

# ULB Gen3 Reference Manual

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G02355-xx

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**AC Power:** The ULB accepts 100-250VAC input. The 6.0A / 250V AC power fuse is located between the power switch and the power cord attachment behind the small plastic door.

**CAN 1 – CAN 4:** Provides 2 port access for each of the 4 CAN buses. The ULB uses CAN 1 to perform closed loop engine speed. The CAN buses contain no termination resistors inside the load box.

**5V/12V:** These 1.0A fused outputs are provided for user convenience and are active when the AC power switch is turned ON.

**External VBATT Input:** If an external VBATT supply is required, attach here. The ULB will automatically switch the ECM's VBATT connection to the external supply when it is turned on.

**Internal VBATT Voltage Select:** Use this switch to select from 12V or 24V internal power supplies for VBATT. When an external VBATT supply is connected, this has no effect.

**USB Port:** This USB port may be used to control the WavemakerIII from a PC using the LUIS Gen2 application. WavemakerIII files currently can not be accessed from the USB port. These files can be accessed by removing the WMIII internal SD card and inserting it into an SD card reader.

## Front Panel



**Keyswitch:** The keyswitch fuse (7.5A) is located on the front panel along with an LED indicator. The switch is always wired in the harness to the location shown above.



**VBATT:** VBATT is fused at the front panel (30A). The banana jacks here are connected to VBATT and also go thru the 30A fuse. The LEDs indicate if the 12V or 24V internal supply is selected. If an external VBATT supply is connected to the load box, the EXTERNAL LED is active. The ON/OFF switch is used to enable/disable VBATT connection to the ECM.

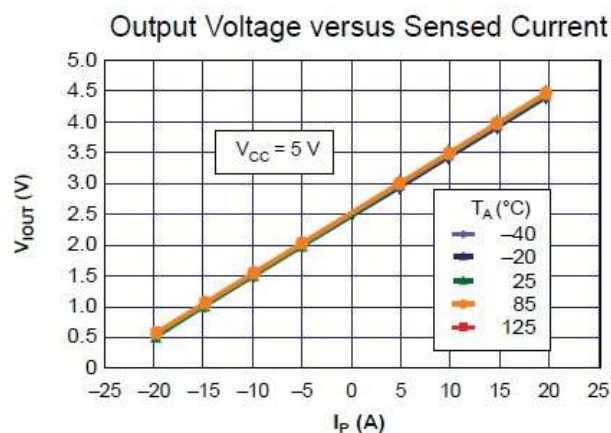


**Dual Pedal Position Sensor:** For ECM's with dual PPS inputs, there are 2 pots and 1 switch used to control the load box outputs. When the switch is in the UP position, the PPS1 and PPS2 pots are used to control the corresponding ECM inputs. When the switch is in the DOWN position, the PPS1 pot is used to control both PPS1 and PPS2 outputs. In this case, PPS2 voltage is automatically adjusted to  $\frac{1}{2}$  PPS1 to prevent PPS1/PPS2 mismatch faults.

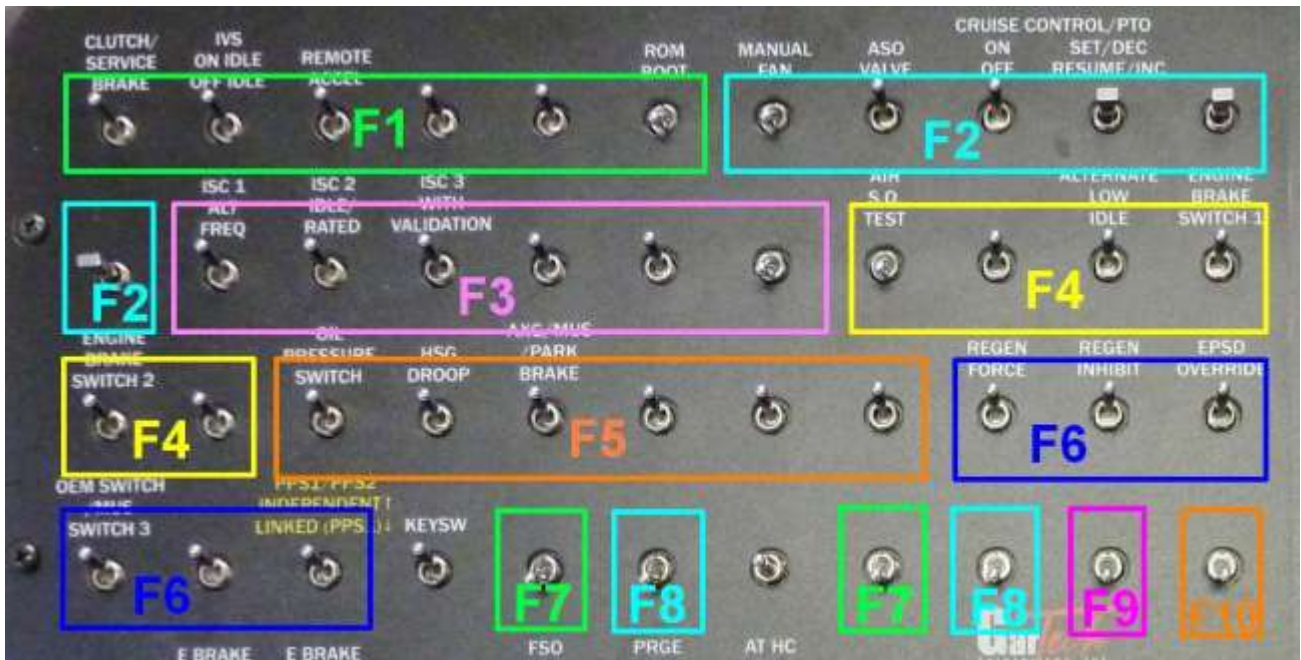
**Automatic Idle Validation:** For ECM's with idle validation (not shown) there are 3 switches and 1 pot to control the throttle and IVS inputs. One switch is connected as OFF IDLE, one switch is connected as ON IDLE, and another switch is used to enable/disable automatic idle validation. When enabled, the automatic idle validation setting will switch between OFF IDLE and IDLE conditions based on the throttle pot setting. The switch point is set at 0.7V by default.



**Injector Indicators:** There are 18 simulated injector loads inside the load box. The LED's shown above indicate when each injector fires. The associated testpoint provided a voltage representation of the injector current. This output is scaled as shown below:







**Switches:** The front panel switch commons are grouped as shown above. Each switch common has a 1.0A fuse which is accessed at the back panel. The fuse associated with each switch common is labeled above (F1-F10). The 2 switches not shown in a box above are fused by the 7.5A keyswitch fuse on the front panel.



**Switch Fuses:** These fuses are found behind the “Switch Fuse Panel” cover on the back side of the load box. Note that 2 spare fuses are included.





**WavemakerIII:** The color display and 2 encoder knobs on the front panel are used to control frequency outputs such as engine speed, vehicle speed, turbo speed, etc. The raw waveform signals may be accessed behind the front panel cover shown above for test/measurement purposes. Output channels 1-8 are Arbitrary Waveform outputs, and channels 9-18 are Digital Waveform outputs. The standard ULB is populated with (2) Arbitrary Waveform output cards (PN G00580-01) and up to 6 additional cards may be installed if purchased separately. All digital output channels are fully populated and available for use. The WavemakerIII user manual can be accessed on the GarTech website.



**Loads:** Each internal load has an LED on/off indicator and high-side voltage testpoint on the front panel. There are (4) bidirectional indicators outlined above. These LED's turn RED or GREEN depending on the direction of current flow through the load.



**Overlay Identification:** Overlays are available for each ECM. Customized overlays suited to your particular application are also available. The ECM/application ID is located above the injector testpoints. The overlays are created by placing 2 vinyl pieces onto an aluminum backing. Each vinyl half has a part number shown above in the bottom left and bottom right corners (Pxxxxx-xx). The overall PN (Gxxxxx-xx) for the complete assembled overlay is in the middle, below the injector testpoints.

**Connector Pinout; J1-J4:** This information can be found in the ULB Harness Generator spreadsheet. The latest version can be downloaded from the GarTech website. This document also specifies the value of each internal load, switch types, and potentiometer values.

**ULB Gen2 / Gen3 Compatibility:** ULB Gen2 wiring harnesses are compatible with ULB Gen3. The additional J4 connector on ULB Gen3 contains extra functionality which was not available on ULB Gen2. The pots and switches are not numbered in the same order between Gen2 and Gen3, so be aware that the front panel control locations have moved when switching between Gen2 and Gen3 boxes.