TS3 SERIES

Micro low power Hall effect joystick

The TS3 Series is the world's smallest low power industrial Joystick. Featuring 3.3V Hall effect architecture for energy efficient long life performance, the TS3 Series is ideal for battery powered applications including UAV and UGV remote controls. Constructed with an M8 x 1mm threaded body to provide IP67 above panel sealing, this micro joystick's optimized design offers proportional control in a total package size measuring 0.81" x 0.55".

FEATURES

- 14mm x 12mm package size above panel
- Hall effect technology
- 3.3V operating voltage
- IP67 above panel sealing
- 2.5 million lifecycles

MECHANICAL SPECIFICATIONS

MECHANICAL (X & Y AXIS)	
Angular travel:	20° total (10° each direction from center)
Expected life:	2.5 million operations
Centering:	Spring return
Mass/weight:	xx grams*
Mounting:	M8 x 1mm knurled nut
Maximum vertical load:	xx lbF
Maximum horizontal load:	xx lbF**
Actuation force:	0.x +/- 0.1N

* Approximate weight. Actual weight dependent on configuration
** Measured 0.42" above panel surface

Version I 10.2025

ELECTRICAL SPECIFICATIONS

ELECTRICAL	
Technology: Hall effect sensor, single	Hall effect sensor, single
Resolution:	8 bit 256 counts, -128 to +127
Supply voltage:	3.3VDC +/- 0.3VDC regulated transient free
Electrical output:	SPI
Current consumption:	8mA typical running
Sleep mode consumption:	150uA typical after 2 sec idle

ENVIRONMENTAL SPECIFICATIONS

ENVIRONMENTAL	
Operating temperature:	-40°C +85°C
Storage temperature:	-50°C +125°C
Above panel sealing:	IP67*
EMC immunity level:	TBD
EMC emissions level:	TBD
ESD immunity level:	TBD
Vibration:	TBD
Mechincal shock:	TBD

* Above panel sealing. All configurations. Product is idle and not in use.
** Extended testing levels

MATERIALS SPECIFICATIONS

MATERIALS	
Plastic housing:	Mineral & glass filled nylon
Boots & actuators:	Silicone (with tear resistant additive) & glass filled nylon

Version | 10.2025

SPECIFICATIONS

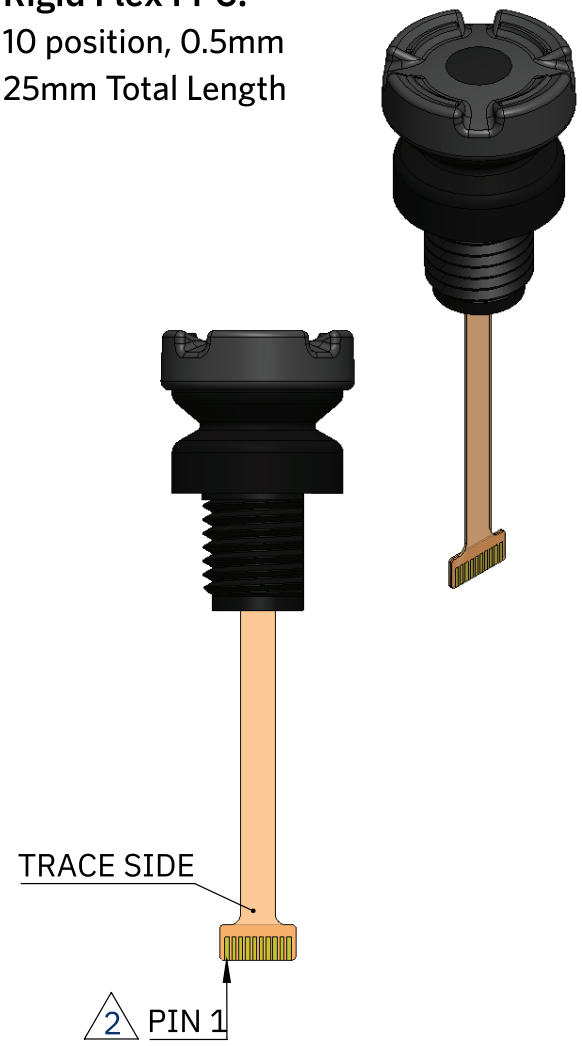
<table>
<tr><td>SPI Joystick Commands:</td><td>Get Joystick Position (CMD=1)</td></tr>
<tr><td colspan="2">Write from Joystick:
<table>
<tr><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th><th>Byte 5</th></tr>
<tr><td>1</td><td>X</td><td>X</td><td>X</td><td>X</td></tr>
</table>
Read from Joystick:
<table>
<tr><th>Byte 1</th><th>Byte 2</th><th>Byte 3</th><th>Byte 4</th><th>Byte 5</th></tr>
<tr><td>STATUS</td><td>Xj Lo</td><td>Xj Hi</td><td>Y Lo</td><td>Y Hi</td></tr>
</table></td></tr>
<tr><td>SPI Communication Settings:</td><td>SPI Mode = 3
SCLK tested up to 100KHz
SPI CS* is active low, assert approximately 1.5us before and after each packet transfer.
New joystick data available every 10ms, 100 samples per second</td></tr>
<tr><td>Developer’s Notes:</td><td>The returned Joystick Position data is the result of 3-stage pipeline processing that is synchronous and driven by the host SPI transfers. (Start measurement, acquire measurement and apply calibration, post result to output buffer.) New position data is output with each request, but the data corresponds with samples that have worked their way through the pipeline. As a result of this 3-stage pipeline, the developer should be aware of the following:
The initial 2 joystick reads after power up are undefined and should be ignored.
The initial 2 joystick reads upon restarting from a pause in reading will represent the joystick position from before the reading was paused.
Example, - if querying the joystick every 10ms, each sample returned will represent the joystick’s position delaved by 2 cycles or 20ms.</td></tr>
</table>

Version I 10.2025

SPECIFICATIONS

ZIF END TERMINATION	
TRACE	**FUNCTION**
1	RESERVED
2	RESERVED
3	RESERVED
4	3.3V
5	MOSI - Host Data Out
6	SCLK
7	CS* Active Low Chip Set
8	MISO - Host Data In
9	GND
10	N/A

Rigid Flex FPC:
10 position, 0.5mm
25mm Total Length



TS3 SERIES PART NUMBER CODE

TS3 Series

LIMITER OPTION	
S	SQUARE
Y	Y LIMITER

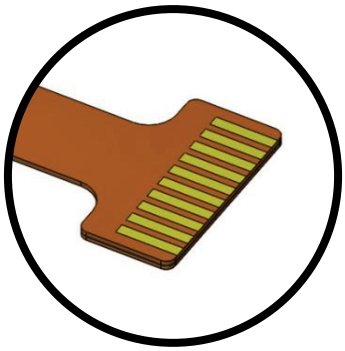
TERMINATION	
A	25MM LENGTH FPC*

COLOR	
BK	BLACK

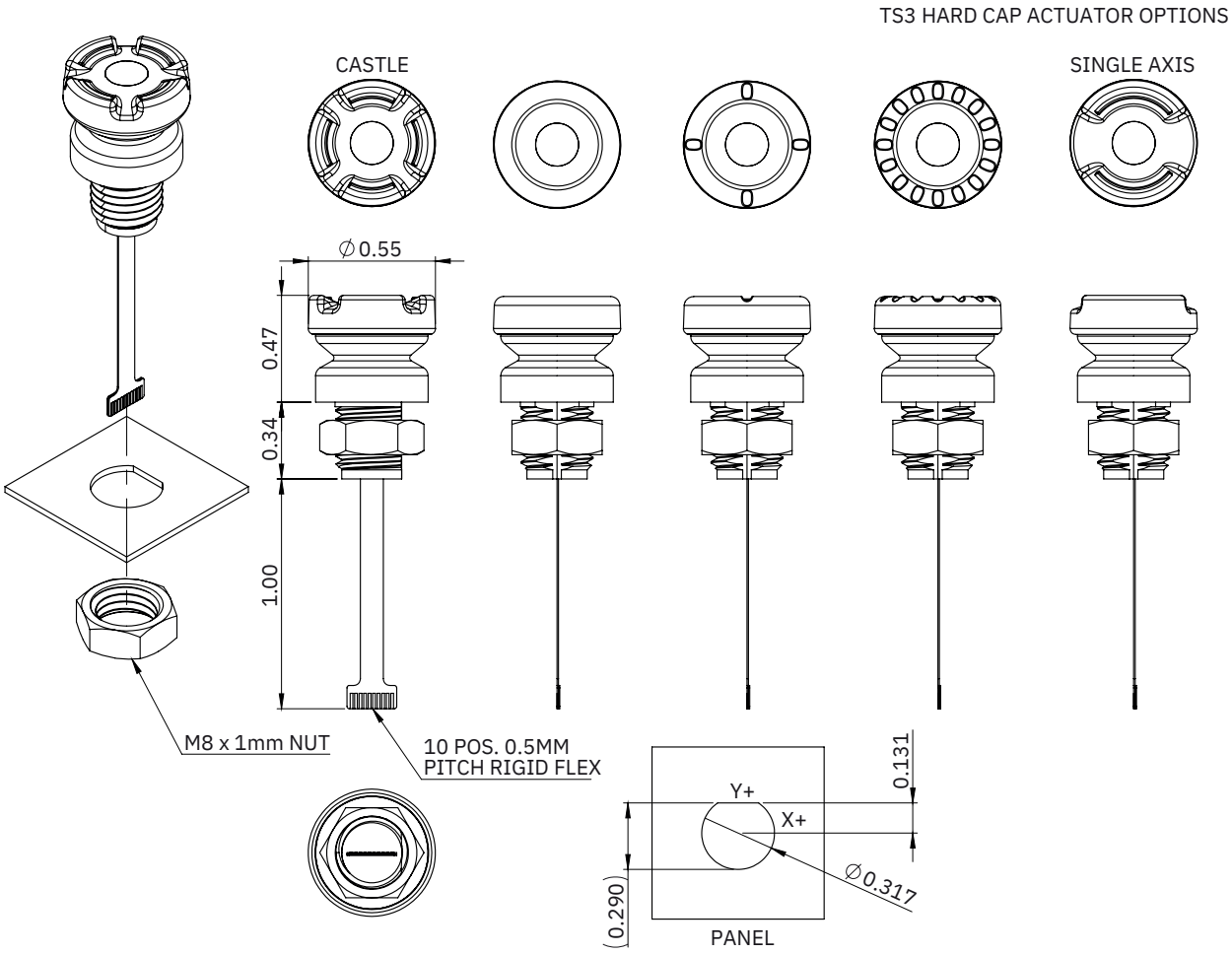
ACTUATOR	
1	CASTLE CAP, ELASTOMER
2	ROUND, 4WAY INDICATOR, ELASTOMER
3	ROUND CONVEX, W/BUMPS, ELASTOMER
4	ROUND, CONCAVE, ELASTOMER
H5	HARD PLASTIC, CASTLE
H6	HARD PLASTIC, CONVEX
H7	HARD PLASTIC, CONVEX NOTCHED
H8	HARD PLASTIC, RIBBED
H9	HARD PLASTIC, SINGLE AXIS

ELECTRICAL OUTPUT	
1	3.3V SPI

SPRING FORCE	
1	STANDARD

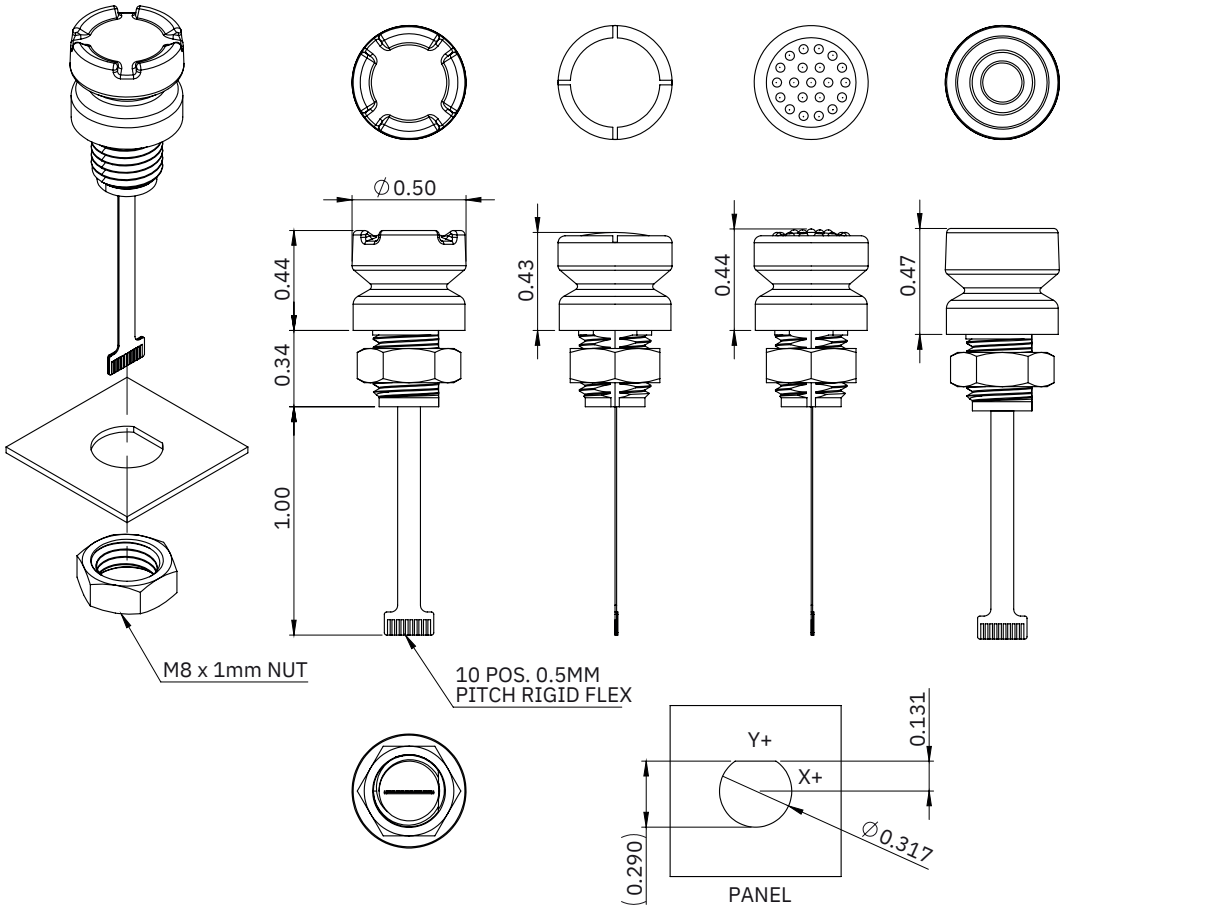


ACTUATOR OPTIONS



ACTUATOR OPTIONS

TS3 ELASTOMER CAP ACTUATOR OPTIONS



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