

LINEAR HALL EFFECT FINGER JOYSTICK

HTL
HALL EFFECT
JOYSTICK

2 & 4-WAY LINEAR HALL EFFECT FINGER JOYSTICK



HTL4 with Castle Style Button

The HTL series provides all of the performance of a full size, dual axis joystick in a miniature package that can be mounted in control handles, armrests and panels. The Hall effect sensors are immune to electromagnetic and radio frequency interference up to 100V/M. Programmable sensors with built-in temperature compensation ensure consistent and repeatable operation. The HTL series has excellent tactile feel for improved operator control and is available with either dusttight or IP68S watertight seal. A wide variety of output configurations are available to satisfy different applications.

Features:

- Designed for grip, armrest & panel mounting
- Proven contactless analog output Hall effect technology
- Redundant outputs available
- 1 million cycles
- Electronics watertight to IP68S
- Outstanding EMI/RFI immunity
- Variety of button styles
- RoHS/WEEE/Reach compliant

Standard Characteristics/Ratings:

MECHANICAL:

Mechanical Life: 1,000,000 all directions

Travel Angle: 23° min to 27° max

Operating Force with Boot: 16 oz typical to 20 oz max (at top of button) @ 25°C

Max Allowable Vertical & Radial Force on Button: 25.0 lbs.

Max Allowable Torque on Button: 7.5 lbs.

ELECTRICAL RATINGS:

HTL2: Rated at Vcc = 5V @ 20°C Load = 1mA (4.7KΩ)

Electrical	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output Voltage Tolerance at Center <i>(see graph for output values)</i>	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel <i>(see graph for output values)</i>	VDC @ 5V Vcc	-0.25	N/A	+0.25
Supply Current per Sensor	mA	N/A	N/A	10
Output Source Current	mA	-1	N/A	1
Output Resistance (Io ≤ 2mA)	Ω	N/A	1	10

HTL4: Rated at Vcc = 5V @ 20°C Load = 1mA (4.7KΩ)

Electrical	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output Voltage Tolerance at Center <i>(see graph for output values)</i>	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel <i>(see graph for output values)</i>	VDC @ 5V Vcc	-0.25	N/A	+0.25
Supply Current per Sensor	mA	N/A	8	10
Output Source Current Limit	mA	-1	N/A	+1

ELECTRONICS

Seal Integrity: Electronics IP68S

ENVIRONMENTAL:

Operating Temp Range: -40°C to +85°C

Storage Temp Range: -40°C to +85°C

RFI: Withstand 100V/M, 14Hz to 1GHz

EMI: Withstand per MIL-STD-461D/SAE J1113-22 at 50Hz and 60Hz

MATERIALS:

Boot: Elastomer

Button: Thermoplastic, black

Case: Thermoplastic, black

Flange: Thermoplastic, black

Wires: 22 or 24 AWG

Mounting Hardware: Panel fastener assembly

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HTL2 PART NUMBER CODE

HTL2 - X		X	X	X	X	1	X	XX	X	X
Button Style	Case Style	Seal	Travel	Operating Force	Output 1 ①		Output 2 ②	Termination	Button Color	
1. Castle	1. 0.970" SQ.	1. Dusttight	1. 25°	1. 16 oz	AA. 2.5 +/- 2.0VDC		NONE	1. Wire Leads	2. Black	
2. External Castle Boot		2. Watertight *			BB. 2.5 +/- 2.0VDC		2.5 +/- 2.0VDC	22 AWG,		
3. Short Double Stadium					CC. 2.5 +/- 2.0VDC		2.5 -/+ 2.0VDC	UL 1569		
4. Tall Concave Stadium					DD. 2.5 +/- 1.5VDC		NONE	2. Pins		
5. External Bat Handle Boot					EE. 2.5 +/- 1.5VDC		2.5 +/- 1.5VDC	3. Wire Leads		
6. External Smooth Boot					FF. 2.5 +/- 1.5VDC		2.5 -/+ 1.5VDC	24 AWG,		
7. Long Concave Y Axis Button					GG. 0.5 - 4.5VDC		0.5 - 4.5VDC	SAE AS22759		
8. Low Profile Button					HH. 1.0 - 4.0VDC		1.0 - 4.0VDC			

* Watertight sealed option available with button styles 2, 5 and 6.

① Outputs are from the center to the full travel position. Options "AA," "BB," "CC," "DD," "EE," and "FF" provide increased voltage in +Y; and decreasing voltage in -Y direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+Y, -Y) from 2 outputs per axis.

② Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

HTL4 PART NUMBER CODE

HTL4 - X		X	X	X	X	X	XX	X	X
Button Style	Case Style	Seal	Travel	Gating	Operating Force	Output 1 ①	Output 2 ②	Termination	Button Color
1. Castle	1. 0.970" SQ.	1. Dusttight	1. 25°	1. Omnidirectional; Square on Axis Guided Feel**	1. 16 oz	AA. 2.5 +/- 2.0VDC	NONE	1. Wire Leads	2. Black
2. External Castle Boot		2. Watertight *		2. Gated; Dual Axis Return to Center		BB. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	22 AWG	
3. Short Double Stadium				3. Omnidirectional; Round; Smooth Feel		CC. 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC	UL 1569	
4. Tall Concave Stadium						DD. 2.5 +/- 1.5VDC	NONE	2. Pins	
5. External Bat Handle Boot						EE. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC	3. Wire Leads	
6. External Smooth Boot						FF. 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC	24 AWG	
7. Long Concave Y Axis Button						GG. 0.5 - 4.5VDC	0.5 - 4.5VDC	SAE AS22759	
						HH. 1.0 - 4.0VDC	1.0 - 4.0VDC	4. Wire Leads	
								22 AWG, UL 1569	
								shared powers and grounds (see schematic)	
								5. Wire Leads	
								24 AWG,	
								SAE AS22759	
								shared powers and grounds (see schematic)	

* Watertight sealed option available with button styles 2, 5 and 6.

① Outputs are from the center to the full travel position in each direction. Options "AA," "BB," "CC," "DD," "EE," and "FF" provide increased voltage in +X, +Y; and decreasing voltage in -X, -Y direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+X, +Y, -X, -Y) from 2 outputs per axis.

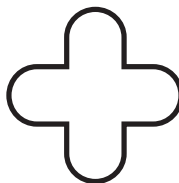
② Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

**Positive tactile feel when moved off X and Y axis positions.

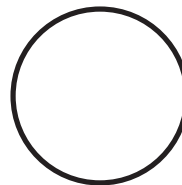
Gating Icons



Omnidirectional Square On-Axis-Guided Feel***



Gated Dual Axis Return to Center



Omnidirectional Round Smooth Feel



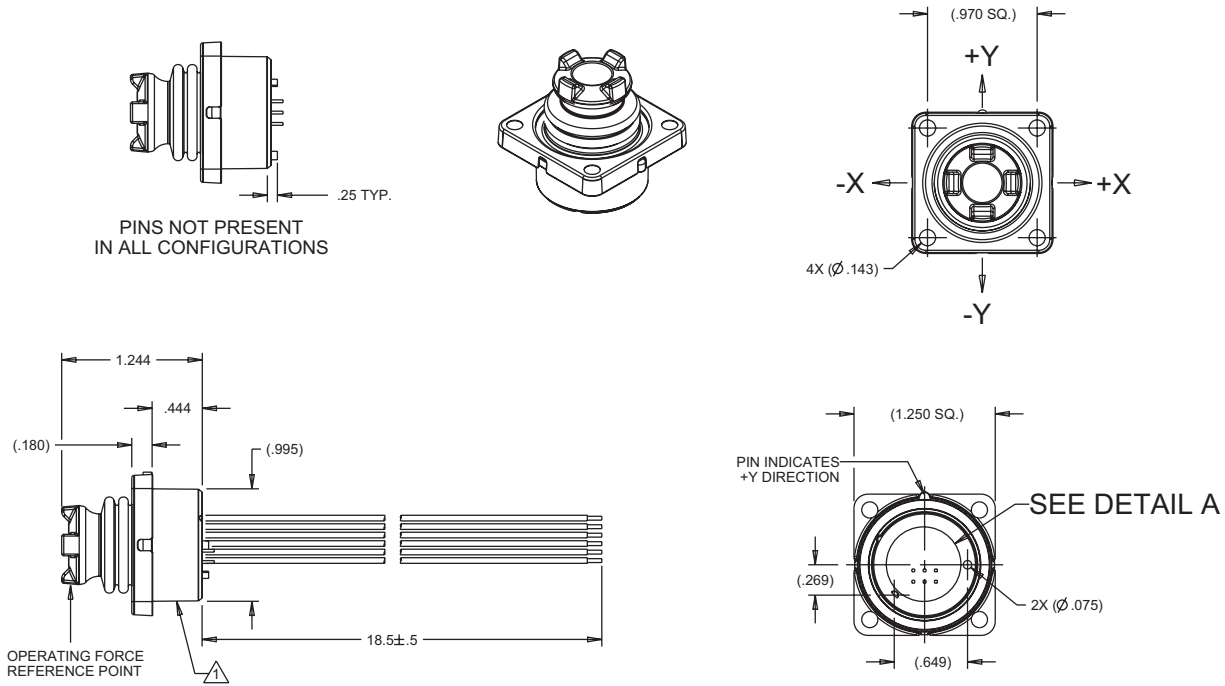
Single Axis (HTL2 version)

***Feel defined by shading.

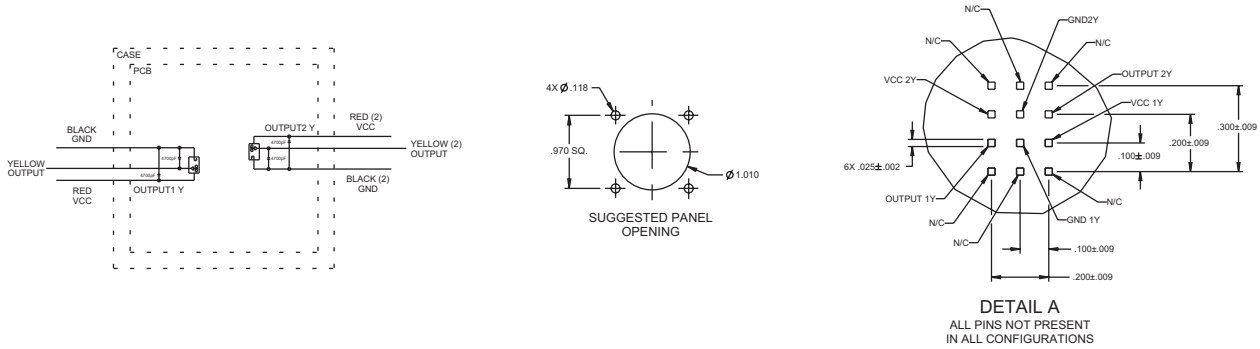
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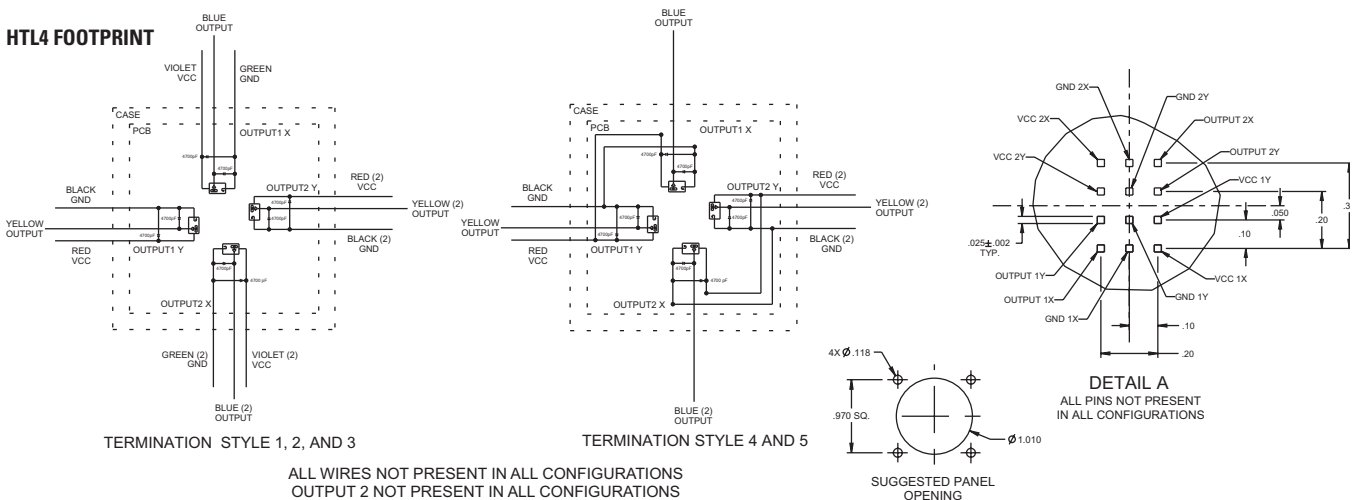
2 & 4-WAY LINEAR HALL EFFECT TOGGLE



HTL2 FOOTPRINT



HTL4 FOOTPRINT



HALL EFFECT

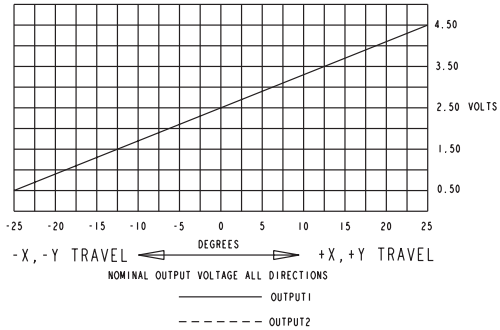
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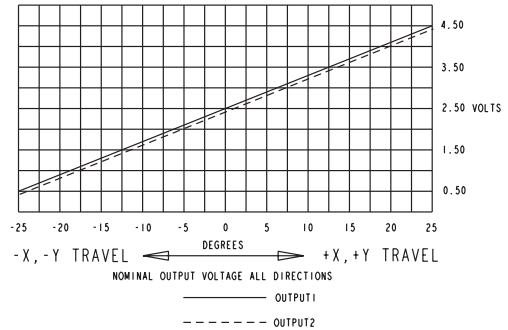
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HTL4 OUTPUTS

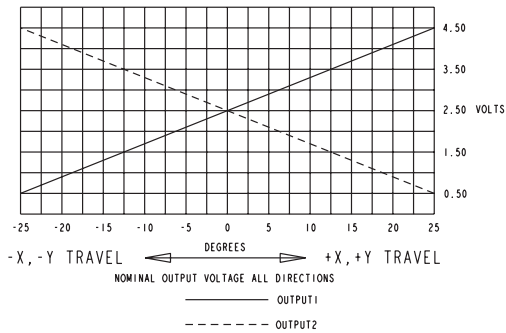
OPTION AA



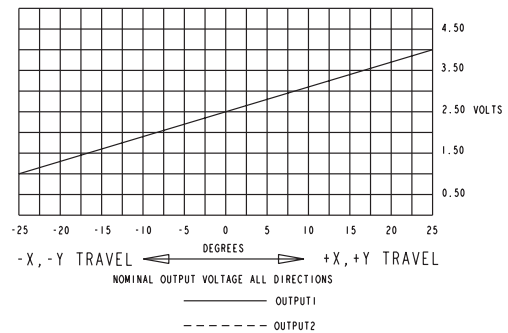
OPTION BB



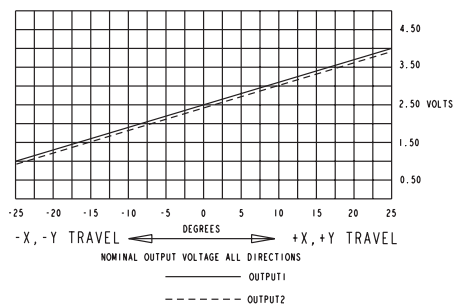
OPTION CC



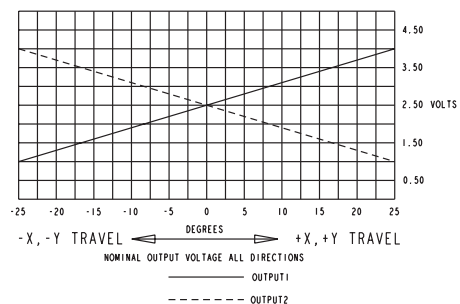
OPTION DD



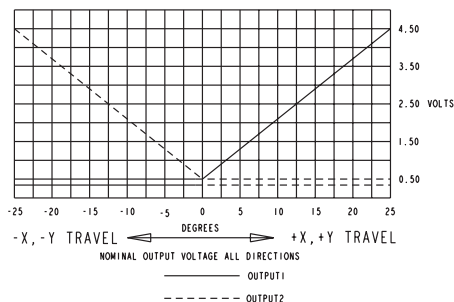
OPTION EE



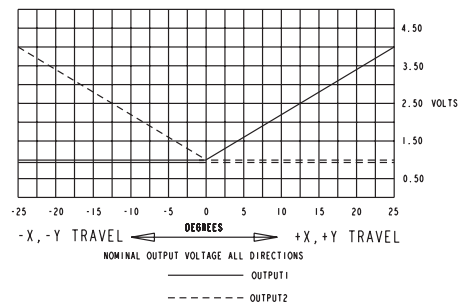
OPTION FF



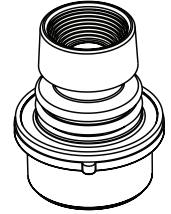
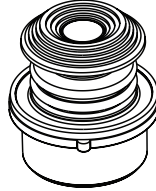
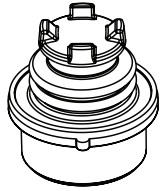
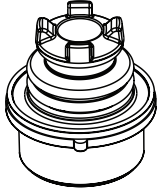
OPTION GG



OPTION HH



BUTTON STYLES

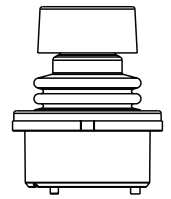
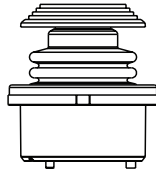
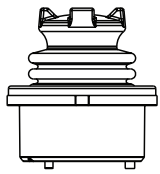
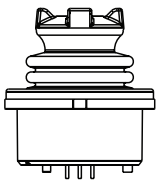


BUTTON STYLE 1
(CASTLE)

BUTTON STYLE 2
(EXTERNAL CASTLE BOOT)

BUTTON STYLE 3
(SHORT DOUBLE STADIUM)

BUTTON STYLE 4
(TALL CONCAVE STADIUM)



BUTTON STYLE 5
(EXTERNAL BAT
HANDLE BOOT)

BUTTON STYLE 6
(EXTERNAL SMOOTH BOOT)

BUTTON STYLE 7
(LONG CONCAVE Y AXIS BUTTON)

BUTTON STYLE 8
(LOW PROFILE BUTTON)
(AVAILABLE FOR HTL2 ONLY)

