Open source Tesla Large drive unit- user information.

Forum support

<https://openinverter.org/forum/viewtopic.php?f=10&t=83>

Detailed schematics

<https://github.com/damienmaguire/Tesla-Drive-Unit>

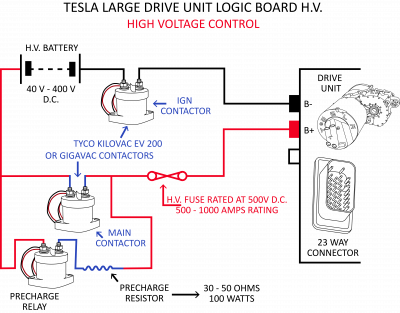
Firmware updates

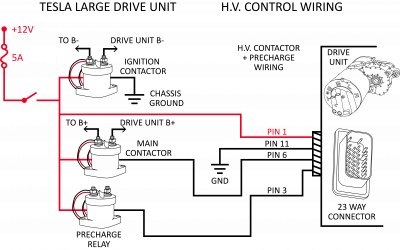
<https://github.com/jsphuebner/stm32-sine/releases>

A circuit board

Description automatically generated

Tesla Large drive unit wiring instructions-





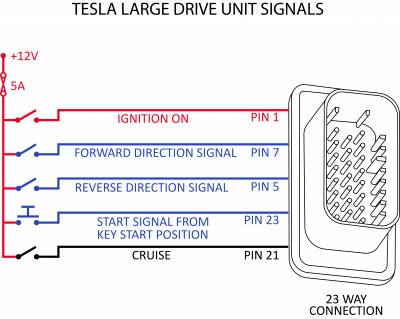
At switch on of 12v supply the negative side and precharge contactors will close allowing the high voltage to enter the inverter capacitor bank via the precharge relay. If the high voltage measured by the inverter (UDC under SPOT VALUES) exceeds the parameter UDCSW within 5 seconds the precharge contactor will remain closed and the inverter will wait for a +12v pulse on the START signal. Once this pulse is received the positive side contactor closes, the precharge contactor opens and the inverter will enter RUN mode and await a throttle signal.  
  
If the high voltage measured by the inverter (UDC under SPOT VALUES) does not exceed UDCSW within 5 seconds the precharge contactor opens as the assumption is made that there is a problem with the high voltage system.  
  
So to answer the question from Johaljaswant, the positive side contactor will not energise until the inverter measures UDC in excess of UDCSW and receives a 12v pulse on the START input. This is as the inverter is designed.  
  
Testing at low voltage is possible by simply reducing he values of UDCSW and UDCLIM.

A screenshot of a computer screen

Description automatically generated

A close up of a screen

Description automatically generated



FAQ list regards the encoder on the large drive unit. Unlike the small drive units the encoder must be wired externally from it's 4 pin connector to the 23 pin main input connector via a screened cable. If you are unlucky and don't have the Tesla harness then stranded CAT5e or CAT6 network cable is a good substitute. I have attached some pictures from the Tesla wiring diagrams detailing pin connection from the 4 pin encoder connector (located on the end of the motor housing) to the 23 pin ampseal connector.  
  
Here we have the pinout of the 23 way ampseal connector :  
[https://github.com/damienmaguire/Tesla- ... NEW\_V2.pdf](https://github.com/damienmaguire/Tesla-Drive-Unit/blob/master/AMPSEAL_PINOUT_NEW_V2.pdf)

Pin 1 of the Encoder connector to Pin 17 of the 23way ampseal main connector  
Pin 2 of the Encoder connector to Pin 16 of the 23way ampseal main connector  
Pin 3 of the Encoder connector to Pin 10 of the 23way ampseal main connector  
Pin 4 of the Encoder connector to Pin 9 of the 23way ampseal main connector  
  
The screen on the cable should be connected to pin 18 on the 23 way ampseal connector. It is not connected at the encoder plug.

User interface   
Once 12v power is applied to the board or drive unit the wifi interface becomes available. Simply connect with any wifi enabled device (laptop,phone,tablet etc) to the wifi access point called inverter. The passphrase is inverter123. Once connected point any web browser to 192.168.4.1 to bring up the interface. Note some devices may complain about not being connected to the internet but just ignore.

Note All fully built boards purchased from the EVBMW webshop are programmed and ready for testing and use. There is no need for initial programming.

ssid:inverter  
Passphrase :inverter123

The Encoder plug is very hard to find. ZeroEV have them for sale on their webshop :  
[https://zero-ev.co.uk/product/tesla-lar ... model-s-x/](https://zero-ev.co.uk/product/tesla-large-drive-unit-4-pin-encoder-connector-model-s-x/)

 Low voltage testing.  
It is recommended to perform initial tests at a low DC bus voltage in order to confirm correct operation of the drive unit and logic board. The voltage should be between around 40 and 100v dc. Some parameters need to be set to enable operation at these voltages.  
UDCSW set to 0.  
UDCMIN set to 0.  
You will need to perform a manual precharge or set UDCSW to about 10v less than your test voltage and use drive unit contactor control.  
Don't forget to reset these parameters to their original values when finished testing.

Precharge system.  
The precharge system behaves as follows :  
  
Upon application of 12v power, energize precharge contactor.  
  
If after 5 seconds the measured voltage at the drive unit (UDC) does not exceed the UDCSW parameter we shutoff the precharge contactor as it is assumed the precharge has failed in some way.  
  
If during those 5 seconds UDC exceeds UDCSW we leave the precharge contactor energised and wait for a start signal. Once start signal is received, we close the main and open the precharge contactor.

IF you experience encoder issues -

Open loop mode is easy. Disconnect the encoder. On the web interface click "Start inverter in manual mode" button. Under spot values verify mode is "manual run". Just above spot values are two params called ampnom(volts) and fslipsetpnt(Hz). Enter say 5 in fslipsetpnt and slowly increase ampnom until motor runs.