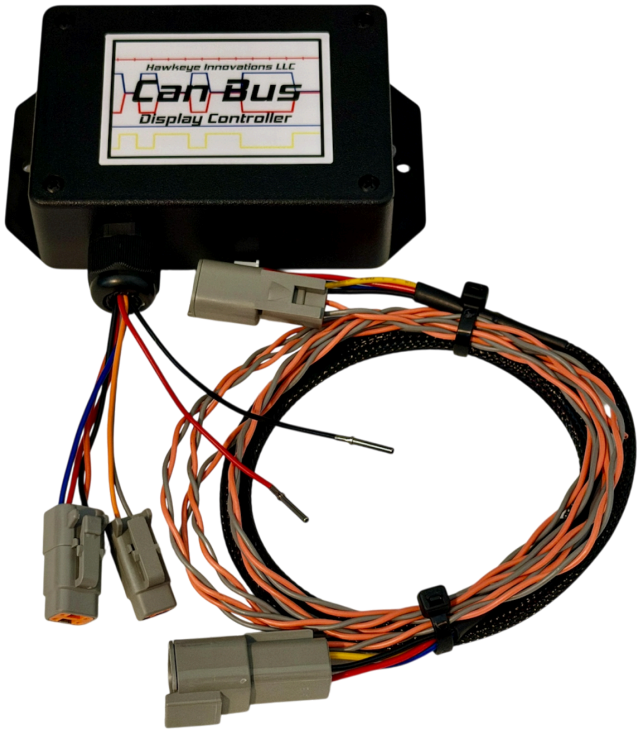
CAN Bus Display Kit MkIII

---User Manual---



Hawkeye Innovations LLC

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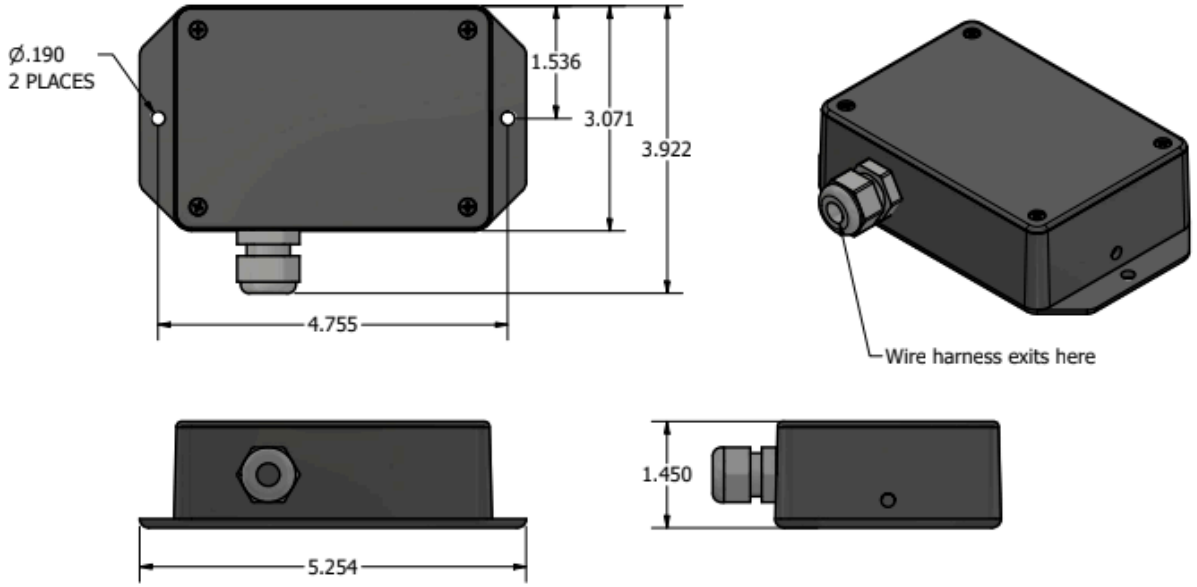
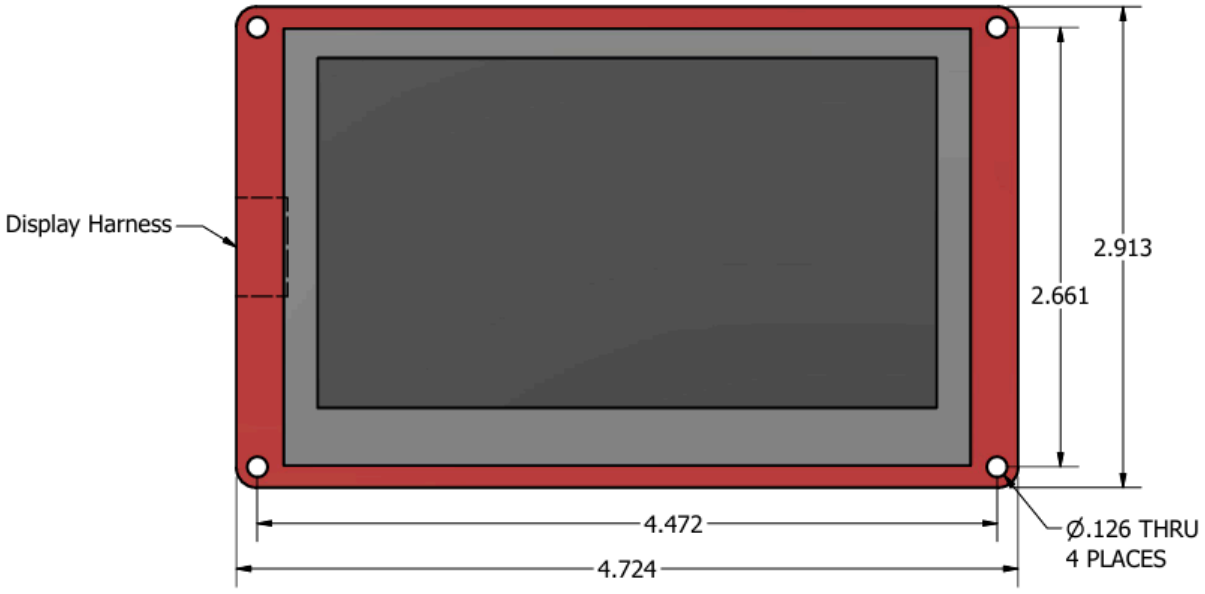
Dimensions

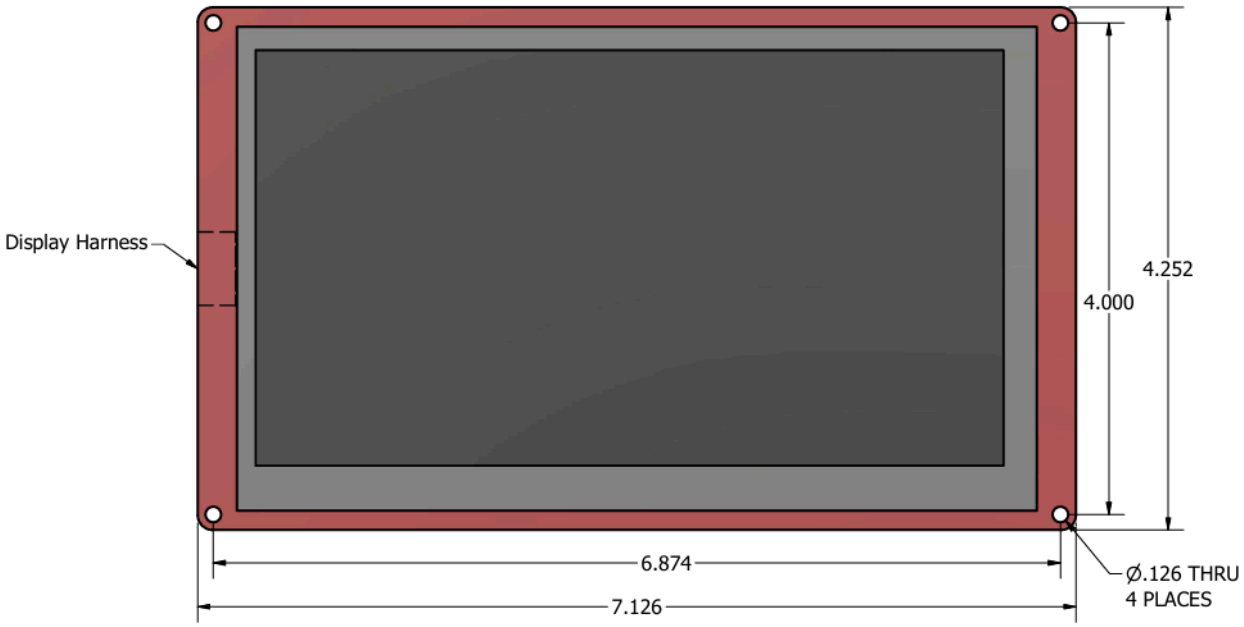
Display Controller Dimensions:



4.3” Display Mounting Dimensions:



7.0” Display Mounting Dimensions:



For 4.3” and 7.0” display case installation instructions and dimensional drawings, please refer to the Display Case Installation Sheet on the Downloads page of the website.

Installation

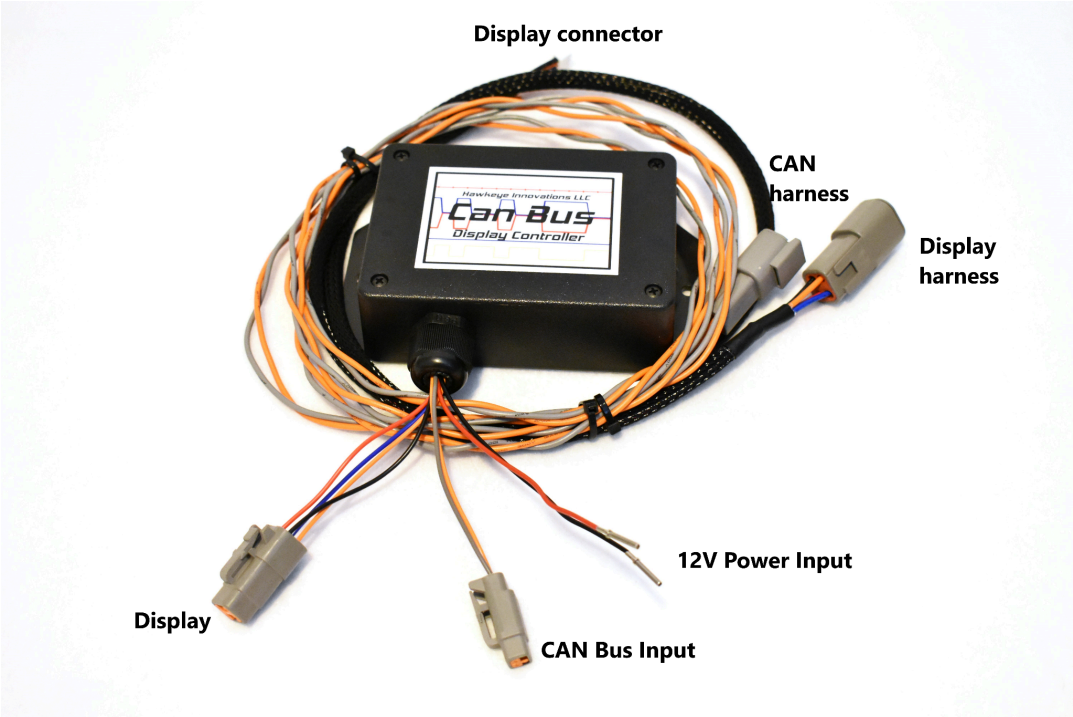


Figure 1

1. Without any power present on your 12V system or CAN bus network, wire up the included CAN bus harness (gray and orange twisted pair) from your harness kit (Figure 2). NOTE: wiring with power on or accidentally shorting out your CAN bus will destroy CAN bus devices! Always double check power supply and CAN wiring before proceeding. There is no termination resistor in the CAN display controller box, be sure your CAN bus has proper termination. Shorted CAN, or connecting power or ground to CAN, can damage the Display Controller, or other devices on your CAN bus. **The display is not waterproof or water resistant, please take care to mount the display in a dry place away from the elements or excess moisture to avoid damage to the display.**

Whether you purchased the 4.3” or 7” display, both will install exactly the same.

CAN Bus Input Harness: (Gray/Orange Twisted Pair, Figure 1)

Orange - CAN High

Gray - CAN Low

A **5A fuse** is recommended on the power supply to the Display Controller. Most applications have it wired so that it is powered on ignition. We have pre-crimped a Deutsch DTM (size 20) contact (socket) on each of the power supply wires. You may add your own Deutsch connector and build into your car harness, or cut off those terminals and solder/crimp your own wires to it.

12V Power Input: (Loose Red/Black wires, Figure 1)

Red: +12V supply (5A fuse)

Black: -12V (Ground)

Figure 2

2. Take care that your CAN bus harness (grey and orange twisted pair) and display harness (black braided wrap harness) in Figure 2 **do not run near any high voltage/high current power cables to avoid any electrical noise and interference.**

On the back of the display, there is a spot for a small circular flat battery. Ignore this and do NOT insert a battery.

3. Once you have verified that the power supply wiring is fused and correct, and the CAN bus wiring is correct, simply plug in the small white display connector into the side of the screen, plug in the display harness (4 pin plug) to the controller, and plug in the CAN Bus harness (2 pin plug), and apply power to turn on the unit. Be sure the connectors click in completely.

4. Next, follow the Orion BMS CAN setup and HyPer 9 CAN setup instructions on the next two pages.

NOTE: The red 'Error' text on page 1 will only appear if there is an Orion BMS fault present, or a HyPer controller fault. For **advanced troubleshooting**, on the second page there will be the controller error code number if available, as well as the BMS error codes shown as a decimal value for each of the three Orion BMS DTC bytes. Byte 1 is on top, byte 3 is on bottom. A screenshot example of an error state on both systems is shown below in Figure 3, and the BMS error statuses can be decoded with the information on the next page.

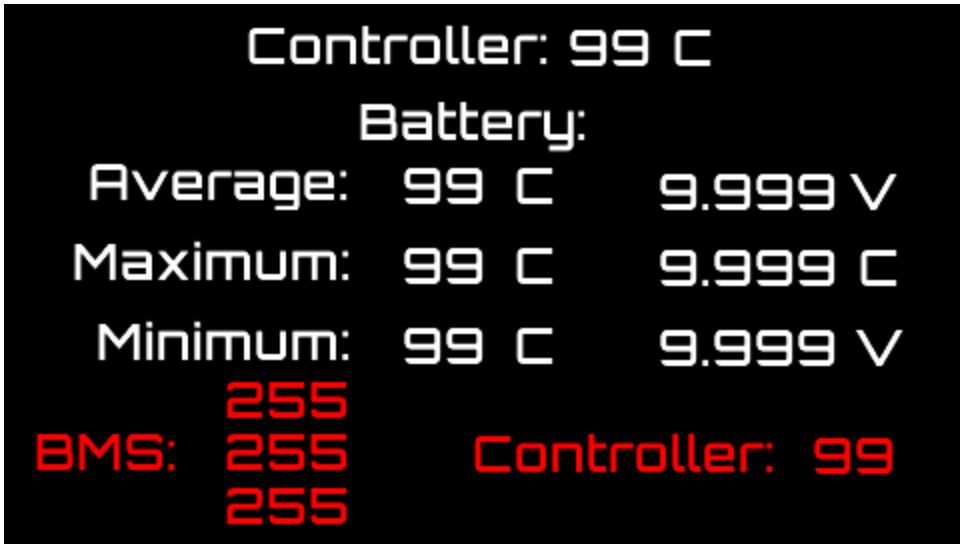


Figure 3

Orion BMS DTC Flags:

Byte #1

Bit #1 (0x0001): P0A07 (Discharge Limit Enforcement Fault)
Bit #2 (0x0002): P0A08 (Charger Safety Relay Fault)
Bit #3 (0x0004): P0A09 (Internal Hardware Fault)
Bit #4 (0x0008): P0A0A (Internal Heatsink Thermistor Fault)
Bit #5 (0x0010): P0A0B (Internal Software Fault)
Bit #6 (0x0020): P0A0C (Highest Cell Voltage Too High Fault)
Bit #7 (0x0040): P0A0E (Lowest Cell Voltage Too Low Fault)
Bit #8 (0x0080): P0A10 (Pack Too Hot Fault)

Byte #2

Bit #1 (0x0001): P0A1F (Internal Communication Fault)
Bit #2 (0x0002): P0A12 (Cell Balancing Stuck Off Fault)
Bit #3 (0x0004): P0A80 (Weak Cell Fault)
Bit #4 (0x0008): P0AFA (Low Cell Voltage Fault)
Bit #5 (0x0010): P0A04 (Open Wiring Fault)
Bit #6 (0x0020): P0AC0 (Current Sensor Fault)
Bit #7 (0x0040): P0A0D (Highest Cell Voltage Over 5V Fault)
Bit #8 (0x0080): P0A0F (Cell ASIC Fault)

Byte #3

Bit #9 (0x0100): P0A02 (Weak Pack Fault)
Bit #10 (0x0200): P0A81 (Fan Monitor Fault)
Bit #11 (0x0400): P0A9C (Thermistor Fault)
Bit #12 (0x0800): U0100 (External Communication Fault)
Bit #13 (0x1000): P0560 (Redundant Power Supply Fault)
Bit #14 (0x2000): P0AA6 (High Voltage Isolation Fault)
Bit #15 (0x4000): P0A05 (Input Power Supply Fault)
Bit #16 (0x8000): P0A06 (Charge Limit Enforcement Fault)

Orion BMS CAN Setup

With the Orion BMS 2, CAN bus setup is easy. Looking at Figure 4, once you have your profile loaded, go to the ‘CANBUS Settings’ tab, then in the ‘3rd party devices’ block, check the box for ‘Hawkeye Display’. **Be sure that the CAN speed of the BMS is 250kbps, unless you have a display that was pre programmed by us to a different CAN speed.** Don’t forget to upload the changes to your BMS! If you change the CAN speed of the BMS, after uploading the changes, you must disconnect the BMS power and wait 30 seconds before reconnecting the power.

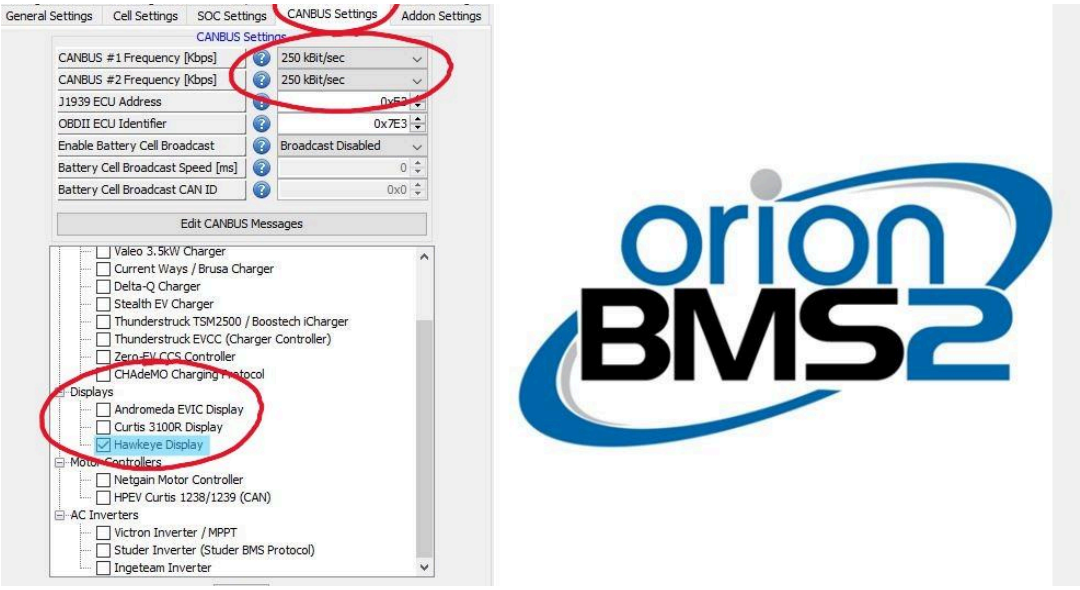


Figure 4

As shown in Figure 5 below, you will see this pop-up message after clicking on Hawkeye Display, just **ignore it.** The old default was 500kbps, but the new default for MkII and MkIII displays is 250kbps.

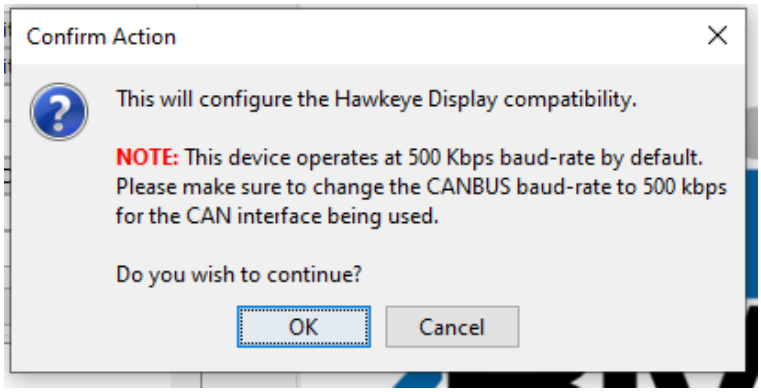


Figure 5

HyPer Controller CAN Setup

<u>This CAN message setup of the HyPer controller is for the Orion BMS & HyPer 9 version of the display. If you ordered the HyPer 9 only version, please see "HyPer 9 Only CAN Setup" in the next section for that CAN message setup, which is slightly different, but the same process.</u>

Once you have enabled the CAN bus functionality of the HyPer controller, make sure the CAN speed is set to 250kbps as shown in Figure 6.

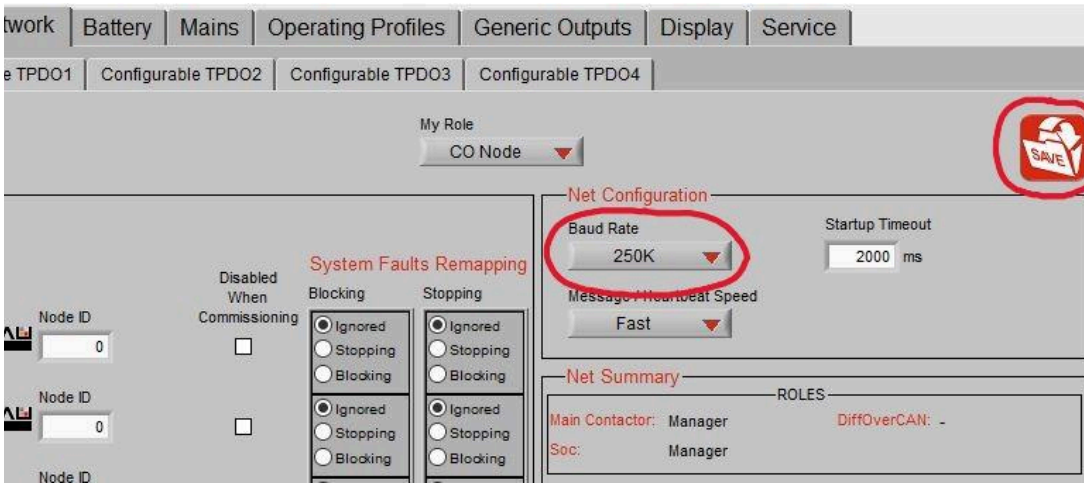


Figure 6

Next, go to the ‘Configurable TPDO1’ page, and type in ‘153’ for the message ID, ‘64’ for the rate, and set the parameters to the right exactly as shown in Figure 7.

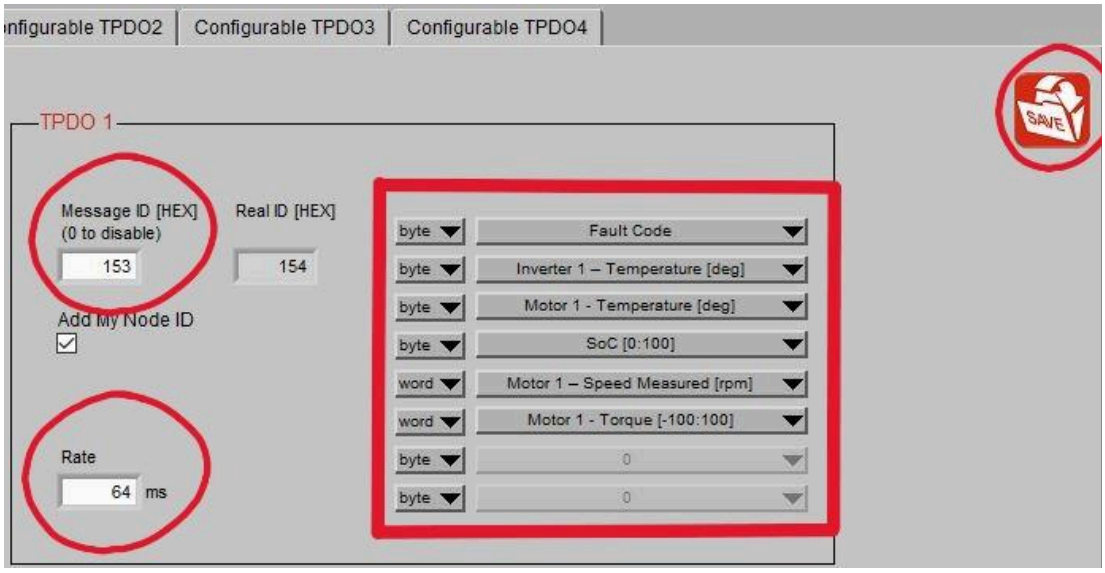


Figure 7

HyPer 9 Only CAN Setup

Except for the CAN bus configuration, all other installation instructions are the same for the HyPer 9 only version of the display (also known as the NetGain Touch Display). Once you have enabled the CAN bus functionality of the HyPer controller, make sure the CAN speed is set to 250kbps as shown in Figure 6. Follow the Figures 8-10 below to set the parameters for each of the CAN messages being sent from the controller. Take care that the ID and rate are both correct as shown below. **Be sure to save the changes after each CAN message is entered so the settings are updated.**

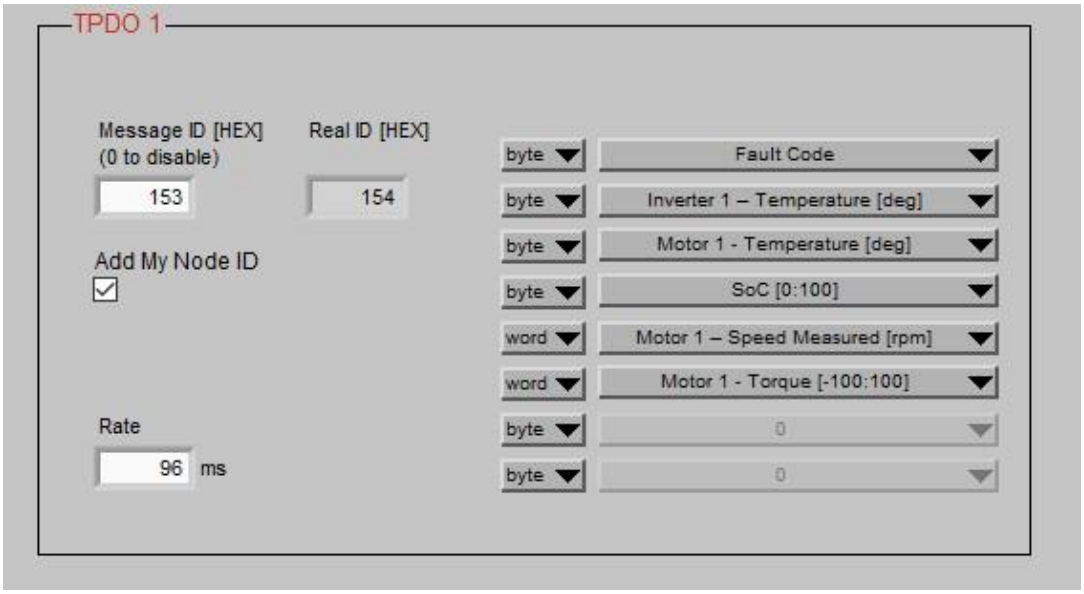


Figure 8

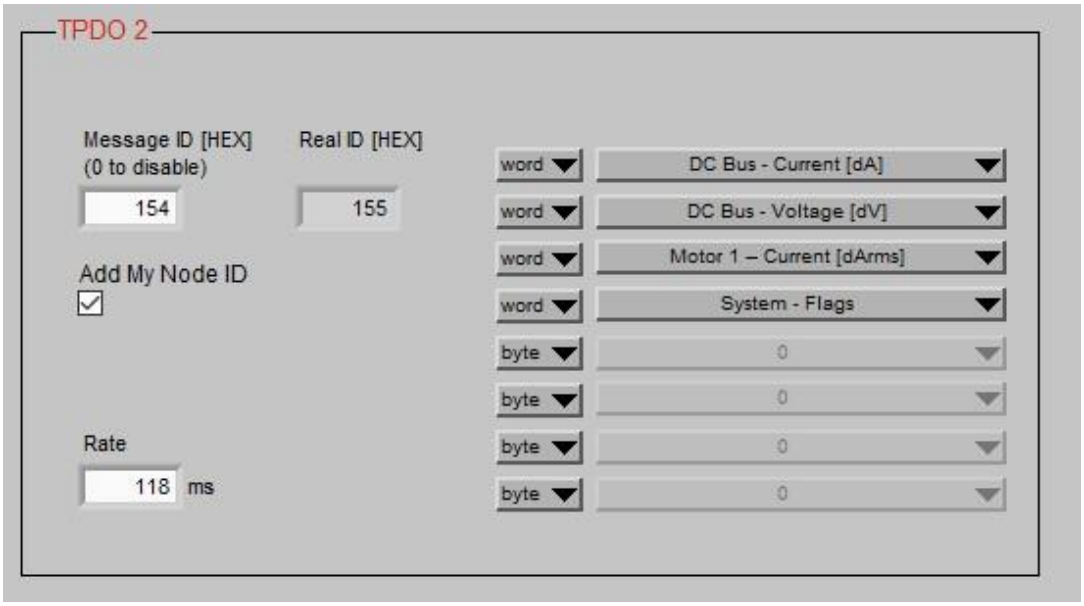


Figure 9

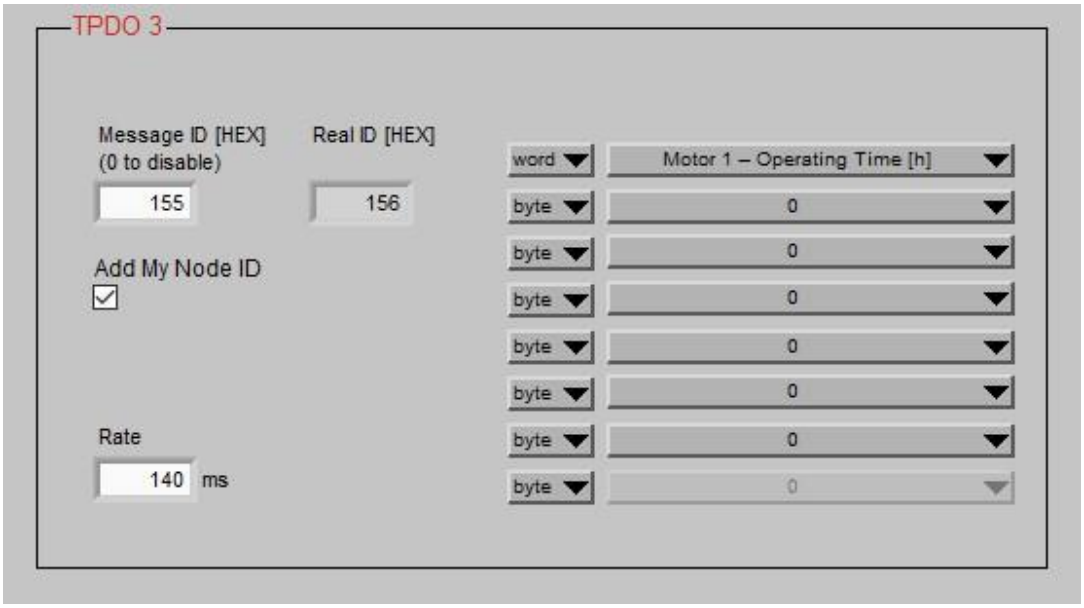


Figure 10

LED States

The LED will be red on start-up until it receives CAN data from either the BMS **OR** the controller, then it will turn green. If it stops receiving data from both, it will turn red.

The CAN Bus Display Kit should now be fully operational and set up with your system. If you have any questions, please feel free to contact us!

Hawkeye Innovations, LLC

Email: support@hawkeyeinnovationsLLC.com

