Supply Partners
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Product Manual

RS485WIFI-PACK

Document Revision 1.6
Effective August 2021

ABOUT THIS MANUAL

This manual describes how to pair Supply Partners RS485 to Wi-Fi converters. Supply Partners sells the wireless kits already pre-programmed for your convenience, this manual should only be used if the settings have been set Incorrectly and require alterations.

Read this manual all the way through before you attempt installation and follow the instructions throughout the installation process.

If you are uncertain about any of the information described in this manual, contact Supply Partners for advice and clarification.

The information included in this manual is accurate at the time of publication. However the product specifications are subject to change without prior notice. In addition the illustrations in this manual are meant to help explain system configuration concepts and installation instructions. The illustrated items may differ from the actual items at the installation location

WARRANTY

This product is supplied with 12 months back-to-base manufacturer warranty.

RS485 to Wi-Fi Converter Usage

Many inverters and associated monitoring and metering components use Modbus RTU over RS485 for communications. RS485 to Wi-Fi converters enable these links to occur wirelessly. Replacing a section of RS-485 2 wi re cable.

Before You Begin

Installation Prerequisites

- Laptop/Smart Phone/Tablet with Wi-Fi for configuration (Mac – with Chrome or PC)
- Web browser

Note on RS-485 Cable. If using twisted pair do not connect a ground cable. If using coaxial shielded cable connect the shield to earth.

Bill of Materials

Component	Quantity
RS485-WIFI-2 Converters	2
6VDCPS (or similar 5-36Vdc power supply)	2
ANTENNA-DIREC	2

Cautions

This manual covers pairing two RS485-WIFI-2 converters using standard settings. Should you wish to configure these converters in a different way, or configure other models, please consult with Supply Partners.

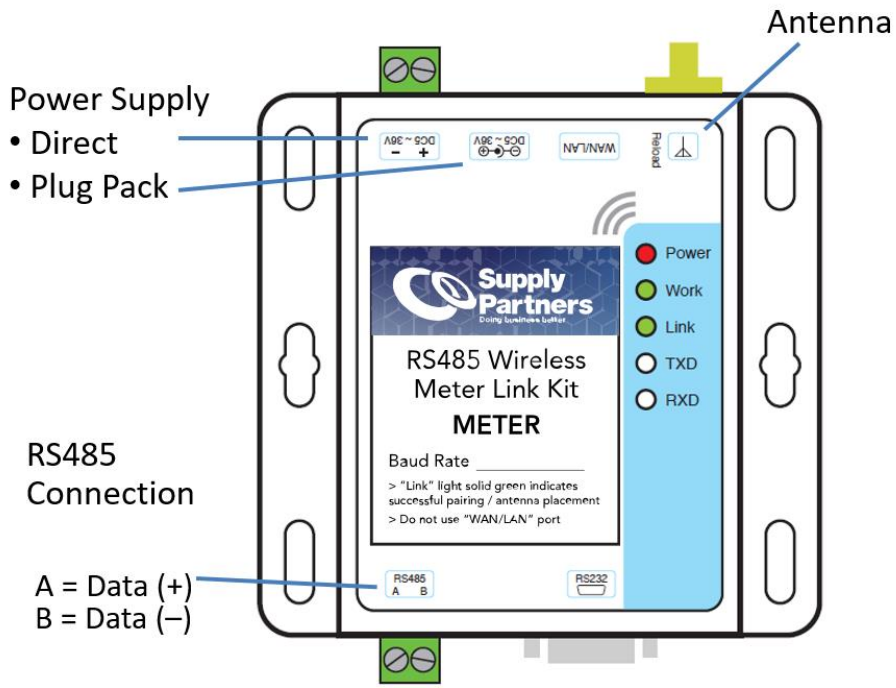
RS485-WIFI-2 Specifications

Parameter	Value
Serial connections supported	RS485 & RS232
Protection	Electrostatic and EFT protection
Flow Control	NFC: No flow control/FC: Hardware flow control
Input Voltage	5-36V DC
Wi-Fi Standards	IEEE802.11b/g/n
Network Support	TCP Server / TCP Client / UDP Server / UDP Client / HTTP Client mode
Modes	AP, STA, AP+STA
Router/bridge mode networking	Yes
Dimensions	86mm x 82.5mm x 25mm (L*W*H)

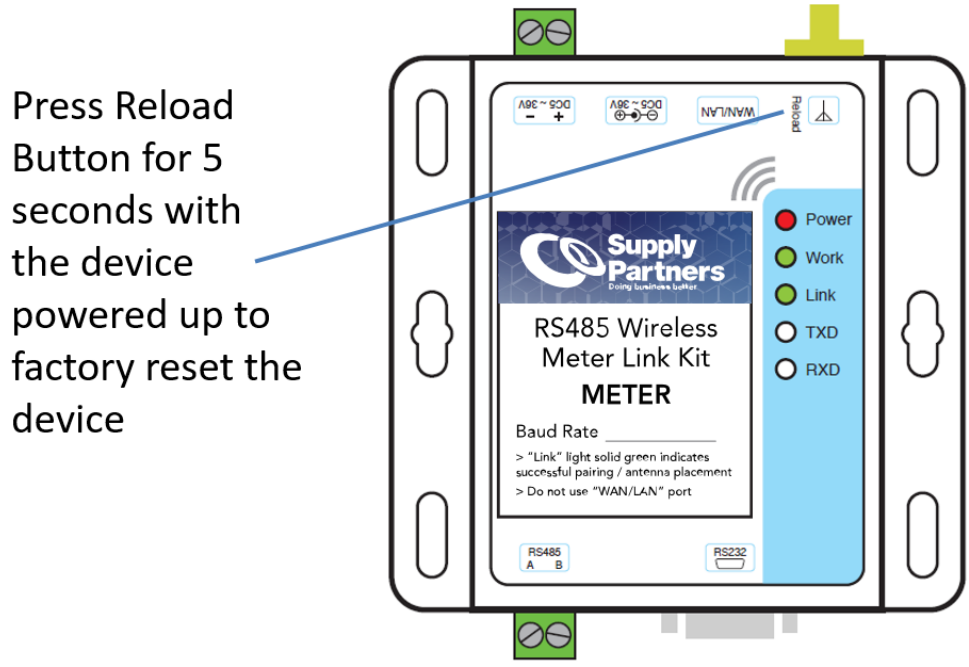
ANTENNA-DIREC (High Gain Antenna) Specifications

Parameter	Value
Outdoor Rated	Yes
Gain	14dBi
Frequency Range	2400 - 2500MHz
Cable Length	Approx. 30cm
Dimensions / Weight	17.5 x 17.4 x 1.3 cm / 358g

Connections



Device Reset



Factory Settings

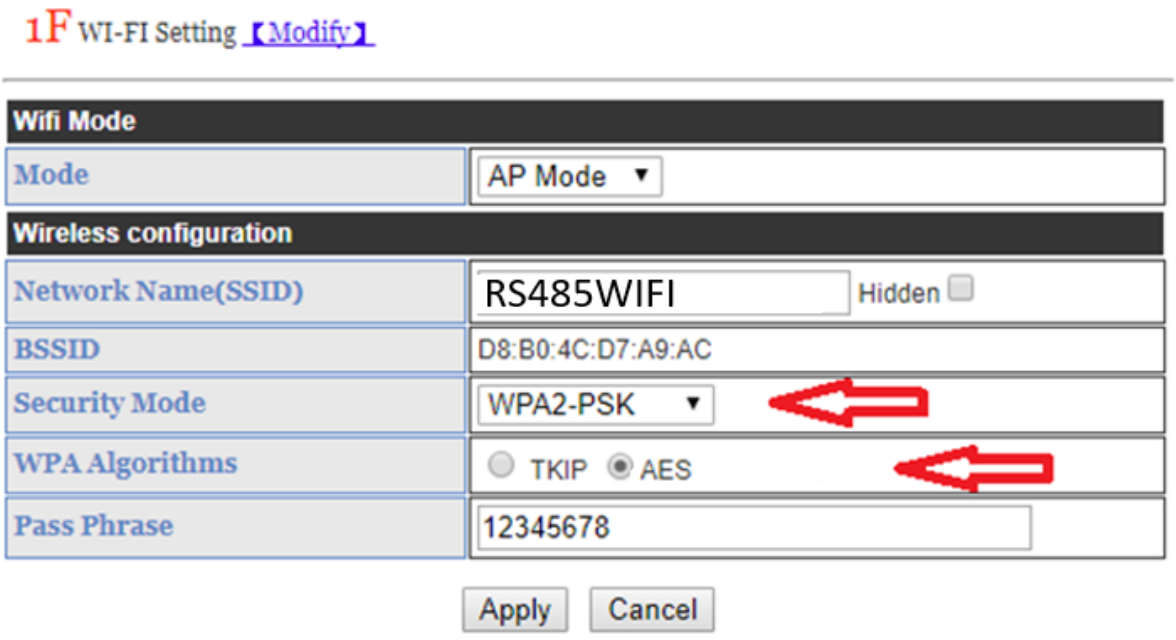
Parameter	Default Setting
SSID (Wi-Fi network broadcast name)	USR-WIFI232-XXX_xxxx
IP Address	10.10.100.254
Subnet Mask	255.255.255.0
User Name	admin
Password	admin

***WARNING* Supply Partners sells the wireless kits already pre-programmed for your convenience, this manual should only be used if the settings have been set Incorrectly and require alterations.**

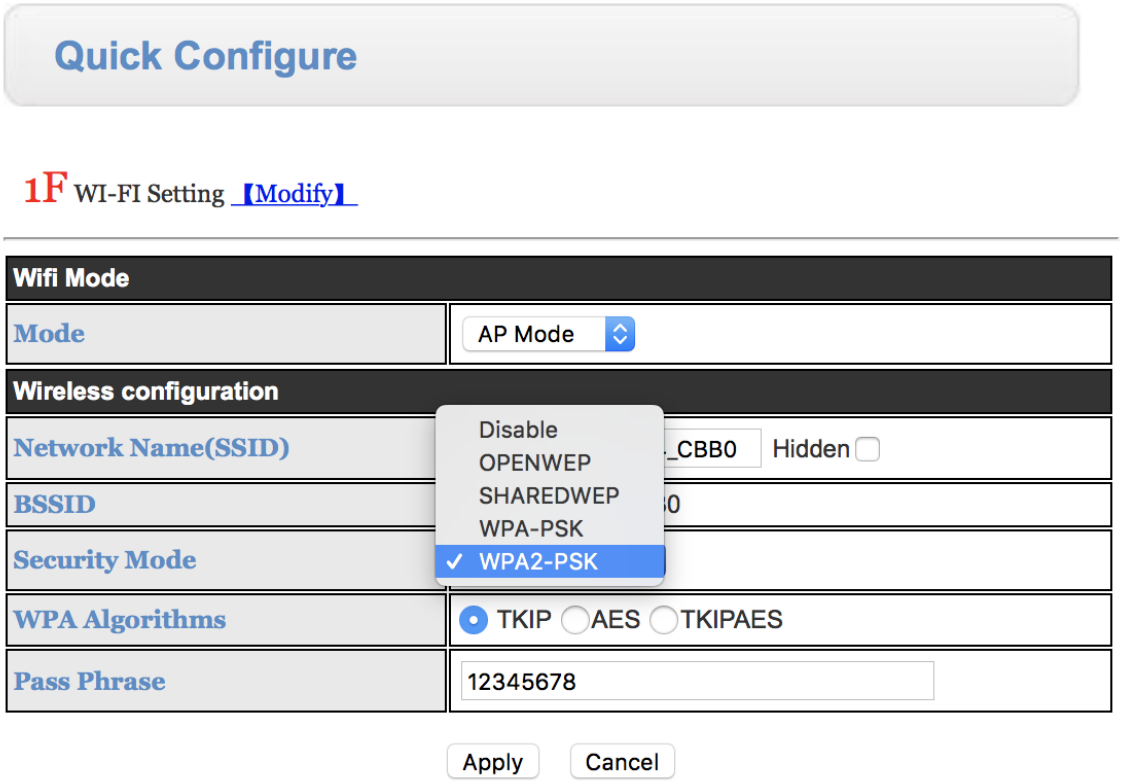
Installation Process

1. Power on one converter and leave the other off
2. Begin by resetting the converter by holding the reload button for longer than 10 seconds.
3. Connect your Wi-Fi enabled smart phone/laptop/tablet to the Wi-Fi network called "USR-WIFI232-XXX_xxxx"
4. In a web browser enter address "10.10.100.254"

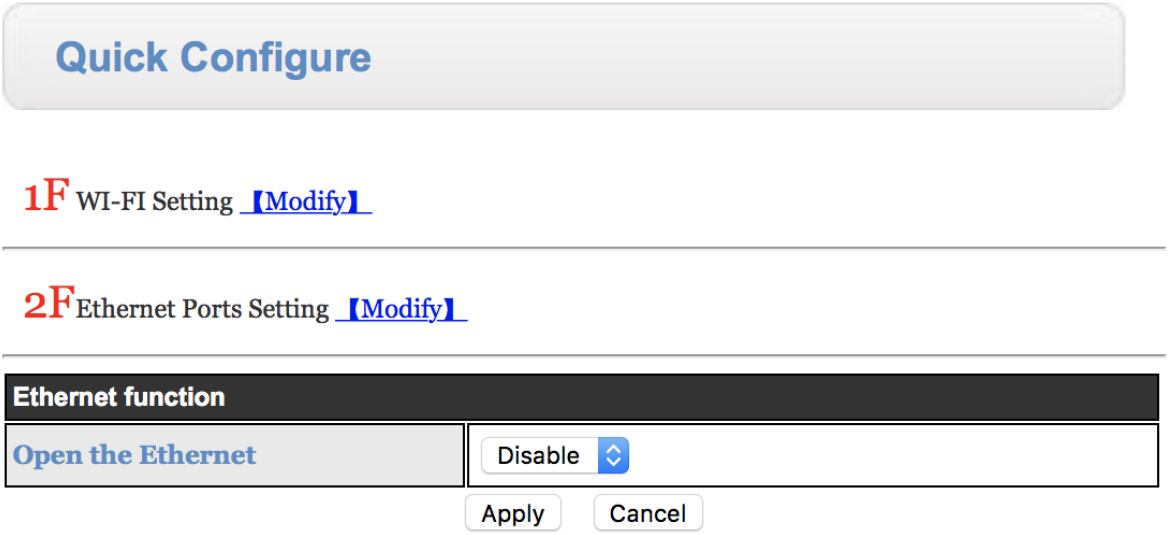
5. Under section 1F set the Network Name (SSID) to **RS485WIFI**, security mode to **WPA2-PSK** and Select **AES** for WPA Algorithms.



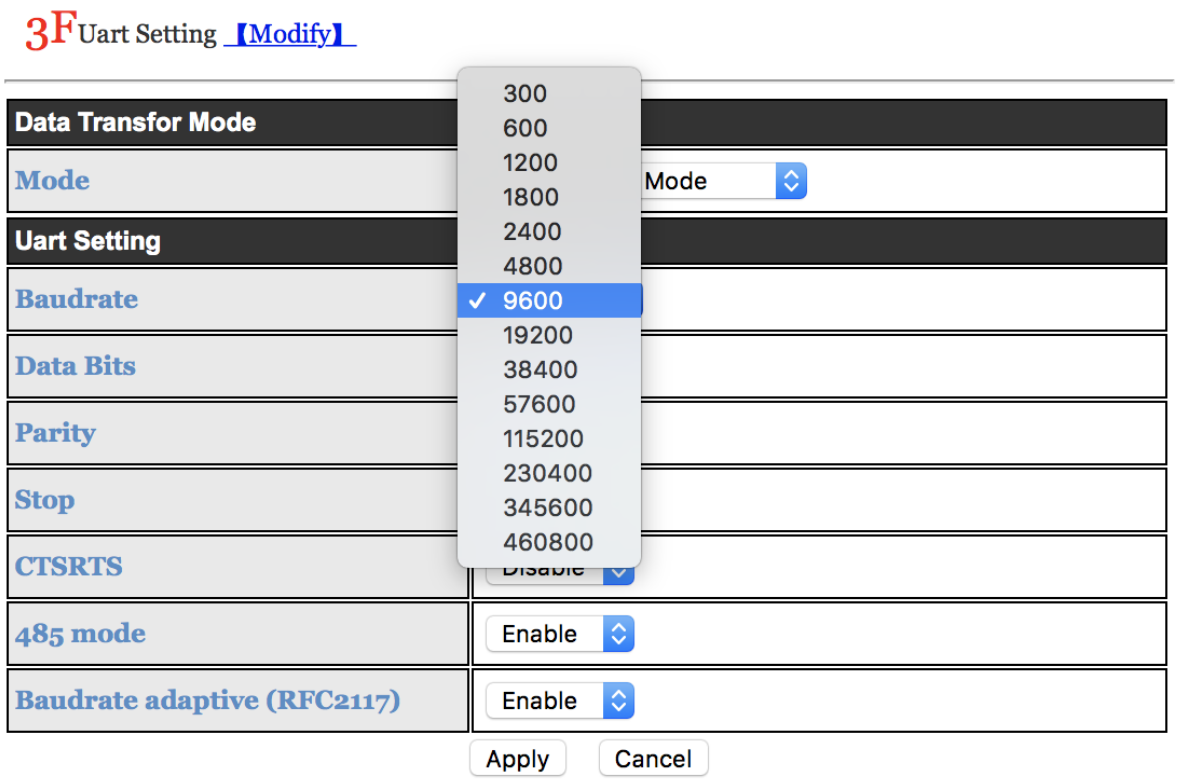
6. Change the default password of "**12345678**" if required and then press Apply.



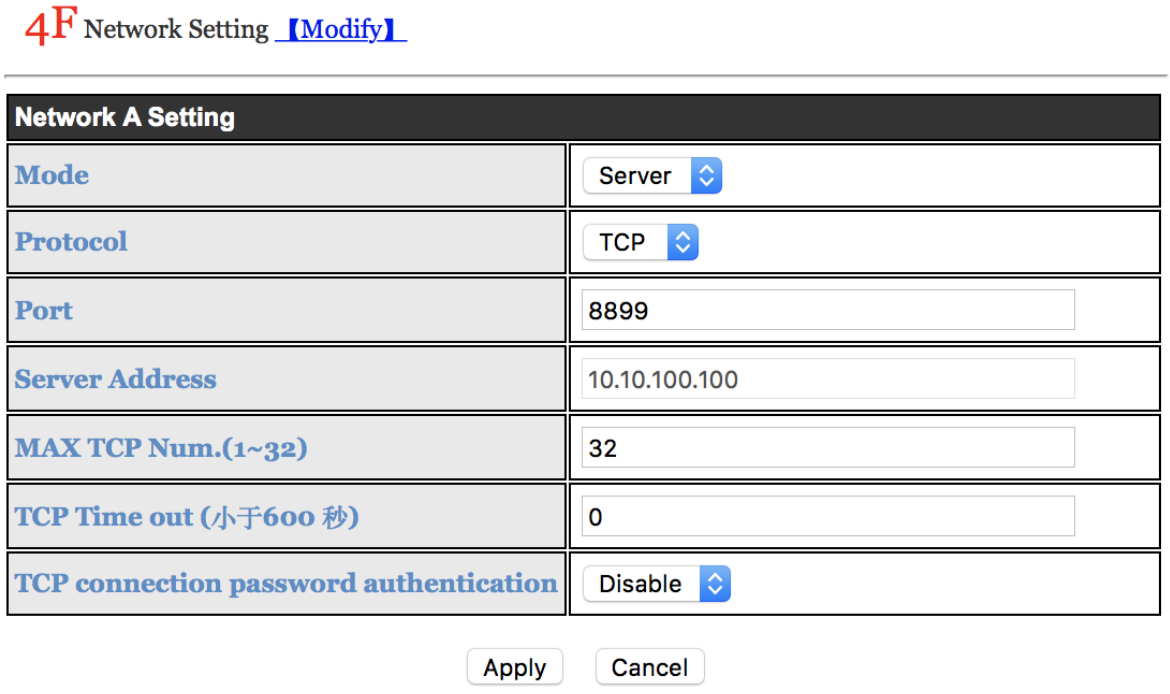
7. Under section 2F leave Ethernet **disabled** and then press Apply.



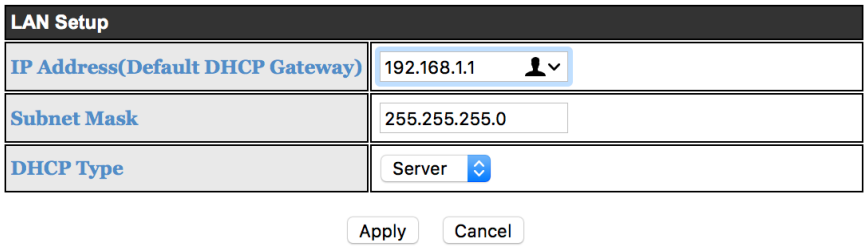
8. Under section 3F set the Baud rate to **9600** (or the baud rate of the devices you are using) then press apply.

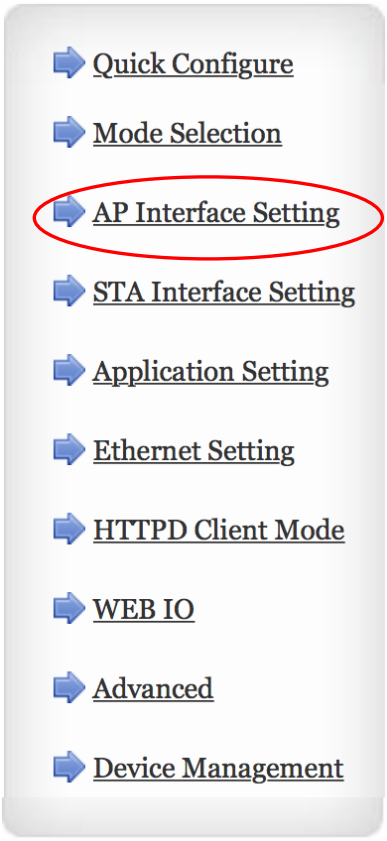


9. Under section 4F leave settings as is then press Apply.

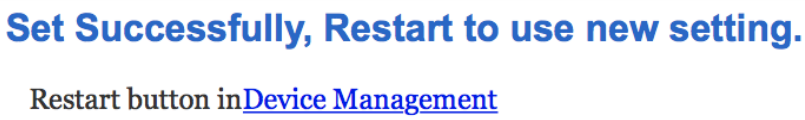


10. Click “AP Interface Settings” in the left hand menu (3rd option) and then change the IP address under LAN setup to be "192.168.1.1" then press apply.





11. Follow the link provided to Device Management.

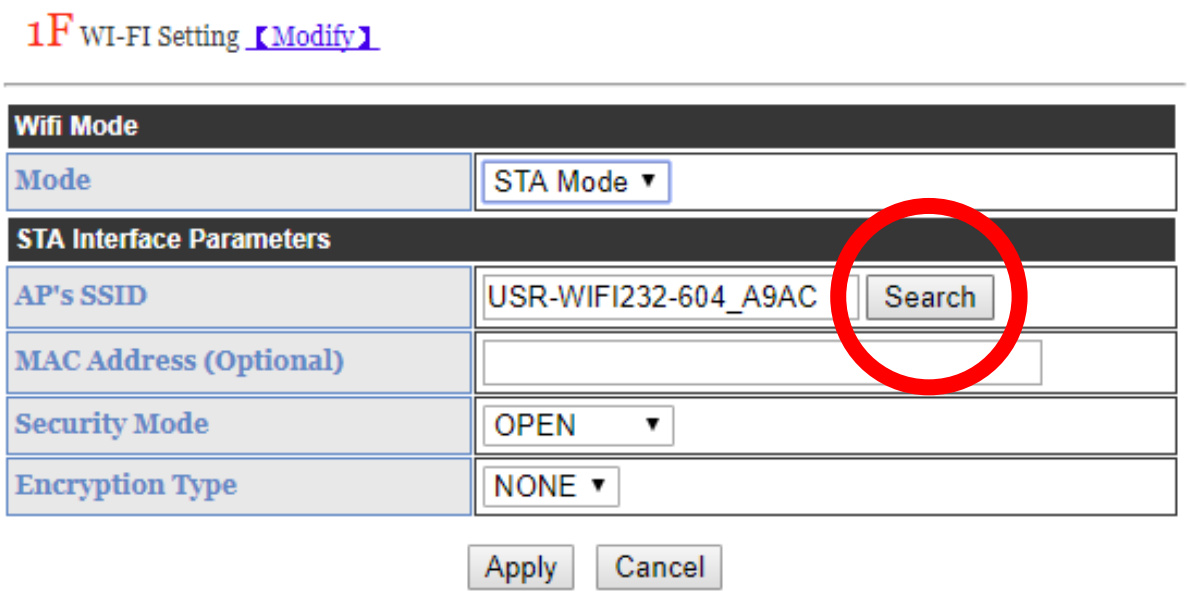


12. Click the 'Restart' button to restart the device and close the browser window.

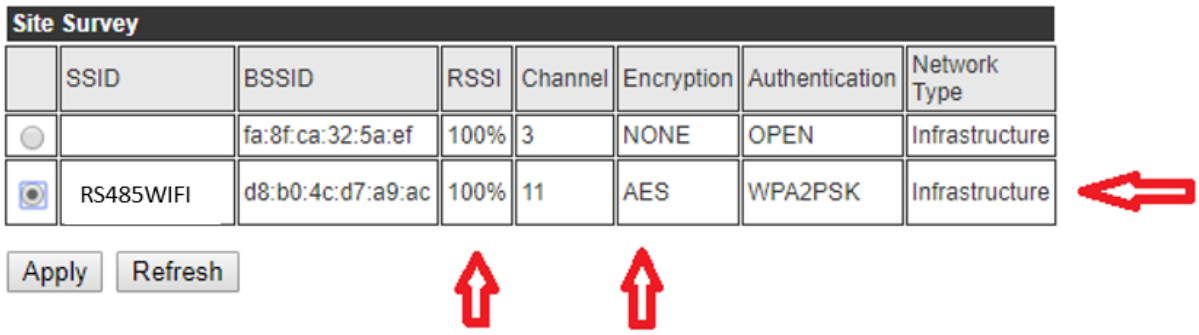
13. Power on the second converter, **hold the reload button for longer than 10 seconds to reset** and connect your Wi-Fi enabled smart phone/laptop/tablet to the Wi-Fi network called “USR-WIFI232-XXX_xxxx”

14. In a web browser enter address “10.10.100.254”

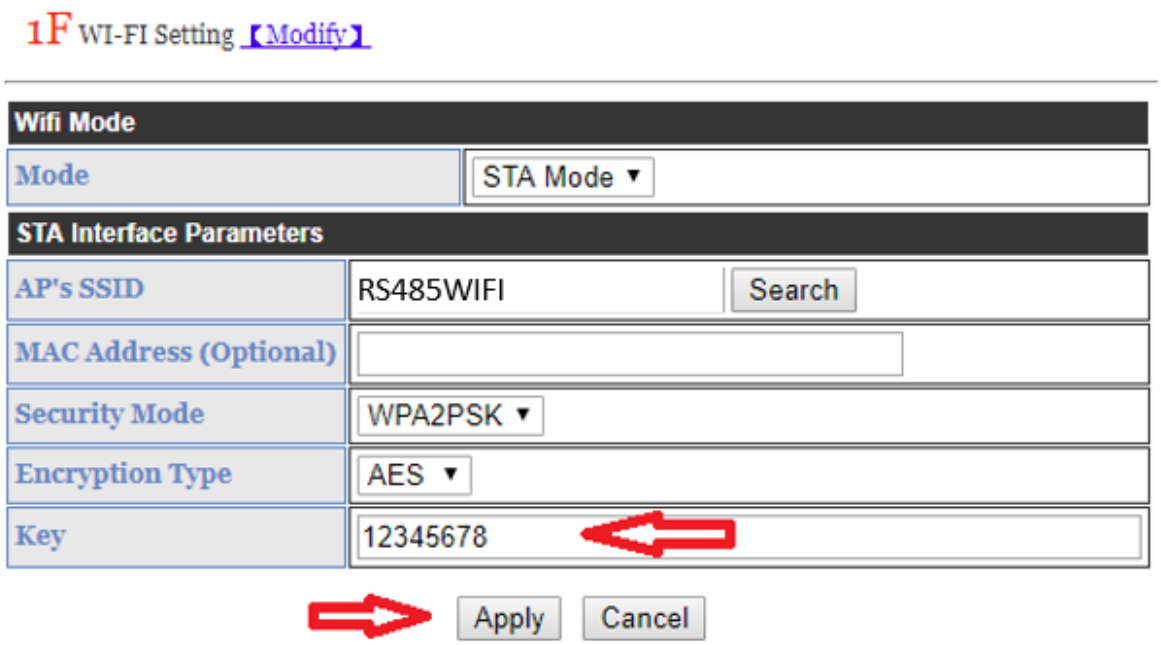
15. Under section 1F ensure Mode is set to STA Mode and then click the AP's SSID search button (circled in red below) to find the server device.



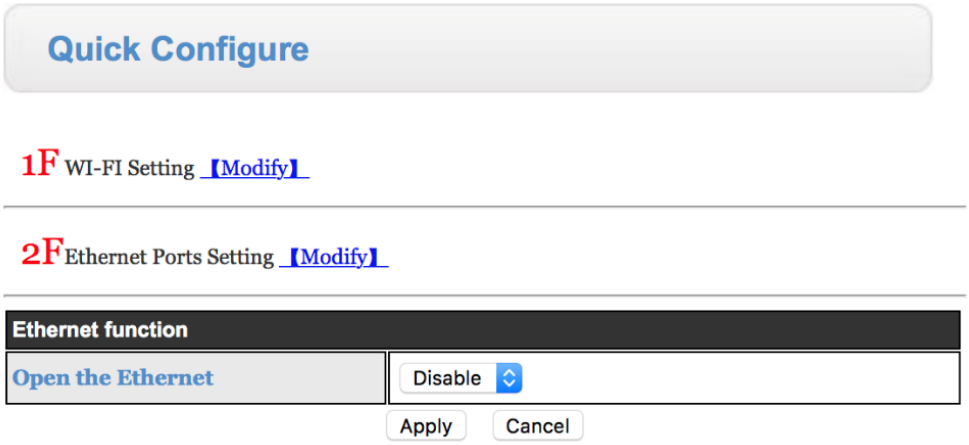
16. In the Site Survey click the radio button alongside the first converter's SSID and then press Apply.



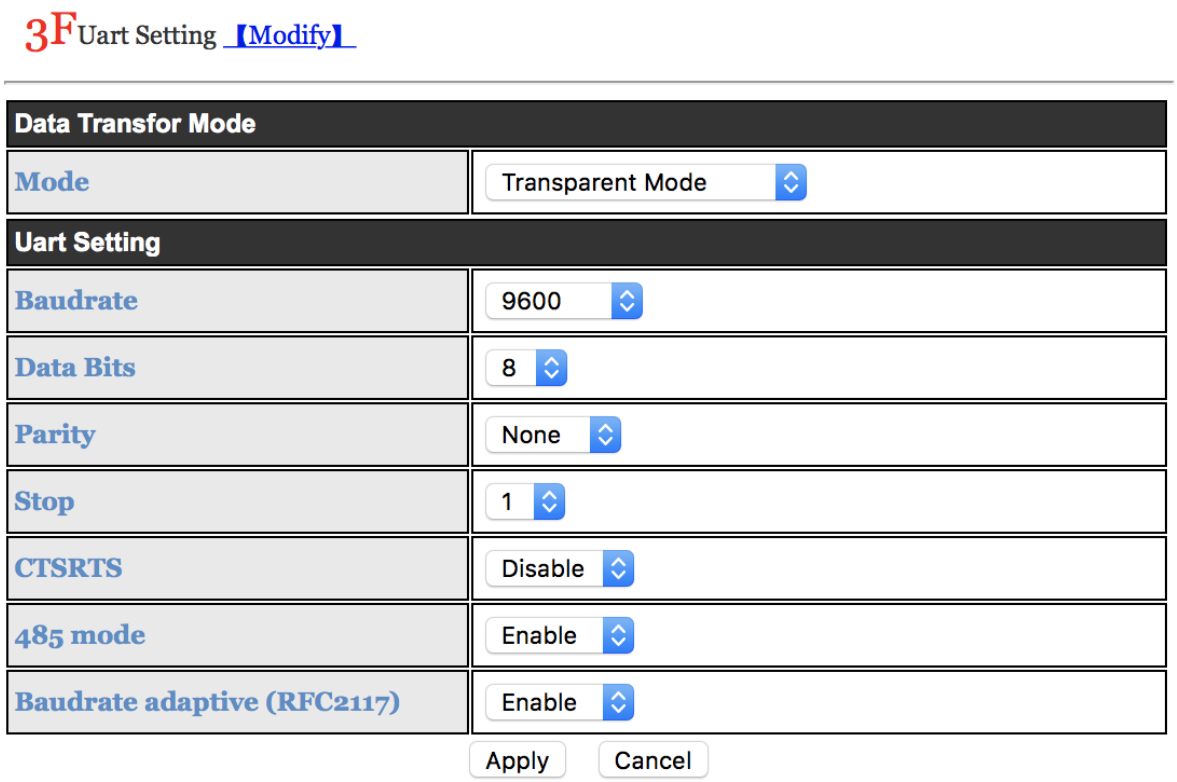
17. Under section 1F ensure that the first converter's AP SSID is registered, set the security mode to **WPA2PSK** and encryption type to **AES**. Enter password **12345678** or the custom set password you entered for the server device.



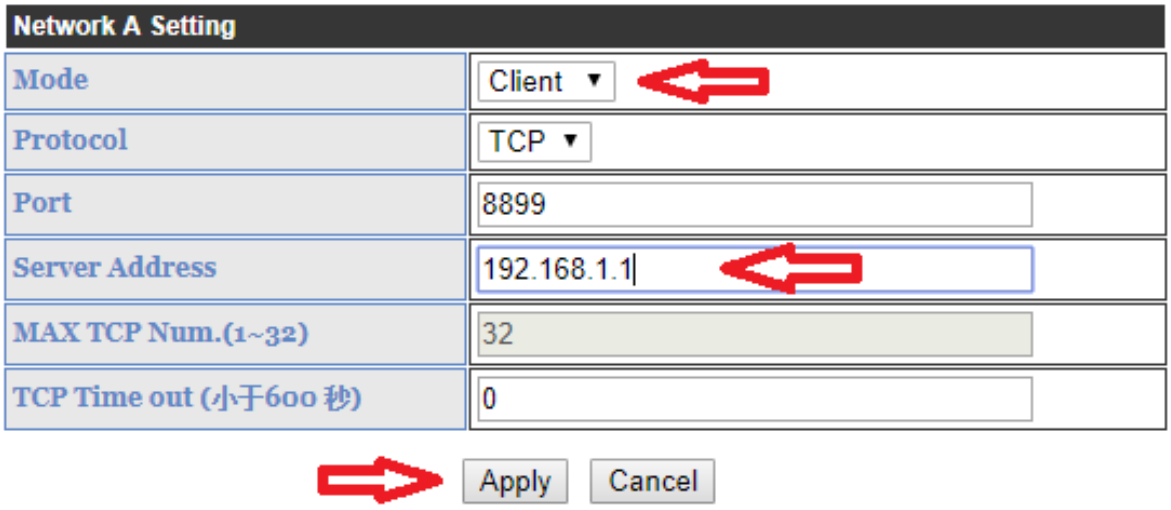
18. Under section 2F leave Ethernet disabled and then press Apply.



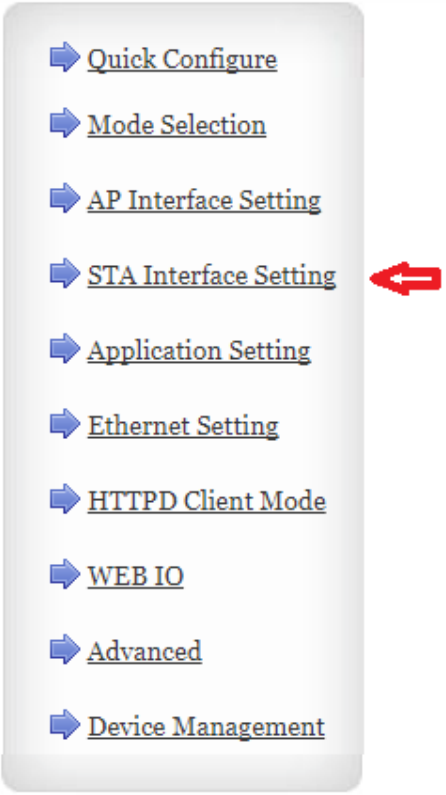
19. Under section 3F set the Baud rate to **9600** (or the baud rate of the devices you are using) then press apply.



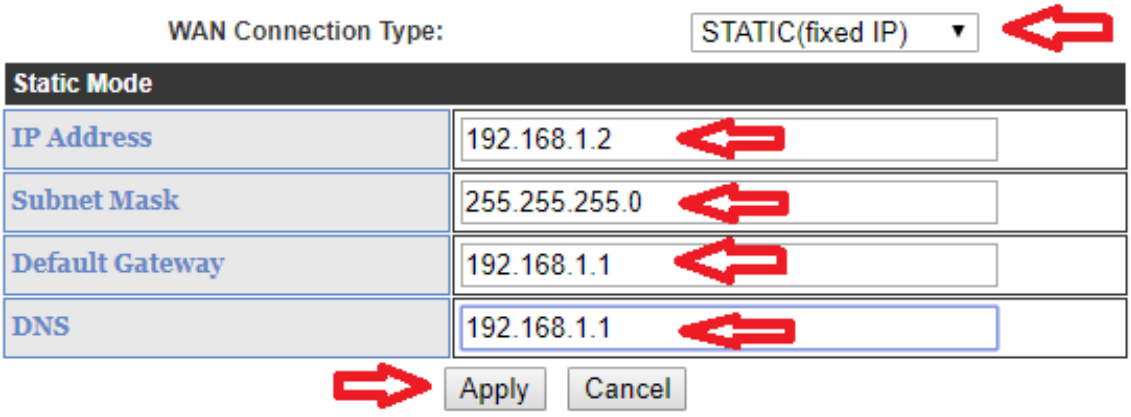
20. Under section 4F set the Mode to Client and set the server address to 192.168.1.1 and then press apply.



21. Click “STA Interface Settings” on the left hand menu (4th option).

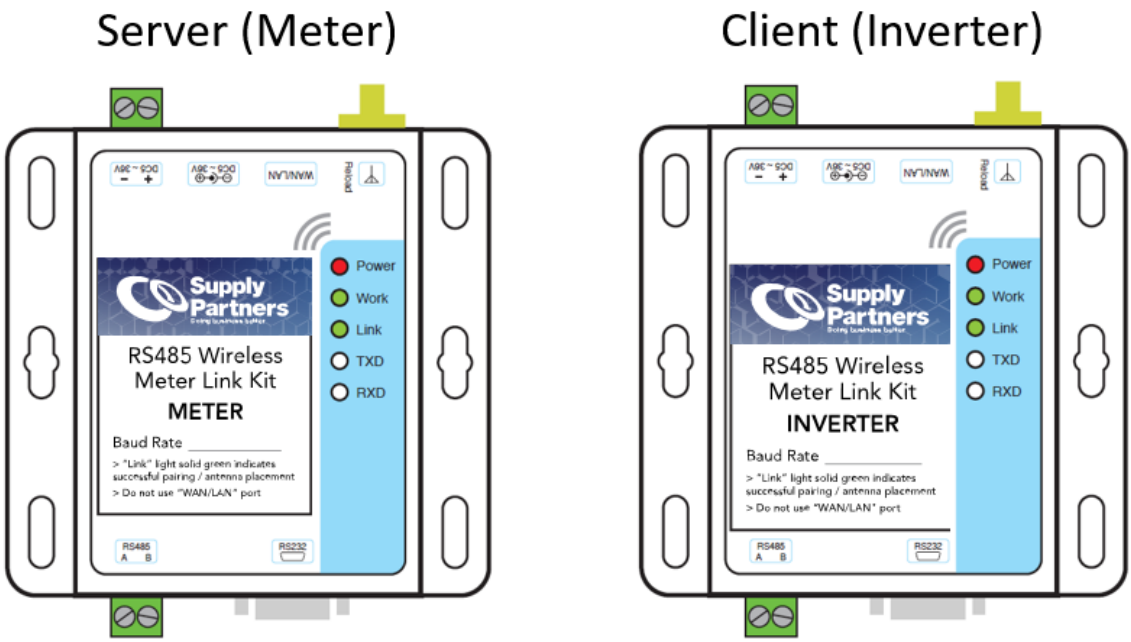


22. Scroll to the bottom and change from DHCP(AUTO) to STATIC and enter the IP Address info as below “192.168.1.2” then press Apply.



23. Under section 5F press Restart Module.

24. Confirm that both devices now have Power, Work and Link lights on.



Completing Installation

Once the two RS485 to Wi-Fi converters are paired proceed to connect RS485 input cables to both units as per the inverter manufacturer's documentation.

Ensure the final installation location of the converters is secured against moisture and vermin.

The final installation location should not exceed 80°C or relative humidity of 95% non-condensing.

Troubleshooting

Green Link Light Not Illuminating

Possible Causes:

A. Signal strength between 'meter' and 'inverter' device poor.
B. Programming error.
C. SMA-RPSMA adaptors may not be fitted to the ANTENNA-DIREC

Resolution:

A. Remove the 'meter' and 'inverter' device from their installed locations and power up the two devices side by side, for this test no antennas are required if the devices are directly next to each other. If the link light illuminates it will indicate the issue lies not with the programming, but rather with the signal strength at the install location.
    1. If this is the case, ensure you are using high-gain directional antennas (ANTENNA-DIREC), the antennas are connected to the wireless devices securely and the

antennas are pointed directly at each other with a clear line of sight. Ensure the antenna cable has not been extended.

2. You can check the speed of the data by logging into the devices. Stand in the path of the antennas and using a phone/laptop/tablet connect to the WiFi network called 'RS485WIFI', the password is **12345678**. Once connected, go to your web browser and enter 192.168.1.1, the username is **admin** and password is **admin**. Once logged in, change the language to 'English' and scroll down to section 3F. Ensure the baudrate is set correctly (9600 for Fronius/Sungrow). The device you are currently communicating with is the 'meter' device. Now you can connect to the 'inverter' device by browsing to 192.168.1.2 using the same login credentials. Once again change the language and check section 3F to ensure the baudrate is correct. At this stage you will be communicating with the 'inverter' device via the 'meter' devices access point. Click various links on the side of the page and check to see how quickly the pages are loading. If the pages are loading slowly, half loading or not loading at all it indicates there is an issue with the antenna placement. In most cases it is caused by obstructions in the antennas line of sight. Ensure the ANTENNA-DIREC have the SMA-RPSMA adaptors fitted and perform the above checks again once the antennas have been repositioned.

Material	Relative Signal Reduction
Open Field	0%
Wood / Glass	From 0 to 10%
Stone / Plywood	From 10 to 40%
Reinforced Concrete	From 60 to 90%
Metal	Up to 100%

B. If the link light still doesn't illuminate even after the devices are physically next to each other it will indicate an issue with the programming.
    1. Using a smart phone/laptop/tablet scan for nearby Wi-Fi networks. If there is no network named RS485WIFI showing you will need to re-program the 'Meter' device by following steps 1 - 12 of the installation process instructions.
    2. If there Is a network named 'RS485WIFI' showing as well as a network named 'USR-WIFI232-XXX_xxxx' It will indicate that the 'inverter' device will need re-programming by following steps 13 - 23 of the installation process instructions.
    3. If In doubt, reset both devices to factory settings and re-program both devices.
C. The high gain directional antennas (ANTENNA-DIREC) do not come with the correct adaptor out of the factory. A SMA-RPSMA adaptor (purchased separately) needs to be fitted. If purchased with the ANTENNA-DIREC, Supply Partners will typically fit this before dispatch. The connector attached to the ANTENNA-DIREC should have a gold pin, If this is missing it means the SMA-RPSMA has not been fitted and effectively the antenna will not be making contact with the RS485-WIFI device(s).

TXD & RXD Lights Are Not Flashing Rapidly / Inverter Not Showing Meter Data

Possible Causes:

A. Incorrect communication cable wiring.
B. Wireless devices programmed with incorrect Modbus parameters.
C. 'Meter' and 'Inverter' devices are installed at Incorrect ends of the wireless link.
D. Inverter requires firmware update/settings alteration
E. Inverter Is not compatible

Resolution:

A. :
    1. Ensure the RS485 A & B ports of the Wireless RS485 devices are used for RS485 connection. Do not use the RJ45 ports.
    2. A shielded twisted pair (STP) should be used typically CAT5/CAT6 - ensure to use colours from the same pair. Ie. Orange (+) and Orange/White (-)
    3. On the Wireless RS485 devices, 'RS485 A' = + and 'RS485 B' = -, ensure these are connected to the corresponding terminals on the inverter and smart meter.
    4. Ensure the RS485 cables are fitted securely into the terminals, if possible re-terminate your connections.
    5. Refer to the smart meter installation guide and ensure any termination resistors/dip switches are fitted/enabled at the smart meter and inverter (if required).

B. Ensure the baud rate labelled on the Wireless RS485 device matches the baud rate of the inverter. Double check the Wireless RS485 device is programmed with the correct baud rate and parity by logging into the Wi-Fi interface of the converters.

C. Ensure the Wireless RS485 devices are installed in the correct locations; 'Meter' connected to the smart meter and 'Inverter' connected to the inverter.

D. **:**
    1. Sungrow SH5K-30 hybrid inverters need to have the Meter Comm. Cycle setting altered to 'low speed'. Sungrow Crystal series inverters need to have 'Wireless Comm Switch' enabled.
    2. In some instances, a Fronius inverter won't find a smart meter even if everything is wired correctly. A simple reboot of the inverter and any additional inverters connected to the same master inverter may correct this. The only Datamanager firmware version that has a very short meter response timeout (and thus issues) is the **3.7.6-4.** If the Datamanager is running this firmware version it will need to be updated.

E. Supply Partners only recommends using approved brands and models with our wireless meter link kit. Even if the correct Modbus settings are programmed into the wireless kit, incompatibility can arise from the inverter side due to the inverter and meter having short meter response timeout requirements that can only be corrected by the inverter manufacturer. Contact Supply Partners for more information about compatible brands and models.

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