TECHNICAL DATASHEET #TDAX021100

CAN Valve Controller, DIN43650A
SAE J1939 or CANopen®
Single Output
M12 Connector
P/N: AX021100

Features:
- 1 CAN SAE J1939 port (or CANopen®)
- High frequency switching output (PWM)
- Drives one solenoid up to 2.5A
- Current sensing circuit maintains output regardless of changes in input voltage and coil resistance
- Short circuit proof (in case of solenoid failure or miswiring)
- Can hot swap
- 9-36Vdc (12V or 24Vdc nominal)
- -40 to +85°C operating temperature
- Mates to a DIN 43650A interface on a cartridge or block style solenoid valve
- M12 Connector
- IP67
- Configurable via Electronic Assistant
- CE marking
- Vibration and shock compliance for off-highway applications

Ordering Part Numbers:
Valve Controller with SAE J1939 (250 kbps) CAN bus: AX021100
Valve Controller with SAE J1939 (500 kbps) CAN bus: AX021100-01
Valve Controller with SAE J1939 (1 Mbps) CAN bus: AX021100-02

Valve Controller with CANopen®: AX021101

Accessories:
Electronic Assistant: AX070502

AX070139 M12 Mating Plug with 2 m cable, unterminated

Application: Accurate control of hydraulic and pneumatic proportional solenoid valves used in mobile construction equipment and industrial processes.
**Description:** The Valve Controller simplifies control of proportional solenoids by supplying a current proportional to an input control from the CAN bus (SAE J1939). It accepts power supply voltages from 9 to 36 VDC. This linear solenoid driver utilizes high frequency switching output (PWM) to provide a DC current output. Maximum current output is up to 2.5 A. A current sensing circuit maintains output current regardless of changes in input voltage and coil resistance. The user can adjust maximum and minimum current. Ramp time, dither frequency and amplitude can also be adjusted to match the application. The unit is available with a DIN 43650 connection to mount directly on the coil. The setpoints are configurable using the Electronic Assistant. It has rugged packaging and performance for IP67, high vibration and off-highway machine environments. A 5-pin M12 connector is provided for power and CAN.

**Block Diagram:**

![Block Diagram Image]

*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 www.axiomatic.com/service.html.*
## Technical Specifications:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Supply Input - Nominal</strong></td>
<td>12Vdc or 24Vdc nominal (9…36 VDC power supply range)</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>Reverse polarity protection is provided. Overvoltage protection is provided.</td>
</tr>
</tbody>
</table>
| **CAN port**                           | Model AX021100: 1 SAE J1939, 250 kbps  
Model AX021100-01: 1 SAE J1939, 500 kbps  
Model AX021100-02: 1 SAE J1939, 1 Mbps  
Model AX021101: 1 CANopen® |
| **Range of maximum output current**    | up to 2.5 A  
Minimum and maximum current are user adjustable. Overcurrent protection  
Short circuit protection in hardware  
1mA resolution, accuracy +/-2% error |
| **Output types**                       | User configurable output types, including:  
- Proportional Current  
- Hotshot Current  
- PWM  
- Proportional Voltage  
- Digital ON/OFF |
| **Solenoid resistance selection (nominal)** | Nominal resistance of solenoid coil should comply with:  
\[ R_{coil} \leq \frac{(V_{power\ supply} - 1.5\ V)}{I_{max}}. \] |
| **Current Ramp Ttime**                 | User configurable  
0.01-5 sec. independent |
| **Dither Amplitude**                   | User configurable |
| **Current Dither Frequency**           | 0 to 10% of rated maximum current  
50 to 400 Hz (+/-10% of full scale) |
| **Microprocessor**                     | STM32F413CGUx  
32-bit, 1024 Kbit program flash |
| **Quiescent Current**                  | 23 mA @ 12Vdc  
14 mA @ 24Vdc Typical |
| **Control Logic**                      | User programmable functionality. Refer to User Manual UMAX021100. |
| **User Interface**                     | Electronic Assistant |
| **Software Flashing**                  | Not supported |
| **Operating Conditions**               | -40 to 85 °C (-40 to 185 °F) |
| **Protection**                         | IP67 when correctly installed with lid, o-ring/washer and base gasket |
| **Weight**                             | 0.15 lb. (0.068 kg) |
| **Approvals**                          | CE marking |
| **Vibration (Pending)**                | MIL-STD-202G, Method 204D test condition C (Sine)  
and Method 214A, test condition B (Random)  
10 g peak (Sine)  
7.68 Grms peak (Random) |
| **Shock (Pending)**                    | MIL-STD-202G, Method 213B, test condition A  
50g (half sine pulse, 9ms long, 8 per axis) |
| **Enclosure**                          | Hirschmann GDME 2011 black housing (PA material, 94 V1), central screw M3 x 40, transparent cover, washer and o-ring, nitrile rubber gasket  
DIN 43650-A contact arrangement with 18 mm spacing (plug-style to mount on valve)  
Contacts: Sn, PA, 94V1  
Approvals: VDE, SEV, GL  
Refer to the dimensional drawing. |
| **Electrical Connections**             | One M12 5-position, A-coded Connector, Binder P/n: 09 0437 87 05  
1 Power +  
2 Power -  
3 CAN L  
4 CAN H  
5 CAN SH  
DIN 43650A connection to solenoid: |

**NOTE:** The EARTH pin (or GND) on the DIN43650A plug is not connected in
So, the Input Signal shield wire should be drained at the equipment end.

PIN 2 is Solenoid -
PIN 3 is Not Used.
PIN 1 is Solenoid +

The Earth GND is not connected.
The input signal shield wire should be drained at the equipment end.

Mating Wire Harness  Ordering p/n AX070139
5 pin A coded female straight plug, M12
2 m unterminated jacketed wire harness

-- Dimensional Drawing --

Note 1: For proper operation of the amplifier, match power supply voltage with rating of solenoid coil. Operating the amplifier with a supply voltage lower than the solenoid rated voltage may result in reduced maximum current output.

Note 2: The coil should have no polarity or protection diodes for proper operation of the device.

Note 3: The maximum current output of the amplifier should not exceed the current rating of the solenoid coil.

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

Form: TDAX021100-05/31/19