Upgrade Fixed FMUs (FMU-2500/3000/3500) to FMU-3505

NOTE Unless differences must be specifically noted, all passive AIM2®, AIM2.4®, AIM2HD, and AIM2.4HD applications will be referenced herein as AIM.

AIM2 and AIM2.4 equipment is not interchangeable. AIM2 operates with 900 MHz, AIM2.4 operates with 2.4 GHz. Different FMU Radio Boards and antennas are required when converting from AIM2 to AIM2.4.

An FMU may contain all the components necessary to operate with AIM2 as well as AIM2.4. This upgrade may be added to an FMU-3500 without removing AIM2 components.

AIM2 900 MHz modules may be upgraded to AIM2.4 without replacing the module. The AIM2 module may be upgraded by connecting an AIM2.4 External Radio.

Description

Fuel Management Units (FMUs) are categorized by the generation (Classic or Plus), application (fixed or mobile), type of reader (Prokee®, Smartcard, Mag-Stripe Credit Card), color (Tan or Grey), and user interface (active or passive). Active FMUs require user activation through a reader and keypad. Passive FMUs are activated by AIM. They do not require user interface, but may have a backup reader and keypad. FMU-3505 is a Plus FMU with passive AIM2.4 (2.4 GHz) capabilities. The following FMU- 3505 series fixed FMU models are available:

FMU-3505PLUS: Passive Master FMU with Prokee backup

FMU-3506PLUS: Passive Satellite FMU with Prokee backup

FMU-3545PLUS: Passive Master FMU with Smartcard backup

FMU-3546PLUS: Passive Satellite FMU with Smartcard backup

FMU-3555PLUS: Passive Master FMU with Prokee and mag stripe credit card backup

FMU-3565PLUS: Passive Master FMU with Smartcard and mag-stripe credit card backup

FMU-3575PLUS: Passive Master FMU with Prokee and Keyless backups

FMU-3576PLUS: Passive Satellite FMU with Prokee and Keyless backups

Fixed FMU upgrades are available for upgrading an FMU-2500 Classic, an FMU-2500 Plus, an FMU-3000, or an FMU-3500 to one of the FMU-3505 series models listed above. Similar upgrades are available for mobile FMUs, but covered elsewhere in other documents.

An RF link is not a requirement for an active FMU-2500, but is critical to the success of the FMU-3505. If an active FMU is being upgraded, it must be re-evaluated for line-of-sight, and within 300 feet of the vehicle fueling positions. If the FMU is inside a building or behind a wall, remote External Radios may be installed to restore line-of-sight. Remote External Radios may be supplied with the upgrade kit, but must be requested in the sales order.

If required, the upgrade will include a new door for the FMU upper cabinet. A new door is provided when the upgrade includes a new reader application(s), or an upgrade to the alphanumeric 43-character keypad. The 4x4 keypad with 16 characters is still available for those who prefer it. When upgrades include a new door or other external cabinet components, requests must specify the desired paint color (gray=G or tan=T).

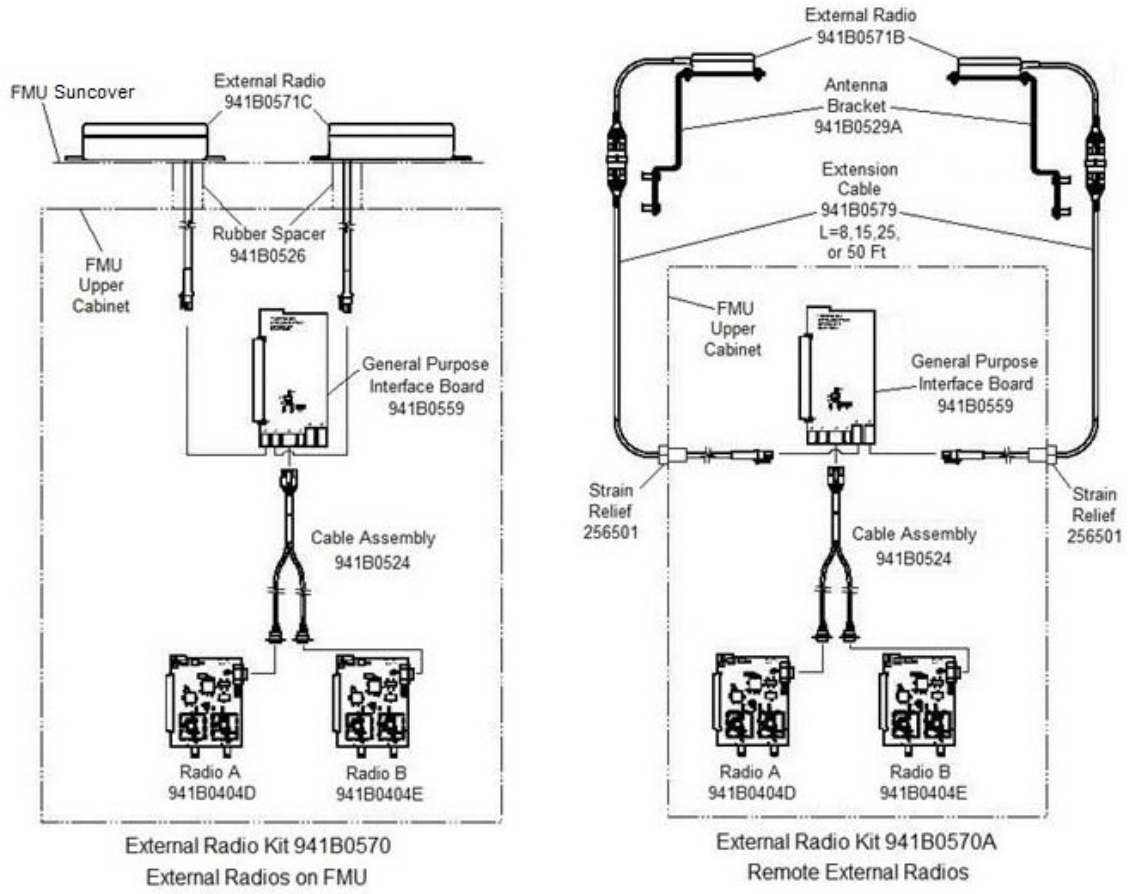


Figure 1. Original AIM2.4 Radio Board Configuration

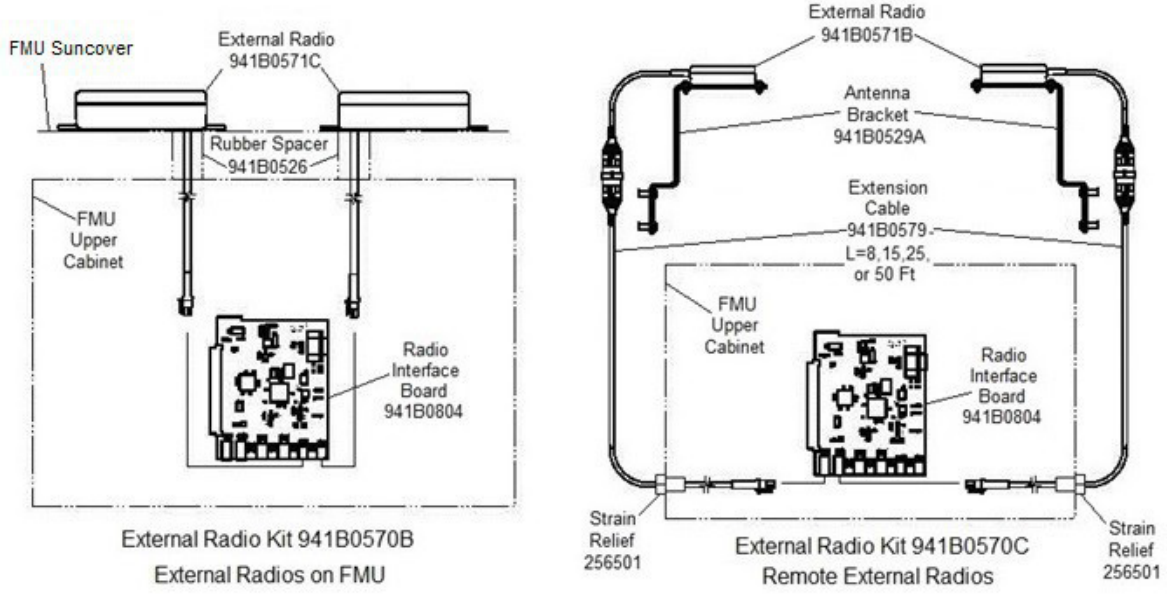


Figure 2. Latest AIM2.4 Radio Board Configuration

Description	Part Number	Qty	Note
FMU-2500 Classic/Plus, FMU-3000, FMU-3500 Upgrade to FMU-3505			
512 MB Compact Flash Memory Card	253111	1	
Sun Cover	931B0205	1	1
Satellite I/O Control Board	941B0102B	1	
Mainboard	941B0222F	1	
Backplate Assembly	941C0100	1	
External Radio Kit	941B0570	1	2
Door Assembly	Various	1	3
Software Upgrade	227838A	1	

Notes

1. 931B0205C painted gray and predrilled for two external radios prior to firmware 3.80; 931B0205D painted tan and predrilled for one external radio after firmware 3.80. 931B0205E painted gray and predrilled for one external radio after firmware 3.80.
2. See breakdown for External Radio Kits. All part numbers begin with 941B0570.
3. Door Assembly is provided when upgrading to newer keypad or different reader combination (specify desired color: grey or tan). Various part numbers.

Table 1. Upgrade Kit Components

Which Upgrade Do I Need?

See Figures 1 and 2. The choice to be made by the customer is whether the External Radios will be mounted on the FMU Suncover, or remotely mounted on antenna brackets. Other differences are dependent upon equipment development. The original configuration shown in Figure 1 was offered before development of the RIB was complete. Figure 2 shows the offering with the introduction of the RIB. When the RIB became available, all upgrade and production configurations were as shown in Figure 2. For those who possess the configurations shown in Figure 1, Syntech will continue to offer parts support for those configurations.

After FMU firmware 3.80, the configuration shown in Figure 2 will reduce the number of External Radios to one, whether mounted on the FMU Suncover, or remote. When mounted on the FMU, the one External Radio will be mounted on the side of the Suncover closest to the FMU door hinge. FMU firmware 3.80 will also support customers who have two External Radios.

Firmware Requirements

FMU firmware 3.72 through 3.76 is used with the configurations shown in Figure 1 with two ERIBs, a general-purpose board, and two External Radios. FMU firmware 3.77 and later is necessary to use the configuration shown in Figure 2 with one RIB and two External Radios. FMU firmware 3.80 and higher will allow the use of the configuration shown in Figure 2 with one or two External Radios.

Use of the equipment shown in Figure 1 requires the use of FMU firmware 3.72 through 3.76. If the FMU firmware must be upgraded to 3.77 or later, the equipment must also be upgraded to the equipment shown in Figure 2.

Inspect Contents of Upgrade Kit

Table 1 lists the major components of the upgrade kits. Table 2 lists the components of the External Radio Kits included in the upgrade kits. Pull the packing list from the shipping container and compare the list of contents with the requirement. This is the best time to

suspend the upgrade if the correct parts are not available. In some cases, it may appear parts are duplicates of parts already installed. Because some circuit boards may look the same and have the same part number, they may not be the latest revision necessary for the upgrade. Install all new parts even if it appears they are duplicates. Call Syntech's Customer Satisfaction Center at 800-888-9136, Ext. 2, if additional parts or any changes are necessary, or if you have questions about the upgrade.

Description	Part Number	Qty	Note
External Radio Kit, 941B0570			
Washer, Flat, Stainless, #6	155349	4	
Screw, Panhead, Corrosion Resistant, #4-40 x 0.19	235342	4	
Nut, Hex, Self Locking, Stainless Steel, #6-32	255475	4	
Screw, Panhead, Stainless Steel, #6-32 x 0.75	255483	4	
Clamp, PCB, Flash	941B0106A	1	
Board, AIM 2, RF. External Radio A	941B04040D	1	
Board, AIM 2, RF. External Radio B	941B04040E	1	
Cable Assembly, FRB to FMU General Purpose Interface	941B0524	1	
Spacer, Rubber, External Radio Module	941B0526	2	
Board, General Purpose Interface	941B0559	1	
External Radio , 90 Degree, FMU, AIM	941B0571C	2	
External Radio Kit, 941B0570A			
Washer, Split, Corrosion Resistant, 0.250 ID	186414	6	
Screw, Panhead, Philips, 1/4-20X0.75	211052	6	
Nut, Rivet, AVDEL, 0.25-20.02-.08	218308	6	
Screw, Panhead, Philips, #4-40x0.19	235342	4	
Nut, Hex, Self Locking, Stainless Steel, #6-32	255475	4	
Nut, Hex, Stainless Steel, 0.25-20, 0.44X0.22	255491	6	
Nut, Locking, Nylon, Black	256471	2	
O-Ring, Strain Relief, 0.39 ID	256498	2	
Strain Relief, Fome, 0.120-0.26	256501	2	
Clamp, PCB, Flash	941B0106A	1	
Board, AIM 2, RF. External Radio A	941B04040D	1	
Board, AIM 2, RF. External Radio B	941B04040E	1	
Cable Assembly, FRB to FMU General Purpose Interface	941B0524	1	
Bracket, Antenna Mount, AIM, External Radio	941B0529A	2	
Board, General Purpose Interface	941B0559	1	
External Radio , HD Connector, AIM	941B0571B	2	
Cable, External Radio, External Antenna, FMU, AIM, 8 Ft	941B0579	2	1
Cable, External Radio, External Antenna, FMU, AIM, 15 Ft	941B0579A	2	1
Cable, External Radio, External Antenna, FMU, AIM, 25 Ft	941B0579B	2	1
Cable, External Radio, External Antenna, FMU, AIM, 50 Ft	941B0579C	2	1

Note

1. Two cables required; part number is dependent upon length desired.

Table 2 (1 of 2). External Radio Kit Components

Description	Part Number	Qty	Note
External Radio Kit, 941B0570B			
Washer, Flat, Stainless, #6	155349	4	
Nut, Hex, Self Locking, Stainless Steel, #6-32	255475	4	
Screw, Panhead, Stainless Steel, #6-32 x 0.75	255483	4	
Clamp, PCB, Flash	941B0106A	1	
Spacer, Rubber, External Radio Module	941B0526	2	
External Radio , 90 Degree, FMU, AIM	941B0571C	2	
Board, Radio Interface, AIM	941B0804	1	
External Radio Kit, 941B0570C			
Washer, Flat, Stainless, #6	155349	4	
Washer, Split, Corrosion Resistant, 0.250 ID	186414	6	
Screw, Panhead, Philips, 1/4-20 x 0.75	211052	6	
Nut, Rivet, AVDEL, 0.25-20.02-.08	218308	6	
Nut, Hex, Self Locking, Stainless Steel, #6-32	255475	4	
Screw, Panhead, Stainless Steel, #6-32 x 0.75	255483	4	
Nut, Hex, Stainless Steel, 0.25-20, 0.44X0.22	255491	6	
Nut, Locking, Nylon, Black	256471	2	
O-Ring, Strain Relief, 0.39 ID	256498	2	
Strain Relief, Fome, 0.120-0.26	256501	2	
Clamp, PCB, Flash	941B0106A	1	
Bracket, Antenna Mount, AIM, External Radio	941B0529A	2	
External Radio , HD Connector, AIM	941B0571B	2	
Cable, External Radio, External Antenna, FMU, AIM, 8 Ft	941B0579	2	1
Cable, External Radio, External Antenna, FMU, AIM, 15 Ft	941B0579A	2	1
Cable, External Radio, External Antenna, FMU, AIM, 25 Ft	941B0579B	2	1
Cable, External Radio, External Antenna, FMU, AIM, 50 Ft	941B0579C	2	1
Board, Radio Interface, AIM	941B0804	1	

Note

1. Two cables required; part number is dependent upon length desired.

Table 2 (2 of 2). External Radio Kit Components

Read These Instructions

Read over these instructions. If you have any questions, call Syntech's CSC and get some answers before you proceed with the upgrade.

NOTE Every upgrade to AIM2.4 includes a new Mainboard, Satellite I/O Control Board, and Backplate Assembly

Perform the Upgrade

Upgrading the FMU requires 1) removal and replacement of the FMU upper cabinet door when a new door is included, 2) removal of the old FMU Backplate Assembly, 3) installation of the AIM2.4 External Radios, 4) installation of the new FMU Backplate Assembly, 5) installation of the FMU Radio Board(s), 6) reconfiguration with the new Radio Boards, and 7) post installation tests to verify serviceability.

1. Remove/Replace FMU Upper Cabinet Door (if applicable). If a different keypad or access device reader are part of the upgrade, it may be necessary to replace the FMU upper cabinet door. Perform the following to remove and replace the FMU upper cabinet door (reference Figures 3 and 4).:

    a. See Figure 3. On the FMU upper cabinet door, remove the hex nut, then remove the lock assembly. The hex nut should remove over the lock latch without further disassembly. The lock will be reinstalled in the new door.

Figure 3. Lock Assembly

    b. See Figure 4. There is a green ground wire extending from the left side of the Backplate to the door. Disconnect the green ground wire from the old door.

Figure 4. FMU Upper Cabinet Door Replacement

> ***NOTE*** FMU-2500 Classic FMUs may have a 941B0110 ribbon cable connecting between the Door and Mainboard J8 receptacle. A new door will have a 941F0206A cable. This cable has two Mainboard connections, to the 44 pin J17 receptacle, and the J4 10 pin Smart Card receptacle.

c. See Figure 4. Disconnect the 941B0110 or 941F0206A ribbon cable from the FMU Mainboard.

d. Support the door. Remove the 5 acorn nuts securing the door to the upper cabinet, then remove the door.

e. Support the new door and insert the 5-hinge attach screws into the upper cabinet screw holes.

f. Loosely attach the 5 acorn nuts. The acorn nuts should be tightened sufficiently to hold the door in place, but permit movement for adjustment.

g. Connect the green ground wire to the new door. There is a ground lug for this purpose in the lower right corner of the door (viewed from behind the door).

h. Reinstall the lock assembly in the new door. When reassembled and locked, the lock latch must be horizontal as shown in Figure 3.

i. Check that the door will close and lock. Adjust the fit until the door will close and lock without interference, then tighten the 5 acorn nuts.

2. Remove the FMU-2500 Plus Backplate Assembly. The Backplate Assembly must be removed to facilitate installation of the AIM2.4 External Radios. Remove the FMU Backplate Assembly as follows:

a. Download transactions.

b. Save a copy of the FMU configuration in the software.

c. Make a laptop connection and note the OPTION BYTES (13 command) so they may be restored.

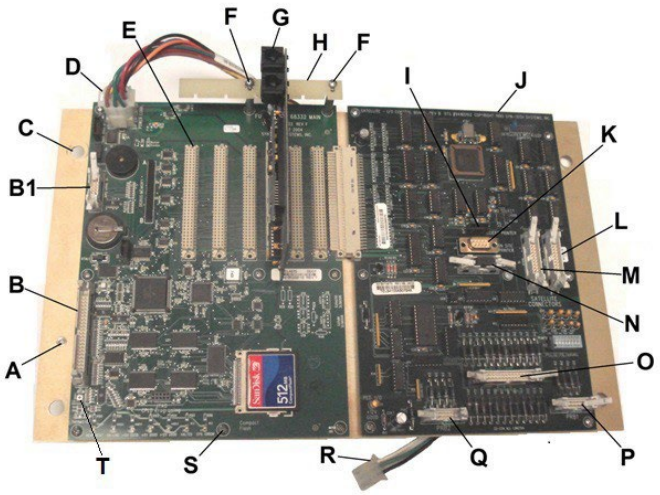
d. Note any custom prompts used by this customer so they may be restored after the upgrade. (Use commands 22, 42, 48, 4b, and 4d to view or change.)

> ***WARNING*** Danger of electrical shock. Removing FMU power at the FMU power switch removes power from the FMU upper cabinet where the modifications are made. It does not remove power from wires coming to the FMU from the power source. If anything below the FMU upper cabinet is accessed, power must be removed from the incoming power wires.

e. Open the FMU pedestal access door and turn off the FMU power switch.

f. Unlock and open the upper cabinet door and disconnect the following cables, as applicable (reference Figure 5 for locations):

A	Ground wire	N	Tank Monitor Ribbon Cable (J4)
B	Ribbon Cable for door accessories (J8)	O	Pedestal I/O Board Ribbon Cable
B1	10 pin ribbon cable receptacle (J4)	P	Relay 1-4 Ribbon Cable (PRB1)
G	Phone Line (from Modem)	Q	Relay 5-8 Ribbon Cable (PRB2)
I	Receipt Printer Cable (J2)	R	AC Power connector
K	On-Site (Transaction) Printer Cable (J3)	Not Shown	Card Reader Cable from Card Reader Board
L	Satellite 1-4 Ribbon Cable (J6)		
M	Satellite 5-8 Ribbon Cable (J5)		



LEGEND

A – Ground wire attach screw
B – J8 or J17 Ribbon Cable
B1 – J4 Ribbon Cable
C - Mount Screw Holes
D – J1 Power Connector
E – Mainboard Expansion Slots
F – Board Retention Bracket Screws, Standoffs
G – Modem Phone Line
H – Board Retention Bracket
I – J2 Receipt Printer
J – Satellite I/O Control Board
K – J3 Onsite (Transaction) Printer
L – J6 Satellite 1-4 Ribbon Cable
M – J5 Satellite 5-8 Ribbon Cable
N – J4 Tank Monitor Ribbon Cable
O – J7 Pedestal I/O Board Ribbon Cable
P – PRB1 Relay 1-4 Ribbon Cable
Q - PRB2 Relay 5-8 Ribbon Cable
R – AC Power Connector
S – Mainboard Attach Screws
T – LCD Contrast Adjustment

Figure 5. FMU-2500Plus Backplate Assembly

(some minor non-applicable differences with Classic Mainboard)

g. Remove two screws (F) and Board Retention Bracket (H), then remove any boards installed in the four expansion slots (E). The removed boards will be reinstalled.

h. Remove the two standoffs under the two screws (F) for Board Retention Bracket.

i. Remove the Backplate mount screws (C), 4 places.

j. Carefully remove Backplate Assembly from the Cabinet.

3. Install External Radios on FMU Suncover (see separate procedure for remote installation of External Radios). Depending upon the firmware loaded on the FMU mainboard, there may be one or two External Radios supplied. All upgrades requiring External Radio mounting on the FMU include a Suncover predrilled and painted to accept the External Radios provided with the upgrade kit. The predrilled Suncovers have clinch nuts preinstalled to accept the mount screws for the External Radios.

   Figure 6 illustrates the location of the predrilled holes in the FMU Suncover. The predrilled holes for the External Radios are circled to indicate which holes are intended for External Radio #1 and External Radio #2. When only one External Radio is supplied, the PREDRILLED HOLES FOR EXTERNAL RADIO #2 will not be present in Suncovers shipped with the upgrade kits.

   If remote External Radios are requested, a predrilled Suncover will not be included with the upgrade kit.

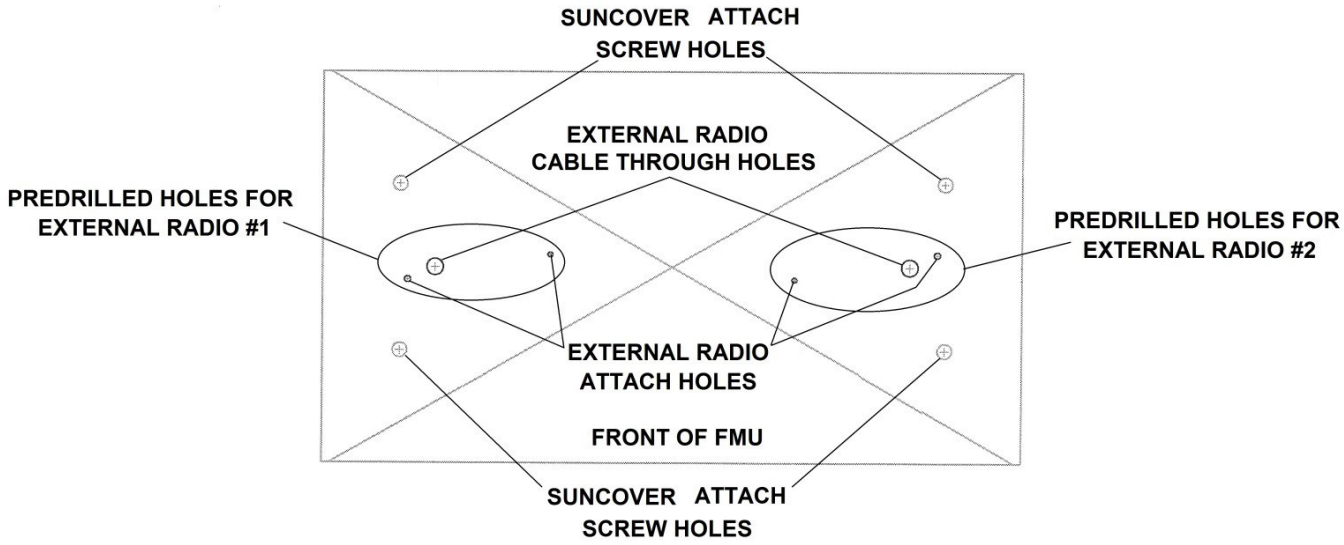


Figure 6. FMU Suncover Predrilled for External Radios

CAUTION	FMU Suncover attach screws may be difficult to remove. The standoffs that support the Suncover are welded to the upper cabinet. If care is not exercised when removing the attach screws, the standoff may break loose. When loosening the attach screws, use vise grips to grip the standoff, then loosen the attach screw.

a. Remove the four FMU Suncover attach screws, then remove the Suncover.

b. Verify FMU power removed at the FMU power switch. FMU power should have been removed during removal of the Backplate Assembly. Open the FMU upper cabinet door.

c. A through hole must be drilled through the FMU upper cabinet for the External Radio cable(s). Temporarily install the new predrilled Suncover with the 941B0526 rubber spacer(s) positioned under the ½ inch External Radio cable hole(s).

d. Mark a location in the FMU upper cabinet for a ½ inch through hole(s). Mark both locations if two External Radios will be installed. After locating the hole(s), use a center punch to mark the hole(s) for drilling.

e. Remove the Suncover and Rubber Spacer(s).

f. The Backplate Assembly should already be removed. Inside the cabinet, at the top, is a sheet of Styrofoam insulation. The hole(s) drilled through the cabinet needs to penetrate the metal (aluminum) and Styrofoam. Put a rag or paper inside the cabinet to catch the filings, and drill ½ inch through holes from the top of the cabinet to the inside.

g. Remove the filings and Styrofoam shavings, and deburr the area around the hole(s).

h. Position the Rubber Spacers between the ½ inch through holes in the Suncover and Upper Cabinet. Using the four attach screws and washers, reinstall the Suncover on the upper cabinet standoffs.

i. A Rubber Gasket and Cable Grommet are provided with each External Radio. Thread the cable(s) from the External Radio(s) down through the hole in the gasket and the ½ inch through holes in the Suncover, Rubber Spacer(s), and Upper Cabinet.

j. Slide the Cable Grommet(s) down the cable into the hole through the Suncover. The Cable Grommets are to protect the cable from chafing.

k. The predrilled Suncovers have clinch nuts (like nutserts/nutplates) for attaching the External Radio(s) with two attach screws. Position the External Radio on the gasket, aligned with the two attach screw holes, and secure to the Suncover with the two attach screws.

CAUTION Water intrusion into the FMU upper cabinet can damage the internal circuit boards. Weatherproofing the through hole(s) into the upper cabinet will prevent water intrusion.

l. From inside the FMU upper cabinet, squeeze a liberal amount of silicone into the through hole(s) the External Radio cables are protruding from. Allow time for the silicone to cure before flexing the cables.

4. Install Remote External Radios (see separate procedure for installation on the FMU Suncover). Remote External Radios provide the flexibility to mount the External Radios where they can look over or around obstacles to the FMU. The Remote External Radios are shipped from the factory preinstalled on Antenna Brackets. The cables that connect the radios to the FMU are available in 8, 15, 25, and 50-foot lengths. Cables should not be shortened (or lengthened) in the field:

a. Verify FMU power removed at the FMU power switch. FMU power should have been removed during removal of the Backplate Assembly. Open the FMU upper cabinet door.

b. Reference Figures 1 and 2 for illustrations of remote External Radios. A satisfactory mount location must be found for the External Radio(s) that will provide line of sight with minimum separation distance with the fueling point. If two External Radios are provided, they should be mounted at least eight inches apart. The External Radio Brackets have 9/32 mount holes. Use the ¼ inch screws, nuts, and washers to mount the External Radio Bracket(s).

c. Verify the cables will reach from the remote mounting location to the FMU, then mount the remote External Radio(s) and Bracket(s) to a vertical surface.

d. The External Radio cables do not need to be contained in explosion- proof conduit unless they enter into a hazardous classified location. The cables will survive much longer if routed in some sort of protective conduit that meets the NEC (National Electric Code) requirements for the location. Route the External Radio Cable(s) to the FMU.

e. A ½ inch through hole must be drilled through the FMU upper cabinet for the External Radio cable(s) and Strain Reliefs. For convenience and best weather seal, hole(s) should be drilled through the side or bottom of the cabinet, and not in the top or back behind the Backplate Assembly.

f. Mark a location in the FMU upper cabinet for a ½ inch through hole(s). Mark both locations if two External Radios will be installed. After locating the hole(s), use a center punch to mark the hole(s) for drilling.

g. The Backplate Assembly should already be removed. Put a rag or paper inside the cabinet to catch the filings, and drill a half inch through hole(s) into the cabinet, one for each remote External Radio to be installed.

h. Remove the filings and deburr the area around the hole(s).

i. Refer to Figure 7. Install the O-Ring onto the O-Ring Seat of the Strain Relief Body, then insert into the ½ inch through hole(s) from outside to the inside of the FMU Upper Cabinet.

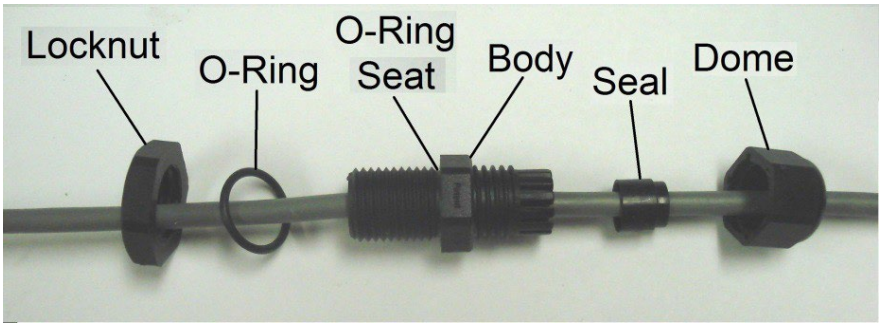


Figure 7. Strain Relief, O-Ring, and Locknut

j. Install and hand tighten the Locknut onto the portion of the Strain Relief Body inside the FMU Upper Cabinet.

k. The 941B0579 Extension Cables are supplied with the four pin Radio Interface Board connector removed so the cable may be inserted through the strain relief. Loosen the Strain Relief Dome and insert the exposed pins of the Extension Cable(s) through the Strain Relief(s) from outside to inside. Leave the Dome loose until the Cable is connected to the Radio Interface Board.

l. See Figure 8. Attach the connector to the 941B0579 Extension Cable by inserting the pin of the properly colored wire into the corresponding pin hole of the receptacle. The pin will lock into the connector when pushed in far enough.

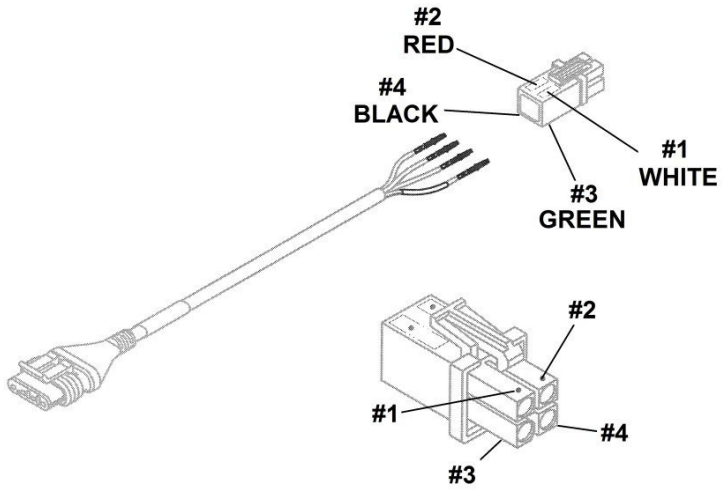


Figure 8. Assembling 941B0579 Extension Cable

5. Install the New FMU Backplate Assembly. A new Backplate Assembly is provided with the upgrade kit to ensure the correct revision level of the boards is installed with the upgrade. Perform the following to install the new Backplate Assembly:

   a. External Radio cable(s) are entering the FMU Upper Cabinet. When the Backplate Assembly is installed, the cables must be to the front side of the Backplate Assembly. Carefully position the Backplate Assembly inside the FMU Upper Cabinet behind the External Radio cable(s).

   b. Refer to Figure 5. Ensure the AC Power Connector (R) is accessible, then secure the Backplate Assembly in the FMU with four mount screws (C).

   c. Install the two standoffs for the Board Retention Bracket (H). There will be a new, longer Board Retention Bracket supplied with the upgrade kit.

   d. Reference Figures 1 and 2, as applicable. Reinstall any boards removed from the Mainboard expansion slots, then install the Radio Boards as follows (any Mainboard expansion slot may be used):

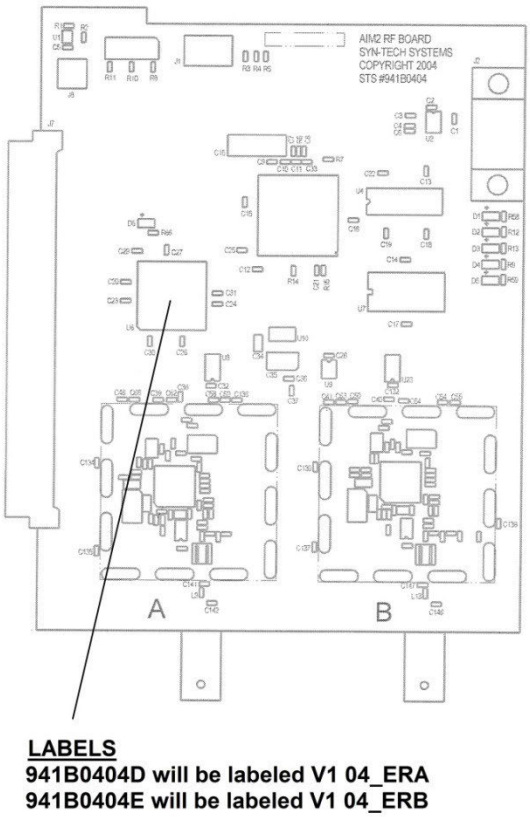


Figure 9. External Radio Interface Board: Identifying ERIB A and B

1) Original (Figure 1) Configuration

   a) Install the 941B0559 General Purpose Interface Board.

   b) Plug the 8-pin plug of the 941B0524 Cable Assembly into J3 of the 941B0559 General Purpose Interface Board

   c) Install the 941B0404D and 941B0404E External Radio Interface Boards (ERIBs). See Figure 9. Labels are attached to the U6 chip on the ERIBs to identify which radio is radio A (ERA), and which radio is radio B (ERB). There must be one of each. They may be installed in any Mainboard expansion slot.

   d) Plug one pigtail of the 941B0524 Cable Assembly into J2 of radio A, and the other into J2 of radio B. Using the captured screws in each pigtail connector, secure the pigtails to the ERIBs.

   e) (External Radios mounted on FMU Suncover) Plug the pigtail 4 pin connector from one of the External Radios into J4 of the 941B0559 General Purpose Interface Board. Plug the pigtail 4 pin connector from the other External Radio into J5 of the 941B0559 General Purpose Interface Board.

f) (Remote Mounted External Radios) Plug the pigtail 4 pin connector from one of the External Radio Extension Cables into J6 of the 941B0559 General Purpose Interface Board. Plug the pigtail 4 pin connector from the other External Radio Extension Cable into J7 of the 941B0559 General Purpose Interface Board.

2) Latest (Figure 2) Configuration

a) Install the 941B0804 Radio Interface Board (RIB).

NOTE	See Figure 10. External Radio cable connections into the RIB will vary depending upon whether the External Radios are mounted on the FMU Suncover, or remote.

b) (External Radios mounted on FMU Suncover) Plug one External Radio pigtail 4 pin connector into J9 of the RIB. Plug the other External Radio pigtail 4 pin connector into J10 of the RIB. If only one External Radio is mounted on the FMU Suncover, the pigtail 4 pin connector may be plugged into either J9 or J10 of the RIB.

c) (Remote Mounted External Radios) Plug one External Radio Extension Cable pigtail 4 pin connector into J11 of the RIB. Plug the other External Radio Extension Cable pigtail 4 pin connector into J12 of the RIB. If only one External

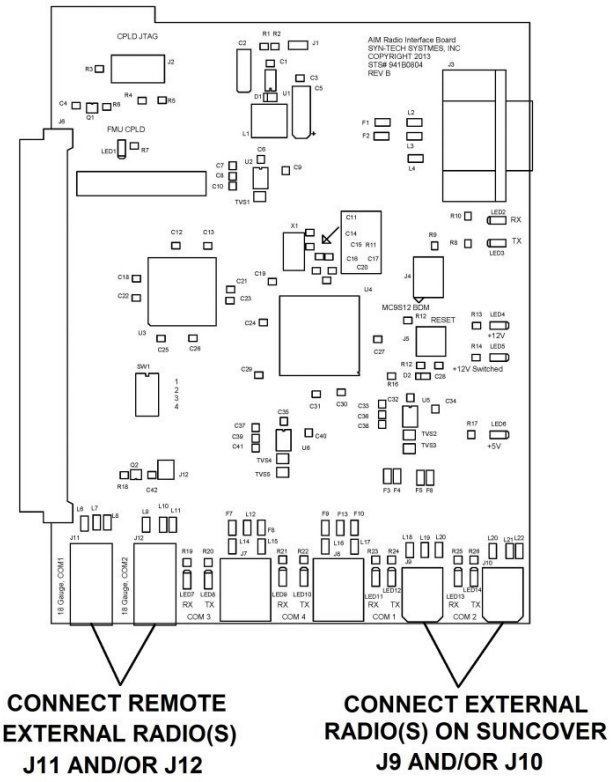


Figure 10.Radio Interface Board (RIB) External Radio Connections

Radio is remotely mounted; the Extension Cable pigtail 4 pin connector may be plugged into either J11 or J12 of the RIB.

e. Using the new longer Board Retention Bracket (H) supplied with the upgrade kit, use two screws (F) to loosely attach it to the standoffs, then slide it down so the boards in the expansion slots fit into the slots in the Bracket. Hold the Bracket in place and tighten the two screws (F).

f. Reconnect the following cables, as applicable (reference Figure 5 for locations):

A	Ground wire	N	Tank Monitor Ribbon Cable (J4)
B	Ribbon Cable for door accessories (J8)	O	Pedestal I/O Board Ribbon Cable
B1	10 pin ribbon cable receptacle (J4)	P	Relay 1-4 Ribbon Cable (PRB1)
G	Phone Line (from Modem)	Q	Relay 5-8 Ribbon Cable (PRB2)
I	Receipt Printer Cable (J2)	R	AC Power connector
K	On-Site (Transaction) Printer Cable (J3)	Not Shown	Card Reader Cable from Card Reader Board
L	Satellite 1-4 Ribbon Cable (J6)		
M	Satellite 5-8 Ribbon Cable (J5)		

NOTE It may be necessary to adjust the LCD contrast to view the display. The LCD contrast may be adjusted by turning the LCD CONTRAST potentiometer (T, Fig. 5) located under the large ribbon cable connector on the left side of the mainboard. Too little contrast will result in no display. Too much contrast will result in two solid black horizontal lines on the display.

g. Reapply power to the FMU and observe the display. As the FMU initializes it will self-test boards installed in the mainboard expansion slots. Verify a display as follows appears to indicate the FMU recognizes the newly installed AIM RF Board:

******* INITIALIZING AIM2 SYSTEM *******

h. When the FMU completes initialization, the following default display should be observed:

```
FUELMASTER FUEL MANAGEMENT SYSTEM

INSERT KEY, HOLD 1 SECOND TO BEGIN
```

i. Make a laptop connection in accordance with Product Bulletin 111, and perform the following:

1) Use command 38 to set/verify the Site Signature.

2) Use command 61 to reset the option bytes.

3) Use commands 22, 42, 48, 4b, and 4d to view or change any custom prompts previously used by this customer.

4) Disconnect the laptop connection.

j. (Use Existing Software) If using the existing Central Controller software and converting from an active system to a passive system, perform the following:

1) Access the FuelMaster software. The software main window will be displayed.

2) Click on the Config icon. A Configuration window will open.

3) In the Configuration window, click on the System tab. The System tab will open.

4) Click on the down arrow next to Passive Sys Type. A pulldown window will open and display AIM, AIM2, and NONE.

5) Change the system type to AIM2, and click on OK. The Configuration window will close. Click on the Config icon, again. The Configuration window will open with an AIM2 tab displayed.

6) Open the AIM2 tab and make any desired default selections. Whatever is selected in this tab will appear as the default choice in Vehicle selections. When complete, click on OK. The Configuration window will close.

7) Click on the Site icon. From the Site List, open the Site where the FMU upgrade is being performed.

8) At the bottom of the Site ID window is an FMU* selection. Click on the down arrow. A pulldown window will open and display several FMU types. A selection is made here for FMU 2500 Plus AIM2, or FMU 2500 Plus AIM2 Prog. Both choices will configure the FMU for passive fueling. The FMU 2500 Plus AIM2 Prog selection will configure the FMU to accept programming information from the software, and transfer it to the vehicle AIM modules. There must be at least one programmer to program the AIM modules as they are installed.

9) In the Site ID window, click on to highlight, then open the FMU Unit ID window for the upgraded FMU.

10) Click to highlight, then open a hose window.

11) Click on the Configure button, then click on the Yes button to open the Grade Positions window.

12) Enter the applicable AIM Nozzle ID in the ANID (AIM Nozzle ID) box, then click on OK at the bottom of the window. The window will close.

13) Click on OK to exit the Hose window. The Unit ID window will be displayed.

14) Repeat steps 10 through 13 for the remaining hoses configured for this FMU, then click on OK to exit the Unit ID window.

15) Repeat steps 9 through 14 for any remaining upgraded FMUs at this site, then click on OK to exit the Site ID window.

16) Click on the Vehicle icon, and perform the following for each vehicle to receive an AIM module:

    a) In the Vehicle List, click on and highlight the vehicle to receive an AIM module, then click on the Open button. The Vehicle ID window will open.

    b) Click on the box next to Check to Install AIM2. A Warning will pop up. Click on the Yes button. Several tabs will be added to the Vehicle ID window. These tabs are to select the options and features to be used with the vehicle, and to select the information you wish to obtain from the AIM module.

c) All vehicles will not require information from each tab. As you become familiar with the type of vehicle and AIM installation, you will learn which tabs apply, and which information to select. More assistance may be obtained from the AIM2 Installation Manual, and the FMPlus User Manual.

17) When complete, click on OK to exit the Vehicle ID window, then click on Close to exit the Vehicle List.

k. (Upgrading Software) Load the software upgrade in accordance with the FMPlus User Manual.

l. Upload the fuel site configuration, send an authorization list, and send pricing, as required.

NOTE	Except as noted, until AIM2.4 is covered in the AIM Installation Manual, references to AIM2 and FMU-3500 may be utilized in step 13.

m. At this point the AIM2 Installation Manual should be referenced to:

1) Develop an FMU-3500 Programmer,

2) Create an AIM2 Programmer Prokee/Smartcard,

3) Install AIM2 in vehicles, and

4) Program an AIM2,

n. Perform an AIM test transaction and download the transaction to the Central Controller. Verify the transaction information is correct.

o. Upgrade complete.

Glossary

The following is an explanation of terms used in this bulletin:

Term	Description
Active FMU	an FMU that requires user activation through the device reader and/or keypad.
AIM (Automotive Information Module)	device installed in/on vehicle with memory and radio to receive from, and transmit info to FMU through RF (radio frequency) interface. Vehicle information entered in FuelMaster software is transmitted to FMU, which in turn transmits to AIM when vehicle is within RF range of FMU. AIM transmits vehicle info to FMU when pulling up to fuel island for fuel.
AIM2	AIM module with radio broadcasting at 900 MHz
AIM2.4	AIM module with radio broadcasting at 2.4 GHz, and utilizing DSSS
AIM2HD	AIM2 ruggedized for installation in the weather. Uses cables developed for use in weather. AIM2.4HD – AIM2.4 ruggedized for installation in the weather. Uses cables developed for use in weather.
FMU General Purpose Interface Board	circuit board plugged into FMU mainboard to transfer inputs from External Radios to ERIBs. Silkscreen on board is labeled FMU Interface Board with part number 941B0599.
FMU Suncover	aluminum plate mounted on standoffs on top of FMU upper cabinet. Suncover is shaped to prevent water pooling on its surface. The Suncover is the mounting surface for the External Radios.
External Radio	all passive FMUs have Radio Boards mounted inside the FMU in mainboard expansion slots. External Radios are mounted outside the FMU either on the FMU Suncover, or remotely where it may be necessary to relocate to gain line of sight.
External Radio Interface Board (ERIB)	part of the original AIM2.4 configuration. Two ERIBs (Figure 1) were installed in FMU mainboard expansion slots, and connected directly to an FMU General Purpose Interface Board, also plugged into an FMU mainboard expansion slot.
Passive FMU	an FMU that is activated by AIM without user interface.
Radio Interface Board (RIB)	component of the latest AIM2.4 configuration. RIB is installed in FMU mainboard expansion slot.

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.