Preliminary
TECHNICAL DATASHEET #TDAX020801

4 Inputs, 8 Proportional Outputs Valve Controller

Wake-on-CAN

2 CAN Ports (CANopen®)

P/N: AX020801

Features

- 4 universal signal inputs configurable as follows.
  - Voltage
  - Current
  - Resistive
  - Frequency
  - PWM
  - Digital
- 8 proportional outputs (up to 3 A) selectable as follows.
  - Voltage
  - Current
  - Hotshot Digital
  - PWM
  - Digital
  - Disabled
- 2 CAN ports (CANopen®)
- **Wake-on-CAN** function for power saving
- Operates on 8 to 65 Vdc battery power
- Surge, transient, and reverse polarity protection
- Withstands -40 to 85 °C (-40 to 185 °F)
- Suitable for high vibration and shock environments for off-highway applications
- IP67 rated CINCH enclosure for protection against dust and water ingress
- 1x 32-pin CINCH connector
- EDS File

Applications

Drive actuators, hydraulic valves, or motors with inputs from sensors, joysticks, switches, or pushbuttons in off-highway or construction equipment, municipal vehicles, trucks, or other CANopen® control systems.

Ordering Part Numbers

4 Inputs, 8 Proportional Outputs Valve Controller, CANopen® - P/N: **AX020801**

Accessories:
EDS File
Mating Plug Kit (Molex 33472-2002 (Key B), Molex 33472-1201 (Key A), 32 crimp terminals, 4 cavity plugs) – P/N: **AX070172**

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Description

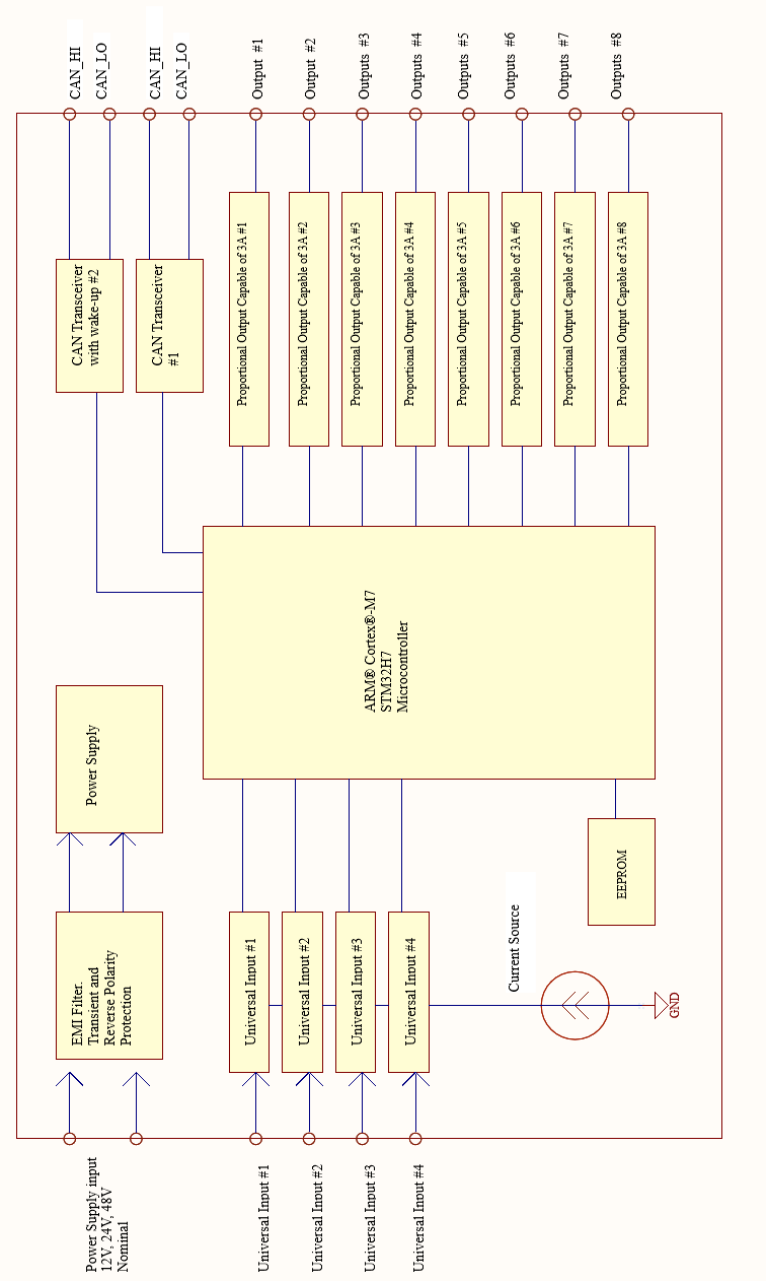
The AX020801 accepts 4 universal command signal inputs as voltage, current, resistive, frequency, PWM, or digital types from sensors, joysticks, switches, or pushbuttons. It provides 8 proportional outputs (up to 3 A) capable of driving actuators, hydraulic valves, or motors. The outputs are programmable as voltage, current, hotshot digital, PWM, digital, or disabled.

It interfaces with 2 CANopen® networks using auto-baud-rate detection and utilizes a Wake-on-CAN function to save on power.

Operating with machine battery power, it accepts 8 to 65 VDC (12, 24, or 48 V nominal). It is designed for harsh environments with an IP67 rating. It operates from -40 to 85 °C (-40 to 185 °F).

The controller can be applied on off-highway machines in distributed valve control CAN networked work functions.

Block Diagram



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 Limitations & Return Materials Process as described on https://www.axiomatic.com/service/.

Power Supply

Input Power Supply	12, 24, or 48 Vdc nominal 8 to 65 Vdc power supply range
Quiescent Current	92.5 mA @ 12V, 56.7 mA @ 24V, 43.0 mA @ 48V In sleep mode: 0.08 mA @ 12V, 0.11 mA @ 24V, 3.36 mA @ 48V
Protection	Surge and transient protection are provided. Reverse polarity protection is provided. Undervoltage protection provided. Hardware shutdown at 5.9 V. Overvoltage protection provided. Hardware shutdown at 65 V.

Inputs

Universal Inputs

4 universal signal inputs user selectable as follows.

Voltage	Ranges: 0-2.5 V, 0-10 V Resolution: 1 mV Accuracy: ±0.1 %
Current	Ranges: 0-20 mA, 4-20 mA Resolution: 1 µA Accuracy: ±1 %
Resistive	Range: up to 250 kΩ Accuracy: ±2 %
Frequency	Range: 0-10 kHz Resolution: 0.01 % Accuracy: ±1 %
PWM	Range: 1 Hz - 10 kHz Duty Cycle: 0-100 % Accuracy: ±1 %
Digital	1 MΩ impedance, or Active High with 10 kΩ pull-up, or Active Low with 10 kΩ pull-down resistor to Ground

12-bit Analog to Digital resolution (voltage, current)
Current source for resistive input using DAC (Digital-to-Analog Converter)
Protected against shorts to Ground

Outputs

Proportional Outputs

8 proportional outputs (up to 3 A sourcing) programmable as follows.

Voltage	Ranges: 0-Vps (up to 48 V) Resolution: 10 mV Accuracy: ± 2 %
Current	Ranges: 0-3 A Resolution: 10 mA Accuracy: ±1 %
Hotshot Digital	See profile diagram below.
PWM	Range: 1 Hz - 25 kHz Duty Cycle: 0-100 % Accuracy: ±1 % error
Digital	On/Off
Disabled	-

Current sensing provided
Overcurrent protection against shorts to Ground or +Vps provided at 4.8 A

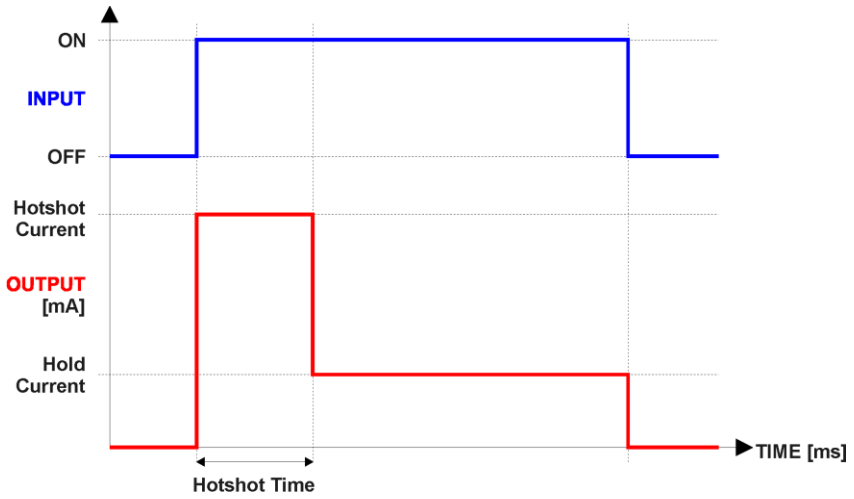
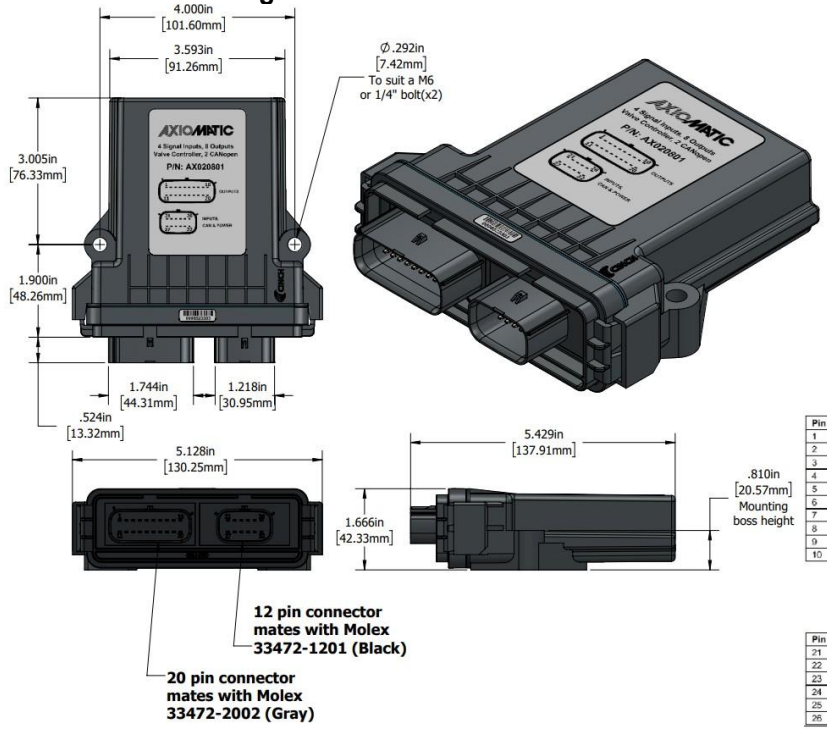
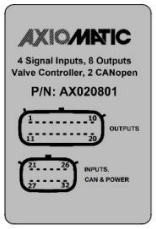


Figure - Hotshot Digital Profile

Dimensional Drawing



Label Detail



32-PIN TWO PARTS RECEPTACLE PINOUT

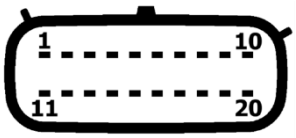
Mates with Molex 33472-2602 (grey)

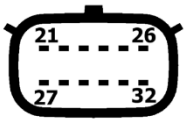
Pin	Description	Pin	Description
1	Output 1	11	Ground
2	Output 2	12	Ground
3	Output 3	13	Ground
4	Output 4	14	Ground
5	Output 5	15	Ground
6	Output 6	16	Ground
7	Output 7	17	Ground
8	Output 8	18	Ground
9	Input 1	19	Ground
10	Input 2	20	Ground

Mates with Molex 33472-1201 (black)

Pin	Description	Pin	Description
21	Input 3	27	Ground
22	Input 4	28	Ground
23	CAN 2 H	29	CAN 2 L
24	CAN 1 H	30	CAN 1 L
25	Battery +	31	Ground
26	Battery -	32	Ground

General Specifications

<table>
<tr><td>Microcontroller</td><td>STM32H723ZGT6, 32-bit, 1 MB flash memory</td></tr>
<tr><td>Control Logic</td><td>User programmable functionality. Refer to the User Manual.</td></tr>
<tr><td>CAN</td><td>2 CAN ports (CANopen®)
Wake-on-CAN functionality on CAN 2 port</td></tr>
<tr><td>Network Termination</td><td>It is necessary to terminate the network at both ends with external resistors of 120 Ω, 0.25 W minimum, metal film or similar type placed between CAN H and CAN L terminals.</td></tr>
<tr><td>User Interface</td><td>EDS File (EDS-25114)</td></tr>
<tr><td>Reflashing</td><td>Axiomatic Electronic Assistant - P/N: **AX070502** or **AX070506K**</td></tr>
<tr><td>Compliance</td><td>RoHS</td></tr>
<tr><td>Operating Temperature</td><td>-40 to 85 °C (-40 to 185 °F)</td></tr>
<tr><td>Storage Temperature</td><td>-50°C to 125 °C (-58 to 257 °F)</td></tr>
<tr><td>Enclosure</td><td>CINCH enclosure P/N: 5810130065
Glass filled Polyphthalamide (PPA) material
Flammability rating: UL94HB
8.93 in. x 5.13 in. x 1.67 in. (226.8 mm x 130.3 mm x 42.4 mm)
L x W x H including integral connectors</td></tr>
<tr><td>Protection</td><td>IP67</td></tr>
<tr><td>Vibration and Shock</td><td>Pending</td></tr>
<tr><td>Weight</td><td>0.576 lb. (0.261 kg)</td></tr>
<tr><td>Mounting</td><td>Mounting holes are sized for ¼” or M6 bolts. The bolt length will be determined by the end-user’s mounting plate thickness. The mounting flange of the controller is 0.81 in. (20.6 mm) thick. It should be mounted with connectors facing left or right to reduce the likelihood of moisture entry. All field wiring should be suitable for the operating temperature range. Install the unit with appropriate space available for servicing and for adequate wire harness access (6 in. or 15 cm) and strain relief (12 in. or 30 cm).</td></tr>
<tr><td>Electrical Connections</td><td>32-pin two-part CINCH ME-MX receptacle - P/N: 5810132011
 

Mates with Molex 33472-2002 (grey)
<table><tr><th>Pin</th><th>Description</th><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>Output 1</td><td>11</td><td>Ground</td></tr><tr><td>2</td><td>Output 2</td><td>12</td><td>Ground</td></tr><tr><td>3</td><td>Output 3</td><td>13</td><td>Ground</td></tr><tr><td>4</td><td>Output 4</td><td>14</td><td>Ground</td></tr><tr><td>5</td><td>Output 5</td><td>15</td><td>Ground</td></tr><tr><td>6</td><td>Output 6</td><td>16</td><td>Ground</td></tr><tr><td>7</td><td>Output 7</td><td>17</td><td>Ground</td></tr><tr><td>8</td><td>Output 8</td><td>18</td><td>Ground</td></tr><tr><td>9</td><td>Input 1</td><td>19</td><td>Ground</td></tr><tr><td>10</td><td>Input 2</td><td>20</td><td>Ground</td></tr></table>
 

Mates with Molex 33472-1201 (black)
<table><tr><th>Pin</th><th>Description</th><th>Pin</th><th>Description</th></tr><tr><td>21</td><td>Input 3</td><td>27</td><td>Ground</td></tr><tr><td>22</td><td>Input 4</td><td>28</td><td>Ground</td></tr><tr><td>23</td><td>CAN 2 H</td><td>29</td><td>CAN 2 L</td></tr><tr><td>24</td><td>CAN 1 H</td><td>30</td><td>CAN 1 L</td></tr><tr><td>25</td><td>Battery +</td><td>31</td><td>Ground</td></tr><tr><td>26</td><td>Battery -</td><td>32</td><td>Ground</td></tr></table></td></tr>
<tr><td>Mating Plug</td><td>Mating Plug Kit (Molex 33472-2002, Grey (Key B)), Molex 33472-1201, Black (Key A)), 32 crimp terminals, 4 cavity plugs) – P/N: **AX070172**</td></tr>
</table>

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