5A Brushed DC Motor Controller

Controls a 12V or 24V Brushed DC Motor
2 Signal Inputs
+5V reference
RS-232
SAE J1939
with the Axiomatic Electronic Assistant
P/N: AX100600

Features:

- Unidirectional or bi-directional brushed DC motor control
- Up to 5A continuous output current to the motor
- Flexible control modes
    - supervisory positioning
    - closed loop position control
    - speed control
- 2 universal signal inputs to command motor position, direction, speed and/or enable (selectable)
- Position feedback on 1 of the universal inputs when in either position control mode
- J1939 CAN commands can control the motor and/or report motor status (selectable)
- 9…60VDC (12V or 24V nominal)
- Thermal overload, under-voltage, over-voltage and short circuit protection provided
- +5V reference to power a sensor or potentiometer
- 1 RS-232 port for monitoring and software updates
- CAN (SAE J1939) port (CANopen® on request)
- Aluminum enclosure with integral 12-pin connector and 3-pin RS-232 connector
- IP67
- The **Axiomatic Electronic Assistant** runs on a *Windows* operating system for user configuration. An Axiomatic USB-CAN links the PC to the CAN bus.

Applications:

- Position or closed loop speed control for heavy equipment (Construction, Forestry, etc.)

Ordering Part Numbers:

SAE J1939 Controller:
For baud rate, refer to the table below for the appropriate P/N.

Model P/N	Baud Rate	Standard Reference
AX100600	250 kBit/s	J1939/11, J1939/15.
AX100600-01	500 kBit/s	J1939/14. New standard
AX100600-02	1Mbit/s	Non-standard

Axiomatic Electronic Assistant Configuration KIT, P/Ns: **AX070502**, or **AX070506K**
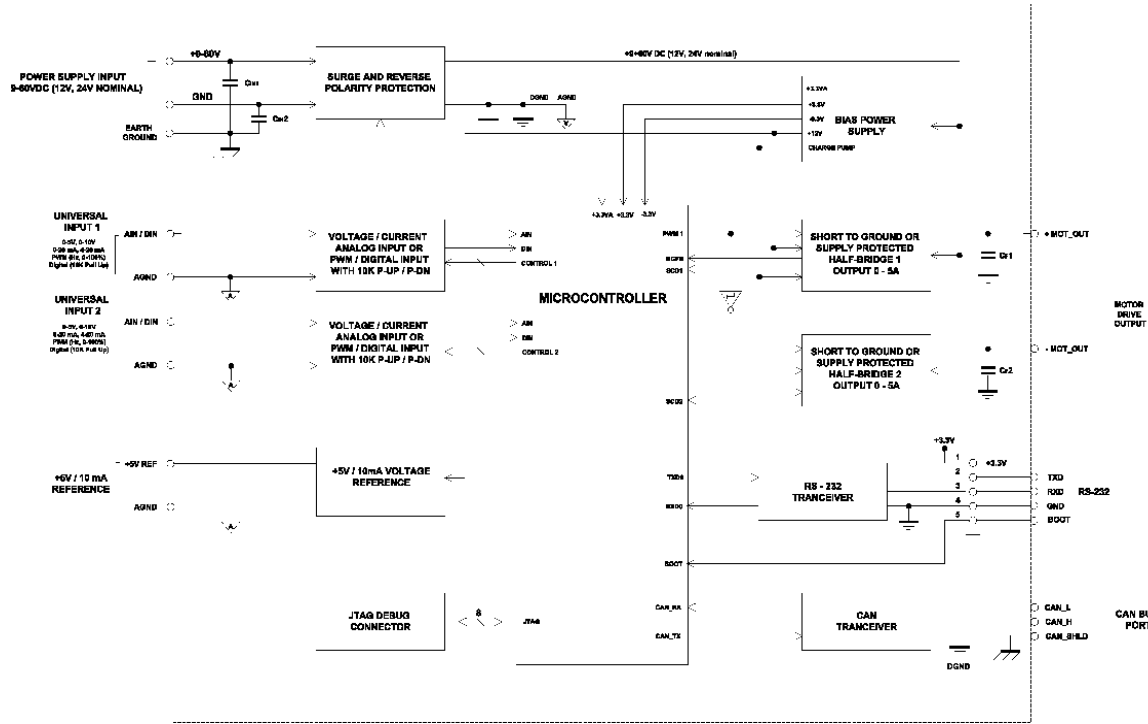
Accessories:
AX070105 - Mating Plug Kit (DT06-12SA, W12S, 12 0462-201-16141, 6 plugs) for CAN, Motor and Input 12-pin Connector
AX070101 - RS-232 mating wire harness for service is available with DB-9.

Technical Specifications:

Specifications are indicative and subject to change. Actual performance will vary depending on the application and operating conditions. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Approvals/Limitations and Return Materials Process as described on https://www.axiomatic.com/service/.

Block Diagram

Inputs

Power Supply Input	12V or 24VDC nominal (9…60 VDC power supply range)
Protection	Reverse polarity protection Overvoltage protection up to 60V Overvoltage (undervoltage) shutdown
Inputs	2 Inputs are provided to command the motor position, direction, speed and/or enable. One of the inputs is used for position feedback, where applicable. 2 Universal Signal Inputs Refer to Table 1.0. The input is user selectable.
Analog Ground	1 provided
CAN port	CAN messages can command the motor and/or report motor status. Refer to the User Manual for details.

Table 1.0 – **Inputs – User Selectable Options**	
Analog Input Functions	Voltage Input or Current Input
Voltage Input	0-5V (Impedance 200 KOhm) 0-10V (Impedance 150 KOhm)
Current Input	0-20 mA (Impedance 130 Ohm) 4-20 mA (Impedance 130 Ohm)
Digital Input Functions	Discrete Input, PWM Input, Frequency Input
Digital Input Level	5V TTL on Input 1 and 2
PWM Input	0 to 100% 100 Hz to 10 kHz
Frequency Input	100 Hz to 10 kHz
Digital Input	Active High or Active Low with 10 kOhm pull-up or pull-down on Input 1 and 2
Input Accuracy	$\leq$ 1%
Input Resolution	12-bit

Outputs

Output	H-bridge 5A @ 24VDC nominal continuous at room temperature 7.5A @ 24VDC for 5 minutes at room temperature
	Overcurrent protection is provided. Short circuit protection is provided. The maximum rated speed and motor rated current are configurable to suit individual motor specifications.
Voltage Reference	+5V, 10 mA Short circuit protected (current limited to 50 mA)
Protection for Output Terminals	Fully protected against short circuit to ground and short circuit to power supply rail. Unit will fail safe in the case of a short circuit condition, self-recovering when the short is removed.

General Specifications

Microcontroller	32-bit, 128 KByte flash memory
Typical Quiescent Current	22 µA @ 24 Vdc
Control Logic	Standard embedded software is provided. Refer to the User Manual for details. (Application-specific control logic or factory programmed setpoints are available on request.)
Communications	1 RS-232 port for monitoring and software updates 1 CAN port (SAE J1939) (CANopen® on request) For different baud rates, see the ordering part numbers on page 1.
Network Termination	It is necessary to terminate the network with external termination resistors. The resistors are 120 Ohm, 0.25W minimum, metal film or similar type. They should be placed between CAN_H and CAN_L terminals at both ends of the network.
User Interface	The controller setpoints can be viewed and programmed using the standard J1939 memory access protocol through the CAN port and the PC-based Axiomatic Electronic Assistant. For default setpoints, refer to the User Manual. The Axiomatic EA can store all controller setpoints in one setpoint file and then flash them into the controller in one operation. The setpoint file is created and stored on disk using a command *Save Setpoint File* from the Axiomatic EA menu or toolbar. The user then can open the setpoint file, view or print it and flash the setpoint file into the controller. The Axiomatic Electronic Assistant for *Windows* operating systems comes with a royalty-free license for use on multiple computers. It requires an Axiomatic USB-CAN converter to link the device's CAN port to a *Windows*-based PC. Order the KIT, P/Ns: **AX070502**, or **AX070506K**.
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Enclosure	Aluminum enclosure, integral connector (equivalent to a TE Deutsch P/N) Encapsulated 4.27 x 4.27 x 2.17 inches 108.49 x 108.49 x 55.07 mm L x W x H including integral 12-pin connector and 3-pin RS-232 connector
Protection	*IP67 rating for the product assembly*
Weight	*1.40 lbs. (0.635 kg)*
Installation	For mounting information, refer to the dimensional drawing. If the module is mounted without an enclosure, it should be mounted to reduce the likelihood of moisture entry. Install the unit with appropriate space available for servicing and for adequate wire harness access (6 inches or 15 cm) and strain relief (12 inches or 30 cm). All field wiring should be suitable for the operating temperature range of the module. All chassis grounding should go to a single ground point designated for the machine and all related equipment.

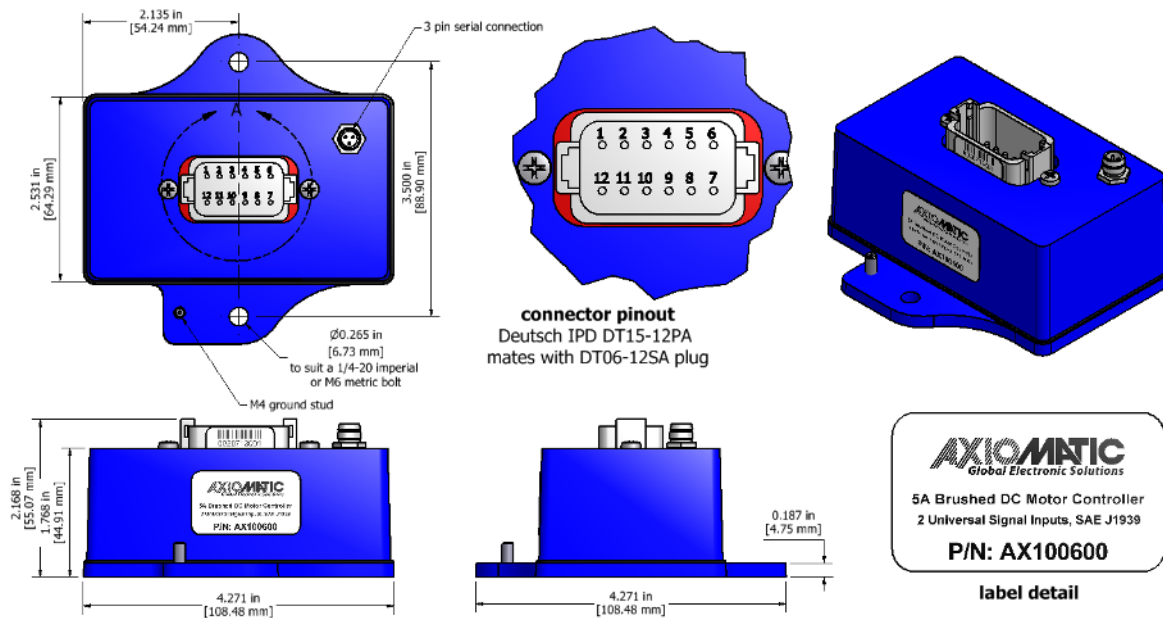| Electrical Connections	**RS-232 port**: 3 pin M8 P/N: NAN-T-3MR-M8

1. TXD
3. RXD
4. GND

Mates with NAN-T-3FP-2M
A mating wire harness, P/N: **AX070101** is available with DB-9.

CAN, Motor and Input Connector: 12-pin connector (equivalent TE Deutsch P/N: DT15-12PA)

A mating plug kit is available as Axiomatic P/N: **AX070105**.

Pin #	Description
1	Output to Motor
2	+5V Reference
3	BOOT
4	CAN_Shield
5	CAN_Low
6	CAN_High
7	Input 1+
8	Input 2+
9	Analog Ground
10	Power -
11	Power +
12	Output to Motor

Dimensional Drawing

connector pinout
Deutsch IPD DT15-12PA
mates with DT06-12SA plug

5A Brushed DC Motor Controller
2 Universal Signal Inputs, SAE J1939

P/N: AX100600

label detail

CANopen® is a registered community trademark of CAN in Automation e.V.

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