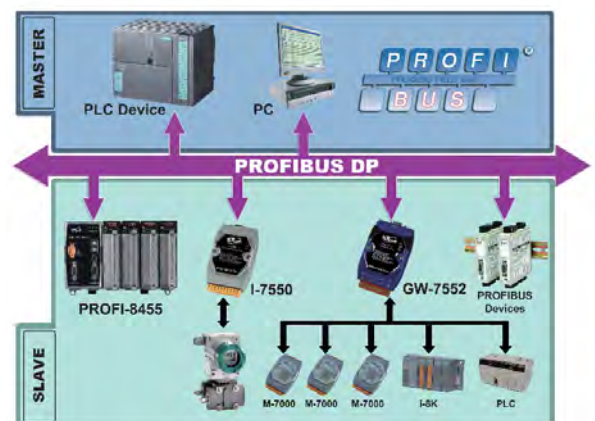
## PROFIBUS DP Slave to Modbus TCP/RTU Gateway

**GW-7553**

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
- Support one 10/100 Base-TX Ethernet port
- Support one RS-232 port
- 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
- Detect Transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically

## PROFIBUS DP Slave to CANopen Master Gateway

**NEW**
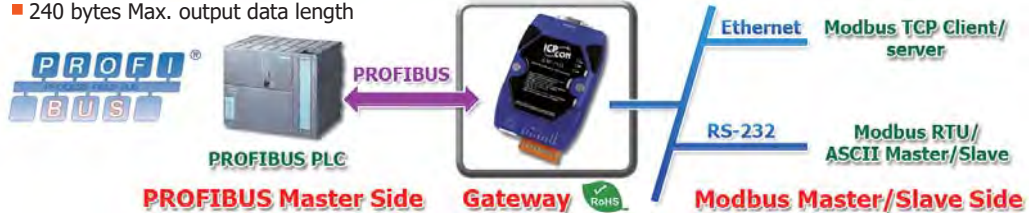
**GW-7553-CPM**

The GW-7553-CPM is designed for the slave device of PROFIBUS DP protocol. It allows PROFIBUS master to access CANopen slave devices. These CANopen slave device may be a sensor, actuators, ICPDAS CAN-2000 series modules and so forth. In addition, we also provide the utility software for users to configure the GW-7553-CPM. By using this module, users can put their CANopen slave devices into PROFIBUS network very easily.

- Protocol: PROFIBUS DP-V0 slave
- Support Heartbeat function
- Support Node Guarding
- 240 bytes Max. input data length
- 240 bytes Max. output data length

- Follow the CiA CANopen Standard DS-301 v4.02
- Support 110 CANopen SDO/PDO commands
- PROFIBUS address 0 ~ 126 set by DIP switch
- Detect Transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically

## PROFIBUS DP Slave to HART Master Gateway

**GW-7557**

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 communicate the HART slave devices into PROFIBUS network very easily.

- PROFIBUS address 0 ~ 126 set by DIP switch
- Support HART mode: point-to-point/multi-drop
- Protocol: PROFIBUS DP-V0 slave
- Support HART Short/Long frame
- 240 bytes Max. input data length
- 240 bytes Max. output data length
- Support 4 HART channels, each for Max. 15 HART modules
- Detect transmission rate (9.6 to 12000 kbps) on PROFIBUS automatically

## Application:

Optional PROFIBUS connector: CNT-PROFI

Step 1  Step 2  Step 3  Step 4

Installation

# 6.16 PROFINET Converters & Gateways

| Model Name | | Description |
|---|---|---|
| PROFINET Converter | I-7580 | PROFINET to RS-232/422/485 Converter |
| PROFINET Gateway | GW-7662 | PROFINET to Modbus RTU/ASCII Gateway |
| | GW-7663 | PROFINET to Modbus TCP Gateway |

**NEW**

## PROFINET to RS-232/422/485 Converter

### I-7580

The I-7580 is specially designed for PROFINET IO device. It offers RS-232, RS-422, and RS-485 three kinds of communication way. With the Hybrid COM 1 design, users can readily choose one type of com port to use. Through the GSDML file, it is easy to communicate with any standard PROFINET IO controller.

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

**NEW**

## PROFINET to Modbus RTU Master Gateway

### GW-7662

The GW-7662 gateway is a PROFINET IO device that allows the PROFINET controller to access the Modbus RTU devices. In the Modbus network, the GW-7662 can be a Modbus master to access the Modbus slaves, can be a Modbus slave provide the data from the PROFINET controller. The flexible design lets the GW-7662 widely applying in the many applications.

- Support several kinds of baud for COM1 from 2.4 ~ 115.2 kbps
- Max length of in/output data is 512/512 Bytes
- PROFINET Conformance Class B and RT Class 1
- Generic GSDML File Provided (Version 2.25)
- Protocol: PROFINET IO Device
- Support Modbus RTU/ASCII protocol
- Support Modbus Master and Slave mode
- Cyclic Time: 1 ms (min)

**NEW**
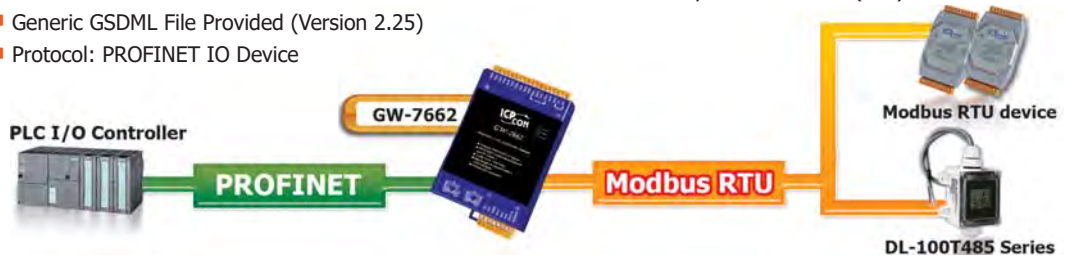
## PROFINET to Modbus TCP Master Gateway

### GW-7663

The GW-7663 is used for data-exchange between the Modbus TCP network and the PROFINET network. It provides the Modbus TCP client and server functions. Therefore, the GW-7663 can satisfy most of the applications of the data transfer between Modbus and PROFINET.

- Max length of in/output data is 512/512 Bytes
- PROFINET Conformance Class B and RT Class 1
- Generic GSDML File Provided (Version 2.25)
- Protocol: PROFINET IO Device
- Cyclic Time: 1 ms (min)
- Support Modbus TCP protocol
- Support Modbus Master and Slave mode

# 6.17 HART Converters, Gateways & Signal Filter

ICP DAS have deeply researched on the HART bus technology for many years. The total HART products have been developed by ICP DAS including HART converter, HART gateway and HART I/O modules. The HART converter can be used to access HART devices via COM, USB or Ethernet interface. The HART gateway can integrate HART communication to the different protocols like Modbus, PROFIBUS etc.

| Model Name | | Description |
|---|---|---|
| **Converter** | I-7547 | Ethernet to HART Converter |
| | I-7567 | USB to HART Converter |
| | I-7570 | RS-232/422/485 to HART Converter |
| | HRT-227CS | HART to Single Mode Fiber Converter |
| | HRT-328-A4 | HART-to-Analog Converter and Loop Monitor |
| **Gateway** | HRT-710 | Modbus RTU/ASCII Slave to HART Master Gateway |
| | HRT-310 | Modbus RTU/ASCII Slave to HART Master Gateway (Upright) |
| | HRT-711 | Modbus TCP Slave to HART Master Gateway |
| | GW-7557 | PROFIBUS DP Slave to HART Master Gateway |
| **Signal Filter** | HRT-370 | HART Signal Filter with one AI and one HART channel |

## Ethernet to HART Converter

**NEW**

**I-7547**

The I-7547 is an Ethernet to HART converter designed as the master device of HART protocol. It allows users to access the HART slave via Ethernet. These HART slave devices may be a transmitter, actuator, current output device and so forth. In addition, by using the HC_Tool utility, users can configure module and test HART communication easily and quickly.

- Selectable 250 Ω load resistor
- Support HART Short/Long frame
- Support point-to-point or multi-drop HART mode
- Support connecting up to 15 HART slave devices
- Support firmware update via Ethernet
- Support HART Pair-Connection (FW_v1.03)
- Support FDT (Field Device Tool) technology

- Support HART Burst mode
- Allow two HART masters
- Provide four HART channels

## USB to HART Converter

**I-7567**

I-7567 is a USB to HART converter specially designed as the master device of HART protocol. Through it, users can easily 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.

- Powered by USB (external power is not necessary)
- Support firmware update via USB
- Provide selectable 250 Ω load resistor
- Allow to connect with Max. 15 HART modules
- Compatible with USB 1.1 and 2.0 standards
- Support HART OPC Server provided by HART COMMUNICATION FOUNDATION (HCF)

- 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

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

**I-7570**

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 as transmitters, actuators, gauges, meters, and the current output devices, can be easil y 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.

- Support firmware update via COM1
- 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 HART OPC Server provided by HART COMMUNICATION FOUNDATION (HCF)

- 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

## HART to Single Mode Fiber Converter

### HRT-227CS

The HRT-227CS is a HART to Fiber converter paired used to extend HART communication distance via single mode fiber optic transmission medium. In order to solve the problem between HART and fiber transmission medium, HRT-227CS is specially designed for converting the HART signal to fiber optic cables. Built-in a HART 250 Ω loop resistor adjustable by dip switch. Therefore, users can make data collection and processing of HART network easier and quicker by applying HRT-227CS. In addition, we also provide the free HC_Tool utility for module configuration easily.

- Support HART Burst mode
- Allow two HART masters
- Fiber broken line detection
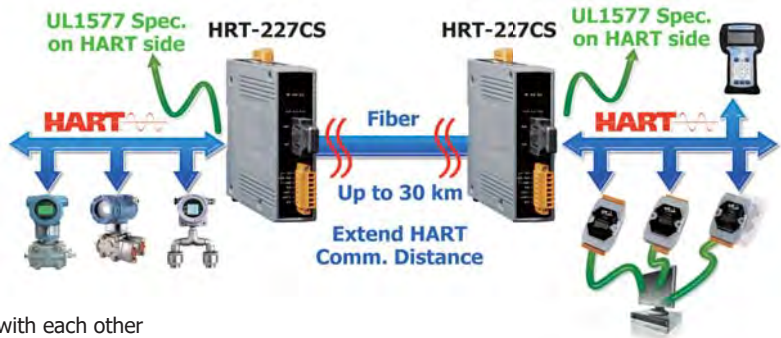
- Support HART Short/Long frame
- Support firmware update via COM port
- Support point-to-point or multi-drop HART mode
- Support connecting up to 15 HART slave devices
- Fiber Type: SC ; Single mode ; 100 Base-FX
- Fiber max. transmission distance up to 30 km
- Selectable 250Ω loop resistor
- The HART port with the same Group ID can communicate with each other

## HART-to-Analog Converter and Loop Monitor

### HRT-328-A4

The ICPDAS HRT-328-A4 HART Loop Converter enables the conversion of a digital multivariable HART signal into four independent 4 ~ 20 mA analog process variables. The HRT-328-A4 can apply in control or monitoring application to obtain up to four additional analog outputs without additional process penetrations.

The HRT-328-A4 allows up to four additional analog process variables from a multivariable transmitter or valve with no additional process penetrations. Besides, installed transparently across the 4~20 mA instrument loop, the HRT-328-A4 reads the HART digital process data that rides on the loop wires. The HRT-328-A4 converts the digital information for up to four isolated analog process signals that are readily accepted by in-place control system, such as DCS or PLC. The HRT-328-A4 not only converts multivariable into analog process signal but also monitors the multivariable under/over limit intelligently. There are 4 built-in user programmable alarm output for monitoring. When a variable of transmitter under or over the user defined limit, the programmable alarm will activate automatically without DCS or PLC.

- Support HART Short/Long frame
- 4 Independent Analog Output Signals
- Built-in 2 Form A and 2 Form C relays
- Intelligent Activate Relay Alarm automatically
- Support Acquire Long Frame Address Automatically
- Working in Point-to-Point Mode
- Support HART Burst mode
- Allow two HART Masters
- Support Firmware Update
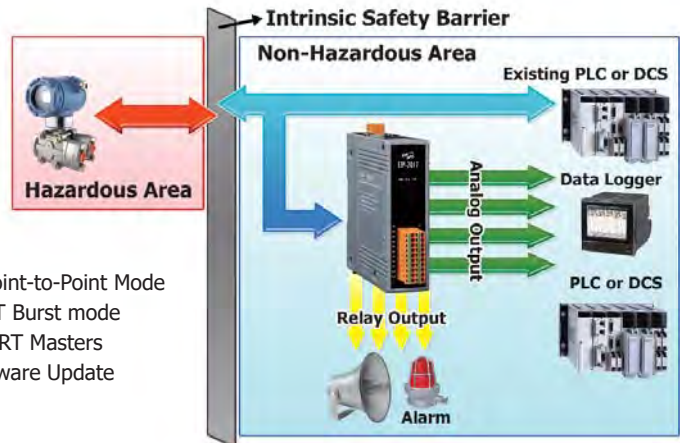
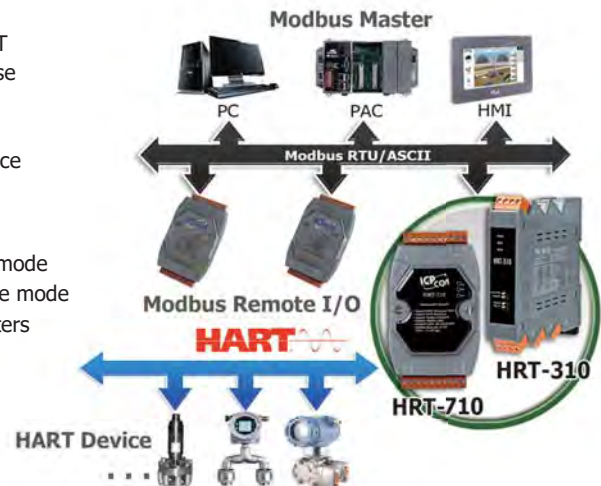## Modbus RTU/ASCII Slave to HART Master Gateway

### HRT-710      HRT-310

The HRT-710/HRT-310 is a Modbus RTU/ASCII slave to HART master 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 HG_Tool Utility with friendly configuration interface is given.

- Support HART Short/Long frame
- Isolated COM 1: RS-232/422/485
- Connecting up to 15 HART modules
- Support Modbus RTU and ASCII format
- Working in point-to-point or multi-drop HART mode
- Support firmware update via Com Port (FW_v1.2 and HW_v1.2)
- Support on-line replacement of HART devices (FW_v1.5)
- Support acquire Long Frame Address automatically (FW_v1.5)
- Support HART Burst mode
- Support Modbus Slave mode
- Allow two HART Masters

## Modbus TCP Slave to HART Master Gateway

**NEW**

### HRT-711

The HRT-711 is a new Modbus/TCP to HART Gateway. It allows the Modbus/TCP Master to access the HART Slave devices. These HART devices may be a transmitter, an actuator, a current output device and so forth. By using the HRT-711, users can integrate their HART devices into Modbus network easily. Therefore, HRT-711 can be a powerful gateway to exchange the data between Modbus and HART network. Moreover, the HRT-711 can be applied in the various hard environments because its high isolation protection designs. This design makes users to apply widely application for the remote data acquisition, control, process automation, and factory automation, etc.

- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART Masters
- Working in point-to-point or multi-drop HART mode
- Connecting up to 15 HART modules
- Support Modbus TCP
- Support Modbus Slave mode
- Support firmware update via Com Port
- Support on-line replacement of HART devices
- Support acquire Long Frame Address automatically
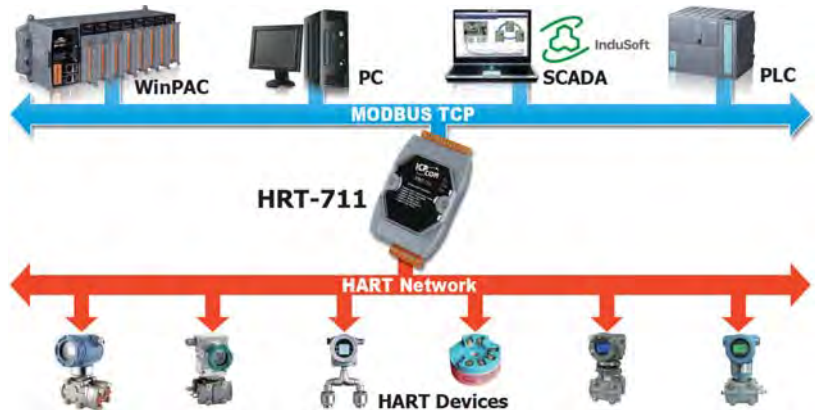
## PROFIBUS DP Slave to HART Master Gateway

### GW-7557

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.

- Support PROFIBUS DP-V0 slave
- Support 4 HART Channels
- Support HART Short/Long frame
- Support HART Burst mode
- Allow two HART Masters

- Protocol & Hierarchy: DP-V0 Slave
- Max I/O Data Length: 240/240 Bytes
- Working in point-to-point or multi-drop HART mode
- Connecting up to 15 HART modules
- Network Isolation Protection: High Speed iCoupler
- Detect transmission rate (9.6 ~ 12000 kbps) automatically
- Max transmission speed up to 12 Mbps for PROFIBUS and 115.2 kbps for COM Port
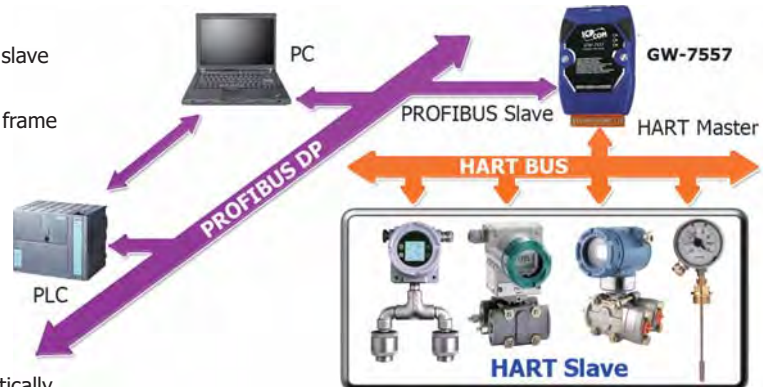
## HART Signal Filter

**Available soon**

### HRT-370

HRT-370 can receive a 4 to 20 mA DC current signal from HART device or control system analog output and passes the signal bi-directionally and uninterruptedly. Besides, HRT-370 also provides a HART interface to communicate with HART device. By using HRT-370, it can effectively isolate the HART device communication signal from control system analog signal.

- Support HART Burst mode
- Allow two HART masters
- Support HART Short/Long frame
- Support 4 ~ 20 mA current input
- 2-wire or 4-wire transmitters of HART
- Allow to connect to the Max. 15 HART modules
- Support the in point-to-point or multi-drop HART network
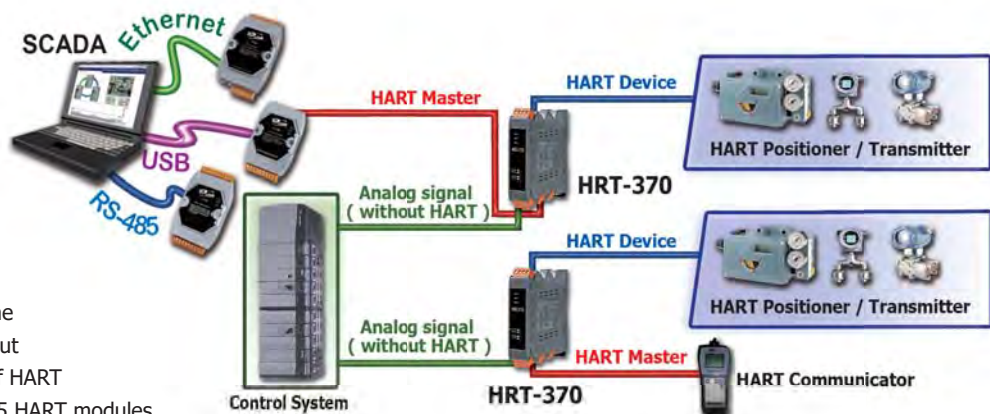
# 6.18 M-Bus Converters & Gateways

| Model Name | | Description |
|---|---|---|
| M-Bus Repeater | I-3591 | M-Bus Repeater |
| M-Bus converter | I-7590 | RS-232/422/485 to M-Bus converter |
| M-Bus gateway | GW-7828 | Modbus RTU slave to M-Bus master gateway |
| | GW-7838 | Modbus TCP server to M-Bus master gateway |

## M-Bus Repeater

**Available soon**

### I-3591

The I-3591 is a M-bus repeater which could be a component of the M-bus system. It is designed for use in plants where extensive bus lines are required, or where large numbers of meters need to be connected, for example in district heat networks that supply heat to entire sections of towns.

- M-Bus to M-Bus Repeater
- Supports M-Bus slaves: 100
- Overcurrent detection
- Duplicate node id detection
- M-Bus Baud rate: Automatic baud rate detection
- M-Bus Data Format: Automatic data format detection

## RS-232/422/485 to M-Bus converter

**NEW**

### I-7590

The I-7590 is specially designed for M-Bus slave device. It offers RS-232, RS-422 and RS-485 three kinds of communication way. For the hardware of the I-7590, it has two rotary switches for serial port and M-Bus port baud rate. This design allows master baud rate to be different from the M-Bus slave baud rate. For the communication of the I-7590, it uses transparent communication. It solves the problem when performing protocol conversion between the master and the slave, and makes the communication easier. I-7590 is perfect for use when a new M-Bus device is added to an old RS-485 network or when the master firmware and configuration required not being changed.

- M-Bus Baud rate : Adjustable by rotary switch from 300 to 2400 bps
- Serial Baud rate : Adjustable by rotary switch from 300 to 115200 bps
- Default serial port data format: Data bit 8, Parity none, Stop bit 1
- Overcurrent and short-circuit protection on the M-Bus
- Update firmware from serial port
- Support up to 100 M-Bus slaves
- Provides transparent communication
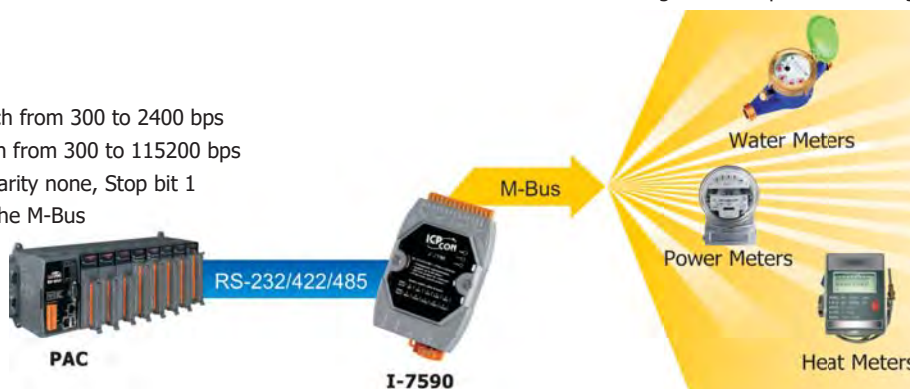
## Modbus RTU/TCP to M-Bus Gateway

### GW-7828

The GW-7828/GW-7838 gateway is a Modbus slave device that allows the Modbus RTU/Modbus TCP master to access the M-Bus slave devices. These M-Bus devices may be a water meter, electric meter, power meter and so forth. Owing to the GW-7828/GW-7838, you can put the M-Bus slave devices into Modbus network very easily.
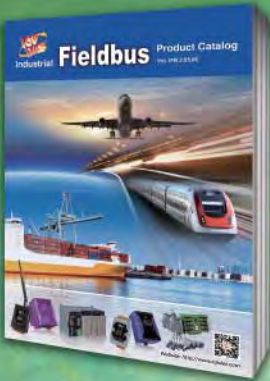
- Support command request mode and cyclic request mode
- Modbus RTU baud rate: Support from 300 to 115200 bps
- Overcurrent and short-circuit protection on the M-Bus
- M-Bus baud rate : Support from 300 to 2400 bps
- Support up to 100 M-Bus slaves

### GW-7838
*Available soon*
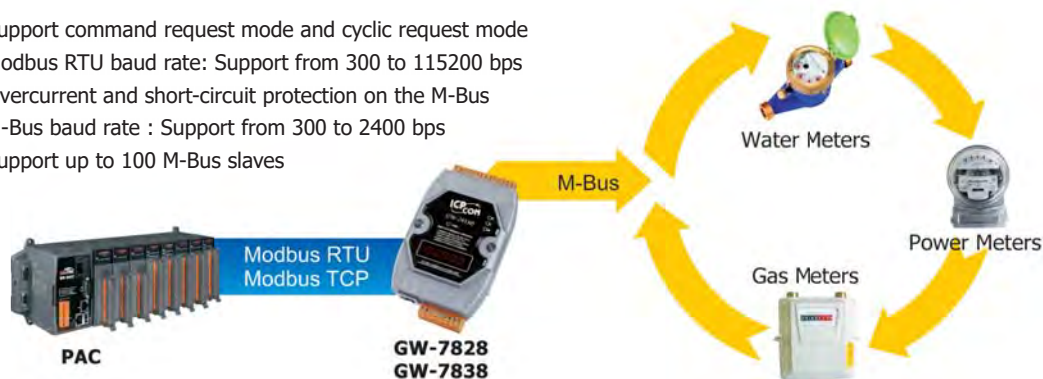
# ICP DAS Catalogs & Brochure

### 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

- InduSofftt SCADA Soffttwarre
- Smart Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module
- TouchPAD Devices - VPD Series

### IIoT Product

- IoTstar: cloud management software
- UA-5200: communication server
- WISE series: IIoT host
- iCAM series: IP camera
- MQ-7200M series: MQTT I/O module
- Sensors: temperature, humidity, CO2, PM2.5,...

### 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/RPIR Series
- Wi-Fi Wireless - WF Series
- Infrared Wireless - IR Series
- ZigBee Wireless - ZT Series
- IIoT Server & Concentrato
- Data Server - iDaSer Series
- LED Display - iKAN Series

### TouchPAD HMI Solutions

- Introduction
- TPD/VPD Products Series
- Video Intercom & Access Control Series
- TPD/VPD Application

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

- RS-485 Products
- Ethernet Remote I/O Modules
- FRnet I/O Modules
- CAN Bus Products
- PROFIBUS Remote I/O Modules
- HART Products
- Smart Power Meter
- WISE I/O Module

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