

# CANBUS I/O EXPANSION MODULE

## MODELS 1356 / 1356P



CURTIS



### DESCRIPTION

The Curtis Model 1356/1356P CANbus I/O expansion module provides accurate control of up to 5 fingertip joysticks, or can be used to add additional digital and analog I/O to any CANopen\* based control system. It is available as a conformally coated PCB (model 1356) or in an epoxy filled enclosure (1356P).

### APPLICATION

Expands I/O capabilities on any CANopen\* vehicle control system. Typically used on materials handling trucks, aerial lift platforms, airport ground support equipment, compact construction equipment and sweeper-scrubber floor care machines.

\*Contact your local Curtis sales office for SAE J1939 support options.

### FEATURES

- Eighteen multi-purpose I/O pins provide simple, flexible vehicle control system expansion.
- Two high-frequency (1A, 3A) PWM driver outputs support a variety of vehicle system loads (i. e. horn, buzzer, relays).
- Five analog inputs which can be enabled for voltage or resistance measurement, supporting a variety of sensor and voltage inputs.
- Quadrature encoder input provides rotation and directional sensing.
- 12V unregulated and +5V regulated power supplies (200mA total) support low current control loads (electronic throttles) as well as sensing based loads (resistive senders, encoders).
- Serial port option allows direct access by Curtis 1313 / 1314 programming tools, Curtis Model 840 Display or status LED configuration.
- Configurable CANbus connection provides communication with other CANbus enabled devices.
- Multi-purpose I/O pins in a compact, low cost, PCB based module.
- Short circuit protection on all output drivers limits potential for load, device circuit damage.
- Analog inputs can also be used as virtual digital inputs with programmable On/Off thresholds and variable filters.
- Built-in programmable dither amount & frequency allow precise hydraulic proportional valve positioning.
- All outputs can also be used as 'active high' digital inputs.
- Constant current or constant voltage output modes provide accurate control.
- Built-in coil fly-back diodes reduce voltage spikes when driving inductive loads/coils.
- Compact PCB design 100 X 70 mm overall size or epoxy filled enclosure, 24 pin & 4 pin Molex connectors.
- PCB version must be mounted within a protective enclosure. PCB is conformally coated for protection from moisture and dust.
- Epoxy enclosed model 1356P mechanically sealed to IP65. IP65 rating does not apply to Molex connectors.
- Optional status LEDs provides immediate, visual status of vital system functions.
- Support of 12–36V or 36–80V nominal supply voltages.
- 12–36V models are suitable for use on internal combustion engine applications.

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## SPECIFICATIONS

### Meets or complies with relevant US and International Regulations:

EMC: Designed to the requirements of EN12895.

Safety: Designed to the requirements of:

EN1175-1:1998+A1:2010.

EN (ISO) 13849-1.

UL583 recognition pending.

Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.

Mating Molex connector information: Molex part number 39-01-2245, 39-01-2045, contact pins 39-00-0059.

**NOTE:** It is the responsibility of the vehicle designer / system installer to insure PCB module is mounted in such a way as to provide adequate protection from dust and / or moisture ingress.

## MODEL CHART

Model	I/O Pins	Voltage	Digital Inputs	PWM Outputs	Analog Inputs	Encoder Inputs	Serial Port	5V & 12V Ext Power Supply	CAN Term Resistor
1356-4101	18	12–36V	11	2	5	1	Yes	Yes	No
1356-6101	18	36–80V	11	2	5	1	Yes	Yes	No
1356P-4101	18	12–36V	11	2	5	1	Yes	Yes	No
1356P-6101	18	36–80V	11	2	5	1	Yes	Yes	No

## FUNCTIONAL SAFETY DATA CHART

Safety Function	PL	Designated Architecture	MTTFd	DC%
Incorrect Measurement Transmission	c	Category 2	>30 yrs	>60
Un-commanded Output	c	Category 2	>30 yrs	>60

## SYSTEM ACCESSORIES



The Curtis Models 1236E and 1238E provide advanced control of AC induction motors performing on-vehicle traction drive or hydraulic pump duties.



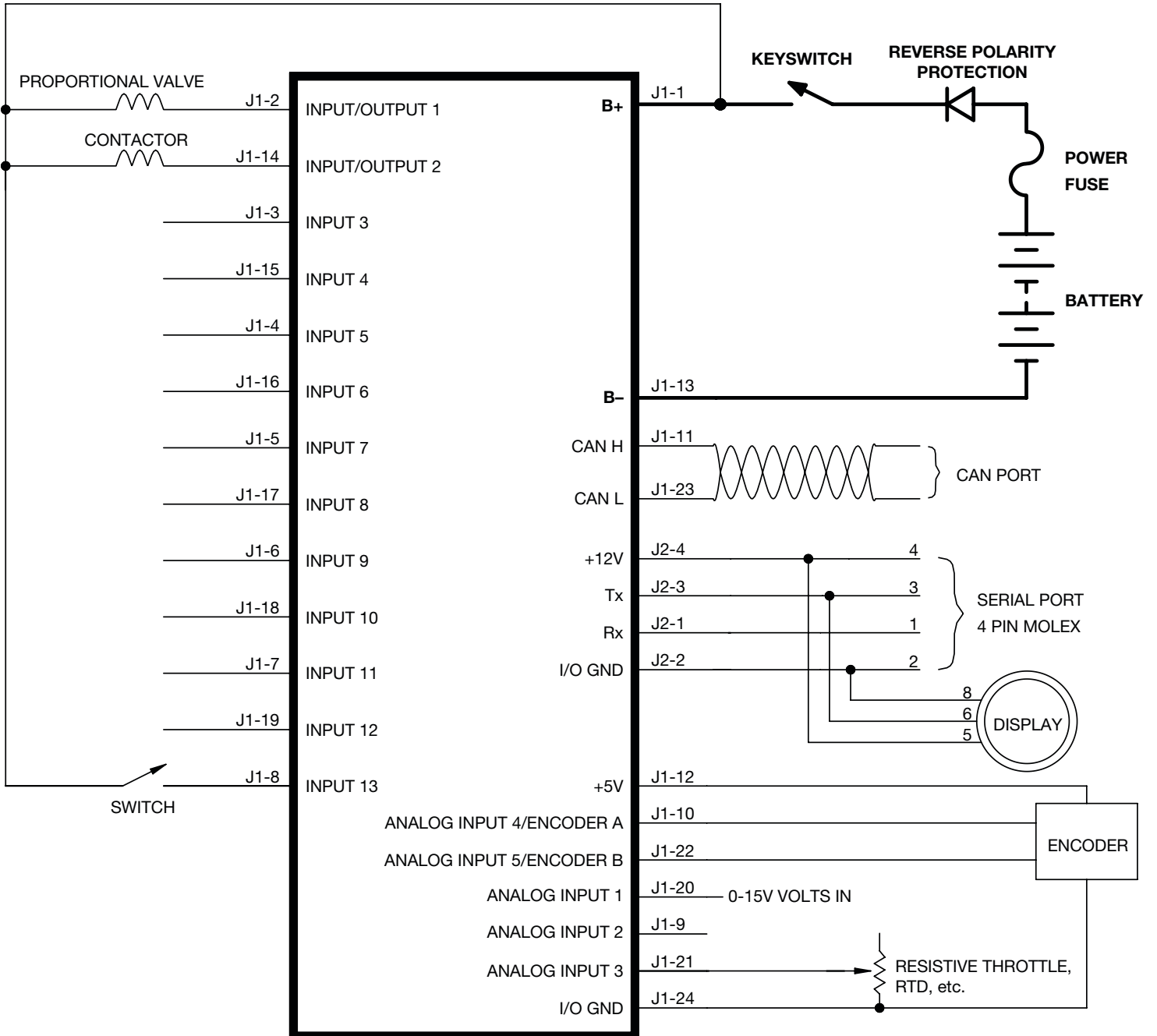
The Curtis Model 1222 is an AC induction motor controller for 'steer by wire' electric power steering systems.



The Curtis Model 1313 Handheld Programmer is ideal for setting parameters and performing diagnostic functions.

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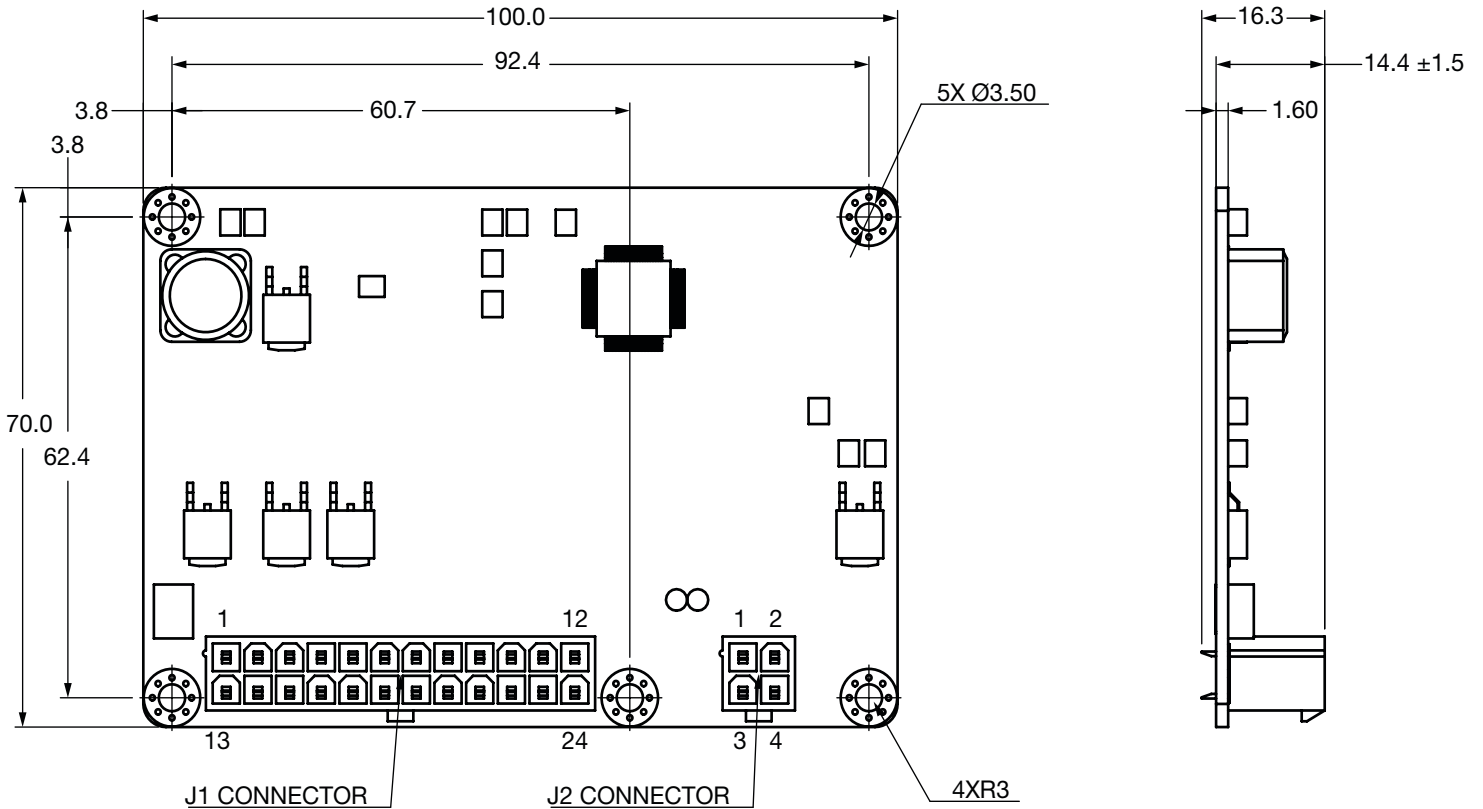
## TYPICAL WIRING DIAGRAM



# MODELS 1356 / 1356P

## DIMENSIONS mm

### 1356



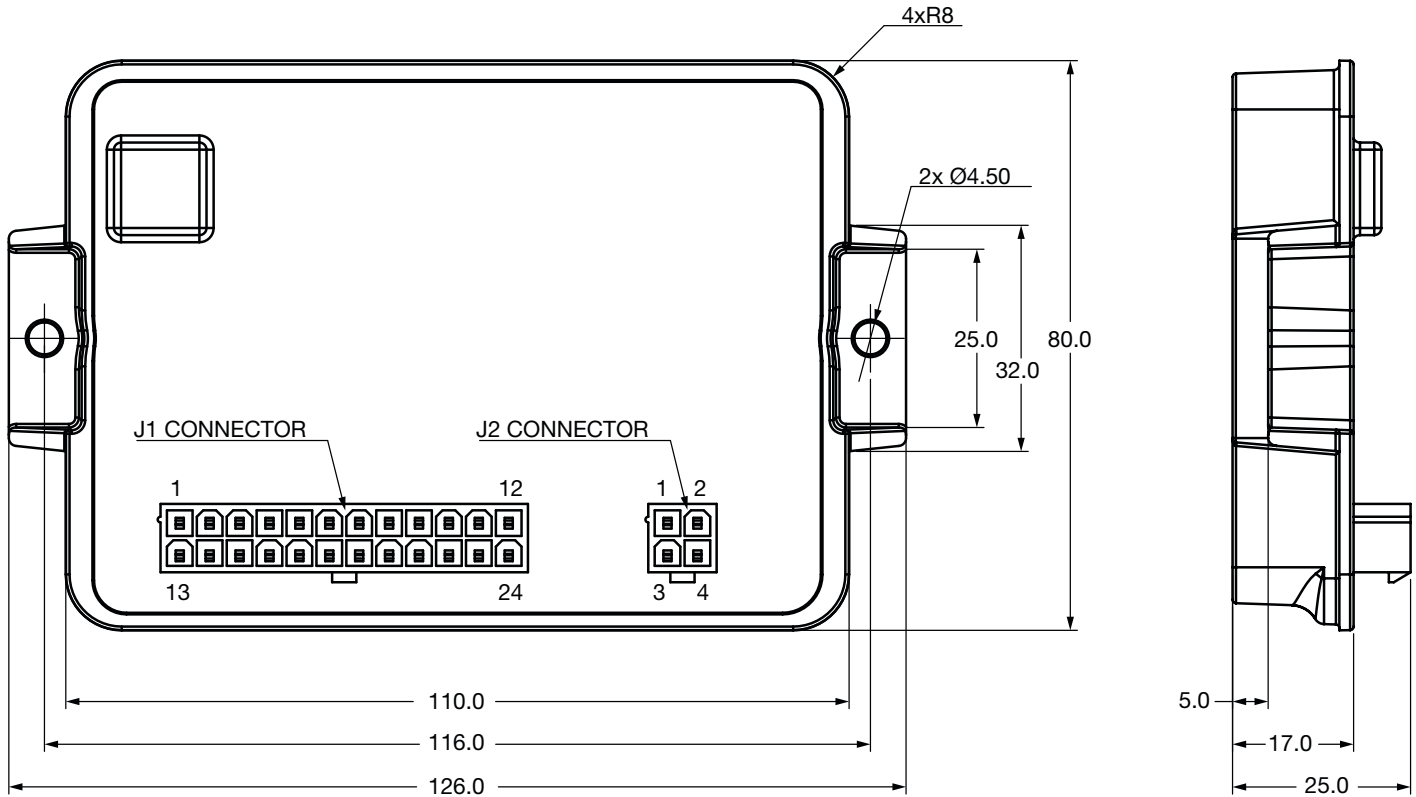
J1 CONNECTOR			
Pin No.	DESCRIPTION	Pin No.	DESCRIPTION
1	B+	13	B-
2	INPUT/OUTPUT1	14	INPUT/OUTPUT2
3	INPUT 3	15	INPUT 4
4	INPUT 5	16	INPUT 6
5	INPUT 7	17	INPUT 8
6	INPUT 9	18	INPUT 10
7	INPUT 11	19	INPUT 12
8	INPUT 13	20	ANALOG INPUT 1
9	ANALOG INPUT 2	21	ANALOG INPUT 3
10	ANALOG INPUT 4 / ENCODER A	22	ANALOG INPUT 5 / ENCODER B
11	CAN H	23	CAN L
12	+5V	24	I/O GND

J2 CONNECTOR	
Pin No.	DESCRIPTION
1	SERIAL Rx / LED ENABLE
2	I/O GND
3	SERIAL Tx / LED OUTPUT
4	+12V

# MODELS 1356 / 1356P

## DIMENSIONS mm

### 1356P



J1 CONNECTOR			
Pin No.	DESCRIPTION	Pin No.	DESCRIPTION
1	B+	13	B-
2	INPUT/OUTPUT1	14	INPUT/OUTPUT2
3	INPUT 3	15	INPUT 4
4	INPUT 5	16	INPUT 6
5	INPUT 7	17	INPUT 8
6	INPUT 9	18	INPUT 10
7	INPUT 11	19	INPUT 12
8	INPUT 13	20	ANALOG INPUT 1
9	ANALOG INPUT 2	21	ANALOG INPUT 3
10	ANALOG INPUT 4 / ENCODER A	22	ANALOG INPUT 5 / ENCODER B
11	CAN H	23	CAN L
12	+5V	24	I/O GND

J2 CONNECTOR	
Pin No.	DESCRIPTION
1	SERIAL Rx / LED ENABLE
2	I/O GND
3	SERIAL Tx / LED OUTPUT
4	+12V

**WARRANTY** Two year limited warranty from time of delivery.

