

# Operating Manual for Precision Microprocessor Thermometer

# GMH 2000



## Specification :

<b>Display Range 1:</b>	-199.9 to +650.0°C
<b>Display Range 2:</b>	-199.9 to +999.9°F
<b>Measuring range:</b>	-199.9 to +650.0°C respectively -327.8 to 1202.0°F (entire Fahrenheit range only available via optional interface GRS232 )
<b>Resolution:</b>	0.1 °C respectively 0.1°F, for the entire display range
<b>Device accuracy:</b>	0.03% FS ± 1 digit
<b>Linearization:</b>	Characteristic curve stored digitally
<b>Sensor:</b>	Pt 100, 4-wire (Line / sensor lengths, contact-transfer resistance etc. do not influence accuracy) Connection via 4-pin Mini DIN-plug. <b>Please note:</b> Pt 100 sensors are not part of the scope of supply - please order separately !
<b>Switch positions:</b>	0 = off 1 = °C 2 = °F
<b>Display:</b>	3 four digit LCD displays to simultaneously display current value (digit height 12.4 mm) as well as min. and max. values (digit heights 7mm each).
<b>Tendency display:</b>	In case of the temperatures rising or falling an arrow pointing upwards or downwards will be displayed at the left-hand side of the current value. (Tendency of last value measured internally)
<b>Sensor damage display:</b>	In case of the display showing dotted lines instead of measuring values after the device has been switched on and the segment test completed, the sensor contact has been interrupted, i.e. the sensor is broken, - provided, of course, a suitable measuring sensor GTF 601, GES 601 or GOF 601 is plugged in. In such a case please return sensor for repair. Please note that the same display reading is shown if the device is switched on without a sensor plugged in or if the measuring values are either too high or too low for the acceptable measuring range.
<b>Min./max. value memory:</b>	Will be activated as soon as device is switched on. Any min. or max. value occurring in active mode will be constantly displayed and updated, if necessary. These values will be deleted as soon as the device is switched off.
<b>Working temperature:</b>	0 to 45°C
<b>Nominal temperature:</b>	25°C
<b>Atmospheric humidity:</b>	0 to 80 % r.F. (not condensing)
<b>Power supply:</b>	9V battery type IEC 6F22 (included in scope of supply) or via stabilised power pack GNG09. (Banana plug, 2.5mm dia located below and next to the slide switch). Battery will be automatically disconnected as soon as power pack is connected.
<b>Power consumption:</b>	max. 10mA
<b>Low battery warning:</b>	"BAT" displayed automatically in case of low battery <u>Please note:</u> For long-time (permanent) operation we recommend using a power pack.
<b>Serial interface:</b>	Connection plug for <u>external</u> serial interface, RS232 compatible. (Please order interface module separately)
<b>Weight:</b>	approx. 250g (measuring sensor not included)
<b>Dimensions:</b>	approx. 150 x 86 x 30 mm (W x H x D) Impact resistant ABS plastic housing, with integrated pop-up clip for table-top or suspended use and clips for laterally attaching of measuring sensor.
<b>Electromagnetic compatibility:</b>	In accordance with EN50081-1 and EN50082-2 for unrestricted use in housing and industrial areas. Additional error: <1%



## GREISINGER electronic GmbH

D - 93128 Regenstauf, Hans-Sachs-Straße 26

Tel.: 09402 / 8500 od. 8748, Fax: 09402 / 1829

## Points to be observed during operation

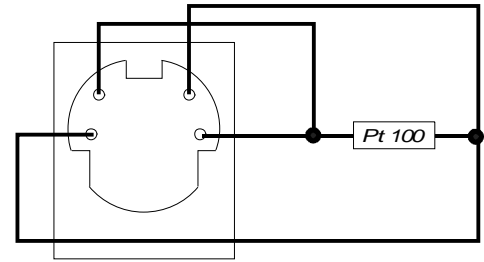
1. Electrical connection, sensor connection Pt 100 : see drawing
2. Make sure to apply correct operating voltage as low or damaged battery will lead to measuring inaccuracies. Immediately after "BAT" is displayed, battery needs to be replaced.
3. Make sure to maintain unit properly and to operate it in accordance with the specifications listed (do not throw, knock etc.). Socket and probe plug have to be kept clean.

### 4. Zero point offset

By pressing the key at the front side of the unit (called "zero point 0.0°C") by means of a ball point pen tip (for example) for approx. 6 seconds the entire system including measuring sensor will be offset to 0.0°C respectively 32.0°F.

This is achieved by means of the ice water method: Take a container, e.g. a high cup, and put in ice cubes. Fill with tap water till ice cubes are covered. Immerse sensor as deeply as possible and move around continuously. As soon as the temperature does not drop any further the offset to 0.0°C respectively 32.0°F can be carried out.

**In case the 0.0°C respectively 32.0°F offset has been carried out incorrectly or by mistake, press key for approx. 12 seconds to reactivate the value set by the manufacturer.**



Sensor connection  
(plan view)

## Safety Advices

This unit has been designed, assembled and tested in accordance with the safety regulations for electronic measurement devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advices will be adhered to when using the unit.

### 1. Mains operation:

When connecting an external power pack make sure not to exceed the permissible operating voltage of the measuring unit, e.g. 9V to 12VDC. The no-load voltage of simple power packs may be too high. We, therefore, recommend using regulated power supply units. Our power pack GNG09 guarantees trouble-free operation.

**Warning :** When running the unit although the power supply is damaged (e.g. short circuit of power supply voltage leading to output voltage) the voltages at the unit (e.g. sensor) may be perilous.

2. When connecting this unit to other units the interconnection has to be designed most thoroughly as internal connections in third-party units (e.g. via serial interface) (connection GND with protective earth) may lead to undesired voltage potentials which may influence or even destroy the unit or any unit connected to it.
3. Trouble-free operation and reliability of the unit can only be guaranteed if the unit is not subjected to any other climatic conditions than those stated under "Specification".
4. Moving the unit from a cold to a warm environment may lead to malfunctions due to condensation. In such a case we recommend waiting to allow unit temperature to adjust to the ambient temperature before re-starting.
5. If there is any risk whatsoever involved in running it, the unit has to be switched off immediately and to be marked accordingly to avoid re-starting.

Operator safety may be a risk, if :

- \* there is visible damage done to the unit.
- \* the unit is not working as specified.
- \* the unit has been stored under unsuitable conditions for a longer time .

In case of doubt, please return unit to manufacturer for repair and/or maintenance.

## Accessories: - to be ordered separately against upcharge !

**Serial interface RS232 compatible:** order number GRS232

Interface adapter complete with technical manual

**Suitable Pt100-sensors (plug-in type) :** 4-wire, DIN class B ( $\pm 0.3^\circ\text{C}$  at  $0^\circ\text{C}$ )

**GTF 601** immersion/ air / gas sensor -200 up to  $+650^\circ\text{C}$

**GES 601** insertion sensor for soft plastic materials -200 up to  $+650^\circ\text{C}$

**GOF 601** surface sensor -50 up to  $+400^\circ\text{C}$

Pt 100 sensor as above, however with even higher accuracy 1/3DIN ( $\pm 0.1^\circ\text{C}$  at  $0^\circ\text{C}$ ) available against upcharge.

Calibration sensors with even higher accuracy (e.g. 1/100°C) and calibration certificate available upon request.

**Suitable power pack:** GNG09 : stabilised power pack (220/240V 50/60Hz; 10VDC/ 120 mA)

**Case GKK1200:** case with punched foam lining suitable for 1 unit, 3 sensors, spare batteries, etc.