

Preliminary

Technical Datasheet #TDAX031855

10 Inputs, 1 Analog & 8 Relay Outputs Controller

1 Isolated CAN port (SAE J1939)
Form C Relay Outputs
Configurable with the Axiomatic Electronic Assistant
P/N: AX031855

Features:

- 10 digital inputs selectable as Active High or Active Low
- 1 analog output programmable as voltage or current type
- 8 Form C relay outputs with 3 terminals each (NC, NO, and COM)
- 1 isolated CAN port (SAE J1939)
- Accepts battery power from 8 to 63 Vdc
- Reverse polarity, undervoltage, overvoltage, surge and transient protection
- Withstands -40 to 85 °C (-40 to 185 °F)
- 1x 40-pin two-part CINCH connector
- IP69K rated CINCH enclosure
- Suitable for high vibration and shock environments for off-highway applications
- Configurable via Axiomatic Electronic Assistant



Applications

- Trucks and other heavy automotives
- Off-highway equipment
- Power gensets
- Diesel engine control systems

Ordering Part Numbers

10 Inputs, 1 Analog & 8 Relay Outputs Controller, SAE J1939 - P/N: **AX031855**

Accessories:

Axiomatic Electronic Assistant KIT - P/N: **AX070502** or **AX070506K**

Mating Plug Kit P/N: **AX070147** (See General Specifications for details)

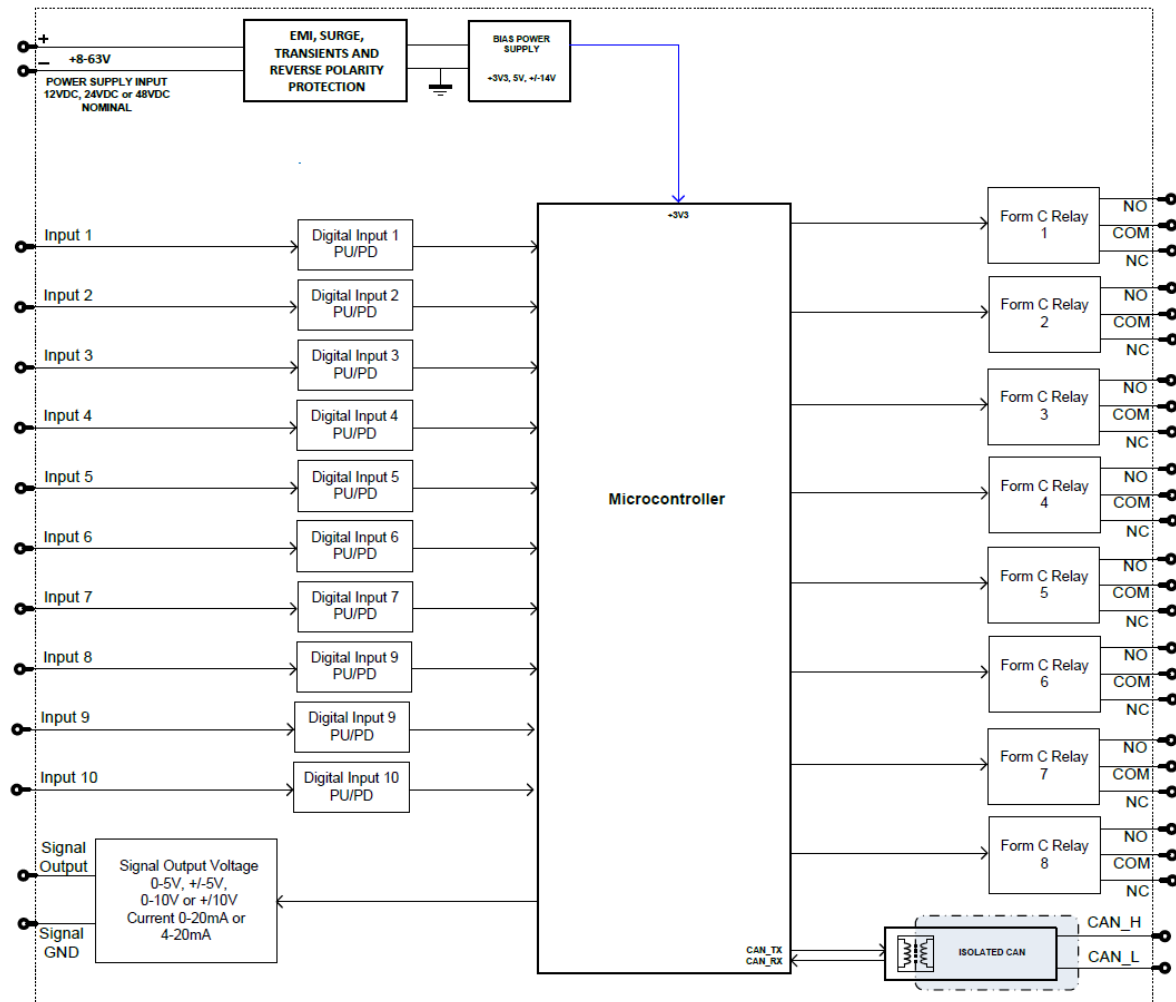
Description

The AX031855 10 Inputs, 1 Analog & 8 Relay Outputs Controller accepts 10 digital inputs, generates 1 analog signal output, and sets 8 Form C relays. It can network with other CAN devices (SAE J1939) in a machine control system. The unit is battery powered with the ability to withstand reverse polarity, undervoltage, overvoltage, and transient power conditions. The outputs can be controlled by any input or via CAN messages.

The AX031855 has a number of setpoints that allow the user to configure it for their application. The Axiomatic Electronic Assistant can be used to configure the module over the CAN line. The setpoints can also be saved to a file and flashed into other AX031855 modules over the CAN bus.

The unit features a rugged enclosure, gasketing and watertight connectors for the highest level IP69K rating.

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 63 Vdc power supply range
Quiescent Current	56 mA @ 12 Vdc; 30.5 mA @ 24 Vdc; 17.9 mA @ 48 Vdc
Protection	Surge and transient protection are provided. Reverse polarity protection is provided. Undervoltage protection is provided. Hardware shuts down at 6 V. Overvoltage protection is provided. Hardware shuts down at 65 V.

Inputs

Digital Inputs	<p>10 digital signal inputs user selectable as Active High with 10 kΩ pull-up, or Active Low with 10 kΩ pull-down resistor</p> <p><u>Impedance:</u> 1 kΩ min.</p> <p><u>Amplitude:</u> Low: 1.5 V max. High: 3.5 V min.</p> <p>Protected against shorts to Ground</p>
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Outputs

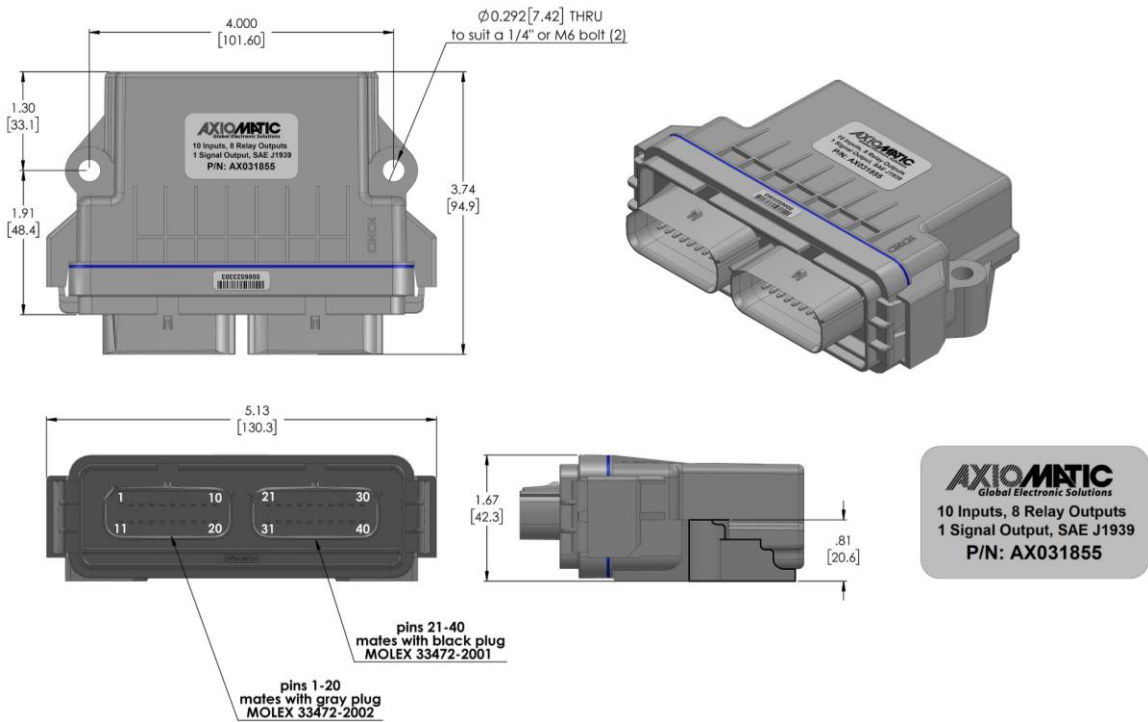
Signal Output	<p>1 analog signal output selectable as follows.</p> <table border="1"> <tr> <td>Voltage</td><td> <p><u>Ranges:</u> 0-5 V, 0-10 V, ± 5 V, or ± 10 V</p> <p><u>Accuracy:</u> ± 0.2 %</p> </td></tr> <tr> <td>Current</td><td> <p><u>Ranges:</u> 0-20 mA, 0-24 mA, or 4-20 mA</p> <p><u>Accuracy:</u> ± 0.2 %</p> </td></tr> </table> <p>Protection against shorts at 25 mA max.</p>	Voltage	<p><u>Ranges:</u> 0-5 V, 0-10 V, ± 5 V, or ± 10 V</p> <p><u>Accuracy:</u> ± 0.2 %</p>	Current	<p><u>Ranges:</u> 0-20 mA, 0-24 mA, or 4-20 mA</p> <p><u>Accuracy:</u> ± 0.2 %</p>
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Current	<p><u>Ranges:</u> 0-20 mA, 0-24 mA, or 4-20 mA</p> <p><u>Accuracy:</u> ± 0.2 %</p>				
Relay Outputs	<p>8 Form C relay outputs 3 contacts per output: NC, NO, and COM Max. 2 A @ 250 Vac or 2 A @ 30 Vdc per contact</p>				

General Specifications

Microcontroller	STM32F405RG
Control Logic	Standard embedded control logic is provided.
Isolation	Isolation is provided for the CAN line
CAN	<p>1 isolated CAN port (SAE J1939) Supported baud rates: 250 kbit/s, 500 kbit/s, and 1 Mbit/s with auto-baud-rate detection</p>
Network Termination	According to the CAN standard, it is necessary to terminate the network with external termination resistors. The resistors are 120 Ω , 0.25 W 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	Axiomatic Electronic Assistant KIT - P/Ns: AX070502 or AX070506K
Compliance	RoHS
Operating Temperature	-40 to 85 $^{\circ}\text{C}$ (-40 to 185 $^{\circ}\text{F}$)
Storage Temperature	-50 to 120 $^{\circ}\text{C}$ (-58 to 248 $^{\circ}\text{F}$)
Enclosure	<p>CINCH mini-ME enclosure P/N: 5810130090 Polymer, Glass filled enclosure Flammability Rating: HB 5.13 in. x 3.74 in. x 1.67 in. (130.3 mm x 94.9 mm x 42.3 mm) L x W x H excludes mating connectors Refer to Dimensional Drawing</p>
Protection	IP69K
Weight	0.438 lb. (0.199 kg)
Mounting	Mounting holes are sized for 1/4" 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).

Electrical Connections	40-pin two-part CINCH ME-MX receptacle P/N: 5810140011																																																																																															
	<table><tr><th colspan="4">Pin Out</th></tr><tr><th colspan="2">Pin 1 to 20 mate with Molex 33472-2002 (Key B) Grey Plug</th><th colspan="2">Pin 21 to 40 mate with Molex 33472-2001 (Key A) Black Plug</th></tr><tr><th>Pin</th><th>Function</th><th>Pin</th><th>Function</th></tr><tr><td>1</td><td>Battery +</td><td>21</td><td>NO 1</td></tr><tr><td>2</td><td>Ground</td><td>22</td><td>NC 3</td></tr><tr><td>3</td><td>Digital Input 1</td><td>23</td><td>C3</td></tr><tr><td>4</td><td>Digital Input 3</td><td>24</td><td>NO 3</td></tr><tr><td>5</td><td>Digital Input 5</td><td>25</td><td>NC 5</td></tr><tr><td>6</td><td>Digital Input 7</td><td>26</td><td>C 5</td></tr><tr><td>7</td><td>Digital Input 9</td><td>27</td><td>NO 5</td></tr><tr><td>8</td><td>Analog Output</td><td>28</td><td>NC 7</td></tr><tr><td>9</td><td>NC 1</td><td>29</td><td>C 7</td></tr><tr><td>10</td><td>C 1</td><td>30</td><td>NO 7</td></tr><tr><td>11</td><td>CAN H</td><td>31</td><td>NO 2</td></tr><tr><td>12</td><td>CAN L</td><td>32</td><td>NC 4</td></tr><tr><td>13</td><td>Digital Input 2</td><td>33</td><td>C4</td></tr><tr><td>14</td><td>Digital Input 4</td><td>34</td><td>NO 4</td></tr><tr><td>15</td><td>Digital Input 6</td><td>35</td><td>NC 6</td></tr><tr><td>16</td><td>Digital Input 8</td><td>36</td><td>C 6</td></tr><tr><td>17</td><td>Digital Input 10</td><td>37</td><td>NO 6</td></tr><tr><td>18</td><td>Analog Output Return</td><td>38</td><td>NC 8</td></tr><tr><td>19</td><td>NC 2</td><td>39</td><td>C 8</td></tr><tr><td>20</td><td>C 2</td><td>40</td><td>NO 8</td></tr></table>				Pin Out				Pin 1 to 20 mate with Molex 33472-2002 (Key B) Grey Plug		Pin 21 to 40 mate with Molex 33472-2001 (Key A) Black Plug		Pin	Function	Pin	Function	1	Battery +	21	NO 1	2	Ground	22	NC 3	3	Digital Input 1	23	C3	4	Digital Input 3	24	NO 3	5	Digital Input 5	25	NC 5	6	Digital Input 7	26	C 5	7	Digital Input 9	27	NO 5	8	Analog Output	28	NC 7	9	NC 1	29	C 7	10	C 1	30	NO 7	11	CAN H	31	NO 2	12	CAN L	32	NC 4	13	Digital Input 2	33	C4	14	Digital Input 4	34	NO 4	15	Digital Input 6	35	NC 6	16	Digital Input 8	36	C 6	17	Digital Input 10	37	NO 6	18	Analog Output Return	38	NC 8	19	NC 2	39	C 8	20	C 2	40	NO 8
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	Mating Plug Kit	<p>Mates with Molex 33472-2002 (grey) and 33472-2001 (black)</p> <p>A mating plug KIT (P/N: AX070147) is available from Axiomatic. It comprises 1x Molex 33472-2001 (Key A), 1x Molex 33472-2002 (Key B), 40x Molex 33012-2002 crimp terminals, and 6x Molex 34345-0001 cavity plugs.</p> <p>To crimp wires onto the receptacle terminals, please use the recommended crimping tools from Molex.</p>																																																																																														

Dimensional Drawing



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