



Bedienungsanleitung  
Instruction Manual  
Manuel d'Instructions  
Gebruiksaanwijzing

Ex-MX2



## List of Contents

	Pages
1. Safety Advice	4
2. Faults and Damage	4
3. Safety Regulations	4
4. Technical Safety Advice	4
5. Operation in Hazardous Areas	5
6. Technical Data	5
7. Applications	6
8. Working Method	6
9. Overall View	7
10. Optical Diagram	7
11. Field Of Sight	7
12. Display Indicator	8
13. Settings	8
14. Operation of the Laser Vision	9
15. Battery Change	10
16. Measurement	10
17. Emission Level	10
18. Hi - Alarm Value	11
19. Fault Finding	12
20. Regular Inspection, Maintenance	12
21. Repairs	13
22. Guarantee	13
23. Liability	13
24. Ex-Data	13

## 1. Safety Advice

The following operating instructions contain information and precautionary advice which for the described conditions must be taken into consideration to guarantee safe operation.

## 2. Faults and Damage

If there is any reason to suspect that the safety of the equipment has been affected then it must be immediately withdrawn from use and precautionary measures taken in order to prevent any further use of the equipment in the hazardous area until such time that all necessary checks and repairs have been carried out.

The safety of the equipment can be compromised by, for example:

- External damage to the housing
- Incorrect storage of equipment
- Equipment has suffered damage whilst in transit

## 3. Safety Regulations

The use of the non-contact temperature-measuring device Ex-MX2 requires the user to comply with the usual safety regulations in order to avoid incorrect operation of the equipment. The batteries must only be changed outside of the hazardous area.

## 4. Technical Safety Advice

Before use please read the operating instructions and ensure that the maximum limitations are not exceeded in hazardous areas.

Only use the instrument in an ambient temperature of up to 50 °C and less than 95% relative humidity.

The batteries must not be changed within the hazardous area.

Within the hazardous area, the instrument may only be operated provided it is fitted with the specified accompanying leather case.

## 5. Operation in Hazardous Areas

The non-contact temperature-measuring device EX-MX 2 is suitable for measuring temperatures in potentially explosive areas. Inside the hazardous area the use is only permitted when used with the specified accompanying leather case.

The batteries must only be changed outside of the hazardous areas.

Only 2 x 1,5V primary batteries type IEC LR6/AA are permitted to be used whose manufacturers and types are listed in the technical data.

The use of any other type of battery is strictly forbidden in that it will invalidate the Ex-data certification.

## 6. Technical Data

Temperature Range	:	-30°C to +900°C
Emissivity	:	0,10 ... 1,50 (0.01 incremental steps) (0,95 default)
Target Sighting	:	Laser Circle (class 2)
Target Size (25°C ± 5°C)	:	60:1 to distance of 1,15m and 35:1 at distance field (>10m)
Accuracy	:	-30°C ... -1°C : 0°C ... 99°C : 100°C ... 900°C ± 2°C : ± 1°C : ± 1%
Repeatability	:	± 0,5% of measurement or ±1°C
Spectral Response	:	8-14µm
Response Time (95%)	:	250ms
Ambient operating range	:	0°C ... +50°C; Laser operation up to max. 45°C
Storage Temperature	:	-20°C ... +50°C without batteries
Relative Humidity	:	10% ... 95% non-condensing at up to 30°C
Dimensions	:	200 x 170 x 50 mm
Weight	:	450 g
Power Supply	:	2 x 1,5V alkaline batteries type IEC LR6/AA

Type (LR6):	Supplier:
Alkaline No. 4806	Varta
Alkaline Extra Longlife No. 4006	Varta
Alkaline Maxi Tech No. 4706	Varta
Alkaline Electric Power No. 8006	Varta
Alkaline	Duracell
Professional Alkaline Battery Procell	Duracell
Alkaline Ultra	Duracell
Alkaline Power Line Industrial Battery	Panasonic
Alkaline Energizer	Eveready
Super Alkaline Battery 15A	GP
Alkaline	Daimon
Maximum Alkaline Battery	Rayovac
Alkaline Battery	Double
	Lion King
Alkaline	RS

## 7. Applications

Portable non-contact pyrometers are robust, easy to operate devices, which are specially designed for maintenance purposes.

They are suitable for the indication of temperatures either mechanical moving or electric under the strain of stationary parts, without production flows being impeded, the installation being switched off or the parts having to be removed.

They also help with the supervision of production processes, with the temperatures being measured during production. In doing so, quality problems can be identified and recognised earlier.

## 8. Working Method

All objects with a temperature above absolute zero radiate infrared energy, which extends in every direction with the speed of light. If an infrared pyrometer is trained on an object the lens gathers the energy and focuses on the infrared sensor.

The sensor reacts through the distribution of a voltage signal, whose absorbed energy is exactly proportional. The microprocessor controlled electronics of the equipment then determine and indicate the momentary temperature (in regard to a wider parameter).

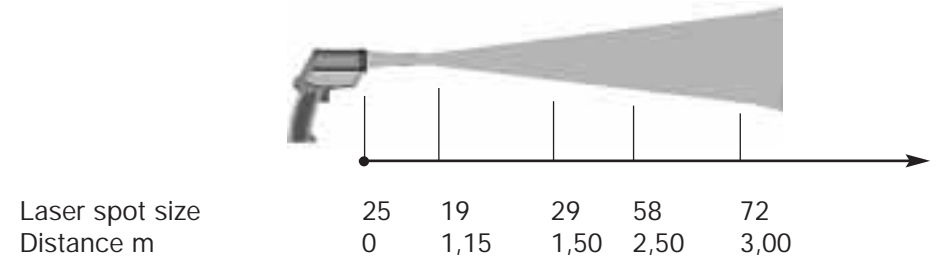
Objects with radiant or polished surfaces radiate not only energy but also reflect a proportion of radiation from their surrounding area. 1, as an emission level indication factor between 0,1 and 1,5 supports this factual calculation, so that only the true radiated energy and not the reflected energy is brought in for the calculation of the object being measured. For the majority of all uses an emission level of 0,95 is used for calculation purposes. For the equipment Ex-MX2, the level is set at a default of 0,95 but this value can be altered incrementally by 0,01 between the range of 0.1 and 1.5.

For emission levels above 1,00, the equipment is designed so that objects positioned closely together with differing temperatures can be measured. For example, if two portable conductors with different temperatures are measured the colder of the two is recorded. The irradiated and reflected energy would effect the measurement so that recording would be impossible. Using a single reference measurement obtained with a contact thermometer the exact temperature can be measured by an emission level setting  $>1,00$ .

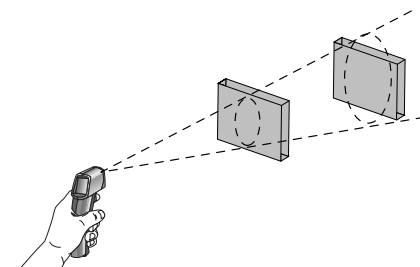
## 9. Overall View



## 10. Optical Diagram

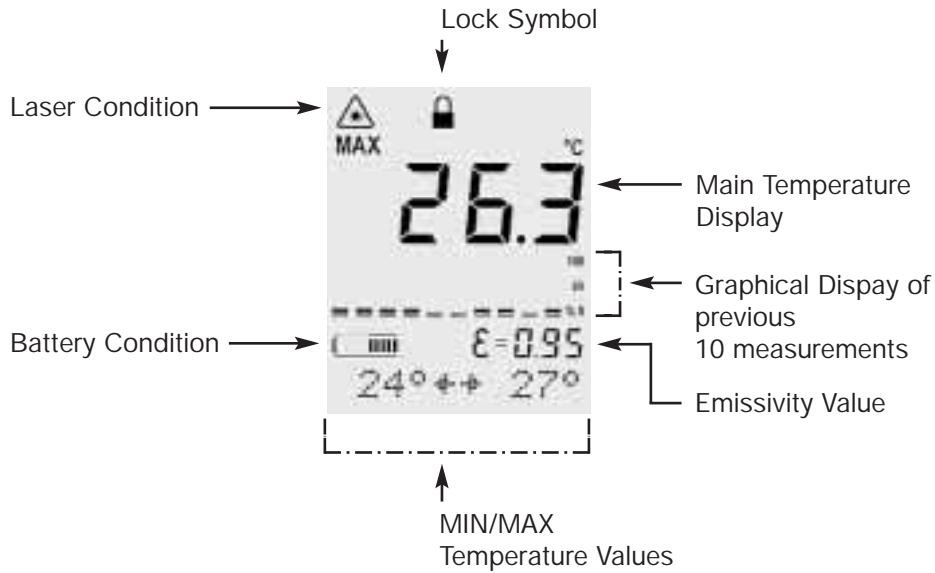


## 11. Field of Sight



Ensure that the specific area or object to be measured is larger than the laser spot size of the device. The smaller the object, the closer the equipment must be. For optimum measuring accuracy the area/object should be at least twice that of the spot size.

## 12. Display Indicator

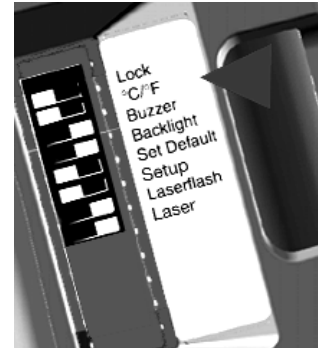


## 13. Settings

The system settings in the unit can be adjusted using the DIP switches located in the battery compartment



Example:



Function	Factory Setting	Description
LOCK	OFF	Continuous reading - activated by trigger
°C / °F	OFF	Switches the temp. indicator between °C (off) °F(on)
Buzzer	ON	Acoustic alarm
Backlight	OFF	Automatic background lighting
Set Default	OFF	Activates factory default settings
Setup	ON	Activates Hi-Alarm value and Emissivity setting control
Laserflash	ON	Hi-Alarm laserflash activated
Laser	ON	Laser is switched on

## 14. Operation of the Laser Vision

The laser vision is an essential part of the Ex-MX2.

The laser vision provides an exact aim and is helpful for the sighting of small or distant objects. The laser circle gives the exact size of the target area. The device is equipped with a robust solid state laser, which is housed inside the equipment.

Please read through the following section carefully:

### WARNING!

**DO NOT LOOK DIRECTLY AT THE LASER BEAM**  
**DANGER OF EYE DAMAGE**  
**OPERATE THE EQUIPMENT CAREFULLY**  
**DO NOT AIM AT OTHER PEOPLE**

### Technical Data for the Laser

Type: Laser beam subdivided through prisms  
 Class: II  
 Power: <1mW  
 Wavelength: 630-670 nm

## 15. Battery Change

When the batteries need changing and while there is still a usable charge the battery condition indicator symbol appears on the display. If this occurs the batteries should be changed in order to ensure a safe and optimum operation.

The exchange of this maintenance element may only be carried out outside of the hazardous area. Take care and ensure that when changing the batteries that only those listed in the operating instructions are used.



In order to open the battery compartment first remove the leather case. The battery compartment is opened by pressing gently on the top part of the handle to release the catch and then pivoting the cover.

Ensure that the new batteries are inserted for correct polarity. After exchanging the batteries refit the leather case in order to use the equipment in the hazardous area.

## 16. Measurement

For a temperature reading, the equipment is pointed towards an object and the trigger is pressed. Consider the distance in relation to the spot size at this point (optical diagram) as well as taking the field of sight into consideration. With increased distance from the object, increase the surface of the measured area of equipment.

## 17. Emission Level

The majority of most organic materials, as well as polished and oxidised surfaces possess an emission level of 0,95. For this reason the emissivity level of the Ex-MX2 is set with a default value of 0,95. This value can be altered by use of the 'UP-DOWN' key providing that the setup switch in the battery compartment is set to the 'ON' position.

The regulation of the temperature of shiny or highly polished metallic surfaces produces inexact measurements. To compensate, the measuring object can be covered with adhesive tape or painted with a matt black colour. Wait until the adhesive tape is the same temperature as the material. Then determine the temperature of the adhesive tape (appropriate material) or of the painted surface.

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

\*oxidized, \*\*opaque, over 20 mils, \*\*\*natural

## 18. Hi - Alarm Value

The Ex-MX2 has a visual and audible alarm function for when a defined temperature value is exceeded.

To set the alarm value press the 'ENTER' key once and then use the 'UP-DOWN' key to set the level required.

When the setpoint is exceeded, both the LED above the display and the laser circle flash in conjunction with an audible alarm. The default factory setting for the alarm is 50 °C.

## 19. Fault finding

Code	Problem	Action
- O - - U -	Target temperature over or under range	Select target within the units specification
E EPROM-Err	E EPROM error	Contact manufacturer
CalAreaErr	Calibration error	Contact manufacturer
ProbCalErr	Calibration error	Contact manufacturer
Blank display	Batteries are dead	Replace batteries
Battery symbol flashes or LowBatt	Batteries are low	Replace batteries
Laser does not Function	Weak or dead batteries. Ambient temp. above $>+45^{\circ}\text{C}$	Replace batteries Operate unit in $\leq+45^{\circ}\text{C}$ ambient or below

## 20. Regular Inspection, Maintenance

Testing and calibration of the apparatus should be at regular intervals – usually every two years.

Cleaning of the lens: Blow away any loose particles with clean air. Any remaining dirt should be carefully removed using a soft brush. Carefully wipe the surfaces with a cotton swab moistened with water or a water based glass cleaner.

The casing can be cleaned with a sponge or soft cloth dampened with water

### **WARNING!**

**NO SOLVENT SHOULD BE USED TO CLEAN THE LENS OR THE CASING  
THE EQUIPMENT MUST NOT BE IMMERSSED IN WATER**

## 21. Repairs

The general terms and conditions of ELEX V apply to repair work. However, it is recommended that the manufacturer carries out all repair work in order to check for the safe working of the protective circuits.

## 22. Guarantee

The instrument parts and functions are guaranteed for one year from the date of delivery. This guarantee remains valid if defective components are submitted. We reserve the right to exchange, modify or repair the equipment.

## 23. Liability

The company ECOM R.Nied GmbH is responsible for the granting of the guarantee. It takes no responsibility for damages, expenses or losses resulting from the use or purchase of equipment. Neither is ECOM liable for damages, expenses or losses arising from any special or subsequent damages.

## 24. EX-Data

Certificate of conformity : TÜV 00 ATEX 1597 X  
Certification :  II 2 G EEx ia IIC T4  
CE number :  0102