

DESCRIPTION:

The MPA chassis is utilized for multi-probe SENIS Magnetic Field-to-Voltage Transducer system with any of SENIS Hall Probes.

TYPICAL APPLICATIONS:

- Characterization and quality control of permanent magnets
- Development of magnet systems
- Mapping magnetic field
- Quality control and monitoring of magnet systems (generators, motors, etc.)
- Application in laboratories and in production lines, etc.



Figure 1: 10-channels MPA chassis for Multi-Probe Magnetic Field Transducer System

SYSTEM STRUCTURE:

The multi-probe magnetic transducer system consists of:

- (a) Signal Processing Electronics modules, with
- (b) Power Supply Unit (PSU), and
- (c) detachable 3-Axis Hall Probes (for Hall Probes selection, please see Hall Probes Sections at www.senis.ch)
- (d) MPA chassis

The Items (a) and (b) are assembled into the aluminum Card Frames and they are integrated into a common 84HP rack (height 3U) enclosure.

- FRONT PANEL:



Figure 2: **The FRONT panel view**

The Signal Processing Electronic modules:

- ① On the lower part of each of ten Electronics AI-boxes there is a panel mounted DIN SFV81 8-pins MALE connector (to match the corresponding Hall Probe);
- ② On the upper side there is a panel mounted DIN KVV81 8-pins FEMALE connector (for the corrected analogue output signals X, Y and Z, as well as for the probe temperature signal). The default range of the real-time corrected differential voltage outputs is $\pm 10V$, which equals to linear $\pm 2T$ measurement range.

The Power Supply unit:

- ③ Power switch controls power to the system (ON/OFF).
- ④ LED indicator highlights when the system is ON, and otherwise.

- REAR PANEL:



Figure 3: **The REAR panel view**

- ⑤ The AC power input (220-240V, 50Hz / 100-120V, 60Hz), and fuse assembly is the primary entry and control point for AC power to the unit.
- ⑥ Fan (ventilator).

HALL PROBES:



Figure 4: Hall Probe connected to the multi-probe system

The multi-probe system includes the standard SENIS Hall Probes, detachable to the Electronic modules, with DIN KV81 8-pins connectors. Each Probe is adjusted relative to the corresponding Electronic processing unit; therefore the Hall Probes are not interchangeable!

Mechanical Specifications:

Part	Description & Size:
The MPA Enclosure	Case, 3U, 84HP Enclosure Material: Aluminum Cabinet Style: Desktop External Dimensions: Height: 132 mm Width: 447 mm Depth: 315 mm
Signal Processing Electronics Modules	Card frame, 3U, 7HP (detachable from the MPA enclosure) Enclosure Material: Aluminum External Dimensions: Height: 129 mm Width: 35 mm Depth: 167 mm
Power Supply Unit (PSU)	Card frame, 3U, 14HP (not detachable from the MPA enclosure) Enclosure Material: Aluminium External Dimensions: Height: 129 mm Width: 70 mm Depth: 167 mm

Connections:

AC Power Input	<p><u>REAR PANEL:</u> A 3-conductor power inlet (with a proper line fuse) on the rear panel for the AC powering. The line cord connects to the power line jack. Line voltage is present across the outer two conductors, and the center conductor is a safety ground. The fuse holder is integrated into the mains. It contains two 5 x 20 mm T fuses. The interior fuse is the active one, and the exterior fuse is the spare one. The proper fuse values are:</p> <ul style="list-style-type: none"> ▪ 0.25 Amps (T) for 220-240 Vac / 50Hz, ▪ 0.50 Amps (T) for 100-120 Vac / 60Hz powering system. <p><u>FRONT PANEL:</u> The ON/OFF Switch that controls the power to the unit. The LED indicates the powering ON/OFF of the system.</p>										
The Hall Probe connector	<p><u>FRONT PANEL:</u> DIN SFV81 8-pins connector (MALE, panel mounted) (mating plug KV81)</p>										
The Analogue Output Signals connector	<p><u>FRONT PANEL:</u> DIN KVF81 8-pins connector (FEMALE, panel mounted) (mating plug SV81):</p> <table border="0" style="margin-left: 20px;"> <tr> <td>Field signal X+, X-</td> <td>Pins 1 and 6, respectively</td> </tr> <tr> <td>Field signal Y+, Y-</td> <td>Pins 5 and 4, respectively</td> </tr> <tr> <td>Field signal Z+, Z-</td> <td>Pins 3 and 7, respectively</td> </tr> <tr> <td>Temperature signal</td> <td>Pin 2</td> </tr> <tr> <td>Signal common GND</td> <td>Pin 8</td> </tr> </table>	Field signal X+, X-	Pins 1 and 6, respectively	Field signal Y+, Y-	Pins 5 and 4, respectively	Field signal Z+, Z-	Pins 3 and 7, respectively	Temperature signal	Pin 2	Signal common GND	Pin 8
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Signal common GND	Pin 8										
Power Requirements:	AC input, 220-240V/50Hz or 100-120V/60Hz; 40 VA max										
Total System Weight:	11.5 kg (including the Hall Probes)										

Environmental Parameters:

Operating Temperature	Hall Probe: +5°C to +85°C Electronics: -20°C to +50°C
Storage Temperature	-20°C to +85°C
Electromagnetic	Compliant to standard norms Documentation available upon request

INSTALLING THE MPA SYSTEM

1. CONNECTING THE HALL PROBE

SENIS Hall probes are built to be as robust as possible for a small, precision device. However, it is most important that certain precautions be taken when handling and installing probes so that they are not damaged or destroyed, and to preserve their accurate calibration.

Your multi-probe system may be used only with the SENIS' Hall probes. Each Hall probe is in-factory calibrated relative to its Electronic module; therefore, the probes cannot be exchanged between the Electronics.

In order to obtain specified performance, make sure that the each Hall probe (labeled with a corresponding Serial Number) is connected properly to its Electronics module (also labeled by the same Serial Number).

Mount the Probe head so that there is no pressure that will tend to bend or depress its ceramic rear surface. 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. Do not apply more force than required to hold the probe in its mounting. Any strain on the ceramic will alter the probe's calibration, and excessive force will destroy the Hall element inside.

When the probe head is mounted, the cable should be clamped firmly nearby so it cannot be torn away from the probe head if accidentally pulled. The flexible section adjacent to the probe head can be carefully folded to allow the cable to come away in any direction, but avoid repeated flexing of this section.

Keep the cable out of the way of foot traffic. Do not pinch the cable, or drop sharp or heavy objects on it. A severed cable cannot be re-joined without altering the probe's performance, and requires factory repair and re-calibration.

The first ensure that the system is not powered. If so, carefully plug the Probe connector (female 8-pins DIN KVF81) to the corresponding male 8-pins DIN SV81 connector on the electronics' front panel. Ensuring that its pins engage correctly, tighten the metal ring of the probe connector. Do not leave these loose as they form part of the shielding system around the transducer.

Always disconnect power from the Signal conditioner before connecting or disconnecting the probe!

2. THE AC LINE INPUT CONNECTION

The MPA chassis is equipped with a 3-conductor power line jack (with a proper line fuse) on the rear panel for the AC powering. Line voltage is present across the outer two conductors, and the center one is a safety ground. The safety ground attaches to the instrument chassis and protects the user in case of a component failure.

The first check if the line voltage is properly selected. Ensure that there is no power. If so, check the outlet and the connection at both ends of the power cord. Next check the fuse. Remove line cord, and then place a small slotted screwdriver in the slot of the small door at the rear of the unit to access the fuse. For 100/120 V operation, the fuse rating is 0.5 A, and the fuse type is 5x20mm T. For 220/240 V operation, the fuse rating is 0.25 A, and the fuse type is 5x20 mm T. Test the fuse with ohmmeter. Do not rely only on visual inspection of the fuse.

Always plug the power cord into a properly grounded receptacle to ensure safe operation of the instrument.

The power switch is a part of the line input assembly on the front panel of the MCSC and turns line power to the instrument ON and OFF. When the switch is down, power is OFF. When the switch is up, power is ON.

3. ANALOG OUTPUTS

The corrected analogue voltage signals of each Hall probe are available at the 8-pins DIN connector KVF81, mounted on the upper side on the front panel of the corresponding transducer.

4. GROUNDING and SHIELDING

All the parts of the MPA chassis metal enclosure are connected together on a manner to form a compact electric shield around the electronics inside. When the probe connector is plugged into the MPA chassis and the connector's metal ring is properly tightened, the probe connector case and the MPA's case are connected together and form an integral shield around the circuitries inside. The cable shield is added to the case shield and extends protection from electrical interference almost up to the probe head. Because there is an internal connection between the electronics common (ground) and the probe connector case, when the probe connector is engaged the inside circuits' common will be connected to the case.

The shielding provided with the above arrangement should be sufficient protection against EMI in most cases.

For electrical safety, the MPA chassis metal case is grounded through the third wire (safety ground) of the AC power input cord.