Tiny Serial Port Converter/Sharer

tSH-700 Series

Tiny Serial Port Sharer

CE FC RoHS PoE
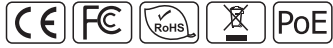
tSH-700 series

Features ▶▶▶▶

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

- Raw data mode for most query-response protocols
- Built-in web server for easy configuration (HTTP)
- Allows automatic RS-485 direction control
- Power or Signal isolation for i versions
- ±4 kV ESD protection

Introduction

Following the success of the original tGW-700/tDS-700 modules, ICP DAS has continued to develop new functions for these products in order to provide increased support for a greater number of applications. The tGW-700 modules are Modbus TCP-to-Serial gateway, while the tSH-700 modules are Serial Port Sharers working as Serial-to-Serial converters. The tSH-700 module provides a number of functions, including "Baud Rate Conversion", "Modbus RTU/ASCII Conversion" and "Two Masters Share One Slave". The built-in web server provides easy configuration interface, and no console commands are required.

• Baud Rate Conversion:

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


• Modbus RTU/ASCII Conversion:

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


• Two Masters Share One Slave:

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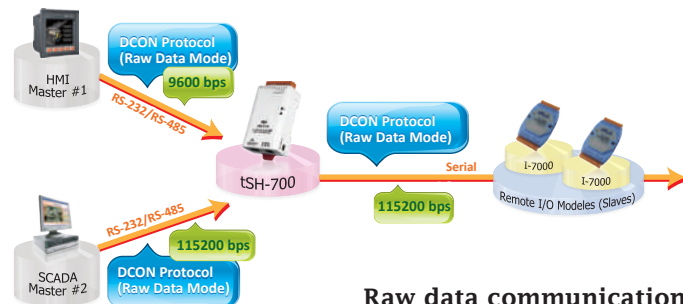
Raw data communication

• Read-Cache Function:

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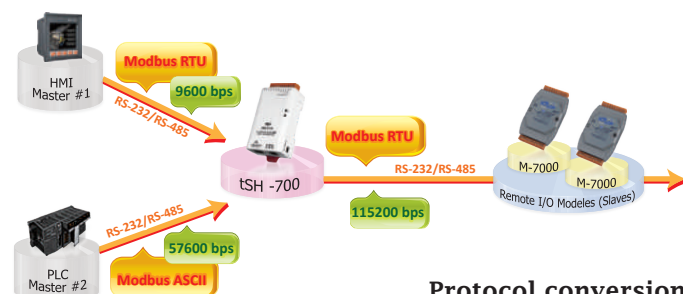
Protocol conversion

Applications
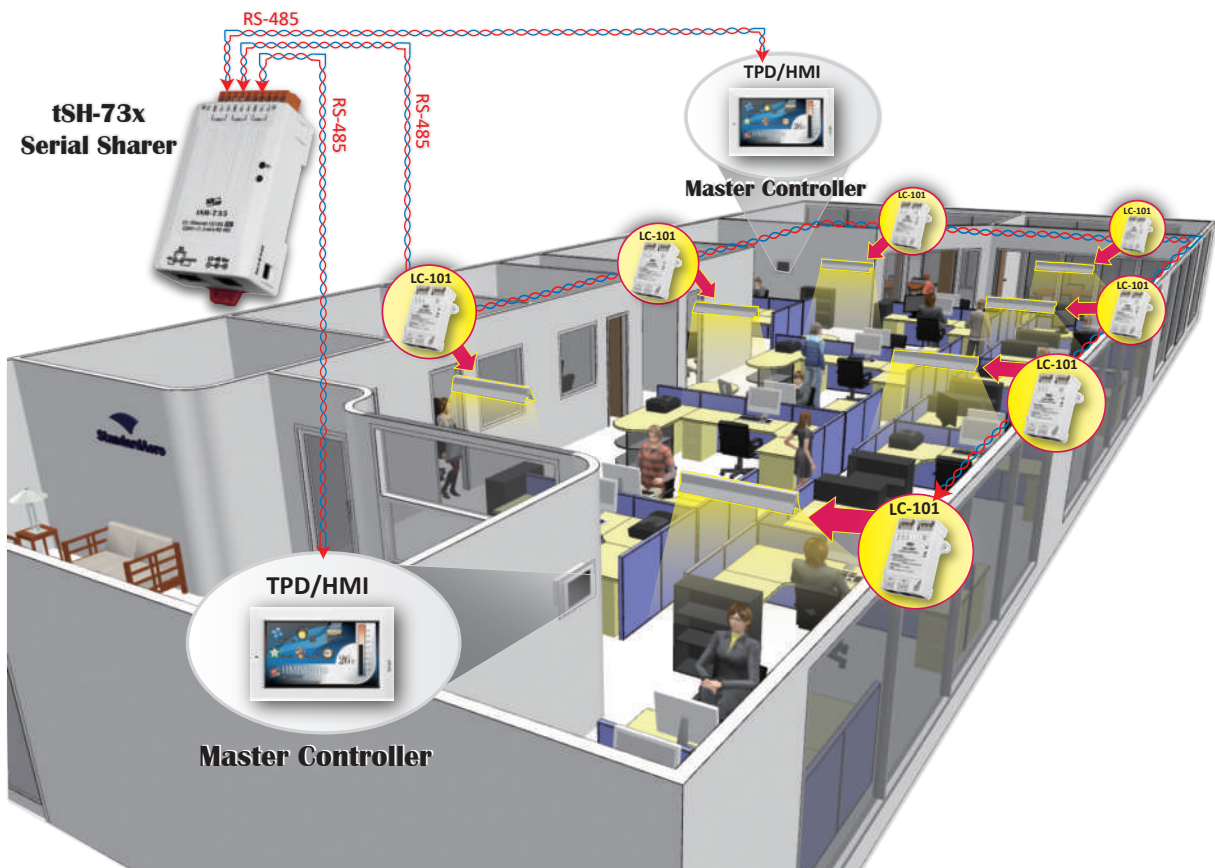
Accessing a Process Controller from Local Panel and Control Center
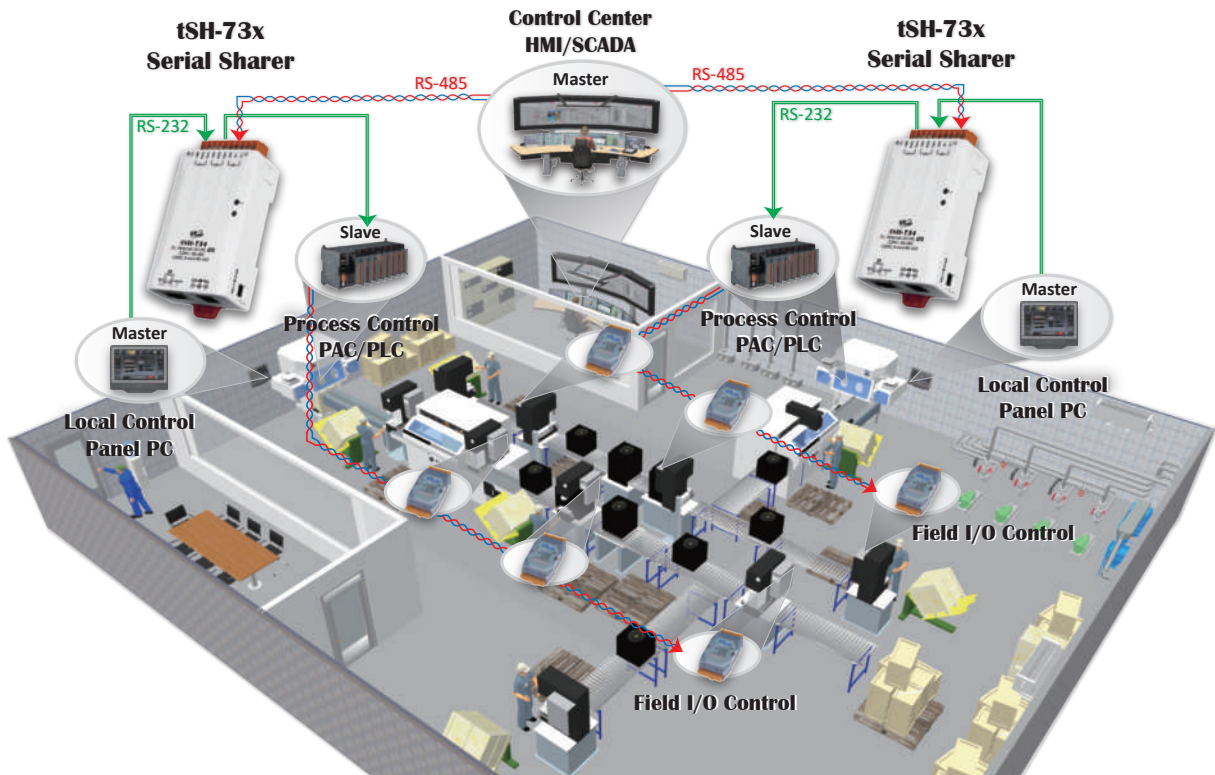
### Control Office Lightings from Two HMI Devices (Masters) in Different Places

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Serial Device Server

System Specifications

Models	tSH-722 tSH-722i	tSH-732 tSH-732i	tSH-725 tSH-725i	tSH-735 tSH-735i	tSH-724 tSH-724i	tSH-734 tSH-734i
System						
CPU	32-bit MCU					
Communication Interface						
Ethernet	10/100 Base-TX, 8-pin RJ-45 x 1, (Auto-negotiating, Auto-MDI/MDIX, LED indicator)					
PoE	IEEE 802.3af, Class 1					
COM Port	2 × RS-232	3 × RS-232	2 × RS-485	3 × RS-485	1 × RS-485 1 × RS-232	1 × RS-485 2 × RS-232
Self-Tuner	–		Yes, automatic RS-485 direction control			
Power Isolation	**1000 V_{DC} for only tSH-722i/ 732i**					
Signal Isolation	**3000 V_{DC} for only tSH-725i/ 735i /724i /734i**					
ESD Protection	+/-4 kV					
COM Port Capability (16C550 or compatible UART)						
Baud Rate	115200 bps Max.					
Data Bit	5, 6, 7, 8					
Parity	None, Odd, Even, Mark, Space					
Stop Bit	1, 2					
Power						
Power Input	IEEE 802.3af, Class 1 for PoE; +12 ~ 48 VDC for DC Jack					
Power Consumption	0.07 A @ 24 V$_{DC}$					
Mechanical						
Connector	10-pin Removable Terminal Block x 1					
Dimensions (W x H x D)	52 mm x 95 mm x 27 mm					
Installation	DIN-Rail mounting					
Case	Plastic					
Environment						
Operating Temperature	-25 °C ~ +75 °C					
Storage Temperature	-30 °C ~ +80 °C					
Humidity	10 ~ 90% RH, non-condensing					

Pin Assignments
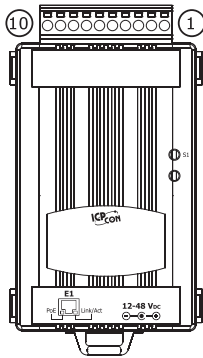
tSH-722/tSH-722i				tSH-732/tSH-732i				tSH-735/tSH-735i		
	10	F.G.			10	F.G.			10	F.G.
	09	CTS2			09	GND			09	GND
COM2	08	RTS2		COM3	08	RxD3		COM3	08	D3-
	07	RxD2			07	TxD3			07	D3+
	06	TxD2			06	GND			06	GND
	05	GND		COM2	05	RxD2		COM2	05	D2-
	04	CTS1			04	TxD2			04	D2+
COM1	03	RTS1			03	GND			03	GND
	02	RxD1		COM1	02	RxD1		COM1	02	D1-
	01	TxD1			01	TxD1			01	D1+

tSH-725/tSH-725i				tSH-724/tSH-724i				tSH-734/tSH-734i		
	10	F.G.			10	F.G.			10	F.G.
	09	N/A			09	N/A			09	GND
	08	N/A			08	CTS2		COM3	08	RxD3
	07	N/A			07	RTS2			07	TxD3
	06	GND		COM2	06	GND			06	GND
COM2	05	D2-			05	RxD2		COM2	05	RxD2
	04	D2+			04	TxD2			04	TxD2
	03	GND			03	GND			03	GND
COM1	02	D1-		COM1	02	D1-		COM1	02	D1-
	01	D1+			01	D1+			01	D1+

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Serial Device Server

Dimensions (Unit: mm)

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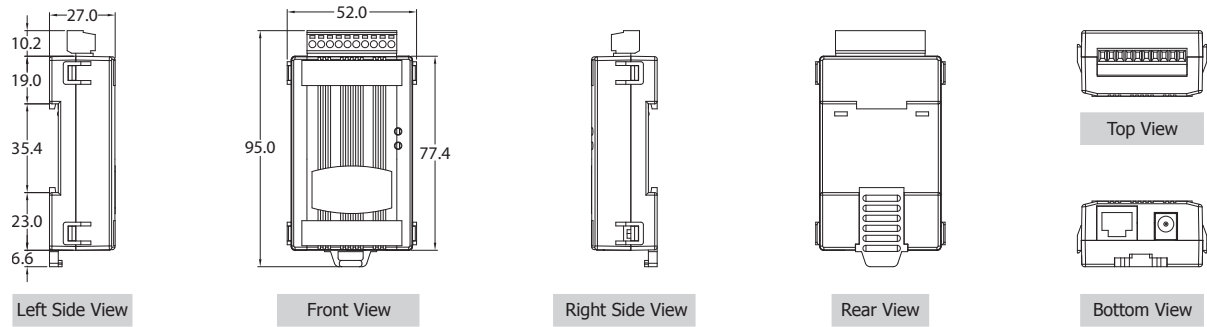
Ordering Information

Non-Isolated	Isolated	Serial Port Sharer: Includes one CA-002 cable.
tSH-722 CR	tSH-722i CR	Tiny Serial Port Sharer with PoE and 2 RS-232 Ports (RoHS)
tSH-732 CR	tSH-732i CR	Tiny Serial Port Sharer with PoE and 3 RS-232 Ports (RoHS)
tSH-725 CR	tSH-725i CR	Tiny Serial Port Sharer with PoE and 2 RS-485 Ports (RoHS)
tSH-735 CR	tSH-735i CR	Tiny Serial Port Sharer with PoE and 3 RS-485 Ports (RoHS)
tSH-724 CR	tSH-724i CR	Tiny Serial Port Sharer with PoE, 1 RS-485 and 1 RS-232 Ports (RoHS)
tSH-734 CR	tSH-734i CR	Tiny Serial Port Sharer with PoE, 1 RS-485 and 2 RS-232 Ports (RoHS)

Accessories

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

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

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

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

CA-PC09F
DB-9 Female Connector with Plastic Cover

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

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

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

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

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

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Serial Device Server