

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 (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel (see graph for output values)	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 (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel (see graph for output values)	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

2 & 4-WAY LINEAR HALL EFFECT FINGER JOYSTICK

HTL2 PART NUMBER CODE

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

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

* 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.

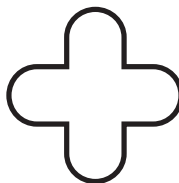
② Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

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

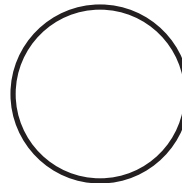
Gating Icons



Omnidirectional
Square On-Axis-
Guided Feel***



Gated
Dual Axis
Return to Center



Omnidirectional
Round
Smooth Feel



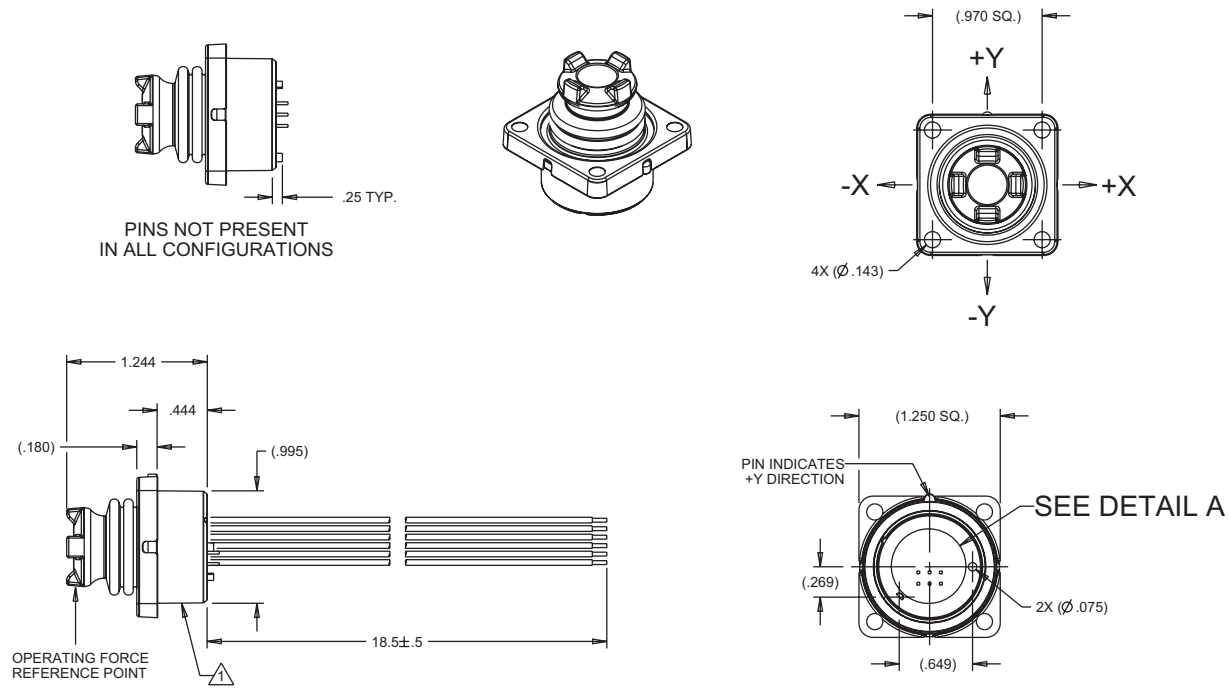
Single Axis
(HTL2 version)

***Feel defined by shading.

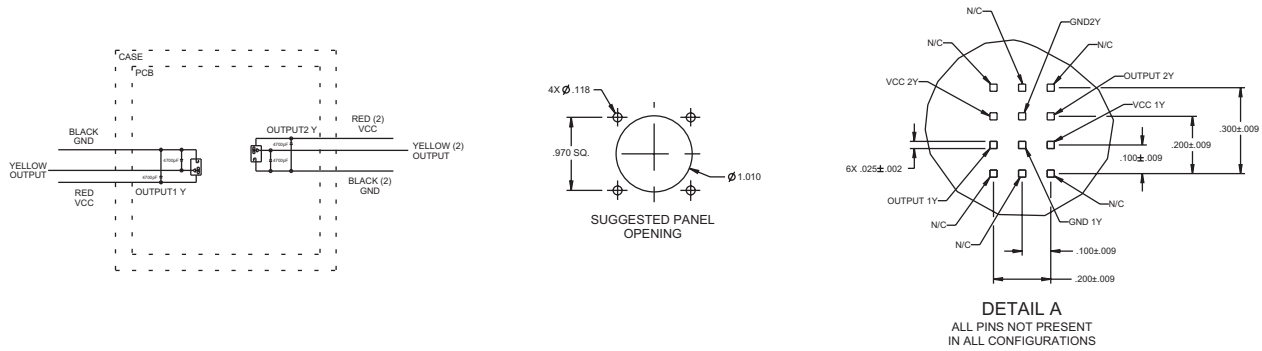
LINEAR HALL EFFECT FINGER JOYSTICK

HTL
HALL EFFECT
JOYSTICK

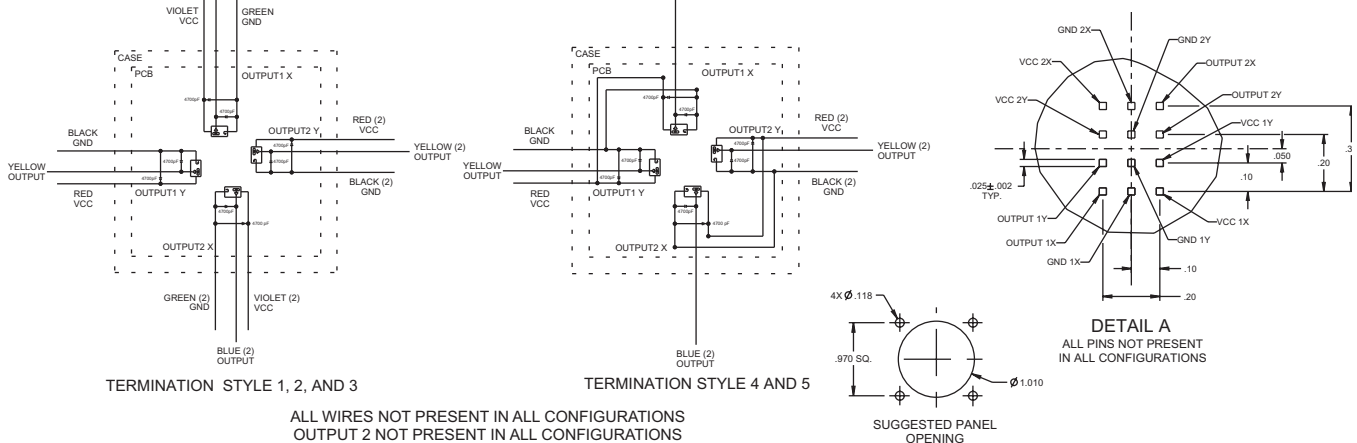
2 & 4-WAY LINEAR HALL EFFECT TOGGLE



HTL2 FOOTPRINT



HTL4 FOOTPRINT



TERMINATION STYLE 1, 2, AND 3

TERMINATION STYLE 4 AND 5

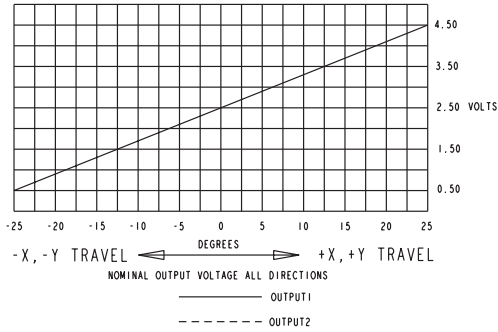
ALL WIRES NOT PRESENT IN ALL CONFIGURATIONS
OUTPUT 2 NOT PRESENT IN ALL CONFIGURATIONS

LINEAR HALL EFFECT FINGER JOYSTICK

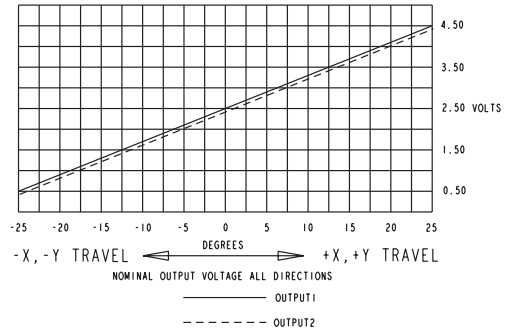
2 & 4-WAY LINEAR HALL EFFECT TOGGLE

HTL4 OUTPUTS

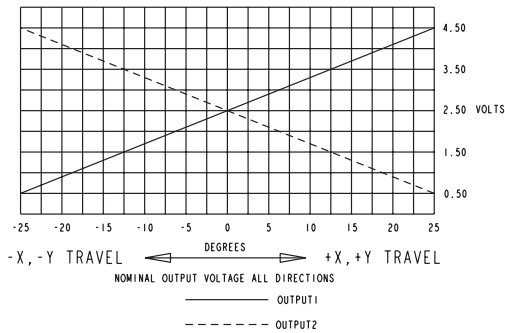
OPTION AA



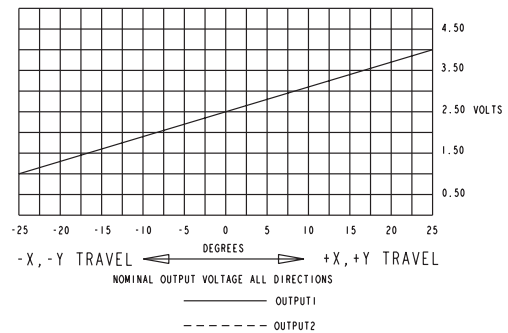
OPTION BB



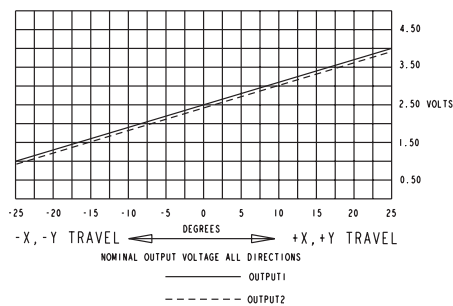
OPTION CC



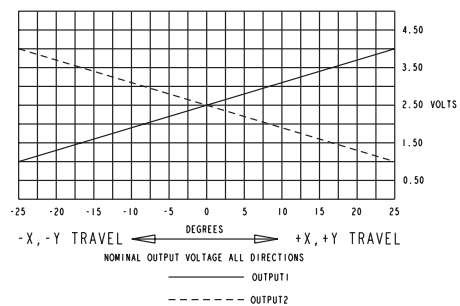
OPTION DD



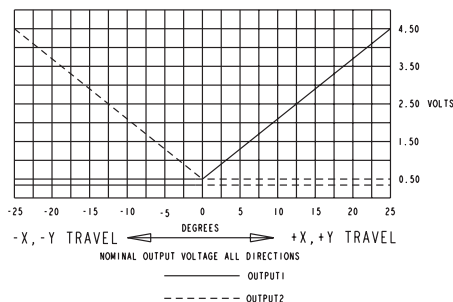
OPTION EE



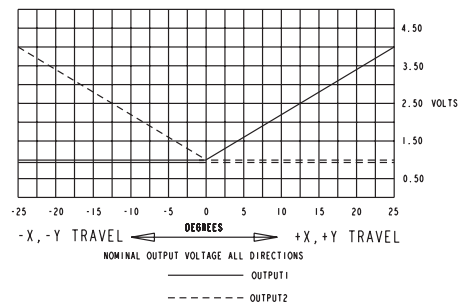
OPTION FF



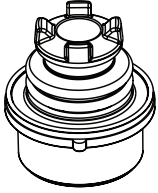
OPTION GG



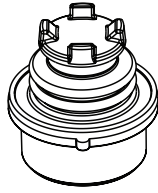
OPTION HH



BUTTON STYLES



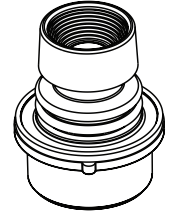
BUTTON STYLE 1
(CASTLE)



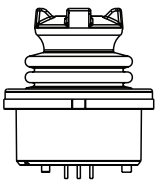
BUTTON STYLE 2
(EXTERNAL CASTLE BOOT)



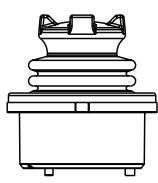
BUTTON STYLE 3
(SHORT DOUBLE STADIUM)



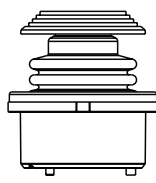
BUTTON STYLE 4
(TALL CONCAVE STADIUM)



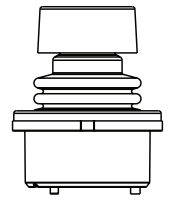
BUTTON STYLE 5
(EXTERNAL BAT
HANDLE BOOT)



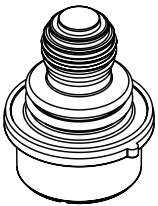
BUTTON STYLE 6
(EXTERNAL SMOOTH BOOT)



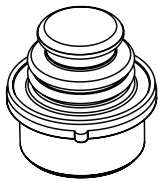
BUTTON STYLE 7
(LONG CONCAVE Y AXIS BUTTON)



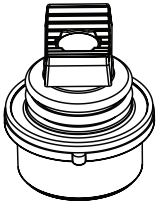
BUTTON STYLE 8
(LOW PROFILE BUTTON)
(AVAILABLE FOR HTL2 ONLY)



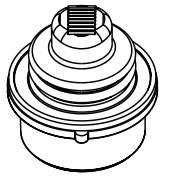
BUTTON STYLE 5
(EXTERNAL BAT
HANDLE BOOT)



BUTTON STYLE 6
(EXTERNAL SMOOTH BOOT)



BUTTON STYLE 7
(LONG CONCAVE Y AXIS BUTTON)



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