

This rugged I/O module interfaces with 2 PWM signals from 2 single-axis joysticks (or one dual-axis), or PWM signal from another source such as an engine control module. Up to 6 digital inputs and 1 analog 0-5V input are accepted for connection to a variety of input devices or instrument panel controls. The controller drives up to 5 proportional valves, 1 on/off valve or relay and 1 LED. An optional 0-5V output can drive on-board valve electronics. The RS-232 port is used for user configuration and diagnostics via a PC. CAN communications are available on request.



**Features:**

*Inputs:*

2 PWM signals (50 Hz to 10 kHz, 0-100% D.C.)  
1 0-5V signal (optional 2<sup>nd</sup> 0-5V input)  
6 digital inputs (user selectable AH or AL)

*Power:*

5...48VDC

*Outputs:*

5 proportional (1.2A) (Option: 2A) (Option: 5 on/off outputs)  
1 on/off (2A)  
1 digital (20 mA) for LED  
(with up to 8A total output current available at one time @ 48 VDC)  
1 regulated +5V reference to power analog input  
2 +12V references (Option: 2<sup>nd</sup> analog input with 2<sup>nd</sup> regulated +5V reference) to power joystick or digital inputs  
4 +5V references

*General Specifications:*

Packaging: IP67  
Potted in an aluminum extrusion with end plates  
40-pin watertight connector

*Control Logic:*

Application-specific software programming

**Applications:**

Off-highway equipment  
Aerial Lift Platforms  
Municipal Vehicles  
Airport Vehicles  
Material Handling Equipment

**Ordering Part Number:**

Hydraulic Valve Controller – 16 I/O: AX020600 Series  
*OEM versions with application-specific software are available on request.*

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**Technical Specifications:** *The specifications represent a particular digital controller hardware platform. Other hardware configurations are available to accommodate alternate input/output configurations. All designs will reflect application-specific software programming requirements.*

**Input Specifications**

Power Supply Input - Nominal	12 or 24VDC nominal 5...48 VDC power supply range
Surge and Reverse Polarity	Protection is provided.
Analog Inputs	One 0...5VDC (2 <sup>nd</sup> 0-5V input on request)
Analog Ground	Two analog ground connections are provided.
Digital Inputs	Up to 6 digital inputs available for interface to instrument panel switches or other Active High or Active Low (user selectable, all inputs must be set the same)
PWM Signal Input	Up to 2 PWM inputs available Interfaces to a PWM signal from an Engine Control Module, PLC or other. PWM Signal Frequency: 50 – 10,000 Hz Amplitude: 5-12V PWM Duty Cycle: 0 to 100%

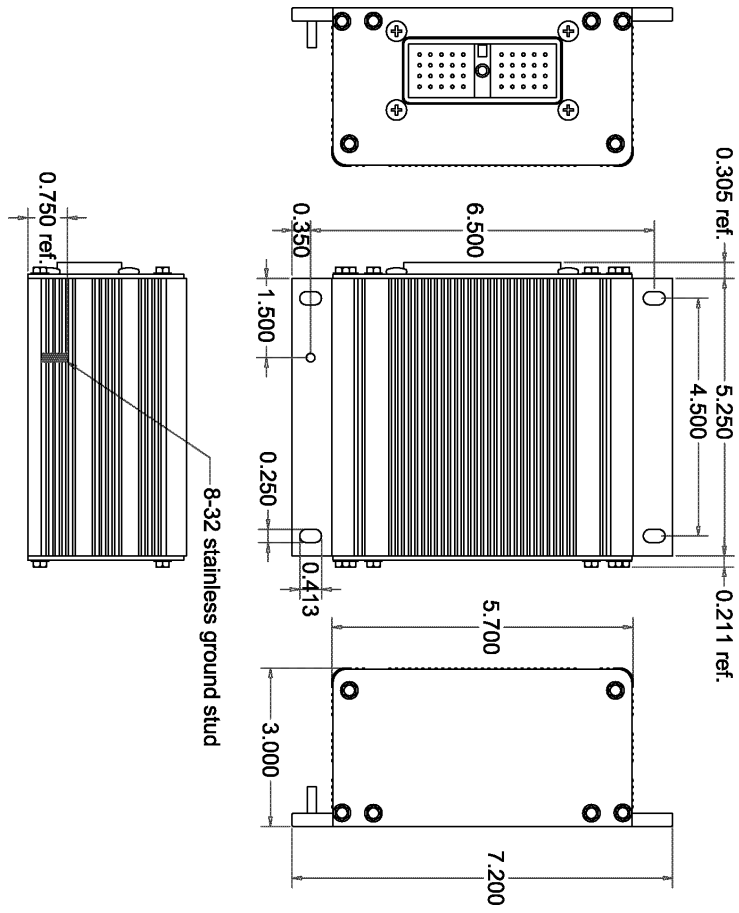
**Output Specifications**

Maximum Current Output (High frequency PWM output)	Five proportional outputs (0...1.2A) (Option: 2A maximum) with current sensing (Option: 5 outputs can be configured as on/off outputs) One digital output ( $\leq 2A$ ), sourcing Overcurrent protection is provided. Short circuit protection and detection is provided. Open circuit detection is provided.
Additional Output	20 mA output to light an LED (Option: 1 0-5V output)
Output Reference Voltages	1 regulated +5V, 50 mA 4 +5V, 50 mA 2 +12V, 50 mA (Option: 2 <sup>nd</sup> analog input and 2 <sup>nd</sup> regulated +5V reference voltage)
Proportional Output Current Adjustments	I-max. (Specified by user – set in software) I-min. (Specified by user – set in software) Both min. and max. current settings are adjustable from 0 to 2 Amps.
Superimposed Dither	<u>Dither Amplitude:</u> (Default specified by user – set in software); Adjustable from 0-10% of I-max <u>Dither Frequency:</u> (Default specified by user – set in software); Adjustable from 50-400 Hz
Ramp Rates	(Default specified by user – set in software) Adjustable from 0 to 10 seconds.

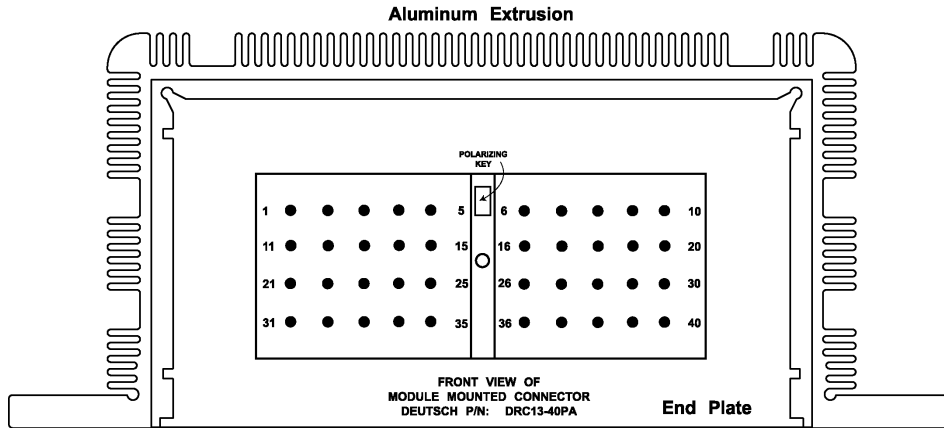
**General Specifications**

Microprocessor	Motorola MC56F8346
Control Logic	Application-specific software is provided. (Provide specification upon ordering.) NB. Multiple data-sets in the embedded software allows greater flexibility in control applications where different machine attachments are used.
CAN Interface	1 CAN port Bosch Controller Area Network Specification (CAN 2.0B) Software support for SAE J1939 stack (on request) CANopen and other higher level protocols on request.
User Interface (for use without CAN bus option)	RS232 serial communication interfaces to a serial port (i.e. COM1) on a PC (115200 Baud Rate, N81, Xon/Xoff Flow Control) Use Tera Term or equivalent data terminal To use the RS232 interface, connect as follows. Pin 6 -> TXD -> DB-9 Pin 2 Pin 7 -> RXD -> DB-9 Pin 3 Pin 18 -> GND -> DB-9 Pin 5
Electrical Connections	40-pin watertight connector Deutsch IPD p/n: DRC14-40PA <i>Mating plugs are provided with prototypes only.</i> Mating plug: Deutsch IPD p/n DRC16-40SA with sockets 0462-201-16141
Packaging and Dimensions	Potted in an aluminum extrusion with end plates 7.20 x 5.76 x 3.00 inches 182.9 x 146.4 x 76.2 mm (W x L x H excluding mating plug) <i>OEM specific packaging and connection styles are available.</i>
Operating Conditions	-40 to 85°C (-40 to 185°F)
Protection	IP67; Unit is conformal coated and encapsulated within the housing.

Dimensions (inches):



## Connections



### Mating Connector Part Number:

Deutsch IPD p/n DRC16-40SA with sockets 0462-201-16141

### Pinout

Pin#	Function	Pin#	Function
1	Proportional Output 3	6	RS232_TX
2	Proportional Output 4	7	RS232_RX
3	Proportional Output 5	8	Analog Input 1 (0-5V)
4	Proportional Output 2	9	Precision +5VA reference* (for Analog Input 1)
5	Proportional Output 1	10	Analog Input_GND
11	Battery – (POUT_GND3)	16	Digital Input 4
12	Battery – (POUT_GND4)	17	Digital Input 3
13	Battery – (POUT_GND5)	18	RS232_GND
14	Battery – (POUT_GND2)	19	PWM Input 2
15	Battery – (POUT_GND1)	20	PWM Input 1
21	Battery –	26	Digital Input 5
22	Battery – (DOUT_GND6)	27	Digital Input 2
23	LED Output (Option: 0-5V Output)	28	Digital Input 1
24	CAN_H	29	PWM Input 2_GND
25	Digital Input 6	30	PWM Input 1_GND
31	Battery +	36	+5V reference 5
32	On/Off Output	37	+5V reference 4
33	LED Output_GND	38	+5V reference 3 (Option: Analog Input 2_GND)
34	CAN_L	39	+5V reference 2 (Option: +12V ref.) (Option: Analog Input 2)
35	+5V reference 6	40	+5V reference 1 (Option: +12V ref.) (Option: +5VA reference* for Analog Input 2)

\* +5VA is a precision reference for analog inputs. All other +5V references are used for powering the digital inputs.

This specification is subject to update.  
Form: TDAX020600-01/06/06