Backplate Assembly Removal & Replacement

(FMU-2500/3000/3500/4500/5000 Series)

The Backplate Assembly is shipped complete with the Power Management Board, Main Board, Satellite I/O Control Board, and Heater Assembly as a modular unit. If a problem requires replacing any of these components, all components will be shipped for replacement as a single unit. This is sometimes referred to as a Line Replacement Unit.

CAUTION	This procedure should not be attempted in a rainy environment.

NOTE	Part numbers with different revision levels may have different cable connections. For example, the 941B0222 Rev D mainboard does not have a Smart Card connector, but the 941B0222 Rev E mainboards do have a J4 Smart Card connector. When new parts are received, verify the connectors match before starting the removal and replacement process.

Remove Backplate Assembly for FMU-2500/3000/3500s

NOTE	If replacing FMU-2500/3000/3500 series with a 4500 series, Syntech will capture, convert, and import data from the Legacy database into FMLive prior to hardware installation at the site.

1. If possible, download all transactions from the FMU, and ensure a current copy of the fuel site configuration has been downloaded to the FuelMaster Plus (FMPlus) software. The fuel site configuration will need to be restored after the new Backplate Assembly is installed.

2. Remove AC power from the FMU at the FMU power switch behind the pedestal door. If necessary, turn off the main power at the breaker panel.

NOTE	The FMU-2500/3000 Classic series FMUs have 4 expansion slots. The FMU-2500/3500 Plus series FMUs have 6 expansion slots. Any expansion slot may be used for any expansion board.

3. Open the upper cabinet door.

4. Note the connections currently in use. If a smartphone or tablet is on hand, capture the current expansion cards and cable locations.

5. Disconnect any cables that connect to the lower pedestal or front panel.

6. Remove Phillips screws (F) (4 places) (see Diagram 1 on the next page).

7. Carefully lift the Backplate Assembly from the cabinet to expose the power cable connected to the Power Management Board located on the back of the assembly.

8. Disconnect the power connector (black, green, and white wires) from the Power Management Board on the back of the Backplate Assembly.
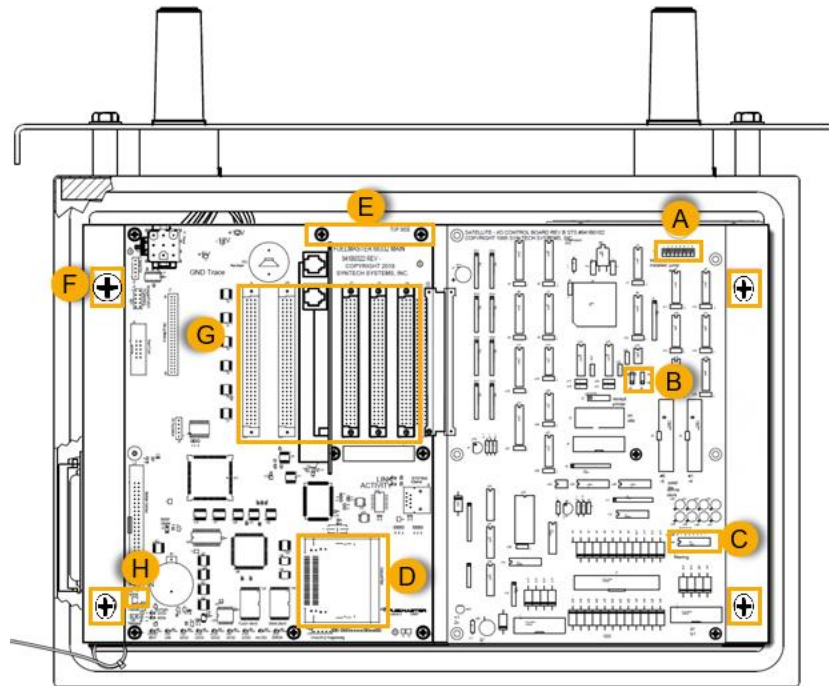
9. Remove the Backplate Assembly.

Diagram 1

Installing a Backplate Assembly for FMU-2500/3000/3500s

1. Remove jumpers, if present, from positions (A) and (B) on the removed Backplate Assembly and install the jumpers in the new Backplate Assembly in the same positions.

2. Check that PULSE FILTERING dip switches (C) are in the same position on the new Backplate Assembly as switches on the removed Backplate Assembly.

3. Check the new Backplate Assembly to see if a Compact Flash (D) is provided.

    a. If the new Backplate Assembly already has a Compact Flash, skip to step 5.

    b. If the new Backplate Assembly does not have a Compact Flash, continue to step 4.

4. Remove the Compact Flash card (D) from the removed Backplate Assembly and install the card in the new Backplate Assembly.

5. Reinstall two standoffs for Board Retention Bracket (E) from the old mainboard.

6. Ensure the FMU power switch is off.

7. Connect the power connector (black, white, and green wires) to the Power Management Board.

8. Locate the Backplate Assembly over 4 standoffs; then insert screws (F) (4 places).

> *NOTE*   The expansion slots are keyed to properly orient the cards.

9. Transfer the cards in the former board's expansion slots (G) to the new board.

10. Position Board Retention Bracket over standoffs (E) and cards in expansion slots (G) and reinstall and tighten two Bracket screws.

11. Properly ground the device to ensure personal safety, as well as the proper operation of the device. See **Grounding the Device** tutorial on page 4 for more information.

12. Reference Diagram 1 (or the image you captured) and re-connect all cables (cables are keyed; match the key on the connector to the notch on the receptacle).

13. Turn FMU power switch ON. Verify front panel LCD reads:

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FUELMASTER FUEL MANAGEMENT SYSTEM

INSERT KEY, HOLD 1 SECOND TO BEGIN
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NOTE	If the display is not visible, or the LCD is displaying two black lines, the LCD contrast should be adjusted to make legible via (H) on the Mainboard.

14. Upload the fuel site configuration to the FMU from the FuelMaster Plus (FMPlus) software.

15. Send the authorization list to the FMU.

16. With the Automatic/Manual Mode Switches in AUTOMATIC, use Prokee (smartcard or credit card, if applicable) and perform test transactions on all hoses, recording hose, quantity, and time as test transactions are conducted.

17. Query FMU to verify test transactions were accurately recorded. If communication from PC was successful, and hoses, quantities, and times match, the repair is successful.

18. Using the Return Shipping Ticket forwarded with the replacement Backplate Assembly, return the removed Backplate Assembly to Syntech Systems, Inc.

Grounding the Device

WARNING	This device must be properly grounded to ensure personal safety, as well as the proper operation of the device.

1. Connect one end of the green ground wire to the grounding lug on the back of the FMU door (if Prokee reader is installed) or to the grounding lug on the back of the Smart Card reader (if said device is installed).
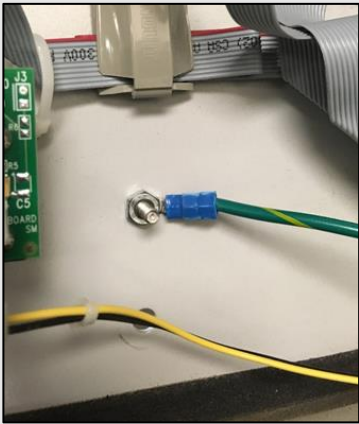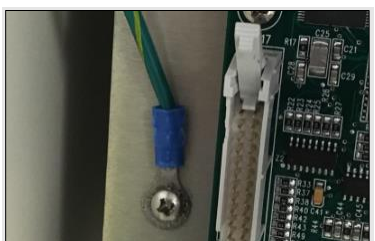

Prokee Reader on Front of FMU Door

Smart Card Reader on Front of FMU Door

2. Route the green ground wire in a serpentine fashion through the Main Ribbon Cable bracket.

3. Secure the free end of the green ground wire to the bottom of the Backplate with a small screw.

Removing a Backplate Assembly for FMU-4500 Series

> **NOTE**   In the event the hardware is inoperative, and the transactions have not successfully been sent to FM*Live*, send the replaced SD card to Syntech to be manually resubmitted.

1. Remove AC power from the FMU at the FMU power switch behind the pedestal door. If necessary, turn off the main power at the breaker panel.

2. Open the upper cabinet door.

3. Wait for the EAPro to shut down. Details on this process can be found in the Power OFF / Shutdown Sequence at the end of this guide.

> **WARNING**   Verify the EAPro has fully shut down by checking all lights on the EAPro are off.
>
> The EAPro not being fully shut down when removing the supercap could result in damage or data loss.

4. Note the connections currently in use. If a smartphone or tablet is on hand, capture the current expansion cards and cable locations.

5. Disconnect any cables that connect to the lower pedestal or front panel.

6. Remove the large Phillips screw adhering the EAPro to the Backplate Assembly in the lower right corner (see Diagram 2).
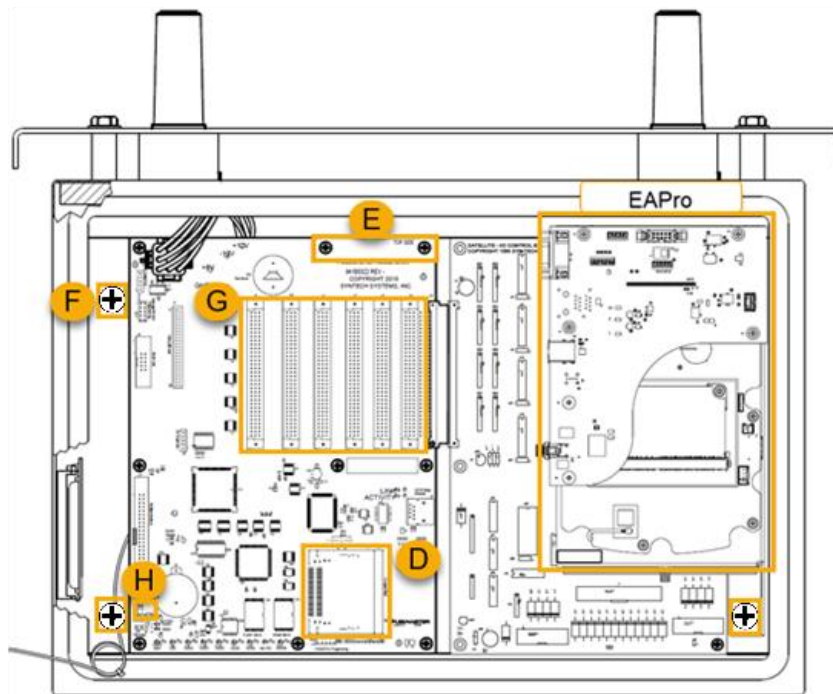

Diagram 2

7. Lift the EAPro up and away to unhook from the Backplate Assembly.

8. Remove the remaining large Phillips screws (F) (3 places).

9. Carefully lift the Backplate Assembly from the cabinet to expose the power cable connected to the Power Management Board located on the back of the assembly.

10. Disconnect the power connection (black, green, and white wires) from the Power Management Board on the back of the Backplate Assembly.

11. Remove the Backplate Assembly.

Installing a Backplate Assembly for FMU-4500 Series

1. Ensure the AC power to the FMU is off.

2. Check the new Backplate Assembly to see if a Compact Flash (D) is provided.

   a. If the new Backplate Assembly already has a Compact Flash, skip to step 4.

   b. If the new Backplate Assembly does not have a Compact Flash, continue to step 3.

3. Remove Compact Flash card (D) from removed Backplate Assembly and install new Backplate Assembly (containing mainboard 941B0322).

4. Place the new Backplate Assembly in the correct orientation. The Main Power Management Board Cable Harness should feed from over the top.

5. To ensure proper placement, insert three of the large Phillips screws (F) through the Backplate Assembly halfway into the frame. The bottom right corner should be ignored.

6. Securely hook the EAPro onto the Backplate Assembly and place the remaining Phillips screw through the EAPro coprocessor assembly and the bottom right corner of the frame to fix it in place.

7. Fully tighten the four large Phillips screws (F).

8. Properly ground the device to ensure personal safety, as well as the proper operation of the device. See **Grounding the Device** tutorial on page 4 for more information.

9. Reconnect the ground wire.

10. Connect the power cable to the EAPro.

11. Attach the connections according to the current configuration.

12. Turn the FMU power switch ON. Verify front panel LCD reads:

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FUELMASTER FUEL MANAGEMENT SYSTEM

INSERT KEY, HOLD 1 SECOND TO BEGIN
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NOTE	The FMU must be configured with the site/configuration data (pumps, hoses, products, etc.) before fueling transactions can be authorized and fuel dispensed. For comprehensive startup and shutdown sequences, please see Power ON / Startup Sequence and Power OFF / Shutdown Sequence.

Power ON / Startup Sequence

1. Apply Power. There is an approximately 3-5 second delay before power is supplied to the EAPro and the mainboard.

NOTE	Once booted, the EAPro will sound with four short beeps followed by a long beep.

2. Check the Mainboard for the following:
   - All LEDs Flash except the 'Halted' LED (D13).
   - The 'Battery Good' LED (D4) should be lit.
   - The 'voltage' LEDs (D8 to D11) and the 'Heartbeat' LED (D6) all light-up solid Green.
   - The 'Heartbeat' LED (D6) will start to flash after a few seconds.
   - The FMU will go through its boot sequence and then display the main prompt unless it needs configuration information.
   - If configuration information has not been downloaded, the FMU will beep periodically and display the message, "Requesting Configuration" until it receives the information.

3. Check the Supercap for the following:
   - LED (D4) turns red (Charging) when power is applied.
   - LED (D4) will turn green (Normal) after a minute or two indicating the Supercap is charged.

4. Check the EAPro for the following:
   - LED (D17 - System Status) will be solid green during the boot process.

IMPORTANT	Gen 3 EAPros require Syntux 4. If a uSD card configured with Syntux 3 is installed, the EAPro will not function correctly. This will be indicated by a solid red System Status LED and must be addressed immediately.
	
	  1. Power off the unit.
	  2. Remove and reinsert the uSD card, ensuring it is pushed all the way in.
	  3. Power on the unit.
	  4. If the red LED re-appears, power down the unit.
	
	Contact Syntech Customer Satisfaction Center.

   - LED (D12 - Power LED) will also be green.
   - LED (D17) will start to blink when the EAPro has completed the boot cycle.

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

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- LED (D16 - Bottom ETH LINK / ACT) should start to blink indicating there is successful communication with the mainboard.

Power OFF / Shutdown Sequence

Power down the FMU. The Discharging LED (D5) on the Supercap will turn blue, initiating shutdown for the EAPro. Then, the System Status LED (D17) will change from flashing green to flashing red and begin beeping every 2 seconds. Eventually, the unit will transition to a series of very short flashes and beeps before shutdown is complete.

- Gen1/Gen2 EAPro: The System Status LED (D17) will turn off briefly and then come back on. It will stay solid green until the Supercap completely discharges and the LED goes off. Once this happens, the unit may be serviced.

- Gen3 EAPro (indicated by label): Unit may be serviced immediately after the beeping ends.

NOTE	This version of EAPro will not discharge the Supercap completely. It can take hours for Supercap to eventually discharge and turn off the blue LED.

CAUTION	If you must disconnect the Supercap from the EAPro assembly, disconnect the Supercap only after FMU power is OFF. When reconnecting, always plug in the Supercap (charged or discharged) into an EAPro when FMU is power OFF. Otherwise, you will damage the Supercap and EAPro assembly.

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.

Removing a Backplate Assembly for FMU 5000 Series

> NOTE   Removing the backplate on an FMU-5000 should only occur if you need
> access to the Power Supply mounted on the back of the backplate
> assembly.

1. Remove AC power from the FMU at the FMU power switch behind the pedestal door.
    If necessary, turn off the main power at the breaker panel.

2. Open the upper cabinet door.

3. Wait for the EAPro to shut down. Details on this process can be found in the Power
    OFF / Shutdown Sequence at the end of this guide.

4. Note the connections currently in use. If a smartphone or tablet is on hand, capture
    the current expansion cards and cable locations.

5. Disconnect any cables that connect to the lower pedestal or front panel.

6. Remove the remaining large Phillips screws (4 places, A).

7. Carefully lift the Backplate Assembly from the cabinet to expose the power cable
    connected to the Power Management Board located on the back of the assembly.

8. Disconnect the power connection (green, yellow, black) from the Power
    Management Board on the back of the Backplate Assembly.

9. Remove the Backplate Assembly.

Installing a Backplate Assembly for FMU-5000 Series

1. Ensure the AC power to the FMU is off.

2. Place the new Backplate Assembly in the correct orientation. The Main Power Management Board Cable Harness should feed from over the top.

3. To ensure proper placement, insert four of the large Phillips screws (A) through the Backplate Assembly halfway into the frame.

4. Fully tighten the four large Phillips screws (See image above, A).

5. Properly ground the device to ensure personal safety, as well as the proper operation of the device. See the **Grounding the Device** tutorial on page 4 for more information.

6. Reconnect the ground wire, if supplied.

7. Turn the FMU power switch ON. Verify front panel LCD reads:

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FUELMASTER FUEL MANAGEMENT SYSTEM

INSERT KEY, HOLD 1 SECOND TO BEGIN
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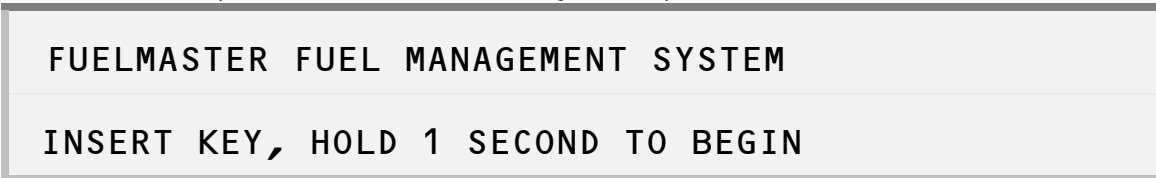
Power ON / Startup Sequence

8. Apply Power. There is an approximately 3-5 second delay before power is supplied to the EAPro and the Mechanical Pump Control Board.

NOTE	Once booted, the EAPro will sound with four short beeps followed by a long beep.

9. Check the Mechanical Pump Control Board (MPCB) for the following:
   - LED (D9) turns solid green when power is supplied.
   - LED (D6) turns solid green.
   - LED (D7) blinks green.

10. Check the Supercap for the following:
    - LED (D4) turns red (Charging) when power is applied.
    - LED (D4) will turn green (Normal) after a minute or two indicating the Supercap is charged.

11. Check the EAPro for the following:
    - LED (D17 - System Status) will be solid green during the boot process.
    - LED (D12 - Power LED) will also be green.
    - LED (D17) will start to blink when the EAPro has completed the boot cycle.
    - LED (D16 - Bottom ETH LINK / ACT) should start to blink indicating there is successful communication with the mainboard.

IMPORTANT	Gen 3 EAPros require Syntux 4. If a uSD card configured with Syntux 3 is installed, the EAPro will not function correctly. This will be indicated by a solid red System Status LED and must be addressed immediately.

1. Power off the unit.
2. Remove and reinsert the uSD card, ensuring it is pushed all the way in.
3. Power on the unit.
4. If the red LED re-appears, power down the unit.

Contact Syntech Customer Satisfaction Center.

Power OFF / Shutdown Sequence

Power down the FMU. The Discharging LED (D5) on the Supercap will turn blue, initiating shutdown for the EAPro. Then, the System Status LED (D17) will change from flashing green to flashing red and begin beeping every 2 seconds. Eventually, the unit will transition to a series of very short flashes and beeps before shutdown is complete.

- Gen3 EAPro (indicated by label): The unit may be serviced immediately after the beeping ends.

NOTE	This version of EAPro will not discharge the Supercap completely. It can take hours for Supercap to eventually discharge and turn off the blue LED.

CAUTION	If you must disconnect the Supercap from the EAPro assembly, disconnect the Supercap only after FMU power is OFF. When reconnecting, always plug in the Supercap (charged or discharged) into an EAPro when FMU is power OFF. Otherwise, you will damage the Supercap and EAPro assembly.

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 History

Version	Date	Description
1.0	unknown	Initial release.
2.0	9/11/2019	Added 4500 Backplate Removal and Installation sections.
3.0	10/29/2019	Added Grounding the Device tutorial.
4.0	06/13/2022	Added Power ON / Startup Sequence and Power OFF / Shutdown Sequence.
5.0	10/10/2022	Updated Power ON / Startup Sequence and Power OFF / Shutdown Sequence to incorporate change of beep behavior for Gen3 EAPros. Modified Step 4 in Removing a Backplate Assembly for FMU-4500 Series. Updated front panel prompts.
6.0	05/11/2023	Updated Diagrams to use colored step/identifier bubbles for all FMU series and reflected Phillips screws for FMU-3500 and FMU-4500. Added Section for: • Removing Backplate from FMU-5000 series. • Installing Backplate for FMU-5000 series. • Added section for FMU 5000 Shutdown and Startup sequences.
7.0	3/1/2024	Added step for sections Installing a Backplate Assembly for FMU-2500/3000/3500s and Installing a Backplate Assembly for FMU-4500 Series. 1. Check the new Backplate Assembly to see if a Compact Flash (D) is provided. a. If the new Backplate Assembly already has a Compact Flash, skip to step 5. b. If the new Backplate Assembly does not have a Compact Flash, continue to step 4. Added Warning to Remove a Backplate for an FMU-4500: ● Verify the EAPro has fully shut down by checking all lights on the EAPro are off. ● The EAPro not being fully shut down when removing the Supercap could result in damage or data loss. Modernized language to include use of smartphone or tablet.

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

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