3.7. Tiny Serial-to-Ethernet Device Server and Modbus Gateway

tDS-712
tDS-715

tDS-700 Series

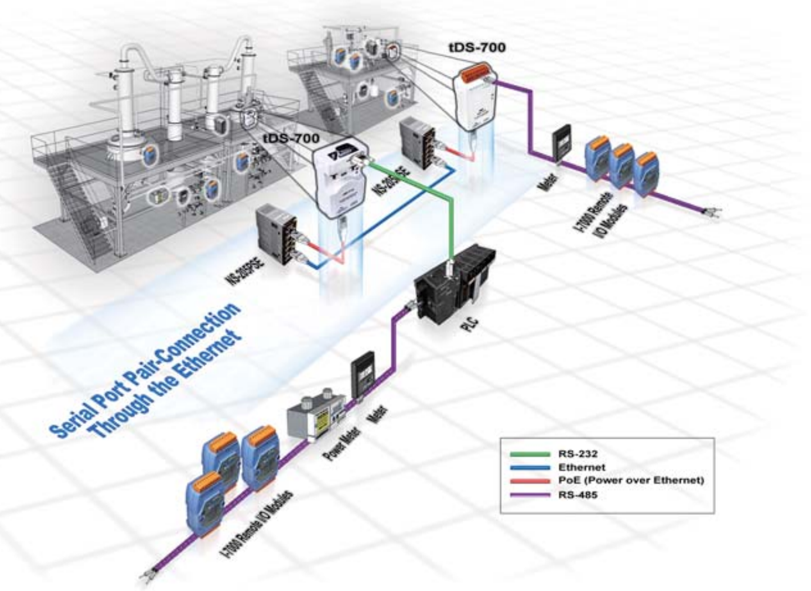
Tiny Serial-to-Ethernet Device Server

Features

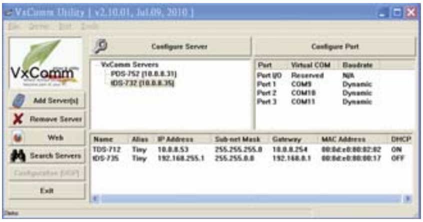
- Incorporates any RS-232/422/485 serial device in Ethernet
- Includes a VxComm Driver for 32/64-bit Windows XP/2003/Vista/7
- Supports pair-connection (serial-bridge, serial-tunnel) applications
- Contains a 32-bit MCU that efficiently handles network traffic
- 10/100 Base-TX Ethernet, RJ-45 x1 (Auto-negotiating, auto MDI/MDIX, LED Indicators)
- Includes redundant power inputs: PoE and DC jack
- Allows automatic RS-485 direction control
- Supports TCP, UDP, HTTP, DHCP, BOOTP and TFTP protocols
- Supports UDP responder for device discovery
- Allows easy firmware updates via the Ethernet
- Contains a tiny Web server for configuration
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant with no Halogen
- Made from fire retardant materials (UL94-V0 Level)
- Cost-effective Device Servers

Introduction

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


tDS-700
tDS-700
NS-205PSE
NS-205PSE
Meter
I-7000 Remote I/O Modules
PLC
Serial Port Pair-Connection Through the Ethernet
Meter
Power Meter
I-7000 Remote I/O Modules
RS-232
Ethernet
PoE (Power over Ethernet)
RS-485

The VxComm Driver/Utility supports the most popular operating system in the world, including 32-bit and 64-bit Windows 7/Vista/2008/2003/XP. 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 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.



VxComm Utility [v2.10.01, Jul.09, 2010]

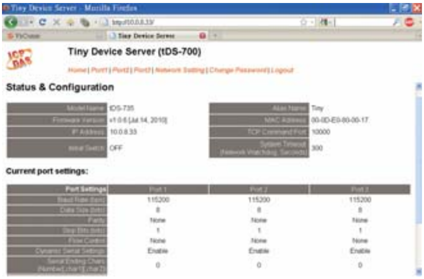
VxComm Servers
PDS-752 (10.0.8.31)
tDS-732 (10.0.8.35)

Port	Virtual COM	Baudrate
Port I/O	Reserved	N/A
Port 1	COM9	Dynamic
Port 2	COM10	Dynamic
Port 3	COM11	Dynamic

Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address	DHCP
TDS-712	Tiny	10.0.8.53	255.255.255.0	10.0.8.254	00:0d:e0:80:02:02	ON
tDS-735	Tiny	192.168.255.1	255.255.0.0	192.168.0.1	00:0d:e0:80:00:17	OFF

The tDS-700 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 meets the demands of virtually any network-enabled application.

DHCP minimizes configuration errors caused by manual IP address configuration, such as address conflicts caused by the assignment of an IP address to more than one computer or device at the same time. The tDS-700 supports the DHCP client function, which allows the tDS-700 to easily obtain the necessary TCP/IP configuration information from a DHCP server. The tDS-700 also contains a UDP responder that transmits its IP address information in response to a UDP search from the VxComm Utility, making local management more efficient.



Tiny Device Server - Mozilla Firefox

http://10.0.8.33/
Tiny Device Server
ICP DAS
Home | Port1 | Port2 | Port3 | Network Setting | Change Password | Logout

Tiny Device Server (tDS-700)

Status & Configuration

Model Name	tDS-735	Alias Name	Tiny
Firmware Version	v1.0.6 [Jul 14, 2010]	MAC Address	00-0D-E0-80-00-17
IP Address	10.0.8.33	TCP Command Port	10000
Initial Switch	OFF	System Timeout (Network Watchdog, Seconds)	300

Current port settings:

Port Settings	Port 1	Port 2	Port 3
Baud Rate (bps)	115200	115200	115200
Data Size (bits)	8	8	8
Parity	None	None	None
Stop Bits (bits)	1	1	1
Flow Control	None	None	None
Dynamic Serial Settings	Enable	Enable	Enable
Serial Ending Chars (Number[,char1][,char2])	0	0	0

The tDS-700 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 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 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 and the host for a predefined period of time (system timeout). This is an important feature that ensures the tDS-700 operates continuously, even in harsh environments.

The tDS-700 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 will also accept power input from a DC adapter. The tDS-700 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.

✓ Low Power Consumption

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.

The tDS-700 has the same basic Serial-to-Ethernet gateway and virtual COM functions as the PPDS-700-MTCP series, as shown in the right-hand-side comparison table.

	tDS-700 Series	PPDS-700-MTCP Series
Ethernet	10/100 M, PoE	10/100 M, PoE
Programmable	-	Yes
Virtual COM	Yes	Yes
Virtual I/O	-	Yes
DHCP	Yes	Yes
Web Configuration	Yes	Yes
UDP Search	Yes	Yes
Modbus Gateway	-	Yes
Multi-client	-	Yes
Remarks	Cost-effective	-

Applications

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

tGW-700 Series

Tiny Modbus/TCP to RTU/ASCII Gateway

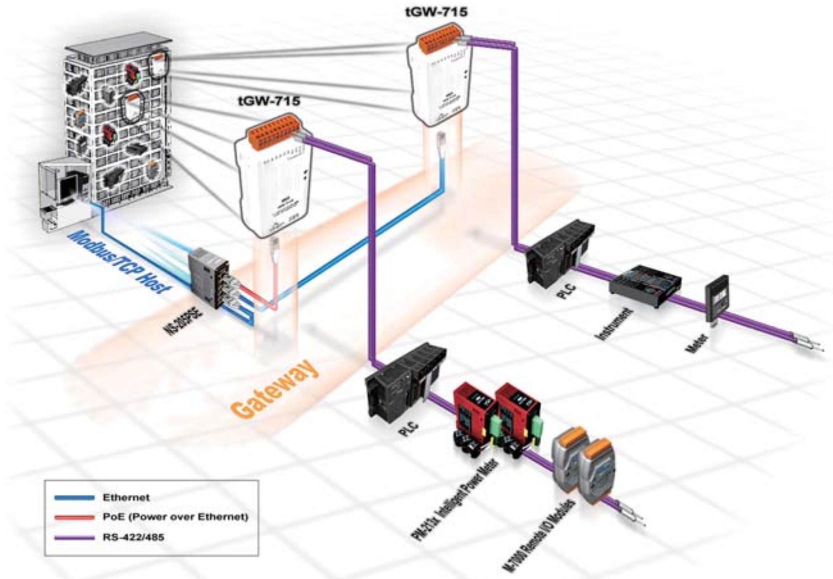
Features

- Cost-effective Modbus/TCP to RTU/ASCII Gateway
- Supports Modbus/TCP master and slave
- Supports Modbus RTU/ASCII master and slave
- Contains a 32-bit MCU that efficiently handles network traffic
- 10/100 Base-TX Ethernet, RJ-45 x1
  (Auto-negotiating, auto MDI/MDIX, LED Indicators)
- Includes redundant power inputs: PoE and DC jack
- Allows automatically RS-485 direction control
- Supports TCP, UDP, HTTP, DHCP, BOOTP and TFTP protocols
- Supports UDP responder for device discovery
- Allows easy firmware updates via the Ethernet
- Contains a tiny Web server for configuration
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant with no Halogen
- Made from fire retardant materials (UL94-V0 Level)

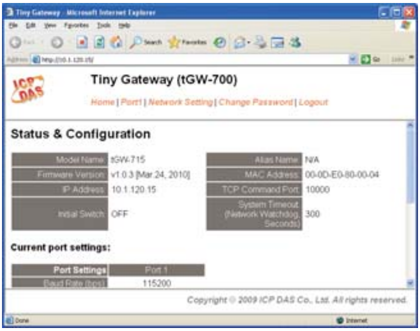
CE FC RoHS PoE

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 module is a Modbus TCP to RTU/ASCII gateway that enables a Modbus/TCP 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.


Tiny Gateway - Microsoft Internet Explorer
Home | Port1 | Network Setting | Change Password | Logout

Tiny Gateway (tGW-700)

Status & Configuration

Model Name: tGW-715
Firmware Version: v1.0.3 [Mar 24, 2010]
IP Address: 10.1.120.15
Initial Switch: OFF
Alias Name: N/A
MAC Address: 00-0D-E0-80-00-04
TCP Command Port: 10000
System Timeout (Network Watchdog, Seconds): 300

Current port settings:

Port Settings	Port 1
Baud Rate (bps)	115200

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DHCP minimizes configuration errors caused by manual IP address configuration, such as address conflicts caused by the assignment of an IP address to more than one computer or device at the same time. The tGW-700 module supports the DHCP client function, which allows it to easily obtain the necessary TCP/IP configuration information from a DHCP server. The module also contains a UDP responder that transmits its IP address information in response to a UDP search from the eSearch utility, making local management more efficient.

The tGW-700 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 module contains a dual watchdog, including a CPU watchdog (for hardware functions) and a host watchdog (for software functions). 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.

Low Power Consumption

The tGW-700 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 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.

The module is equipped with a male DB-9 or a removable terminal block connector to allow easy wiring. Based on an amazing tiny form-factor, the tGW-700 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.

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

Applications

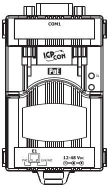
- Factory Automation
- Building Automation
- Home Automation
- Remote Diagnosis and Management

Specifications

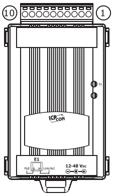
Models		tDS-712 tGW-712	tDS-722 tGW-722	tDS-732 tGW-732	tDS-715 tGW-715	tDS-725 tGW-725	tDS-735 tGW-735	tDS-718 tGW-718	tDS-724 tGW-724	tDS-734 tGW-734
System										
CPU		32-bit MCU								
Communication Interface										
Ethernet		10/100 Base-TX, 8-pin RJ-45 x 1, (Auto-negotiating, Auto-MDI/MDIX, LED indicator) PoE (IEEE 802.3af, Class 1)								
COM1		5-wire RS-232	5-wire RS-232	3-wire RS-232	2-wire RS-485 4-wire RS-422	2-wire RS-485	2-wire RS-485	3-wire RS-232 2-wire RS-485 4-wire RS-422	2-wire RS-485	2-wire RS-485
COM2		-	5-wire RS-232	3-wire RS-232	-	2-wire RS-485	2-wire RS-485	-	5-wire RS-232	3-wire RS-232
COM3		-	-	3-wire RS-232	-	-	2-wire RS-485	-	-	3-wire RS-232
Self-Tuner		-			Yes, automatic RS-485 direction control					
UART		16c550 or compatible								
COM Port Format										
Baud Rate		115200 bps Max.								
Data Bit		5, 6, 7, 8								
Parity		None, Odd, Even, Mark, Space								
Stop Bit		1, 2								
Power										
Power Input	PoE	IEEE 802.3af, Class 1								
	DC jack	+12 ~ 48 V_{DC}								
Power Consumption		0.05 A @ 24 V_{DC}								
Connector		Male DB-9 x 1	10-Pin Removable Terminal Block x 1							
Mechanical										
Flammability		Fire Retardant Materials (UL94-V0 Level)								
Dimensions (W x H x D) (mm)		52 x 90 x 27	52 x 95 x 27							
Installation		DIN-Rail mounting								
Environment										
Operating Temperature		-25 °C ~ +75 °C								
Storage Temperature		-30 °C ~ +80 °C								
Humidity		10 ~ 90% RH, non-condensing								

3-wire RS-232: RxD, TxD, GND (Non-isolated)
5-wire RS-232: RxD, TxD, CTS, RTS, GND (Non-isolated)
2-wire RS-485: DATA+, DATA-, GND (Non-isolated)
4-wire RS-422: TxD+, TxD-, RxD+, RxD-, GND (Non-isolated)

Pin Assignments



tDS-712/tGW-712		
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/tGW-722		
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/tGW-732		
	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-715/tGW-715		
	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/tGW-725		
	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-735/tGW-735		
	10	F.G.
COM3	09	GND
	08	D3-
	07	D3+
COM2	06	GND
	05	D2-
	04	D2+
COM1	03	GND
	02	D1-
	01	D1+

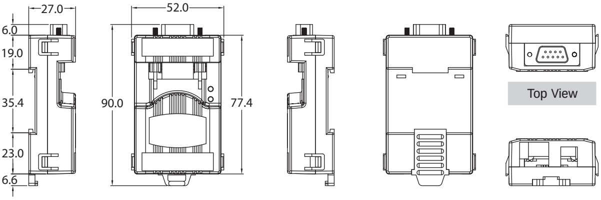
tDS-718/tGW-718		
	10	F.G.
	09	N/A
RS-232	08	GND
	07	RxD1
	06	TxD1
RS-485/ RS-422	05	GND
	04	RxD1-
	03	RxD1+
	02	TxD1-/D1-
	01	TxD1+/D1+

tDS-724/tGW-724		
	10	F.G.
	09	GND
COM2	08	CTS2
	07	RTS2
	06	GND
	05	RxD2
	04	TxD2
COM1	03	GND
	02	D1-
	01	D1+

tDS-734/tGW-734		
	10	F.G.
COM3	09	GND
	08	RxD3
	07	TxD3
COM2	06	GND
	05	RxD2
	04	TxD2
COM1	03	GND
	02	D1-
	01	D1+

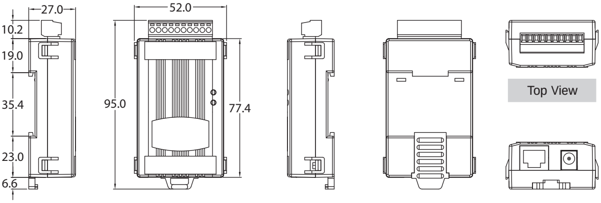
Dimensions (Unit: mm)

tDS-712/tGW-712



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

tDS-715/718/722/725/732/735/724/734 & tGW-715/718/722/725/732/735/724/734



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

Ordering Information

tDS-700 Series		
NEW	tDS-712 CR	Tiny Device Server with PoE and 1 RS-232 Port (RoHS)
NEW	tDS-722 CR	Tiny Device Server with PoE and 2 RS-232 Ports (RoHS)
NEW	tDS-732 CR	Tiny Device Server with PoE and 3 RS-232 Ports (RoHS)
NEW	tDS-715 CR	Tiny Device Server with PoE and 1 RS-422/485 Port (RoHS)
NEW	tDS-725 CR	Tiny Device Server with PoE and 2 RS-485 Ports (RoHS)
NEW	tDS-735 CR	Tiny Device Server with PoE and 3 RS-485 Ports (RoHS)
NEW	tDS-718 CR	Tiny Device Server with PoE and 1 RS-232/422/485 Port (RoHS)
Available Soon	tDS-724 CR	Tiny Device Server with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
	tDS-734 CR	Tiny Device Server with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)
tGW-700 Series		
NEW	tGW-712 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-232 Port (RoHS)
NEW	tGW-722 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2 RS-232 Ports (RoHS)
NEW	tGW-732 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3 RS-232 Ports (RoHS)
NEW	tGW-715 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-422/485 (RoHS)
NEW	tGW-725 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2 RS-485 Ports (RoHS)
NEW	tGW-735 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3 RS-485 Ports (RoHS)
NEW	tGW-718 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1 RS-232/422/485 Port (RoHS)
Available Soon	tGW-724 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
Available Soon	tGW-734 CR	Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)

Accessories

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