ICP DAS

Industrial Communication & Networking Products Catalog

Vol. ICNP 2.2.00

ICP DAS Industrial Communication & Networking Products Catalog Vol. ICNP 2.2.00

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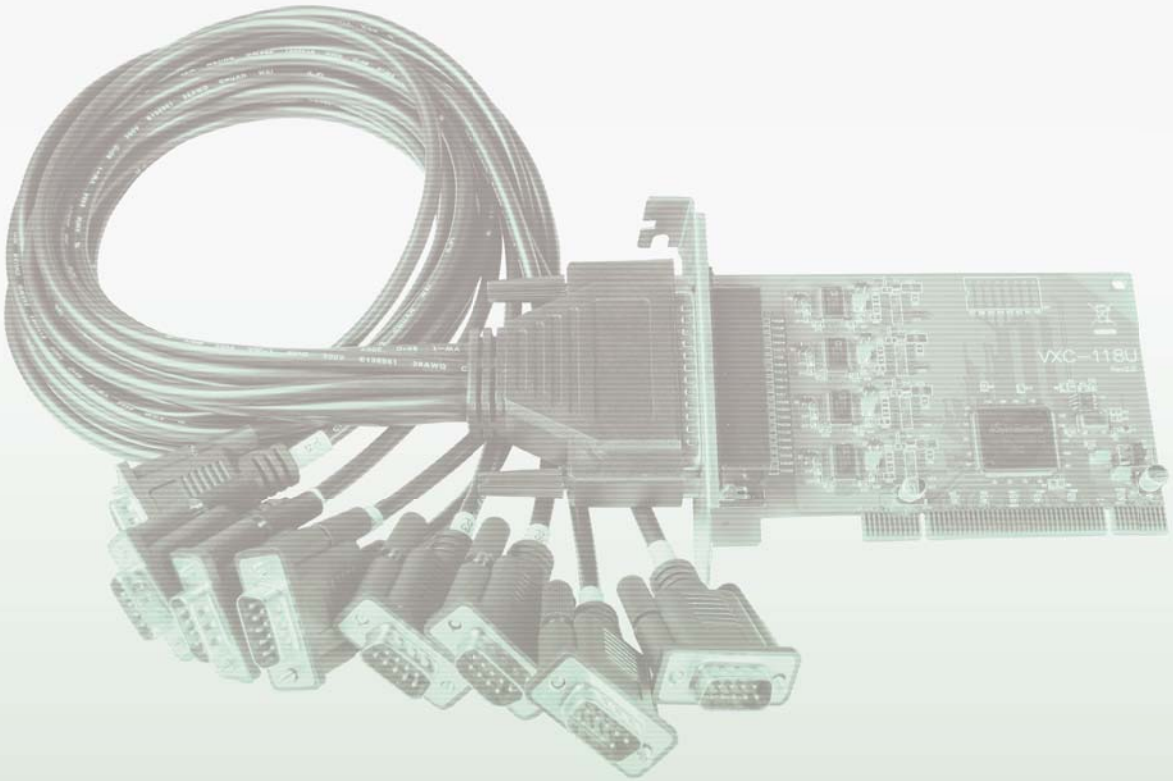
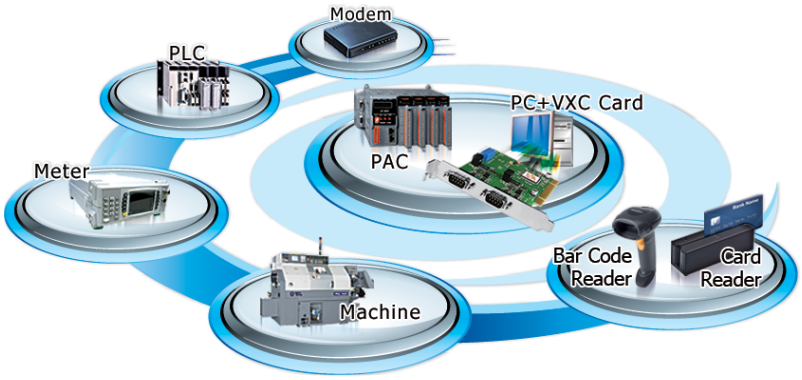
Multiport Serial Cards



1-1 Overview

Overview

The VXC/VEX/PCIe-S 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/PCIe-S 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, serial printers, RFID readers, bar code readers, and sensors, etc.



The PAC family from ICP DAS is a modular network-based programmable automation controller that provides the capability of adding I/O and RS-232/422/485 serial port modules. This exciting new PAC family offers a flexible, versatile and economical solution to a wide range of applications, from data acquisition, process control, testing and measurement, and motion control to energy and building management, and is an ideal alternative when replacing an existing PC-based system.

Features

COM-Selector

Most VXC/VEX cards are equipped with a COM-Selector (DIP switch) for the COM port number selection. It supports two selection modes: Auto- and Manual-mode. The Auto-mode is the default setting (DIP switch is set as 0), and the uncertain COM port number will be assigned automatically by OS. The Manual-mode of the COM-selector (DIP switch is set as 1 ~ 255) can force the card to use user-defined COM port number.

The Manual-mode of the COM-Selector provides the following advantages:

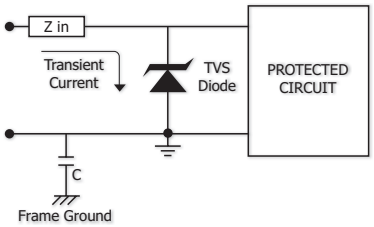
- Simplifies the COM port number selection without configuration utility.
- Specifies the COM port number directly, regardless of which PCI slot is plugged in.
- Avoids the confusion of uncertain COM port number that other PnP COM port devices use.
- Easy to replace a broken card just with the same DIP switch setting.

Easy COM Port Selection by DIP switch

ESD Protection

The VXC/VEX cards offer ESD protection technology, protecting your system from being damaged by the high potential voltages.

When the voltage is beyond the limits, the TVS diode junction avalanches providing a low impedance path for the transient current. As a result, the transient current is diverted away from the protected components and shunted through the TVS diode. The device returns to a high impedance state after the transient threat passed.



Self-Tuner

Without the help of Self-Tuner, users need to enable RS-485 transmitter before sending, and disable the transmitter after finish sending. The timing to enable and disable transmitter (direction control) is the major issue on many communication problems, and it is very difficult to debug. The built-in Self-Tuner on VXC/VEX/PCIe-S cards effectively gets rid of this direction control issue and also simplifies software programming for communication applications.

Isolation

Photo coupler is a device that uses a short optical transmission path to transfer a signal between elements of a circuit. This keeping them electrically isolated — the electrical contact along the path is broken.
It can help cutting down on ground loops, common mode voltages and block voltage spikes, provide electrical isolation, and offer significant protection from serious over-voltage conditions in one circuit affecting the other.

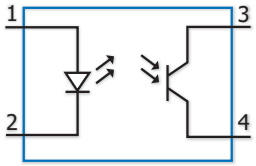


Photo Coupler Operation

Hardware FIFO up to 256 bytes

FIFO is used for buffering and flow control while data come from hardware to software. When using hardware FIFO (buffer), a little delay on software or operating system will not lose data at all. VXC/VEX/PCIe-S Cards are equipped with 128- or 256-byte hardware FIFO for each port.

1-2 PC-based Serial Communication Cards

● PCI Express

Model Name	COM-Selector	RS-232	RS-422/485	Self-Tuner	Isolation (VDC)	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

2-Port RS-232 Card

VEX-112, VEX-112i

- Provides two 9-wire RS-232 ports
- +/-4 kV ESD Protection and for i version
- 128-byte Hardware FIFO for Each Port
- Built-in COM-Selector DIP switch
- 2500 VDC Isolation for i version
- Baud rate: 50 ~ 115200 bps

4-Port RS-232 Card

VEX-114, VEX-114/D2, VEX-114i, VEX-114i/D2

- Provides four 9-wire RS-232 ports
- +/-4 kV ESD Protection and for i version
- 128-byte Hardware FIFO for Each Port
- Built-in COM-Selector DIP switch
- 2500 VDC Isolation for i versions
- Baud rate: 50 ~ 115200 bps

8-Port RS-232 Card

PCIe-S118, PCIe-S118/D2

- 256-byte Hardware FIFO for Each Port
- Automatic COM number assigned by OS
- Provides eight 8-wire RS-232 ports
- Baud rate: 2400 ~ 921600 bps

2-Port RS-422/485 Card

VEX-142, VEX-142i

- Provides two 2-wire RS-485/8-wire RS-422 ports
- Built-in COM-Selector DIP switch
- +/-4 kV ESD Protection and for i version
- Supports pull-high/-low jumpers on RS-485 port
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps
- Automatic RS-485 Direction Control
- 2500 VDC Isolation for i version

4-Port RS-422/485 Card

VEX-144, VEX-144i

- Provides four 2-wire RS-485/8-wire RS-422 ports
- Supports pull-high/-low jumpers on RS-485 port
- Built-in COM-Selector DIP switch
- +/-4 kV ESD Protection and for i version
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps
- 2500 VDC Isolation for i versions
- Automatic RS-485 Direction Control

8-Port RS-422/485 Card

PCIe-S148

- Provides eight 2-wire RS-485/4-wire RS-422 ports
- Supports pull-high/-low jumpers on RS-485 port
- Automatic COM number assigned by OS
- 256-byte Hardware FIFO for each port
- Baud rate: 2400 ~ 921600 bps
- Automatic RS-485 Direction Control

● Universal PCI

Model Name	COM-Selector	RS-232	RS-422/485	Self-Tuner	Isolation (VDC)	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

2-Port RS-232 Card

VXC-112AU, VXC-112iAU

- Provides two 9-wire RS-232 ports
- Built-in COM-Selector DIP switch
- +/-4 kV ESD Protection for i versions
- 2500 VDC Isolation for i version
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps

4-Port RS-232 Card

VXC-114U, VXC-114iAU, VXC-114U/D2, VXC-114iAU/D2

VXC-114U
VXC-114iAU

VXC-114U/D2
VXC-114iAU/D2

- Provides four 9-wire RS-232 ports
- Built-in COM-Selector DIP switch
- +/-4 kV ESD Protection and for i version
- 2500 VDC Isolation for i version
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps

8-Port RS-232 Card

VXC-118U, VXC-118U/D2

VXC-118U

VXC-118U/D2

- Automatic COM number assigned by OS
- 256-byte Hardware FIFO for Each Port
- Provides eight 8-wire RS-232 ports
- Baud rate: 50 ~ 115200 bps

2-Port RS-422/485 Card

VXC-142AU, VXC-142iAU

- Provides two 2-wire RS-485/8-wire RS-422 ports
- Supports pull-high/-low jumpers on RS-485 port
- +/-4 kV ESD Protection and for i version
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps
- Built-in COM-Selector DIP switch

1-Port RS-422/485 and 1-Port RS-232 Card

VXC-182iAU

- Provides one 2-wire RS-485/8-wire RS-422 port
- Supports pull-high/-low jumpers on RS-485 port
- Provides one 9-wire RS-232 port
- Built-in COM-Selector DIP switch
- +/-4 kV ESD Protection on RS-485 port
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps
- Automatic RS-485 Direction Control
- 2500 VDC Isolation on RS-485 port

4-Port RS-422/485 Card

VXC-144U, VXC-144iU

- Provides four 2-wire RS-485/8-wire RS-422 ports
- Supports pull-high/-low jumpers on RS-485 port
- +/-4 kV ESD Protection and for i version
- 2500 VDC Isolation for i version
- Built-in COM-Selector DIP switch
- 128-byte Hardware FIFO for Each Port
- Baud rate: 50 ~ 115200 bps
- Automatic RS-485 Direction

8-Port RS-422/485 Card

VXC-148U

- Provides eight 2-wire RS-485/4-wire RS-422 ports
- Supports pull-high/-low jumpers on RS-485 port
- Automatic COM number assigned by OS
- 256-byte Hardware FIFO for each port
- Baud rate: 50 ~ 115200 bps
- Automatic RS-485 Direction Control

Ordering Information

PCI Express	Universal PCI	Ordering Information
VEX-112 CR	VXC-112AU CR	Communication Card with 2 RS-232 ports (RoHS)
VEX-112i CR	VXC-112iAU CR	Communication Card with 2 Isolated RS-232 ports (RoHS)
VEX-114 CR	VXC-114U CR	Communication Card with 4 RS-232 ports (RoHS). Includes One CA-4002 Connector
VEX-114/D2 CR	VXC-114U/D2 CR	Communication Card with 4 RS-232 ports (RoHS). Includes One CA-9-3715D Cable
VEX-114i CR	VXC-114iAU CR	Communication Card with 4 Isolated RS-232 ports (RoHS). Includes One CA-4002 Connector
VEX-114i/D2 CR	VXC-114iAU/D2 CR	Communication Card with 4 Isolated RS-232 ports (RoHS). Includes One CA-9-3715D Cable
VEX-142 CR	VXC-142AU CR	Communication Card with 2 RS-422/485 ports (RoHS)
VEX-142i CR	VXC-142iAU CR	Communication Card with 2 Isolated RS-422/485 ports (RoHS)
VEX-144 CR	VXC-144U CR	Communication Card with 4 RS-422/485 ports (RoHS). Includes One CA-4002 Connector
VEX-144i CR	VXC-144iU CR	Communication Card with 4 Isolated RS-422/485 ports (RoHS). Includes One CA-4002 Connector
	VXC-182iAU CR	Communication Card with 1 Isolated RS-422/485 port and 1 RS-232 port (RoHS)
PCIe-S118 CR	VXC-118U CR	Communication Card with 8 RS-232 ports (RoHS). Includes one CA-PC62M Connector
PCIe-S118/D2 CR	VXC-118U/D2 CR	Communication Card with 8 RS-232 ports (RoHS). Includes One CA-9-6210 Cable
PCIe-S148 CR	VXC-148U CR	Communication Card with 8 RS-422/485 ports (RoHS). Includes one CA-PC62M Connector

Accessories

CA-0910F CR	9-Pin Female-Female D-Sub Cable 1 m
CA-0915 CR	9-Pin Male-Female D-Sub Cable, 1.5 m
CA-PC09F CR	9-Pin Female D-Sub Connector with Plastic Cover
DN-09-2F CR	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Header. Includes CA-0910F x 2 (9-Pin Female-Female D-Sub Cable 1 m)
CA-4002 CR	37-Pin Male D-Sub Connector with Plastic Cover
CA-9-3715D CR	Male DB-37 to 4-port Male DB-9 Cable, 1.5 M (180°)
CA-9-3705 CR	Male DB-37 to 4-port Male DB-9 Cable, 0.3 M (90°)
CA-9-6210 CR	Male DB-62 to 8-port Male DB-9 Cable, 1.0 M
CA-PC62M CR	62-pin Male D-sub connector with plastic cover

1-3 PAC-based Serial Communication Module

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

PAC	XP-8000-WES	XP-8000-CE6	WP-8000-CE7	iP-8000	VP-1231	VP-4231
Pictures						
CPU	x86 CPU, 1 GHZ, dual-core	x86 CPU, 1 GHZ, dual-core	Cortex-A8, 1 GHZ	80186, 80 MHz	Cortex-A8, 1 GHZ	
OS	WES7	WinCE 6.0	WinCE 7.0	MiniOS7	WinCE 7.0	
LCD	-				5.7" TFT LCD with Touch Panel	10.4" TFT LCD with Touch Panel
I/O Expansion	I/O Slots, RS-232/485, Ethernet					
I/O Slot	1/3/7		4/8		3	
Software Development Tool	VS .NET 2005/2008, VC6, VB6, Delphi, BCB	VS .NET 2005/2008 ISaGRAF, InduSoft	VS .NET 2008 Win-GRAF, InduSoft	C language, ISaGRAF	VS .NET 2008 Win-GRAF, InduSoft	

The communication modules offer the possibility to add several serial ports into a XPAC, WinPAC, ViewPAC and iPAC. Up to 4 ports, optionally isolated, RS-232, RS-422 or RS-485 ports.

Model Name	I-8112iW	I-8114W	I-8114iW	I-8142iW	I-8144iW
Pictures					
Communication					
Interface	RS-232	RS-232	RS-232	RS-422/485	RS-422/485
Port	2	4	4	2	4
Max. Speed (K bps)	115.2				
System					
Isolation	2500 V_{rms}	-	2500 V_{rms}	2500 V_{rms}	
Power Consumption	1.5 W	1.25 W	1.75 W	1.5 W	1.75 W
Connector	Male D-Sub 9 x 2	Female D-Sub 37		Terminal Block	
Optional Accessories	CA-0915 CA-0910F	CA-9-3705 CA-9-3715D	CA-9-3705 CA-9-3715D	-	-

Optional Accessories

CA-0910F CR

9-Pin Female-Female D-Sub cable, 1 M

CA-0915 CR

9-Pin Male-Female D-Sub cable, 1.5 M

DN-09-2F CR

I/O Connector Block with DIN-Rail Mounting and two 9-pin Male Header. Includes: 2 x CA-0910F

CA-9-3705 CR

DB-37 Male (D-Sub) to 4-port DB-9 Male (D-Sub) cable. 0.3 M (90°)

CA-9-3715D CR

DB-37 Male (D-Sub) to 4-port DB-9 Male (D-Sub) cable. 1.5 M (180°)

CA-9-6210 CR

Male DB-62 to 8-port Male DB-9 Cable, 1.0M

● 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 VDC RS-232 side	3000 VDC RS-232 side	3000 VDC RS-485 side	3000 VDC RS-232 side	3000 VDC RS-422/485 side	3000 VDC 3 ways	3000 VDC	3000 VDC		3000 VDC 3 ways
Operating Temperature	-25 °C ~ +75 °C									

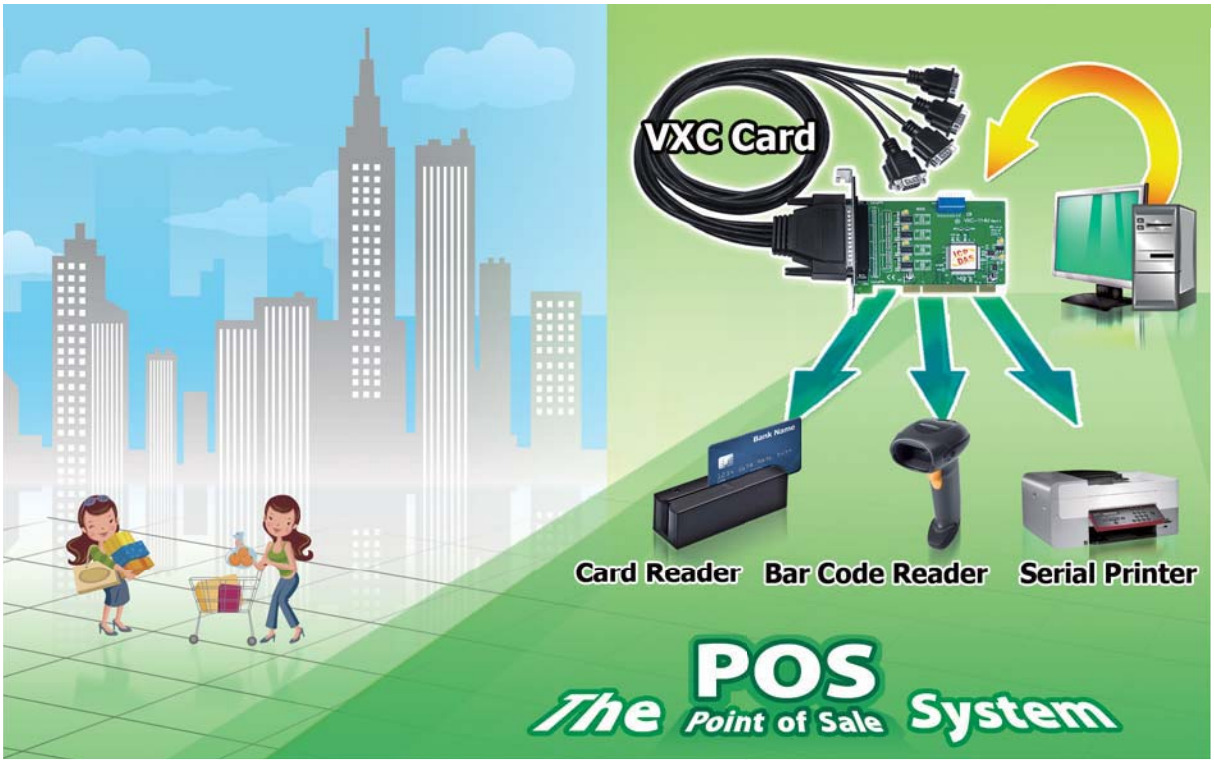
● USB to RS-232/422/485 Converter

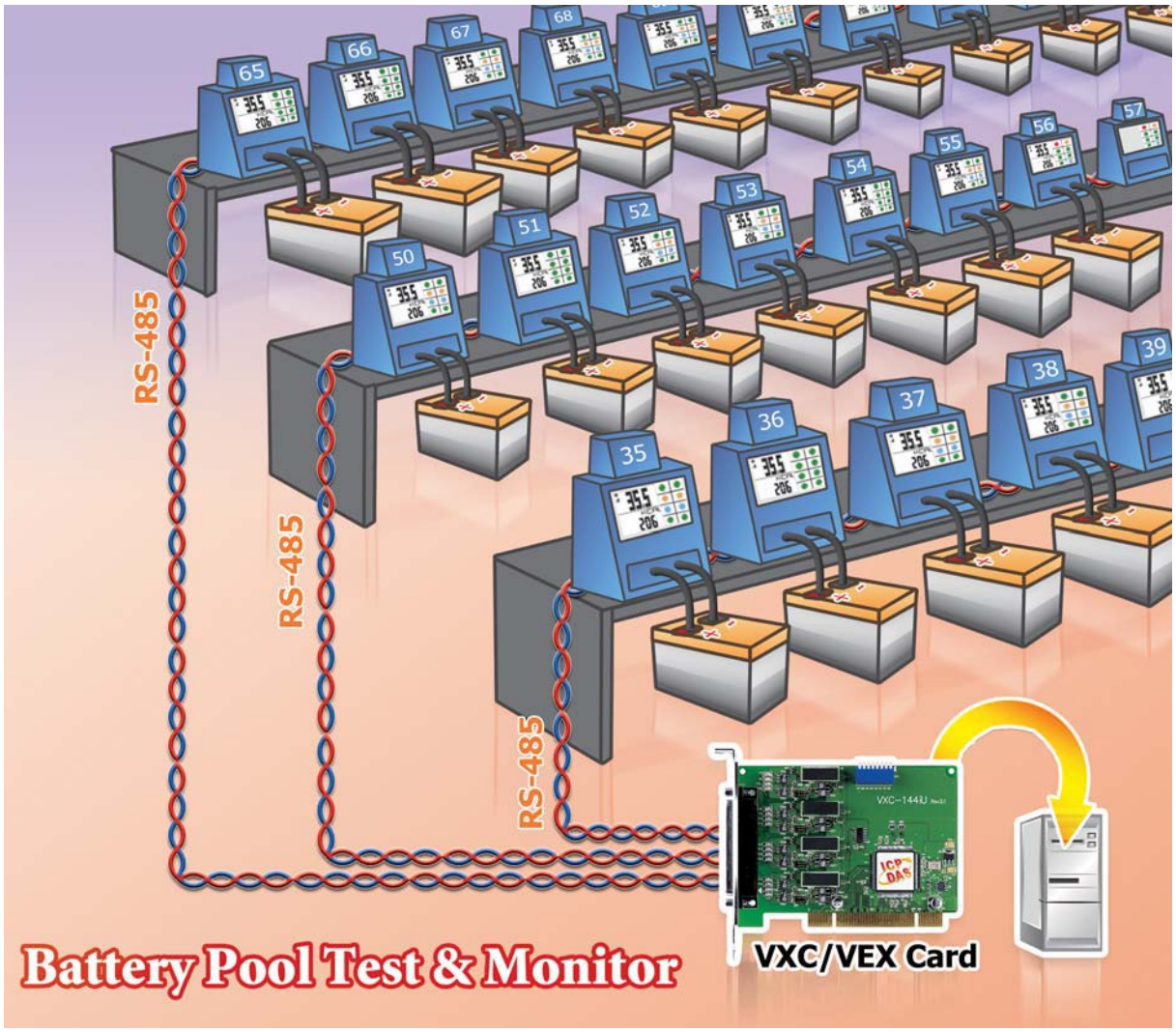
Model Name	I-7560U	USB-2514	I-7561U	tM-7561
Pictures				
Function	Converter	Converter	Converter	Converter
Interface	USB to RS-232	USB to 4-Port RS-232	USB to RS-232/422/485	USB to RS-485
Isolation	-	-	3000 VDC	3000 VDC
Operating Temperature	-25 °C ~ +75 °C			

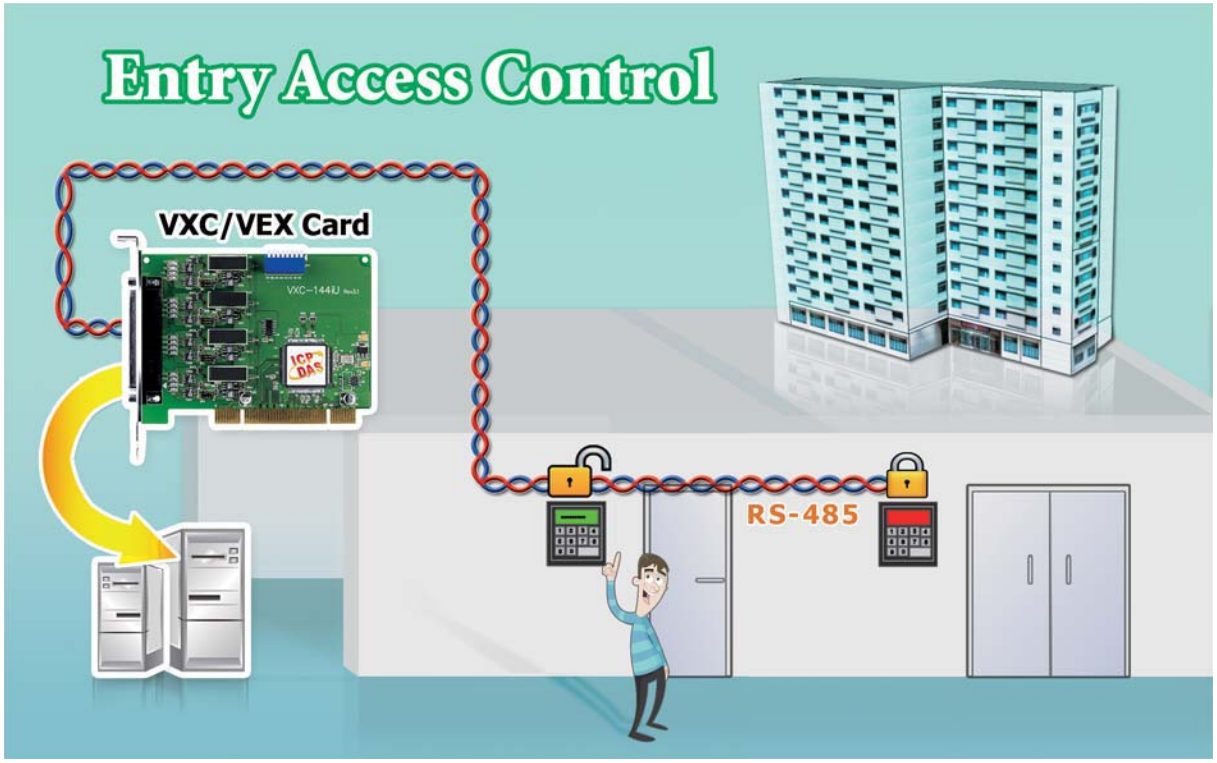
● USB RS-232/485 to RS-485 Hub

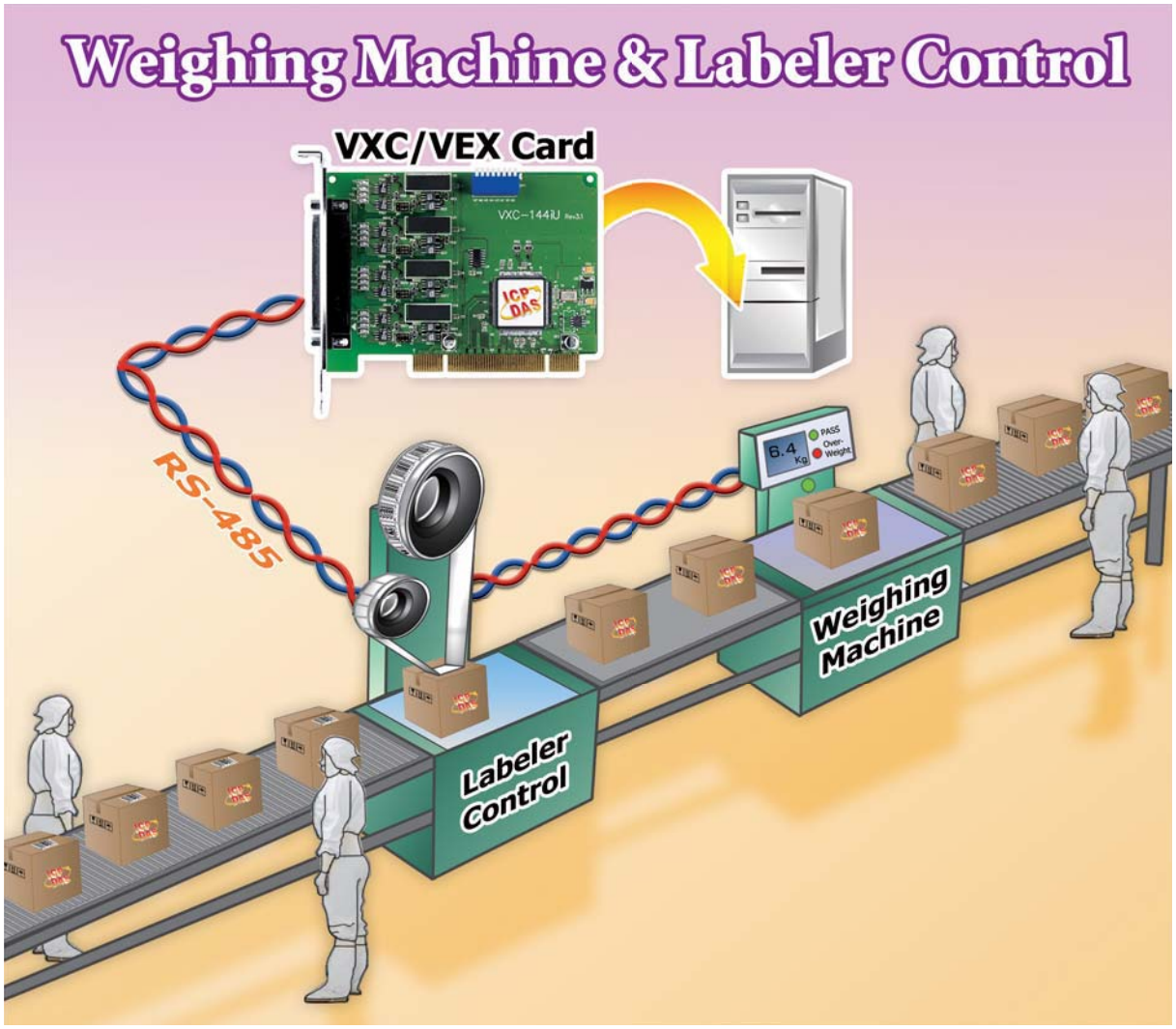
Model Name	I-7563U	I-7513	I-7520U4	I-7514U
Pictures				
Function	3-Ch Hub/Splitter	3-Ch Hub/Splitter/Repeater	4-Ch Hub/Splitter	4-Ch Hub/Splitter/Repeater
Interface	USB to 3-Ch RS-485	RS-485 to 3-Ch RS-485	RS-232 to 4-Ch RS-485	RS-485 to 4-Ch RS-485
Isolation	3000 VDC	3000 VDC 3 ways	3000 VDC RS-232 side	3000 VDC Ch1-Ch4 side
Operating Temperature	-25 °C ~ +75 °C			

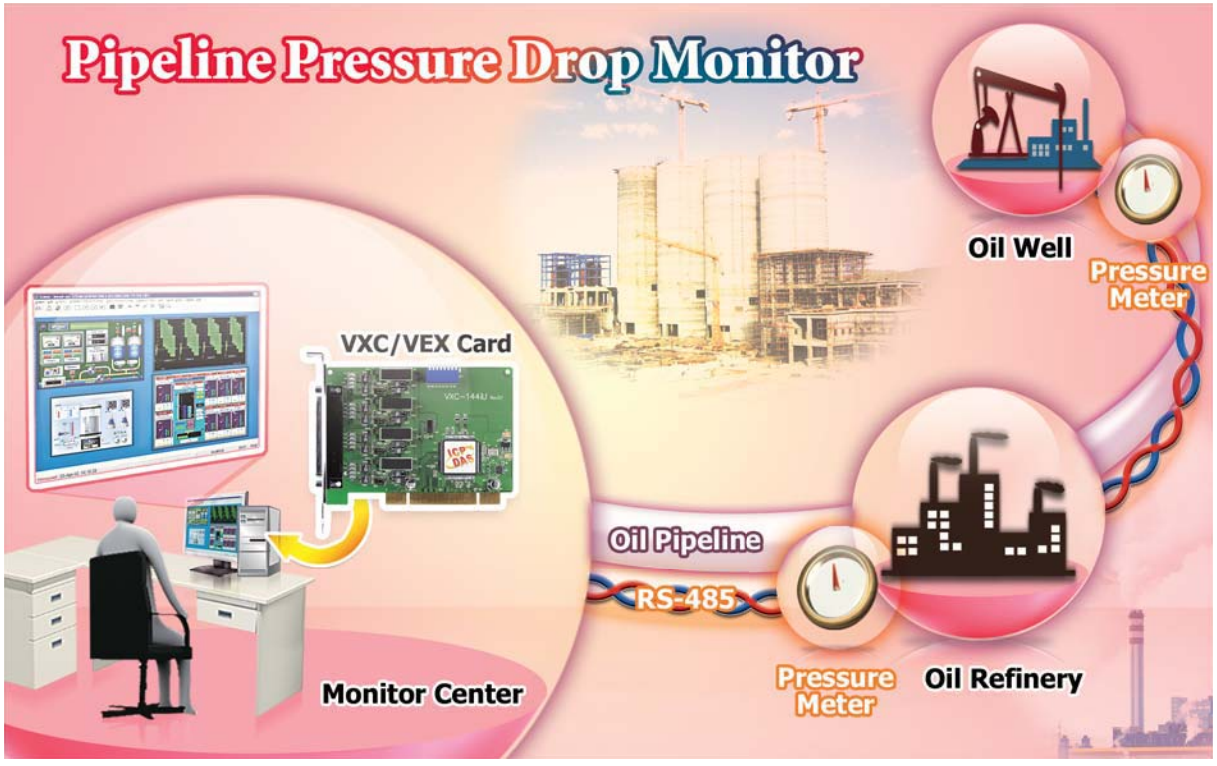
1-4 Applications




RS-485
RS-485
RS-485
VXC/VEX Card
Battery Pool Test & Monitor

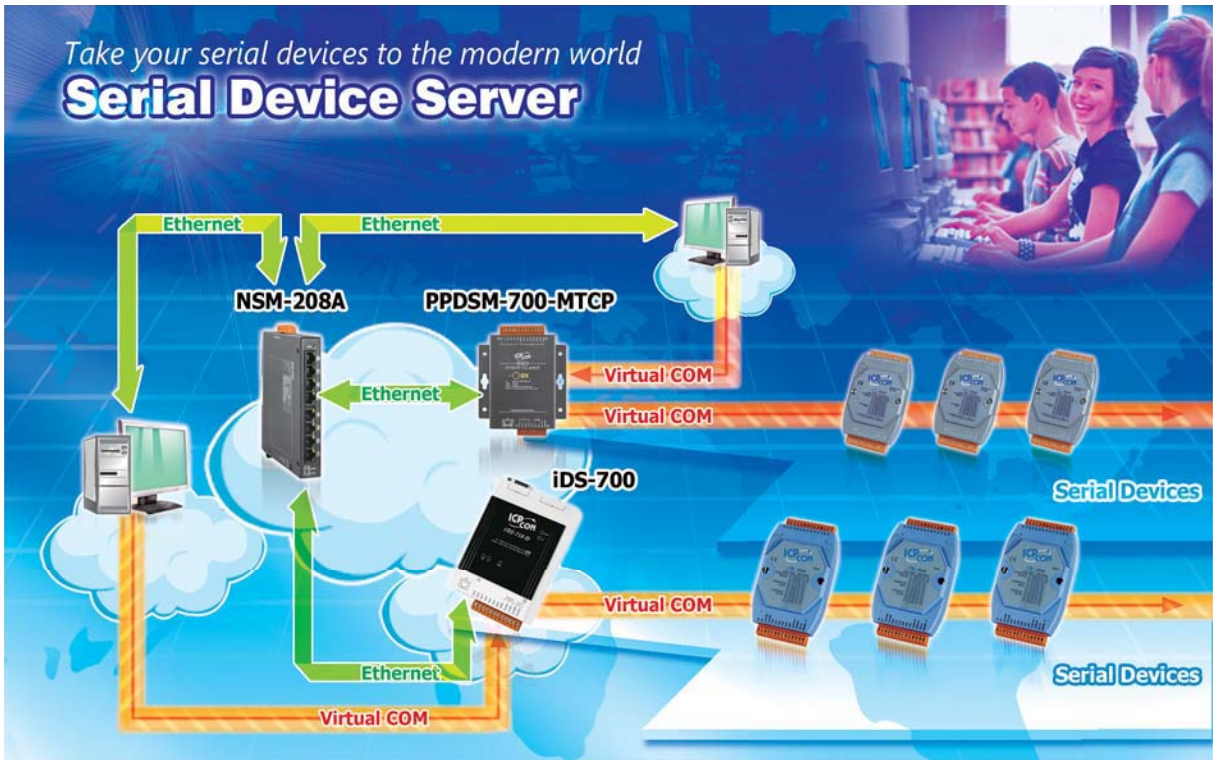

Entry Access Control
VXC/VEX Card
RS-485


Weighing Machine & Labeler Control
VXC/VEX Card
RS-485
Weighing Machine
Labeler Control


Pipeline Pressure Drop Monitor
Oil Well
Pressure Meter
VXC/VEX Card
Oil Pipeline
RS-485
Monitor Center
Pressure Meter
Oil Refinery

Serial Device Server

2-1 Overview



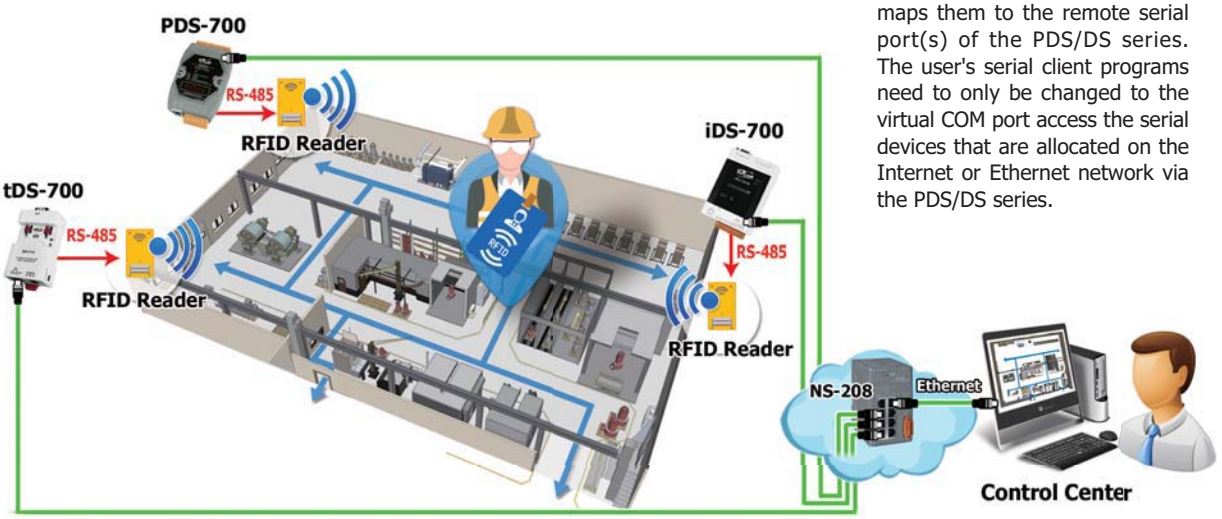
Serial Devices to Ethernet Gateway

The ICP DAS Serial 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 Serial Device Servers are your best choice for implementing this scenario in a robust, reliable and cost-effective way.

VxComm driver & utility
Where remote serial devices become part of your PC

The VxComm Driver creates virtual COM port(s) on 32-bit and 64-bit Windows XP/7/10/2012/2016 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:

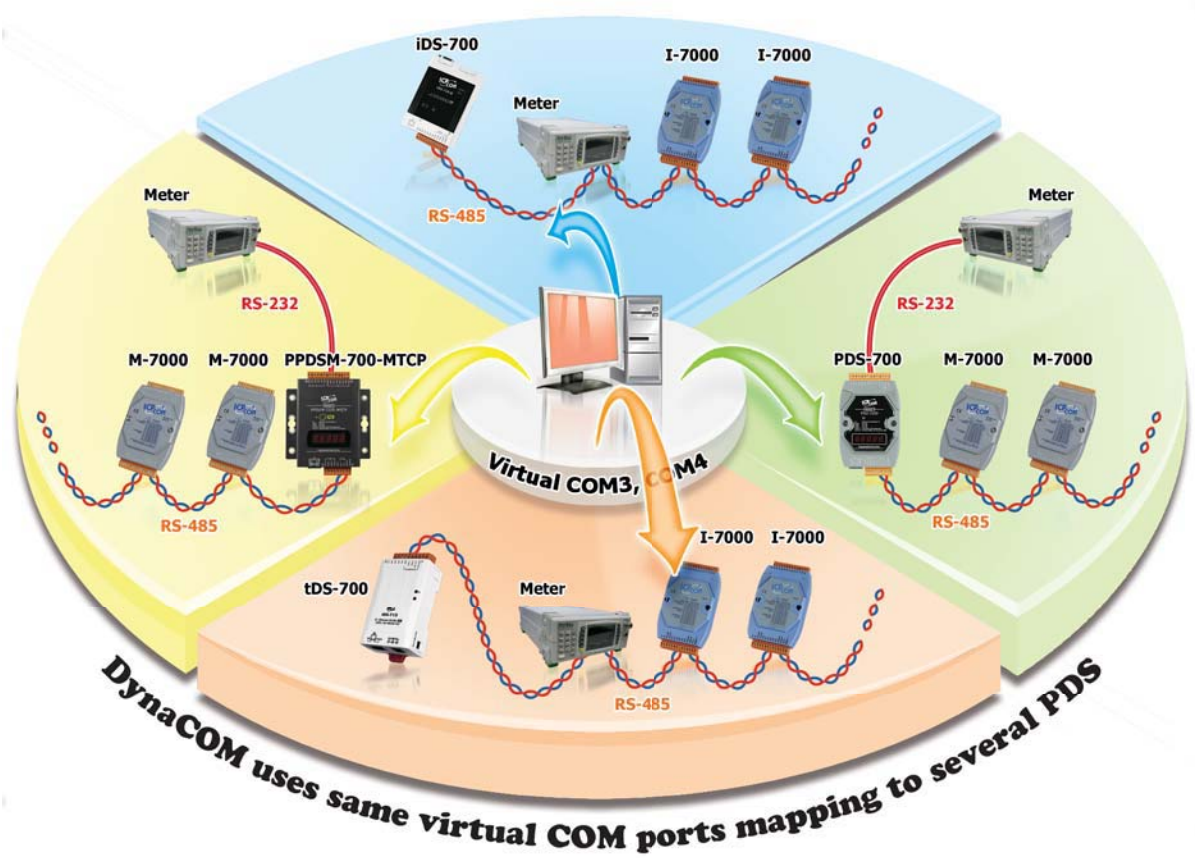
Using a TCP/IP socket connection, client programs can exchange information with specific PDS/DS serial ports and talk to serial devices directly. For example, simply create a socket connection to the TCP/IP port 10001 (default) of the PDS/DS device and you can then access Port1 of the PDS/DS remotely. 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
PoE	Yes	Yes	–	–	Yes	Yes
Programmable	–	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 TCP Server TCP Client UDP Pair Connection RFC2217 Telnet Modem Emulator	Virtual COM TCP Server TCP Client Pair Connection Modbus TCP Slave	Virtual COM TCP Server TCP Client Pair Connection	Virtual COM TCP Server TCP Client Pair Connection	Virtual COM TCP Server TCP Client Pair Connection	Modbus TCP Master Modbus TCP Slave Modbus UDP Master Modbus UDP Slave Pair Connection
Remarks	Intelligent	Professional	Powerful	Isolation for DS-715	Cost-effective, Entry-level	Cost-effective, Entry-level

iDS Series – Intelligent Device Server

Series	Ethernet	Virtual COM	Virtual I/O	Programmable	SNMP	Casing
 iDS-700	10/100 M, PoE	Yes	–	–	Yes	Plastic
 iDS-700M						Metal
 iDS-400M	2-port 10/100 M Switch, PoE	Yes	–	–	Yes	Metal

PPDS Series – Programmable Device Server and Modbus Gateway with PoE

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

PDS Series – Programmable Device Server

Series	Ethernet	Virtual COM	Virtual I/O	Programmable	Modbus	Casing
 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
 DS-700	10/100 M	Yes	–	Yes	–	Plastic	Isolation for DS-715
 tDS-700	10/100 M, PoE			–			Cost-effective
 tGW-700		–		Yes	Yes		
 tDS-2200	10/100 M Ethernet Switch, PoE	Yes		–	–		
 tGW-2200		–		Yes	Yes		

2-2 Intelligent Serial-to-Ethernet Device Servers

iDS-700
iDS-400 *NEW*

Intelligent Device Servers
Remotely Monitor and Control RS-232/RS-485 Devices via an Ethernet Network

iDS-718i-D iDS-728iM-T iDS-448iM-D

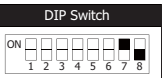
Features

- 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
- Serial ESD protection
- Provides Virtual COM (COM port redirection), TCP Server/Client (Max. 32 connections), UDP, Serial Tunnel (Pair connection), Modem Emulator, and RFC2217 application modes.
- Built-in Buzzer, RTC, and Watchdog
- Wide operating temperature range: -25 to +75°C
- 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
- Supports RS-485 Data Direction Control with Self-Tuner Technology
- Includes a Smart Ethernet Port that recognizes both straight and crossover Ethernet Cables
- Reset button for restoring the factory configuration
- RoHS Compliant

Introduction

The iDS product range is the 3rd generation of Device Servers from ICPDAS. 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.

COM1	M1	M0	DIP Switch
RS-232	ON	OFF	
RS-422	OFF	ON	
RS-485	OFF	OFF	
Software	ON	ON	

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.

Easy web-based Configuration

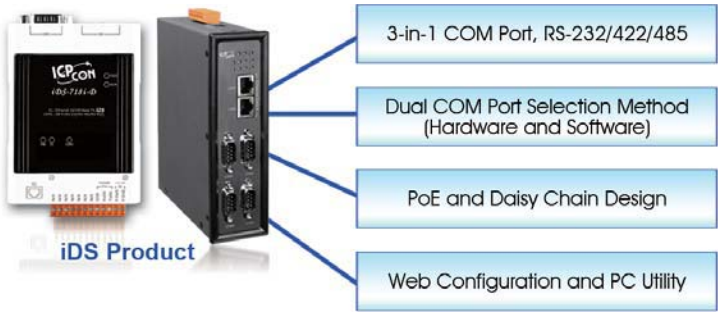
The built-in web server allows the iDS product to be accessed and configured using a standard web browser, such as Internet Explorer or Google Chrome. The configurations include parameters of serial ports, SNMP, the mode of Serial-To-Ethernet service. In addition, the onboard Flash memory provides the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

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

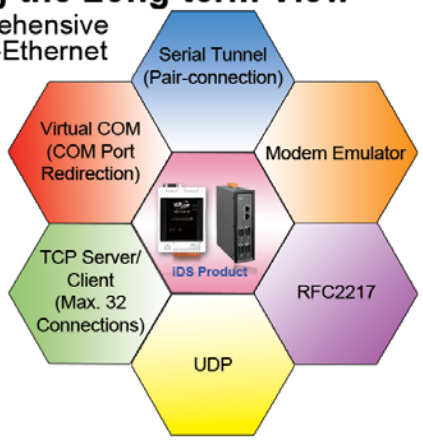
We Know Time is Everything
Quick and Easy Installation



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.

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

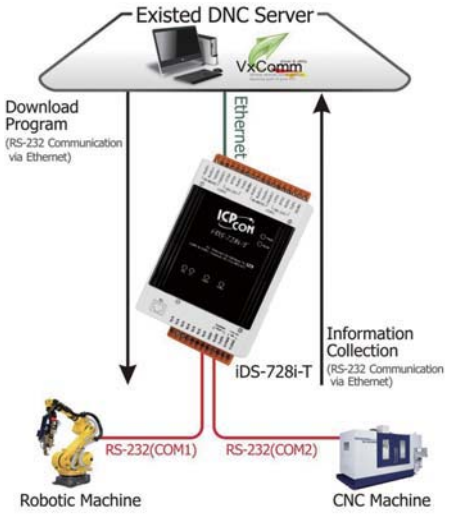


Application

Factory Automation Application

Typically, a DNC Server is used to manage or communicate with remotely distributed CNC Machines. In the past two decades, the interface used for data transfer has been either via floppy disk or via serial port transmission. However, an Ethernet network can offer a far more rapid rate of data transmission, allowing greater communication efficiency between the DNC server and the CNC machine, as well as the ability to perform real-time information monitoring.

Generally speaking, in larger factory environments, the installed DNC Servers and CNC machines are frequently exchanging significant amounts of data, meaning that challenging conditions may be encountered when attempting to perform data transfer via an Ethernet network, such as:
1. Electronic noise or power surges that cause severe damage to the device and potential interruption to communication.
2. The processing of large amounts of data can cause the device server to become unreliable and unstable.



The ICPDAS iDS-700 series of devices are equipped with the complete Serial-To-Ethernet service, which, together with the Industrial-grade Design, can be used to overcome these issues.

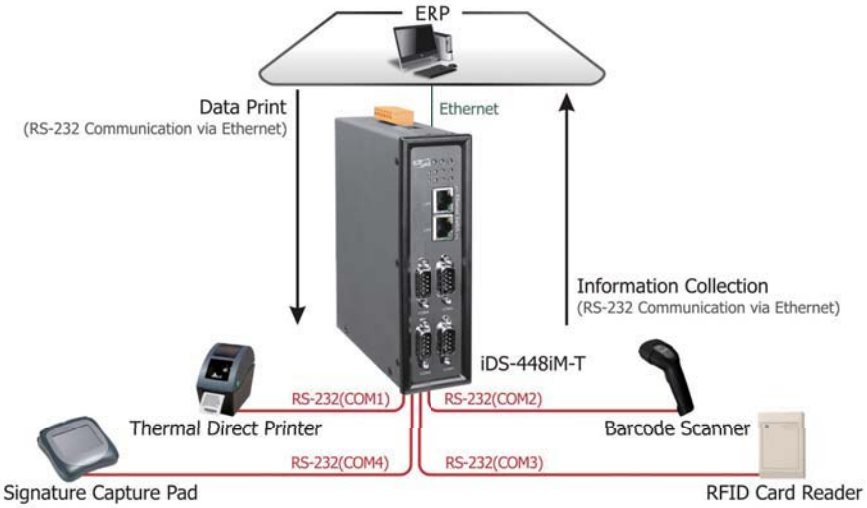
By integrating an iDS-728i-T module into this scenario via an Ethernet connection to the existing DNC server, and then connecting the remote machines via the RS-232 COM ports, communication reliability could be ensured and data transfer could be performed at much higher levels.

Stock Management Application

In a normal stock management situation, a large number of workstations are connected to external devices such as barcode scanners, printers and card readers, etc. Using the information collected from the workstations, the data in the ERP system can be quickly organized and then used to precisely predict both the demands and the requirements from the supply chain so as to maintain both at a reasonable or prescribed level.

The smartest choice for this situation is to use an iDS product rather than a PC as it is more compact in size, has a lower power consumption, and is more stable, reliable and convenient to operate. These devices also provide full Ethernet services such as Virtual COM technology and SNMP Trapping for monitoring purposes, as well as the ability to perform online maintenance tasks such as setup or firmware upgrades.

By integrating an iDS-448iM-D module into the scenario illustrated below, an Ethernet connection can be established to the existing ERP host system, and then the remote peripheral devices (barcode scanners, printers and card readers, etc.) can be connected via the RS-232 COM ports on the iDS module, thereby ensuring reliable communication and more convenient data collection.



Connecting Remote Serial Devices

The ICPDAS range of iDS-700 device servers can be used to create a pair-connection application (as well as serial-bridge or serial-tunnel applications), which can then be used to route data over a TCP/IP connection between serial devices. This can be useful when connecting a mainframe computer, server or other serial devices that do not themselves have Ethernet capability, thereby eliminating the limitation on cable length inherent in the majority of legacy serial communication devices.

In the example illustrated below, an iDS-718i-D module is connected to both the DNP Host (via the RS-232 COM port) and the DNP3 device (via the RS-485 COM port), meaning that both devices are able to communicate via the Ethernet, making communication much more efficient and reliable.

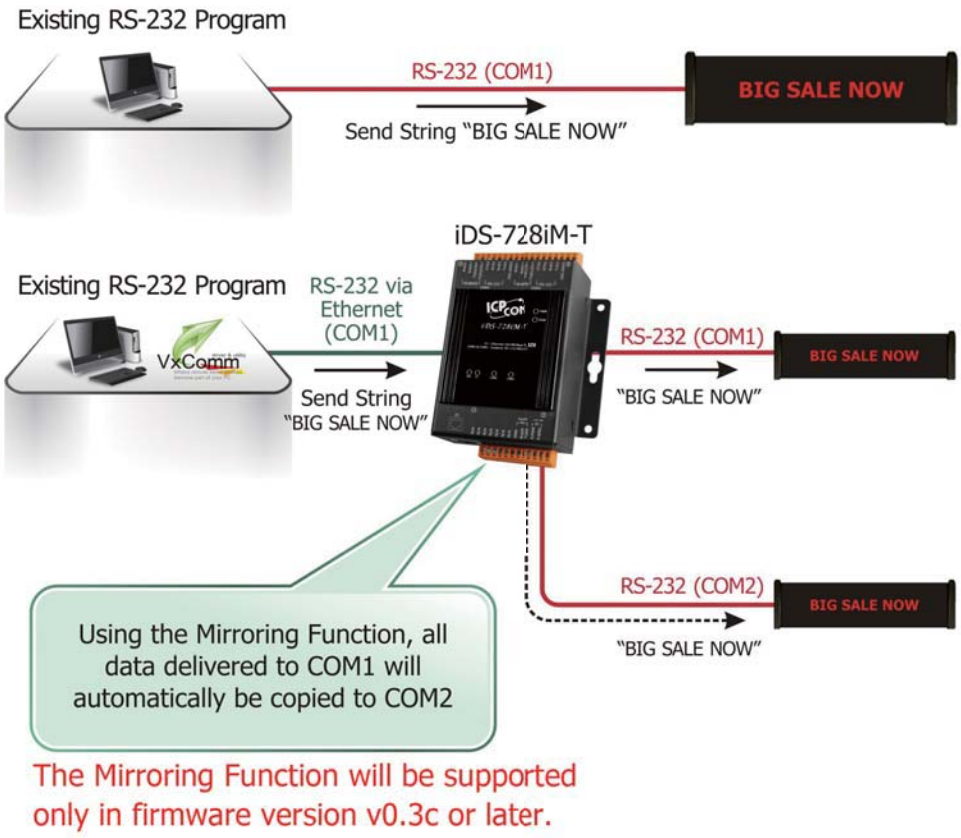
Multiple-Broadcasting System

Nowadays, many supermarkets or shopping malls use an LED display board to present the latest promotional messages, and will modify the content of the message using software on a remote PC.

As the business grows, additional LED displays may become necessary in order to present these promotional messages in other locations. Conventionally, the source code would need to be modified in order to create a new function to transmit the messages to the additional sites.

However, by utilizing the "Mirroring" function provided by iDS products, data can be automatically transmitted to the additional locations without the need for any additional software tasks.

In the scenario illustrated below, by integrating an iDS-728iM-T, the message sent from the Host PC can be simultaneously transmitted to multiple devices, thereby providing more effective communication to multiple locations with minimal effort.



The Mirroring Function will be supported only in firmware version v0.3c or later.

Data Monitoring and Redundant Communication

Generally speaking, an RS-232 device is only designed for one-to-one communication. Sometimes, however, when attempting to monitor data being transmitted between RS-232 devices, such as between a PLC and a meter using an alternative approach, difficulties may be encountered that cause frustration, meaning that the task is impossible unless the communication method or control structure is changed.

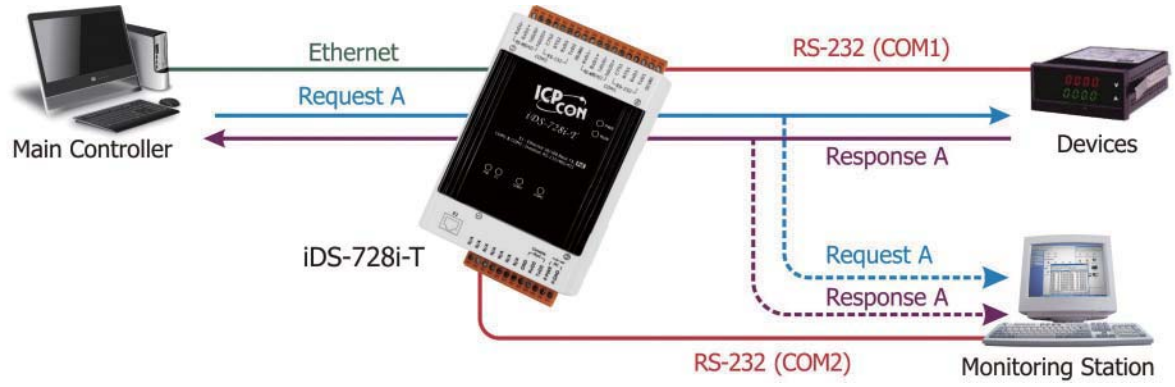
In fact, the majority of control structures in the automation field are implemented using traditional RS-232 communications. However, with the concept of IOT (Internet of Things) becoming increasingly commonplace, more and more companies and governments are faced with the need to share information with either the stakeholders or the general public, so the data being transmitted between RS-232 devices must also be shared with not only one authorized station, but also with potentially two or more stations, some of which may possibly only exist on the IT cloud.

The problem faced by many organizations is how to connect these serial control systems to the Ethernet while still retaining the original structure. The solution is the iDS range of products from ICPDAS. These products include an innovative function called "Mirroring Function", which provides the following capabilities:

1. Monitoring the TCP-to-Serial Data Transfer Process through the Serial Port.

It is often useful to be able to monitor the requests and responses between the Host PC and the PLC. By integrating an iDS module from ICPDAS, requests from the TCP connection on the Host PC, or responses from the RS-232 connection on the remote device will be automatically shared via the specified port on the iDS module.

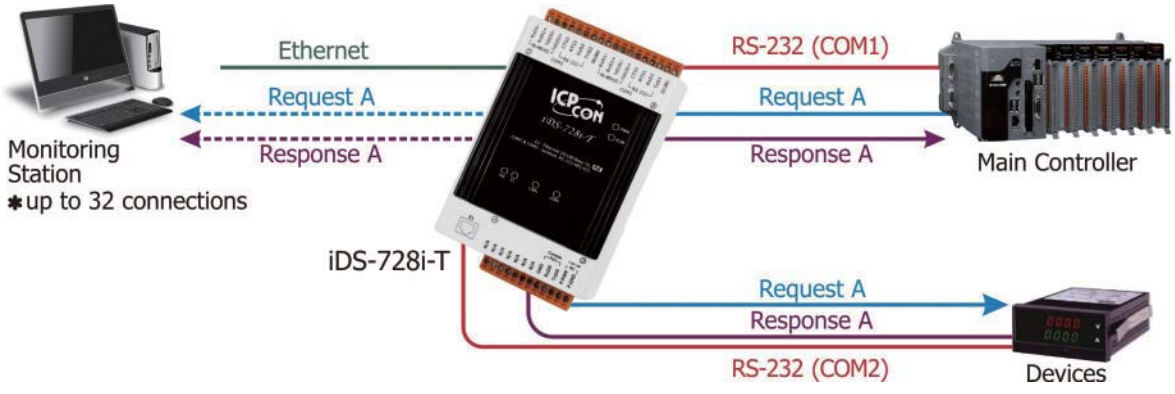
In the scenario illustrated below, an iDS-728i-T is used to share the requests and responses between the Host PC and a remote device with a remote monitoring station, thereby providing a more efficient method of examining communications between multiple devices with minimal effort.



2. Monitoring the Serial-to-Serial Data Transfer Process through the TCP Port.

The majority of industrial control systems are based on either a PLC or a PAC device, where RS-232 communication is common. By integrating an iDS module, it is easy for the remote monitoring system to receive information from multiple devices via the existing serial communication network.

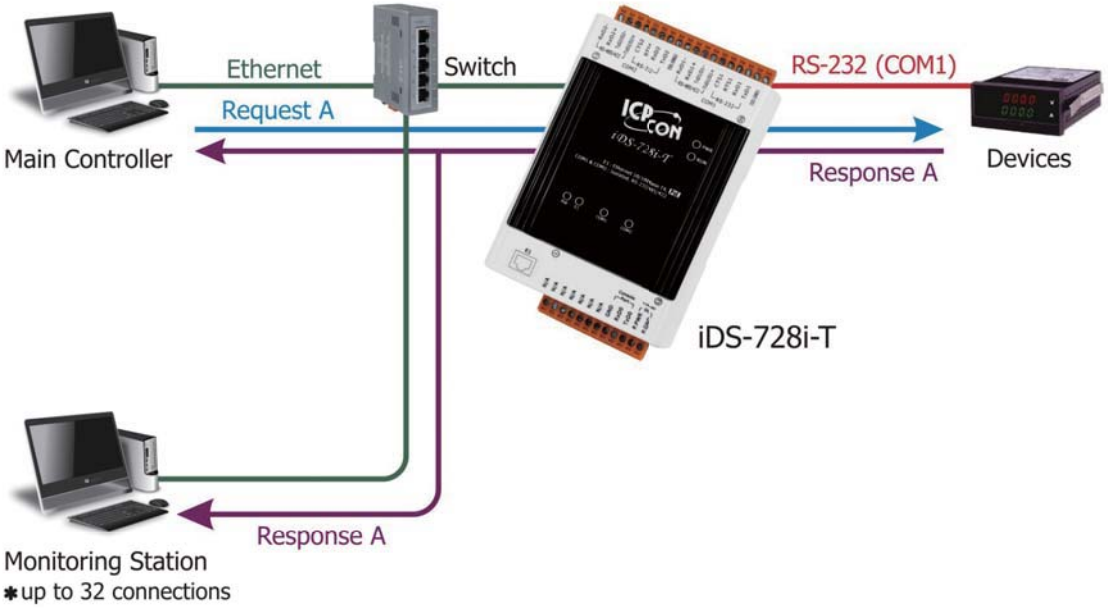
For example, in the scenario illustrated below, an iDS-728i-T is used to monitor the requests and responses between a remote monitoring station and several remote devices, thereby providing a more efficient method of controlling communications between multiple devices with minimal effort.



3. Redundant TCP Communication with Response Broadcast

Integrating an iDS product that can be used to transfer response data from remote equipment is one of the most cost-effective solutions to building a simple redundant monitoring station. Using this approach, it is possible to ensure that critical information transmitted from remote devices will not only be sent to the main control station, but also to any other redundant stations.

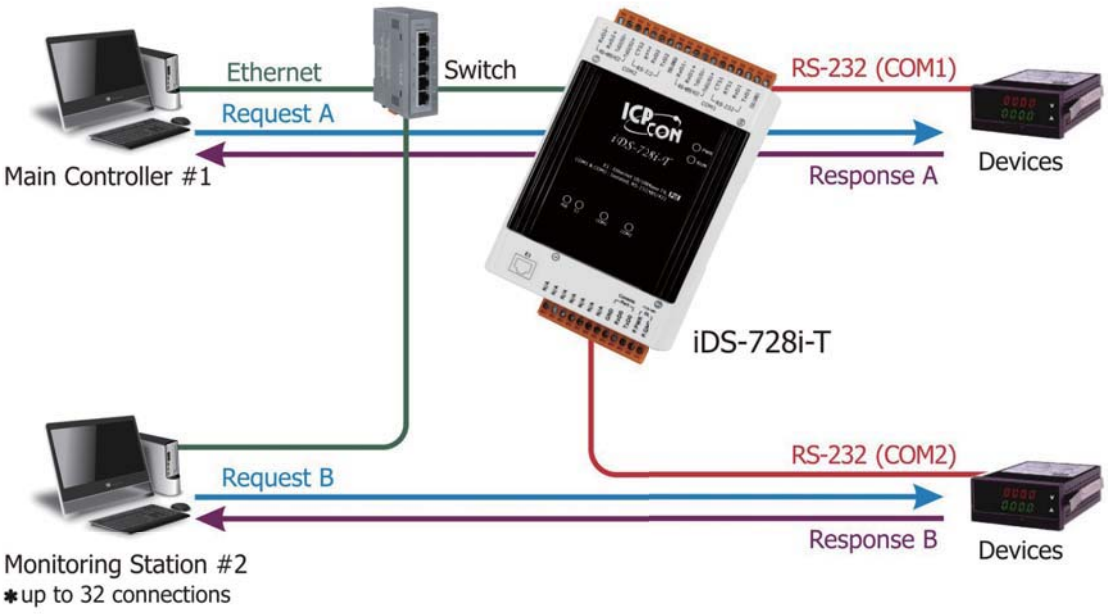
For example, in the scenario illustrated below, an iDS-728i-T is combined with an Ethernet switch to monitor requests and responses between a remote device (via RS-232) and the main controller (via the Ethernet), while simultaneously forwarding the data to an additional (redundant) monitoring station, thereby ensuring that no critical data is lost and providing a more efficient method of controlling communications between multiple devices with minimal effort.



4. Redundant TCP Communication with Multiple Hosts

The solution to the problem of enabling a serial device to serve more than two controllers is using iDS product. By utilizing the capacity for high speed computing together with a substantial amount of RAM as a FIFO, iDS products allow up to 32 TCP connections to be used to read from and write to the same serial devices.

In the scenario illustrated below, an iDS-728i-T is combined with an Ethernet switch to control requests and responses between multiple remote devices (via RS-232 and RS-485) and multiple controllers (via the Ethernet), thereby providing a more efficient method of controlling communications between multiple devices with minimal effort.

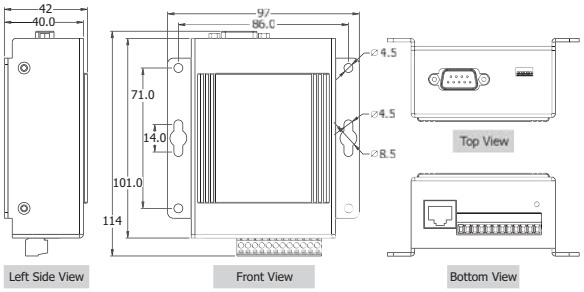


Specifications

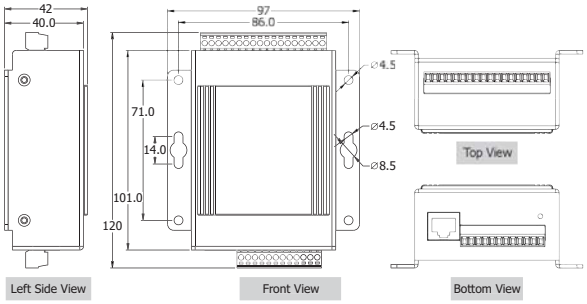
Models	iDS-718i-D	iDS-728i-T	iDS-718iM-D	iDS-728iM-T	iDS-448iM-D
CPU Module					
CPU	32-bit RISC, 720 MHz				
RAM	256 MB DDR3				
Flash	256 MB				
Peripheral	microSD, RTC, 64-bit Serial Number, Watchdog, Buzzer				
Communication Interface					
COM1	5-wire RS-232/422/485 (Isolated)				8-wire RS-232/422/485 (Isolated)
COM2	–	5-wire RS-232/422/485 (Isolated)	–	5-wire RS-232/422/485 (Isolated)	8-wire RS-232/422/485 (Isolated)
COM3	–	–	–	–	8-wire RS-232/422/485 (Isolated)
COM4	–	–	–	–	8-wire RS-232/422/485 (Isolated)
Ethernet	10/100 Base-TX, RJ-45 port (Auto-negotiating, Auto MDI/MDI-X, LED indicators), PoE (IEEE 802.3af, Class 1)				2-port 10/100 Base-TX Ethernet Switch with LAN Bypass, RJ-45 port (Auto-negotiating, Auto MDI/MDI-X, LED indicators), PoE (IEEE 802.3af, Class 1)
COM Port Signals					
3-wire RS-232	RxD, TxD and GND				
5-wire RS-232	RxD, TxD, CTS, RTS and GND				
8-wire RS-232	RxD, TxD, CTS, RTS ,DCD, DSR ,DTR, and GND				
RS-422/485	TxD+, TxD-, RxD+, RxD- and GND/Data+, Data- and GND				
RS-485	Data+, Data- and Iso.GND				
COM Port Formats					
Data Bits	5, 6, 7, 8				
Parity	None, Even, Odd, Mark, Space				
Stop Bits	1, 1.5, 2				
Baud Rate	921.6 kbps Max.				
Flow Control	RTS/CTS, XON/XOFF				
Pull High/Low Resistor	Switch-selectable (1 kΩ for RS-422/485, Non-Resistor for RS-232)				
Power					
ESD Protection	Yes (with Frame Ground)				
Protection	Power input reverse polarity protection				
Required Supply Voltage	+12 V_{DC} ~ +48 V_{DC} (non-regulated) or PoE (IEEE 802.3af, Class 1)				
Power Consumption	3.5 W				
Software					
Protocols	ICMP, IPv4, TCP, UDP, DHCP, BOOTP, Telnet, SSH, FTP, SFTP, DNS, SNMP V1/V2c/V3, HTTP, SMTP, ARP				
Configuration Method	Web, Serial Console, Telnet/SSH Console, eSearch Utility for Windows				
Virtual COM for Windows	Windows XP/7/10/2012/2016 x86/x64, 2012 x64, XP Embedded				
Virtual COM for Linux	Linux kernel 2.4.x, 2.6.x, 3.x				
SNMP Standards	RFC1213 MIB-II, RFC1317				
Application Modes	Virtual COM, TCP Server, TCP Client, UDP, Pair Connection, RFC2217, Terminal, Reverse Telnet, TCP Modem				
Mechanical					
Dimensions (W x H x D)	76 mm x 114 mm x 42 mm (97 mm x 114 mm x 42 mm for "M" versions)		76 mm x 120 mm x 42 mm (97 mm x 120 mm x 42 mm for "M" versions)		129 mm x 166 mm x 47 mm
Installation	DIN-Rail				
Casing	Plastic (Metal for "M" versions)				
Environment					
Operating Temperature	-25 °C ~ +75 °C				
Storage Temperature	-40 °C ~ +80 °C				
Humidity	5 ~ 90% RH, non-condensing				

Dimensions (Units: mm)

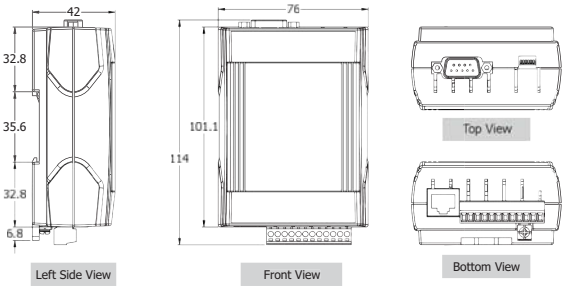
iDS-718iM-D



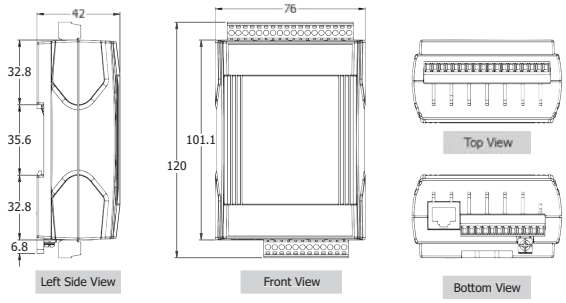
iDS-728iM-T



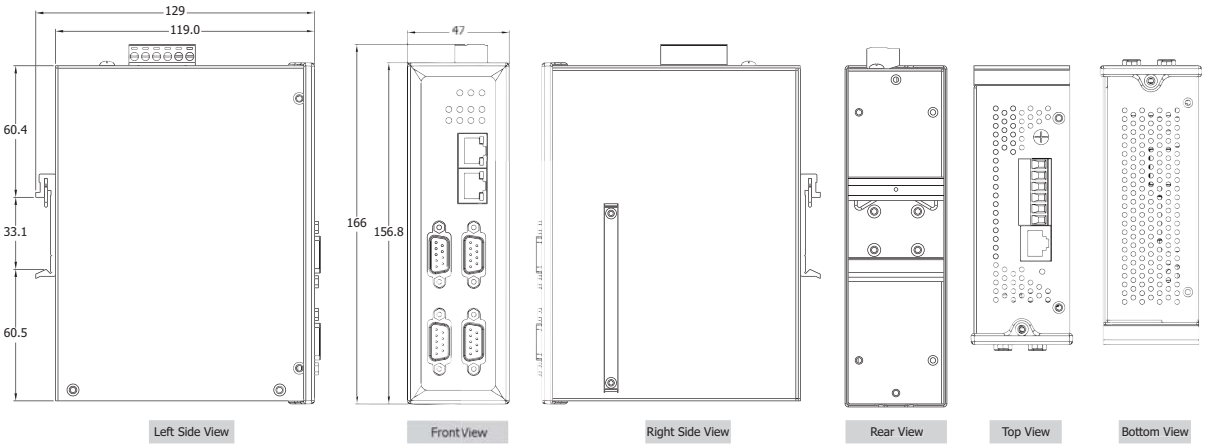
iDS-718i-D



iDS-728i-T



iDS-448iM-D



Ordering Information

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)

Accessories

GPSU06U-6 CR	24 VDC/0.25 A, 6 W Power Supply
MDR-20-24 CR	24 VDC/1 A, 24 W Power Supply with DIN-R
DIN-KA52F-48 CR	48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS, for NS-205PSE)
CA-0903	9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm Cable
CA-0910	9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)

2-3 Palm-size Programmable Serial-to-Ethernet Device Server

PDS-720(D)

PPDS-720(D)-MTCP

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

PPDS-720D-MTCP PDS-720

PDS-782-25/D6

PDS-782D-25/D6

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

PDS(M)-700(D) Series

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

Programmable Device Server with RS-232 and RS-485 ports

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

Features

Powerful software functions

- Incorporates serial devices in an Ethernet network
- Application Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- Supports Modbus TCP to RTU/ASCII Gateway (for MTCP versions)
- Programmable with lib and sample programs
- Built-in high performance MiniOS7 from ICP DAS
- Supports Virtual I/O technology (for models with DIO)
- Supports IP filter (Accessible IP) for security control
- Supports multi-client and data sharing function

Robust hardware features

- 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)
- Palm-size form factor with multiple serial ports
- Industrial DIN-Rail mounting

Introduction

The PDS-700/PPDS-700-MTCP 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 PDS-700/PPDS-700-MTCP series into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the PDS-700/PPDS-700-MTCP series is able to meet the demands of every network-enabled application.

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

These modules also provide advanced features as follows:

Programmable Enhanced "Device Servers"

The programmable features of the PDS series of products makes it possible to effectively implement exclusive protocols and exclusive communication mechanisms for complex PDS-based applications. This provides the following advantages:

• Effective network transmission:
Place your customized software on the PDS to directly perform processes locally. The effective data and information can be periodically sent back to the PC based on a schedule that can be planned in advance and the devices will work independently on-site, even when not connected to a network. Therefore, the design of system can be much more flexible. This also reduces the need to rely on the network, which is an inevitable factor for conventional DS (Device Server) as it has to keep on "talking" to the PC via the network to ensure the status maintains transparency.

• Previous development efforts can be duplicated:
Along with serial devices, you can place your customized or value-added software on the PDS to implement an intelligent Ethernet controller. This controller can then be used in applications for future projects, dramatically reducing programming requirements. In addition, your value-added software is embedded in the PDS, so if a computer system undergoes hardware replacement or upgrade, incompatibility issues don't need to be considered, which therefore reduces system maintenance work.

Virtual I/O Highly Integrates On-Site Messages

I/O acquisition is very important when performing on-site integration. The RS-485 port of PDS is able to be connected to I/O devices, like I-7000/M-7000 series, to offer abundant I/O functions for various purposes. For easier on-site integration, some PDS models also provide Digital I/O, which is also supported by the ICP DAS DCON utility, EZ Data Logger or other DCON client programs.

"Virtual I/O" is an extension of "Virtual COM" technology that simulates the PDS's digital I/Os control as a virtual COM port (Port I/O) application on the PC. You are now able to access the PDS's digital I/Os using the DCON protocol through the virtual COM port.

In addition, the DCON utility and EZ Data Logger also support control of the PDS's digital I/Os through the use of "Virtual I/O" technology, so you can monitor PDS's digital I/Os and complete the I/Os application in a convenient way.

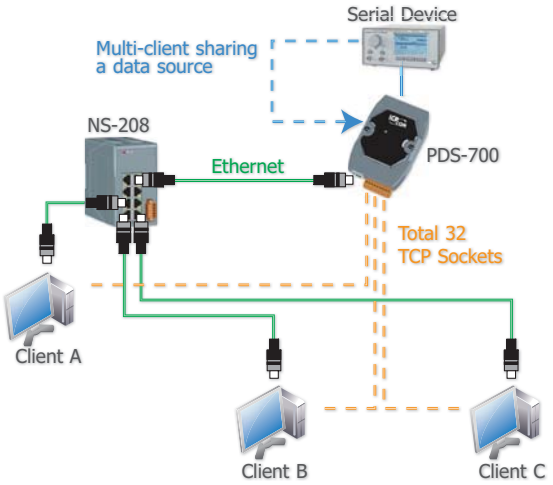
Data Sharing with Multiple Clients

M0: Transparent Mode (Multi-echo)

In transparent mode, the PDS sends data from a serial device to each client that is connected to the same serial port of the PDS. Thus, each connected client has a copy of the same data from the serial device.

M1: Slave Mode (Single-echo)

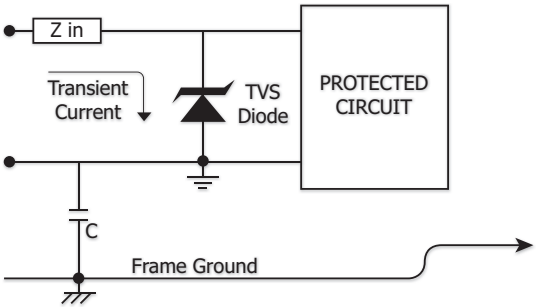
In slave mode, the PDS only sends data from a serial device to the client that requires the service. If there are no requirements from the client, then data will not be sent to the client. The PDS services each client individually when sharing data from the serial device, but the clients do not have a copy of the same data.

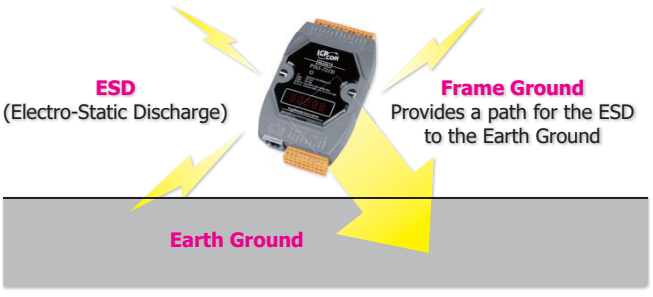


ESD Protection and Frame Ground

The PDS series offers TVS diode ESD protection technology with a frame ground design that protects your system from being damaged by high potential voltages.

Under normal operating conditions, the TVS diode presents high impedance (appears as an open circuit) to the protected component. If the voltage exceeds the limitation, the TVS diode avalanches, providing a low impedance path for the transient current. As a result, the transient current is diverted away from the protected components and shunted through the TVS diode. The device returns to a high impedance state after the transient threat has passed.





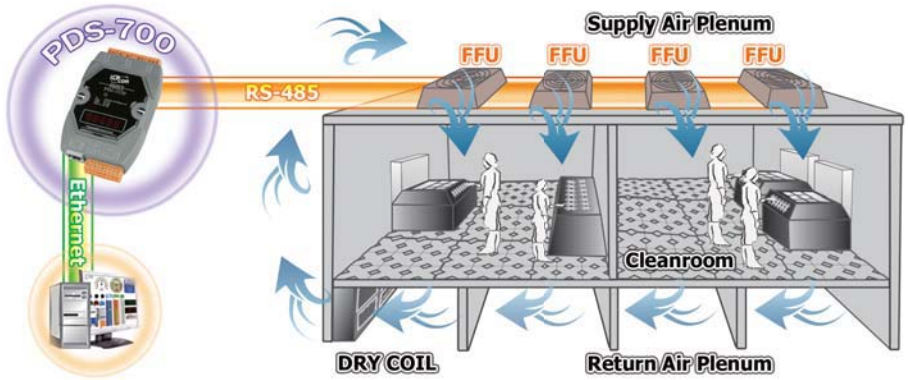
Self-Tuner Inside

Without the presence of Self-Tuner, users need to enable the RS-485 transmitter before transmitting, and disable the transmitter after the transmission is complete. The time required to enable and disable the transmitter (direction control) is the major source of many communication issues, and it is very difficult to debug. The built-in Self-Tuner in the PDS effectively removes this direction control issue and also simplifies the software/firmware programming required for communication applications.

PoE

The PPDS-700-MTCP series features true IEEE 802.3af compliant (classification, Class 1) Power over Ethernet (PoE) using a standard category 5 Ethernet cable to receive power from a PoE switch like the NS-205PSE. The PPDS-700-MTCP also works as a Modbus/TCP to RTU/ASCII gateway that supports most SCADA/HMI communications based on the Modbus/TCP protocol.

Applications



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.

System Specifications

CPU		
CPU		80186, 80 MHz or compatible
SRAM		512 KB
Flash Memory		Flash ROM: 512 KB; Erase unit is one sector (64 KB); 100,000 erase/write cycles
EEPROM		16 KB; Data retention: 40 years; 1,000,000 erase/write cycles
Built-in Watchdog Timer		Yes
Communication Interface		
Ethernet		10/100 Base-TX, RJ-45 port (Auto-negotiating, auto MDI/MDI-X, LED indicator)
PoE		IEEE 802.3af (PPDS(M)-700(D)-MTCP series only)
COM Port Formats		
Data Bit	COM1 and COM2	7, 8
	COM3 ~ COM8	5, 6, 7, 8
Parity		None, Even, Odd, Mark, Space
Stop Bit	COM1 ~ COM8	1, 2
Baud Rate		115200 bps max.
LED Indicators		
5-digit 7 Segment		Yes (D versions only)
System		Red
PoE		Green (PPDS(M)-700(D)-MTCP series only)
Power		
Protection		Power Reverse Polarity Protection
Required Supply Voltage	PDS(M)-700(D) Series	+10 V_{DC} ~ +30 V_{DC} (non-regulated)
	PPDS(M)-700(D)-MTCP Series	PoE or +12 V_{DC} ~ +48 V_{DC} (non-regulated)
Power Consumption	D versions (LED display)	2.9 W
	Others	2.2 W
Mechanical		
Dimensions (W x H x D)	M versions (Metal case)	88 mm x 123 mm x 28 mm
	Others (Plastic)	72 mm x 123 mm x 35 mm
Installation		DIN-Rail or Wall mounting
Environment		
Operating Temperature		-25 °C ~ +75 °C
Storage Temperature		-40 °C ~ +80 °C
Humidity		5 ~ 90% RH, non-condensing

I/O Specifications

Digital Output		
Output Type		Open Collector (Sink/NPN)
Load Voltage		30 V_{DC}, max.
Load Current		100 mA, max.
Isolated Voltage		Non-isolated
Digital Input		
Input Type		Source (Dry Type), Common Ground
Off Voltage Level		+1 V max.
On Voltage Level		+3.5 ~ +30 V
Isolated Voltage		Non-isolated
Counters	Max. Count	16-bit (65535)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms

Ordering Information

Models							RS-232 RS-485 RS-422/485	DI/DO	Includes Cable
	PDS	M	- 7 ☐ ☐	D		CR			
P	PDS	M	- 7 ☐ ☐	D	- MTCP	CR			
PoE	Programmable Device Server	Metal		LED Display	Modbus/TCP	RoHS			
P D S - 7 2 0 D CR P P D S - 7 2 0 D -MTCP CR							1 RS-232 1 RS-485	–	1 CA-0910
PDS M -721 D CR PPDS M -721 D -MTCP CR							1 RS-232 1 RS-485	6/7	1 CA-0910
PDS M -732 D CR PPDS M -732 D -MTCP CR							2 RS-232 1 RS-485	4/4	1 CA-0910
PDS M -734 D CR PPDS M -734 D -MTCP CR							1 RS-232 1 RS-485 1 RS-422/485	4/4	1 CA-0910
PDS M -742 D CR PPDS M -742 D -MTCP CR							3 RS-232 1 RS-485	–	1 CA-0910
PDS M -743 D CR PPDS M -743 D -MTCP CR							3 RS-232 1 RS-485	4/4	1 CA-0910
PDS M -752 D CR PPDS M -752 D -MTCP CR							4 RS-232 1 RS-485	–	1 CA-0910
PDS M -755 D CR PPDS M -755 D -MTCP CR							1 RS-232 4 RS-485	–	1 CA-0910
PDS M -762 D CR PPDS M -762 D -MTCP CR							5 RS-232 1 RS-485	1/2	1 CA-0910
PDS M -782 D CR PPDS M -782 D -MTCP CR							7 RS-232 1 RS-485	–	1 CA-0910
P D S - 7 8 2 D -25/D6 CR							7 RS-232 1 RS-485	–	1 CA-0910 1 CA-9-2505D

Note:
1. PPDS(M)-700(D)-MTCP supports PoE and Modbus Gateway.
2. D versions support 7-segment 5-digit LED display.
3. M versions is equipped with metal case.

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting
CA-0903	9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm Cable
CA-0910	9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m Cable
CA-9-2505D	DB-25 Male (D-Sub) to 6-port DB-9 Male (D-Sub) Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)
DN-09-2	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Headers. Includes CA-0915 x 2 (9-Pin Male-Female D-Sub Cable 1.5 m)
DN-09-2F	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Headers. Includes CA-0910F x 2 (9-Pin Female-Female D-Sub Cable 1.0 m)

2-4 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

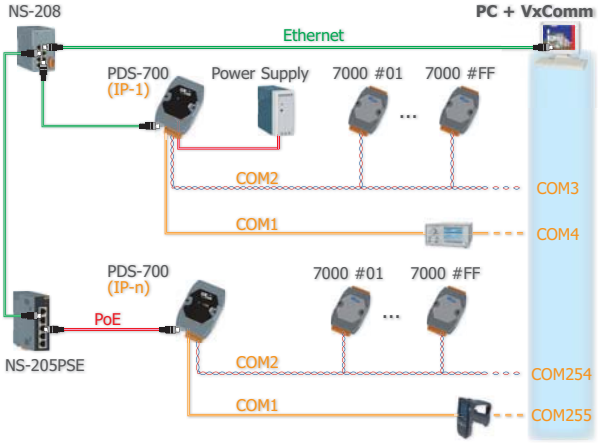
Features

- Incorporate Serial Devices in an Ethernet network
- Application Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- 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.



Applications

- Factory, Building and Home Automation

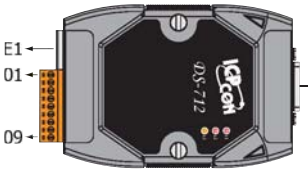
System Specifications

Models		DS-712	DS-715
CPU			
CPU		80186, 80 MHz or compatible	
Built-in Watchdog Timer		Yes	
Communication Interface			
COM1	Non-isolated	RS-232 (TxD, RxD, RTS, CTS, GND)	–
	Isolated (2000 V_{rms})	–	RS-422 (TxD+, TxD-, RxD+, RxD-); RS-485 (D2+, D2-)
Ethernet		10/100 Base-TX, RJ-45 port (Auto-negotiating, auto MDI/MDI-X, LED indicator)	
COM Port Formats			
Data Bit		7, 8	
Parity		None, Even, Odd, Mark, Space	
Stop Bit		1, 2	
Baud Rate		115200 bps max.	

Models	DS-712	DS-715
LED Indicators		
L1	Run (Red)	
L2	Link/Act (Red)	
L3	10/100M (Orange)	
Power		
Protection	Power Reverse Polarity Protection	
Required Supply Voltage	+12 VDC ~ +48 VDC (non-regulated)	
Power Consumption	2.0 W	
Mechanical		
Dimensions (W x H x D)	72 mm x 118 mm x 35 mm	72 mm x 124 mm x 35 mm
Installation	DIN-Rail or Wall mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +80 °C	
Humidity	5 ~ 90% RH, non-condensing	

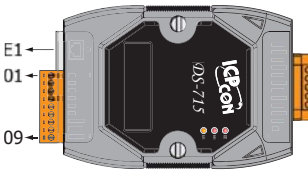
Pin Assignments

Terminal No.	Pin Assignment
E1	
01	N/A
02	N/A
03	N/A
04	N/A
05	INIT*
06	N/A
07	N/A
08	(R)+Vs
09	(B)GND



COM1: (RS-232)

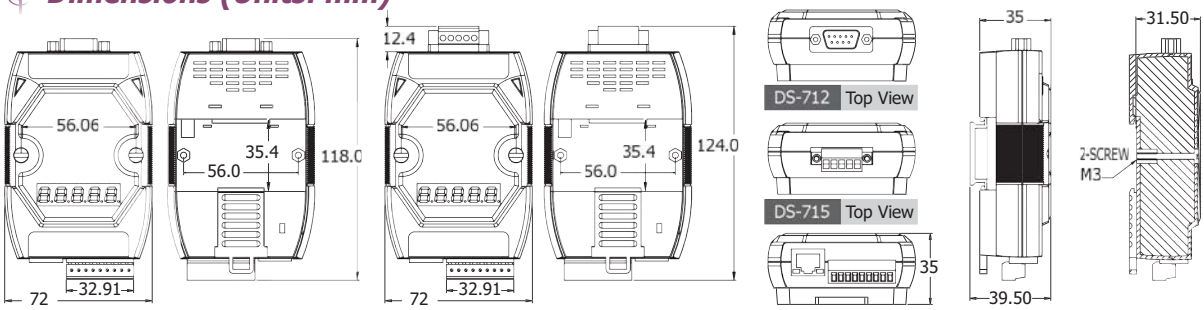
Pin Assignment	Terminal No.		Pin Assignment
GND	05	09	--
--	04	08	CTS
TxD	03	07	RTS
RxD	02	06	--
--	01		



COM1 (RS-422/485)

- F.G.
- Tx+/D+
- Tx-/D-
- Rx+
- Rx-

Dimensions (Units: mm)



DS-712: Front View | Rear View

DS-715: Front View | Rear View

DS-712/DS-715: Bottom View

DS-712/DS-715: DIN-Rail Mounting Bracket | Side View

Ordering Information

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)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting
CA-0915	9-Pin Male-Female D-Sub Cable, 1.5 m Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)
DN-09-2F	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Headers. Includes CA-0910F x 2 (9-Pin Female-Female D-Sub Cable 1.0 m)

2-5 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

Features

- Incorporate Serial Devices in an Ethernet network
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- 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}.

Applications

- Factory Automation
- Transportation Automation
- Chemical Industry Automation
- Marine Automation

System Specifications

Models	PPDS-741-IP67	PPDS-742-IP67	PPDS-743-IP67
CPU			
CPU	80186, 80 MHz or compatible		
SDRAM	512 KB		
Flash Memory	Flash ROM: 512 KB; Erase unit is one sector (64 KB); 100,000 erase/write cycles		
EEPROM	16 KB; Data retention: 40 years; 1,000,000 erase/write cycles		
Watchdog Timer	Yes		
Communication Interface			
COM1	5-wire RS-232		
COM2	Isolated 2-wire RS-485		
COM3	Isolated 2-wire RS-485	5-wire RS-232	5-wire RS-232
COM4	Isolated 2-wire RS-485	Isolated 2-wire RS-485	5-wire RS-232
Ethernet	10/100 Base-TX, RJ-45 port (Auto-negotiating, Auto MDI/MDI-X, LED indicators), PoE (IEEE 802.3af, Class 1)		
COM Port Formats			
Data Bit	5, 6, 7, 8		
Parity	None, Even, Odd, Mark, Space		
Stop Bit	1, 2		
Baud Rate	115200 kbps (max.)		
LED Indicators			
System	Red: Sys		
Ethernet	Green: Link/Act (E1), Orange: 10/100M (E1)		
COM1 ~ COM4	Green: RxD, Orange: TxD		
Power			
Protection	Power input reverse polarity protection		
Required Supply Voltage	+12 V_{DC} ~ +48 V_{DC} (non-regulated) or PoE (IEEE 802.3af, Class 1)		
Power Consumption	2.2 W		
Mechanical			
Casing	Plastic casing with IP67 waterproof protection		
Dimensions (W x H x D)	85 mm x 76 mm x 137 mm		
Installation	Wall mounting		
Environment			
Operating Temperature	-10 °C ~ +60 °C		
Storage Temperature	-10 °C ~ +60 °C		
Humidity	100% RH for operating temperature -10 °C ~ +60 °C		
Note: 5-wire RS-232: TxD, RxD, CTS, RTS, GND Isolated 2-wire RS-485: DATA+, DATA-, GND; Self-Tuner Inside; 2500 V_{rms} Isolation			

Ordering Information

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)

Accessories

GPSU06U-6

24 V_{DC}/0.25 A, 6 W Power Supply

MDR-20-24

24 V_{DC}/1 A, 24 W Power Supply with DIN-Rail Mounting

DIN-KA52F-48

48 V_{DC}/0.52 A, 25 W Power Supply with DIN-Rail Mounting

NS-205 CR

Unmanaged 5-port Industrial Ethernet Switch (RoHS)

NS-205PSE CR

Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)

2-6 Programmable Serial-to-Fiber Device Server

PDS-220Fx

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

PDS-220FT

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

Features

- Adds optical fiber connectivity to serial devices
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- Watchdog Timer suitable for use in harsh environments
- Serial Port +/-4 kV ESD Protection Circuit
- 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

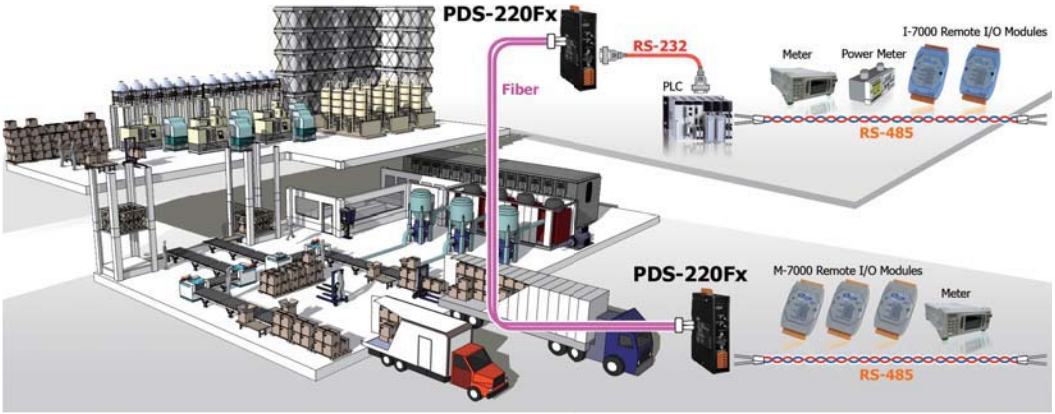
Introduction

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.



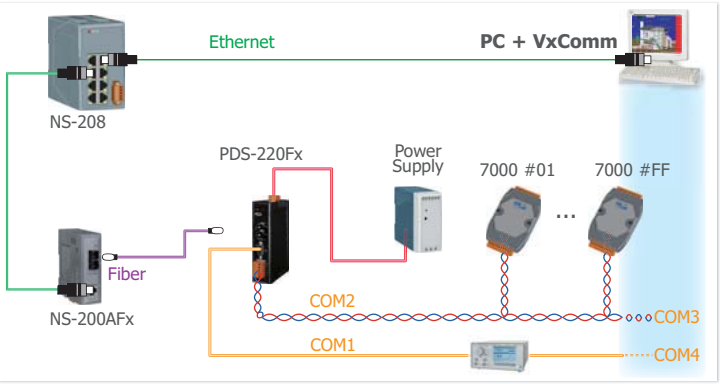
The user-friendly VxComm Driver/Utility allows users to easily turn the built-in COM ports of the PDS-220Fx series into standard COM ports on a PC. By virtue of its protocol independence, a small-core OS and high flexibility, the PDS-220Fx series is able to meet the demands of every network-enabled application.

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.

Applications

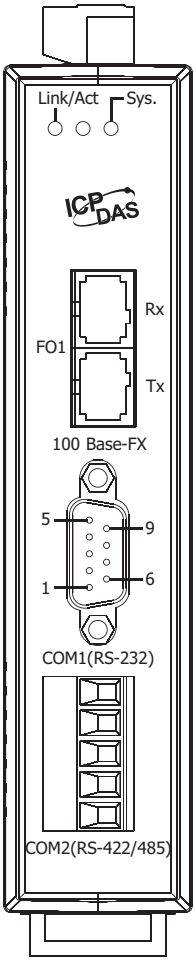
- Factory Automation
- Building Automation
- Home Automation



System Specifications

Models		PDS-220FT	PDS-220FC	PDS-220FCS	PDS-220FCS-60
CPU					
CPU		80186, 80 MHz or compatible			
SRAM		512 KB			
Flash		512 KB; Erase unit is one sector (64 KB); 100,000 erase/write cycles			
EEPROM		16 KB; Data retention: 40 years; 1,000,000 erase/write cycles			
Peripheral		Watchdog Timer, Init Pin			
Communication Interface					
COM1		Male DB-9, 5-wire RS-232 (RxD, TxD, CTS, RTS, GND); Note: +/- 4 kV ESD Protection			
COM2		Removable Terminal Block 2-wire RS-485 (D+, D-, GND) with Self-Tuner ASIC or 4-wire RS-422 (TxD+, TxD-, RxD+, RxD-, GND) Note: +/- 4 kV ESD Protection			
Fiber Port		100 Base-FX, ST connector 	100 Base-FX, SC connector 		
Mode	Fiber Cables	Multi-mode: 50/125, 62.5/125 or 100/140 µm		Single-mode: 8.3/125, 8.7/125, 9/125 or 10/125 µm	
	Wavelength	1300 or 1310 nm			
	Min. TX Output	-20 dBm		-15 dBm	-5 dBm
	Max. TX Output	-14 dBm		-8 dBm	-0 dBm
	Max. RX Sensitivity	-32 dBm		-34 dBm	-35 dBm
	Min. RX Overload	-8 dBm		-5 dBm	
	Budget	12 dBm		19 dBm	30 dBm
Distance		2 km, (62.5/125 µm recommended) for full duplex		**30 km**, (9/125 µm recommended) for full duplex	**60 km**, (9/125 µm recommended) for full duplex
COM Port (16C550 or compatible UART)					
Data Bit		7, 8			
Parity		None, Even, Odd, Mark, Space			
Stop Bit		1, 2			
Baud Rate		115200 bps max.			
LED Indicators					
Link/Act		Green			
System		Red			
Power					
Power Input		+12 V_{DC} ~ +48 V_{DC} (non-regulated)			
Power Consumption		0.14 A @ 24 V_{DC}			
Protection		Power Reverse Polarity Protection, EMS Protection (Frame GND)			
Mechanical					
Dimensions (W x L x H)		31 mm x 121 mm x 157 mm	31 mm x 123 mm x 157 mm		
Installation		DIN-Rail mounting			
Environment					
Operating Temperature		-25 °C ~ +75 °C			
Storage Temperature		-30 °C ~ +85 °C			
Humidity		10 ~ 90% RH, non-condensing			

Pin Assignments

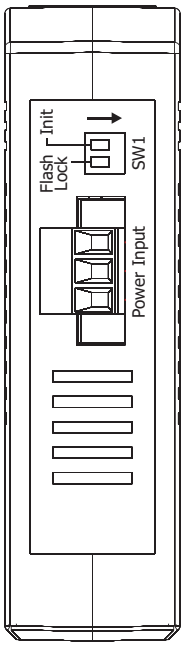


Pin Assignment	Terminal No.		Pin Assignment
GND	05	09	--
--	04	08	CTS
TxD	03	07	RTS
RxD	02	06	--
--	01		

COM1: Male DB-9 Connector

Terminal No.	Pin Assignment
01	TxD+/D+
02	TxD-/D-
03	RxD+
04	RxD-
05	GND

COM2: Removable Terminal Block



Terminal No.	Pin Assignment
03	PWR
02	P.GND
01	F.G.

Power Input: Removable Terminal Block

Ordering Information

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)

Accessories

GPSU06U-6

24 VDC/0.25 A, 6 W Power Supply

MDR-20-24

24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting

DIN-KA52F-48

48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting

CA-0903

9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm Cable

CA-0910

9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m Cable

NS-200AFT-T CR

Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 Multi-mode ST connector (RoHS)

NS-200AFC-T CR

Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 Multi-mode SC connector (RoHS)

NS-200AFCS-T CR

Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 Single-mode SC connector (RoHS)

NS-200AFCS-60T CR

Industrial 10/100 Base-T to 100 Base-FX Media Converter; 1 (40 km) Single-mode SC connector (RoHS)

NS-205 CR

Unmanaged 5-port Industrial Ethernet Switch (RoHS)

2-7 Tiny Serial-to-Ethernet Device Server & Modbus Gateway

tDS-700/tDS-2200 Series

Tiny Serial-to-Ethernet Device Server

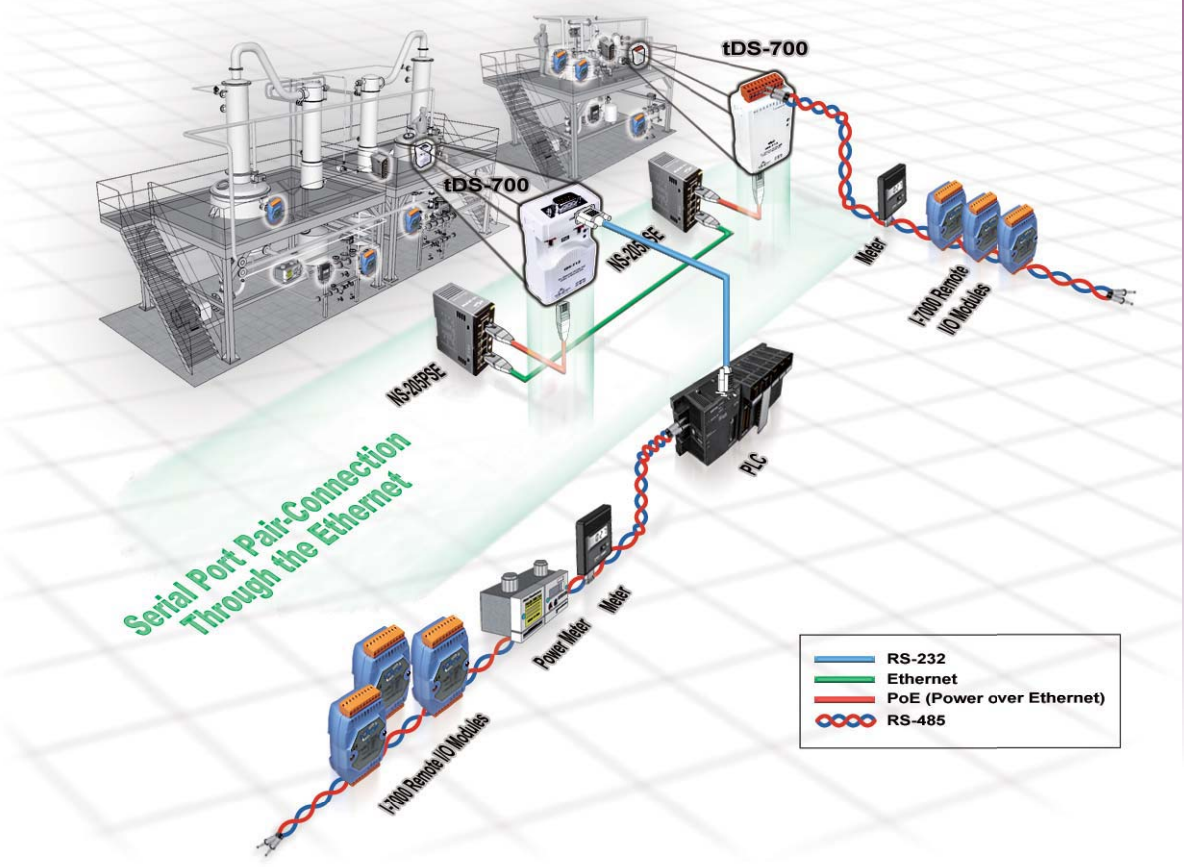
tDS-712 tDS-700 series tDSM-712 tDS-2200 series

Features

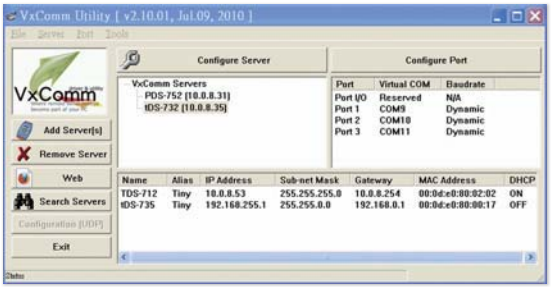
- Incorporates any RS-232/422/485 serial device in Ethernet
- Application Modes: Virtual COM, TCP Server, TCP Client
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- Data Packing Modes: Length, Delimiter, timeout, Char-timeout.
- Supports pair-connection (serial-bridge, serial-tunnel) applications
- Supports UDP responder for device discovery (UDP Search)
- Static IP or DHCP network configuration
- Easy firmware update via the Ethernet (BOOTP, TFTP)
- Tiny Web server for serial and network configuration (HTTP)
- Contains a 32-bit MCU that efficiently handles network traffic
- tDS-700/tDSM-712: 10/100 Base-TX Ethernet, RJ-45 × 1
- tDS-2200: 2-port Ethernet Switch (LAN Bypass for Daisy-Chain Wiring)
- Redundant power inputs: PoE and DC jack
- Allows automatic RS-485 direction control
- 2500 V_{DC} isolation and +/-4 kV ESD protection for i versions
- tDSM-712 is the tDS-712 with Metal Case
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant & no Halogen

Introduction

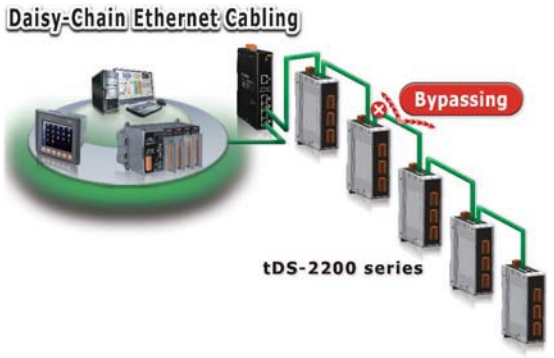
The tDS-700/tDS-2200 is a series of Serial-to-Ethernet device servers designed to add Ethernet and Internet connectivity to any RS-232 and RS-422/485 device, and to eliminate the cable length limitation of legacy serial communication. By using the VxComm Driver/Utility, the built-in COM port of the tDS-700/tDS-2200 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. Note: For multiple TCP connections on the same serial port, use PDS-700 instead.



The VxComm Driver/Utility supports the most popular operating system in the world, including 32-bit and 64-bit Windows XP/7/10/2012/2016. **The virtual COM works transparently and is protocol independent, enabling perfect integration with your current central computer.** The utility provides an easy configuration interface that can be used to quickly create and map virtual COM ports to one or several tDS-700/tDS-2200 modules. In addition, the utility contains a built-in terminal program, so users can send/receive command/data via the terminal program for easy testing.



The tDS-700/tDS-2200 device servers can be used to create a pair-connection application (as well as serial-bridge or serial-tunnel), and can then route data over TCP/IP between two serial devices, which is useful when connecting mainframe computers, servers or other serial devices that do not themselves have Ethernet capability. By virtue of its protocol independence and flexibility, the tDS-700/tDS-2200 meets the demands of virtually any network-enabled application.



The tDS-2200 series has a built-in two-port Ethernet switch to implement daisy-chain topology. The cabling is much easier and total costs of cable and switch are significantly reduced. LAN Bypass feature guarantees the Ethernet communication if tDS-2200 loses its power.

The tDS-700/tDS-2200 features a powerful 32-bit MCU to enable efficient handling of network traffic. It also has a built-in web server that provides an intuitive web management interface to allow users to modify the settings of the module, including DHCP/Static IP, gateway/mask and serial ports.

Based on an amazing tiny form-factor, the tDS-700/tDS-2200 achieves the maximum space savings that allows it to be easily installed anywhere, even directly attached to a serial device or embedded into a machine.

The tDS-700/tDS-2200 series also contains a built-in CPU watchdog, which automatically resets the CPU if the built-in firmware is operating abnormally, or if there is no communication between the tDS-700/tDS-2200 and the host for a predefined period of time (system timeout). This is an important feature that ensures the tDS operates continuously, even in harsh environments.

The tDS-700/tDS-2200 offers true IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) functionality using a standard category 5 Ethernet cable to receive power from a PoE switch such as the NS-205PSE. If there is no PoE switch on site, the tDS-700/tDS-2200 will also accept power input from a DC adapter. The tDS-700/tDS-2200 is designed for ultra-low power consumption, reducing hidden costs from increasing fuel and electricity prices, especially when you have a huge amount of device servers installed. Reducing the amount of electricity consumed by choosing energy-efficient equipment can have a positive impact on maintaining a green environment.

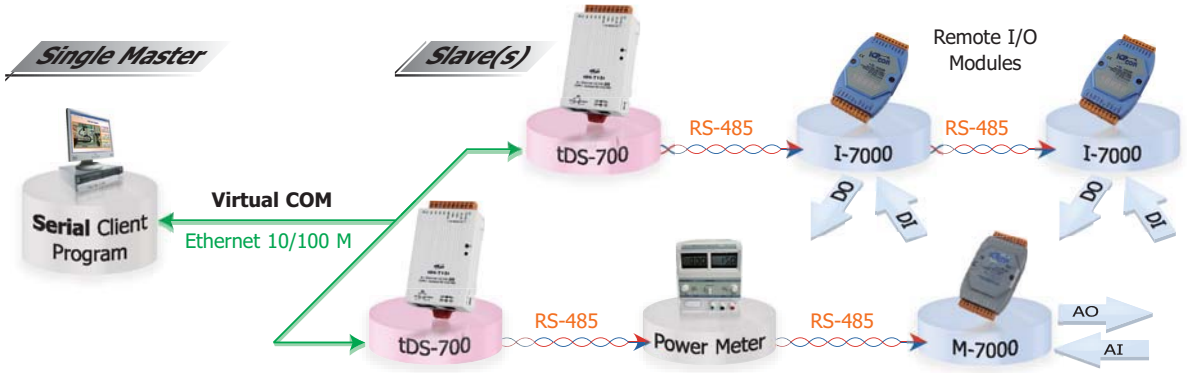
The tDS-712 is equipped with a male DB-9 connector, while other models are equipped with a removable terminal block connector to allow easy wiring, and also supports automatic RS-485 direction control when sending and receiving data.

Applications

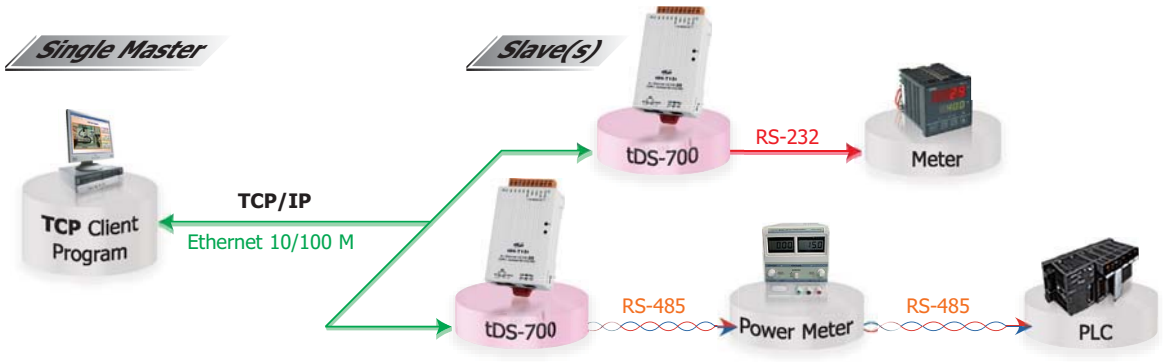
- Factory Automation
- Building Automation
- Home Automation
- Remote Diagnosis and Management

Comparison Table	tDS-700 Series	PDS-700 Series
Ethernet	10/100 M, PoE	10/100 M
Programmable	–	Yes
Virtual COM	Yes	Yes
Virtual I/O	–	Yes
DHCP	Yes	Yes
Web Configuration	Yes	Yes
UDP Search	Yes	Yes
Multi-client	–	Yes
Remarks	Cost-effective	–

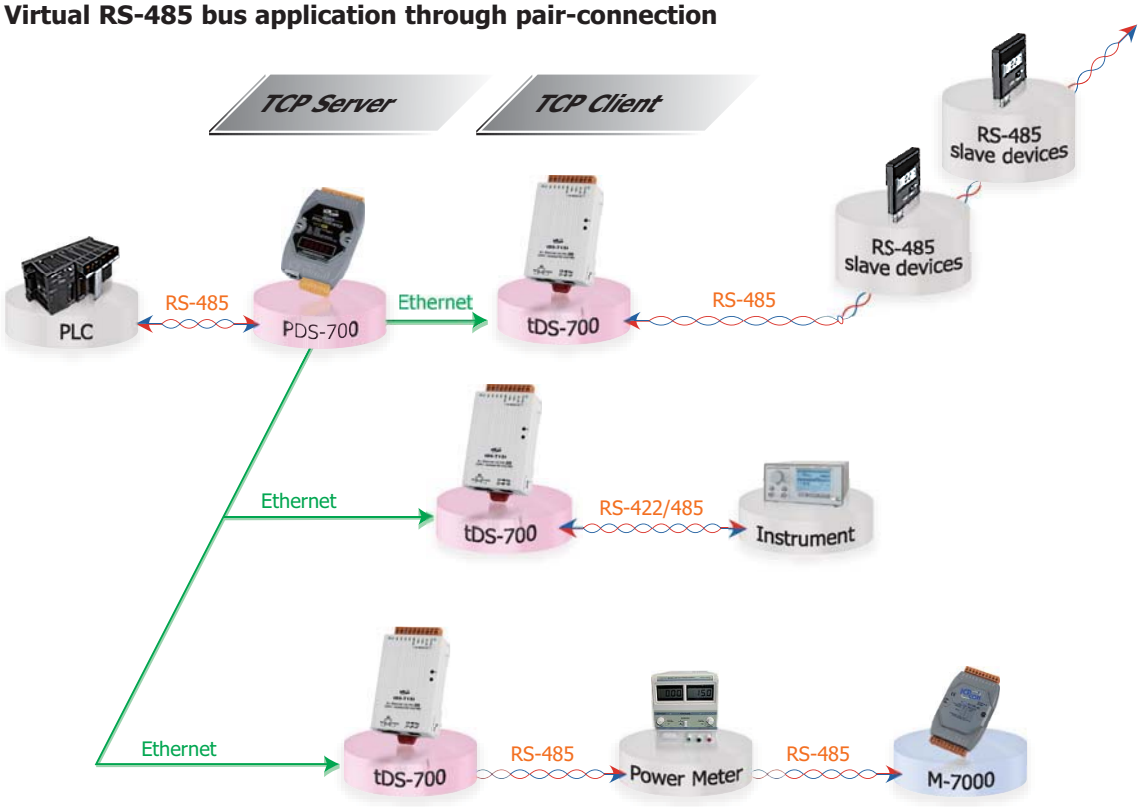
1. Access serial device via Virtual COM ports



2. Access serial device via TCP/IP socket connection



3. Virtual RS-485 bus application through pair-connection



tGW-700 Series

Tiny Modbus/TCP to RTU/ASCII Gateway

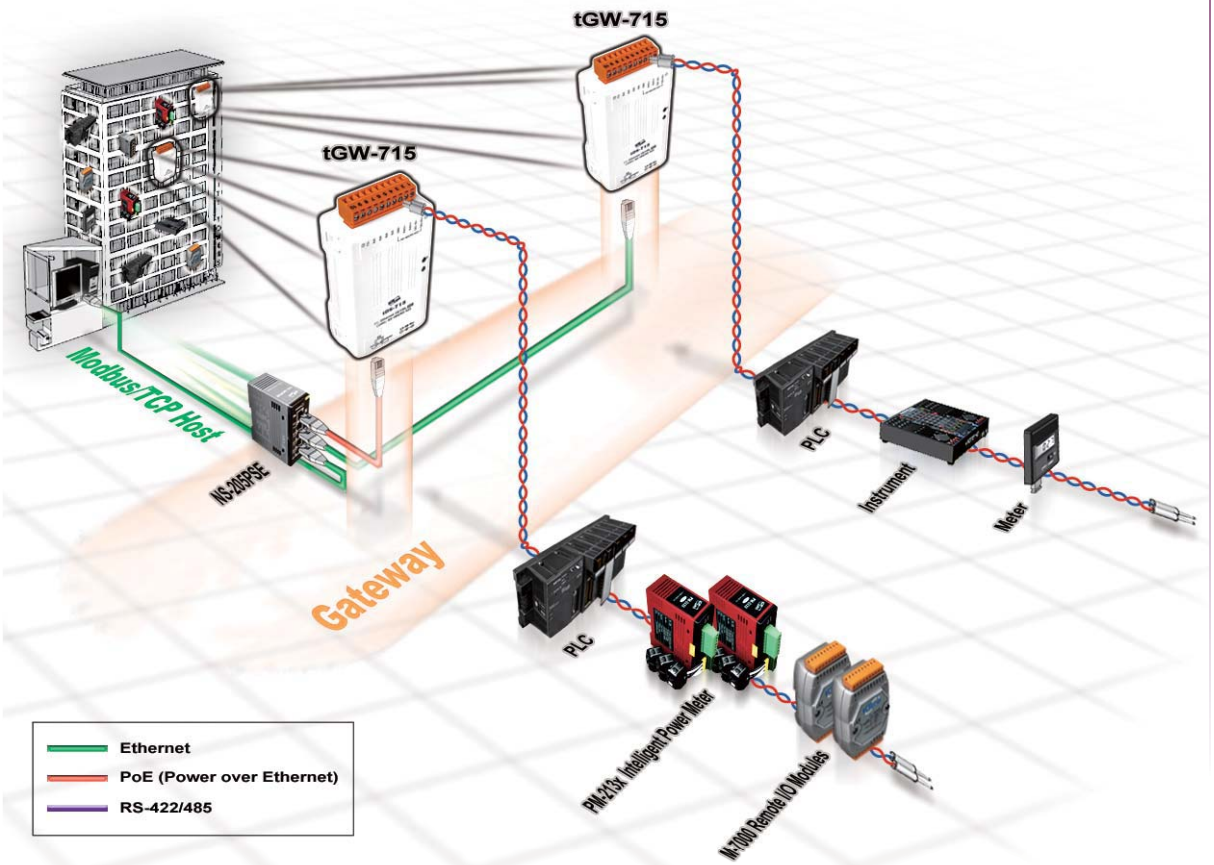
tGW-712 tGW-700 series tGW-2200 series

Features

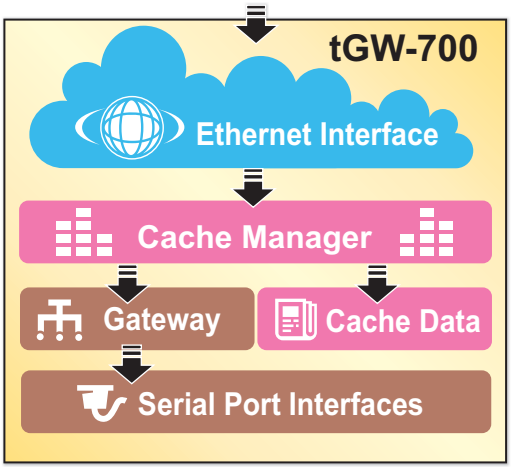
- Supports Modbus TCP/UDP master and slave
- Supports Modbus RTU/ASCII master and slave
- Max. TCP masters per serial port: 32 (RevB)
- Read-cache ensures faster Modbus TCP/UDP response
- Supports UDP responder for device discovery (UDP Search)
- Static IP or DHCP network configuration
- Easy firmware update via the Ethernet (BOOTP, TFTP)
- Tiny Web server for serial and network configuration (HTTP)
- Redundant power inputs: PoE and DC jack
- tGW-700: 10/100 Base-TX Ethernet, RJ-45 × 1
- tGW-2200: 2-port Ethernet Switch (LAN Bypass for Daisy-Chain Wiring
- Allows automatic RS-485 direction control
- 2500 V_{DC} isolation and +/-4 kV ESD protection for i versions
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant & no Halogen

Introduction

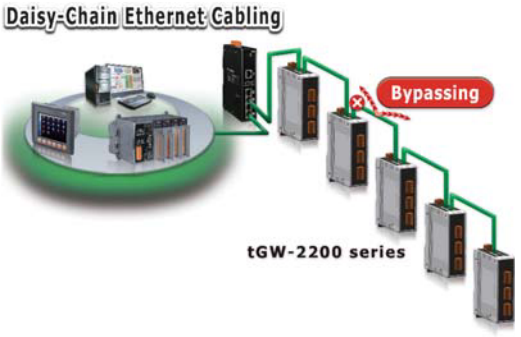
Modbus has become a de facto standard industrial communication protocol, and is now the most commonly available means of connecting industrial electronic devices. Modbus allows for communication between many devices connected to the same RS-485 network, for example, a system that measures temperature 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 tGW-700/tGW-2200 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 (as well as serial-bridge or serial-tunnel 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.

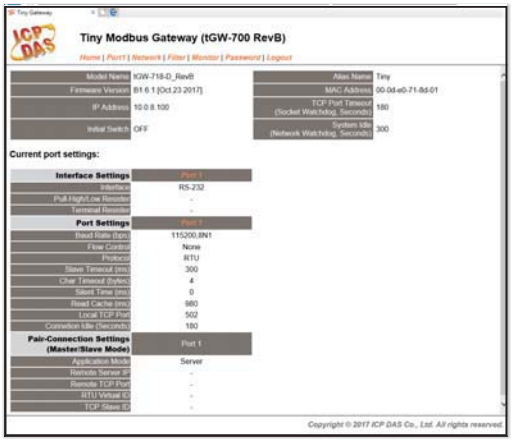


The maximum number of TCP connections for each serial port is up to 32(RevB), this allows multiple masters accessing slave devices on the same serial port. The **read-cache function** is used to store previous requests and responses in the memory buffer of the tGW-700/tGW-2200 module. When other HMI/SCADA master controllers send the same requests to the same RTU slave device, the cached response is returned immediately. **This feature dramatically reduces the loading on the serial port communication, ensures faster TCP responses, and improves the stability of the entire system.**



The tGW-2200 series has a built-in two-port Ethernet switch to implement daisy-chain topology. The cabling is much easier and total costs of cable and switch are significantly reduced. LAN Bypass feature guarantees the Ethernet communication if tGW-2200 loses its power.

The tGW-700/tGW-2200 module features a powerful 32-bit MCU to enable efficient handling of network traffic, and also has a built-in web server that provides an intuitive web management interface that allows users to modify the configuration of the module, including the DHCP/Static IP, the gateway/mask settings and the serial port settings.



The CPU watchdog automatically resets the CPU if the built-in firmware is operating abnormally, while the host watchdog automatically resets the CPU if there is no communication between the module and the host (PC or PLC) for a predefined period of time (system timeout). The dual watchdog is an important feature that ensures the module operates continuously, even in harsh environments.

The tGW-700/tGW-2200 module offers true IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) functionality using a standard category 5 Ethernet cable to receive power from a PoE switch such as the NS-205PSE. If there is no PoE switch on site, the module will also accept power input from a DC adapter. The tGW-700/tGW-2200 module is designed for ultra-low power consumption, reducing hidden costs from increasing fuel and electricity prices, especially when you have a large number of modules installed. Reducing the amount of electricity consumed by choosing energy-efficient equipment can have a positive impact on maintaining a green environment.

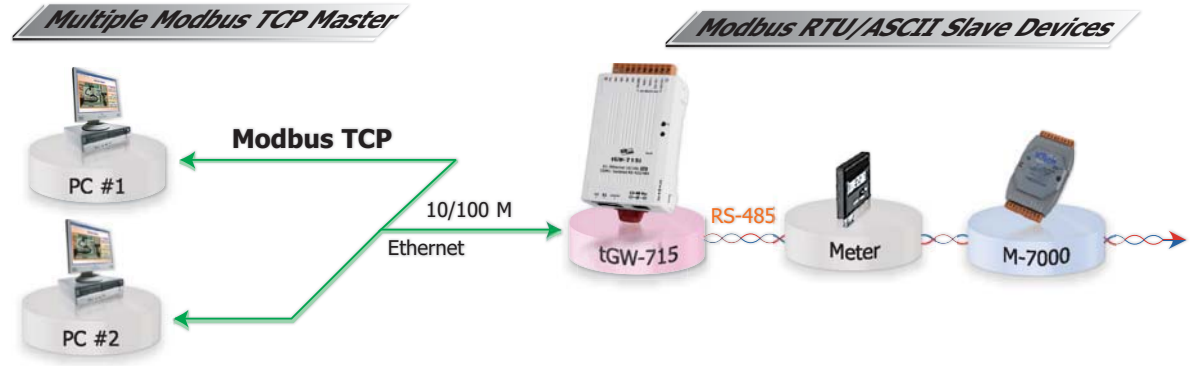
Based on an amazing tiny form-factor, the tGW-700/tGW-2200 achieves maximum space savings that allows it to be easily installed anywhere, even directly embedded into a machine. It also supports automatic RS-485 direction control when sending and receiving data, thereby improving the stability of the RS-485 communication.

Comparison Table	Ethernet	Programmable	Virtual COM	Virtual I/O	DHCP	Web Configuration	UDP Search	Modbus Gateway	Multi-client
tGW-700 Series	10/100 M, PoE	–	–	–	Yes	Yes	Yes	Yes	Yes
PPDS-700-MTCP Series	10/100 M, PoE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Applications

- Factory Automation
- Building Automation
- Home Automation
- Remote Diagnosis and Management

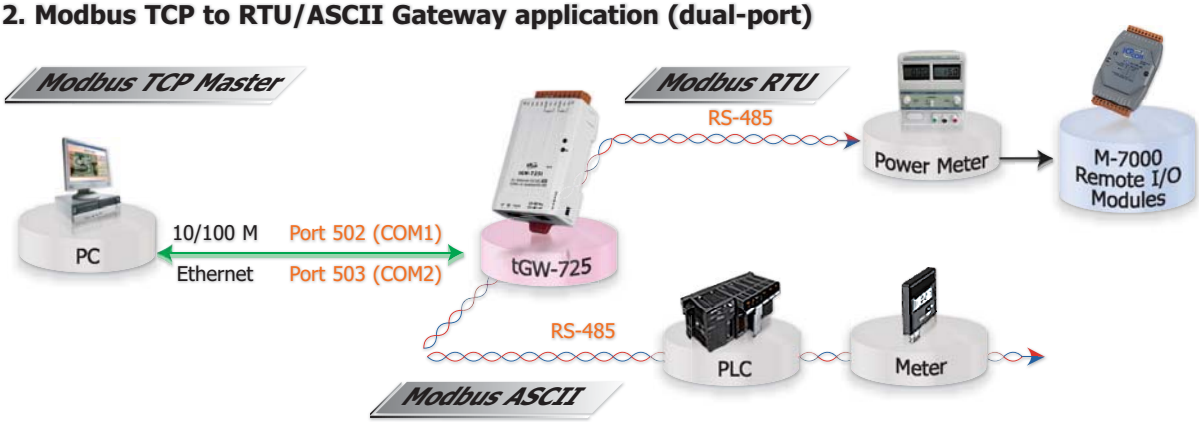
1. Modbus TCP Masters to RTU/ASCII Gateway application



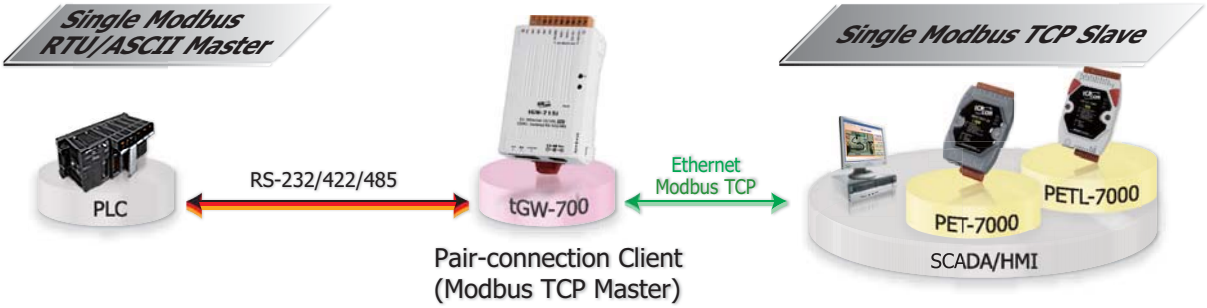
Max. TCP connections (Masters) per serial port: 32 (RevB)

Max. Device (Slave) per serial port: 247

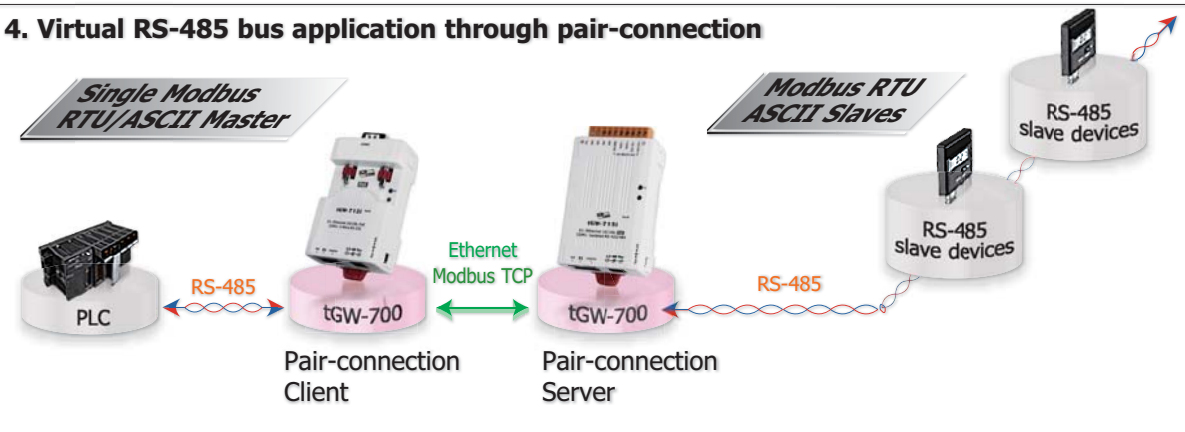
2. Modbus TCP to RTU/ASCII Gateway application (dual-port)



3. Modbus RTU/ASCII to TCP Gateway application (like pair-connection)



4. Virtual RS-485 bus application through pair-connection



tSH-700 Series

Tiny Serial Port Sharer

tSH-700 series

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
- 2500 V_{DC} isolation and +/-4 kV ESD protection for i versions

Introduction

Following the success of the original tGW-700/tDS-700 modules, ICP DAS has continued to develop new functions for these products in order to provide increased support for a greater number of applications. The tGW-700 modules are Modbus TCP-to-Serial gateway, while the tSH-700 modules are Serial Port Sharers working as Serial-to-Serial converters. 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:**

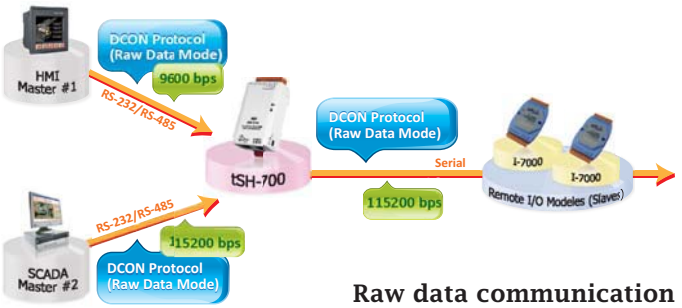
This function allows a single master device to communicate with slave devices using different baud rates and data formats. Most query-response protocols (half-duplex), e.g. DCON, are supported in the raw data mode. Full-duplex communication should also work when the data size is smaller than the built-in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

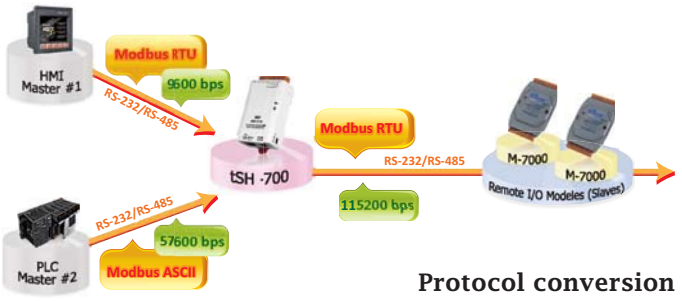
This function allows two master devices connected to different serial ports to share slave devices. The queries from the masters are queued in the tSH-700 module and then processed one-by-one. Modbus mode can be used to convert the Modbus RTU/ASCII protocols, while raw data mode can be used for DCON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



Raw data communication

- **Read-Cache Function:**

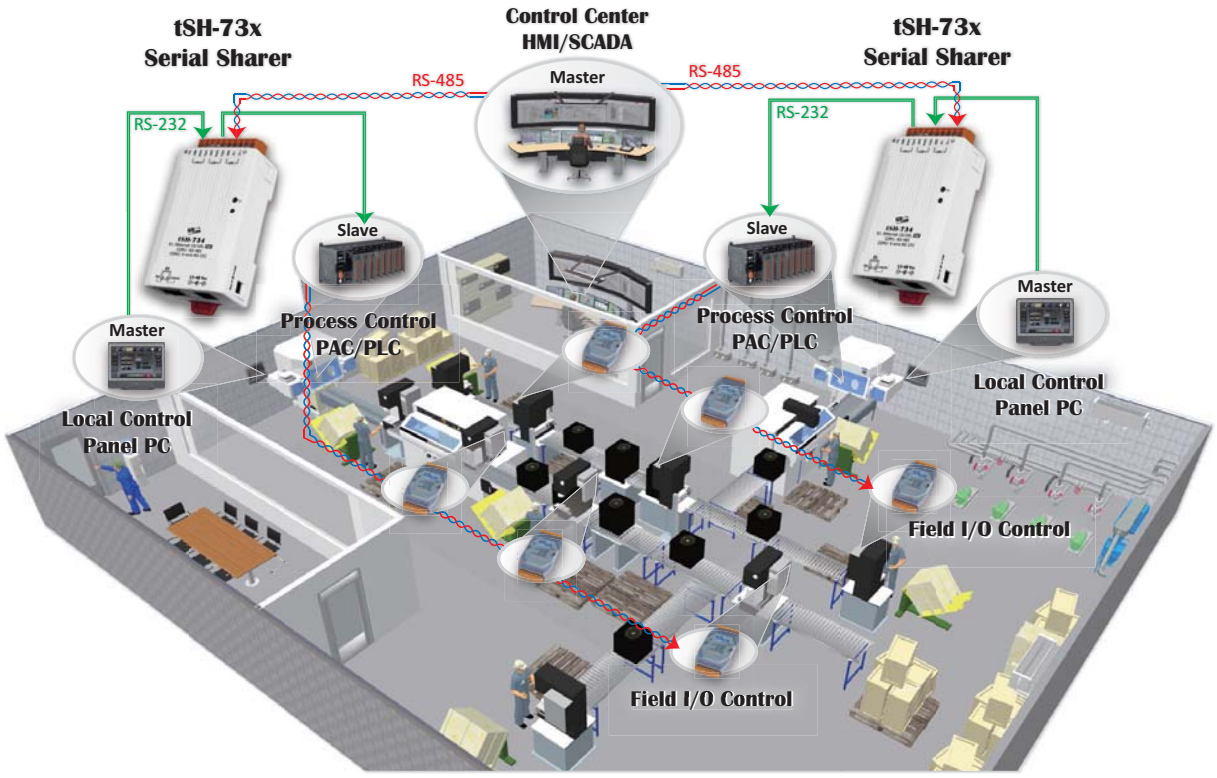
The built-in read-cache function is used to store previous requests and responses of the Modbus messages in the memory buffer of the tSH-700 module. When other HMI/SCADA master controllers requiring the same information from the same salve RTU device, the cached response is returned immediately. This 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.



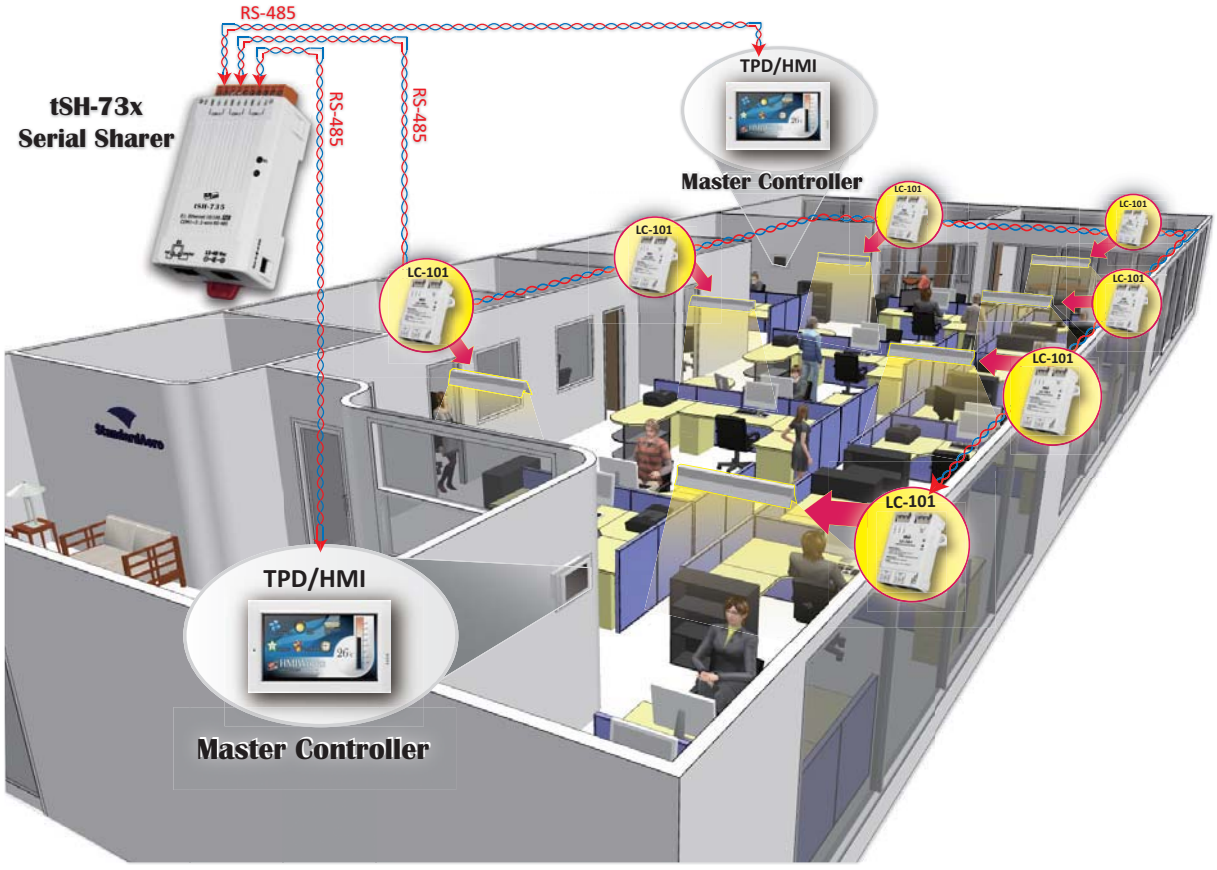
Protocol conversion

Applications

Accessing a Process Controller from Local Panel and Control Center



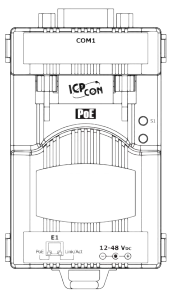
Control Office Lightings from Two HMI Devices (Masters) in Different Places

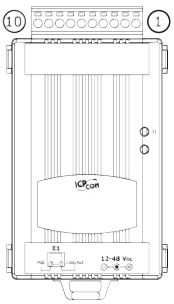


System Specifications

Models	tDS-712 tDS-712i tDSM-712 tDS-2212 tGW-712 tGW-712i tGW-2212	tDS-722 tDS-722i tGW-722 tGW-722i tSH-722 tSH-722i	tDS-732 tDS-732i tGW-732 tGW-732i tSH-732 tSH-732i	tDS-715 tDS-715i tDS-2215 tGW-715 tGW-715i tGW-2215	tDS-725 tDS-725i tDS-2225 tGW-725 tGW-725i tGW-2225 tSH-725 tSH-725i	tDS-735 tDS-735i tDS-2235 tGW-735 tGW-735i tGW-2235 tSH-735 tSH-735i	tDS-718 tDS-718i tDS-2218 tGW-718 tGW-718i tGW-2218	tDS-724 tDS-724i tGW-724 tGW-724i tSH-724 tSH-724i	tDS-734 tDS-734i tGW-734 tGW-734i tSH-734 tSH-734i
System									
CPU	32-bit MCU								
Communication Interface									
Ethernet 700 Series	10/100 Base-TX, 8-pin RJ-45 x 1, (Auto-negotiating, Auto-MDI/MDIX, LED indicator)								
Ethernet 2200 Series	2-Port 10/100 Base-TX Ethernet Switch with LAN Bypass, RJ-45 x 2 (Auto-negotiating, Auto-MDI/MDIX, LED indicator)								
PoE	IEEE 802.3af, Class 1								
COM Port	1 × RS-232	2 × RS-232	3 × RS-232	1 × RS-422/ RS-485	2 × RS-485	3 × RS-485	1 × RS-232 or RS-422/485	1 × RS-485 1 × RS-232	1 × RS-485 2 × RS-232
Self-Tuner	–			Yes, automatic RS-485 direction control					
Isolation	**1000 VDC (Power isolation for i version)**			**3000 VDC (Signal isolation for i version)**					
ESD Protection	+/-4 kV								
COM Port Capability (16C550 or compatible UART)									
Baud Rate	115200 bps Max.								
Data Bit	5, 6, 7, 8								
Parity	None, Odd, Even, Mark, Space								
Stop Bit	1, 2								
Power									
Power Input	IEEE 802.3af, Class 1 for PoE; +12 ~ 48 VDC for DC Jack								
Power Consumption	0.07 A @ 24 VDC								
Mechanical									
Connector 700 Series	Male DB-9 x 1	10-pin Removable Terminal Block x 1							
Connector 2200 Series	5-pin Removable Terminal Block x 3								
Dimensions (W x H x D) 700 Series	52 mm x 95 mm x 27 mm (tDS/tGW-712: 52 mm x 90 mm x 27 mm) (tDSM-712: 75 mm x 83 mm x 24 mm)								
Dimensions (W x H x D) 2200 Series	90mm x 110mm x 33mm (without connectors)								
Installation	DIN-Rail mounting								
Case	Metal for tDSM-712; Plastic for others.								
Environment									
Operating Temperature	-25 °C ~ +75 °C								
Storage Temperature	-30 °C ~ +80 °C								
Humidity	10 ~ 90% RH, non-condensing								

Pin Assignments





tDS-712(i)/tDSM-712/tGW-712(i)

COM1 (Male DB-9)	09	N/A
	08	CTS1
	07	RTS1
	06	N/A
	05	GND
	04	N/A
	03	TxD1
	02	RxD1
	01	N/A

tDS-722(i)/tGW-722(i)/tSH-722(i)

COM2	10	F.G.
	09	CTS2
	08	RTS2
	07	RxD2
	06	TxD2
COM1	05	GND
	04	CTS1
	03	RTS1
	02	RxD1
	01	TxD1

tDS-732(i)/tGW-732(i)/tSH-732(i)

	10	F.G.
COM3	09	GND
	08	RxD3
	07	TxD3
COM2	06	GND
	05	RxD2
	04	TxD2
COM1	03	GND
	02	RxD1
	01	TxD1

tDS-735(i)/tGW-735(i)/tSH-735(i)

	10	F.G.
COM3	09	GND
	08	D3-
	07	D3+
COM2	06	GND
	05	D2-
	04	D2+
COM1	03	GND
	02	D1-
	01	D1+

tDS-718(i)/tGW-718(i)

	10	F.G.
	09	N/A
RS-232	08	GND
	07	RxD1
	06	TxD1
RS-485/ RS-422	05	GND
	04	RxD1-
	03	RxD1+
	02	TxD1-/D1-
	01	TxD1+/D1+

tDS-715(i)/tGW-715(i)

	10	F.G.
	09	N/A
	08	N/A
	07	N/A
	06	N/A
RS-485/ RS-422	05	GND
	04	RxD1-
	03	RxD1+
	02	TxD1-/D1-
	01	TxD1+/D1+

tDS-725(i)/tGW-725(i)/tSH-725(i)

	10	F.G.
	09	N/A
	08	N/A
	07	N/A
COM2	06	GND
	05	D2-
	04	D2+
COM1	03	GND
	02	D1-
	01	D1+

tDS-724(i)/tGW-724(i)/tSH-724(i)

	10	F.G.
	09	N/A
COM2	08	CTS2
	07	RTS2
	06	GND
	05	RxD2
	04	TxD2
COM1	03	GND
	02	D1-
	01	D1+

tDS-734(i)/tGW-734(i)/tSH-734(i)

	10	F.G.
COM3	09	GND
	08	RxD3
	07	TxD3
COM2	06	GND
	05	RxD2
	04	TxD2
COM1	03	GND
	02	D1-
	01	D1+

Ordering Information

Note: ▶ Available soon

Non-Isolated	Isolated	2-port Ethernet Switch	Serial Device Server: Includes one CA-002 cable.
tDS-712 CR	tDS-712i CR	▶tDS-2212	Tiny Device Server with PoE and 1 RS-232 Port (RoHS)
tDS-722 CR	tDS-722i CR	-	Tiny Device Server with PoE and 2 RS-232 Ports (RoHS)
tDS-732 CR	tDS-732i CR	-	Tiny Device Server with PoE and 3 RS-232 Ports (RoHS)
tDS-715 CR	tDS-715i CR	▶tDS-2215	Tiny Device Server with PoE and 1 RS-422/485 Port (RoHS)
tDS-725 CR	tDS-725i CR	▶tDS-2225	Tiny Device Server with PoE and 2 RS-485 Ports (RoHS)
tDS-735 CR	tDS-735i CR	▶tDS-2235	Tiny Device Server with PoE and 3 RS-485 Ports (RoHS)
tDS-718 CR	▶tDS-718i CR	▶tDS-2218	Tiny Device Server with PoE and 1 RS-232/422/485 Port (RoHS)
tDS-724 CR	tDS-724i CR	-	Tiny Device Server with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
tDS-734 CR	tDS-734i CR	-	Tiny Device Server with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)
tDSM-712 CR	-	-	Tiny Device Server with PoE and 1 RS-232 Port (Metal case, RoHS)
Non-Isolated	**Isolated**	**2-port Ethernet Switch**	**Modbus/TCP to RTU/ASCII Gateway: Includes one CA-002 cable.**
tGW-712 CR	tGW-712i CR	▶tGW-2212	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-232 Port (RoHS)
tGW-722 CR	tGW-722i CR	-	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2 RS-232 Ports (RoHS)
tGW-732 CR	tGW-732i CR	-	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3 RS-232 Ports (RoHS)
tGW-715 CR	tGW-715i CR	▶tGW-2215	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-422/485 (RoHS)
tGW-725 CR	tGW-725i CR	▶tGW-2225	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2 RS-485 Ports (RoHS)
tGW-735 CR	tGW-735i CR	▶tGW-2235	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3 RS-485 Ports (RoHS)
tGW-718 CR	▶tGW-718i CR	▶tGW-2218	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-232/422/485 Port (RoHS)
tGW-724 CR	tGW-724i CR	-	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
tGW-734 CR	tGW-734i CR	-	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)
Non-Isolated	**Isolated**	**2-port Ethernet Switch**	**Serial Port Sharer: Includes one CA-002 cable.**
tSH-722 CR	tSH-722i CR	-	Tiny Serial Port Sharer with PoE and 2 RS-232 Ports (RoHS)
tSH-732 CR	tSH-732i CR	-	Tiny Serial Port Sharer with PoE and 3 RS-232 Ports (RoHS)
tSH-725 CR	tSH-725i CR	-	Tiny Serial Port Sharer with PoE and 2 RS-485 Ports (RoHS)
tSH-735 CR	tSH-735i CR	-	Tiny Serial Port Sharer with PoE and 3 RS-485 Ports (RoHS)
tSH-724 CR	tSH-724i CR	-	Tiny Serial Port Sharer with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
tSH-734 CR	tSH-734i CR	-	Tiny Serial Port Sharer with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)

Accessories

CA-002
DC connector to 2-wire power cable, 0.3 M

CA-0915
Male DB-9 to Female DB-9 Cable, 1.5 m

CA-0910F
Female DB-9 to Female DB-9 Cable, 1.0 m

CA-0910N
DB-9 Female-Female 3-wire Null Modem Cable, 1M

CA-PC09F
DB-9 Female Connector with Plastic Cover

FRA05-S12-SU CR
12V/0.58A (max.) Power Supply (RoHS, for tDS/tGW-700)

DIN-KA52F CR
24V/1.04A, 25 W Power Supply with DIN-Rail Mounting (RoHS, for NS-205 and NS-205PSE-24V)

DIN-KA52F-48 CR
48V/0.52A, 25 W Power Supply with DIN-Rail Mounting (RoHS, for NS-205PSE)

NS-205PSE CR
Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)

NS-205PSE-24V CR
Unmanaged 5-port 10/100 Mbps PoE (PSE) Ethernet Switch; 24 VDC Input (RoHS)

2-8 Programmable Serial Device Server with LAN Switch

PDS-5105D-MTCP

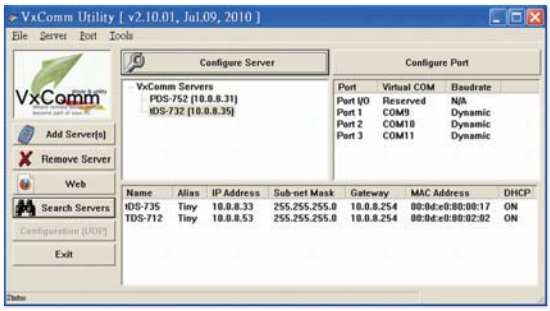
Programmable Device Server with 10 RS-485 Ports, 2-port LAN Switch and LED Display

Features

- Integrates any RS-485 serial device in an Ethernet Network
- Virtual COM extends the PC COM ports
- Virtual COM supports 32/64-bit Windows XP/7/10/2012/2016
- 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

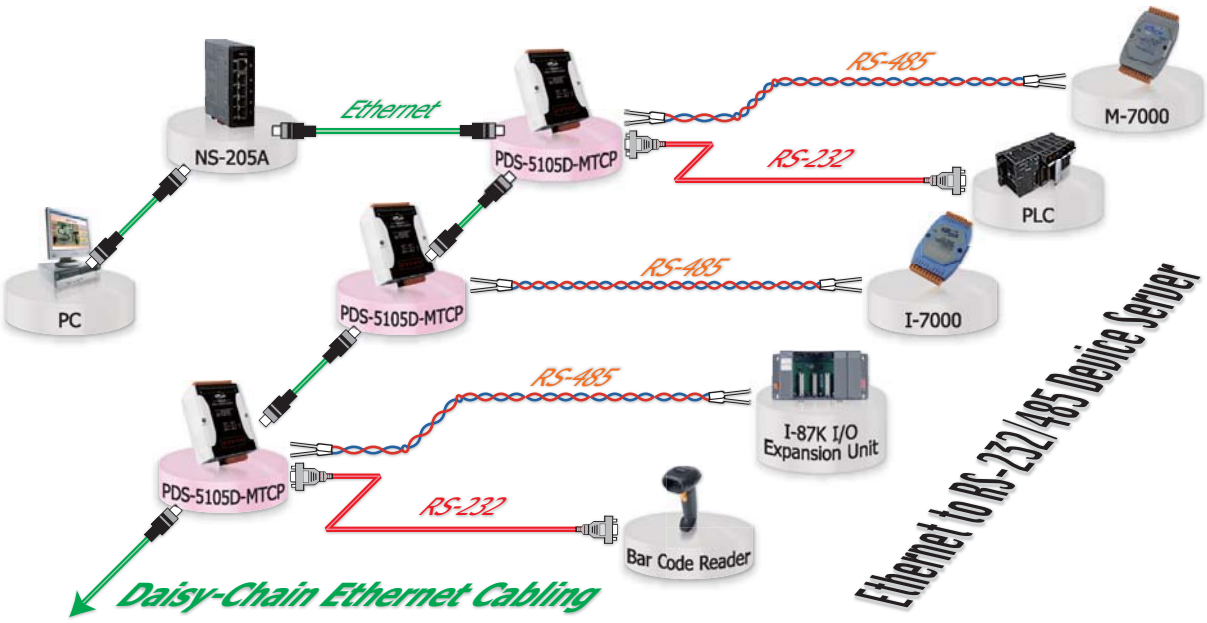
Introduction

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.



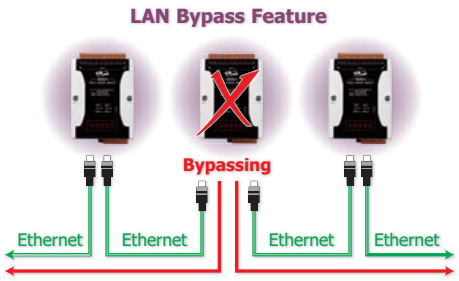
The user-friendly VxComm Driver/Utility allows users to easily turn the built-in COM ports of the PDS-5105D-MTCP series into standard COM ports on a PC. By virtue of its protocol independence, specialized OS and high flexibility, the PDS-5105D-MTCP series is able to meet the demands of any network-enabled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



Applications

- Factory Automation
- Building Automation
- Home Automation

System Specifications

System	
CPU	80186 or compatible (16-bit and 80 MHz)
SRAM	512 KB
Flash Memory	512 KB; Erase unit is one sector (64 KB); 100,000 erase/write cycles
EEPROM	16 KB
Watchdog Timers	Yes (0.8 seconds)
Communication Ports	
Ethernet	2-port 10/100 Base-TX Ethernet Switch with LAN Bypass, RJ-45 x 2 (Auto-negotiating, Auto-MDI/MDIX, LED indicator)
COM1	RS-232 (TxD, RxD, GND)/RS-485 (D1+, D1-), Self-Tuner ASIC inside, non-isolated
COM2 ~ 10	RS-485 (Dx+, Dx-), Self-Tuner ASIC inside, non-isolated
COM Port Formats	
Baud Rate	115200 bps Max. @ 10 Ports, half-duplex, 80% loading
Data Bit	7, 8: for COM1 and COM2 5, 6, 7, 8: for COM3 ~ COM10
Parity	None, Odd, Even, Mark, Space
Stop Bit	1, 2: for COM1 ~ COM10
LED Indicators	
5-Digit 7 Segment	Yes
System	Red
Power	
Protection	Power Reverse Polarity Protection
Frame GND	Yes (for EMS Protection)
Input Range	+12 ~+48 VDC (non-regulated)
Power Consumption	4.8 W
Mechanical	
Dimension (W x H x D)	91 mm x 123 mm x 52 mm
Installation	DIN-Rail mounting
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +85 °C
Humidity	5 ~ 95% RH, non-condensing

Ordering Information

PDS-5105D-MTCP CR	Programmable Device Server with 10 RS-485 Ports, 2-port LAN Switch and LED Display. (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting
CA-0903	9-Pin Female D-sub and RS-232 connector cable, 30 cm Cable
CA-0910	9-Pin Female D-sub and 3-wire RS-232 cable, 1 M Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)
DIN-KA52F-48	48 VDC/0.52 A, 25 W Power Supply with DIN-Rail Mounting

2-9 Modbus Data Concentrator, MDC-700 series

MDC-711

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

MDC-714

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

MDC-711

MDC-714

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

	A	B	C	D	E	F	G	H	I
1	#	TCPPort	ModbusID						
2	*	502	1						
3	#	ModuleInfo							
4	*	this is my data concentrator							
5	#	ComPortNo	BaudRate	DataBit	Parity	StopBit	TimeOut	PollDelay	Mode
6	*	1	115200	8	0	1	50	20	Master
7	*	2	115200	8	0	1	50	20	Master
8	*	3	9600	8	0	1	100	20	Master
9	*	4	9600	8	0	1	100	20	Master
10	*	5	9600	8	0	1	100	20	Master
11	#	UseComPort	SlaveModbusID	FunctionCo	RegStartAddr	RegCount			
12	*	2	1	1	0	4			
13	*	2	2	2	0	4			
14	*	2	3	3	0	4			
15	*	2	4	4	0	4			
16	*	2	4	4	4	8			

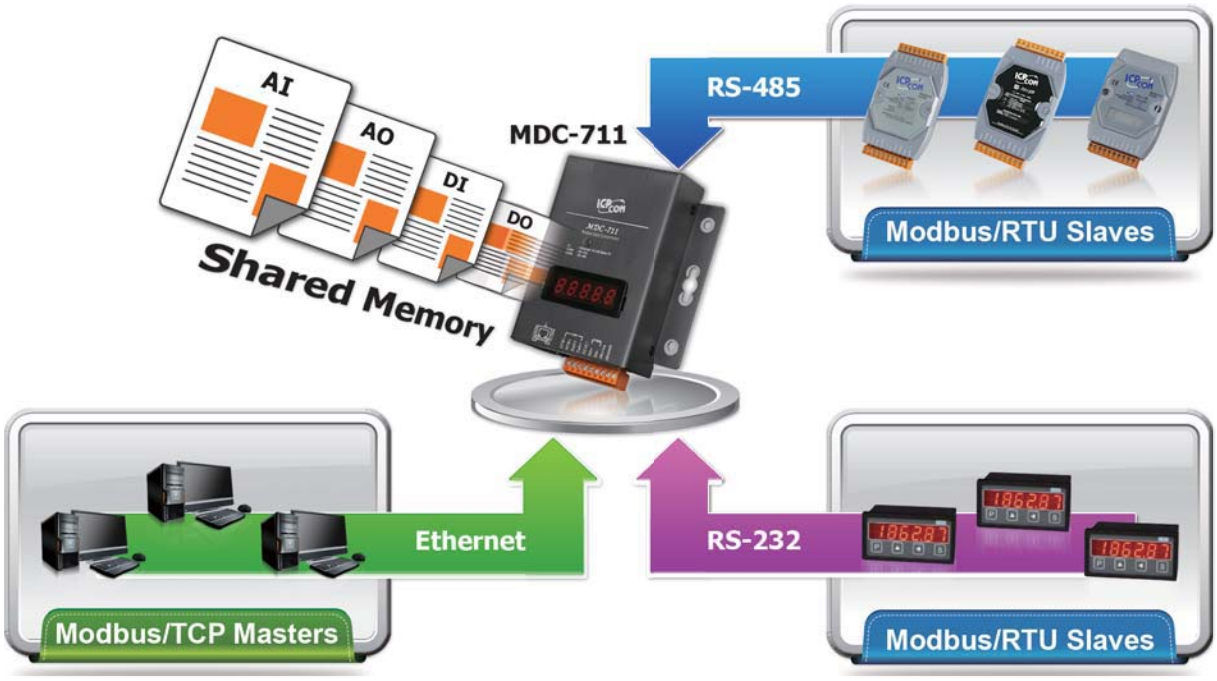
Config.CSV to Ease Hard Work of Editing a lot of Definition

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

Models	MDC-711	MDC-714
Ethernet		
Port	x1, 10/100 Base-TX	
Protocol	Modbus/TCP Slave	
Max. connection	8	
COM port		
RS-232	x1, (TXD, RXD, RTS, CTS, GND)	
RS-485	x1, (Data+, Data-)	x4, (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 x H x D)	102 mm x 101 mm x 28 mm	102 mm x 125 mm x 28 mm
Installation	Wall Mounting	
Power		
Required Supply Voltage	+10 VDC ~ +30 VDC (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

MDC-711 CR	Modbus data concentrator with 1x Ethernet and 1 x RS-232, 1 x RS-485 (RoHS)
MDC-714 CR	Modbus data concentrator with 1x Ethernet and 1 x RS-232, 4 x RS-485 (RoHS)

2-10 Programmable Modbus to Ethernet Gateway

µPAC-7186EX(D)-MTCP

Modbus/RTU to Modbus/TCP Gateway

µPAC-7186EX-MTCP µPAC-7186EXD-MTCP

Features

- Incorporate Serial Devices in an Ethernet network
- "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
- Supports Modbus/TCP and Modbus/RTU
- Virtual COM for 32/64-bit Windows XP/7/10/2012/2016
- 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.

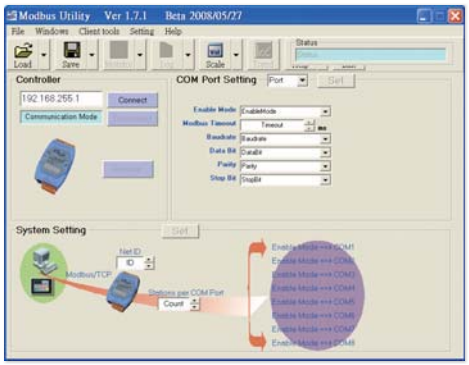
Modbus allows for communication between many devices connected to the same network, for example a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and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

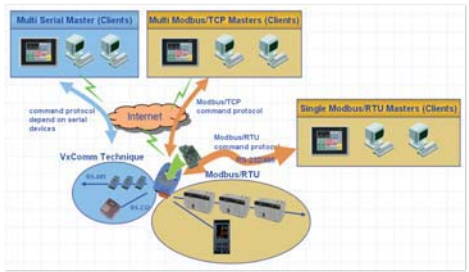
The µPAC-7186EX(D)-MTCP uses a default firmware to become a single Modbus/TCP to multiple Modbus/RTU converter. You can simply use the Modbus Utility to configure the device and then set the connection between the SCADA or HMI software and the µPAC-7186EX(D)-MTCP.

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) with a robust case.

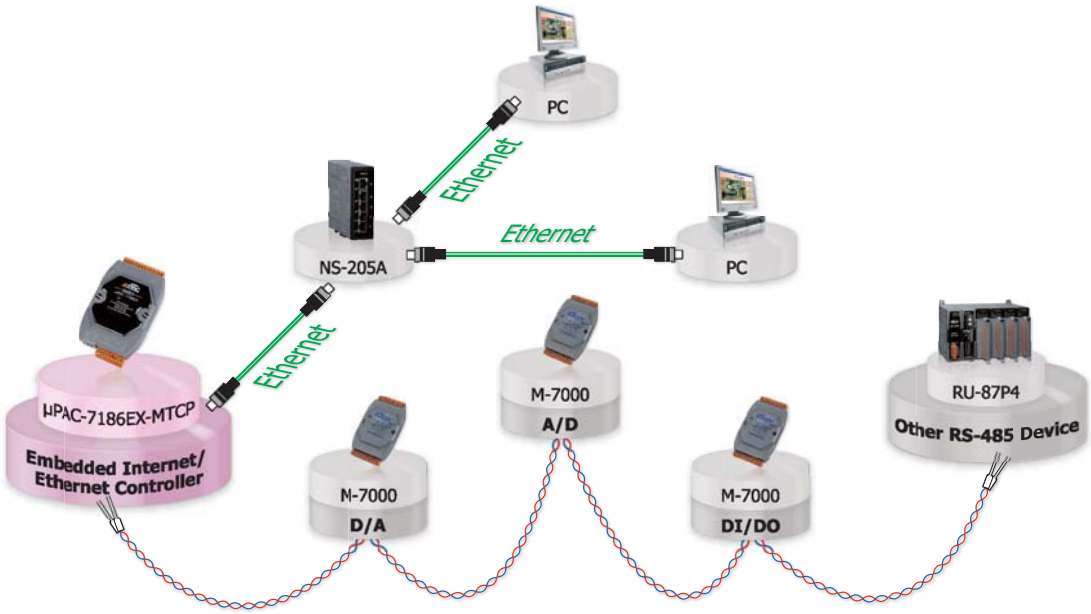




I/O Expansion Bus and Expansion Board

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.

Applications

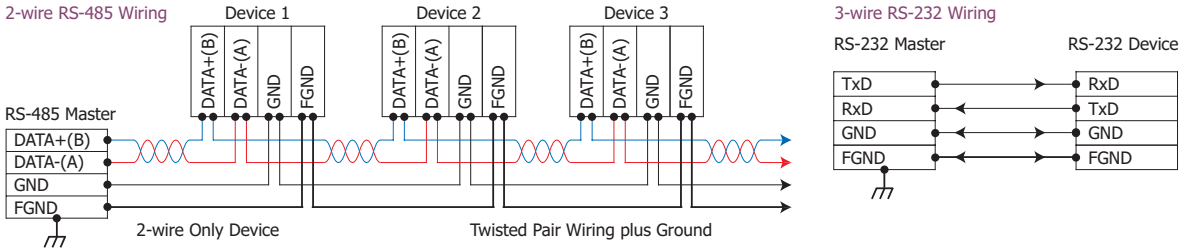


COM2 RS-485 with Modbus/RTU

System Specifications

Models	µPAC-7186EX-MTCP	µPAC-7186EXD-MTCP
CPU		
CPU	80186, 80 MHz or compatible	
SRAM	512 KB	
Flash Memory	512 KB	
EEPROM	16 KB	
NVRAM	31 Bytes (battery backup, data valid for up to 10 years)	
RTC (Real Time Clock)	Yes	
Hardware Serial Number	Yes (64-bit)	
Built-in Watchdog Timer	Yes	
Communication Interface		
COM1	RS-232 (TxD, RxD, RTS, CTS, GND)	
COM2	RS-485 (D2+, D2-, GND)	
Ethernet	10/100 Base-TX, RJ-45 port (Auto-negotiating, auto MDI/MDI-X, LED indicators)	
COM Port Formats		
Speed	115200 bps max.	
Data Bit	7, 8	
Parity	None, Even, Odd	
Stop Bit	1	
LED Indicators		
5-Digit 7 Segment	–	Yes
System	Yes	
Power		
ESD Protection	Yes (with Frame Ground)	
Protection	Power Reverse Polarity Protection	
Required Supply Voltage	+10 VDC ~ +30 VDC (non-regulated)	
Power Consumption	1.5 W	2.5 W
Mechanical		
Dimension (W x H x D)	72 mm x 123 mm x 35 mm	
Installation	DIN-Rail or Wall mounting	
Environment		
Operating Temperature	-25 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +80 °C	
Humidity	5 ~ 95% RH, non-condensing	

Wiring



Pin Assignments

µPAC-7186EX(D)-MTCP

Terminal No.		Pin Assignment
E1		Link/Act 10/100M
COM1	01	CTS1
	02	RTS1
	03	RxD1
	04	TxD1
	05	INIT*
COM2	06	D2+
	07	D2-
	08	(R)+Vs
	09	(B)GND

I/O Expansion Bus

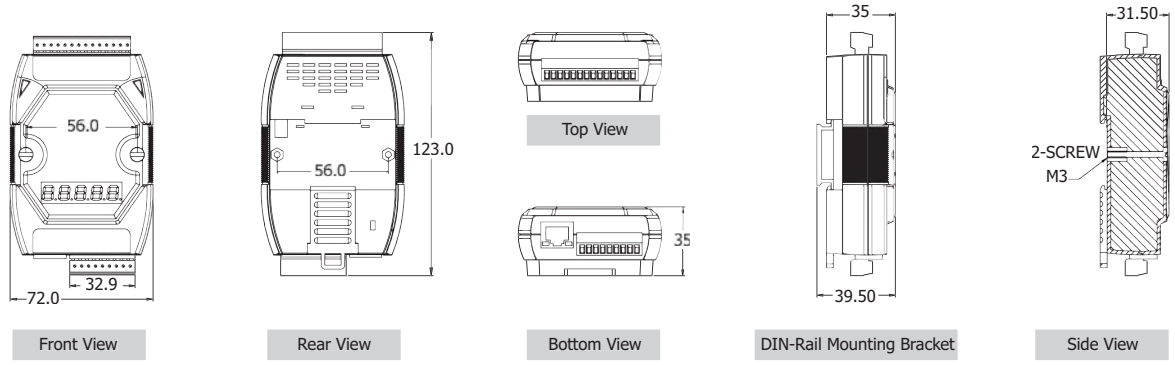
J1			
GND	01	02	GND
CLKOUTA	03	04	ARDY
INTO	05	06	INT1
VCC	07	08	RESET
GND	09	10	RESET\
TO0	11	12	TO1
TI0	13	14	TI1
SCLK	15	16	DIO9
DIO4	17	18	DIO14
VCC	19	20	VCC

CON20A JDIP20P

J2			
MA0	01	02	AD0
MA1	03	04	AD1
MA2	05	06	AD2
MA3	07	08	AD3
MA4	09	10	AD4
MA5	11	12	AD5
MA6	13	14	AD6
MA7	15	16	AD7
INT4	17	18	WRITE\
CS\	19	20	READ\

CON20A JDIP20P

Dimensions (Units: mm)



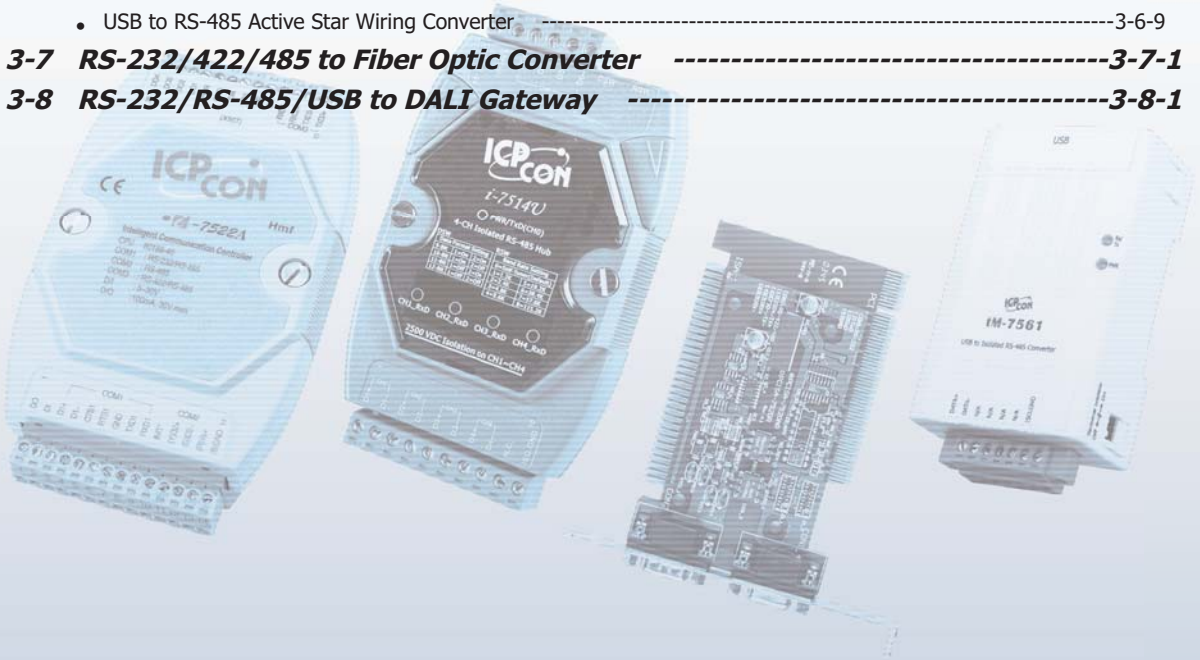
Ordering Information

µPAC-7186EX-MTCP CR	µPAC-7186EX with Default Modbus/TCP Firmware (RoHS)
µPAC-7186EXD-MTCP CR	µPAC-7186EXD with Default Modbus/TCP Firmware (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting
CA-0903	9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm Cable
CA-0910	9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m Cable
NS-205 CR	Unmanaged 5-port Industrial Ethernet Switch (RoHS)

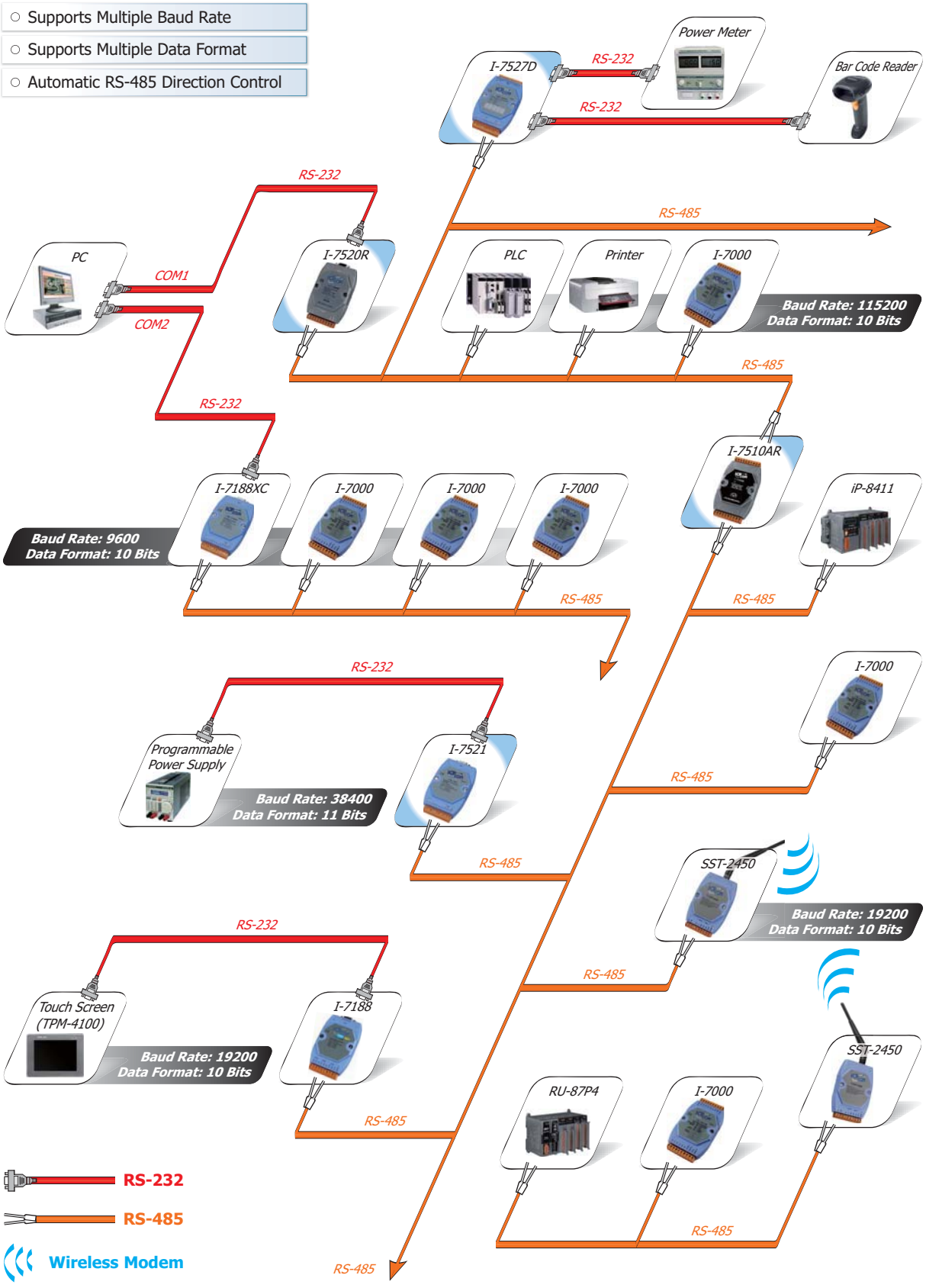
Converters, Repeaters, Hubs and Splitter



3-1 RS-485 Network Configuration

ICP DAS Self-Tuner ASIC Features

- Supports Multiple Baud Rate
- Supports Multiple Data Format
- Automatic RS-485 Direction Control



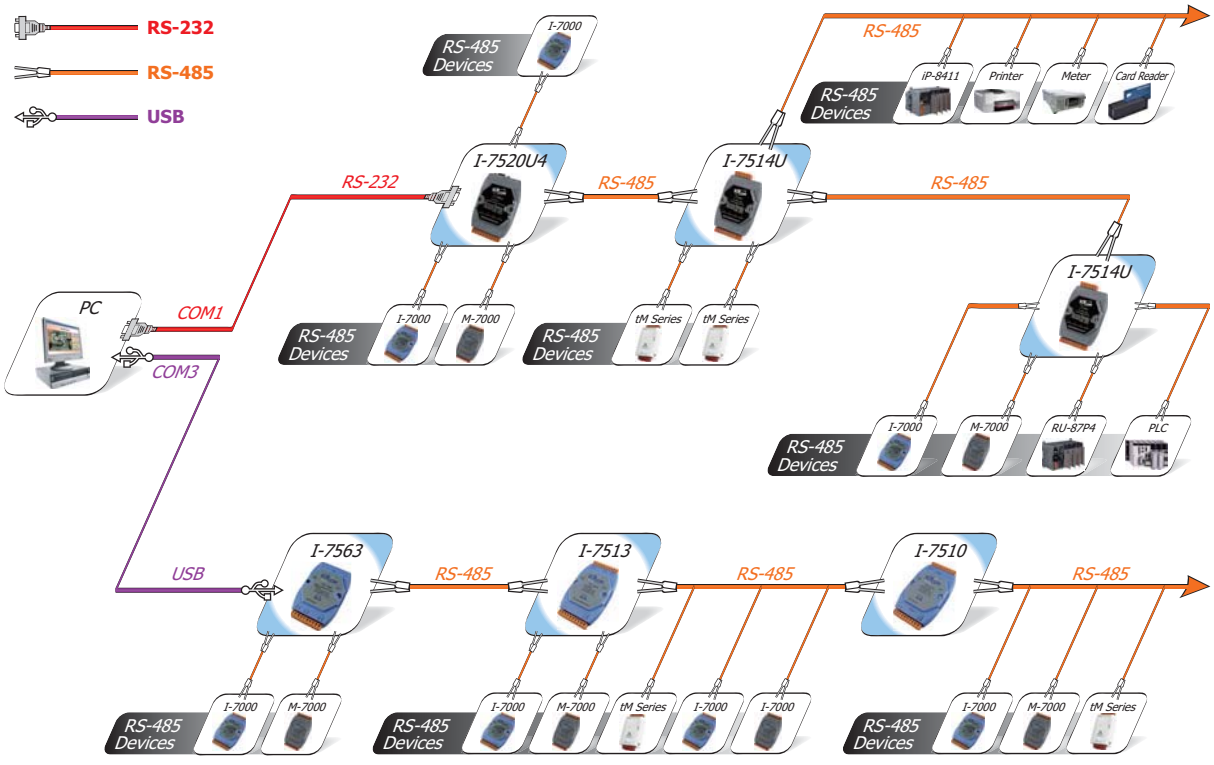
Bus Type

Star Type

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 communication 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. These features make it perfect to star type or mixed type topology in complex and large scale RS-485 network.



3-2 RS-422/485 Repeaters

tM-7510U

Isolated RS-485 Repeater

Features

- 2-way 3000 VDC Isolation Protection
- ESD Protection for RS-485 Data Line
- Power Input, +10 ~ +30 VDC
- Low power consumption
- Long-cable application
- Power and data flow indicator for troubleshooting
- Easy-to-use rotary switch for baud rate setting, 1200 ~ 115200 bps
- Operating Temperatures, -25 °C ~ +75 °C
- Tiny packaging fits on your DIN-Rail Mounting

Introduction

The tM-7510U repeater simply amplifies, or boosts, existing RS-485 signal to enable them to cover longer distances. It extends the communication distance by 4000 ft. (1200 m) or increases the maximum number of bus nodes. The module provides 3000 VDC of isolation allowing you to separate and protect critical segments of the system from the rest of the RS-485 network.

The tM-7510U provides 2 modes of baud rate setting, one is Self-Tuner mode and the other is Fixed baud rate mode. The Self-Tuner mode can support multiple baud rate and multiple data format. The Self-Tuner design is exactly the same as I-7510 series. The Fixed baud rate mode offers a better quality for data transmission over long or lossy lines or electrically noisy environments.

Baud rate 1200 ~ 115200 bps

Comparison Table of Repeater

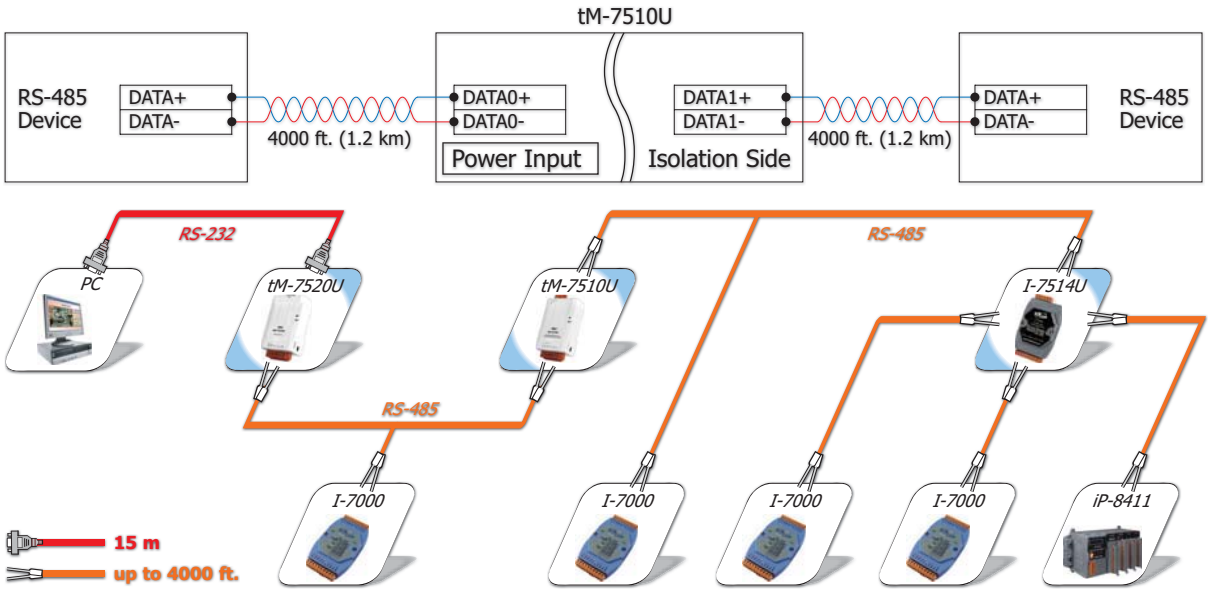
Mode name	tM-7510U	I-7510
RS-485 Direction Control	Fixed baud rate setting and Automatic RS-485 Direction Control (Self-Tuner, default)	Automatic RS-485 Direction Control (Self-Tuner)
Baud rate	300 ~ 115200 bps for Self-Tuner 1200 ~ 115200 bps for Fixed baud rate setting	300 ~ 115200 bps
Dimensions (W x H x D)	52 mm x 95 mm x 27 mm	72 mm x 122 mm x 35 mm
Remarks	Entry-level Long-cable application	Entry-level

System Specifications

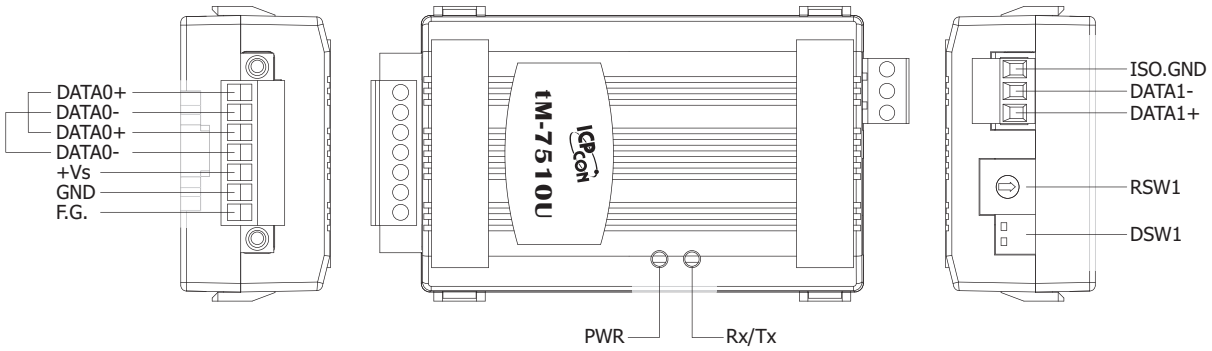
Interface		
Serial Interface	RS-485	Data+, Data-
Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
3000 VDC Isolated Voltage		2-way Isolation
Connector		Removable 7-Pin Terminal Block x 1; Removable 3-Pin Terminal Block x 1
LED Indicators		
Power/Communication		Yes
Power		
Input Voltage Range		+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption		0.6 W
Environment		
Operating Temperature		-25 °C ~ +75 °C
Storage Temperature		-30 °C ~ +75 °C
Humidity		10 ~ 90% RH, non-condensing

Applications

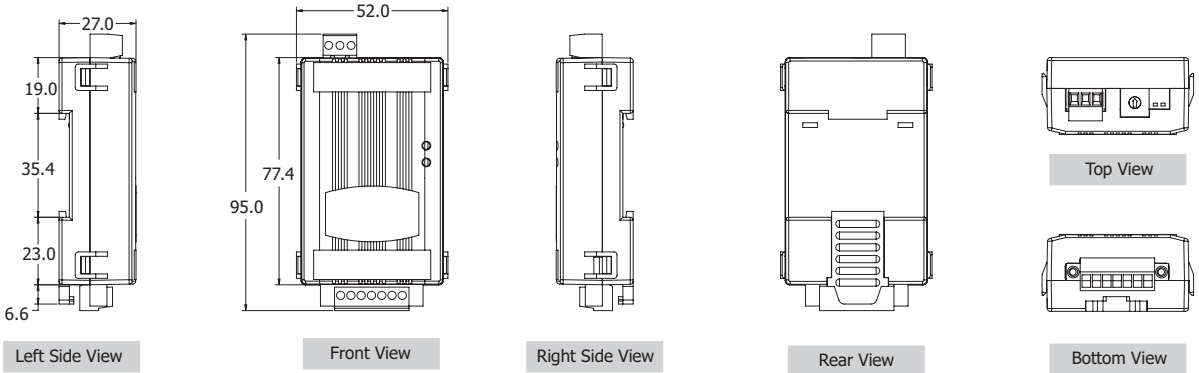
RS-485 to RS-485 Repeater (Only for half duplex application)



Pin Assignments



Dimensions (Units: mm)



Ordering Information

tM-7510U CR	Isolated RS-485 Repeater (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting

I-7510

Isolated RS-485 Repeater

I-7510A

Isolated RS-422/485 Repeater/Converter

I-7510AR

Three Way Isolated RS-422/485 Repeater/Converter

I-7510P *NEW*

Three Way 5 kV Isolated 485 Repeater

Features

- Automatic RS-485 Direction Control
- 3-way 3000 VDC Isolation Protection for I-7510AR
- Transmission Speed of up to 115200 bps
- Operating Temperatures, -25 °C ~ +75 °C
- 2-way 3000 VDC Isolation Protection for I-7510/I-7510A
- ESD Protection for RS-485 Data Line
- Power Input, +10 ~ +30 VDC
- DIN-Rail Mounting
- 3-way 5000 VDC Isolation Protection for I-7510P (IEC 60664-1 section 6.1.2.2.1)

Introduction

The I-7510/I-7510A provides 2-way optical isolation between one piece of RS-422/RS-485 equipment and the rest of the system. It can also be used as a repeater to extend the transmission of an existing network. Additionally, an RS-485 system can be expanded beyond the 256 node limitation imposed by the standard. It can also be used to convert a four-wire RS-422 signal into a 2-wire RS-485 signal, and vice versa.

The I-7510AR is exactly the same as the I-7510A, except for the isolation side. The isolation side of the I-7510A is located in the input interface circuit, but the isolation side of the I-7510AR is located in the input and output interface circuit. In other words the I-7510AR is 3-way isolation repeater module.

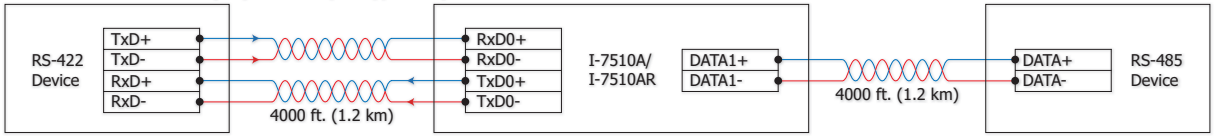
System Specifications

Models		I-7510	I-7510P	I-7510A	I-7510AR
Interface					
Serial Interface	RS-422	–		TxD+, TxD-, RxD+, RxD- The RS-422 and RS-485 cannot be used simultaneously	
	RS-485	Data+, Data-			
Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)			
Self-Tuner Asic Inside		Yes			
Speed		300 ~ 115200 bps			
ESD Protection		Yes			
Isolated Voltage		2-way 3 kV Isolated	3-way 5 kV Isolated	2-way 3 kV Isolated	3-way 3 kV Isolated
Connector		Removable 10-Pin Terminal Block x 2			
LED Indicators					
Power/Communication		Yes			
Power					
Input Voltage Range		+10 VDC ~ +30 VDC			
Power Consumption		2.2 W			
Mechanical					
Casing		Plastic			
Dimensions (W x H x D)		72 mm x 122 mm x 35 mm			
Installation		DIN-Rail Mounting			
Environment					
Operating Temperature		-25 °C ~ +75 °C			
Storage Temperature		-30 °C ~ +75 °C			
Humidity		10 ~ 90% RH, non-condensing			

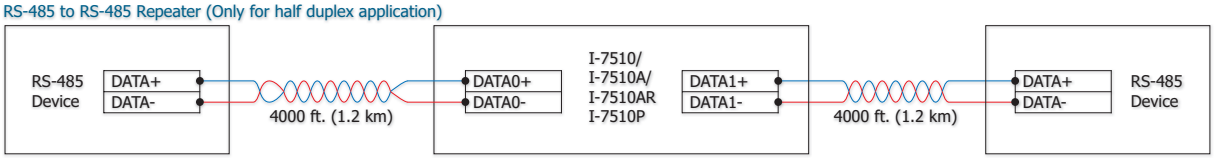
Applications

Applications for RS-422/485

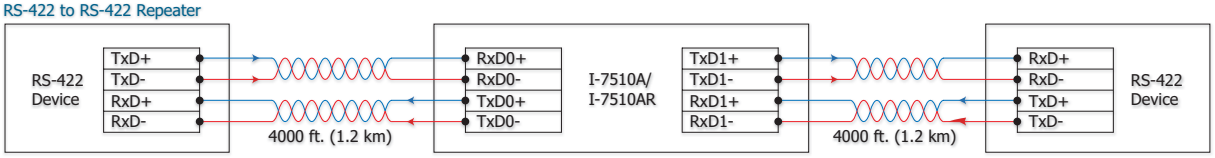
RS-422 to RS-485 Converter (Only for half duplex application)



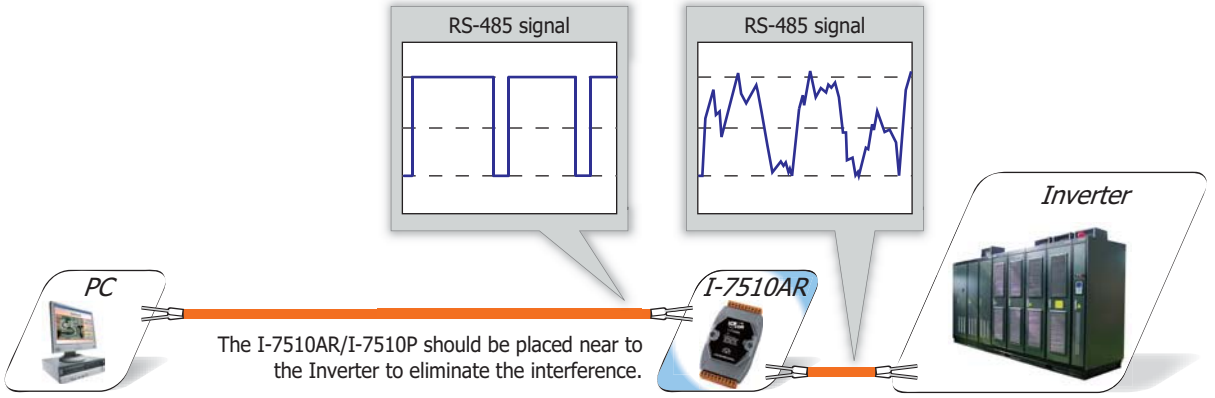
RS-485 to RS-485 Repeater (Only for half duplex application)



RS-422 to RS-422 Repeater



Application for 3-way isolation



Pin Assignments

I-7510/I-7510P

Terminal No.	Pin Assignment	Terminal No.	Pin Assignment
01	DATA+	20	DATA1+
02	DATA-	19	DATA1-
03	--	18	--
04	--	17	--
05	--	16	--
06	--	15	--
07	--	14	--
08	--	13	--
09	(R)+Vs	12	--
10	(B)GND	11	--

I-7510A / I-7510AR

Terminal No.		Pin Assignment	Pin Assignment
RS-485	01	DATA0+	DATA0+
	02	DATA0-	DATA0-
	03	--	--
RS-422	04	RxD0+	TxD0+
	05	RxD0-	TxD0-
	06	TxD0+	RxD0+
	07	TxD0-	RxD0-
	08	--	--
	09	(R)+Vs	(R)+Vs
	10	(B)GND	(B)GND

I-7510A/7510AR

Terminal No.		Pin Assignment
RS-485	20	DATA1+
	19	DATA1-
	18	--
RS-422	17	TxD1+
	16	TxD1-
	15	RxD1+
	14	RxD1-
	13	--
	12	--
	11	--

Ordering Information

I-7510 CR	Isolated RS-485 Repeater (RoHS)	I-7510-G CR	Isolated RS-485 Repeater (Gray Cover) (RoHS)
I-7510A CR	Isolated RS-422/485 Repeater/Converter (RoHS)	I-7510A-G CR	Isolated RS-422/485 Repeater/Converter (Gray Cover) (RoHS)
I-7510AR CR	Three Way Isolated RS-422/485 Repeater/Converter (RoHS)	I-7510AR-G CR	Three Way Isolated RS-422/485 Repeater/Converter (Gray Cover) (RoHS)
I-7510P CR	Three Way 5 kV Isolated 485 Repeater (RoHS)		

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting

3-3 RS-485 Repeater/Hub/Splitter

I-7513

Three Way Isolated RS-485 Active Star Wiring Hub

Features

- RS-485 Active Star Wiring Applications
- 3000 VDC Three Way Isolation Protection
- Power Input, +10 ~ +30 VDC
- DIN-Rail
- Automatic RS-485 Direction Control
- ESD Protection for the RS-485 Data Line
- Operating Temperatures, -25 °C ~ +75 °C

Introduction

The I-7513 is a 3-ch RS-485 Active Star Wiring Hub. The unit has three independent RS-485 output channels, each with their own driver, which can transmit signals across 4,000 ft. (1200 m) of cable on each channel.

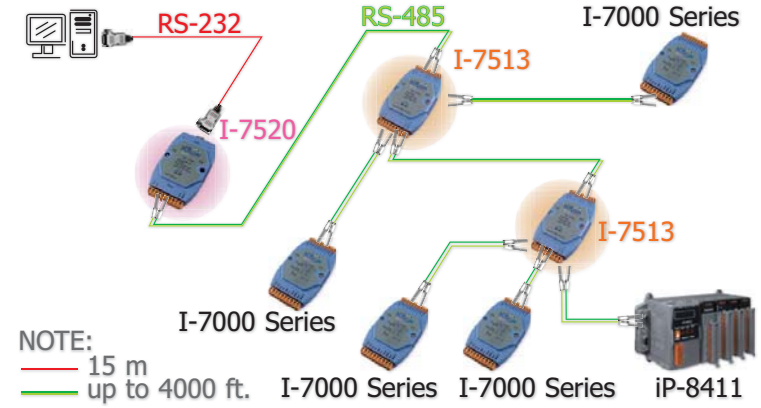
The I-7513 includes both Hub and Repeater functions, so each output channel can be connected to another hub.

The isolation site of the I-7513 is located in the input and output interface circuit. In other words, the I-7513 is a three-way
isolation module.

System Specifications

Interface	
Input	1 RS-485 Channel: Data+, Data-
Output	3 RS-485 Channels: Data+, Data-
Transfer Distance	Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
Self-Tuner Asic Inside	Yes
Speed	300 ~ 115200 bps
ESD Protection	Yes
3000 VDC Three Way Isolated Protection	Yes
Connection	Removable 10-Pin Terminal Block x 2
LED Indicators	
Power/Communication	Yes
Power	
Input Voltage Range	+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption	2.16 W
Mechanical	
Casing	Plastic
Flammability	Fire-Retardant Materials (UL94-V0 Level)
Dimensions (W x H x D)	72 mm x 122 mm x 35 mm
Installation	DIN-Rail
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +75 °C
Humidity	10 ~ 90% RH, non-condensing

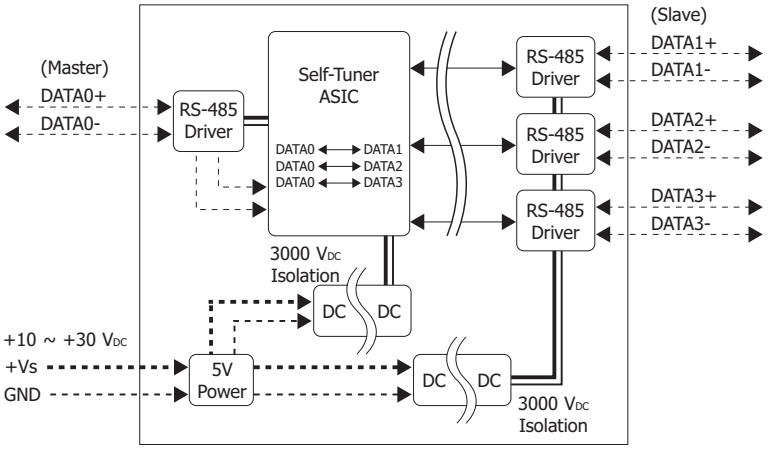
Applications



Pin Assignments

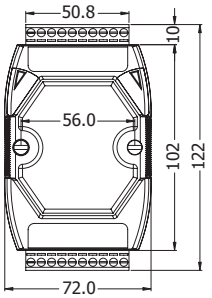
Terminal No.	Pin Assignment
01	DATA+
02	DATA-
03	--
04	--
05	--
06	--
07	--
08	--
09	(R)+Vs
10	(B)GND
11	DATA3-
12	DATA3+
13	--
14	DATA2-
15	DATA2+
16	--

Internal I/O Structure

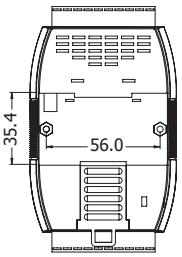


The following block diagram shows how I-7513 was designed as independent channel. Data coming from the master input will be transmitted to all four RS-485 slave channels. But data coming from the slave channels will be returned to the master input only. Thus reduces the possibility of interference between each RS-485 slave loop and makes the RS-485 networks more robust and reliable.

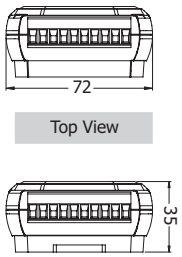
Dimensions (Unit: mm)



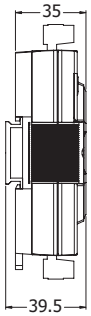
Front View



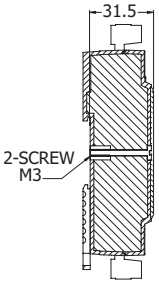
Rear View



Top View / Bottom View



Din-Rail Mounting Bracket



Side View

Ordering Information

I-7513 CR	Three Way Isolated RS-485 Active Star Wiring Hub (RoHS)
I-7513-G CR	Three Way Isolated RS-485 Active Star Wiring Hub (Gray Cover) (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with Din-Rail Mounting

I-7514U

Isolated 4 Channels RS-485 Repeater/Hub/Splitter

Features

- RS-485 Splitter
- True RS-485 Star Wiring Hub
- Power and data flow indicator for troubleshooting
- Easy-to-use rotary switch for fixed baud rate setting, 1200 ~ 115200 bps
- Independent RS-485 driver for each channel
- Automatic RS-485 Direction Control
- 120 Ω termination resistor for each channel
- Operating Temperatures, -25 °C ~ +75 °C
- DIN-Rail Mounting

Introduction

RS-485 Active Hub

The I-7514U is a 4-ch RS-485 active star wiring hub, it has 4 independent RS-485 output channels and one RS-485 input channel. Each output channel is equipped with an individual driver. The data from a master to the input channel will simultaneously be forwarded to all the four output channels.

Splitter

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.

Baud Rate Setting

The I-7514U provides 2 modes of baud rate setting, one is Self-Tuner mode and the other is fixed baud rate mode. The Self-Tuner mode can support multiple baud rate and multiple data format. The Self-Tuner design is exactly the same as I-7513 and I-7510 series. The Fixed baud rate mode offers a better quality for data transmission over long or lossy lines or electrically noisy environments.

RS-485 Short-Circuit

The Short-circuit protection can automatically shut off the breakdown channel, this kind of design can suffice to protect the communication system. When a connected RS-485 equipment breaks down, the breakdown channel will be isolated to ensure that other equipments work normally.

Termination resistors

In some critical environments, you may need to add termination resistors to prevent the reflection of serial signals. The I-7514U includes a jumper-selectable 120 Ω termination resistor for each channel (Default disable).

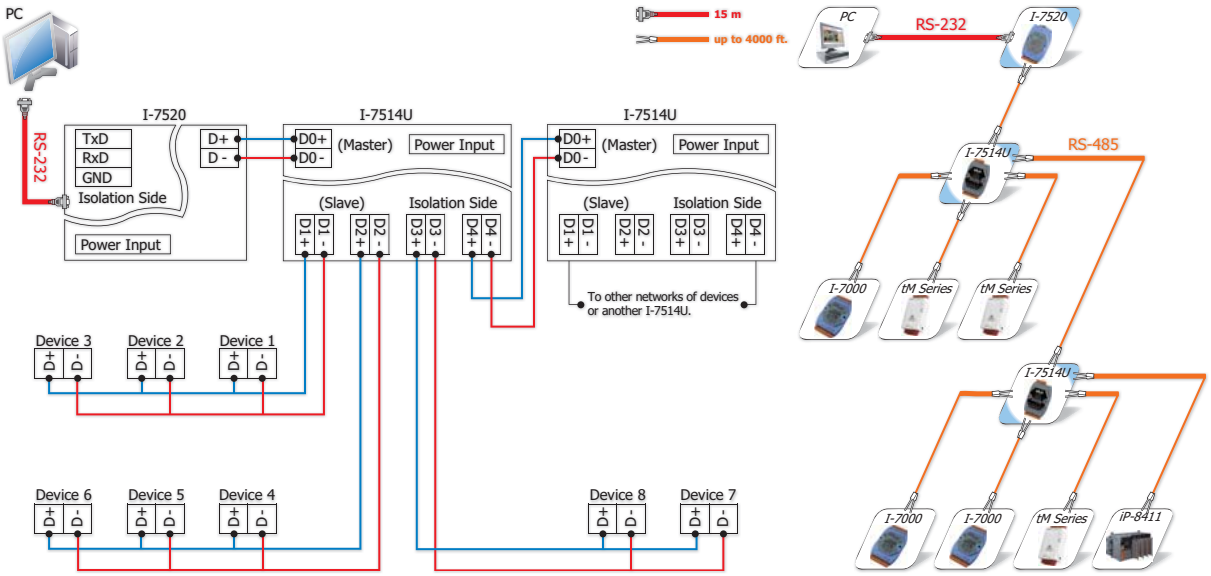
LED Indicators

The I-7514U has 6 LED to indicate the power status and network traffic. The TxD/RxD LED will flash when the unit is being sent out or received data.

System Specifications

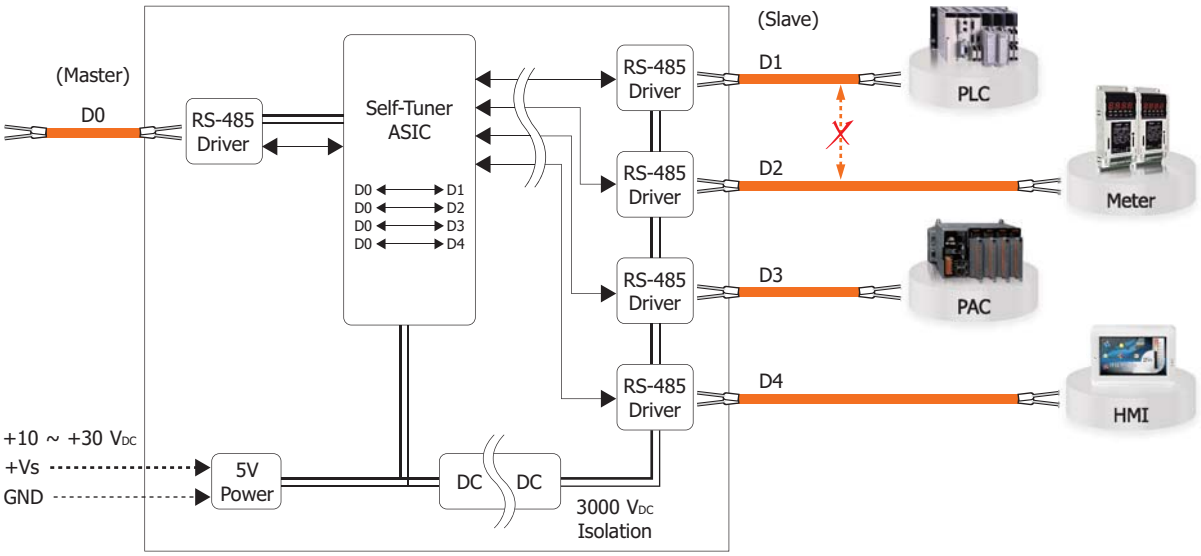
Interface	
Input (Master)	1 RS-485 Channel: Data+, Data-
Output (Slave)	4 RS-485 Channels: Data+, Data-
Transmission Distance	Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
Self-Tuner Asic Inside	Yes
Speed	300 ~ 115200 bps via Self-Tuner mode; 1200 ~ 115200 bps via Fixed Baud Rate mode
ESD Protection	Yes
3000 VDC Isolation on CH1 ~ CH4	2-way Isolation
Connector	Removable 10-Pin Terminal Block x 1; Removable 6-Pin Terminal Block x 1
LED Indicators	
Power/Communication	Yes
Power	
Input Voltage Range	+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption	1.2 W
Mechanical	
Casing	Plastic
Dimensions (W x H x D)	72 mm x 122 mm x 35 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +75 °C
Humidity	10 ~ 90% RH, non-condensing

Applications

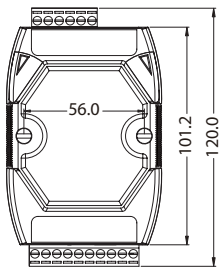


RS-485 Splitter

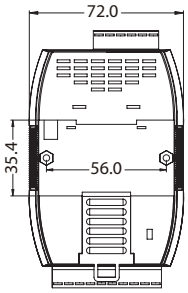
The following block diagram shows how I-7514U was designed as independent channel. Data coming from the master input will be transmitted to all four RS-485 slave channels. But data coming from the slave channels will be returned to the master input only. Thus reduces the possibility of interference between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



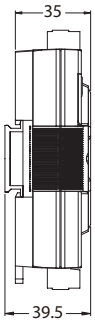
Dimensions (Units: mm)



Front View



Rear View



DIN-Rail Mounting Bracket

Ordering Information

I-7514U-G CR	Isolated 4 Channels RS-485 Active Hub (Gray Cover) (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting

3-4 RS-232/RS-422/485 Converters

tM-7520U

Isolated RS-232 to RS-485 Converter

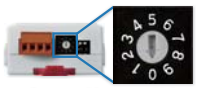
Features

- 2-way 3000 VDC Isolation Protection
- ESD Protection for RS-485 Data Line
- Power Input, +10 ~ +30 VDC
- Low power consumption
- Long-cable application
- Power and data flow indicator for troubleshooting
- Easy-to-use rotary switch for baud rate setting, 1200 ~ 115200 bps
- Operating Temperatures, -25 °C ~ +75 °C
- Tiny packaging fits on your DIN-Rail Mounting

Introduction

Most industrial computer systems provide standard RS-232 serial ports with limited transmission speed, range, and networking capabilities. The RS-485 standards overcome these limitations by using differential voltage lines for data and control signals. The tM-7520U transparently converts RS-232 signals into isolated RS-485 signal with no need to change any hardware or software. This lets you easily build an industrial grade, long-distance communication system using standard PC hardware. The module provides 3000 VDC of optical isolation allowing you to separate and protect critical segments of the system from the rest of the RS-485 network.

The tM-7520U provides 2 modes of baud rate setting, one is Self-Tuner mode and the other is Fixed baud rate mode. The Self-Tuner mode can support multiple baud rate and multiple data format. The Self-Tuner design is exactly the same as I-7520 series. The Fixed baud rate mode offers a better quality for data transmission over long or lossy lines or electrically noisy environments.



Baud rate 1200 ~ 115200 bps

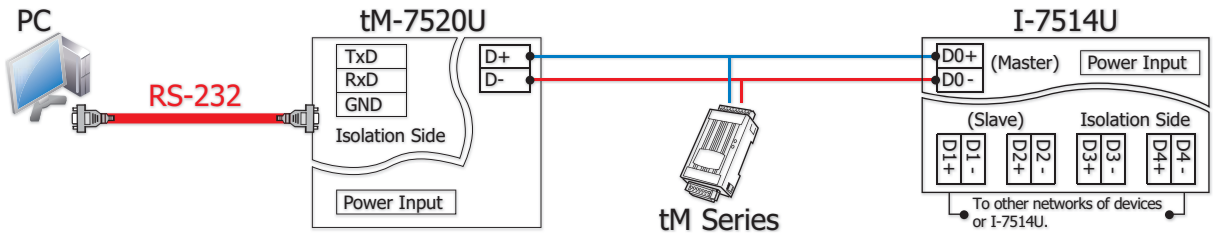
Comparison Table of Repeater

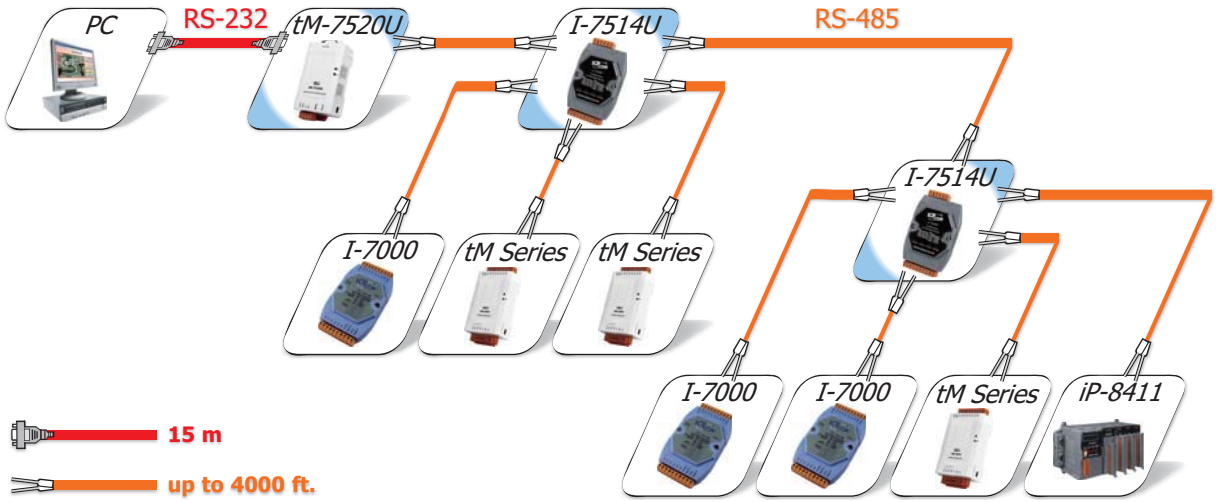
Mode name	tM-7520U	I-7520
RS-485 Direction Control	Fixed baud rate setting and Automatic RS-485 Direction Control (Self-Tuner, default)	Automatic RS-485 Direction Control (Self-Tuner)
Baud rate	300 ~ 115200 bps for Self-Tuner 1200 ~ 115200 bps for Fixed baud rate setting	300 ~ 115200 bps
Dimensions (W x H x D)	52 mm x 92 mm x 27 mm	72 mm x 118 mm x 35 mm
Remarks	Entry-level Long-cable application	Entry-level

System Specifications

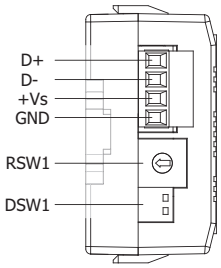
Interface	
Input	RS-232: TxD, RxD and GND
Output	RS-485: Data+, Data-
Transmission Distance	Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
3000 VDC Isolated Protection	Yes
Connector	Removable 4-Pin Terminal Block x 1; 9-Pin Female D-Sub x 1
LED Indicators	
Power/TxD/RxD	Yes
Power	
Input Voltage Range	+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption	0.5 W
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +75 °C
Humidity	10 ~ 90% RH, non-condensing

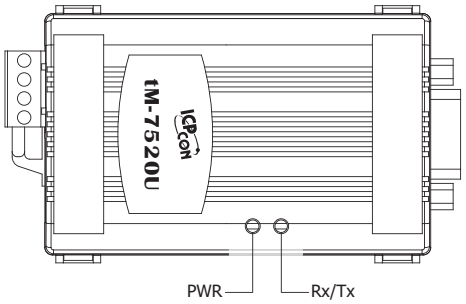
Applications





Pin Assignments

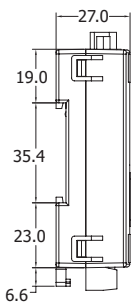




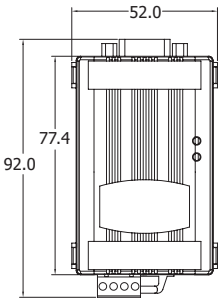
Pin Assignment	Terminal No.	Pin Assignment
--	01	06 --
TxD	02	07 --
RxD	03	08 --
--	04	09 --
GND	05	

RS-232: Female DB-9 Connector

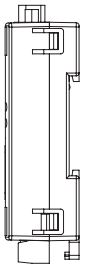
Dimensions (Units: mm)



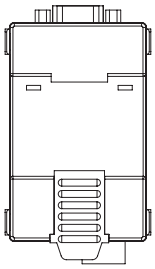
Left Side View



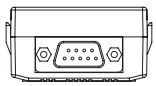
Front View



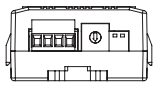
Right Side View



Rear View



Top View



Bottom View

Ordering Information

tM-7520U CR	Isolated RS-232 to RS-485 Converter (RoHS)
tM-7520U-CA CR	tM-7520U CR with CA-0915 cable x 1 (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting
tM-7510U CR	Isolated RS-485 Repeater (RoHS)
CA-0915	9-Pin Male-Female D-Sub Cable, 1.5 m

I-7520U4

Isolated RS-232 to 4 Channels RS-485 Active Star Wiring Hub

Features

- True RS-485 Star Wiring Hub
- Power and data flow indicator for troubleshooting
- Easy-to-use rotary switch for fixed baud rate setting, 1200 ~ 115200 bps
- Power Input, +10 ~ +30 VDC
- Independent RS-485 driver for each channel
- Automatic RS-485 Direction Control
- 120 Ω termination resistor for each channel
- Operating Temperatures, -25 °C ~ +75 °C
- DIN-Rail Mounting

Introduction

RS-485 Active Hub

The I-7520U4 is isolated RS-232 to 4-ch RS-485 active star wiring hub, it has 4 independent RS-485 output channels and one RS-232 input channel. Each output channel is equipped with an individual driver. The data from a master to the input channel will simultaneously be forwarded to all the four output channels.

Baud Rate Setting

The I-7520U4 provides 2 modes of baud rate setting, one is Self-Tuner mode and the other is fixed baud rate mode. The Self-Tuner mode can support multiple baud rate and multiple data format. The Self-Tuner design is exactly the same as I-7520 series. The Fixed baud rate mode offers a better quality for data transmission over long or lossy lines or electrically noisy environments.

RS-485 Short-Circuit

The Short-circuit protection can automatically shut off the breakdown channel, this kind of design can suffice to protect the communication system. When a connected RS-485 equipment breaks down, the breakdown channel will be isolated to ensure that other equipments work normally.

Termination resistors

In some critical environments, you may need to add termination resistors to prevent the reflection of serial signals. The I-7520U4 includes a jumper-selectable 120Ω termination resistor for each channel (Default disable).

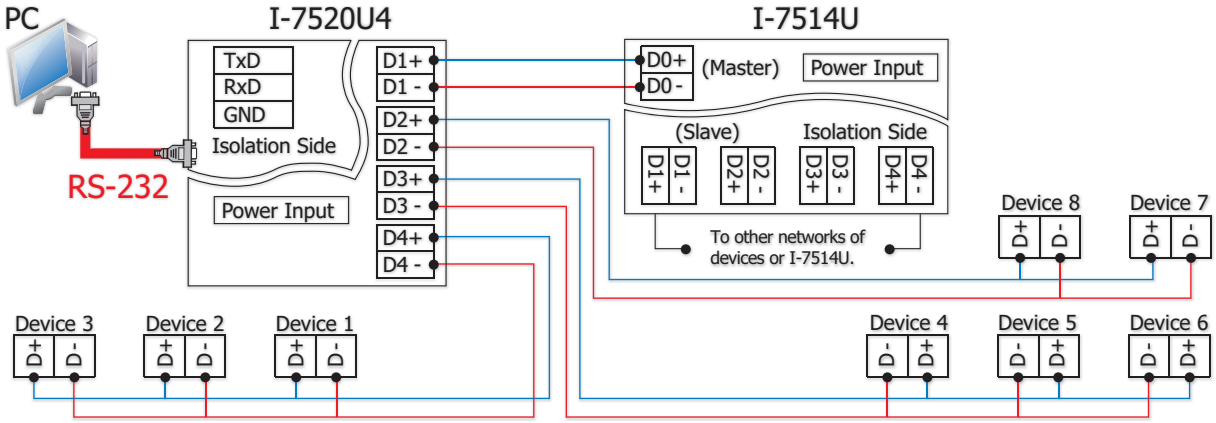
LED Indicators

The I-7520U4 has 6 LED to indicate the power status and network traffic. The TxD/RxD LED will flash when the unit is being sent out or received data.

System Specifications

Interface	
Input	1 RS-232 Channel: TxD, RxD and GND
Output	4 RS-485 Channels: Data+, Data-
Transmission Distance	Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
Self-Tuner Asic Inside	Yes
Speed	300 ~ 115200 bps via Self-Tuner mode; 1200 ~ 115200 bps via Fixed Baud Rate mode
ESD Protection	Yes
3000 VDC Three Way Isolated Protection	Yes
Connector	Removable 10-Pin Terminal Block x 1; 9-Pin Female D-Sub x 1
LED Indicators	
Power/Communication	Yes
Power	
Input Voltage Range	+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption	1.2 W
Mechanical	
Casing	Plastic
Dimensions (W x H x D)	72 mm x 118 mm x 35 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +75 °C
Humidity	10 ~ 90% RH, non-condensing

Applications



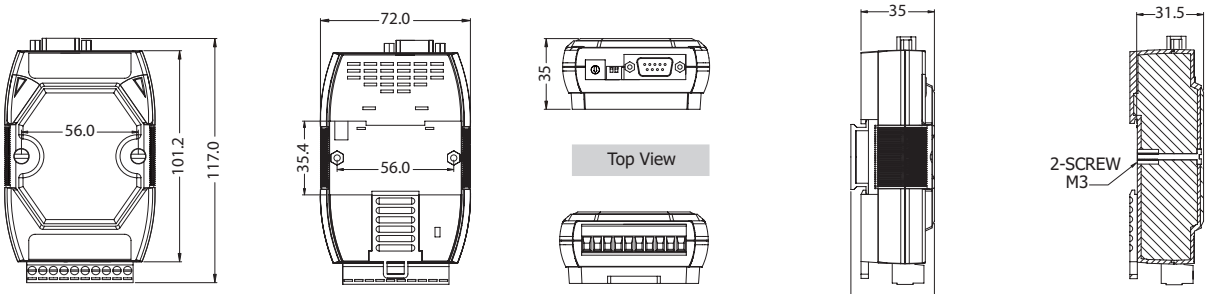
Pin Assignments

Terminal No.		Pin Assignment
RS-485	01	D1+
	02	D1-
	03	D2+
	04	D2-
	05	D3+
	06	D3-
	07	D4+
	08	D4-
	09	(R)+Vs
	10	(B)GND

Pin Assignment	Terminal No.	Pin Assignment
--	01	
TxD	02	
RxD	03	
--	04	
GND	05	
	06	--
	07	--
	08	--
	09	--

RS-232: Female DB-9 Connector

Dimensions (Units: mm)



Front View | Rear View | Bottom View | DIN-Rail Mounting Bracket | Side View

Ordering Information

I-7520U4-G CR	Isolated RS-232 to 4 Channels RS-485 Active Hub (Gray Cover) (RoHS)
I-7520U4-CA-G CR	I-7520U4-G CR with CA-0915 cable x 1

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting
I-7510 CR	Isolated RS-485 Repeater (RoHS)
CA-0915	9-Pin Male-Female D-Sub Cable, 1.5 m

I-7520

Isolated RS-232 to RS-485 Converter

I-7520A

Isolated RS-232 to RS-422/485 Converter

I-7520R

RS-232 to Isolated RS-485 Converter

I-7520AR

RS-232 to Isolated RS-422/485 Converter

Features

- Automatic RS-485 Direction Control
- ESD Protection for the RS-232/422/485 Data Line
- Power Input, +10 ~ +30 VDC
- DIN-Rail Mounting
- 3000 VDC Isolation Protection on the RS-485 side
- Transmission Speed of up to 115200 bps
- Operating Temperatures, -25 °C ~ +75 °C

Introduction

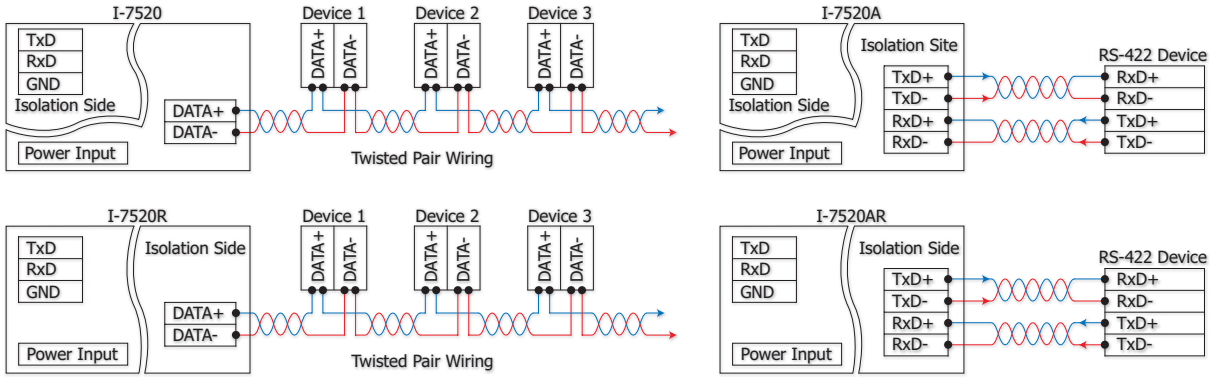
Most industrial computer systems provide standard RS-232 serial ports. Though widely accepted, RS-232 has limited transmission speed, range, and networking capabilities. The RS-422 and RS-485 standards overcome these limitations by using differential voltage lines for data and control signals, which transparently converts RS-232 signals into isolated RS-422 or RS-485 signal with no need to change any hardware or software. The I-7520/I-7520A lets you easily build an industrial grade, long-distance communication system using standard PC hardware.

The design of the isolation between the I-7520 and the I-7520R/AR is different. If the user wants to supply power from the PLC/PC, the I-7520R/AR should be used, otherwise the isolation will be broken. Refer to the I-7000 bus converter manual for detailed information.

System Specifications

Models		I-7520	I-7520R	I-7520A	I-7520AR
Interface					
Serial Interface	RS-232	TxD, RxD, GND			
	RS-422	–		TxD+, TxD-, RxD+, RxD- The RS-422 and RS-485 cannot be used simultaneously	
	RS-485	Data+, Data-			
Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)			
Self-Tuner Asic Inside		Yes			
Speed		300 ~ 115200 bps			
ESD Protection		Yes			
3000 VDC Isolated Voltage		on RS-232 side	on RS-485 side	on RS-232 side	on RS-485 side
Connector	RS-232	9-Pin Female D-Sub			
	RS-422/485	Removable 10-Pin Terminal Block			
LED Indicators					
Power/Communication		Yes			
Power					
Input Voltage Range		+10 VDC ~ +30 VDC (Non-isolated)			
Power Consumption		1.2 W			
Mechanical					
Casing		Plastic			
Dimensions (W x H x D)		72 mm x 118 mm x 35 mm			
Installation		DIN-Rail Mounting			
Environment					
Operating Temperature		-25 °C ~ +75 °C			
Storage Temperature		-30 °C ~ +75 °C			
Humidity		10 ~ 90% RH, non-condensing			

Applications



Pin Assignments

I-7520/I-7520R

Terminal No.		Pin Assignment
RS-485	01	DATA+
	02	DATA-
	03	--
	04	--
	05	--
	06	--
	07	--
	08	--
	09	(R)+Vs
	10	(B)GND

Pin Assignment	Terminal No.		Pin Assignment
--	01	06	--
TxD	02	07	--
RxD	03	08	--
--	04	09	--
GND	05		

RS-232: Female DB-9 Connector

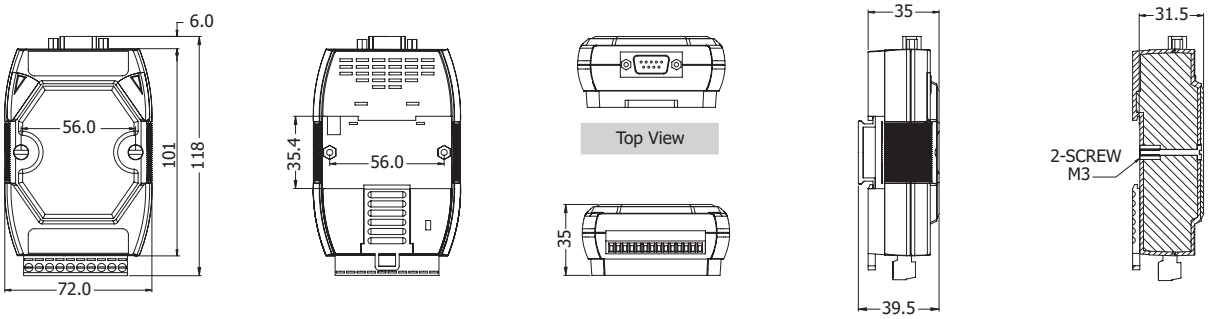
I-7520A/I-7520AR

Terminal No.		Pin Assignment
RS-485	01	DATA1+
	02	DATA1-
	03	--
RS-422/485	04	TxD+
	05	TxD-
	06	RxD+/DATA2+
	07	RxD-/DATA2-
	08	--
	09	(R)+Vs
	10	(B)GND

Pin Assignment	Terminal No.		Pin Assignment
--	01	06	--
TxD	02	07	--
RxD	03	08	--
--	04	09	--
GND	05		

RS-232: Female DB-9 Connector

Dimensions (Units: mm)



Front View | Rear View | Bottom View | DIN-Rail Mounting Bracket | Side View

Ordering Information

I-7520 CR	Isolated RS-232 to RS-485 Converter (RoHS)
I-7520A CR	Isolated RS-232 to RS-422/485 Converter (RoHS)
I-7520-G CR	Isolated RS-232 to RS-485 Converter (Gray Cover) (RoHS)
I-7520A-G CR	Isolated RS-232 to RS-422/485 Converter (Gray Cover) (RoHS)
I-7520R CR	RS-232 to Isolated RS-485 Converter (RoHS)
I-7520AR CR	RS-232 to Isolated RS-422/485 Converter (RoHS)
I-7520R-G CR	RS-232 to Isolated RS-485 Converter (Gray Cover) (RoHS)
I-7520AR-G CR	RS-232 to Isolated RS-422/485 Converter (Gray Cover) (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting
I-7510 CR	Isolated RS-485 Repeater (RoHS)
I-7510A CR	Isolated RS-422/485 Repeater (RoHS)
CA-0915	9-Pin Male-Female D-Sub Cable, 1.5 m

I-7551

Isolated RS-232 to RS-232 Converter

I-7551 I-7551-G

Features

- 3000 VDC 3-way Isolation Protection
- Transmission Speed of up 115200 bps
- Operating Temperatures, -25 °C ~ +75 °C
- ESD Protection
- Power Input, +10 ~ +30 VDC
- DIN-Rail Mounting

Introduction

The I-7551 provides a complete full-duplex (including control signal) electrical isolation channel between two RS-232 devices. This isolation is an important consideration if a system uses different power sources, has noisy signals, or must operate at different ground potentials.

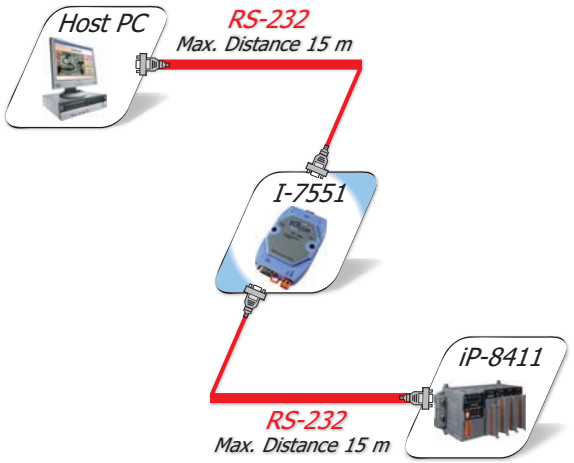
The CTS/RTS pins of the I-7551 module can be reconfigured as DSR/DTR to meet requirements on different applications.

The I-7551 incorporates two DC-to-DC converters, the isolation side of the I-7551 is located in the input and output interface circuit. In other words, the I-7551 is 3-way isolated RS-232 to RS-232 converter.

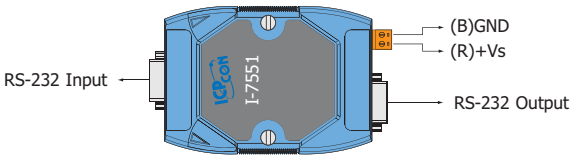
System Specifications

Interface		
Input		TxD, RxD, CTS, RTS, GND (Default) or TxD, RxD, DSR, DTR, GND Jumpers JP1 and JP2 are used to select the RS-232 input source type
Output		TxD, RxD, CTS, RTS, GND (Default) or TxD, RxD, DSR, DTR, GND
Transmission Distance		Max. 15 M at 115200 bps
Speed		300 ~ 115200 bps
ESD Protection		Yes
3000 VDC Three Way Isolated Protection		Yes
Connector	RS-232 Input	9-Pin Female D-Sub
	RS-232 Output	9-Pin Male D-Sub
LED Indicators		
Power/Communication		Yes
Power		
Input Voltage Range		+10 VDC ~ +30 VDC (Non-isolated)
Power Consumption		1.2 W
Mechanical		
Casing		Plastic
Dimensions (W x H x D)		72 mm x 118 mm x 35 mm
Installation		DIN-Rail Mounting
Environment		
Operating Temperature		-25 °C ~ +75 °C
Storage Temperature		-30 °C ~ +75 °C
Humidity		10 ~ 90% RH, non-condensing

Applications



Pin Assignments



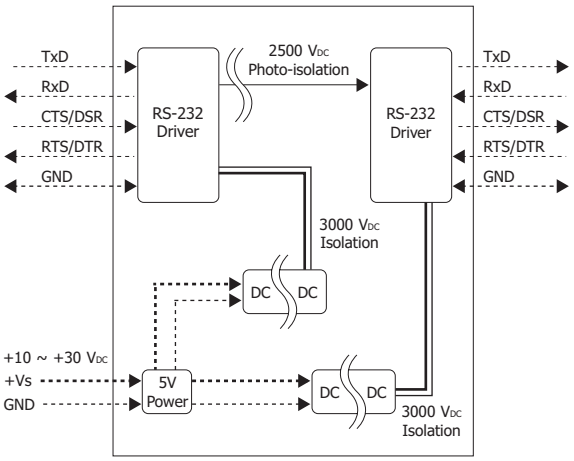
TxD, RxD, CTS, RTS, GND (Default)

RS-232 Input			RS-232 Output		
Pin Assignment	Terminal No.	Pin Assignment	Pin Assignment	Terminal No.	Pin Assignment
--	01	06 DTR	GND	05	09 --
TxD	02	07 CTS	--	04	08 CTS
RxD	03	08 RTS	TxD	03	07 RTS
DSR	04	09 --	RxD	02	06 --
GND	05		--	01	
Female DB-9 Connector			Male DB-9 Connector		

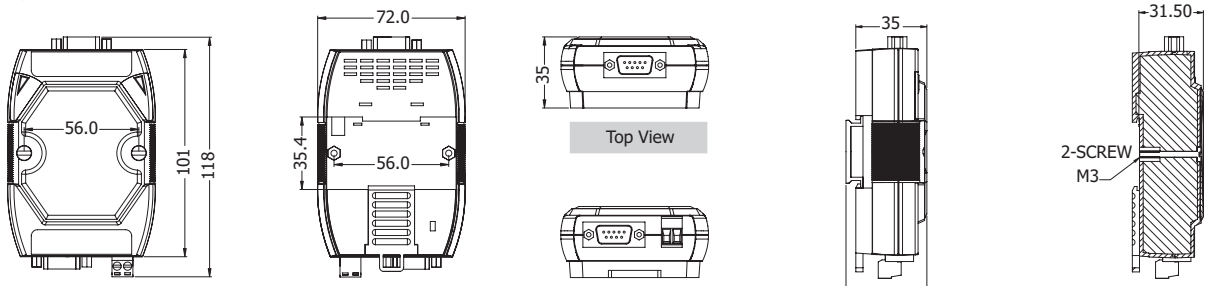
TxD, RxD, DTR, DSR, GND

RS-232 Input			RS-232 Output		
Pin Assignment	Terminal No.	Pin Assignment	Pin Assignment	Terminal No.	Pin Assignment
--	01	06 DTR	GND	05	09 --
TxD	02	07 CTS	DTR	04	08 --
RxD	03	08 RTS	TxD	03	07 --
DSR	04	09 --	RxD	02	06 DSR
GND	05		--	01	
Female DB-9 Connector			Male DB-9 Connector		

Internal I/O Structure



Dimensions (Units: mm)



Front View | Rear View | Top View | Bottom View | DIN-Rail Mounting Bracket | Side View

Ordering Information

I-7551 CR	Isolated RS-232 to RS-232 Converter (RoHS)
I-7551-G CR	Isolated RS-232 to RS-232 Converter (Gray Cover) (RoHS)

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting

3-5 Intelligent Communication Controllers

I-752N Series

Programmable Intelligent Communication Controller

Features

- Built-in "Addressable RS-485 to RS-232 Converter" firmware
- Supports about 30 well-defined commands
- Supports power-up and safe value for DO
- R.O.C. Invention Patent No. 086674, No.103060 and No.132457
- Programmable Intelligent Communication Controller
- Supports Dual-Watchdog commands
- Watchdog timer provides fault tolerance and recovery
- Low power consumption

Introduction

There are many RS-232 devices in industry applications. Nowadays it becomes important to link all those RS-232 devices together for automation and information. Usually those RS-232 devices are far away from the host-PC and widely distributed in the factory. So it is not a good idea to use multi-serial cards to connect all these RS-232 devices together. The I-752N series product can be used to link multiple RS-232 devices by a single RS-485 network. The RS-485 is famous for its easy maintenance, simple cabling, stable, reliable and low cost.

Onboard 1 KB Queue buffer

The I-752N series module is equipped with a 1 KB queue buffer for its local RS-232 device. All input data can be stored in the queue buffer until the Host PC has time to read it. This feature allows the Host PC to link thousands of RS-232 devices without any loss of data.

3000V isolation on RS-485 side

COM2 of the I-752N modules is an isolated RS-485 port with 3000 VDC isolation, which protects the local RS-232 devices from transient noises coming from the RS-485 network.

Self-Tuner ASIC inside

The built-in Self-Tuner ASIC on an RS-485 port can auto detect and control the send/receive direction of the RS-485 network. Thus, there is no need for application programs to be concerned about direction control of the RS-485 network.

Can be used as Addressable RS-485 to RS-232 Converter

Most RS-232 devices don't support device addressing. The ICP DAS I-752N module assigns a unique address for each RS-232 device installed. When Host PC sends a command with a device address to the RS-485 network, the destination I-752N module will remove the address field, and then pass the other commands to the specified local RS-232 devices. The response from the local RS-232 devices will be returned to the Host PC via the I-752N.

Master-type Addressable RS-485 to RS-232 Converter

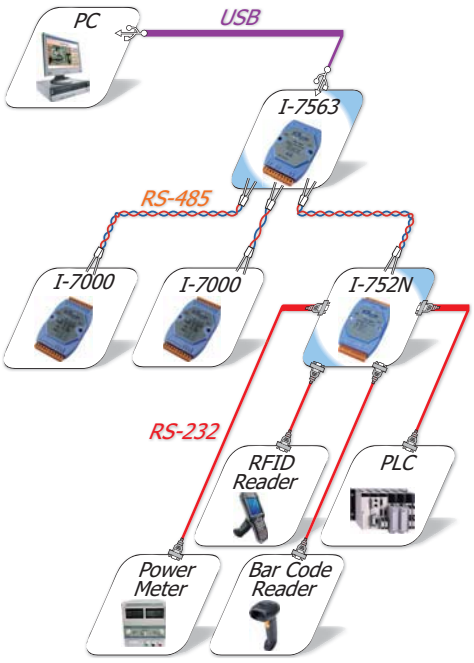
The ICP DAS I-752N product is unique that they are Master type converters which use our R.O.C. Patent 086674, while most other converters are Slave-type, which are helpless without a Host PC. In real industrial applications, many users are not satisfied with Slave-type converters as they cannot be adapted to individual requirement. The powerful I-752N series analyzes the local RS-232 devices, DI and DO without the need for a Host PC. Refer to Applications 5 ~ 9 for more information in the manual.

Can be used as RS-232 to RS-485 Device Server

The Device Server is an appliance that networking any device with a serial communication port. The I-752N series Intelligent Communication Controller allows the RS-232 serial devices to connect to the RS-485 network. Also, there are PDS series products available from ICP DAS, which provide Ethernet connectivity for serial devices.

Applications

- Factory Automation
- Building Automation
- Home Automation



I/O Specifications

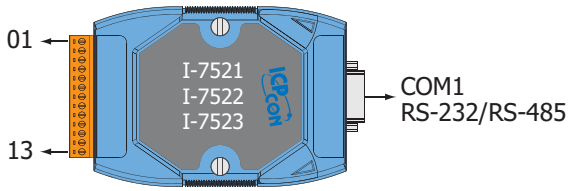
Models	I-7521(D)	I-7522(D)	I-7523(D)	I-7522A(D)	I-7524(D)	I-7527(D)
User-Defined I/O						
I/O Channel	3	–	–	–	–	–
Digital Output						
DI Channel	2	2	1	5	1	1
Input Type	Source (Dry Type), Common Ground, non-isolated					
Off Voltage	+1 V max.					
On Voltage	+3.5 VDC ~ +30 VDC					
Digital Output						
DO Channel	3	1	–	5	1	1
Output Type	Open Collector (Sink/NPN), non-isolated					
Load Voltage	+30 VDC max.					
Load Current	100 mA max.					

System Specifications

Models	I-7521(D)	I-7522(D)	I-7523(D)	I-7522A(D)	I-7524(D)	I-7527(D)
System						
CPU	80188, 20 MHz (MiniOS7 Operating System)					
Memory	128 KB SRAM, 512 KB Flash, 2 KB EEPROM					
Real-Time Clock	–					
Watchdog Timer	Yes					
Communication Interface						
COM1	5-wire RS-232 or 2-wire RS-485					
COM2	Isolated 2-wire RS-485			2-wire RS-485		
COM3	–	5-wire RS-232	5-wire RS-232	4-wire RS-422	5-wire RS-232	3-wire RS-232
COM4	–	–	3-wire RS-232	–	5-wire RS-232	3-wire RS-232
COM5	–	–	–	–	5-wire RS-232	3-wire RS-232
COM6	–	–	–	–	–	3-wire RS-232
COM7	–	–	–	–	–	3-wire RS-232
COM8	–	–	–	–	–	3-wire RS-232
Baud Rate	300 ~ 115200 bps					
Data Bit	COM1 ~ COM2: 7 or 8					
	COM3 ~ COM8: 5, 6, 7 or 8					
Parity	COM1 ~ COM2: None, Even, Odd					
	COM3 ~ COM8: None, Even, Odd, Mark , Space					
Stop Bit	COM1 ~ COM2: 1 or 2 (data bit must be 7)					
	COM3 ~ COM8: 1 or 2					
Connector	Male DB-9 x 1 13-Pin screw terminal block x 1 (for 16 ~ 26 AWG wires; 3.81 mm pitch)			14-Pin screw terminal block x 2 (for 16 ~ 22 AWG wires; 3.5 mm pitch)		
LED Indicators						
LED Display	5-digit 7-segment LED display for D versions					
Power						
Protection	Power input reverse polarity protection					
Power Requirement	Unregulated +10 VDC ~ 30 VDC					
Power Consumption	2 W (without display), 3 W (with display)					
Mechanical						
Casing	Plastic					
Dimensions (W x H x D)	72 mm x 118 mm x 35 mm			72 mm x 120 mm x 35 mm		
Installation	DIN-Rail Mounting					
Environment						
Operating Temperature	-25 °C ~ +75 °C					
Storage Temperature	-40 °C ~ +80 °C					
Humidity	0 ~ 90% RH, non-condensing					

Note:
3-wire RS-232: RxD, TxD, GND
5-wire RS-232: RxD, TxD, CTS, RTS, GND
2-wire RS-485: DATA+, DATA-, GND; Self-Tuner inside
Isolated 2-wire RS-485: DATA+, DATA-; Self-Tuner inside; 3000 VDC Isolation
4-wire RS-422: RxD+, RxD-, TxD+, TxD-, GND

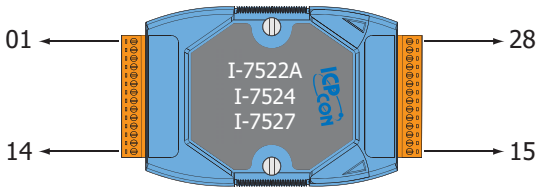
Pin Assignments



Terminal No.		Pin Assignment
	01	X3
	02	X2
	03	X1
DO	04	DO3
	05	DO2
	06	DO1
DI	07	DI3
	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment	Terminal No.	Pin Assignment
GND	05	09 Data-
N.C.	04	08 RTS
RxD	03	07 CTS
TxD	02	06 N.C.
Data+	01	

COM1: RS-232
Male DB-9 Connector



Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

X507

Terminal No.		Pin Assignment
DO	28	DO3
	27	DO2
	26	DO1
	25	DO0
	24	DO.PWR
	23	GND
DI	22	DI3
	21	DI2
	20	DI1
	19	DI0
COM3	18	RxD3-
	17	RxD3+
	16	TxD3-
	15	TxD3+

Terminal No.		Pin Assignment
COM3	01	CTS3
	02	RTS3
	03	RxD3
	04	TxD3
	05	GND
DO	06	DO1
DI	07	DI3
	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment	Terminal No.	Pin Assignment
GND	05	09 Data-
N.C.	04	08 RTS
RxD	03	07 CTS
TxD	02	06 N.C.
Data+	01	

COM1: RS-232
Male DB-9 Connector

Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

X505

Terminal No.		Pin Assignment
COM5	28	RxD5
	27	TxD5
	26	RTS5
	25	CTS5
	24	GND
COM4	23	RxD4
	22	TxD4
	21	RTS4
	20	CTS4
	19	GND
COM3	18	RxD3
	17	TxD3
	16	RTS3
	15	CTS3

Terminal No.		Pin Assignment
COM3	01	CTS3
	02	RTS3
	03	RxD3
	04	TxD3
	05	GND
COM4	06	TxD4
	07	RxD4
DI	08	DI2
	09	INIT*
COM2	10	(Y)D2+
	11	(G)D2-
Power Input	12	(R)+Vs
	13	(B)GND

Pin Assignment	Terminal No.	Pin Assignment
GND	05	09 Data-
N.C.	04	08 RTS
RxD	03	07 CTS
TxD	02	06 N.C.
Data+	01	

COM1: RS-232
Male DB-9 Connector

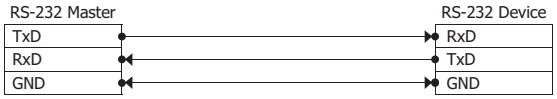
Terminal No.		Pin Assignment
DO	01	DO
DI	02	DI
COM1	03	D1+
	04	D1-
	05	CTS1
	06	RTS1
	07	GND
	08	TxD1
	09	RxD1
	10	INIT*
COM2	11	(Y)D2+
	12	(G)D2-
Power Input	13	(R)+Vs
	14	(B)GND

X506

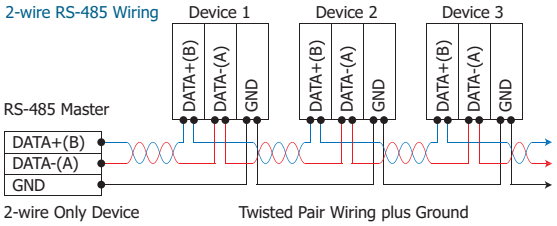
Terminal No.		Pin Assignment
COM7/8	28	TxD8
	27	RxD8
	26	TxD7
	25	RxD7
	24	GND
COM5/6	23	TxD6
	22	RxD6
	21	TxD5
	20	RxD5
	19	GND
COM3/4	18	TxD4
	17	RxD4
	16	TxD3
	15	RxD3

Wiring

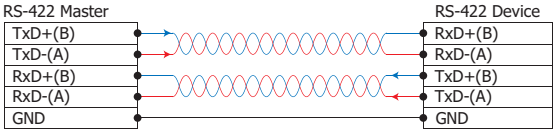
3-wire RS-232 Wiring

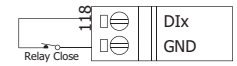
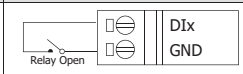
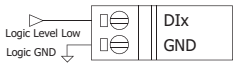
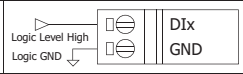
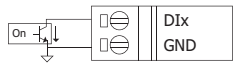
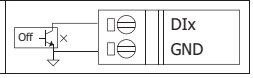


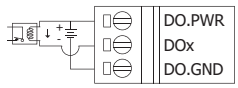
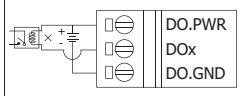
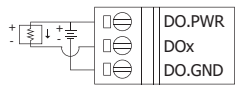
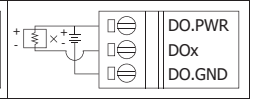
2-wire RS-485 Wiring



4-wire RS-422 Wiring

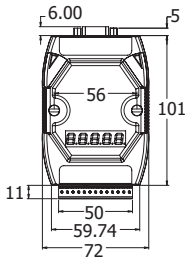


Input Type	DI Value as 0	DI Value as 1
Relay Contact	Relay ON	Relay Off
		
TTL/CMOS Logic	Voltage < 1V	Voltage > 3.5V
		
Open Collector	Open Collector On	Open Collector Off
		

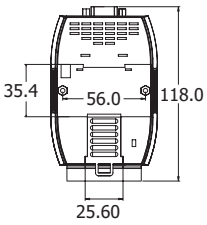
Output Type	DO Command as 1	DO Command as 0
Drive Relay	Relay ON	Relay Off
		
Resistance Load		
		

Dimensions (Units: mm)

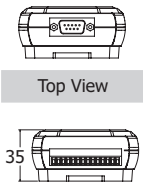
I-7521(D)/I-7522(D)/I-7523(D)



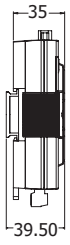
Front View



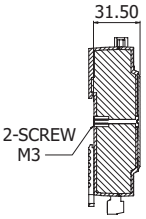
Rear View



Bottom View

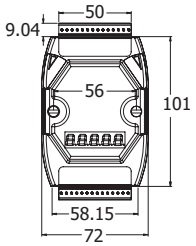


DIN-Rail Mounting Bracket

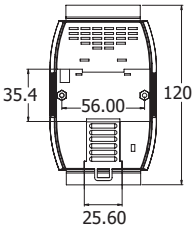


Side View

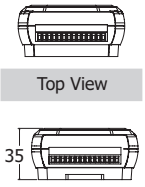
I-7521(D)/I-7522(D)/I-7523(D)



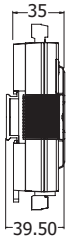
Front View



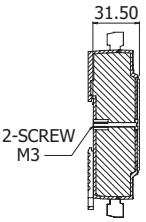
Rear View



Bottom View



DIN-Rail Mounting Bracket



Side View

Ordering Information

I-7521 CR	Programmable Intelligent Communication Controller (RoHS)	I-7523 CR	Programmable Intelligent Communication Controller (RoHS)
I-7521D CR	I-7521 with Display	I-7523D CR	I-7523 with Display
I-7522 CR	Programmable Intelligent Communication Controller (RoHS)	I-7524 CR	Programmable Intelligent Communication Controller (RoHS)
I-7522D CR	I-7522 with Display	I-7524D CR	I-7524 with Display
I-7522A CR	Programmable Intelligent Communication Controller (RoHS)	I-7527 CR	Programmable Intelligent Communication Controller (RoHS)
I-7522AD CR	I-7522A with Display	I-7527D CR	I-7527 with Display

Accessories

MDR-20-24	24 VDC/1 A, 24 W Power Supply with DIN-Rail Mounting	GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting	KA-52F	24 VDC/1.04 A, 25 W Power Supply

3-6. USB to RS-232/422/485 Converters

USB-2514

USB to 4-Port RS-232 Converter

Features

- Hi-Speed USB 2.0 for up to 480 Mbps USB transmission
- Power and data flow indicator for troubleshooting
- Driver Supports Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/Linux
- Transmission speed up to 921.6 kbps
- Bus-powered; no need for external power supply for USB-2514
- Operating Temperatures, -25 °C ~ +75 °C
- DIN-Rail Mounting

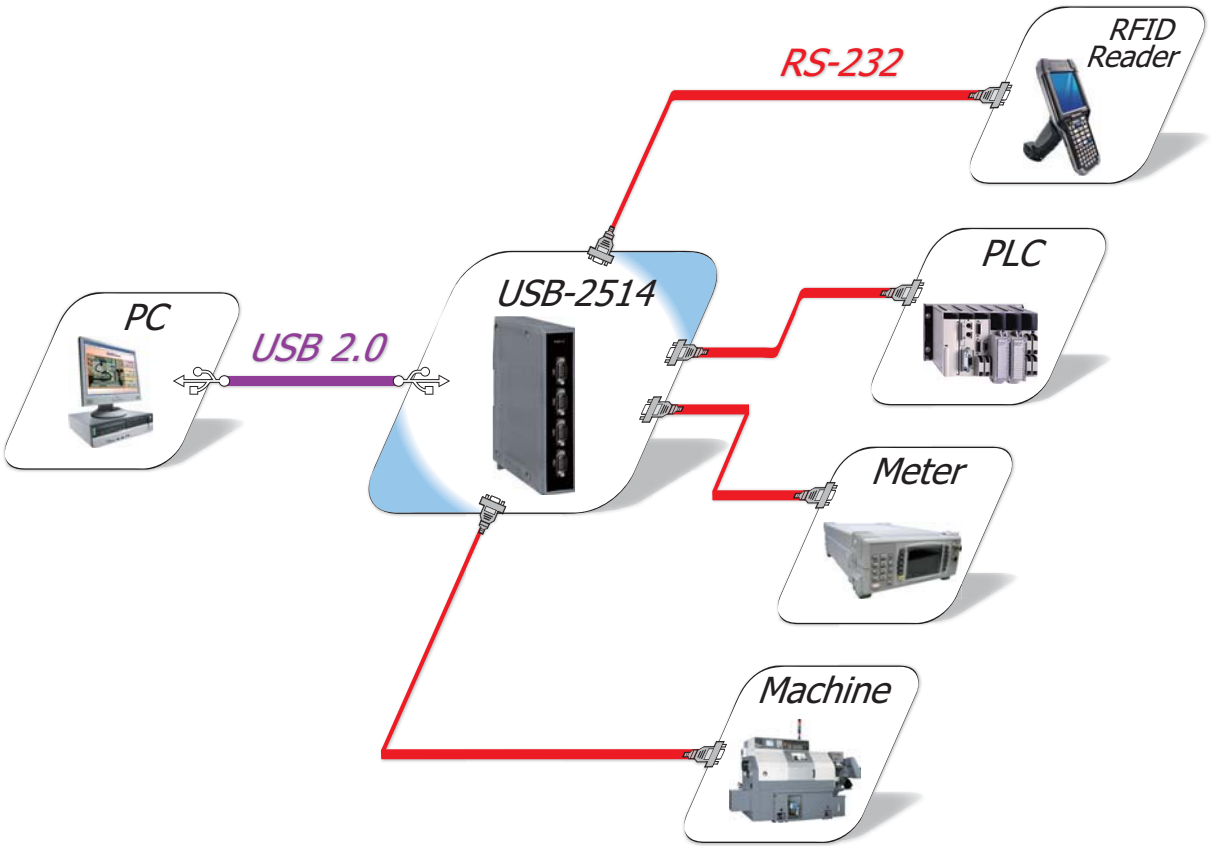
Introduction

USB-2514 allows PC users to connect a serial device to a system that use a USB interface. To attach the USB-2514 to a PC, you don't need to open the chassis or power down your PC. Instantly get extra high-speed RS-232 ports. The power is derived from the USB port, so there are no power adapters to deal with. Supporting high-speed 921.6 kbps transmission.

System Specifications

Interface		
USB		Fully Compliant with the USB 1.1/2.0/3.0
RS-232		TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
Speed		300 bps ~ 921.6 Kbps
Connector	RS-232	DB9 male x 4
	USB	Type B
LED Indicators		
Power/Communication		Yes
Power		
Input Voltage Range		Bus-powered
Power Consumption		4 W
Mechanical		
Casing		Plastic
Dimensions (W x H x D)		31 mm x 157 mm x 116 mm
Environment		
Operating Temperature		-25 °C ~ +75 °C
Storage Temperature		-30 °C ~ +75 °C
Humidity		10 ~ 90% RH, non-condensing

Applications



Ordering Information

USB-2514 CR	USB to 4-Port RS-232 Converter (RoHS)
Include Cable	CA-USB18 (1.8 m Cable) x 1

Accessories

USB-2560 CR		Industrial 4-port USB 2.0 Hub

I-7560

USB to RS-232 Converter

I-7560U

USB to RS-232 Converter (Windows 8 / 8.1)

Features

- Fully Compliant with the USB 1.1/2.0/3.0
- Transmission speed up to 921.6 kbps (For I-7560U)
- No External Power Supply required
- Operating Temperatures, -25 °C ~ +75 °C

Introduction

The I-7560/I-7560U provides a Windows serial COM port via it's USB connection and is compatible with new and legacy RS-232 devices. USB Plug-and-Play allows easy serial port expansion and requires no IRQ, DMA, or I/O port settings manually.

The I-7560/I-7560U features a full set of RS-232 modem data and control signals (TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND) on it's PC compatible DB-9 male connector. It also features a high-speed 115200 bps transmission rate.

The I-7560/I-7560U is powered from the USB bus and no additional power supply is needed.

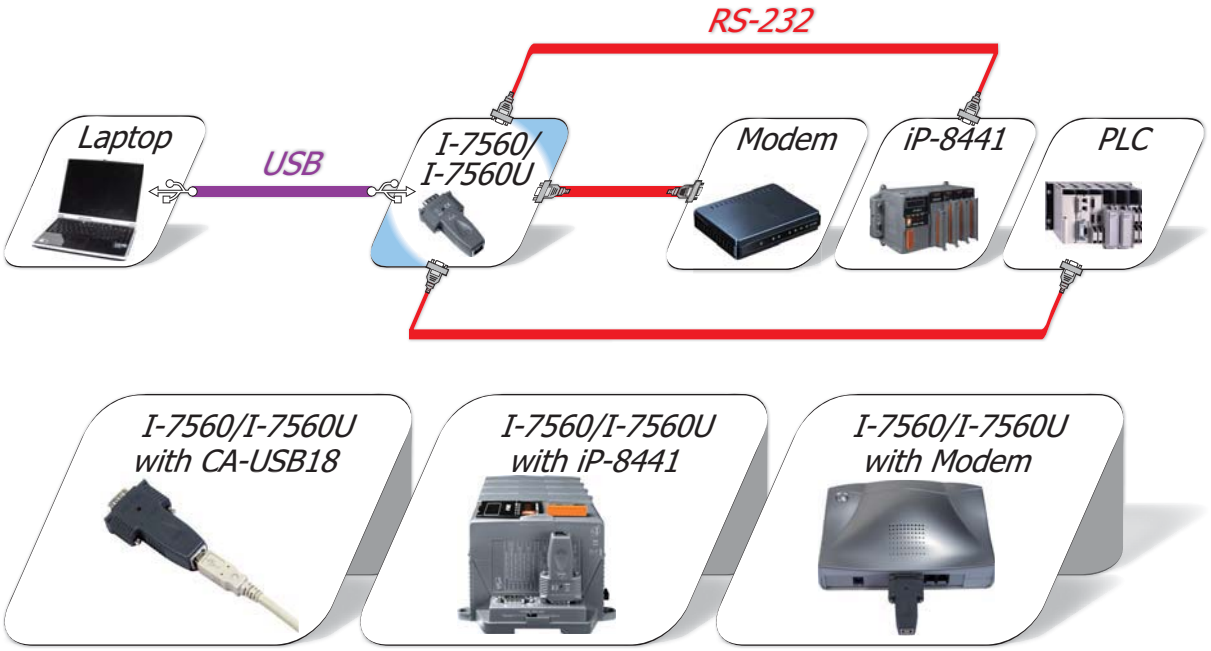
Software

I-7560 Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/10/Linux
I-7560U Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/10/Linux

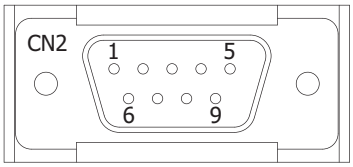
System Specifications

Models		I-7560	I-7560U
Interface			
USB		Fully Compliant with the USB 1.1/2.0/3.0	
RS-232		TxD, RxD, RTS, CTS, DSR, DTR, DCD, RI and GND; non-isolated	
Speed		300 ~ 115200 bps	300 ~ 921.6 kbps
Connector	RS-232	9-Pin Male D-Sub	
	USB	Type B	
Cable Included		CA-USB18 (1.8 m Cable) x 1	
LED Indicators			
Power		Yes	
Power			
Input Voltage Range		+5 VDC from USB	
Power Consumption		0.3 W	
Mechanical			
Casing		Plastic	
Dimensions (W x H x D)		33 mm x 60 mm x 15 mm	
Environment			
Operating Temperature		-25 °C ~ +75 °C	
Storage Temperature		-30 °C ~ +75 °C	
Humidity		10 ~ 90% RH, non-condensing	

Applications

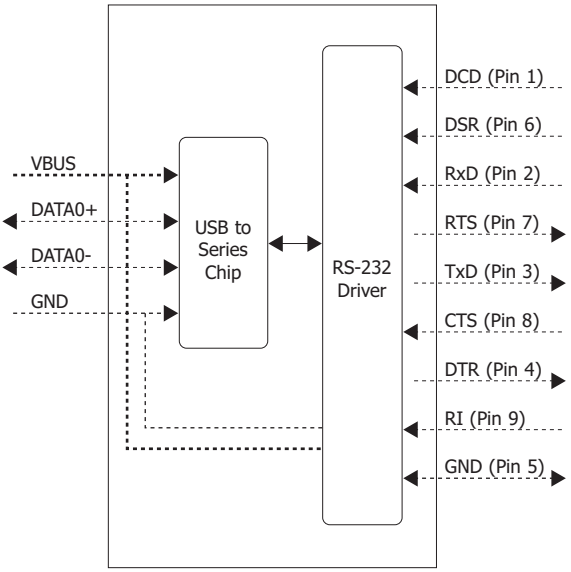


Pin Assignments

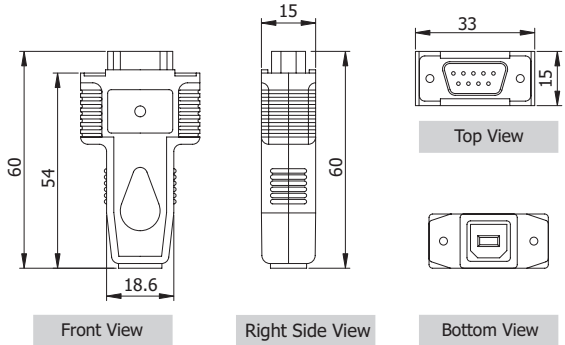


Pin	Signal		Mode
01	DCD	Data Carrier Detect	Input
02	RxD	Receive Data	Input
03	TxD	Transmit Data	Output
04	DTR	Data Term Ready	Output
05	GND	Ground	--
06	DSR	Data Set Ready	Input
07	RTS	Request To Send	Output
08	CTS	Clear To Send	Input
09	RI	Ring Indicator	Input

Internal I/O Structure



Dimensions (Units: mm)



Ordering Information

I-7560 CR	USB to RS-232 Converter (RoHS)
I-7560U CR	USB to RS-232 Converter (RoHS)

Accessories

USB-2560 CR	CA-USB18
Industrial 4-port USB 2.0 Hub	USB Type A to Type B Cable

tM-7561

USB to Isolated RS-485 Converter

Features

- Fully Compliant with the USB 1.1/2.0/3.0
- Power and data flow indicator for troubleshooting
- 2500 VDC Isolation Protection on the RS-485 side
- Driver Supports Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/Linux
- Tiny packaging fits on your DIN-Rail Mounting
- No External Power Supply required
- Automatic RS-485 Direction Control
- Operating Temperatures, -25 °C ~ +75 °C
- Low power consumption
- Cost-effective Converter

Introduction

The tM-7561 is a cost-effective USB to RS-485 converter. Connecting the tM-7561 to a PC, you get one RS-485 port that allows you to access RS-485 devices through the USB interface. Like the I-7520, the tM-7561 contains "Self-Tuner" chip auto-tunes the baud rate and data format to the RS-485 network. The tM-7561 module derives its power from the USB port and doesn't need external power adapter.

Comparison Table of Converter

Models Name	tM-7561	I-7561U	I-7561
Serial Interface	Only RS-485	RS-232/422/485	RS-232/422/485
Dimensions (W x H x D)	52 mm x 87 mm x 27 mm	72 mm x 115 mm x 35 mm	72 mm x 115 mm x 35 mm
Remarks	Cost-effective, Entry-level	Entry-level	Entry-level

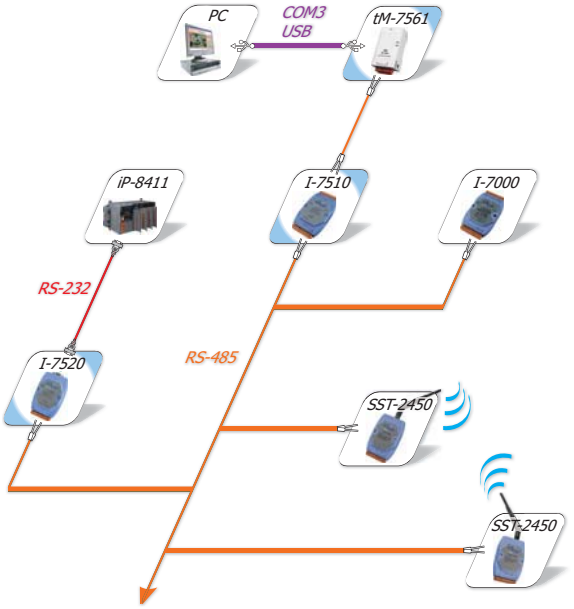
Software

Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/10/Linux

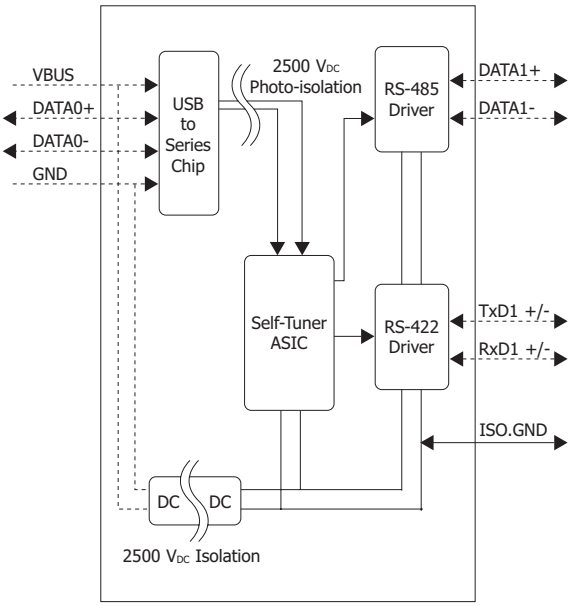
System Specifications

Models		tM-7561
Interface		
USB		Fully Compliant with the USB 1.1/2.0/3.0
Serial Interface	RS-422	–
	RS-485	Data+, Data-
Serial Interface Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)
Self-Tuner Asic Inside		Yes
Speed		300 ~ 115200 bps
Connector	RS-422/485	Removable 7-Pin Terminal Block
	USB	Type B
Cable Included		CA-USB18 (1.8 m Cable) x 1
LED Indicators		
Power		Yes
Power		
Input Voltage Range		+5 VDC from USB
Power Consumption		0.4 W
Mechanical		
Casing		Plastic
Dimensions (W x H x D)		52 mm x 87 mm x 27 mm
Installation		DIN-Rail Mounting
Environment		
Operating Temperature		-25 °C ~ +75 °C
Storage Temperature		-30 °C ~ +75 °C
Humidity		10 ~ 90% RH, non-condensing

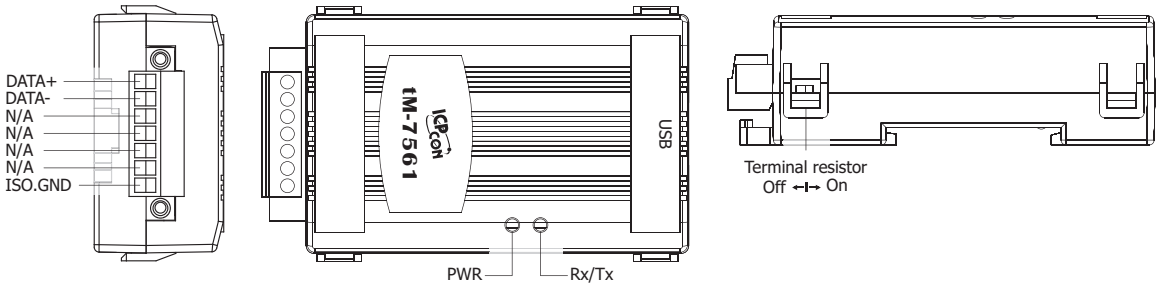
Applications



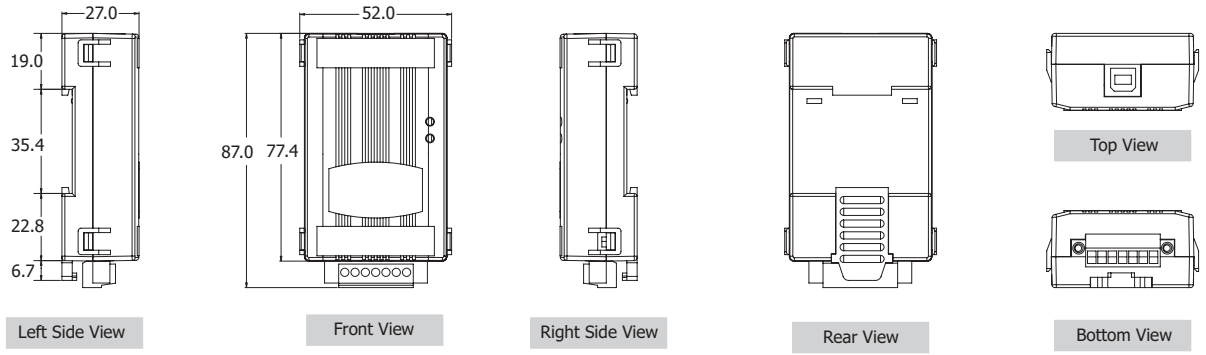
Internal I/O Structure



Pin Assignments



Dimensions (Units: mm)



Ordering Information

tM-7561 CR	USB to Isolated RS-485 Converter (RoHS)
Include Cable	CA-USB18 (1.8 m Cable) x 1

Accessories

USB-2560 CR	Industrial 4-port USB 2.0 Hub
CA-USB18	USB Type A to Type B Cable

I-7561

USB to Isolated RS-232/422/485 Converter

I-7561U

USB to Isolated RS-232/422/485 Converter (Windows 8 / 8.1)

Features

- Fully Compliant with the USB 1.1/2.0/3.0
- 3000 VDC Isolation Protection on the RS-232/422/485 side
- ESD Protection for the RS-232/422/485 Data Line
- Transmission speed up to 921.6 kbps (For I-7561U)
- No External Power Supply required
- Automatic RS-485 Direction Control
- Operating Temperatures, -25 °C ~ +75 °C
- DIN-Rail Mounting

Introduction

The I-7561/I-7561U is a cost-effective module for transferring serial data via USB. It allows you to connect your serial devices to systems that use a USB interface. Connecting the I-7561/I-7561U to a PC, you get one RS-232/422/485 port. Like the I-7520A, the I-7561 contains "Self-Tuner" chip auto-tunes the Baud Rate and data format to the RS-485 network. The I-7561/I-7561U module derives its power from the USB port and doesn't need any power adapter.

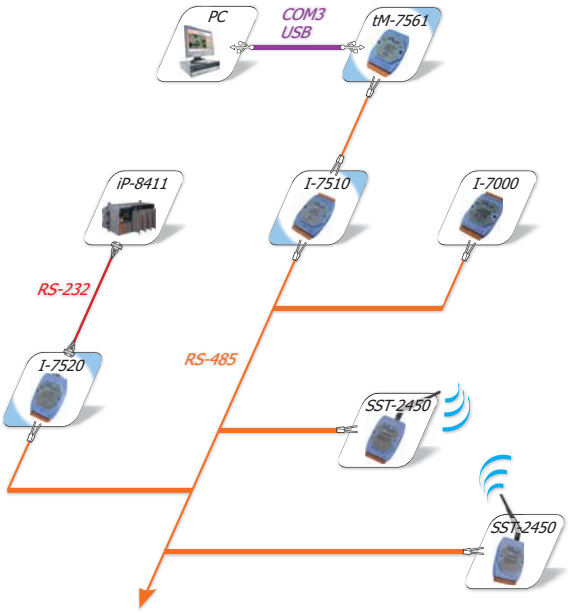
Software

I-7561 Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/10/Linux
I-7561U Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/10/Linux

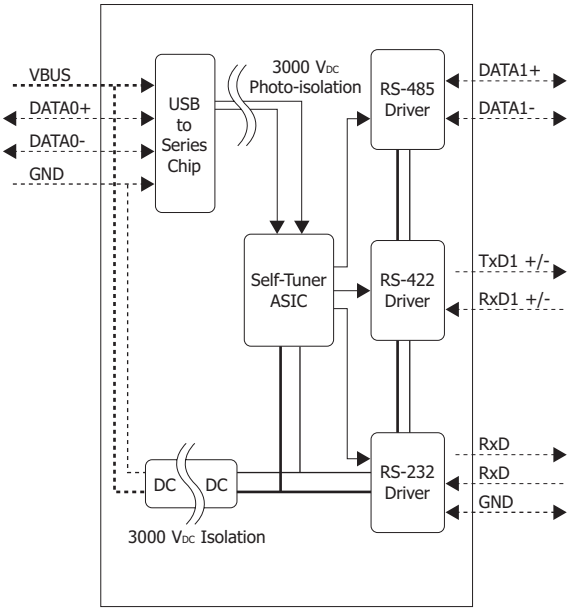
System Specifications

Models		I-7561	I-7561U
Interface			
USB		Fully Compliant with the USB 1.1/2.0/3.0	
Serial Interface	RS-232	The RS-232, RS-422 and RS-485 cannot be used simultaneously • TxD, RxD, GND • TxD+, TxD-, RxD+, RxD- • Data+, Data-	
	RS-422		
	RS-485		
RS-422/485 Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)	
Self-Tuner Asic Inside (RS-485)		Yes	
Speed		300 ~ 115200 bps	300 ~ 921.6 kbps
Connector	RS-232/422/485	Removable 10-Pin Terminal Block	
	USB	Type B	
Cable Included		CA-USB18 (1.8 m Cable) x 1	
LED Indicators			
Power		Yes	
Power			
Input Voltage Range		+5 VDC from USB	
Power Consumption		0.5 W	
Mechanical			
Casing		Plastic	
Dimensions (W x H x D)		72 mm x 115 mm x 35 mm	
Installation		DIN-Rail Mounting	
Environment			
Operating Temperature		-25 °C ~ +75 °C	
Storage Temperature		-30 °C ~ +75 °C	
Humidity		10 ~ 90% RH, non-condensing	

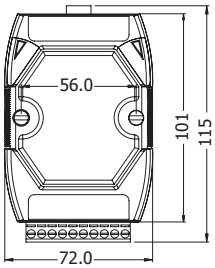
Applications



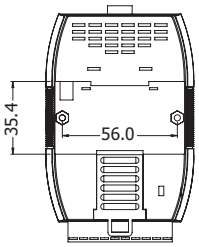
Internal I/O Structure



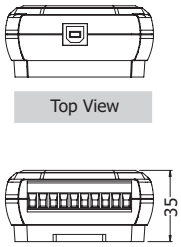
Dimensions (Units: mm)



Front View

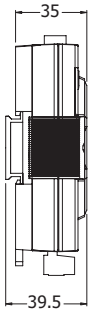


Rear View

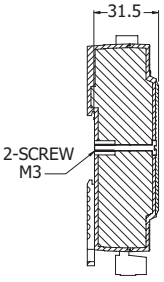


Top View

Bottom View



DIN-Rail Mounting Bracket



Side View

Pin Assignments

Terminal No.		Pin Assignment
RS-485	01	DATA+
	02	DATA-
RS-422/485	03	TxD+
	04	TxD-
	05	RxD+/DATA2+
	06	RxD-/DATA2-
RS-232	07	TxD
	08	RxD
	09	(B)GND
	10	(B)GND

Ordering Information

I-7561 CR	USB to Isolated RS-232/422/485 Converter (RoHS)
I-7561-G CR	USB to Isolated RS-232/422/485 Converter (Gray Cover) (RoHS)
I-7561U-G CR	USB to Isolated RS-232/422/485 Converter (Gray Cover) (RoHS)
Include Cable	CA-USB18 (1.8 m Cable) x 1

Accessories

USB-2560 CR	Industrial 4-port USB 2.0 Hub
CA-USB18	USB Type A to Type B Cable

I-7563

USB to Isolated RS-485 Active Star Wiring Converter

I-7563U NEW

USB to Isolated RS-485 Active Star Wiring Converter (Windows 8 / 8.1)

I-7563/I-7563-G I-7563U-G

Features

- Fully Compliant with the USB 1.1/2.0/3.0
- RS-485 Active Star Wiring Applications
- 3000 VDC Isolation Protection on the RS-485 side
- Transmission speed up to 921.6 kbps (For I-7563U)
- No External Power Supply required
- Automatic RS-485 Direction Control
- ESD Protection for the RS-485 Data Line
- Operating Temperatures, -25 °C ~ +75 °C
- DIN-Rail Mounting

Introduction

The I-7563/I-7563U is a cost-effective module for transferring serial data via USB. It allows you to connect your serial devices to systems that use a USB interface. Connecting the I-7563/I-7563U to a PC, you get one COM port on system. The I-7563/I-7563U contains "Self-Tuner", this chip auto-tunes the Baud Rate and data format to the RS-485 network. The I-7563/I-7563U module derives its power from the USB port and doesn't need any power adapter.

Do you have any RS-485 wiring problems I-7563/I-7563U is a USB to 1-channel RS-485 converter with a 3-way RS-485 Hub. Each channel contains its own RS-485 driver IC, so it can support star-shaped wiring.

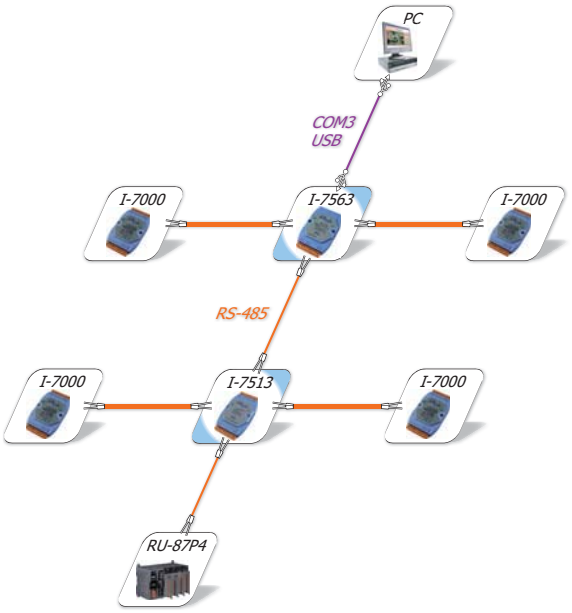
Software

I-7563 Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/10/Linux
I-7563U Driver	Windows 98/ME/2000/XP/Vista (32/64-bit)/7 (32/64-bit)/8 (32/64-bit)/8.1 (32/64-bit)/10/Linux

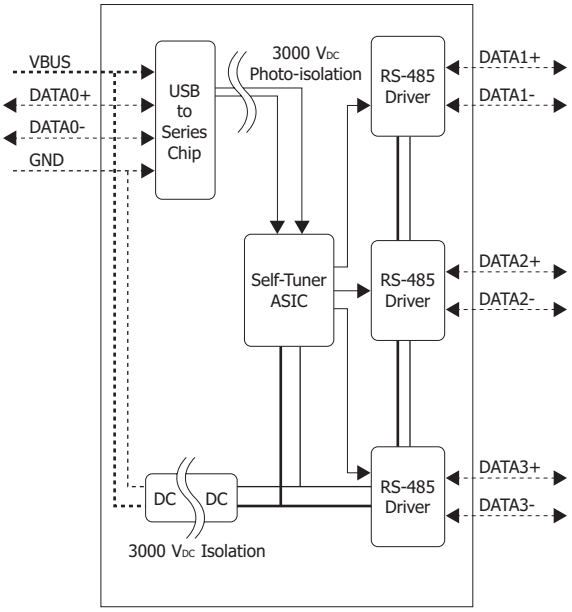
System Specifications

Models		I-7563	I-7563U
Interface			
USB		Fully Compliant with the USB 1.1/2.0/3.0	
RS-485		3 Channels: For active star wiring applications	
		Data1+, Data1-	
		Data2+, Data2-	
		Data3+, Data3-	
RS-485 Transmission Distance		Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)	
Self-Tuner Asic Inside for RS-485		Yes	
Speed		300 ~ 115200 bps	300 ~ 921.6 kbps
Connector	RS-485	Removable 10-Pin Terminal Block	
	USB	Type B	
Cable Included		CA-USB18 (1.8 m Cable) x 1	
LED Indicators			
Power		Yes	
Power			
Input Voltage Range		+5 VDC from USB	
Power Consumption		0.5 W	
Mechanical			
Casing		Plastic	
Dimensions (W x H x D)		72 mm x 115 mm x 35 mm	
Installation		DIN-Rail Mounting	
Environment			
Operating Temperature		-25 °C ~ +75 °C	
Storage Temperature		-30 °C ~ +75 °C	
Humidity		10 ~ 90% RH, non-condensing	

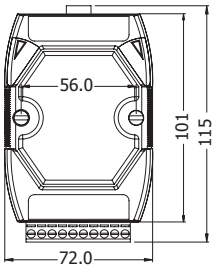
Applications



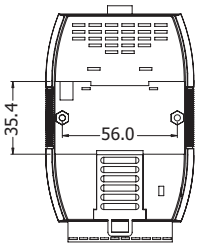
Internal I/O Structure



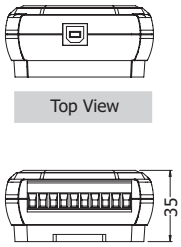
Dimensions (Units: mm)



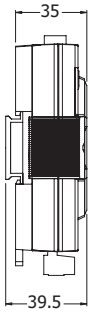
Front View



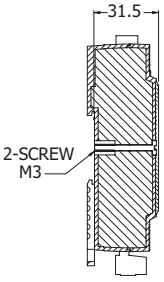
Rear View



Bottom View



DIN-Rail Mounting Bracket



Side View

Pin Assignments

Terminal No.		Pin Assignment
RS-485	01	DATA3-
	02	DATA3+
	03	--
RS-485	04	DATA2-
	05	DATA2+
	06	--
	07	--
	08	--
RS-485	09	DATA1-
	10	DATA1+

Ordering Information

I-7563 CR	USB to Isolated RS-485 Active Star Wiring Converter (RoHS)
I-7563-G CR	USB to Isolated RS-485 Active Star Wiring Converter (Gray Cover) (RoHS)
I-7563U-G CR	USB to Isolated RS-485 Active Star Wiring Converter (Gray Cover) (RoHS)
Include Cable	CA-USB18 (1.8 m Cable) x 1

Accessories

USB-2560 CR	Industrial 4-port USB 2.0 Hub
CA-USB18	USB Type A to Type B Cable

3-7. RS-232/422/485 to Fiber Optic Converter

I-2541

RS-232/422/485 to Multi-Mode Fiber optic converter

I-2542 series NEW

RS-232/422/485 to Single-Mode Fiber optic converter

Features

- Automatic RS-485 Direction Control
- Avoids lightning strikes and EMI/RFI interference
- Supports +10 VDC ~ +30 VDC
- DIN-Rail Mounting
- ESD Protection for the RS-232/422/485 Data Line
- Optical fibers enable transmission: 2 km for I-2541
  15 km for I-2542-A/I-2542-B
  25 km for I-2542-A25/I-2542-B25
- Supports operating temperatures from -25 °C ~ +75 °C

Introduction

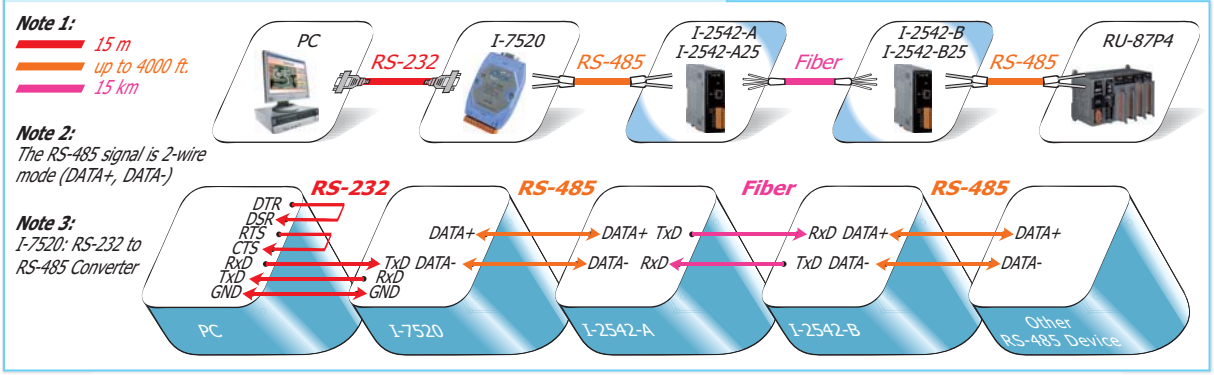
The I-2541 is an RS-232/422/485 to fiber optic converter that secures data transmission by using fiber optic transmission to provide immunity from EMI/RFI interference. The I-2541 is used for RS-232/422 point-to-point connections and RS-485 multi-drop applications for transmitting a signal up to 2 km and is the perfect solution for applications where transmission must be protected from electrical exposure, surges or chemical corrosion.
The I-2542 series of Single-Strand Fiber Converters supports Wavelength Division Multiplexing (WDM) technology that allows two independent data communication channels to transmit and receive over one standard, single mode, fiber optic line. This not only doubles your existing bandwidth, but also effectively reduces the cost of creating a new fiber optic infrastructure.

System Specifications

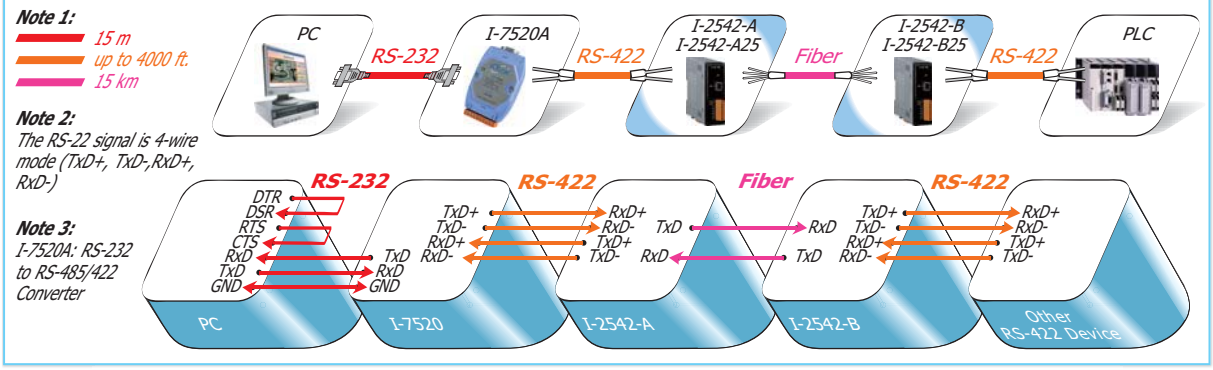
Models			I-2541	I-2542 series
Interface				
Fiber Interface	Fiber Port		Multi-Mode; ST connector	Single-Mode; SC connector
	Wavelength		850 nm	TX: 1310, RX: 1550 nm for I-2542-A/I-2542-A25 TX: 1550, RX: 1310 nm for I-2542-B/I-2542-B25
	Fiber Cable		50/125, 62.5/125, 100/140 µm	8.3/125, 8.7/125, 9/125 or 10/125 µm
	Distance		2 km, (62.5/125 µm recommended)	15 km for I-2542-A/I-2542-B 25 km for I-2542-A25/I-2542-B25 (9/125 µm recommended)
Serial Interface	RS-232	The RS-232, RS-422 and RS-485 cannot be used simultaneously	TxD, RxD, GND	
	RS-422		TxD+, TxD-, RxD+, RxD-	
	RS-485		Data+, Data-	
RS-422/485 Transmission Distance			Max. 1,200 m at 9.6 kbps; Max. 400 m at 115.2 kbps (Belden 9841 2P twisted-pair cable, if different cables are used, the transmission distance may change)	
Self-Tuner Asic Inside			Yes	
Speed			300 ~ 115200 bps	1200 ~ 115200 bps
ESD Protection			Yes	
RS-232/422/485 Connector			Removable 8-Pin Terminal Block	
LED Indicators				
Power			Yes	
Power				
Input Voltage Range			+10 VDC ~ +30 VDC (Non-isolated)	
Power Consumption			1.5 W	2 W
Mechanical				
Casing			Plastic	
Dimensions (W x L x H)			33 mm x 89 mm x 107 mm	33 mm x 88 mm x 107 mm
Installation			DIN-Rail Mounting	
Environment				
Operating Temperature			-25 °C ~ +75 °C	
Storage Temperature			-30 °C ~ +75 °C	
Humidity			10 ~ 90% RH, non-condensing	

Applications

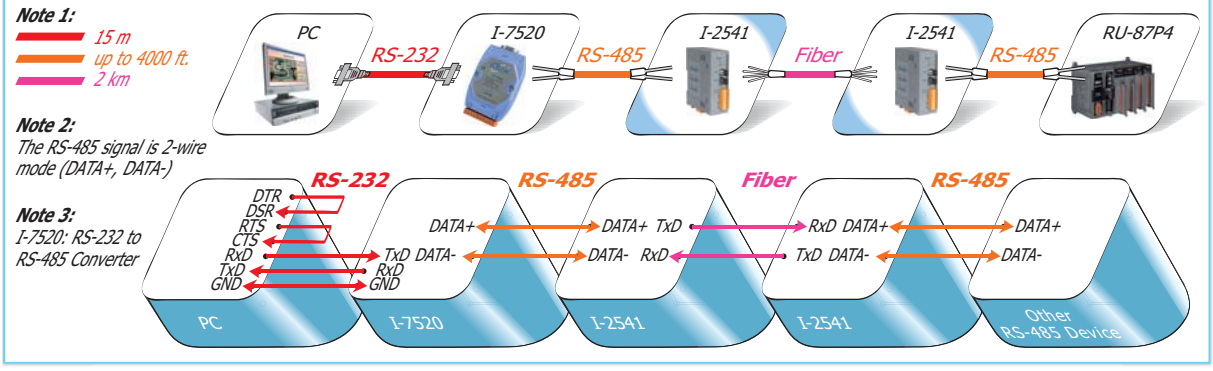
An illustration of the I-2542 for RS-485 Devices



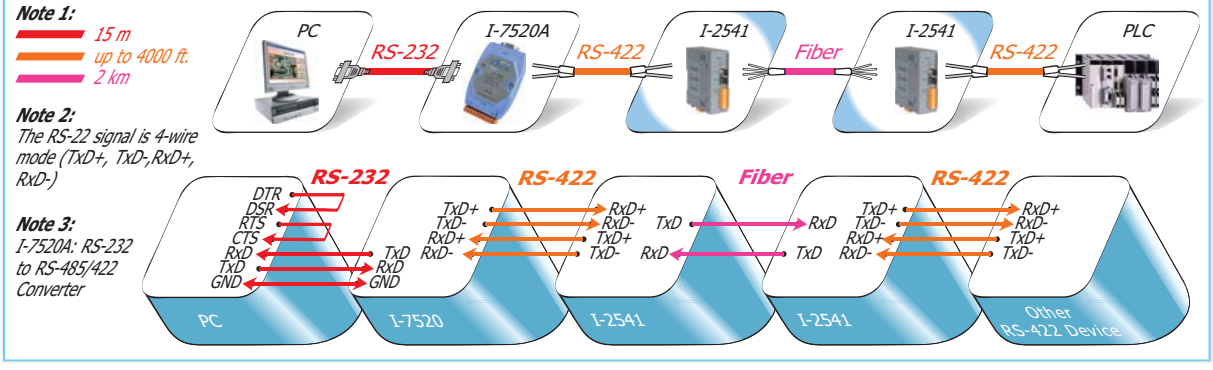
An illustration of the I-2542 for RS-422 Devices



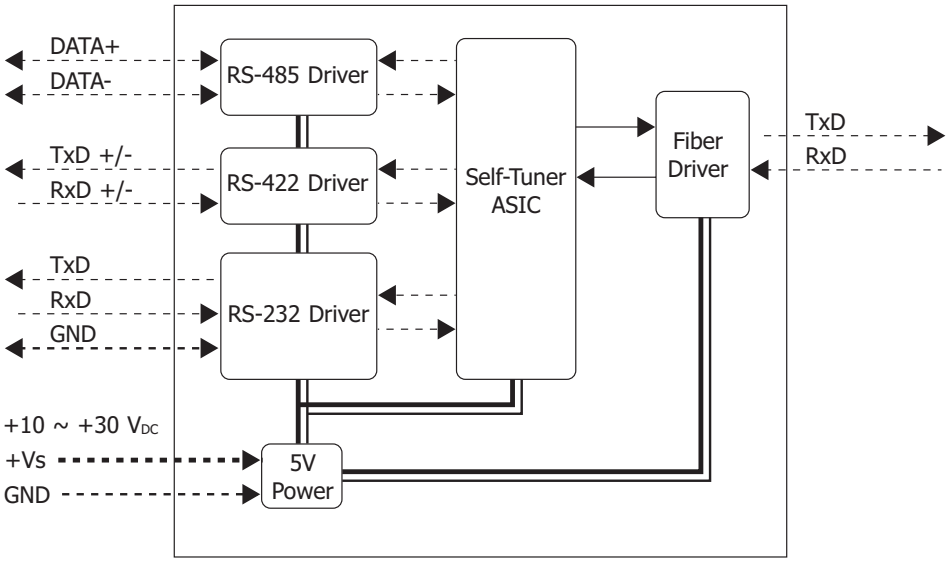
An illustration of the I-2541 for RS-485 Devices



An illustration of the I-2541 for RS-422 Devices

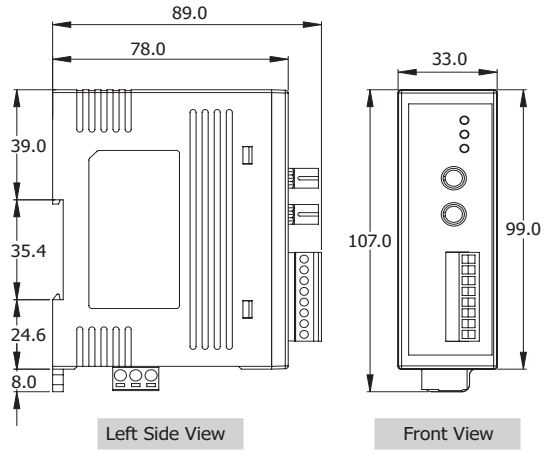


Internal I/O Structure

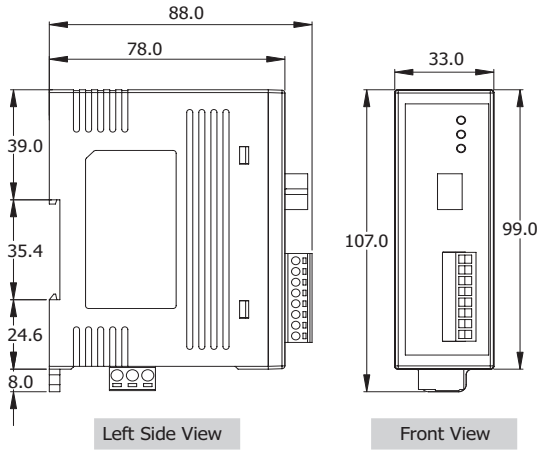


Dimensions (Units: mm)

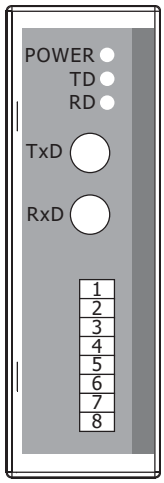
I-2541



I-2542 series



Pin Assignments



Terminal No.	Pin Assignment
TxD	Fiber TxD
RxD	Fiber RxD
01	TxD+/DATA+
02	TxD-/DATA-
03	RxD+
04	RxD-
05	NC
06	GND
07	TxD
08	RxD

Ordering Information

I-2541 CR	RS-232/422/485 to Multi-Mode 2 Km, ST Fiber optic converter
I-2542-A CR	RS-232/422/485 to Single-Mode 15 Km, SC Fiber optic converter, TX 1310 nm, RX 1550 nm (RoHS)
I-2542-B CR	RS-232/422/485 to Single-Mode 15 Km, SC Fiber optic converter, TX 1550 nm, RX 1310 nm (RoHS)
I-2542-A25 CR	RS-232/422/485 to Single-Mode 25 Km, SC Fiber optic converter, TX 1310 nm, RX 1550 nm (RoHS)
I-2542-B25 CR	RS-232/422/485 to Single-Mode 25 Km, SC Fiber optic converter, TX 1550 nm, RX 1310 nm (RoHS)

Important Note:
You must purchase both **I-2542-A/I-2542-A25** and **I-2542-B/I-2542-B25** since these products work as a pair.

Accessories

GPSU06U-6	24 VDC/0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC/1.04 A, 25 W Power Supply with DIN-Rail Mounting

3.8. RS-232/RS-485/USB to DALI Gateway

DGW-521

RS-232/RS-485/USB to DALI Gateway

Features

- Conversion between RS-485/RS-232/USB and DALI Interfaces
- ±4 ESD Protection for the RS-232/485/USB Data Line
- Built-in DALI Power can be enabled or disabled using a Switch
- ±4 kV EFT Protection and ±2 kV Surge Protection for the Power Line
- Simplified Wiring Process
- 1500 VDC Isolation
- DIN-Rail Mounting
- Wide Operating Temperature Range: -25 °C ~ +75 °C

Introduction

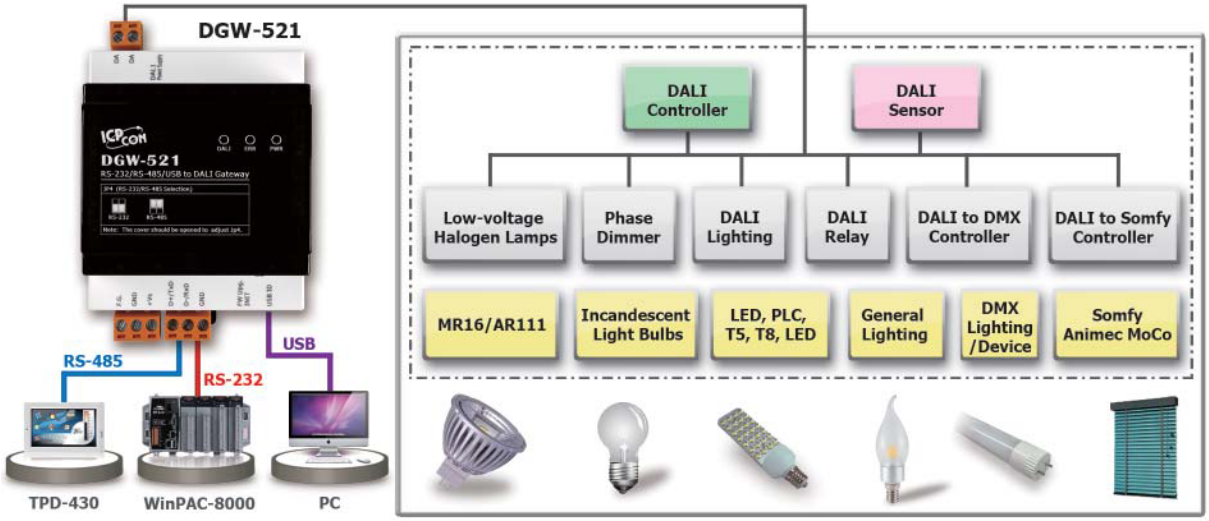
The DGW-521 is a communication gateway between the Modbus RTU/DCON and the DALI (Digital Addressable Lighting Interface) protocols, and allows a Host PC, PAC, or TouchPAD to access DALI devices by providing three interfaces that enable conversion from RS-232/RS-485/USB to DALI. The module provides a built-in DALI power supply that can be enabled or disabled via a switch. DALI is an international standard for lighting control interfaces, and is suitable for DALI lighting systems covering small areas. The maximum length of the DALI signal cables cannot exceed 300 m.

System Specifications

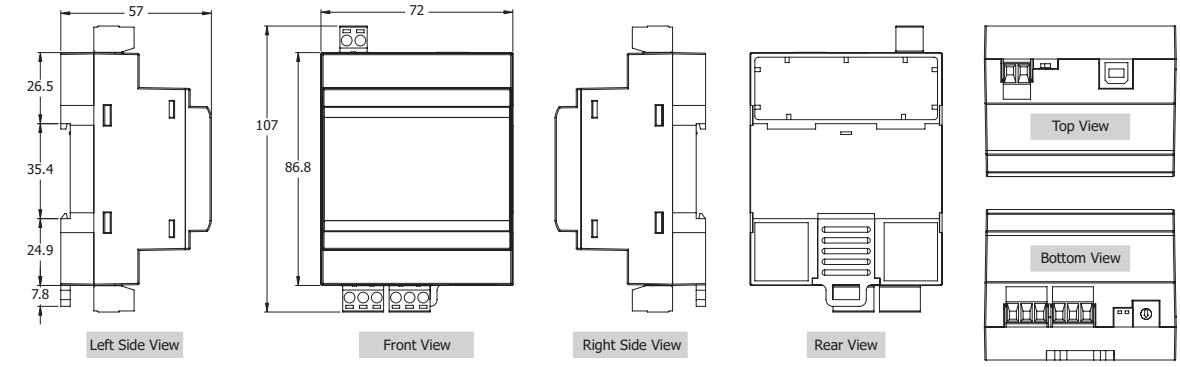
Model		DGW-521
Interface		
DALI	Connector	2-pin Terminal Block
	Baud Rate (bps)	1200
	Isolation	1500 VDC
	Built-in DALI power	16 VDC ±5%, Max. Current 250 mA (Enabled/Disabled via a switch)
UART	COM Port	RS-485/RS-232
	Connector	3-pin Terminal Block (D+, D-, GND/TxD, RxD, GND), Jumper Selectable
	Transmission Distance (m)	Depends on Baud Rate
	Baud Rate (bps)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
	Protocol	DCON, Modbus RTU
USB	Connector	USB Type B
	Transmission Speed	12M bps
	Specification	USB 1.1 and USB 2.0 standard compatible
	OS Support	Windows XP (32/64-bit), Windows 7 (32/64-bit)
	Protocol	DCON and Modbus RTU via Virtual COM port
LED Indicators		
System LED Indicators		PWR/RUN/ERR LED
EMS Protection		
ESD (IEC 61000-4-2)		±4 kV Contact for Each Terminal, ±8 kV Air for Random Point
EFT (IEC 61000-4-4)		±4 kV for Power Line
Surge (IEC 61000-4-5)		±2 kV for Power Line
Power		
Power Supply		Unregulated +10 VDC ~ +30 VDC
Connector		3-pin Terminal Block
Protection		Power Reverse Polarity Protection, Overvoltage Brown-out Protection
Power Consumption		6 W

Model	DGW-521
Mechanical	
Casing	Plastic
Dimensions (L x W x H)	107 mm x 72 mm x 57 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-30 °C ~ +80 °C
Humidity	10 ~ 90% RH, Non-condensing

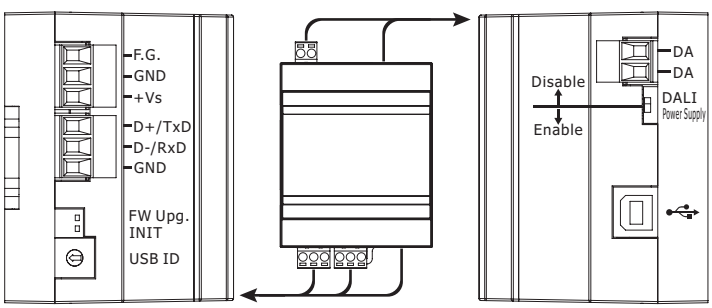
Applications



Dimensions (Units: mm)



Pin Assignments



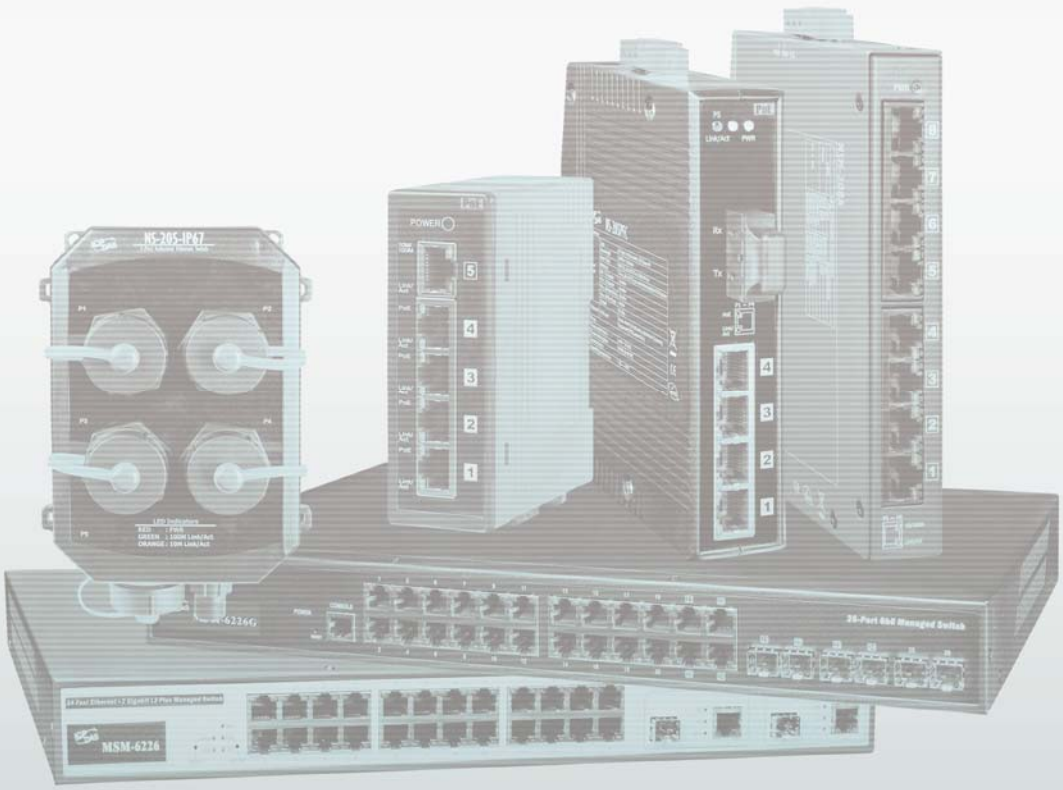
Ordering Information

DGW-521 CR	RS-232/RS-485/USB to DALI Gateway (RoHS)

Accessories

GPSU06U-6	24 VDC /0.25 A, 6 W Power Supply
DIN-KA52F	24 VDC /1.04 A, 25 W Power Supply with DIN-Rail Mounting

Ethernet Switches

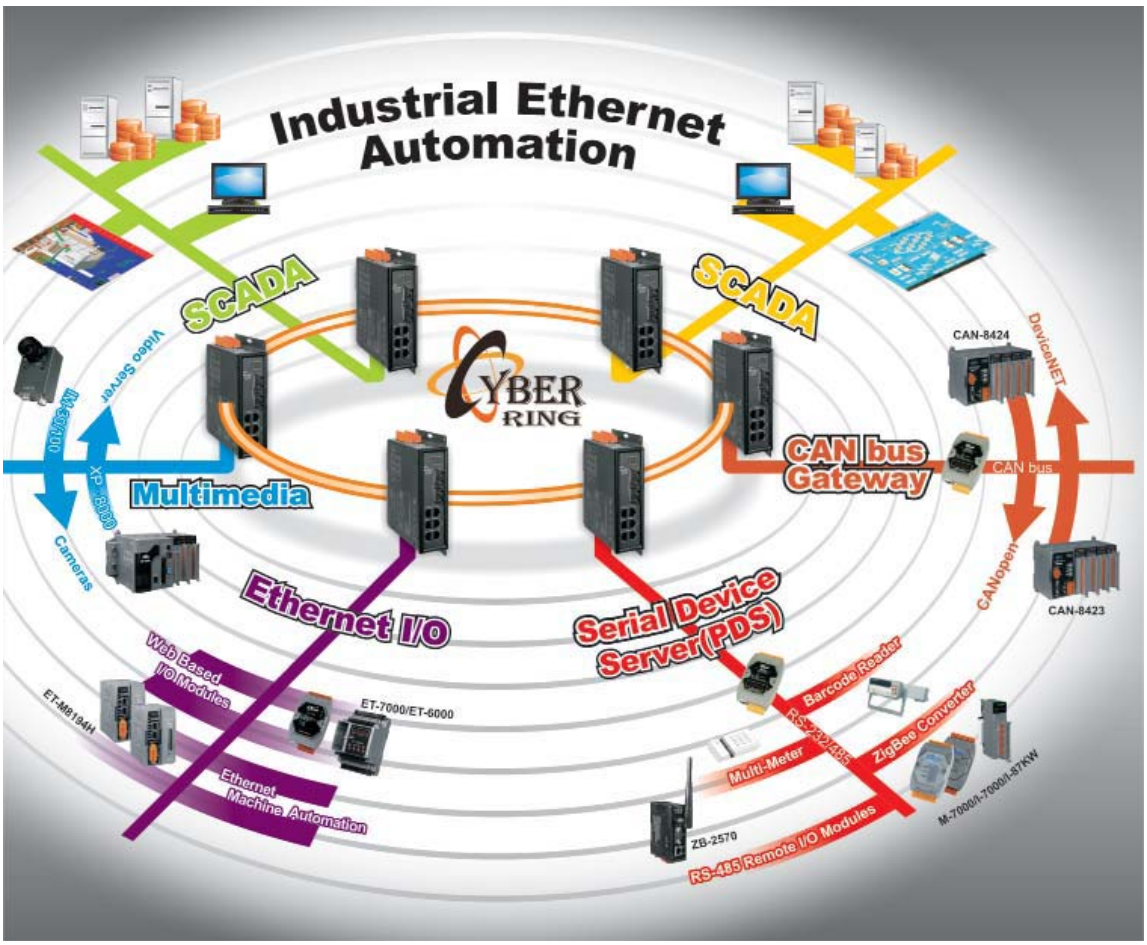


4-1 Overview

The Ethernet is an ideal medium for transporting large volumes of data across great distances at high speed. Previously, multiple networks carrying specific protocols were installed side by side in order to carry out unique tasks. This inevitably lead to increases in project costs as additional fiber optic or copper cables needed to be installed so as to accommodate the increasing volume of data. Using the Ethernet, multiple protocols can be carried over a single fiber optic cable. Furthermore, manufacturers are now exporting their legacy protocols onto the Ethernet, designing new IP-based communication protocols and providing embedded web pages within their devices that offer real-time information using simple tools such as Internet Explorer, Firefox or Google Chrome.

Early Ethernet networks were based on a hub or a repeater. However, these devices have no intelligence and are therefore unable to identify any information contained within the Header frame of an Ethernet packet, which means that they are not capable of determining the destination port for the frame. Consequently, every frame is sent to every port.

Like a hub, a switch is used to forward and receive packets between one network or device and another. Of course, the switch could forward all packets, but, if this was the case, the behavior would be similar to a hub. It would be more logical if the switch was able to identify the destination of the packets and only forward those that needed to travel from one network or device to another.



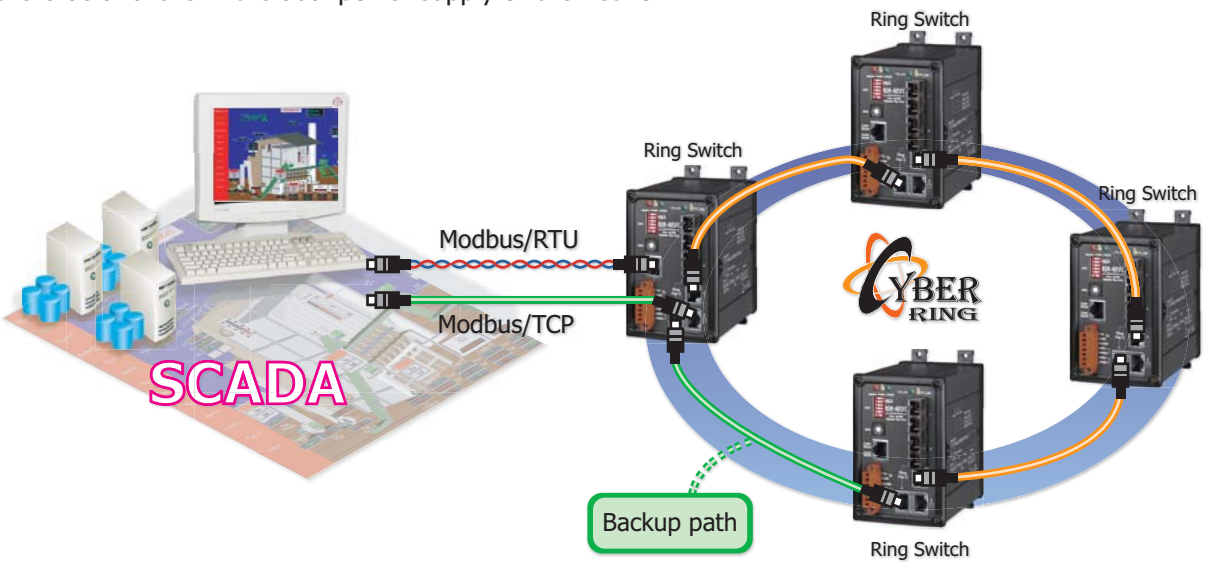
Many poorly designed switches exist in the market, and the majority of them are fragile, fail easily, and often suffer from transmission delay or unreliable communication conditions due to packet collisions or other issues. In contrast, ICP DAS switches are built using truly industrial-grade switch chips that are temperature tolerant and highly reliable. The switches are all well designed by skilled engineers, and are subjected to very strict communication and environment tests prior to shipment. All ICP DAS switches have a long operational lifetime and are guaranteed to function perfectly under harsh environmental conditions.

▸▸▸▸ Managed Switch for Industrial Ethernet Applications

Managed switches provide performance, management, diagnostics, and security capabilities that are not supported on unmanaged switches. These types of features allow the network administrator to configure the switch to provide traffic prioritization, basic and advanced security capabilities, multicast traffic control, diagnostic capabilities, and a number of other features that are important for most industrial and office network environments. Given the critical nature and performance requirements of automation and control networks, a managed switched Ethernet architecture is the most appropriate choice for most industrial environments.

Real-time Redundant Ring Switch

The ICP DAS Real-time Redundant Ring Switch offers fault-tolerant industrial Ethernet with ring network topology. The built-in proprietary ICP DAS Cyber-Ring technology is able to detect and recover from a fiber or copper link failure within approximately 20 ms, which is a seamless process for the majority of applications. The Modbus/TCP, Modbus/RTU and OPC protocols are supported, and SCADA applications can be used to monitor the status of an Ethernet or fiber port via the Modbus or OPC protocol. In addition, the Relay Output feature can be used to deliver a warning signal should there be a failure in the dual power supply or the network link.



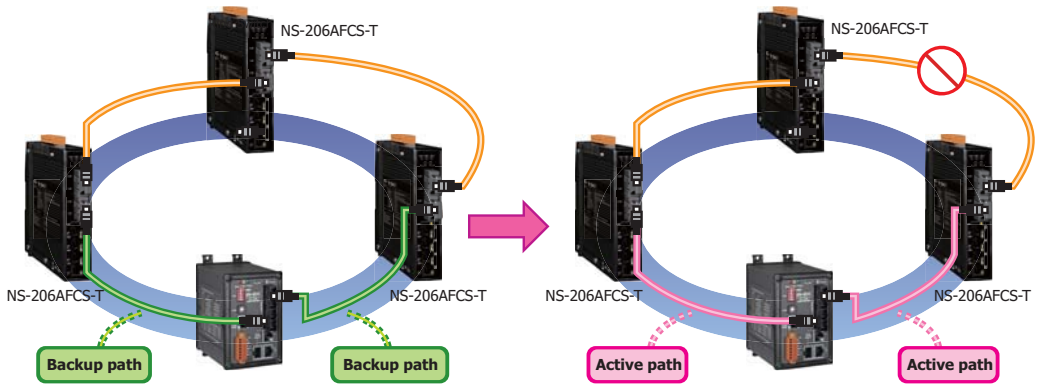
Managed Ethernet Switch

The ICP DAS Managed Switch provides a cost-effective managed Ethernet solution for industrial control and automation applications. The switch provides a wide range powerful managed functions, including 802.1Q Tag-based VLAN, Port-based VLAN, 802.1p QoS (Quality of Service), Port Trunking, Spanning Tree, Cable Testing and Port Mirroring, each of which can be configured using telnet or a web browser through an RS-232 port via either a serial console or an Ethernet port. In addition, the built-in proprietary ICP DAS Cyber-Ring technology offers a real-time, fault-tolerant ring topology that increases the reliability and performance of the network, meaning that the ICP DAS Managed Switch is an ideal solution for industrial environments.

Cyber-Ring

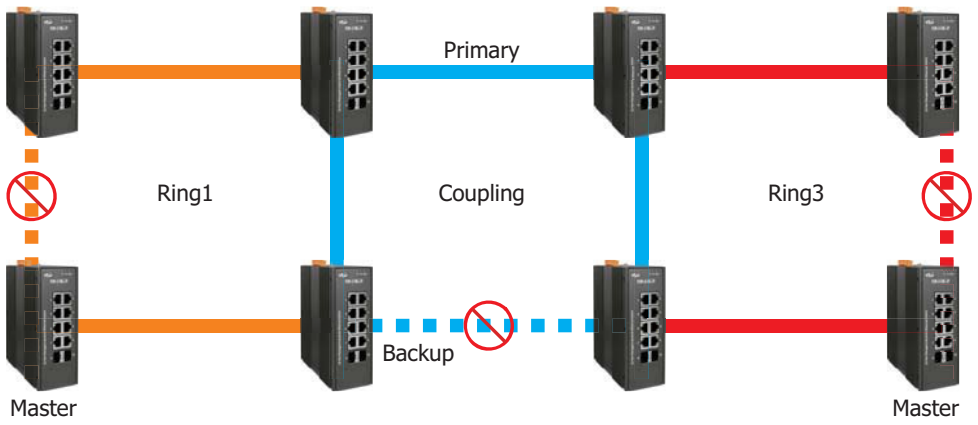
Solo Ring

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.



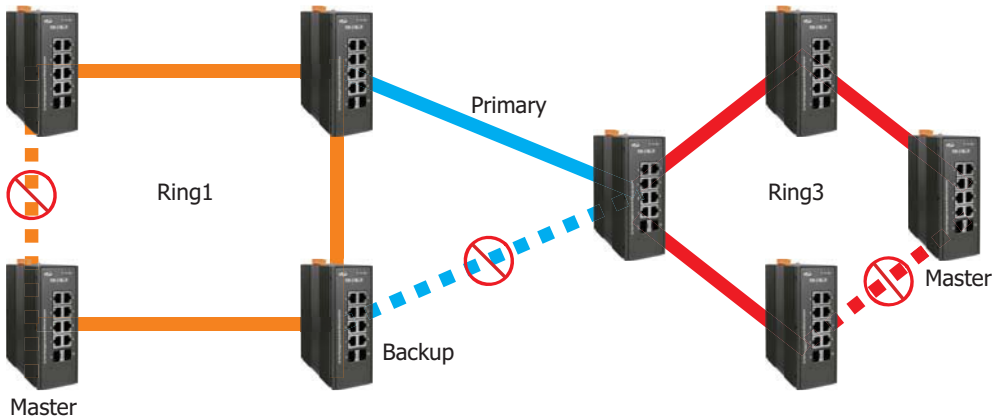
Coupling

Coupling is an enhanced version of a Dual Ring topology that can be implemented to improve the reliability of Dual Ring network topology by preventing the failure of a single device from affecting the entire network.



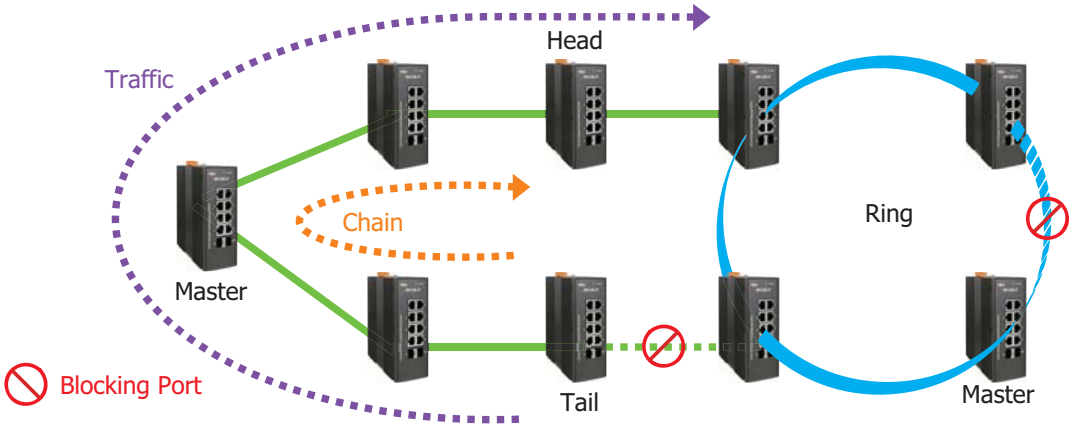
Dual-Homing

Dual Homing is the process of coupling two separate rings using a single FSM switch that is connected to two independent connection points.
If there is only one FSM switch that is easy to connect, or if there is only one FSM switch implemented in a stable environment, then Dual Homing is a better solution.



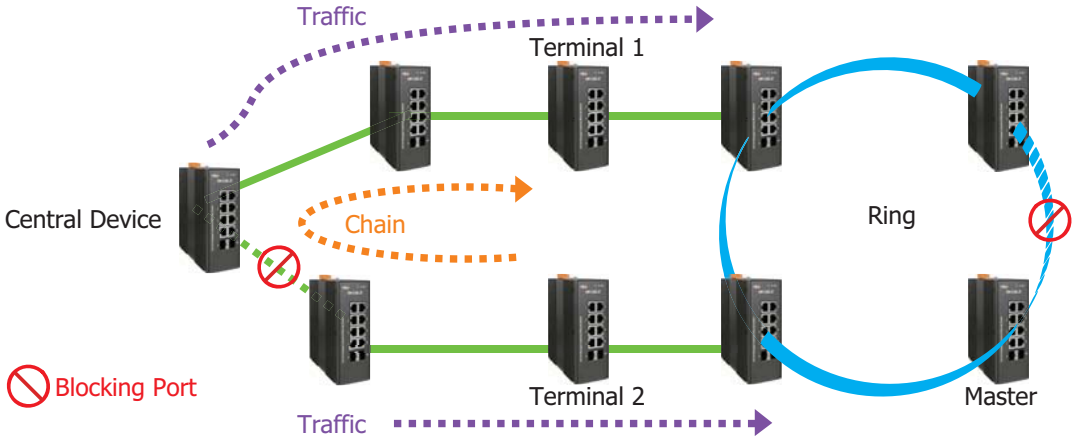
Daisy Chain

A Daisy Chain solution can be employed to easily connect and/or extend an existing redundant network, providing a cost-efficient approach to reconfiguration, since the integration of different redundant networks can be achieved directly without requiring any ring coupling effort.



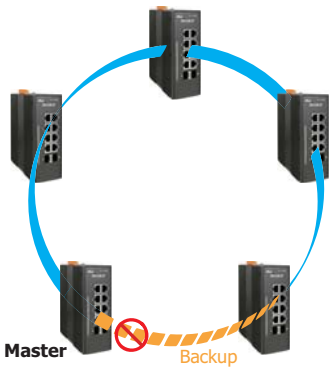
Balanced Chain

Using a Balanced Chain solution, the direction of the traffic can be defined and an individual node can be designated as the central device in order to achieve load balance.



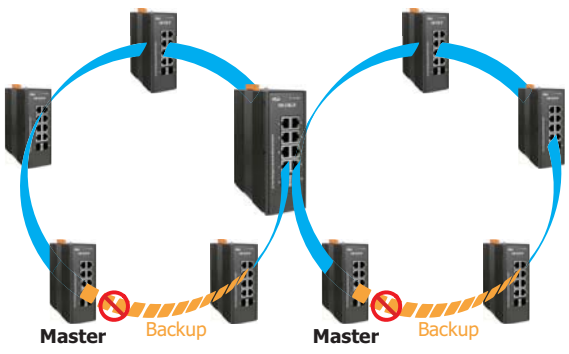
Single Ring

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.



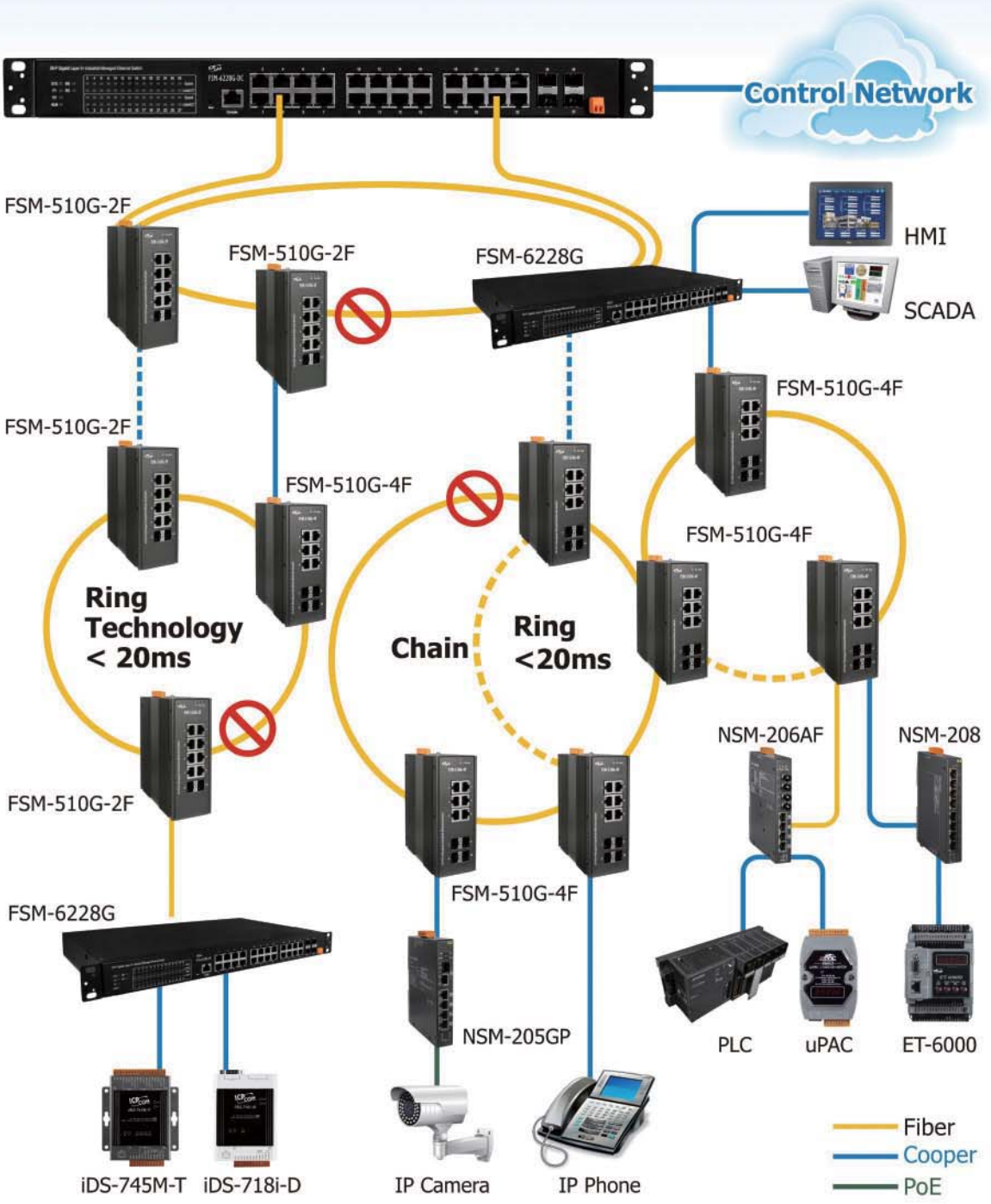
Dual Ring

Dual Ring network topology can be used to integrate two individual Cyber-Ring networks using a single switch.



Product Portfolio of Industrial Ethernet Switches

☑ Rack Mount/DIN-Rail mount ☑ Unmanaged Switch
☑ PoE Switch ☑ Layer2 Managed Switch ☑ Media Converter



4.2. Applications

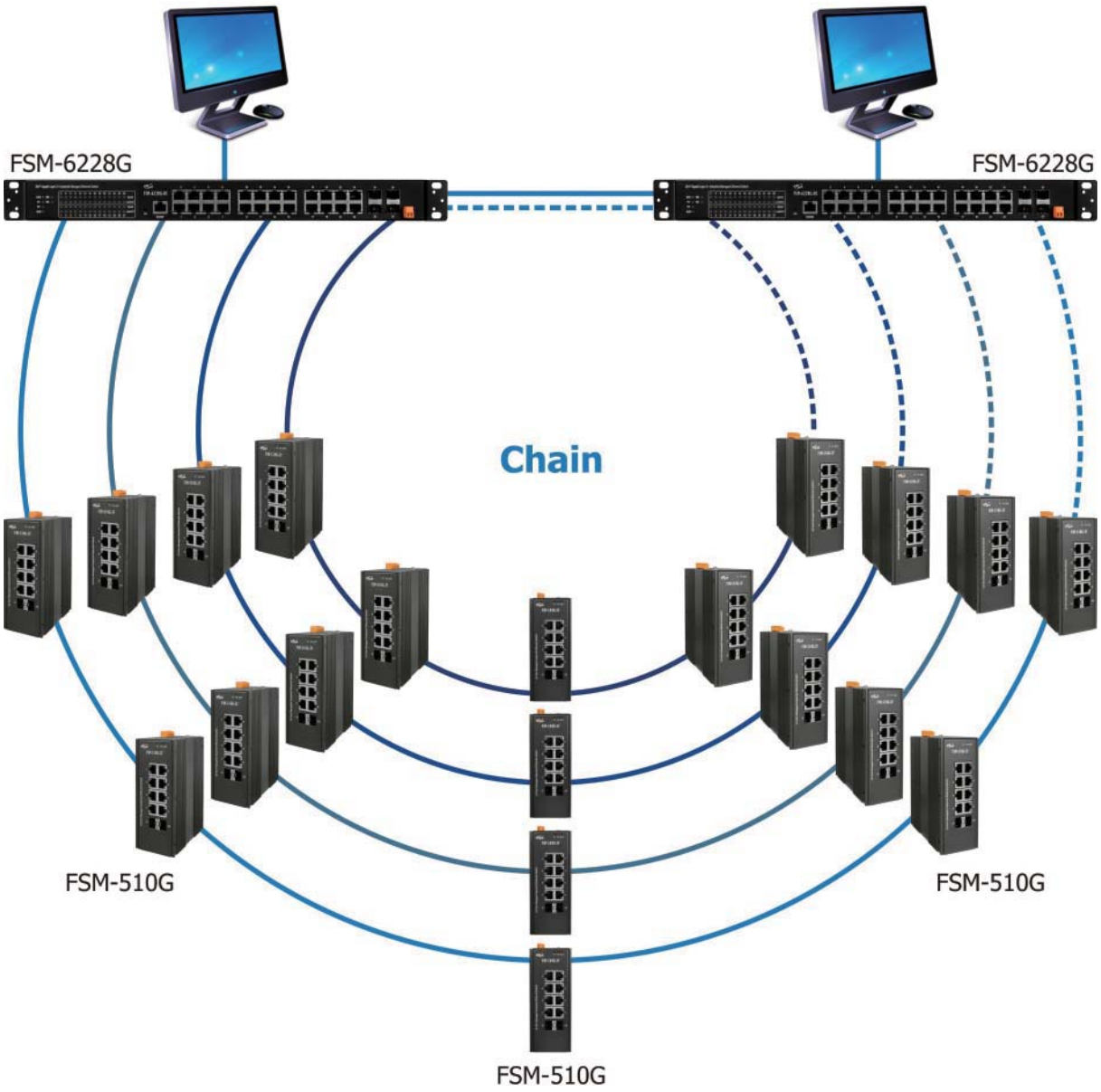
Cost-efficient Approach to Reconfiguration

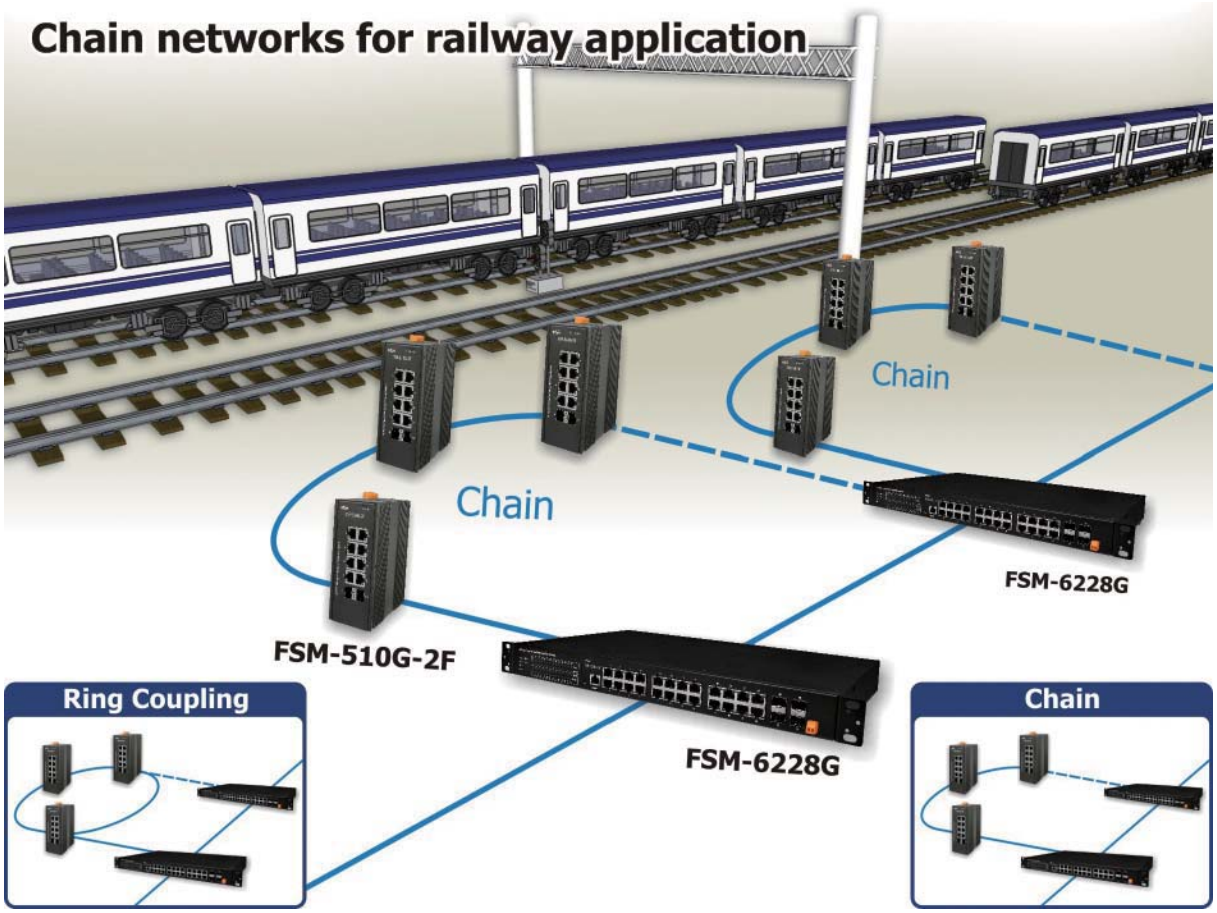
A Daisy Chain solution can be employed to easily connect and/or extend an existing redundant network, providing a cost-efficient approach to reconfiguration, since the integration of different redundant networks can be achieved directly without requiring any ring coupling effort.

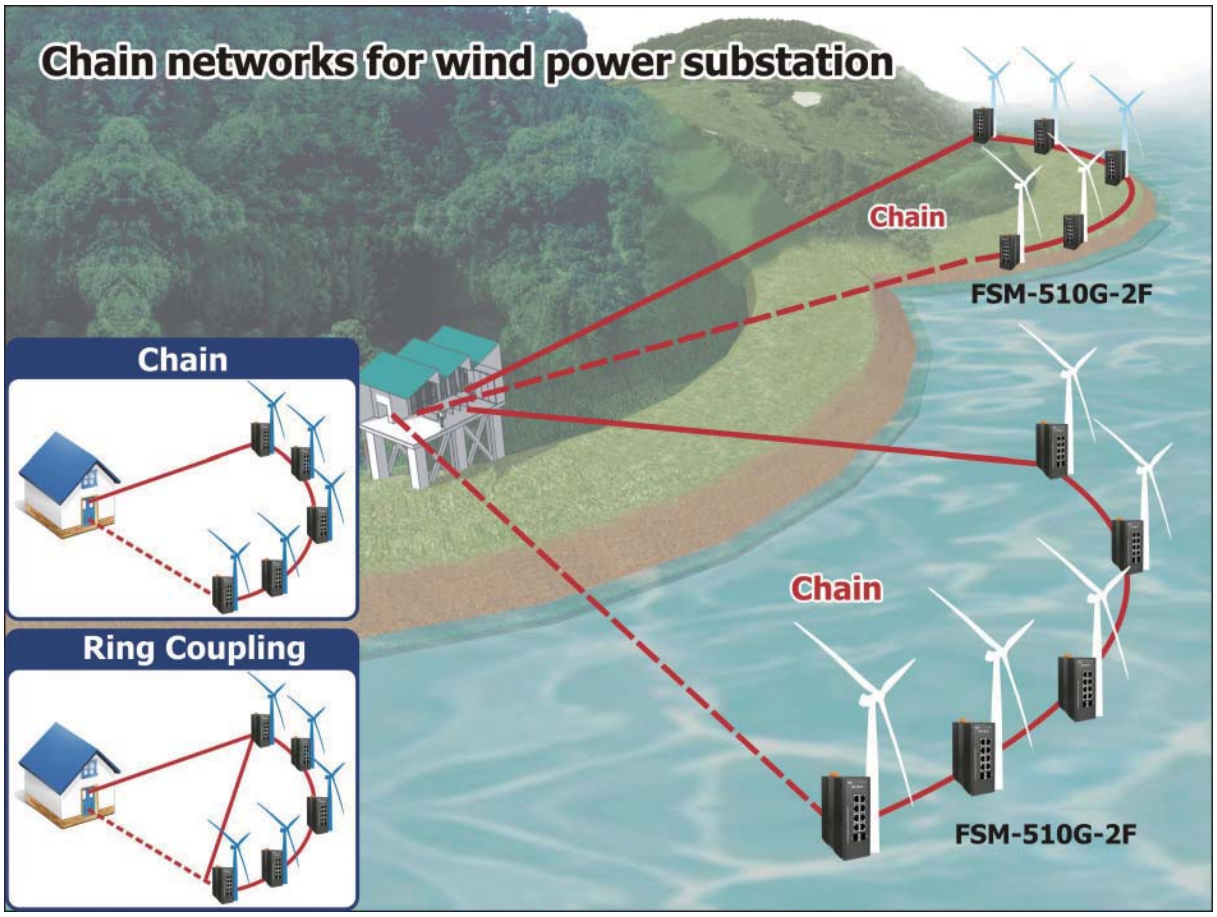
Flexible and Expandable Redundancy

Chain is a technological adaptation of daisy chains that allows unrestricted network expansion without requiring the full reconfiguration or rewiring of an existing network.
You can immediately scale up networks with new branches without sacrificing any redundancy, security, or speed.

Chain Application




Chain networks for railway application
Chain
Chain
FSM-6228G
FSM-510G-2F
FSM-6228G
Ring Coupling
Chain


Chain networks for wind power substation
Chain
FSM-510G-2F
Chain
Chain
Ring Coupling
Chain
FSM-510G-2F

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 VDC	Metal
MSM-508F Series	10/100 Mbps	6	–	–	100 Mbps	2	+12 ~ 48 VDC	Metal
FSM-510G-2F	10/100/1000 Mbps	8	SFP cage	LC	100/1000 Mbps	2	+12 ~ 48 VDC	Metal
FSM-510G-4F	10/100/1000 Mbps	6	SFP cage	LC	100/1000 Mbps	4	+12 ~ 48 VDC	Metal
FSM-6228G-DC	10/100/1000 Mbps	24	SFP cage	LC	100/1000 Mbps	4	+12 ~ 48 VDC	Metal
FSM-6228G-AC	10/100/1000 Mbps	24	SFP cage	LC	100/1000 Mbps	4	100 ~ 240 VAC	Metal

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 VDC ~ +48 VDC
- Each port supports both 10/100 Mbps speed auto negotiation
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Store-and-forward architecture
- Frame buffer memory: 1 Mbit
- Supports 2K MAC Addresses
- Power failure alarm by relay output
- Operating temperature range: -40°C ~ +75°C

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 VDC ~ +48 VDC
- 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

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.

- L2+ features provide better manageability, security, QoS and performance
- Network redundant Ring fail-over protection (< 20 ms)
- Multicasting support IGMP v1/v2/v3, proxy & snooping
- 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

FSM-510G-4F NEW

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

FSM-510G-2F NEW

8-port 10/100/1000Base-T + 2 (100/1G) SFP L2 Plus Managed Switch

Features

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

Introduction

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.

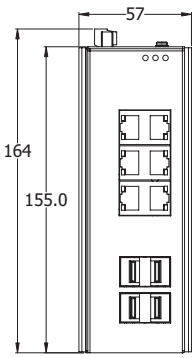
Specifications

Models	FSM-510G-4F	FSM-510G-2F
Technology		
Standards	Port Mirroring helps supervisor monitoring network	
	IEEE 802.1Q tag-based VLAN for performance	
	IEEE 802.1X Access Control improve network security	
	IEEE 802.1D Compatible, IEEE802.1w Rapid Spanning Tree & IEEE802.1s Multiple Spanning Tree	
	IEEE 802.3ab 1000BASE-T Gigabit Ethernet (twisted-pair copper)	
	IEEE 802.3z Gigabit Ethernet (fiber) ANSI/IEEE 802.3	
	Unknown Unicast/Broadcast/Multicast storm control	
	IP-MAC-Port binding for LAN security	
	QCL Based on Application traffic for QoS and rate limitation management	
	Supports DHCP snooping (DHCP option 82)	
	ACL Based on Ethernet Type/ARP/IPv4 for packets permit or deny, rate limitation and port copy	
	Supports "power saving" for Green Ethernet requirement	
	Supports LLDP (Link Layer Discovery Protocol) provides a standards-based method for enabling switches to advertise themselves.	

Models	FSM-510G-4F	FSM-510G-2F
Technology		
MAC Addresses	8 K	
Processing Type	Store & forward	
Protocol	VLAN, QoS, Port Trunk, SMTP, TELNET, SNMP, IGMP, IEEE802.1X, LLDP	
Interface		
RJ-45 Ports	6-port 10/100/1000 Base-TX auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection	8-port 10/100/1000 Base-TX auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
SFP	4-port 100/1000 Mbps SFP Fiber Module slots	2-port 100/1000 Mbps SFP Fiber Module slots
LED Indicators	POWER, ALARM , TP Port LED	
Ethernet Isolation	1500 Vrms 1 minute	
Serial Port	RS-232 (TxD, RxD and GND); Non-isolated	
Frame Ground for EMS Protection	EMS Requirements: IEC-61000-4-2, IEC-61000-4-3, IEC-61000-4-4, IEC-61000-4-5, IEC-61000-4-6	
Power		
Input Voltage Range	+12 VDC ~ +48 VDC	
Power Consumption	10.5 W	
Frame Ground for EMS Protection	Yes	
Mechanical		
Casing	Metal	
Environmental Rating	IP30 Protection	
Dimensions (W x L x H) (Units: mm)	57 mm x 121 mm x 164 mm	
Installation	DIN-Rail Mounting or Wall mounting	
Environmental		
Operating Temperature	-40 °C ~ +75 °C	
Storage Temperature	-40 °C ~ +85 °C	
Ambient Relative Humidity	5% ~ 95% RH, non-condensing	

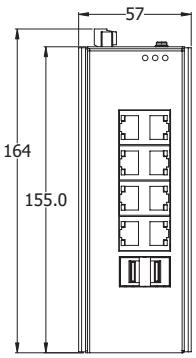
Dimensions (Units: mm)

FSM-510G-4F



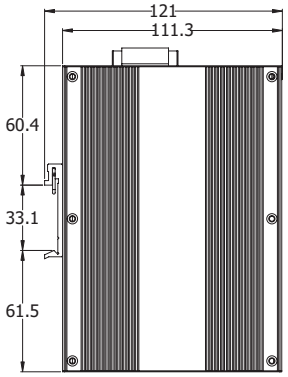
Front View

FSM-510G-2F

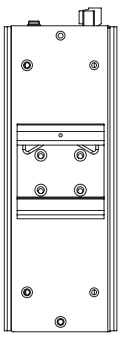


Front View

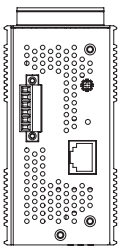
FSM-510G-4F/FSM-510G-2F



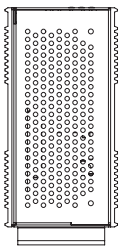
Left Side View



Rear View



Top View



Bottom View

Ordering Information

FSM-510G-4F CR	6-port 10/100/1000Base-T + 4 (100/1G) SFP L2 Plus Managed Switch (RoHS)
FSM-510G-2F CR	8-port 10/100/1000Base-T + 2 (100/1G) SFP L2 Plus Managed Switch (RoHS)

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

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

Appearance:

▲ NS-208-IP67
NS-208PSE-IP67

▲ NS-205-IP67
NS-205PSE-IP67

▲ NS-208PSE-M12-IP67

▲ NSM-208PSE-M12

NSM-316G NEW

Unmanaged 16-port Industrial 10/100/1000 Base-TX Ethernet Switch

Features

- Provides 16 10/100/1000 Mbps Ethernet ports
- Each port supports both 10/100/1000 Mbps speed auto negotiation
- Supports 4 kV Ethernet ESD protection and 1 kV EFT protection
- Supports operating temperatures from -40 °C ~ +75 °C
- DIN-Rail Mounting, Wall Mounting
- Automatic MDI/MDI-X crossover for plug-and-play
- Store-and-forward architecture
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Supports Dual +12 VDC ~ +48 VDC power input and 1 relay output
- DIP switch alarm setting for Port's break

Introduction

The NSM-316G has 16 Ethernet ports that support 10/100/1000 Base-TX, with a 10/100/1000M auto negotiation feature and auto MDI/MDI-X function. It can connect 16 workstations and automatically switches the transmission speed (10 or 100 or 1000 Mbps) for corresponding connections.

All Ethernet ports have memory buffers that support the store-and-forward mechanism, which assures that data can be transmitted properly. The NSM-316G supports advanced network standards to optimize network performance, reduce maintenance costs, and secure network safety.

The flow control mechanism is also negotiated. There is link/Act LEDs for each port to aid troubleshooting. Port connectors are shielded RJ-45. DIP switch setting alarm for each port loss link or break.

Specifications

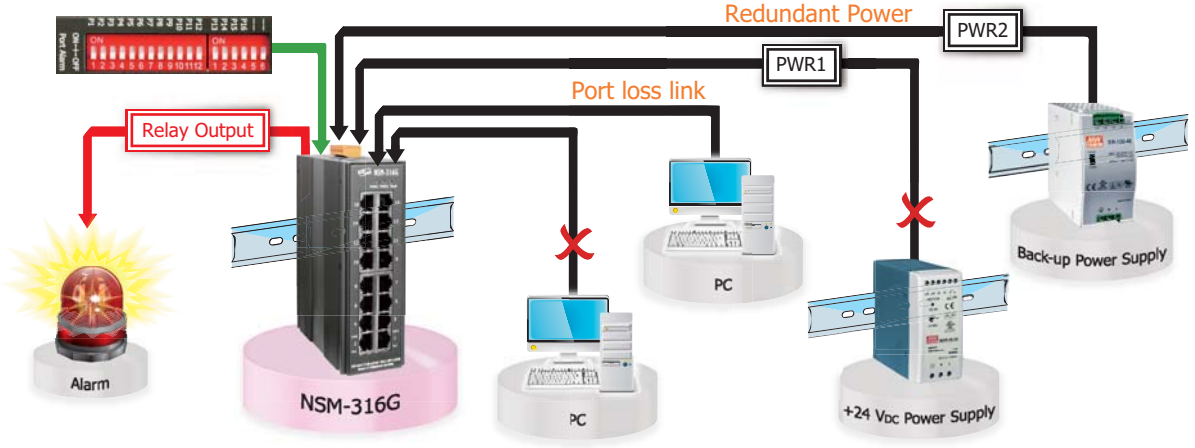
Technology	
Standards	IEEE802.3, 802.3u, 802.3x, 802.3az
Processing Type	Store & forward, wire speed switching
MAC Addresses	8K
Packet Buffer Memory	512 KByte
Jumbo Frame	9216 Byte
Flow Control	IEEE 802.3x flow control, back pressure flow control

Interface	
RJ-45 Ports	10/100/1000 Base-TX auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
LED Indicators	PWR1, PWR2, Power fail, Link, Act
Ethernet Isolation	1500 Vrms 1 minute
Power	
Redundant Input Range	+12 VDC ~ +48 VDC (Non-isolated)
Power Consumption	0.39 A @ 24 VDC
Alarm Contact	One relay output with current carrying capacity of 1A @ 30 VDC
Protection	Power reverse polarity protection
Connector	6-Pin Removable Terminal Block (Power & Relay)
Mechanical	
Casing	Metal (IP30 Protection)
Dimensions (W x L x H)	51 mm x 164 mm x 128 mm
Installation	DIN-Rail Mounting or Wall Mounting
Environmental	
Operating Temperature	-40 °C ~ +75 °C
Storage Temperature	-40 °C ~ +85 °C
Ambient Relative Humidity	10 ~ 90% RH, non-condensing

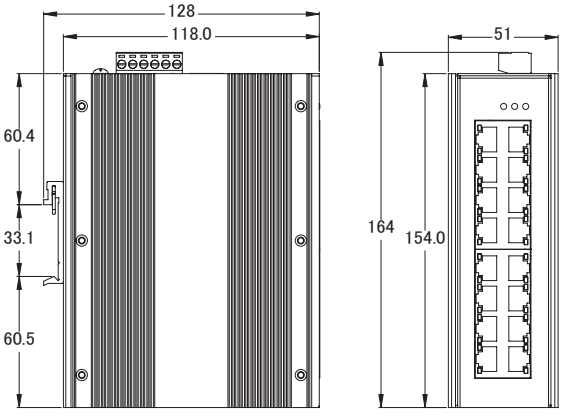
Redundant Power Input & Port Alarm Setting

Both power inputs can be connected simultaneously to live DC power sources.
If one power source fails, the other live source will act as a backup, and automatically supplies all of NSM-316G series power needs.
Port Alarm function can be enabled via DIP switch, and the relay will be activated when port loses link or break.

DIP Switch	Setting	Description
Port Alarm Function (P1 to P16)	ON	Enables the PORT Alarm. When the port's loss link, the relay will forced an close circuit, and the fault LED will light up.
	OFF	Disables the PORT Alarm. When the port loses link, the relay will has no action, and it remain in open circuit, and the fault LED will not light up.



Dimensions (Units: mm)



Left Side View

Front View

Ordering Information

NSM-316G CR	16-port GBE Ethernet Unmanaged Switch (RoHS)

Accessories

DR-120-48	48 V/2.5 A, 120 W Single Output Industrial DIN Rail Power Supply
MDR-60-48	48 V/1.25 A, 60 W Single Output Industrial DIN Rail Power Supply
DR-120-24	24 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply
SDR-240-24	24 V/10 A, 240 W Single Output Industrial DIN Rail Power Supply with PFC Function
DIN-KA52F	24 V/1.04 A, 25 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 V/0.52 A, 25 W Power Supply with DIN-Rail Mounting

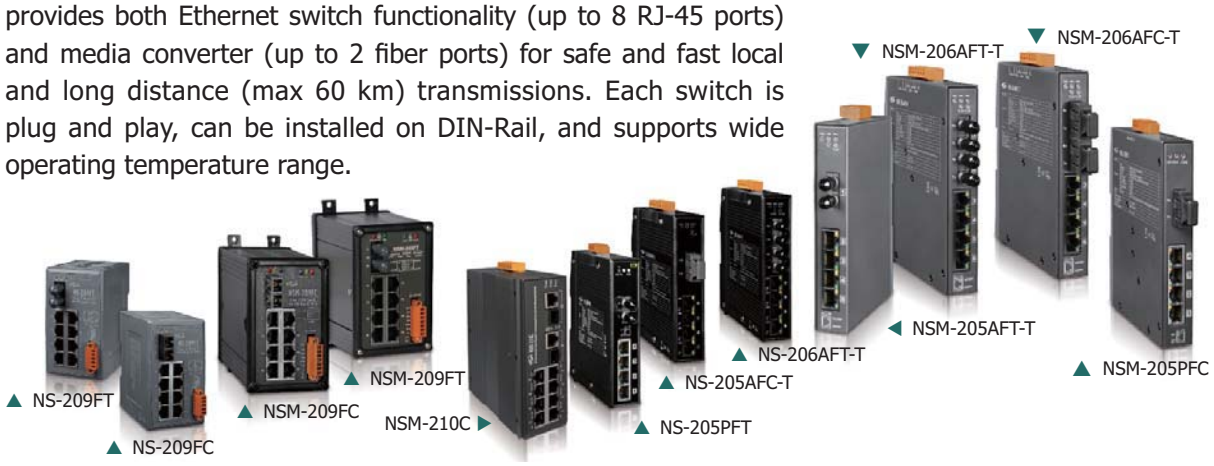
Industrial Media Converters & WDM Media Converter

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.

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 RJ-45 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.



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

NSM-200G-SFP NEW

1000Base-T to 1000Base-X SFP Media Converter

NSM-200LX/NSM-200SX/NSM-200SX2 NEW

1000Base-T to 1000Base-LX/SX Fiber Media Converter

Features

- Provides 1 x 1000 Mbps fiber port with SC type connector for 1000 Base-SX/LX device
- Supports wide operating temperatures from -30 °C ~ +75 °C
- Transparent to jumbo packets up to 10 KB
- Provides Link Fault Pass-through (LFP)
- Supports redundant +12 VDC ~ +48 VDC power input

Introduction

ICP DAS's line of feature rich 10/100/1000 SFP Media Converters transparently connects copper to SFP for multimode or single mode fiber. Our 10/100/1000 Ethernet to Fiber Converters provide an economical path to extend the distance of an existing network, the life of non-fiber based equipment, or the distance between two devices. The pluggable fiber optics port allows for flexible network configurations using SFP transceivers supplied by ICP DAS or other manufacturers of MSA (Multi-source Agreement) compliant SFPs.

Gigabit Media Converters are also available with support for LFP (Link Fault Pass-through) feature.

Specifications

Models	NSM-200SX	NSM-200SX2	NSM-200LX	NSM-200G-SFP
Interface				
RJ-45 Port	10/100/1000 Base-T(X) auto negotiation speed and auto MDI/MDI-X connection			
Fiber Port	Multi-mode: Up to 2 km; Single-mode: Up to 10 km			1000BaseSFP slot/100BaseSFP slot
LED Indicators	PWR1, PWR2, P-Fail, Link/Act, 100M, 1000M			
Optical Fiber	50/125 µm (Multi-mode)	50/125 µm (Multi-mode)	10/125 µm (Signal Mode)	--
Distance	0.55 km	2 km	10 km	--
Wavelength	850 nm	1310 nm	1310 nm	--
Min. TX Output	-9.5 dBm	-9 dBm	-9.4 dBm	--
Max. TX Output	-4 dBm	-1 dBm	-3 dBm	--
Max. RX Sensitivity	-17 dBm	-19 dBm	-20 dBm	--
Min. RX Overload	-3 dBm	-1 dBm	-3 dBm	--
Power				
Input Voltage Range	+12 VDC ~ +48 VDC (Non-isolated)			
Power Consumption	0.1 A @ 24 VDC			
Mechanical				
Dimensions (W x L x H)	34 mm x 111 mm x 121 mm			
Installation	DIN-Rail Mounting (optional wall mounting kits)			
Environmental				
Operating Temperature	-30 °C ~ +75 °C			
Storage Temperature	-40 °C ~ +85 °C			
Ambient Relative Humidity	10% ~ 90% RH, non-condensing			

Applications

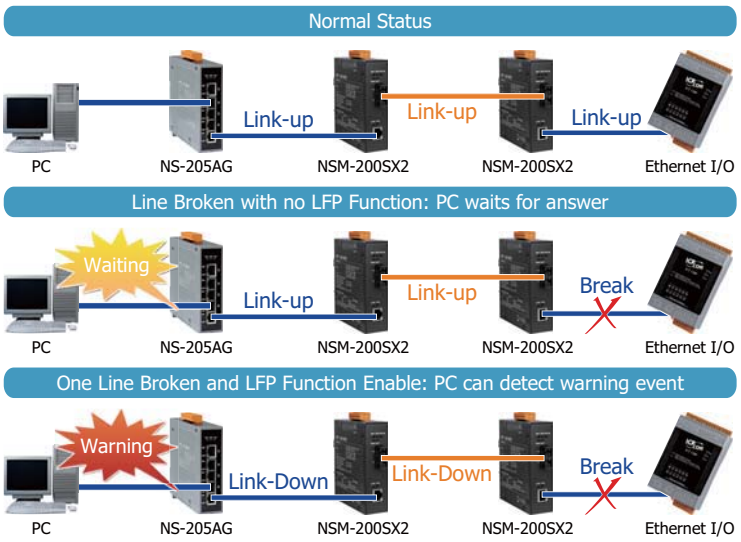
LFP (Link Fault Pass-through) function

The LFP (link fault pass through) means the link fault on the one side (local side) media converter will be passed to the media converter on the other side (remote side).

For example, the media converter on side A (local side) has the Ethernet link loss, the media converter will disconnect the link of transmission on fiber. The media converter on the side B (remote side) will know there is the linkage error and also disconnect the Ethernet link.

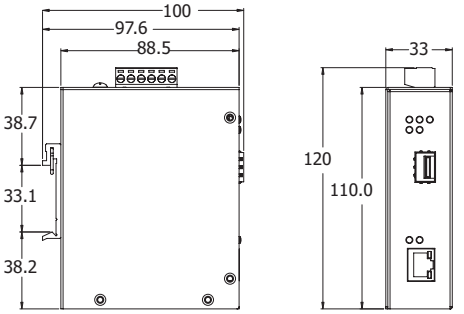
The LFP function can immediately alarm network administrators the problem of the link media and provide efficient solution to monitor the network, which can minimize the loss caused by the link problem.

ICP DAS's LFP fiber media converter has a DIP switch to enable or disable the LFP (link fault pass through) function.



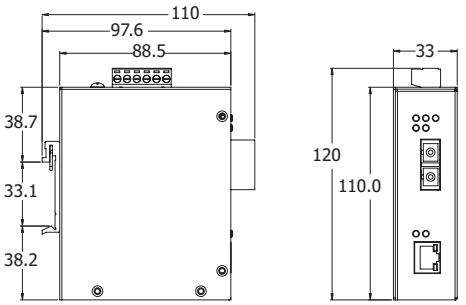
Dimensions (Units: mm)

NSM-200G-SFP



Left Side View | Front View

NSM-200SX/NSM-200SX2/NSM-200LX



Left Side View | Front View

Ordering Information

NSM-200G-SFP CR	Industrial 1000 Base-T to 1000 Base-X Converter, SFP slot (RoHS)
NSM-200SX CR	Industrial 1000 Base-T to 1000 Base-SX Fiber Converter, Multi-mode 850 nm, 0.55 km, SC connector (RoHS)
NSM-200SX2 CR	Industrial 1000 Base-T to 1000 Base-SX Fiber Converter, Multi-mode 1310 nm, 2 km, SC connector (RoHS)
NSM-200LX CR	Industrial 1000 Base-T to 1000 Base-LX Fiber Converter, Single-mode 1310 nm, 10 km, SC connector (RoHS)

Accessories

GPSU06U-6	24 V/0.25 A, 6 W Power Supply	
MDR-20-24	24 V/1 A, 24 W Single Output Industrial DIN Rail Power Supply	
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	

NSM-205G-1SFP NEW

4G+1G Combo Port Gigabit Unmanaged Ethernet Switch

Features

- Full Gigabit Ethernet ports
- 10 Gbps high performance memory bandwidth
- Supports Auto Negotiation and Auto MDI/MDI-X
- Pluggable SFP transceiver port for extending distance and electrical noise immunity
- Supports 10 KB jumbo frames
- Supports Dual +12 VDC ~ +48 VDC power input and 1 relay output
- Supports operating temperatures from -40 °C ~ +75 °C
- Slim packaging fits on your DIN-Rail Mounting

Introduction

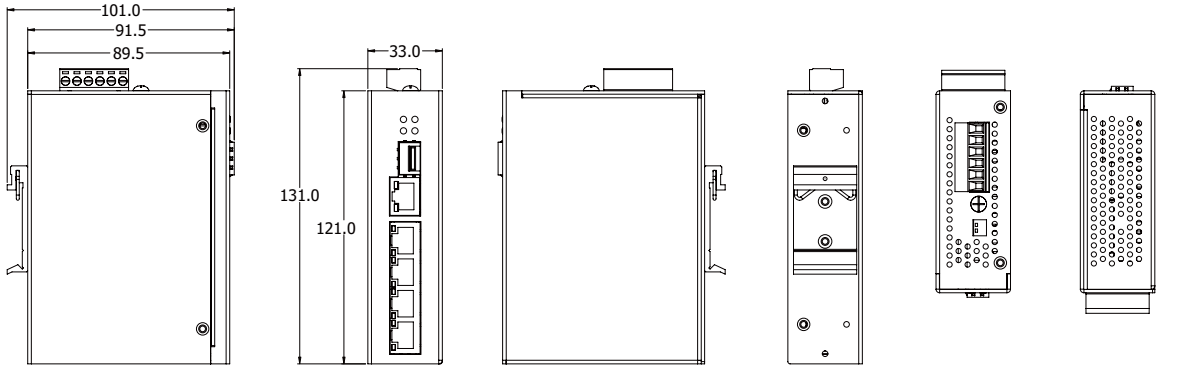
The NSM-205G-1SFP switch is equipped with 5 Gigabit Ethernet ports, respectively, and 1 fiber optic ports, making them ideal for applications that demand high bandwidth. In addition, the add-on DIP switch can be used for controlling over the functions of 100/1000 SFP speed switching is ideal for easy on-site configuration.

Specifications

Technology	
Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3ab for 1000Base-T IEEE 802.3x for Flow Control Energy Efficient Ethernet (EEE) as per 802.3az; this provides power savings during idle network activity
Processing Type	Store & forward; wire speed switching
MAC Addresses	8K
Memory Bandwidth	10 Gbps
Frame Buffer Memory	1 Mbit
Jumbo Frames	10K for Speed 1000M
Flow Control	IEEE 802.3x flow control, back pressure flow control
Interface	
RJ-45 Ports	10/100/1000 BaseT(X), 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X
Fiber Port	1000BaseSFP slot/100BaseSFP slot
LED Indicators	PWR1, PWR2, Power fail, 10/100M, 1000M, Link/Act
Ethernet Isolation	1500 Vrms 1 minute
DIP Switch	100BaseSFP/1000BaseSFP setting

Power	
Redundant Input Range	+12 VDC ~ +48 VDC
Power Consumption	0.25 @ 24 VDC
Alarm Contact	One relay output with current carrying capacity of 1A @ 30 VDC
Protection	Power reverse polarity protection
Connector	6-Pin Removable Terminal Block (Power & Relay)
Mechanical	
Chassis	Metal with an IP30 ingress protection rating
Dimensions (W x L x H)	33 mm x 131 mm x 101 mm
Installation	DIN-Rail or Wall Mounting (with optional kit)
Environmental	
Operating Temperature	-40 °C ~ +75 °C (-40° F to 167° F)
Storage Temperature	-40 °C ~ +85 °C (-40 F to 185° F)
Ambient Relative Humidity	10% ~ 90% RH, non-condensing

Dimensions (Units: mm)



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

Ordering Information

NSM-205G-1SFP CR	Gigabit Ethernet switch with 4 10/100/1000BaseT(X) ports and 1 combo 10/100/1000BaseT(X) or 100/1000BaseSFP port

Accessories

DR-120-48	48 V/2.5 A, 120 W Single Output Industrial DIN Rail Power Supply
MDR-60-48	48 V/1.25 A, 60 W Single Output Industrial DIN Rail Power Supply
DR-120-24	24 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply
SDR-240-24	24 V/10 A, 240 W Single Output Industrial DIN Rail Power Supply with PFC Function
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

Applications

NSM-210C NEW

8+2G Combo Port Gigabit Unmanaged Industrial Ethernet Switch

LAN x 8 | Gigabit Fiber Combo x 2 | -25 ~ +75 Wide Temperature | DIN-Rail Mounting | +12 ~ +48 Wide Input Voltage | CE | FCC | RoHS | WEEE

Features

- Up to 2 Gigabit uplinks for high bandwidth data aggregation SFP socket for Easy and Flexible Fiber Expansion
- Supports Auto Negotiation and Auto MDI/MDI-X
- Supports Dual +12 ~ 48 VDC power input and 1 relay output
- Supports operating temperatures from -25 ~ +75°C

Introduction

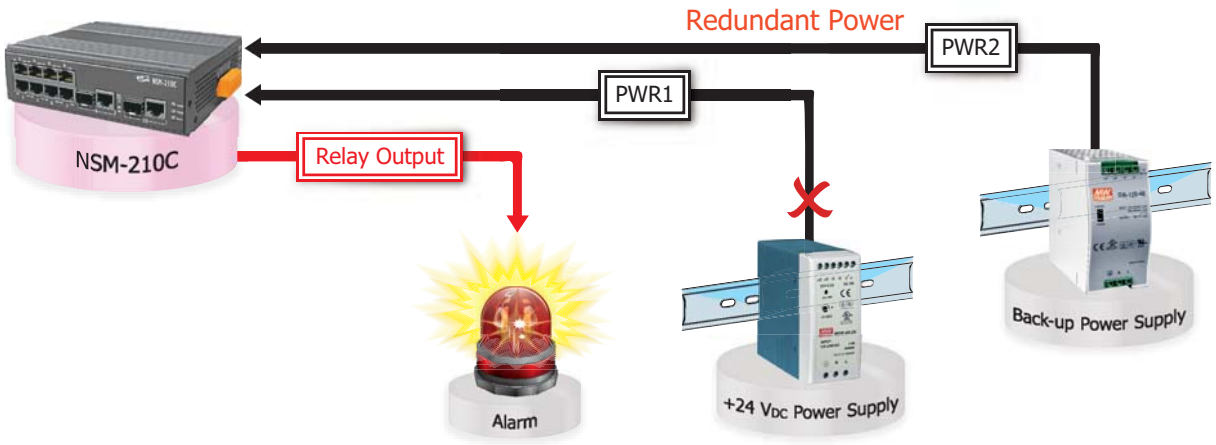
The NSM-210C is 8 Port 10/100 Base copper and 2 Gigabit fiber optic/copper combo port Ethernet Switch, Supports Auto Negotiation, Auto MDI/MDI-X, high-speed(100 Mbps) and high-distance transmissions. Apart from this, NSM-210C supports dual power and provides a wide +12 VDC ~ +48 VDC power range to fit all the common power standards found in industrial automation, without external power converters.

Specifications

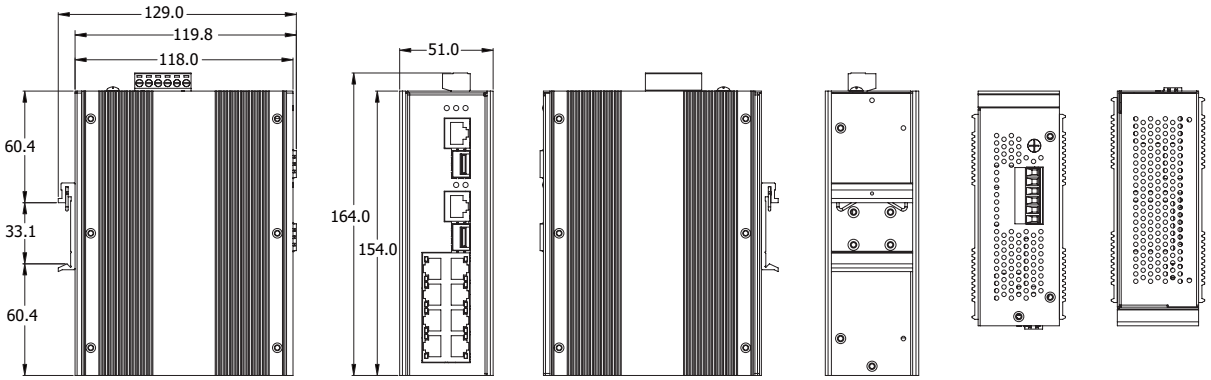
Technology	
Standards	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-TX, IEEE 802.3ab for 1000Base-T, IEEE 802.3x for Flow Control
MAC Addresses	8K
Frame buffer memory	1 Mbit
Flow Control	IEEE802.3x flow control, back pressure flow control
Interface	
RJ-45 Ports	8 x 10/100BaseT(X) , 2x 10/100/1000 BaseT(X) (Combo SFP) Auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection
Fiber Ports	2 x 1000Base SFP slot
LED Indicators	PWR1, PWR2, FAULT, SFP & Gigabit Act, 8-Port 10/100 Link and Act
Power Input	
Redundant Input Range	+12 VDC ~ +48 VDC (Non-isolated)
Power Consumption	0.15A @ 24 VDC idle without loading; 0.25A @ 24 VDC with full loading
Alarm Contact	One relay output with current carrying capacity of 1A @ 30 VDC
Mechanical	
Chassis	Metal
Dimensions (W x L x H)	51 mm x 154 mm x 118 mm
Installation	DIN-Rail or Wall Mounting (with optional kit)
Environmental	
Operating Temperature	-25 °C ~ +75 °C
Storage Temperature	-40 °C ~ +85 °C
Ambient Relative Humidity	10% ~ 90% RH, non-condensing

Redundant Power Input

Both power inputs can be connected simultaneously to live DC power sources.
If one power source fails, the other live source will act as a backup, and automatically supplies all of NSM-210C series power needs.



Dimensions (Units: mm)



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

Ordering Information

NSM-210C CR	8+2G Combo Port Gigabit Unmanaged Industrial Ethernet Switch (RoHS)

Accessories

DR-120-48	48 V/2.5 A, 120 W Single Output Industrial DIN Rail Power Supply
MDR-60-48	48 V/1.25 A, 60 W Single Output Industrial DIN Rail Power Supply
DR-120-24	24 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply
SDR-240-24	24 V/10 A, 240 W Single Output Industrial DIN Rail Power Supply with PFC Function

Unmanaged PoE Ethernet Switch

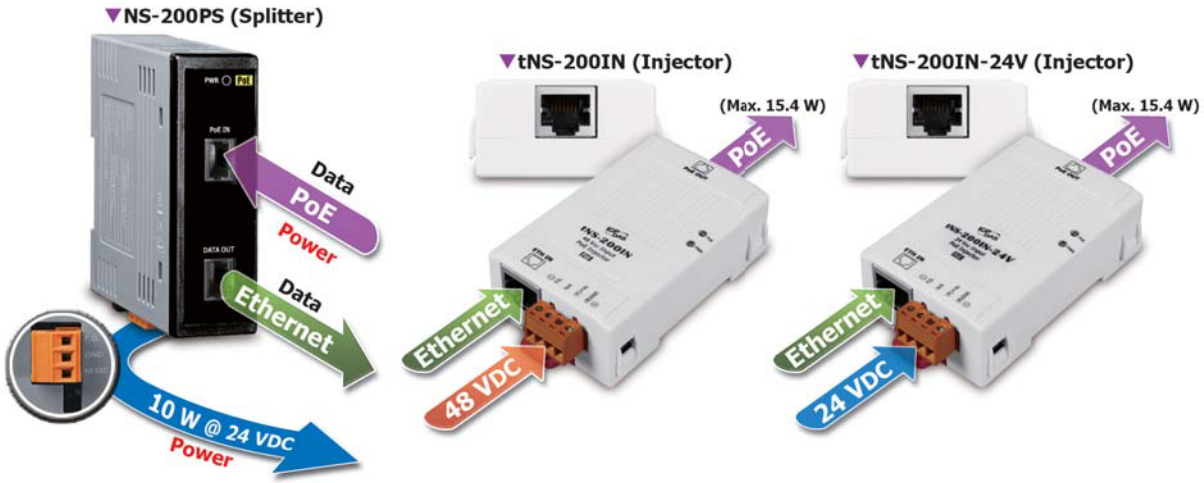
Model Name	Speed	Port	PoE Type	Power Input	Housing
NS-105PSE	10/100 M	5	PSE x 4 (IEEE 802.3af)	+46 ~ 55 VDC	Plastic
NSM-205GP	10/100/1000 M		PSE x 4 (IEEE 802.3at)	+18 ~ 55 VDC	Metal
NS-208PSE/NSM-208PSE	10/100 M	8	PSE x 8 (IEEE 802.3af)	+46 ~ 55 VDC	Plastic/Metal
NSM-208PSE-24V				+18 ~ 55 VDC	Metal
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

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.

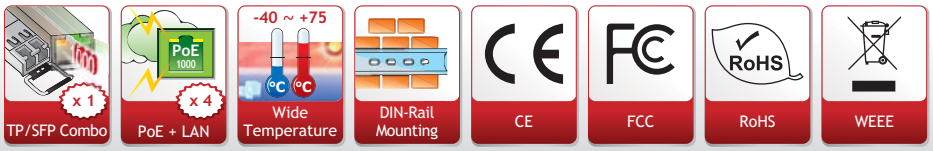
A PoE injector enables the powering of a PoE compatible device over Ethernet in spite of a non PoE capable Ethernet Switch. The PoE injector, placed between the Ethernet switch and the PoE powered device, merges both data (Ethernet Port) and voltage (power connector) on the Ethernet cable.

Model Name	Speed	Input	Output	Housing
NS-200PS	10/100/1000 Mbps	PoE	Ethernet + 24 VDC	Plastic
tNS-200IN	10/100 Mbps	Ethernet + 48 VDC	15.4 W PoE	Plastic
tNS-200IN-24V	10/100 Mbps	Ethernet + 24 VDC	15.4 W PoE	Plastic
tNS-200GIN	10/100/1000 Mbps	Ethernet + 48 VDC	30 W PoE	Plastic
tNS-200GIN-24V	10/100/1000 Mbps	Ethernet + 24 VDC	30 W PoE	Plastic



NSM-205GP NEW

4G+1G Combo Port Gigabit Unmanaged Ethernet Switch with 4 IEEE 802.3af/at PoE+ ports



Features

- Full Gigabit Ethernet ports
- 4 PoE/PoE+ PSE capable ports, fully compliant to IEEE 802.3af/at
- 24/48 VDC flexible redundant power inputs
- Supports 10 KB jumbo frames
- Pluggable SFP transceiver port
- Supports Auto Negotiation and Auto MDI/MDI-X
- Supports Dual +18 ~ 55 VDC power input and 1 relay output
- Supports operating temperatures from -40 °C ~ +75 °C
- Slim packaging fits on your DIN-Rail Mounting

Introduction

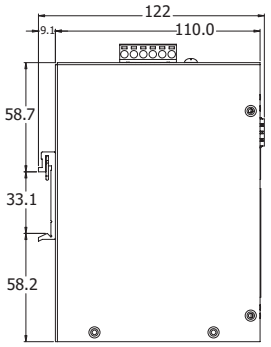
The NSM-205GP is 5-port unmanaged full Gigabit Ethernet switch supporting Power-over-Ethernet on ports 1 to 4. The switch is classified as power source equipment (PSE), and when used in this way, the NSM-205GP switch enable centralization of the power supply, providing up to 30 watts. The NSM-205GP can be used to power IEEE 802.3af/at standard devices (PD). Voltage boost technology supports 24V industrial power sources ensuring that a full and proper PSE voltage is available across all PoE ports.

Specifications

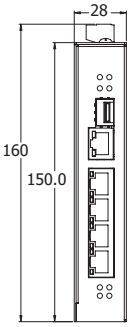
Technology	
Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3ab for 1000Base-T IEEE 802.3x for Flow Control IEEE 802.3af Power Over Ethernet IEEE 802.3at Power Over Ethernet Energy Efficient Ethernet (EEE) as per 802.3az; this provides power savings during idle network activity
Processing Type	Store & forward; wire speed switching
MAC Addresses	8K
Memory Bandwidth	10 Gbps
Frame Buffer Memory	1 Mbit
Jumbo Frames	10K for Speed 1000M
Flow Control	IEEE 802.3x flow control, back pressure flow control

Interface	
RJ-45 Ports	10/100/1000 BaseT(X), 10/100BaseT(X) auto negotiation speed, full/half duplex mode, and auto MDI/MDI-X connection
Fiber Port	1000BaseSFP slot/100BaseSFP slot
LED Indicators	PWR1, PWR2, Power fail, 10/100M, 1000M, Link/Act, Power Device is detected
Ethernet Isolation	1500 Vrms 1 minute
DIP Switch	100BaseSFP/1000BaseSFP and PoE/PoE+ setting
Power Input	
Redundant Input Range	Flexible input +24/+48 VDC Nominal. (+18 ~ +55 VDC)
Power Consumption	0.13@ 48 VDC without PD loading; 3.1 A @ 48 VDC with PD full loading (30 W per ports) 0.25@ 24 VDC without PD loading; 6.2 A @ 24 VDC with PD full loading (30 W per ports)
Alarm Contact	One relay output with current carrying capacity of 1A @ 30 VDC
Protection	Power reverse polarity protection
Connector	6-Pin Removable Terminal Block (Power & Relay)
Mechanical	
Chassis	Metal with an IP30 ingress protection rating
Dimensions (W x L x H)	28 mm x 160 mm x 122 mm
Installation	DIN-Rail or Wall Mounting (with optional kit)
Environment	
Operating Temperature	-40 °C ~ + 75 °C (-40 °F to 167 °F)
Storage Temperature	-40 °C ~ + 85 °C (-40 °F to 185 °F)
Ambient Relative Humidity	10 ~ 90% RH, non-condensing

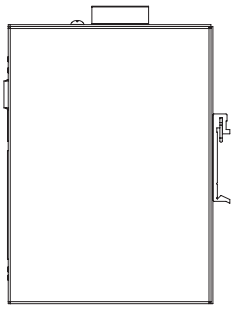
Dimensions (Units: mm)

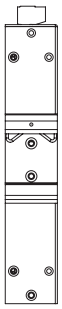


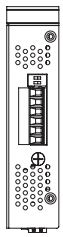
Left Side View

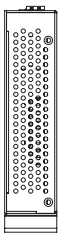


Front View


Right Side View


Rear View


Top View


Bottom View

Ordering Information

NSM-205GP CR	4G+1G Combo Port Gigabit Unmanaged Ethernet Switch with 4 IEEE 802.3af/at PoE+ ports (RoHS)

Applications

Accessories

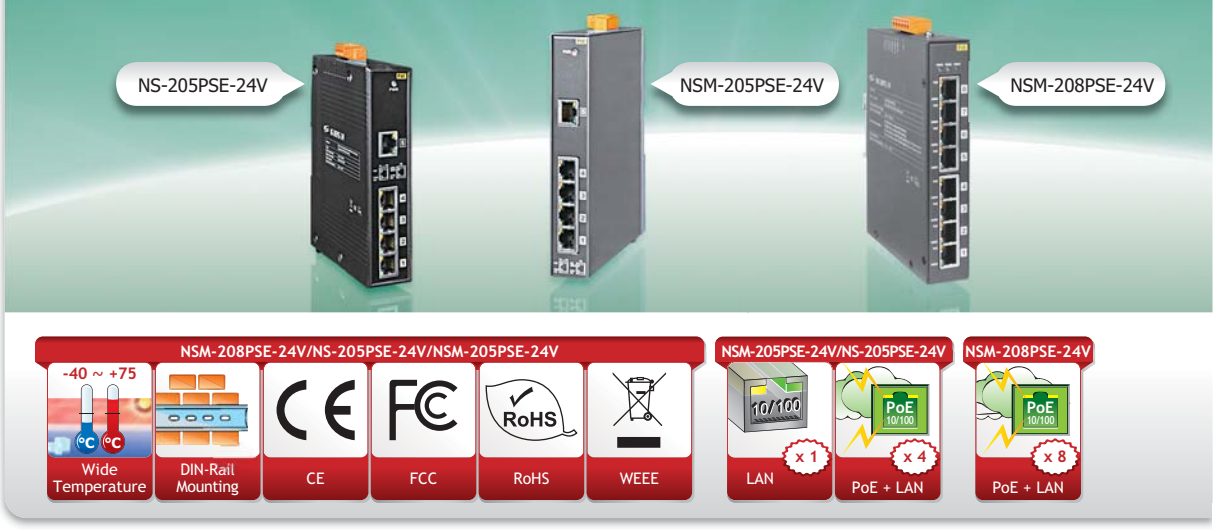
DR-120-48	48 V/2.5 A, 120 W Single Output Industrial DIN Rail Power Supply	
MDR-60-48	48 V/1.25 A, 60 W Single Output Industrial DIN Rail Power Supply	
DR-120-24	24 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply	
SDR-240-24	24 V/10 A, 240 W Single Output Industrial DIN Rail Power Supply with PFC Function	
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	

NS-205PSE-24V/NSM-205PSE-24V

5-port 10/100 Mbps PoE (PSE) Ethernet Switch with +24 VDC Input

NSM-208PSE-24V

8-port 10/100 Mbps PoE (PSE) Ethernet Switch with +24 VDC Input



Features

- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Supports operating temperatures from -40 °C ~ +75 °C
- Each port supports both 10/100 Mbps speed auto negotiation
- Power Inputs +18 VDC ~ +32 VDC For NS-205PSE-24V/NSM-205PSE
- Power Inputs +18 VDC ~ +55 VDC For NSM-208PSE-24V
- Automatic MDI/MDI-X crossover for plug-and-play
- Store-and-forward architecture
- 3.2 Gbps high performance memory bandwidth
- IEEE 802.3af compliant PoE ports
- DIN-Rail Mounting

Introduction

The NS-205PSE-24V/NSM-205PSE-24V is a 5-port unmanaged PoE (Power over Ethernet) Industrial Ethernet switch; it supports 4 PoE ports which are classified as power source equipment (PSE). The NSM-208PSE-24V/NS-205PSE-24V/NSM-205PSE-24V makes centralized power supply come true and provides up to 15.4 watts of power per PSE port.
Voltage boost technology supports 24V industrial power sources ensuring that a full and proper PSE voltage is available across all PoE ports.

Specifications

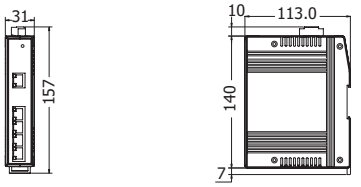
Models	NS-205PSE-24V	NSM-205PSE-24V	NSM-208PSE-24V
Technology			
Standards	IEEE 802.3, 802.3u, 802.3x ,802.3af (Power over Ethernet)		
Processing Type	Store & forward; wire speed switching		
MAC Addresses	1024		
Memory Bandwidth	3.2 Gbps		
Frame Buffer Memory	512 Kbit		
Flow Control	IEEE 802.3x flow control, back pressure flow control		
Interface			
RJ-45 Ports	10/100 Base-T(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection		
LED Indicators	Power, Link/Act , 10/100M, Power Device is detected		
Ethernet Isolation	1500 Vrms 1 minute		
EMS Protection	Yes		
Power Input			
Input Voltage Range	+18 VDC ~ +32 VDC		+18 VDC ~ +55 VDC
Power Consumption	0.24 A @ 24 VDC without PD loading 3.2 A @ 24 VDC with PD full loading		0.28 A @ 24 VDC without PD loading 6.1 A @ 24 VDC with PD full loading
Protection	Power reverse polarity protection		
EMS Protection	Yes		
Connector	3-Pin Removable Terminal Block		6-Pin Removable Terminal Block

Models	NS-205PSE-24V	NSM-205PSE-24V	NSM-208PSE-24V
PoE Technology			
PoE Compliance	100% IEEE 802.3af compliant		
PoE Classification	PSE (Power Sourcing Equipment)		
PoE Power	Up to 15.4 watts per port		
PoE Operation	Automatic detection and power management		
PoE Pin Assignments	V+ (Pin 1, 2), V- (Pin 3, 6)		
Certifications			
Shock	IEC 60068-2-27		
Freefall	IEC 60068-2-32		
Vibration	IEC 60068-2-6		
Mechanical			
Casing	Plastic	Metal (IP30 Protection)	
Dimensions (W x L x H) (Units: mm)	31 x 113 x 157	25 x 119 x 168	28 x 120 x 160
Installation	DIN-Rail Mounting		
Environment			
Operating Temperature	-40 °C ~ +75 °C		
Storage Temperature	-40 °C ~ +85 °C		
Ambient Relative Humidity	10% ~ 90% RH, non-condensing		

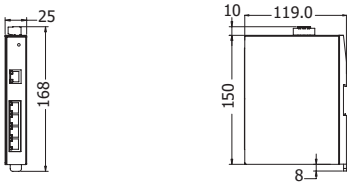
Dimensions (Units: mm)

NSM-208PSE-24V

NS-205PSE-24V

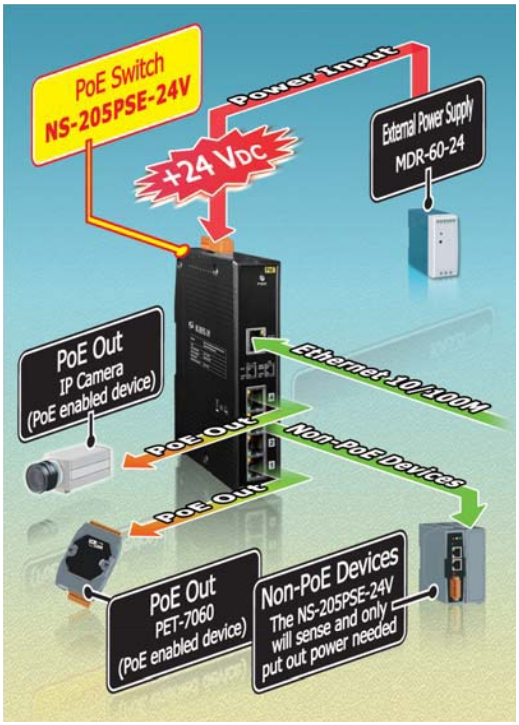


NSM-205PSE-24V



Front View | Right Side View

Applications



Ordering Information

NS-205PSE-24V CR	Unmanaged 5-port 10/100 Mbps PoE (PSE) Ethernet Switch; +24 VDC Input (RoHS)
NSM-205PSE-24V CR	Unmanaged 5-port 10/100 Mbps PoE (PSE) Ethernet Switch with Metal Casing; +24 VDC Input (RoHS)
NSM-208PSE-24V CR	Unmanaged 8-port 10/100 Mbps PoE (PSE) Ethernet Switch with Metal Casing; +24 VDC Input (RoHS)

Accessories

DP-1200	24 V/5 A, 120 W Power Supply with DIN-Rail Mounting
MDR-60-24	24 V/2.5 A, 60 W Power Supply with DIN-Rail Mounting
DR-120-24	4 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply
SDR-240-24	24 V/10 A, 240 W Single Output Industrial DIN Rail Power Supply with PFC Function

NS-208-M12-IP67 NEW

8-port M12 Unmanaged Ethernet Switch with IP67

NS-208PSE-M12-IP67 NEW

8-port M12 Unmanaged PoE Ethernet Switch with IP67

Features

- Each port supports both 10/100 Mbps speed auto negotiation
- 8 PoE ports with Power Sourcing Equipment (PSE) operation (NSM-208PSE-M12-IP67)
- Over-temperature, over-current and over/under-voltage detection (NSM-208PSE-M12-IP67)
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- Automatic MDI/MDI-X crossover for plug-and-play
- Store-and-forward architecture
- Auto-detection of PD (powered devices) and automatic power management (NSM-208PSE-M12-IP67)
- 8-port 10/100 Mbps M12 type connector with IP67 protection
- Supports operating temperatures from -40 °C ~ +75 °C

Introduction

The NS-208PSE-M12-IP67/NS-208-M12-IP67 is designed for industrial applications in harsh environments. The M12 connectors ensure tight, robust connections, and guarantees reliable operation, even for applications that are subject to high vibration and shock.

The NS-208PSE-M12-IP67 PoE switch provides 8 fast Ethernet M12 ports with 8 IEEE 802.3af compliant PoE ports. The switch is classified as power source equipment (PSE) and provide up to 15.4 W of power per port.

The Ethernet switch supports IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provides an economical solution for your industrial Ethernet network.

The NS-208-M12-IP67 provides a wide +12 VDC ~ +53 VDC power range to fit all the common power standards found in industrial automation, without external power converters. The wide power input lowers installation and maintenance costs.

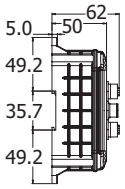
Comparison Table of 8-port M12 Ethernet Switch

Mode Name	NSM-208PSE-M12	NSM-208PSE-M12-IP67	NS-208PSE-M12-IP67	NS-208-M12-IP67
PoE	802.3af x 8	–	802.3af x 8	–
Input Voltage Range	+46 VDC ~ +53 VDC	+12 VDC ~ +53 VDC	+46 VDC ~ +53 VDC	+12 VDC ~ +53 VDC
Operating Temperature	-40 °C ~ +75 °C		-40 °C ~ +75 °C	
Casing	Metal with IP40		Plastic with IP67	
Installation	Wall Mounting		DIN-Rail Mounting or Wall Mounting	
Dimensions (W x L x H)	190 mm x 56 mm x 100 mm		190 mm x 62 mm x 134 mm	

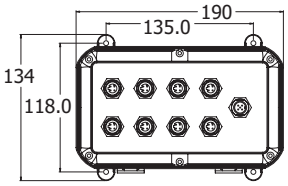
Specifications

Models	NS-208PSE-M12-IP67	NS-208-M12-IP67
Technology		
Standards	IEEE 802.3, 802.3u, 802.3x, 10/100 Base-T(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection	
Processing Type	Store & forward	
MAC Addresses	1024	
Memory Bandwidth	3.2 Gbps	
Frame Buffer Memory	512 Kbit	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Interface		
LED Indicators	PWR, Link/Act, Power Device is detected	PWR, Link/Act
Ethernet Isolation	1500 Vrms 1 minute	
Connector	Female 4-Pin shielded M12 D-coding connector x 8	
Power Input		
Input Voltage Range	+46 VDC ~ +53 VDC	+12 VDC ~ +53 VDC
Power Consumption	0.12 A @ 48 VDC without PD loading 3.0 A @ 48 VDC with PD full loading	0.12 A @ 48 VDC
Protection	Power reverse polarity protection	
Connector	Male 5-Pin shielded M12 A-coding connector x 1	
PoE Technology		
PoE Compliance	100% IEEE 802.3af compliant	–
PoE Classification	PSE (Power Sourcing Equipment)	–
PoE Voltage	+48 VDC depending on power input	–
PoE Power	Up to 15.4 W per port	–
PoE Operation	Automatic detection and power management	–
PoE Pin Assignments	V+ (Pin 1, 2), V- (Pin 3, 6) for RJ-45	–
Mechanical		
Casing	Plastic with IP67	
Dimensions (W x L x H)	190 mm x 62 mm x 134 mm	
Installation	DIN-Rail Mounting or Wall Mounting	
Environmental		
Operating Temperature	-10 °C ~ +60 °C (Protection rating IP67)	
	-40 °C ~ +75 °C (Protection rating IP66)	
Storage Temperature	-10 °C ~ +60 °C (Protection rating IP67)	
	-40 °C ~ +75 °C (Protection rating IP66)	
Ambient Relative Humidity	100% RH for Operating Temperature -10 °C ~ +60 °C	
	10% ~ 90% RH, non-condensing for Operating Temperature -40 °C ~ +75 °C	

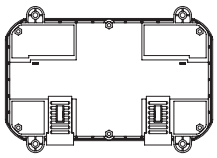
Dimensions (Units: mm)



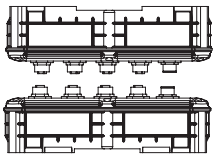
Left Side View



Front View


Bottom View

Top View


Rear View

Ordering Information

NS-208-M12-IP67 CR	8-port M12 Unmanaged Ethernet Switch with IP67 (RoHS) Includes M12D-4P-IP68 x 8, A-CAP-M12M x 8, M12A-5P-IP68 and A-CAP-M12F x 1
NS-208PSE-M12-IP67 CR	8-port M12 Unmanaged PoE Ethernet Switch with IP67 (RoHS) Includes M12D-4P-IP68 x 8, A-CAP-M12M x 8, M12A-5P-IP68 and A-CAP-M12F x 1

Accessories

MDR-60-48	48 V/1.25 A, 60 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 V/0.52 A, 25 W Power Supply with DIN-Rail Mounting
KA52F-48	48 V/0.52 A, 25 W Power Supply

M12D-4P-IP68	A-CAP-M12M	M12A-5P-IP68	A-CAP-M12F
			
4PIO1K0000001	4PIO1K0000002	4PIO1K0000003	4PIO1K0000004
You need to choose high quality M12 cable, please refer to http://www.balluff.ca/Balluff			

NSM-206PSE/NSM-206PF Series NEW

6-port unmanaged Ethernet switches with 4 IEEE 802.3af/at PoE+ ports

Features

- 4 PoE/PoE+ PSE capable ports, fully compliant to IEEE 802.3af/at
- Up to 30 watts per PoE port
- Supports operating temperatures from -40 °C ~ +75 °C
- Full duplex IEEE 802.3x and half duplex backpressure flow control
- 12/24/48 VDC wide range redundant power inputs
- Automatic MDI/MDI-X crossover for plug-and-play
- Store-and-forward architecture
- 4 Mbit Packet Buffer Size
- DIN-Rail Mounting, Wall Mounting (optional)

Introduction

The NSM-206PSE/NSM-206PF is 6-port unmanaged Ethernet switch supporting Power-over-Ethernet on ports 1 to 4. The switch is classified as power source equipment (PSE), and when used in this way, the NSM-206PSE/NSM-206PF switch enable centralization of the power supply, providing up to 30 watts. The NSM-206PSE/NSM-206PF can be used to power IEEE 802.3af/at standard devices (PD).

Voltage boost technology supports 24V industrial power sources ensuring that a full and proper PSE voltage is available across all PoE ports.

Specifications

Models	NSM-206PSE	NSM-206PFT	NSM-206FC	NSM-206FCS
Technology				
Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3x for Flow Control, Back Pressure Flow Control IEEE 802.3af Power Over Ethernet IEEE 802.3at Power Over Ethernet Energy Efficient Ethernet (EEE) as per 802.3az; this provides power savings during idle network activity			
Processing Type	Store & forward, wire speed switching			
MAC Addresses	16K			
Frame buffer memory	4 Mbit			
Jumbo Frames	16K			

Models	NSM-206PSE	NSM-206PFT	NSM-206FC	NSM-206FCS
Interface				
RJ-45 Ports	10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection			
PoE Pinout	V+, V+, V-, V- for pins 1, 2, 3, 6 (Endspan, MDI-X Alternative A)			
Fiber Ports	--	100BaseFX ports (SC/ST connector)		
LED Indicators	PWR1, PWR2, Power fail, 10/100M, Link/Act, Power Device is detected			
Optical Fiber	--	50/125, 62.5/125 µm (Multi-mode)	50/125, 62.5/125 µm (Multi-mode)	8.3/125, 8.7/125, 9/125 µm (Signal Mode)
Distance	--	2 km (62.5/125 µm recommended)	2 km (62.5/125 µm recommended)	30 km
Wavelength	--	1300 or 1310 nm	1300 or 1310 nm	1300 or 1310 nm
Min. TX Output	--	-20 dBm	-20 dBm	-5 dBm
Max. TX Output	--	-14 dBm	-14 dBm	-0 dBm
Max. RX Sensitivity	--	-32 dBm	-32 dBm	-35 dBm
Min. RX Overload	--	-8 dBm	-8 dBm	-5 dBm
Budget	--	12 dBm	12 dBm	30 dBm
Power				
Redundant Input Range	Flexible input +12/+24/+48 VDC Nominal. (+12 ~ +57 VDC)			
Power Consumption	0.13@ 48 VDC without PD loading; 3.1 A @ 48 VDC with PD full loading (30 W per ports) 0.25@ 24 VDC without PD loading; 6.2 A @ 24 VDC with PD full loading (30 W per ports)			
Power Budget	Max. 120 W for total PDs' consumption Max. 30 W for each PoE port			
Alarm Contact	One relay output with current carrying capacity of 1A @ 30 VDC			
Protection	Power reverse polarity protection			
Connector	4-Pin Removable Terminal Block			
Mechanical				
Chassis	Metal with an IP30 ingress protection rating			
Dimensions (W x L x H)	28 mm x 160 mm x 129 mm			
Installation	DIN-Rail or Wall Mounting (with optional kit)			
Environmental				
Operating Temperature	-40 °C ~ +75 °C (-40 °F to 167 °F)			
Storage Temperature	-40 °C ~ +85 °C (-40 °F to 167 °F)			
Ambient Relative Humidity	10% ~ 90% RH, non-condensing			

Ordering Information

NSM-206PSE CR	Unmanaged Ethernet switch with 2 10/100BaseT(X) ports, and 4 PoE ports (RoHS)
NSM-206PFT CR	Unmanaged Ethernet switch with 4 PoE ports, and 2 100BaseFX multi-mode ports with ST connectors (RoHS)
NSM-206PFC CR	Unmanaged Ethernet switch with 4 PoE ports, and 2 100BaseFX multi-mode ports with SC connectors (RoHS)
NSM-206PFCS CR	Unmanaged Ethernet switch with 4 PoE ports, and 2 100BaseFX single-mode ports with SC connectors (RoHS)

Accessories

DR-120-24	24 V/5 A, 120 W Single Output Industrial DIN Rail Power Supply
MDR-60-24	24 V/2.5 A, 60 W Power Supply with DIN-Rail Mounting
MDR-60-48	48 V/1.25 A, 60 W Power Supply with DIN-Rail Mounting
DIN-KA52F-48	48 V/0.52 A, 25 W Power Supply with DIN-Rail Mounting
KA52F-48	48 V/0.52 A, 25 W Power Supply

Wireless Networking Solutions

5-1 Overview

Industrial Wireless Communication creates new prospects for automation. In the harsh environment, chemicals, vibrations, or moving parts could potentially damage cabling. Industrial Wireless Communication system substantially reduces cost and time for the installation and maintenance of the large number of cable, thus makes plants setup and reconfiguration easy and safe.

ICP DAS provides a great variety of wireless products with modular and universal solution specially designed for industrial harsh environment.

• Comparison of ICP DAS Wireless Technologies

Items	3G/4G	RF Modem	ZigBee	Bluetooth LE	Wi-Fi
Advantage	Long range	Diffraction	Low power	Anti-interference	High bandwidth
Expenses	Depends on mobile network operators	Free			
Max Radio Speed (bps)	3G: 384K ~ 14.4 M 4G: 100M/150M	57.6k ~ 250k	250k	1M	300M
Max Transmission Range (LOS)	No limitation (Base station coverage)	700 ~ 1000 m	700 m	20 ~ 30 m	50 ~ 100 m
Product Type	I/O, PAC, Gateway, SMS, Modem	Converter	I/O, Converter, Repeater, Data Collector	Converter, Meter Data Collector	I/O, Converter, AP, Gateway, Data Collector

5-2 WLAN Products

WLAN (Wireless Local Area Network) links devices by wireless distribution method (spread-spectrum or OFDM radio), and generally provides a connection through an access point to the Internet. WLAN allows users to move device within a local coverage area, and still be connected to the network. High-bandwidth allocation for wireless will make a relatively low-cost wiring possible.

ICP DAS provides a great variety of WLAN products which are compliant with standard of IEEE 802.11. The WLAN products have two modes: Ad-hoc and Infrastructure.

Advantages & Benefits

- Build a wireless network via Wi-Fi technology. There is no need to build an expensive fixed line network.
- Enable Serial/Ethernet device to be connected to the same network via Wi-Fi without any cable.
- Use widely available IEEE 802.11 (Wi-Fi) or Ethernet network infrastructure.
- Compatible with IEEE 802.11b/g standards
- Secure data access with WEP, WPA, WPA2.

• WLAN Selection Guide

☑ WLAN Remote Maintenance Device

Models	Interface	Wi-Fi standard	Data Encryption
M2M-711D	5-wire RS-232 x 1 2-wire RS-485 x 1 10/100M Ethernet x 1	IEEE 802.11 b/g Data rate: up to 54 Mbps (Auto scaling)	64/128-bit WEP, WPA-TKIP and WPA2-AES

☑ WLAN Gateway

Models	Interface	Wi-Fi standard	Data Encryption
RMV-760D-MTCP	3-wire RS-232 x1 4-wire RS-422 x1 2-wire RS-485 x1 10/100M Ethernet x1	IEEE 802.11 b/g Data rate: up to 54 Mbps(Auto scaling)	64/128-bit WEP, WPA-TKIP and WPA2-AES

☑ Wi-Fi Access Point

Models	Interface	Wi-Fi standard	Data Encryption
APW77BAM	10/100/1000M Ethernet x 1 10/100/1000M PoE x 1	IEEE 802.11 a/b/g/n/ac Concurrent Dual Band with 802.11ac 2T2R 866Mbps (5GHz) and 802.11n 2T2R MIMO 300 Mbps (2.4 GHz)	WEP, WPA, WPA2, WPA-PSK, WPA2-PSK, 802.1X

☑ Ethernet to Wi-Fi Converter

Models	Interface	Wi-Fi standard	Data Encryption
WF-2571	10/100M Ethernet	IEEE 802.11b/g Data rate: up to 54 Mbps (Auto scaling)	64/128-bit WEP, WPA-TKIP and WPA2-AES
IOP760AM	10/100M Ethernet x 1 RJ12 (RS-232/RS-485) x 1	IEEE 802.11 a/b/g/n/ac With 802.11n/ac (2.4G/5GHz selectable)	WEP, WPA, WPA2, WPA-PSK, WPA2-PSK, 802.1X

Wi-Fi Access Point

APW77BAM

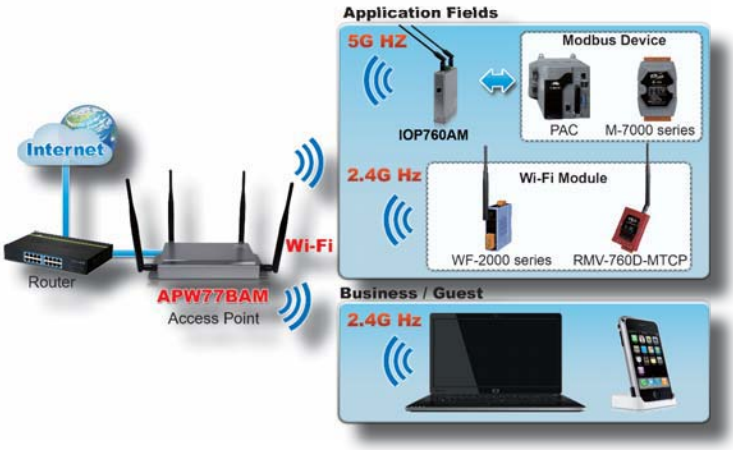
Introduction:

The APW77BAM is designed for medium-sized businesses to extend the existing networks and has the ability to operate in different modes and can be used in a wide variety of wireless applications. Its Universal Repeater Mode not only has an easier way for setup, but also provides better performance and compatibility to create a larger wireless network infrastructure by linking up other access points. It also supports Multiple-SSID function to simultaneously emulate 8 APs with different ESSIDs and separate packets via VLAN IDs.

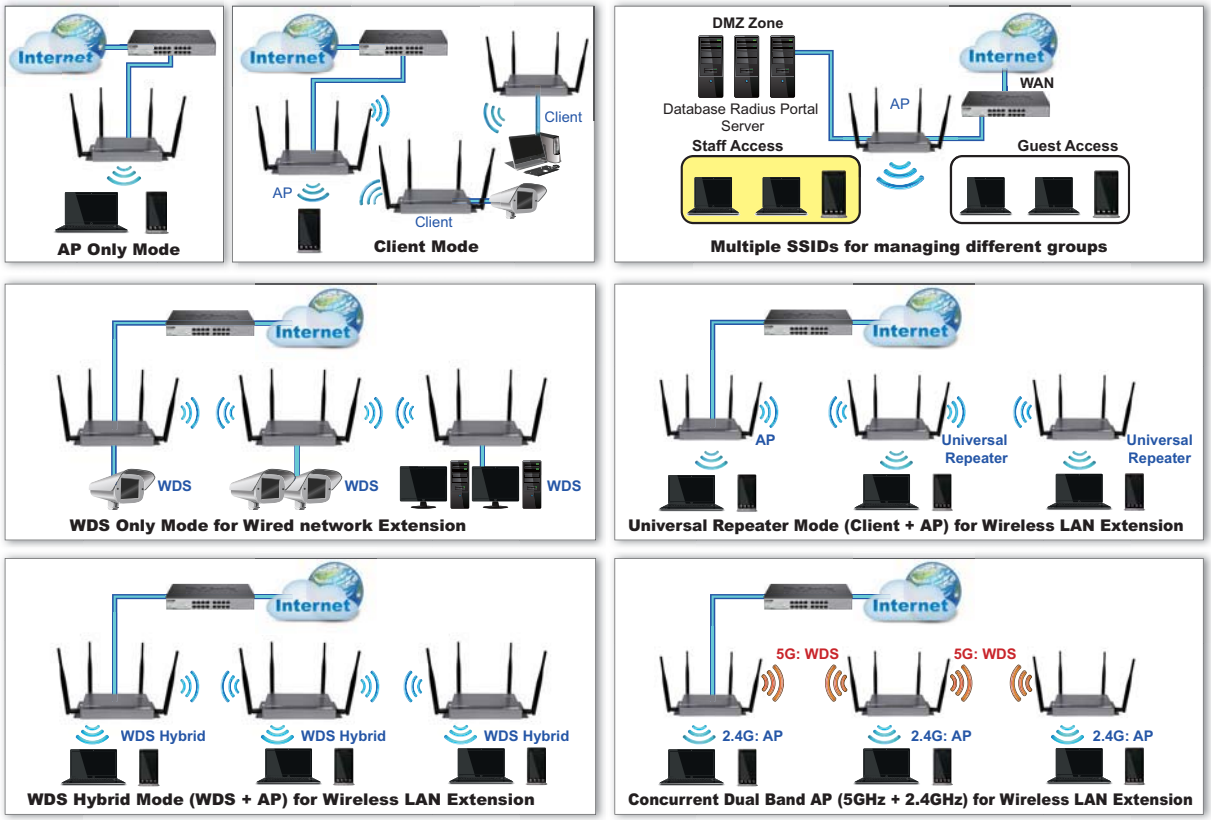
Features:

- Thin AP
- Wall-Mount Wi-Fi Access Point
- IEEE 802.11a/b/g/n/ac Wi-Fi Compliance
- Configurable AP Transmit Power and Channel
- Supports WEP, WPA, WPA2, WPA-PSK, WPA2-PSK and 802.1x
- Segmented guest and corporate access with multiple SSIDs
- One IEEE 802.3 af (PoE), or DC12V/1A
- Roaming
- WDS/Repeater/Client Modes
- Point-to-Point and Point-to-Multipoint Bridging
- AP Load Balance
- Website Configuration Interface

Connection Diagram:



Applications:



▼ Ethernet / UART to Wi-Fi Converter

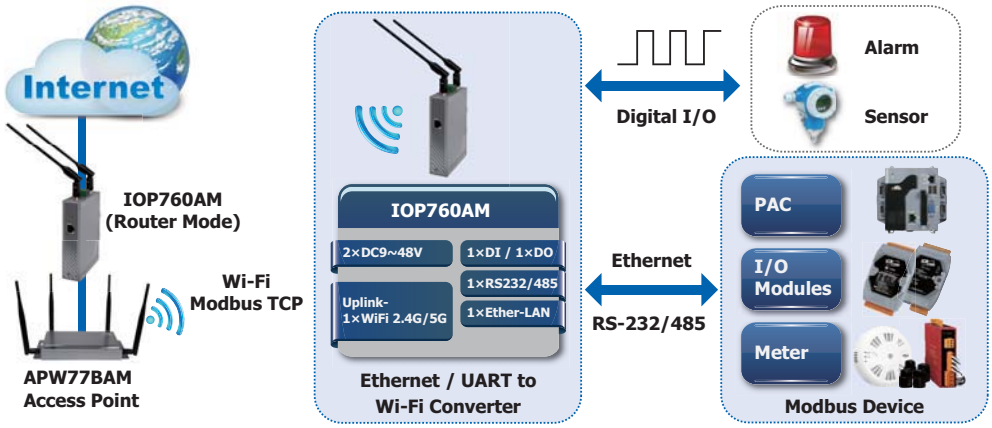
IOP760AM

Features:

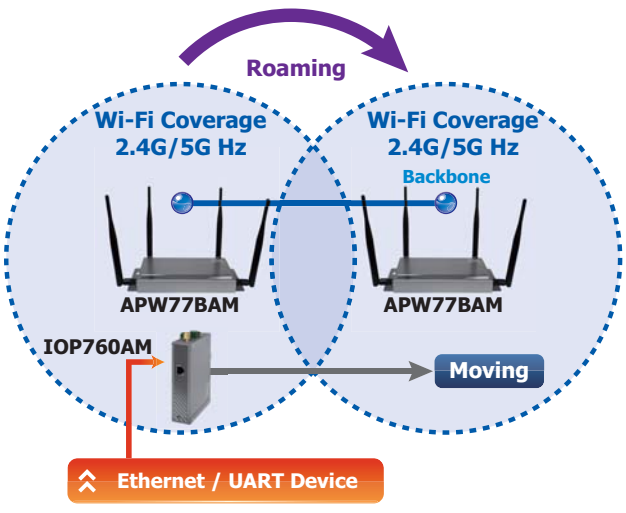
- Wi-Fi Uplink or Ethernet WAN Connection
- One RS-232/485 for Modbus RTU Connection
- IEEE 802.11a/b/g/n/ac Wi-Fi Compliance
- One LAN Port for Linking Local Ethernet Devices
- One DI/One DO For Device Triggering or Event Reporting
- Designed by Solid And Easy to Mount Metal Body
- Wi-Fi/Ethernet/UART Bridge
- Roaming
- Command Line Interface (CLI)
- Website Configuration Interface
- Modbus Connections
- Router Mode

Introduction:

The IOP760AM is absolutely the right choice for wireless M2M (Machine-to-Machine) applications. With built-in high performance IEEE802.11a/b/g/n/ac compliant Wi-Fi uplink or multi-mode access point function, you can connect all your devices wirelessly while the wired deploying is too difficult or not feasible. Besides, with VPN tunneling technology, remote sites easily become a part of Intranet, and all data are transmitted in a secure (256-bit AES encryption) link. IOP760AM is loaded with luxuriant security features including VPN, firewall, NAT, port forwarding, DHCP server and many other powerful features for complex and demanding business and M2M applications. The redundancy design in fallback 9 ~ 48 V_{DC} power terminal and VRRP function makes the device as a back-up in power, network connection and data transmission without lost.



Applications:



Function:

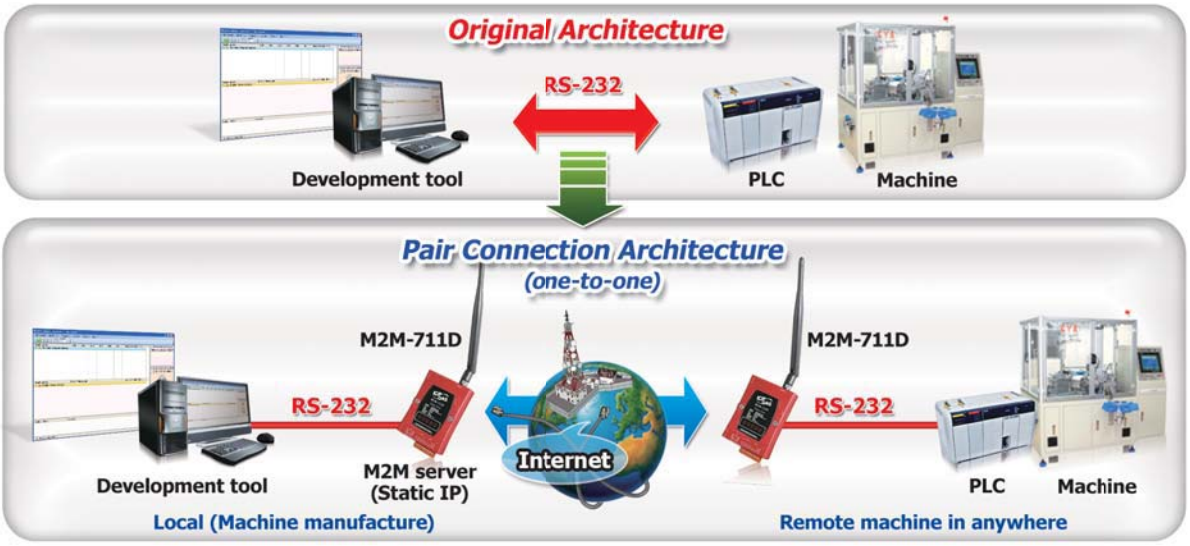
- To deploy an Ethernet/UART to Wi-Fi Converter for industrial automation.

Description:

- The easiest way to deploy an Ethernet/UART to Wi-Fi Converter for connecting your industrial automation or telemetry equipments to the local / remote management center with wireless solution.
- With 802.11n/ac (2.4G/5GHz selectable) as connection interface, it is simple to connect with existing wireless local data network.
- The most cost-effective product for you with robust design for secure internet access, variable voltage range, wide temperature range.
- Wi-Fi Roaming applications with APW77BAM

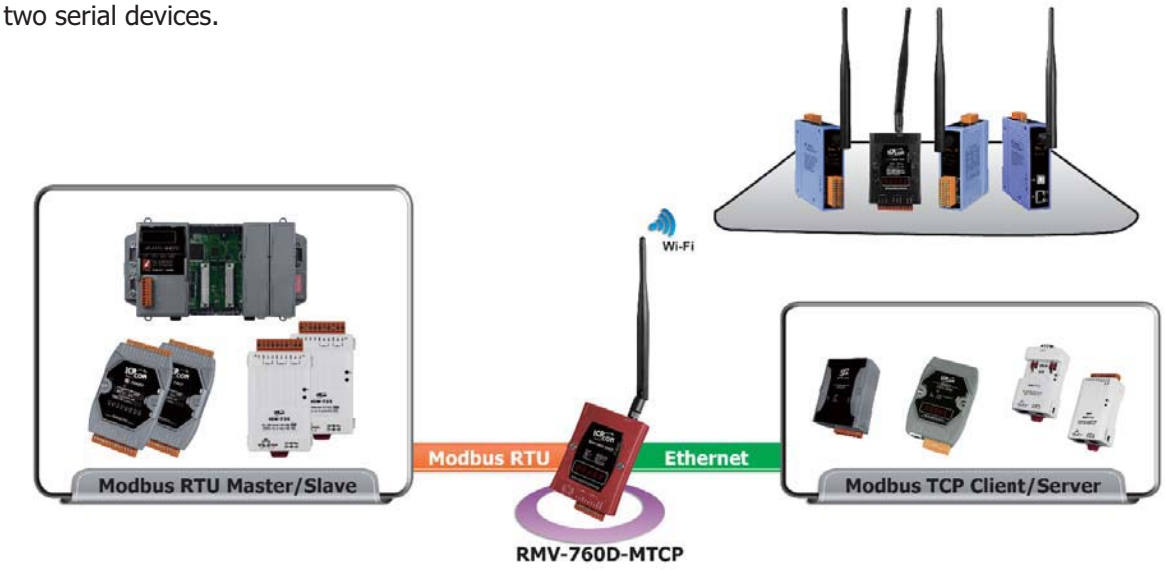
▼ WLAN Remote Maintenance Device

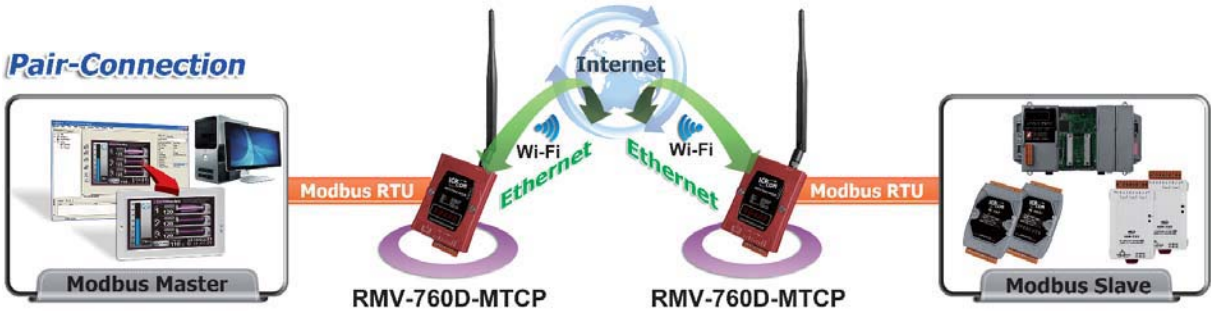
M2M-711D can provide the remote serial data transmission by Ethernet or Wi-Fi (IEEE 802.11b/g) between local and remote sides.



▼ WLAN Gateway

RMV-760D-MTCP is a Modbus TCP/RTU gateway. It exchanges Modbus command from Modbus TCP/RTU master to Modbus RTU/TCP slave. Modbus TCP command can be transceived by Ethernet port and Wi-Fi interface. It supports VxComm and Pair-Connection functions. Users can choose Ethernet mode or Wi-Fi mode to implement the pair connection, which provides TCP data tunneling between two serial devices.

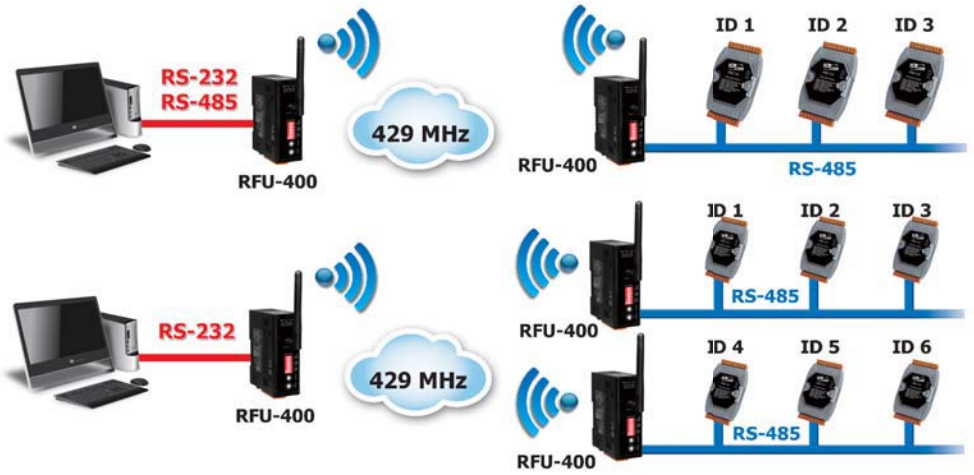




5-3 Radio Modem

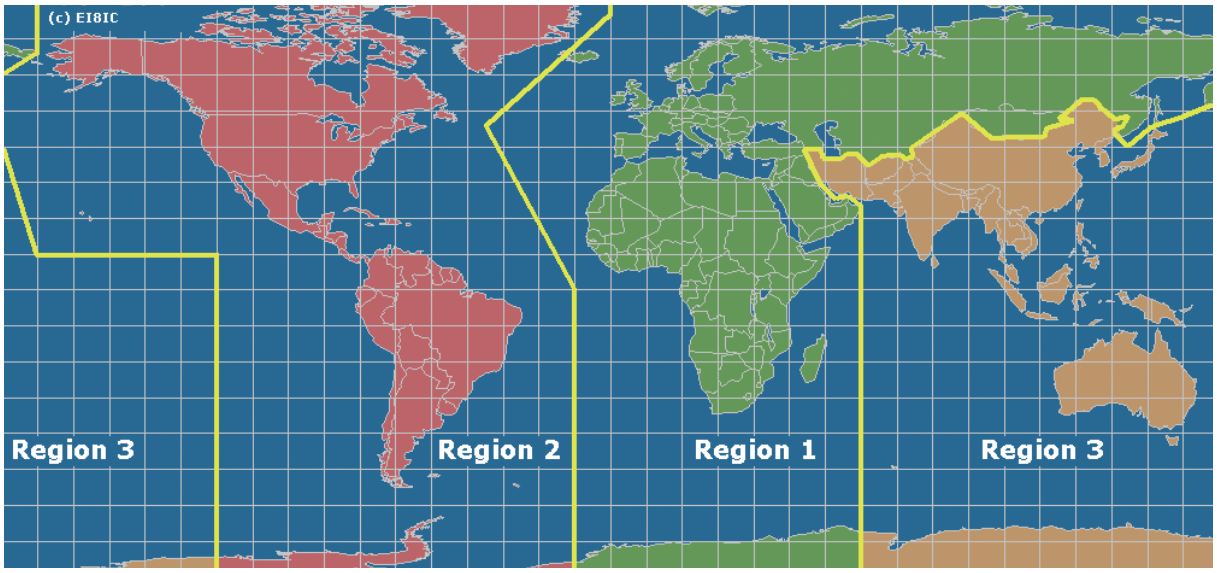
ICP DAS provides RFU and SST series wireless modem which is designed for data acquisition and control applications between a host and remote sensors. It is also useful for those applications where the installation of cable wire is inconvenient.

The wireless modem series is a spread spectrum radio modem with an RS-232 or RS-485 interface port. The module can be used not only in peer to peer mode, but also in a multi-port structure.



Model Name	Radio		COM port	
	Frequency	Transmission Distance (LoS)	Interface	Baud rate (bps)
RFU-400	429 MHz / 433 MHz	1000 m	RS-232/485	1200 ~ 115200
RFU-433	433 MHz	1000 m	RS-232/485	1200 ~ 115200
RFU-2400	2.4 GHz	700 m	RS-232/485	2400 ~ 115200
tRFU-2400	2.4 GHz	180 m	RS-232/422/485	2400 ~ 115200

Note: tRFU-2400 is a tiny module with PCB antenna. RFU-433 complies with CE certification.



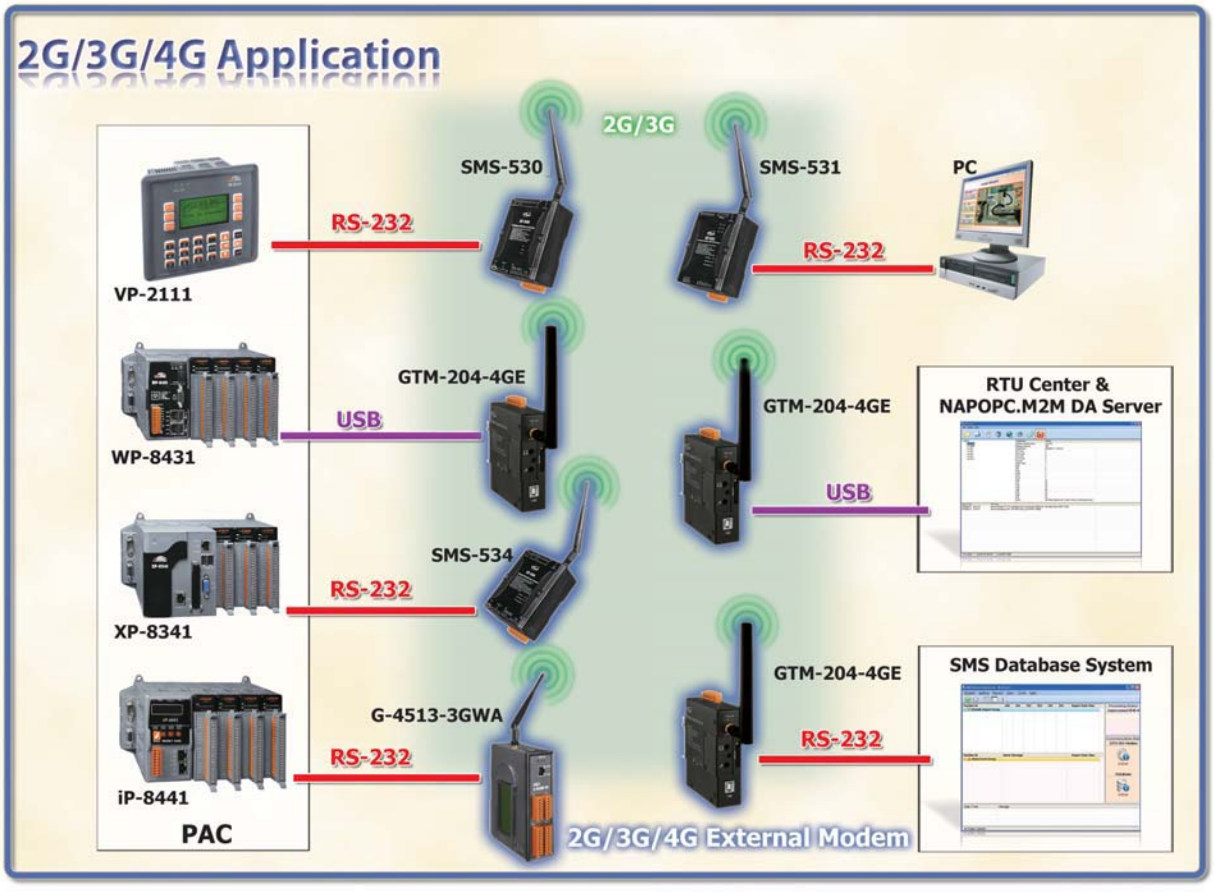
5-4 2G/3G/4G Products

ICP DAS 2G/3G/4G wireless solutions are uniquely designed to meet the challenges of implementing and managing a small, medium and large number of unmanned remote devices as well as mobile terminals using the 2G/3G/4G network. The ICP DAS 2G/3G/4G wireless system is comprised of intelligent 2G/3G/4G modems with versatile interfaces, a 2G/3G/4G Data Server (DS), and 2G/3G/4G PACs with embedded dynamic IP resolution technology to help system integrators and application service providers can quickly integrate 2G/3G/4G technology into their own solutions, and save development time with reduced costs and assured performance.

The 2G/3G/4G products support Quad-band GSM (850, 900, 1800, 1900 MHz) and Tri-band 3G WCDMA (850, 1900, 2100 MHz), two of the major frequency bands. By supporting these two bands, 2G/3G/4G products are compatible with most mobile networks worldwide.

Advantages & Benefits

- There is no need to build an expensive fixed line network.
- Enable any devices to be connected to the Internet via serial port over a 2G/3G/4G network.
- The most efficient method of handling data over a 2G/3G/4G wireless network and the Internet.
- A full turnkey solution that is designed for both fixed and mobile machine to machine applications.
- Reliable GSM/GPRS/EDGE/UMTS/HSPA network connectivity, providing fast and cost-effective long-range wireless applications



2G/3G/4G Module Selection Guide

ICP DAS provides various industrial Quad-band 2G or Tri-band 3G or LTE 4G modem. The modems utilize the 2G/3G/4G network for convenient and inexpensive data transfer from remote instruments, meters, computers or control systems in either live data or packet data. The modems have the integrated TCP/IP stack so that even simple controllers with serial communications ports can be connected to the modem without the need for special driver implementation.

Stand Alone Modem

Model Name	Frequency (MHz)	Reset Input	MIC Input Audio Output	GPS	TCP/IP Stack	Baud Rate (bps)	Interface	Driver	Casing
GTM-201-RS232	2G (GSM/GPRS): 850/900/1800/1900	Yes	Yes	-	Yes	9.6K ~ 115.2K	RS-232	Windows XP/7 Windows CE Linux	Plastic
GTM-201-USB	2G (GSM/GPRS): 850/900/1800/1900	Yes	Yes	-	Yes	9.6K ~ 115.2K	USB2.0		
GTM-203M-3GWA	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 2100/1900/900/850	Yes	Yes	-	Yes	9.6K ~ 115.2K	USB2.0 RS-232	Windows XP/7/8/10, Windows Server 2012	Metal
GTM-204M-4GE	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/DC-HSPA+): B1/B5/B8 4G (FDD LTE): B1/B3/B5/B7/B8/B20	Yes	Yes	-	Yes	9.6K ~ 115.2K	USB2.0 RS-232		Metal

2G/3G/4G Module

Model Name	Frequency (MHz)	GPS Interface	Max. Download Speed	AT Command	TCP/IP Protocol
I-8212W	2G (GSM/GPRS): 850/900/1800/1900	-	85.6 Kbps	Yes	Yes
I-8212W-3GWA	2G (GSM/GPRS): 850/900/1800/1900	-	115.2 Kbps		
I-8213W-3GWA	3G (UMTS/HSDPA/HSUPA): 2100/1900/850	Yes			
I-8213W-4GE	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/DC-HSDPA+): 850/900/2100 4G (FDD LTE): B1/B3/B5/B7/B8/B20	Yes	100 Mbps		

Intelligent 2G/3G/4G Modules Selection Guide

ICP DAS provides various intelligent 2G/3G/4G modules and gateway, GT-5xx Series. The Module is GSM remote control and alarm system allows users to use their mobile phone to monitor and control the business from any location. Its alarm facilities provide a flexible way to distribute critical alarm information to any number of mobile phone users. The Gateway allows user to access mobile phone by using standard protocol, such as Modbus.

Model Name	Interface	Frequency (MHz)	I/O	Alarm	Micro SD	Battery Backup	Transparent Communication	VxComm	3G Router
GT-530	2 × RS-232	2G (GSM/GPRS): 850/900/1800/1900	2 × DO 10 × DI	Yes (SMS)	-	Yes	SMS	-	-
SMS-530	2 × RS-232	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/ HSDPA/HSUPA): 850/900/1900/2100	2 × DO 10 × DI	Yes (SMS)	-	Yes	SMS	-	-
GT-531	2 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900	-	Yes (SMS, Voice)	Yes	-	Modbus RTU	-	-
SMS-531	2 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/ HSDPA/HSUPA): 850/900/1900/2100	-	Yes (SMS, Voice)	Yes	-	Modbus RTU	-	-
GT-534	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900	2 × DO 6 × DI 1 × AI	Yes (SMS, Voice)	Yes	Yes	SMS	-	-
SMS-534	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/ HSDPA/HSUPA): 850/900/1900/2100	2 × DO 6 × DI 1 × AI	Yes (SMS, Voice)	Yes	Yes	SMS	-	-
GT-540	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900	2 × DO 6 × DI 1 × AI	Yes (GPRS)	Yes	Yes	GPRS	-	-
GT-540-3GWA	1 x RS-232 1 x RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/ HSDPA/HSUPA): 850/900/1900/2100	2 × DO 6 × DI 1 × AI	Yes (GPRS)	Yes	Yes	3G/GPRS	-	-
GT-540P	1 × RS-232 1 × RS-485 GPS	2G (GSM/GPRS): 850/900/1800/1900	2 × DO 6 × DI 1 × AI	Yes (GPRS)	Yes	Yes	GPRS	-	-
GT-540P-3GWA	1 x RS-232 1 x RS-485 GPS	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/ HSDPA/HSUPA): 850/900/1900/2100	2 × DO 6 × DI 1 × AI	Yes (GPRS)	Yes	Yes	3G/GPRS	-	-

Model Name	Interface	Frequency (MHz)	I/O	Alarm	Micro SD	Battery Backup	Transparent Communication	VxComm	3G Router
GT-541	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900	-	-	-	-	GPRS	Yes	-
RMV-531	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 850/900/1900/2100	-	-	-	-	3G/GPRS	Yes	-
RMV-514	1 x RS-485	2G (GSM/GPRS): 850/900/1800/1900	2 × DO 6 × DI 1 × AI	-	-	Yes	3G/GPRS	Yes	-
GRP-530M	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 850/900/1900/2100	-	-	Yes	-	3G/GPRS	Yes	Yes
GRP-540M	1 × RS-232 1 × RS-485	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/HSDPA/HSUPA): 2100/1900/850 4G FDD LTE: B1/B3/B5/B7/B8/B20	-	-	Yes	-	4G/3G/GPRS	Yes	Yes

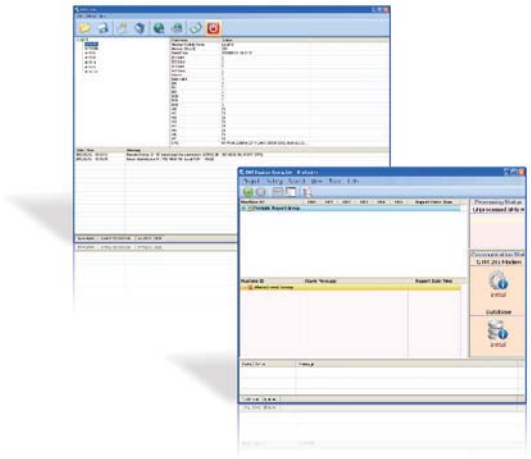
Mini PAC with 3G/4G Selection Guide

The G-4500 series provided by ICP DAS are M2M (machine to machine) mini programmable controller with a cellular transceiver can monitor industrial equipment that sends live data to the monitoring system, providing real-time status. With optional GPS model, the G-4500 can also be a GPS tracking system. It can be used in vehicle management system or maritime system.

Model Name	OS	Interface	I/O	Frequency (MHz)	LCM (Dot)	GPS	Power Saving	Solar Charging	Case
G-4513-3GWA	MiniOS7	1 × Ethernet 1 × RS-232 1 × RS-485	3 × DO 3 × DI 8 × AI 1 × Relay	2G (GSM/GPRS): 850/900/1800/1900 3G(WCDMA): 850/900/1900/2100	-	-	YES	for 12V Lead-Acid Battery	Metal
G-4513D-3GWA					128 x 64	-			
G-4513P-3GWA					-	YES			
G-4513PD-3GWA					128 x 64	YES			
▶G-4514-4GAU	MiniOS7	1 × Ethernet 1 × RS-232 1 × RS-485	3 × DO 3 × DI 8 × AI 1 × Relay	2G (GSM/GPRS): 850/900/1800/1900 3G (UMTS/DC-HSPA+): 850/900/1900/2100 4G (FDD LTE): B1/B2/B3/B4/B5/B7/B8/B20 4G (TDD LTE):B40	-	-	YES	for 12V Lead-Acid Battery	Metal
▶G-4514D-4GAU					128 x 64	-			
▶G-4514P-4GAU					-	YES			
▶G-4514PD-4GAU					128 x 64	YES			

Note: ▶ Available soon

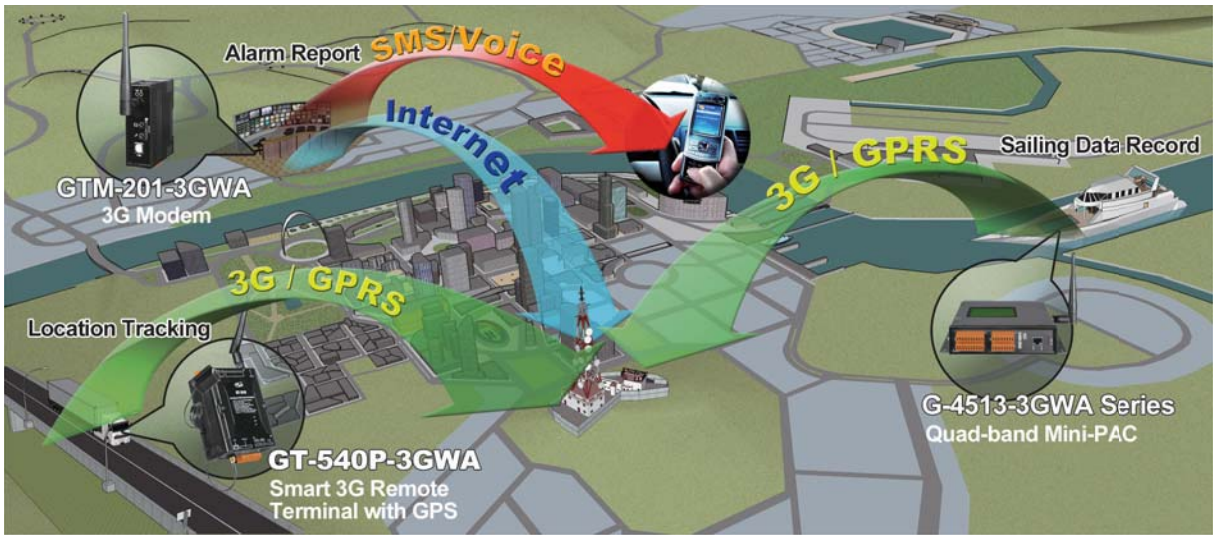
Software Solutions



ICP DAS provides various software solutions which allow users to manage 2G/3G/4G products more efficiently with easy-to-use interface. The SMS Database System is a GT-53x series management tool which allows the 3rd party software being easily integrated with the modules. The M2M RTU Center is a M2M (Machine to Machine) management software that has a strong core technology for handling data and lets the user save the trouble of dealing with large IO data. The M2M RTU Center can also work with NAPOPC. M2M DA Server, so user can easily access or monitor IO data by using OPC 2.0 Data Access Standards. ICP DAS also provides M2M RTU API Tool for those users who want to develop their own application.

Software Name	Description	Charge
SMS DBS	SMS Monitor/Database System software solution6 for GT-53x series	Free with 3 phone numbers
M2M RTU Center	M2M RTU series management software	Free with 256 device
M2M RTU API Tool	M2M RTU Win32 API library	Free
NAPOPC.M2M DA Server	OPC server for RTU devices	Free

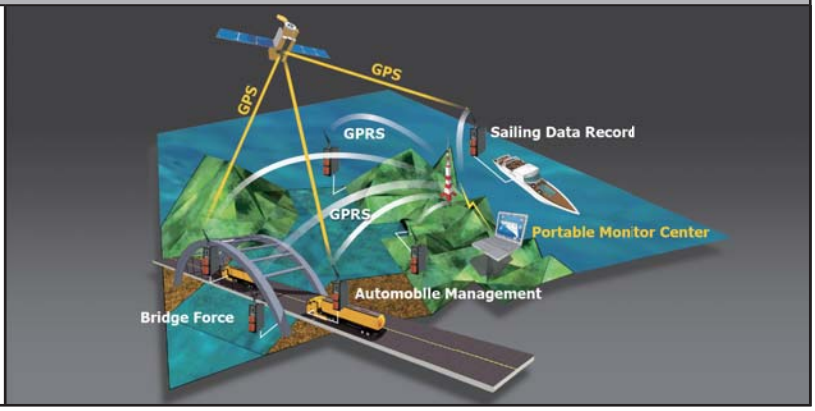
2G/3G/4G Wireless Applications



The absorption of ICP DAS Co., Ltd. is to develop cost effective solutions to the industries. In recent years, the significance of communication is expanding exponentially. It is not only people who communicate via internet or telecommunication technologies, but also machines. The technology which allows you to connect your physical resources online is also called M2M Technology. From home application to large scale industrial machines, there are trillion of machines waited to be connected online. The advancement in 2G and 3G technologies has enabled wireless integration with wired-machines more affordable & effective than ever. The live applications are showed below.

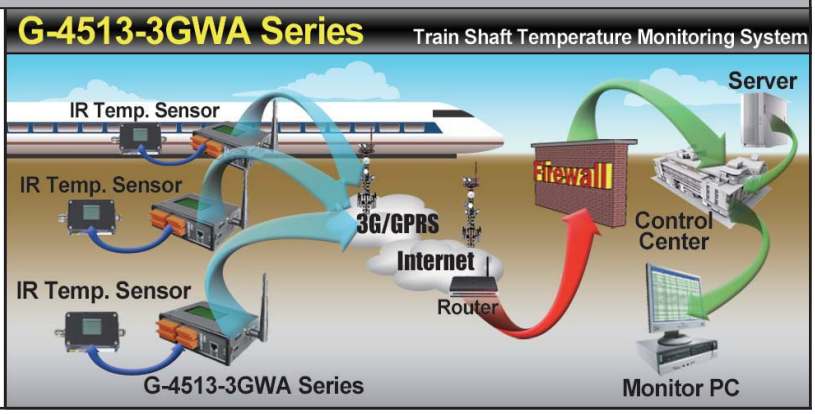
G-4513-3GWA Series General Application

By using G-4513-3GWA series, user can easily acquire data from any site without wiring limitation. G-4513-3GWA can also combine with a GPS module which allows user to monitor the location of moving transportations. To place the G-4513-3GWA on a vehicle or ship, users not only monitor its position but also record the fuel consumption.



Temperature Monitoring system

Placed infrared temperature sensors around shafts, and these sensors are connected to **G-4513-3GWA series** (M2M Mini-Programmable Automation Control). G-4513-3GWA controller will transmit data via 3G/GPRS service to Internet back to control center in real-time.

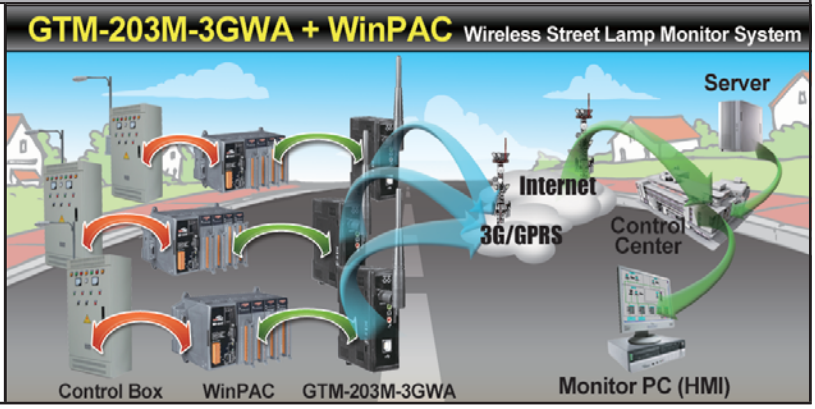


Vending/Gaming Machine Monitoring System

Each machine has a **SMS-530** or **SMS-534** (Intelligent SMS/Voice Alarm Controller) inside itself. Once the specific circumstances occurred (for example, vending machine ran out of drink), SMS-530/SMS-534 will automatically send either SMS or voice message to users in program list.

Street Lamp Monitor System

In each control box of street lamp, we placed a **WinPAC** (Windows CE embedded Programmable Automation Controller) and I/O Modules to acquire data from control box. All data will be transmitted back to control center in real-time by using **GTM-203M-3GWA** (Industrial 3G Modem).



5-5 ZigBee Products

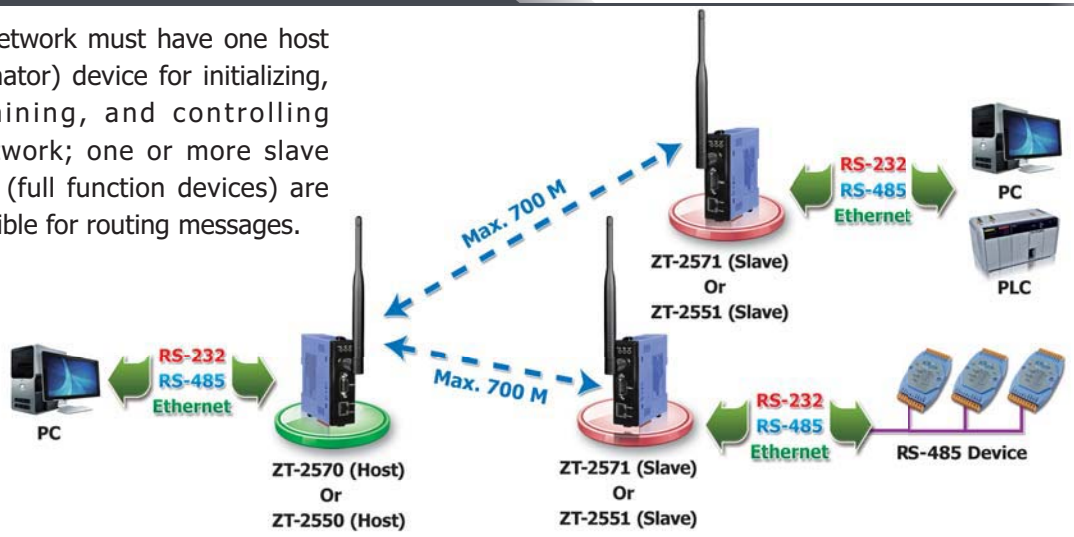
Features:

- ISM 2.4 GHz Operating Frequency and Fully Compliant with 2.4 G IEEE 802.15.4 / ZigBee PRO (2007)
- Support 3 Topologies Defined in the ZigBee Standard: Mesh, Star and Cluster Tree
- Support the 128-bit AES (Advanced Encryption Standard) Encryption
- GUI Configuration Software (Windows Version)
- ZigBee Node Supports Active Routing
- Supports Topology Utility for Network Monitoring and Improvement
- Wireless Transmission Range up to 700 m (Default)
- Provide Signal Strength LED Indicator
- Wide Operating Temperature (-25 ~ 75°C)

ZigBee is a specification based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs). ZigBee operates in the ISM radio bands, and it defines a general-purpose, inexpensive, self-organizing, mesh network for industrial control, medical data collection, smoke and intruder warning, building automation and home automation, etc.

● ZigBee Converter

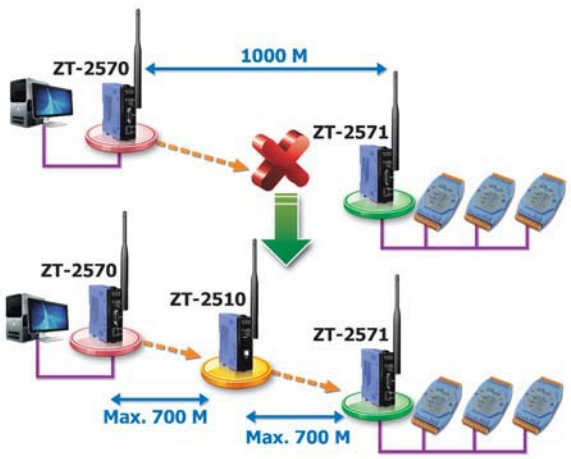
Every network must have one host (coordinator) device for initializing, maintaining, and controlling the network; one or more slave devices (full function devices) are responsible for routing messages.

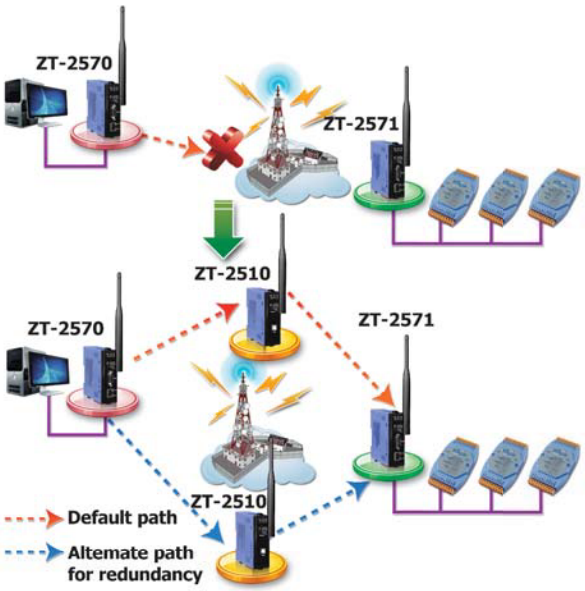


Model Name	Interface	Module Type	Transmit Power	Antenna	Distance (LOS)
ZT-2550	1 × RS-232, 1 × RS-485	Host (Coordinator)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m
ZT-2551	1 × RS-232, 1 × RS-485	Slave (Router)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m
ZT-2570	1 × RS-232, 1 × RS-485, 1 × Ethernet	Host (Coordinator)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m
ZT-2571	1 × RS-232, 1 × RS-485, 1 × Ethernet	Slave (Router)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m
ZT-USBC	1 × USB	Full Function (Coordinator/Router)	3 dBm	2.4 GHz, PCB antenna	60 m

ZigBee Repeater

The ZT-2510 is a ZigBee repeater to extend the distance of ZigBee network or avoid an obstacle that may be located between two wireless devices.

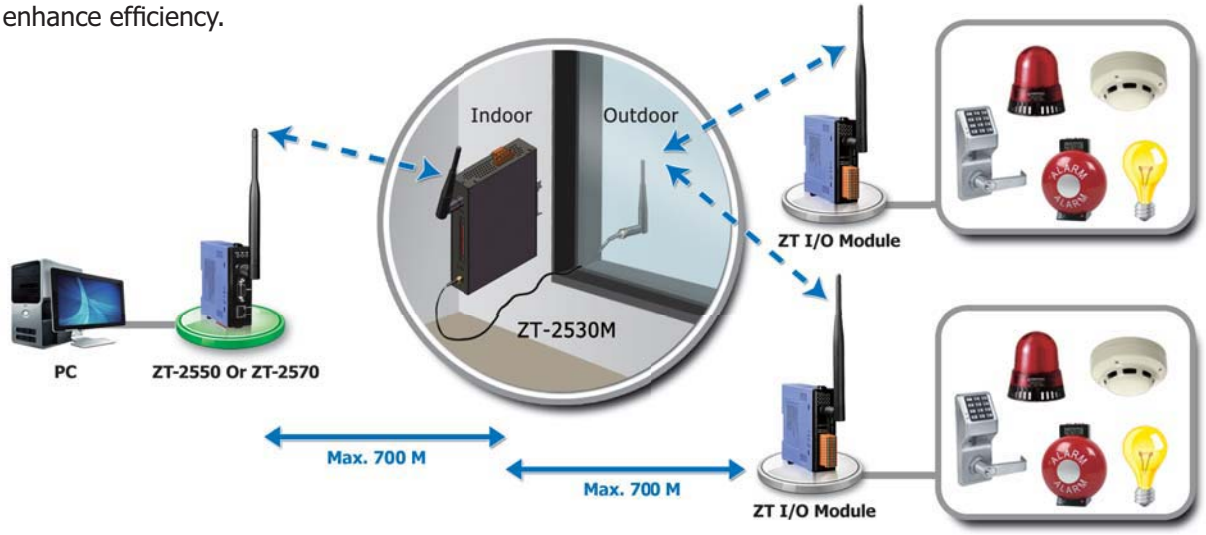




Model Name	Interface	Module Type	Transmit Power	Antenna	Distance (LOS)
ZT-2510	ZigBee	Slave (Router)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m

ZigBee Bridge

The ZT-2530M is a ZigBee bridge operating as a bridge between two ZigBee networks. It is full hardware configuration, used to communicate indoor and outdoor units or divide complex network to enhance efficiency.



Model Name	Interface	Module Type	Transmit Power	Antenna	Distance (LOS)
ZT-2530M	ZigBee	Slave (Router) + Host (Coordinator)	11 dBm	2.4 GHz, 5 dBi Omni-Directional antenna	700 m

5-6 Bluetooth LE Products

Bluetooth is a short range wireless technology, which is defined and maintained by the Bluetooth SIG. Bluetooth Low Energy (LE) has the following features like worldwide operation, robust, short range, low power and built-in most of mobile devices. It operates in 2.4 GHz ISM radio bands and provides network applications in the smart home, building automation and Industrial IoT, etc.

Advantages & Benefits

- ISM 2.4 GHz operating frequency and compliant with Bluetooth 4.0
- Wireless transmission range up to 20m (Line of sight)
- Robust wireless protocol
- Compatible with smartphone and tablet

Bluetooth LE Converters Selection Guide

The ICP DAS provides two kinds of Bluetooth low energy (LE) converters. One is the RS-232/RS-422/RS-485 to Bluetooth LE converter. The other is the USB to Bluetooth LE converter. The ICP DAS Bluetooth LE converter can combine into some existing systems that use RS-232, RS-422 or RS-485 network, and it can use smartphone, tablet or notebook as receiver. It will greatly to improve ease of use.

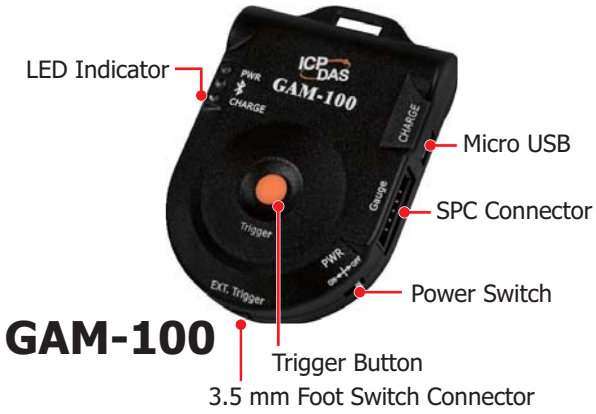
Model Name	Bluetooth LE Standard	Interface	Data Rate	Transmit Range
tBLE-720	Bluetooth 4.0	RS-232/RS-422/ RS-485	85 kbps	20 m (LOS)
BLE-USB	Bluetooth 4.0	USB	85 kbps	20 m (LOS)

GAM-100 Selection Guide

The GAM-100 is a Bluetooth Low Energy (LE) gauge master for Mitutoyo gauge like digimatic Caliper and digital Dial Indicator. The GAM-100 can connect with the smart phone or tablet. The mobile device can use Bluetooth to acquire gauge data through the GAM-100. The data can be kept in the local memory storage or uploaded to the remote MySQL server.

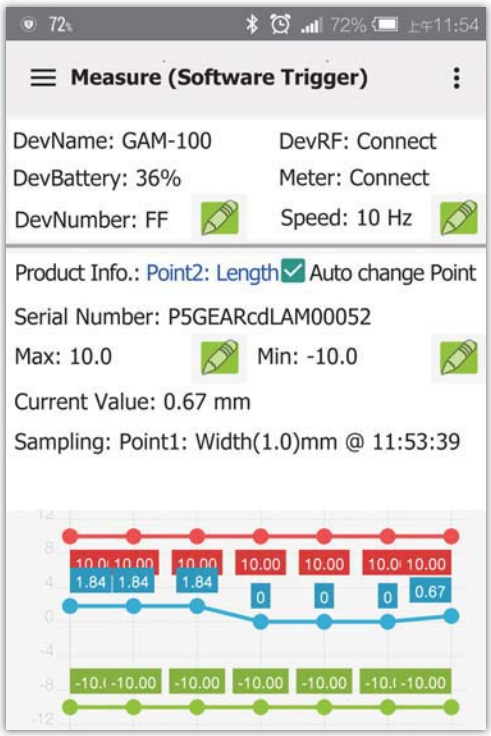
Model Name	Gauge type	Interface	Transmit Range
GAM-100	ID-S1012MX (543-782) NTD-10-6" PMX (573-782)	Mitutoyo SPC	1, 2, 5 and 10 Hz

Bluetooth LE Gauge Master for Mitutoyo Gauges



Features:

- Frequency: ISM 2.4 GHz
- Standard: Bluetooth 4.0
- Wireless transmission range up to 20 meters (Line of Sigh)
- Fully compliant with the Mitutoyo ID-S1012MX/ NTD-10-6" PMX
- LED indicators for Battery/RF link/Charge LEDs
- Support different transmission rate: 1/2/5/10 Hz
- Support Trigger button and 3.5 mm foot switch connector to log data
- Power by micro USB chargeable Li-ion battery
- Battery Usage Life: 100HR



Introduction:

The GAM-100 is a Bluetooth Low Energy (Bluetooth LE/Bluetooth 4.0) gauge master for Mitutoyo gauges, with SPC output. A smart phone or tablet can use Bluetooth to get Mitutoyo gauge date through the gauge master. With the built-in micro USB chargeable Li-ion battery, the gauge master can work for 100 hours. To get and log the data, an Android APP is designed for a mobile device. The data can be kept in the local memory storage or uploaded to the remote MySQL server.

Android APP:

- Provide device search function
- Display meter data in real-time graphics
- Battery remaining capacity display
- Support trigger mode configuration
- Upload data to remote MySQL server
- Provide recording file (*.csv)

Applications:

5-7 Wireless Modbus Data Concentrators

Wi-Fi Modbus Data Concentrator

MDC-211-WF

Available soon

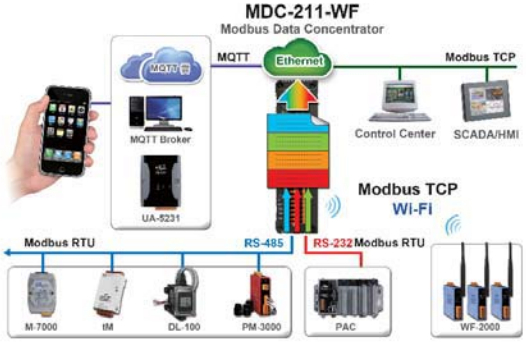
Introduction:

MDC-211-WF is a Modbus Data Concentrator used to access data from disparate Modbus slave devices with a contiguous Modbus address table ranged by the concentrator. Up to 240 Modbus commands can be performed to read data from Modbus slave devices via Wi-Fi/RS-232/485, and up to 6 Modbus/TCP masters are allowed to get the polled data via the Ethernet. The Modbus/TCP masters directly read/write the data in the MDC-211-WF instead of polling each Modbus slave device one by one. This way not only makes the data on the Wi-Fi/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.

Features:

- Compatible with IEEE 802.11b / g / n standards
- Support Infrastructure and Limit-AP mode
- Support WEP, WPA and WPA2 encryption mechanism
- Support data logger (MicroSD) function
- Support the Modbus TCP/RTU protocol
- Support the MQTT v3.1 Client protocol
- Support for up to 8 Modbus TCP masters
- Support Ethernet, RS-232/485 and Wi-Fi interfaces

System Structure:



ZigBee Modbus Data Concentrator

MDC-211-ZT

Available soon

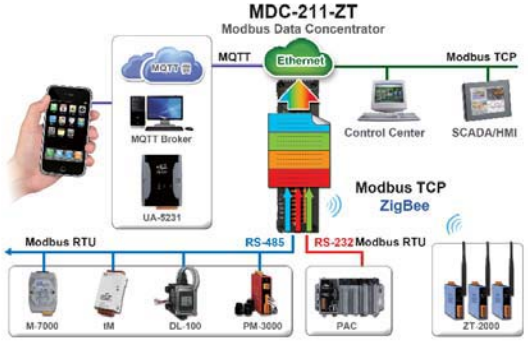
Introduction:

MDC-211-ZT is a Modbus Data Concentrator used to centrally manage decentralized I/O data via the ZigBee wireless mesh network. It access data from disparate Modbus slave devices with a contiguous Modbus address table ranged by the concentrator. Up to 240 Modbus commands can be performed to read data from Modbus slave devices via ZigBee/RS-232/RS-485, and up to 8 Modbus/TCP masters are allowed to get the polled data via the Ethernet. This way not only makes the data on the ZigBee/RS-232/RS-485 sharable to multiple Modbus/TCP master but also reduce the flow of ZigBee/Ethernet traffic load to improve the system performance. It is the best solution for users quickly establishing a remote monitoring system.

Features:

- Fully Compliant with 2.4 G (IEEE802.15.4/ ZigBee Specifications)
- Upgrade ZigBee I/O modules with Ethernet communication ability
- Support the Modbus TCP/RTU protocol
- Support the MQTT v3.1 Client protocol
- Support I/O data logger (MicroSD) function
- Data pool for up to 9600 registers
- Modbus polling commands for up to 240 definitions
- Speed up the time for reading from ZT-2000 series modules
- Support ZigBee, Ethernet and RS 232/485 interfaces

System Structure:



5-8 Wireless Applications

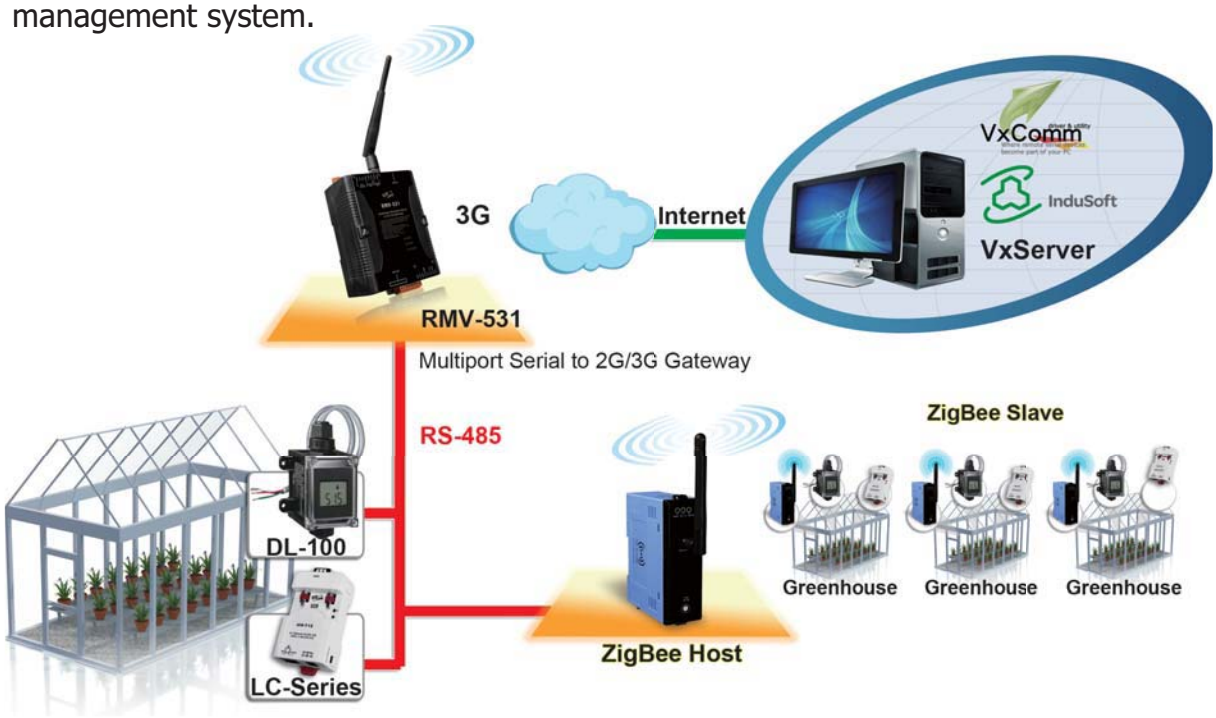
● PLC Remotely Debug Over 3G Solution

It will be easy to debug or modify the program over 3G remotely with ICP DAS 3G Virtual COM Port solution. It also has higher mobility than RS-485 bus. The control center can monitor many PLCs or machines at the same time.

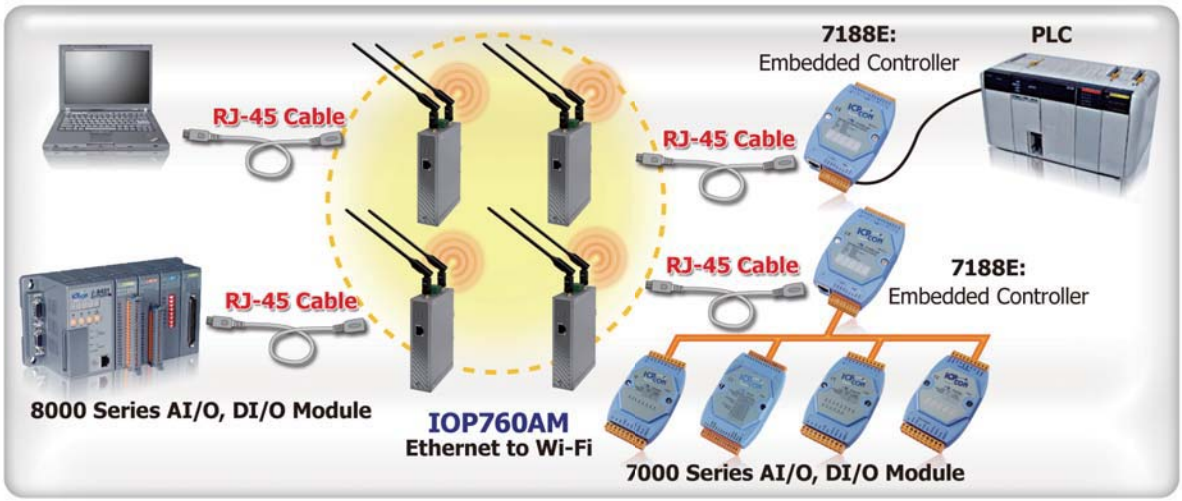
It is a SMS and voice alarm system in machine application. The Machine can report or inform the worker to fix the machine when it break down.

Green House Management

ICP DAS provides a greenhouse management solution: It can monitor temperature and humidity, and control light and water of the green house. With our ZigBee module, this solution can expand to multi-greenhouse management system easily. With InduSoft SCADA software at back-end, it can be real-time greenhouse management system.

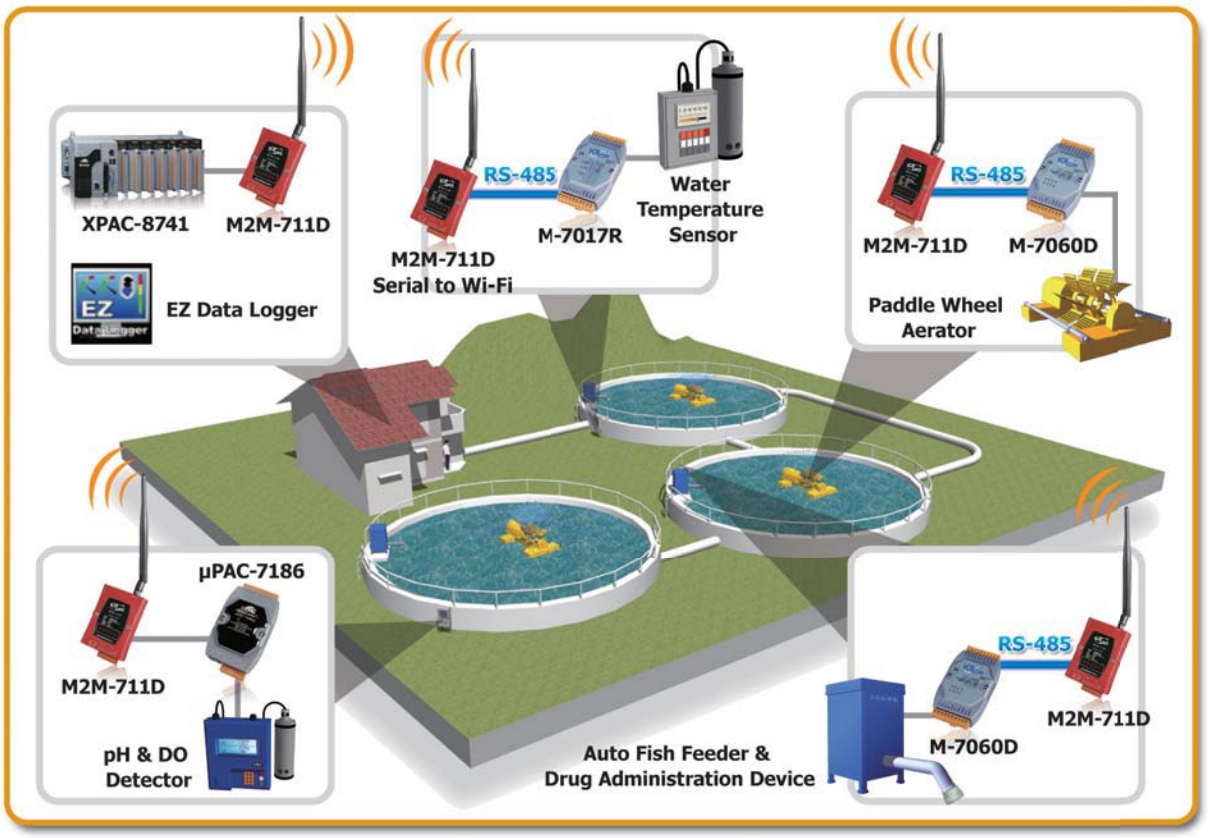


Ethernet to Wireless Solutions



The applications of 802.11b/g/n/ac wireless LAN are getting more popular by mature technology. It is not only faster than the industrial traditional transmission i.e. RS-232, RS-485, RS-422 etc., but also able to reduce the troublesomely wiring works. It also has higher mobility than Ethernet network. The multipoint wireless network of a short distance using WDS-Hybrid mode is shown in the above figure. There is also infrastructure mode which supports long distance as user's option.

Serial to Wireless Solutions



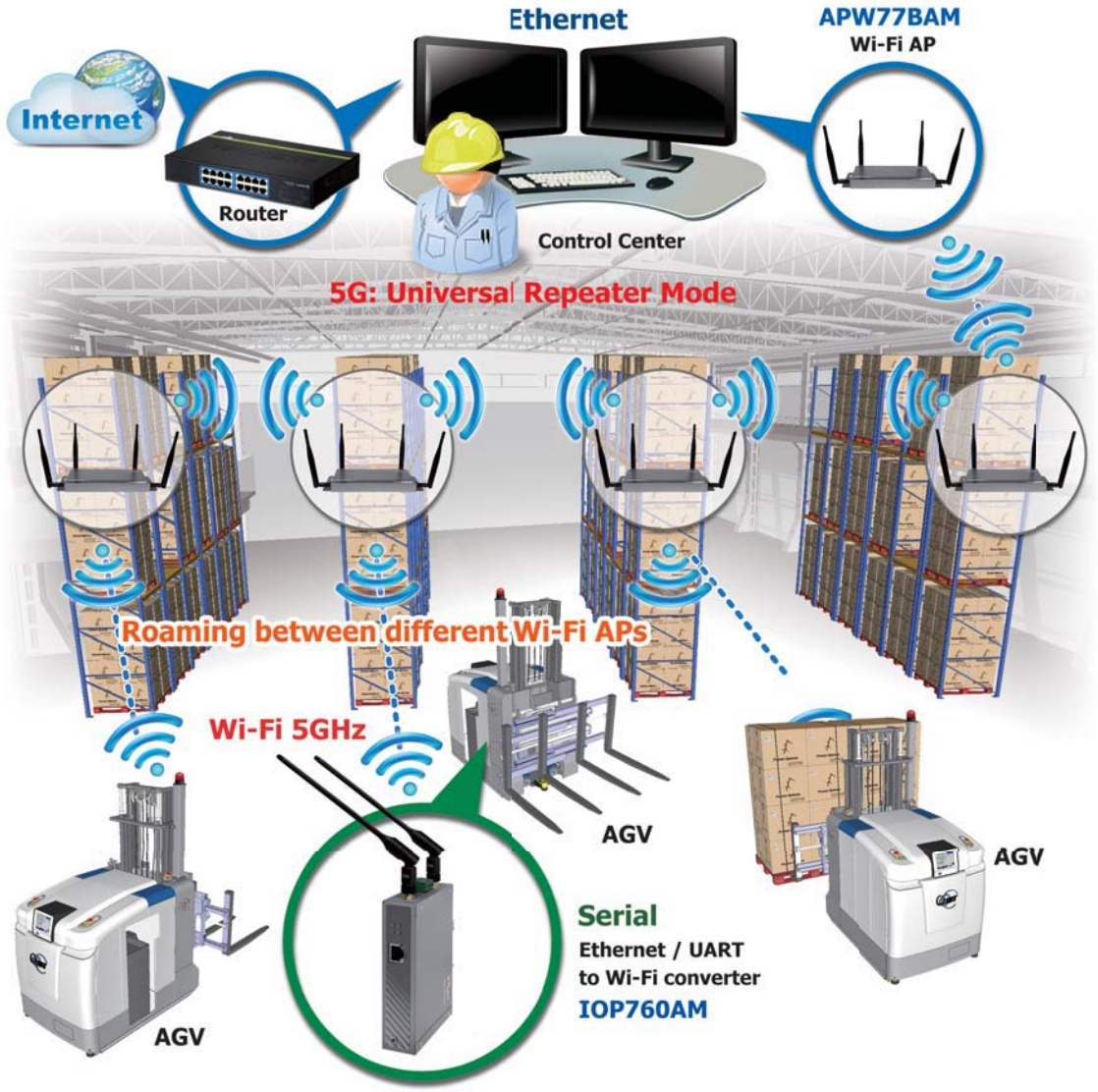
Setting up a fixed-line network on site is relatively complicated, makes the agricultural production technology underdeveloped, and left behind the state of the art in factories of manufactured products. The application shown above is a project aiming to improve the production process in fish farms using new perception, control and automation technologies. Simply converting serial signal to wireless allows fisher to monitor or control fish farm easily.

It is easy to convert serial RS-232/485 to a wireless product by wireless modems or with converters instead of running a wire. All of the following products allow you to convert a serial port to a wireless serial connection.

Model Name	Interface	Wireless
Serial to WLAN		
M2M-711D	RS-232 / RS-485	Wi-Fi (IEEE 802.11b/g)
IOP760AM	RS-232 / RS-485 / Ethernet	Wi-Fi (IEEE 802.11a/b/g/n/ac)
Serial to DSSS RF		
SST-900B	RS-232 / RS-485	DSSS RF (900 MHz)
RFU-400	RS-232 / RS-485	DSSS RF (429 MHz)
RFU-2400	RS-232 / RS-485	DSSS RF (2.4 GHz)
Serial to ZigBee		
ZT-2550	RS-232 / RS-485	ZigBee Host (2.4 GHz)
ZT-2551	RS-232 / RS-485	ZigBee Slave (2.4 GHz)
Serial to 3G		
RMV-531	RS-232 / RS-485	2G GSM 850/900/1800/1900 MHz 3G WCDMA 850/900/1900/2100 MHz
Serial to Bluetooth LE		
tBLE-720 CR	RS-232/RS-422/RS-485	Bluetooth LE (2.4 GHz)

Wi-Fi solution for AGV system

The AGV (Automated Guided Vehicle) system is more and more popular in the warehouse management. People can control their AGV system via the wireless interface. Wi-Fi is the proper media for the AGV application. It provides the large bandwidth transmission for the film of the camera. It is also expandable. If you want to extend your communication distance, you can add more Wi-Fi devices for the larger coverage.



ICP DAS provides a better Wi-Fi solution for the AGV system. IOP760AM and APW77BAM support IEEE 802.11 ac (5GHz) and Wi-Fi roaming. IEEE 802.11 ac works in the 5GHz band, and it does not be influenced by 2.4GHz (802.11 b/g/n) or another ISM band devices. Wi-Fi roaming can make the communication stable between APs (APW77BAM). APW77BAM is a thin AP. It is convenient for monitoring and extending the Wi-Fi coverage range. The Wi-Fi converter IOP760AM provides one RS-232 and one Ethernet interface. The AGV can work via different interface. That is adaptable and convenient for AGV application.

Model	Description
APW77BAM CR	Wi-Fi Access Point (with category A plug type)
APW77BAM-EU CR	Wi-Fi Access Point (with category E plug type)
IOP760AM CR	Ethernet/UART to Wi-Fi Converter (with category A plug type)
IOP760AM-EU CR	Ethernet/UART to Wi-Fi Converter (with category E plug type)

5-9 IIoT and smart phone Integration Solution

WISE + I/O & Sensor + Camera +

The WISE-5231 series is the IIoT host designed by ICP DAS for industrial IoT. In addition to the simple, easy-to-use, flexible and full-featured features of the past, the new features were introduced in January 2018. The I/O data and pictures taken by the camera can be instantly pushed to the LINE contacts and chat rooms on the smart phone.

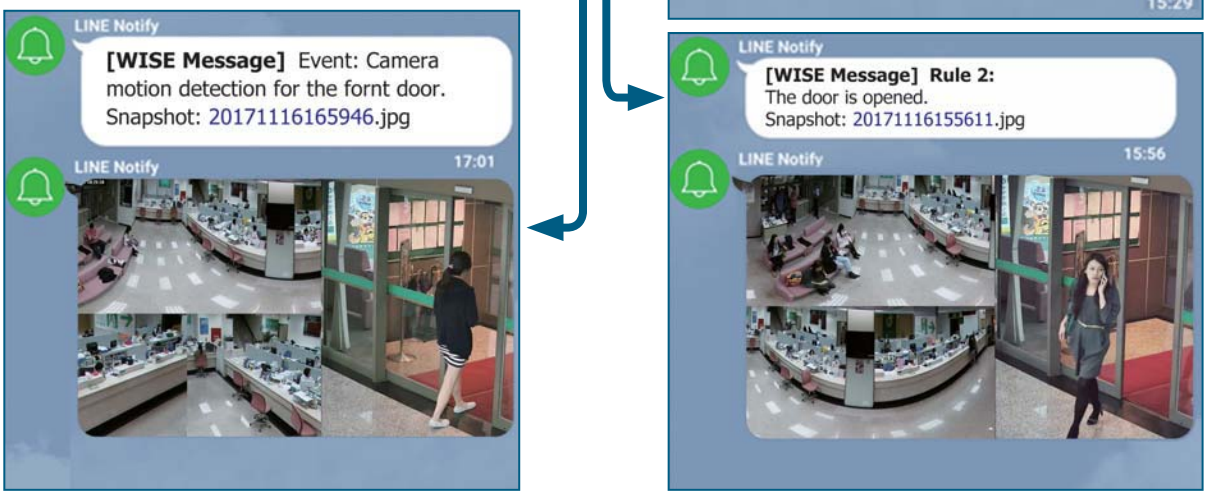
WISE message notification to smart phone

SMS: Sends alert messages and receives commands

- The same SMS can be sent to multiple phone numbers
- The same SMS can include multiple data
- Phone number must be authorized to send SMS commands

LINE: Sends alert messages and picture

- Object: Contact, Chat Room
- Content: text, picture
  - Text: 1000 / hour
  - Picture (1024 x 1024, < 1 MB): 50 / hour
- When:
  - Triggered by WISE If-Then-Else rules
  - Triggered by camera motion detection



Ordering Information:

WISE-5231	IIoT host, support for LINE notification, with Ethernet
WISE-5231M-3GWA	IIoT host, support for LINE notification, with Ethernet and 3G (WCDMA)
WISE-5231M-4GE	IIoT host, support for LINE notification, with Ethernet and 4G (FDD LTE)
WISE-5231M-4GC	IIoT host, support for LINE notification, with Ethernet and 4G (FDD, TDD LTE)
WISE-2241	IIoT host, support for LINE notification, with Ethernet and optional 4G (FDD LTE)

More:

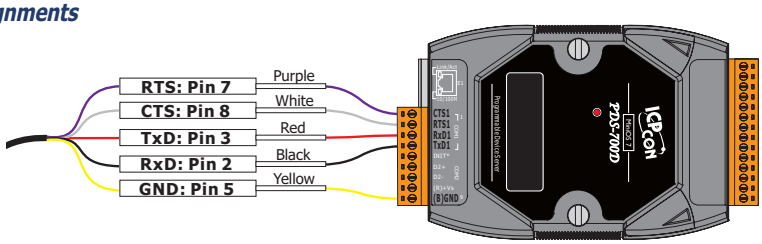
WISE introduction and live demo: ***http://wise.icpdas.com***
RS-485 remote I/O module: M-7000 series

Accessories

6.1. Cables

CA-0903

Pin Assignments

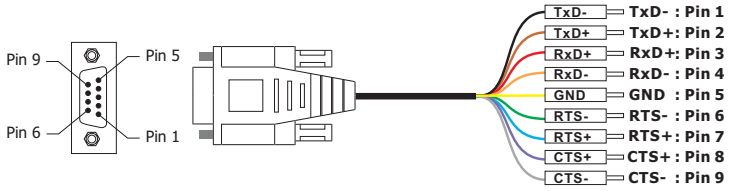


Ordering Information

CA-0903	9-Pin Female D-Sub and RS-232 Connector Cable, 30 cm

CA-090910

Pin Assignments

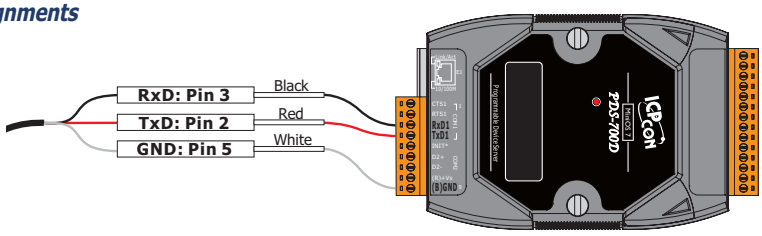


Ordering Information

CA-090910	9-Pin Female D-Sub Cable for RS-422 Connector, 1 m

CA-0910

Pin Assignments



Ordering Information

CA-0910	9-Pin Female D-Sub and 3-wire RS-232 Cable, 1 m

CA-0910F
CA-0915

Pin Assignments

CA-0910F

CA-0915

Ordering Information

CA-0910F	9-Pin Female-Female D-Sub Cable, 1 m
CA-0915	9-Pin Male-Female D-Sub Cable, 1.5 m

CA-9-2505D

Ordering Information

CA-9-2505D	Male DB-25 to 6 Male DB-9 Cable, 0.5 m

CA-9-3705
CA-9-3715D

Pin Assignments

Pin Assignment	Terminal No.	Pin Assignment
N.C.	01	
DCD3	02	20 RI3
GND	03	21 DTR3
CTS3	04	22 DSR3
RxD3	05	23 RTS3
RI4	06	24 TxD3
DTR4	07	25 DCD4
DSR4	08	26 GND
RTS4	09	27 CTS4
TxD4	10	28 RxD4
DCD2	11	29 RI2
GND	12	30 DTR2
CTS2	13	31 DSR2
RxD2	14	32 RTS2
RI1	15	33 TxD2
DTR1	16	34 DCD1
DSR1	17	35 GND
RTS1	18	36 CTS1
TxD1	19	37 RxD1

RS-232 Female DB-37 Connector

Pin Assignment	Terminal No.	Pin Assignment
GND	05	09 RI
DTR	04	08 CTS
TxD	03	07 RTS
RxD	02	06 DSR
DCD	01	

RS-232 Female DB-37 to Male DB-9 Connector

CA-9-3705

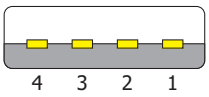
CA-9-3715D

Ordering Information

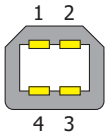
CA-9-3705	Male DB-37 to 4 Male DB-9 Cable (90°), 0.3 m
CA-9-3715D	Male DB-37 to 4 Male DB-9 Cable (180°), 1.5 m

CA-USB18

Pin Assignments



Type A



Type B

Pin	Name	Description
1	VCC	+5V
2	D-	Data-
3	D+	Data+
4	GND	Ground

Ordering Information

CA-USB18	USB Type A to Type B Cable, 1.8 m

CA-9-6210

Ordering Information

CA-9-6210	Male DB-62 to 8-port Male DB-9 Cable, 1.0 M

6.2. Power Supplies

▶▶▶▶ GPSU06U-6/GPSU06E-6

Specifications

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

Ordering Information

GPSU06U-6	24 VDC/0.25 A, 6W Power Supply
GPSU06E-6	24 VDC/0.25 A, 6W Power Supply with 2 pole EURO plug

GPSU06U-6

GPSU06E-6

▶▶▶▶ DP-1200

Specifications

Input	
Range	100 ~ 250 AC
Frequency	50 Hz ~ 60 Hz
Output	
Power	24 VDC/5 A max., 120 W
Mechanical	
Dimensions (W x H x D)	65 x 103 x 125
Installation	DIN-Rail Mounting
Environmental	
Operating Temperature	-10 °C ~ +70 °C
Storage Temperature	-25 °C ~ +85 °C

Ordering Information

DP-1200	24 VDC/5 A, 120 W Power Supply with DIN-Rail Mounting

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

Specifications

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

Ordering Information

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

KA-52F/KA-52F-48

DIN-KA52F/
DIN-KA52F-48

6.3. Enclosures and Mounting Kit

▶▶▶▶ I-36166-ENC/I-25091-ENC/I-25140-ENC/I-25166-ENC

Specifications

Models	I-36166-ENC	I-25091-ENC	I-25140-ENC	I-25166-ENC
Includes				
Case Accessory	2 × cable glands: 4PASO-0028 (Cable Range Φ9 ~ 14 mm)			
	1 × cable glands: 4SASO-0007 (Cable Range Φ7 ~ 4 mm)			
	6 × captive lid screws	4 × captive lid screws		
	1 × DIN-Rail (34 cm)	1 × DIN-Rail (20 cm)		
Mechanical				
Casing	Plastic			
Dimensions (W x H x D, Unit: mm)	361 × 254 × 166	255 × 181 × 91	255 × 181 × 140	255 × 181 × 166
Environmental				
Temperature	0 ~ +50 °C for Protection rating IP66			

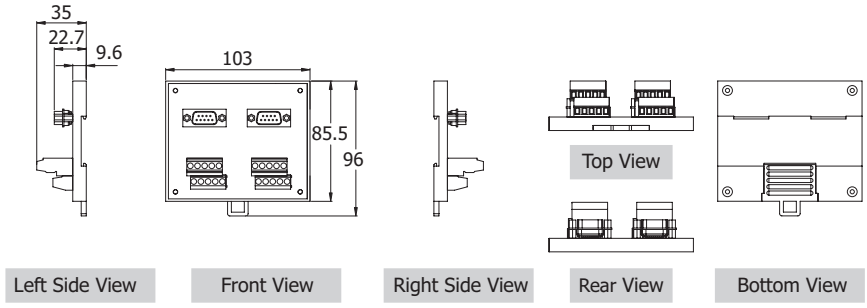
Ordering Information

I-36166-ENC	IP66 Industrial Enclosure. Includes: Case Accessory, 2 x cable glands: 4PASO-0028 (Cable Range Φ9 ~ 14 mm), 1 x cable glands: 4SASO-0007 (Cable Range Φ7 ~ 4 mm), 6 x captive lid screws and 1 x DIN-rail (34 cm)
I-25091-ENC	IP66 Industrial Enclosure. Includes: Case Accessory, 2 x cable glands: 4PASO-0028 (Cable Range Φ9 ~ 14 mm), 1 x cable glands: 4SASO-0007 (Cable Range Φ7 ~ 4 mm), 4 x captive lid screws and 1 x DIN-rail (210 mm)
I-25140-ENC	IP66 Industrial Enclosure. Includes: Case Accessory, 2 x cable glands: 4PASO-0028 (Cable Range Φ9~14 mm), 1 x cable glands: 4SASO-0007 (Cable Range Φ7~4 mm), 4 x captive lid screws and 1 x DIN-rail (210 mm)
I-25166-ENC	IP66 Industrial Enclosure. Includes: Case Accessory, 2 x cable glands: 4PASO-0028 (Cable Range Φ9 ~ 14 mm), 1 x cable glands: 4SASO-0007 (Cable Range Φ7 ~ 4 mm), 4 x captive lid screws and 1 x DIN-rail (210 mm)

6.4. Terminal Boards & Connector

▶▶▶▶ DN-09-2/DN-09-2F

Dimensions (Units: mm)



Ordering Information

DN-09-2	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Header Includes: CA-0915 x 2 (9-Pin Male-Female D-Sub Cable 1.5 M)
DN-09-2F	I/O Connector Block with DIN-Rail Mounting and Two 9-Pin Male Header Includes: CA-0910F x 2 (9-Pin Female-Female D-Sub Cable 1.0 M)

CA-4002

Ordering Information

CA-4002	37-Pin Male D-Sub Connector with Plastic Cover

CA-PC09F

Ordering Information

CA-PC09F	Female D-Sub Connector with Plastic Cover

6.5. USB Hub

USB-2560

Features

- Compliant with USB Specification Revision 2.0
- Provides 4 Downstream Ports
- Only Supports Self-powered Mode +10 ~ + 30 V_{DC} Power Input (power adapter included for USB-2560/S)
- Built-in NEC uPD720114 USB 2.0 Hub Controller
- Supports High-speed (480 Mbps) and Full-speed (12 Mbps)
- Supports Downstream Port Status with LED
- DIN-Rail Mounting

Introduction

The USB-2560 allows you to add multiple high performance USB 2.0 peripheral devices to your computer (Or XP-8000 series). It supports the USB 2.0 high-speed mode that can achieve 480 Mbps data transmitting rate.
The USB-2560 only supports self-powered mode (drawing power from an external power supply). Externally powered USB hubs are the only way to guarantee the broadest compatibility for USB devices.

Specifications

Interface	
Ports	Upstream x 1 (Type B), Downstream x 4 (Type A)
Compatibility	Universal serial bus; Specification Rev. 2.0/1.1/1.0
Transfer Speed	480 Mbit/s-high speed mode, 12 Mbit/s- full speed mode, 1.5 Mbit/s-low speed mode
Supply Current	500 mA max. per port
Include Cable	CA-USB18 (1.8 m Cable) x 1
Power Supply Included (USB-2560/S Only)	GPSU06U-6 x 1 for 250 mA per port
LED Indicators	
Power	1 LED
Downstream Ports	4 LEDs
Power	
Input Voltage Range	+10 ~ + 30 V_{DC}
Power Consumption	0.25 A @ 24 V_{DC} for 250 mA per port, 0.5 A @ 24 V_{DC} for 500 mA per port
Power Input Connection	Removable 3-Pin Terminal Block
Mechanical	
Casing	Plastic
Flammability	UL 94V-0 materials
Dimensions (W x L x H)	33 mm x 78 mm x 107 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	0 °C ~ +70 °C
Storage Temperature	-20 °C ~ +80 °C
Humidity	10 ~ 90% RH, non-condensing

Ordering Information

USB-2560 CR	4-port Industrial USB 2.0 Hub (RoHS)
USB-2560/S CR	4-port Industrial USB 2.0 Hub with GPSU06U-6 (Power Supply) (RoHS)

Accessories

DIN-KA52F	24 V_{DC}/1.04 A, 25 W Power Supply with DIN-Rail Mounting
MDR-20-24	24 V_{DC}/1 A, 24 W Power Supply with DIN-Rail Mounting
GPSU06E-6	24 V_{DC}/0.25 A, 6W Power Supply with 2 pole EURO plug

PACTECH

PAC TECH Vol. EC17W35 (PDF file)

The PAC TECH Vol. EC17W35 is now available to download. The content includes the following applications:

- New Generation of Power Management Solution
- OPC UA: New Generation Technology of the Standard Industrial Communication
- WISE-5231 Intelligent Multifunction IoT I/O Concentrator
- Residential/Commercial Building Leakage Monitoring Application
- Lighting and Air Conditioning Management System in Hospital
- PAC in Railway Signaling Application
- ZigBee Application - Emergency Bell Alarm System
- ZigBee Application - Route Management System for AGV
- CANopen Application for Motion Control and Multi - Axis Compensation
- PMD-2201 Power Meter Concentrator with Touch Panel Display
- Industrial IoT Power Meter Concentrator: PMC-52xx
- Non-Contact Three-Color Signal Tower Monitoring Application
- Smart Power Meter Application - Measurements of Household Appliances
- Intelligent Monitoring System for Fisheries Research Institute
- Intelligent Automation for Conventional Devices - Application of Production Statistics Database
- Remotely Monitoring Win-GRAF Control Systems by Using a Browser on a Smart Phone/Tablet/Laptop
- IoT Cloud Management Software – IoTstar

PAC TECH Vol. E16_ 2016 (PDF file)

The PAC TECH Vol. E16_ 2016 is now available to download. The content includes the following applications:

- ICP DAS ZigBee Application for Wireless Monitoring in a Conventional Factory
- ICP DAS ZigBee I/O Pair-Connection Products and Applications
- Introduction of tSH-700 Function & Application
- PROFIBUS Gateway Product and Application
- ICP DAS Solution for Monitoring and Controlling Groundwater Pumping Systems

PAC TECH Vol. E05_2017 (PDF file)

The PAC TECH Vol. E05_ 2017 is now available to download. The content includes the following applications:

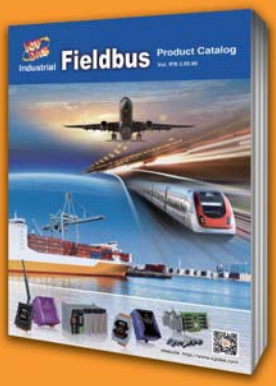
- New Generation of Power Management Solution
- OPC UA: New Generation Technology of the Standard Industrial Communication WISE-5231
- Intelligent Multifunction IoT 1/0 Concentrator
- Residential/Commercial Building Leakage Monitoring Application
- Lighting and Air Conditioning Management System in Hospital
- PAC in Railway Signaling Application
- ZigBee Application - Emergency Bell Alarm System
- ZigBee Application - Route Management System for AGV

PAC TECH Vol. EC01_ 2016 (PDF file)

The PAC TECH Vol. EC01_16 is a combined issue of PAC TECH Vol. E30_ 2015 and Vol. E16_ 2016; and is now available to download. The content includes the following applications:

- Generator Management System in Taipei 101 Building
- FCU (Fan-Coil Unit) Control System Solutions
- Lighting & Air Conditioning Service in KTV
- UniDAQ - Development Software of ICP DAS PC-based I/O boards
- WISE Controllers Play a Key Role in the Hydraulic Control
- WISE Application in Fire Alarm Linked System
- WISE in the Application of Aquaculture
- PMC-5151 used in Power & Air Conditioning Monitoring System Application in Campus
- New ISaGRAF Application: Air Pollution Monitoring and Alarm System
- PDS-700 Applications - Remote Access to Multiple Distributed RS-485 Devices
- HMI and Device Control on a Large Screen using a Small PAC
- ICP DAS ZigBee Application for Wireless Monitoring in a Conventional Factory
- ICP DAS ZigBee I/O Pair-Connection Products and Applications
- Introduction of tSH-700 Function & Application
- PROFIBUS Gateway Product and Application
- ICP DAS Solution for Monitoring and Controlling Groundwater Pumping Systems

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

Full Product Catalog

- PAC Products and BoxPC
- Panel Products
- Remote I/O Module and Unit
- IIoT
- Industrial Communication
- Wireless Solution
- Machine Automation
- Energy Management Solution
- DAQ Card

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

Industrial Wireless Communication

- Introduction
- WLAN Products
- Wireless Modem
- 2G/3G/4G Products
- ZigBee Products
- Bluetooth LE Products
- GPS Products
- Infrared Products

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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