



- 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

19 MM OPTICAL OEM TRACKBALLMODULE

Utilizing the latest and most advanced laser optical tracking technology, the X19 Series laser optical 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 X19 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.

GENERAL TECHNICAL SPECIFICATIONS

Mechanical

Weight	30 grams
Ball	Epoxy Resin, 19 mm
Tracking Force	10 grams Nominal - damper ring 20 - 40 grams - rubber seal
Ball Load	100N Maximum downward pressure (10 Kg) for 2 mins.
Ball Rotation	Continuous and reversible any direction
Resolvable Ball Speed	30 Inches/sec.
Housing Material	Polycarbonate (Lexan®LS2 lens grade) / ABS
Tracking engine	Laser navigation Technology (solid state sensing)
Mounting Position	All angles (Dependant on top plate arrangement)
Sealing gasket	Cellular silicone

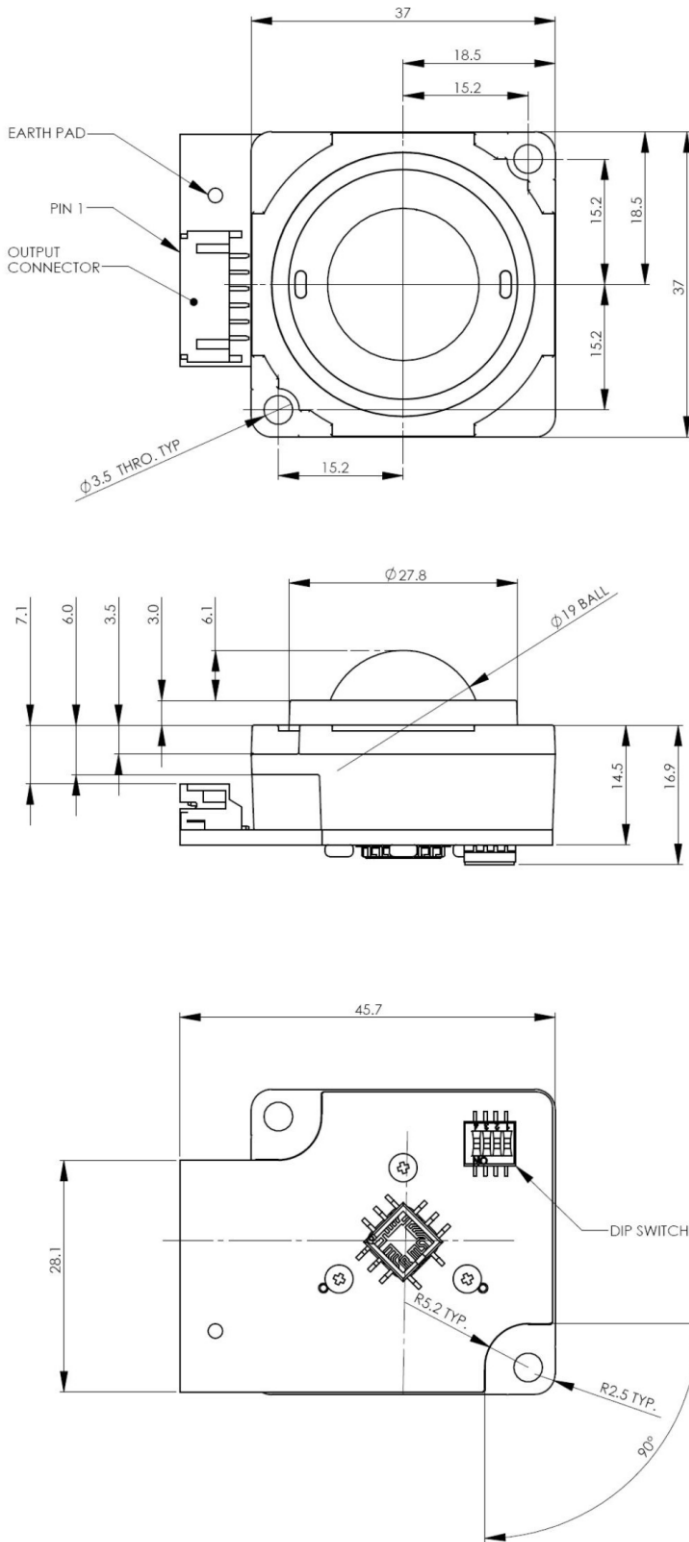
Electrical

Supply voltage	4.4V to 5.25V D.C.
Supply current	12mA typical, 25mA maximum
Resolution	425 counts per ball revolution @ 1 IPS (inches per second) +/- 10%
Output connector	6 Way JST, right-angled header, part no. S6B-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	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)
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 100,000 hours (MIL-STD-217F)
ESD	15kV air-discharge and 8kV contact discharge (IEC 61000-4-2)
EMC	Radiated immunity - limits according to level 2 of IEC 61000-4-3. Radiated emissions to EN55022 class B
Sealing capability	IP68 (BS EN 60529)

DIMENSIONAL DRAWING



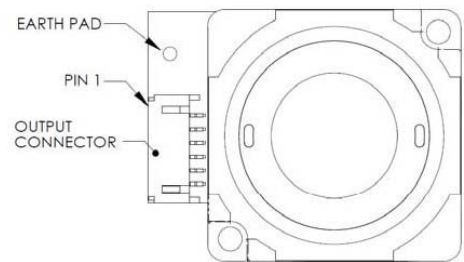
Dimensional drawing specifies factory default orientation.

All dimensions are in mm unless otherwise stated.

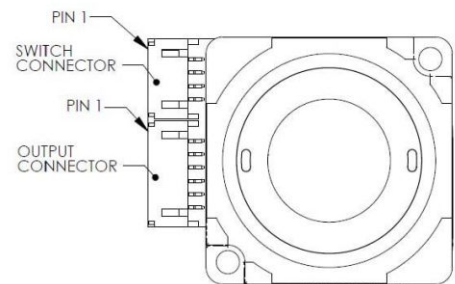
Tolerances +/- 0.2mm unless otherwise stated

Please note that an IGES model is available on request. Please contact your local sales office for more information.

Quadrature output



PS/2 & USB output



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: 6 Way JST, right-angled header.

Pin Number	Quadrature
1	X1
2	X2
3	+5V
4	Y1
5	Y2
6	0V

General connector details (for all connectors)

Manufacturer: JST (or equivalent)
Part No: S6B-PH-SM4-TB
Mating connector: PH, CR or KR types (e.g. PHR-6)

CONNECTION DETAILS PS/2 - USB OUTPUT

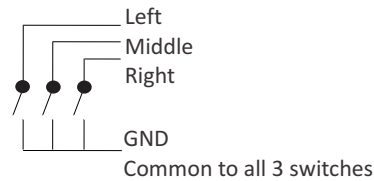
Output Connector : P1
6 Way JST, right-angled header.

Pin Number	PS/2 & USB
1	EARTH
2	-
3	5V D.C
4	PS/2 Data, D-
5	PS/2 Clock, D+
6	0V

Switch Input Connector : P2
4-way JST, right-angled header.

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

Switch Schematic



CONFIGURATION

The X19 Series 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

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	Factory setting	Switch must be set in the OFF Position	
4	Factory setting	Switch must be set in the OFF Position	
5	Factory setting	Switch must be set in the OFF Position	
6	Factory setting	Switch must be set in the OFF Position	

DIP Switch Functions PS/2 & USB

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 3rd Axis Function	Feature Disabled	Feature Enabled
4	Tracking Mode	Ballistic	Linear (1:1)
5	Factory setting	Switch must be set in the OFF Position	
6	Factory setting	Switch must be set in the OFF Position	

Factory default setting: All DIP switches OFF

ORIENTATION

The orientation function allows the user to mount the X19 Series 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.

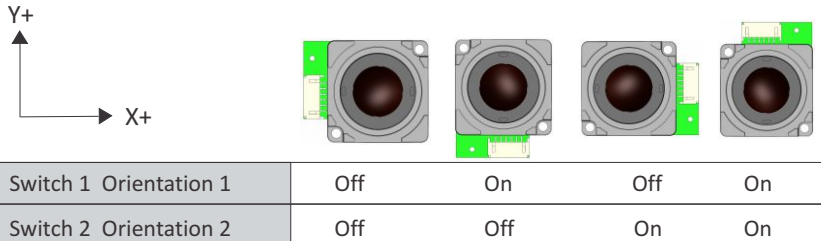


Figure.1 Mounting Orientations

VX3 (for PS/2, USB output)

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. 3rd 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

TRACKING MODE (for PS/2, USB output)

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. 425 counts per ball revolution maintained at all tracking speeds.

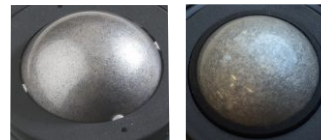
OPTIONAL LEAD ASSEMBLIES

Standard Lead assemblies for connection to the X19 unit are available. Other lead assemblies can also be supplied to customer specifications.

Part Number	Leads / Adapters	Description
OC6006160	Output cable PS/2	1,6 m shielded cable with 6 pin mini DIN plug
OC5006160	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
IC060635	Interconnection	Interconnection cable, 35 cm long

ORDER INFO

OUTPUT	DAMPER RING	RUBBER SEAL
Quadrature	X19-70021D-K	X19-70022D-K
PS/2 & USB	X19-76021D-K	X19-76022D-K



damper ring

rubber seal

Please add corresponding output cable to the X19 trackball module
see page 3

MANUFACTURER

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