ISO175 IMD

Points of contact from bender:

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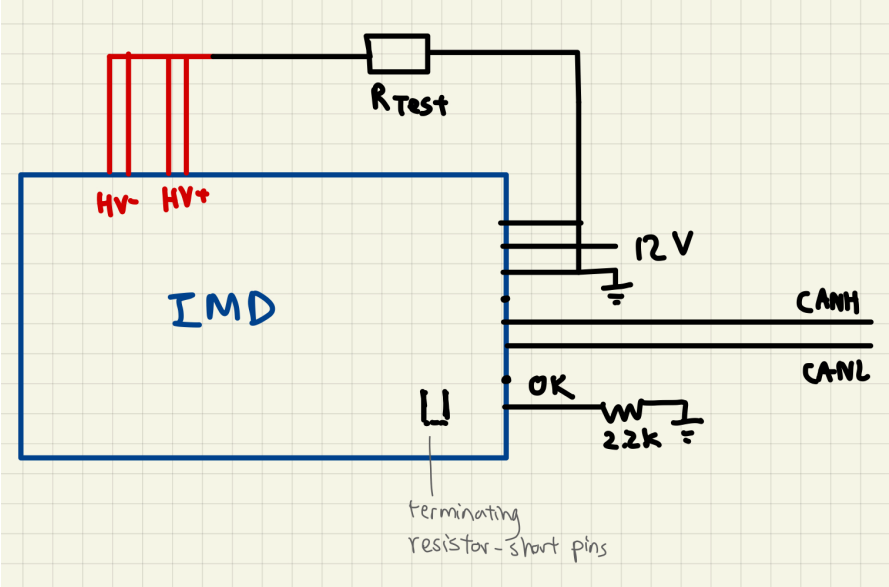
All manuals are in github

Testing setup:



- Pin 1 is chassis and pin 3 is ground. They don't necessarily need to have the same potential (there should be a configuration for it). For our purposes, though, chassis ground and low voltage ground are one thus we connect those together.
- The OK status signal is is active low signal. Without the Rtest resistor the signal should be high. When a Rtest value below a certain threshold (default 100kOhms) is used, the OK status signal will drop after maybe 15ish seconds.

Changing configurations

- The baudrate for the unit we have is 250kB. The CAN frames are in a format defined by the SAEJ1939 protocol hence we need to use that manual. This protocol uses PGNs (parameter group numbers) instead of standard CAN ids. So if you see a number like 61428 in the manual, you can convert it online. I feel like some of the online converters are incorrect though. I'd also refer to the customer_commands.xmt file for writing/setting configurations.

- I handled all CAN on an arduino during testing. When you connect the bus then power on the IMD, after 2 seconds, it will read a message with ID 0x1CEBFFF4. This is the DeviceInfoMessage.
- Additionally every 100ms you'll get the Info_general message with ID 0x18FFABF4. I'd recommend filtering this id out of the messages displayed on serial monitor.

- Reading threshold resistance:
    - unsigned char stmp[1] = {0x46};
    - CAN.sendMsgBuf(0x18EFF417, 1, 1, stmp);
    - Response: 0x18EF17F with data {0x46, 0x64, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF}
        - The value is in the first 1st data bit (not 0th). 0x64 = 100, meaning 100kOhm

- Setting threshold resistance:
    - Per industry standards and FSAE rules, the isolation requirement is 500*HV. Since we are using 400V this year, we need 200kOhms of isolation.
    - unsigned char stmp[3] = {0x47, 0xC8, 0x00};
    - CAN.sendMsgBuf(0x18EFF417, 1, 3, stmp);
    - No response
    - 0xC8 = 200