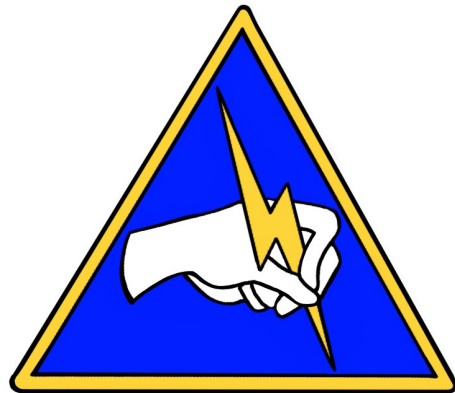
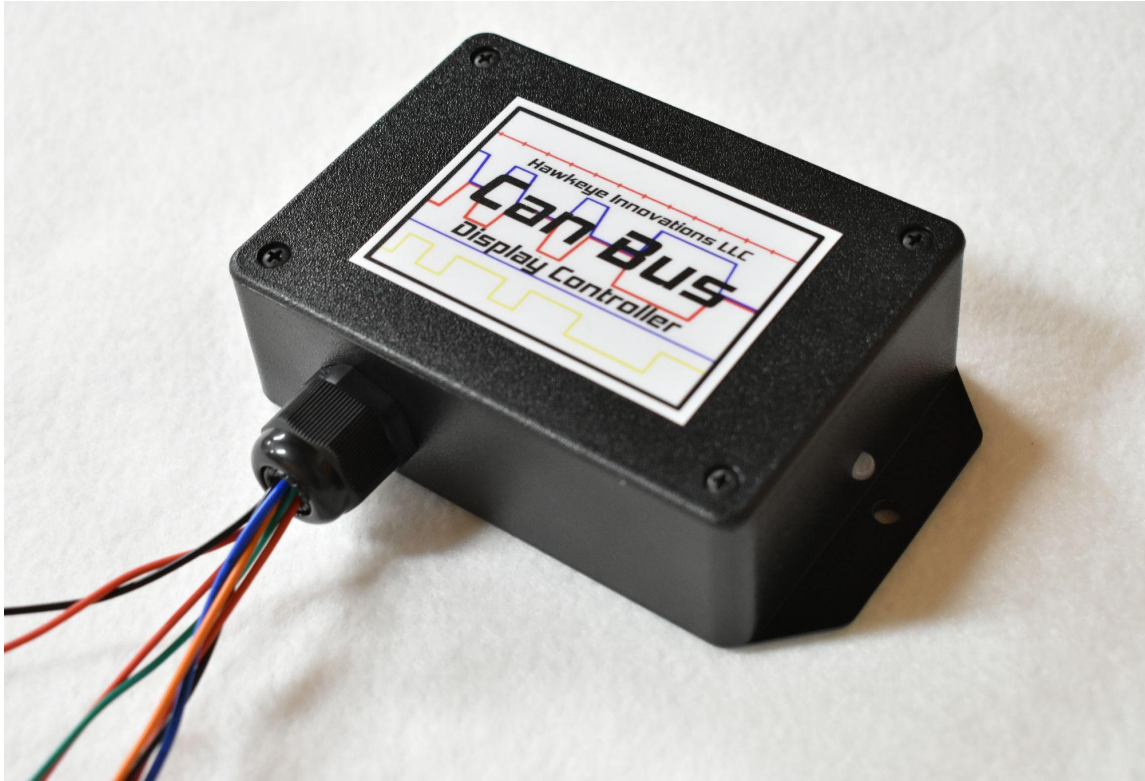


CAN Bus Display Kit MkII

---Manual---



**HAWKEYE INNOVATIONS
LLC**

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Installation

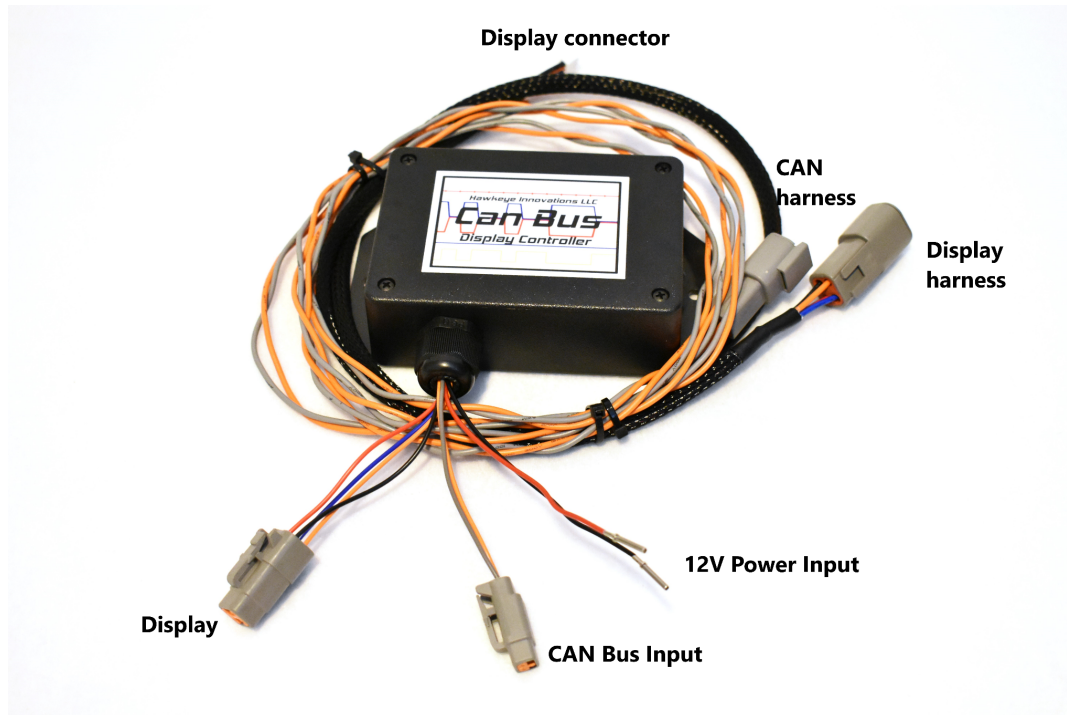


Figure 1

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 network. **Be careful! For units purchased before September 1st 2023, your twisted pair CAN harness may be red/black. Red is CAN high, black is CAN low.**

Gray/Orange Twisted Pair (CAN Bus harness):

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 your own wires to it.

Loose Red/Black Wires (power supply wires, shown in Figure 1)

Red - +12V supply (5A fuse)

Black - -12V (Ground)



Figure 2

2. Take care that your CAN bus harness and display harness (black braided wrap harness in Figure 2) do not run near any high voltage/high current power cables. 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.

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

NOTE: The 'Error' text will only appear if there is an Orion BMS fault present, or a HyPer controller fault. For advanced troubleshooting, on the second page will be the controller error code number if available, as well as the BMS error codes outputted as a decimal value for each of the three DTC bytes. Byte 1 is on top, byte 3 is on bottom.

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 3, 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.

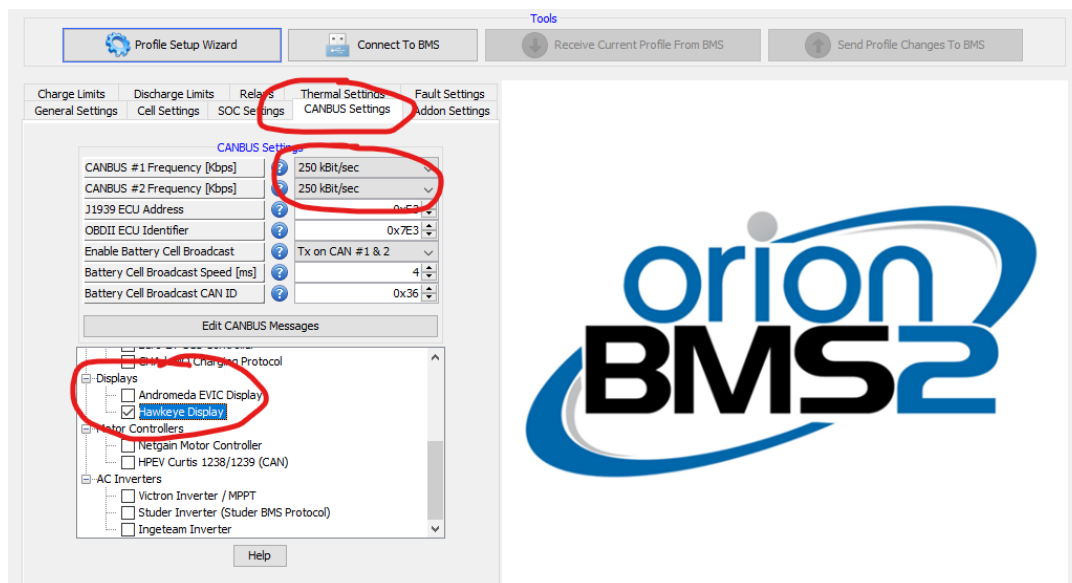


Figure 3

In Figure 4 below, you will see this message after clicking on Hawkeye Display, and just **ignore it**. The old default was 500kbps, but the new default for MkII displays is now 250kbps.

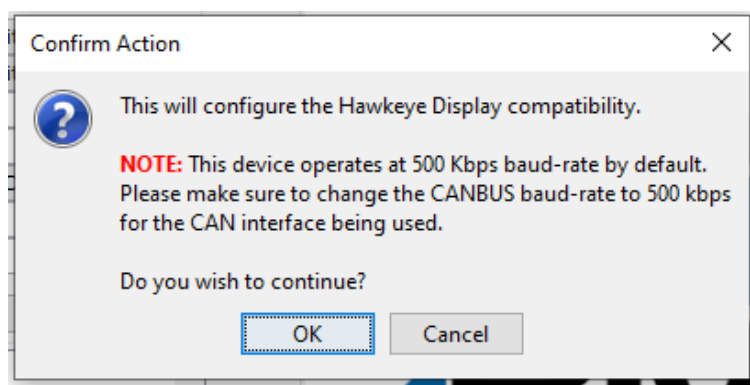


Figure 4

HyPer Controller CAN Setup

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 5.

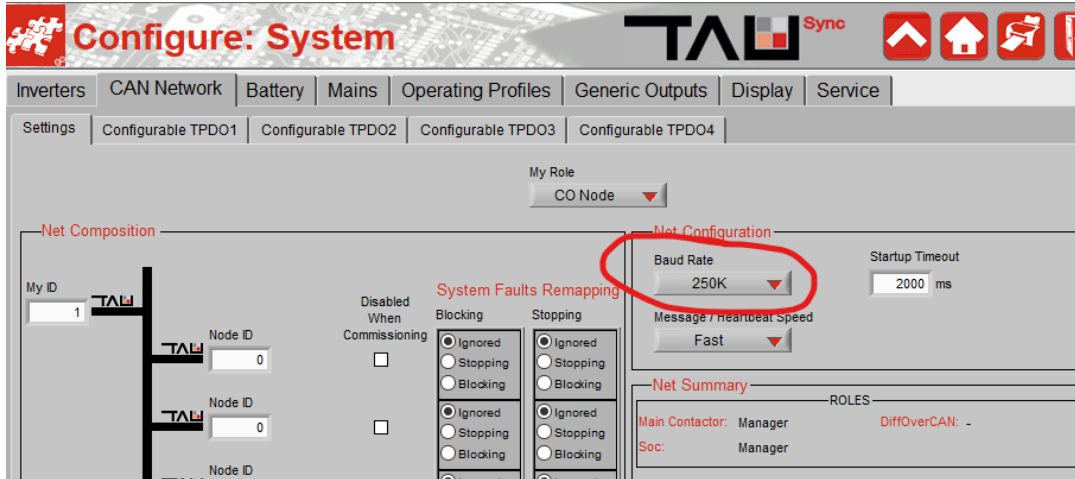


Figure 5

Next, go to ‘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 6. If you need help with this, just send us your clone file via email and we can configure it for you.

If you purchased the HyPer 9 only version of the display, please see pages 11 and 12 for the CAN message setup.

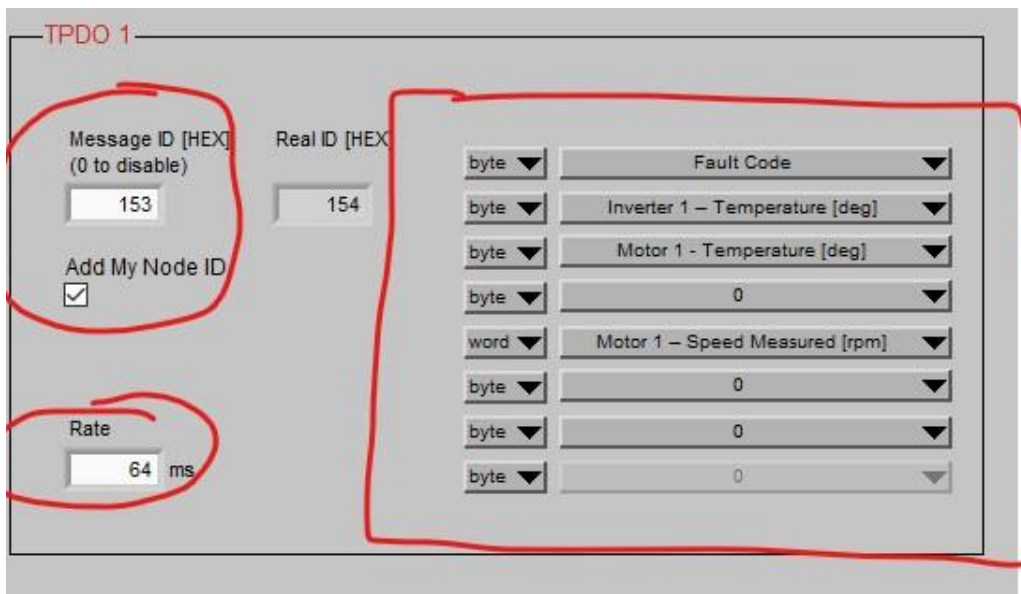


Figure 6

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

Display Case Installation

The Display Case will include mounting bolts (#5-40 countersunk), nuts, and plastic spacers as shown in Figure 7. Insert the display module into the case, then the bolts, and then the spacers as shown in Figure 8. This will allow you to mount the assembly flush.

NOTE: DO NOT overtighten the bolts otherwise it will damage the display. Lightly tighten only.



Figure 7

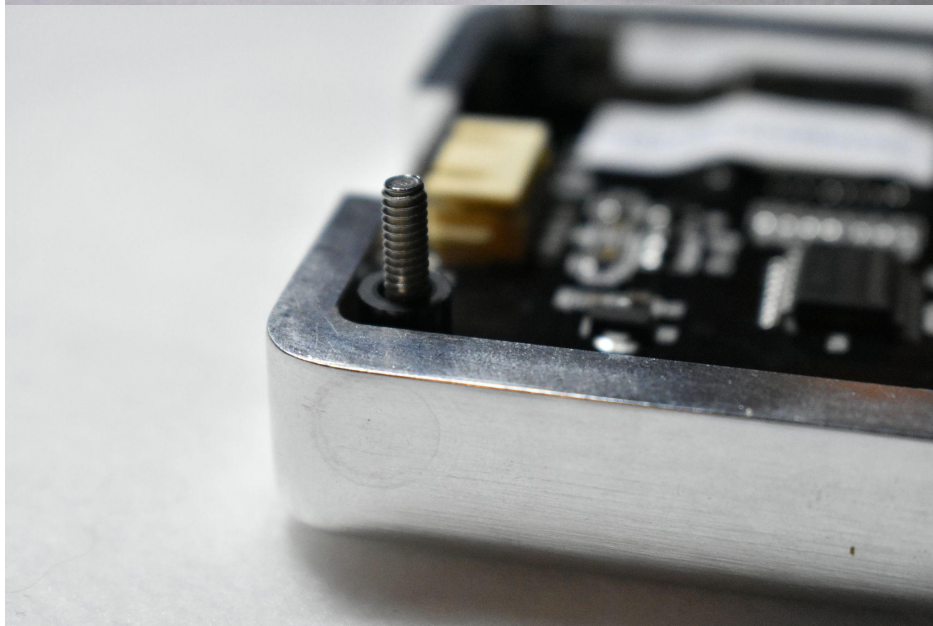


Figure 8

HyPer Controller Display Setup

All other installation instructions are the same for the HyPer 9 only version of the display, except the CAN configuration. 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 5. Follow the images below to set the parameters for each of the CAN messages being sent from the controller. Be sure to save the changes after each CAN message is entered in.

TPDO 1

Message ID [HEX] (0 to disable)	Real ID [HEX]	byte ▼	Fault Code ▼
<input type="text" value="153"/>	<input type="text" value="154"/>	byte ▼	Inverter 1 – Temperature [deg] ▼
Add My Node ID <input checked="" type="checkbox"/>		byte ▼	Motor 1 - Temperature [deg] ▼
Rate		byte ▼	SoC [0:100] ▼
<input type="text" value="96"/> ms		word ▼	Motor 1 – Speed Measured [rpm] ▼
		word ▼	Motor 1 - Torque [-100:100] ▼
		byte ▼	0 ▼
		byte ▼	0 ▼

Figure 9

TPDO 2

Message ID [HEX] (0 to disable)	Real ID [HEX]	word ▼	DC Bus - Current [dA] ▼
<input type="text" value="154"/>	<input type="text" value="155"/>	word ▼	DC Bus - Voltage [dV] ▼
Add My Node ID <input checked="" type="checkbox"/>		word ▼	Motor 1 – Current [dArms] ▼
Rate		word ▼	System - Flags ▼
<input type="text" value="118"/> ms		byte ▼	0 ▼
		byte ▼	0 ▼
		byte ▼	0 ▼
		byte ▼	0 ▼

Figure 10

TPDO 3

Message ID [HEX] (0 to disable)	Real ID [HEX]	word ▼	Motor 1 – Operating Time [h] ▼
<input type="text" value="155"/>	<input type="text" value="156"/>	byte ▼	<input type="text" value="0"/>
Add My Node ID <input checked="" type="checkbox"/>		byte ▼	<input type="text" value="0"/>
Rate		byte ▼	<input type="text" value="0"/>
<input type="text" value="140"/> ms		byte ▼	<input type="text" value="0"/>
		byte ▼	<input type="text" value="0"/>
		byte ▼	<input type="text" value="0"/>
		byte ▼	<input type="text" value="0"/>
		byte ▼	<input type="text" value="0"/>

Figure 11