

# *Operating Instruction*

DC Measuring Amplifier with Data Logger

# **GM 80**



## 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.

**Brief Description:**

GM 80 is a DC measuring amplifier for passive or active sensors.  
 A flexible data logger can store up to 3000 measured values with time and date. Mobile operation is possible by battery or accu operation, however, it can also be operated with a power unit.  
 Measuring or logging values are transmitted via an RS-232 interface to a pc or printer.  
 10 parameter sets for sensors are available. There, in each case, the calibration data, the sensor designation and the physical unit are being stored.  
 Functions such as tare, min./max.-recall and min./max.-delete are available during the measurement procedure.  
 Via a trigger input the data logger or the interface can be controlled externally.

If the GM 80 is being delivered with one or more sensors, these sensors will be in-calibrated to the GM 80 and are immediately ready for operation.  
 An assignment of sensors to the corresponding parameter set is documented on the rear of the device.

**Operation Example:**

- The GM 80 is switched on by pressing **ENTER**
- Control time and date in SYSTEM menu or adjust if necessary
  - Adjust language  
 Call menu 2 SYSTEM – 2.1 LANG. When **ENTER** button was pressed, the GM 80 is in the selection mode. With keys **PLUS** and/or **MINUS** the language can be selected. With **ENTER** the selected language will be stored. With **ESC** the selected language will be discarded.
  - Adjust time  
 Call menu 2 SYSTEM – 2.8 DATE. When **ENTER** button was pressed TIME will appear on the LCD. Press **ENTER** again and the time can be adjusted. With **PLUS** and **MINUS** the hours can be adjusted. After **ENTER** the minutes can be adjusted with **PLUS** and **MINUS**. With **ENTER** the selected time will be stored. With **ESC** the selected time will be discarded.
- Change to the measuring mode  
 From menu 1 MEASUR by pressing **ENTER** the list of all sensors is called. With **PLUS** and/or **MINUS** a sensor parameter set is being chosen. With **ENTER** the GM 80 is being adjusted to this sensor parameter set. With **ESC** it is possible to switch back to menu 1 MEASUR from any mode.
- Change measuring rate by measuring mode  
 The measuring mode can be left by pressing **ESC**. After pressing **ESC** again, the GM 80 will be in menu 1 MEASUR. From there the menu 2 SYSTEM – 2.4 Rate can be called. Select RATE by key **PLUS** and/or **MINUS**. By pressing key **ENTER** the set measuring rate is being displayed first. By key **PLUS** and/or **MINUS** a new measuring rate can be adjusted. By **ENTER** the new measuring rate will be taken over, by **ESC** the new measuring rate will be discarded.
- Switch off GM 80  
 GM 80 is switched off, when **ESC** button is pressed >3 seconds.

**Key Assignment:**

Key	Menu:
↑	Scroll up
↓	Scroll down
<b>ENTER</b>	Confirmation One step forward in the menu
<b>ESC</b>	Discard, one step back in the menu



### Measuring with the GM 80:

**Selected Sensor:** Force sensor with measuring range: 200KN  
 Sensitivity 2mV/V  
 Designation e.g.: Press  
 Parameter set: Sensor no.: 3  
 Option: 100% Calibration control

In order to be able to now measure with this sensor, the sensor " Press" is selected in the measuring mode. During a measurement, a minimum and maximum value buffer can be called with the **MINUS** key. The respective displayed minimum or maximum value can be deleted by **ENTER**.

If the measured value shall be sent through an interface to a pc or printer, the baud rate must be adjusted to the receiver and at SCI-MODE the operating mode must be chosen. For example: HAND, a measured value with time is displayed during every keystroke on **ENTER** while measuring.

For data logging, adjust operating mode in the logger mode, e.g. choose AUTO and interval time e.g. 10 sec and change to measuring mode. A measured value with time is now stored every 10 sec. In mode LOGGSEND, these data can then be sent through the interface.

### Key Assignment:

Key	Measuring Mode:
↑	Press = TARE
↓	MEASURING---MIN---MAX--- MEASURING...
<b>ENTER</b>	At MEASURING: send data At LOGG: store measured value, if adjusted At MIN: delete MIN At MAX: delete MAX
<b>ESC</b>	Back to menu / Press for 3 sec. = Off

### Parameters of a Sensor:

After entering the password (9373) in menu 2SYSTEM-2.5PASS, the sensor can be installed in the calibration menu.

Following parameters are possible:

Sensor__l	Sensor no. 3	Sensor 0 – 9 possible
POINTDIS	200,0	Match meas. range and decimal point (max. 9999)
UNIT	_kN	1 – 3 digit unit possible
DESIGN	Press	Up to 8 digit name (or numbers) arbitrary
CALIB	PAS_wCON	Select Passive with cal. control. See data sheet of sensor
0% LOAD	Unload sensor	0% value of sensor is assigned to display 0
100% CON	Autom. calibration	100% value of sensor is assigned to display 200,0 kN
SAVE	ENTER or ESC	Confirm or discard

**Menu Description:**

- 1 MEASURE: Measuring mode**
- SENSOR\_\_:** **Sensor selection for measuring mode, sensor 0 - 9**  
Here the sensor parameter set for the measurement is being selected.  
The sensor parameter set must match the connected sensor.
- 2 SYSTEM: All system parameters are being stored in this menu column.**
- 2.1 LANG Language adjustment**  
The menu language can be chosen in German, English, French or Spanish.
- 2.2 INFO Information query was configured factory-sided an is not variable.**  
VERS NO. Software version
- 2.3 SCI Interface configuration**  
BAUD: Baud rate adjustment must be conform with the receiver (pc or printer).  
SCI MODE Interface configuration only refers to the measuring mode, not the logg mode!  
OFF Interface off  
HAND At key stroke „ENTER“ the measured value is issued  
AUTO Interval time, adjustable from 10ms to 1h (at high measuring rate only possible with highest baud rate)  
TRIGGER At impulse on trigger input the measured value is issued
- 2.4 RATE Measuring rate and average value**  
RATE Measuring rate adjustment can be chosen between 1/s and 1000/s. At fast courses (screw joint, insert press...) always choose a fast measuring rate, e.g. 1000/s, at very slow courses a small rate, e.g. 1/s.  
AVERAGE Forming an average value, the numbers indicate by how many measurements an average value is accumulated. Applicable at e.g. vibrations, control oscillations.....
- 2.5 PASS Password query**  
After entering the password **9373** it is possible to enter menu **3 CALIB** .  
There the sensor parameters can be modified.
- 2.6 LCD LCD-contrast adjustment**  
If the LCD becomes unreadable by external influences e.g. solar radiation, heat or cold, the LCD-contrast can be corrected here.
- 2.7 LOGG Data logger adjustments**  
LOGGMODE Data logger configuration.  
OFF Off-switch for logger operation, by this the measuring mode is possible only.  
HAND At each key stroke on Enter a logg value is being taken over.  
AUTO Adjustment of the measuring intervals.  
DIAGRAM With each increasing flank of the trigger signal a logg value is being taken over.  
WINDOW The window operation is being started by an increasing trigger flank and can only be finished by a decreasing flank. During this time, measured values will be deposited in the data logger in 1ms raster.  
LOGGSEND Logger values are issued through the interface, press ENTER twice  
LOGGDEL Logger values are deleted, beforehand there will be a safety query whether the buffer should be deleted. Before deleting please assure that you have received the desired data.
- 2.8 DATE Date and time adjustment**  
DATE Date  
TIME Time



**3 CALIB**

Calibration menu – this is active only, if the password has been entered correctly in 2.5PASS. For the calibration the sensor needs to be connected to the sensor socket.

Sensor\_\_

POINTDIS

Sensor number or name of the sensor which is to be calibrated.

Measuring range with decimal indication of the sensor, e.g. 100,0; 200,0; 63,00;...

Call menu "POINTDIS", after pressing **ENTER** the final value of the sensor can be entered, by **PLUS** or **MINUS** the numeric character can be edited, by **ENTER** the next figure can be edited, if all figures are edited, by **PLUS** and/or **MINUS** the comma will be shifted. For the completion of the input press **ENTER**, thereafter the final value is being logged in the GM 80.

UNIT

Input of the physical unit, e.g. Kg, Ncm, t, gr, kN, N·m, bar...

DESIG

Name of the sensor e.g. sensor 1,2,3, silo, tank, mixer, balance1, motor, test1..

CALIB

Selection of the sensor type (active, passive, 4-20mA, with or without calib. control..)

## Calibration Procedure:

### **ACT\_wCON Active sensor with calibration control**

following calibration type is possible:

0% load and 100 % load

0% load unload sensor

100%Con thereafter it will be calibrated automatically to 100 % load.

SAVE query for takeover of calibration data

### **ACT\_nCON Active sensor without calibration control**

following calibration type is possible:

0% load and 100 % load

0% load and enter 100 % load in V

Enter 0% load in V and enter 100 % load in V

By pressing **PLUS** or **MINUS** a selection between 0%LOAD or NOMINAL VALUE is possible.

0% load unload sensor

or NOMVALUE input of the nominal value in V

By pressing **PLUS** or **MINUS** a selection between 100%LOAD or NOMINAL VALUE is possible.

100%load calibration by 100%LOAD (apply the nominal load)

or NOMVALUE input of the nominal value in V

SAVE query for takeover of calibration data

### **PAS\_wCON Passive sensor with calibration control**

following calibration type is possible:

0% load and 100 % load

0%LOAD unload sensor

100%Con thereafter it will be calibrated automatically to 100 % load.

SAVE query for takeover of calibration data

### **PAS\_nCON Passive sensor without calibration control**

following calibration type is possible:

0% load and 100 % load

0% load and enter 100 % load in mV/V

Enter 0% load in mV/V and 100% load in mV/V

By pressing **PLUS** or **MINUS** a selection between 0%LOAD or NOMINAL VALUE is possible.

0% load unload sensor

or NOMVALUE input of the nominal value in mV/V

By pressing **PLUS** or **MINUS** a selection between 100%LOAD or NOMINAL VALUE is possible.

100%load calibration by 100%LOAD (apply the nominal load)

or NOMVALUE input of the nominal value in mV/V

SAVE query for takeover of calibration data

### **CURRENT Sensor with 4 - 20mA**

with following calibration types:

0% load and 100 % load

0% load and enter 100 % load in mA

Enter 0% load in mA and 100% load in mA

By pressing **PLUS** or **MINUS** a selection between 0%LOAD or NOMINAL VALUE is possible.

0% load unload sensor

or NOMVALUE input of the nominal value in mA (fixed value 4-20 mA)

By pressing **PLUS** or **MINUS** a selection between 100%LOAD or NOMINAL VALUE is possible.

100%load calibration by 100%LOAD (apply the nominal load/nominal torque)

or NOMVALUE input of the nominal value in mA

SAVE query for takeover of calibration data

## Operation via the Serial Interface (SCI):

Through the serial interface, measurement values can be issued singly or automatically by the GM 80. The commands can be sent to the GM 80 via a terminal program or PLC.

If the GM 80 is in the measuring mode, following commands are available:

ASCII	HEX	Description
<b>0</b>	0x30	Query continuous measured value (signed integer)
<b>1</b>	0x31	Query maximal value (signed integer)
<b>2</b>	0x32	Query minimal value (signed integer)
<b>3</b>	0x33	Tare display
<b>4</b>	0x34	Reset maximal value
<b>5</b>	0x35	Reset minimal value
<b>6</b>	0x36	Actuate calibration control for sensors with 100 % control resistance
<b>7</b>	0x37	Switch off calibration control for sensors with 100 % control resistance
<b>A</b>	0x41	Read-Out datalogger
<b>B</b>	0x42	Delete datalogger
<b>C</b>	0x43	Read-Out current sensor parameter
<b>D</b>	0x44	Read-Out status
<b>E</b>	0x45	Read-Out complete status
<b>g</b>	0x67	Change protocol setup
<b>k</b>	0x6B	ENTER
<b>l</b>	0x6C	PLUS
<b>m</b>	0x6D	MINUS
<b>n</b>	0x6E	ESC

## Outside of the measuring mode following commands are available:

ASCII	HEX	Description
<b>A</b>	0x41	Read-Out datalogger
<b>C</b>	0x43	Read-Out current sensor parameter
<b>D</b>	0x44	Read-Out status
<b>E</b>	0x45	Read-Out complete status
<b>a</b>	0x61	Write time
<b>b</b>	0x62	Read-Out time
<b>c</b>	0x63	Write company header
<b>d</b>	0x64	Read-Out company header
<b>e</b>	0x65	Write all sensor parameters
<b>f</b>	0x66	Read-Out all sensor parameters
<b>g</b>	0x67	Change protocol setup
<b>k</b>	0x6B	ENTER
<b>l</b>	0x6C	PLUS
<b>m</b>	0x6D	MINUS
<b>n</b>	0x6E	ESC

### Read-Out of CurrentSensor Parameters:

Sensor designation	8Byte	ASCII
Display final value	2Byte	packed BCD-figure
Unit	3Byte	ASCII
Sensor type and digit	1Byte	0xAB: A ... Sensor type, B ... digit of the dec. point (binary coded)
		Sensor type: 0xxxxx xxxx <pre>       0000 ... active with calibration control 0%load and 100% load calibration 0001 ... active without calibration control 0%load and 100% load calibration 0010 ... active without calibration control 0%load calibration and edit 100%load V 0011 ... active without calibration control edit 0%load V and 100%load V 0100 ... passive with calibration control 0%load and 100% load calibration 0101 ... passive without calibration control 0%load and 100% load calibration 0110 ... passive without calibration control 0%load calibration and edit 100% load in mV/V 0111 ... passive without calibration control edit 0%load and 100% load in mV/V 1000 ... current 0%load and 100% load calibration 1001 ... current 0%load calibration and edit 100%load in mA 1010 ... current edit 0%load mA and 100%load mA </pre>
		Dec. point: 0xxxxx xxxx <pre>        000 ... _5000__  001 ... _5,000__  010 ... _50,00__  011 ... _500,0__  100 ... 5,000__ </pre>
0%load	2Byte	HEX-value (MSB/LSB)
100% load	2Byte	HEX- value (MSB/LSB)

### Read-Out Status:

Status	2Byte	general error condition of the GM 80
--------	-------	--------------------------------------

### Read-Out Complete Status:

Status	2Byte	general error condition of the GM 80
Measuring rate	1Byte	0x01 ... 1000/sec 0x02 ... 100/sec 0x03 ... 10/sec 0x04 ... 1/sec
Average value	1Byte	0x01 ... x/1 0x02 ... x/2 0x04 ... x/4 0x08 ... x/8 0x10 ... x/16 0x20 ... x/32
SCI_MODE	1Byte	0x00 ... interface off 0x04 ... hand mode 0x08 ... automatic mode 0x0C ... trigger mode
SCI_MODE_DELAY	1Byte	0x02 ... 10ms 0x03 ... 100ms 0x04 ... 1s 0x05 ... 10s 0x06 ... 1min 0x07 ... 10min 0x08 ... 1h
LOGGMODE	1Byte	0x00 ... logger off 0x04 ... hand mode 0x08 ... automatic mode 0x0C ... graph mode 0x10 ... screen mode
LOGGMODE_DELAY	1Byte	0x01 ... 1ms 0x02 ... 10ms 0x03 ... 100ms 0x04 ... 1s 0x05 ... 10s 0x06 ... 1min 0x07 ... 10min 0x08 ... 1h
Language	1Byte	0x00 ... GERMAN 0x02 ... ENGLISH 0x04 ... FRENCH 0x06 ... SPANISH
Protocol status	1Byte	0xxxxx xxxx (binary coded) <pre>            1 ... do not send conclusion character      1 ... send CR/LF      1 ... send CR      1 ... send LF </pre>

**Read Time:**

Output:

**DAY.MONTH.YEAR**

**2xspace**

**HOURS:MINUTES:SECONDS**

**Write Time:**

The writing is identically with the data block for receipt of time, however, the data block for writing is protected with a checksum and the corresponding weighted checksum.

**Read Company Header:**

With this command the company header, which is stored in the GM 80, can be read.

**Write Company Header:**

The input is ended either if 256 characters are received or if the character ETX (0x03) Strg-C is contained in the character string.

**Read all Parameters:**

The output of all parameters from sensor 1 to sensor 10 occurs in following sequence:

- Sensor designation
- Final display value
- Unit
- Sensor type (calibration type) / decimal place
- Calibration values 0% load, 100% load with respectively 2 bytes

For this see command read-out of current sensor parameters.

**Write all Parameters:**

The write-data block for all sensors is identical to the received read all parameters-data block. However for the writing of sensor parameters a checksum and the corresponding weighted checksum is required.

**Change of Protocol Setup:**

Protocol status	1Byte	0xXXXX XXXX (binary coded)
		1 1 1
		1 1 1  ... no closing character is sent
		1 1 0  ... send CR/LF
		1 0 1  ... send CR
		1 0 0  ... send LF

**Calculation of the Checksum (CS) and the Weighted Checksum (gewCS)**

The calculation takes place via all parameter bytes (without the command byte). At the CS all bytes are added (overflows are not considered here). For the calculation of the gewCS the CS is added to the gewCS. At overflow the gewCS is incremented by 1.

## Formatting of the Serial Interface Output

### Output Format in SCI Mode:

HAND:		Algebraic sign, measured value, unit, time and CRLF
AUTO:	<b>10ms</b>	Signed integer and CRLF
	<b>100ms</b>	Signed integer and CRLF
	<b>1s</b>	Algebraic sign, measured value, unit, time and CRLF
	<b>10s</b>	Algebraic sign, measured value, unit, time and CRLF
	<b>1min</b>	Algebraic sign, measured value, unit, time and CRLF
	<b>10min</b>	Algebraic sign, measured value, unit, time and CRLF
	<b>1h</b>	Algebraic sign, measured value, unit, time and CRLF
TRIGGER:		Signed integer and CRLF

### Output Format in LOGG Mode:

HAND:	Algebraic sign, measured value, unit, time and CRLF
AUTO:	Algebraic sign, measured value,unit and CRLF
DIAGRAM:	Algebraic sign, measured value,unit and CRLF
WINDOW:	Algebraic sign, measured value,unit and CRLF

## Adjustments in the SCI Mode

**SCI OFF:** At this adjustment a transfer of measured values from the GM 80 is disabled.  
The GM 80 can be controlled however with the GM 80-commands.

**HAND:** In this mode a measured value is issued via the serial interface when the Enter key is pressed at the GM 80.

**AUTO:** In this mode a measured value is issued via the serial interface in the adjusted delay

**TRIGGER:** At a trigger event In this mode, a measured value is written in the logger. Since the trigger pulses may occur in 10ms raster and additional time-logg is not possible. The flank of the trigger pulse must be on HIGH for at least 4ms. Then it must be on LOW for at least 6ms.

**WINDOW:** This mode reacts to increasing, respectively decreasing flanks. With a decreasing flank the logging of the measured values is started. Now the measured values are written in the data logger in 1ms raster. A decreasing flank ends the recording.

## Operation and Function Principle of the GM 80-Data Logger

The data logger can, if the GM 80 is not in the measuring mode, be read by the menu option 2,7 LOGG - SENDING or by the command "A" via the interface. Outside of the measuring mode the data logger is deleted only by the menu option 2,7 LOGG - DELETION.

If the GM 80 is in the measuring mode, the data logger can be read with the command "A" and be deleted with the command "B".

If the measuring mode is being switched on from the menu option 1MEASURING-sensor selection, the starting time of the measurement, the current sensor designation, the final value of the measuring range, the adjusted measuring rate and the logger mode (e.g.: AUTO 1ms) are saved in the logger.

**NOTE: All previous measured values are deleted here!**

With the read-out of the data logger via the serial interface different adjustments are sent from the GM 80.

- a) Company header
- b) Starting time of the measurement
- c) Sensor designation
- d) Final display value
- e) Adjusted measuring rate
- f) Adjusted logger mode
- g) Thereafter the measured values

In the HAND MODE the measured values are always logged with the time. The measured value is logged at the data in the AUTOMODE. A time can be assigned to each measured value by the indicated starting time. Since in GRAPHS and in the WINDOW MODE trigger events smaller than 1sec can occur, an additional time log is not possible.

### Adjustments in the Logg Mode

**LOGG OUT:** Here the data logger is switched off. The logg mode in the measuring mode is switched to "LOGG OUT" as soon as the entire data logger has been edited.

**HAND:** In this mode a measured value is written into the data logger when the enter key was pressed at the GM 80. By an additional logg of time, there is a time assignment for each measured value.

**AUTO :** In this mode in the adjusted Delay a measured value is written into the data logger. By the stored starting time there is a time assignment for each measured value.

**GRAPH:** In this mode at a trigger event a measured value is written into the logger. Since the trigger pulses occur in 10ms raster, an additional logg of the time is not possible. The flank of the trigger pulse must stand on HIGH for 4ms at least. Afterwards on LOW for at least 6ms.

**WINDOW:** This mode reacts to increasing and/or decreasing flanks. At an increasing flank the logging of the measured values is started. From now on the measured values are written in the data logger with 1ms raster. A decreasing flank ends the recording.

### Mains Operation:

A wall power supply with controlled 6VDC with min 500mA must be used. By this, the accumulators are loaded simultaneously, even if the GM 80 is off-state.

**Before mains operation (single-serving-) batteries need to be removed from the device because they would be destroyed through the charging procedure and thus the device would be damaged as well!**

### Accu Operation:

4 x NiMH Mignon-accus with min. 1500mAh and 1,2V with correct pole must be used.

### Accu Charging Time:

The accu charging time is approx. 12h, whereby the charging current is 200mA in uncharged condition which will sink with increasing accu capacity and will change over to trickle charge (overload protection) at full accus. For fast-charging an external charging device (e.g. Ansmann 4-6) is recommended.

### Battery Operation:

4 x Mignon batteries with 1,5 V can be used.

**Never use a wall power supply while batteries are inserted!!**

### Excitation Voltage:

If the permissible battery voltage is fallen below, the display begins to flash.

### Trigger Input:

This input can be controlled e.g. with a PLC, remote switch, foot switch... or similar.

It is an optocoupler input and therefore it is separated galvanically.

As a control signal, 0V - 2V is recognized as low level, 3,5V -27V as high level.

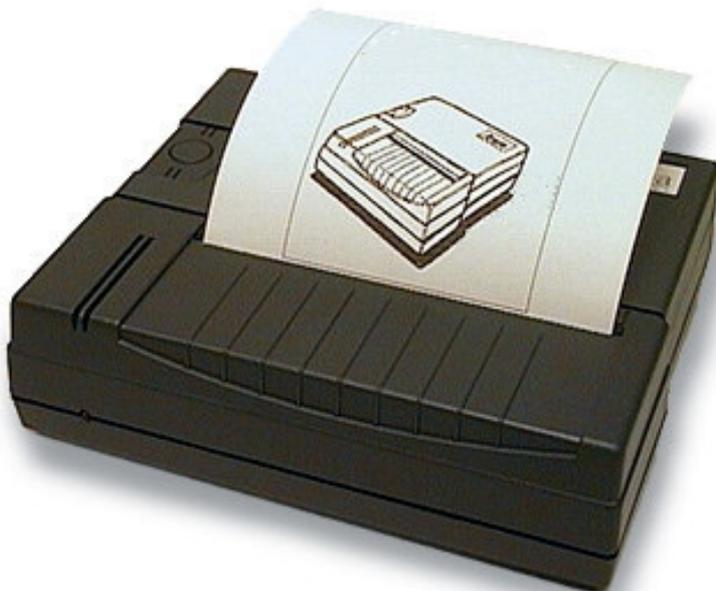
This input has a high sampling rate, therefore very short impulses are recognized as well.

### Serial Interface Adjustment:

Parity:	none
Data bits:	8
Stop bits:	1

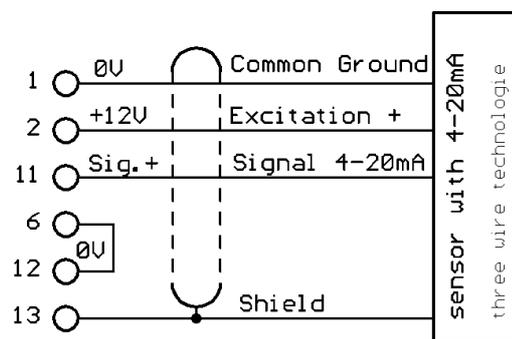
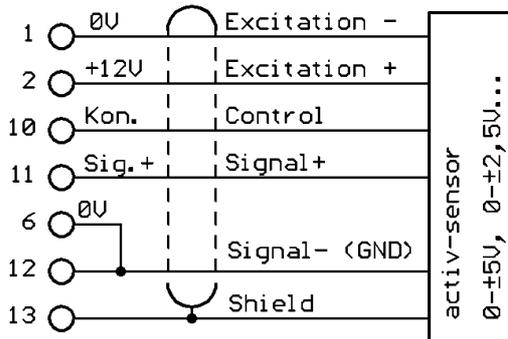
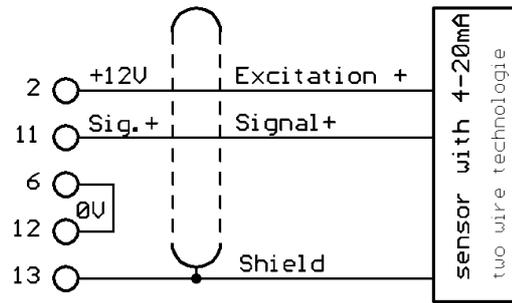
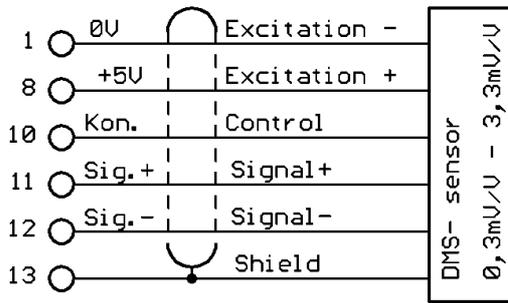
### Printer: Type: E-GM 80 - DR: (available as an accessory)

With this small thermal printer and the connection cable the measured values with time can be read out and printed from the GM 80. By the embedded accumulators, a mobile operation is possible. By the wall power supply, the accumulators can be charged, at the same time a mains operation is possible. A baud rate of 9600 must be adjusted at the GM 80.



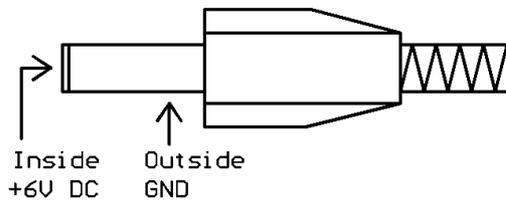
**Pin Assignment:**

connection for sensor plug SUB-D HD fem. 15pol

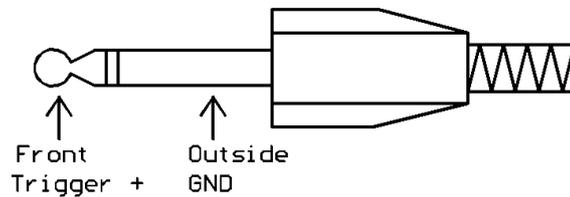


⋮ Attention: not connected pins not for use,  
⋮ only reserved for programming in factory!!

supply connector 2,1mm

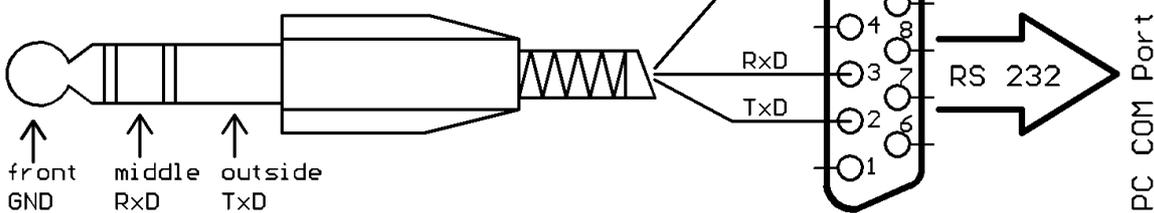


trigger jack 2pol. 2,5mm

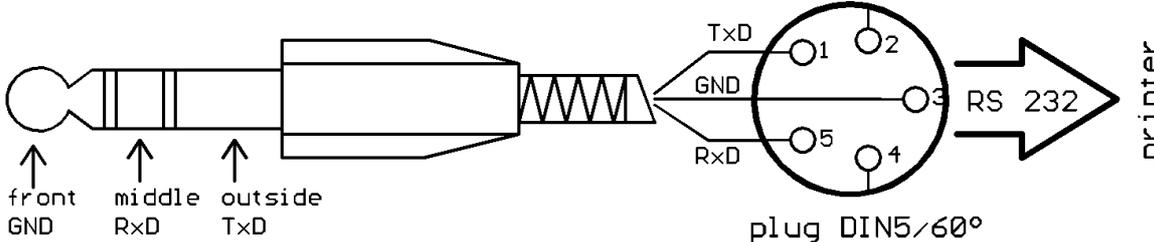


Connector SUB-D male 9 pol.

RS 232 jack 3pol. 3,5mm



PC COM Port 1-4



printer

## Supplement

### Device Disposal:

Please dispose the unserviceable device according to the legal rules.  
By this you meet the legal obligations and contribute to the environmental protection!

### Tendance:

The device may be cleaned with a slightly moistened cloth.

### FAQ – Trouble Shooting

#### **Device can not be turned on**

Battery/accumulator inserted correctly?  
Connect power supply at operation with accumulators.

#### **The display begins to flash.**

Charge the accumulators and/or exchange the batteries.

#### **The calibrated adjustments do not match with the sensor anymore.**

Was the sensor overloaded?  
Is the correct sensor selected?  
Possibly recalibrate the sensor.

#### **Wrong values are indicated after the calibration**

Was the sensor type selected correctly?  
At calibration with calibration control check sensor for this option.

## Declaration of Conformity

Herewith it is certified that following defined product corresponds to the substantial protection requirements which were determined in the directive of the European Council for the assimilation of the law of the EC Members regarding the electromagnetic compatibility – EMC - (89/336/EWG).

**DC Measuring Amplifier with Data Logger Type: GM 80 handheld device**  
**GM 80 - TG**  
**GM 80 - PA**

For the evaluation of the model range regarding the electromagnetic compatibility the following standard was consulted:

EN61000-6-4:2001  
EN61000-3-2:2000  
EN61000-3-3:1995 + A1:2001

**Emitted Interference: (Industrial Environment)**  
Harmonics  
Flicker

EN61000-6-2:2001  
EN61000-4-2:1995 + A1:1998 + A2:2001  
EN61000-4-3:2002  
EN61000-4-4:1995 + A1:2001 + A2:2001  
EN61000-4-5:1995 + A1:2001  
EN61000-4-6:1996 + A1:2001  
EN61000-4-11:1994 + A1:2001

**Interference Resistance: (Industrial Environment)**  
Discharge of static electricity  
High-frequency electromagnetic fields  
Fast transient electrical disturbance variables  
Surge voltages  
Conducted disturbance variables  
Voltage drops and voltage fluctuations

This declaration is in exclusive responsibility of the manufacturer

**LORENZ Messtechnik GmbH**  
**Obere Schloßstrasse 131**  
**73553 Alfdorf**

It is guaranteed by internal measures that the standard devices always correspond to the demand of the current EEC guidelines and the applied standards.

In the case of a modification of the product not coordinated with us this declaration loses its validity

Alfdorf, den 18.02.2004

  
-----  
Geschäftsführer, Peter Lorenz



**Lorenz**®  
*messtechnik gmbh*

D-73553 Alfdorf  
Obere Schloßstr. 131  
☎ +49 7172 93730-0

[www.lorenz-sensors.com](http://www.lorenz-sensors.com)  
[info@lorenz-sensors.com](mailto:info@lorenz-sensors.com)  
Fax: +49 7172 93730-22

Kalibrierlaboratorium  
**DKD**  
DKD-K-37801  
Deutscher Kalibrierdienst





**Lorenz**®  
*messtechnik gmbh*

D-73553 Alfdorf Obere Schloßstrasse 131 Tel. +49 7172 / 93730-0 Fax. -22

**QUALITY  
MANAGEMENT**  
Certificate

Voluntary participation in regular  
monitoring according to ISO 9001:2000



Contactless,  
digital signal  
transmission

## Torque - Sensors

0,03...20000 Nm  
static or rotating  
contactless  
active output signal,  
RS 485



## Several components Sensors



Torque - Force - Speed - Angle

## Force Transducer

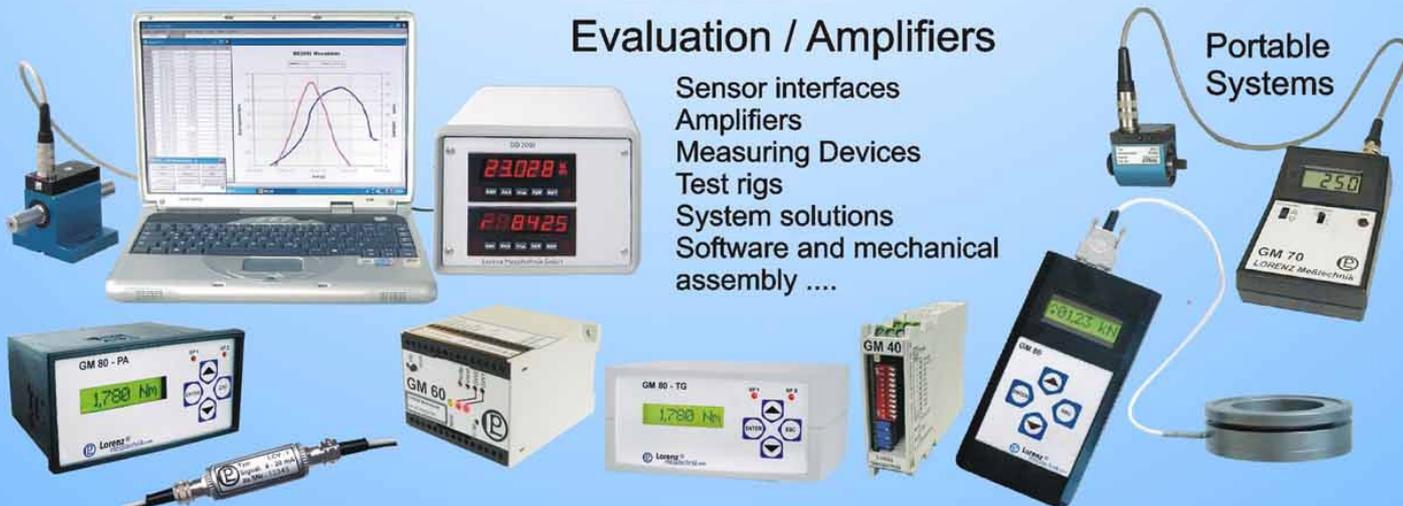
1N...5000kN  
Tension and / or  
Compression



## Evaluation / Amplifiers

Sensor interfaces  
Amplifiers  
Measuring Devices  
Test rigs  
System solutions  
Software and mechanical  
assembly ....

## Portable Systems



Homepage: [www.lorenz-sensors.com](http://www.lorenz-sensors.com) Email: [info@lorenz-sensors.com](mailto:info@lorenz-sensors.com)