

Set up guide to communicate with Sun chamber using an S2W232 serial to WIFI adapter

There are 2 types of connections that can be made.

1. AP (Access Point) mode - Connect your PC's WIFI to the S2W232 adapter for 1 on 1 communication between your PC and chamber.
 - In this mode, your PC's wifi adapter will connect to the S2W232 serial adapter allowing communication with the chamber. If you are using your wifi adapter to access the internet, you will not be able to access the internet while connected to the adapter. This mode is ideal for a computer, phone or tablet that is dedicated solely for communication with the chamber.
2. STA (Station) mode - connect the S2W232 adapter to a wireless network to control multiple adapters (chambers).
 - This way of connecting will allow your PC's wifi to maintain access with your wifi router as well as allow you to add multiple adapters to your network to communicate with multiple chambers with one PC. You will need to know the IP address that was assigned to each adapter to create a virtual COM port. To find out the adapter's IP address, you can log into your router or download a free IP scanner such as [Advanced IP Scanner](#).

This guide shows the steps required for operating the S2W232 device in AP mode.

Summary of steps:

1. Supply power to the S2W232 device.
2. Connect the S2W232 device to the chamber.
3. Set switch to DTE on S2W232.
4. Press reset button to restore device to default settings (if state of device unknown).
5. Use a browser to access the device settings at 192.168.0.3.
6. Open a browser and go to the device's IP address.
7. Enter serial port settings and choose a port number such as 5000 for the device.
8. Download, install and run [VCOM](#) software to create a virtual COM port.
9. Open the terminal software of your choice (e.g TeraTerm, [coolTerm](#) from this [website](#)) to begin communicating with the chamber through the COM port created with VCOM.

Detailed setup guide:

Parts required:

1. Sun EC1x Chamber.
2. [S2W232E-ESP32](#) Serial to WIFI adapter with 5Vdc power supply.
3. A 3 wire, DB9 female to DB25 male (connects to adapter) to DB25 male (connects to chamber) cable to connect the adapter to the EC1x chamber.

This cable can be manufactured yourself and wired as follows:

DB9 connector (female)
Connects to adapter

DB25 connector (male)
connects to chamber

Pin #3 (TXD) >-----> Pin #3 (RXD)
Pin #2 (RXD) <-----< Pin #2 (TXD)
Pin #5 (GND) <-----> Pin #7 (GND)

Alternatively, this cable can be purchased from Sun (Sun part:930026).

Software required:

1. [VCOM](#) program to add a virtual port
2. RS232 software such as [TC10RS232Demo](#), [TeraTerm](#) or [Access Port](#)

Detailed instructions for the quick start guide above:

1. Supply power to the S2W232 device.
 - The S2W232 device can receive power in three ways.
Through the mini USB connector using a 5Vdc, 1A adapter, by supplying 5-40Vdc to the 2 position terminal or to pin 9 of the device's DB9 port. Only one power source should be applied at a time. The red LED should light up when power is applied and the blue 'link' LED will blink when the adapter is not connected.
2. Connect the S2W232 device to the chamber.
 - Connect the device to the chamber by using either a 3 wire cable or DB9-F to DB25-M adapter board wired in a NULL MODEM configuration as shown below:
DB9 connector (female) DB25 connector (male)
Connects to S2W232 device connects to Sun chamber

Pin #3 (TXD) >-----> Pin #3 (RXD)
Pin #2 (RXD) <-----< Pin #2 (TXD)
Pin #5 (GND) <-----> Pin #7 (GND)

The cable or adapter board can be manufactured by the user or purchased from Sun.

3. Make sure that the DTE/DCE switch on the S2W232 device is set to DTE.
4. If the state of the device is unknown, you can restore it to factory default settings by using a paper clip to press the reset button.
 - The network default settings of the device after reset are:
 - AP mode with DHCP disabled
 - SSID: S2W232-abcd (abcd is the last 4 numbers of the MAC address)
 - TCP Server mode

- IP: 192.168.0.3
 - Socket port: 5000
 - Log in ID: admin Log in password: admin
- Default COM port settings:
- Baud rate: 9600 bps
 - Data bit: 8
 - Parity: none
 - Stop bit: 1
 - Flow control: none
5. On your PC, click on the WIFI symbol on the lower right portion of the task bar to open the Windows WIFI connection manager and locate your adapter. It will start with S2W232 followed by a - and four more characters (e.g. S2W232-ba1g). Select the device and select connect.
 6. Open a web browser and type in the default IP address of the adapter. This address is: 192.168.0.3. This should bring up the login screen. Enter the following credentials:
Username: admin
Password: admin
 7. Select the BASIC tab to set the serial port settings as shown below. The port number in this example is 5000 and will be used when creating a virtual port.

The screenshot shows a web-based configuration interface with a top navigation bar containing tabs: Basic, Advanced, WIFI, WIFI Wizard, and Status. The 'Basic' tab is selected and highlighted in blue. Below the tabs, the 'Serial Settings' section is visible, containing the following fields:

- Data Baud Rate: 38400
- Data Bits: 8
- Data Parity: None
- Stop Bits: 2
- Flow Control: None (with a note: 'Only valid for RS232.')
- Modbus: None
- Serial Packet Time: 10 (with a range: '1~255(ms)')
- Serial Packet Length: 32 (with a range: '1~1460(byte)')

Below the Serial Settings is the 'Serial to Network Settings' section, containing the following fields:

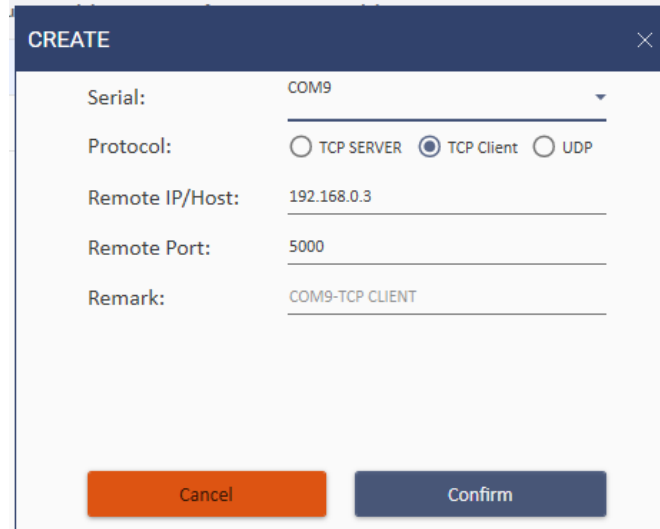
- Operation Mode: Socket
- Protocol: TCP
- Server/Client Mode: Server
- TCP Server Connections: 1
- Port Number: 5000 (with a note: 'Please enter an integer between 1024~65535.')

An 'Apply' button is located at the bottom right of the configuration area.

8. Go to the chamber and verify that the baud rate in the chamber's SDEF menu is the same as the S2W232 adapter's baud rate set earlier. While in the SDEF menu, set the

RS Char Echo to NO and set RS DTR-CTS to NO, then press ENTER until you exit the menu.

9. Next, download and install the VCOM software to create a virtual COM port.
10. Open the VCOM software and select create. Enter the settings as shown below. You can use any available COM port. COM9 was used in this example:



11. Click Confirm to create a virtual COM port.
12. Once the COM port is created, you can then use a terminal application such as CoolTerm, TeraTerm to communicate with the chamber. The TC10RS232Demo on Sun's website can be used for basic communication as well as simple charting and to upload/download local programs. This is all that is required to begin communicating with the chamber. When starting up the terminal program you have chosen, make sure to select the new COM port that was created and use the following settings if required by the application:

BAUD RATE: 38,400 (or same as selected in SDEF menu)
STOP BITS:2
DATA: 8 bits
PARITY:NONE
FLOW CONTROL:NONE

Useful links:

[Purchase the S2W232E-ESP32 adapter](#)
[S2W232E-ESP32 Quick Reference Guide](#)
[Detailed Setup Guide for the S2W232 adapter](#)
[Advanced IP Scanner](#)
[Access Port - Free terminal program](#)

Troubleshooting common issues

- Verify that the S2W232E-ESP32 adapter has power. The red LED on the device should be on.
- Use an ohmmeter to verify that the DB9 to DB25 cable is wired as shown below:

DB9 connector (female)
Connects to adapter

DB25 connector (male)
connects to chamber

Pin #3 (TXD) >-----> Pin #3 (RXD)

Pin #2 (RXD) <-----< Pin #2 (TXD)

Pin #5 (GND) <-----> Pin #7 (GND)

- Verify that the DTE/DCE switch on the S2W232E-ESP32 adapter is set to DTE.
- Make sure that the chamber has the same baud rate as the S2W232E-ESP32 adapter and that RS DTR-CTS is set to NO in the EC1x chamber's SDEF menu. If using the TC10RS232 Demo you will also need to set RS Char Echo to NO .
- The adapter's serial port settings and any software used to communicate with the chamber should have the following settings:
 - Baud rate: same as the chamber (check SDEF menu). STOP bits:2
 - DATA bits: 8
 - PARITY: NONE
 - FLOW CONTROL: NONE
- If you need to return the device to AP mode (i.e. return to 1 on 1 communication), log into the device, click on the ADVANCED tab, then click 'Reset to Default'. Then select the Basic tab to enter serial port settings. Using a paper clip to press the RESET button on the device will also restore the device to factory default settings.
- If errors are occurring when using TC10RS232 demo, open up the VCOM2 software and verify that CONFIG/SerialPackageSettings is set to:
 - SP time: 0ms
 - SP length:0
- Verify that your wireless network has "Obtain an IP address automatically" selected. Go to "Control Panel\All Control Panel Items\Network Connections", right-click wireless network and click "Properties". Select "Internet Protocol Version 4 (TCP/IPv4)" and click "Properties".
- This detailed [setup guide](#) from the mfg of the S2W232 serial to wifi device has more tips that can assist in troubleshooting issues with the adapter.
- There are also helpful links at the bottom of the [S2W232's web page](#) that include accessories, specs, source code and firmware updates.