

Wiring the tSH-735 Modbus Multiplexer / Port Sharing Module

This device allows two Modbus masters to share one downstream slave network. As delivered, all three ports are configured for 9600 8N1 RS485 serial interface.

Communication port 1 goes to the Omni device, Communication port 2 goes to the Annunciator/BMS, and Communication port 3 is set for the Genset Control.

If these settings are not appropriate for your application, they can be edited by plugging the device into your network, on the same subnet as your computer, and running the application contained in the CD included with the device.

The device accommodates different baud rates, so feasibly the two masters could operate at entirely different baud rates from the slaves. Obviously, all the slaves must have the same serial settings and the Com Port 3 must match those devices.



Be sure to pay attention to the Data + / Data - polarity. It won't work at all if you cross connect. Most applications don't require shields but do use twisted pair wires for noise immunity. No connection to the GND pins on the ports is required.

OmniMetrix devices use the following RS485 Color Code: White Wire = Data + Green Wire = Data –





To set up the tSH-735 Serial Port Sharer, install the eSearch Utility found on the ICP-DAS web site... https://www.icpdas-usa.com/software/esearch.zip

Power up the device and plug it into your office Ethernet network near your workstation computer so that both will be on the same subnet.

Click on the SEARCH SERVER button and the utility should find the device, with a 192.168... style address.

af eSearch Utility [v1.1.13, Nov.29, 2016]					
<u>File S</u> erver <u>T</u> ools					
Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address
tSH-735_RevB	Tiny	192.168.255.1	255.255.0.0	192.168.255.1	00:0d:e0:80:95:ca
	Search	-List window, Right-Click	(for popup menu		
<					>
🙀 Search Se	erver Co	nfiguration (UDP)	🚺 Web	Exit	
Status					1.

Double click on the tSH-735 item in the above window and it should present the window below:

Configure Server	(UDP)					×
Server Name :	tSH-735_RevB					
DHCP:	0: OFF 💌	Sub-net Mask :	255.255.0.0	Alias:	Tiny	
IP Address :	192.168.255.1	Gateway :	192.168.255.1	MAC:	00:0d:e0:80	:95:ca
Warning!! Contact your Network Administrator to get correct configuration before any changing! OK Cancel						

Change DHCP to ON and click OK.

Configure Server	(UDP)					
Server Name :	tSH-735_RevB					
DHCP:	1: ON	Sub-net Mask :	255.255.0.0	Alias:	Tiny	
IP Address :	192.168.255.1	Gateway :	192.168.255.1	MAC:	00:0d:e0:80	1:95:ca
Warning!! Contact your Network Administrator to get correct configuration before any changing! OK Cancel						



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Go back to the prior screen and click on SEARCH SERVER, again. This time it will likely come up with an IP 10.x.x.x Address (or an address similar to the address of your computer).

🥩 eSearch Utility [v1.1.13, Nov.29, 2016]					
<u>File S</u> erver <u>T</u> ools					
Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address
tSH-735_Re∨B	Tiny	10.0.0.190	255.255.0.0	10.0.0.1	00:0d:e0:80:92:a§
		Search-List wind	ow, Right-Click for po	pup menu	
<					
Search Se	rver Con	figuration (UDP)	0 Web	Exit	
Status					1.

In your browser (you can click the **WEB** button above to invoke the browser), browse to the IP Address now assigned to the device. It should look like this...

U Opera			
http://ftp.icpdas.com/pu × STiny Serial Port Shar	rer × 🕇		·
← → 2 ⊶ S Web 10.0.0.190		۲	Search with Google
Tiny Serial Home Applicatio	Port Sharer (tSH-700 Revi	3) Setting Filter Monitor Change Pas:	sword Logout
Model Name:	tSH-735_RevB	Alias Name:	Tiny
Firmware Version:	B1.4.3 [Aug.17 2016]	MAC Address:	00-0d-e0-80-92-a9
IP Address:	10.0.0.190	TCP Command Port:	10000
Initial Switch:	OFF	System Timeout: (Network Watchdog, Seconds)	0
Current port settings:			
Port Settings	Port 1	Port 2	Port 3
Baud Rate (bps):	115200	115200	115200
Data Size (bits):	8	8	8
Parity:	None	None	None
Stop Bits (bits):	1	1	1
Connected Device:	Master	Slave	Master
Protocol:	Modbus RTU	Modbus RTU	Modbus RTU
Char Timeout (bytes):	5	5	5
Port Watchdogs	Port 1	Port 2	Port 3
IX Idle (seconds):	0	U	0
RX Idie (seconds):	U	U	U
Application Settings:			×
		Copyright © 20	016 ICP DAS Co., Ltd. All rights reserved.
🗈 🜰 🙆 http://10.0.0.190/configAP.html			<u>م</u>



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Start by clicking on the pull down menu item **APPLICATION MODE** to get to this window...

ICP Tiny Serial Port	t Sharer
Home Application Mo with raw data; Mode 2: Modbus Sharer (2-to-1 or 1-to-1 half-duplex communication with Modbus RTU/ASCII conversion)	de Port1 Port2 Port3 Network Filter Monitor Password Logout Masterz Slave Devices Connected on : Port 1 Port 2 Port 3 Note: Most query-response protocols (like DCON, Modbus) can be used without conversion. HHT Modbus RTU B5-232/485 Nodbus ASCII FS-232/485 Port1 Port1 Port2 Port3 Nodbus RTU Modbus RTU Port1 Port1 Port2 Port3 Nodbus RTU Access Device Mode Device v Device Device Device Read/Write Read/W
Slave Timeout	200 - (60 - 65000 ms_step 10) Refer to Note1 below.
Slave Silent Time	0 (20 - 65000 ms, step 10, 0 = disable) Set to 200
Read-Cache Lifetime	0 (500 - 655000 ms, step 10, 0 = disable) Enable Modbus cache to keep the read requests until the lifetime.
Deferred Cache Deletion	[0 (500 - 655000 ms, step 10, 0 = disable) may set to 0 aster when it read cache only.
Virtual Modbus ID	1 to 247 (Available ID range: 0 to 255) Note: Sharer will skip the Modbus messages when its ID is NOT in the specified range.
Modbus ID Offset	0 (Offset= -255 to 255, No change=0) For example: Virtual ID = 1 to 10, offset = 10, then physical Slave ID = 11 to 20. Virtual ID = 31 to 40, offset = -10, then physical Slave ID = 21 to 30.
	Submit

Select MODE2, click PORT 3 as the SLAVE DEVICE, and reduce the Slave Timeout to 200. Set the READ CACHE and DEFERRED CACHE to 0.. Click the SUBMIT button. This will send you back to the prior screen...





Then click the PORT 1 tab from the menu bar...

🛡 Opera			
http://ftp.icpdas.com/pu >	🕼 Tiny Serial Port Sharer	× +	▼
← → ○ ○	Web 10.0.0.190		★) 🚼 マ Search with Google
DAS	Tiny Serial Po	ort Sharer (tSH-700 RevB)	
	Home Application w	iode Porti Porti Porti Network S	etting Fliter Wonitor Change Password Logout
	Model Name: ts	6H-735_RevB	Alias Name: Tiny MAC Address: 00.0d.e0.80.92.a9
	IP Address: 1	0.0.0.190	TCP Command Port. 10000
	Initial Switch: C	FF	System Timeout (Network Watchdog, Seconds)
Port 1 Settings		-	
	Port Settings	Current	Updated
	Baud Rate (bps):	115200	9600 🔽 bits/S
	Data Size (bits):	8	8 v bits/character
	Parity:	None	None 💌
	Stop Bits(bits):	1	1 💌
	CRC/LRC Confirm:	YES	YES 🗸
	Char Timeout (bytes)	5	5 (4 ~ 15, Default: 5)
	Port Watchdogs	Current	Updated
	TX Idle (seconds)	0	0 (20 ~ 65535, Disable: 0)
	RX Idle (seconds)	0	0 (20 ~ 65535, Disable: 0)
			Submit
			Copyright © 2016 ICP DAS Co., Ltd. All rights reserved.

Select the desired baud rate settings... typically 9600 or 19200 8N1. Click the **SUBMIT** button.

Repeat this step on PORT 2 and PORT 3, then navigate to the *Home Page*.

Note: The OMNI unit wants either 9600 or 19200 8N1. If the other connected devices, for example an annunciator or SCADA system and the Modbus slave want other baud rates, that is fine. The port sharing device allows all three ports to operate at different speeds, and the device manages the data flow accordingly.





The Home Page should now look like this...

U Opera						
http://ftp.icpdas.com/pu × 👺 Tiny Serial Port Sharer 🛛 🗙	+		~			
← → ⊃ ⊶ 🔇 Web 10.0.0.190		*	Search with Google			
Tiny Serial Port	Sharer (tSH-700 RevE	3)				
Home Application Mod	e Port1 Port2 Port3 Network	Setting Filter Monitor Change Passw	ord Logout			
Model Name: tSH-	735_RevB	Alias Name:	Tiny			
Firmware Version: B1.4	3 [Aug.17 2016]	MAC Address:	00-0d-e0-80-92-a9			
IP Address: 10.0.	0.190	TCP Command Port:	10000			
Initial Switch: OFF (Network Watchdog, Seconds) 0						
Current port settings:						
Port Settings	Port 1	Port 2	Port 3			
Baud Rate (bps):	9600	9600	9600			
Data Size (bits):	8	8	8			
Parity.	None	None	None			
Stop Bits (bits).	Mastor	1 Master	1 Slavo			
Protocol:	Modbus RTI I	Modbus PTLI	Modbus RTU			
Char Timeout (bytes):	5	5	5			
Port Watchdogs	Port 1	Port 2	Port 3			
TX Idle (seconds):	0	0	0			
RX Idle (seconds):	0	0	0			
Application Settings:						
Application Mode: 2 (Modbus Sharer - Half Duplex) Port for Slave Device: 3 Slave Timeout (ms); 500 Read Cache (ms); 980 Modbus ID Range: 1 to 247						
		Copyright © 201	6 ICP DAS Co., Ltd. All rights reserved.			

Click LOGOUT and go back to the eSearch Utility, which should look something like this...

🥩 eSearch Ut	ility [v1.1.13, N	ov.29, 2016]			
<u>File S</u> erver <u>T</u> o	ols				
Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address
tSH-735_Rev	/B Tiny	10.0.0.190	255.255.0.0	10.0.0.1	00:0d:e0:80:92:a9
1					
			(
Searc	h Server Co	nfiguration (UDP)	🚺 Web	Exit	
Status					



Double click on the device in the window above, and change DHCP back to OFF.

Put the 192.x.x.x values shown below back into the IP Address and Gateway and click OK. (*This step is optional.*)

Configure Server	(UDP)				
Server Name :	tSH-735_RevB				
DHCP:	0: OFF 💌	Sub-net Mask :	255.255.0.0	Alias:	Tiny
IP Address :	192.168.255.1	Gateway :	192.168.255.1	MAC:	00:0d:e0:80:92:a9
Warning!! Contact your Network Administrator to get correct configuration before any changing! OK					

As a final sanity check, power down the device and then power up and search for the device again, and confirm the configuration. <u>Do not</u> go in the field without double checking!!!

🍜 eSearch Utility [v1.1.13, Nov. 29, 2016]					
<u>File S</u> erver <u>T</u> ools					
Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address
tSH-735_Re∨B	Tiny	192.168.255.1	255.255.0.0	192.168.255.1	00:0d:e0:80:92:a
<					>
Search Se	rver Con	figuration (UDP)	0 Web	Exit	
Status					

All done!

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ADDENDUM: Point to Point / Non-Network Configuration

If you must do this configuration in the field with no network / DHCP option, you can do so by connecting an ethernet cable between the device and your network. This will require that the device and the laptop have IP addresses that are on the same subnet.

You can use the E-SEARCH by direct connection, and this will tell you the IP Address the device has... 192.168.255.1 / 255.255.0.0 in the example above. You will need to set your laptop's ethernet (not WiFi) IP Address to something like 192.168.255.2 / 255.255.0.0 in order to browse into the device. If you don't know how to do this, contact your in-house desktop support / IT support... do not contact OmniMetrix for this support.

