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EE491 - Project Proposal
11/19/2019

Requirements Pre-Check

1. Shall be powered by an automotive electrical system.
   - 1.1. Shall be powered by a nominal 12V power rail.
   - 1.2. Shall follow the following recommendations for electrical components in an automotive system: https://www.maximintegrated.com/en/design/technical-documents/app-notes/4/4240.html
     - 1.2.1. Shall survive 100V transients for several hundred millivolts
     - 1.2.2. Shall remain in operation at 4V for tens of milliseconds.
2. Shall be able to determine engine rotation speed and angle with an angle error of no more than 0.2 degrees.
   - 2.1. Shall have support for the NA Miata cam angle sensor. (2 input optical type trigger wheel)
   - 2.2. Shall have support for 2 Variable Reluctance (VR) sensors for alternative cam angle sensing.
     - 2.2.1. Shall support the decoding of different tooth number trigger wheels.
3. Shall have 2 spark channels supporting 4 spark plugs in wasted spark configuration.
   - 3.1. Should have 4 spark channels for sequential spark configuration.
   - 3.2. Spark power requirements here
   - 3.3. Shall have user configurable 2D spark map with at least 16x16 cells
4. Shall have 4 injector outputs in a batch fire configuration.
   - 4.1. Should support sequential injection.
   - 4.2. Shall be user configurable for use with both high and low impedance fuel injectors.
   - 4.3. Shall have a user configurable 2D fuel injection map with at least 16x16 cells.
5. Shall have various air flow measurement device support.
   - 5.1. Shall support potentiometer type (barndoor type) air flow meter.
   - 5.2. Shall have and support a Manifold Absolute Pressure (MAP) sensor for air flow sensing.
   - 5.3. Shall have support for a Mass Air Flow (MAF) sensor for air flow sensing.
6. Shall have various O2 sensor inputs.
   - 6.1. Shall have input for narrowband O2 sensor data.

6.2. Shall have input for an external controller preprocessed wideband O2 sensor.

6.3. Should have hardware and software support for an integrated wideband O2 controller. leave the shoulds out.

7. Shall have an input for a throttle position sensor (TPS).
   7.1. Shall support switch type TPS.
   7.2. Shall support potentiometer based TPS.
8. Shall have Idle Air Control (IAC) support.
   8.1. Shall have PWM output for IAC solenoid type valves.
   8.2. Should have stepper motor control for stepper motor type IAC valves.
9. Shall have fuel pump control.
   9.1. Shall be have pre-start fuel pump priming.
10. Shall have an Idle Air Temperature (IAT) input.
11. Shall support clutch switch input.
12. Shall support neutral position switch input.
13. Shall support tachometer output.
14. Shall have radiator fan high current output support.

Make these part of a general "will support common automotive I/O" user req

weight?
size?
power usage?