X50

## 50 MM LASER TRACKBALL MODULE

Waterproof IP68 sealed



Utilizing the latest and most advanced laser tracking technology, the X50 Series laser Trackerball™ is an extremely high specification, contact-less device, ideal for the most demanding of cursor control applications.

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 X50 trackballs are available with a variety of electrical outputs and sealing to IP68. The solid state design allows the device to be subjected to extreme conditions and provides the user with the ability to wash down, decontaminate, and sterilise, making it the ideal trackball for a wide range of demanding applications and environments.

The unit has been designed to be back of panel mounted as part of OEM keyboards and consoles.

- ` Solid state sensing technology Laser tracking engine
- Sealing to IP68
- Output: PS/2 & USB or Quadrature
- ` Smooth operation in rugged environments
- `Various top plate configurations
- ` Custom connector options
- ` VX3™ integrated zoom feature for scroll wheel functionality

#### **GENERAL TECHNICAL SPECIFICATIONS**

**Mechanical** 

Weight 150 grams

Ball Epoxy Resin, 50,8 mm

Tracking Force 20 grams nominal - damper ring / 30 - 80 grams - PTFE seal Ball Load 200N Maximum downward pressure (20 Kg) for 2 mins.

Resolvable Ball Speed 40 Inches/sec. Housing Material Polycarbonate / ABS

Transducer Optical Navigation Technology (solid state sensing)

Mounting Position All angles
Sealing gasket Cellular silicone

**Electrical** 

Supply voltage 4.4V to 5.25V D.C.

Supply current 25mA typical, 30mA maximum

Resolution 1200 counts per ball revolution @ 1 IPS (inches per second) +/- 10% (Quadrature protocol)

2400 counts per ball revolution @ 5 IPS (inches per second) +/- 10% (USB, PS/2 protocol)

Output connector 10 Way JST, right-angled header, part no. S10B-PH-SM3-TB

Switch Inputs (USB, PS/2) 3 switches: left, middle, right. Connection through 4-way JST, right-angled header, part no: S4B-PH-SM3-TB

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 5g, 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) Non-operating shock 50g/11ms, ½ sine, 3 shocks in +ve and -ve direction, all 3 axes (IEC 60068-2-27)

Mechanical lifetime 1 million ball revolutions

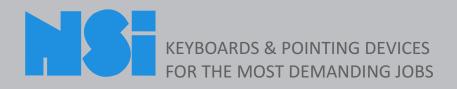
MTBF in excess of 80,000 hours (MIL-STD-217F)

ESD 15kV air-discharge and 8kV contact discharge (IEC 61000-4-2)

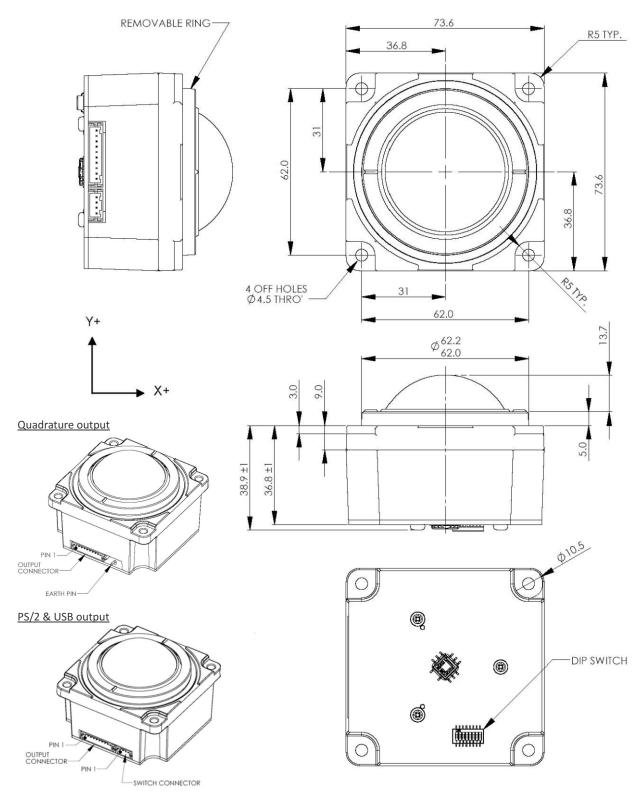
EMC Radiated immunity - limits according to level 3 of IEC 61000-4-3. Radiated emissions to EN55022 class B

Sealing capability IP68 (BS EN 60529)

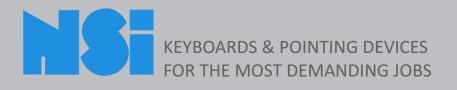
VER. 1.1



## **DIMENSIONAL DRAWING**



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



### CONNECTION DETAILS QUADRATURE OUTPUT

Output Connector: P1

Description: 10 Way JST, right-angled header.

Manufacturer: JST (or equivalent) Part No: S10B-PH-SM4-TB

Mating connector: PH, CR or KR types (e.g. PHR-8)

Pin Number	Quadrature
1	X1
2	X2
3	Y1
4	Y2
5 and 6	EARTH
7	5V D.C
8 and 9	See Note 1
10	0V

Note 1: Pin to be left floating (unconnected)

## CONNECTION DETAILS PS/2 - USB OUTPUT

Output Connector: P1

Description: 10 Way JST, right-angled header.

Manufacturer: JST (or equivalent)

Part No: S10B-PH-SM4-TB

Mating connector: PH, CR or KR types (e.g. PHR-10)

Pin Number	PS/2 & USB
1, 2, 3 and 4	See note 1
5 and 6	EARTH
7	5V D.C
8	PS/2 Data, D-
9	PS/2 Clock, D+
10	0V

Note 1 : Pin to be left floating (unconnected)

Switch Input Connector: P2

Description: 4-way JST, right-angled header.

Manufacturer: JST (or equivalent)

Part No: S4B-PH-SM4-TB

Mating connector: PH, CR or KR types (e.g. PHR-4)

Pin Number	Function
1 2 3 4	Left switch Middle switch Right switch OV

Switch Schematic

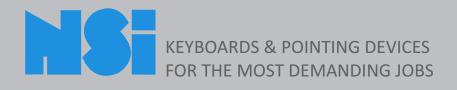


Common to all 3 switches

### **OPTIONAL LEAD ASSEMBLIES**

Standard Lead assemblies for connection to the X50 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



### **CONFIGURATION**

The X50 trackball provides features that may be selected using the DIP switch located on the printed circuit board. This table details 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	Not used	N/A	N/A
4	Not used	N/A	N/A
5	Not used	N/A	N/A
6	Factory setting	N/A	N/A
7	Not used	N/A	N/A
8	Not used	N/A	N/A
3		1 -7	1

Factory default setting: All DIP switches OFF

### DIP Switch Functions PS/2 - USB 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	VX3 - Virtual 3 Axis Function	Feature disabled	Feature enabled
4	Smart Feature	Feature disabled	Feature enabled
5	Tracking mode	Ballistic tracking	Linear tracking
6	Factory setting	N/A	N/A
7	Factory setting	N/A	N/A
8	N/A	N/A	N/A

Factory default setting: All DIP switches OFF

#### Orientation

The orientation function allows the user to mount the X50 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 trackball orientation can be selected to accommodate customer requirements for connector location and wiring.

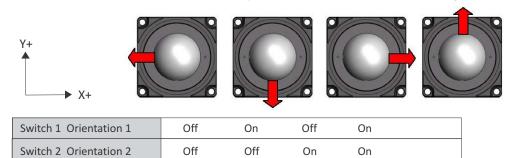


Figure.1 Mounting Orientations



#### **CONFIGURATION**

#### VX3™

VX3 is patent protected facility that provides the same 2 modes of functionality as a scroll wheel on a 3-axis mouse.

#### Operation:

Press middle button once to latch scroll mode one (e.g. dynamic pan feature);

Press middle button again to latch scroll mode two (e.g. 3<sup>rd</sup> axis zoom feature);

Further middle button presses toggles between scroll mode one and scroll mode two;

Press either left or right buttons to cancel feature and resume normal X-Y cursor operation

#### **Smart Switch**

A patent protected button latch facility.

#### Operation:

Press right button for 3 seconds or more to enable;

Once enabled, pressing any button for approximately 1 second latches that button on;

Press any button momentarily to de-latch;

Disabled with a further press of the right button for 3 seconds or more;

#### **Tracking Mode**

Ballistic Tracking: Intuitive tracking algorithm to provide increased cursor resolution when tracking fast whilst retaining the original resolution for tracking accurately at slow speeds.

Linear Tracking: No tracking algorithm. 1200 counts per ball revolution maintained at all tracking speeds.

### **ORDER INFO**

OUTPUT	DAMPER RING	PTFE SEAL
Quadrature	X50-70021D	X50-70023D
PS/2 & USB	X50-76021D	X50-76023D

# **MANUFACTURER**

Cursor Controls Ltd, Brunel Drive, Newark, U.K

Tel: ++44 (0) 1636 615600 Fax: ++44 (0) 1636 615601

Website: www.cursorcontrols.com E-mail: sales@cursorcontrols.com



**EUROPEAN SALES & SERVICE CENTER** 

NSI bvba, Haakstraat 1A, B-3740 Bilzen, Belgium Tel.: +32 89 51 90 00

Fax: +32 89 91 90 09 Website: www.nsi-be.com E-mail: info@nsi-be.com

