

HT series

Ruggedized Hall effect joysticks

Distinctive features and specifications



- Rugged finger positioning control
- Available with CANbus J1939
- Available with USB 1.1 HID compliant interface
- 1, 2 and 3 axis configurations
- 10 million life cycles
- Sealing up to IP68

MECHANICAL (FOR X, Y AXIS)

- Break Out Force: 1.8N (0.4lbf)
- Operating Force: 3.5N (0.75lbf)
- Maximum Applied Force: 450N (100lbf)
- Mechanical Angle of Movement: 40°
- Expected Life: 10 million cycles
- Material: Glass filled nylon
- Lever Action: Spring centering

MECHANICAL (FOR Z AXIS)

- Break Out Torque: 0.09N·m (0.80lbf-in)
- Operating Torque: 0.121N·m (1.07lbf-in)
- Maximum Allowable Torque: 0.150N·m (1.33lbf-in)
- Hand Mechanical Angle: 60°
- Handle Action: Spring centering
- Expected Life: 10 million cycles

CANbus OUTPUT VERSION

- Supply Voltage Range: 6V to 30V
- CANbus Version: J1939

- NOTES:
- All values are nominal.
 - Exact specifications may be subject to configuration.
 - Contact Technical Support for the performance of your specific configuration.
 - * Excludes some handle options.

ENVIRONMENTAL

- Operating Temperature: -25°C to 70°C (-13°F to 158°F)
- Storage Temperature: -40°C to 70°C (-40°F to 158°F)
- Sealing (IP): IP65 to IP68*
- EMC Immunity Level (V/M): IEC 61000-4-3: 2006
- EMC Emissions Level: IEC 61000-4-8: 1993/A1: 2000
- ESD: IEC 61000-4-2: 2008
- Vibration Crash (non operational): IAW MIL-STD-810F Method 516.5 Procedure V, Table 516.5-8 SRS (75G)
- Vibration Shock (non operational): IAW MIL-STD-810F, Method 516.5, Procedure 1, 40G peak sine wave pulse with 11ms duration
- Vibration Shock (operational): IAW MIL-STD-810F, Method 516.5, Procedure, 20G peak half sine wave pulse with 11ms duration







ELECTRICAL

- Sensor: Hall effect
- Supply Voltage Operating: 5.00VDC
- Reverse Polarity Max: -14.5VDC
- Overvoltage Max: 18VDC
- Output Voltage: See options
- Output Impedance: 6Ω
- Current Consumption Max: 10mA per axis
- Return to Center Voltage (No Load): ±200mV

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Overview

HT				
SERIES	Handle	Limiter Plate	Mounting	Output Options
	10 Ball Tip (2 Axis) 11 Tapered (2 Axis) 22 1 Pushbutton (2 Axis) 33 3 Axis 44 1 Pushbutton (3 Axis) 45 2 Pushbuttons (3 Axis) 46 Low Profile (3 Axis)	S Square  R Round  X Slotted  Y Slotted  P Plus  C Cross 	1 Drop-in 4 Rear Mount	0 0V to 5V (Rail to Rail) 1 0.5V to 4.5V 2 0.25V to 4.75V 3 1V to 4V 4 0V to 5V – Sensor 1 0V to 5V – Sensor 2 5 0.5V to 4.5V – Sensor 1 0.5V to 4.5V – Sensor 2 6 0.25V to 4.75V – Sensor 1 0.25V to 4.75V – Sensor 2 7 1V to 4V – Sensor 1 1V to 4V – Sensor 2 8 0V to 5V – Sensor 1 5V to 0V – Sensor 2 9 0.5V to 4.5V – Sensor 1 4.5V to 0.5V – Sensor 2 10 0.25V to 4.75V – Sensor 1 4.75V to 0.25V – Sensor 2 11 1V to 4V – Sensor 1 4V to 1V – Sensor 2 0-U USB 1-J Cursor Emulation 2-C CANbus

NOTES:



Up to IP68 available.



Mounting accessories.

Standard hardware includes: gasket, clamping ring, and four #4-40x3/4 Phil Ph MS SS screws.


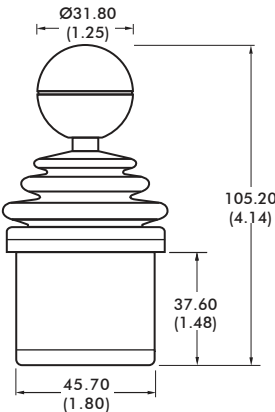
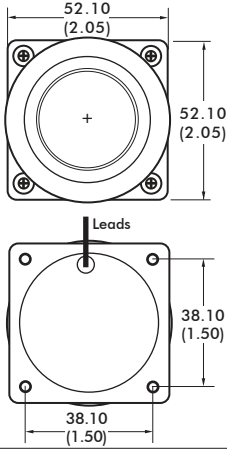

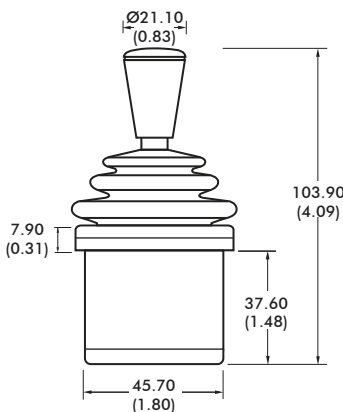
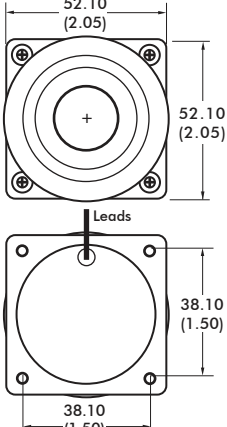

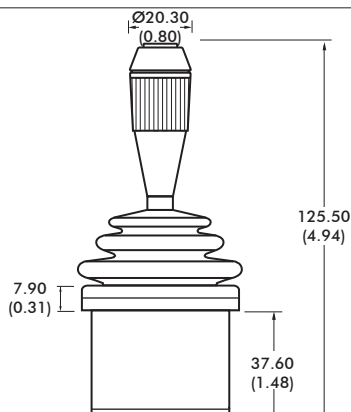
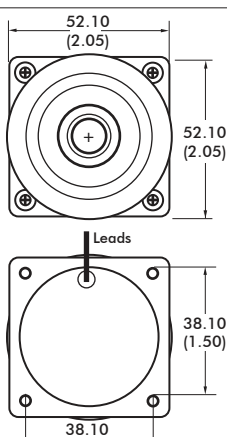

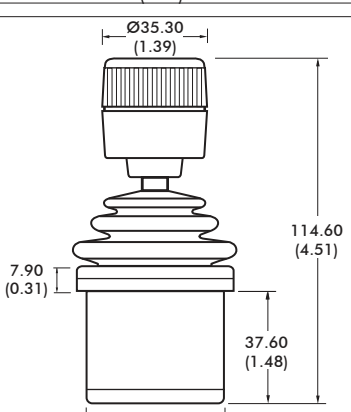
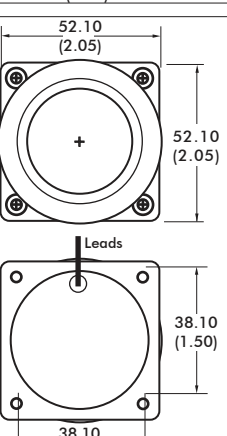


Note: The company reserves the right to change specifications without notice.

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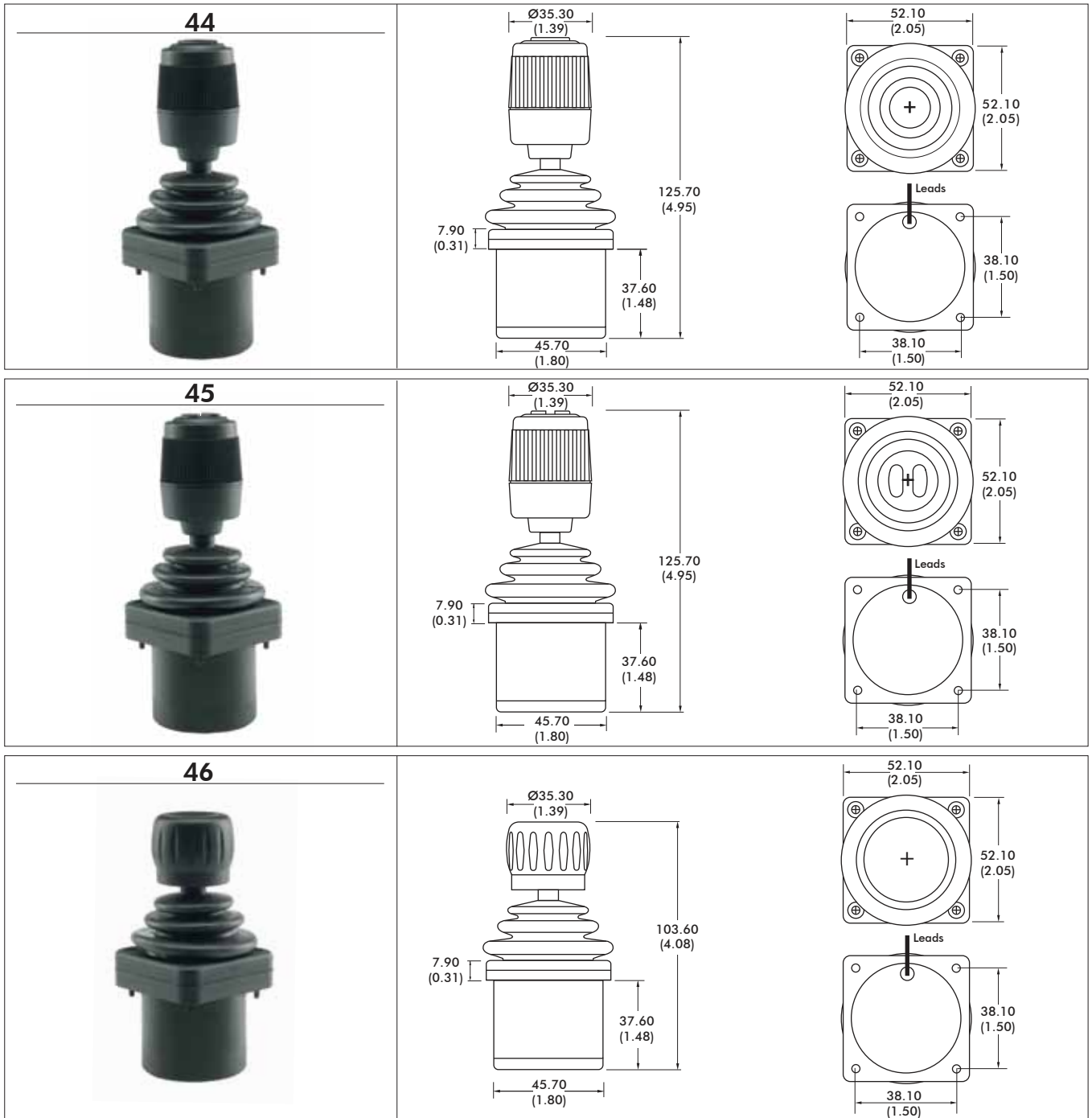
<p>10</p> 	 <p> $\varnothing 31.80$ (1.25) 105.20 (4.14) 37.60 (1.48) 45.70 (1.80) </p>	 <p> 52.10 (2.05) 52.10 (2.05) Leads 38.10 (1.50) 38.10 (1.50) </p>
<p>11</p> 	 <p> $\varnothing 21.10$ (0.83) 103.90 (4.09) 7.90 (0.31) 37.60 (1.48) 45.70 (1.80) </p>	 <p> 52.10 (2.05) 52.10 (2.05) Leads 38.10 (1.50) 38.10 (1.50) </p>
<p>22</p> 	 <p> $\varnothing 20.30$ (0.80) 125.50 (4.94) 7.90 (0.31) 37.60 (1.48) 45.70 (1.80) </p>	 <p> 52.10 (2.05) 52.10 (2.05) Leads 38.10 (1.50) 38.10 (1.50) </p>
<p>33</p> 	 <p> $\varnothing 35.30$ (1.39) 114.60 (4.51) 7.90 (0.31) 37.60 (1.48) $\varnothing 45.70$ (1.80) </p>	 <p> 52.10 (2.05) 52.10 (2.05) Leads 38.10 (1.50) 38.10 (1.50) </p>

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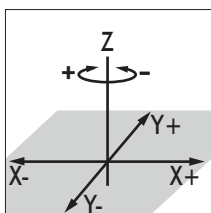
Ruggedized Hall effect joysticks

Overview



NOTES:

1. Dimensions are in mm/(inch).
2. Axis orientation:



DEFAULT WIRE COLOR CODE*		
COLOR	FUNCTION	AWG
RED	Vcc or Vdd	28
BLACK	Ground	
BLUE	X Axis	
YELLOW	Y Axis	
GREEN	Z Axis	22
WHITE	Switch Common (optional)	
ORANGE	Switch 1 (optional)	
VIOLET	Switch 2 (optional)	

NOTE: * Starting from the strain relief, the leads are 178mm (7in) long, 3.18mm (0.125in) stripped.

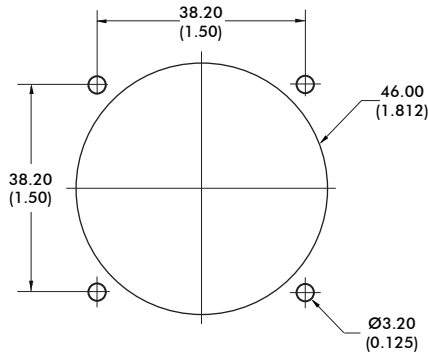
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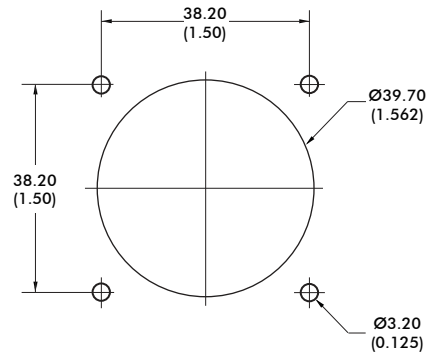
Ruggedized Hall effect joysticks

Overview

PANEL CUTOUT DIMENSIONS

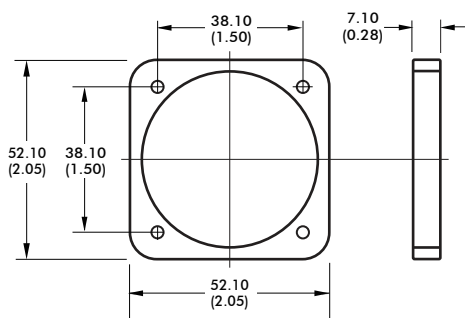


DROP-IN

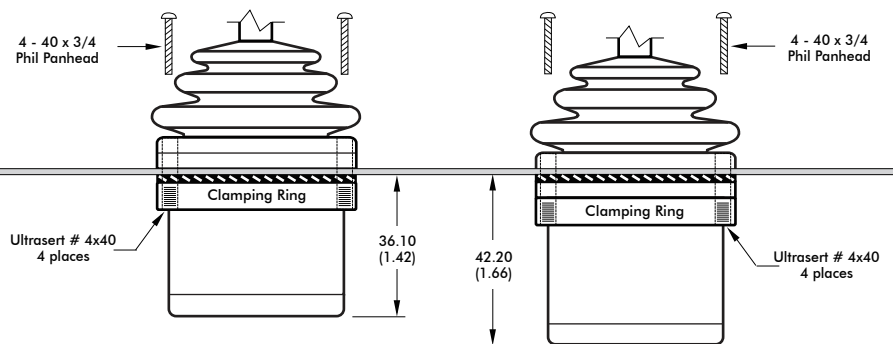


REAR MOUNT

CLAMPING RING



MOUNTING OPTIONS



DROP-IN

REAR MOUNT

- Panel
- Gasket = $\frac{0.50}{(0.02)}$

NOTES:

- For DROP-IN mounting, the panel thickness can be 1.17mm to 3.17mm (0.046in to 0.125in).
- For REAR MOUNT the maximum panel thickness is 1.6mm (0.063in).
- A panel thickness of 1/16" (1.6mm/0.063in) was considered for all the below-panel depth values.
- The below-panel depth is extended by 7.11mm (0.28in) with the Mouse Emulation, USB, CANbus, and Dual Sensor options.

NOTE:

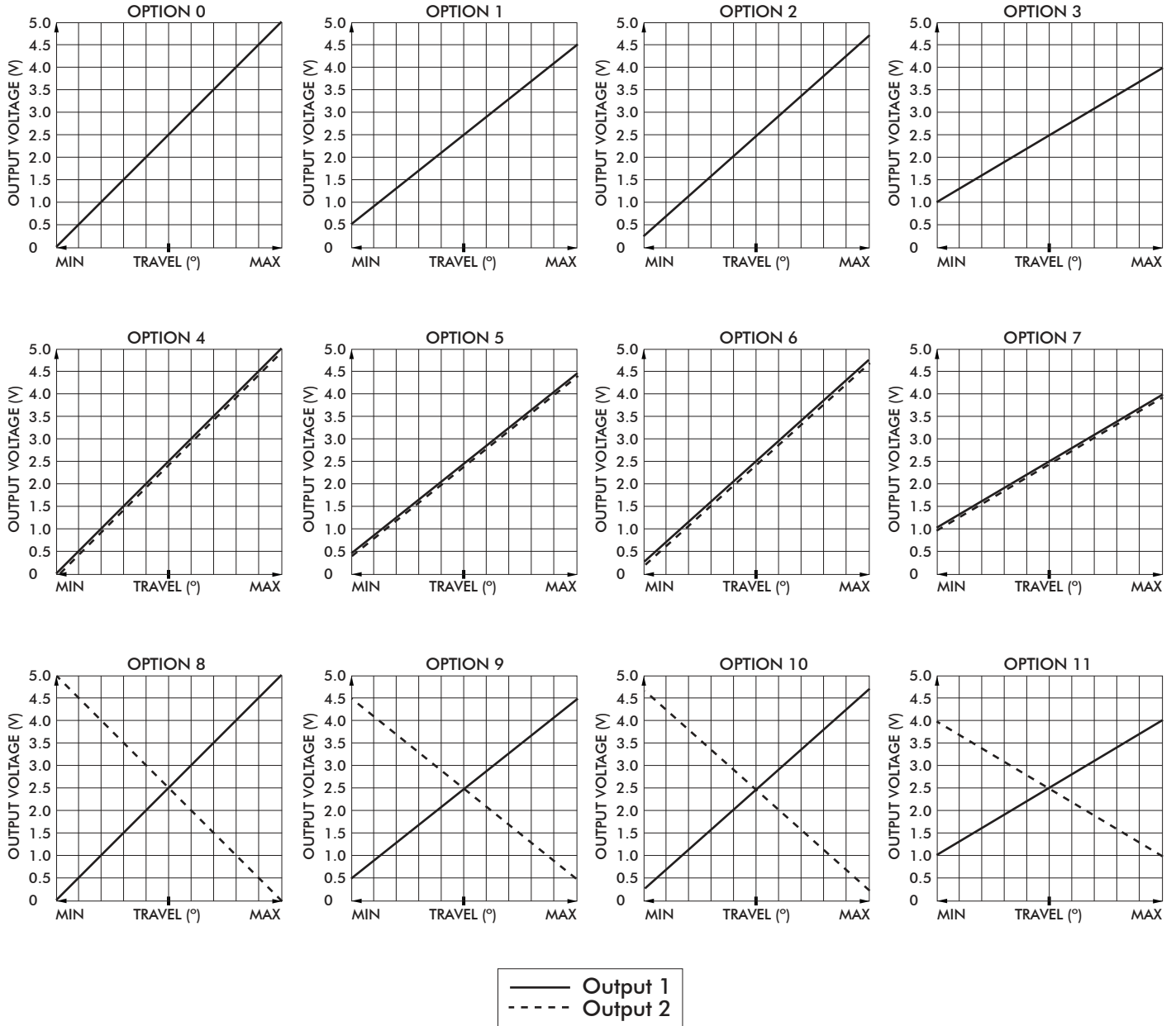
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VOLTAGE OUTPUT OPTIONS



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ADDITIONAL OUTPUT OPTIONS

CANbus J1939

APEM's HT CANbus joysticks conform to the J1939 serial bus specification used for communications between electronic control units and vehicle components.

ELECTRICAL SPECIFICATIONS

- Supply Voltage: 6VDC to 35 VDC
- Supply Current: 15mA min, +5mA per LED, +10mA per axis

WIRING SPECIFICATION

- Red Wire: Supply Power
- Black Wire: Ground
- Green Wire: CAN high data
- White Wire: CAN low data
- Blue Wire: Identifier Select LSB
- Orange Wire: Identifier Select MSB

ENVIRONMENTAL

- Operating temperature: -25°C to +70°C (-13°F to +158°F)
- Storage temperature: -40°C to +70°C (-40°F to +158°F)

CONNECTOR OPTIONS:

- Cable assembly with Deutsch DT04 style plugs

CANbus CONFIGURATION:

- Contact Technical Support for assistance

CANopen

- Contact Technical Support for assistance with CANopen configuration.

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USB

USB

Featuring USB 1.1 HID compliant interface, APEM's USB joysticks are recognized as standard HID "game controller" devices. Adhering to the HID specification, APEM's USB joysticks are plug-and-play with most versions of Windows and Linux. Joystick button and axes assignments are dependent upon the controlled application.

FEATURES

- USB 1.1 HID compliant "game controller" device
- Easy to install and operate
- Functions determined by controlled application
- Standard Male Type A Connector

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable
(Optional ruggedized military connectors are available.)

CURSOR EMULATION

The Cursor Emulation option converts multi-axis joystick output into a mouse, trackball, or cursor control device. The joystick's internal microprocessor converts absolute axis position into a cursor velocity, which is translated as a relative trackball or mouse position.

APPLICATIONS

The Joyball option is ideal for vehicle applications subjected to dirt and high vibration which makes operating a traditional cursor control device difficult. The Cursor Emulation option is widely used in shipboard and military applications.

FEATURES

- HID compliant "pointing device"
- Plug-and-play with USB option
- Ideal for marine GPS and navigation
- Environmental sealing up to IP68*

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable

I/O COMPLEMENT/ USER SPECIFIED PARAMETERS:

- USB 2 pushbuttons 2 or 3 axis (X, Y, and Z "scroll")

NOTE: *Excludes some handle options.