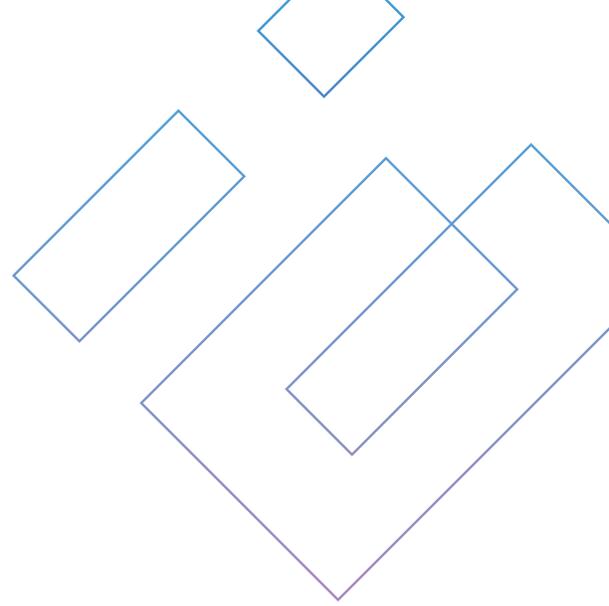


Standard Trailer Backup Generator & HMI



OVERVIEW

Purpose and Scope

This document provides EPIC iO field service personnel, partner organizations, or customers the information necessary to configure the generator backup system included in EPIC iO standard security trailers. The generator backup system powers a battery charger that partially recharges the trailer's battery bank when there is insufficient solar power to recharge the battery bank.

Standard Trailers may be equipped with one of two models of generator. Original Standard Trailers were equipped with a Kipor IG3000 generator. More recent Standard Trailers are equipped with a Yaofeng YF3500i generator. This document covers both generators.

Generator operation is automated by the Human Machine Interface (HMI) when the settings are properly configured within the HMI. This document defines the approved standard processes and procedures for the configuration, operation and management of the generator backup system using the HMI.



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NOTE: The generator backup is a TEMPORARY power source only and not designed or intended to be the Standard Trailer's primary or continued power source.

Responsibilities

Assigned field service personnel conducting mobilization or breakdown operations must ensure all appropriate safety precautions are followed, and all assembly/operation/disassembly steps are performed exactly as prescribed. Additionally, the parties conducting set-up or breakdown operations are solely responsible for protection of the sensors, batteries, solar panels, and other equipment related to the trailer.

Tools and Equipment Required

Personal Protective Equipment (PPE)

As a minimum, the following PPE is required during trailer set-up or breakdown:

- Hard Hat - ANSI/ISEA Z89.1, Type I, Class G certified
- Eye Protection (safety glasses or protective goggles) – ANSI Z87.1 certified
- Foot Protection - Steel-toed ASTM F2413-05 M(F) I/75 C/75 standard
- Hand Protection – Suitable to protect against cuts by sharp objects and minor pinch points
- Reflective Clothing – High visibility reflective vest, or clothing with retroreflective material
- Flame-Resistant Clothing (location- and customer-dependent) – Arc-flash protective with “FR” tech tag clearly visible on the exterior of the garment



Trailer Key



Stabilizer Arm Wrench



Hitch Lock



T30 Torx® Security Bit

STEP 1

CONFIGURING THE HMI AND BACKUP GENERATOR

NOTE: There are 2 different versions of the HMI; a push-button version (Version 1) and a touchscreen version (Version 2). This document covers both versions.

Push-button HMI (Version 1)

A. Apply power to the HMI.

- The HMI is located above the generator, behind a plexiglass shield (**Figure 1**).
- Use a 5mm Allen wrench to remove the four screws securing the plexiglass and remove the cover.
- A circuit breaker is located to the left of the HMI (**Figure 2**). Make sure the circuit breaker is ON (the circuit breaker indicator shows red). Actuate the circuit breaker if necessary.
- When power is applied to the HMI, the Main Screen displays.

B. Set the Voltage Low (VL) and Voltage High (VH) values.

NOTE: The VL value is the battery bank voltage threshold at which the generator will turn on. The VH value is the battery bank voltage threshold at which the generator will turn off.

- From the Main Screen (**Figure 3**), use the down arrow ▼ button to navigate to the Battery Status screen (**Figure 4**). The screen shows the current battery bank voltage and the message “Standby.”
- Press the SET button, then use the down arrow ▼ button to toggle between the VL and VH settings. The currently selected setting will blink.
 - Select the VH field, then use the numeric buttons to set the VH value to 26.000 volts (press the buttons **2-6-0-0-0**, then press the **ENT** button).

NOTE: When the ENT button is pressed, the VH field updates to show the value 25.995.



Figure 1. HMI Location



Figure 2. HMI Circuit Breaker



Figure 3. HMI Main Screen



Figure 4. HMI Battery Status Screen

CAUTION If the VH value is set too high, the generator will not automatically turn off and will continue to run until the fuel supply is exhausted.

Select the VL field, then use the numeric buttons to set the VL value to 23.800 volts (press the buttons **2-3-8-0-0**, then press the **ENT** button).

NOTE: When the ENT button is pressed, the VL field updates to show the value 23.790.

C. Reinstall the plexiglass cover.

- Reinstall the plexiglass cover over the HMI, and secure with four screws.

This completes setup of the HMI. Continue configuring the generator on **page 6**.

Touchscreen HMI (Version 2)

A. Apply power to the HMI.

- The HMI is located above the generator, behind a plexiglass shield (**Figure 5**).
- Use a 5mm Allen wrench to remove the four screws securing the plexiglass cover, and remove the cover.
- A circuit breaker is located to the left of the HMI (**Figure 6**). Make sure the circuit breaker is ON (the circuit breaker indicator shows red). Actuate the circuit breaker if necessary.
- When power is applied to the HMI, the Main Screen displays.



Figure 5. HMI Location



Figure 6. HMI Circuit Breaker

B. Set the Voltage Low (V-L) and Voltage High (V-H) values

NOTE: The V-L value is the battery bank low voltage threshold at which the generator will turn on. The V-H value is the battery bank voltage threshold at which the generator will turn off.

- The Main Screen (**Figure 7**), shows the current generator status, charging status, and battery bank voltage.
- Set the **V-H** and **V-L** values:
 - Tap the **V-H** field on the lower left side of the Main Screen. The data entry keypad displays (**Figure 8**), showing the current **V-H** value.
 - Use the numeric keys to set the **V-H** value to 26.000 volts (tap the keys **2-6--0**), then tap the **Enter** button to save the value and close the keypad.

CAUTION If the V-H value is set too high, the generator will not automatically turn off and will continue to run until the fuel supply is exhausted.

- Tap the **V-L** field on the lower left side of the Main Screen. The data entry keypad displays (**Figure 9**), showing the current **V-L** value.
- Use the numeric keys to set the **V-L** value to 23.800 volts (tap the keys **2-3--8**), then tap the **Enter** button to save the value and close the keypad.

C. Set the HMI operating mode.

- Confirm the **Generator status** field on the left side of the screen indicates **AUTO** (**Figure 10**).
- If the **Generator status** field indicates **Manual**, set the operating mode to **Auto**:
 - Tap the **Manual/AUTO** selector knob on the right side of the screen. A confirmation dialog displays (**Figure 11**).
 - Tap the **Yes(Y)** button on the dialog to confirm the operating mode change.



Figure 7. HMI Main Screen



Figure 8. HMI Data Entry Keypad – V-H Setting



Figure 9. HMI Data Entry Keypad -V-L Setting



Figure 10. Generator Status Field

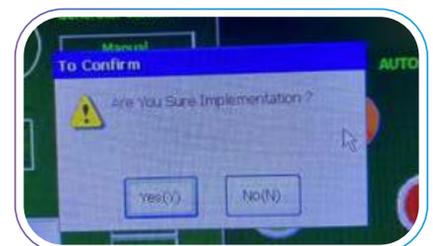


Figure 11. Confirmation Dialog

STEP 2

Configuring the Generator

Once the HMI has been configured, the generator must also be configured for the HMI to properly control generator operation automatically.

NOTE: Original Standard Trailers were equipped with a Kipor IG3000 generator (**Figure 12**). More recent Standard Trailers are equipped with a Yaofeng YF3500i generator (**Figure 13**).

Kipor IG3000 Generator

- Place the **STARTER SWITCH (A, Figure 14)** in the **ON** position.
- Place the **SMART THROTTLE SWITCH (B, Figure 14)** in the **ON** position.
- Make sure the Fuel Value Lever (**Figure 15**) is On (or turned counterclockwise as illustrated).

Yaofeng YF3500i Generator

- Make sure the **Fuel Value (Figure 16)** is **ON** (or turned clockwise as illustrated).
- Place the **CHOKE** button (**Figure 16**) in the **RUN** position.
- Place the **IGNITION** switch (**Figure 17**) in the **OFF** position.
- Place the **ECONOMY** switch (**Figure 17**) in the **ON** position.
- Place the **BATTERY** switch (**Figure 18**) in the **OFF** position.



Figure 12. Kipor IG3000 Generator



Figure 13. Yaofeng YF3500i Generator



Figure 14. STARTER SWITCH / SMART THROTTLE Switch



Figure 16. Fuel Valve / CHOKE Button



Figure 17. IGNITION Switch / ECONOMY Switch



Figure 18. BATTERY Switch

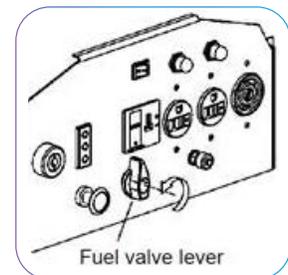


Figure 15. Fuel Valve Level

STEP 3

Resetting An Alarm Condition

Push-button HMI (Version 1)

The HMI will enter into an Alarm condition in cases where the generator fails to start or stops running during a run cycle. Typical causes for these failures include:

- The generator is out of fuel
- The generator's on-board battery has a low charge

The HMI sounds an audible tone (beep) when in the Alarm condition, and the Battery Status screen displays the message "Alarm to be reset" (**Figure 19**). The Alarm condition must be cleared to return automatic control of the generator to the HMI.

NOTE: Power cycling the HMI is not sufficient to clear an Alarm condition.

To clear an Alarm condition:

- A. Use the down arrow ▼ button to navigate to the Reset Alarm screen.
 - The Reset Alarm screen shows the message "Reset" or "Alarm Reset" (**Figure 20**)
- B. Press and hold the 0 button for 3 to 10 seconds to reset the Alarm condition.

NOTE: No change will appear on the Reset Alarm page.

- C. To verify the Alarm condition has been cleared:
 - Use the down arrow ▼ button to scroll the screens until the Battery Status screen displays.
 - Verify the Battery Status screen shows the message "Standby."



Figure 19. Battery Status Screen-Alarm condition



Figure 20. Alarm Reset Screen

Touchscreen HMI (Version 2)

The HMI will enter into an Alarm condition in cases where the generator fails to start or stops running during a run cycle. Typical causes for these failures include:

- The generator is out of fuel
- The generator's on-board battery has a low charge

The HMI sounds an audible tone (beep) when in the Alarm condition, and the Generator status field displays the message "Alarm to be reset" (**Figure 21**). The Alarm condition must be cleared to return automatic control of the generator to the HMI.

NOTE: Power cycling the HMI is not sufficient to clear an Alarm condition.

To clear an Alarm condition:

- Tap the **Next** button in the lower right corner of the screen.
 - The Reset Alarm screen displays (**Figure 22**).
- Press and hold the **Reset** button for 3 to 10 seconds to reset the Alarm condition.

NOTE: No change will appear on the Reset Alarm page.

- To verify the Alarm condition has been cleared:
 - Tap the **Return** button to return to the Main Screen.
 - Observe the Generator status field. When the Alarm condition is cleared, the Generator status field will display Standby, AUTO, or Manual, depending on the current operating mode



Figure 21. Generator Status – Alarm Condition



Figure 22. Alarm Reset Screen

Generator Maintenance

Periodic Maintenance

The generator must be maintained according to the manufacturer's recommended maintenance schedule. Maintenance must be performed more frequently when the Standard Trailer and generator are deployed in dusty areas or under conditions of higher load, extreme temperature and weather environments and humidity.

It is recommended a log of hours of operation and maintenance be kept with the Standard Trailer as a means of recording and memorializing preventative maintenance efforts.

CAUTION Be sure the generator engine is turned off before performing any maintenance. Failure to do so may result in personal injury or death.

Preventative maintenance items:

- A. Ensure the generator fuel tank is checked and filled periodically. Add an appropriate fuel preservative /additive with each fill up.

NOTE: Failure to utilize fuel preservative / additive may cause fuel to go "stale" and potentially impact the generator's ability to start when necessary.

- B. Check battery voltage. Without an electrical load, voltage should be ≥ 12.4 volts
- C. Check battery voltage under load while starting

Periodic Activation:

CAUTION Be sure to operate the generator in a well-ventilated area. Failure to do so may result in personal injury or death.

The generator must be started and operated for no less than 30 minutes every 14 days to ensure proper lubrication, proper battery charge, and clean fuel lines.

Periodic activation may be accomplished via remote start for Standard Trailers equipped with remote start capabilities.

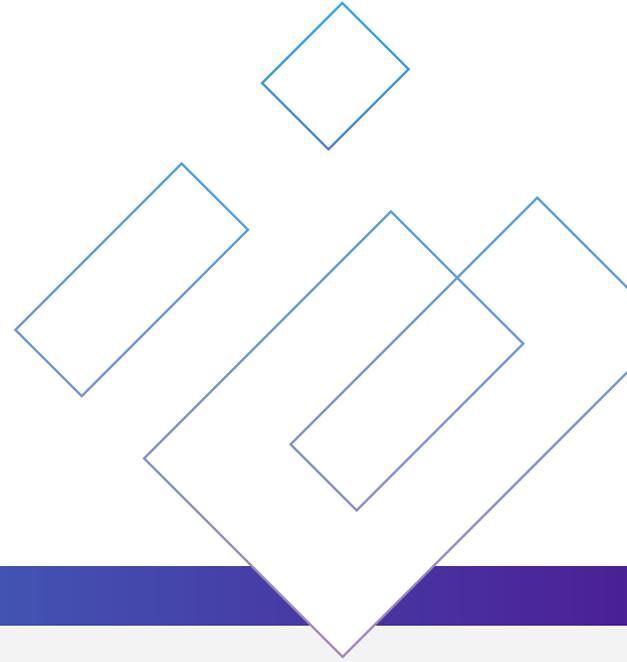
NOTE: Certain operating environments may require the generator's choke be actuated to facilitate generator start. The generator's choke can only be actuated manually at the generator. The choke cannot be actuated remotely.

If generator engine won't start, check the fuse behind front panel of generator and replace if necessary.

External References

[Kipor IG3000 Generator User Manual](#)

[Yaofeng YF3500I Generator User Manual](#)



3 simple steps to setting up your Standard Trailer Backup Generator and HMI.

For additional questions please contact our customer support team at [**support@epicio.com**](mailto:support@epicio.com). We're happy to help!

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