



Ex-MX4 BT

Bedienungsanleitung

Operating Instructions

Notice d'utilisation

Gebruiksaanwijzing

Istruzioni per l'uso

Instrucciones de uso

Manual de instruções

Bruksanvisning





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Note:

The prevailing operating manual, EC Declaration of Conformity and the Ex-certificate can be downloaded from the relevant product page under **www.ecom-ex.com** or they can be requested directly from the manufacturer.

1. Application

The Ex-MX4 BT is a contactless temperature measuring device with an integrated Bluetooth™ and is designed for industrial use in potentially explosive areas of Zones 2 and 1 in accordance with Directive 99/92/EC (ATEX 137).

2. Safety instructions

This operating manual contains information and safety regulations that must be followed to ensure the safe and reliable operation of the device under the described conditions. Non-observance of the information and instructions can have dangerous consequences or may contravene applicable regulations.

Please take the time to read through the operating manual carefully before you start using the device.

The German version of this operating manual shall prevail in the event of any doubt or discrepancies (for example, due to translation or printing errors).

3. Errors and load restrictions

If there is a possibility of the safety of the device being hampered, the device must be taken out of operation and removed from the Ex-area immediately.

Accidental re-commissioning of the device must be prevented.

We recommend sending the device to the manufacturer for examination.

The safety of the device may be at risk if, for example:

- damages are visible on the casing
- the device has been subjected to excessive loads for which it is not designed
- the device has been improperly stored
- the device has been damaged in transit
- labels on the device are illegible
- malfunctions occur
- obvious measuring inaccuracies occur
- measurements using the device are not possible any longer
- permitted threshold values have been exceeded

4. Safety regulations

Persons using the device must observe the standard safety regulations and read the certificate to prevent incorrect operation of the device.

The following safety regulations must be observed in addition:

- The device must not be opened inside the Ex-area.
- The batteries must be changed only outside the Ex-area.
- Additional batteries must not be carried in the Ex-area.
- Only the approved battery types must be used.

- In potentially explosive areas, the device must be operated only when in its leather pouch. Please ensure that the leather pouch is always closed completely and is undamaged while using.
- Only the accessories approved by ecom instruments GmbH must be used.
- Avoid using the device in corrosive acidic or alkaline mediums.
- Please ensure that the device is not taken into Zone 0 areas.
- The supplied thermocouple must be used only outside the Ex-area.

4.1 Special conditions for use in Zone 0 areas

Temperature measurement using the Ex-MX4 BT is allowed within Zone 0 only if the following conditions are met:

1. The Ex-MX4 BT temperature measuring device must not be brought into Zone 0.
2. Absolutely ensure that the device does not fall into Zone 0, even by mistake. To ensure this, the device's carrying sling must also be attached securely to the operator's belt or to a belt loop. The length of the carrying sling should be measured such that the Ex-MX4 BT is still at a distance of 50 cm from the boundary area of Zone 0 when it hangs freely on the carrying sling.
Only carrying slings approved by ecom instruments GmbH must be used.

5. Safety instructions



- Caution: laser beam!
- Do not look directly into the laser beam!
- Do not aim the beam at other people!
- Danger of eye damage!
- Laser class 2
- Power < 1 mW
- Wave length 635 nm

6. Ex data

EC-type examination certificate no.: TÜV 00 ATEX 1597 X

Ex designation:  II 2 G EEx ia IIC T4

Approved for Zones 1 and 2, device group II, gas group C potentially explosive gases, vapours or mist, temperature class T4.

7. Technical specifications

Measuring range:	-30°C ... +900°C
Display resolution:	0.1°C
Ambient temperature:	0°C... +50°C; laser operation up to a maximum of 45°C
Storage temperature:	-20°C ... +50°C (without batteries)
Batteries / power supply:	2 x LR06 (AA) type approved in compliance with IEC

Emissivity:	0,10 ... 1.50 (0.95 preset)
Measuring spot marking:	3 point laser marking
Optical resolution (standard optics):	60:1 (19 mm measuring spot for 1.15 m)
Accuracy (+25 °C):	± 0.75% of the measured value or ± 0.75 K, whichever is greater
Ambient derating (at +25 °C ± 25 K):	(± 2 K for measurement objects below –5 °C)
Reproducibility:	< 0.05 K/K or < 0.05 %/K, whichever is greater
	± 0.5% of the measured value or ± 0.5 K, whichever is greater;
	± 1K for measurement objects below –5 °C
Spectral sensitivity:	8-14 µm
Response time:	250 ms (95%)
Dimensions:	200 x 170 x 50 mm
Weight:	Approximately 600 g
CE mark:	CE 0102

Manufacturer:	Model (LR6):
Varta	Alkaline No. 4806 LR6
Varta	Alkaline Extra Longlife No. 4006
Varta	Alkaline Maxi Tech No. 4706
Varta	Alkaline Electric Power No. 8006
Varta	No. 4706 Alkaline LR6
Varta	LR6 High Energy No. 4906
Duracell	Alkaline
Duracell	Professional Alkaline Battery Procell
Duracell	Alkaline Ultra
Duracell	Ultra M3 MN1500 LR6
Duracell	Plus MN1500 LR6
Duracell	Procell MN1500 LR6
Panasonic	Alkaline Power Line Industrial Battery LR6
Panasonic	Powermax 3 LR6
Eveready	Alkaline Energizer
Eveready	Energizer No. E91
GP	Super Alkaline Battery 15A LR6
Daimon	Alkaline
Rayovac	Maximum Alkaline Battery
Double Lion King	Alkaline Battery
RS	Alkaline

7.1 Bluetooth™ configuration

The Ex-MX4 BT allows data transfer via Bluetooth™.

System requirements:

- Windows-compatible computer (operating systems 98, ME, 2000, XP or higher).
- Bluetooth system completely installed on the computer (not included in the scope of supply).
- Configuration software BlueTool (included in the supplied CD).

After installing the Bluetooth system on the computer, the thermometer can be operated in different modes (for the description of modes, refer to 8.7 Setup).

Please refer to the PDF files in the Bluetooth_Modul and BlueTool folders in the supplied CD for information regarding the configuration of the LinTech Bluetooth module.

8. Functional description / operating instructions

Please take the time to read through this operating manual carefully to ensure that you are familiar with and can use all the functions of your Ex-MX4 BT. Please go through the instructions on the following pages for your own safety and information!

8.1 Operation

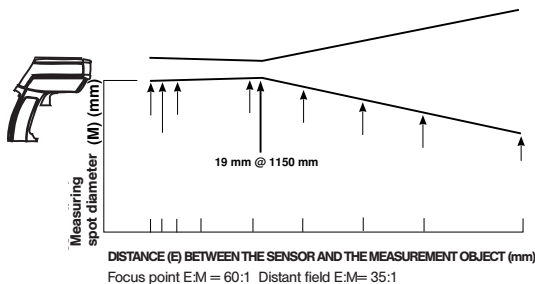
All objects with a temperature above absolute zero radiate infrared energy that spreads in all directions at the speed of light. If an infrared thermometer is aimed at a measurement object, the lens gathers the energy and focuses it on an infrared sensor.

The sensor reacts by generating a voltage signal that is directly proportional to the absorbed energy. The microprocessor-controlled electronic unit of the device can determine and display the current temperature using additional parameters. Measurement objects with a shiny or polished surface not only radiate energy, but also reflect a part of the radiation from their surroundings.

An emissivity factor between 0.1 and 1.5 takes account of this fact so that only the actually radiated (and not the reflected) energy is included in the calculation of the measured value. The majority of applications are measured with an emissivity of 0.95. It is therefore preset to 0.95 in our device and can be adjusted in steps of 0.01 depending on the application. Emissivity range over 1.00 is intended for applications, where adjacent measurement objects having different temperatures are to be measured. For example, this is the case if there are two conveying lines with different temperatures and the temperature of 'the colder one' is to be measured. The radiated reflected energy would thereby falsify the measurement and hence a correct result would be impossible. The temperature can now also be measured accurately using the emissivity setting > 1.00 by way of a one-time reference measurement using a contact thermometer.

8.2 Measuring marking

Keep in mind that the measured part of the object surface (3 point measuring spot marking) changes with the increasing measuring distance as shown in the figure. The ratio between the measuring distance and measuring spot diameter is approximately 60:1 at the focus point and approximately 35:1 in the distant field (> 10 m). To take continuous readings, set the LOCK switch in the battery compartment to „On“ and press the measurement button (the laser does not remain on continuously). Reset the LOCK switch to „Off“ for the normal operation.



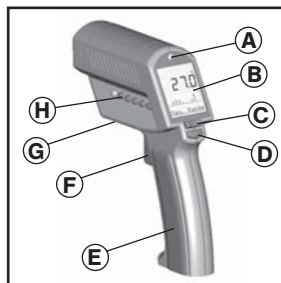
The laser sight makes sighting a measurement object easier. Laser points indicate the exact diameter of the measuring spot. You can use the LASER function key for switching the laser on and off by keeping the measurement button pressed. The laser icon (refer to 8.5 Display screen) indicates the switched-on laser.

8.3 Measurement

Aim at the object to be measured and press the measurement button. The measured temperature is shown in the display. It is visible in the display for seven seconds after releasing the measurement button. If another button is not pressed, the device switches off automatically after this time. Selected functions remain set and the function selection menu returns to the initial position. To recall the last measured value, press ENTER without pressing the measurement button.

8.4 Operating and display elements

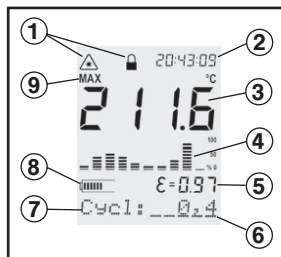
- (A) Acoustic/optical warning signal
- (B) Display
- (C) Arrow keys
- (D) Enter key
- (E) 11 setting switches
- (F) Measurement button
- (G) Tripod connection
- (H) 6 function keys



For selecting the functions, switch on the device by pressing the measurement button (F). Then press the appropriate function key (H). In order to change the functions, either press ENTER or press the current function key first and then the desired one.

8.5 Display screen

- (1) Status and warning icon
- (2) Time
- (3) Measured value
- (4) Graphical display of the measured value
- (5) Emissivity
- (6) Status line
- (7) Mode display
- (8) Battery status
- (9) MAX, MIN, DIFF... Icon



8.6 Settings

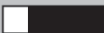
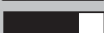
Open the battery compartment. You can set the DIL switches.

Lock:	(ON) locks the measurement button.
°C/°F:	Toggling the display between °C and °F (the time and date format also change).
Buzzer:	(ON) acoustic alarm.
Backlight:	(ON) display light
Set default:	reset to the factory defaults.
Ltd. Access:	Function keys are disabled.
Laserflash:	The laser marking starts blinking when the alarm values are exceeded.
Auto Off:	(On) The turn-off time does not extend automatically after receiving a command from the software (applicable only to the operation in the master mode)
Siv./Mstr.:	Toggles the Bluetooth™ mode.
Time/Date:	Toggles between the date and time display.
TC-K:	Thermocouple type Temperature range for the K type: -30°C ... +400 °C

Note: The thermocouple must be used only outside the Ex-area!

Factory defaults

DIL switch

ON	
	Lock
	C/ F
	Buzzer
	Backlight
	Set Default
	Ltd. Access
	Laserflash
	Auto off
	Siv. / Mstr.
	Time/Date
	TC-K

8.7 Setup

8.7.1 Slave mode (passive mode/Bluetooth™)

The thermometer is constantly ,on‘ in this mode and the computer searches for it. This is advantageous when the temperature needs to be monitored continuously.

Caution: Batteries of the thermometer that is operated continuously discharge considerably quickly when compared with those used intermittently.

Proceed as follows:

1. Open the handle of the thermometer and set the DIL switch 9 to OFF (SLAVE).
2. Switch on the thermometer using the measurement button.
3. Press the Setup key. The following scrolling message appears on the display - "Bluetooth on-up, off-down". Activate the Bluetooth operation by pressing the Up key below the display. A blinking icon in the display indicates the stand-by mode of the Bluetooth module - The lock icon indicates continuous operation.



Note: If the auto-executing battery test detects that the battery is too low (display: „LowBat - no BT“), the Bluetooth application is not started.

4. Now launch the Bluetooth software on your computer and let it search for Bluetooth devices and connect them. (The exact functioning for your Bluetooth application can be referred to from the corresponding operating manual).
5. The thermometer is detected as „IR Therm....“. The requested PIN is „1234“ by default. Right-click the icon of the device and switch to the „Properties“ sub-menu. Remember the number of the ComPort. The green light-emitting diode over the display of the thermometer indicates the existing connection.
6. Now start the corresponding application software, if yet to start, for the thermometer. Before you can exchange data between the thermometer and the computer you have to set the ComPort number as mentioned in point 5.
7. Press the Setup key and then the Down key below the display to terminate the Bluetooth™ connection. If data is being transferred at this moment, you cannot stop the Bluetooth™ module.

Important note: Aforementioned statements are applicable only to the thermometer in the delivery condition. It can be set by the user using the „BlueTool“ software. Refer to the „User-defined configuration“ section for this purpose.

8.7.2 Master mode (active mode/Bluetooth™)

After switching on, the thermometer is automatically connected to the computer, the address of which has been programmed in the thermometer. This takes place using the supplied BlueTool software (refer to the „User-defined configuration“ section for this purpose). The active mode is especially suitable for the intermittent operation of the infrared thermometer. Energy consumption of the thermometer is considerably less than that in the passive mode.

Proceed as follows:

1. Open the handle of the thermometer and set the DIL switch 9 to ON (Master).
2. Switch on the thermometer using the measurement button.
3. Press the Setup key, the following scrolling message appears on the display - "Bluetooth on-up, off-down".

Activate Bluetooth™ by pressing the Up key below the display. A blinking icon in the display indicates the stand-by mode of the Bluetooth module - the lock icon indicates continuous operation.

The thermometer starts searching for the corresponding computer. When the connection is established, a green LED above the display illuminates and the colour of the Bluetooth™ icon on the connected computer changes. You can now transfer the data to the application software of the thermometer. If the measurement button is not pressed and data is not transferred, the thermometer switches off automatically after approximately 7 seconds.

8.7.3 User-defined configuration (Bluetooth™)

Proceed as follows:

Open the handle of the thermometer and set the DIL switch 5 to ON (Set default). Does „Default“ appear in the display? The DIL switch 9 must be set to OFF (slave) at this point in time without fail. Now start the Bluetooth module as described under the passive mode.

Programming the thermometer with the help of BlueTool

Launch the Bluetooth software on your computer and start the device search. Double-click the infrared thermometer icon to establish a connection (indicated by the green LED at top-left of the display and changed colour of the Bluetooth icon on your computer).

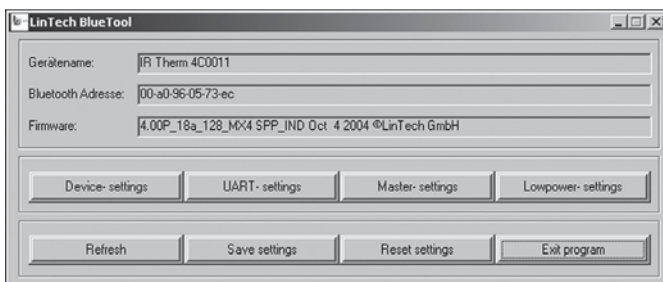
You can view the properties by right-clicking the service under Serial Ports.

Note down the number of the connected ComPort.

Now launch the BlueTool application, enter this ComPort number and then click Connect.



A configuration window opens.

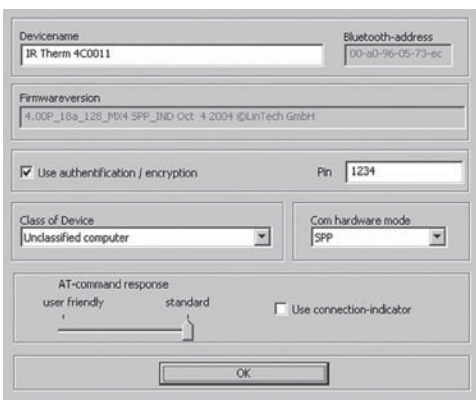


It shows various details about the device and multiple fields for invoking other setting options.

Open „Device settings“ first.

Here you can allocate a name to the thermometer and change the PIN.

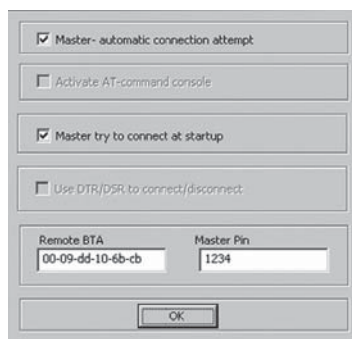
Caution: Do not forget this PIN, since it is always requested for encrypted transfer and for connections using the BlueTool software. Select SPP as the ComHardware mode and deactivate the connection indicator. Confirm the settings with OK.



Now open „Master settings“.

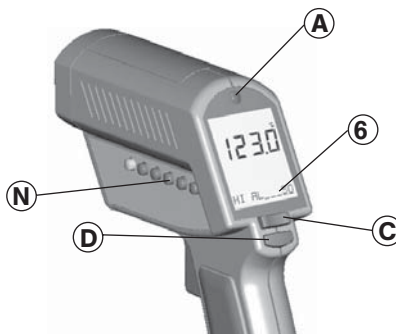
Select the checkboxes in front of “Master tries - to establish a connection automatically” and “Master tries to establish a connection while starting”. The Remote BTA field contains the address of the current computer.

Note: Only if you wish that the thermometer should respond to another computer (e.g. PDA or Notebook) later, enter the Bluetooth address of this computer. The same naturally applies to the PIN in this window. It is then mandatory to connect to the other computer. Therefore, please remember it well. Click OK. First click „Save settings“ in the main window - the data is transferred to the thermometer. You can verify the current settings with „Update“. Then exit the program. Now reset the DIL switch 5 in the handle of the thermometer to OFF. Press the DOWN key below the display. Wait till the device switches off automatically (approximately 7 s).



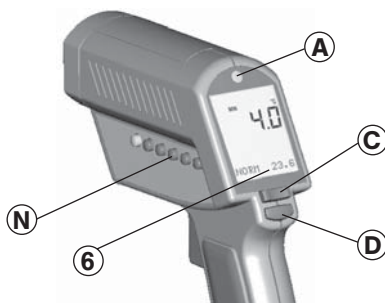
8.7.4 High alarm (upper limit)

The setting of a temperature value, which when exceeded should initiate an optical (blinking red LED (A) and blinking laser) and an acoustic warning signal. Press SETUP (N) twice. Change the current setting (6) using arrow keys (C). Confirm the input with ENTER (D).



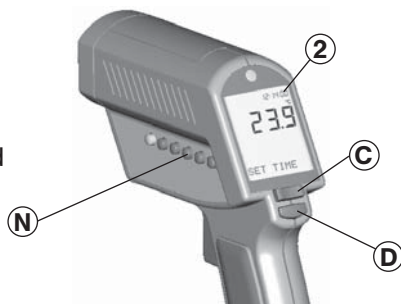
8.7.5 Low alarm (lower limit)

The setting of a temperature value, which when drops below this value should initiate an optical (blinking green LED (A) and blinking laser) and an acoustic warning signal. Press SETUP (N) thrice. Change the current setting (6) using arrow keys (C). Confirm the input with ENTER (D).



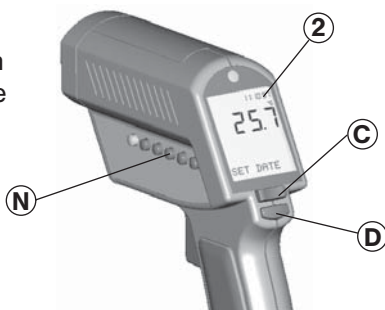
8.7.6 Time

Set the time (2) (appears in the display, in the data memory and in the printout). Press SETUP (N) four times. Change the setting using arrow keys (C) and ENTER (D). Press SETUP again to confirm the change.



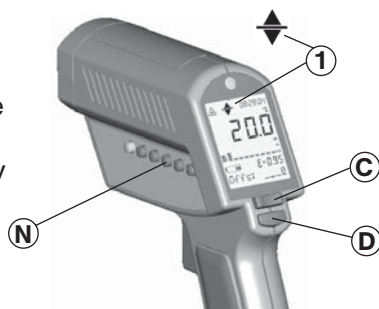
8.7.7 Date

Set the date (2) (appears in the data memory and in the printout). Press SETUP (N) five times. Change the setting using arrow keys (C) and ENTER (D). Press SETUP again to confirm the change.



8.7.8 Offset

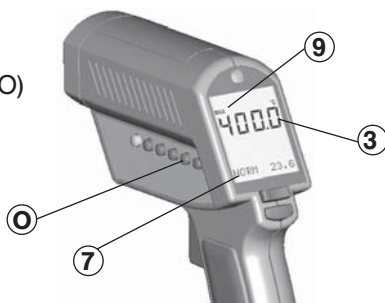
This function adds or subtracts the set offset value ($\pm 10\text{ }^{\circ}\text{C}$) from every measured temperature value. You can thus minimise (permissible) deviations in the display of different devices or improve the accuracy within a restricted temperature range when emissivity has been set correctly. Press the Setup key (N) till „Offset“ appears in the display. Select the value using arrow keys (C) and confirm with Enter (D). The icon (1) appears in the display.



8.8 Setting the mode

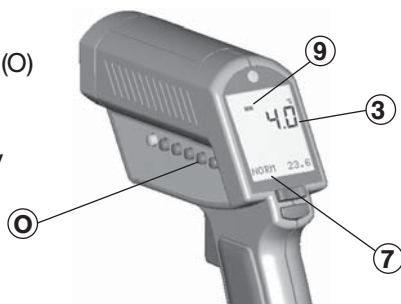
8.8.1 Max value

To activate the maximum value mode, press MODE (O) till the MAX icon (9) appears. The highest measured value (3) is always displayed as long as the measurement button is kept pressed. The currently measured value appears in the status line (7).



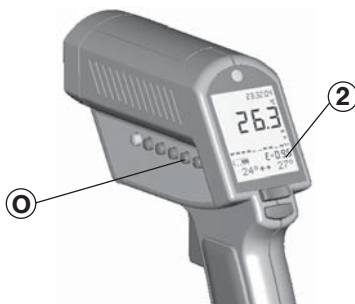
8.8.2 Min value

To activate the minimum value mode, press MODE (O) till the MIN icon (9) appears. The lowest measured value (3) is always displayed as long as the measurement button is kept pressed. The currently measured value appears in the status line (7).



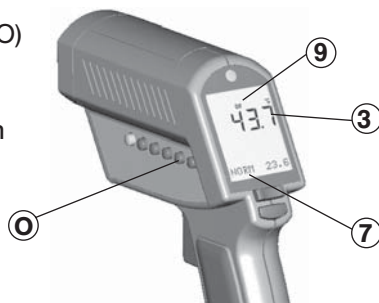
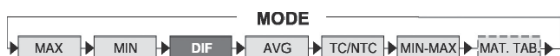
8.8.3 Min-Max range

To display the minimum and maximum temperature values determined during the measurement in the status line, press MODE (O) till both values are displayed (6).



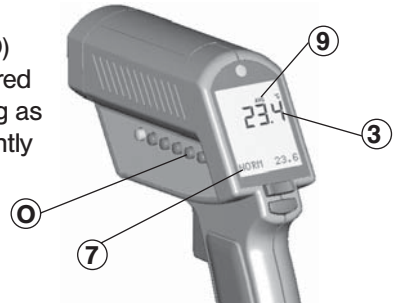
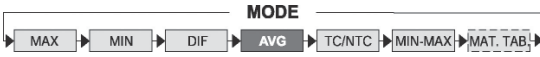
8.8.4 Difference value

To activate the difference value mode, press MODE (O) till the DIF icon (9) appears. The difference between the highest and lowest measured temperature (3) is always displayed as long as the measurement button is kept pressed. The currently measured value appears in the status line (7).



8.8.5 Average value

To activate the average value mode, press MODE (O) till the AVG icon (9) appears. The average of measured temperatures (3) is calculated and displayed as long as the measurement button is kept pressed. The currently measured value appears in the status line (7).



8.8.6 Sensor port

This function must be executed only outside the Ex-area.

Proceed as follows for determining an unknown emissivity:

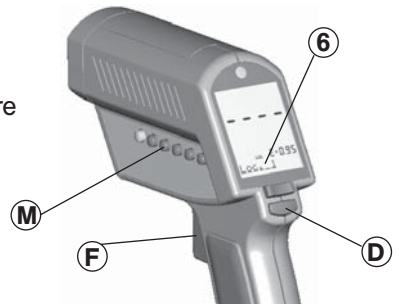
Connect the sensor to the port at the end of the handle. Press MODE till the corresponding sensor icon appears in the display. The temperature measured by the sensor is displayed in the status line in a small font. The infrared measured value is displayed in the main display screen.

8.9 Data

8.9.1 Storing the measured values

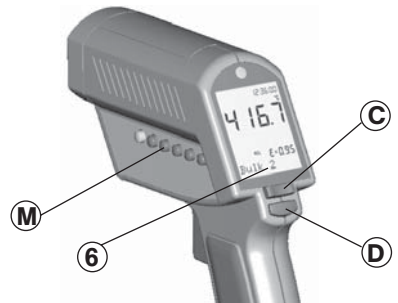
Use ENTER (D) for invoking LOG (6) in the display. Now press the measurement button (F) and record. Please ensure that the laser marking remains inside the surface to be measured. To store the temperature value, release the measurement button. The next memory location is invoked.

Note: Pressing the DATA key (M) once invokes the same function.



8.9.2 Displaying the memory

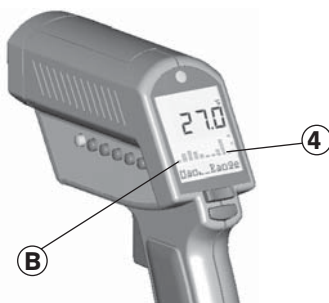
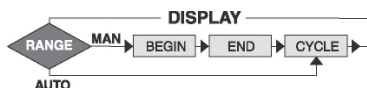
For reading the stored values, press ENTER (D) without pressing the measurement button. Then press the DATA key (M) till RCL appears in the display. A memory location is displayed (6). You can use arrow keys (C) for selecting another memory location.



8.10 Display

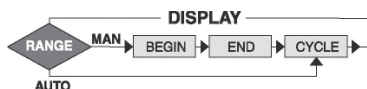
8.10.1 Graphics range

The graphical component (4) of the display shows the last 10 measured values as a trend display. The measuring range of a column (B) can be calculated automatically by the device (Auto Range Function) or set manually (Manual Range Function).



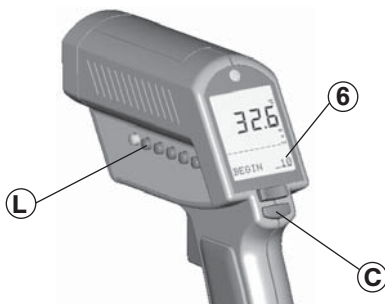
8.10.2 Selecting the graphics functions

Press DISPLAY (L) once. Use arrow keys (C) to choose between Auto Range (temperature range includes measured minimum and maximum values) and Manual Range (refer to the section 8.10.3).



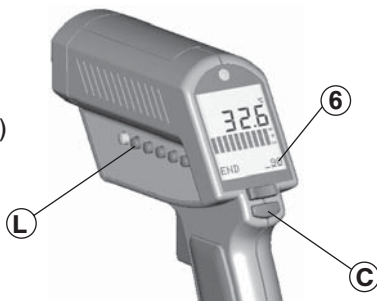
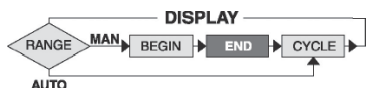
8.10.3 Begin (Manual Range)

Manual setting of the lower limit of the temperature range to be shown graphically. Press DISPLAY (L) till „Begin“ appears in the status line. Change the value (6) using arrow keys (C).



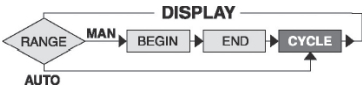
8.10.4 End (Manual Range)

Manual setting of the upper limit of the temperature range to be shown graphically. Press DISPLAY (L) till „End“ appears in the status line. Change the value (6) using arrow keys (C).



8.10.5 Cycle

The setting of the interval, in which numeric and graphical display is refreshed automatically. Press DISPLAY (L) till Cycl.: (7) appears in the status line. Change the cycle time using arrow keys (C). The default setting is 0.2 s.



8.11 Changing batteries

First remove the leather pouch and then open the battery compartment by pressing the upper handle halves lightly. Then open the handle. You need 2 Type LR6 (AA / type approved) batteries for operating the measuring device.

- Always replace all batteries together.
- Make sure that the polarity of the inserted batteries is correct.
- Please ensure that all used batteries are properly disposed of in an environment-friendly manner.

9. Emissivity

Most organic materials as well as lacquered and oxidised surfaces have an emissivity of 0.95. The emissivity is preset to 0.95 in the Ex-MX4 BT for this reason, but can be changed using the rocker switch.

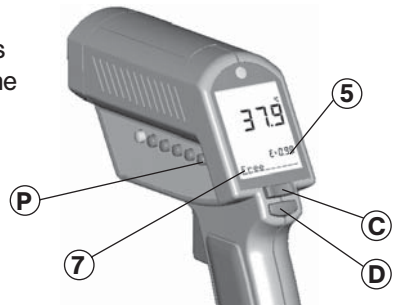
The determination of the temperatures of shiny or highly polished metal surfaces results in inaccurate measured values. To compensate for this, the surface to be measured can be covered with adhesive tape or painted matt black. Wait until the adhesive tape attains the same temperature as the material underneath it. Then determine the temperature of the adhesive tape (corresponds to the material) or the painted surface.

Aluminium*	0.30	Skin	0.98	Brass*	0.50
Asbestos	0.95	Wood***	0.94	Oil	0.94
Asphalt	0.95	Limestone	0.98	Paper	0.95
Basalt	0.70	Ceramics	0.95	Sand	0.90
Concrete	0.95	Carbon	0.85	Dirt	0.94
Lead*	0.50	Copper*	0.95	Snow	0.90
Ice	0.98	Plastic**	0.95	Steel*	0.80
Iron*	0.70	Foodstuffs,	0.90	Textiles	0.94
Paint	0.93	frozen		Water	0.93
Glass (plate)	0.85	Foodstuffs,	0.93	Bricks	0.90
Rubber	0.95	hot			

*oxidised, **impervious to light, more than 50 µm, ***natural

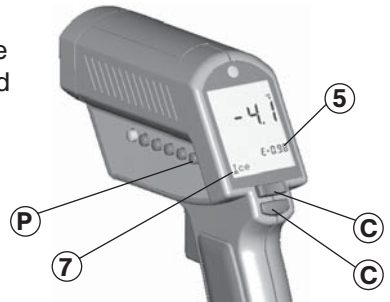
9.1 Setting the emissivity

Press EMISS. (P). Select „Free“ (7) using arrow keys (C). Press EMISS. again. The emissivity icon (5) in the display starts blinking. Change the emissivity using arrow keys (C). Confirm the input with ENTER (D).



9.2 Selecting the material

Press EMISS. (P). The display shows a material name (7), the emissivity and the newly calculated measured value (5). Use arrow keys (C) for selecting another material. Use ENTER (D) to confirm the selection.



9.3 Emissivity in case of an unknown value

To be used only outside the Ex-area!

Connect a sensor to set the device for a material having an unknown emissivity (only outside the Ex-area). Then press the measurement button and maintain the measuring range of the sensor within the range of the object to be measured.

Wait till the measured value of the sensor stabilises and then record the measured value. Release the measurement button and press it again. Now measure the same range of the object. Press the Emiss. key and select the „Free“ material name using arrow keys. Press the Emiss. key again till the emissivity icon starts blinking. You can now use arrow keys to change the value till the displayed temperature matches that of the contact sensor.

For connecting the sensor, refer to 8.8.6.: Sensor port.

10. Troubleshooting

Display	Fault	Procedure
- O - - U -	The target temperature is above or the range below the measuring range	Select a target within
EEPROM-Err	EEPROM error	Please contact the manufacturer
CalAreaErr	Calibration error	Please contact the manufacturer
ProbCalErr	Calibration error	Please contact the manufacturer
No display	Weak or discharged batteries	Replace batteries
Battery icon blinks or LowBatt is displayed	Weak or flat batteries	Replace batteries
Laser does not work	Weak or flat batteries Ambient temperature over +45 °C	Replace batteries Work at an ambient temperature of + 45 °C or less than that.

11. Repairs

Repair work is subject to the different nationally valid regulations and directives. We therefore recommend that such work be performed by ecom instruments GmbH, Germany, as all repairs must be examined to ensure functional safety.

12. Cleaning, maintenance and storage

- Only use an appropriate cloth or sponge to clean the device. Do not use solvents or abrasive cleaning agents for cleaning, especially the lens.

Cleaning the lens:

- Blow off loose particles with clean air. Then remove the remaining impurities carefully using a soft brush. Wipe the surface carefully with a moist swab. The swab can be moistened with water.
- We recommend that the functionality and accuracy of the device be checked by the manufacturer every two years.
 - The batteries should be removed from the device if it is to be stored for long periods.
 - The storage temperature should be within the permitted range between -20°C and +50°C (without batteries)!

13. Disposal

Old electrical equipment and „historic“ old electrical equipment from ecom instruments GmbH will be disposal obligation and disposed of at no cost in accordance with the EC Directive 2002/96/EC and the German Electrical and Electronic Equipment law of 16/03/2005. The costs of the transport of the equipment to ecom instruments GmbH are borne by the sender.

14. Warranty and liability

As per the general terms and conditions of business, ecom instruments GmbH offers a 2-year warranty for the functioning and materials of this product under the specified operating and maintenance conditions. This does not cover all wearing parts (e.g. batteries and lamps).

This warranty does not extend to products that have been used improperly, altered, used negligently, damaged by accident or subjected to abnormal operating conditions or improper handling.

Warranty claims can be asserted by sending the defective device. We reserve the right to re-calibrate, repair or replace the device.

The above warranty terms represent the sole rights of the purchaser for compensation and apply exclusively and in place of all other contractual or statutory warranty obligations. ecom instruments GmbH does not accept liability for specific, direct, indirect, incidental or consequential damages or losses, including the loss of data, regardless of whether they are caused by breach of warranty, lawful or unlawful actions, actions in good faith or other actions.

If the restriction of statutory warranty and the exclusion or restriction of incidental or consequential damages is unlawful in certain countries, then it may be possible that the above restrictions and exclusions do not apply for all purchasers. If any clause in these warranty terms is found to be invalid or unenforceable by a competent court, then such a judgement shall not affect the validity or enforceability of any other clause contained in these warranty terms.

15. EC Declaration of conformity

Further details relating to the declaration of conformity can be found at the following Website <http://www.ecom-ex.com> in the Products Download area.

16. EC-Type Examination Certificate

- (1) **EC-Type Examination Certificate**
- (2) Equipment and Protected Systems Intended for Use in Potentially Explosive Atmospheres – **Directive 94/9/EC**
- (3) **TÜV 00 ATEX 1597 X**
- (4) Machine: Explosion protected temperature measuring device type Ex-MX2
- (5) Manufacturer: ECOM Rolf Nied GmbH
- (6) Address: D-97959 Assamstadt, Industriestraße 2
- (7) The design of this equipment and its various approved embodiments are defined in the attachment to this type examination certificate.
- (8) The TÜV Hannover/Sachsen-Anhalt e.V, TÜV CERT certification body, notified body no. 0032 in accordance with Article 9 of the EC Council Directive dated March 23, 1994 (94/9/EC), certifies that this equipment has been found to conform with the essential health and safety requirements for the design and construction of equipment and protected systems for proper intended use in potentially explosive areas in accordance with Appendix II of the directive. The results of the test are documented in the confidential test report no. 00 PX 16900.
- (9) The essential health and safety requirements are met by virtue of conformity with
- EN 50 014:1997** **EN 50 020:1994**
- (10) If the certification number is followed by an "X", then this indicates that special conditions exist for the safe operation of the equipment. These special conditions are contained in the attachment to this certificate.
- (11) This EC Type Examination Certificate refers only to the design and construction of the specified device according to the Directive 94/9/EC. Further requirements contained in this directive apply for the manufacture and marketing of this device.
- (12) The equipment must be labelled with the following information:

 **II 2 G EEx ia IIC T4**

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 19/07/2000

The Director

This EC-type examination certificate may only be circulated without alteration.
Extracts or modifications require the permission of TÜV Hannover/Sachsen-Anhalt e.V.

APPENDIX

(13)

(14) **EC-type-examination certificate no.: TÜV 00 ATEX 1597 X**

(15) Description of the equipment

The explosion protected temperature measuring device type Ex-MX2 may be used within Category 2 or 3 potentially explosive areas (Zone 1 or 2).

The maximum permissible ambient temperature is 50 °C,

Electrical specifications

Power supply 2 alkaline manganese (Mignon) batteries according to IEC LR6/AA or R6/AA

(internal battery) $U = 3 \text{ V}$

Only batteries successfully type-approved according to paragraph 10.9 of EN 50020:1994 are permitted. The manufacturers and types are listed in the operating instructions.

(16) Test documents are listed in Test Report No. 00 PX 16900.

(17) Special conditions

The battery must only be changed outside potentially explosive areas.

In potentially explosive areas, the temperature measuring device may only be operated in its leather pouch.

(18) Essential health and safety requirements
no additional requirements

**I. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X**

of the company: ECOM Rolf Nied GmbH
Industriestraße 2
D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured in accordance with the documents listed in the Test Report.

The modifications concern the internal structure.

The electrical data, special conditions and all other details apply unchanged for this supplement.

16) Test documents are listed in Test Report No. 01 PX 01310.

(17) Special conditions

unchanged

(18) Essential health and safety requirements

no additional requirements

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle Am TÜV 1 D-30519
Hannover

Hannover, 19/01/01

The Director

2. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X

of the company: ecom instruments GmbH
Industriestraße 2
D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured and operated in accordance with the documents listed in the test report.

The electrical data, special conditions and all other details apply unchanged for this supplement.

(16) Test documents are listed in Test Report No. 01 YEX 126578.

(17) Special conditions

The following also apply for measuring temperatures within Category 1 (Zone 0):

The Ex-MX2 temperature measuring device itself must not be brought into the Category 1 (Zone 0) area.

The device's carrying strap and leather pouch must be attached to the operator's belt or to a belt loop so that the device still maintains a safety distance of > 50 cm to the Category 1 (Zone 0) boundary area when it hangs freely on the carrying sling. Only carrying slings of the manufacturer may be used.

(18) Essential health and safety requirements

no additional requirements

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 25/07/01

The Director

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3. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X

of the company: ecom instruments GmbH
Industriestraße 2
D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured and operated in accordance with the documents listed in the test report.

The modifications concern the internal structure.

The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in Test Report No. 03 YEX 551036.

(17) Special conditions

The battery must only be changed outside potentially explosive areas.

In potentially explosive areas, the temperature measuring device may only be operated in its leather pouch.

The following also apply for measuring temperatures within Zone 0:

The Ex-MX2 temperature measuring device itself must not be brought into Zone 0.

The device's carrying strap and leather pouch must be attached to the operator's belt or to a belt loop so that the device still maintains a safety distance of > 50 cm to the boundary area of Zone 0 when it hangs freely on the carrying sling. Only carrying slings of the manufacturer may be used.

(18) Essential health and safety requirements

no additional requirements

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 01/03/04

The Director

4th ADDITION
t o
the EC-type examination certificate No. TÜV 00 ATEX 1597 X

Device: Explosion-resistant temperature measuring device type Ex-MX*

Manufacturer: ecom instruments GmbH

Address: Industriestraße 2
97959 Assamstadt

The explosion-resistant temperature measuring device type Ex-MX2 has been upgraded to type Ex-MX4 BT that is equipped with an integrated Bluetooth interface.

The max transmission power of the Bluetooth interface is restricted securely.

The electrical data, special conditions and all other details apply unchanged for this addition.

Test documents are listed in Test Report No. 05 YEX 551642

TÜV NORD CERT GmbH & Co. KG
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D-30519 Hanover
Tel.: +49 511 986-1470
Fax: +49 511 986-1990

Hanover, 03.05.05

The Director

