

IMPAC Pyrometer

IS 8 pro • IGA 8 pro • IS 8-GS pro



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1 General Information

1.1 Information about the user manual

Congratulations on choosing the high quality and highly efficient Series 8 pro pyrometer.

This manual provides important information about the instrument and can be used as a work of reference for installing, operating, and maintaining your Series 8 pro pyrometer. It is important that you carefully read the information contained in this manual and follow all safety procedures before you install or operate the instrument.

To avoid handling errors, keep this manual in a location where it will be readily accessible.

1.1.1 Legend



Note: The note symbol indicates tips and useful information in this manual. All notes should be read to effectively operate the instrument.



Attention: This sign indicates special information which is necessary for a correct temperature measurement.



Warnings and Cautions: The general warnings and cautions symbol signifies the potential for bodily harm or damage to equipment.

MB Shortcut for Temperature range (in German: **Messbereich**)

1.1.2 Terminology

The terminology used in this manual corresponds to the VDI- / VDE-directives 3511, Part 4.

1.2 Safety

This manual provides important information on safely installing and operating the Series 8 pro pyrometer. Several sections of this manual provide safety warnings to avert danger. These safety warnings are specified with a warning symbol. You must read and understand the contents of this manual before operating the instrument even if you have used similar instruments or have already been trained by the manufacturer.

It is also important to continually pay attention to all labels and markings on the instrument and to keep the labels and markings in a permanent readable condition.



Warning: The pyrometer is only to be used as described in this manual. It is recommended that you only use accessories provided by the manufacturer.

In addition, signs and markings on the device is to be observed and maintained in legible condition.

1.2.1 Eye protection filter

The eye is exposed to extreme brightness during the alignment of the pyrometer with the view finder at temperatures above 1200 °C. The pyrometer is equipped with an eye protection filter to prevent a damage of the eye. This filter must be used for such measurements.

1.3 Limit of liability and warranty

All general information and notes for handling, maintenance, and cleaning of this instrument are offered according to the best of our knowledge and experience.

LumaSense Technologies is not liable for any damages that arise from the use of any examples or processes mentioned in this manual or in case the content of this document should be incomplete or incorrect. LumaSense Technologies reserves the right to revise this document and to make changes from time to time in the content hereof without obligation to notify any person or persons of such revisions or changes.

All instruments from LumaSense Technologies have a regionally effective warranty period. Please check our website at <http://info.lumasenseinc.com/warranty> for up-to-date warranty information. This warranty covers manufacturing defects and faults which arise during operation, only if they are the result of defects caused by LumaSense Technologies.

The *Windows compatible software* was thoroughly tested on a wide range of Windows operating systems and in several world languages. Nevertheless, there is always a possibility that a Windows or PC configuration or some other unforeseen condition exists that would cause the software not to run smoothly. The manufacturer assumes no responsibility or liability and will not guarantee the performance of the software. Liability regarding any direct or indirect damage caused by this software is excluded.

The warranty is VOID if the instrument is disassembled, tampered with, altered, or otherwise damaged without prior written consent from LumaSense Technologies; or if considered by LumaSense Technologies to be abused or used in abnormal conditions.

There are no user-serviceable components in the instrument:

- No adjustments may be made to the targeting laser. It is fixed at the factory.
- No adjustments may be made to the targeting laser's power level.

1.4 Unpacking the Instrument

Thoroughly inspect the instrument upon delivery to purchaser. Check all materials in the container against the enclosed packing list. LumaSense Technologies cannot be responsible for shortages against the packing list unless a claim is immediately filed with the carrier. Final claim and negotiations with the carrier must be completed by the customer.

Save all packing materials, including the carrier's identification codes, until you have inspected the pyrometer and find that there is no obvious or hidden damage. Before shipment, the pyrometer was examined and has been tested. If you note any damage or suspect damage, immediately contact the carrier and LumaSense Technologies, Inc.

1.5 Service Request, Repair, or Support

Contact LumaSense Technologies Technical Support in case of a malfunction or service request. Provide clearly stated details of the problem as well as the instrument model number and serial number. Upon receipt of this information, Technical Support will attempt to locate the fault and, if possible, solve the problem over the telephone.

If Technical Support concludes that the instrument must be returned to LumaSense Technologies for repair, they will issue a Return Material Authorization (RMA) number.

Return the instrument upon receipt of the RMA number, transportation prepaid. Clearly indicate the assigned RMA number on the shipping package exterior. Refer to Section 1.6, Shipments to LumaSense for Repair, for shipping instructions.

Technical Support can be contacted by telephone or email:

Santa Clara, California

- Telephone: +1 408 727 1600 or +1 800 631 0176
- Email: support@lumasenseinc.com

Frankfurt, Germany

- Telephone: +49 (0) 69 97373 0
- Email: support@lumasenseinc.com

Erstein, France

- Telephone +33 (0)3 88 98 98 01
- Email support@lumasenseinc.com

1.6 Shipments to LumaSense for Repair

All RMA shipments of LumaSense Technologies instruments are to be prepaid and insured by way of United Parcel Service (UPS) or preferred choice. For overseas customers, ship units air-freight, priority one.

The instrument must be shipped in the original packing container or its equivalent. LumaSense Technologies is not responsible for freight damage to instruments that are improperly packed.

Contact us to obtain an RMA number (if one has not already been assigned by Technical Support). Clearly indicate the assigned RMA number on the shipping package exterior.

Send RMA Shipments to your nearest technical service center:

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Email: support@lumasenseinc.com

Frankfurt, Germany

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60326 Frankfurt
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Telephone: +49 (0)69-97373 0

Email: support@lumasenseinc.com

1.7 Disposal / decommissioning

Inoperable IMPAC pyrometers must be disposed of in compliance with local regulations for electro or electronic material.

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2 Introduction

2.1 Appropriate use

The IS 8 pro and IGA 8 pro pyrometers are high-quality, battery powered portables for non-contact temperature measurement between 250 and 2500 °C, dependent on the type. The instruments have full digital signal processing, which results in long measurement ranges as well as very high accuracy. The instruments are mainly used in the steel, glass, forging industries as well as in foundries. For high temperatures, the IS 8 pro is available in two temperature ranges between 600 and 2500 °C. For the medium temperatures, the IGA 8 pro is available in two temperature ranges between 250 and 2000 °C.

The IS 8-GS pro is modified for the use in foundries. It is specially designed for non-contact temperature measurement of molten metals in the range of 1000 to 2000 °C. In casting processes, the correct measurement can only be obtained on the pouring stream to avoid the influence of slag. The specially selected wavelength in the near infrared facilitates this accurate temperature measurement as molten metals have their maximum emissivity in this spectral range. Additionally, the influence of changing emissivity is reduced in this range and the interference of the measurement by atmospherical absorption is avoided. A longer response time of 0.5 s prevents the possible influence of hot sparks.

2.2 Scope of delivery

Instrument (including battery case and a battery set), protection window, carrying case, inspection sheet, and operation manual.

2.3 Technical data

Temperature Ranges:	IS 8 pro: 600 to 1800 °C (MB 18) 750 to 2500 °C (MB 25) IGA 8 pro: 250 to 1600 °C (MB 16) 280 to 2000 °C (MB 20) IS 8-GS pro: 1000 to 2000 °C (MB 20)
Spectral Ranges:	IS 8 pro: 0.78 ... 1.1 µm IGA 8 pro: 1.45 to 1.8 µm IS 8-GS pro: 0.55 µm
Detector:	IS 8 pro, IS 8-GS pro: Si detector IGA 8 pro: InGaAs detector
Accuracy:	0.4% of measuring range + 1 °C (at $\varepsilon = 1$, $T_{amb.} = 23$ °C)
Resolution:	LED inside: 1 °C/°F; LED outside: 0.1° up to 1000 °C/°F, behind this: 1° LCD: 0.1 °C/°F
Temperature coefficient:	0.01% of measuring range in °C per °C deviation from the ambient temperature of 23 °C
Repeatability:	0.1% of measuring value (at $\varepsilon = 1$, $T_{amb.} = 23$ °C)
Exposure time t_{90} :	IS 8 pro, IGA 8 pro: 1 ms IS 8-GS pro: 0.5 s
Emissivity ε :	adjustable from 10 to 100%
Measuring functions:	Normal (normal temp. measurement), MAX (maximum value measurement), AVG (average temperature)

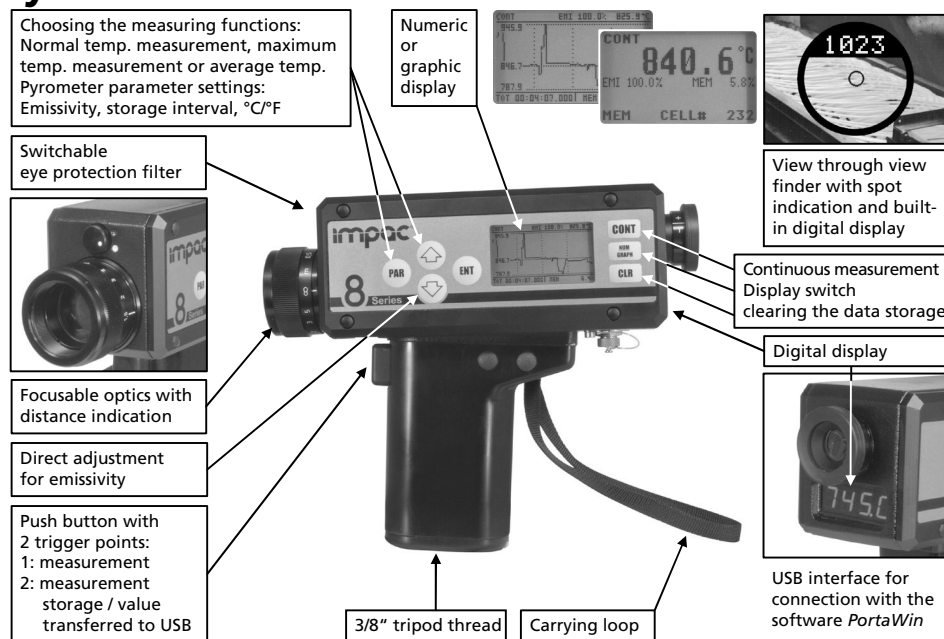
Parameters:	Emissivity, direct emissivity setting; storage interval, temperature indication in °C or °F, reading temperature values
Objective:	Achromatic, optics adjustable from a = 500 mm to ∞, with close-up lens (optional) a = 250 mm to 500 mm Effective lens aperture diameter <i>D</i> : 20 mm (distance ∞) to 25 mm (distance 500 mm)
Sighting (ocular):	Optimized thru-lens view finder with diopter correction -2.5 ... +3 dpt, view magnification: 3 x, angle of view 10° indication circle for measuring spot
Instrument settings:	side keypad
Data storage:	4000 values, storage of: measurement value, date, time, parameters, emissivity, temperature unit
Storage interval:	Off; 0.001 s; 0.02 s; 0.1 s; 1 s; 10 s; 100 s; 500 s
Displays:	instrument's back side: LED, 4 digit, 7 segment, 10 mm high, additional built-in LED display in the view finder left side: LC display, 128 x 64 pixel, illuminated. 3 values / s; last value is displayed for another 15 s after finishing measurement (HOLD function), display when exceeding the max. temp range: 20 °C above end of temp. range, display when falling below the min. temp. range: 5 °C below beginning of temp. range
Serial interface:	USB 2.0 (supplies the instrument when connected, but without battery charging function)
Ambient temperature:	0 to 50 °C
Storage temperature:	-10 to 65 °C
Power supply:	6 x 1.5 V alkaline-manganese batteries (AA) or 6 x 1.2 V rechargeable batteries (AA)
Battery operation time:	approx. 35 hours with one battery set
Tripod socket:	3/8"
Housing:	Aluminum, handle polyamide
Weight:	1.2 kg with batteries
Protection class:	IP52 (housing, except push button at the handle) IP40 (handle)
Dimensions:	210 x 75 x 175 mm (L x W x H)
CE-label:	according to EU directives about electromagnetic immunity



Note: The calibration / adjustment of the instruments was carried out in accordance with VDI/VDE directive "Temperature measurement in industry, Radiation thermometry, Calibration of radiation thermometers", VDI/VDE 3511, Part 4.4.

For additional details on this directive, see <http://info.lumasenseinc.com/calibration> or order the directive from "Beuth Verlag GmbH" in D-10772 Berlin, Germany.

2.4 Physical user interface



2.5 Transport, packing, and storage

With faulty shipping, the instrument can be damaged or destroyed. To transport or store the instrument, please use the original box or a box padded with sufficient shock-absorbing material. For storage in humid areas or shipment overseas, the device should be placed in welded foil (ideally along with silica gel) to protect it from humidity.

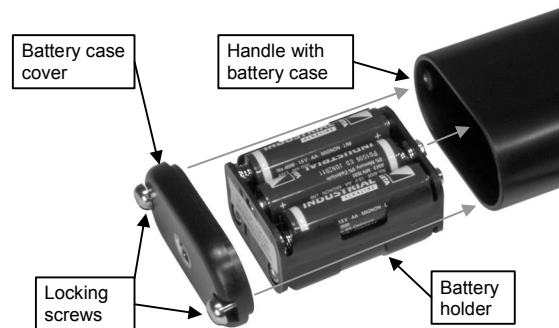
The pyrometer is designed for a storage temperature of -10 to 65 °C with non-condensing conditions. Storing the instrument out of these conditions can cause damage or result in malfunction of the pyrometer.

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3 Controls and Installation

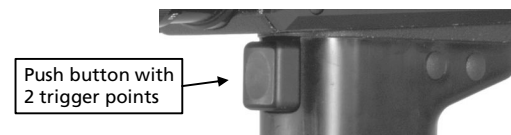
3.1 Battery insertion

The pyrometer requires six (alkaline-manganese or rechargeable) batteries to operate. The batteries must be inserted into the battery holder with correct polarity connections. In addition, ensure that the battery case correctly touches the contacts in the handle.



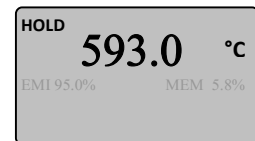
3.2 Switching on

The pyrometer can be switched on and off with the 2-stage push button on the handle.



3.2.1 First trigger point

If the push button is activated up to the first trigger point, the instrument is turned on and starts the measurement immediately. The result of the measurement is shown on the back side of the instrument in the view finder and on the left side of the instrument. If the switch is released, the last measured value remains on displays for 15 seconds before the instrument shuts itself off again automatically ("HOLD" appears in the top left of the LC display during this time).



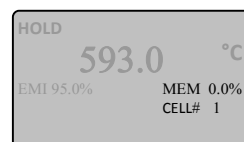
Note: If the measurement temperature is less than the beginning of the measurement range, a measurement result of 5 °C less than the beginning of the measurement range is displayed. If the measurement temperature is above the end of the measurement range of the pyrometer, the value that is displayed is 20 °C greater than the end of the measurement range.

3.2.2 Second trigger point

The second trigger point is used to save measured values. You can record individual measurement values or entire series of measurement values (provided the measurement temperature is not outside the measurement range of the pyrometer). To make the results easier to read, they are stored in blocks. When an individual value is saved, a block consists of only one temperature value. Continuous storage saves all values that were recorded during the relevant time period.

Single value storage (Setting INT = OFF, see Section 5.4):

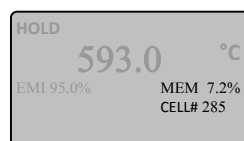
With single value storage, the current measured value is saved at the second trigger point. This value appears on the rear display and in the view finder when the push button is held in the second trigger point. The assigned storage slot appears briefly in the LC display as "CELL#" together with the storage slot number. When memory is full, a beep sounds and the display shows "MEM 100%".



Note: To ensure temperatures are recorded correctly, do not activate the switch by moving it immediately to the second trigger point. Instead activate the first trigger point first and then move to the second one.

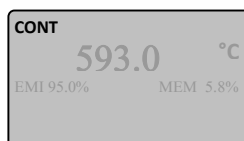
Continuous storage (setting INT = 1 ms ... 500 s, see Section 5.4):

Values will be saved at the selected storage interval as long as the push button is held in the second trigger point. If a new storage process is started, values will be stored in a new block. The process of storing values can be tracked on the LC display. When memory is full, a beep sounds and the display shows "MEM 100%".



3.2.3 Continuous measurement

CON The pyrometer can also be used in continuous measurement mode. To enter continuous measurement mode, press the "CONT" push button (left side of the instrument) after the pyrometer is switched on. To end continuous measurement, press "CONT" again. When continuous measurement mode is activated, "CONT" appears on the LC display on the top left.



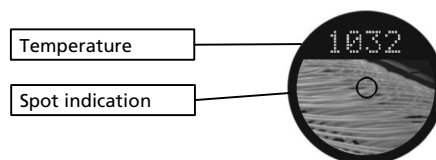
If a fixed storage interval is set (see **INT**, Section 5.4), values will be saved at that interval in CONT mode. When memory is full, the oldest values start to be overwritten by current values.

3.2.4 Measurement value output via USB interface

The pyrometers are equipped with a USB interface which can be used to connect them to a PC. Optional *PortaWin* software can then be used either to readout data storage subsequently for easy analysis or to track new measurements directly in the graphical interface (see **Chapter 6 Software PortaWin**). About 100 values per second can be transferred via the USB interface.

3.3 Sighting

The bright, optimized view finder with spot indication and built-in temperature display facilitates the accurate aiming onto the object.



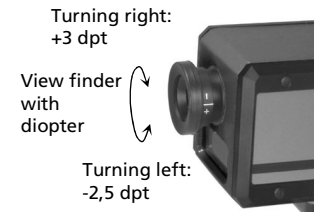
Note: For spot indication size as a ratio of the measuring spot diameter (with correct adjustment of the diopter adapter and objective setting):



- | | |
|--------------|--|
| IGA 8 pro: | The internal diameter of the spot indication corresponds to the size of the measuring spot |
| IS 8-GS pro: | The external diameter of the spot indication corresponds to the size of the measuring spot |
| IS 8 pro: | The measuring spot is smaller than the spot indication |

3.3.1 Adjustment of the diopter adaptor

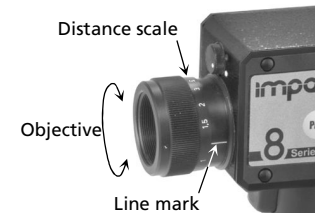
Since most people have a light ametropia, the view finder is equipped with an adjustable diopter adaptor. The diopter adjuster has no visual zero position and *has to be adjusted individually* so that focusing the objective shows the correct distance values at the line mark.



Note: Only if a diopter adaptor is used, the following objective adjustment via the view finder results in a match to the specified distances on the objective.

To adjust the diopter adaptor:

1. Unscrew the objective completely (position 0.5 m).
2. Aim at any object in approximately 2 m, it should be illustrated diffuse.
3. Turn the diopter adaptor of the view finder until the circle of the spot indication is displayed exactly.



Adjustment of the diopter adaptor is completed with these steps, so that only the objective has to be adjusted to the respective measuring object.

3.3.2 Adjusting the objective to the measuring object

The objective must be adjusted to the distance from the relevant measuring object so that the measurement will actually be restricted to inside the spot indication. After a successful diopter adaption, the objective only has to be focused to the measuring object. If it is not certain whether focusing was successful, the distance from the measuring point can also be determined with a yardstick, for example, and the objective can be adjusted accordingly.



Note: The objective has to be adjusted correctly to the distance of the measuring object to avoid that the spot size is not larger than the spot indication.

3.3.3 Spot size table

The objective can be focused to objects within distances between 0.5 m and ∞ . For measuring distances between 0.25 m and 0.5 m, a close-up lens (accessory) has to be screwed onto the objective.

Measuring distance a [mm]	Spot size M_{90} [mm]				
	IS 8 pro (MB 18)	IS 8 pro (MB 25)	IS 8-GS pro	IGA 8 pro (MB 16)	IGA 8 pro (MB 20)
500	1.6	1	2.8	2.2	1.6
1000	3.2	2	5.6	4.4	3.2
2000	6.4	4	11	8.7	6.4
3000	9.6	6	17	13.3	9.6
4000	13	8	22	17.5	13
5000	16	10	28	22	16
9000	29	18	51	40	29

With additional close-up lens

250	0.8	0.5	1.4	1.1	0.8
500	1.6	1	2.8	2.2	1.6

Close-up lens / protection window



If using the close-up lens, the emissivity setting of the instrument (EMI) has to be corrected with the following factor (emissivity see **5.1**) due to reduced measuring signal:

IS 8 pro or IGA 8 pro with close-up lens: $\varepsilon_{\text{close-up lens}} = 0.92 \times \varepsilon_{\text{object}}$

IS 8 pro or IS 8-GS pro with protection window: $\varepsilon_{\text{protection window}} = 0.93 \times$

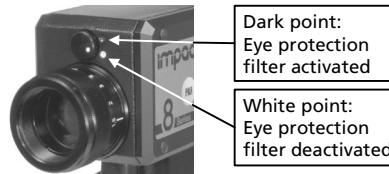
$\varepsilon_{\text{object}}$

IGA 8 pro with protection window: $\varepsilon_{\text{protection window}} = 0.94 \times$

$\varepsilon_{\text{object}}$

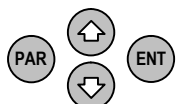
3.3.4 Eye protection filter

The eye is exposed to extreme brightness during the alignment of the pyrometer with the view finder at temperatures above 1200 °C. The pyrometer is equipped with an eye protection filter to prevent a damage of the eye. This filter must be used for such measurements.



Warning: For temperatures above 1200 °C, switch the eye protection filter on to prevent damage to the eye.

4 Display functions / adjustment buttons

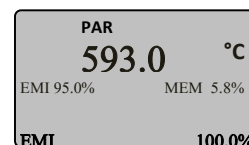


The pyrometers are equipped with extensive adjustment options for optimal adaptation to the relevant measurement condition. They are controlled by the adjustment buttons on the left side of the instrument.

4.1 Displays and adjusting special displays / parameters



Pressing the **PAR** parameter push button repeatedly brings up the following functions one after the other. They appear in the bottom left of the LC display in short form. **The current setting is shown in the bottom right.**



Display	Meaning	Settings	Brief description*
EMI	Emissivity	10...100%	Display and setting of the measuring object emissivity
MAX	Maximum value display	ON / OFF	In addition to the measured value, show the maximum value of the current measurement process and save it if appropriate
AVG	Average value display	ON / OFF	In addition to the measured value, show the average value of the current measurement process and save it if appropriate
INT/SEC	Interval [s]	OFF, 1 ms...500 s	Display and setting of time interval for storage of measured values during continuous measurement
EMI DIRECT	Direct adjustment of emissivity	ON / OFF	Direct adjustment of the emissivity with arrow keys in measuring mode
C/F	Temp. display in °C or °F	°C / °F	Set temperature display to °C or °F
MEM CELL#	Show contents of memory	CELL# 1... CELL# 4000... BLOCK ...	Display of stored measured values Display of stored blocks

* For a detailed description see Chapter 5.



The arrow keys can be used to turn special displays on and off (maximum value display or average value display) and to select available parameter values (show emissivity, storage interval or stored measured values)



When the emissivity is set or stored measured values are called up, pressing and holding the arrow keys causes the display to run through values in fast mode.

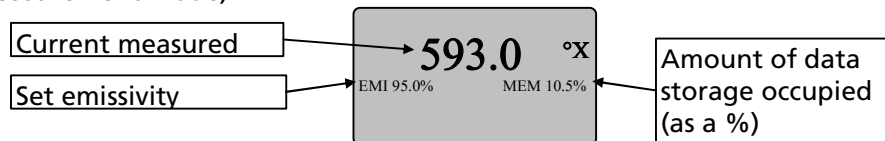


If a parameter has been changed with the arrow keys, it must be confirmed with the **ENTER** key to be accepted. Changing to another parameter (with the PAR push button) will not cause a value that has been changed with the arrow keys to be accepted. If no entries are made for about 30 seconds, the pyrometer switches back to measuring mode without accepting any parameter that may have been changed but not confirmed.

4.2 Switching between numeric and graphic display

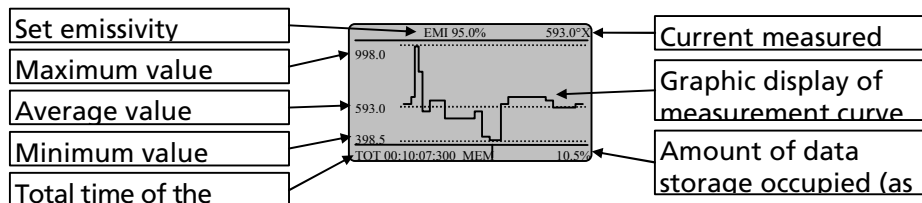
NUM **GRAPH** Two different temperature displays are available: numeric and graphic. Pressing the NUM/GRAPH button switches between the displays (switching between these displays is possible either in measurement mode or subsequently while viewing the measured values. The subsequent display also contains some additional information, see **5.7 MEM**):

NUM (in measurement mode):



In measurement mode the display always shows the current measured value, the set emissivity and how much of measured value memory is occupied (as a % of 4000 values). The display is updated with 5 values per second.

GRAPH (in measurement mode):



A graph of the temperature is displayed in measurement mode. In addition to the information in the numeric display, the maximum, average and minimum values are also shown together with the total time of the measurement. The relevant maximum and minimum values define the scaling of the Y-axis. The measurement curve runs in the direction of the X-axis. Each measured value is represented by one pixel.



Measured value storage:

- If the pyrometer is set to single value storage (INT = OFF) and the push button is activated up to the second trigger point, the stored measured value will be represented by a continuous line instead of the graphic. The values for the measured value and the minimum, average and maximum value are identical in this case.
- The measurement graph is displayed for continuous storage (INT = setting INT = 1 ms ... 500 s). When the push button is released, the entire temperature graph appears briefly in the display (same view as in the subsequent view (see also **5.7, MEM**)).

4.3 Factory settings

EMI: 100%; **MAX:** OFF; **AVG:** OFF; **INT/SEC:** OFF; **EMI DIRECT:** OFF; **C/F:** C

4.4 Special displays

Display	Meaning
5° below the beginning of the measurement range	Measured temperature below the beginning of the measurement range
20° above the end of the measurement range	Measured temperature above the end of the measurement range
LED display:  LC display: 	Battery capacity low, the pyrometer will only remain operational for a short time

5 Parameter descriptions / Settings

The pyrometer is equipped with a wide range of settings for optimal adaptation to the required measuring condition and to measure the temperature correctly.

5.1 Emissivity ϵ

For a correct measurement, it is necessary to adjust the emissivity. The *emissivity* is the relationship between the emission of a real object and the emission of a blackbody radiation source (this is an object which absorbs all incoming rays and has an emissivity of 100%) at the same temperature.

Different materials have different emissivities ranging between 0% and 100% (settings at the pyrometer between 10 and 100%, the set value is indicated on the display). Additionally, the emissivity is dependent on the surface condition of the material, the spectral range of the pyrometer, and the measuring temperature. The emissivity setting of the pyrometer has to be adjusted accordingly.

Typical emissivity values of various common materials for the three spectral ranges of the instruments are listed below. The tolerance of the emissivity values for each material is mainly dependent on the surface conditions. Rough surfaces have higher emissivities.

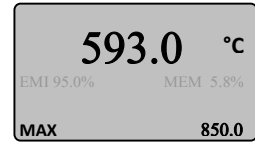
Measuring object	Emissivity [%]	
	IS 8 plus IS 8-K plus (0.78...1.1 μm)	IGA 8 plus (1.45...1.8 μm)
"Blackbody furnace"	100	100
Steel heavily scaled	93	85...90
Steel rolling skin	88	80...88
Steel, molten	30	20...25
Slag	85	80...85
Aluminum, bright	15	10
Chromium, bright	28...32	25...30
Brass oxidized (tarnished)	65...75	60...70
Bronze, bright	3	3
Copper, oxidized	88	70...85
Zinc	58	45...55
Nickel	22	15...20
Gold, Silver, bright	2	2

Measuring object	Emissivity [%]	
	IS 8 plus IS 8-K plus (0.78...1.1 μm)	IGA 8 plus (1.45...1.8 μm)
Porcelain glazed	60	60
Porcelain rough	80...90	80...90
Graphite	80...92	80...90
Refractory bricks	45...60	45...60
Earthenware, glazed	86...90	80...90
Brick	85...90	80...90
Soot	95	95

Measuring object	Emissivity [%] IS 8-GS plus (0.55 μm)
Cast iron (liquid)	40...50
Steel (liquid)	20...50
Melted non-iron metal	30...50

5.2 Maximum value display MAX

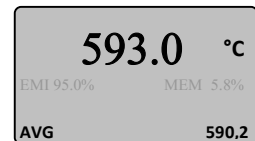
If the MAX function is activated (MAX = ON), the highest value reached during a measurement process appears. This will be the value that is saved (second trigger point on the push button). This storage function can be used, for example, with greatly fluctuating temperatures or to record measuring objects that are only in the measuring spot briefly. Maximum value storage is automatically deleted with every new measurement, i.e. every time the push button is pressed.



Note: The recording time of the pyrometer, and therefore the maximum value storage function, is faster than the display update.

5.3 Average value display AVG

The AVG function always shows the average measurement value over the last 3 seconds. When measured values are stored (second trigger point on the push button) these average values are transferred to the pyrometer instead of the current measured value.



5.4 INT (time interval for measured value storage)

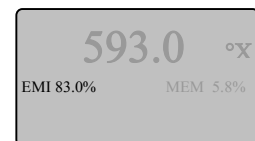
INT determines whether only one value will be stored when the push button is pressed up to the second trigger point (INT setting = OFF) or whether measured values will be stored continuously (INT setting = 1 ms ... 500 s).

Continuous storage with push button: During continuous storage with the push button, always one measured value is stored in distance of the set storage interval INT. A maximum of 4000 values can be saved. When memory is full, a beep sounds and the display shows "MEM 100%".

Continuous storage with the CONT push button: During continuous storage with the CONT push button, always one measured value is stored in distance of the set storage interval INT as long as the function is active. A maximum of 4000 values can be saved. After that older values are overwritten so that the 4000th value is always the most recent measurement.

5.5 EMI Direct

If this setting is activated (ON), the emissivity can be set while measurement mode is running by using the arrow keys on the left side of the instrument.



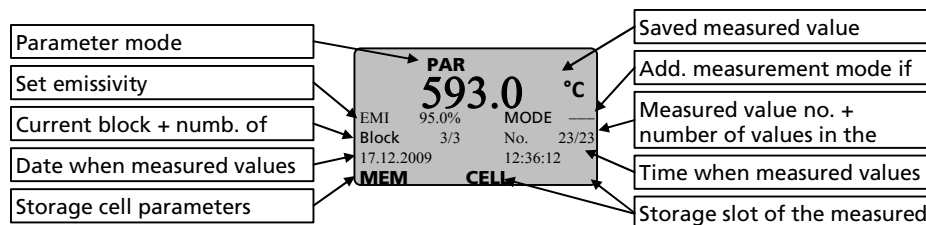
5.6 C / F (display in °C or °F)

The temperature can be displayed either in °C or °F.

5.7 MEM

Shows stored measured values. Information varies slightly depending on the display selected (numeric or graphic):

NUM: In numeric mode, all stored temperature values can be displayed one after the other (NO DATA appears if memory is empty). The display also shows the block in which the value is found and how many values are saved in it.

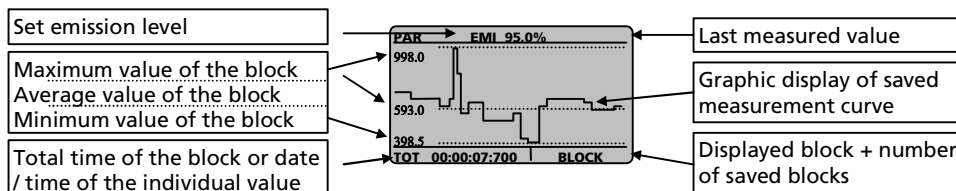


- Arrow keys:** The arrow keys can be used to display all the temperature values in a block one after the other.
- EMI:** Shows the emissivity that was set when the measured value was stored.
- MODE:** If maximum value storage or average value display were active while the measured values were being stored, only maximum or average values will be saved. In that case "MAX" or "AVG" appears in the display.
- Block:** Shows the current block and the total number of blocks.
- No.:** Shows the measured values in the current block. A measured value is assigned to each number in the block. The arrow keys can be used to display values one after the other.
- Date / time:** Shows the data and time of the stored values.
- MEM CELL (Nr.):** Shows the storage slot position of the current measured value.

NUM GRAPH To switch quickly from one block to the next, first switch to graphic display with the NUM/GRAPH push button and then select another block with the arrow keys. Pressing the NUM/GRAPH push button again switches back to numeric view and the content of the block that is now selected can be viewed.

GRAPH: In graphic mode, the content of each block is shown graphically. If a block contains only one value, only one line is displayed. If there are several different values, a graph appears according to the number of stored values. The relevant maximum and minimum values define the scaling of the Y-axis. Scaling in the direction of the X-axis depends on the number of measured value to be displayed. The display is 128 pixels wide. If there are exactly those numbers of measured values, one value is assigned to each pixel. If there are more or fewer values in the block, the graph will be compressed or stretched to fit the 128 pixels. Manual scaling is not possible.

Overview:

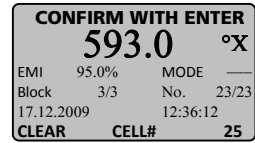


- Arrow keys:** The arrow keys can be used to display all the temperature values in a block one after the other.
- EMI:** Shows the emissivity that was set when the measured value was stored.
- Measured value:** Top right the last measured value of the measurement series is shown.
- Values to the left:** Shows the maximum, average and minimum values from the block.
- TOT:** If there is only one value in the block (single value storage), the storage date and time are shown. If there are several values in the block (continuous storage), the total time required is displayed.
- BLOCK:** Shows the data and time of the stored values.

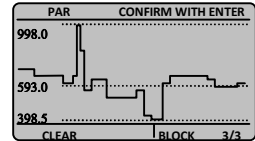
5.8 Deleting measured value memory

CLR Pressing the CLR push button (clear) activates delete mode for data storage (not possible during a storage process). Individual values, blocks or all stored values can be deleted:

Delete individual value: Select NUM mode and press CLR to delete individual values. CLEAR CELL with a storage slot number appears in the display (at the bottom). The arrow keys can be used to select an individual value. "CONFIRM WITH ENTER" flashes in the display. Delete the value with ENT (Enter). If there is no input for 30 seconds, the instrument switches back to measurement mode.



Delete block: Select GRAPH mode and press CLR once. A block appears in the display together with the total number of blocks. Select the block to be deleted with the arrow keys and confirm the deletion process with ENT as long as "CONFIRM WITH ENTER" appears at the top of the display.



Delete all stored values: Press CLR twice (from any mode). "CLEAR ALL" appears in the display and "CONFIRM WITH ENTER" flashes. Confirming with ENT causes all stored values to be deleted. Memory is cleared. Press PAR or ENT for a quick way to return to measurement mode.



Note: The user can switch back and forth between numeric and graphic display at any time to make certain the correct block is active with the desired data.

If CLR is pressed a third time, the pyrometer returns to measurement mode.

5.9 Changing time and date

To get access to the menu for date and time, keep the PAR key pressed before switching on the instrument. Pressing the PAR button repeatedly selects the values in sequence and the current value is shown at the bottom of the display. Use the arrow keys for changing values and use the ENTER key to confirm the values.

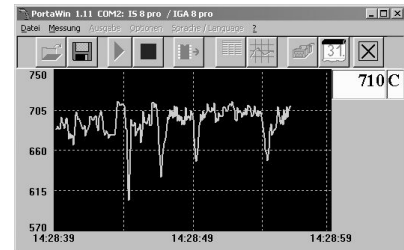
6 Software PortaWin

Pyrometers are equipped with a digital USB interface that can be used to connect the pyrometer with a PC. Optional *PortaWin* software can be used to store measured values. Then the data can be accessed later and evaluated in graphical or table format (for connection cable and software see Chapter 9, **Reference numbers**).

If the push button is activated up to the second trigger point, the current measured value is sent to the interface. About 100 values per second can be transferred via the USB interface. While the pyrometer is connected with the USB interface, power is supplied via the interface. There is no battery charging process.

PortaWin is an easy to operate program that provides useful additional options for using the pyrometer:

- Readout of data storage
- Record individual measured value
- Display temperature measurement graphs
- Subsequent evaluation in graphical or table format for printing or export
- Adjusting the instrument time and date



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7 Maintenance

7.1 Cleaning the front window

Since the device does not contain parts that require regular maintenance, the only regular maintenance required is periodic inspection of the front window for build-up of foreign particiles. If allowed to build up, the particles can influence the energy received by the instrument.

The window is not water soluable and can be cleaned with standard lens tissue dampened with a commercially available glasses or camera lens cleaning solution. Use a soft blower/brush (available in camera stores) to remove any grit on the window before you rub the lens with lens tissue and solution.



Attention: NEVER CLEAN THE WINDOW WITH A DRY TISSUE OF ANY KIND! The only time dry lens tissue may be used is to dry a window which has already been cleaned with wet lens tissue.

7.2 Calibration

LumaSense calibrated your pyrometer at the factory and delivered your instrument with a Works Certificate. Normally we advise against changing the factory set calibration. If you believe that the calibration may have changed, perhaps because your operating environment is severe, an approximate field (on-site) calibration is possible. You have the choice of an on-site calibration or arranging a more precise calibration at the LumaSense factory.

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8 Troubleshooting

Before sending the pyrometer for repair, try to find the error and to solve the problem with the help of the following list.

Temperature indication too low

- Incorrect alignment of the pyrometer to the object
⇒ New correct alignment to achieve the max. temperature signal
- Measuring object is smaller than spot size
⇒ Choose correct measuring distance
- Measuring object is not always in the measuring spot of the pyrometer (e.g. swinging wire or pouring stream)
⇒ Use max. value storage
- Emissivity set too high
⇒ Set lower correct emissivity corresponding to the material
- Lens contaminated
⇒ Clean lens carefully

Temperature indication too high

- Emissivity set too low
⇒ Set higher correct emissivity corresponding to the material
- The measurement is influenced by reflections of hotter machine parts
⇒ Try to avoid the influence of the interfering radiation or change measuring position

Measuring errors

- Indicated temperature is decreasing during the use of the pyrometer, contamination of the lens
⇒ Clean lens
- Air contamination in the sighting path between pyrometer and object
⇒ Change position of the pyrometer with a clean sighting path
- Strong HF-interferences
⇒ Change position of the pyrometer



Note: The wavelength band of the pyrometers reacts at low measuring temperatures (below 130 °C) to incandescent lamps or very bright daylight (not valid for fluorescent tube). For a correct measurement strong external light to the measured object should be avoided.

9 Reference Numbers

9.1 Reference numbers instrument

Pyrometer	Temperature Range	Reference Number
IS 8 pro	600 ... 1800 °C (MB 18)	3 807 300
	750 ... 2500 °C (MB 25)	3 807 310
IS 8-GS pro	1000 ... 2000 °C (MB 20)	3 807 380
IGA 8 pro	250 ... 1600 °C (MB 16)	3 807 350
	280 ... 2000 °C (MB 20)	3 807 410

9.2 Reference numbers accessories

3 858 560	Protection window
3 858 100	Close-up lens
3 876 030	Set of rechargeable batteries
3 876 020	Spare battery set (6 pieces)
3 858 600	Analyzing software PortaWin incl. USB cable
3 858 610	USB cable

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