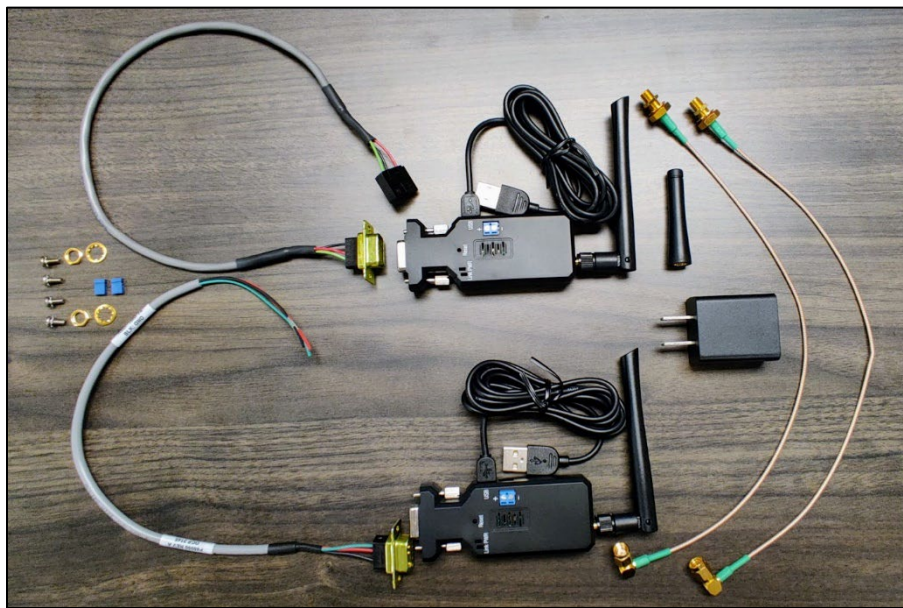


Serial-to-Wireless USConverters Modem for Tank Monitor to FMU Communications

CAUTION Modems will come preconfigured from Syntech. Each kit contains two modems that are paired to one another.

The USConverters S2B2232FEV2 Modem is an RS232-to-Bluetooth device that converts a wired connection between a Fuel Management Unit (FMU) and a Tank Monitor Unit (TMU) (or Automatic Tank Gauge) console to a wireless connection.



Equipment

The device includes AC/DC adapters that may be plugged into a 120VAC power outlet. Alternatively, if a standard USB connection exists, you may plug the antenna into said port.

The radio modem is operable in temperature ranges from -13° F to 185° F and must be installed either inside an FMU or in a weatherproof box attached to, or near to, the FMU. The radio is not approved for installation in Class I, Division 1 or Division 2 locations, so it must be installed no closer than 18 inches from a Class I Division 1 or Division 2 fuel dispenser and at least 18 inches above grade level when installed within 20 feet of a Class I Division 1 or Division 2 fuel dispenser. The radio modem is certified by the FCC and CE.

The external antenna supplied with the radio modem has supported communication to 150 feet when the radio modem is installed inside an FMU cabinet, but the manufacturer reports line-of-sight range of 328 feet (100 meters).

Syntech Part Numbers

191F0223-20: WIRELESS TMU KIT, SERIAL-TO-BLUETOOTH, USC

Part Number	Number in Kit	Description
267273	2	RS-232/Bluetooth Wireless Adapter
191F0221-10	1	FMU/RS-232 Cable Assembly
191F0222-10	1	TMU/RS-232 Cable Assembly
267284	2	900/2.4 Antenna
266548	2	Antenna Extension Cables
267285	2	USB 5V 5W Power Supply
252611	4	Screws with Lock Washers
267291	2	Hex Socket Jackscrew
201782	2	TMU Programming Jumpers (if necessary)

NOTE

In some cases, a remote antenna kit may be needed to ensure even greater distances or to prevent interference.

Kit #	Description
191F0231-120	Remote Antenna Kit, OMNI. 2.4GHz, 20 FT
191F0231-140	Remote Antenna Kit, OMNI. 2.4GHz, 40 FT
191F0231-150	Remote Antenna Kit, OMNI. 2.4GHz, 50 FT
191F0231-200	Remote Antenna Kit, OMNI. 2.4GHz, 100 FT

Remote antenna kits include an adapter cable, antenna, antenna cable, and L-bracket mount. The specified distance spans between the FMU and the remote antenna. For example, if the antenna needs to be mounted 48 feet away from the FMU, order a 191F0231-150 kit.

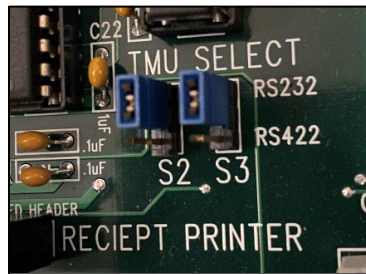
Installation

Modem Connection to FMU

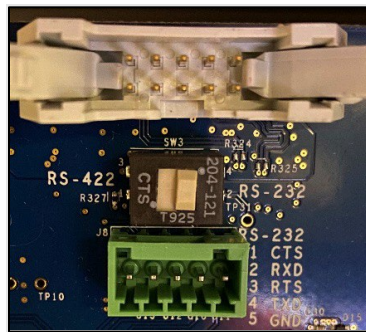
1. Find a weatherproof installation location for the modem – whether in the FMU cabinet itself or inside another weatherproof enclosure.

2. Prepare the FMU:

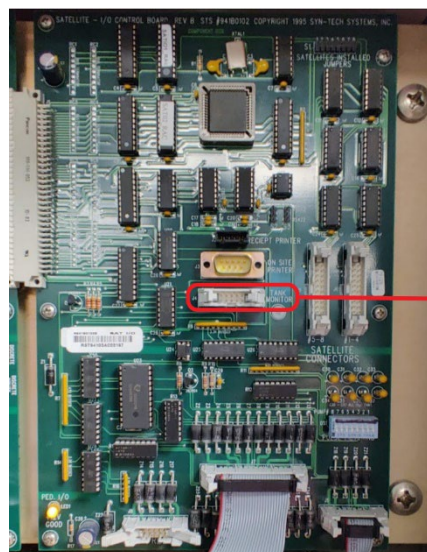
- a. Legacy: Install jumpers on the Satellite I/O Board on the top two pins of positions S2 and S3, labeled *TMU SELECT*.



- b. *FMLive*: Verify the switch underneath the *Tank Monitor* connector is toggled to *RS-232* on the right.

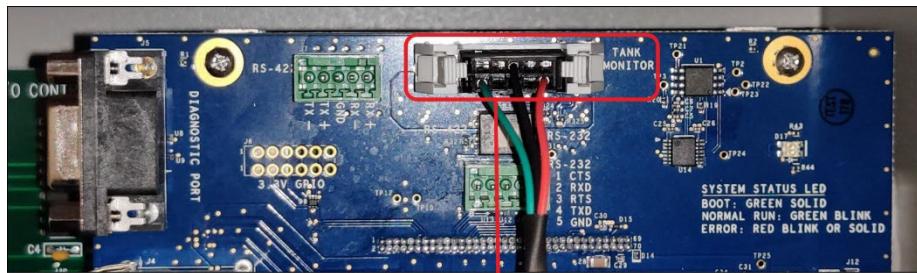


3. If utilizing the AC adapter, connect it into the internal AC power receptacle inside the FMU cabinet. If the FMU does not have an AC power receptacle, you can order one from Syntech (STS#: 178802A). However, if a USB port is available in the FMU, you may connect the USB power cable there.
4. Connect the FMU-to-Modem Cable to:
- a. Legacy: the *Tank Monitor* connector in the middle of the SAT I/O board.



Legacy TMU
Connector

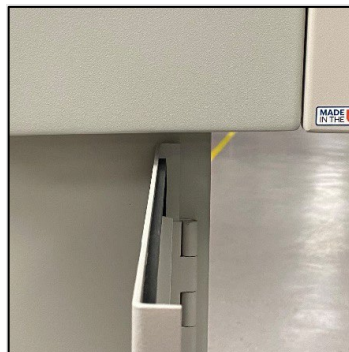
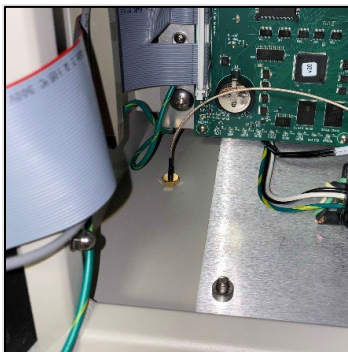
- b. FMLive: the *Tank Monitor* connector at the top of the EAPro board.



FMLive TMU Connector

External Antenna Mounting

If desired, the external antenna may be installed to further improve the performance of the modem. Do not use the antenna that can bend because it is not waterproof. You can install the external antenna adapter anywhere on the FMU that is out of the way. A common location is pointing down through the bottom of the cabinet on the left side. Utilize a 9/32-inch drill bit to create the correct sized hole. When installing here, take care to ensure the antenna is installed behind the fully opened pedestal door to avoid antenna damage when opening the door.



Modem Connection to TMU

1. Verify the TMU power switch is off.
2. Verify the TMU has an RS-232 input/output board installed.



3. Determine a suitable mounting location for the radio modem by considering line-of-sight and indicator light visibility. The modem will connect to the TMU via a DB9 or DB25 port. Most TMUs are mounted indoors, so weatherproofing should not be a factor.
4. Affix the radio modem to its mount location.
5. Connect the TMU-to-Modem cable from the radio modem to the tank monitor as follows:

Signal	Color
TMU Transmit	Red
TMU Receive	Green
Ground	Black

NOTE

Different makes and models of TMU have different serial pinouts. Consult with the TMU's manual and/or manufacturer to verify how to land the signals above. Additionally, if it doesn't seem to be working as specified, flip the transmit and receive wires.

6. Connect the AC adapter into the internal AC power receptacle or plug the USB connector into a standard USB port.
7. Turn the FMU and TMU power ON.
8. Test the connection. Link light on the modems should illuminate a solid blue.

Configure the Modem

NOTE

Both modems are preconfigured if you order the 191F0223-20 kit, and the following settings have already been applied. If you order a replacement modem, use the instructions below to pair the new modem to the existing modem.

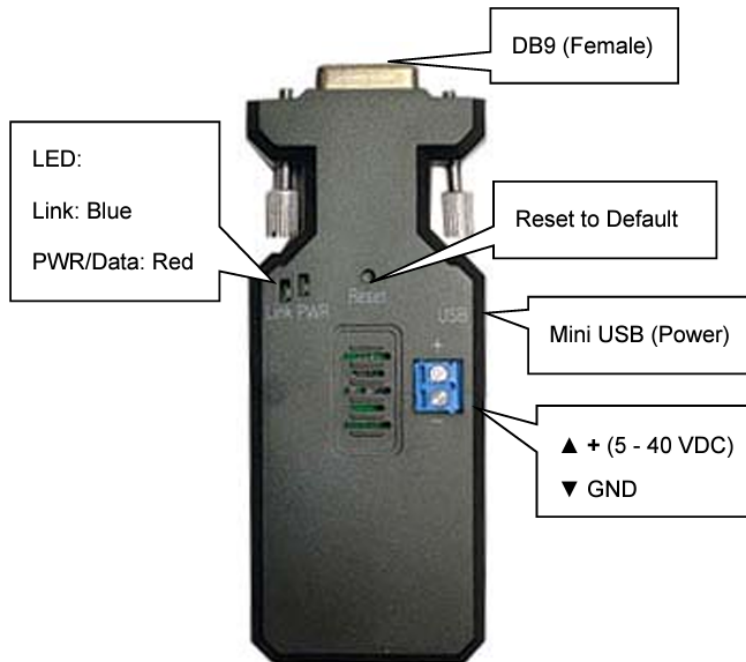
1. Apply power to both modems.
2. If replacing one modem, identify via the Blue Link LED whether the remaining antenna is a master or slave. LED Status and Description information is in the [LED Description](#).
3. Connect the master (or the one intended to be the master, if replacing) to a PC serial port or Serial-USB converter.
4. Open PuTTY or another terminal emulator.
5. Set the serial connection up for 9600 baud with an 8, N, 1 format.
6. To pair the modems, issue the following commands:
 - a. ROLE=M
 - b. SEARCH=?
 - i. Find the selection named *Serial Adapter*.
 - ii. Note the number associated with that entry.

c. CONNECT=#

i. Substitute the Serial Adapter entry number found in Step 6.b.ii for #.

7. The blue lights on both radios should turn solid.

USConverters S2B2232FEV2 LED Description



Status	Description
Red power LED on	Power is on
Blue Link LED flashing fast (2/second)	Adapter in slave mode; Bluetooth ready.
Blue Link LED flashing slowly (1/second)	Adapter in master mode; Bluetooth ready.
Blue Link LED Solid	<ul style="list-style-type: none"> ▪ Master Mode: Master and Slave Linked ▪ Slave Mode: Bluetooth linked; COM Port open

Troubleshooting

Required Tools

- 5mm socket
- Flat head screwdriver
- Null modem cable (crossover serial cable)

Referenced Documents

- *FM Live* - How to Run a Loopback Test
- PB-119 Testing FMU Outputs to Tank Monitors with a Laptop

Checking Components

TIP

Issues can sometimes be resolved by switching the transmit and receive conductors.

1. Ensure both the FMU and TMU are set for 9600 baud, with 8 data bits, 1 stop bit, and no parity.
 - a. *FMLive* FMU: Check in the Enterprise software within the Management -> Unit -> Tank Monitoring tab.
 - b. Legacy FMU: When connected to the FMU firmware via direct connect or with a technician from Syntech's Customer Satisfaction Center (CSC) connected, the settings may be found within the 5A command.
2. Within the FMU, ensure the hardware is set for RS-232 as per [Step 2](#) of the *Installation* section, *Modem Connection to FMU* subsection of this document.
3. Ensure the FMU can communicate to the end of the cable that normally plugs into the FMU-side antenna by testing loopback. Disconnect the cable from the antenna and jumper pins 2 and 3 with a screwdriver. Follow the instructions below for your FMU model. If successful, move to Step 4. If unsuccessful, contact CSC to order a replacement EAPro.
 - a. *FMLive* FMU: Utilize the FMU-side instructions in the document *FMLive - How to Run a Loopback Test*.
 - b. Legacy FMU: When connected to the FMU firmware via direct connect or with a technician from CSC connected, enter the 99 command. Anything typed should show up on screen.
4. Using the instructions in PB-119, *Testing FMU Outputs to Tank Monitors with a Laptop*, determine if the issue lies with the TMU or antennas.
 - If commands are displayed successfully, the issue lies with the TMU.
 - If commands are not displayed successfully, the issue lies with one or both antennas.

TIP

If any questions arise, contact Syntech Systems, Inc.'s Customer Satisfaction Center (CSC) at 1-800-888-9136, ext. 2, or email support@myfuelmaster.com.

Change Log

Date	Description
06/07/2023	Original - not yet published