

DESCRIPTION:

The SENIS Hall Probe **I3C-03D** is high-resolution and very robust single-chip integrated 3-axis Hall-Probe.

The Probe contains a CMOS integrated circuit, which incorporates three groups of mutually orthogonal Hall elements and a temperature sensor. The integrated Hall elements occupy very small area (100 x 100 μm), which provides very high spatial resolution of the probe.

The sensor chip is embedded in the probe package and connected to the CaH cable, which makes this probe both mechanically and electrically very robust. The chip is glued onto a reference ceramic plate suitable for an appropriate fixing of the probe.

The outputs of the Hall Probe are high-level analog voltages proportional to the three components (Bx, By, and Bz) of a magnetic flux density and a voltage proportional with the probe temperature.

KEY FEATURES:

- **Very small and robust Hall Probe: the silicon chip is encapsulated into a ceramic package (ext. dim. 8.0 x 4.0 x 0.9 mm), allowing for an appropriate fixing of the probe**
- **High operating temperature of the Hall probe and cable (up to +155°C)**
- **Integrated CMOS 3-axis Hall Probe (Bx, By, Bz), of which one, two or three channels are used**
- **Very high spatial resolution: 100 x 10 x 100 μm^3**
- **High angular accuracy (orthogonality error less than 0.1° after calibration)**
- **Virtually no planar Hall Effect**
- **Negligible inductive loops on the Probe**
- **Integrated temperature sensor on the probe for temperature compensation**
- **The Hall Probe 03D is consisting part (Module H) of the SENIS I3C Analog Magnetic Transducer, Digital Teslameter 3MH5B and Magnetic Field Mapper**



Figure 1. **SENIS Integrated 3-Axis Hall probe 03D**

PROBE AND CABLE DIMENSIONS AND CHARACTERISTICS

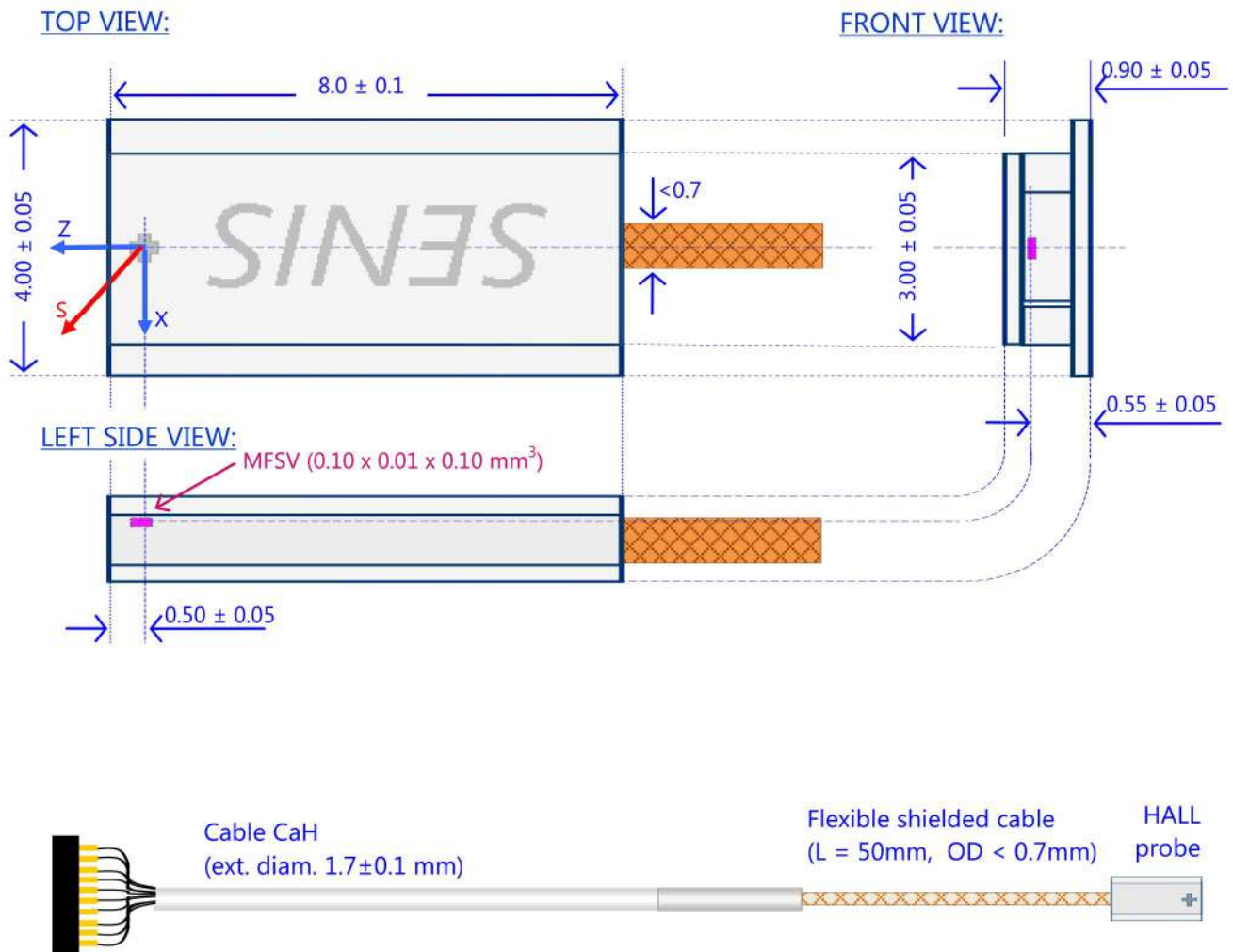


Figure 2. Dimensions of the I3C-03D Hall probe and Cable CaH (Module H). All measures are given in millimetres.

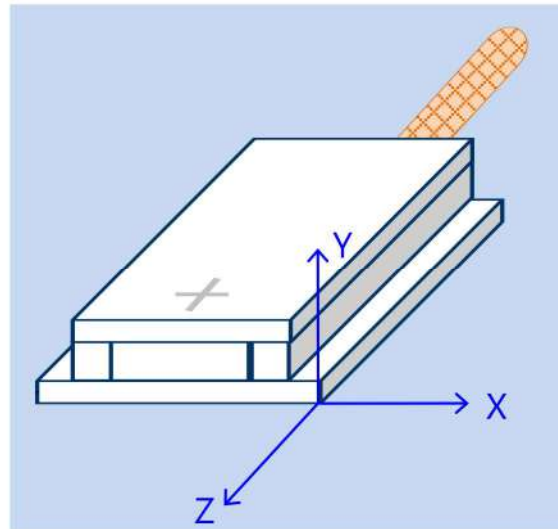


Figure 3. Reference Cartesian coordinate system of the integrated I3C-03D Hall probe

Dimension	X [mm]	Y [mm]	Z [mm]
Magnetic field sensitive volume (MFSV)	0.10	0.01	0.10
Position of the center of MFSV (see Figures 2 and 3)	-2.0 ±0.1	0.55 ±0.05	-0.50 ±0.05
Total Probe external dimensions	4.0 ±0.05	0.90 ±0.05	8.0 ±0.1
Angular accuracy of the axes	< ±2° with respect to the reference surface better than ±0.1° after calibration		
CaH Cable (construction and characteristics)	Thin Cable:	Copper braided flexible cable, ext. diameter < 0.7 mm	
	Conductor:	Silver plated soft copper core, 7 x 44 AWG	
	Insulation:	PFA (Perfluoro Alkoxy), diameter ≈ 0.3 mm	
	Twisting:	15 x Diameter	
	Shield:	Silver plated soft copper braid	
	Jacket:	PFA (Perfluoro Alkoxy)	
	Service temp.:	-196 / +200 °C	
	Linear resistance:	1.4 Ω/m	
	Rated voltage:	150 Vac	
	RoHS compliance:	Yes	
Total length of the CaH cable:	- Standard: 2 m (Probe notation: I3C-03D02) - Optional: XX m (Probe notation: I3C-03DXX) NOTE: Various cable lengths are available upon request.		

INSTALLATION MANUAL FOR THE 03D HALL PROBE

Although the 03D probe is very robust with respect to its size, it should be handled with special care. Considering that we deal with a high-precision device of very small dimensions, following precautions should help to avoid damage to the probe during installation and handling, and ensure that the device's accurate calibration remains preserved:

- The Hall Probe is sensitive to Electrostatic Discharge (ESD). Be sure to ground yourself and follow proper procedure when handling the Hall probe.
- **Always disconnect powering of the Electronic module before plugging/unplugging the Hall probe!**
- The mounting of the Probe should be carried out by application of very low pressure to its head and particularly on the thin cable.
- Do not apply more force than required to hold the probe in its place. Damage to either the ceramics package of the Hall sensor or thin wiring could destroy the Probe. We strongly suggest storing the probe in its protective case when not in use.



**NOTE: The Probe tip is fragile!
Please handle it with a special care.**

- If the probe head is clamped, the user needs to make sure that the environment surface in contact with the reference plane of the probe is flat and covers as much of the probe reference surface as possible (see image below). Do not apply more force than required to hold the probe in its mounting.



Do not push / pull the probe cable while the probe head is fixed!!!

Do not press and do not sharply bend the thin cable!

Do not expose the probe head to any liquid or gas material!

- In order to prevent rupture of the thin probe wiring, the user should fix and secure the probe cable in the proximity of the head. The thin wires of the **flexible section** of the probe need to be folded with a special care. Any repetition sharp bending must be strongly avoided.
- Avoid any high pressure and bending of the **transient section** between the thin and thick Probe cables.
- Avoid the immersion of the probe of any liquid, and its exposure to moisture and aggressive gasses.
- Although the Hall probe is operable even on the higher temperatures (up to +155°C), it is strongly recommendable to avoid its exposing to rapid temperature changes!