

SENIS's 3H05x2x42-02 is a very thin and long 3-Axis Hall-Probe System. The core of the device is a CMOS integrated circuit, which contains Hall elements, biasing circuits, amplifiers, and a temperature sensor. The probe gives a high-level analogue voltage output for each of the three components of the measured magnetic flux density, and for the chip temperature.

## Key Features of the 3H05x2x42-02 Probe System

The unique advantages of the probe include:

- Thickness: 0.5 mm; length: 42 mm;
- Measurement of all three magnetic field components with a high angular accuracy and high spatial resolution;
- Virtually no planar Hall Effect;
- Negligible inductive loops, and
- The probe provides a temperature signal for an efficient compensation of temperature effects.

The 3H05x2x42-02 Hall probe is available as a *Module H* of a SENIS's Magnetic Transducer (see Transducer data-sheet).

The 3H05x2x42-02 is also available as a separate unit for OEM customers.

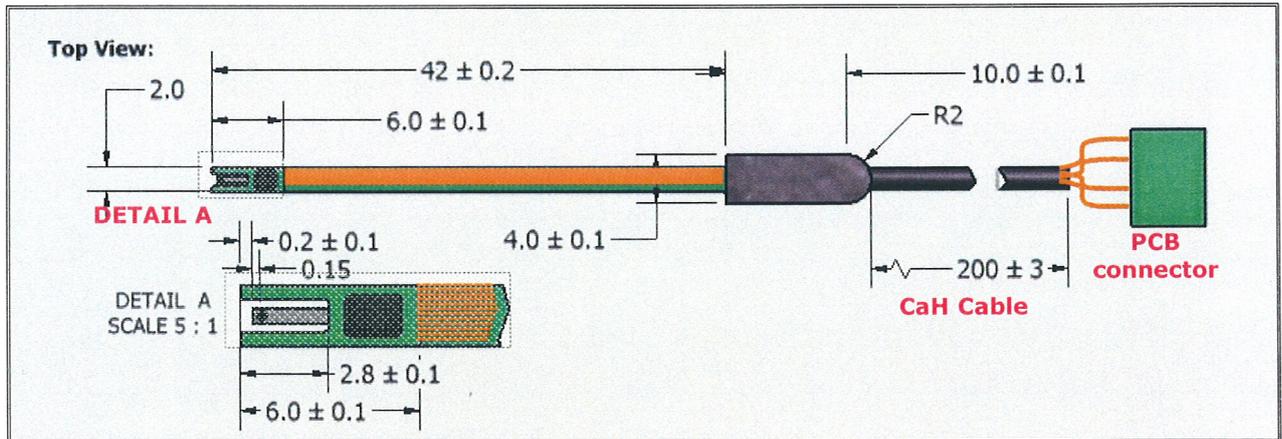


Figure 1: Dimensions of the SENIS's 3H05x2x42-02 Hall probe (Top view). All measures are in [mm]. Field sensitive point (FSP) is marked with the cross on Detail view. The tolerances:  $\pm 0.1$ mm.

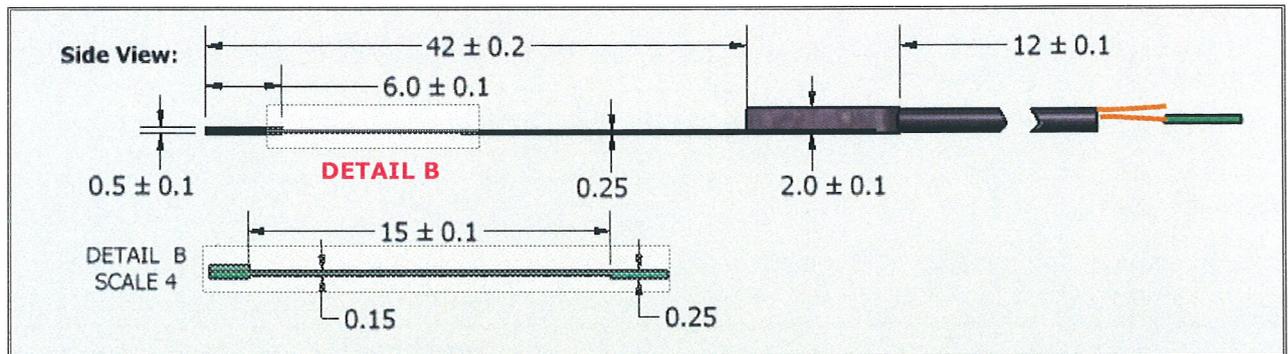


Figure 2: Dimensions of the SENIS's 3H05x2x42-02 Hall probe (Side view). All measures are in [mm].

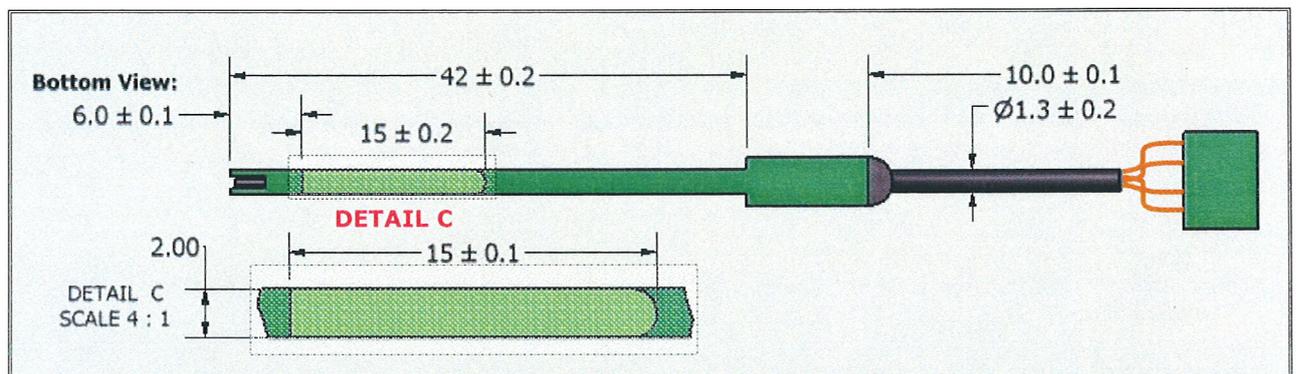
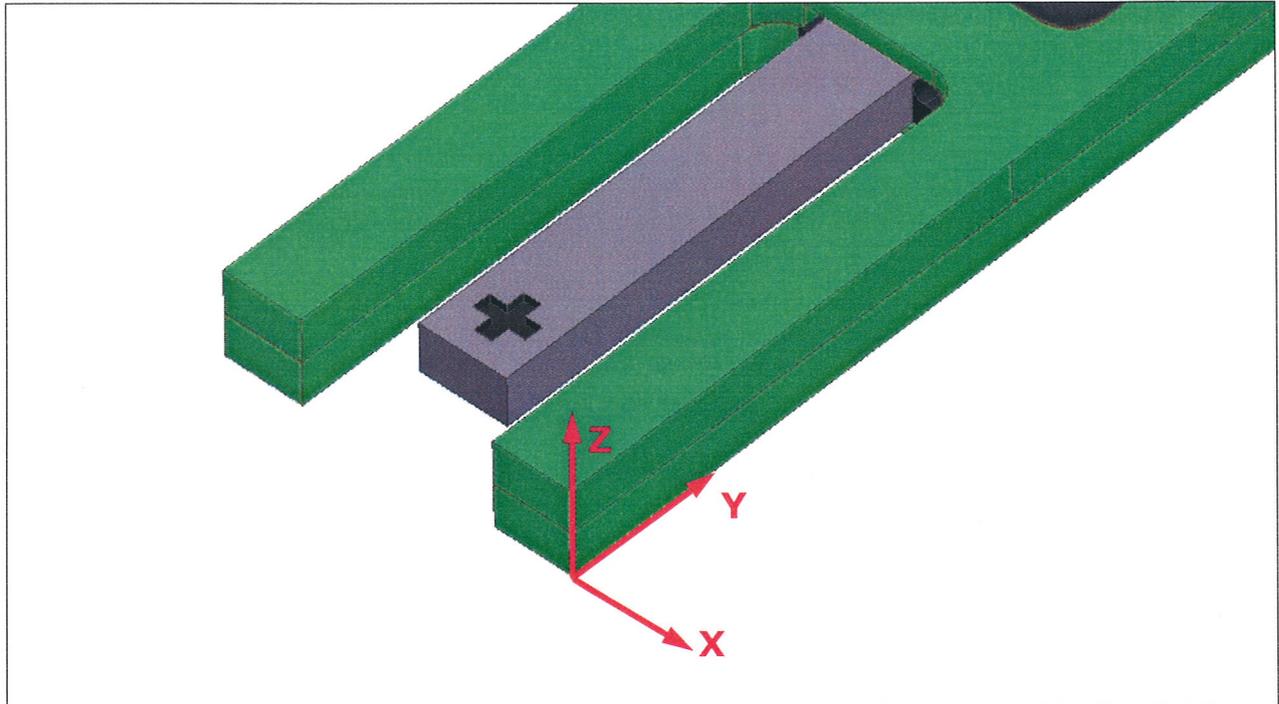


Figure 3: Dimensions of the SENIS's 3H05x2x42-02 Hall probe (Bottom view). All measures are in [mm].



**Figure 4:** The reference Cartesian coordinate system of the SENIS's 3H05x2x42-02 Hall probe.

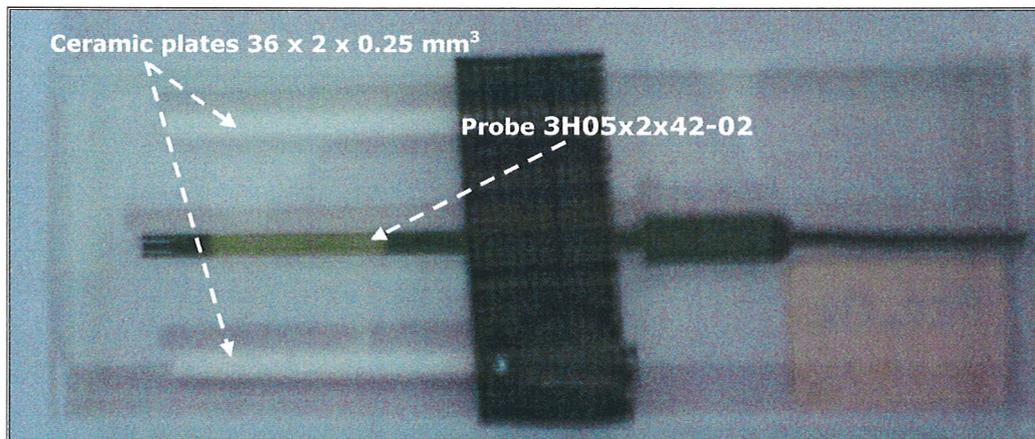
Probe Dimensions & Characteristics			
Dimension	X [mm]	Y [mm]	Z [mm]
Field sensitive volume (FSV)	0.15	0.15	0.01
Position of the center of FSV (corresponding to FSP, see Fig.1)	-1.0 ± 0.1	0.35 ± 0.1	0.35 ± 0.05
Total Probe external dimensions	<ul style="list-style-type: none"> <li>• 2.0 - Longer, thinner part</li> <li>• 4.0 - Shorter, thicker part of the probe</li> </ul>	<ul style="list-style-type: none"> <li>• 42.0 - Longer, thinner part</li> <li>• 12.0 - Shorter, thicker part of the probe</li> </ul>	<ul style="list-style-type: none"> <li>• 0.5 - Probe head</li> <li>• 0.15/0.25 - Longer, thinner part</li> <li>• 2.0 - Shorter, thicker part of the probe</li> </ul>
Angular accuracy of the axes	± 0.5° with respect to the reference surface		
CaH Cable	Shielded, with a flexible thin part near the probe		
Total length of the CaH cable:	<ul style="list-style-type: none"> <li>• Standard: <b>0.2</b> m (Probe notation: 3H05x2x42-02)</li> <li>• Optional: <b>X.X</b> m (Probe notation: 3H05x2x42-xx)</li> </ul> <p><b>Note: Various lengths are available upon request.</b></p>		

## Application Manual for the Probe 3H05x2x42-02

### Warning: the Probe Tip is Fragile!

In order to achieve the small thickness of the probe, a part of the sensor chip is left non-encapsulated. The sensor chip is a 0.3mm thick bar of mono-crystalline silicon, and can be easily broken. Therefore, avoid any mechanical contact of the probe chip with other objects! Moreover, avoid the immersion of the probe of any liquid, and its exposure to moisture and aggressive gasses.

**The probe is delivered to OEM customers in a very thin and flexible form (see Details B and C on Fig. 2 & 3, respectively); so during a calibration, the customer may fold the probe so that it fits into a gap smaller than 10mm. After the calibration, the customer may glue on the probe a rigid part (an appropriate dimensioned ceramic plate, which will be also delivered with the probe (see picture below) and make the probe stiff.**



**Figure 5: The 3H05x2x42-02 and two ceramic plates into the same plastic package**

The following precautions shall help ensure that the transducer accurate calibration remains preserved:

The mounting of the probe should be carried out by application of very low pressure to its back-end and thin wires. If the probe head is clamped, the user should make sure that the substrate surface in contact with the reference plane of the probe is flat and covers as much of the probe reference surface as possible. Do not apply more force than required to hold the probe in its place.

**In order to prevent rupture of the thin wires from the probe head, the user should fix and secure the probe cable in the proximity of the probe. The thin wires of the flexible section of the cable may be folded with care; repeated strong bending should be avoided.**