

**Operating Instruction: SG-Portable Measuring Device** **Type GM 77****Brief Description:**

The GM 77 is a portable measuring system with a well-readable 4¹/₂-digit LCD display.

It is designed for passive sensors with a sensibility of 0,35 – 3,5mV/V.

It is particularly suitable for mobile application through economic accumulators or rather battery operation. However, it can also be operated with an optional mains adapter, which can charge the accumulators at the same time.

Easy and fast calibration for sensors is warranted by the 2-point scaling through potentiometers, easy decimal point switching and the control activation at any time (if available in the sensor).

By special functions, such as peak-level-detector, signal reverse (+/-) and integrated accumulator charger, the GM 77 is multilaterally applicable.

Sensor Socket Connection: Type: 15pol. SUB-D HD (High Density)

Pin 1	Excitation -	Pin 11	Signal +
Pin 8	Excitation +	Pin 12	Signal -
Pin 10	Control	Pin 13	Shield

Mains Operation:

A mains adapter with stabilized 6VDC $\pm 2\%$ with min. 300mA must be used. By this, the accumulators will be charged, even if the GM 77 is switched off.

Mains adapter: 2,1mm female jack inside +6VDC outside 0V

Caution: During the mains operation, batteries must be removed from the device. Otherwise, the batteries and the device will be damaged!!

Battery/Accumulator Operation:

Battery operation: 4 x type: Micro AAA (LR03) with 1,5V.

Before mains operation, batteries have to be removed from the device!!

Accumulator operation: 4 x type: NiMH Micro AAA (LR03) with min. 600mAh and 1,2V. At mains operation the load time takes approx. 5-7h, whereby the charging current at empty accumulators is max. 200mA, then however sinks with increasing capacity, and switches to preservation charge (overload protection) with full accumulators.

Tension Supply:**LOW BATTERY**

If the permissible battery/accumulators voltage is falling below, LOW BATTERY begins to flash at the display.

Switch On/Off:**P/ON**

The device is switched on with the P/ON switch. It automatically switches off 10-15 minutes after the last activation of the P/ON switch.

Peak-Level-Detector:**P/ON**

The peak-level-detector and the appropriated LED is switched on by the P/ON switch. From this point, the highest occurred measurement value is displayed. The function will be switched off by pressing the switch again and reactivated by the same action.

**Signal Reverse Function:** +/-

The signal reverse function and the corresponding LED are switched on by the +/- switch. In order to determine the peak value, by this function a negative measured value is converted into a positive measured value through the peak-value-detector. Repeated pressing switches the function off.

Calibration Control: CAL

By this key, 100 % calibration control can be switched on in the sensor (if available, see data sheet of the sensor). Therewith, easy control of the system is possible. By pressing the key, the characteristic value of the sensor will be shown on the display.

Calibration to a Sensor:

Switch on device, connect sensor, signal reverse and peak-level-detector has to be switched off.

Determine sensor sensitivity (mV/V) and 100% value (e.g. 500Nm) and carry out the basic settings according to the table.

Relieve sensor and adjust the display to 0 by potentiometer zero.

Switch to control and keep the key pressed, or apply nominal load (100%), adjust 100% value (e.g. 500,0) by potentiometer amplification. Re-check zero point - finished.

If the GM 77 is delivered with a sensor, the sensor will be in-calibrated to the GM 77.

Pre-Settings for Sensitivity with S1 and S2

mV/V	100% display	S1	S2
0,35 – 1,0	1000	open	closed (ON)
0,9 – 1,8	1000	open	open
0,35 – 2,1	2000	open	closed (ON)
2,0 – 3,5	2000	open	open
0,35 – 0,55	5000	closed (ON)	closed (ON)
0,5 – 0,9	5000	closed (ON)	open
0,88 – 3,5	5000	open	closed (ON)
0,35 – 1,1	10000	closed (ON)	closed (ON)
1,0 – 1,82	10000	closed (ON)	open
1,75 – 3,5	10000	open	closed (ON)
0,35 – 2,2	19999	closed (ON)	closed (ON)
2,0 – 3,5	19999	closed (ON)	open

Decimal Point Settings with S3 and S4

S 3	S4	display
open	open	1888,8
closed (ON)	open	188,88
open	closed (ON)	18,888
closed (ON)	closed (ON)	18888

Calibration Example 1: with Calibration Control

Torque sensor 50Nm, 2mV/V.

Display at 100% = 50,00, in this case decimal point setting: S3 closed, S4 open.

Presetting for 5000 and 2mV/V, S1 is open and S2 is closed.

Then adjust zero-potentiometer = 0 at relieved sensor.

Press control and adjust 50,00 with amplification potentiometer.

Calibration Example 2: with Nominal Load(100%) and without Calibration Control

Force sensor 10N, 1mV/V.

Display at 100% = 10,000, in this case decimal point setting: S3 open, S4 closed.

Presetting for 10000 and 1mV/V, S1 and S2 is closed.

Then adjust with zero-potentiometer = 0 at unloaded sensor.

Apply nominal load(100%) and adjust 10,000 with amplification potentiometer.

Example 3 of Calibration: with e.g. 123kg Part Load and without Calibration

Force sensor 200kg, 1,6mV/V.

Display at 100% = 199,99, in this case decimal point setting: S3closed, S4open (high resolution).

Presetting for 19999 and 1,6 mV/V, S1 and S2 are closed.

200,0 so decimal point setting: S3 open, S4 open (can measure more than 200kg).

Presetting for 2000 and 1,6 mV/V S1 is open and S2 is closed.

Then adjust with zero-potentiometer = 0 at unloaded sensor.

Apply 123kg load and adjust 123,00 (123,0) with amplification potentiometer.





Safety Notes

General References

The enclosed operating instruction is intended for technically qualified personnel who has corresponding knowledge in the field of measurement and industrial process & control technology.

The precise information about all safety notes contained in this operation manual and warnings, as well as its perfect technical implementation are precondition for the safe installation, the initiation, the secure operation and the maintenance of **Lorenz Messtechnik** technology devices. For this purpose it is absolutely necessary that all measures are carried out by qualified personnel. All persons concerned with the project planning, installation and service of **Lorenz Messtechnik** devices, must be familiar to the security concepts in automatic control and should be qualified in this sense.

For clarity reasons, the enclosed operating instruction can not represent complete details in all conceivable cases of applications for the handling of **Lorenz Messtechnik** devices. Further, we cannot consider the entire types of installation, handling and maintenance. If you wish further information or if special problems occur, which were not, or not at length represented in this operating instruction, contact us, please.

The oblivion of the safety notes can and will lead to material damages, body injuries and death.

Lorenz Messtechnik devices may only be operated in accordance with the applications described in this operation manual. Built-in devices may only be operated in appropriate installations.

With the connection and the initiation of the device, the customer accepts the general sale and delivery conditions of **Lorenz Messtechnik**. Further, he accepts eventually incomplete operation manuals. The information described is without guarantee. Errors and changes are reserved.

Intended Purpose, Improper Usage

A **Lorenz Messtechnik** device is used for displaying, processing and controlling or regulation of processes. It shall not be used as the only tool for the prevention of dangerous states to machines and plants. Machines and plants must be constructed in such a way, that erroneous states can not lead to a dangerous situation for the staff (e.g. by independent limit switches, mechanical locking devices). It must be guaranteed in particular that device-operating errors, its malfunction or it's breakdown do not lead to great property damages or danger for the staff.

Consequently, the device then can be used to prevent the machine or the technical installations from error conditions.

It is also important that the use of devices does not endanger precautions for the safety of technical installations. Emergency-off settings must remain effective in all operation modes.

Installation Notes

Lorenz Messtechnik devices must be installed and connected by compliance with the relevant DIN- and VDE-norms. They must be installed in such manner that an unintentional use is sufficiently excluded. The corresponding hardware and software safety precautions are to be observed in such manner that an interruption of the supply and signal cables cannot lead to an undefined or dangerous state. Supply and signal cables must be installed in such way, that disturbing signals (e.g. inductive or capacitive intersperses) will not cause derogations to the function of **Lorenz Messtechnik** devices.

Disturbance, Maintenance and Repair Notes

The devices do not contain parts which can be maintained on the customer side. Repairs shall be carried out by **Lorenz Messtechnik** exclusively.

If assuming that a safe operation of the device is not possible anymore, it must be closed down and protected against unintentional handling immediately. This, in particular, applies:

- If the device shows visible damages
- If the device is no longer operative
- If parts of the device are loose or slack
- If the connection cables show visible damages

Furthermore, we point out that all obligations of **Lorenz Messtechnik** exclusively result from the respective sales contract in which the guarantee has been conclusively settled.