



- Solid state sensing technology – laser tracking engine
- Z-axis control wheel for scroll/zoom capability
- Removable Ball
- 38mm or 50 mm ball
- Output: PS/2 & USB or Quadrature
- Smooth operation in rugged environments
- Various top plate configurations available
- Custom connector options available
- Various ball colours

### 3-AXIS OEM TRACKBALLMODULES

Utilizing the latest and most advanced laser optical tracking technology, the Z- Series laser optical Trackerballs™ are extremely high specification, contact-less devices, ideal for the most demanding of cursor control applications. The device provides both conventional X and Y-axis cursor movement with an additional Z-axis control wheel surrounding the ball. The laser tracking engine provides accurate cursor motion at all speeds and on virtually any ball, combining the benefits of solid state sensing (no moving parts except the ball). The unit has been designed to be back of panel mounted as part of OEM keyboards and consoles.

#### GENERAL TECHNICAL SPECIFICATIONS

##### Mechanical

Weight	200 grams (Z38) / 350 gr (Z50)
Ball	Epoxy Resin, 38 mm
Tracking Force	20 grams Nominal - damper ring / 30 - 80 grams - dust seal PTFE or silicone rubber
Z-xis wheel tracking force	5 - 15 grams
Ball Load	100N max. downward pressure (10 Kg) for 2 mins.
Resolvable Ball Speed	40 Inches/sec.
Resolvable Z-axis wheel speed	1 revolution per second
Mounting Position	All angles
Tracking engine	Laser Navigation Technology (solid state sensing)
Housing Material	PC/ABS - black
Z-axis wheel material/finish	PC/ABS with soft touch coating - black

##### Electrical

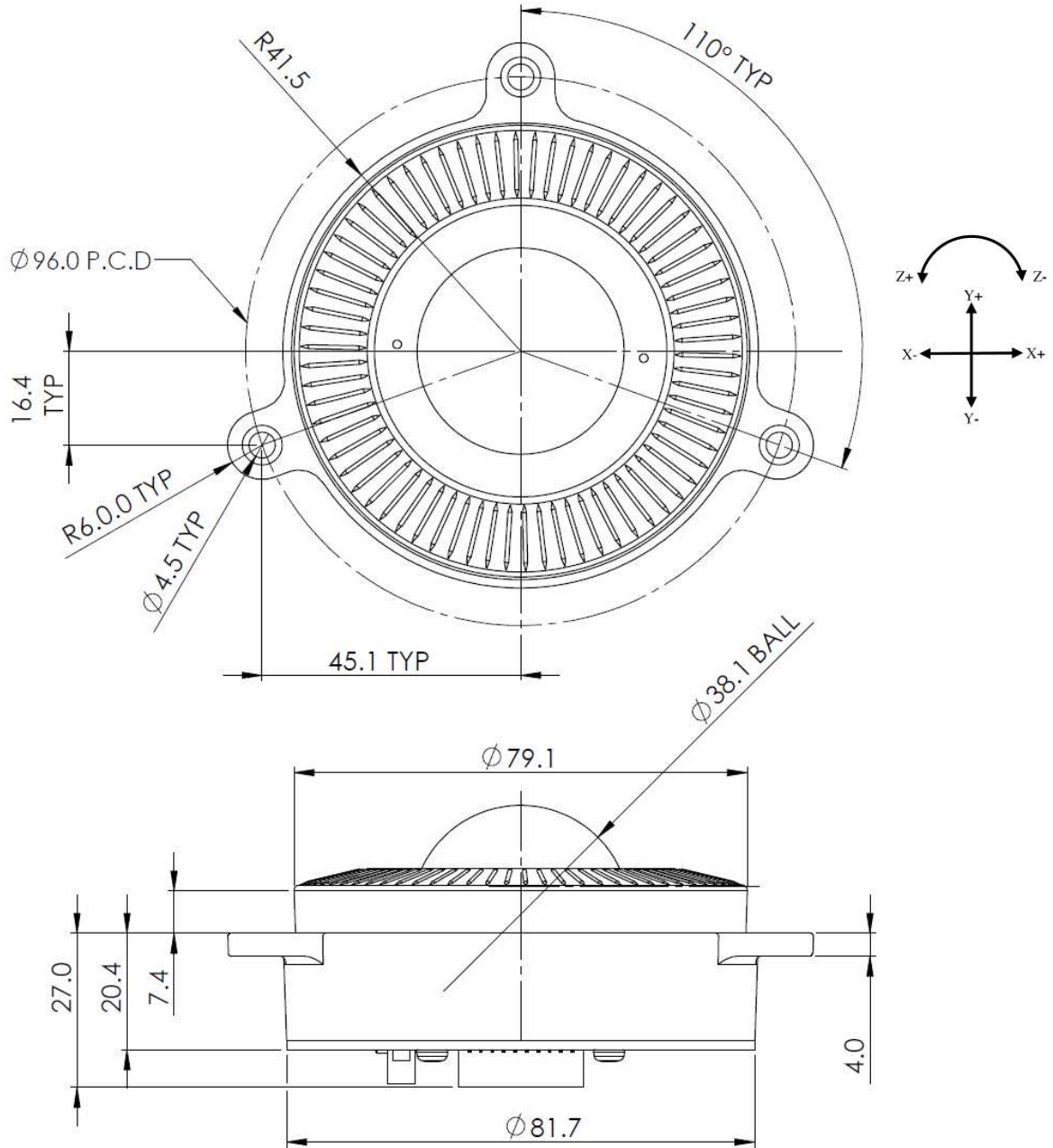
Supply voltage	4.4V to 5.25V D.C.
Supply current	28mA typical, 35mA maximum
Resolution	900 counts (Z38) / 1250 counts (Z50) per ball revolution @ 1 IPS (inches per second) +/- 10% 1800 counts (Z38) / 2500 counts (Z50) counts per ball revolution @ 5 IPS (inches per second) +/- 10%
Resolution - Z-axis wheel	200 counts (Z38) / 300 counts (Z50) per revolution
Output connector	10 Way JST, vertical header, part no. B10B-PH-SM4-TB
Mating output connector	10 Way JST connector, part no. PH, CR or KR types (e.g. PHR-10)
Switch connector	4 Way JST, vertical header, part no B4B-PH-SM4-TB
Mating switch connector	4 Way JST connector, part no: PH, CR or KR types (e.g. PHR-4)
Switch Inputs (USB, PS/2)	3 switches: left, middle, and right.
Laser safety class	Embedded class 1M laser safety, IEC 60825-1

##### Environmental

Operating temperature	0°C to +55°C (IEC 60068-2-1, IEC60068-2-2)
Storage temperature	-40°C to +85°C (IEC 60068-2-1, IEC60068-2-2)
Operating humidity	93% RH @ 40°C, non-condensing (IEC 60068-2-78)
Storage humidity	10%-95% non-condensing (IEC 60068-2-78)
Vibration	2g, 10-500Hz, 1 octave/min, 10 sweep cycles (IEC 60068-2-6)
Operating Shock	15g/11ms, ½ sine, 3 shocks in +ve and -ve direction, all 3 axes (IEC 60068-2-27)
Mechanical lifetime	1 million ball revolutions
MTBF	in excess of 80,000 hours (MIL-STD-217F)
ESD	15kV air-discharge and 8kV contact discharge (IEC 61000-4-2)
EMC	Radiated immunity - limits according to level 3 of IEC 61000-4-3. Radiated emissions to EN55022 class B

## DIMENSIONAL DRAWING

38 mm trackball

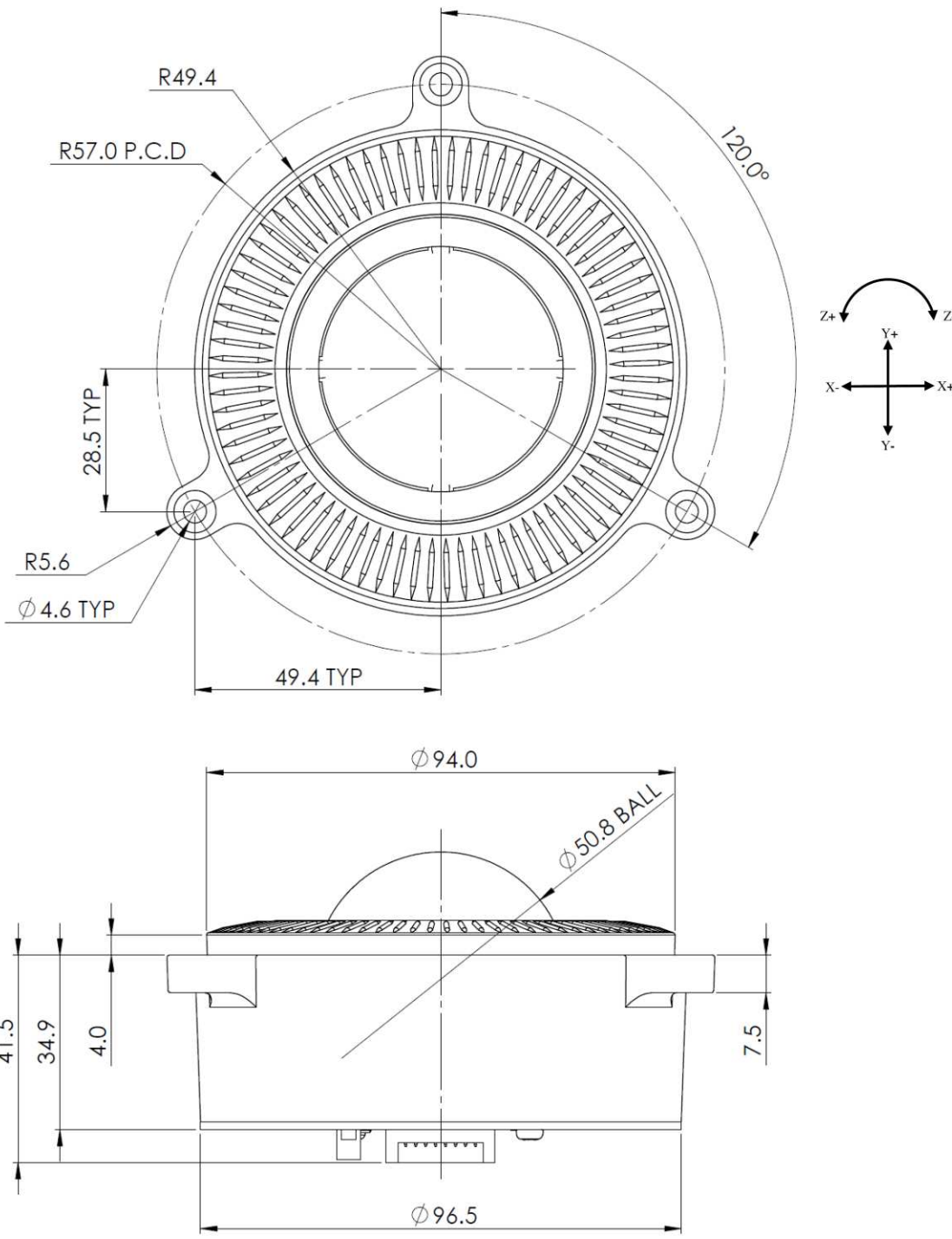


Dimensional drawing specifies factory default orientation.  
 All dimensions are in mm unless otherwise stated.  
 Tolerances +/- 0.2mm unless otherwise stated

The company reserves the right to alter without prior knowledge the specification or design of any standard product or service.

DIMENSIONAL DRAWING

50 mm trackball

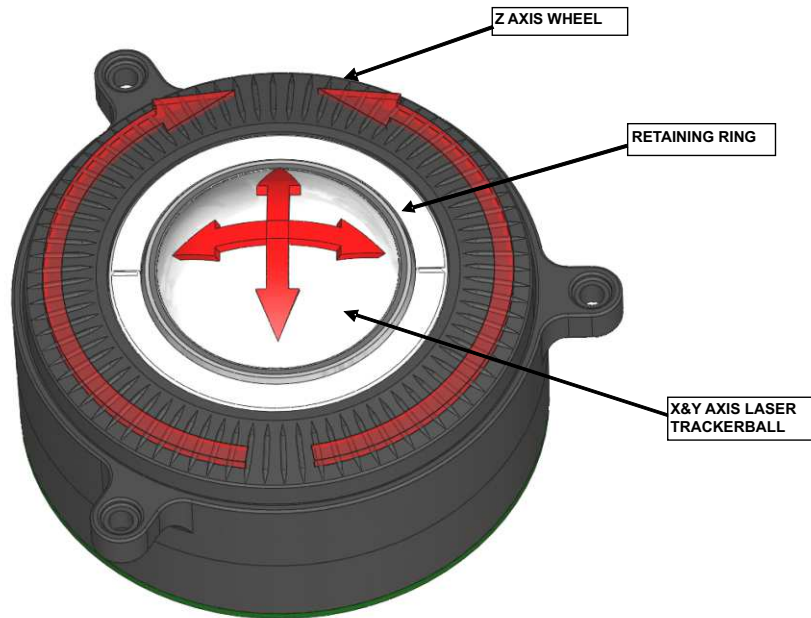


Dimensional drawing specifies factory default orientation.  
 All dimensions are in mm unless otherwise stated.  
 Tolerances +/- 0.2mm unless otherwise stated

The company reserves the right to alter without prior knowledge the specification or design of any standard product or service.

## Z-AXIS CONTROL WHEEL

The Z- laser trackball provides conventional X and Y axis cursor movement with an additional Z-axis control wheel surrounding the ball. The Z-axis control wheel provides scroll/zoom capabilities for more effective navigation in complex user interfaces and operating systems (please note the function of the control wheel is software dependent). The control wheel incorporates a high quality roller bearing providing smooth and reliable motion throughout the trackball lifetime. The trackball also features a removable retention ring enabling the user to remove the ball for servicing and maintenance purposes.



## CONNECTION DETAILS QUADRATURE OUTPUT

Output Connector : P1

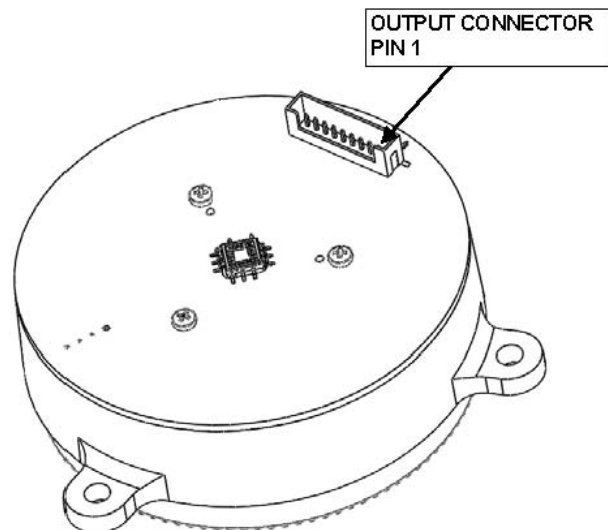
Description: 10 way, 2mm pitch, vertical connector

Manufacturer: JST (or equivalent)

Part No: B 10B-PH-K-S

Mating connector: PH, CR or KR types

Pin Number	Quadrature
1	X1
2	X2
3	Y1
4	Y2
5 and 6	EARTH
7	+5V
8	Z1
9	Z2
10	0V

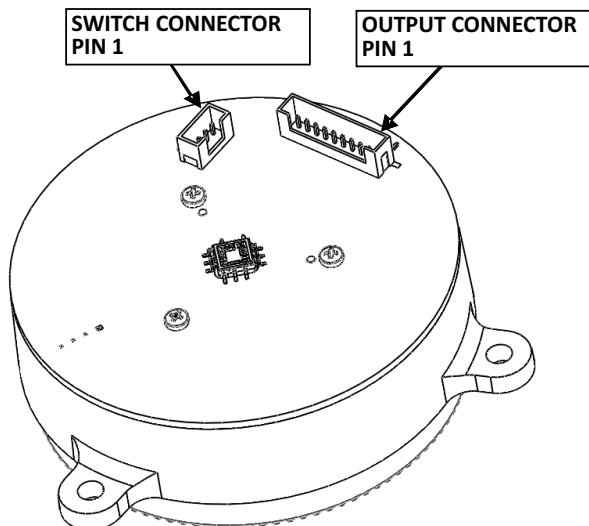


CONNECTION DETAILS PS/2 - USB OUTPUT

Output Connector : P1

Description: 10 way, 2mm pitch, vertical connector  
 Manufacturer: JST (or equivalent)  
 Part No: B10B-PH-SM4-TB  
 Mating connector: PH, CR or KR types

Pin Number	PS/2 & USB
1, 2,3 and 4	Do not connect
5	Earth
6	Do not connect
7	+ 5V D.C
8	PS/2 Data, D-
9	PS/2 Clock, D+
10	0V

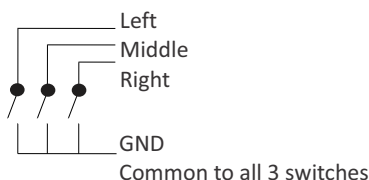


Switch Input Connector : P2

Description: 4 way, 2mm pitch, vertical connector  
 Manufacturer: JST (or equivalent)  
 Part No: B4B-PH-SM4-TB  
 Mating connector: PH, CR or KR types

Pin Number	Function
1	Left switch
2	Middle switch
3	Right switch
4	0V

Switch Schematic



CONFIGURATION

The Z - Series trackball provides features that may be selected using the DIP switch located on the printed circuit board. Here the assigned function of each switch

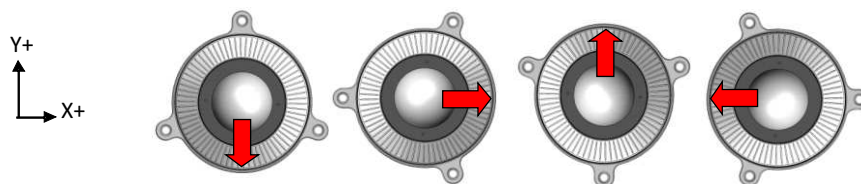
DIP Switch Functions quadrature Trackballs

DIP Switch	Function	OFF	ON
1	Orientation 1 Setting	See Figure.1	See Figure.1
2	Orientation 2 Setting	See Figure.1	See Figure.1
3	Scroll Orientation	Clockwise [-ve]	Clockwise [+ve]
4	Factory setting	N/A	N/A
5	Tracking Mode	Ballistic	Linear
6	Factory setting	N/A	N/A

Factory default setting: All DIP switches OFF

Orientation

The orientation function allows the user to mount the Z- trackball device in one of four positions (see figure. 1 below). The orientation of the device is determined by the direction in which the output connector is facing (when viewed from the top of Trackerball device). The direction of the output connector is denoted by the red arrow. The Tracker ball orientation can be selected to accommodate customer requirements for connector location and wiring.



Switch 1 Orientation 1	Off	On	Off	On
Switch 2 Orientation 2	Off	Off	On	On

Figure.1 Mounting Orientations

ORDER INFO

38 mm trackball

OUTPUT	DAMPER RING	PTFE SEAL
Quadrature	<b>Z38-10021D-G</b>	<b>Z38-10023D-G</b>
PS/2 & USB	<b>Z38-16021D-G</b>	<b>Z38-16023D-G</b>

50 mm trackball

OUTPUT	DAMPER RING	PTFE SEAL
Quadrature	<b>Z50-10021D-G</b>	<b>Z50-10023D-G</b>
PS/2 & USB	<b>Z50-16021D-G</b>	<b>Z50-16023D-G</b>

Standard Lead assemblies for connection to the Z-unit are available. Other lead assemblies can also be supplied to customer specifications.

Part Number	Leads / Adapters	Description
OC6010160	Output cable PS/2	1,6 m shielded cable with 6 pin mini DIN plug
OC5010160	Output cable USB	1,6 m shielded cable with USB type A plug
IC040035	Switch Input	4 way JST style - bare wires, 35 cm long
IC101035	Interconnection	Interconnection cable, 35 cm long