tDS-700 Series
DS-2200 Series
User Manual

Tiny Serial-to-Ethernet Device Server *Jul. 2025, Ver. 2.4*

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service@icpdas.com

Support

This manual relates to the following modules:

tDS-712, tDS-722, tDS-732
tDS-715, tDS-725, tDS735
tDS-718, tDS-724, tDS-734
tDS-712i, tDS-722i, tDS-732i
tDS-715i, tDS-725i, tDS735i
tDS-718i, tDS-724i, tDS-734i
tDSM-712, tDS-718i-D
DS-2212i, DS-2222i, DS-2232i
DS-2215i, DS-2225i, DS-2235i

TABLE OF CONTENTS

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Packing List

The tDS-700 shipping package includes the following items:


Or

tDS-700/tDSM-700 Series

Quick Start

CA-002 Cable

The DS-2200 shipping package includes the following items:

DS-2200 Series

Quick Start

Note

If any of these items are missing or damaged, please contact the local distributor for more information. Save the shipping materials and cartons in case you need to ship the module in the future.

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More Information

- **Documentation**

tDS-700 Series

https://www.icpdas.com/en/download/index.php?model=tDS-712

DS-2200 Series

https://www.icpdas.com/en/download/index.php?model=DS-2215i

- **Firmware**

tDS-700 Series

https://www.icpdas.com/en/download/show.php?num=2420

DS-2200 Series

https://www.icpdas.com/en/download/show.php?num=2790

- **Software**

EtherDOT

https://www.icpdas.com/en/download/index.php?nation=US&kw=EtherDOT

VxComm Utility

https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=VxComm

eSearch Utility

https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=eSearch

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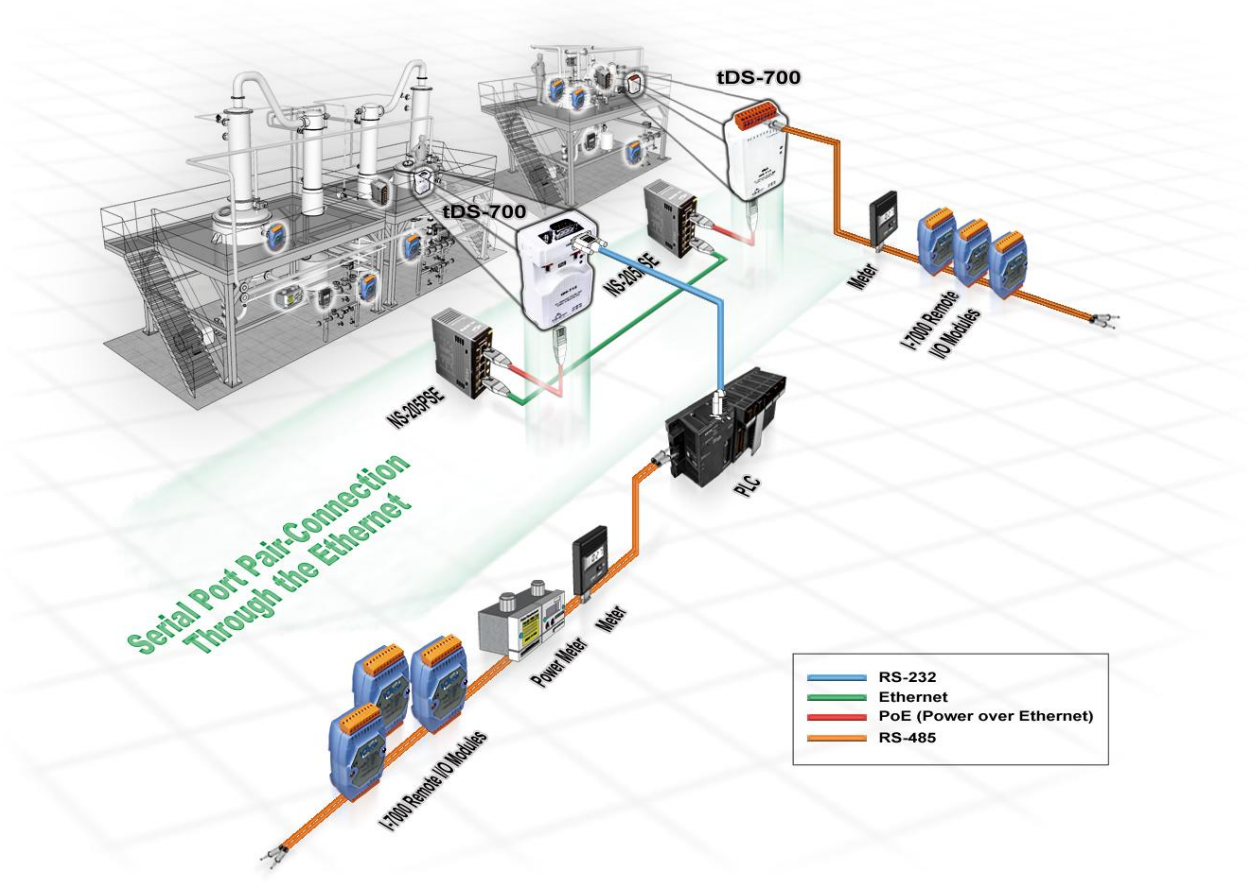
1. Introduction

The tDS-700/DS-2200 is a series of Serial-to-Ethernet device servers that are 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 communications. By using the VxComm Driver/Utility, the built-in COM Port of the tDS-700/DS-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 the need for software modification.

tDS-700/DS-2200 device servers can be used to create a pair-connection application (as well as serial-bridge or serial-tunnel), and then route data between two serial devices via TCP/IP. This 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/DS-2200 meets the demands of virtually any network-enabled application.



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In harsh industrial environments, the tDS-700/DS-2200 series (for i version) also adds 3000 V_{DC} and ±4 kV ESD protection component that diverts the potentially damaging charge away from sensitive circuit to protects the module and equipment from the sudden and momentary electric current.

To achieve maximum space savings, the tDS-700 is offered in an amazingly small form-factor that enables it to be easily installed anywhere, even directly attached to a serial device or embedded into a machine. The tDS-700/DS-2200 features a powerful 32-bit MCU that allows it to efficiently handle network traffic. The tDS-700/DS-2200 offers true IEEE 802.3af-compliant (classification, Class 1) Power-over-Ethernet (PoE) functionality using a standard category 5 Ethernet cable that allows it to receive power from a PoE switch such as the NS-205PSE. If there is no PoE switch available on site, the tDS-700/DS-2200 can accepts power input from a DC adapter.

Comparison of Device Servers:

Series / Features	PPDS-700	PDS-700	DS-700	tDS-700 DS-2200	tGW-700 GW-2200
Virtual COM	✓	✓	✓	✓	-
Programmable	✓	✓	-	-	-
PoE	✓	-	-	✓	✓
Modbus Gateway	✓	-	-	-	✓
Multi-client	About 20 Sockets			1 Sockets/Port	tGW-700 RevB/GW-2200: 32 Sockets/port tGW-700 Non-RevB: 10 Sockets/port
Remarks	Professional	Powerful	Isolation for DS-715	Cost-effective, Entry-level	Cost-effective, Entry-level

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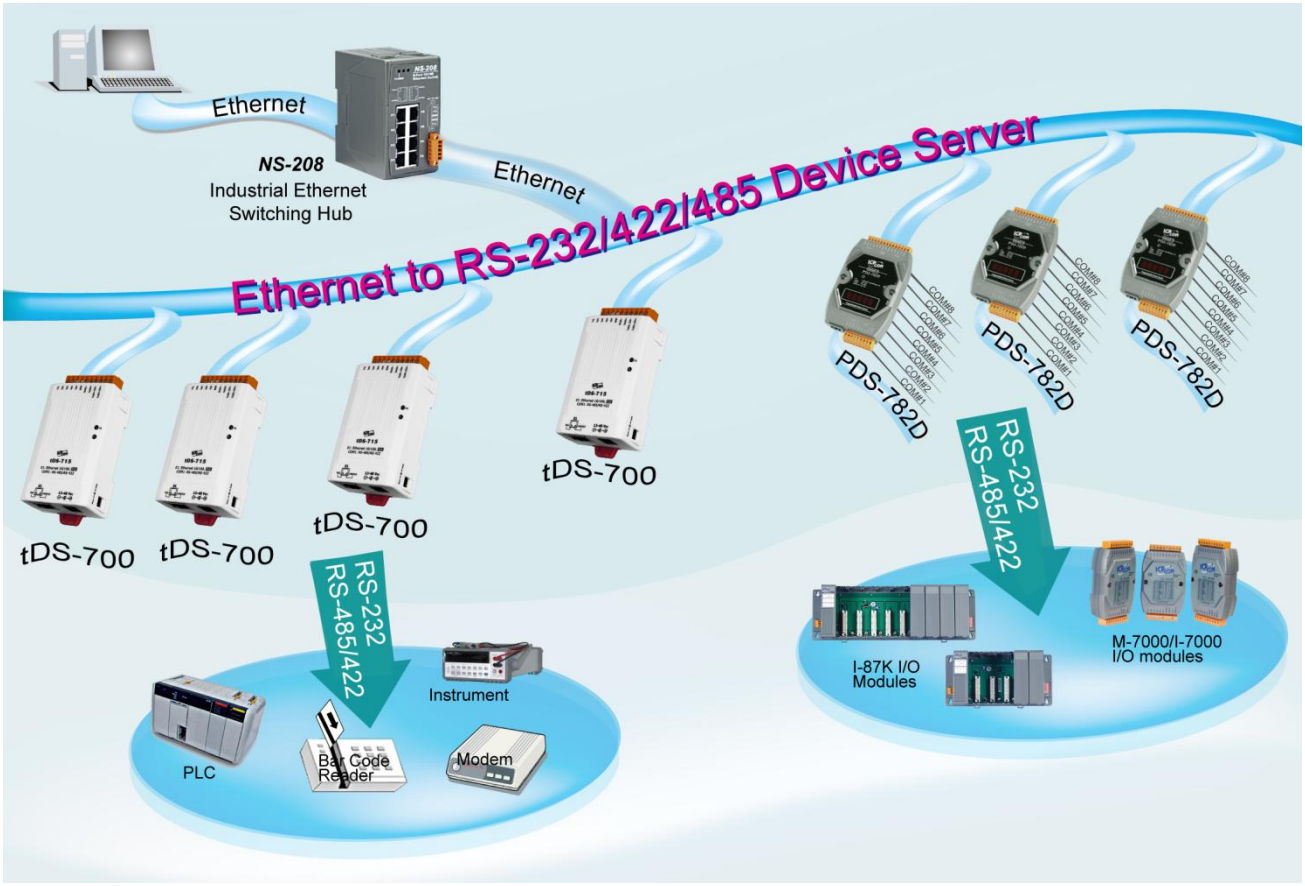
1.1 Ethernet Solutions

Nowadays, the Ethernet protocol has become the foremost standard for local area networks. Connectivity via the Internet is now common in many of the latest applications from home appliances, to vending machines, to testing equipment, to UPS, etc. An Ethernet network can link office automation and industrial control networks, access remote systems and share data and information between machines from multiple vendors, and also provides a cost-effective solution for industrial control networks.



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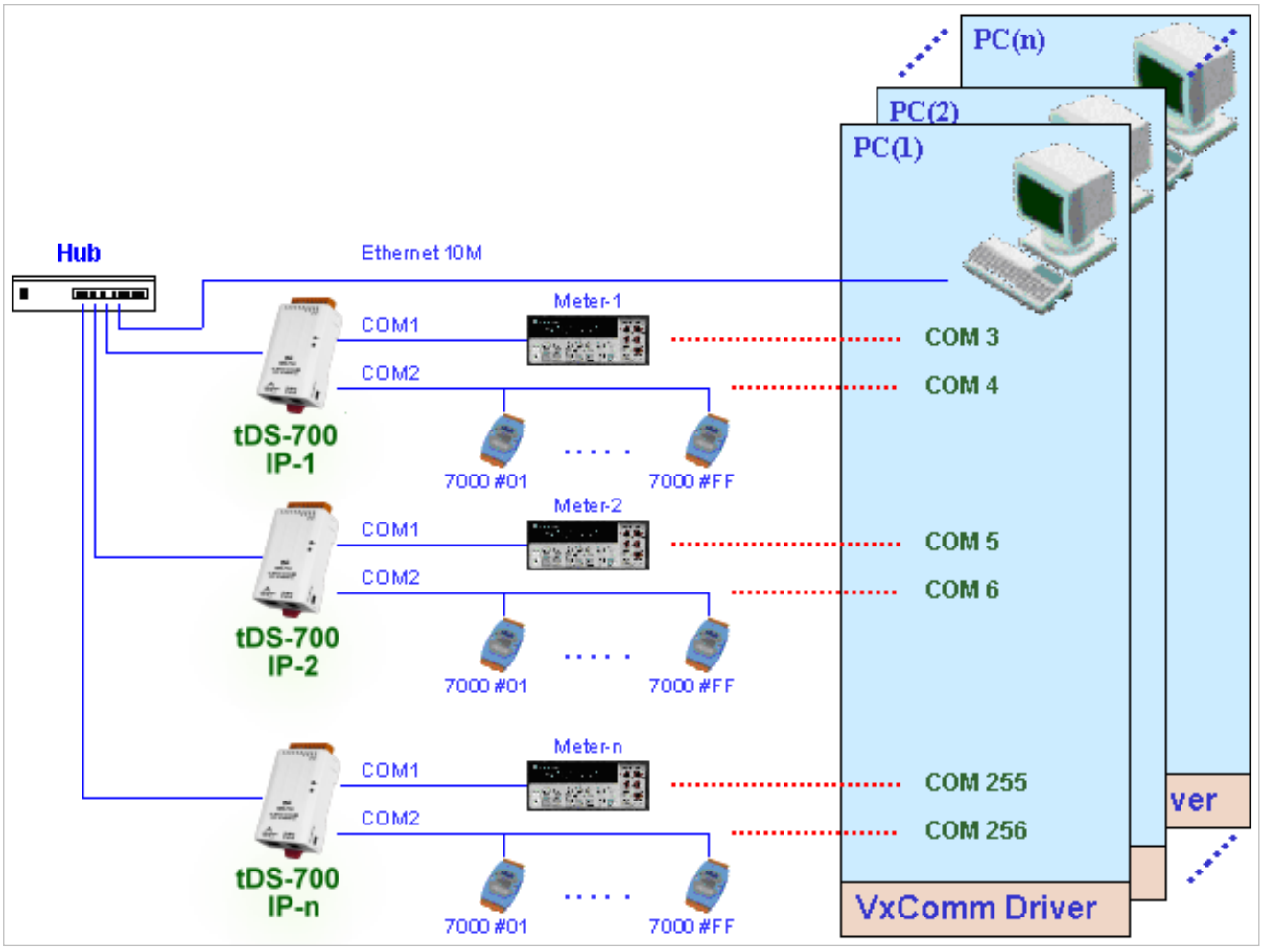
1.2 VxComm Technology

In general, writing a TCP/IP program is more difficult than writing a COM Port program. Another issue is that perhaps the existing the COM Port communication system was built many years ago that cannot be connected to the Internet.

As a result, a new technology, VxComm was developed to virtualize the COM Ports of the tDS-700/ DS-2200 to allow up to 256 COM Ports to be used on a central computer. The VxComm driver saves time when accessing serial devices through the Ethernet without the need for reprogramming the COM Port software on the PC.



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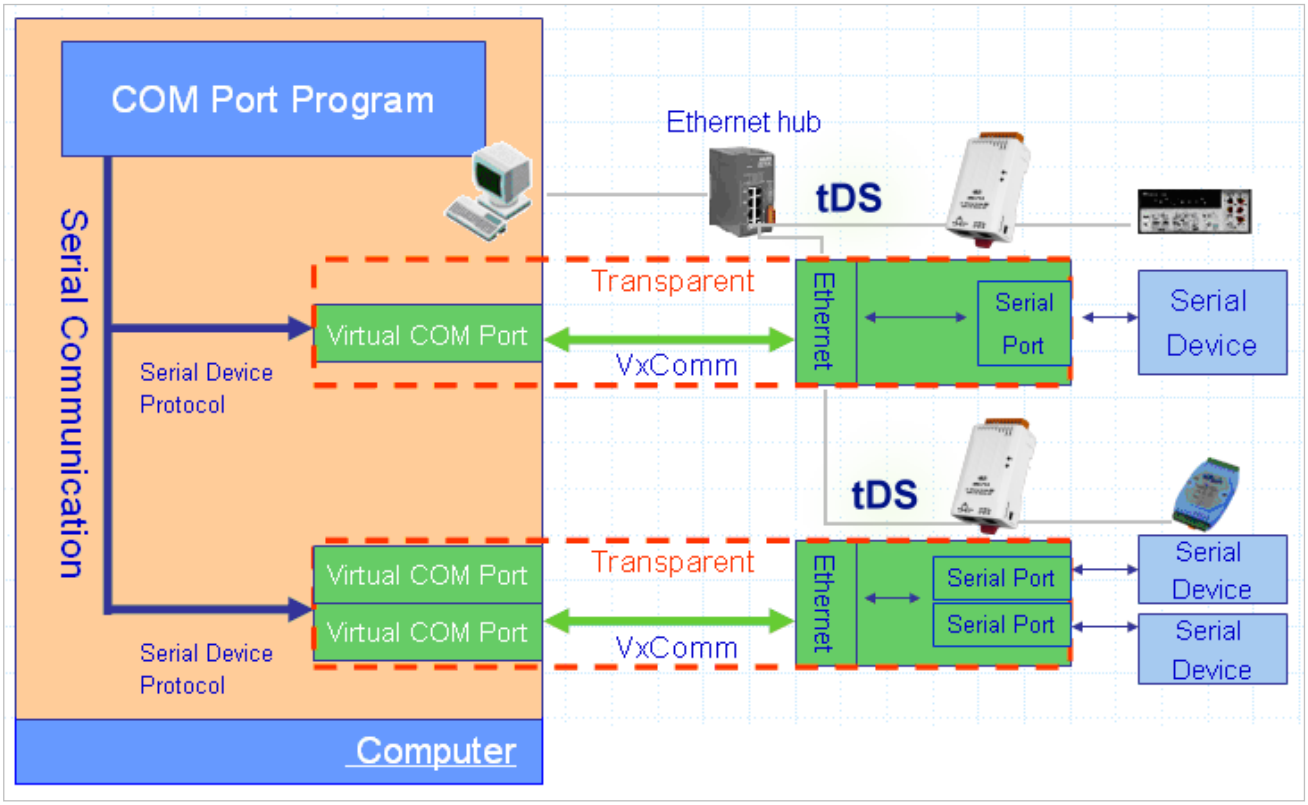
The VxComm driver handles all the complexities of Ethernet TCP/IP programming, meaning that, with the assistance of tDS-700/DS-2200 and VxComm technology, your COM Port program will be able to access serial devices over Ethernet just as if they were connected through a local COM port.



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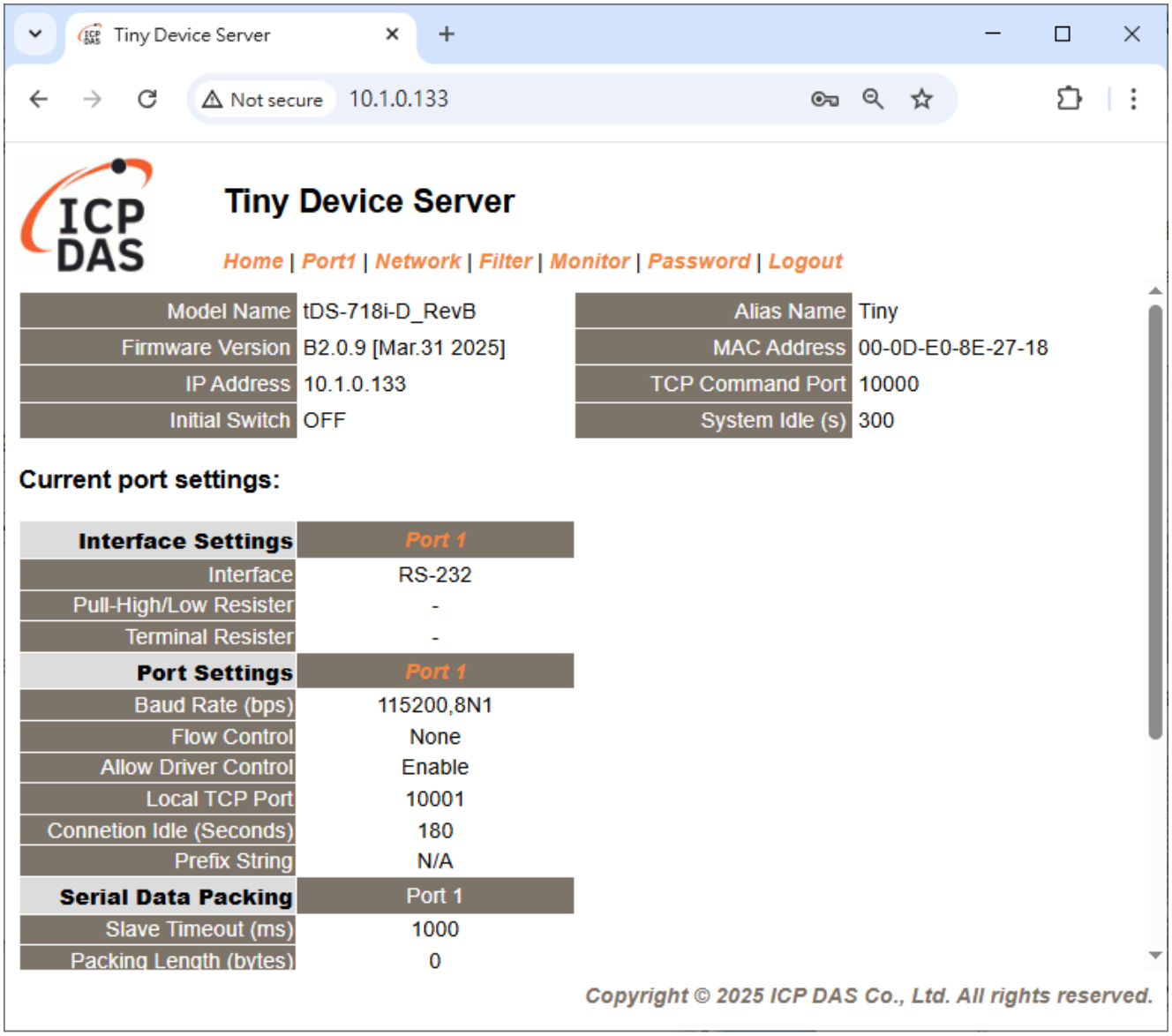
1.3 Web Server Technology

Web server technology enables the tDS-700/DS-2200 to be configured through any standard web browser - such as Microsoft Edge, Google Chrome, Internet Explorer, or Firefox - making it easy to view and adjust settings over an Ethernet network without the need for additional software. This simplifies device maintenance and lowers the learning curve for users.



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2. Hardware Information

This chapter provides a detailed description of the front panel, the hardware specifications, the pin assignments, the wiring notes and the dimensions for the tDS-700/DS-2200 series modules.

2.1 Specifications

Model	tDS series tDSM series	tDS-712 tDS-712i tDSM-712	tDS-722 tDS-722i	tDS-732 tDS-732i	tDS-715 tDS-715i	tDS-725 tDS-725i	tDS-735 tDS-735i	tDS-718 tDS-718i tDS-718i-D	tDS-724 tDS-724i	tDS-734 tDS-734i
	DS series	DS-2212i	DS-2222i	DS-2232i	DS-2215i	DS-2225i	DS-2235i	-	-	-
System										
CPU		32-bit ARM								
Communication Interface										
Ethernet	700 Series	10/100 Base-TX, 8-pin RJ-45 x 1, (Auto-negotiating, Auto-MDI/MDIX, LED indicator)								
	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	700 Series	1 x RS-232	2 x RS-232	3 x RS-232	1 x RS-422/ RS-485	2 x RS-485	3 x RS-485	1 x RS-232 or RS-422/485	1 x RS-485 1 x RS-232	1 x RS-485 2 x RS-232
	2200 Series					2 x RS-422/ RS-485	3 x RS-422/ RS-485			
Self-Tuner		-			Yes, automatic RS-485 direction control					
RS-485	Bias Resistor	-			Yes, 1 KΩ					
	Node	-			254 (max.)					
UART		16c550 or compatible								
Power Isolation		1000 V_{DC} for only tDS-722i / 732i / 718i-D , DS-2212i / 2222i / 2232i								
Signal Isolation		3000 V_{DC} for only tDS-712i / 715i / 725i / 735i / 718i / 724i / 734i , DS-2215i / 2225i / 2235i								
ESD Protection		+/-4 kV								
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		0.07 A @ 24 V_{DC}								
Mechanism										
Connector	700 Series	Male DB-9 x1 for tDS-712(i)/718i-D and tDSM-712 10-Pin Removable Terminal Block x 1 for tDS-722(i)/732(i)/715(i)/725(i)/735(i)/718(i)/724(i)/734(i)								
	2200 Series	5-pin Removable Terminal Block x 1 for 2212i/2215i; x 2 for 2222i/2225i; x 3 for 2232i/2235i								
Mounting		DIN-Rail								
Case		Metal for tDSM-712; Plastic for others.								
Environment										
Operating Temperature		-25 ~ +75 °C								
Storage Temperature		-30 ~ +80 °C								
Humidity		10 ~ 90% RH, non-condensing								
Note: COM1/COM2/COM3 = TCP Port 10001/10002/10003										

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2.2 Features

- Incorporates any RS-232/422/485 serial device in Ethernet
- Data transmission via Virtual COM or raw TCP connection
- VxComm Driver for 32-bit and 64-bit Windows 11/10/2016/2012/8/7/XP
- Max. connections: 1 socket per serial port is suggested
- Supports pair-connection (serial-bridge, serial-tunnel) applications
- Supports TCP client-mode and TCP server-mode operations
- 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 configuration (HTTP)
- 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)
- DS-2200 series supports 2-port Ethernet Switch (LAN Bypass) for Daisy-chain wiring
- Includes redundant power inputs: PoE (IEEE 802.3af, Class 1) and DC jack
- Allows automatic RS-485 direction control
- Power or Signal isolation for i versions
- +/- 4 kV ESD protection
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant with no Halogen
- Cost-effective device servers

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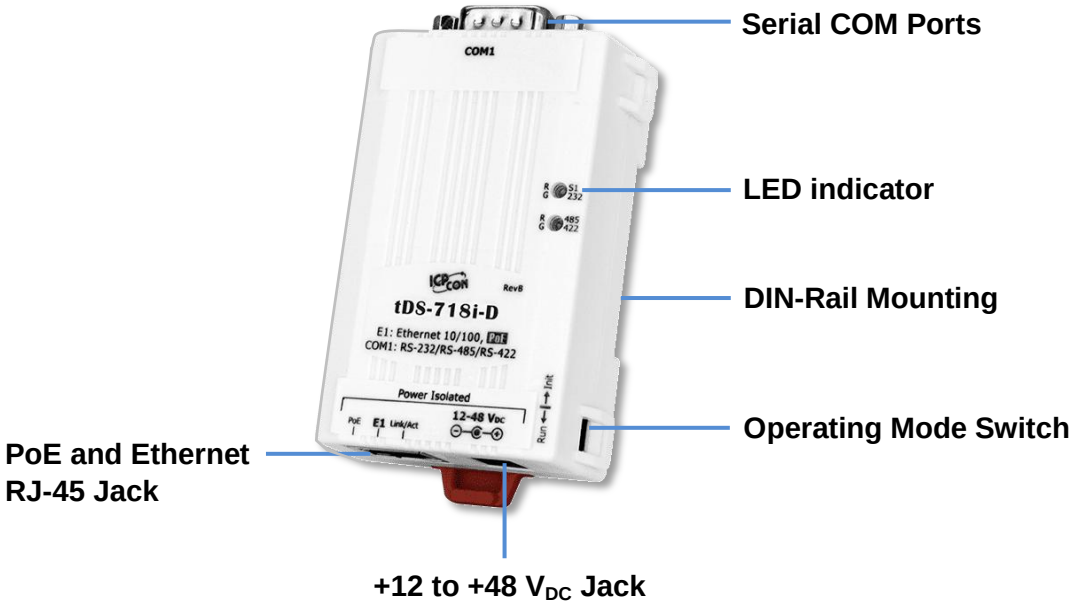
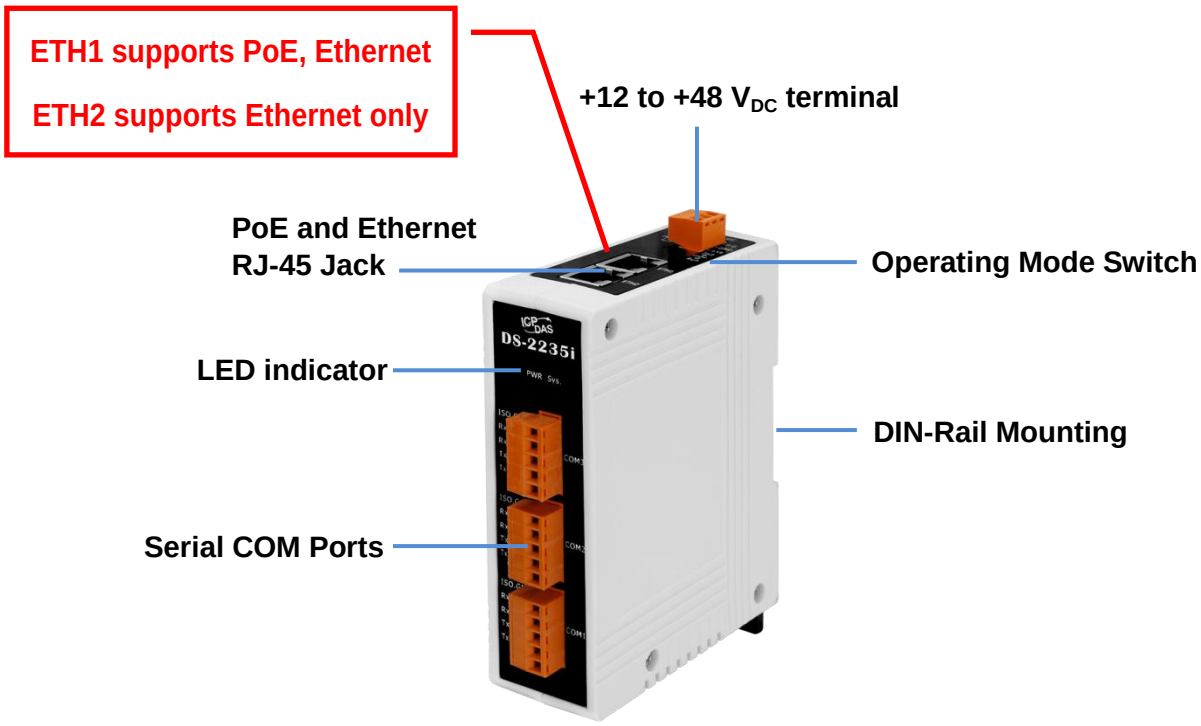
2.3 Appearance





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PoE and Ethernet RJ-45 Jack

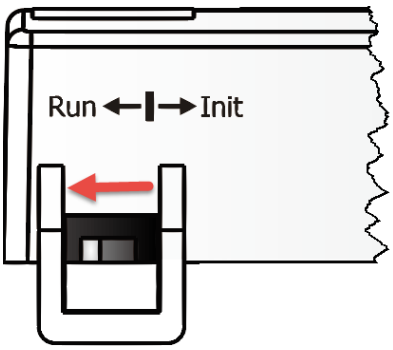
The tDS-700 series module is equipped with an RJ-45 jack that is used as the 10/100 Base-TX Ethernet port and features networking capabilities, supports PoE power supply. The DS-2200 series module is equipped with two RJ-45 jacks that are used as the 10/100 Base-TX Ethernet port and features networking capabilities, only ETH1 supports PoE power supply. When an Ethernet link is detected and an Ethernet packet is received, the **Link/Act LED (Orange)** indicator will be illuminated. When power is supplied via PoE (Power-over-Ethernet), the **PoE LED (Green)** indicator will be illuminated.

+12 to +48 VDC Jack

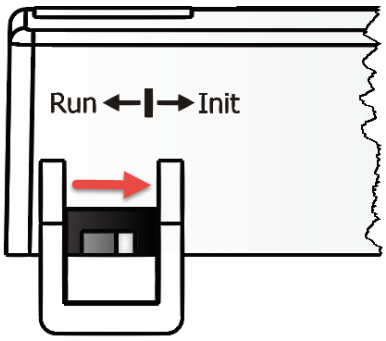
The tDS-700 series is equipped with a +12V_{DC} to +48 V_{DC} jack that can be used to connect a power supply. The DS-2200 series is equipped with a +12V_{DC} to +48 V_{DC} terminal that can be used to connect a power supply. If no PoE switch is available on site, a DC adapter can be used to power the tDS-700/DS-2200 series module.

Operating Mode Switch

Run Mode: Firmware operation



Init Mode: Configuration mode



For tDS-700/DS-2200 series modules, the operating mode switch is set to the **Run** position by default. In order to update the firmware for the tDS-700/DS-2200 series module, the switch must be moved from the **Run** position to the **Init** position. The switch must be returned to the **Run** position after the update is complete.

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LED Indicator

Once power is supplied to the tDS-700/DS-2200 series module, the system LED indicator will illuminate. An overview of the system LED functions is given below:

Function	Color	S1 LED Behavior
Running Firmware	**Red** 	Steady ON
Network Ready		Slow flashing – Once every 3 seconds
Serial Port Busy		Rapid flashing – Once every 0.2 seconds

The following serial port LED indicators are available on the tDS-718i-D only. You can change the serial interface via web server. An overview of the serial Port LED functions is given as below:

Function	RS-232	RS-485	RS-422
LED Behavior			

Serial COM Ports

The number of COM ports varies depending on the function of tDS-700/DS-2200 series module. For more detailed information regarding the pin assignments for the Serial COM ports, refer to Section 2.5 “Pin Assignments”.

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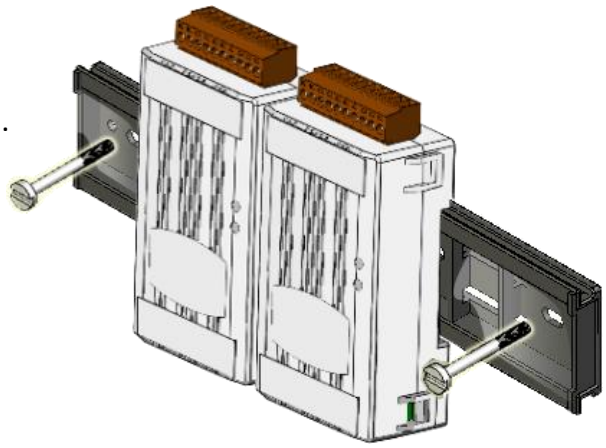
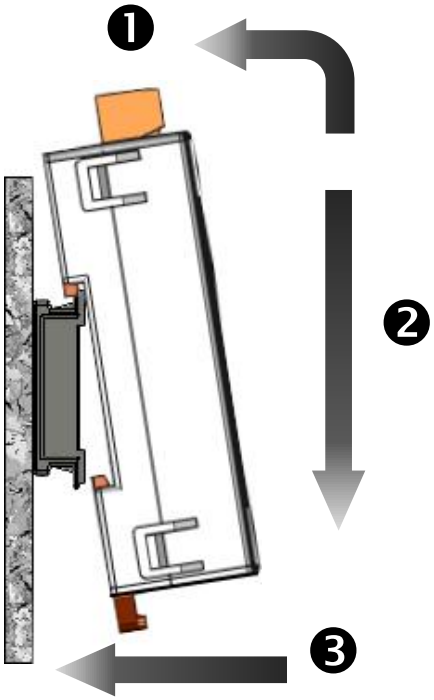
DIN-Rail Mounting

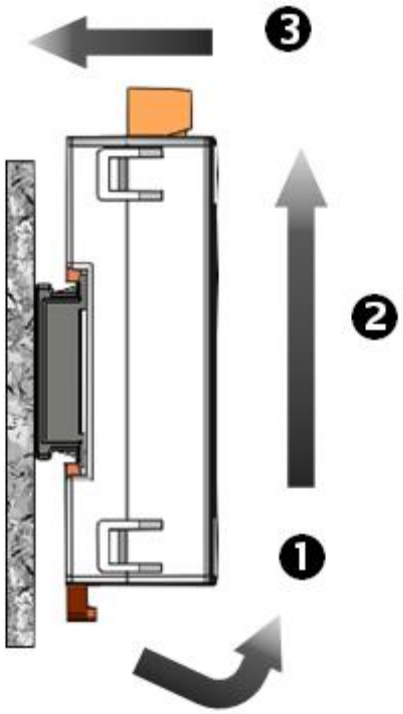
The tDS-700/DS-2200 series modules are equipped with simple rail clips located on the back of the chassis that allow them to be reliably mounted on a DIN-Rail or a wall. For more detailed information regarding DIN-Rail Mounting, refer to the illustration in the figure below.



Mounting on a DIN-Rail



Dismounting form a DIN-Rail



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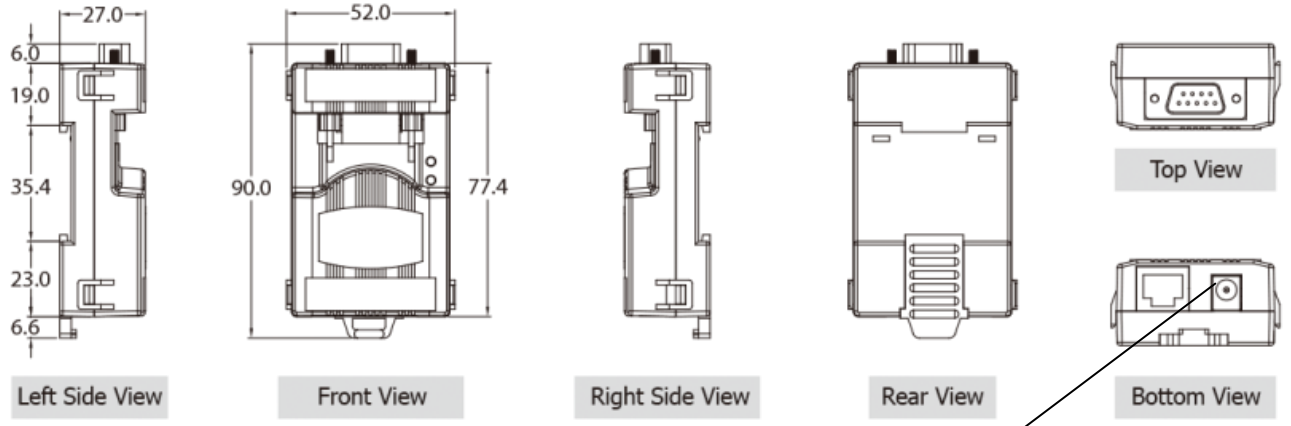
2.4 Dimensions

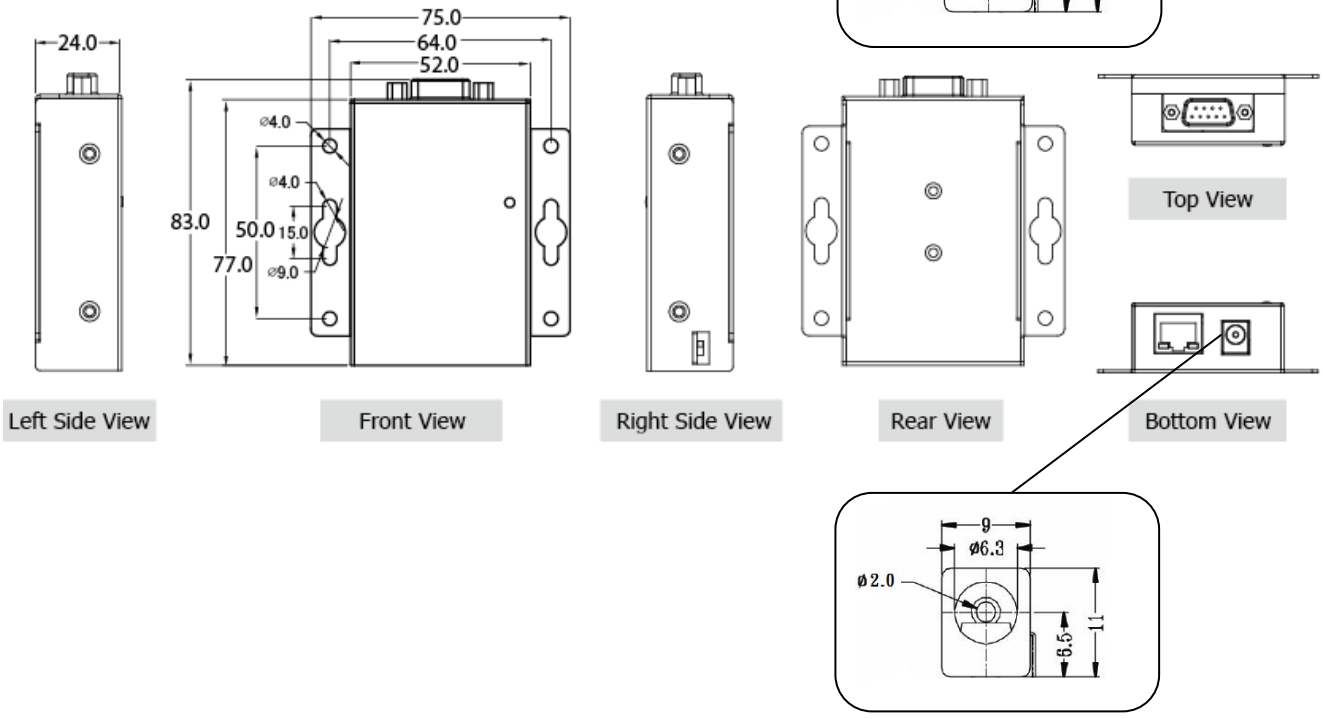
The following diagrams provide the dimensions of the tDS-700/DS-2200 series module and CA-002 cable that can be used as a reference when defining the specifications and the DC power supply plug for any custom enclosures. All dimensions are in millimeters.

2.4.1 tDS-700 Series Module

➢ **tDS-712:**



➢ **tDSM-712:**



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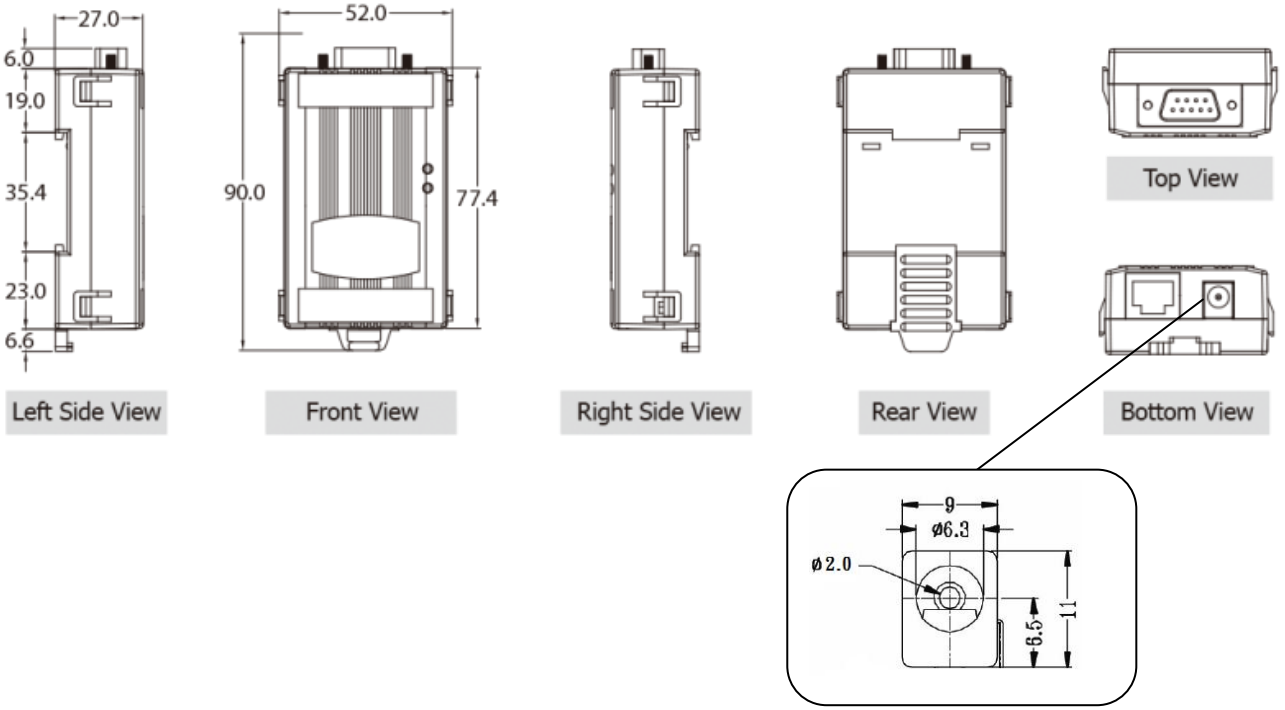
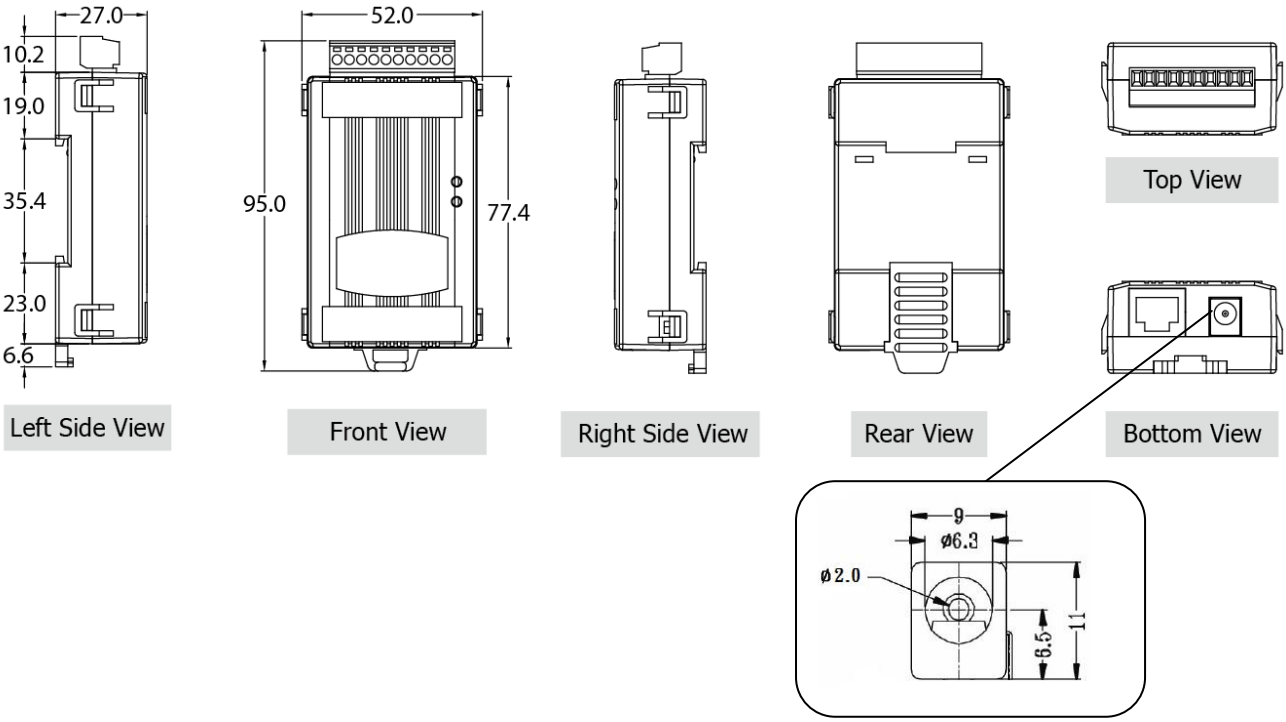
➢ **tDS-712i/718i-D:**



➢ **tDS-722(i)/732(i)/715(i)/725(i)/735(i)/718(i)/724(i)/734(i):**



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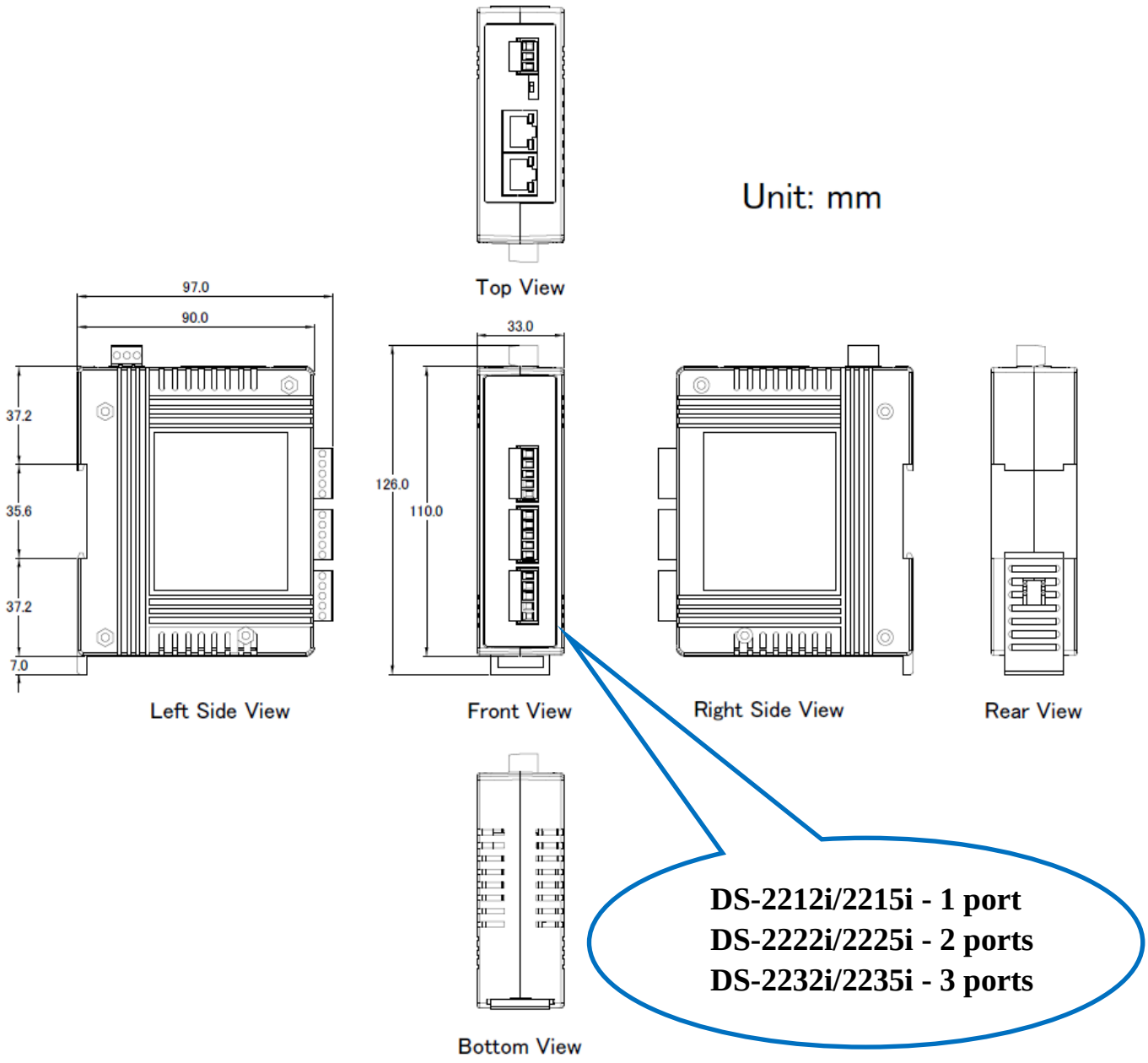
2.4.2 DS-2200 Series Module

➢ **DS-2212i/2222i/2232i/2215i/2225i/2235i**



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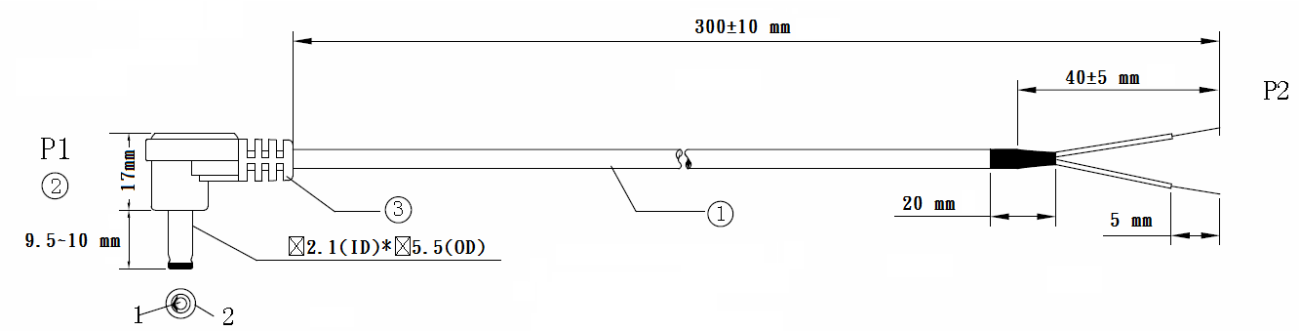
2.4.3 CA-002 Cable



Pin Assignment

P1		P2
1	RED	OPEN
2	BLACK	OPEN

Note: Cable color: BLACK

NO	DESCRIPTION	QTY	UNIT
1	UL2464 18AWG 2C(RED/BLACK) 0D5.0 COLOR BLACK	1	PCS
2	DC PLUG 5.5*2.1	1	PCS
3	PVC:45/P BLACK		G

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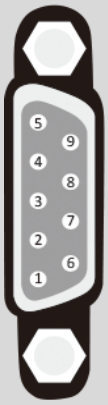
2.5 Pin Assignments

tDS-712/tDS-712i/tDSM-712

		tDS-712/tDSM-712	tDS-712i
Terminal No.		Pin Assignment	
COM1 	09	N/A	N/A
	08	CTS1	CTS1
	07	RTS1	RTS1
	06	N/A	N/A
	05	GND	ISO.GND
	04	N/A	N/A
	03	TxD1	TxD1
	02	RxD1	RxD1
	01	N/A	N/A

tDS-722/tDS-722i

		tDS-722	tDS-722i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
COM2	09	CTS2	CTS2
	08	RTS2	RTS2
	07	RxD2	RxD2
	06	TxD2	TxD2
COM1	05	GND	ISO.GND
	04	CTS1	CTS1
	03	RTS1	RTS1
	02	RxD1	RxD1
	01	TxD1	TxD1

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tDS-732/tDS-732i

		tDS-732	tDS-732i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
COM3	09	GND	ISO.GND
	08	RxD3	RxD3
	07	TxD3	TxD3
COM2	06	GND	ISO.GND
	05	RxD2	RxD2
	04	TxD2	TxD2
COM1	03	GND	ISO.GND
	02	RxD1	RxD1
	01	TxD1	TxD1

tDS-715/tDS-715i

		tDS-715		tDS-715i	
Terminal No.		Pin Assignment			
		RS-485	RS-422	RS-485	RS-422
	10	F.G.		F.G.	
	09	N/A		N/A	
	08	N/A		N/A	
	07	N/A		N/A	
	06	N/A		N/A	
COM1	05	GND		ISO.GND	
	04	N/A	RxD1-	N/A	RxD1-
	03	N/A	RxD1+	N/A	RxD1+
	02	D1-	TxD1-	D1-	TxD1-
	01	D1+	TxD1+	D1+	TxD1+

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tDS-725/tDS-725i

		tDS-725	tDS-725i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
	09	N/A	N/A
	08	N/A	N/A
	07	N/A	N/A
COM2	06	GND	ISO.GND
	05	D2-	D2-
	04	D2+	D2+
COM1	03	GND	ISO.GND
	02	D1-	D1-
	01	D1+	D1+

tDS-735/tDS-735i

		tDS-735	tDS-735i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
COM3	09	GND	ISO.GND
	08	D3-	D3-
	07	D3+	D3+
COM2	06	GND	ISO.GND
	05	D2-	D2-
	04	D2+	D2+
COM1	03	GND	ISO.GND
	02	D1-	D1-
	01	D1+	D1+

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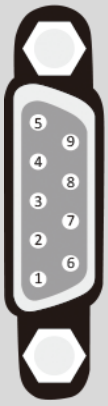
tDS-718/tDS-718i

		tDS-718		tDS-718i	
Terminal No.		Pin Assignment			
	10	F.G.		F.G.	
	09	N/A		N/A	
RS-232	08	GND		ISO.GND	
	07	RxD1		RxD1	
	06	TxD1		TxD1	
RS-485/RS-422	05	GND		ISO.GND	
	04	N/A	RxD1-	N/A	RxD1-
	03	N/A	RxD1+	N/A	RxD1+
	02	D1-	TxD1-	D1-	TxD1-
	01	D1+	TxD1+	D1+	TxD1+

tDS-718i-D

		RS-232	RS-422	RS-485
Terminal No.		Pin Assignment		
COM1 	09	-	-	-
	08	CTS	-	-
	07	RTS	-	-
	06	-	-	-
	05	GND	GND	GND
	04	-	RxD-	-
	03	TxD	RxD+	-
	02	RxD	TxD+	Data+
	01	-	TxD-	Data-

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tDS-724/tDS-724i

		tDS-724	tDS-724i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
	09	GND	ISO.GND
COM2	08	CTS2	CTS2
	07	RTS2	RTS2
	06	GND	ISO.GND
	05	RxD2	RxD2
	04	TxD2	TxD2
COM1	03	GND	ISO.GND
	02	D1-	D1-
	01	D1+	D1+

tDS-734/tDS-734i

		tDS-734	tDS-734i
Terminal No.		Pin Assignment	
	10	F.G.	F.G.
COM3	09	GND	ISO.GND
	08	RxD3	RxD3
	07	TxD3	TxD3
COM2	06	GND	ISO.GND
	05	RxD2	RxD2
	04	TxD2	TxD2
COM1	03	GND	ISO.GND
	02	D1-	D1-
	01	D1+	D1+

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DS-2212i/2222i/2232i

		DS-2212i	DS-2222i	DS-2232i
Terminal No.		Pin Assignment		
COM3	05	--	--	ISO.GND
	04	--	--	RTS3
	03	--	--	CTS3
	02	--	--	RxD3
	01	--	--	TxD3
COM2	05	--	ISO.GND	ISO.GND
	04	--	RTS2	RTS2
	03	--	CTS2	CTS2
	02	--	RxD2	RxD2
	01	--	TxD2	TxD2
COM1	05	ISO.GND	ISO.GND	ISO.GND
	04	RTS1	RTS1	RTS1
	03	CTS1	CTS1	CTS1
	02	RxD1	RxD1	RxD1
	01	TxD1	TxD1	TxD1

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DS-2215i/2225i/2235i

Terminal No.		DS-2215i		DS-2225i		DS-2235i	
		Pin Assignment					
		RS-485	RS-422	RS-485	RS-422	RS-485	RS-422
COM3	05	--		--		ISO.GND	
	04	--		--		--	RxD3-
	03	--		--		--	RxD3+
	02	--		--		D3-	TxD3-
	01	--		--		D3+	TxD3+
COM2	05	--		ISO.GND		ISO.GND	
	04	--		--	RxD2-	--	RxD2-
	03	--		--	RxD2+	--	RxD2+
	02	--		D2-	TxD2-	D2-	TxD2-
	01	--		D2+	TxD2+	D2+	TxD2+
COM1	05	ISO.GND		ISO.GND		ISO.GND	
	04	--	RxD1-	--	RxD1-	--	RxD1-
	03	--	RxD1+	--	RxD1+	--	RxD1+
	02	D1-	TxD1-	D1-	TxD1-	D1-	TxD1-
	01	D1+	TxD1+	D1+	TxD1+	D1+	TxD1+

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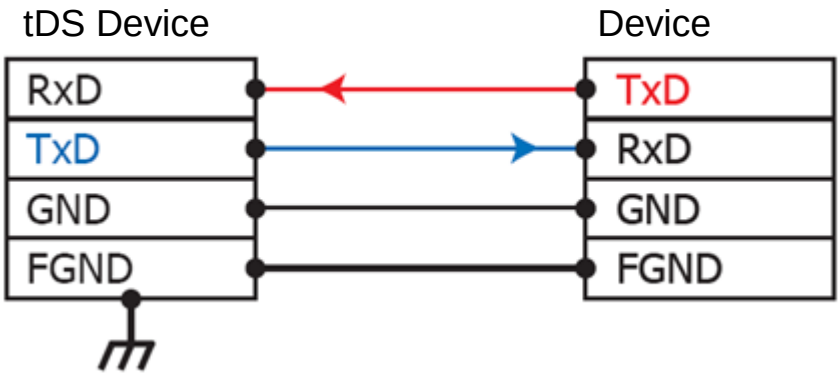
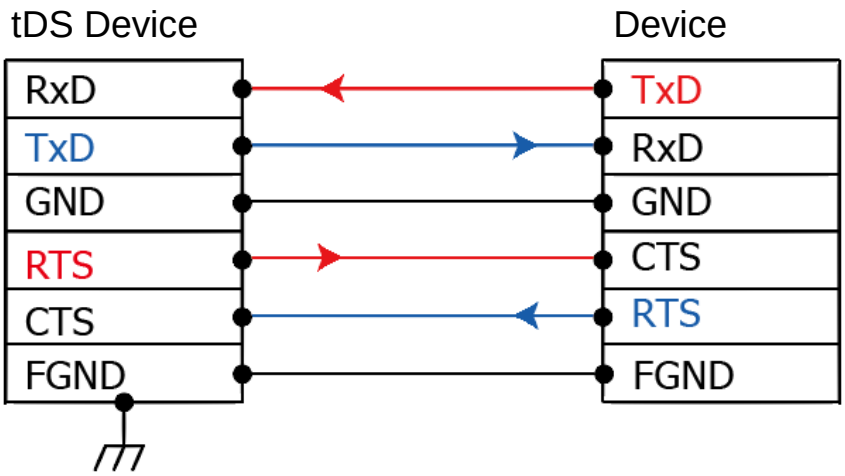
2.6 Wiring Notes for RS-232/485/422 Interfaces

RS-232 Wiring

3-wire RS-232 Connection



5-wire RS-232 Connection



Note: FGND is the frame ground that is soldered to the metal shield on the DB-9 cable.

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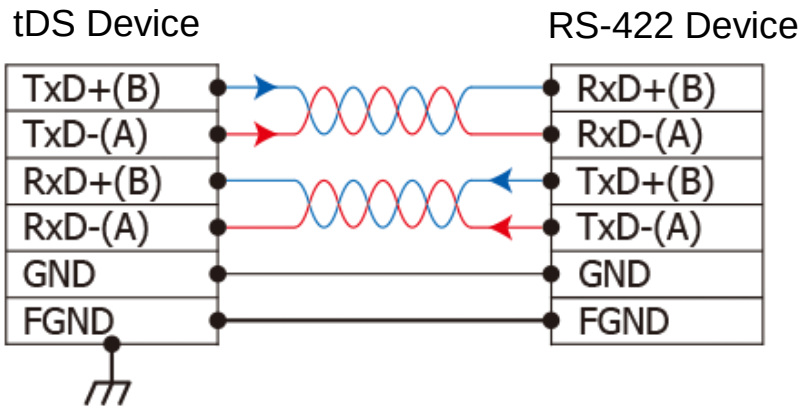
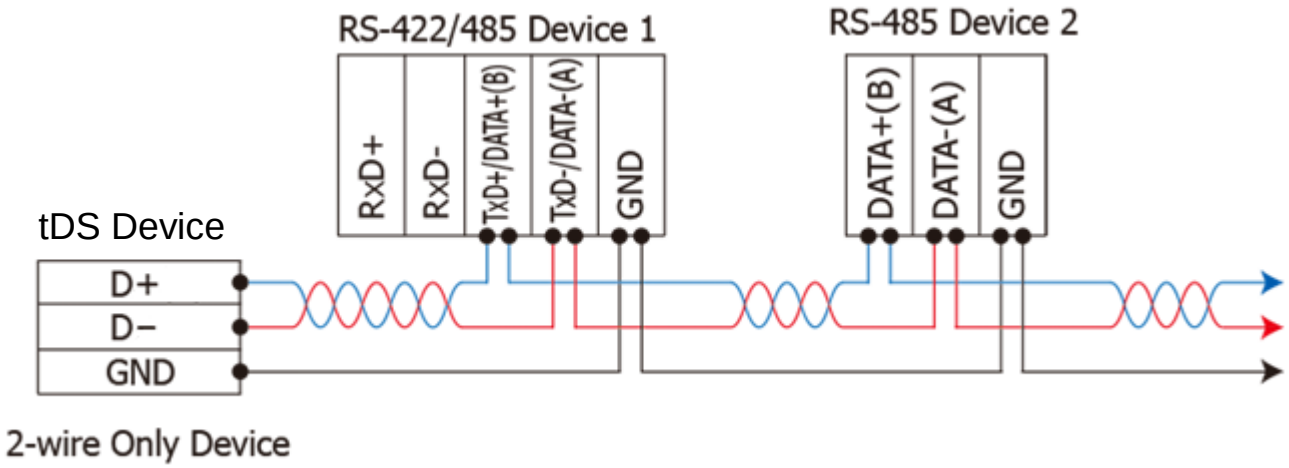
RS-422 Wiring



RS-485 Wiring



Notes:

1. Usually, you have to connect all signal grounds of RS-422/485 devices together to reduce common-mode voltage between devices.
2. The D+/D- (or Data+/Data-) wiring of RS-485 must use twisted pair cables.
3. Termination resistors (typically 120Ω) may be required at both ends of the wiring, connected across the D+ and D- lines.
4. The D+ and B pins are positive-voltage pins, and D- and A pins are negative-voltage pins in the above figure. The B/A pins may be defined in another way depending on *your* devices, please check it first.

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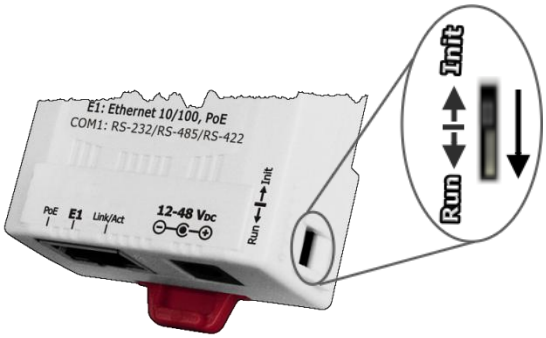
3. Getting Started for tDS-700 series

This chapter provides detailed information about the “Self-Test” process, which is used to confirm that the tDS-700 series module is operating correctly. Before beginning the “Self-Test” process, the wiring test, Ethernet configuration and VxComm utility driver installation procedures must first be fully completed. Follow the procedure described below:

3.1 Connecting the Power and Host PC

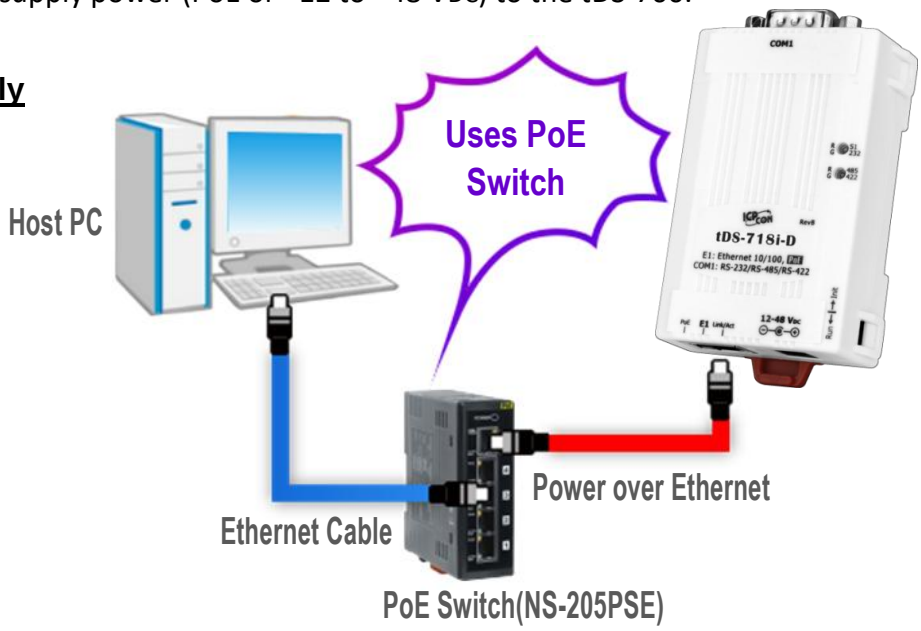
1. Ensure that the network settings on your PC are configured correctly.
Make sure that the Windows Firewall and any Anti-Virus firewalls on your PC are temporarily disabled or properly configured. Otherwise, the VxComm Utility may not be able to correctly detect the tDS-700 module during the search process. (Please consult your system administrator)

2. Check that the **Init/Run switch** is in the “**Run”** position.



3. Connect both the tDS-700 and the Host computer to the same sub-network or the same Ethernet Switch, and then supply power (PoE or +12 to +48 VDC) to the tDS-700.

PoE Power Supply



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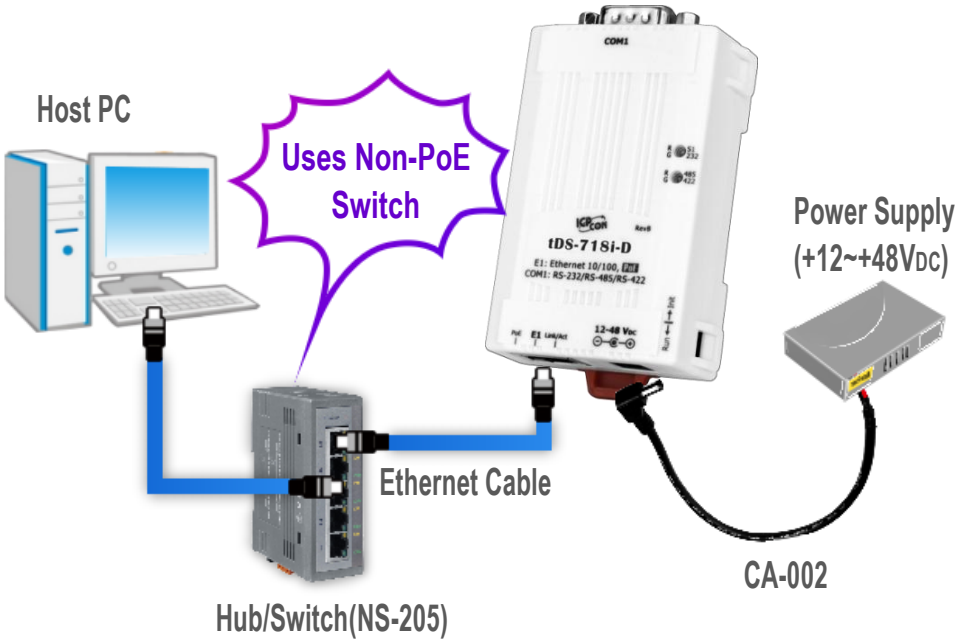
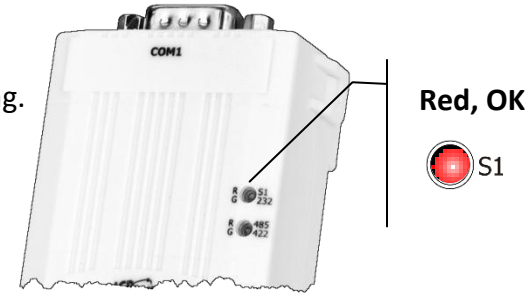
+12 to +48 VDC Jack Power Supply (Non-PoE)

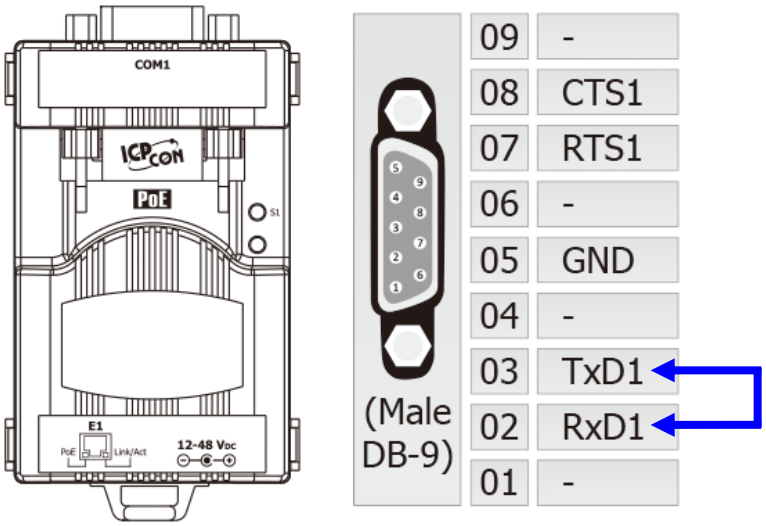


4. Verify that the **System (S1) LED** indicator is flashing.



5. Perform a Self-test wiring check as follows:

- **RS-232 Wiring**
  Connect the RxD pin to the TxD pin.



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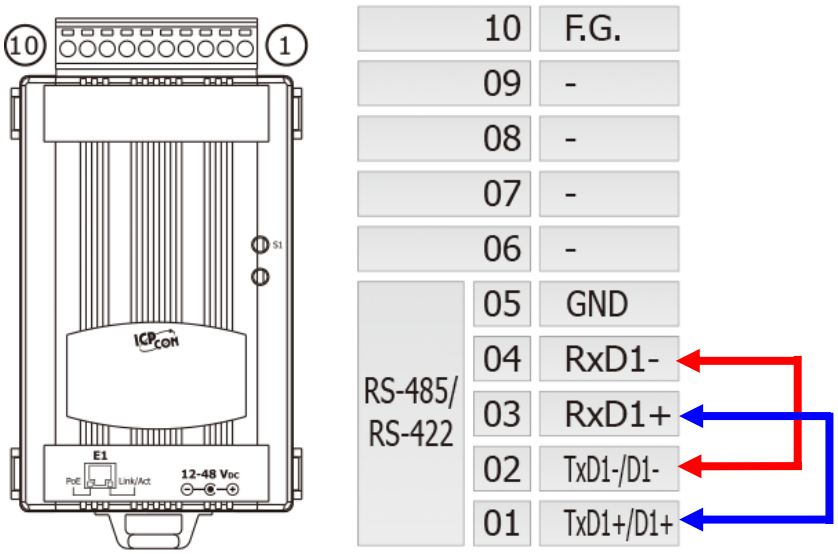
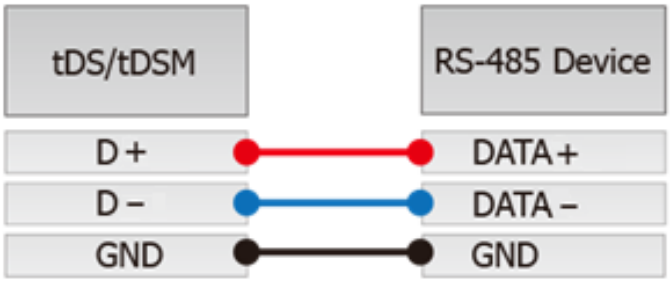
➢ RS-422 Wiring

Connect the RxD1- to the TxD1-, and then connect the RxD1+ to the TxD1+.



➢ RS-485 Wiring

While using RS-485 modules (e.g., tDS-715), you should wire the D+ with Data+, and wire the D- with Data- for self-test.



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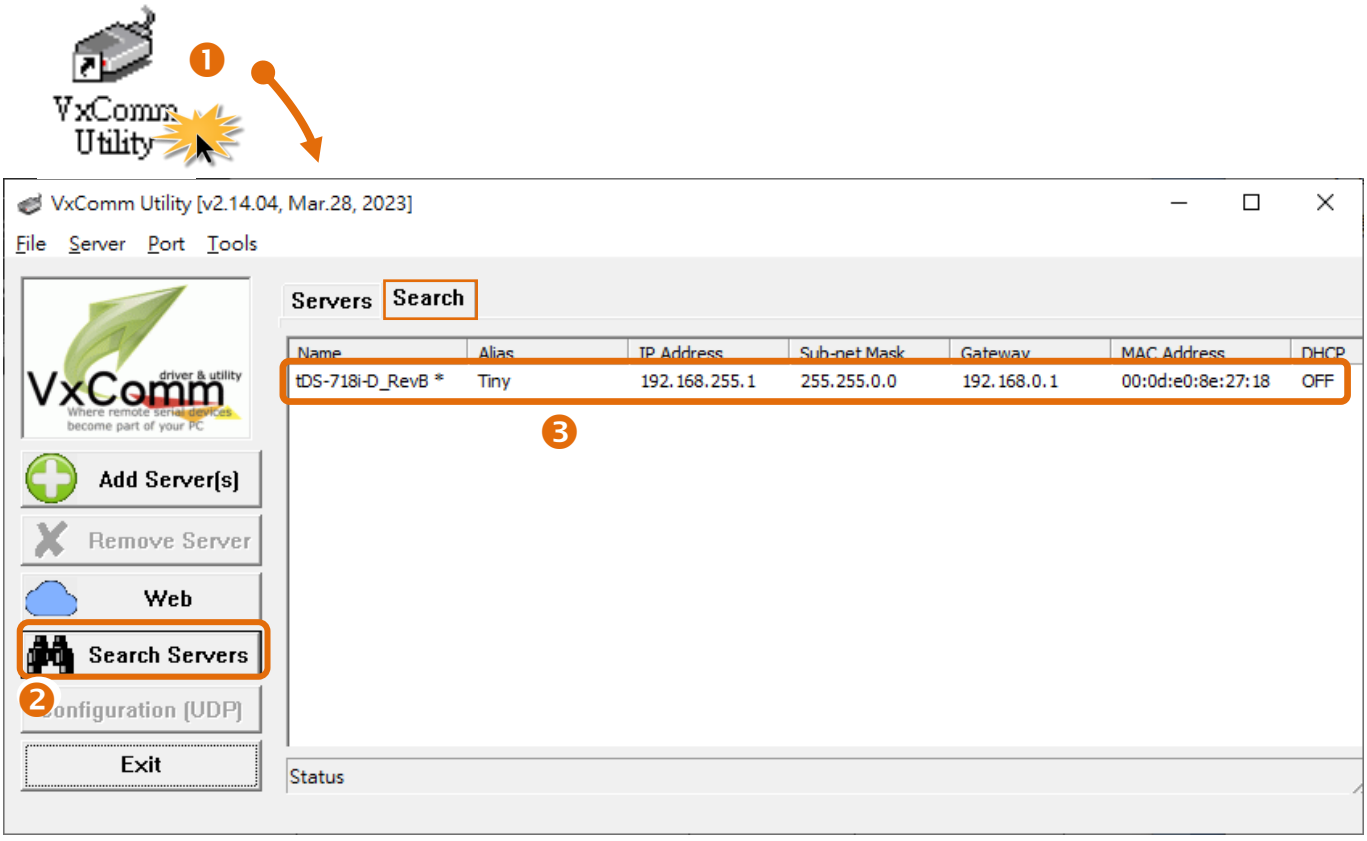
3.2 Install the VxComm Utility

The VxComm Utility can be obtained from the ICP DAS website.
The download link is as follows:

https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=vxcomm

3.3 Configuring Network Settings

1. **Double-click the VxComm Utility** shortcut on the desktop.
2. Click the **"Search Servers"** button to search for the tDS-700 module.
3. Once the search process is complete, **double-click the tDS-700 module name** to open the "Configure Server" dialog box.



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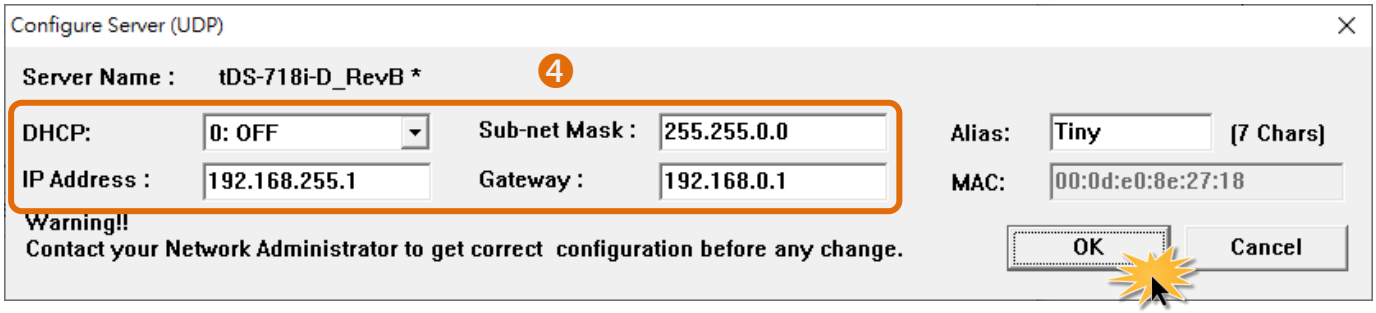
4. Contact your network administrator to obtain the correct network configuration. Enter the settings in the relevant fields, including the **IP, Sub-net Mask and Gateway addresses**, and click the "OK" button. The tDS-700 will apply the new settings after 2 seconds.



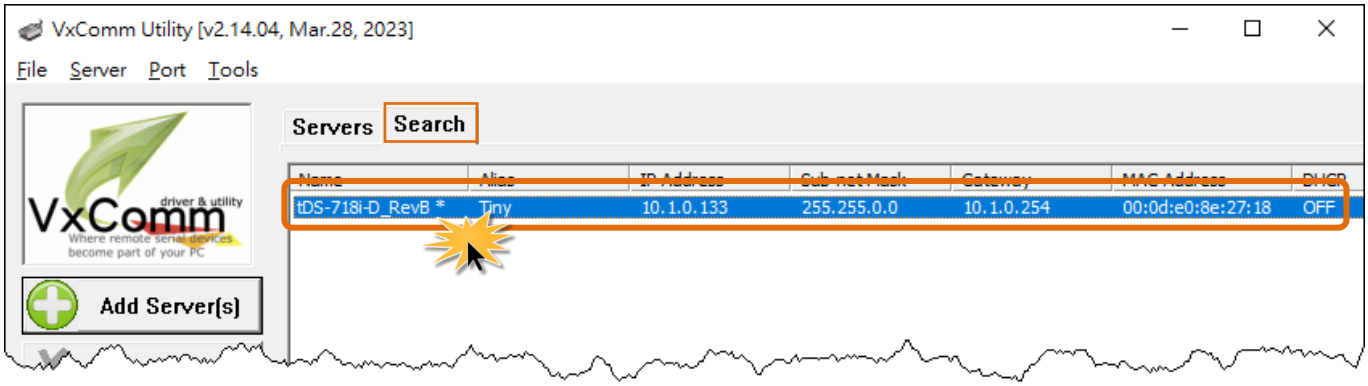
Factory Default Settings of tDS-700 Series Module

IP Address	192.168.255.1
Subnet Mask	255.255.0.0
Gateway	192.168.0.1

3.4 Configuring the Virtual COM Ports

1. Wait 2 seconds and then click the **"Search Servers"** button again to ensure that the tDS-700 is working correctly with the new configuration.

2. Click the tDS-700 name to select it from the list on the Search page.



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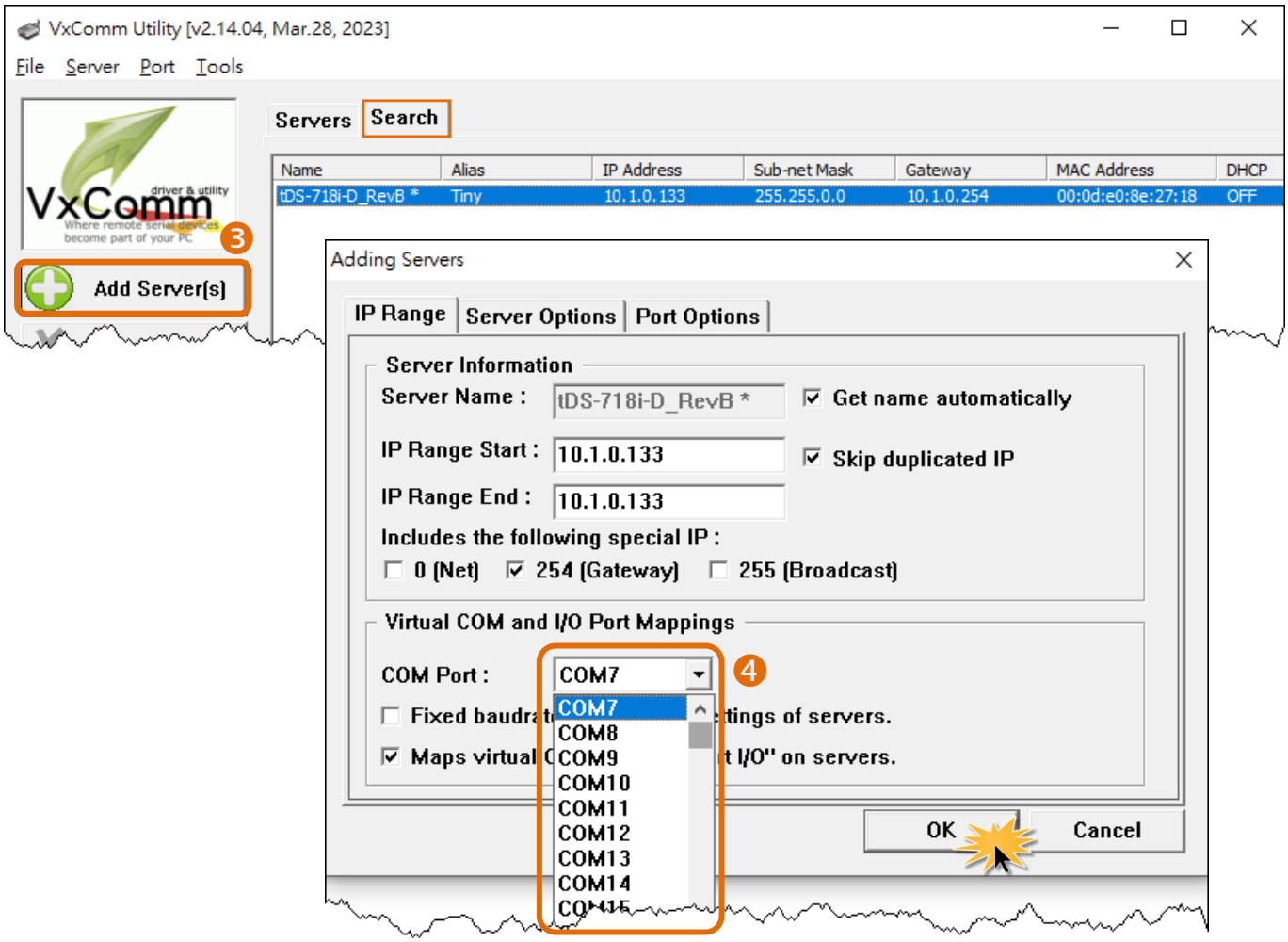
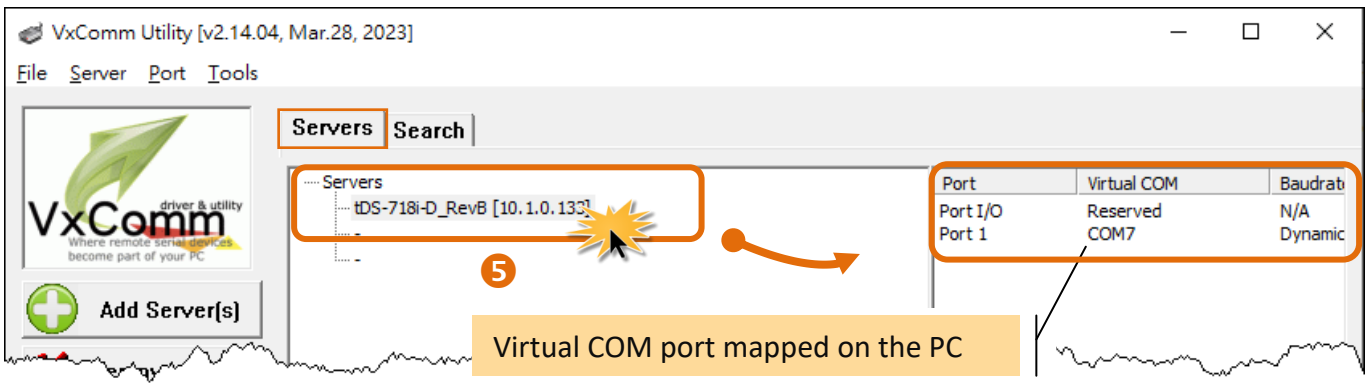
3. Click the **"Add Server[s]"** button.

4. Assign a COM Port number and click **"OK"** to save your settings.



5. Click on the tDS-700 name from the Servers list on the "Servres" page, and **check the virtual COM port** mapped on the PC in the Port field on the right.



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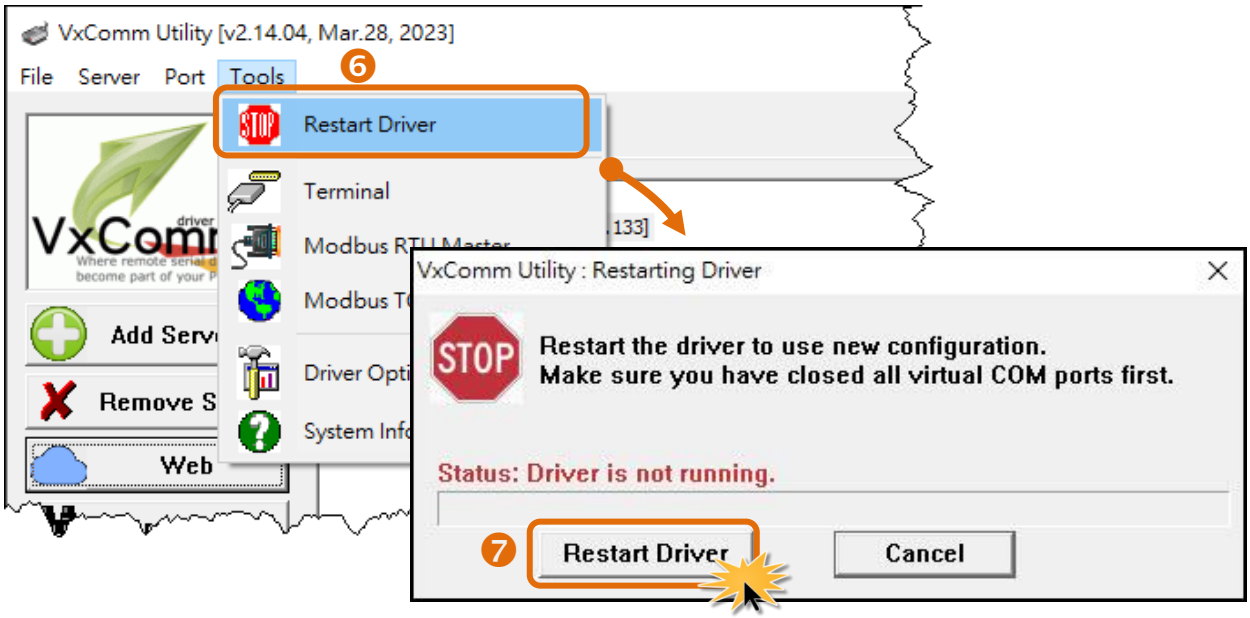
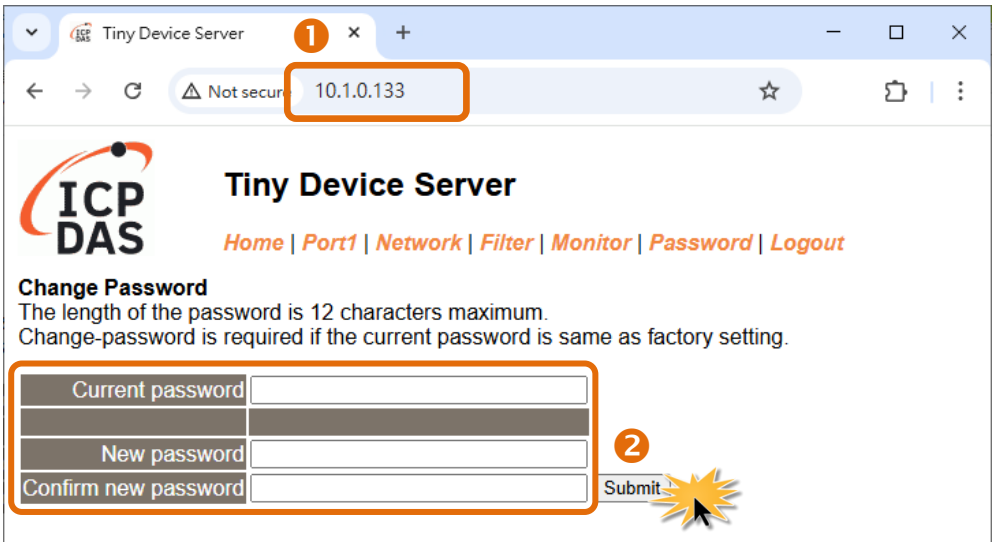
6. Click the **"Restart Driver"** item in the **"Tools"** menu.
7. Click the **"Restart Driver"** button on the "VxComm Utility: Restarting Driver" dialog box.



3.5 Configuring the Serial Port

1. Enter the tDS-700 module's IP address into your web browser address line and press **Enter**, or click the **"Web"** button in the VxComm Utility.
2. It is required to change password when logging into the tDS-700 web interface for the first time:
   - Enter the default password **admin** in the Current password field,
   - Enter your password in the **New password** field and the **Confirm new password** field,
   - Click the "**Submit**" button to complete the setting.



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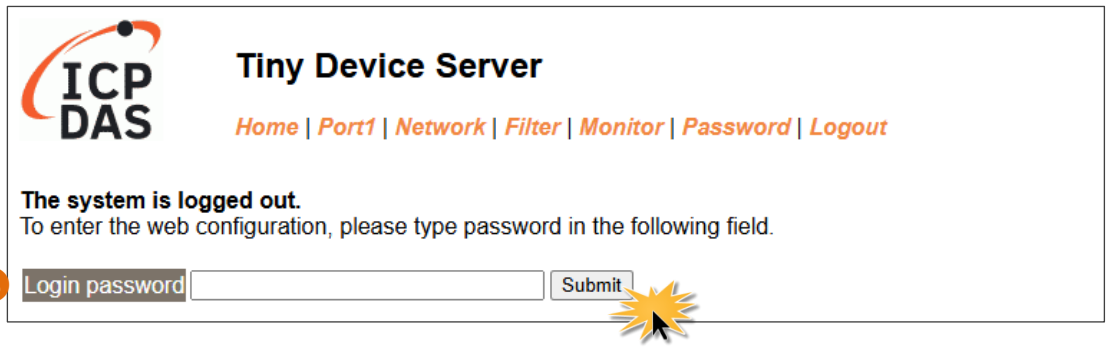
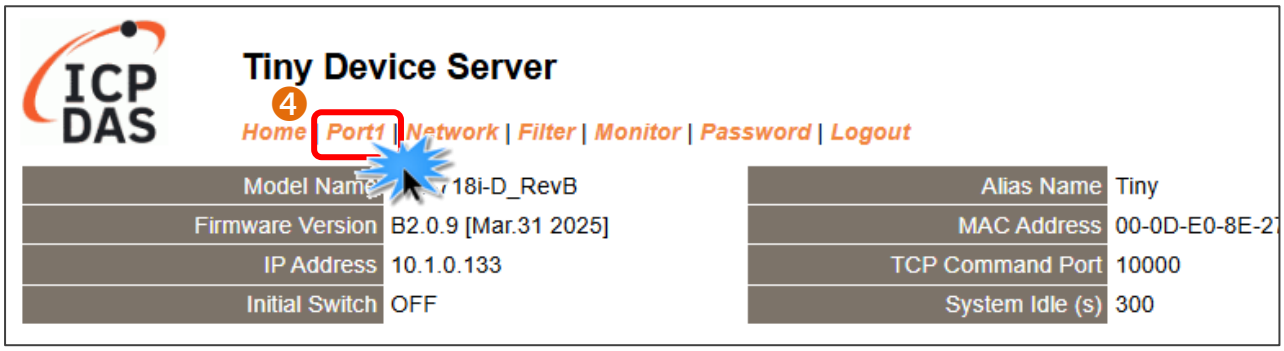
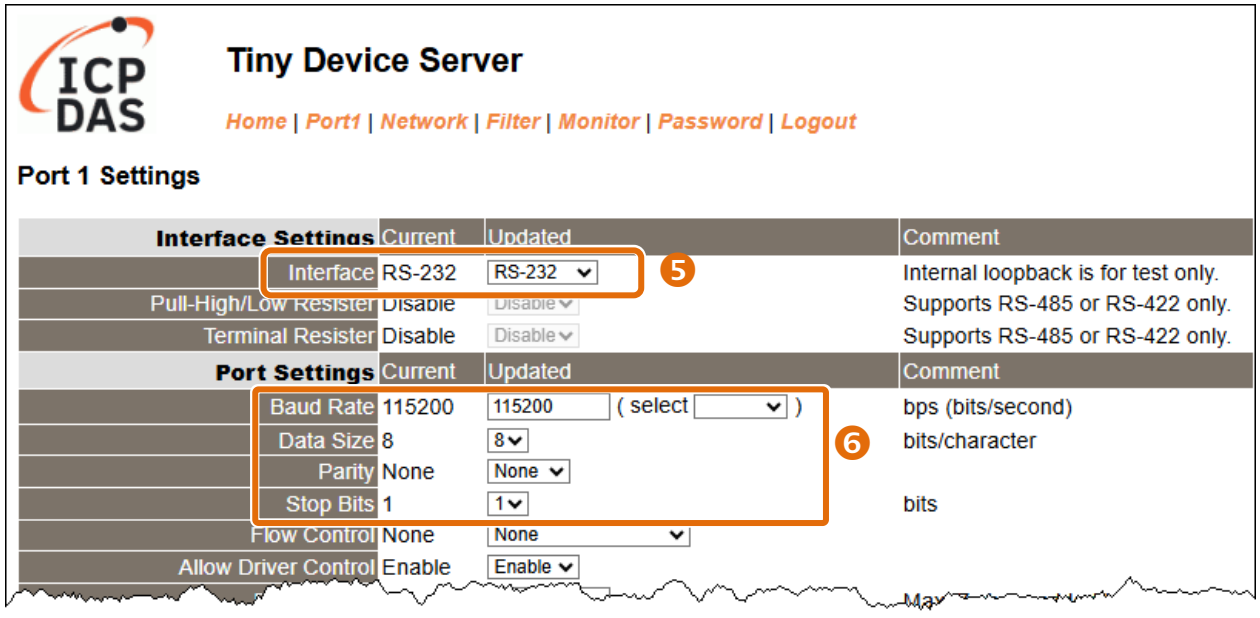
3. Enter the new password in the Login password field and click "**Submit**".



4. Click on **"Port1"** in the navigation bar.



5. Set interface mode using the "Interface" dropdown menu. **(This step applies only to the tDS-718i-D module. For other tDS-700 modules, please skip this step.)** **Note:** The interface setting should match the wiring that goes to your device.
6. Select the appropriate Baud Rate and Data Format (e.g., 115200 and 8N1) from the relevant dropdown menus. **Note:** These settings should be configured according to your device's requirements.
7. Click **"Submit"** at the bottom of the page to save your settings.



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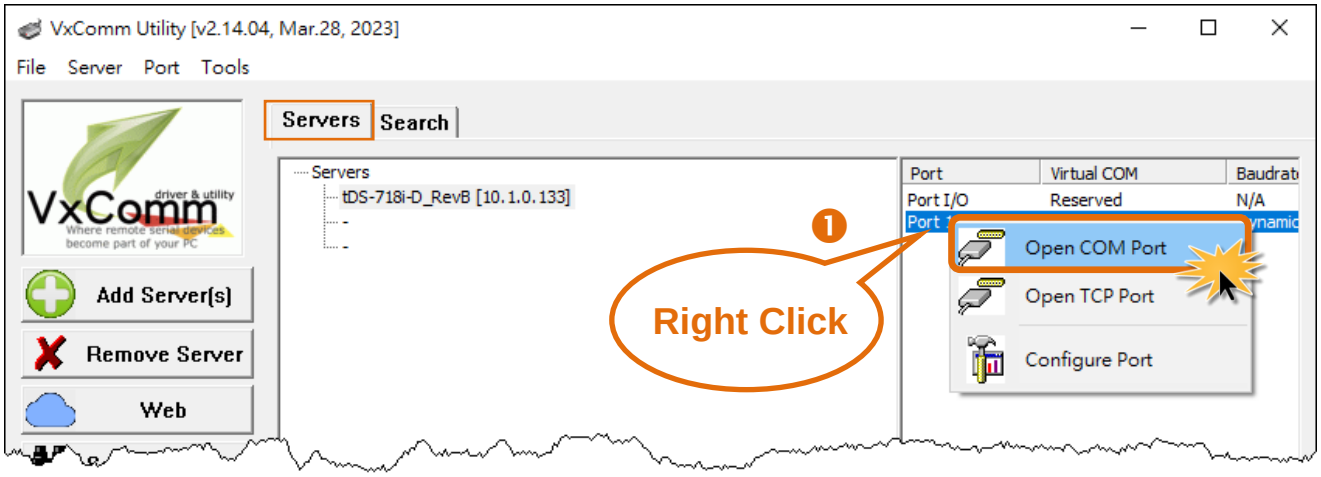
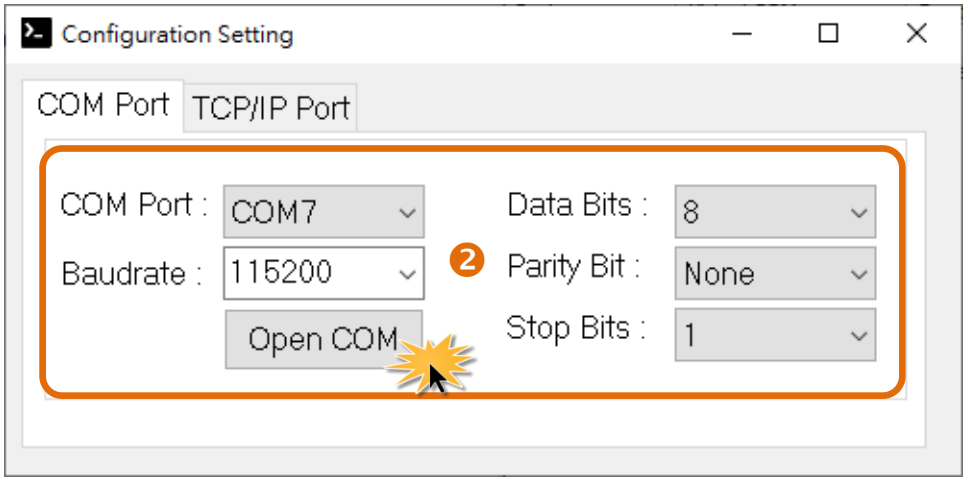
3.6 Testing Your tDS-700

1. Back to VxComm Utility, **Right click Port 1** and then choose the "**Open COM Port**" item.



2. Check that the configuration of the COM Port is correct and then click the "**Open COM**" button.



3. Type a string (e.g., $01M) in the **"send"** field

4. Click the **"Hex/Text"** option in the "**Display**" section.

5. Click the "**Send**" button to send the message.

6. If a response is received, it will be displayed in the received field.

If the test is successful, then your COM port program should now be able to work with this Virtual COM Port.

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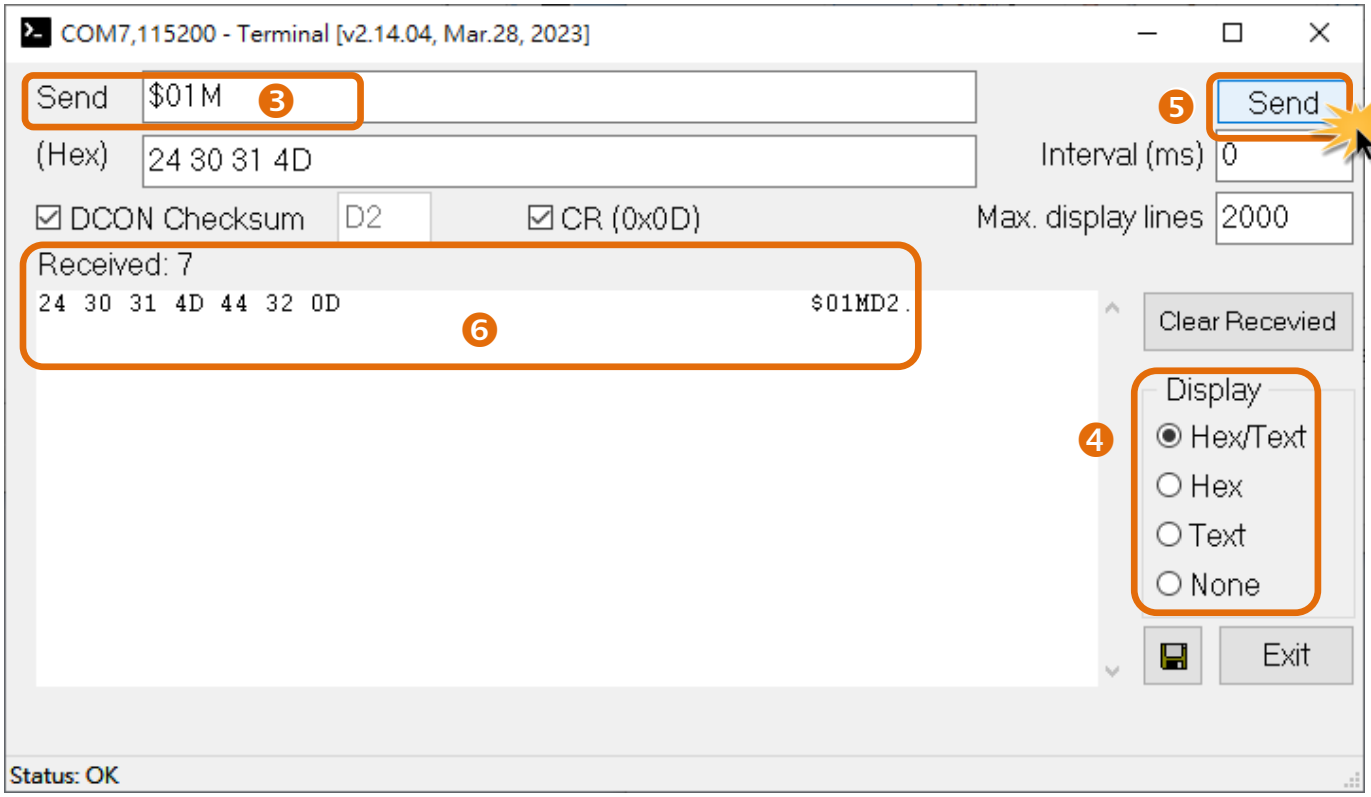
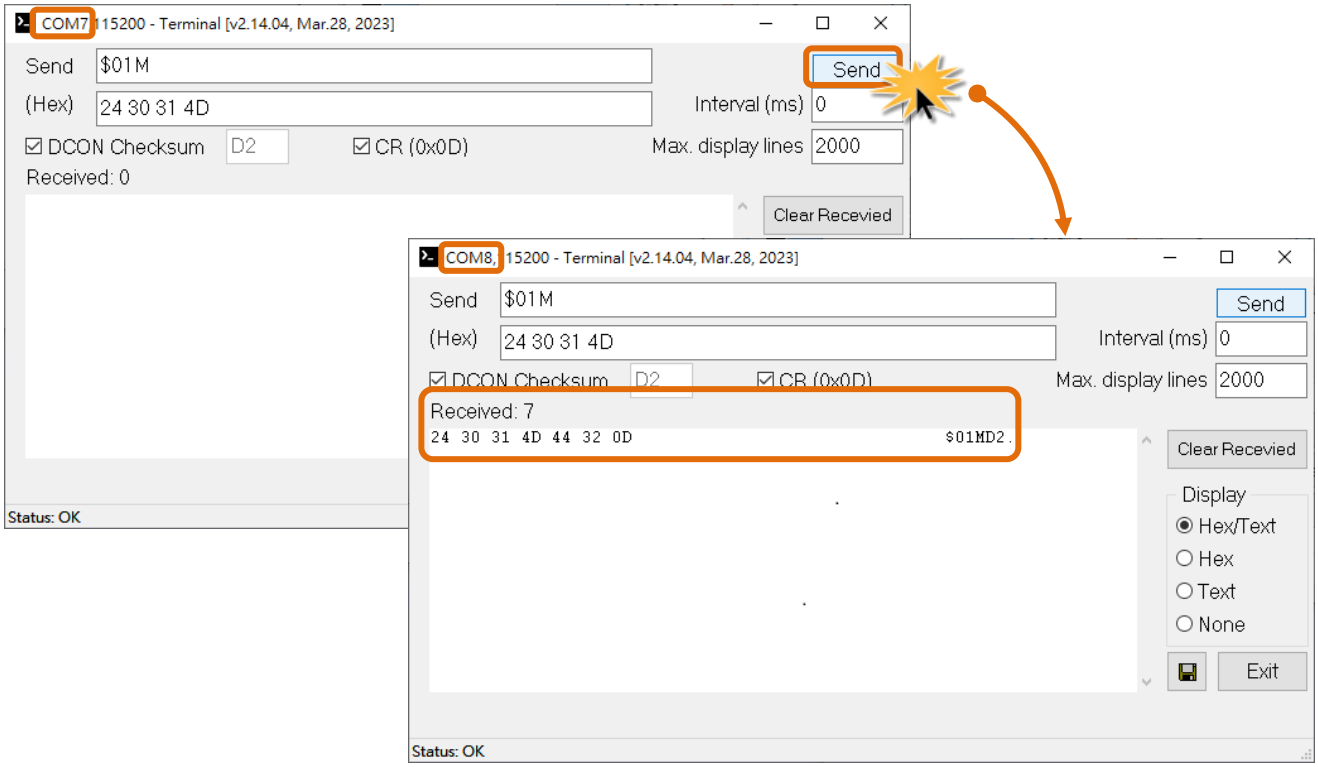


Note

While using RS-485 modules (e.g., tDS-715), open the first two COM Ports and use one (e.g., COM7) to send data to and the other (e.g., COM8) to receive data.



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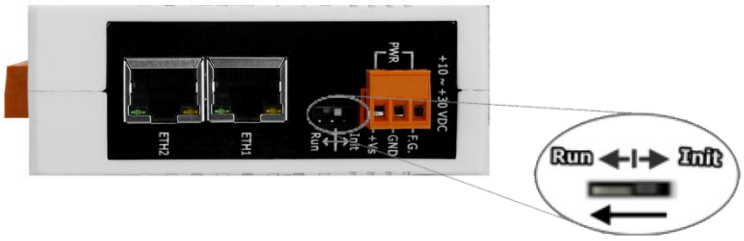
4. Getting Started for DS-2200 series

This chapter provides detailed information about the “Self-Test” process, which is used to confirm that the DS-2200 series module is operating correctly. Before beginning the “Self-Test” process, the wiring test, Ethernet configuration and VxComm Utility driver installation procedures must first be fully completed. Follow the procedure described below:

4.1 Connecting the Power and Host PC

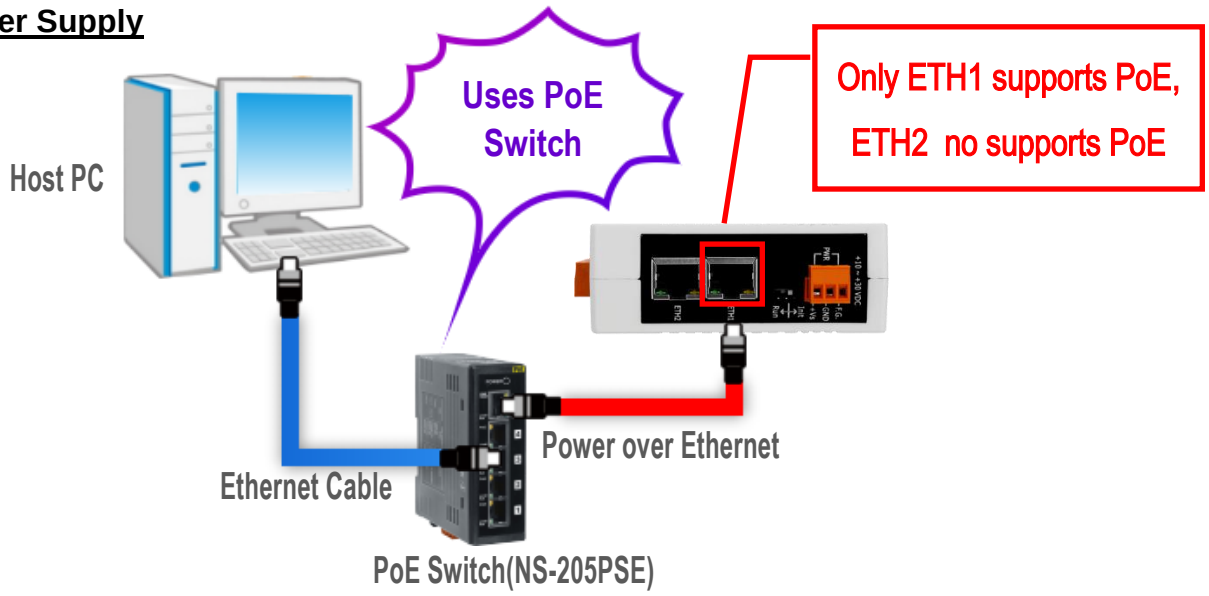
1. Ensure that the network settings on your PC are configured correctly.
Make sure that the Windows Firewall and any Anti-Virus firewalls on your PC are temporarily disabled or properly configured. Otherwise, the VxComm Utility may not be able to correctly detect the tDS-700 module during the search process. (Please consult your system administrator)

2. Check that the **Init/Run switch** is in the “**Run”** position.



3. Connect both the DS-2200 and the Host computer to the same sub-network or the same Ethernet Switch, and then supply power (PoE or +12 to +48 VDC) to the DS-2200.

PoE Power Supply



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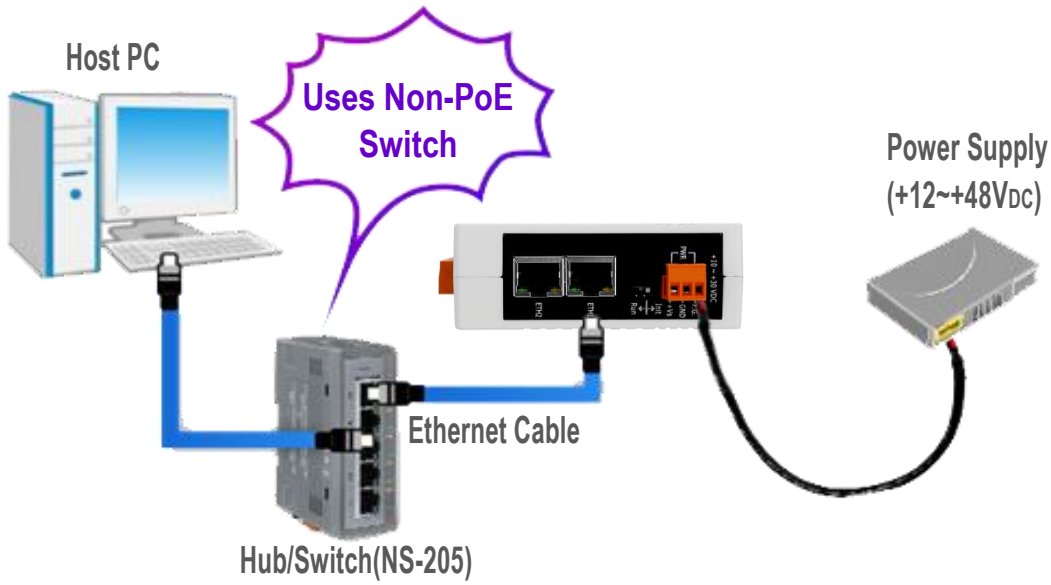
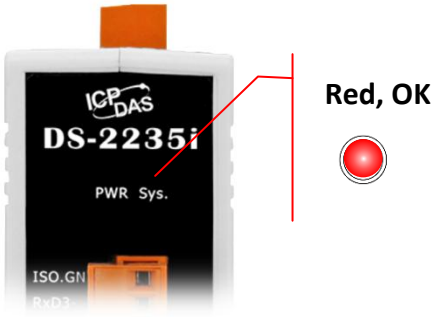
+12 to +48 VDC Jack Power Supply (Non-PoE)

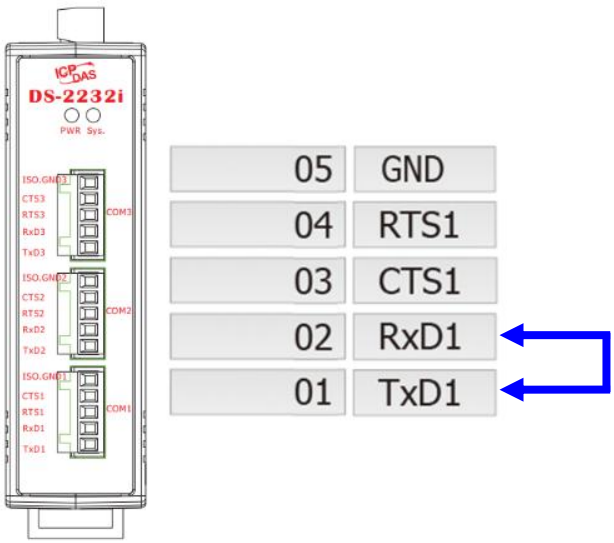


4. Verify that the **System LED** indicatoris flashing.



5. Perform a Self-test wiring check as follows:

- **RS-232 Wiring:**
  Connect the RxD to the TxD.



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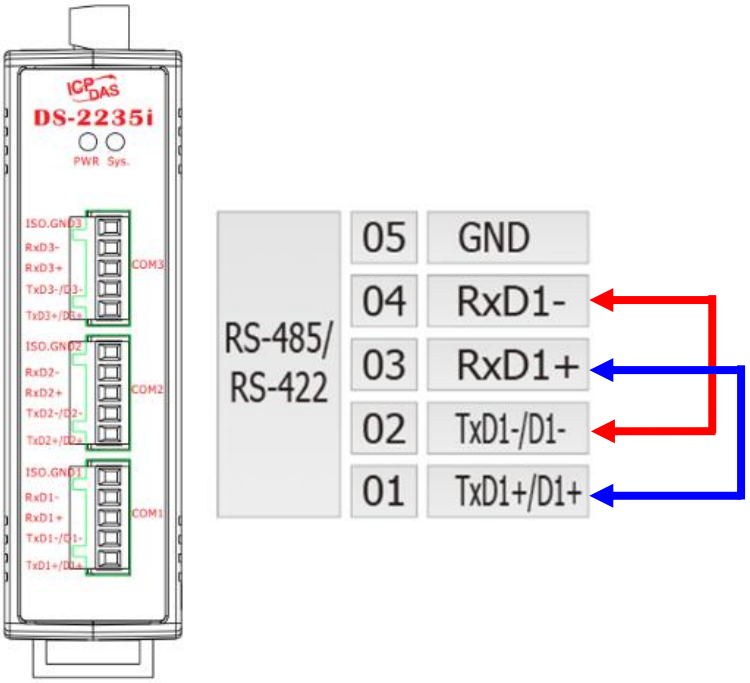
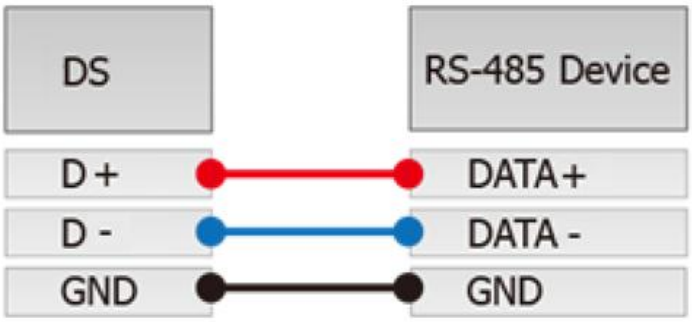
➢ **RS-422 Wiring:**

Connect the RxD1- to the TxD1- and connect the RxD1+ to the TxD1+.



➢ **RS-485 Wiring:**

While using RS-485 modules (e.g., DS-2215i), you should wire the D+ with Data+ signals, and wire the D- with Data- signals for self-test.



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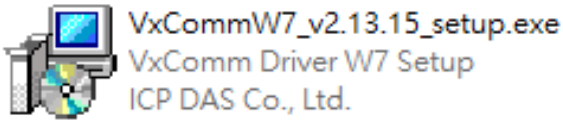
4.2 Install the VxComm Utility

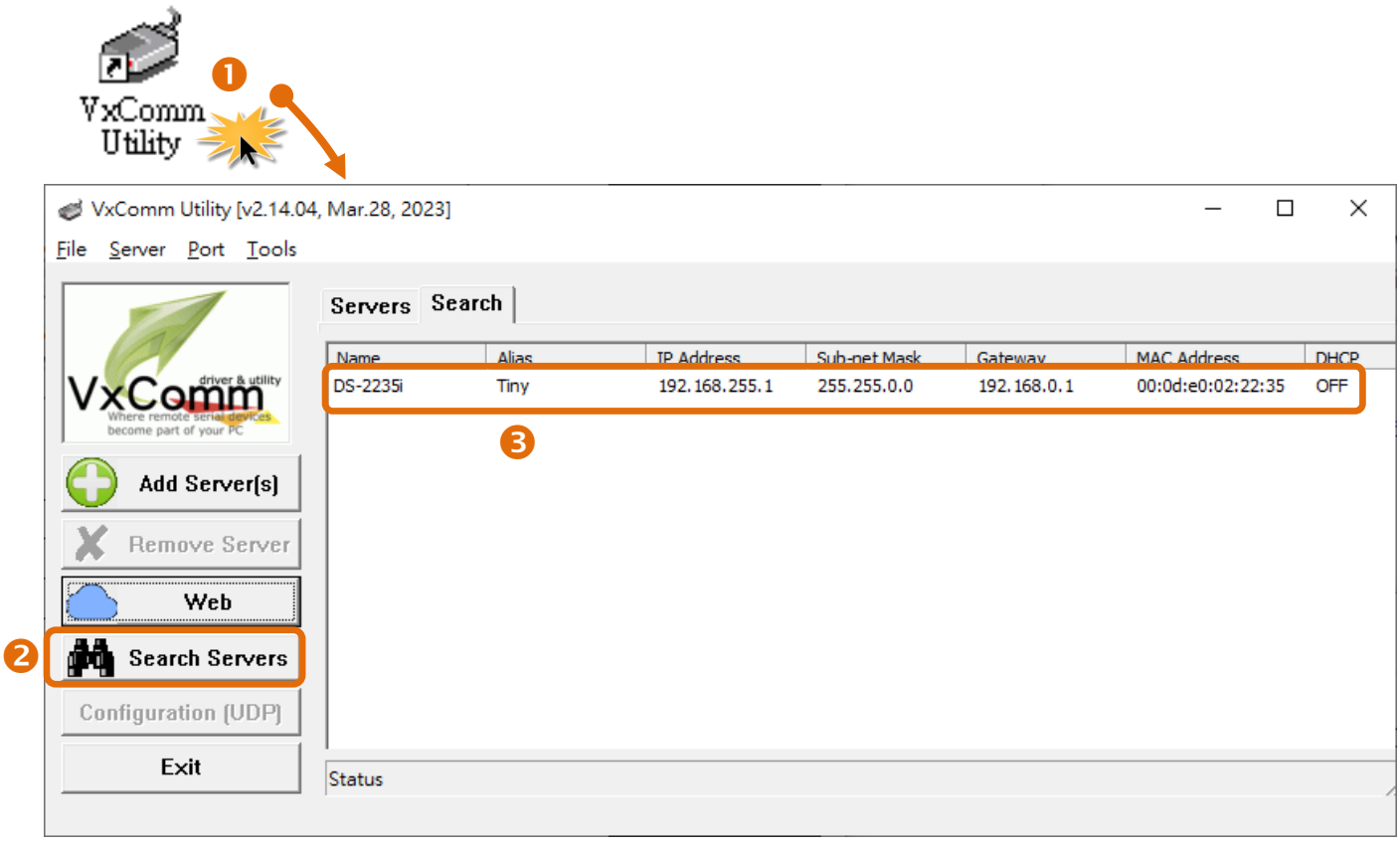
The VxComm Utility can be obtained from the ICP DAS website.
The download link is as follows:



https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=VxComm

4.3 Configuring Network Settings

1. **Double-click the VxComm Utility** shortcut on the desktop.
2. Click the **"Search Servers"** button to search for the DS-2200 module.
3. Once the search process is complete, **double-click the DS-2200 module name** to open the "Configure Server" dialog box.



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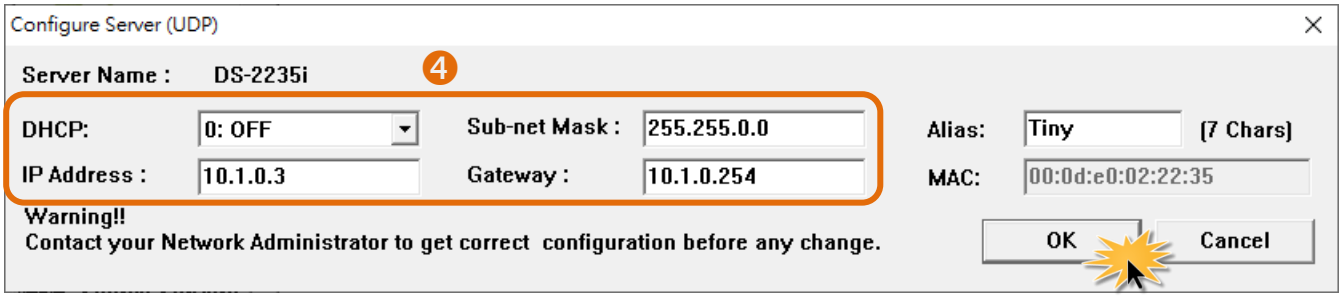
4. Contact your network administrator to obtain the correct network configuration. Enter the settings in the relevant fields, including the **IP, Sub-net Mask and Gateway addresses**, and click the "**OK**" button. The DS-2200 will apply the new settings after 2 seconds.



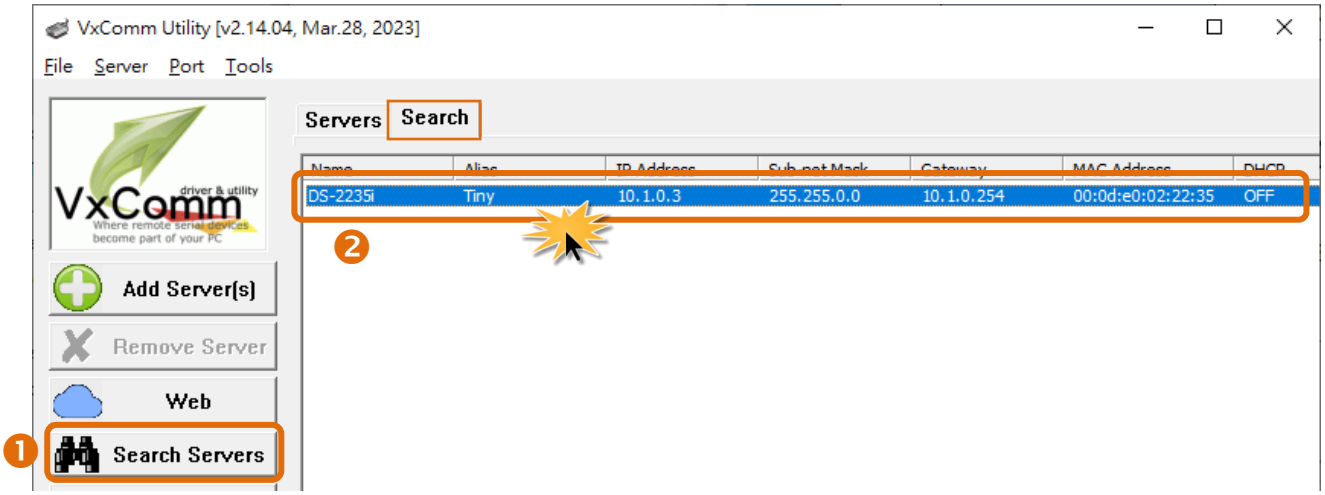
Factory Default Settings of DS-2200 Series Module

IP Address	192.168.255.1
Subnet Mask	255.255.0.0
Gateway	192.168.0.1

4.4 Configuring the Virtual COM Ports

1. Wait 2 seconds and then click the **"Search Servers"** button again to ensure that the DS-2200 is working correctly with the new configuration.

2. Click the DS-2200 module name to select it.



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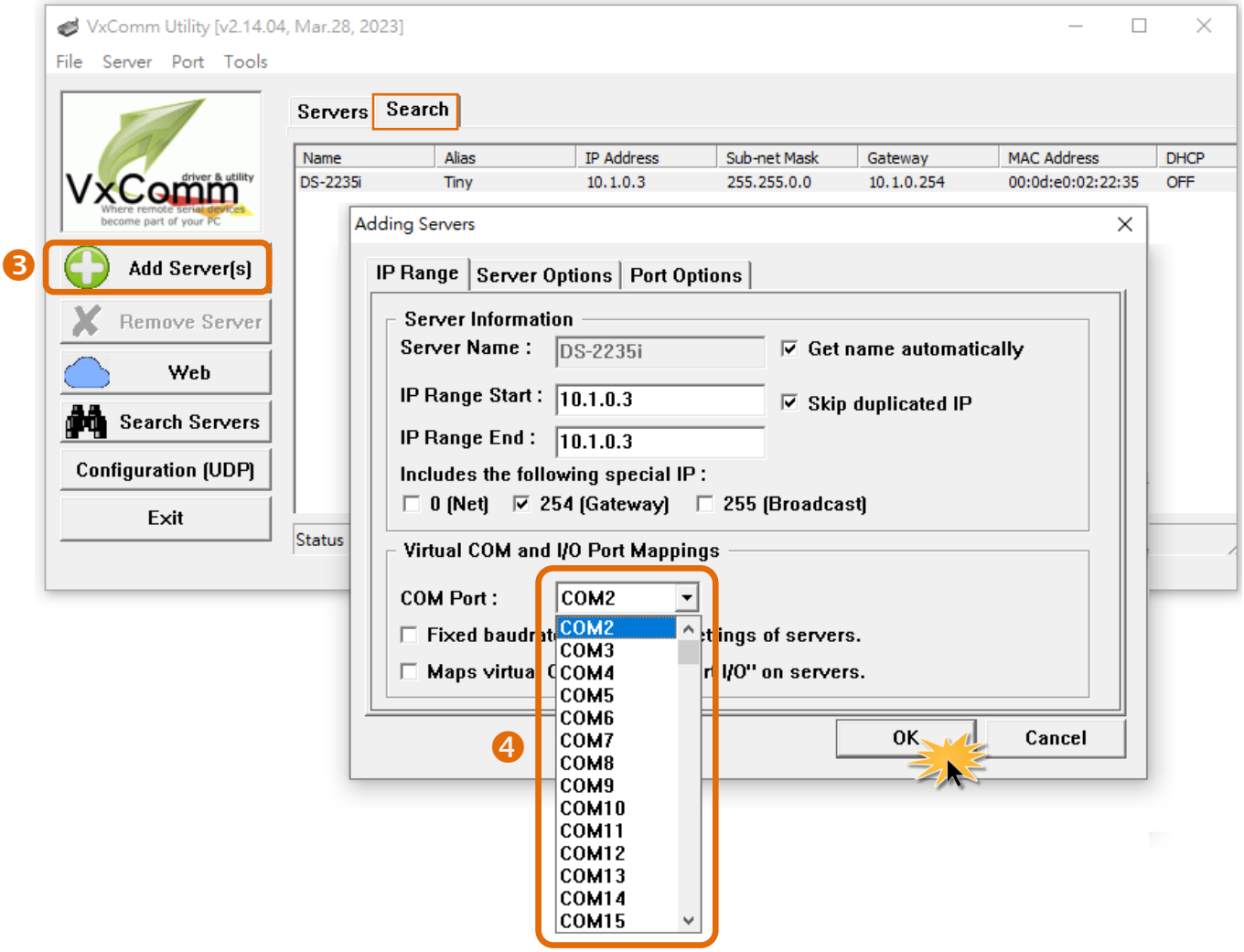
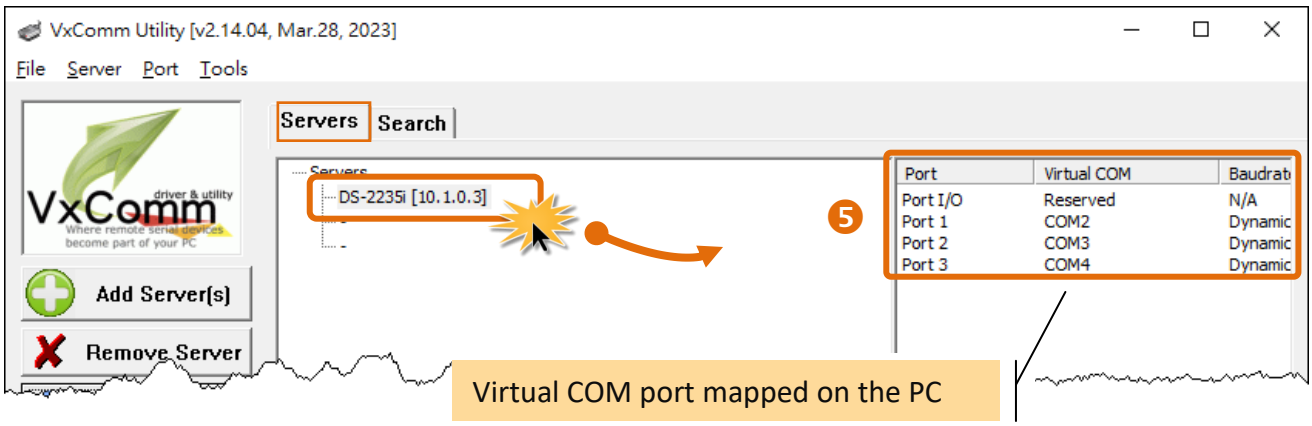
3. Click the **"Add Server[s]"** button.

4. Assign a COM Port number and click **"OK"** to save your settings.



5. Click on the DS-2200 name from the Servers list on the "Servres" page, and **check the virtual COM port** mapped on the PC in the Port field on the right.



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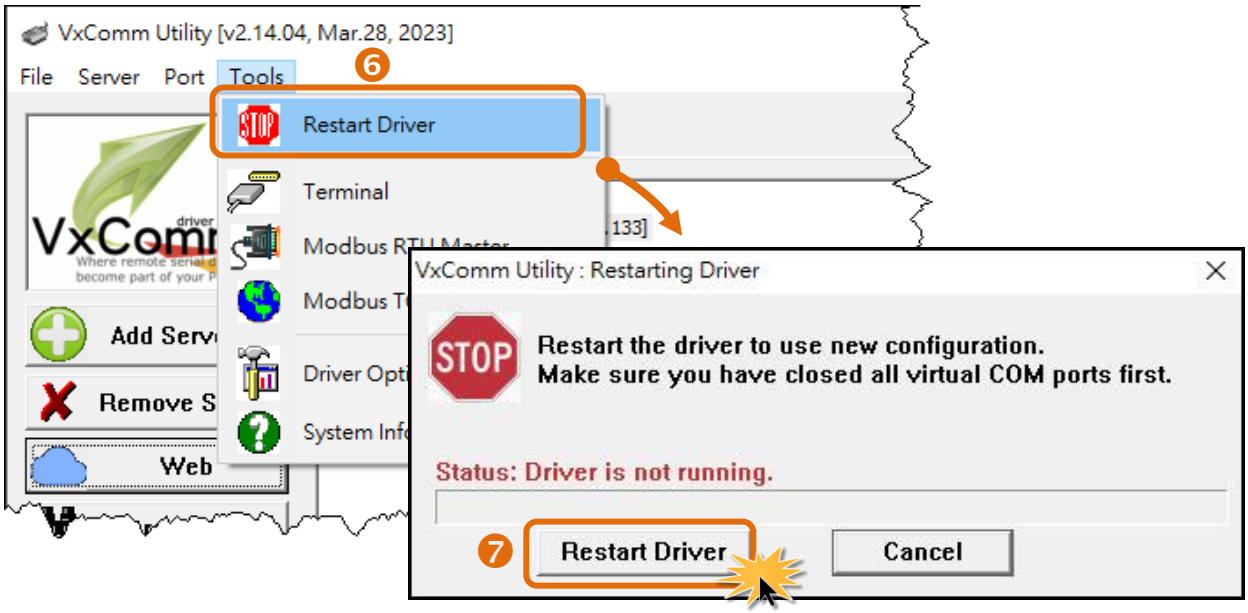
6. Click the **"Restart Driver"** item in the **"Tools"** menu.

7. Click the **"Restart Driver"** button on the "VxComm Utility: Restarting Driver" dialog box.

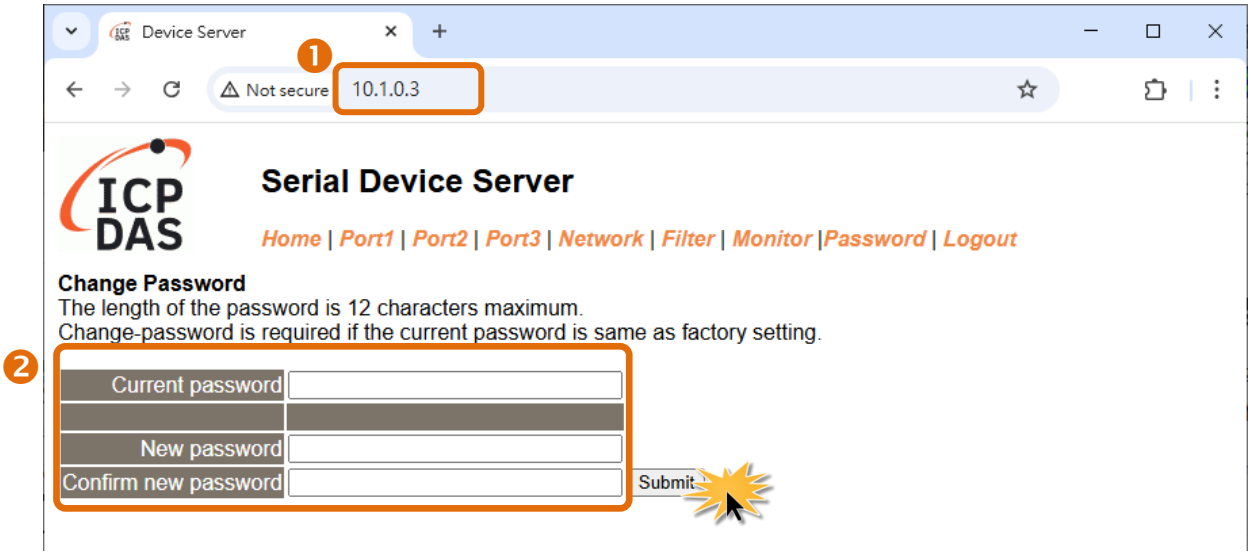


4.5 Configuring the Serial Port

1. Enter the DS-2200 module's IP address into your web browser address line and press **Enter**, or click the **"Web"** button in the VxComm Utility.

2. It is required to change password when logging into the DS-2200 web interface for the first time:

- Enter the default password **admin** in the Current password field,
- Enter your password in the **New password** field and the **Confirm new password** field,
- Click the "**Submit**" button to complete the setting.



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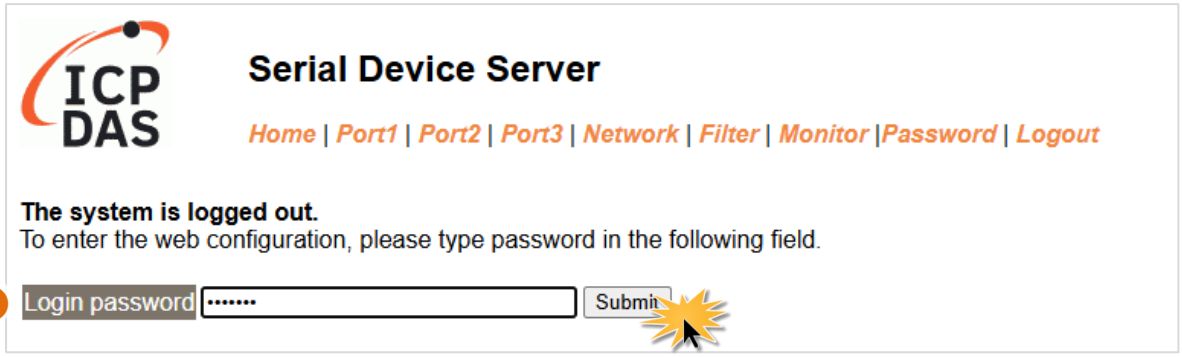
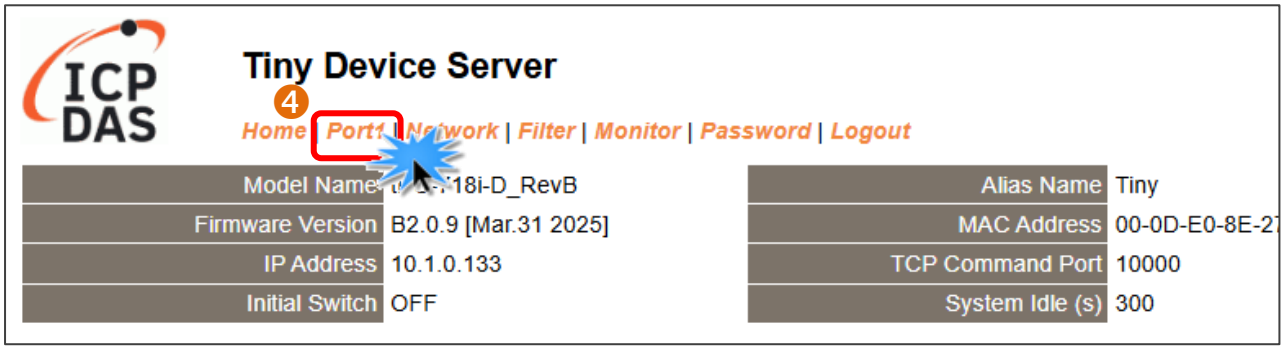
3. Enter the new password in the Login password field and click "**Submit**".

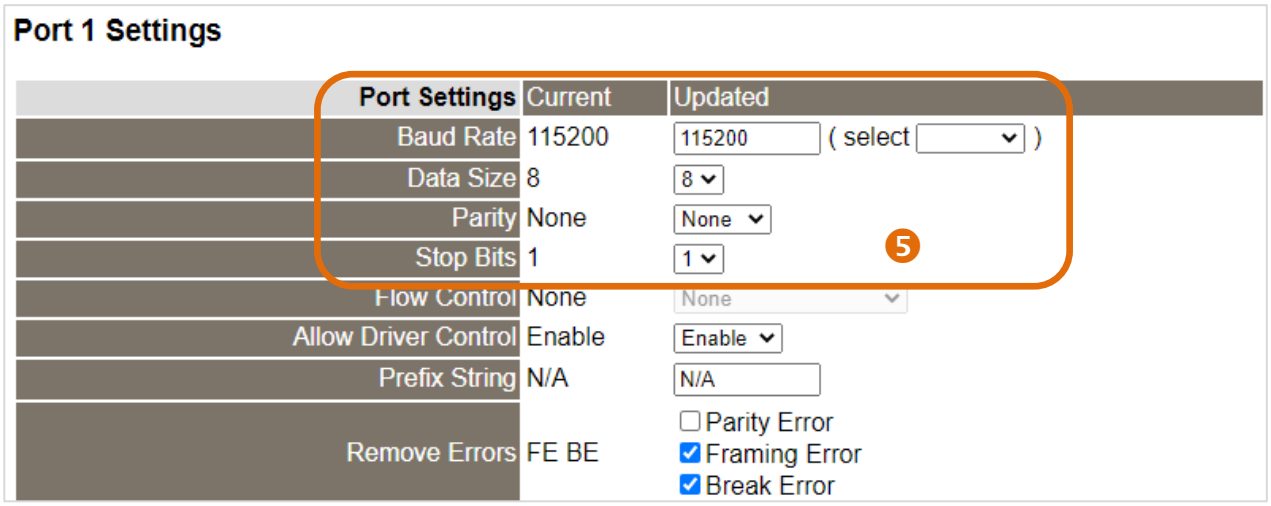


4. Click the **"Port1"** tab in the navigation bar.



5. Select the appropriate Baud Rate and Data Format (e.g., 115200 and 8N1) from the relevant drop down menus. **Note:** These settings should be configured according to your device's requirements.

6. Click **"Submit"** at the bottom of the page to save your settings.



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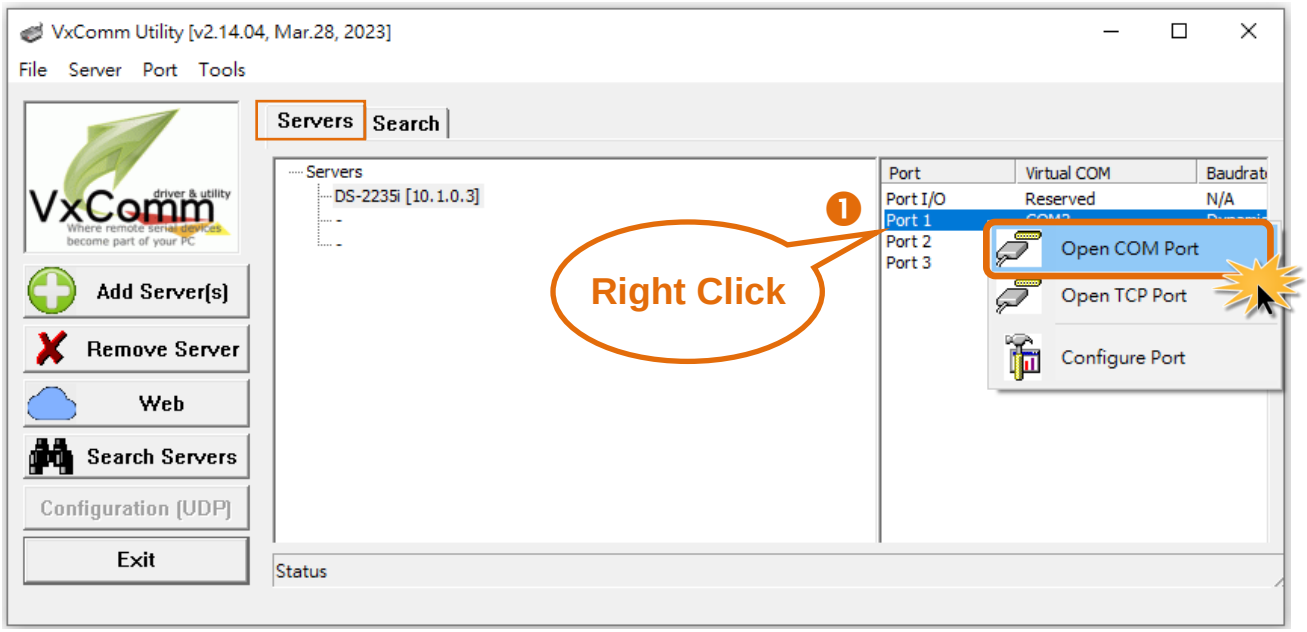
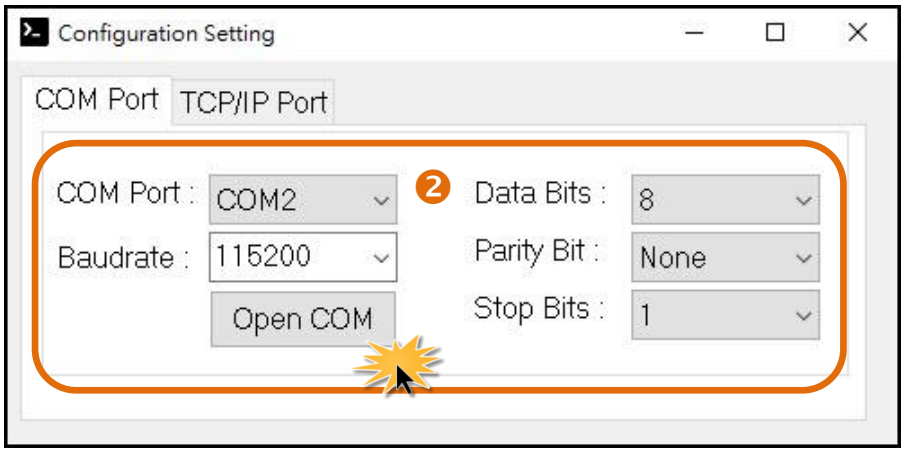
4.6 Testing Your DS-2200

1. Back to VxComm Utility, **Right click Port 1** and then choose the "**Open COM Port**" item.



2. Check that the configuration of the COM Port is correct and then click the "**Open COM**" button.



3. Type a string (e.g., $01M) in the **"send"** field

4. Click the **"Hex/Text"** option in the "**Display**" section.

5. Click the "**Send**" button to send the message.

6. If a response is received, it will be displayed in the received field.

If the test is successful, then your COM port program should now be able to work with this Virtual COM Port.

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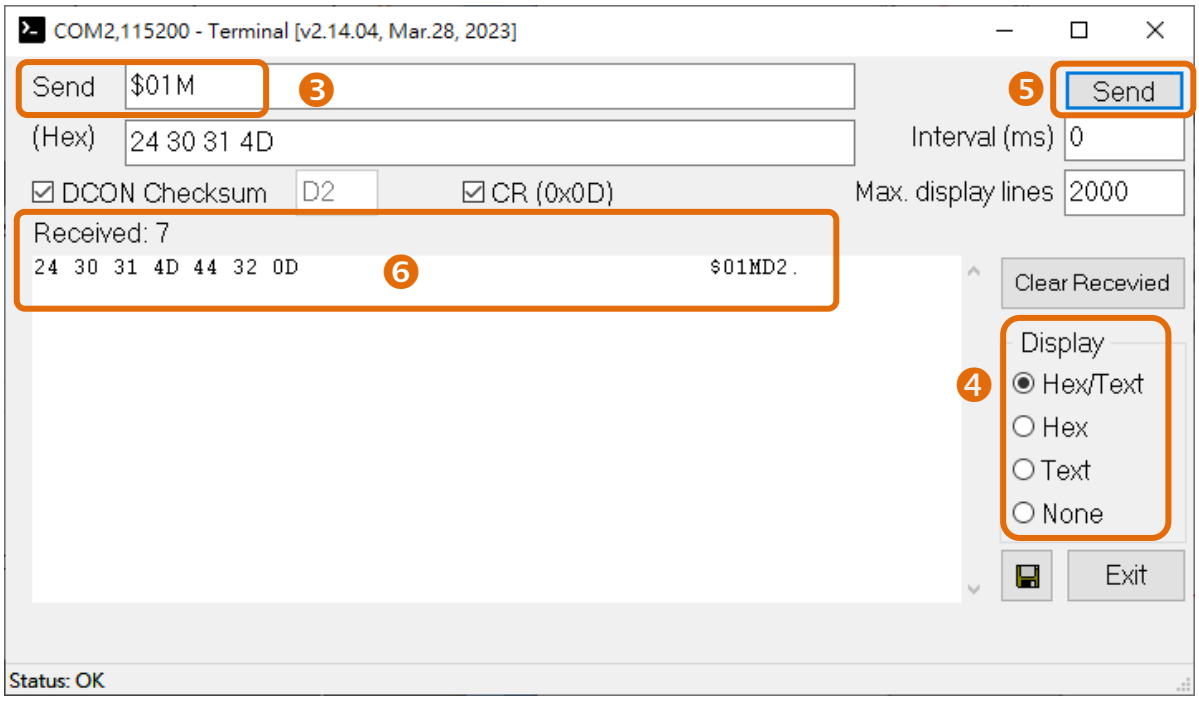
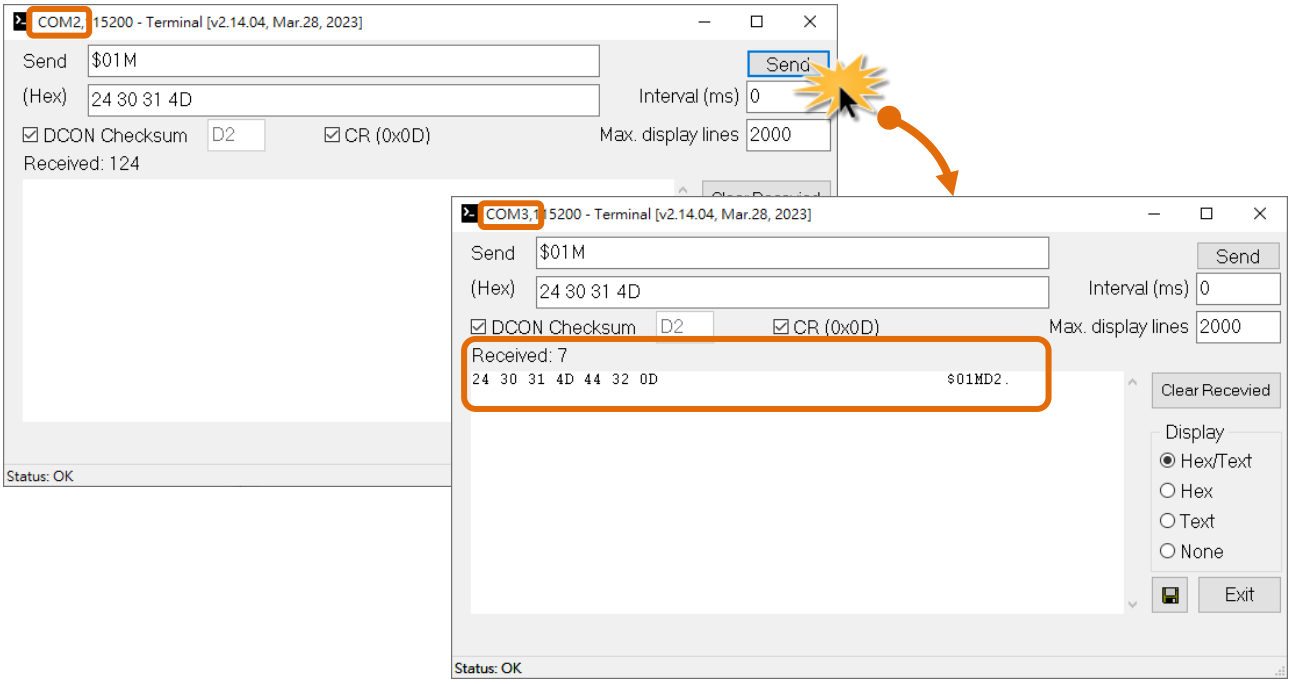


Note

While using RS-485 modules (e.g., DS-2215i), open the first two COM Ports and use one (e.g., COM2) to send data to and the other (e.g., COM3) to receive data.



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5. Web Configuration

Once the Ethernet settings for the tDS-700/DS-2200 module have been correctly configured and the module is functioning properly, you can proceed with further configuration using the VxComm Utility or a standard web browser.

5.1 Logging in to the tDS-700/DS-2200 Web Server

The embedded tDS-700/DS-2200 series web server can be accessed from any computer that has an Internet connection.

Step 1: Open a Web Browser

Open your web browser, such as Microsoft Edge, Mozilla Firefox, Apple Safari, or Google Chrome, to configure and check the settings of the tDS-700/DS-2200 module.

Step 2: Enter the IP of the tDS-700/DS-2200 into the Address Bar

Ensure that the tDS-700/DS-2200 series module has been configured with the correct network settings. (If not, refer to Chapter 3 “Getting Started for tDS-700 series”, Chapter 4 “Getting Started for DS-2200 series” for setup instructions), and then enter the IP address for the tDS-700/DS-2200 series module in the address bar and press “**Enter**”.

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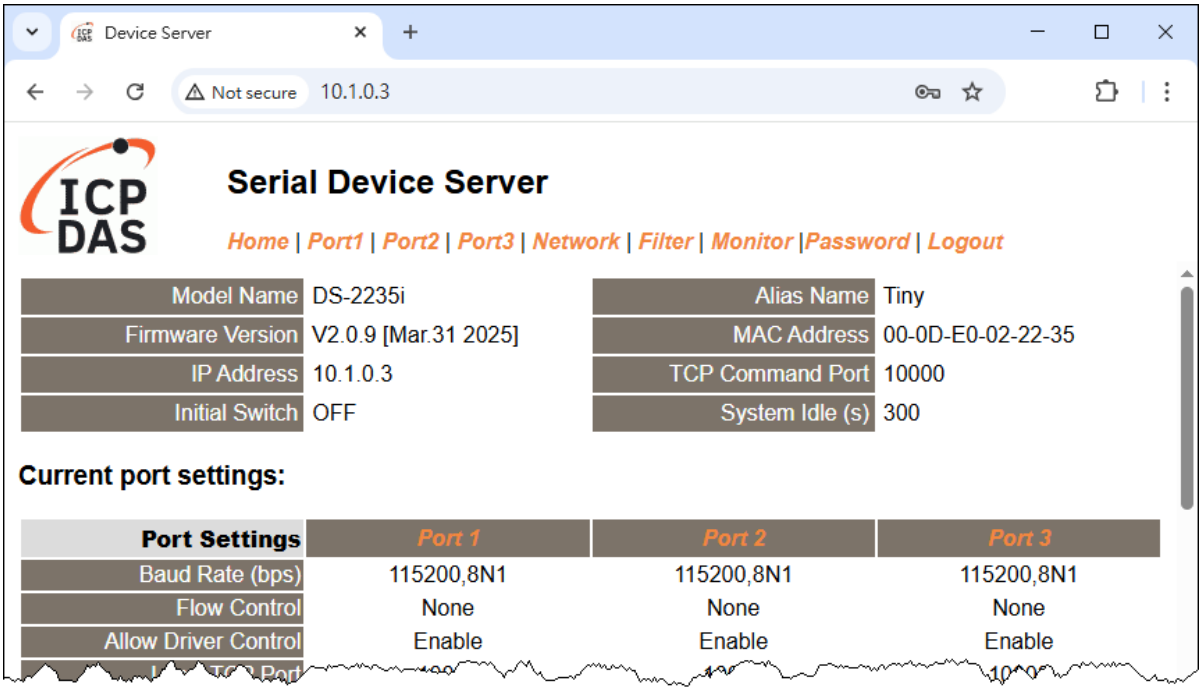
Step 3: Enter the Password

For the first login, you will be prompted to change the default password. Please refer to Section 3.5 "Configuring the Serial Port".
Once connected to the module's web page, enter the password in the "Login password" field, then click the "**Submit**" button to access the tDS-700/DS-2200 web server.
To change the password, please refer to Section 5.7 "Password Configuration Page".

Step 4: Access to the tDS-700/DS-2200 Web Server

After successfully logging into the tDS-700/DS-2200 web server, the main page will display various information. Detailed explanations begin in Section 5.2.



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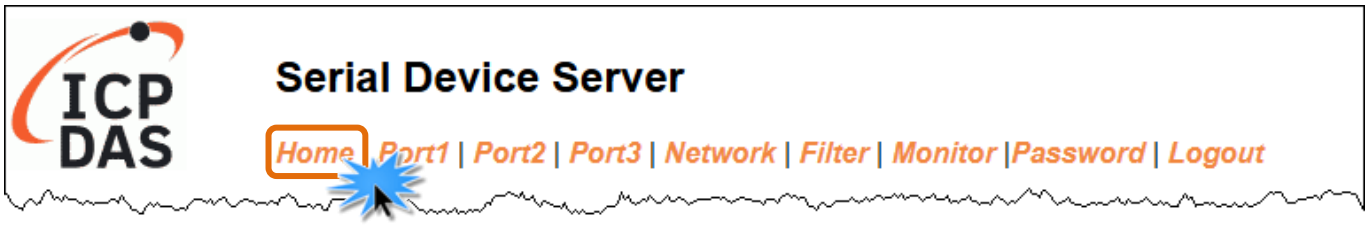
5.2 Home Page

The **Home** link connects to the main page, which contains two parts.



The first part provides basic information about the module. It includes information related to the model name, the current firmware version, the IP address, the current position of the Initial Switch, the alias, the MAC address, and the TCP port, and the system timeout values.

After updating the firmware, you can check the version information here.

Model Name	DS-2235i	Alias Name	Tiny
Firmware Version	V2.0.9 [Mar.31 2025]	MAC Address	00-0D-E0-02-22-35
IP Address	10.1.0.3	TCP Command Port	10000
Initial Switch	OFF	System Idle (s)	300

The lower section provides information related to the COM port and pair-connection settings.

Current port settings:

Port Settings	*Port 1*	*Port 2*	*Port 3*
Baud Rate (bps)	115200,8N1	115200,8N1	115200,8N1
Flow Control	None	None	None
Allow Driver Control	Enable	Enable	Enable
Local TCP Port	10001	10002	10003
Connetion Idle (Seconds)	180	180	180
Prefix String	N/A	N/A	N/A
Serial Data Packing	Port 1	Port 2	Port 3
Slave Timeout (ms)	1000	1000	1000
Packing Length (bytes)	0	0	0
Serial Ending Chars: (Number[,char1][,char2])	0	0	0
Timeout Between Chars (ms)	10	10	10
Pair-Connection Settings (Client/Server Mode)	Port 1	Port 2	Port 3
Application Mode	Server	Server	Server
Remote Server IP	Disable	Disable	Disable
Remote TCP Port	Disable	Disable	Disable

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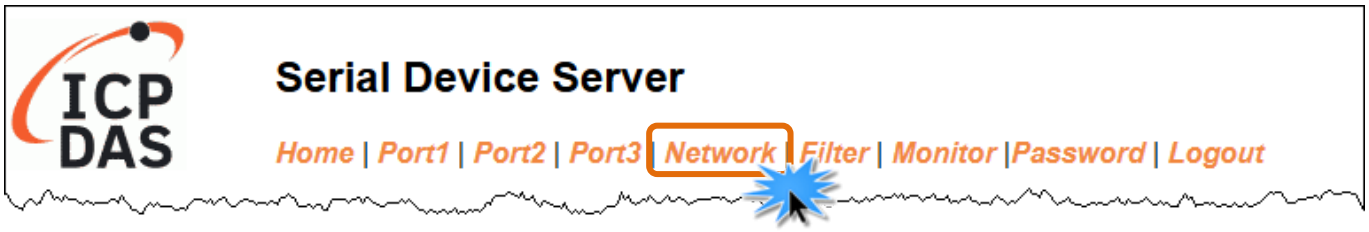
5.3 Network Setting

Click "**Network**" to open the network settings page, where you can modify the IP and other communication parameters, update the firmware, restore the factory defaults, and restart the module remotely.



5.3.1 IP Address Settings

The **Address Type**, **Static IP Address**, **Subnet Mask**, and **Default Gateway** settings must match the network configuration that the module is being connected to. Otherwise, the tDS-700/DS-2200 module will not function properly. Modifying these settings while the module is in operation may cause the application's connection to the virtual COM port to be interrupted, resulting in errors.

IP Address Settings

IP Address	
Address Type	Static IP
Static IP Address	10 . 1 . 0 . 3
Subnet Mask	255 . 255 . 0 . 0
Default Gateway	10 . 1 . 0 . 254
MAC Address	00-0D-E0-02-22-35 (Format: FF-FF-FF-FF-FF-FF)
Virtual COM	
TCP Command Port	10000 (Default: 10000)
Command Port Timeout (Socket Watchdog)	180 (1 ~ 65535 seconds, 30=default, 0=disable)
Update Settings	

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The following is an overview of the parameters contained in the **IP Address Settings** section:

Item	Description
IP Address	
Address Type	**Static IP:** If no DHCP server is available on the network, the network settings can be configured manually. Refer to "Manual Configuration" section for more details.
	DHCP: The Dynamic Host Configuration Protocol (DHCP) is a network application protocol that automatically assigns an IP address to each device. Refer to "Dynamic Configuration" section for further information.
Static IP Address	Each tDS-700/DS-2200 module must have a unique IP address on the network. This setting specifies that unique address.
Subnet Mask	Defines the subnet mask for the module. It determines which portion of the IP address is used to identify the local network or subnet.
Default Gateway	This parameter is used to assign the IP Address of the Gateway to be used by the tDS-700/DS-2200. A Gateway (or router) is a device that is used to connect an individual network to one or more additional networks.
MAC Address	Allows the user to assign a custom MAC address, which must follow the format: FF-FF-FF-FF-FF-FF.
Virtual COM	
TCP Command Port	Sets a custom TCP command port number based on your application requirements. Once configured, the serial port's TCP port changes as follows: COM1= TCP Command Port + 1 COM2= TCP Command Port + 2 By default, the TCP Command Port is 10000. Therefore, COM1 and COM2 will default to 10001 and 10002, respectively.
Command Port Timeout (Socket Watchdog)	If no data is received on the command port within the time interval set by this parameter, the module will automatically close the socket. Valid range: 1 ~ 65535 (seconds); Default: 30 (seconds); Disabled: 0;
Update Settings	Click this button to to save and apply the modified settings to the module.

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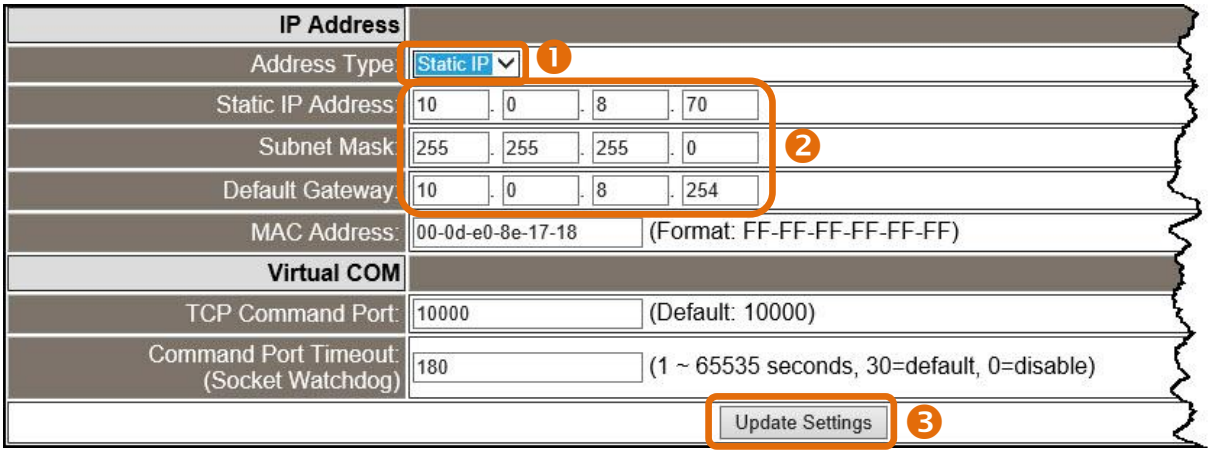
Manual Configuration

Before manually configuring the IP address, consult your network administrator to obtain valid network settings.

Step 1: Select **"Static IP"** from the **"Address Type"** drop-down menu.

Step 2: Enter the the correct and appropriate network settings in the "**network settings"** fields**.**

Step 3: Click the **"Update Settings"** button to complete the configuration.

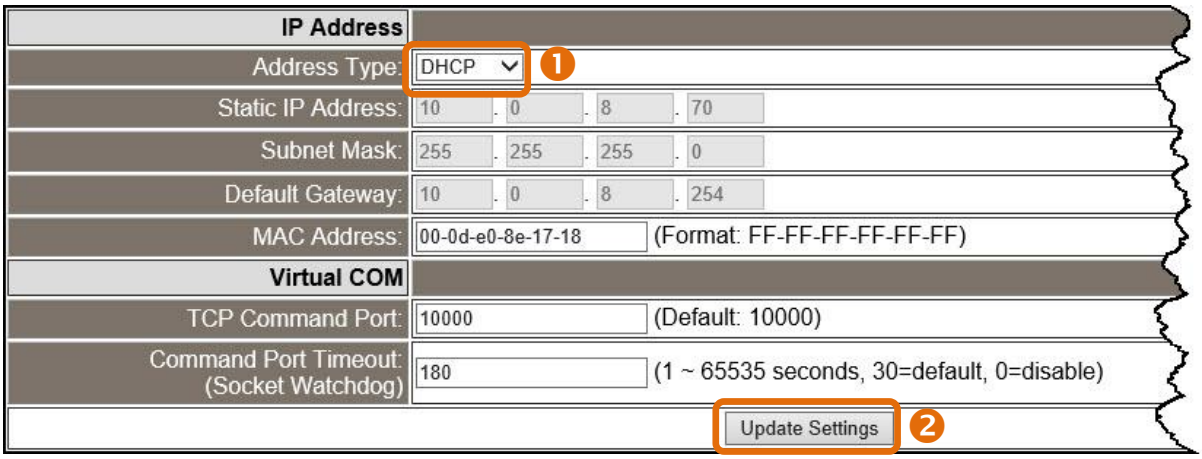


Dynamic Configuration

Dynamic configuration is very easy to perform. If your network has a DHCP server, you can enable DHCP to allow the server to automatically assign an IP address.

Step 1: Select **"DHCP"** from the **"Address Type"** drop-down menu.

Step 2: Click the **"Update Settings"** button to complete the configuration.



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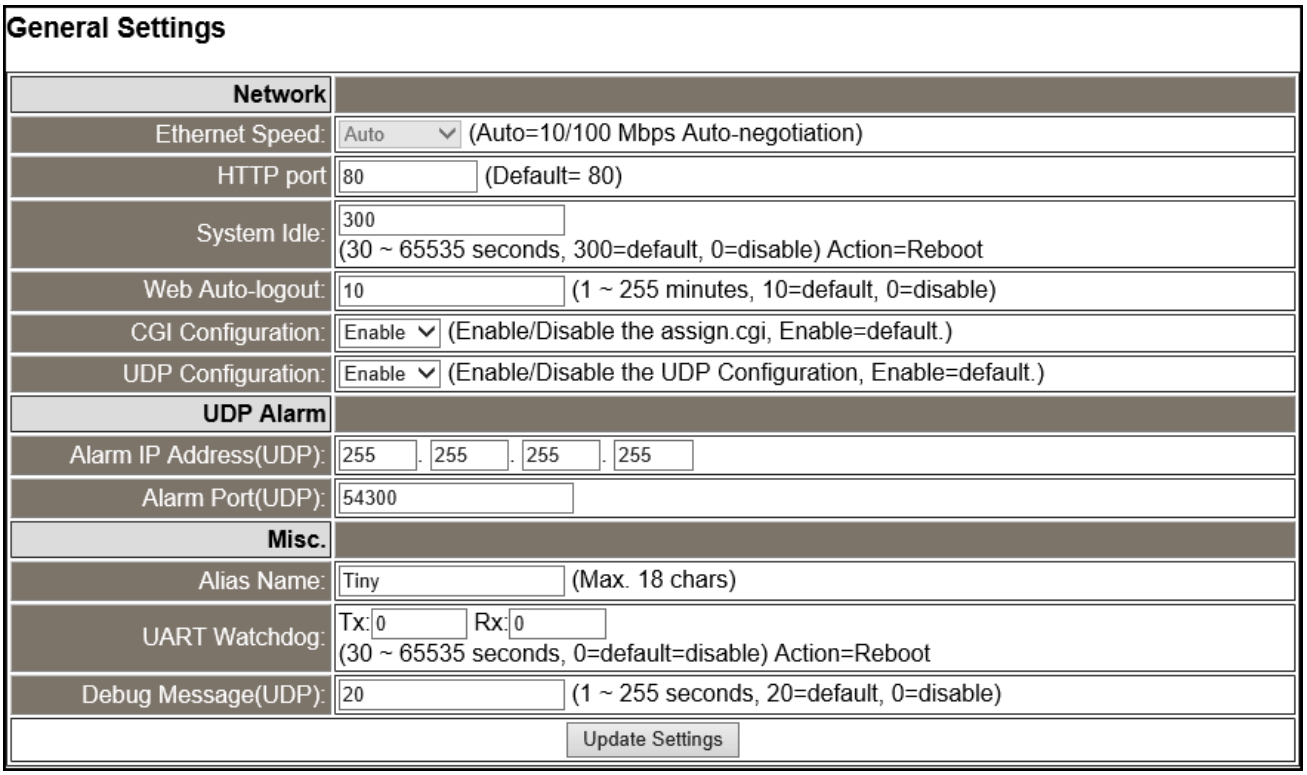
5.3.2 General Settings

You can view and modify the settings for HTTP port, Auto-logout time, CGI Configuration, Alias Name, UART Watchdog and UDP Alarm.



The following is an overview of the parameters contained in the **General Settings** section:

Item	Description	Default
Network		
Ethernet Speed	Displays the current Ethernet speed setting. (Auto: 10/100 Mbps auto-negotiation).	Auto
HTTP Port	Assigns the HTTP port number. After changing the HTTP port, you need to restart the module. If the HTTP port is not 80, the HTTP port need be added following the module's IP address in the format: "IP address:HTTP port" to connect to the web server correctly. (e.g. 10.0.8.123:81, when HTTP port is set to 81)	80

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Item	Description	Default
System Idle (Network Watchdog)	Sets the system timeout duration. If the module encounters abnormal operation and no communication occurs within the specified time period, the module will automatically reboot. Range: 30 to 65535 (seconds); Disable = 0.	300
Web Auto-logout	Sets the automatic logout time. If no activity occurs on the web interface within the configured time, the user will automatically be logged out. Range: 1 to 65535 (minutes); Disable = 0.	10
CGI Configuration	Enables or disables CGI commands for configuring the tDS-700/DS-2200 module. For detailed CGI command usage, refer to Chapter 7 "CGI Configuration" Enable/Disable the assign.cgi.	Enable
UDP Configuration	Enables or disables the UDP configuration feature.	Enable
UDP Alarm		
Alarm IP Address (UDP)	When an alarm event occurs, the tDS-700/DS-2200 can send a UDP packet containing the alarm message to a specified IP address and port. Alarm IP Address (UDP): Destination IP address for UDP alarm messages. Alarm Port (UDP):Destination port for UDP alarm messages.	
Alarm Port (UDP)		
Misc.		
Alias Name	Sets a user-defined alias for the module, up to 18 characters. Assigning unique alias names to each module helps distinguish them on the network.	Tiny
UART Watchdog	Sets the UART Watchdog timeout duration. If no communication occurs or an error happens within the specified time, the module will automatically restart. Range: 30 ~ 65535 (seconds); Disable = 0.	0
Debug Message(UDP)	Sets the interval for sending debug message broadcast packets. The tDS-700/DS-2200 will broadcast debug messages at the configured interval. Range: 1–255 (seconds); Disable = 0	20
Update Settings	Click this button to save the revised settings to the tDS-700/DS-2200.	

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5.3.3 Other Operations

In the Other Operations section, it provides functions for restoring factory defaults, restarting the module, and updating firmware over the network.

Other Operations

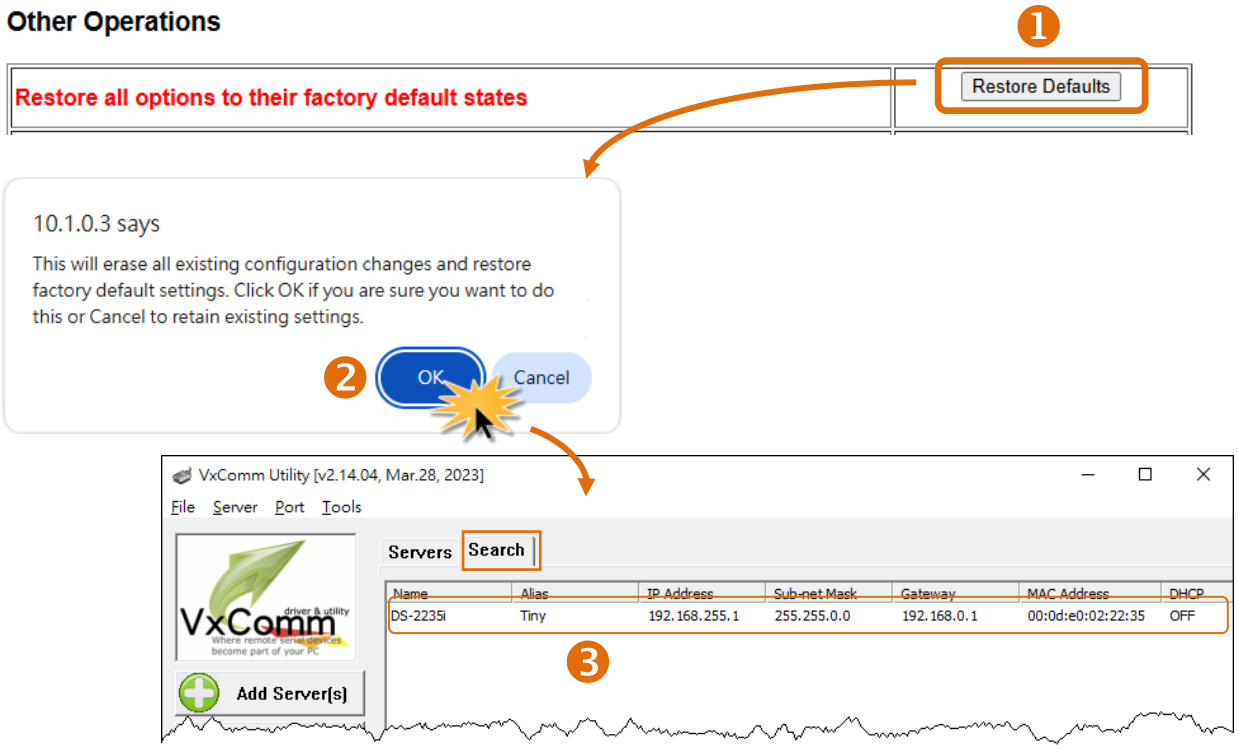
Restore all options to their factory default states	Restore Defaults
Reboot the module	Reboot
Firmware update via Ethernet If the remote firmware update is failed, then on-site firmware update is required to make the module working again. Step 1: Refer to firmware update manual first. Step 2: Run eSearch Utility to prepare and wait for update. Step 3: Click the [**Update**] button to **reboot** the module and start update. Step 4: Configure the module again.	Update

Restore all options to their factory default states

Step 1: Click the **"Restore Defaults"** button to reset the configuration.

Step 2: Click the **"OK"** button in the message dialog box.

Step 3: Check whether the module has been restored to factory defaults by using the VxComm Utility. Refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" for more details.



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The following is an overview of the factory default settings:

Factory Default Settings			
Network Settings		**Basic Settings**	
IP Address	192.168.255.1	Alias	Tiny
Gateway Address	192.168.0.1		
Subnet Mask	255.255.0.0		
DHCP	Disabled		

Reboot the module

Clicking the reboot button on the right side of the "**Reboot the module**" field can remotely reboot the module. After the tDS-700/DS-2200 module restarts, you will need to refresh the web page and re-enter your password to log in again.

Other Operations

Restore all options to their factory default states	Restore Defaults
Reboot the module	Reboot

Firmware update via Ethernet

When updating the firmware of the tDS-700/DS-2200 module, it typically requires manually switching the Init/Run mode switch and restarting the module. However, if the module is installed in a location that is difficult to detach, and the host is in the same sub-network of the module, you can click the Update button in the "**Firmware update via Ethernet**" field to initialize the module to Init mode, without any manual intervention.

Other Operations

Restore all options to their factory default states	Restore Defaults
Reboot the module	Reboot
Firmware update via Ethernet If the remote firmware update is failed, then on-site firmware update is required to make the module working again. Step 1: Refer to firmware update manual first. Step 2: Run eSearch Utility to prepare and wait for update. Step 3: Click the [**Update**] button to **reboot** the module and start update. Step 4: Configure the module again.	Update

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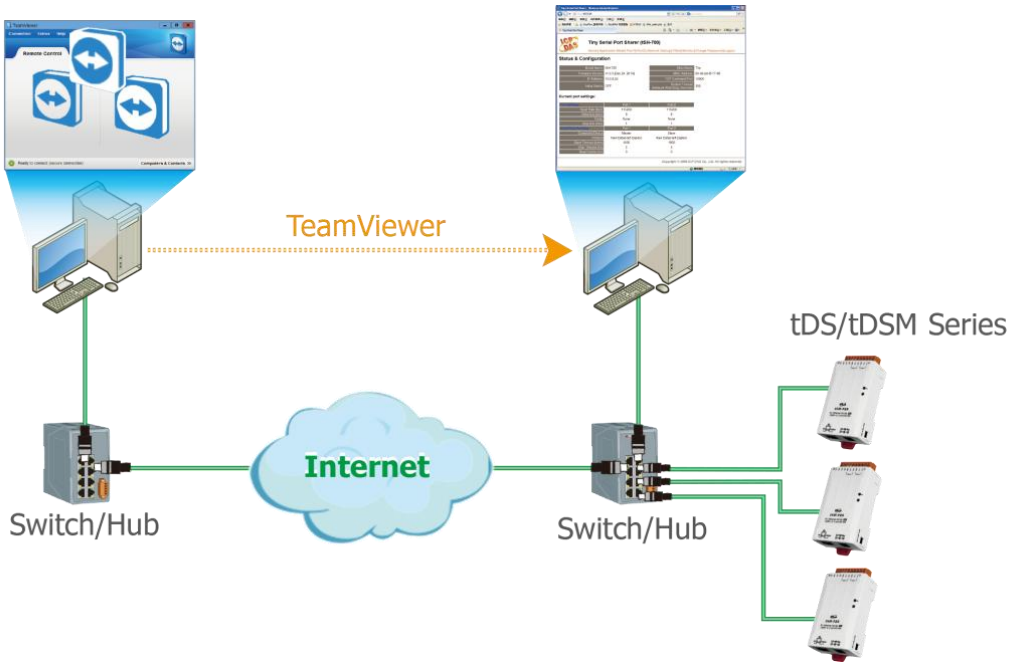
If the tDS-700/DS-2200 module is not on the same subnet of your computer, you can use remote control software (e.g., TeamViewer) to access a computer that is on the same subnet of the module, and perform the firmware update from that remote PC.



Note:

If the remote firmware update fails, the module may become non-operational. In such cases, you must physically remove the module, manually switch the Init/Run mode to Init, and restart the module. Then perform the firmware update again to restore normal operation.

For detailed instructions on updating the firmware of the tDS-700/DS-2200 module, please refer to the Firmware Update Manual:

tDS-700 :
https://www.icpdas.com/en/download/show.php?num=2420

DS-2200 :
https://www.icpdas.com/en/download/show.php?num=2790

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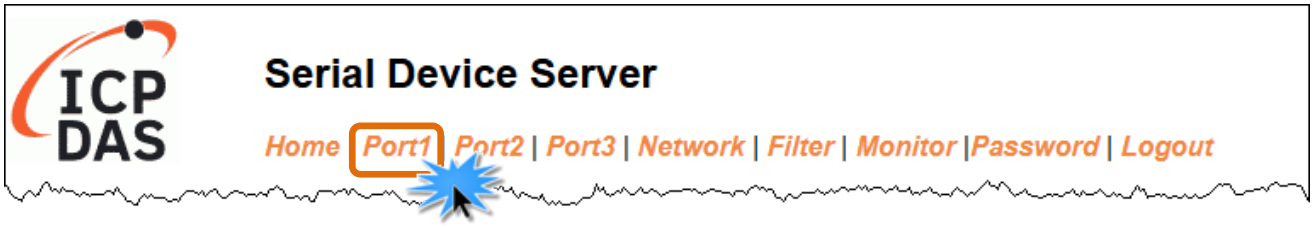
5.4 Serial Port Settings

Depending on the number of COM ports on the tDS-700/DS-2200 module, the navigation bar will display the name of each COM port. Click the COM port number to enter the individual function setting page. The following uses COM 1 as an example to introduce the setting page.



5.4.1 Port1 Settings

The **Port 1 Settings** section provides functions allowing items such as port settings, serial data packing and pair-connection settings to be configured.

Port 1 Settings

Interface Settings	Current	Updated	Comment
Interface	RS-232	RS-232	Internal loopback is for test only.
Pull-High/Low Resister	Disable	Disable	Supports RS-485 or RS-422 only.
Terminal Resister	Disable	Disable	Supports RS-485 or RS-422 only.
Port Settings	Current	Updated	Comment
Baud Rate	115200	115200 (select)	bps (bits/second)
Data Size	8	8	bits/character
Parity	None	None	
Stop Bits	1	1	bits
Flow Control	None	None	
Allow Driver Control	Enable	Enable	
Prefix String	N/A	N/A	Max. 7 chars added to TCP output.
Remove Errors	FE BE	☐ Parity Error ☑ Framing Error ☑ Break Error	Clear RX FIFO data when serial errors.
Remove Data		☐ Remove RX	Clear RX data when TCP disconnected.
Serial Data Packing	Current	Updated	Comment
Slave Timeout	1000	1000	ms, After last TX
Packing Length	0	0	0 ~ 1024 bytes, 0=default=disable
Serial Ending Chars (Number[,char1][,char2])	0	0	e.g.: 2,0x0D,0x0A
Timeout Between Chars	10	10	ms, After last RX 10 ~ 65000, 10=default, 0=disable
TCP/IP	Current	Updated	Comment
Local TCP Port	10001		=TCP Command Port +1
Operation Mode	0	0	0=Data-sharing, 1=Non-sharing
Connetion Idle	180	180	1 ~ 65000 seconds, 180=default, 0=disable
Pair-Connection Settings (Client/Server Mode)	Current	Updated	Comment
Application Mode	Server	Server	Server=Slave, Client=Master
		Submit	

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The following is an overview of the parameters contained in the **Port1 Settings** section:

Item	Description	Default
Interface Settings		
Interface	Sets the interface mode (Loopback, RS-232, RS-422 or RS-485) of serial port **for the tDS-718i-D only**. **Loopback:** the internal loopback is used to self-testing.	RS-232
Pull-High/Low Resister	Enables or disables pull-high/low resister **for RS-485 or RS-422 of the tDS-718i-D only (1K Ohm)**.	Disable
Terminal Resister	Enables or disables terminal resister **for RS-485 or RS-422 of the tDS-718i-D only (120 Ohm)**.	Disable
Port Settings		
Baud Rate (bps)	Sets the Baud Rate of the COM port.	115200
Data Size (bits)	Sets the Data Size of the COM port.	8
Parity	Sets the Parity of the COM port.	None
Stop Bits (bits)	Sets the Stop Bits of the COM port.	1
Flow Control	Sets the Flow Control of the COM port.	None
Allow Driver Control	Enables client (VxComm Driver) to dynamically change the data format and baud rate settings.	Enable
Prefix String	Set the prefix dtring added to the TCP output. Range: Max. 7 chars.	N/A
Remove Errors	Clears RX FIFO data when the error(s) checked occurs.	Framing Error checked Break Error checked
Remove Data	Enables or disables clearing RX data when TCP disconnected.	Disable
Serial Data Packing		
Slave Timeout (ms)	Set the waiting time after last Tx of the request sent to the device. If the device does not respond within the timeout value, the tDS-700/DS-2200 will return existing data via TCP package and process next request.	1000
Packing Length (bytes)	Sets the packet character length. When the length of received data reaches this configured value, an Ethernet packet will be sent at once. Range: 0 ~ 1024; Disabled: 0.	0

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Item	Description	Default
Serial Data Packing		
Serial Ending Chars (Number[,char1][,char2])	Sets the serial ending characters. When the tDS-700/DS-2200 module receives serial data ending with the specified characters, it will immediately send an Ethernet packet. The ending characters can be disabled (0), or configured as one or two characters. Disabled: 0, 1 char: **1,0x0D,** 2 chars: **2,0x0D,0x0A.**	0
Timeout Between Chars (ms)	Sets the inter-character timeout for the response sent from the device. If the device does not send further data within this period, the tDS-700/DS-2200 will process this response. Range: 10 ~ 65535, Disabled: 0.	10
TCP/IP		
Local TCP Port	TCP Command Port +1 Note: COM1/COM2/COM3 = TCP port 10001/10002/10003	10001
Operation Mode	**0: M0/Multi-echo**: Shares the received data from the COM port between clients. **1: M1/Single-echo**: Sends received data from the COM port to the requested client only.	0
Connection Idle (seconds)	If the Local TCP port does not receive any data sent via the TCP/IP within the certain period set by this parameter, the tDS-700/DS-2200 will disconnect the socket. Range: 1 ~ 65535 (seconds); Disabled: 0.	180
Pair-Connection Settings (Client/Server Mode)		
Application Mode	Server	Client
Remote Server IP	-	IP address of the remote device
Remote TCP Port	-	TCP Port number of the remote device
Submit	Click this button to save the revised settings to the tDS-700/DS-2200.	

Note

For more detailed information regarding pair-connection applications settings, refer to Section 6.4 "Pair-Connection Applications".

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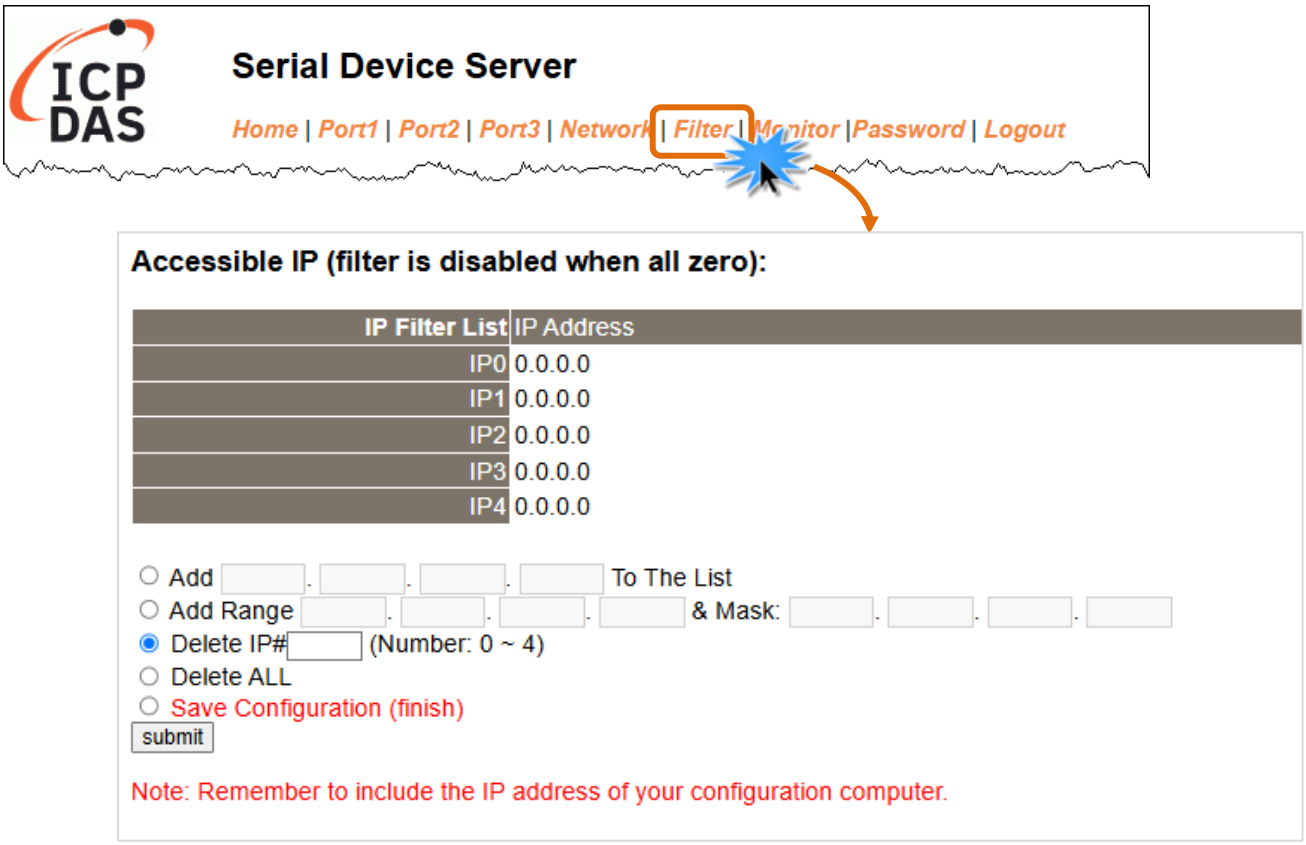
5.5 Filter Settings

The IP Filtering function on the tDS-700/DS-2200 series modules can prevent connections from untrusted IP addresses by restricting access based on IP.

- If any IP addresses are configured in the list, only the IPs in the list is allowed to access the module's web interface.
- If the list is empty, the IP filtering function is disabled.

Click the "**Filter**" item to go to the settings page:



The following is an overview of the parameters contained in the Filter Settings (white list) section:

Item	Description
Add "IP" To The List	Add an IP address to the IP Filter List.
Add Range "IP"& Mask "IP"	Add an IP address range to the IP Filter List.
Delete IP# "Number"	Delete a specific IP# address from the IP Filter List. (Number: 0 ~ 4)
Delete All	Delete all items from the IP Filter List.
Save Configuration (finish)	Save a new IP Filter List to the Flash memory.
Submit	Click this button to save the revised settings to the tDS-700/DS-2200.

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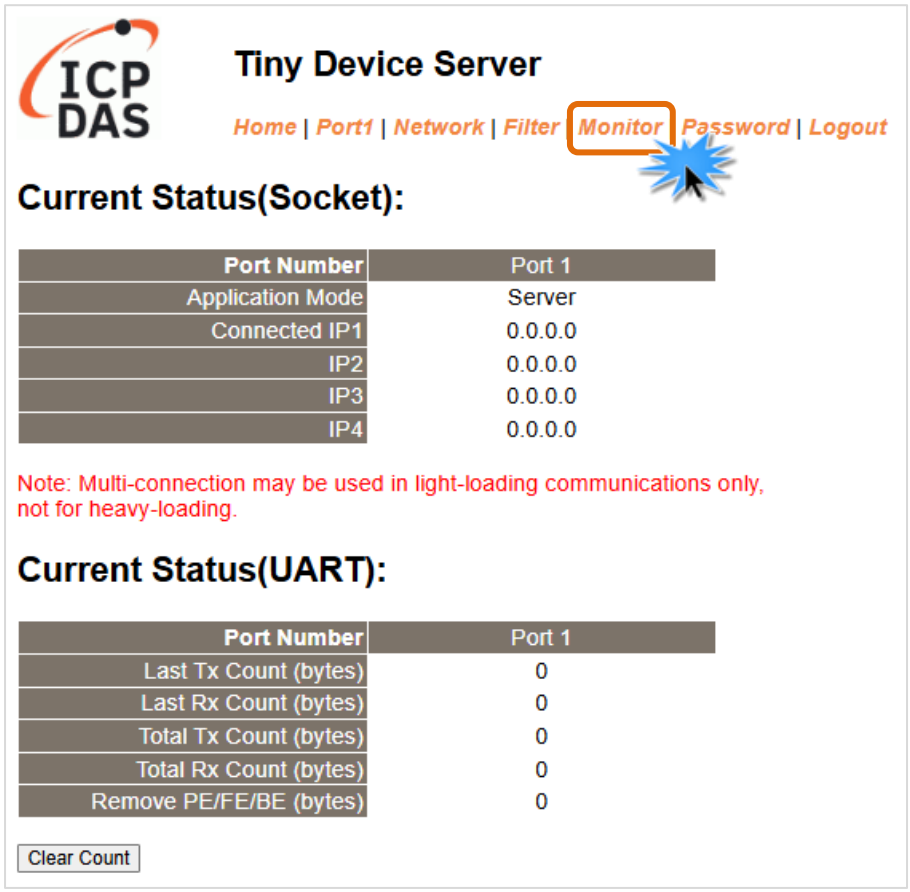
5.6 Monitor Page

Click the **Monitor** item to view the the current TCP/IP connection status and COM ports status on the tDS-700/DS-2200 module.



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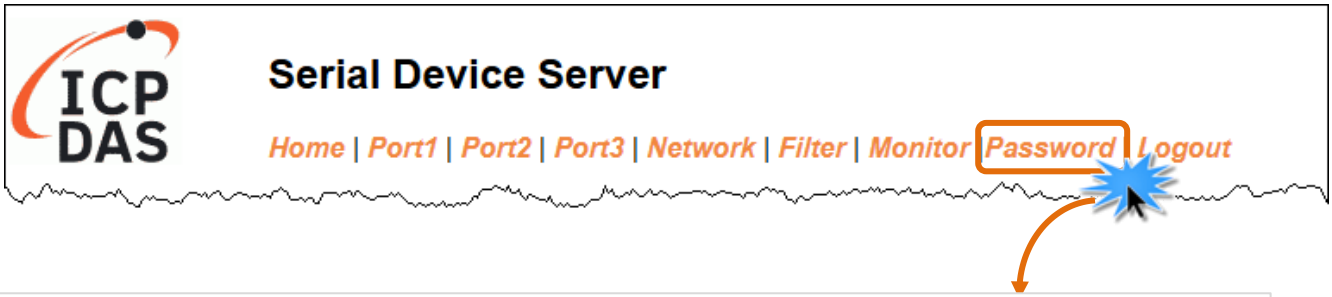
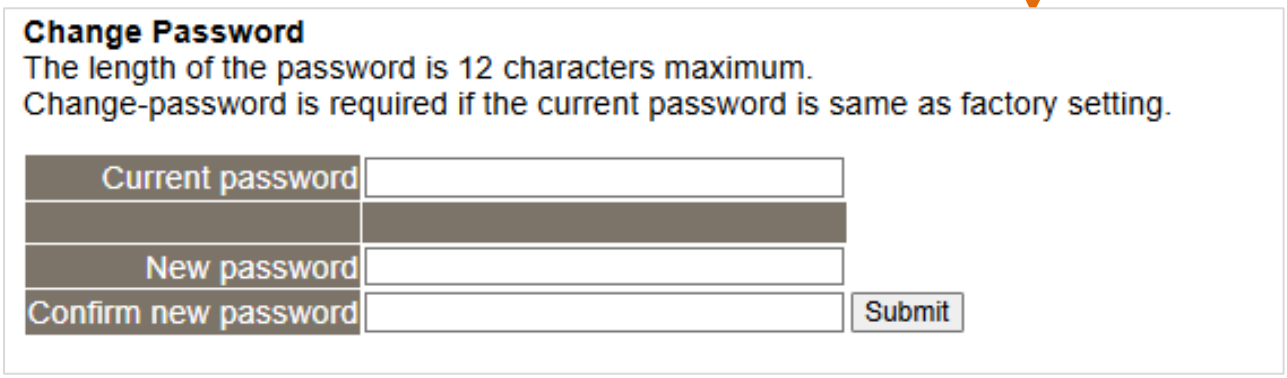
5.7 Change Password

You can click "**Password**" in the navigation bar to change the tDS-700 /DS-2200 web server login password.





Item	Description
Current password	Enter the current password。 Using the factory default password "**admin**" for the first time login.
New password	Enter the new password. (12 characters maximum)
Confirm new password	Enter the new password again. (12 characters maximum)
Submit	Click this button to save the revised settings to the tDS-700/DS-2200.

Note

If you forgot password, please refer to Section A1. How do I restore the web password for the module to the factory default password?

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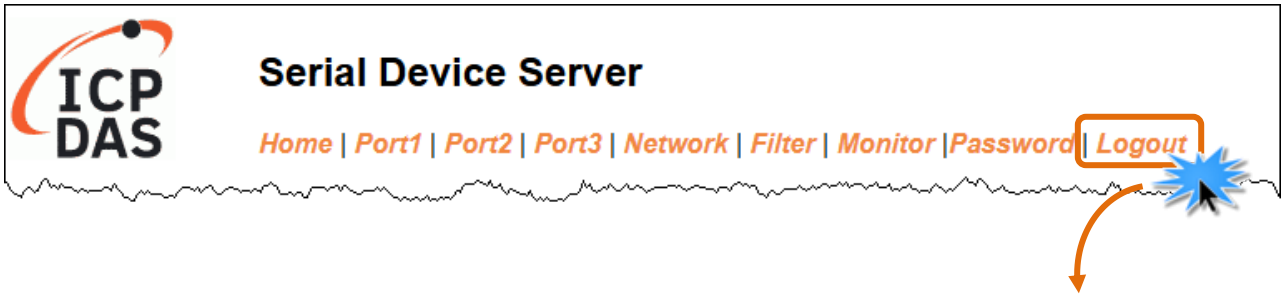
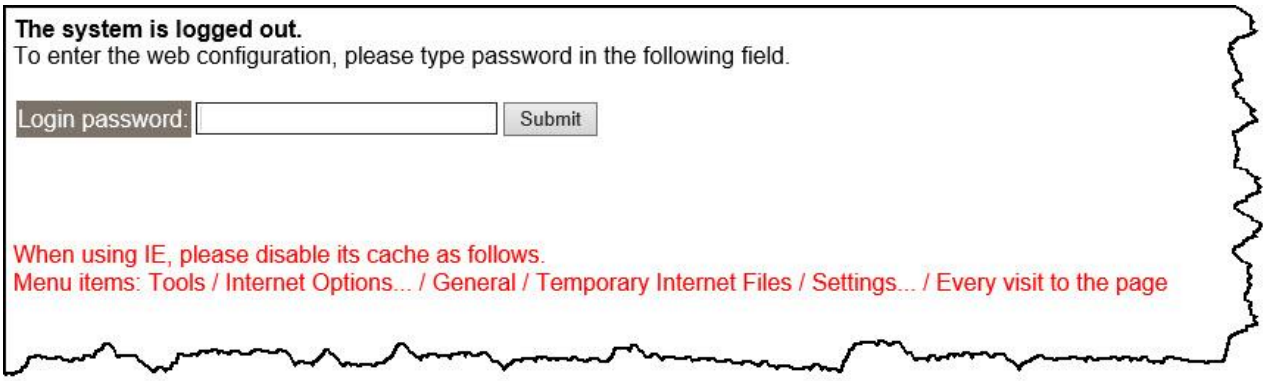
5.8 Logout

After clicking the **Logout**, you will be immediately logged out from the system and be returned to the login page.





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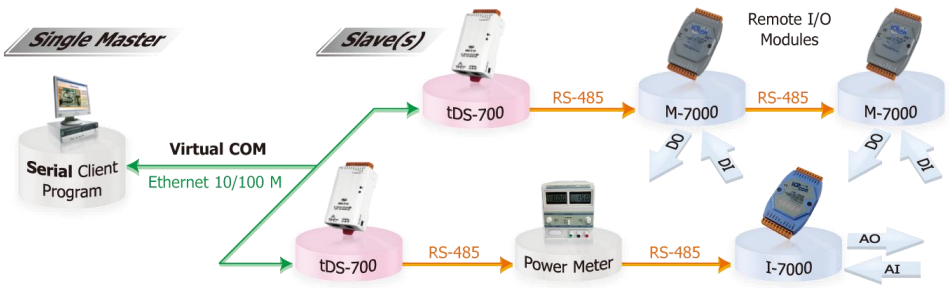
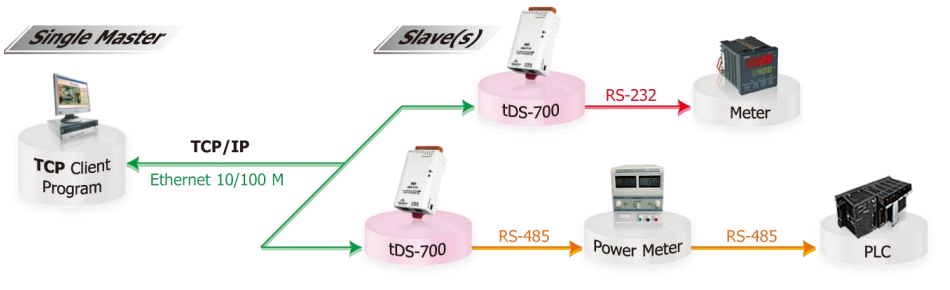
6. Typical Applications

This chapter provides some examples of typical scenarios for the tDS-700/DS-2200 module, including applications focused on the Virtual COM, Direct Socket Connection, Ethernet I/O, Pair-connection and TCP Client Mode, etc...

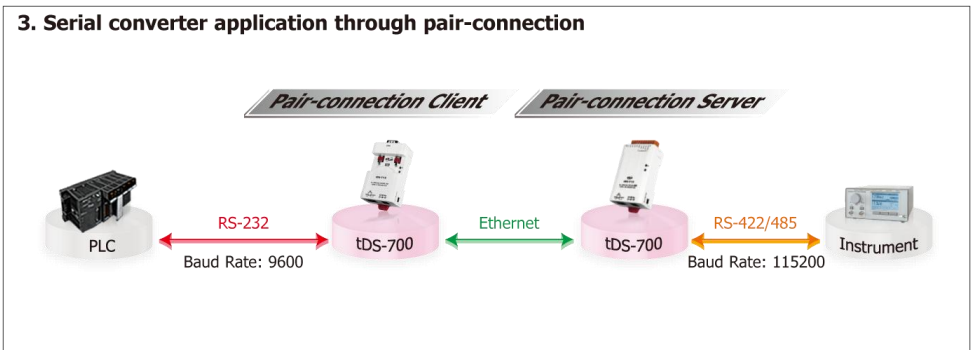
1. Access serial device via Virtual COM ports



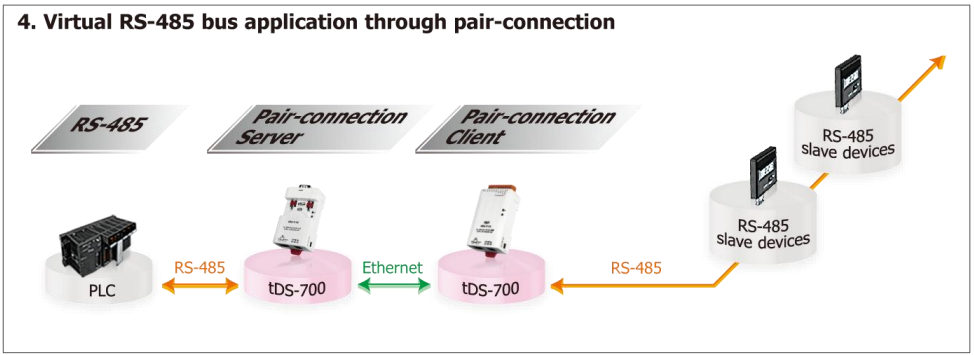
2. Access serial device via TCP/IP socket connection



3. Serial converter application through pair-connection



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



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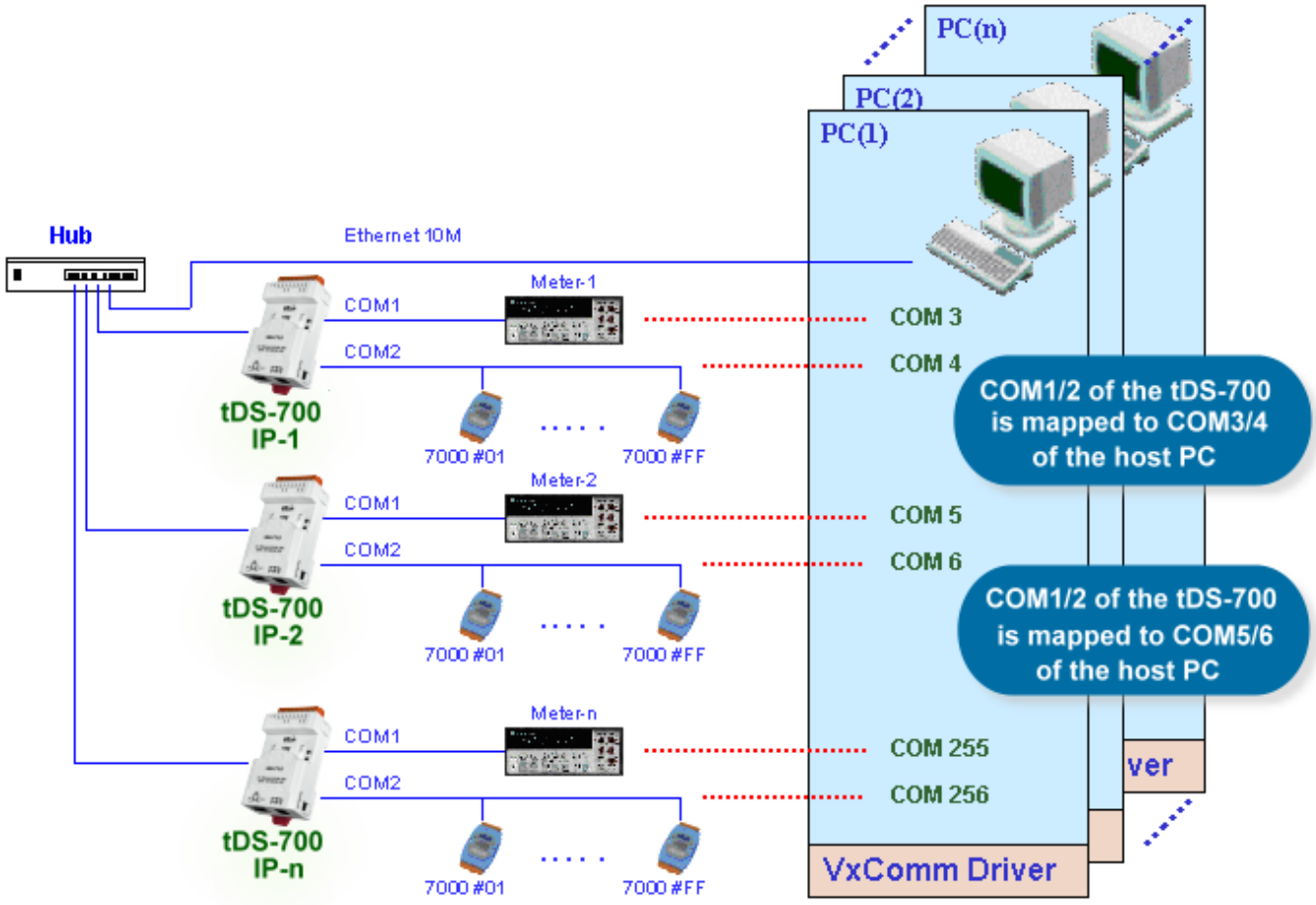
6.1 Virtual COM Application

The tDS-700/DS-2200 series is designed to link RS-232/422/485 devices to an Ethernet network. The VxComm utility allows the built-in tDS-700/DS-2200 COM Port to be virtualized to a standard COM Port of a host PC, as shown below:



In the configuration above, Meter-1 is virtualized to link to COM3 of the host PC. Therefore, a program originally designed for the MS-COMM standard can access the meter without the need for any modification.

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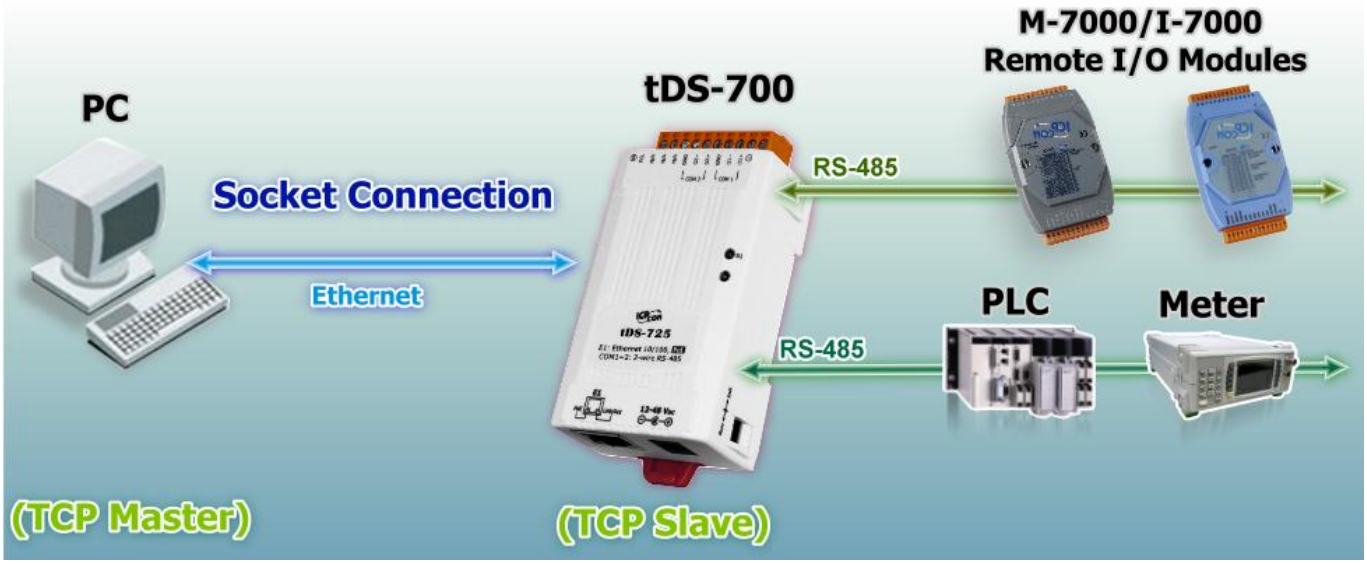
6.2 Direct Socket Connection Applications



tDS-700/DS-2200 series module can accept the TCP connection (include raw data) directly, it also can communicate with TCP client and Serial Device in this way.

For examples of socket connection test as follows:

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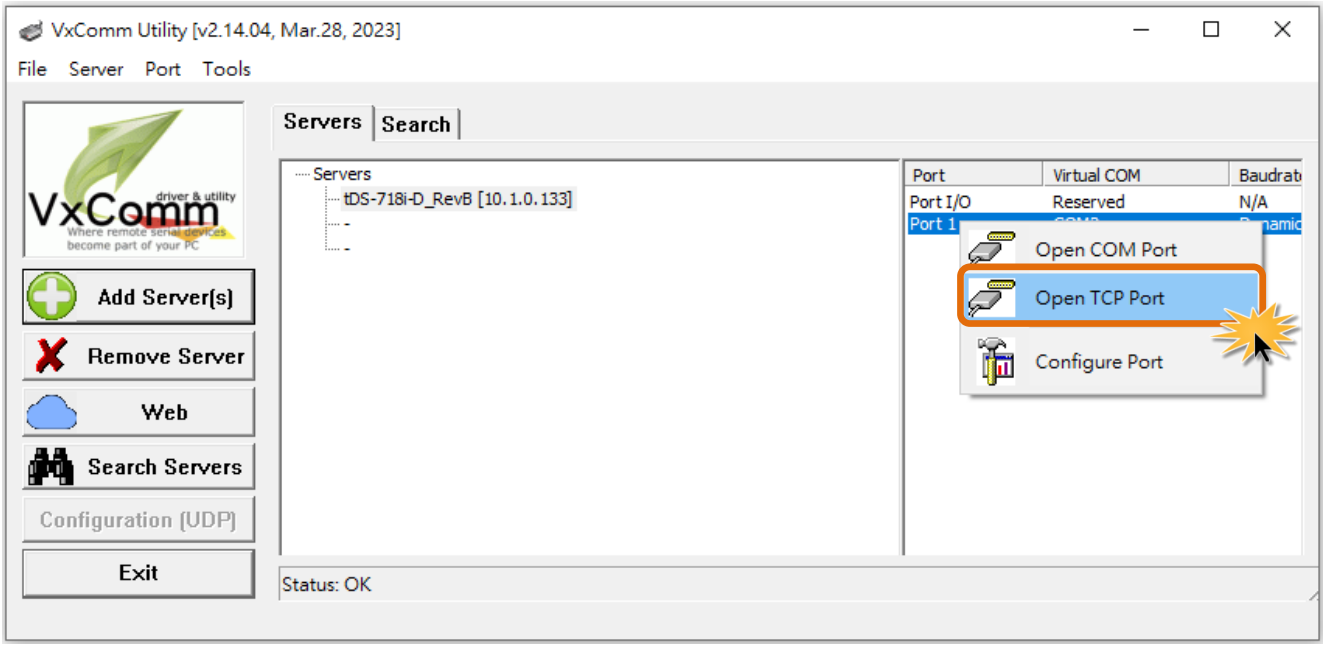
1. Confirm that the tDS-700/DS-2200 modules are functioning correctly. Refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" for more details.
2. Wire the slave device (e.g., M-7015, optional) with your tDS-700/DS-2200. For detailed RS-232/422/485 wiring information, refer to Section 2.6 "Wiring Notes for RS-232/485/422 Interfaces".
3. Supply power to the slave device (e.g., M-7015, Device ID: 2, +10 to +30 V_{DC} power used.)
4. Install VxComm Utility, and then configuration Ethernet setting **(such as IP/Mask/Gateway details)** for tDS-700/DS-2200 series module; refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series".
5. Confirm the serial port settings **(Baud Rate and Data Format)** must be the same between the tDS-700/DS-2200 and slave device (e.g., M-7015).
   For example:

Model	Port Settings		TCP Port
	Baud Rate	Data Format	
tDS-700/DS-2200	9600	8,N,1	10001
Slave Device (M-7015)	9600	8,N,1	-

6. Run VxComm Utility, select your tDS-700/DS-2200 module name in the Servers list, select "**Port 1**" in the port list pane on the right, and choose the **"Open TCP Port"** item on the right-click menu of Port 1.



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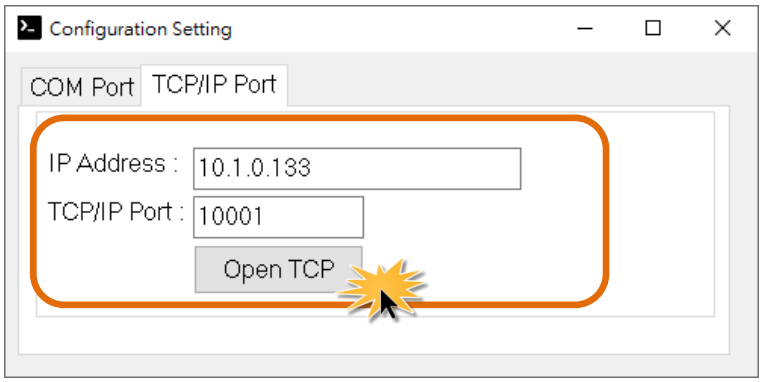
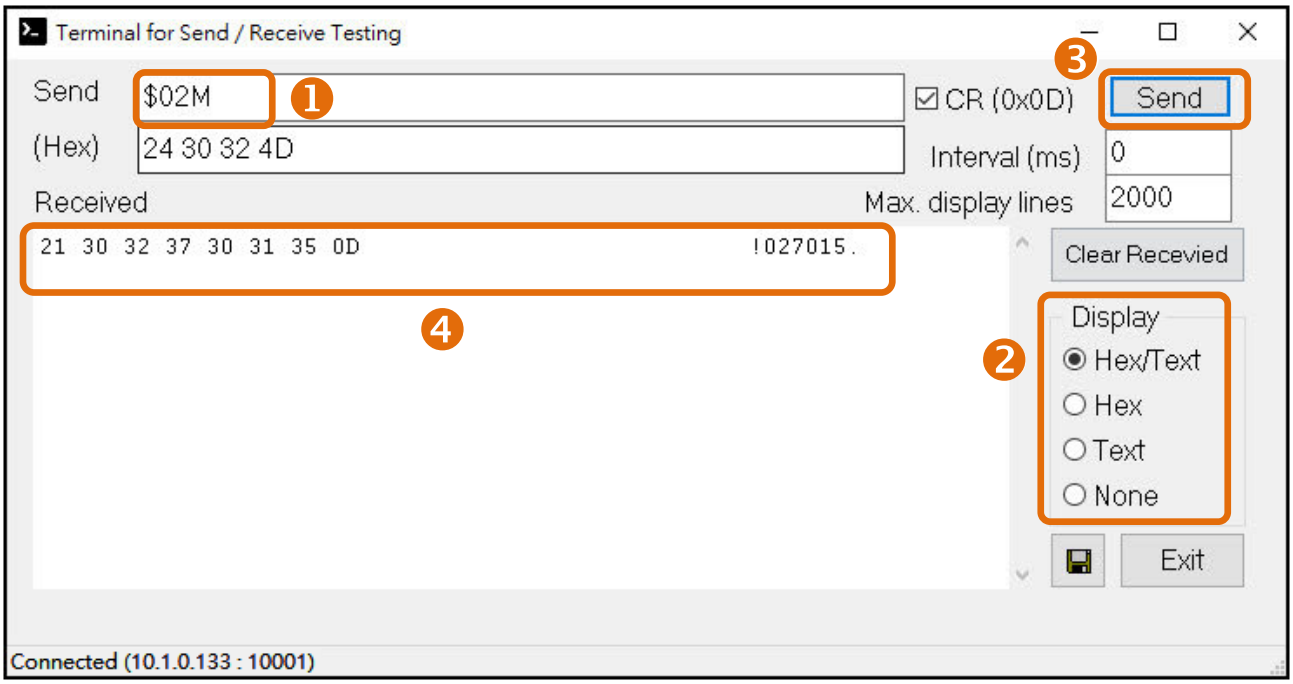
7. Ensure that the **IP address of the tDS-700/DS-2200** module and TCP/IP port are correct, and then click the "**Open TCP**" button.



8. Enter a string (e.g., $02M) in the **"Send"** field and then click the **"Send"** button. If a response is received, it will be displayed in the received field.



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6.3 Ethernet I/O Applications

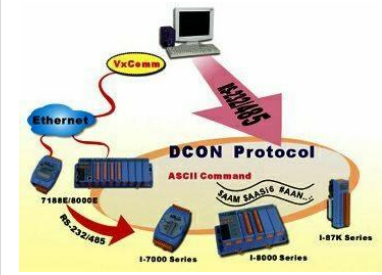
Linking to I-7000 series modules

The I-7000 series provides a variety of I/O operations, such as D/I, D/O, A/D, D/A, Counter and Frequency Measurement, etc. The I-7000 series was originally designed to be used with RS-485 networks, so the RS-485 of COM on the tDS-700/DS-2200 can be used to link to I-7000 series modules.

By using VxComm technology, programs that support serial devices on the host PC can be upgraded from an RS-485 network to an Ethernet network without requiring any modifications to the program.

Configurable Ethernet Data Logger

Using the VxComm driver, the tDS-700/DS-2200 + I-7000 modules can be virtualized to become COM Port + I-7000 modules located on the host PC, and then the Data Logger in the DCON Utility Pro can be used to access data related to the I-7000 from the Ethernet. Signal data originating from the I-7000 modules can be analyzed using MS Excel without the need to write any custom programs.



1. The DCON utility Pro includes a log function, you can click the following icon to run it:

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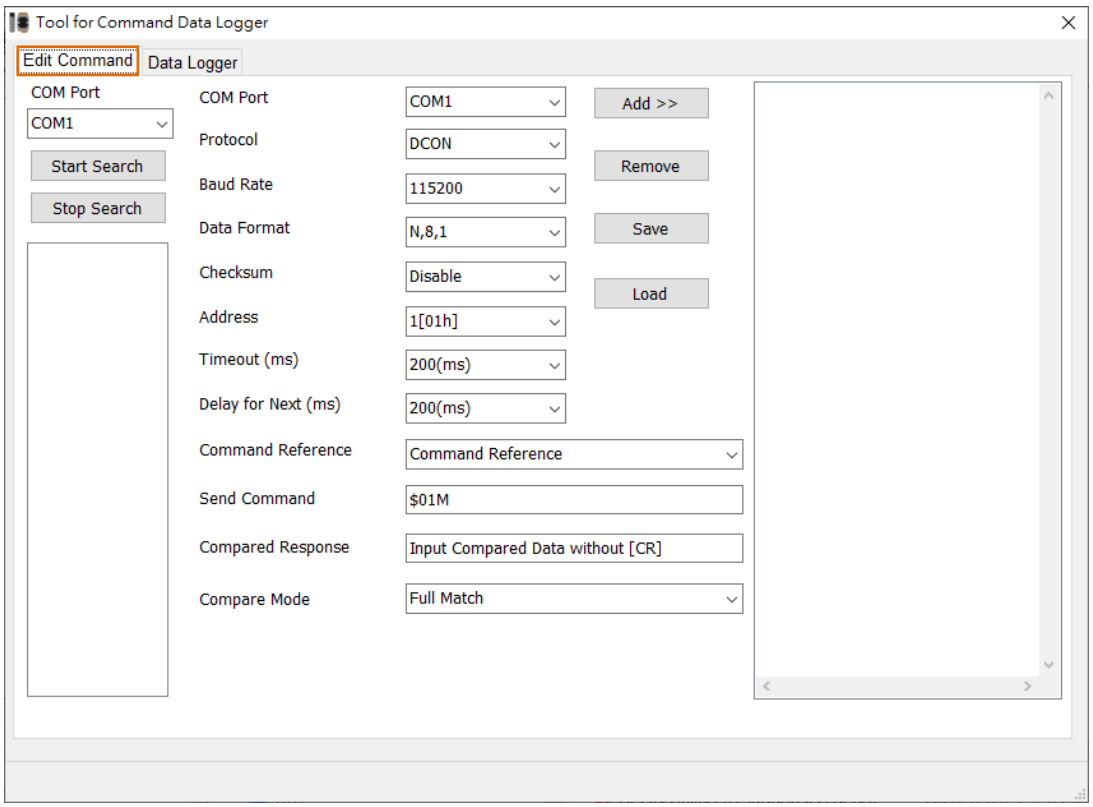
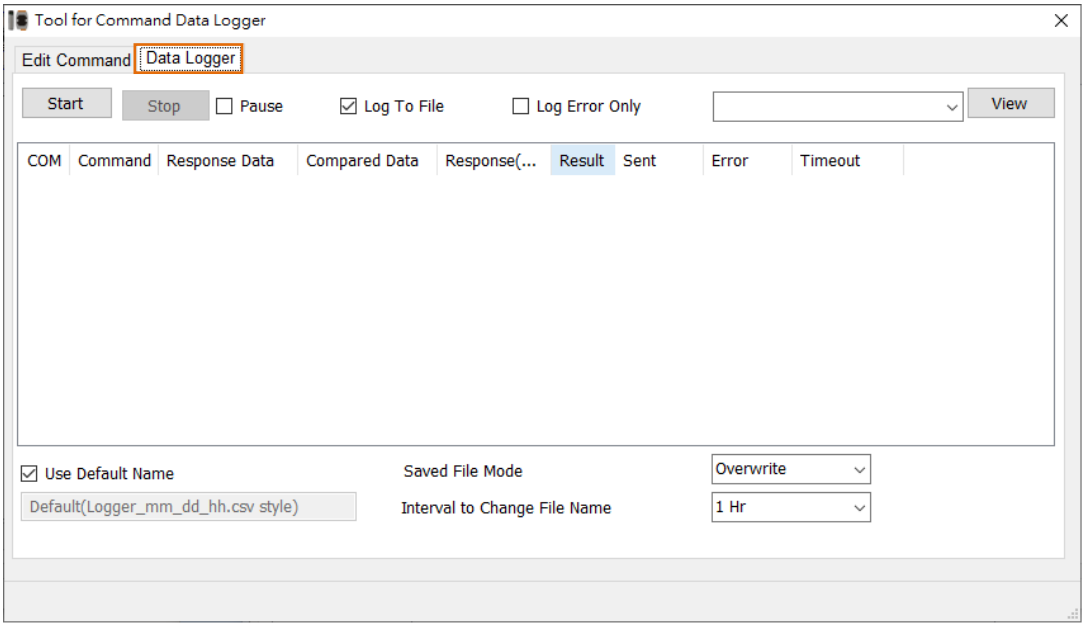
2. Add the commands used to read the data to be recorded into the command list on the Edit Command page.



3. Click the Start button on the Data Logger page to log the data.



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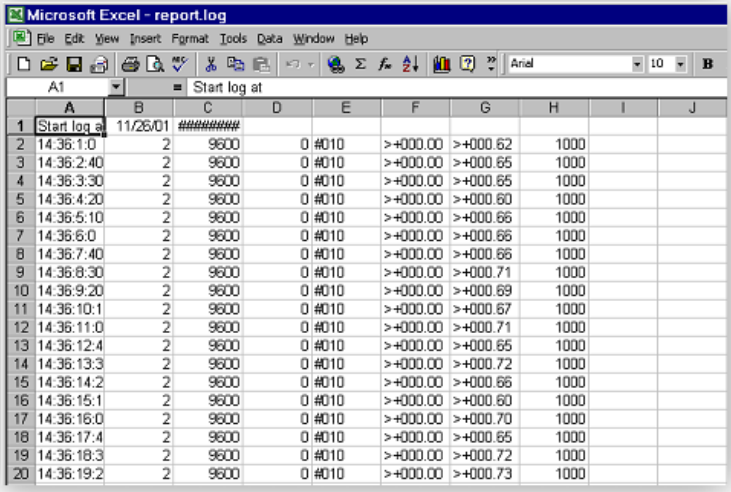
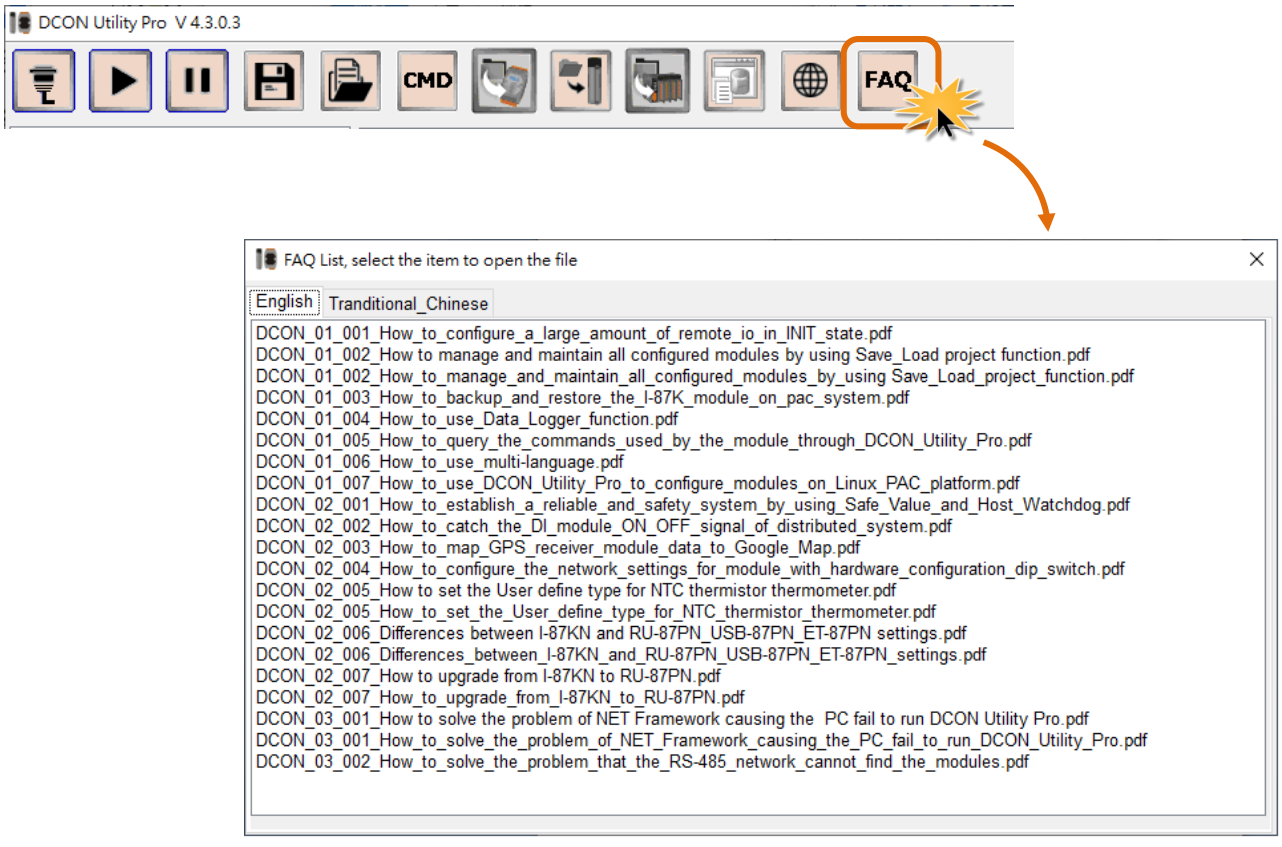
4. Open the log file in MS Excel to view the log data, as shown in the following example:



	A	B	C	D	E	F	G	H	I	J
1	Start log at	11/26/01	#########							
2	14:36:1:0	2	9600	0	#010	>+000.00	>+000.62	1000		
3	14:36:2:40	2	9600	0	#010	>+000.00	>+000.65	1000		
4	14:36:3:30	2	9600	0	#010	>+000.00	>+000.65	1000		
5	14:36:4:20	2	9600	0	#010	>+000.00	>+000.60	1000		
6	14:36:5:10	2	9600	0	#010	>+000.00	>+000.66	1000		
7	14:36:6:0	2	9600	0	#010	>+000.00	>+000.66	1000		
8	14:36:7:40	2	9600	0	#010	>+000.00	>+000.66	1000		
9	14:36:8:30	2	9600	0	#010	>+000.00	>+000.71	1000		
10	14:36:9:20	2	9600	0	#010	>+000.00	>+000.69	1000		
11	14:36:10:1	2	9600	0	#010	>+000.00	>+000.67	1000		
12	14:36:11:0	2	9600	0	#010	>+000.00	>+000.71	1000		
13	14:36:12:4	2	9600	0	#010	>+000.00	>+000.65	1000		
14	14:36:13:3	2	9600	0	#010	>+000.00	>+000.72	1000		
15	14:36:14:2	2	9600	0	#010	>+000.00	>+000.66	1000		
16	14:36:15:1	2	9600	0	#010	>+000.00	>+000.60	1000		
17	14:36:16:0	2	9600	0	#010	>+000.00	>+000.70	1000		
18	14:36:17:4	2	9600	0	#010	>+000.00	>+000.65	1000		
19	14:36:18:3	2	9600	0	#010	>+000.00	>+000.72	1000		
20	14:36:19:2	2	9600	0	#010	>+000.00	>+000.73	1000		

By combining VxComm technology, DCON Utility Pro and MS Excel, you can retrieve data from I-7000 series modules over Ethernet and analyze the data without writing any code. For more advanced features (such as the Log Function), please refer to the DCON Utility Pro FAQ online documentation.



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6.4 Pair-connection Applications

tDS-700/DS-2200 device servers support Pair-Connection applications (as known as serial-bridge or serial-tunnel). Once the pair-connection is configured, you can establish communication between two host computers, servers, or serial devices without Ethernet capabilities using the TCP/IP protocol, allowing for data transmission and device control.

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The following are examples of pair-connection tests:

Pair-connection Settings:

Model	Port Settings (default)		Pair-connection Settings		
	Baud Rate	Data Format	Application Mode	Remote Server IP	Remote TCP Port (default)
tDS-700 #1	115200	8N1	Client	IP Address of tDS-700 #2	10001
tDS-700 #2	115200	8N1	Server	-	-

Note

The Baud Rate and Data Format settings of the client and server (tDS-700 #1 and #2) depend on the COM ports of the PC (or the connected device). The serial port settings between tDS-700 #1 and tDS-700#2 can be different.

Ensure that the following items are available:

☑ A DN-09-2F Terminal Board

(Optional, Website: https://www.icpdas.com/en/product/DN-09-2F)

☑ A I-7520 module

(Optional, Website: https://www.icpdas.com/en/product/I-7520__series)

Step 1: Connecting to a network, PC and Power

1. Confirm that the tDS-700/DS-2200 modules are functioning correctly. Refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series".

2. Use a DN-09-2F wiring terminal board to connect COM1 of the PC to COM1 of the tDS-700 #1, refer to Section 2.6 "Wiring Notes for RS-232/485/422 Interfaces" for RS-232 wiring details information.

3. Use an I-7520 module to connect COM2 of PC to COM1 of the tDS-700 #2, refer to Section 2.6 "Wiring Notes for RS-232/485/422 Interfaces" for RS-422/485 wiring details information.

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The image below shows an example of the setup for a pair-connection test:

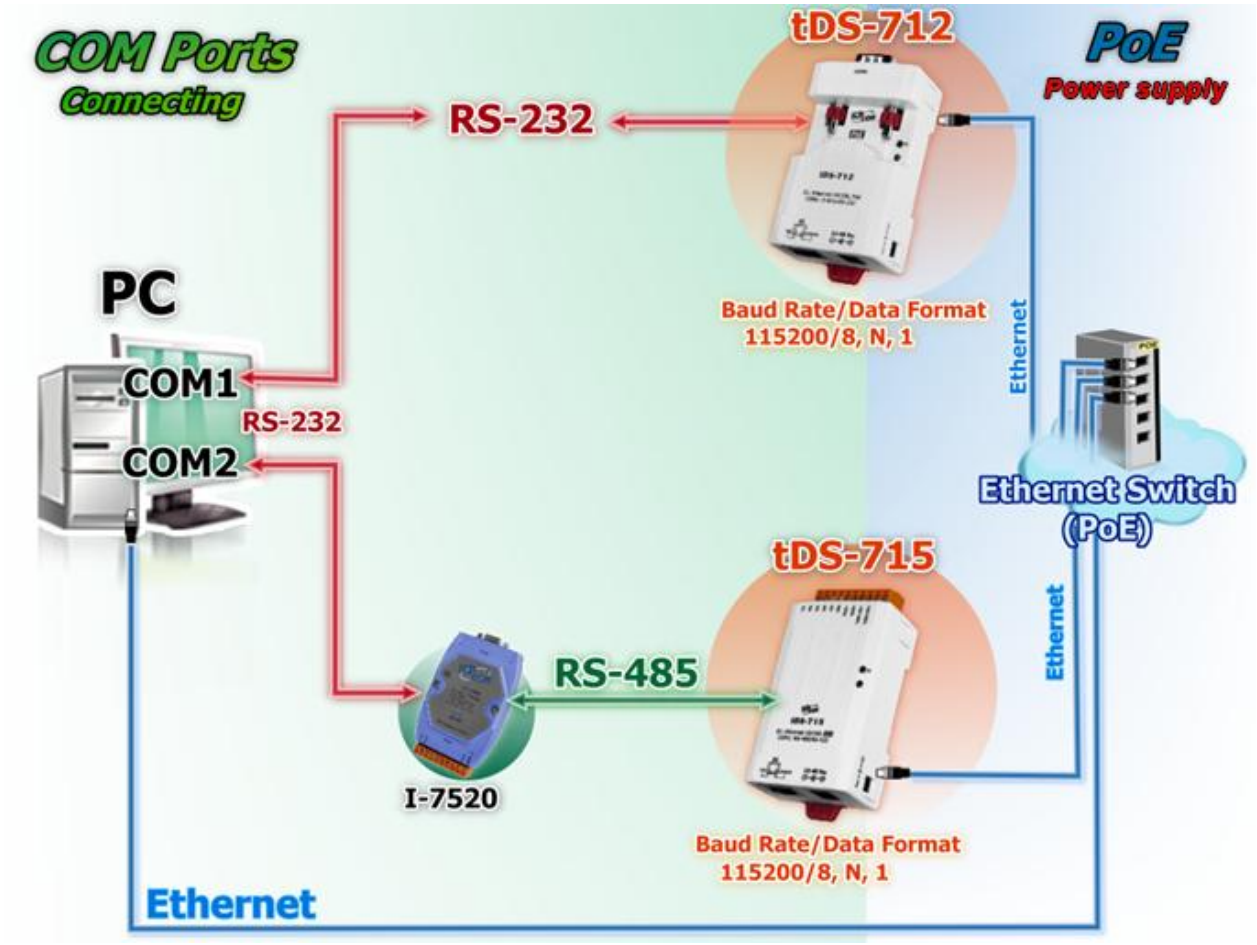
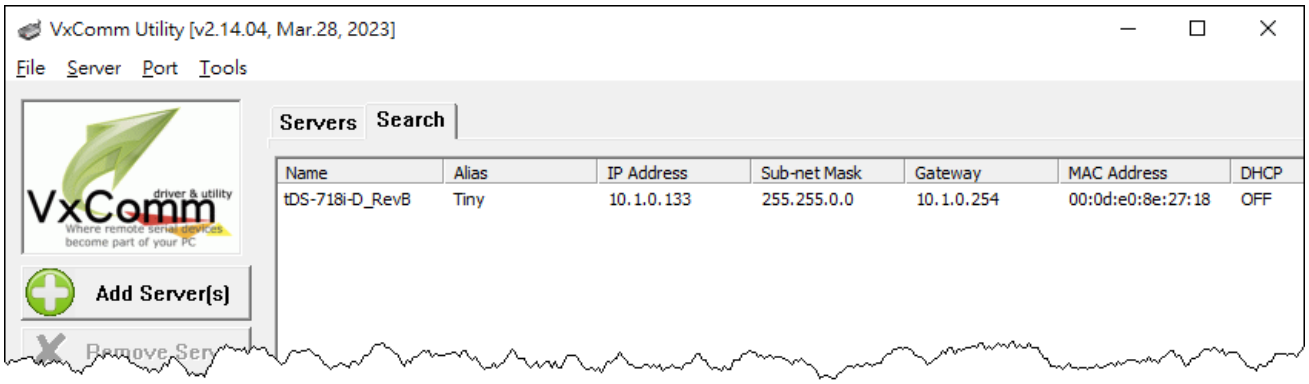


Figure 6-1

Step 2: Configuring the Ethernet Settings

Contact your Network Administrator to obtain the correct network configuration for the tDS-700/DS-2200 modules (including the **IP Address, Mask and Gateway details)**. Refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" for more details.



Step 3: Configuring the Pair-connection (Client Mode) on the Web Server for tDS-700#1

1. Enter the **IP address of the tDS-700 #1** in the address bar of the browser.
2. **Enter the password** in the Login password field, and click the **"Submit"** button.

Figure 6-3

3. Click the **"Port1"** item to go to the **Port1 Settings** page.

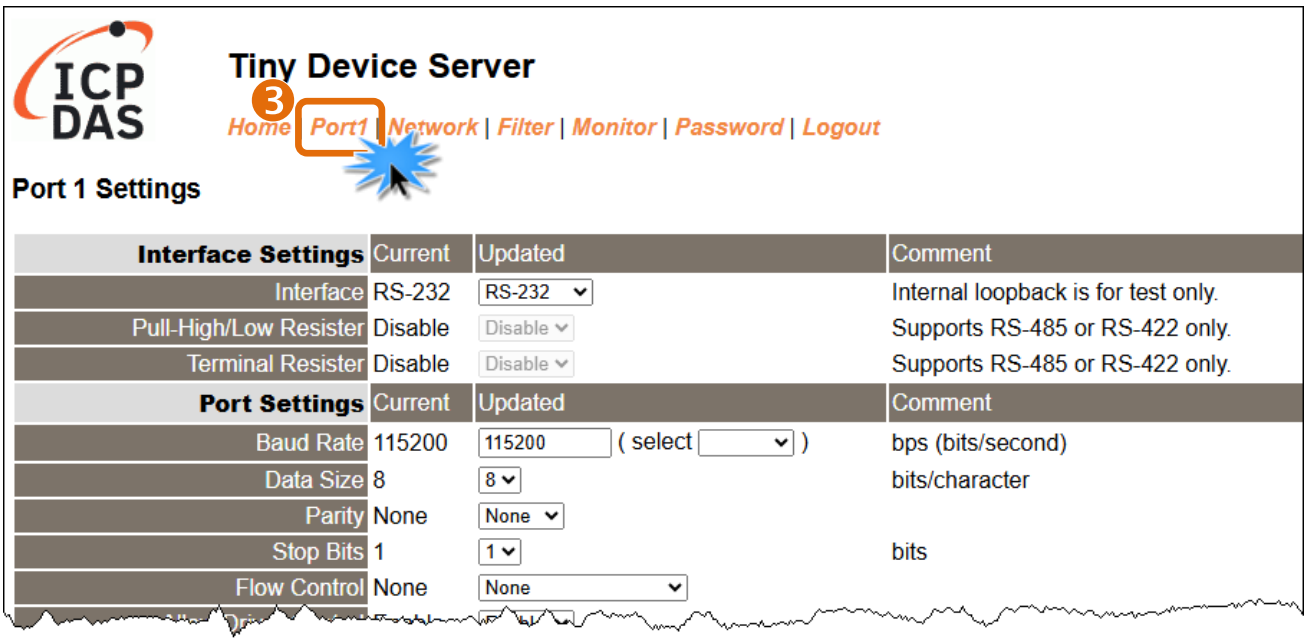


Figure 6-4

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4. Select the appropriate **Baud Rate and Data Format** settings from the relevant drop down menus, for example "**115200**", "**8", "None"** and **1**".

5. The pair-connection settings area as follows:
   5-1: Select "**Client**" from the "**Application Mode (Server Mode)**" drop down options
   5-2: Type the **IP address of the tDS-700 #2** in the "**Remote Server IP**" field.
   5-3: Assign a **TCP port for the tDS-700 #2** in the "**Remote TCP Port**" field.

6. Click the "**Submit**" button to complete the configuration.

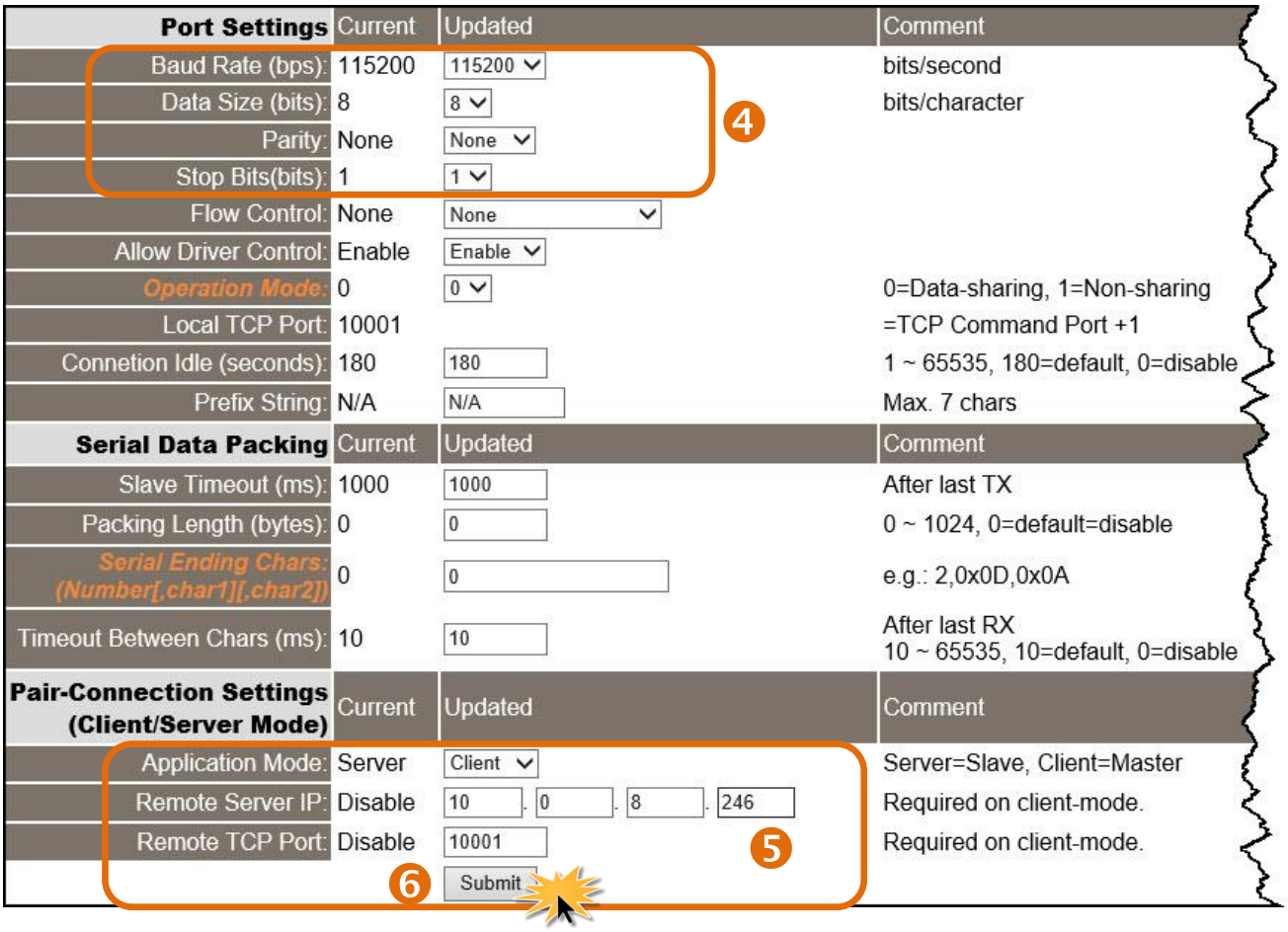

Figure 6-5

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Step 4: Configuring the Pair-connection (Server Mode) on the Web Server for tDS-700#2

1. Enter the configuration page for the tDS-700 #2 web server.
2. Click the **"Port1"** link to enter the settings page of the tDS-700 #2.
3. Set the Baud Rate to "**115200"** and the Data Format to "**8, None, 1"**.

Refer to Figures 6-3 to 6-5 for illustrations of how to perform the above steps.

4. Select "**Server**" from the "**Application Mode (Server Mode)**" drop down options and then click the "**Submit**" button to complete the configuration.

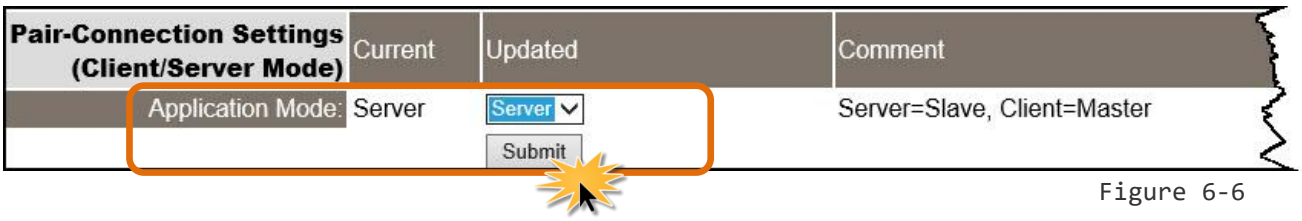

Figure 6-6

Step 5: Testing the Pair-connection Functions

1. Lauch the Test Program.

The following example use Test2COM.exe to perform self-test.

The Test2COM.exe program can be obtained from the ICP DAS web site.

The location of the download addresses are shown below:

https://www.icpdas.com/en/download/show.php?num=2910

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2. Double-click the Test2COM.exe program and type the relevant configuration as follows:

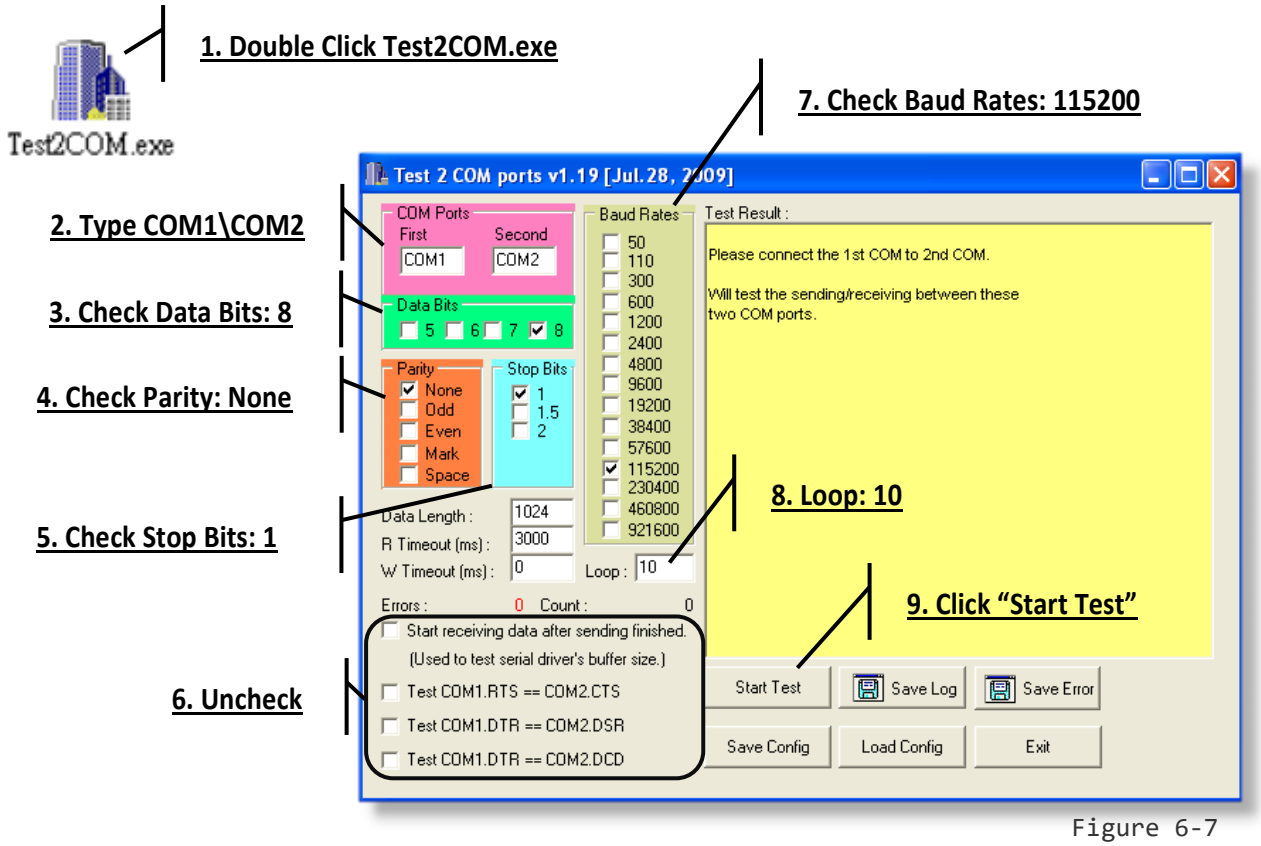

Figure 6-7

Note

The Baud Rate and data format depend on the serial port settings for the web configuration above.

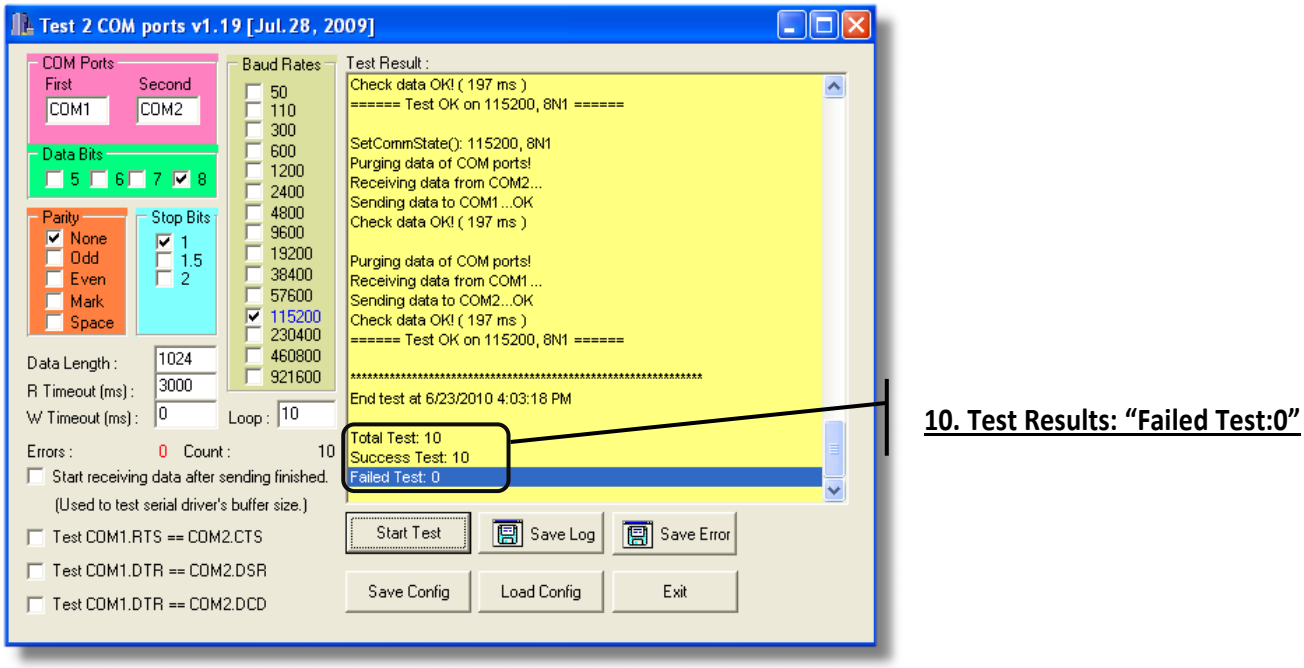

Figure 6-8

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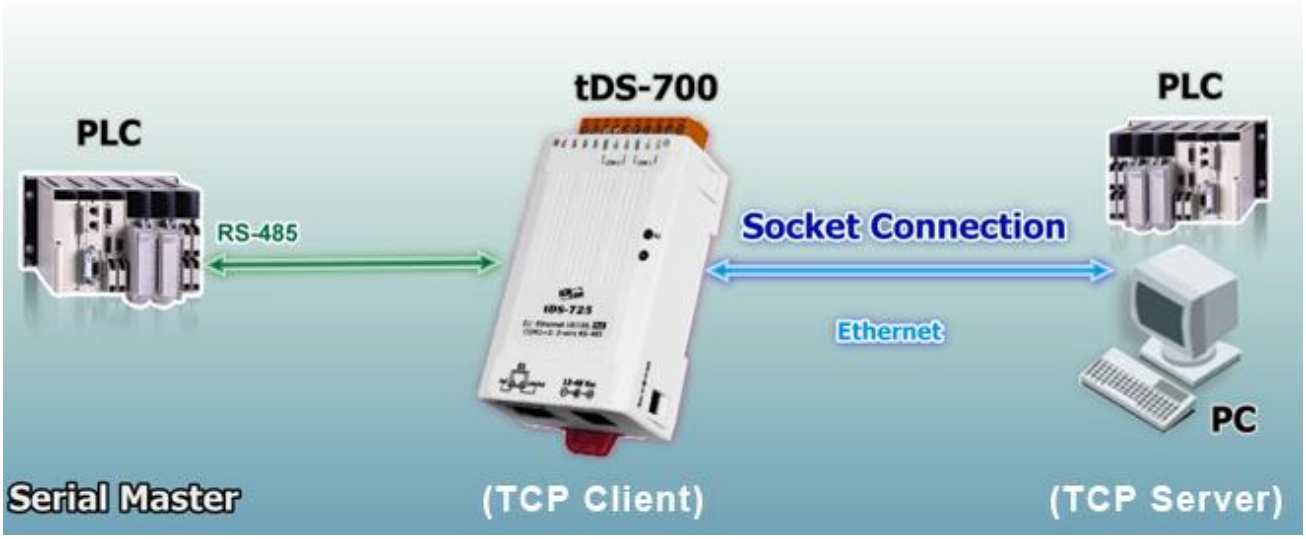
6.5 TCP Client Mode Applications

In TCP Client Mode, the tDS-700/DS-2200 can establish a TCP connection to a specific TCP slave device actively by TCP server program. The whole system should operate like this:



The following are examples of TCP Client Mode tests:

TCP Client Mode Settings:

Model	Port Settings (default)		Pair-connection Settings		
	Baud Rate	Data Format	Application Mode	Remote Server IP	Remote TCP Port
tDS-700	115200	8, N, 1	Client	10.0.8.21	500
				IP address and TCP port for the PC #2 (TCP Server)	
PC #2 (TCP Server)	-	-	-	-	-
PC #1 (Serial Master)	115200	8, N, 1	-	-	-

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Follow the procedure described below:

Step 1: Connecting to a network, a PC and a Power Supply

1. Confirm that the tDS-700/DS-2200 module is functioning correctly. Refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" for more details.

2. Connect both the tDS-700/DS-2200, TCP server (PC #2) and hyper terminal (PC #1) to the same sub network or the same Ethernet Switch. For detailed RS-232/RS-422/485 wiring information, refer to Section 2.6 "Wiring Notes for RS-232/485/422 Interfaces".

The wiring diagram is as follows:

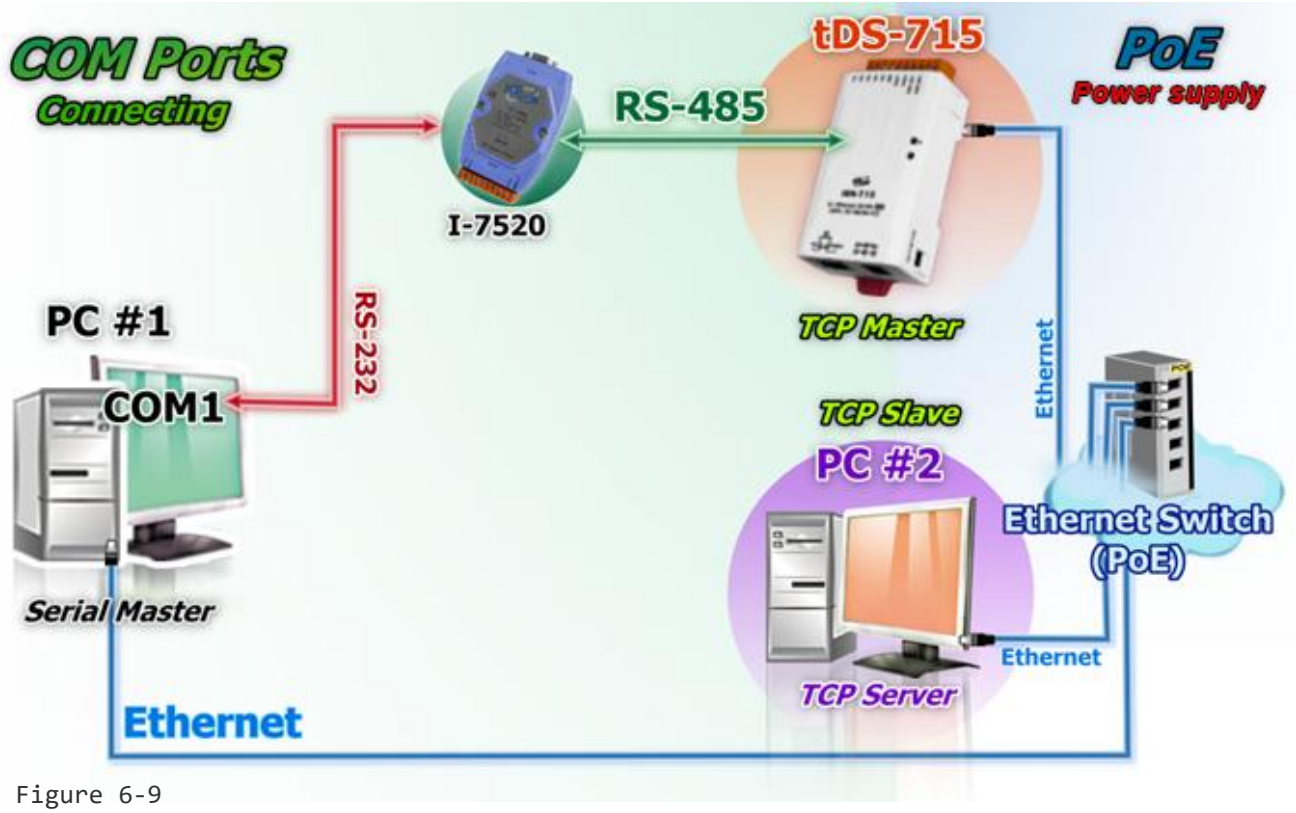

Figure 6-9

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Step 2: Configuring the Ethernet Settings

Contact your Network Administrator to obtain valid network configuration (including the **IP Address, Mask and Gateway details)** for the tDS-700/DS-2200 module. Also refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" for more details.

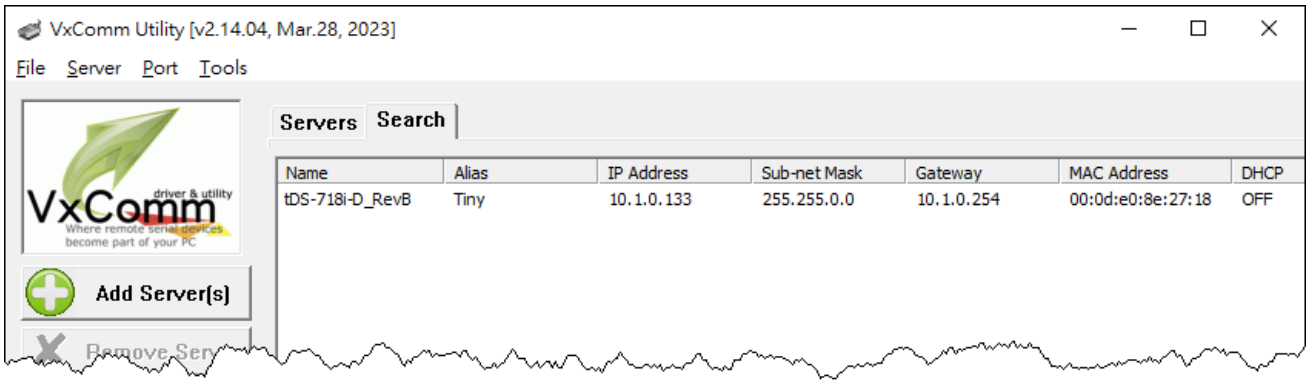

Figure 6-10

Step 3: Configuring Pair-connection (TCP Client Mode) on the Web Server for the tDS-700/DS-2200 module

1. Enter the **URL address of the tDS-700/DS-2200** in the address bar of the browser.
2. **Enter the password (default: admin)** in the Login password field, and click the **"Submit"** button to enter the configuration page.

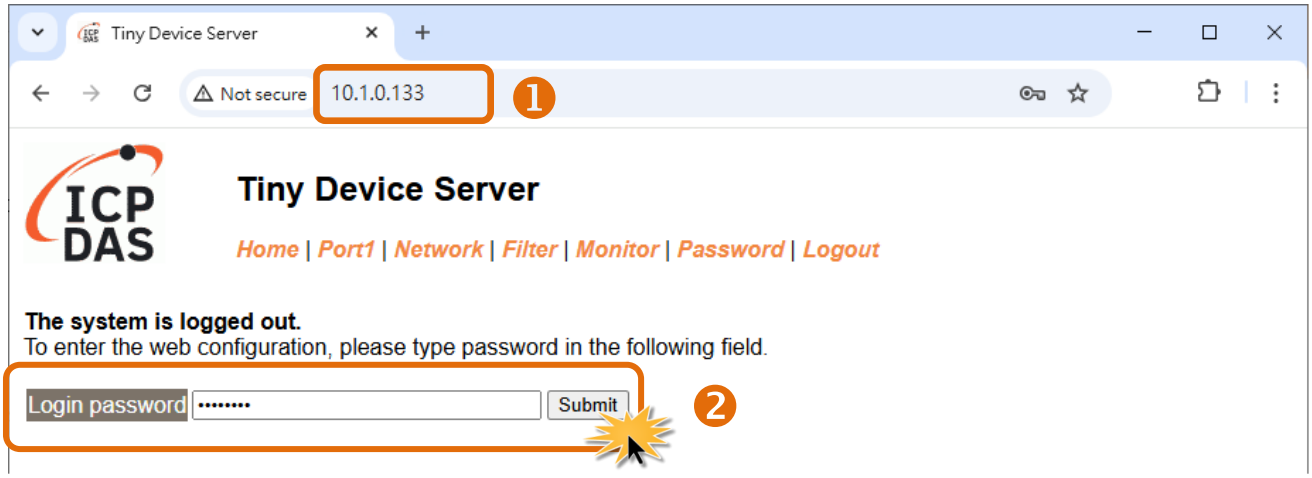

Figure 6-11

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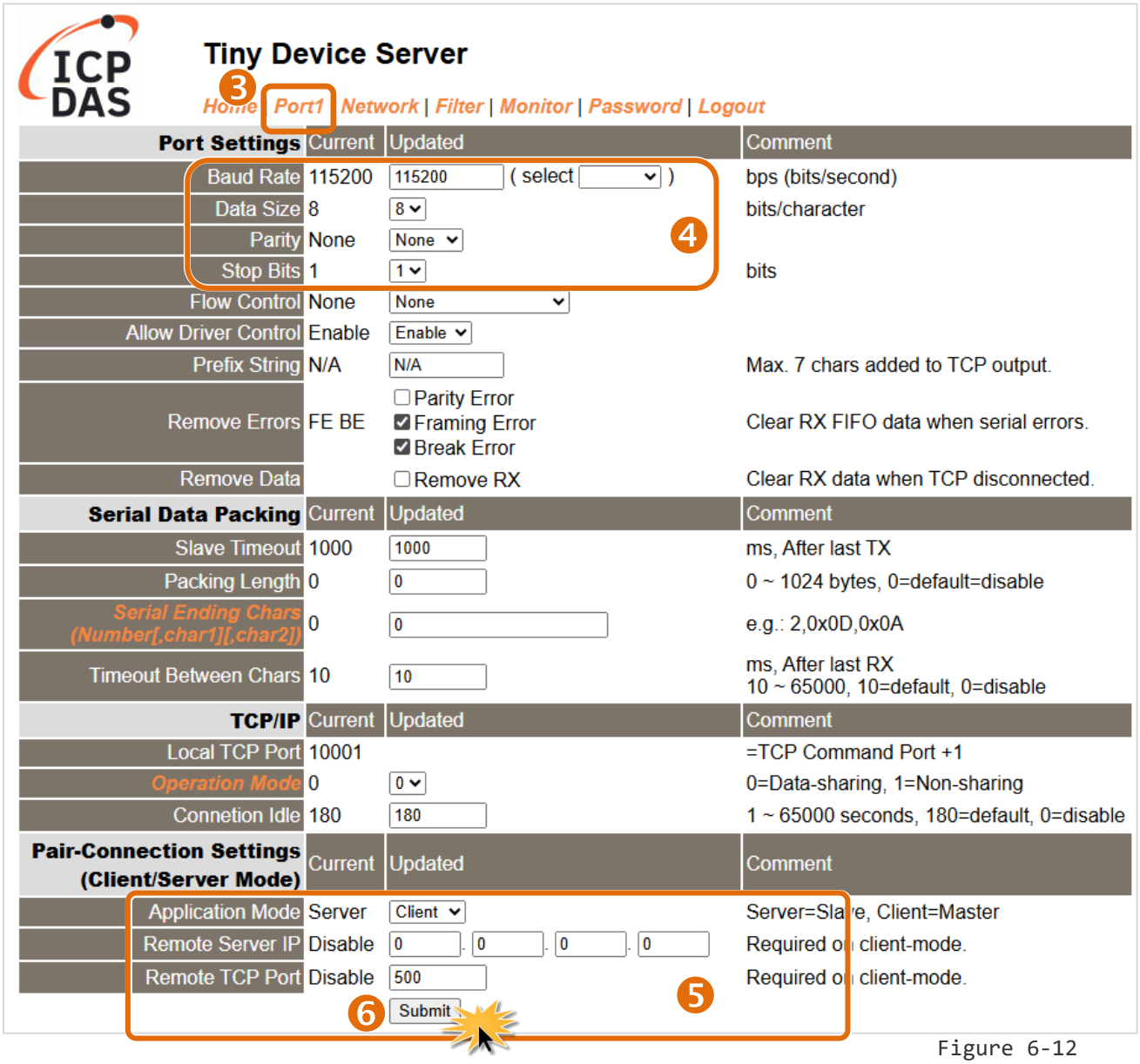
3. Click the **"Port1**" link to enter the settings page.
4. Select the appropriate **Baud Rate and Data Format** settings from the relevant drop down options, for example "**115200**", "**8", "None"** and **1**".

5. The pair-connection settings area as follows:
   5-1: Select "**Client**" from the "**Application Mode (Server Mode)**" drop down options
   5-2: Type the **IP address of the TCP Server (PC #2)** in the "**Remote Server IP**" field.
   5-3: Assign a **TCP port for the TCP Server (PC #2)** in the "**Remote TCP Port**" field.

6. Click the "**Submit**" button to complete the configuration.



Port Settings	Current	Updated	Comment
Baud Rate	115200	115200 (select)	bps (bits/second)
Data Size	8	8	bits/character
Parity	None	None	
Stop Bits	1	1	bits
Flow Control	None	None	
Allow Driver Control	Enable	Enable	
Prefix String	N/A	N/A	Max. 7 chars added to TCP output.
Remove Errors	FE BE	☐ Parity Error ☑ Framing Error ☑ Break Error	Clear RX FIFO data when serial errors.
Remove Data		☐ Remove RX	Clear RX data when TCP disconnected.
Serial Data Packing	Current	Updated	Comment
Slave Timeout	1000	1000	ms, After last TX
Packing Length	0	0	0 ~ 1024 bytes, 0=default=disable
Serial Ending Chars (Number[,char1][,char2])	0	0	e.g.: 2,0x0D,0x0A
Timeout Between Chars	10	10	ms, After last RX 10 ~ 65000, 10=default, 0=disable
TCP/IP	Current	Updated	Comment
Local TCP Port	10001		=TCP Command Port +1
Operation Mode	0	0	0=Data-sharing, 1=Non-sharing
Connetion Idle	180	180	1 ~ 65000 seconds, 180=default, 0=disable
Pair-Connection Settings (Client/Server Mode)	Current	Updated	Comment
Application Mode	Server	Client	Server=Slave, Client=Master
Remote Server IP	Disable	0 . 0 . 0 . 0	Required on client-mode.
Remote TCP Port	Disable	500	Required on client-mode.
		Submit	

Figure 6-12

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Step 4: Testing the Pair-connection (TCP Client Mode) Functions

1. Install **SocketTest (TCP/IP Test Server program)** on your PC.
   The download link is shown as below:

   https://sockettest.sourceforge.net/

2. Run the SocketTest program.

3. Click the **"Socket"** tab, Enter 500 into the port field, and then click **"Start Listening"**.

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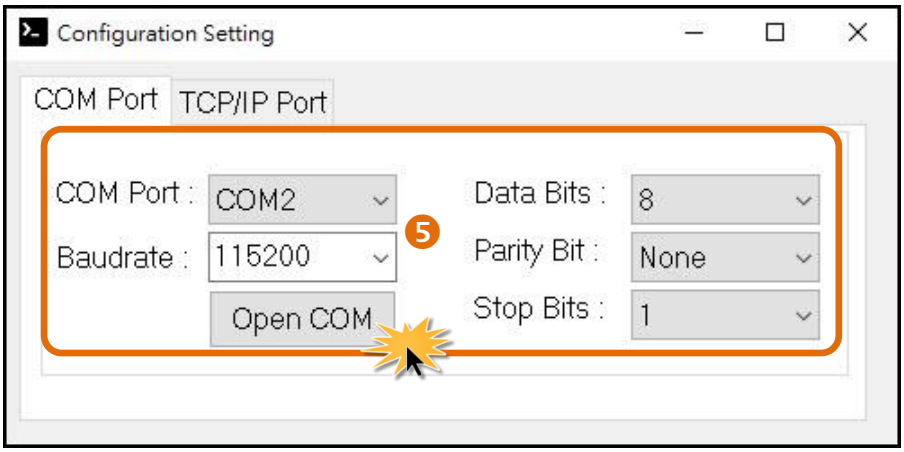
4. Run **VxComm Utility**, go to the **Servers** page, select the tDS-700 / DS-2200 module name in the Servers list, then click the desired COM Port number in the right-hand panel. From the right-click menu, choose “Open COM Port”.
5. Select the appropriate Baud Rate from the dropdown menu, then click the “**Open COM**” button.



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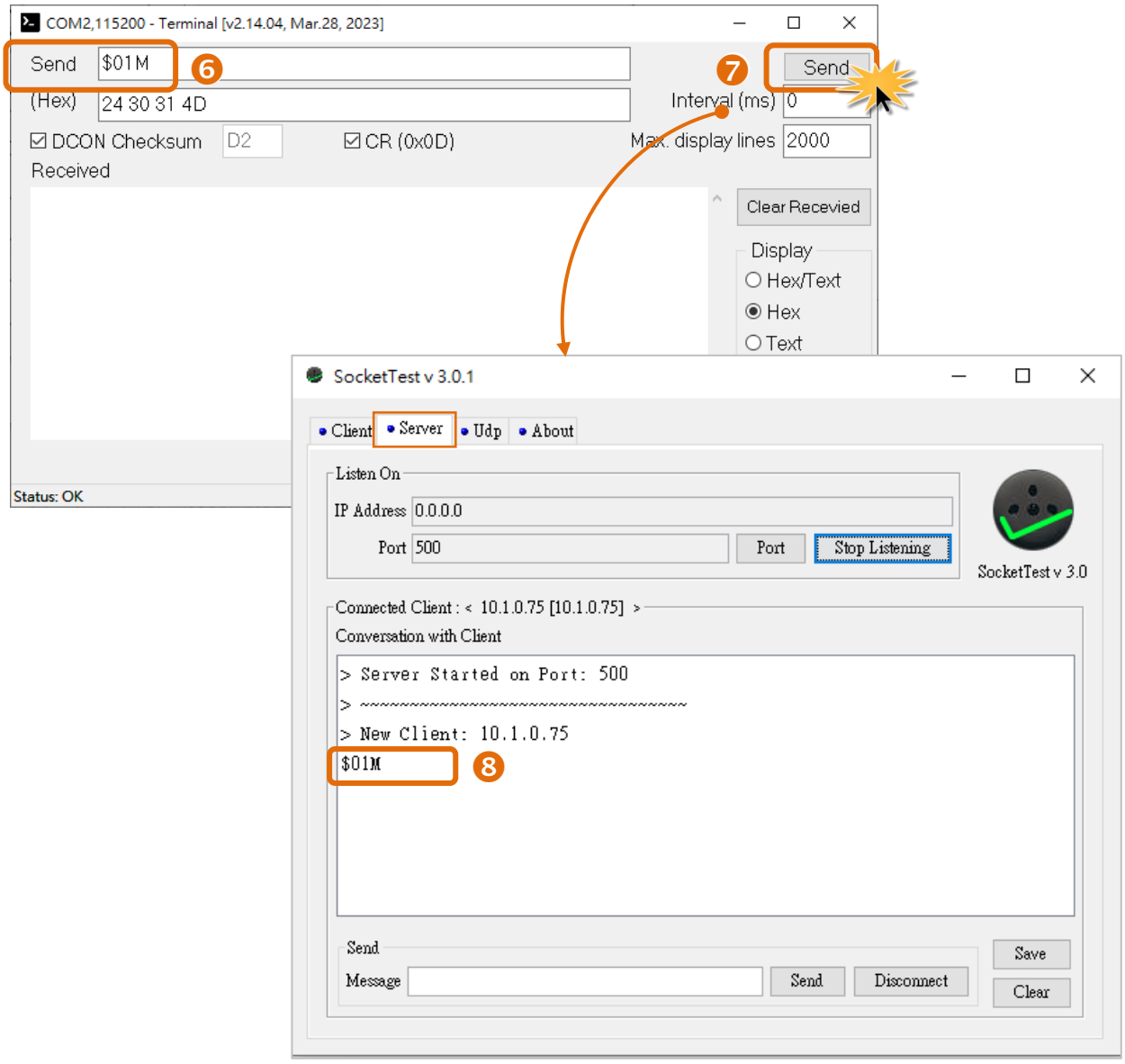
6. Enter a string (e.g., $01M) in the send field on the COMx Terminal (PC#1) dialog.
7. Then click the “Send” button to transmit the message.
8. The “**Conversation with Client**” panel on the Server page of the SocketTest will display the received string.



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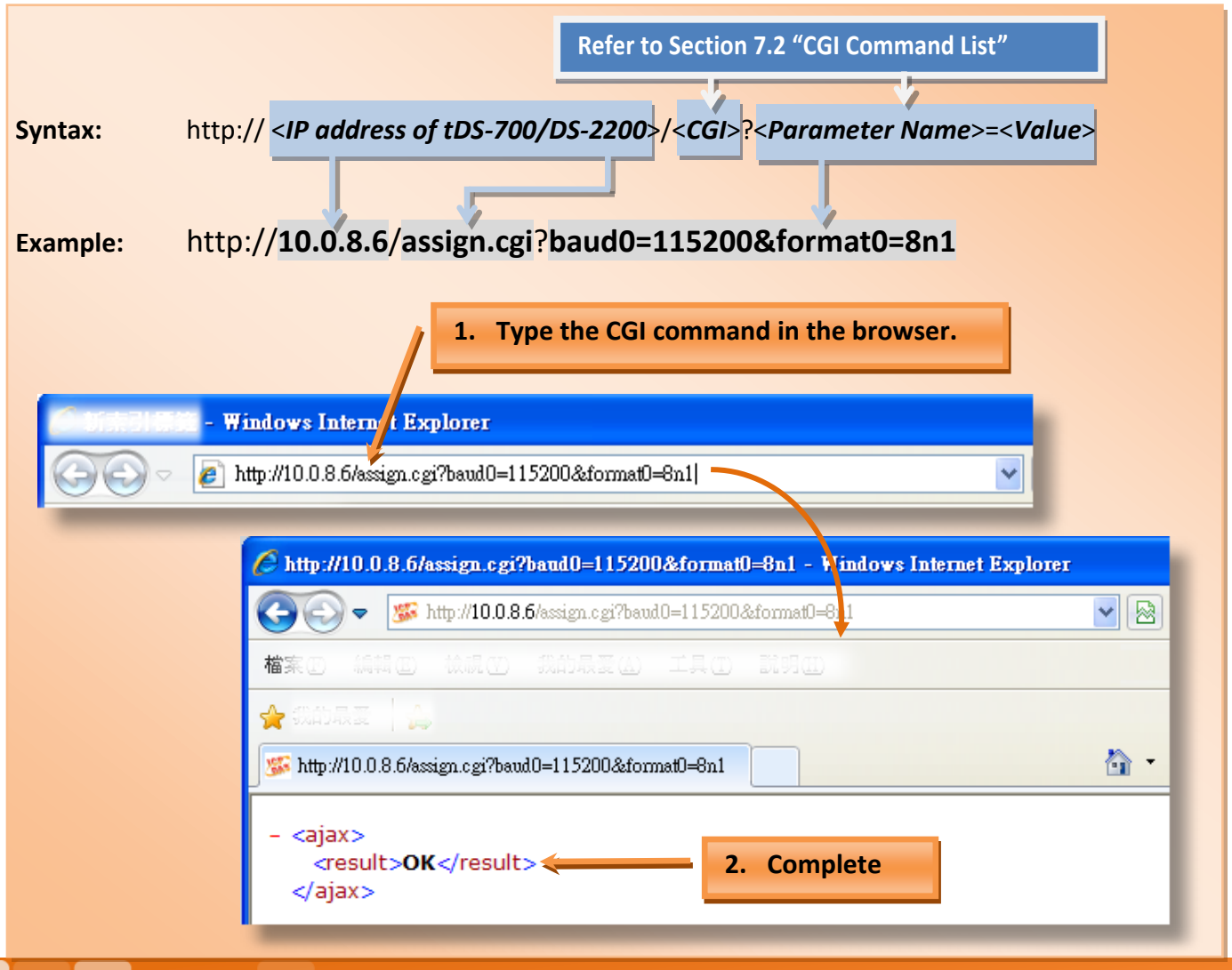
7. CGI Configuration

The tDS-700/DS-2200 series can be configured via convenient URL commands. This section lists the commands in URL format corresponding to the basic functions of tDS-700/DS-2200. Please make sure you have correctly configured the network settings for the tDS-700/DS-2200 before using CGI configuration. (Please refer to Chapter 3 "Getting Started for tDS-700 series", Chapter 4 "Getting Started for DS-2200 series" about the Ethernet settings.)

7.1 CGI URL Syntax

Type the CGI URL syntax in the browser, as follows:



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7.2 CGI Command List

Network Settings				
No.	**Function Name**	**Parameter Name**	**Value Constraint**	**CGI**
01	Set Address Type	dhcp	0,1 0: Disable; 1: Enable;	assign.cgi
02	Set IP Address	ip	xxx.xxx.xxx.xxx	
03	Set Gateway	gway	xxx.xxx.xxx.xxx	
04	Set Net Mask	mask	xxx.xxx.xxx.xxx	
05	Set TCP Command Port	cmdport	1~65535 Default: 10000	
06	Set Command Port Timeout (Socket Watchdog)	cmdwdt	1~65535 seconds, Default: 30; Disable: 0;	
07	Set MAC Address	mac	Format: FF-FF-FF-FF-FF-FF	
08	Set Alarm IP Address(UDP)	aip	xxx.xxx.xxx.xxx	
09	Set Alarm Port(UDP)	aport	1~65535 seconds, Default: 30; Disable: 0;	

General Configuration Settings				
No.	**Function Name**	**Parameter Name**	**Value Constraint**	**CGI**
01	Set Alias Name	aliname	Max. 18 chars	assign.cgi
02	Set System Timeout	syswdt	30 ~ 65535 seconds, Default: 300; Disable: 0	

Filter Settings				
No.	**Function Name**	**Parameter Name**	**Value Constraint**	**CGI**
01	Add IP to List (white list)	fip0 ~ fip4 fipm0 ~ fipm4 (mask)	xxx.xxx.xxx.xxx	assign.cgi
02	Delete IP#	delfip	0 ~ 4	
03	Delete All	delfip	all	

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Serial Port Settings				
No.	**Function Name**	**Parameter Name**	**Value Constraint**	**CGI**
01	Set Baud Rate	baud0 & baud1	(bits/S)	assign.cgi
02	Set Data Format	format0 & format1	8n1 Data bits: 5 ~ 8; Parity: n, e, o, m, s; Stop bits: 1, 2;	
03	Set Flow Control	flow0 & flow1	0,1 0: None; 1: CTS/RTS	
04	Set Dynamic Serial Setting	dyna0 & dyna1	0,1 0: Disable; 1: Enable	
05	Set Serial Ending Chars	endchr0 & endchr1	Number[,char1][,char2]	
06	Set Operation Mode	opmode0 & opmode1	0,1	
07	Set Slave Timeout	slto0 & slto1	(ms)	
08	Set Data Buffer Delay Time	dbdt0 & dbdt1	(ms)	
09	Set Packing Length	Packlen0 & packlen1	0 ~ 255 bytes	
10	Set TCP Timeout	tto0 & tto1	1~65535 seconds, Default: 180; Disable: 0	

Restore Factory Defaults				
No.	**Function Name**	**Parameter Name**	**Value Constraint**	**CGI**
01	Reboot	-	-	Reboot.cgi
02	Reset To Factory	-	-	Reset.cgi

Queries Setting Status					
No.	**Function Name**	**Access Method**	**Parameter Name**	**Value Constraint**	**CGI**
01	Get module status.	-	-	-	status.cgi
02	Get the serial port configuration information.	-	-	-	conf_port.cgi
03	Get the network configuration information.	-	-	-	conf_net.cgi

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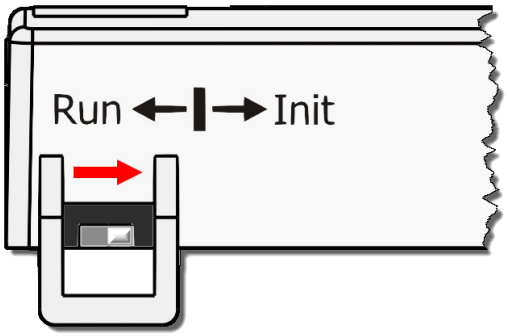
Appendix A: Troubleshooting

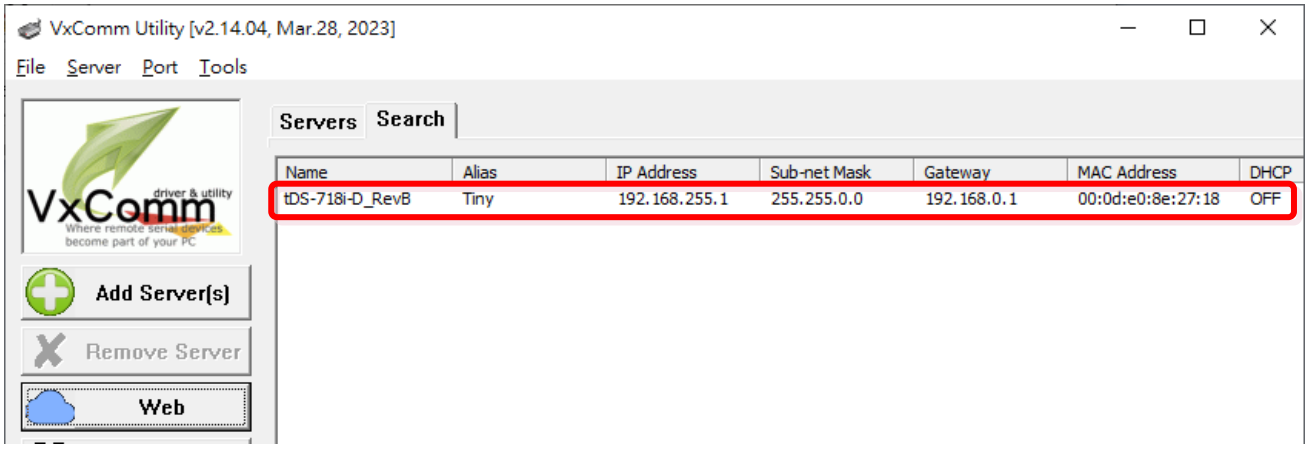
A1. How do I restore the web password for the module to the factory default password?

The instructions below outline the procedure for resetting the web password to the factory default value. **Note:** Be aware that **ALL** settings will be restored to the factory default values after the module is reset.

Step 1 Locate the Init/Run switch that can be found on the right-hand side of the tDS-700/DS-2200 module and set it to the **"Init"** position. Reboot the module to **load factory default settings** including default web password.



Step 2 Execute either the VxComm Utility or the eSearch Utility to search for any tDS-700/DS-2200 modules connected to the network. Verify that the tDS-700/DS-2200 has been reset to the original factory default settings. For example, the module should be shown as having the default IP address, which is 192.168.255.1.



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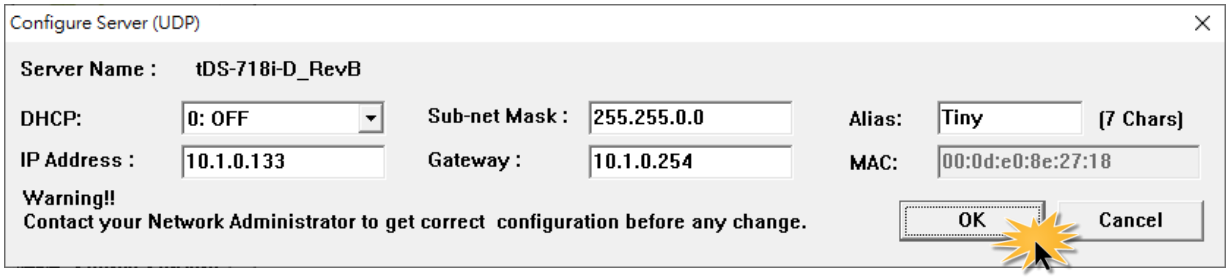
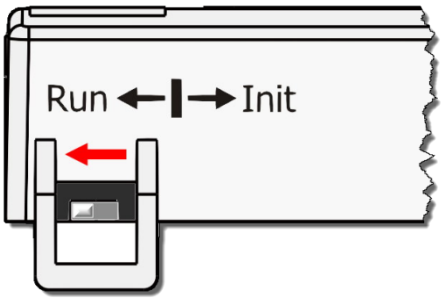
Step 3 Double-click the name of the module to open the Configure Server (UDP) dialog box, and modify the basic settings as necessary, e.g., the IP, Mask and Gateway addresses, and then click the **"OK"** button to **save the new settings**.

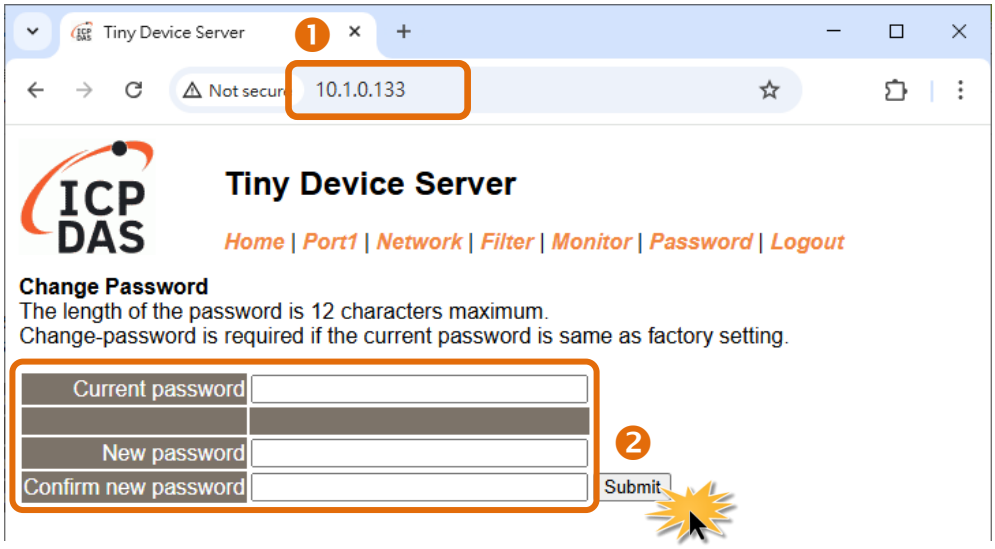




Step 4 Reset the Init/Run switch on the tDS-700/DS-2200 module to the **"Run"** position and reboot the device.

Step 5 Log in to the tDS-700/DS-2200 web configuration interface.

Note: You will be prompted to change your password, just like when you are login for the first time. The default current password is "**admin**".



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Appendix B: Glossary

1. ARP (Address Resolution Protocol)

The Address Resolution Protocol (ARP) is a telecommunication protocol that is used to convert an IP address to a physical address, such as an Ethernet address.

Consider two machines A and B that share the same physical network. Each has an assigned IP address IP_A and IP_B, and a MAC address, MAC_A and MAC_B. The goal is to devise a low-level software application that hides the MAC addresses and allows higher-level programs to work only with the IP addresses. Ultimately, however, communication must be carried out by the physical networks using whatever MAC address scheme the hardware supplies.

Suppose machine a wants to send a packet to machine B across a physical network to which they are both attached, but an only has the Internet address for B, IP_B. The question arises: how does A map that address to the MAC address for B, MAC_B?

ARP provides a method of dynamically mapping 32-bit IP address to the corresponding 48-bit MAC address. The term dynamic is used since the mapping is performed automatically and is normally not a concern for either the application user or the system administrator.

2. Clients and Servers

The client-server paradigm uses the direction of initiation to categorize whether a program is a client or server. In general, an application that initiates peer-to-peer communication is called a client. End users usually invoke client programs when they use network services.

By comparison, a server is any program that waits for incoming requests from a client program. The server receives a request from a client, performs the necessary action sand returns the result to the client.

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3. Ethernet

The term Ethernet generally refers to a standard published in 1982 by Digital Equipment Corp., Intel Corp. and Xerox Corp. Ethernet is the most popular physical layer Local Area Network (LAN) technology in use today.

4. Firmware

Firmware is an embedded software program or set of instructions programmed on a device that provides the necessary instructions for how the device communicated with other computer hardware, and is located or stored in a semi-permanent storage area, e.g., ROM, EEPROM, or Flash memory. Firmware can often be updated by downloading a file from the manufacturer's web site or FTP.

5. Gateway

Computers that interconnect two networks and pass packets from one to the other are called Internet Gateways or Internet Routers. Gateways route packets that are based on the destination network, rather than the destination host.

6. ICMP (Internet Control Message Protocol)

ICMP provides a method of communicating between the Internet Protocol software on one machine and the corresponding software on another. It allows a gateway to send error or control messages to other gateways, or allows a host to diagnose problems with the network communication.

7. Internet

Physically, the Internet is a collection of packet switching networks interconnected by gateways that together with the TCP/IP protocol, allows them to perform logically as a single, large and virtual network. The Internet recognizes hosts using 32-bit IP address.

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8. IP (Internet Protocol) Address

Each interface on the Internet must have a unique IP address (also called an Internet address). These addresses are 32-bit numbers, and are normally written as four decimal numbers, one for each byte of the address for example "192.168.41.1**"**. This is called dotted-decimal notation.

9. MAC (Media Access Control) Address

To allow a computer to determine which packets are meant for it, each device attached to an Ethernet network is assigned a 48-bit integer known as its MAC address (also called the Ethernet address, the hardware address or the physical address). A MAC address is normally written as eight hexadecimal numbers, for example "**00:71:88:af:12:3e:0f:01**". Ethernet hardware manufacturers purchase blocks of MAC addresses and assign them in sequence as they manufacture Ethernet interface hardware. Thus, no two hardware interfaces can have the same MAC address.

10. Packet

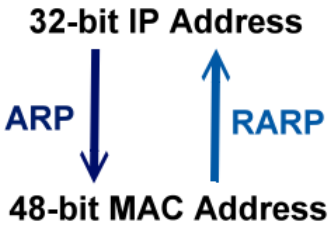
A packet is the unit of data sent across a physical network. It consists of a series of bits containing data and control information, including the source and the destination node (host) address, and is formatted for transmission from one node to another.

11. Ping

Ping is a network administration utility used to test the whether a host on an Internet network is active, and to measure the round-trip time for messages sent from the originating host to a destination computer. Ping operates by sending an ICMP echo request message to a host, expecting an ICMP echo reply to be returned. Normally, if a host cannot be pinged, Telnet or FTP cannot be used to connect to the host. Conversely, if Telnet or FTP cannot be used to connect to a host, Ping is often the starting point to determine the nature of the problem.

12. RARP (Reverse Address Resolution Protocol)

RARP provides a method of dynamically mapping 48-bit MAC address to the corresponding 32-bit IP address. RARP has now been replaced by the Bootstrap Protocol (BOOTP) and the modern Dynamic Host Configuration Protocol (DHCP).



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13. Socket

Each TCP segment contains a source and destination port number that can be used to identify the sending and receiving application. These two values, along with the source and destination IP addresses in the IP header, uniquely identify each connection. The combination of an IP address and a port number is called a socket.

14. Subnet Mask

A Subnet mask, often simply called the “Mask”, is a 32-bit number that masks and IP address, and divides the IP address into the network address and the host address. Given its own IP address and its subnet mask, a host can determine whether a TCP/IP packet is destined for a host that is (1) on its own subnet, or (2) on a different network. If (1), the packet will be delivered directly; otherwise it, will be delivered via a gateway or a router.

15. TCP (Transmission Control Protocol)

TCP is a set of rules used in combination with the Internet Protocol to send data in the form of message units between computers over the Internet. TCP provides a reliable flow of data between two hosts and is associated with tasks such as dividing the data passed to it from an application into appropriately sized chunks for the network layer below, acknowledging received packets, setting timeouts to make certain that the other end acknowledges packets that are sent, and so on.

16. TCP/IP

The Transmission Control Protocol (TCP) and the Internet Protocol (IP) is standard network protocols that are almost always implemented and used together in a formation are known as TCP/IP. TCP/IP can be used to communicate across any set of interconnected networks.

17. UDP (User Datagram Protocol)

UDP is an internet protocol that provides a much simpler service to the application layer as it only sends packets of data from one host to another, but there is no guarantee that the packets will reach the destination host. UDP is suitable for purposes where error checking and correction is either not necessary or is performed in the application.

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Appendix C: Actual Baud Rate Measurement

Ideal Baud Rate (bps)	Actual Baud Rate (bps)	Error
50	50	0.00%
110	109.92	0.07%
300	298.48	0.51%
600	597.04	0.49%
1200	1197.6	0.20%
2400	2395.2	0.20%
4800	4790.4	0.20%
9600	9568.0	0.33%
14400	14392	0.05%
19200	19136	0.33%
38400	38464	0.17%
57600	57552	0.08%
115200	114960	0.21%
128000	128240	0.18%
230400	229920	0.21%
250000	250000	0.00%
256000	256400	0.15%
460800	459760	0.22%
921600	921600	0.00%

Note

Recommended max baud rate is 115200 bps or below. Because the loading of the module, we don't guarantee a proper operation if using a larger buad rate (over 115200 bps).

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Appendix D: Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
2.4	Jul. 2025	Updated user interface.
2.3	Jun. 2020	Added the software and hardware information about the DS-2200 Series.
2.2	Aug. 2018	Added the software and hardware information about the tDS-718i-D.
2.1	Mar. 2018	Remove the package CD.
2.0	Aug.2017	Added Chapter Appendix A: Troubleshooting. Added Chapter Appendix D: Revision History.
1.9	Feb.2017	Added the software and hardware information about the tDSM-712 and tDS-712i/722i/732i/715i/725i/735i/718i/724i/734i.
1.2	Jan. 2011	Added the software and hardware information about the tDS-724/734.
1.1	Dec. 2010	Added the software and hardware information about the tDS-712/722/732/715/725/735/718.
1.0	Jul. 2010	Initial issue

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