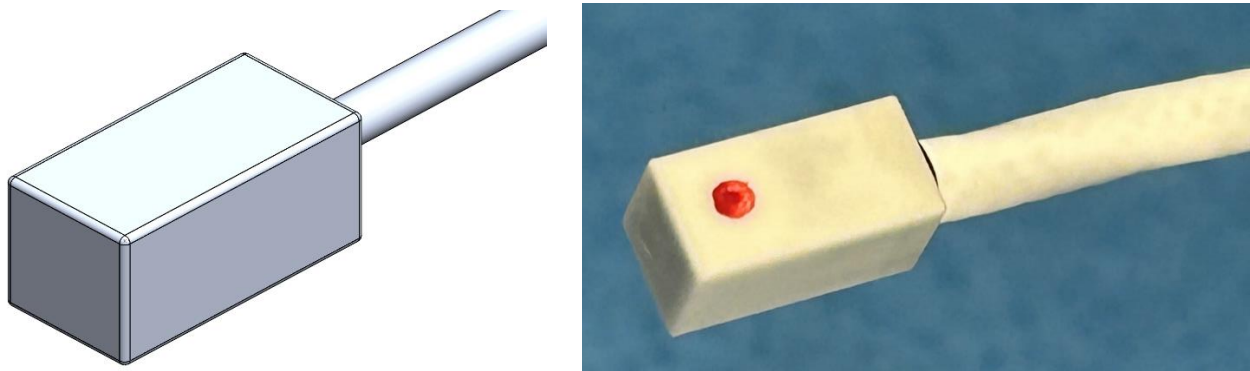


**Datasheet:****Standard (prismatic) 3-axis Hall probe for the SENIS K3A Cryogenic low-noise analog magnetic field transducers****DESCRIPTION:**

The SENIS prismatic-shaped Hall probe is a compact and robust 3-axis cryogenic Hall probe that can measure the amplitude and direction of magnetic fields at cryogenic temperatures down to about 1 K.

External dimensions of the probe are 9.0 x 4.5 x 4.5 mm.

With the three Hall sensors arranged in a cube, this probe also features the world's smallest 3D (B<sub>x</sub>, B<sub>y</sub>, B<sub>z</sub>) magnetic field sensitive volume of < 0.6 mm<sup>3</sup>.



**Figure 1:** Standard SENIS prismatic-shaped 3D cryogenic Hall probe. Red point denotes the upper surface of the probe.

The cryogenic Hall probe integrates three high-resolution discrete Hall sensors with very good angular accuracy of the three measurement axes of the probe (orthogonality error is less than 2°).

The housing is made of a printed alumina-ceramic (Al<sub>2</sub>O<sub>3</sub>) part, which improves overall mechanical and electrical robustness of the probe.

The Hall probe is connected via a flexible shielded cable (OD < 2 mm) to an electronic box, which provides power to the Hall probe by using the spinning-current technique, which reduces the offsets, low-frequency noise and the planar Hall effect.

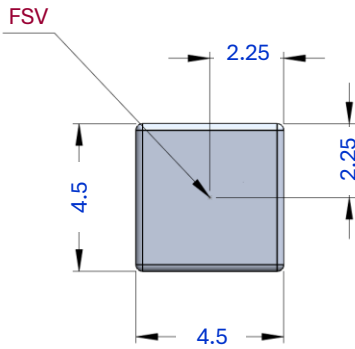
The additional conditioning of the Hall probe output signals in the electronic box includes Hall signal amplification and limitation of the frequency bandwidth..

**Key features of the Hall probe:**

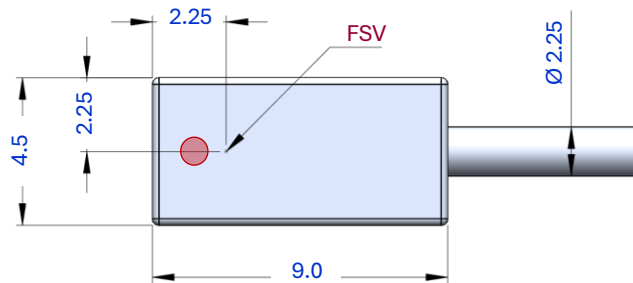
- Very compact and robust cylindrical-shaped Hall probe made of a printed alumina ceramic (Al<sub>2</sub>O<sub>3</sub>)
- 3-axis (B<sub>x</sub>, B<sub>y</sub>, B<sub>z</sub>) Hall probe based on three discrete Hall sensors
- Smallest overall effective 3D (B<sub>x</sub>, B<sub>y</sub>, B<sub>z</sub>) magnetic field sensitive volume: < 0.6 mm<sup>3</sup> (1.5 x 1.3 x 0.3 mm<sup>3</sup>)
- Very low noise and offset fluctuations
- Very good angular accuracy: mutual orthogonality error of the three measurement axes is < ±2°
- Virtually no planar Hall Effect
- Negligible inductive loops on the Probe, etc.

**H-Module (Hall probe & cable) - Mechanical specifications:**

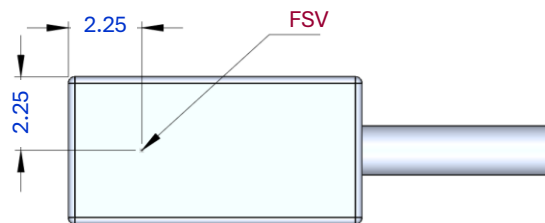
FRONT side view:



TOP side view:

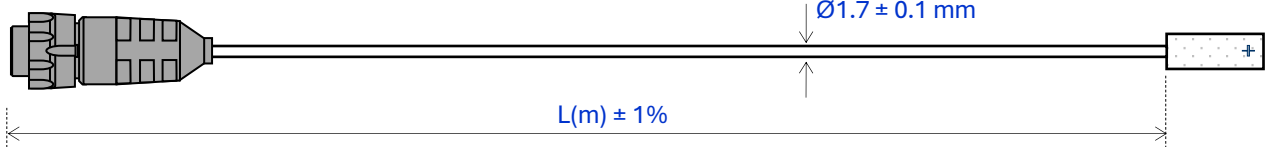


LEFT side view:

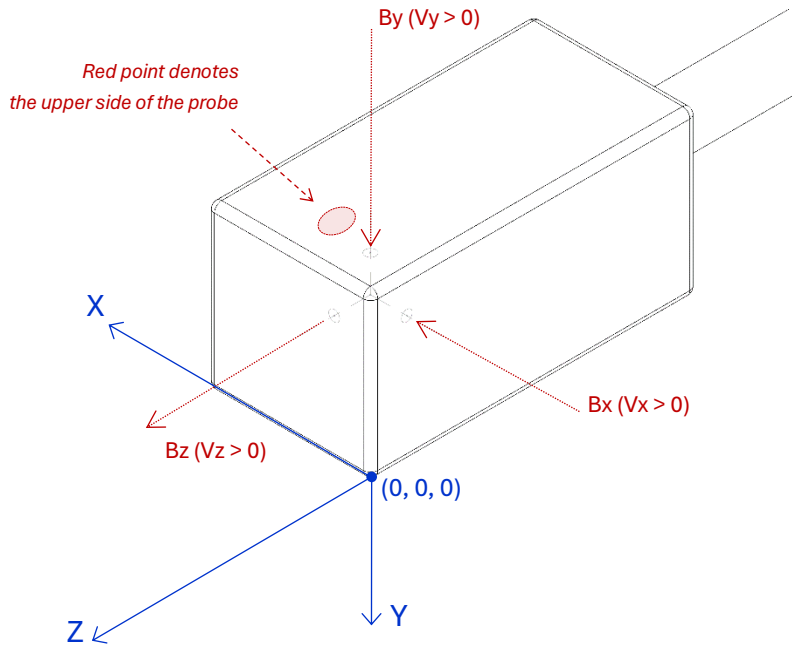


Hall Probe Connector:

Switchcraft 18P MALE CORD



**Figure 2:** Dimensions of the prismatic-shaped 3-axis cryogenic Hall probe and cable. Standard lengths (L) of the probe cable are 2m and 5m. Different lengths are available on a request.



**Figure 3:** Reference Cartesian coordinate system (X, Y, Z) of the prismatic-shaped 3-axis cryogenic Hall probe. The origin (0, 0, 0) is located at the intersection of the coordinate planes XY, YZ and XZ of the defined coordinate system. Red point denotes the upper side of the probe.

Hall probe Specifications:				
Dimensions		X (mm)	Y (mm)	Z (mm)
Magnetic field sensitive volume (MFSV)		each Hall sensor: 300 µm(OD) x 1 µm		
Position of the FSV centre of X-sensor	<i>Relative to the defined Cartesian coordinate system of the probe (Fig. 3)</i>	1.58 ± 0.10	-1.92 ± 0.10	-2.58 ± 0.10
Position of the FSV centre of Y-sensor		2.58 ± 0.10	-2.92 ± 0.10	-2.58 ± 0.10
Position of the FSV centre of Z-sensor		2.58 ± 0.10	-1.92 ± 0.10	-1.58 ± 0.10
External dimensions of the probe		4.50 ± 0.05	4.50 ± 0.05	9.00 ± 0.05
Positioning accuracy:				
Mutual orthogonality between the measurement axes		< ±2°		
Cable properties:				
Conductor:		Silver plated soft copper core, 7 x 44 AWG		
Insulation:		PFA (Perfluoro Alkoxy), diameter 0.30 mm		
Diameter (OD):		1.7 ± 0.1 mm		
Minimum bending radius:		15 x OD		
Shield:		Silver plated soft copper braid		
Jacket:		PFA (Perfluoroalkoxy)		
Service temperature:		(-196, +200) °C		
Linear resistance:		1.4 Ω/m		
Rated voltage:		150 Vac		
RoHS compliance:		Yes		
Hall probe connector:		Standard circular connector Switchcraft EN3C18M26X, 18-pins		