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PFEUFFER

Installation and Operating instructions GTM 800



Pfeuffer GmbH
Flugplatzstraße 70
97318 Kitzingen
GERMANY
Phone: 09321 9369-0
info@pfeuffer.com
www.pfeuffer.com

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Translation of the original operating instructions



These Operating Instructions are a constituent part of the machine and must be available to all operating personnel at all times. They are intended for the operating company of the system, the operating personnel and the specialists who are responsible for the transport, assembly, installation, operation, maintenance, cleaning, disassembly and disposal.

The Pfeuffer GmbH has prepared and reviewed these Operating Instructions with the greatest care. However, no guarantee is made for its completeness or accuracy.

Subject to technical modifications.

Translation

In the event of delivery of subsequent sale to the countries of the European Economic Area (EEA), the operating instructions must be translated into the corresponding language of the country of use. In the event of discrepancies in the translated text, the original operating instructions (German) must be used for clarification, or the manufacturer must be contacted.


Operating instructions in electronic format

The original operating instructions (German) and translations of the original operating instructions can be requested as PDF files by e-mail: doku@pfeuffer.com. Specifying the correct type designation and serial number is important for further processing!

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(DIN ISO 16016)

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1 Introduction

1.1 General

The temperature monitoring system GTM 800 allows the permanent control of temperatures in grain stores. The microprocessor integrated in the evaluating device GTM 800 controls the measurement process, checks the single readings of the sensors with regard to limit exceeding, sends alarm messages, if necessary, and stores all results. An illuminated LCD-module indicates the single temperatures of the measurement sensors. All settings and results are stored even after turning-off. A clear protocol of the single temperature readings can be printed by means of an output unit (available as option). The various settings allow the output of a tendency measurement. By means of a serial IR-interface (RS232) the data can be transmitted to a PC.

The GTM 800 is a device that can only be used in Zone 22!



The Pfeuffer temperature measuring system type **GTM 800** is not approved for zones 20 and 21! Please contact us before use, if this is in contradiction to your explosion protection document. Please check whether you are subject to the regulations of the company safety ordinance! Relevant guidelines have been published by the associations on the Internet. We would be happy to help you if you need further information!

1.2 Note – applied as directed

The **GTM 800** system is designed exclusively for the temperature measurement in grain stores. Other applications are not allowed without permission of the manufacturer. These operating instructions draw your attention to very important details referred to the application of the measuring system.

Unauthorized conversions are not permitted. The indications of these operating instructions referred to operation and maintenance must be followed.

Any use beyond that is considered as application as not directed. The manufacturer does not assume any liability for damages resulting from it. The risk must be borne by the user. It is absolutely necessary to contact the service department of Pfeuffer GmbH, Kitzingen for any application of the measuring system beyond the determined areas.

2 Safety

2.1 Symbol and note explanation

Operator safety symbol



You will find this symbol in connection with all notices regarding operator safety in these operating instructions (OI), which refer to **dangers to life and limb of persons**. Pay attention to these notices and be very careful in these cases. Pass all notices regarding operator safety on to other operators. Besides the notices of these operating instructions the general rules for safety and prevention of accidents must be considered.

Attention note

Attention! You will find »Attention!« at points in these operating instructions, which particularly must be complied with in order to maintain the directives, rules, notices and correct operation and to prevent damage or **destruction of the temperature monitoring system**.

Important note

Important! Dieses »Wichtig!« weist Sie auf Stellen hin, die für die ordnungsgemäße Funktion der Temperaturmessanlage sichergestellt werden müssen. Es besteht, im Gegensatz zum Achtung-Hinweis, jedoch **keine Gefahr**, dass die Temperaturmessanlage durch Nichtbeachten beschädigt oder zerstört wird.

2.2 Operator safety instructions

The **GTM 800** is manufactured according to the latest technological standards, especially with regard to the rules for prevention of accidents (RPA) and is operationally reliable. This instrument can be dangerous if it is used improperly by untrained persons or if it is not used in accordance with the directions. We draw your attention especially to the fact that all safety precautions of the machine serve for accident prevention, i.e. the protection of the operating and maintenance personnel and for the machine itself.



During all works regarding mounting, dismounting, conversions, adaptations and maintenance the system must be separated from the mains in order to avoid power failures or short circuits.

The following notices regarding operator safety must particularly be considered:

- Each person, who is concerned with commissioning, operation and maintenance (inspection, maintenance) of the **GTM 800** system in the company of the operator must have read and understood the complete operating instructions and especially the chapter regarding safety.
- The operator is obliged to use the **GTM 800** system only in perfect condition.
- The operator of the **GTM 800** system is responsible for the safety devices, that they are not changed, that they are working and that they are not blocked. It is not allowed to remove, make unusable or bridge over safety devices from the machine, such as locks, covers and housing switches.
- The local rules for safety and prevention of accidents must be considered in every case before starting the operation of the **GTM 800** system.


2.3 Working with electric components



The opening of the housing as well as all repair and maintenance works at electric components of the **GTM 800** must be carried out by an electric specialist in accordance with the VDE (Association of German Electric Engineers)-regulations as well as the requirements of the local electric supply companies. In case of improper use the warranty will expire.

During works at the bus wire and sensor wire, the system must be switched off. During works in connection with the bus lead and the measurement lead the system must be connected at zero potential

2.4 Classification of zones in the protection area – operators liability

For the installation of electrical systems in potentially explosive atmospheres (-zone) the ATEX-directive 2014/34/EU and for the operator's liabilities the ATEX-directive 1999/92/EC must be applied. Please also refer to the regulations of the Accident Prevention and Insurance BGR 104 stating that the operator must divide his silo plant into different zones in accordance with the danger of explosion.

Zone 20 includes all areas, in which a danger of a potentially explosive atmosphere is existing in the form of a cloud consisting of combustible dust contained in the air permanently, over a longer period or frequently.

Zone 21 determines the areas, in which under normal conditions an explosive atmosphere in the form of a cloud consisting of combustible dust contained in the air can appear occasionally.

Zone 22 determines the areas, in which under normal conditions an explosive atmosphere in the form of a cloud consisting of combustible dust contained in the air normally is not or only temporarily existing.

Remarks:

1. Layers, accumulations and piles of combustible dust which might cause an explosive atmosphere must be taken into account just as any other cause.
2. The use of the system within the design parameters is considered to be the normal condition.

For equipment's used in this zone a design test certificate is required. This certificate is not available for the Pfeuffer temperature monitoring system type GTM 800!



Should this be contradictory to your explosion protection document, please contact us prior to the installation. Please check, whether you are subject to the directions of the operational safety regulations! Relevant guidelines were published by the organizations on the Internet. We will be pleased to assist you, if you need further information!

2.5 Instructions for use in explosion protection zone 22

For use in zone 22, the following notes must be observed:



1. The **GTM 800** may only be operated with the protective bag. It prevents the battery from falling out of the housing when the device falls down.
2. The temperature probes must not be exposed to a continuous grain flow. Normally the setting of the temperature probes is done only after filling the cells/boxes. A continuous grain flow could lead to a static charge on the surface. The insertion of the measuring rods into the bulk does not pose any danger.
3. A battery change must always be carried out outside the ex-zone. The battery could be lost and pose a hazard. In addition, a lost battery is to be negatively evaluated for environmental reasons.
4. The **GTM 800** may not remain permanently in the ex-zone. It is only carried for the purpose of measuring in the ex-zone, and then removed again.

3 Packing, transport

3.1 Transport and storage

3.1.1 Notice and protective measures for the transport

- Use the supplied original packing for dispatch only
- Treat with usual care
- Keep instrument in original packing and prevent it from moisture
- Do not keep in the open
- Do not put heavy objects on the packing.

3.1.2 Information about damages in transport / Inspection on receipt by the recipient

Damages in transport must be reported immediately in written form (possibly by means of a photograph). Does the supplied instrument show any scratches, dents or other damages on the supplied instrument?

3.2 Equipment supplied

Check the equipment supplied with regard to completeness. Compare the delivery note with the delivered parts. The delivery note contains all parts delivered by us. Missing parts must be reported to us immediately in written form. A list of all terms is included in **chapter 10** – Glossary.

 <p>Instrument GTM 800</p>	 <p>Battery 9 V block</p>	
 <p>1 Measuring cable 5-pins for temperature probes</p>	 <p>IR module and adapter for printer and PC (option)</p>	 <p>Protective bag with hand strap (option) absolutely necessary for use in zone 22!</p>

The following item can be ordered according to individual request:
 Temperature probes made of fiberglass plastic

4 Installation and commissioning

4.1 Installation procedure

After the filling of the flat store the fiberglass probes are inserted into the bulk goods from the top. A distance of 4-6 m per square meter (spacing) is useful, depending on the quality and the storage conditions (e. g. humidity!).



The temperature probes must not be exposed to a continuous grain flow. Normally the setting of the temperature probes is done only after filling the cells/boxes. A continuous grain flow could lead to a static charge on the surface. The insertion of the measuring rods into the bulk does not pose any danger.

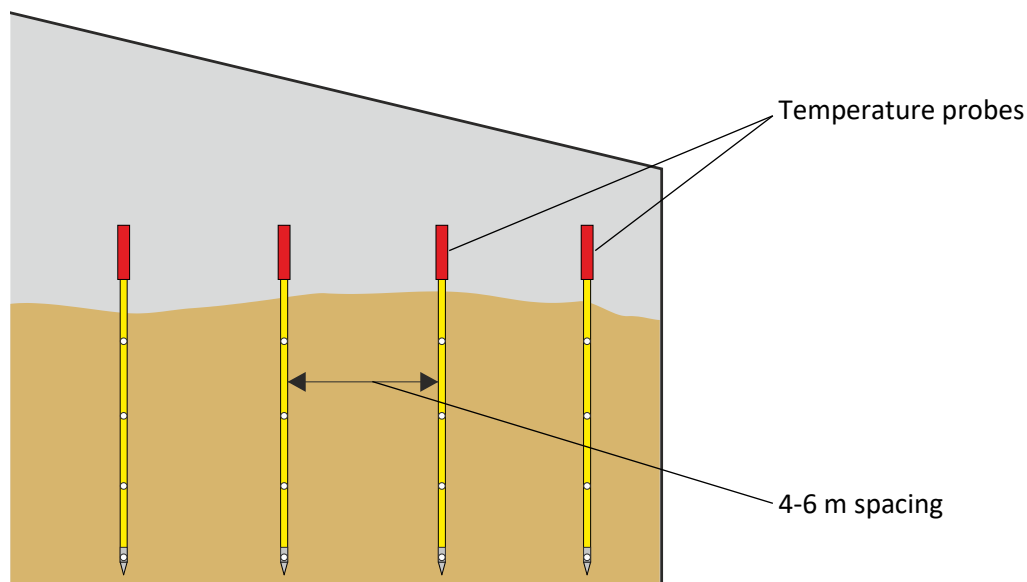
The measurement sequence should be taken into consideration before starting the first measurement in order to be able to retrace where the temperature has been taken from. We recommend to prepare a table opposing the number of the temperature probe (1-200) with box or position number. Thus it is possible to carry out control measurements more selectively.



The GTM 800 may only be operated with the protective bag. It prevents the battery from falling out of the housing when the device falls down.

The GTM 800 may not remain permanently in the ex-zone. It is only carried for the purpose of measuring in the ex-zone, and then removed again.

The measurement procedure is easy and fast. The temperature probes are connected to the **GTM 800** one by one (the temperature probes must be numbered) during the normal flat store inspections. When pressing the measurement key the **GTM 800** stores the temperature readings of the temperature probe. In case of limit exceeding an acoustic signal is sent immediately. Optionally it is also possible to connect a printer.

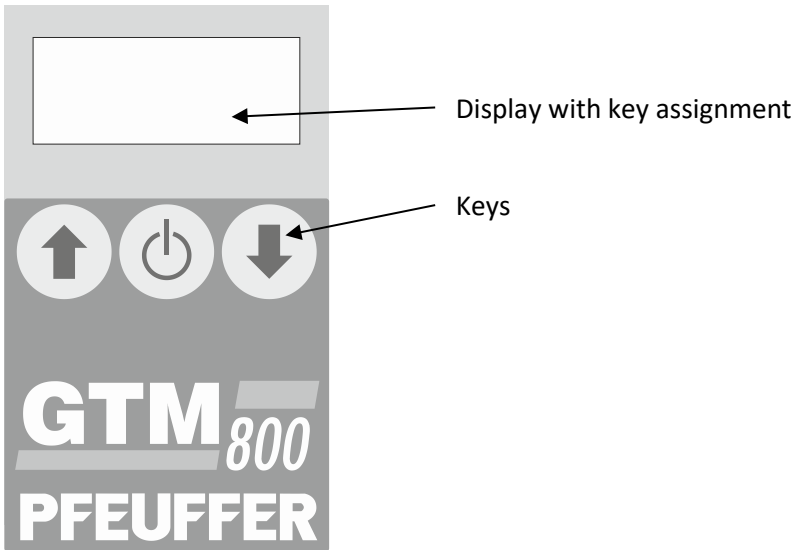


4.2 Assembly of the GTM 800

Due to the portability of the **GTM 800** device any location for the printer (option) can be chosen. Do not expose the printer to direct solar irradiation, heat, humidity and dust. Pay attention to a correct paper feed when using endless paper. The mains and the interface cable should not hinder the paper feed. A printer pillar can be supplied on request.

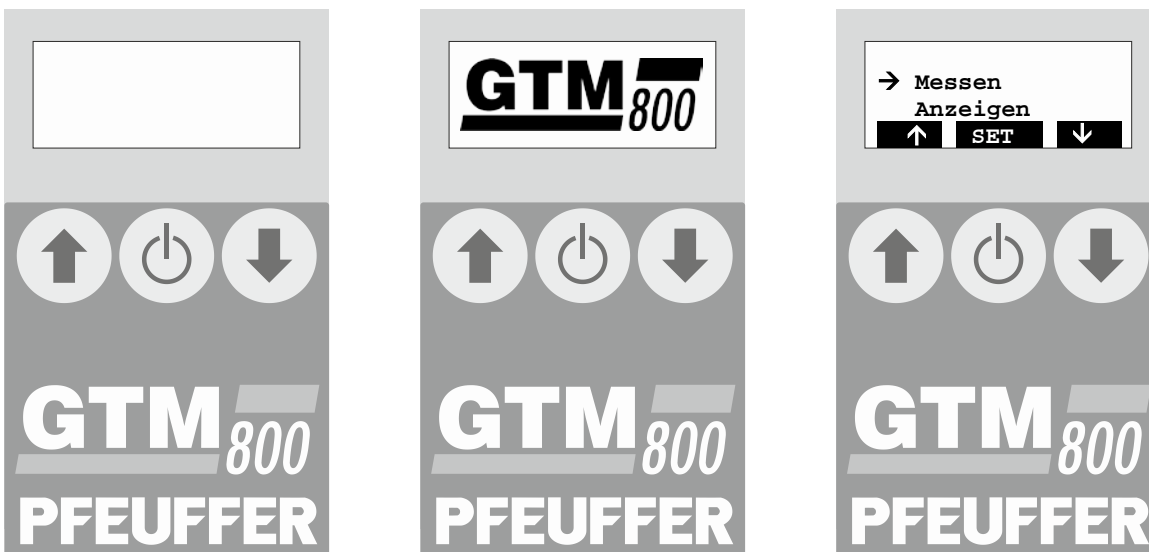
5 Configuration

5.1 Survey of the single keys and indications



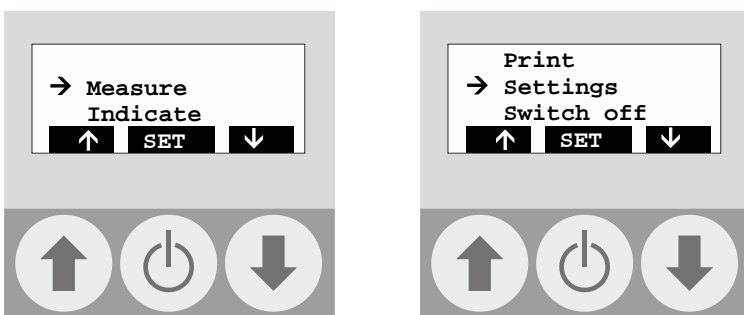
5.2 Switch on

Press the central key :

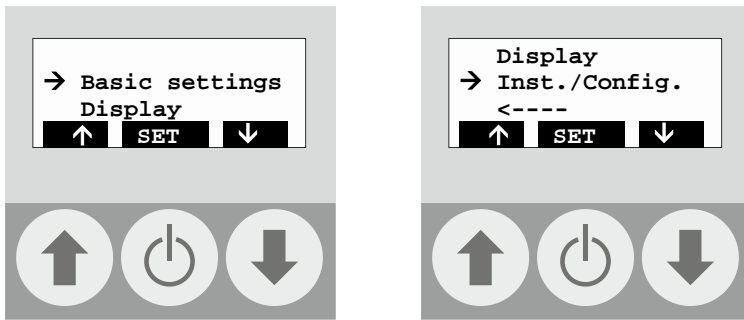


5.3 Menu Installation/Configuration

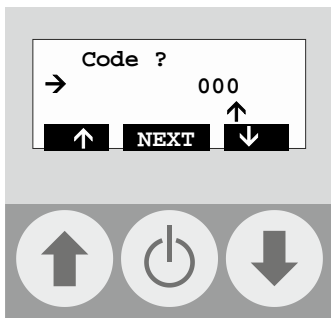
Select the menu item "Settings" by means of the arrow keys and confirm by pressing the central key :



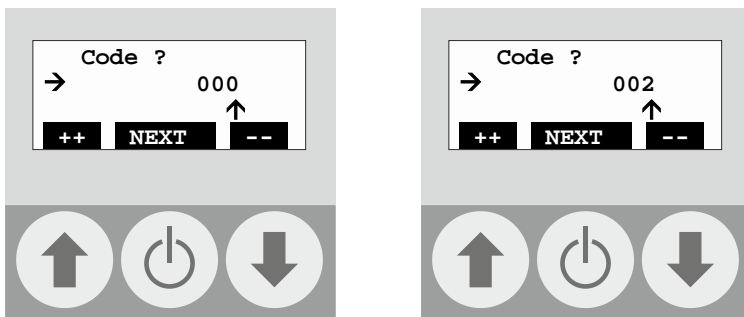
Then select the menu item "Inst./Config." by means of the arrow keys **↓** **↑** and confirm by pressing the central key **⏻** :



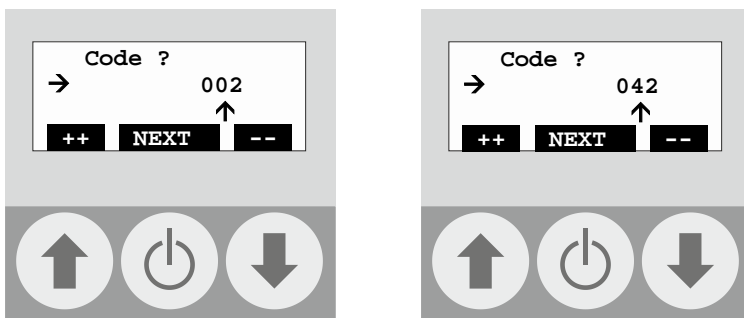
The window "Code ?" appears in order to protect the configuration from unintended modifications.



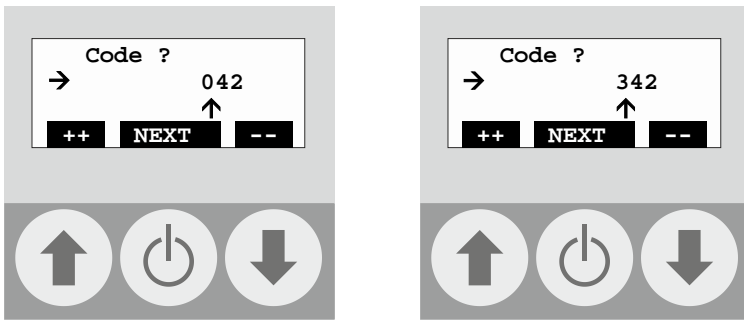
Set code by entering the figure " 2 " by means of the arrow keys **↓** **↑** and confirm it by means of the central key **⏻**.



Then enter the figure " 4 " by means of the arrow keys **↓** **↑** and confirm by means of the central key **⏻** :



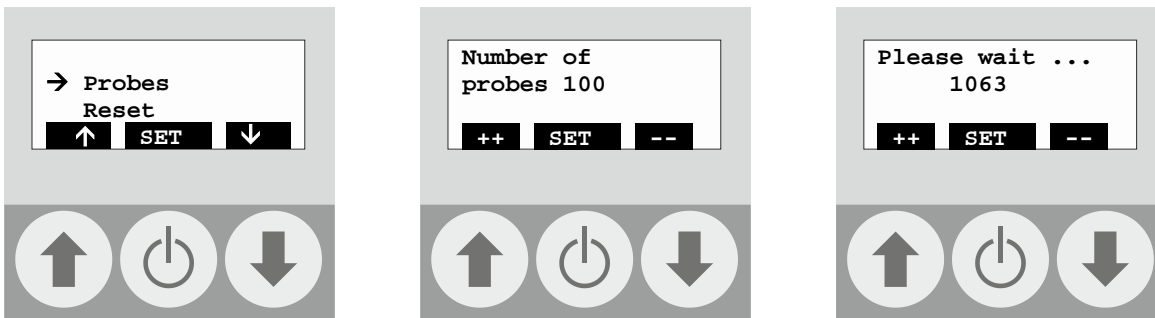
Then enter the figure " 3 " ↓ ↑ and confirm by pressing the central key ⏻ :



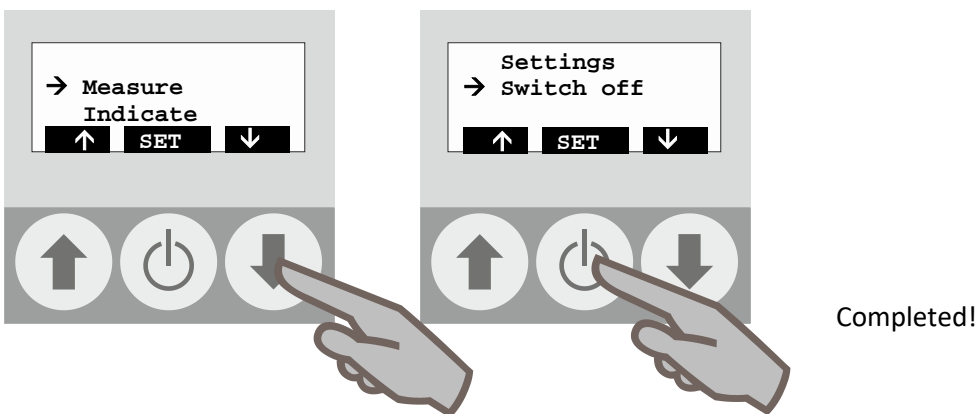
Now the menu "Installation and Configuration" displays.

5.4 Configuration probes

First select the menu and then enter the code as described under **chapter 5.3**. Select "Number of probes" ↓ ↑ and confirm by pressing the central key ⏻. Increase the figure until the number of probes is reached. A value from 0 to 200 is permitted.

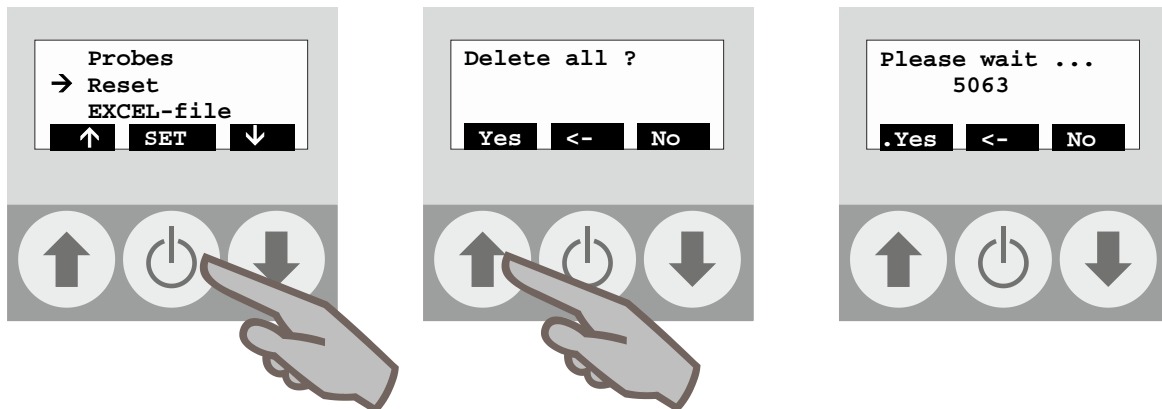


At the end of the setting the start menu appears again. In order to store the settings into the permanent memory the instrument must be switched off (You also can wait until the instrument switches off automatically after approx. 30 seconds):



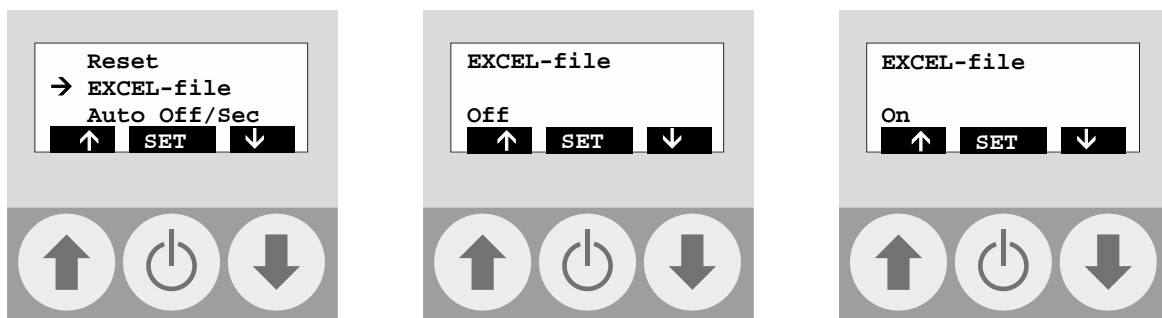
5.5 Reset

"Reset" deletes the complete measuring memory and the complete configuration.



5.6 EXCEL-file

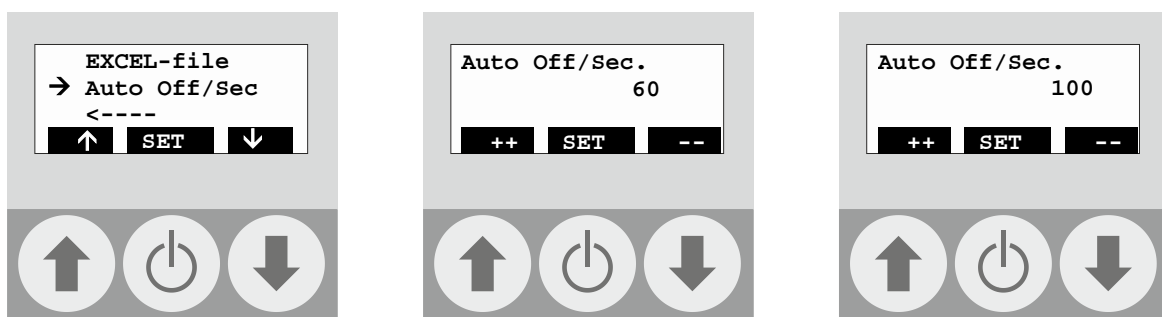
"EXCEL-file" allows the output of the temperature data in an Excel compatible file format. Select "On/Off" by means of the arrow keys ↓ ↑ and confirm by pressing SET ⏻.



The correct reception of this format on the PC requires the configuration of the interface as well as the use of a terminal program! If you have any questions, please contact Pfeuffer GmbH.

5.7 Auto Off/Sec

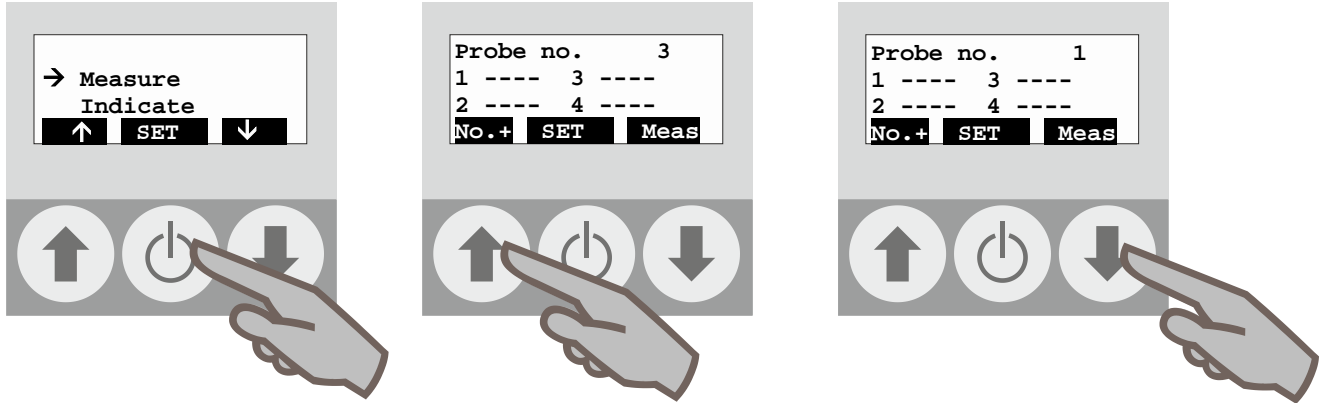
"Auto Off/Sec" regulates the period time the **GTM 800** remains activated without entering any data. This figure is indicated in seconds and can be changed by means of the arrow keys ↓ ↑ and confirmed by pressing SET ⏻. The standard value is 100 seconds.



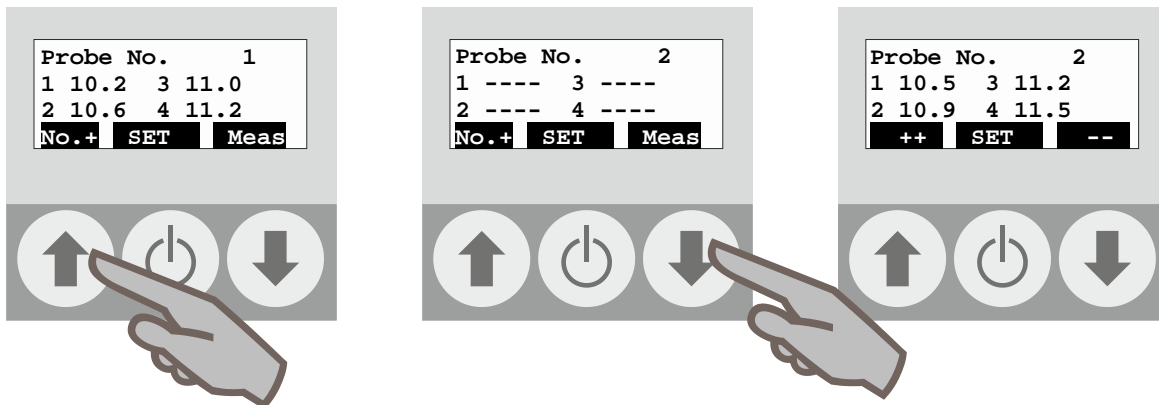
6 Routine operation

6.1 Measurement

Switch on the instrument. The main menu appears. Now you can move to the measurement menu by pressing the central key \odot . Press the left key \uparrow to select the probe number. Press the right key \downarrow to start the measurement.



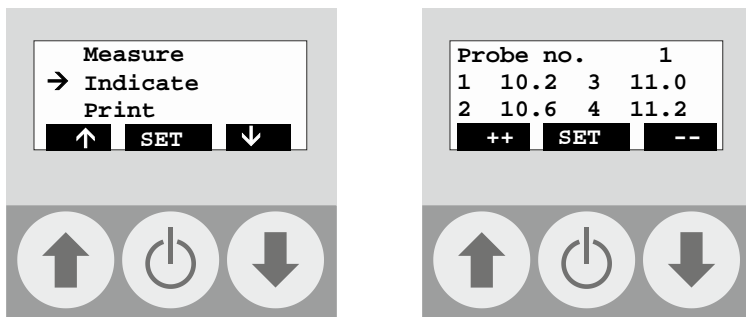
The **GTM 800** indicates the measured readings on the display. To select the next probe, press the left key \uparrow again and then press the right key \downarrow to activate the measurement.



The proceeding is the same for the measurement of the other probes.

6.2 Indicate measurement

Move to Indicate by means of the arrow keys \downarrow \uparrow and confirm by pressing the central key \odot . Probe no. 1 and the measured temperature readings appear on the display. By means of the arrow keys \downarrow \uparrow the single probes can be selected. By pressing the central key \odot you can quit the menu to return to the main menu.



6.3 Print measurement

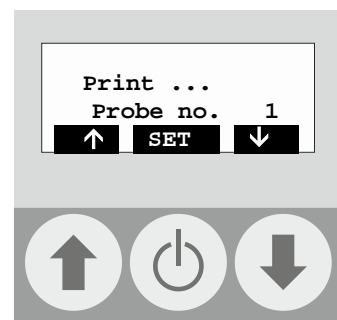
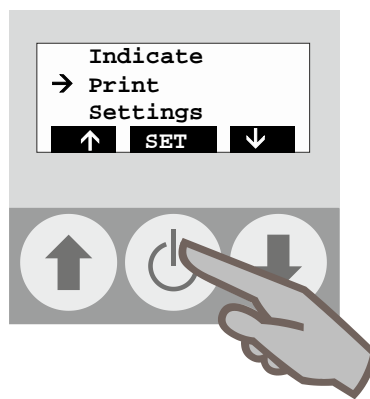
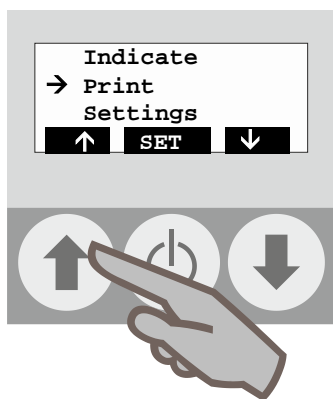
First of all the IR interface with the adapter must be connected to the printer and an optical connection between the instrument and the adapter must be available.



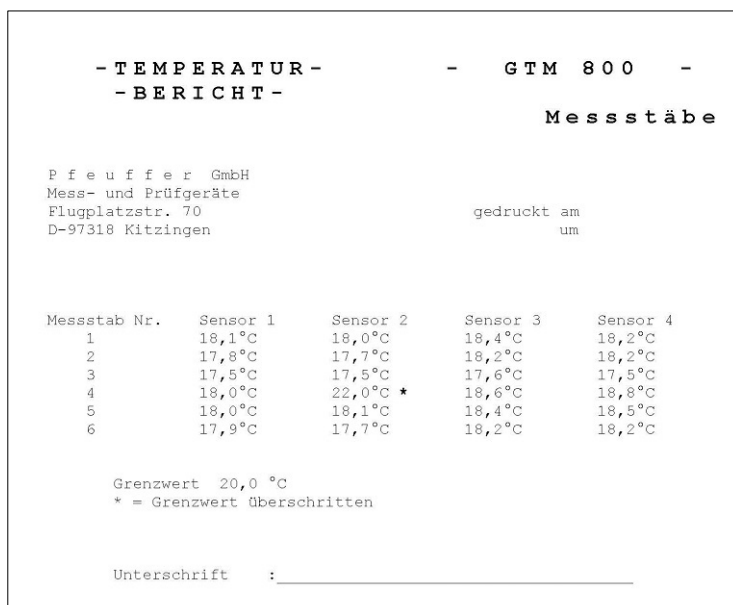
IR module at **GTM 800**

Printer LX 300 from the bottom side with IR module and adapter

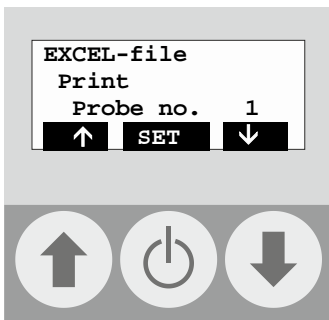
Now select the menu "Print" ↓ ↑ and confirm by pressing the central key ⏻.



The printing starts. Please hold up the connection between the IR module and the **GTM 800** until the printing procedure is completed.



If the setting was changed to Excel format, this is indicated on the display:

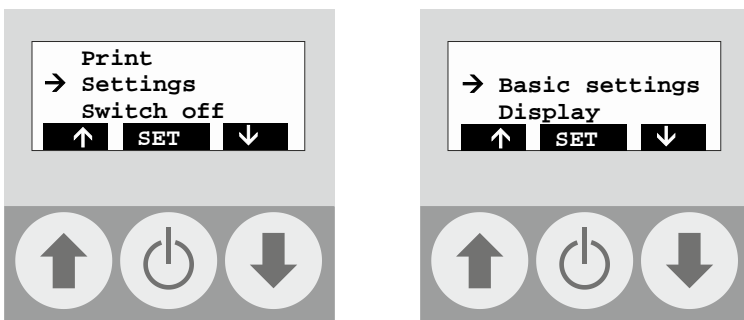


The correct reception of this format on the PC requires the configuration of the interface as well as the use of a terminal program! This format is not suitable for the output on the printer! If you have any questions, please contact Pfeuffer GmbH.

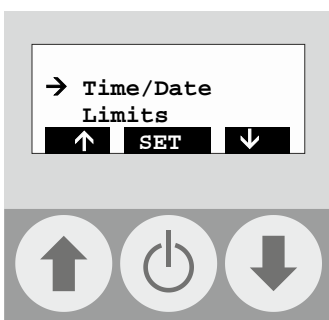
7 Other settings

7.1 Menu Basic settings

Select the menu item "Settings" by means of the arrow keys \downarrow \uparrow and confirm by pressing the central key \odot :



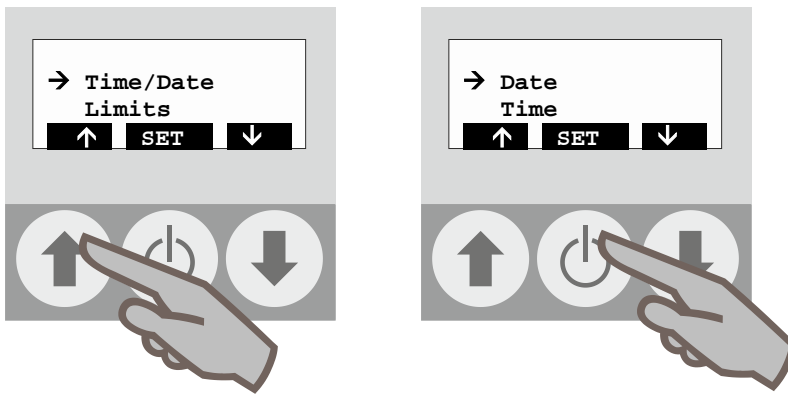
Then select the menu item "Basic settings" \downarrow \uparrow and confirm by pressing the central key \odot . The window basic settings and the corresponding submenus appears:



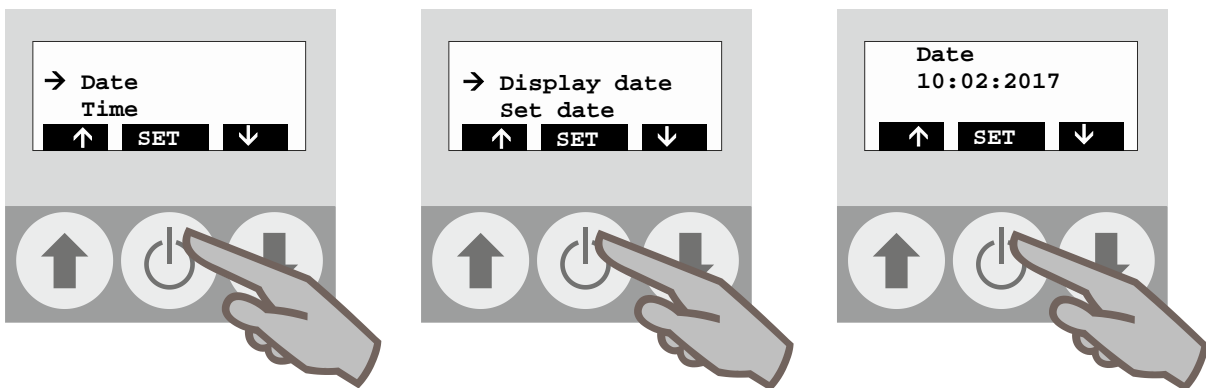
7.1.1 Menu Time/Date

Allows the setting of date and time.

Select the menu item "Time/date" \downarrow \uparrow and confirm by pressing the central key \odot . Then select the requested menu item (time, date or reset) by means of the arrow keys:



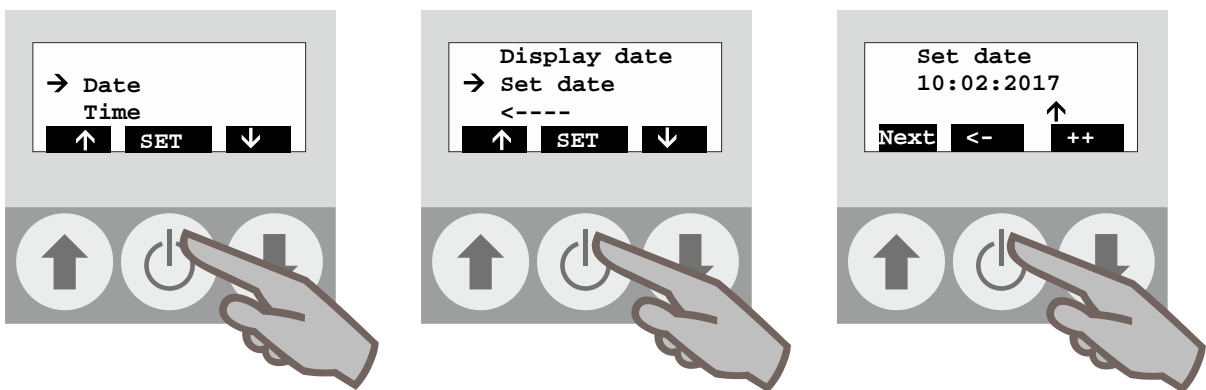
The submenus "Date" as well as "Time" offer can be indicated on the display:



or can be changed:

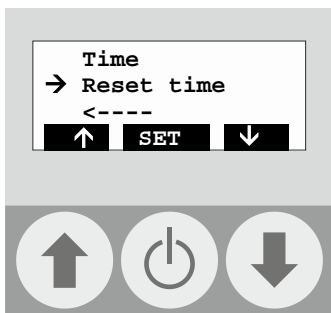
At the date indication you can move forward by one position by means of the arrow key \uparrow .

The arrow key \downarrow increases the numerical value above the selection arrow by one figure. Confirm the requested setting by means of the central key \odot .



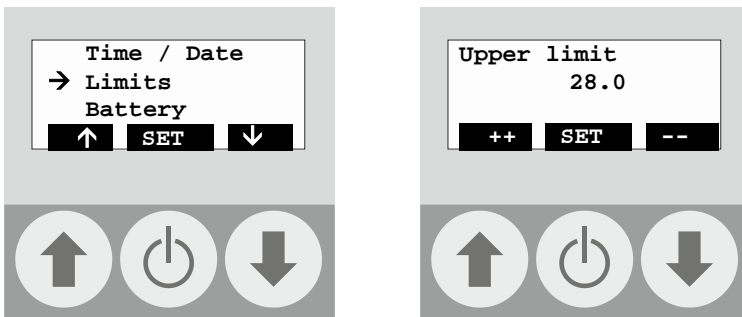
The same proceeding is valid for the submenu »Time«.

The submenu "Reset time" deletes the date and time settings. After pressing the central key \odot the date and time settings must be readjusted.



7.1.2 Menu Limits

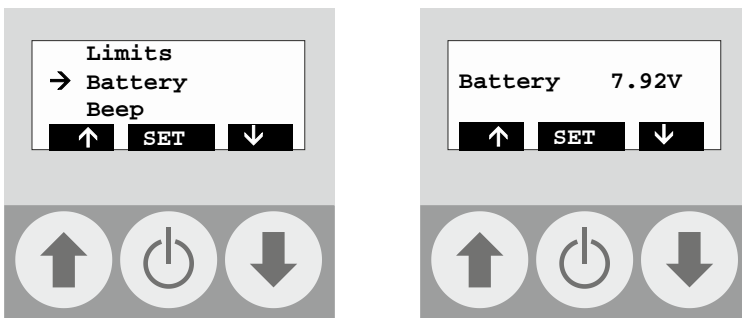
Allows the determination of the upper limit at which the alarm signal is to be raised. Select the menu item "Limits" by means of the arrow keys \downarrow \uparrow and confirm it by pressing the central key \odot :



The requested temperature reading is set by means of the arrow keys \downarrow \uparrow in steps of 0.5°C. Confirm by pressing the central key \odot .

7.1.3 Menu Battery

Allows the inquiry of the battery voltage. Confirm by pressing the central key \odot :

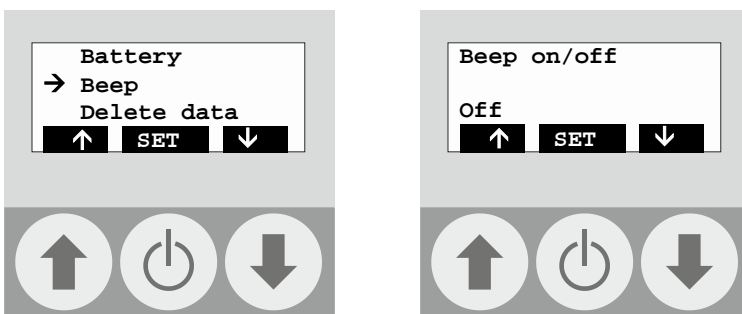


The voltage of a new 9 V compound battery is 9.4 V – 9 V.

We recommend replacing the battery at a voltage of 7.0 V, at least, however, when the message "Battery empty" (see **chapter 8** – trouble shooting) appears on the display.


7.1.4 Menu Beep

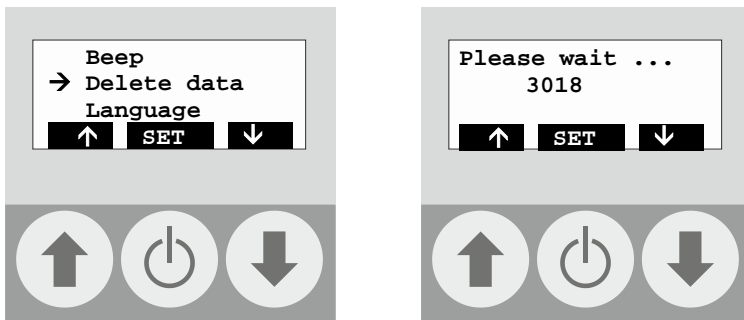
Allows the activation and deactivation of the beep for the warning in case the set limit is exceeded. Select the menu item "Beep" by means of the arrow keys \downarrow \uparrow and confirm it by pressing the central key \odot :




The activation or deactivation of the beep is done by means of the arrow keys \downarrow \uparrow . Confirm by pressing the central key \odot .

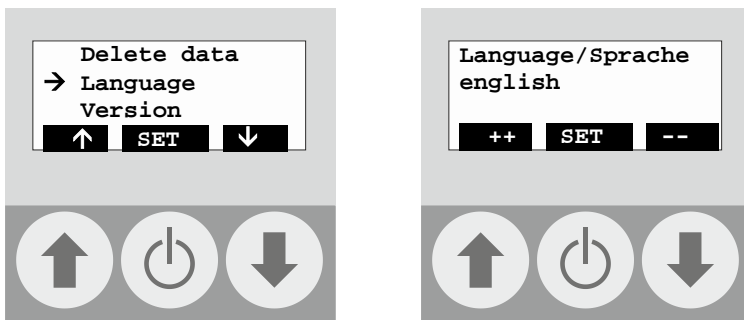
7.1.5 Menu Delete data

Allows the deletion of all stored measurement data. Confirm by pressing the central key . Then the erasing procedure is carried out automatically. This process takes some minutes.




7.1.6 Menu Language

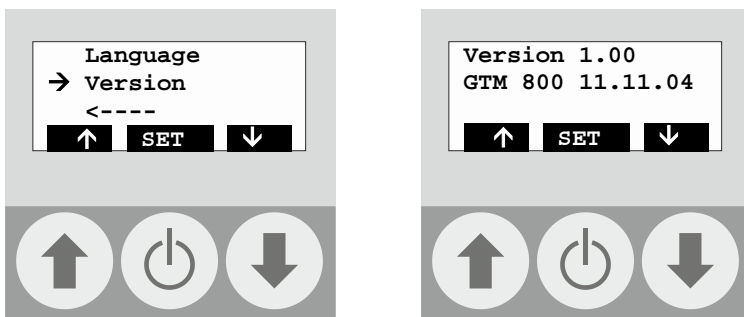
Allows the language selection (German/English). Press the central key  to activate this option:




The selection is done by means of the arrow keys  . Confirm by pressing the central key .

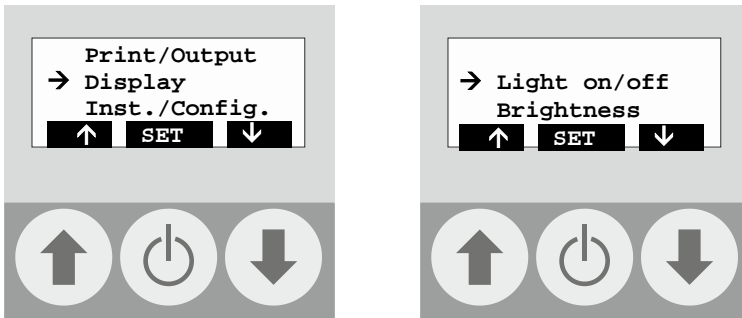
7.1.7 Menu Version

Allows the inquiry of the release. Activate this option by pressing the central key  :




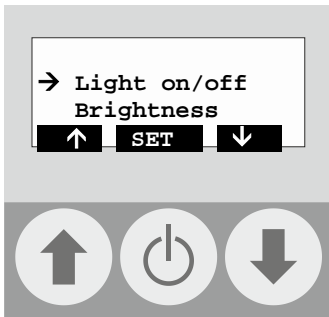
7.2 Menu Display

Allows the modification of the display settings (illumination, brightness, contrast). Confirm by pressing the central key .




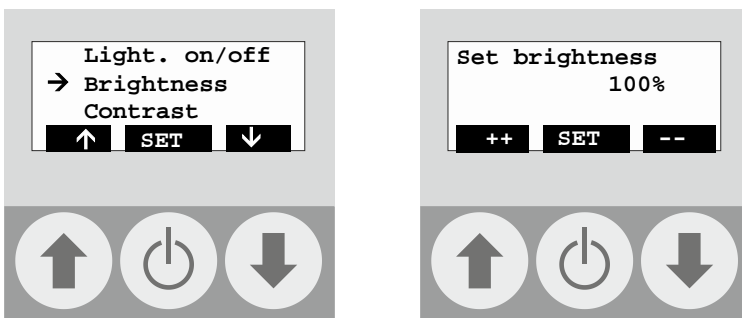
7.2.1 Menu Lighting on/off




Allows the activation and deactivation of the display illumination. Activate this menu item by pressing the central key . The illumination is switched on or off.




7.2.2 Menu Brightness

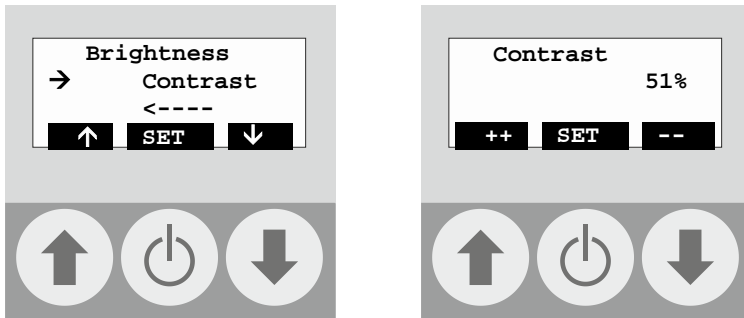
Allows the setting of the illumination intensity. Confirm this menu item by pressing the central key .






The requested degree of brightness can be selected by means of the arrow keys   in steps of 20%. Press the central key  after the setting.

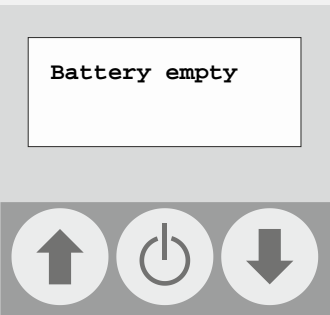
7.2.3 Menu Contrast

Allows the setting of the display contrast. Confirm the setting by pressing the central key .



The requested contrast intensity is selected by means of the arrow keys   in steps of 3-5 %. The basic setting should be between approx. 51 % and 64 %. Confirm the setting by pressing the central key .

8 Small trouble shooting - Problems and solutions

Error message	Cause
	<p>Battery is empty. Confirm error message by means of the central key and replace the battery or charge the accumulator, see chapter 7.1.3.</p> <p>You should only use the following battery or accumulator types:</p> <ul style="list-style-type: none"> - 9 V compound battery Alkali Mangan, 6LR61, 550 mAh - 9 V accumulator / 120 mAh



A battery change must always be carried out outside the ex-zone. The battery could be lost and pose a hazard. In addition, a lost battery is to be negatively evaluated for environmental reasons.


9 Technical data

9.1 Specifications (please enter):

Company/City: _____
 Pfeuffer order no. _____
 Designation: **GTM 800**
 Serial no. _____
 Year of construction: _____

9.2 Measuring device GTM 800

Measuring range -20°C to +70 °C
 Measuring accuracy ±0,5 °C
 Ambient temperature housing +5 °C to +40 °C
 Interface Infrared (firmly installed in the device)

The measuring instrument is marked according to category  II 3 EEx D n T4 on the type plate.

9.3 Temperature measuring probes

The probes are marked according to category  II 3 D c T4.

10 Glossary

GTM 800

Hand-held unit for the configuration and evaluation of temperature probes

Measuring probes; fiberglass probes; probes

Temperature probe made of fiberglass plastic with to 2 up to 4 temperature sensors

Infrared interface

- Integral infrared interface inside the hand-held instrument for the wireless transmission of the measurement data to a printer or a PC.
- Peripheral device for the connection to a printer or a PC.

11 Table temperature values sensor

Temperature in °C	Corresponding resistance in ohm
0	16.300
5	12.700
10	9.950
15	7.860
20	6.250
25	5.000
30	4.030
35	3.270
40	2.660

12 Declaration of Conformity

EU Declaration of Conformity

In accordance with the EU Directives Low voltage 2014/35/EU and
Electromagnetic compatibility (EMC) 2014/30/EU

Manufacturer: **Pfeuffer GmbH**
Flugplatzstraße 70
97318 Kitzingen
GERMANY

Person authorized to compile the technical documents: **Lothar Pfeuffer, General Manager**

Designation: **Temperature monitoring system for flat grain stores**

Type: **GTM 800** Serial no. _____

The aforementioned product complies with the requirements of the following relevant directives and harmonized standards:

Directives / Standard	Title
2014/35/EU	EU Directive: Low voltage
DIN EN 60204-1	Safety of machinery – Electrical equipment of machines; Part 1: General requirements
DIN EN 610101	Safety requirements for electrical equipment for measurement, control and laboratory use; Part 1: General requirements
2014/30/EU	EU Directive: Electromagnetic compatibility
DIN EN 61000-6-2	Electromagnetic compatibility – Part 6-2: Generic standards – Imission for industrial environments
DIN EN 61000-6-3	Electromagnetic compatibility – Part 6-3: Generic standards – Interference transmission for residential areas, business and industrial premises as well as small-scale companies

Any modification to the temperature monitoring system not agreed with us shall result in this declaration becoming null and void.

Kitzingen, _____

Lothar Pfeuffer, General Manager