Veeder-Root Tank Monitor Interface

CAUTION	The FMU doors must be opened for this procedure. Exercise caution to prevent moisture (rain, snow) from entering FMU.

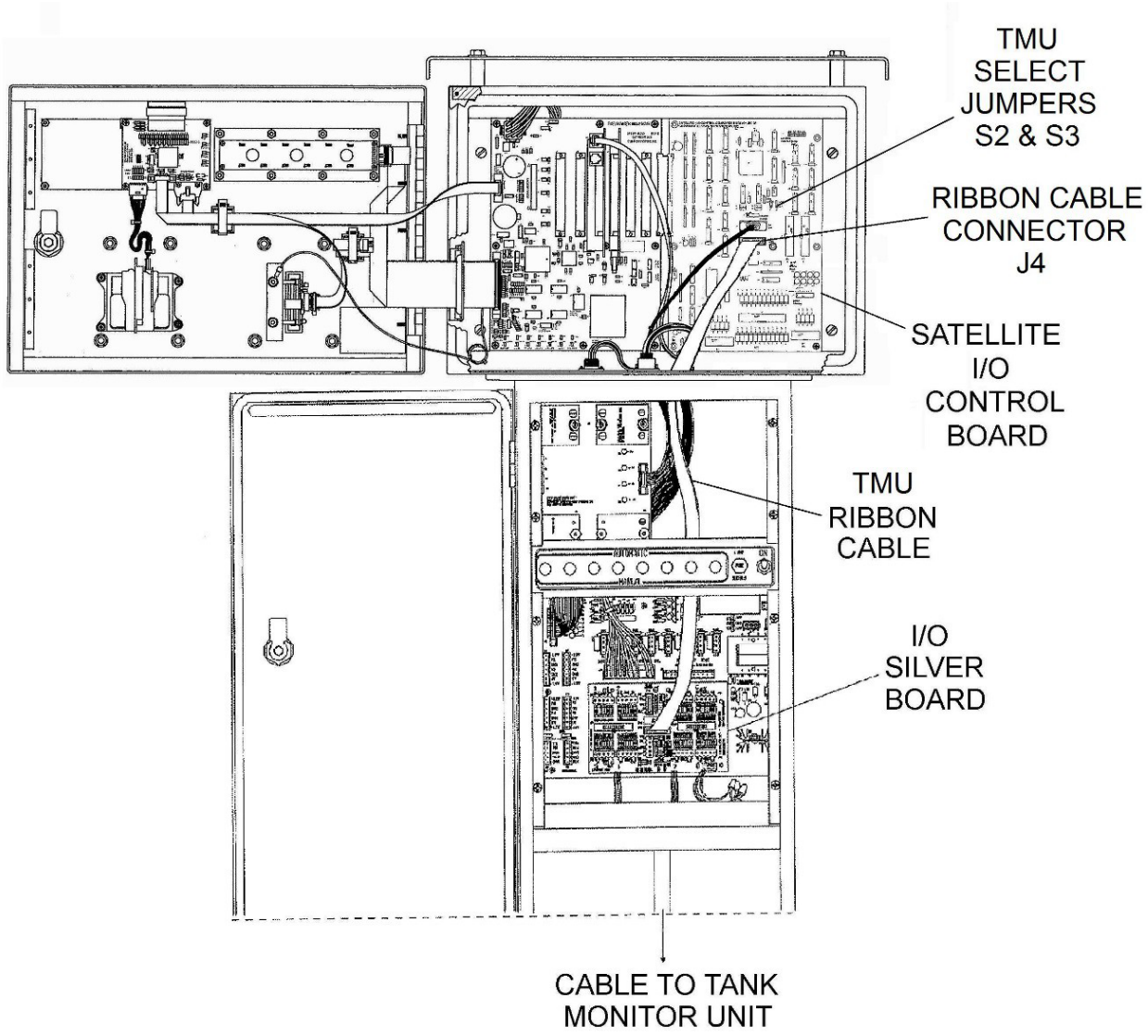

Figure 1. Tank Monitor Interface Kit (TMIK) Installed in FMU

Description

FuelMaster master FMUs may interface Veeder Root tank monitor units (TMUs) via an RS-232 communications link to obtain tank data. The interface is not active in the sense that tank monitor alarms show on reports, but not immediately as they occur. Tank monitor reports are acquired when a command is sent from the FuelMaster software to the FMU. The FMU passes the command through to the tank monitor. Command sets are selectable in the software by manufacturer and model. Veeder Root report selections may be made by selecting the following applicable models in the FuelMaster software site setup: Guardian AST, TLS-250, TLS-250i, TLS- 300, TLS-300i, or TLS-350. TLS-450 reports may be acquired by selecting TLS-350.There is no known RS232 interface to the ILS-350.

The FuelMaster software has an option for configuring which tank monitor reports are desired in Site setup. When a tank monitor model is selected, and the Configure button is depressed, the available reports are shown with check boxes to select the desired reports.

TMU interface components for a Master FMU are available in kit form from Syntech using part number 202002A. The Tank Monitor Interface Kit (TMIK) components shown in Figure 1 include an I/O Silver Board (see Figure 2). If the TMIK is being purchased and installed in an FMU already possessing an I/O Silver Board, make Syntech aware of the existing application. The TMIK I/O Silver Board may be sent with the additional components installed on the board to cover both applications with one board.

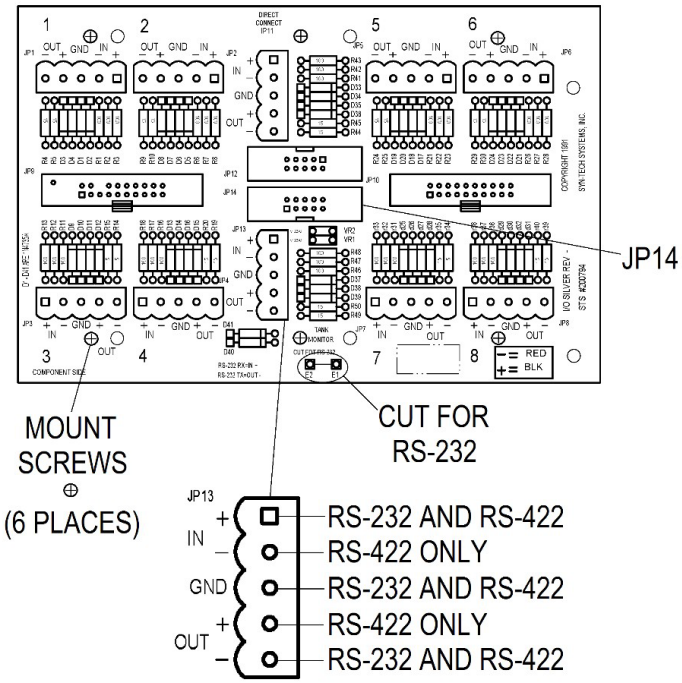

Figure 2. I/O Silver Board for Tank Monitor Interface Kit

202002A TMIK Components:

Part #	Description	Amount
190977	5 Pin Pluggable Terminal Block	1
199273	Standoff, Hex, M-F, #6-32X1.00	6
201782	Jumper	2
201839	Ribbon Cable Assembly,10 Pin,36 inch	1
201847	I/O Silver Board Assembly, TMIK	1

The serial communications link may be hardwired or wireless between the FMU and tank monitor. The hardwire connections are covered in this Product Bulletin (PB). Tested wireless options are covered in PB-133, Zlinx for Wireless RS-232/RS-422 Master-Satellite, Tank Monitor, and Transaction Printer Communications, and PB-190, Using B&B SmartWorx Serial/Ethernet Converters for RS232/RS422/RS485 Communications.

Making the Interface to the Tank Monitor

The FMU I/O Silver Board will accept either RS-232 or RS-422 connections (see Figure 2). If using a cable connection, an RS-232 or RS-422 cable must be routed from the FMU to the TMU control box. RS-232 cable lengths should not exceed the TMU manufacturer's recommendations, normally 50 feet. RS-232 cable lengths to 150 feet or more have been successful. If the cable length exceeds the manufacturer's recommendation, it is highly recommended the interface be tested before pulling the cable through conduit. If the distance exceeds the effective length for RS-232, RS-422 cable may be used for distances out to 2000 feet. If the tank monitor requires an RS-232 connection, an RS-422 cable may be converted to RS-232 through the use of an RS-232/422 converter at the TMU. The various converters tested for these applications are covered in PB-69, Tank Monitor Connection with RS-232/422 Converter. For all Veeder Root tank monitors with a 25 pin D connector, a Patton Electronics 222N with a DB25 connector has been successful. Syntech carries it with part number 219517.

The TLS-450 has a 9-pin connector, and requires an interface using a power supply whether connecting RS-232 or RS-422. The converters with a power supply described in PB-69 satisfy the requirement.

Perform the following to install the TMIK (if not certain the TMU will interface FuelMaster, call Syntech's Customer Satisfaction Center for assistance):

1. Remove AC power from the FMU and all connected dispensers at the circuit breaker.
2. Unlock and open the FMU cabinet and pedestal doors, and remove the upper and lower electrical access covers from the pedestal electrical access panel.

> ***NOTE*** Veeder Root does not recommend RS-232 communications for distances greater than 50 feet. Syntech has achieved satisfactory communications via RS-232 to 150 feet using 22 AWG shielded cable. Either RS-232 or RS-422 may be used for distances to 150 feet. Distances greater than 150 feet must use RS-422. When RS-422 is used, RS-232/422 converters must be installed at the tank monitor.
>
> Communications to a TLS-450 from an FMU have been unsuccessful without the use of an RS- 232/422 converter with an attached power supply. The power supply seems to be the key ingredient whether using RS-232 or RS-422.

3. As required, pull RS-232 or RS-422 cable from the TMU control box to the FMU electrical access panel. Rigid explosion-proof conduit must be used in hazardous locations.

> ***NOTE*** If the FMU was previously configured with an I/O Silver Board for another purpose, the new I/O Silver Board may be ordered with the additional components necessary to also support the previous configuration.

4. (Existing I/O Silver Board) If applicable, remove the previously used I/O Silver Board mounted over the Pedestal I/O Board on six standoffs:
   a. Note locations and disconnect all ribbon cables and plugs from I/O Silver Board.
   b. Remove I/O Silver Board from standoffs (6 screws).
5. (No existing I/O Silver Board) Remove six screws from Pedestal I/O Board (above and below TB1, TB2, and TB3 terminal strips) and thread six standoffs into the screw holes.
6. Position new I/O Silver Board over Pedestal I/O Board and attach to standoffs with 6 screws removed in step 5.

7. If applicable, reconnect any pre-existing cables and plugs.
8. On tank monitor:
   a. Verify a communications card with an RS-232 connector is installed,
   b. If temperature compensation is being used, in System Setup enable “PRINT TC (temperature compensation) VOLUMES”
   c. Disable front-panel and RS-232 security. Generally switched with dipswitches inside console.
   d. (TLS 300) Use RS-232 connector marked “DIRECT”
   e. (TLS 350) Disable RS-232 End of Message under Communications Setup Data

NOTE RS-422 cable contains 4 conductors and a drain. The drain is usually a bare, uninsulated stranded wire. The drain should be connected to I/O Silver JP13 GND (ground) on one end, and bent over and taped to the cable at the tank monitor end without connecting to ground. If the cable has two drain wires, twist the two drains together and connect to I/O Silver JP13 GND (ground) on one end, and bend over and tape on the tank monitor end.

9. (Tank Monitors with DB25 RS232 Connector) Make the following cable connections. FMU JP13 is the 5-pin connector on the I/O Silver Board. RS-232 TMU DB25 are the connections you make to the DB25 connector on the TMU when running RS-232 from the FMU to the TMU. With RS-232, only the IN+, GND, and OUT- pins on JP13 are used. RS-232/422 Converter has the connections you make on the Patton converter before plugging it into the TMU DB25.

FMU	RS-232	RS-232/422
JP13	TMU DB25	Converter
IN+	2 (TX)	XMT-
IN-		XMT+
GND	7 (GND)	Do Not Connect
OUT+		RCV-
OUT-	3 (RX)	RCV+

10. (Tank Monitors with DB9 RS232 Connector) The B&B 4WSD9TB with its power supply has been successful with Veeder Root TLS-450 applications. It required a straight through cable between the converter and the tank monitor. In some cases, gender changers were needed to change from male to female (or vice versa) pin configuration. Unless you know it is or is not needed, have a compatible power supply available. The 4WSD9TB utilizes a B&B 485PS power supply having a plug to insert into the converter. The 422PP9TB has no plug; the B&B 485PS2 power supply conductors are hardwired to the terminal strip where the RS-422 cable is connected. If it is not known if a power supply will be required, the 4WSD9TB is a little easier to plug in or unplug the power supply.

a. Loosen the TD B(+), TD A(-), RD B(+), RD A(-), and GND screws on the 5-pin terminal strip of the converter. If using the 422PP9TB, also loosen the +12V and GND screws.

b. (422PP9TB) As required, connect the power supply positive wire to +12V, and the negative wire to GND.

c. (4WSD9TB) Set the dipswitches: 1 to RS-422, 2 to Echo On, 3 to 4-wire, 4 to 4-wire.

d. Refer to the color codes recorded in step 1. Connect the communications cable to the converter as shown below. Do not connect the drain/ground to the converter. Bend it back and tape to the cable.

FMU	Converter w/RS-232	Converter w/RS-232/422
1 (IN+)	TD B(+)	TD B(+)
2 (IN-)	TD A(-)	
3 (GND)	Tape	GND
4 (OUT+)	RD B(+)	
5 (OUT-)	RD A(-)	RD A(-)

CAUTION In steps e and f, below, do not apply power to the power supply until all connections are complete.

NOTE Some applications may not permit the converter to be securely attached directly to the tank monitor receptacle. As necessary, install a null modem or straight through cable extension between the converter and tank monitor receptacle. Some applications may also require a gender changer to match the pin configuration of the tank monitor.

e. If being used with a TLS-450, attach a power supply and plug the converter into the tank monitor receptacle.

f. If being used with an untested application, it is advisable to have a power supply and null modem cable or adapter to complete the connection. Plug the converter into the tank monitor receptacle.

CAUTION Do not cut the trace between E1 and E2 if using RS-422 cable!

11. For RS-232, cut the trace between E1 and E2 at the bottom center of the I/O Silver Board. Do not cut the trace for RS-422.

12. Connect one end of the new ribbon cable into **JP14**. Route the other end of the new ribbon cable up to the FMU upper cabinet and plug into **J4** of the Satellite I/O Control Board.

13. On the Satellite I/O Control Board, set the **S2** and **S3 TMU SELECT** jumpers for correct cable type: two upper pins for RS-232, or two lower pins for RS-422.

14. Refer to the TMU Operator's Manual or applicable manufacturer's technical support staff, and program the TMU for correct emulation. Where available, use Veeder Root TLS-250 or TLS-350 emulation.

15. Installation of the Tank Monitor Interface Kit has to be enabled in both the FMU and Central Controller software.

    a. Some tank monitors must be configured with specific communications parameters. It is advisable to determine the communications parameters set in the tank monitor, and make those settings in the FMU. In the Tank Monitor Control Box, determine the baud rate, data bits, stop bits, and parity configured for the TMU. Some tank monitors may have additional settings when making an RS-232 communications connection.

NOTE The only setting that may be changed with a Supervisor Prokee/Smartcard is the baud rate to communicate between the FMU and tank monitor. For this reason, it is recommended FMU communications settings be made either with a laptop connection, or by Syntech's Customer Satisfaction Center (CSC), assuming they can obtain a communications connection with the FMU.

    b. A Supervisor Prokee/Smartcard may be used to view tank monitor settings, but only the baud rate may be changed. To view tank monitor settings:

        1) Insert a Supervisor Prokee/Smartcard. The following menu will appear:

```
SUPV: 1=SYSTEM, 2=PM, 3=ODOM, 4=AIM *
A=CONFIG, B=ISSUES, C=TANKS, D=EXIT *
```

        2) Select **A=CONFIG**. The following menu will appear:

```
CONFIGURATION:  13:05:24 06/17/14 TUE.
A=MODIFY, B=TESTS, C=TIME/DATE, D=EXIT
```

        3) Select **A=MODIFY**. The following menu will appear:

```
CONFIG MENU:  1=COMM, 2=TOTALIZERS A=PUMPS,
B=SYSTEM, C=SHOW OPTIONS, D=EXIT
```

        4) Select **C=SHOW OPTIONS**. Depending upon the software version, the option numbers may vary, but the options will show if TANK MONITOR INTERFACE: ENABLED, TMU INTERFACE TYPE: (7, E,1 or 7, O,1 or 8, N,1), and TMU BAUD RATE. If the TANK MONITOR INTERFACE is not ENABLED, or if the communications parameters do not match the tank monitor communication parameters, go to step c and configure the FMU with a laptop or CSC connection.

    c. Configure FMU with laptop connection (or by Syntech's CSC):

        1) Reapply AC power to the master FMU configured with the TMIK.

2) If applicable, make a laptop connection in accordance with Product Bulletin 111.

3) Using a 5a command:

   a) ENABLE the TANK MONITOR INTERFACE by depressing the space bar when the flashing cursor follows the TANK MONITOR INTERFACE: DISABLED prompt.

   b) Set the TMU DATA FORMAT to correspond with the data bits, parity, and stop bits of the tank monitor. Choices are 7,E,1; 8,N,1; 7,O,1.

   c) Set the TMU BAUDRATE to correspond with the baud rate setting in the tank monitor. Choices are 300, 1200, 2400, 4800, 9600, and 19200.

   d) The DAILY TMU INVENTORY option, when enabled, will automatically generate a command at midnight to obtain an inventory report from the tank monitor. If desired, ENABLE the DAILY TMU INVENTORY.

   e) The TMU MANUFACTURER option is tied to DAILY TMU INVENTORY. A TMU inventory report is normally generated by the FuelMaster software. When DAILY TMU INVENTORY is selected, the command is generated from the FMU. When this option is turned on, the TMU MANUFACTURER must be selected to know which command must be sent from the FMU to the tank monitor. Choices are VR TLS-300, VR TLS- 350, and VR TLS-350R.

4) If applicable, disconnect the laptop connection in accordance with Product Bulletin 111.

d. Configure software.

1) The tank monitor interface must be configured in the software. Access the software, and the site and master FMU where the TMIK was installed.

NOTE The tank monitor selection must be made before the Configure button is depressed. The Configure button permits the selection of various reports that may be obtained from the selected tank monitor. The available reports are dependent upon the tank monitor selected.

Available Veeder Root tank monitor selections are: Guardian AST, TLS-250, TLS-250i, TLS-300, TLS-300i, or TLS-350. TLS-450 may be selected by using TLS-350.There is no known RS232 interface to the ILS-350.

2) Near the bottom of the Site ID window, there is a Tank Monitor pulldown menu. Make the tank monitor selection from the pulldown menu.

3) Click on the Configure button. A TMU Monitor window will open and permit the selection of various reports which may be obtained from the selected tank monitor.

4) Select the desired reports by clicking on and adding a check mark to the box preceding the applicable report. When complete, click on the OK button at the bottom of the window. The TMU Monitor window will close.

5) The tank monitor is configured in the software. The selected tank monitor reports may be obtained whenever an Online connection is made from the software to the FMU by selecting TMU Interface from the Go Online with FMUs window.

The tank monitor interface is complete.

Troubleshooting

When manually rebooting the tank monitor, wait 30 seconds before reapplying power. Failure to wait the full 30 seconds may not save setting changes made before the reboot.

Laptop Connections/Troubleshooting:

A laptop may be connected to the FMU to bypass the FuelMaster software inputs, and send commands to the tank monitor. The connection is made in accordance with Product Bulletin

111. When the connection is established, a 99 command is entered to pass-thru the FMU to the tank monitor. At that point, a compatible Veeder Root report command may be sent to the tank monitor. If communications are properly set, the applicable report will display on the laptop screen. To exit the pass-thru, type Ctrl-Z.

Compatible Report Commands (precede command with **Ctrl-A**) The communications interface on TLS-300, TLS-350, and AST may be tested using some TLS-250 commands:

TLS 250: 200 (Inventory Report), 210 (Leak Report), 240 (Probe Alarm History Report), 250 (Delivery Report), 2A0 (Probe Alarm Status Report)

TLS 300, TLS 350, AST: I20100 (Inventory Report), I20300 (Leak Report), I20600 (Alarm Report), I30200 (Liquid Sensor Alarm Report)

A laptop may be connected to the tank monitor end of the cable used between the FMU and tank monitor to verify the FuelMaster software is sending the correct commands to the FMU, and the FMU is sending the commands to the tank monitor. See Product Bulletin 119 to Test FMU Outputs to Tank Monitors with a Laptop.

A laptop may be connected to a tank monitor to verify serviceability of the tank monitor.

See Product Bulletin 136, Laptop Connect to Tank Monitor.

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
1/16/2017	Original
11/23/2020	Reformatted/Rebranded