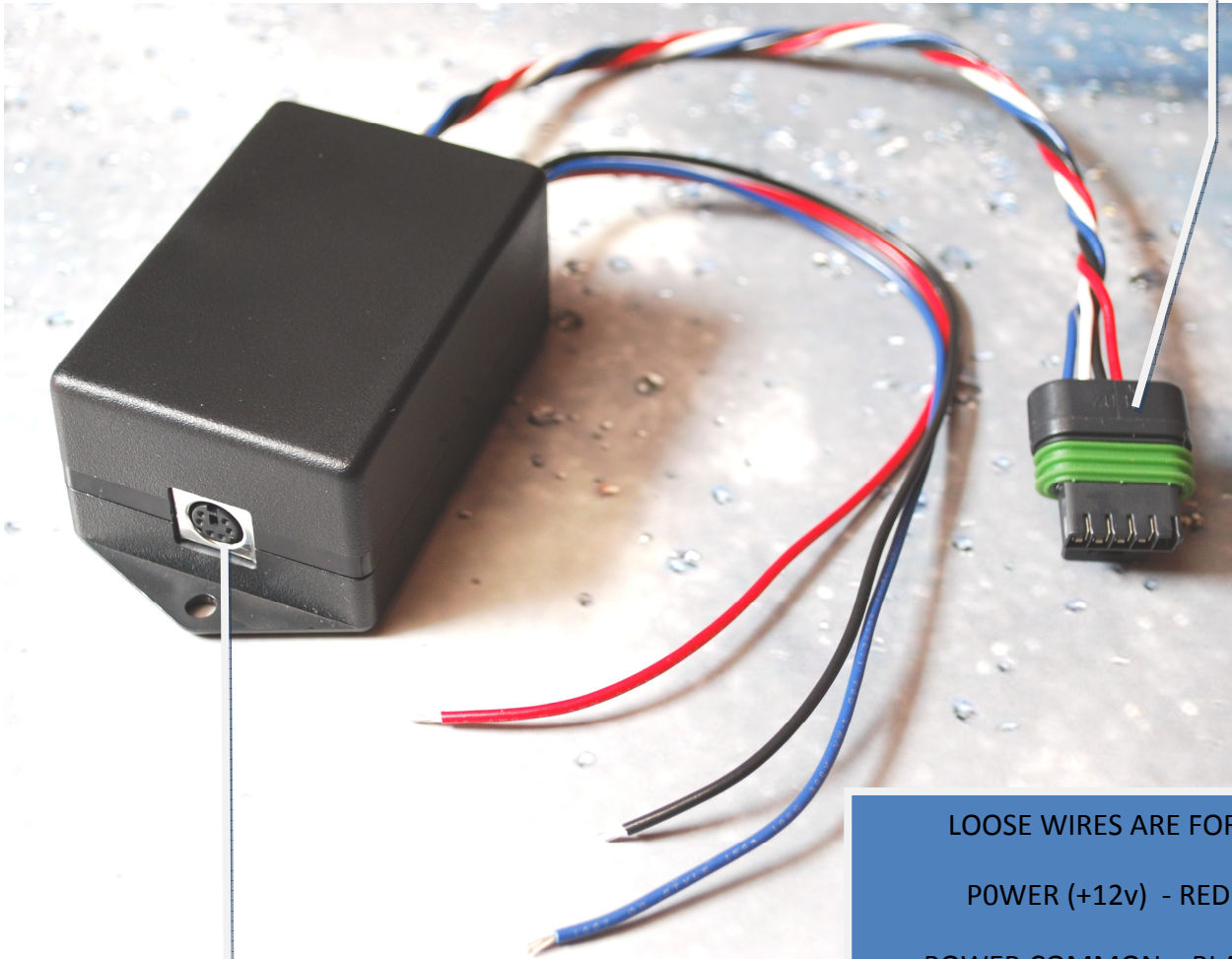


## NL3 INSTALLATION and OPERATION GUIDE

DELPHI 5 POS. FEMALE CONNECTOR.  
INSERTED INTO THE SPEEDOMETER.



PS2 MINI CIRCULAR CONNECTOR.  
GPS RECEIVER CONNECTS HERE.

LOOSE WIRES ARE FOR:  
POWER (+12v) - RED  
POWER COMMON - BLACK  
GAUGE BACKLIGHT - BLUE

# NL3 INSTALLATION and OPERATION GUIDE

The installation of the NL3 and Speedometer is not complicated. The process is analogous to installing a car stereo. Before you begin, have a clear idea/plan of where to tap the boat's +12Vdc power, common, and dash lights; please refer to manufacturer, local dealership, mechanic, and/ or online manuals for greater insight.

## TURN OFF THE POWER and DISCONNECT THE BATTERY.

### Locate the GPS Receiver.

The NL3 compatible GPS Receivers are waterproof with great reception. They are resilient and tolerant in marine surroundings. These following constraints are key: the GPS requires a clear line-of-sight to the sky; the windshield and/or cloth top are NOT a problem. However, keep it away from other electronics / antenna's that may interfere with the receiver. Every boat is different, so experiment with varied Receiver locations to find the best (before mounting it permanently). Route the GPS cable / connector to the back of the dash. *Picture above:* a new ski boat has a similar GPS Receiver mounted ahead of the windshield.



### Access to the rear of the Speedometer.

Remove the old speedometer from the dash. The gauges are typically secured with a rear mounting bracket. The bracket is captivated by two nuts. Remove the nuts. Slide the bracket back and clear of the screws. Pull the gauge out of the dash front.

### Attach the NL3 to the Primary Speedometer.

Insert the NL3's five-position Female connector into the back of the new Speedo: the fit is tight, a little finesse is required. **NOTE: The female is NOT polarized! Make sure the clip and mating ramp engage, otherwise electrical damage will ensue.**

### Option: 2<sup>nd</sup> Speedometer.

Insert the NL3's five-position Female connector marked "2<sup>nd</sup>" into the back of the second Speedo; see NL3 interconnect on the last page. Insert the Power Pod Female connector into "2<sup>nd</sup>" Male connector. **MAKE SURE THE LATCHES FULLY ENGAGED...** clip the latch over the ramp.

### Power.

Attach the free Red wire to boat power (+12V). Attach its associated Black wire to boat common (or batt-). Connect the free blue wire to the 'switched' dash light power; the old gauge wiring is probably a good source.

The NL3's circular PS2 connector is shipped stuffed with Factory jumper wires. These wires assist in the Calibration process. Remove them after the Calibration is complete.

It's time to Calibrate. Reconnect the Battery.

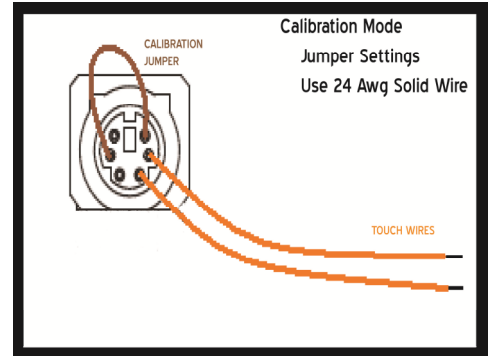


# NL3 INSTALLATION and OPERATION GUIDE

## Calibration.

A calibration is required to accurately convert reported GPS speeds into needle positions. The procedure is simple and takes two minutes. For best results read the entire procedure first.

1. Confirm the GPS Receiver is unplugged. And the Jumper wires are correctly inserted in the PS2 mini circular connector.
2. Confirm the NL3 power wires and signal connectors are correct.
3. Turn the Dash / Gauge / NAV lights on. Note: The speedo backlight will NOT come on until the NL3 does.
4. With the two orange Touch wires in reach, view the Speedometer's face at a close-up.
5. Turn the Key On and power-up the gauges.
6. After two seconds the Speedo will present 4 rapid flashes. This signals Calibration Mode is now entered. If it's not there already, the needle will fall to the lowest possible position. This position varies with boat model.
7. The needle will slowly increase. When the needle points exactly at **ELEVEN** [11] miles per hour, briefly contact the two Touch Wire (exposed) ends. The Speedo will acknowledge this 'touch' with a Flash.
8. The needle will jump to approach **FIFTEEN** [15] miles per hour. Again the needle will creep upwards. When it is centered on **FIFTEEN**, momentarily touch the wires. The Speedo will flash.
9. Continue the jump, approach - center and touch routine for **20, 25, 30, 35, 40, and 45** miles per hour; for those speedometers with a 60 mph scale, additional points are taken at **50 and 55** miles per hour.
10. **ONLY** after the confirmation 'touch' at the last calibration point will the NL3 compute the calibration constants. The calibration constants are saved in non-volatile memory.
11. The needle will reset and automatically retrace most of the calibration steps (over-and-over). The first retrace step will be near TEN [10]. No intervention is required... just observe.
12. An accurate retrace indicates the calibration is valid; see notes below. To redo or replace this calibration, simply turn the key/power off, wait 10 seconds, and begin again at step 5.
13. Your Calibration is done. Turn the power off. Remove the Jumper wires.



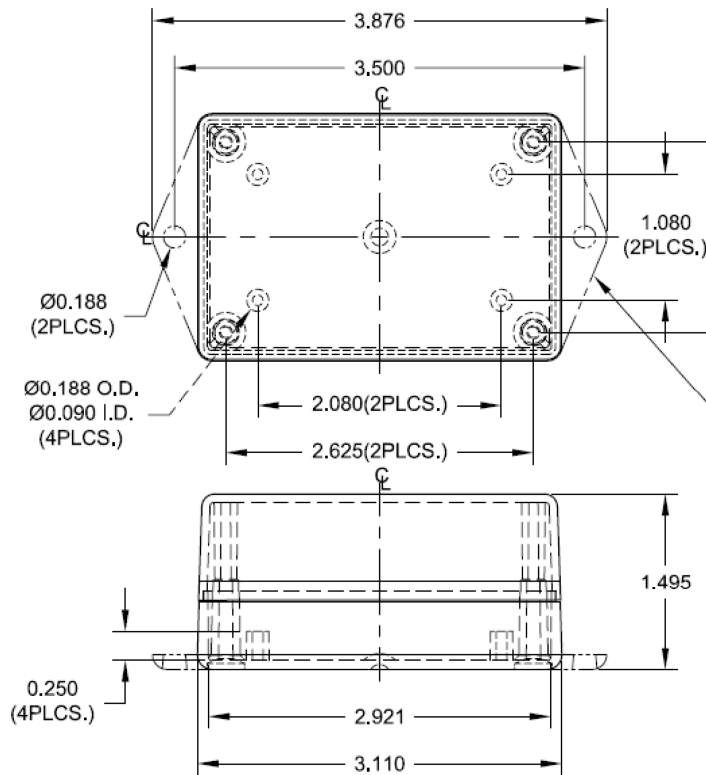
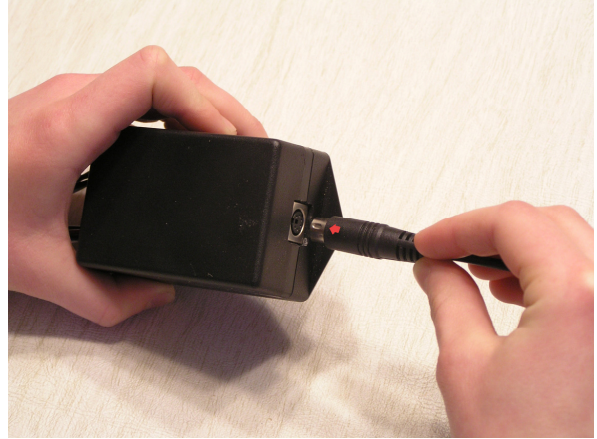
## Notes:

- The first Cal step is ELEVEN because some Speedo's (i.e. Toyota) begin at TEN... and thus TEN is unapproachable. After the calibration is saved, all needle positions are calculated.
- We've found there are Speedo's limited to FORTY-FIVE [45] mph, despite their printed scale of FIFTY [50]. And, even after valid Calibration, the needle still falls short of FORTY-FIVE.
- Should your boat be equipped with Speedometer Calibration buttons or switches, they will have no effect on the NL3 system. Unlike the Pitot tube and Rotary Speed Sensors that drift due to temperature, wear, and/or contaminant, the NL3 system won't require further calibration.

## Dash re-assembly.

Depending on the available work space behind the dash, you may want to mount the NL3 before mounting the Speedo... thereby using the Speedo access hole to work through. Likewise the GPS Receiver can remain unplugged during the mounting process, provided there is sufficient access to it. Or the NL3 is reached from under the dash: this is the preferred access, as it will ease the relocation of the GPS Receiver (if needed). Plug the GPS Receiver into the NL3's PS2 connector. Note the 'ARROW' embossed into the connector. Orient the arrow at 12 o'clock, or away from the mounting flange. Be sure to strain relief the GPS Receiver cable/connector, with a cable tie to a nearby fixed provision.

Insert the Speedo to its dash hole. Reinstall it following the reverse order of removal.



## Mounting Considerations.

The NL3 provides two mounting flanges on its case. Use these to secure the case to a local surface or bulk head. The mounting holes accept #8 screws (not provided). Alternately, use the mounting holes to cable tie the case to a nearby wire bundle or mounting provision.

## Option: Power Pod.

The footprint of the Power Pod is identical to the NL3.



# NL3 INSTALLATION and OPERATION GUIDE

## Operation.

The NL3's sole function is to communicate speed data from the GPS Receiver to the speedometer.

The NL3 will flash or blink the Speedo's backlight to convey its state, intent, or warning. To witness the flashing, the dash lights must be ON. This is by design! For under normal conditions visual feedback from the NL3 becomes routine and unnecessary. Thus, the user has ability to enable/disable these visible cues by turning the dash lights On or Off. Upon power-up, the NL3 waits 2 seconds for the power to settle.

Visible Cues:

- **No Flash or blinking:** the NL3 is operating normal.
- **Continuous Flash; ON for one second, OFF for one second:** the NL3 is waiting for a satellite fix from a 1Hz GPS Receiver.
- **Continuous Flash; ON for ½ second, OFF for a ½ second:** the NL3 is waiting for a satellite fix from a 5Hz (or faster) GPS Receiver.
- **Two Rapid blinks:** there's a mis-communication with the 5Hz Receiver; the Receiver is not configured correctly. Consult the Factory.
- **Rapid Flashing for Three Seconds:** the time since the last satellite fix has exceeded ten minutes... the NL3 will attempt a GPS Receiver re-configuration.
- **Rapid Flashing for Eight Seconds:** the non-volatile memory is corrupt; the NL3 will reinitialize it to Defaults.

**Warranty.** Nautic Laugic warranties the NL3 for one year.

Should this product malfunction or fail, please return it so we can make it right!! Please see our policies page at [www.nauticlaugic.com](http://www.nauticlaugic.com)

THANK YOU FOR BUYING OUR PRODUCT!!



# NL3 INSTALLATION and OPERATION GUIDE

## NL3 Interconnect.

