

TECHNICAL DATASHEET #TDAX021400
Multipurpose Engine Control Module

CANbus
with Electronic Assistant for PC-based Configuration
P/N: AX021400

Features:

- 4 analog inputs are user selectable from the following.
 - 0-5V, 0-10V, 4-20 mA or 0-20 mA
 - PWM signal from sensors or diesel engine ECM's
 - Enable or disable input commands
- 2 fully isolated Type J or K thermocouple inputs
- 1 Magnetic pick up (RPM) sensor input
- 8 active low/active high digital inputs (also selectable as PWM, pulse or counter)
- 6 resistive inputs for pressure or temperature sensors
- 1 voltage reference output (to power an external sensor)
- 2-2A outputs to drive proportional or on/off solenoids
- 2-10mA LED outputs
- 2 Form C relay outputs
- 12V/24V/48V/72VDC input power (nominal) with rugged surge protection
- 1 CAN (SAE J1939), 1 RS-232
- CANopen module available on request (P/N: AX021401)
- Rugged IP67 packaging and connectors
- A PC-based Electronic Assistant provides for user configuration, saving and writing settings to additional controllers during set-up. An USB-CAN converter links the PC to the CAN bus.



Sample of housing design

Description: The rugged controller features 1 CAN port for user-defined communications over the bus. Versatile and flexible, it accepts up to 4 analog inputs (0-5V, 0-10V, 0-20 mA, 4-20 mA or PWM), 2 fully isolated thermocouple inputs, 6 pressure or temperature sensor inputs as well as 6 digital inputs. A voltage reference can power an external sensor. Each input can be configured to measure the input value, and send the data to a SAE J1939 CAN network (CANopen on request). The controller provides 2 PWM or digital outputs to drive a proportional or on/off solenoid, 2 LED outputs and sets 2 Form C Relays. Diagnostics messages are provided over the CAN network for the status of inputs or outputs. Rugged IP67 rated packaging in addition to a wide ranging power supply input section suits power generation and large engine applications. During set-up, using the PC-based Axiomatic Electronic Assistant and an Axiomatic USB-CAN Converter, the operator can quickly configure the controller to suit a wide variety of applications. Alternatively, a RS-232 port is provided for user configuration via PC or for some diagnostic purposes.

Applications:

- Power generation
- Co-generation
- Stationary power
- Large engines

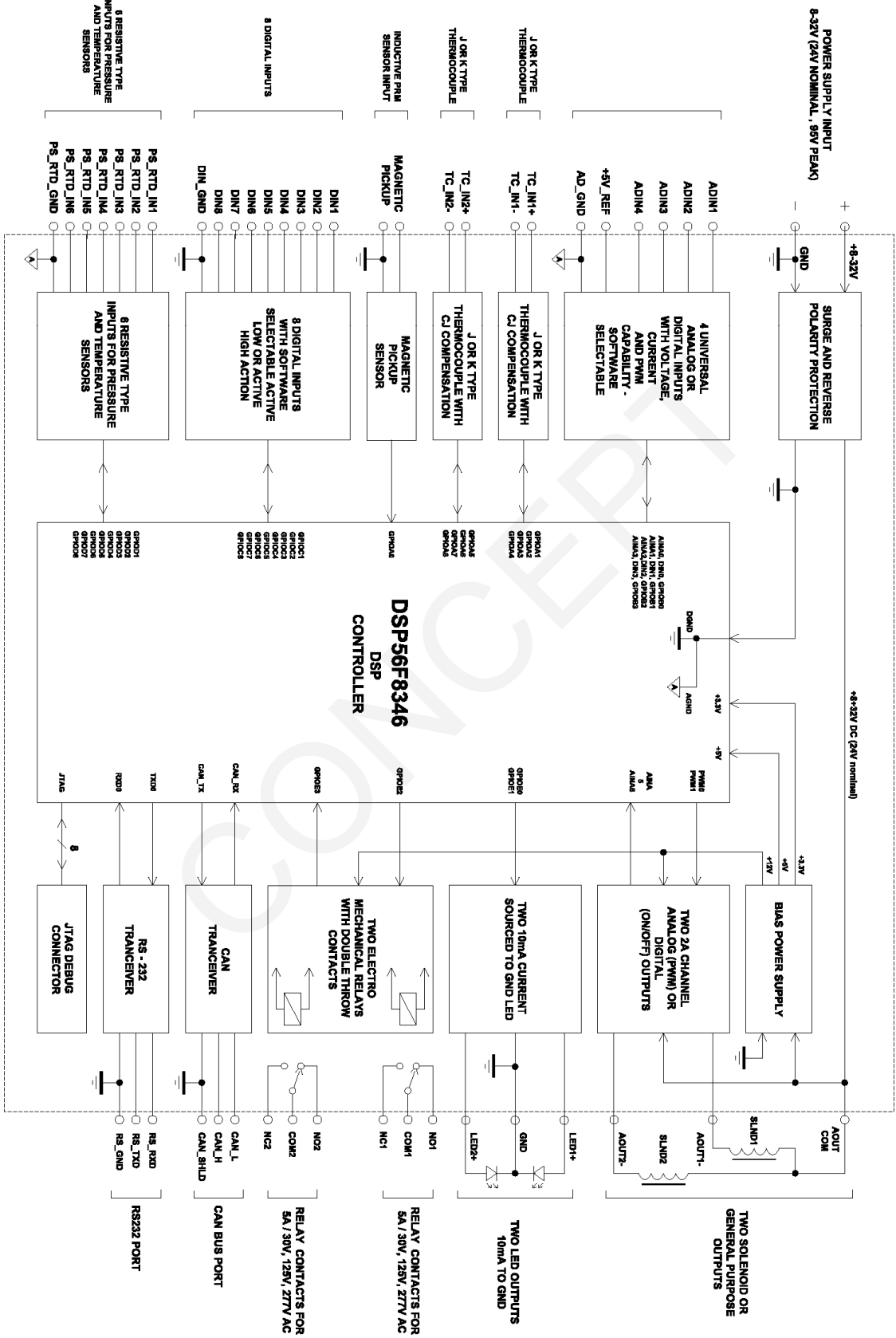
Ordering Part Numbers:

<i>SAE J1939 version</i>	<i>CANopen version</i>
Controller: AX021400 Accessories: Mating plug kit (Contact Axiomatic.)	Controller: AX021401 (on request) EDS File: EDS-AX021401
<i>PC-based Electronic Assistant: AX070500</i> <i>USB-CAN Converter with Software Development Kit & CAN Network Monitoring System: AX070501</i> <i>Cables for USB-CAN Converter: DB9 cable, USB cable</i> Or, you can order them as a KIT. - AX070502 , KIT (EA, AX070501 USB-CAN, SDK, CAN Network Monitoring System + 2 cables)	PC-based CANopen Configuration Tool to access the object dictionary (not supplied) Commercially available USB-CAN converter (not supplied).

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BLOCK DIAGRAM



**Technical Specifications:
Input Specifications**

Power Supply Input - Nominal	12, 24, 36, 42, 48, 72VDC nominal (8...80 VDC power supply range)
Protection	Surge and reverse polarity protection are provided.
All Inputs	Up to 21 inputs are selectable by the user. Refer to Table 1.0. The user can select the type of filter that is applied to the measured data, before it is transmitted to the bus. The available filters are: <ul style="list-style-type: none"> • Filter Type 0 = No Filter • Filter Type 1 = Moving Average • Filter Type 2 = Repeating Average With the CAN model, AX021400, all input channels are completely independent of each other as well as can simultaneously control any on-board output and send a message to the J1939 bus.
Input Protection	Full protection to all other physical pins (any other input, output or power terminal).
CAN Commands	SAE J1939 {CANopen (model AX021400)}
Ground Connections	1 Analog GND connection is provided for the analog inputs. 1 GND connection is provided for the Frequency Input. 1 Digital GND connection is provided. 1 GND connection is provided for the resistive inputs. 2 analog ground connections are provided for the Thermocouples.
Voltage Reference	1 +5V, 10 mA

Table 1.0 - Inputs	
Analog Inputs	Up to 4 analog inputs are available. Each analog input can be configured for any one of the following options. <ul style="list-style-type: none"> • Disable input • 0...5VDC or 0...10VDC • 4...20mA or 0...20mA • PWM signal (0-50,000 Hz, 0-100% D.C.)
Input Accuracy	0-5V: +/- 0.5% 0-10V: +/- 0.5% 0-20mA: +/- 0.5% 4-20mA: +/- 0.5% PWM, single channel: Contact Axiomatic.
Input Resolution	12-bit A to D
Frequency Input	1 frequency input is available for a magnetic pick up sensor. Pulse (Hz or RPM) 0-50,000 Hz, 50 mV-3V RMS
Digital Inputs	Up to 8 digital inputs are available. Each digital input can be configured for the following options. <ul style="list-style-type: none"> • Digital Input (Active Low 10 KOhm or Active High 10 KOhm) • PWM signal (0-50 KHz, 0-100% D.C.) • Pulse (Hz or RPM) • Counter Threshold 2.5V (Other values are available on request.) Hysteresis 1V
Resistive Inputs	Up to 6 resistive type inputs for pressure or temperature sensors are provided. <i>Temperature Sensor Input:</i> Will accept a thermistor sensor 25 Ohm to 1050 Ohm (150 to 40°C) <i>Pressure Sensor Input:</i> Will accept a resistive sensor 240 Ohm to 33 Ohm (0, 30, 80, 100 PSI)
Thermocouple Inputs	2 Type J or K Thermocouple Modules (other types on request) Isolated (Floating) Channels are configured to indicate the SAE J1939 SPN to transmit the temperature measured by that input.
Common Mode	Common mode rejection is >90 db@ 5V p-p (50-60 Hz). Common mode input range is +/- 4 V minimum.
Resolution	Temperature data is measured with a resolution of 0.1 °C. When sending data to the J1939 bus, one byte parameters have a resolution of 1 °C/bit and a range of -40 °C to 210 °C. Two byte parameters have resolution of 0.03125 °C / bit and a range of -273 °C to 1735 °C.
Accuracy	+/- 1°C throughout the entire range of the thermocouple input
Drift	Overall drift with temperature is 50ppm/°C of span (maximum).

