

**Multi-featured I/O for machine control applications in harsh environments...**

- 2 CAN ports
- 2 RS-232 or 1 RS-232 and 1 LIN
- User configurable I/O via PC or CAN master module
- Application-specific (OEM) control logic
- 8 analog (0-5V or 4-20 mA) inputs
- 8 digital inputs
- 4 frequency or PWM inputs
- Rotary position encoder interface
- 12 proportional or on/off outputs (2.5A)
- 4 on/off outputs (3A)
- 3 +5V reference voltage outputs
- 9...36VDC power input accepted
- Rugged IP67 packaging



**Description:**

The controller can be used as a stand-alone machine control or as a bus-controlled I/O multiplexor. It features 2 CAN and 2 RS-232 ports. A LIN interface is also available for LIN bus applications. The device accepts up to 8 digital inputs, 8 analog inputs and 4 frequency or PWM inputs. To suit diverse applications, it can drive up to 12 proportional valves (2.5A/channel) and 4 on/off hydraulic valves (3A/channel). Alternatively, the module can be configured to drive up to 16 on/off valves (12 @ 2.5A and 4 @ 3A). A sophisticated DSP microprocessor accommodates complex control algorithms for advanced machine control applications. Application-specific software with an appropriate user interface is provided to meet the needs of an OEM machine application. Rugged IP67 rated packaging with watertight connectors in addition to a rugged power supply input section suits the harsh environment of mobile equipment.

**Applications:**

- Off-highway construction equipment (excavator attachments, excavators, cranes, skid-steers, backhoes, loaders, trucks, pavers, etc.)
- Municipal vehicles (dump trucks, snow ploughs, sweepers, etc.)
- Mining equipment (loaders, trucks, drill rigs, road headers, coal mining equipment)
- Marine applications (hoists)
- Material handling equipment (container handlers, telehandlers, etc.)

**Ordering Part Number:**

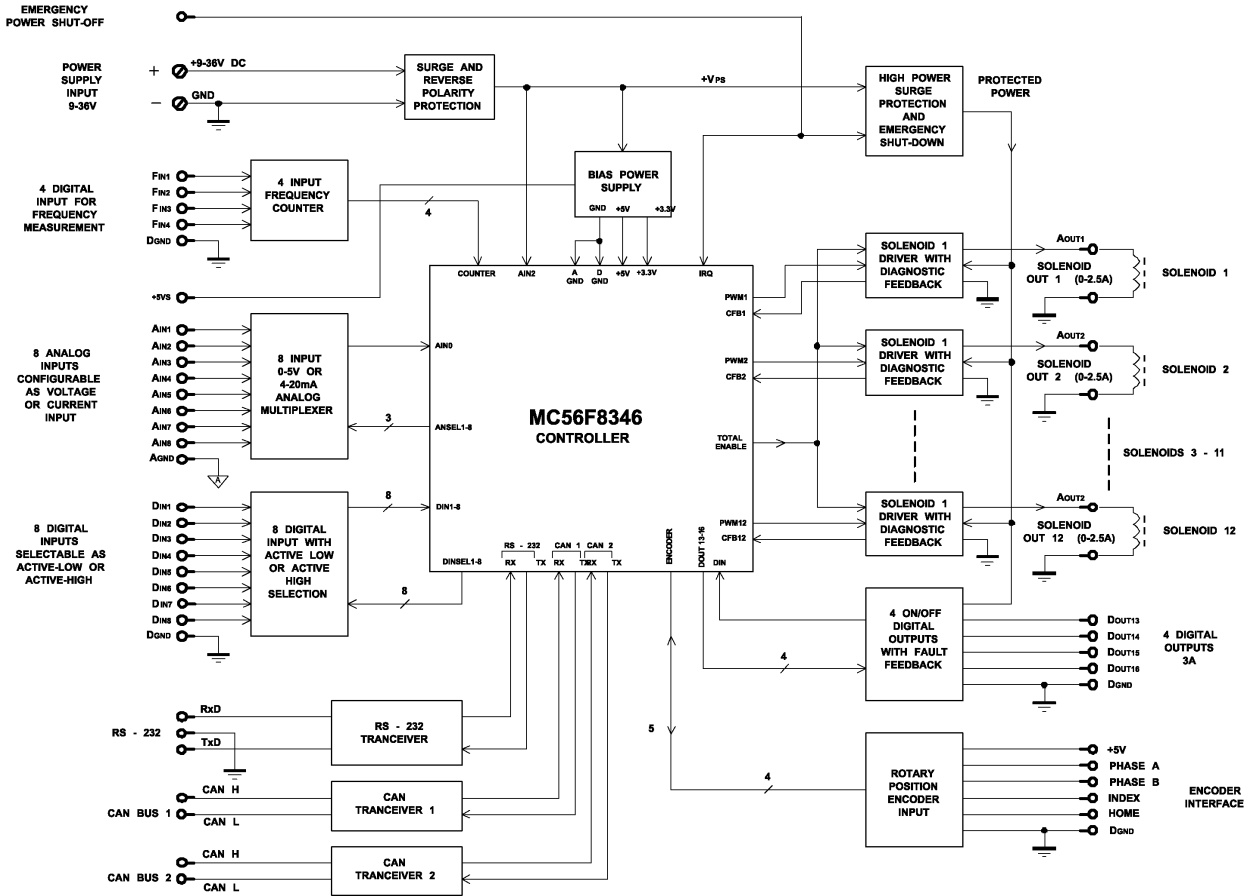
32 Machine I/O (CANopen version): AX021100

*This is an OEM application platform (hardware).*

*Contact Axiomatic for a quotation to provide OEM control logic.*

*Industry standard CANopen PC-based software and USB-CAN protocol converters provide an appropriate user interface to configure and troubleshoot this controller.*

# Block Diagram



NB. 2<sup>nd</sup> RS-232 interface (or LIN interface) is not shown.

## Technical Specifications: Input Specifications

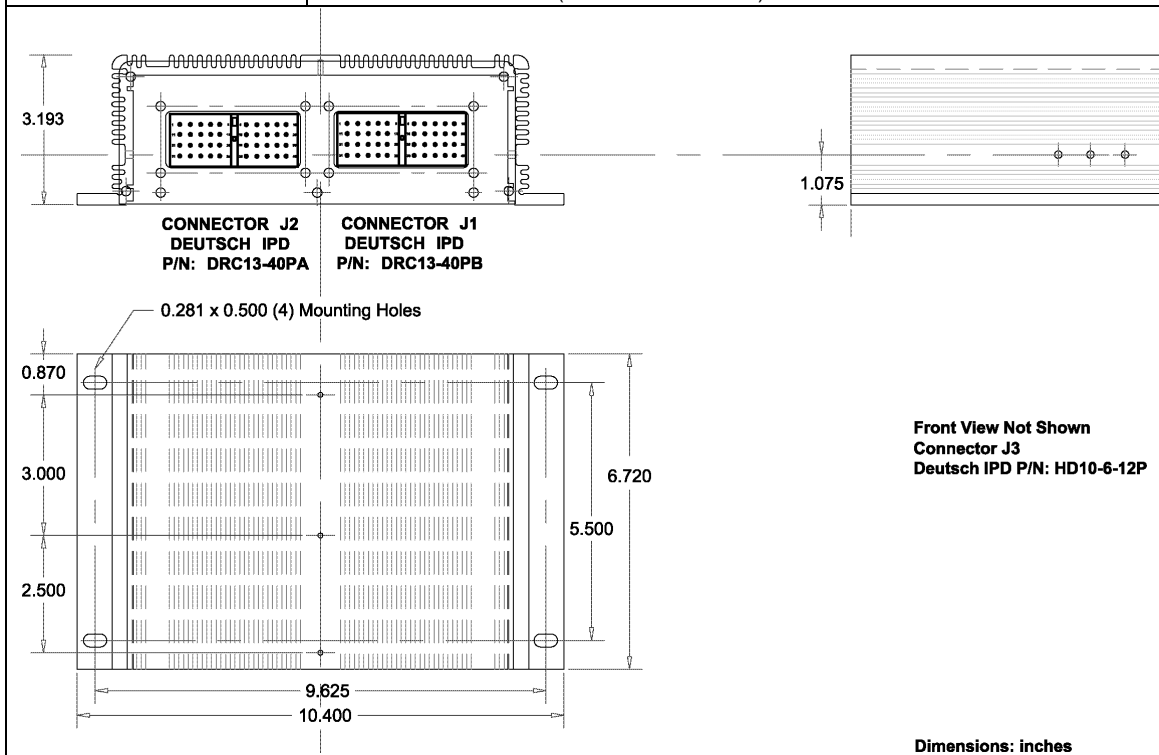
Power Supply Input - Nominal	12 or 24 VDC nominal 9...36 VDC power supply range Surge protection provided
Reverse Polarity Protection	Provided
Emergency Shutdown	Connection point available for an external switch to turn output power off.
Digital Inputs	8 digital inputs Individually software configurable as active high or active low Voltage threshold is 2.5V. 1 digital GND connection provided
Frequency Inputs	4 frequency or PWM inputs 1 digital GND connection provided
Analog Inputs	8 analog inputs Software configurable as voltage (0-5V), current (4-20mA) 1 analog GND connection provided 3 +5V, 20 mA references provided
Encoder Input	Rotary position encoder interface 10 kHz max. frequency, 3V minimum +5V (20 mA), Phase A, Phase B, Index, Home, GND connections provided

## Output Specifications

Proportional or On/Off Outputs	Half-bridge with high side current sensing Configurable as proportional or on/off outputs (0...2.5A) High frequency PWM (up to 20 kHz, configurable) 4 ground pins provided Diagnostic feedback provided
Digital Outputs for On/Off valves	High side protected switches 4 digital outputs (3A) 1 ground pin provided Fault feedback provided
Short Circuit and Overcurrent Protection	Provided

## General Specifications

Microprocessor	MC56F8346
Communications	2 RS-232 2 CAN ports (CANopen per CiA standard DS401) or SAEJ1939 (on request) Option: 1 RS-232 and 1 LIN
Control Logic	Application-specific <i>Contact us for a quotation to provide OEM software.</i>
User Interface	The user interface will depend on the application. In CANopen applications, a CAN master module can be used to configure the controller. In a stand alone application, a PC-based user interface would be appropriate.
Packaging and Dimensions	Aluminum extrusion with end plates Potted assembly Dimensions: See below (excludes connectors).



Operating Conditions	-40 to 85°C (-40 to 185°F)
Vibration	Vibration compliance is suitable for mobile equipment applications.
Protection	IP67, Unit is conformally coated and potted within the housing. Plugs carry an IP69 rating.

Electrical Connections

**2 40-pin watertight connectors**

**Connector 1: Deutsch DRC13-40PA Connector 2: Deutsch DRC13-40PB**  
 Mating connectors (not supplied): Deutsch P/N: Deutsch IPD p/n DRC16-40SA and DRC16-40SB with sockets 0462-201-16141

Connector 1 – OUTPUTS and DIGITAL INPUTS			
1	PWM Proportional Output 1	21	Proportional_GND
2	PWM Proportional Output 3	22	Proportional_GND
3	PWM Proportional Output 5	23	Proportional_GND
4	PWM Proportional Output 7	24	Proportional_GND
5	PWM Proportional Output 9	25	Proportional_GND
6	PWM Proportional Output 11	26	Proportional_GND
7	Digital Output 1	27	Proportional_GND
8	Digital Output 3	28	Proportional_GND
9	GND	29	GND
10	BATT+	30	BATT+
11	PWM Proportional Output 2	31	Digital Input 1
12	PWM Proportional Output 4	32	Digital Input 2
13	PWM Proportional Output 6	33	Digital Input 3
14	PWM Proportional Output 8	34	Digital Input 4
15	PWM Proportional Output 10	35	Digital Input 5
16	PWM Proportional Output 12	36	Digital Input 6
17	Digital Output 2	37	Digital Input 7
18	Digital Output 4	38	Digital Input 8
19	GND	39	GND
20	BATT+	40	BATT+

Connector 2 - INPUTS			
1	BATT+	21	CAN_GND 1
2	CAN_H 2	22	CAN_H 1
3	RS232_RXD	23	RS232_RXD 2
4	Frequency Input 1	24	RS232_GND
5	Frequency Input 3	25	HOME
6	+5V for Encoder	26	PHASE A
7	Analog_GND	27	Analog_GND
8	+5V Reference	28	+5V Reference
9	Analog Input 1	29	Analog Input 3
10	Analog Input 5	30	Analog Input 7
11	BATT+	31	CAN_GND 2
12	CAN_L 2	32	CAN_L 1
13	RS232_TXD	33	RS232_TXD 2
14	Frequency Input 2	34	BREAK
15	Frequency Input 4	35	INDEX
16	GND	36	PHASE B
17	Analog_GND	37	Analog_GND
18	+5V Reference	38	Analog_GND
19	Analog Input 2	39	Analog Input 4
20	Analog Input 6	40	Analog Input 8

**1 6-pin watertight connector (Deutsch HD10-6-12P)**

Mating connector (not supplied): Deutsch P/N: HD16-6-12S-B010  
 (Refer to Deutsch IPD literature for contact specifications.)

- A Power for Microprocessor
- B Power GND for Microprocessor
- C Battery +
- D GND\_P
- E Battery +
- F GND\_P

Use dielectric grease on the pins when installing the controller. Wires should be of the appropriate gauge to meet requirements of applicable electrical codes and the connector.

Specifications are subject to update without notice. Form: TDAX021100-08/29/06