MINIATURE Z-AXIS HALL EFFECT JOYSTICK

COMPACT DESIGN



With Pushbuttons

Without Pushbuttons

The z-axis mechanism of the miniature Hall effect joystick knob means that it can rotate horizontally up to 60°. Z-Axis options include detent, friction hold or spring return to center. Its compact design is the ideal solution where space is limited and precision control is required, while its robust construction is suited for demanding applications.

The JHT joystick has been tested to five million cycles in all directions with no degradation of performance. The Z-Axis and/or pushbuttons have been tested to one million cycles. Various gating options are also available. The JHT Z-Axis electronics are sealed to IP68S and can withstand EMI/RFI per SAE J1113 specifications. The JHT Z-Axis has numerous applications and is ideal for construction equipment, unmanned vehicles, hydraulic controls, industrial vehicle controls, medical and surgical equipment, remote control boxes and surveillance cameras.

Features:

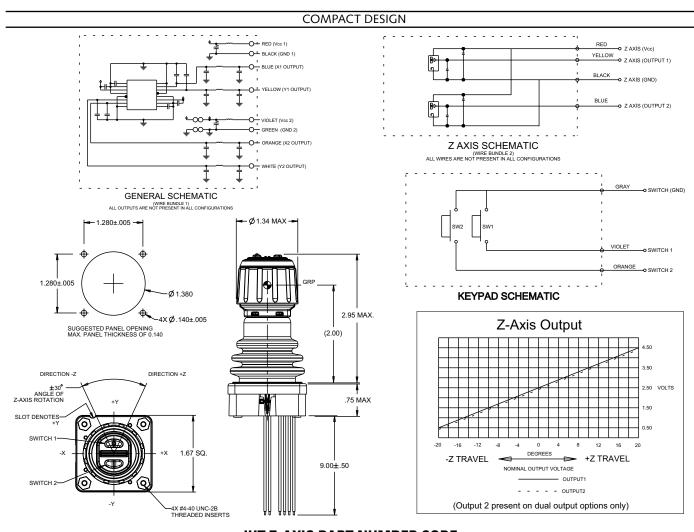
- 60° rotational movement of the ergonomic knob
- Compact design
- Contactless analog output Hall effect technology
- 5 million operational cycles in all directions (Joystick)
- Joystick electronics sealed per IP68S
- Optional pushbutton switches available
- 3.3V SPI & 5V SPI or Analog Output Options
- RoHS compliant

Environmental Ratings and Materials:							
ENVIRONMENTAL:							
Operating Temp Range:	-40°C to +85°C						
Seal:	Joystick electronics without pushbutton sealed to IP68S Keypad electronics sealed to IP65S						
EMI/RFI:	Withstand per SAE J1113						
MATERIALS:							
Housing:	Thermoplastic, black						
Bellows:	Silicone, black. Additional materials available, contact factory.						

Sensor Type: Hall effect analog, factory programmed ground and supply line break detection; over voltage and reverse voltage protection	DESIGN							
Sensor Type:	Standard Characte	ristics/Rati	ngs:					
Sensor Type: Hall effect analog, factory programmety ground and supply line break detection, over voltage and reverse voltage protection								
Design Contactless sensing ELECTRICAL RATINGS: Rate at Vcc = 5V @ 20° C Load = 1ma (4.7KC)	_	Hall offeet or	nalog factor	nrogram	ned around a	nd eunply line		
Design: Contactless sensing	осноот туре.							
Electrical - Analog Joystick	Design:							
Pelectrical - Analog Joystick Supply Voltage				D°C Load	= 1ma (4.7KΩ)			
Note					,			
Output Voltage Tolerance VDC 2.5			Units	Min	Тур	Max		
at Center Output Voltage Tolerance Full Travel Ø 5V Vcc Supply Current* MA N/A 10 12 (8 − 0, Vcc − 5V, lo = 0) Output Impedance KΩ N/A *Single output per axis. Dual output per axis available. Supply current 20mA typical. Electrical - Joystick Z-Axis Return to Center Units Min Typ Max Supply Voltage VDC 4.5 5.5 5.5 Output 1+2 Voltage, +Z, -Z VDC Output 1+2 At Full Travel *2 Direction Ø 5V Vcc Output 1+2 at Full Travel -Z Direction Supply current (per sensor) B = 0, Vcc = 5V, 10 = 0 Electrical - Joystick Z-Axis Friction Flectrical - Joystick Z-Axis Friction Units Min Typ Max Supply Current (per sensor) B = 0, Vcc = 5V, 10 = 0 Typic C = 2.5 A.50 A.55 A.	Supply Voltage				5	5.5		
Dutput Voltage Tolerance VDC -25		ce		25	N/A	+.25		
Full Travel		ce		25	N/A	+.25		
(B = 0, Vcc = 5V, loc = 0)	Full Travel							
Output Impedance KΩ N/A 1 N/A *Single output per axis. Dual output per axis available. Supply current 20mA typical.			mA	N/A	10	12		
Supply Voltage			kΩ	N/A	1	N/A		
Supply Voltage	*Single output per axis	. Dual output p	oer axis availa	able. Supp	ly current 20r	nA typical.		
Supply Voltage	Electrical - Joystick Z-Axis Return to Center							
Output 1+2 Voltage, +Z, -Z VDC 2.25 2.50 2.75 O' Deffection Ø5V Vcc Ø5V Vcc Output 1+2 at Full Travel VDC 0.45 0.50 0.75 Couput 1+2 at Full Travel VDC 0.45 0.50 0.75 Output 1+2 at Full Travel VDC 0.45 0.50 0.75 Output 1+2 at Full Travel VDC 0.45 0.50 0.75 Output 1-2 out			Units	Min	Тур	Max		
0° Deflection ⊕ 5V Vcc Late of the property of the p		-						
Dutput 1+2 at Full Travel		, -Z		2.25	2.50	2.75		
Output 1+2 at Full Travel - Z Direction VDC @ 5V Vcc 0.45 0.50 0.75 Supply current (per sensor) B = 0, Vcc = 5V, 1o = 0 mA N/A N/A 10.0 Supply current (per sensor) B = 0, Vcc = 5V, 1o = 0 mA -1.0 N/A 1.0 Electrical - Joystick Z-Axis Friction Units Min Typ Max Supply Voltage VDC 4.5 5 5.5 Output 1+2 at Full Travel + Z Direction VDC 4.25 4.50 4.55 - Z Direction @ 5V Vcc 0.50 0.75 Supply Current (per sensor) (B - 0, Vcc - 5V, 1o = 0) mA N/A N/A 10 Electrical - Joystick Z-Axis 3 Detent Units Min Typ Max Supply Voltage VDC 4.5 5 5.5 Output 1+2 voltage, +Z, -Z VDC 4.5 5 5.5 Output 1+2 at Full Travel VDC 4.5 0.50 2.75 O'D effection @ 5V Vcc 0.50 0.75 Units Min Typ Max Supply current (per sensor) B - Vcc = 5V, 1o = 0 0.50	Output 1+2 at Full Trave	el	VDC	4.25	4.50	4.55		
-Z Direction		N.		0.4F	0.50	0.75		
B = 0, Vcc = 5V, 1o = 0 Output - Source Current Limit	-Z Direction	;i		U.43	0.50	U./D		
Dutput - Source Current Limit BX, Vo = 0	Supply current (per ser	nsor)	mA	N/A	N/A	10.0		
B = -X, Vo = 0		nt Limit	mA	-1.0	N/A	1.0		
Units Min Typ Max	B = -X, Vo = 0				// .			
Supply Voltage	Electrical - Joystick	Z-Axis Friction	on					
Output 1+2 at Full Travel +Z Direction VDC								
AZ Direction		.1						
Z Direction		} I		4.25	4.30	4.33		
Supply Current (per sensor) (B = 0, Vcc = 5V, 1o = 0)		el		0.45	0.50	0.75		
B = 0, Vcc = 5V, 1o = 0		nsor)		N/A	N/A	10		
B = -X, Vo = 0	(B = 0, Vcc = 5V, 1o = 0))		·	<u>, </u>			
Supply Voltage		nt Limit	mA	-1.0	N/A	1.0		
Units Min Typ Max	·							
Supply Voltage				Min	Тур	Max		
O° Deflection © 5V Vcc Output 1+2 at Full Travel +Z Direction VDC					5			
Output 1+2 at Full Travel +Z Direction VDC		, -Z		2.25	2.50	2.75		
### A Provided Heat Part		el	VDC	4.25	4.50	4.55		
-Z Direction	+Z Direction		@ 5V Vcc					
Supply current (per sensor) B = 0, Vcc = 5V, 1o = 0 Output - Source Current Limit B = -X, Vo = 0 Output - Source Current Limit B = -X, Vo = 0 Output - Source Current Limit MA		el		0.45	0.50	0.75		
B = 0, Vcc = 5V, 10 = 0 Output - Source Current Limit B = -X, Vo = 0	Supply current (per sei	nsor)		N/A	N/A	10.0		
B = -X, Vo = 0	B = 0, $Vcc = 5V$, $10 = 0$		mΛ	-1.0	NI/A	1.0		
Mechanical Life: 5,000,000 cycles in all directions Units Min Typ Max		it Liiiill	IIIA	-1.0	IN/A	1.0		
Travel Angle Degrees 18 20 22	Joystick							
Travel Angle	Mechanical Life:		5,000,000 c	ycles in al	l directions			
Degree			Units	Min	Тур	Max		
Max Allowable Radial Force (Styles 11, 12 & 21) @ GRP Lbs. N/A N/A 50 Max Allowable Radial Force (All Other Styles) @ GRP Lbs. N/A N/A 15 Z-Axis Mechanical Life: 1,000,000 cycles in all directions Units Min Typ Max Travel Angle (Total) Degrees 56 60 64 Operational Torque with Detent 0Z 10 20 30 Operational Torque with Friction Hold 0Z 1.0 4.0 7.0 Operational Torque Return to Center 0Z 8.0 16 24								
Styles 11, 12 & 21) @ GRP		Eoroo						
(All Other Styles) @ GRP Z-Axis Mechanical Life: 1,000,000 cycles in all directions Units Min Typ Max Travel Angle (Total) Degrees 56 60 64 Operational Torque with Detent 0Z 10 20 30 Operational Torque with Friction Hold 0Z 1.0 4.0 7.0 Operational Torque Return to Center 0Z 8.0 16 24			LUS.	IN/A	IN/A	ນບ		
Z-Axis Units Min Typ Max Travel Angle (Total) Degrees 56 60 64 Operational Torque with Detent 0Z 10 20 30 Operational Torque with Friction Hold 0Z 1.0 4.0 7.0 Operational Torque Return to Center 0Z 8.0 16 24			Lbs.	N/A	N/A	15		
Mechanical Life: 1,000,000 cycles in all directions Units Min Typ Max Travel Angle (Total) Degrees 56 60 64 Operational Torque with Detent 0Z 10 20 30 Operational Torque with Friction Hold 0Z 1.0 4.0 7.0 Operational Torque Return to Center 0Z 8.0 16 24		r						
No. Comparison Comparison			1,000 000 0	vcles in al	l directions			
Travel Angle (Total) Degrees 56 60 64	oa.mour Ello.			•		Max		
Operational Torque with Detent 0Z 10 20 30 with Detent Operational Torque with Friction Hold 0Z 1.0 4.0 7.0 with Friction Hold Operational Torque Actum to Center 0Z 8.0 16 24	Travel Angle (Total)							
Operational Torque with Friction Hold OZ 1.0 4.0 7.0 Operational Torque Return to Center OZ 8.0 16 24	Operational Torque							
with Friction Hold Operational Torque OZ 8.0 16 24 Return to Center			07	1.0	4.0	7.0		
Return to Center			UZ	1.0	4.0	7.0		
			0Z	8.0	16	24		
	neturii to center	C	oification - C	ubicat T	Characitan	hout M-4		

MINIATURE Z-AXIS HALL EFFECT JOYSTICK





JHT Z-AXIS PART NUMBER CODE

Switch/Boot Style (All Half Boot)

32. Z-Axis with Detent, Single Output

JHT -

42. Z-Axis with Friction Hold, Single Output

XX

- 52. Z-Axis Return to Center, Single Output
- 62. Z-Axis with Detent, Dual Output
- 72. Z-Axis with Friction Hold, Dual Output
- 82. Z-Axis Return to Center, Dual Output
- 92. Z-Axis with Detent, Single Output wtih Two Pushbuttons
- A2. Z-Axis with Friction, Single Output with Two Pushbuttons
- B2. Z-Axis Return to Center, Single Output with Two Pushbuttons
- C2. Z-Axis with Detent, Dual Output with Two Pushbuttons
- D2. Z-Axis with Friction, Dual Output with Two Pushbuttons
- E2. Z-Axis Return to Center, Dual Output with Two Pushbuttons

X Gating* Operating Force 1. Gated; Single axis -1.1 lb

- Return to Center
- 2. Gated: Two axis -Return to Center
- 3. Omni-directional; Round Smooth Feel
- 4. Omni-directional; Round On-Axis and Off-Axis Guided Feel
- 5 Omni-directional Round On-Axis Guided

Joystick Output 1 Joystick Output 2 **AA.** 2.5 +/- 2.0VDC NONE

MM. J1939***

BB. 2.5 +/- 2.0VDC 2.5 +/- 2.0VDC CC. 2.5 +/- 2.0VDC 2.5 -/+ 2.0VDC **DD**. 2.5 +/- 1.5VDC NONE EE. 2.5 +/- 1.5VDC 2.5 +/- 1.5VDC FF. 2.5 +/- 1.5VDC 2.5 -/+ 1.5VDC

NONE

NONE

NONE

GG. 0.5 - 4.5VDC 0.5 - 4.5VDC HH. 1.0 - 4.0VDC 1.0 - 4.0VDC NONE

JJ. SPI, 3.3V Supply** KK. SPI, 5V Supply** LL. CANopen***

Termination 1. 24 AWG

Wire Leads 2. Cable, 22 AWG (19/34) PVC / Polyurethane outer jacket (11" long not shown)***

N

*Gated = Restricted movement in XY axis only. Gating Icons shown on page 111 in the JHT mini joystick section.

NOTES (Applies to Joystick Output Only):

- 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.
- 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.

^{**}Z-Axis and Pushbuttons are not part of the SPI message.

^{***}Outputs LL & MM must be used with termination option 2. Cable termination option only available with LL & MM options.

COMPACT DESIGN

Joystick Output Configuration

