

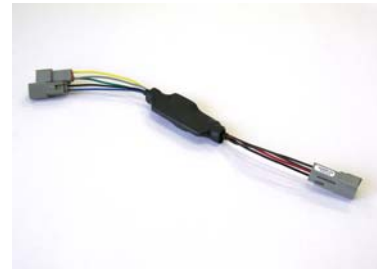
**Single Channel  
Valve Controller**

Universal Input, 2A Output  
CANopen  
Inline

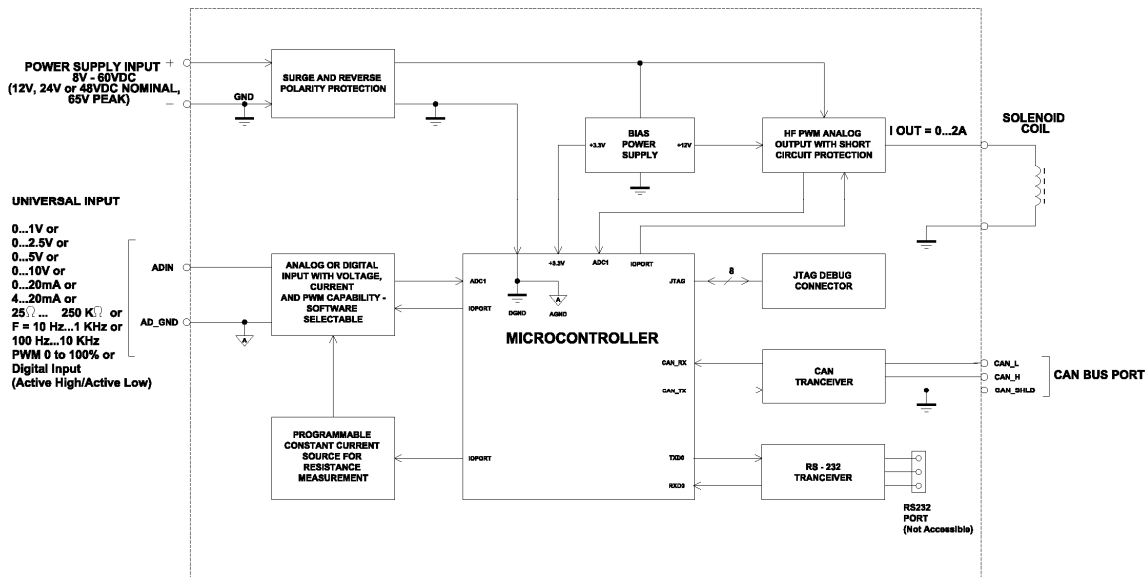
P/N: AX021602, AX021602K

**Features:**

- 1 universal signal input
- 1 output up to 2 A
- Wide power supply range (8...60VDC), 12V, 24V or 48V nominal
- 1 CANopen® port
- P/N: AX021602 (shown): PCB is enclosed in heat shrink wrap with 6 inch lead wires terminated in 3 Deutsch IPD plugs.



**BLOCK DIAGRAM**



## Ordering Part Numbers:

<i>CANopen version</i>	
Controller KIT (Shrink wrapped model with lead wires and mating plug kits included): <b>AX021602K</b>	
Or you can order the items separately.	
Controller (Shrink wrapped with lead wires/connectors): AX021602	
<b>Accessories:</b>	
AX070106 4-socket Mating Plug Kit	
AX070107 2-socket Mating Plug Kit	
AX070104 3-socket Mating Plug Kit	
Controller (SAE J1939): <b>AX021600</b>	

## Technical Specifications:

### Inputs

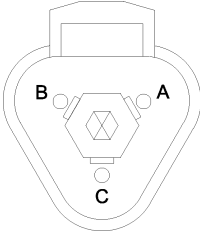
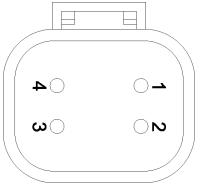

Power Supply Input - Nominal	12V, 24V or 48VDC nominal (8...60 VDC power supply range)
Protection	Reverse polarity protection is provided. Overvoltage protection up to 65V is provided. Overvoltage (undervoltage) shutdown of the output load is provided.
CAN	CANopen® Commands
Universal Signal Input	Refer to Table 1.0 All inputs are user selectable.

Table 1.0 – Input – User Selectable Options	
Analog Input Functions	Voltage Input, Current Input or Resistive Input
Voltage Input	0-1V (Impedance 1 MOhm) 0-2.5V (Impedance 1 MOhm) 0-5V (Impedance 200 KOhm) 0-10V (Impedance 133 KOhm for 0-5V, 133 to 20 KOhm for 5-10V)
Current Input	0-20 mA (Impedance 124 Ohm) 4-20 mA (Impedance 124 Ohm)
Resistive Input	25Ω to 250 kΩ
Digital Input Functions	Discrete Input, PWM Input, Frequency Input
Digital Input Level	5V CMOS
PWM Input	0 to 100% 10 Hz to 1kHz 100 Hz to 10 kHz
Frequency Input	10 Hz to 1kHz 100 Hz to 10 kHz
Digital Input	Active High, Active Low
Input Impedance	1 MOhm High impedance, 10KOhm pull down, 10KOhm pull up to +5V
Input Accuracy	≤ 1%
Input Resolution	12-bit

### Outputs

CAN	CANopen® Messages
Output	Up to 2A High Side Switch, Current Sensing, Grounded Load The user can select the following options for output using the EA. <ul style="list-style-type: none"> <li>• Output Disable</li> <li>• Discrete Output</li> <li>• Output Current (PID loop*, with current sensing)</li> <li>• Output Voltage</li> <li>• Output PWM Duty Cycle</li> </ul> *Parameters are password protected. Refer to the user manual for details.
Output Accuracy	Output Current mode ≤2% Output Voltage mode ≤3% Output PWM Duty Cycle mode ≤3%

## General Specifications

Microprocessor	32-bit, 128 KByte program memory Contact Axiomatic for details.
Control Logic	User programmable functionality using commercially available CANopen® tools Refer to the user manual for details.
Communications	1 CAN port (CANopen®)
User Interface	Commercially available CANopen® tools
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.
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Packaging	P/N: AX021602 PCB assembly (conformal coated PCB in heat shrink wrap) with 6 inch (153 mm) 18 WG lead wires terminated with 3 Deutsch IPD DT06 plugs made of thermoplastic with silicone seals and using #16 sized nickel contacts. 1.52 x 17.76 x 0.66 inches or 38.6 x 451.1 x 16.7 mm (W x L x H excluding mating connectors)
Protection	P/N : AX021602 IP50 (PCB conformal coated and housed in heat shrink wrap) NOTE : Deutsch IPD connectors are rated at IP67 for submersion (3 ft., 0.9 m) and IP69K for high pressure, high temperature wash down applications.
Weight	P/N: AX021602 0.20 lbs. (0.09 kg)
Electrical Connections	<p><b>P/N: AX021602</b></p> <p><u>CAN Connector:</u> 3 pin Deutsch IPD P/N: DT04-3P</p>  <p>A: CAN_H (Yellow) B: CAN_L (Green) C: CAN Shield (Grey)</p> <p>Mates with P/N: DT06-3S including W3S wedgelock and sockets. A mating plug kit is available from Axiomatic. Use ordering P/N: AX070104. (The mating plug kit is comprised of Deutsch IPD P/N: DT06-3S, W3S and 3 contact sockets 0462-201-16141.)</p> <p><u>Power and Output Connector:</u> 4 pin Deutsch IPD P/N: DT04-4P</p>  <p>1: Power Input (Red) 2: Power GND (Black) 3: Solenoid + (White/Red) 4: Solenoid – (Internally connected to Power GND) (Brown)</p> <p>Mates with P/N: DT06-4S including W4S wedgelock and sockets. A mating plug kit is available from Axiomatic. Use ordering P/N: AX070106. (The mating plug kit is comprised of Deutsch IPD P/N: DT06-4S, W4S and 4 contact sockets 0462-201-16141.)</p> <p><u>Signal Input Connector:</u> 2 pin Deutsch IPD P/N: DT04-2P</p>  <p>1: Signal Input (Blue) 2: Signal GND (Black)</p> <p>Mates with P/N: DT06-2S including W2S wedgelock and sockets. A mating plug kit is available from Axiomatic. Use ordering P/N: AX070107. (The mating plug kit is comprised of Deutsch IPD P/N: DT06-2S, W2S and 2 contact sockets 0462-201-16141.)</p>

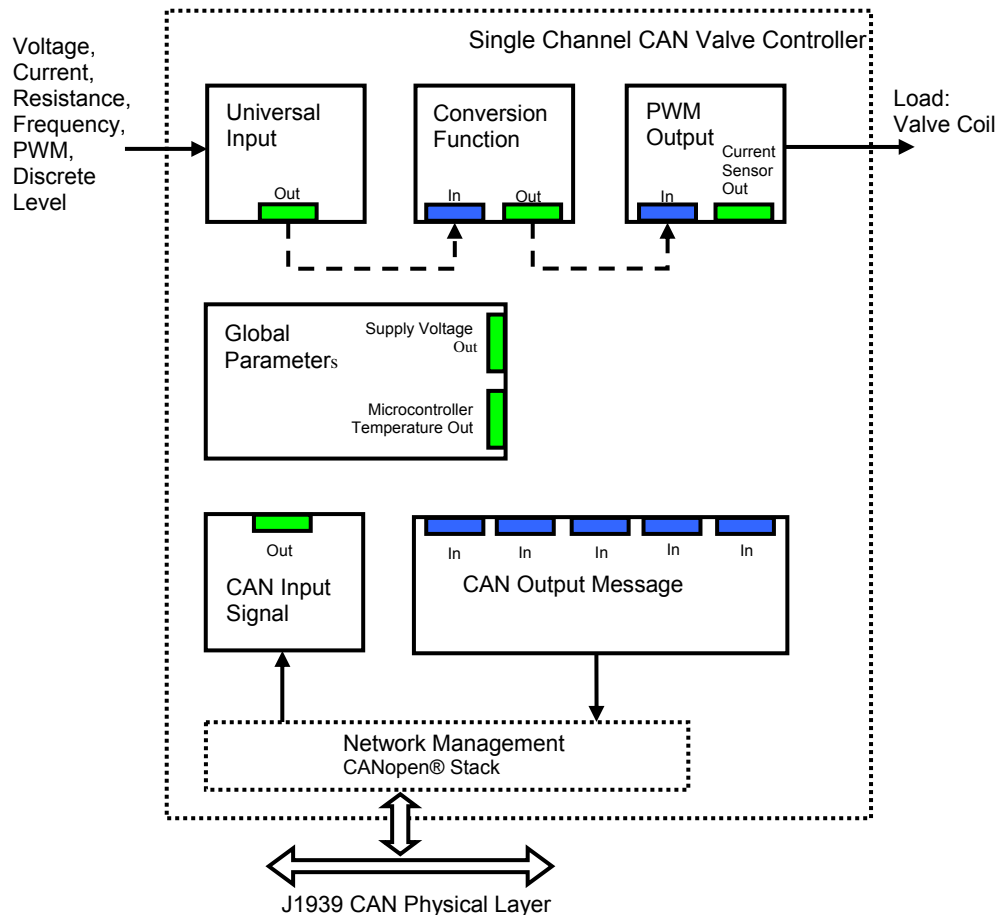
## Control Logic

The controller consists of a set of internal functional blocks, which can be individually programmed and arbitrarily connected together to achieve the required system functionality, Fig. 1. For additional flexibility, in a majority of functional blocks, logical input signals can be inverted.

Each functional block is absolutely independent and has its own set of parameters, or objects, used to control its functionality. The objects are accessible through CAN.

There are two types of the controller functional blocks. One type represents the controller hardware resources, for example: universal input or PWM output. The other type is purely logical – these functional blocks are included to program the user defined functionality of the controller.

The user can build virtually any type of a custom control by logically connecting inputs and outputs of the functional blocks. This approach gives the user an absolute freedom of customization and an ability to fully utilize the controller hardware resources in a user's application.



**Fig. 1. Controller Architecture. As an example, Universal Input is connected to the Conversion Function and the Conversion Function to the PWM Output, providing a path for the signal from input to output through the Conversion Function. CAN input and outputs are not used in this example.**

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

*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](http://www.axiomatic.com/service.html).*

Form: TDAX021602-10/13/09