

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

IMPORTANT Modems will come preconfigured from Syntech. Each kit contains two modems that are already paired.

The Omntec Modem is a RS232 Serial-to-RF device that converts a wired connection between the Fuel Management Unit (FMU) and the Tank Monitor Unit (TMU, also known as an Automatic Tank Gauge, or ATG) console to a wireless connection.



Equipment

The device includes an AC/DC adapter that must be plugged into a 120VAC power outlet. The radio modem is operable in temperature ranges from -40° F to 185° F and must be installed either inside an FMU or in a weatherproof box attached to or near 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. When surveying for placement, ensure that the radios have line-of-sight visibility with each other. The radio modem is certified by the FCC.

The internal antenna supplied with the radio modem has supported communications to 200 feet when the radio modem is installed inside an FMU cabinet. Greater distances are possible when the included external antenna is used as the manufacturer has reported communication success at 1,320 feet (.25 mile).

Syntech Part Numbers

191F0223-30: WIRELESS TMU KIT, SERIAL-TO-WIRELESS

Part Number	Part Name
267309	Wireless Bridge Kit (x2), Omntec
266548	External Antenna Adapter Cable
267284	900MHz External Antenna
191F0234-10	FMU-to-Modem Cable
191F0222-10	TMU-to-Modem Cable
267122	Power Supply
201782	Jumpers (Legacy Only)

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

Kit #	Description
191F0231-100	Remote Antenna Kit, OMNI. 900MHz, 100 FT
191F0231-75	Remote Antenna Kit, OMNI. 900MHz, 75 FT
191F0231-50	Remote Antenna Kit, OMNI. 900MHz, 50 FT
191F0231-40	Remote Antenna Kit, OMNI. 900MHz, 40 FT
191F0231-25	Remote Antenna Kit, OMNI. 900MHz, 25 FT
191F0231-20	Remote Antenna Kit, OMNI. 900MHz, 20 FT

These kits include an adapter cable, antenna cable, antenna, and L-bracket antenna mount. The distance shown spans between the FMU and the remote antenna (e.g., if the antenna is to be mounted 48 feet away from the FMU, order the 191F0231-50 kit).

Installation

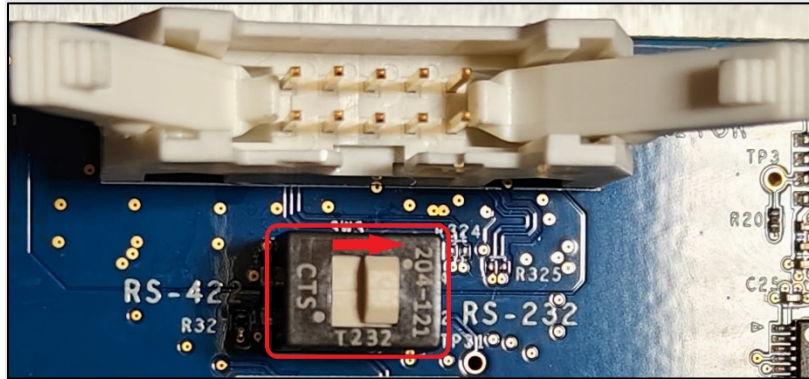
NOTE For both new and replacement orders, both modems are already paired and preconfigured. No configuration is required.

Modem Connection to FMU

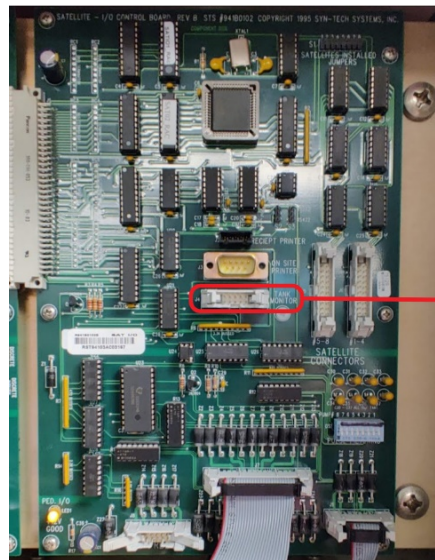
1. Prepare the FMU:
 - a. Legacy: Install jumpers on the Satellite I/O Board on the top two pins, labeled *RS232*, of positions *S2* and *S3*, labeled *TMU SELECT*.



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

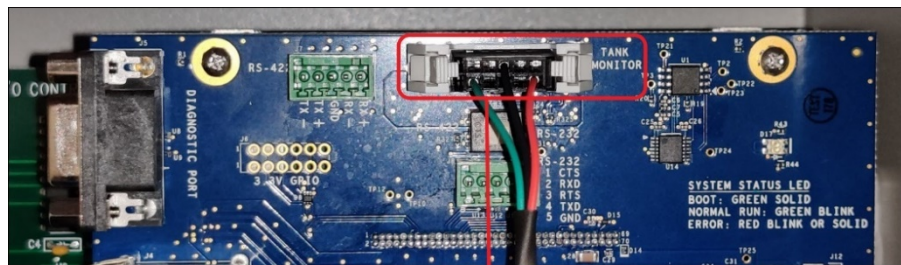


- 2. Connect the AC adapter into the internal AC power receptacle inside the FMU cabinet. If the FMU does not have an AC power receptacle, you can order one from Syntech (STS#: 178802A).
- 3. Connect the FMU-to-Modem Cable (Legacy, *FMLive*):
 - a. Legacy: Connect the FMU-to-Modem cable to the *Tank Monitor* connector in the middle of the SAT I/O board.



Legacy TMU Connector

- b. *FMLive*: Connect the FMU-to-Modem cable to the *Tank Monitor* connector at the top of the EAPro board.



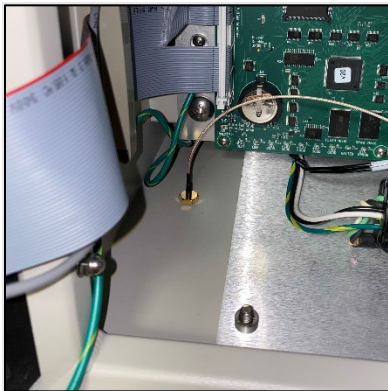
FMLive TMU Connector

External Antenna Mounting

CAUTION When mounting an external antenna:

- Ensure the antenna is installed behind a fully opened pedestal door to avoid antenna damage when opening the door.
- Ensure that the drill's rotating chuck does not come in contact with any boards or cables.

To improve performance, install the external antenna. The external antenna may be installed 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 correctly sized hole.



Modem Connection to TMU

1. Verify the TMU power switch is off.
2. Verify the TMU has an RS-232 input/output board installed by noting the presence of a DB9 or DB25 port (DB9 seen below). If the TMU has a DB25 port, use a DB9-to-DB25 adapter (not sold by Syntech).



Color	DB9 Pin	DB25 Pin	Function
Green	2	3	TMU Receive
Red	3	2	TMU Transmit
Black	5	7	Ground

3. Determine a suitable mounting location for the radio modem by considering line-of-sight visibility and weatherproofing. If a remote antenna kit is needed to achieve line-of-sight, refer to the kits on page 2 to order the proper length of cable. While weatherproofing should not typically be a factor, ensure the device is in a weatherproof housing if the mount location will be subject to weather.
4. Affix the radio modem to its mount location.
5. Connect the AC adapter into the internal AC power outlet.
6. Turn the FMU and TMU power ON.
7. Test the connection by requesting a TMU Interface from FMPlus software or Requesting Inventory from the FMLive application.

Troubleshooting

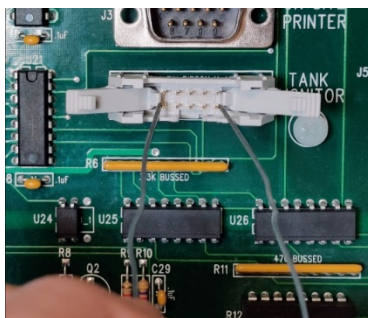
Required Tools (other than common hand tools)

Jumper wire or paperclip

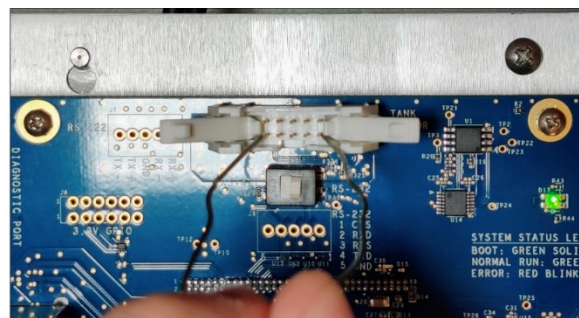
Checking Components

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. Legacy FMU: When connected to the FMU firmware via direct connect or with a technician from Syntech's Customer Satisfaction Center (CSC), the settings may be found within the 5A command.
 - b. FMLive FMU: Check in the application within the Management -> Unit -> Tank Monitoring tab.
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 through its TMU port by testing loopback. Disconnect the cable from the antenna and jumper pins 1 and 9 (the left- and right-most pins on the bottom row of the port) with a jumper wire or paper clip. Follow the instructions below for your FMU model. If successful, move to Step 4. If unsuccessful, contact CSC to order replacement hardware.



Legacy Loopback



FMLive Loopback

- a. Legacy FMU: When connected to the FMU firmware via direct connect or with a technician from CSC, enter the 99 command. Anything typed should show up on screen.
- b. FMLive FMU:
 - i. When connected to the FMU via direct connect or with a technician from CSC, log into the FMU.
 - ii. Open a separate Nagios/Moba window or tab.
 - iii. Log in to the unit in the second terminal window as well.
 - iv. In one of the windows, enter the command `tail -f /var/log/felix/tetra-tm-comms.log`.
 - v. In the other window, enter the gogo shell with the command `nc localhost 6667`.
 - vi. Enter the command `runinventoryreport`.
 - vii. In the first window, check the result of the command. You should see two items:

```

2023-08-03 09:18:09.314 INFO [pool-16-thread-1] tmu.device.serial - [id: 0xembedded, L:embedded - R:embedded] WRITE: 7B
+-----+
| 0 1 2 3 4 5 6 7 8 9 a b c d e f |
+-----+
|00000000| 01 69 32 30 31 30 30 |.i20100
+-----+
2023-08-03 09:18:09.315 INFO [pool-16-thread-1] tmu.device.serial - [id: 0xembedded, L:embedded - R:embedded] FLUSH
2023-08-03 09:18:09.385 INFO [Netty-Serial-Device] tmu.device.serial - [id: 0xembedded, L:embedded - R:embedded] READ: 7B
+-----+
| 0 1 2 3 4 5 6 7 8 9 a b c d e f |
+-----+
|00000000| 01 69 32 30 31 30 30 |.i20100
+-----+
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```

- viii. First, the Write command, and its results, shown by the blue arrow. This confirms that the inventory report command was sent.
- ix. Second, the Read command, and its results, shown by the green arrow. This shows that loopback is successful at the point where the wires are shorted.

4. Disconnect the DB9 from the TMU and jumper pins 2 and 3 as below. Follow the instructions for your FMU model. If successful, the issue exists with the TMU or its setup. If unsuccessful, contact CSC to order replacement modems.



- a. Legacy FMU: When connected to the FMU firmware via direct connect or with a technician from CSC, enter the 99 command. Anything typed should show up on screen.

b. FMLive FMU:

- i. When connected to the FMU via direct connect or with a technician from CSC, log into the FMU.
- ii. Open a separate Nagios/Moba window or tab.
- iii. Log in to the unit in the second terminal window as well.
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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
01/22/2024	Original