IMPAC IS 6 ADVANCED AND IGA 6 ADVANCED

Stationary, digital pyrometers for non-contact temperature measurement in ranges between 250 and 3000°C (482 to 5432°F).

The Impac® IS 6 Advanced and IGA 6 Advanced pyrometers are digital, compact, and fast infrared measuring instruments for non-contact temperature measurement on metals, ceramics, or graphite. For optimal match to the application, the instruments are equipped with high-end optics with manual focus.

PRODUCT HIGHLIGHTS

- Widest temperature ranges for most flexible process adaptation
- Highest accuracy and repeatability in its class
- Fully digital core for sub-ranging and adopted analog output
- Reponse time of 120 µs for very fast and highly dynamic processes
- High-end optics with manual focus capability
- 4 digit LED display
- Robust, stainless steel sensor for harsh environments (IP65/NEMA4)

TYPICAL APPLICATIONS

- Steel making
- Induction processes (e.g. hardening, welding, brazing, soldering etc.)
- Heating and cooling processes
- Melting
- Casting
- Annealing
- Rolling
- Forging
- Sintering

AT A GLANCE

Temperature Ranges

250 to 2500°C (MB 25), IGA
250 to 1800°C (MB 18), IGA
600 to 3000°C (MB 30), IS
600 to 1800°C (MB 18), IS

Spectral Range

IS 6: 0.7 to 1.1 µm
IGA 6: 1.45 to 1.8 µm

Measurement Uncertainty

300 to 1500°C: 0.3% + 2°C
> 1500°C: 0.6%

Repeatability

> 300°C : 0.15% oR + 1°C

Optics

Manually focusable between 210 to 5000 mm

Sighting

Built-in laser aiming light or through-lens sighting

OVERVIEW

For a precise alignment of the pyrometers to the measuring object, the instruments are optionally equipped with a laser targeting light or a view finder. The integrated 4 digit LED display indicates the current measuring temperature or the currently set measuring distance.

The fast response time of only 120 µs facilitates the measurement of fast and dynamic processes or short temperature peaks.

The pyrometers can be connected to a PC through an RS485 to USB connection, enabling you to make parameter adjustments using the InfraWin software. The software can be used for temperature indication, data logging, and further analyzing of complete temperature processes.

TECHNICAL DATA

Measurement Specifications	
Temperature Range	250 to 2500°C (482 to 4532°F) (MB 25), IGA
	250 to 1800°C (482 to 3272°F) (MB 18), IGA
	600 to 3000°C (1112 to 5432°F) (MB 30), IS
	600 to 1800°C (1112 to 3272°F) (MB 18), IS
Sub Range	Any range adjustable within the temperature range, minimum span: 50°C
Spectral Ranges	IS: 0.7 to 1.1 µm
	IGA: 1.45 to 1.8 µm
Resolution	0.1°C or 0.2°F at interface
	<0.0015% of selected sub range at analog output, min. 0.1°C, 16 bit; 1°C or 1°F on display
Emissivity ε	0.050 to 1.000 in steps of 1/1000
Transmittance τ	0.050 to 1.000 in steps of 1/1000
Response Time t_{90}	120 µs (for IGA 6 Advanced, it is recommended for measuring temperatures below 300°C to set a response time of 1 ms (min)); adjustable to min; 1 ms, 3 ms, 5 ms, 10 ms, 50 ms, 250 ms, 1 s, 3 s, 10 s
Measurement Uncertainty (κ = 1, t_{90} = 1 S, $T_{amb.}$ = 25°C)	300 to 1500°C: 0.3% of reading in °C + 2°C
	>1500°C: 0.6% of reading in °C
Repeatability (κ = 1, t_{90} = 1 S, $T_{amb.}$ = 25 °C)	>300°C: 0.15% of reading in °C + 1°C

Optical Specifications	
Sighting	Built-in laser aiming light (max. power level < 1 mW, λ = 630 to 680 nm, CDRH class II) or through-lens sighting
Optics	Manually focusable from rear cover measuring distance a = 210 to 5000 mm
Distance Ratio	Approx. 350:1

Electrical	
Power Supply	24 VDC ±25%, ripple must be less than 50 mV
Power Consumption	Max 3 W (incl. laser)
Load (analog output)	0 to 500 Ω
Isolation	Power supply, analog output and digital interface are galvanically isolated from each other

TECHNICAL DATA (CONTINUED)

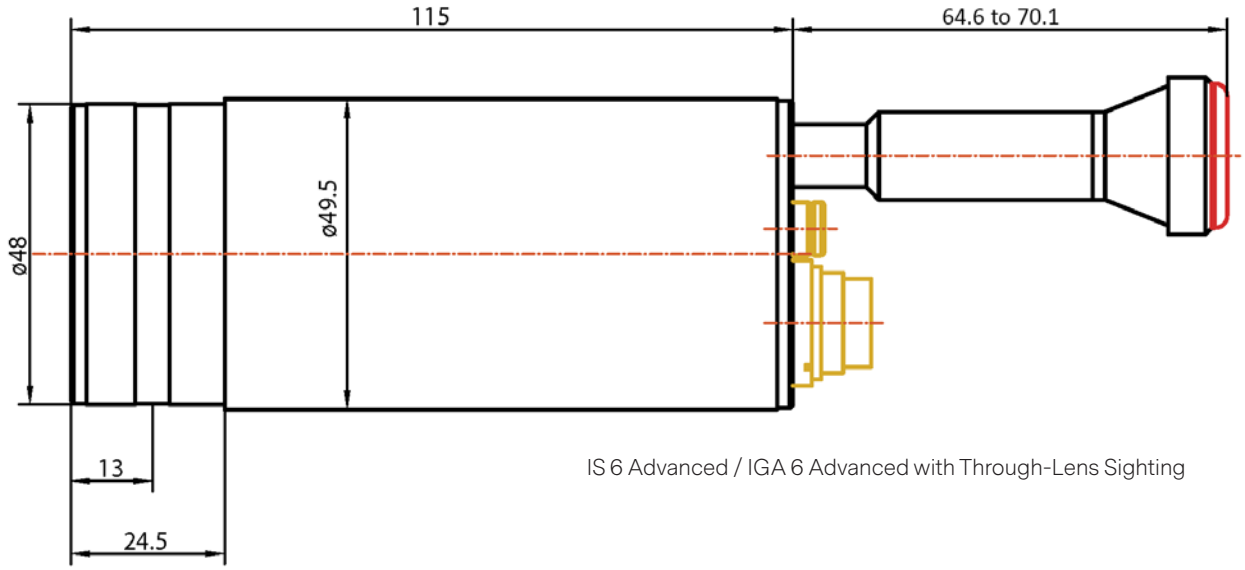
Environmental Specifications	
Protection Class	IP 65 IEC 60529 (value in mated condition)
Operating Position	Any
Ambient Temperature	0 to 70°C (32to 158°F) at housing
Storage Temperature	-20 to 80°C (-4 to 176°F)
Relative Humidity	Non-condensating conditions
Weight	0.6 kg (~1.32 lbs)
Housing	Stainless steel
CE Label	According to EU directives about electromagnetical immunity

Interface	
Connection	12-pin connector
Display (in rear cover)	LED, 4 digit matrix, 5 mm high temperature signal or measuring distance
Parameters	Adjustable via interface: emissivity, sub range, settings for maximum value storage, address, baud rate, transmittance, response time t_{90}, 0 to 20 mA or 4 to 20 mA analog output range, °C / °F
	Readable via interface: measured value, internal temperature of the unit, measuring distance

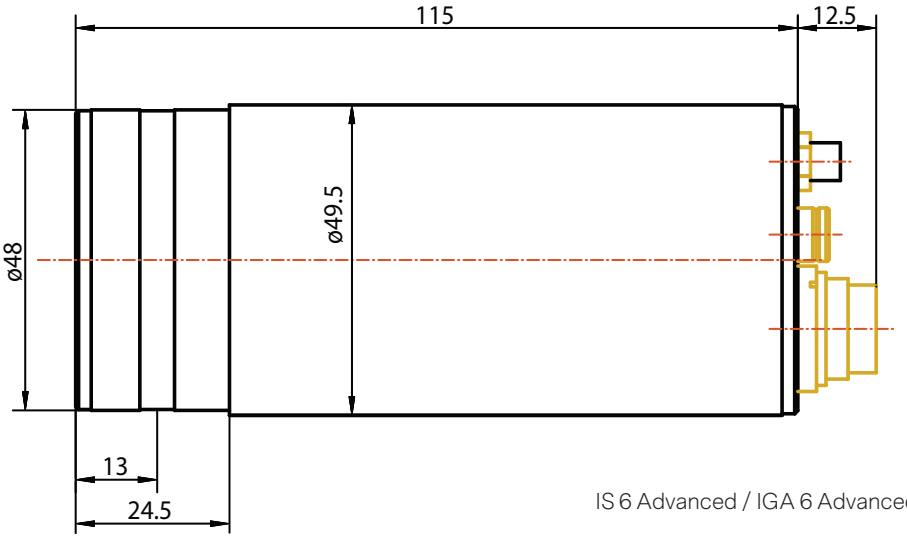
Communication	
Analog Output	Adjustable 0 to 20 mA or 4 to 20 mA, linear (via digital interface)
Digital Interface	RS485 addressable (half-duplex)
	Baud rate: 1200 Bd to 115.2 kBd (on request RS232, not addressable)
Maximum Value Storage	Built-in single or double storage. Clearing with adjusted time t_{clear} (off, 10 ms, 50 ms, 250 ms, 1 s, 5 s, 25 s), via interface, automatically with the next measuring object, hold-function

1 MB is a shortcut used for temperature range (in German: Messbereich).
The determination of the technical data of this pyrometer is carried out in accordance with VDI/VDE IEC TS 62942-2, the calibration / adjustment in accordance with VDI/VDE 3511, Part 4.4.

PRODUCT SCHEMATIC



IS 6 Advanced / IGA 6 Advanced with Through-Lens Sighting



IS 6 Advanced / IGA 6 Advanced with Laser Aiming

SIGHTING

IS 6 Advanced / IGA 6 Advanced with Through-Lens Sighting

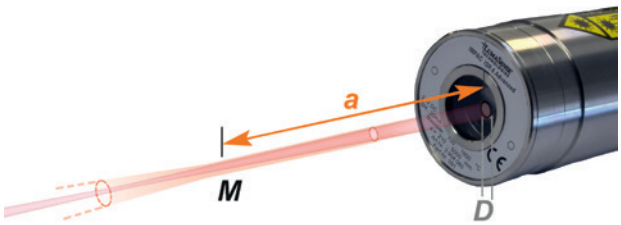
IS 6 Advanced / IGA 6 Advanced with Laser Aiming

OPTICS

IS 6 Advanced / IGA 6 Advanced	
Distance a [mm]	Spot Diameter M [mm]
210	0.6
300	0.9
500	1.5
800	2.3
1300	3.7
2000	5.8
5000	15

The optics can be manually adjusted at all distances between 210 mm and 5000 mm. The table shows examples of distances and the corresponding spot diameters.

Effective aperture D for all temperature ranges: 13 mm (focused to longest distance) to 15 mm (focused to shortest distance).



REFERENCE NUMBERS

Type	Temperature Range	With Through Lens Sighting	With Laser Aiming
IGA 6 Advanced	250 to 2500°C (MB 25)	3 914 020	3 914 010
	250 to 1800°C (MB 18)	3 914 060	3 914 050
IS 6 Advanced	600 to 3000°C (MB 30)	3 914 520	3 914 510
	600 to 1800°C (MB 18)	3 914 560	3 914 550

Scope of Delivery

Pyrometer with PC software InfraWin for adjustment and evaluation, Works Certificate, and Manual

Ordering Note

A connection cable is not included in scope of delivery and must be ordered separately

ACCESSORIES

PN	Description
3 820 320	Special connection cable with plug and key for pilot light, 5 m
3 820 330	Connection cable, 5 m, straight connector[1]
3 820 500	Connection cable, 10 m, straight connector[1]
3 820 510	Connection cable, 15 m, straight connector[1]
3 820 810	Connection cable, 20 m, straight connector[1]
3 820 820	Connection cable, 25 m, straight connector[1]
3 820 520	Connection cable, 30 m, straight connector[1]
3 820 340	Connection cable, 5 m, 90° connector[1]
3 820 530	Connection cable, 10 m, 90° connector[1]
3 820 540	Connection cable, 15 m, 90° connector[1]
3 820 830	Connection cable, 20 m, 90° connector[1]
3 820 840	Connection cable, 25 m, 90° connector[1]
3 820 550	Connection cable, 30 m, 90° connector[1]
3 852 290	Power supply NG DC for DIN rail mounting; 100 to 240 VAC ⇒ 24 VDC, 1 A
3 852 550	Power supply NG 2D for DIN rail mounting; 85 to 265 VAC ⇒ 24 VDC, 600 mA with 2 settable limit switches
3 826 750	USB to RS485 adapter cable, HS-Version, 1.8 m long
3 852 440	Protocol transducer RS485/RS232 (switch.) ⇔ Profibus-DP for 1 device
3 852 460	Protocol transducer RS485 ⇔ Profibus DP for 32 devices
3 852 620	Protocol converter UPP RS485 or RS232 ⇔ ProfiNet, for 1 pyrometer
3 852 630	Protocol converter UPP RS485 ⇔ ProfiNet, for max. 32 pyrometers
3 890 650	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 230 VAC
3 891 220	DA 4000: LED-display, 2-wire power supply, 2 limit switches (relay contacts), 115 VAC 2 limit switches (relay contacts), 115 V AC
3 890 570	DA 6000-N: digital display, to allow adjustment of Pyrometer through RS485 interface
3 890 530	DA 6000: like the DA 6000-N, but with analog input and 2 limit switches for the RS485 interface.
3 826 510	PI 6000: PID programmable controller, extremely fast, for digital IMPAC pyrometers
3 890 630	LD24-UTP; large digital indicator, 57 mm height of digits
3 843 490	SCA 5, External Scanner Series 5 and 6 with fused silica window, 24 VAC/DC
3 846 260	Instrument's support (Series 5 and 6)
3 834 210	Adjustable mounting support (Series 5 and 6)
3 846 290	Instrument's support (Series 5 and 6) with fused silica window
3 835 590	90° mirror with quartz glass window (Series 5 and 6)
3 843 250	ROT 5 scanning mirror attachment up to 70°
3 835 160	Air purge unit, aluminium
3 837 230	Water cooling jacket (heavy duty) with integrated air purge unit
3 837 280	Water cooling jacket (heavy duty) with fused silica window
3 837 500	Water cooling jacket (light duty, with air purge unit (only for instruments with laser targeting)
3 837 510	Water cooling jacket (light duty), with fused silica window (only for instruments with laser targeting)
3 837 540	Cooling plate for series 5 and 6, with air purge
3 846 590	Vacuum flange KF16 with quartz glass window

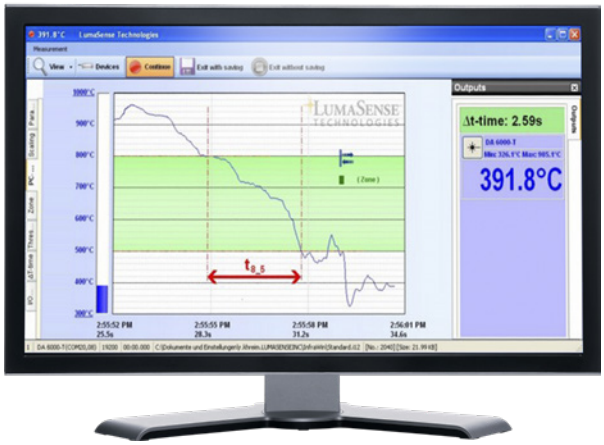
1 All connection cables include a short adapter cable with a 9-pin SUB-D connector.
This connector may be used in combination with the RS485 to USB adapter.

INFRAWIN 5 OVERVIEW

InfraWin is easy-to-use measurement and evaluation software for remote configuration of stationary, digital Impac brand pyrometers.

This software allows the user to remotely adjust and control settings for one or two pyrometers from a single computer. InfraWin also allows the user to simultaneously monitor and control temperatures.

- Display temperature data as color bars and online graphics
- Capture downstream evaluations as tables, graphics or text files
- Calculate the spot size for different measuring distances
- Features UPP standard (Universal Pyrometer Protocol)



Pyrometer Settings

An Impac digital pyrometer connected to a PC will be automatically detected by the software. All available parameters are adjustable, including emissivity, response time, maximum value storage, output signal and sub range.

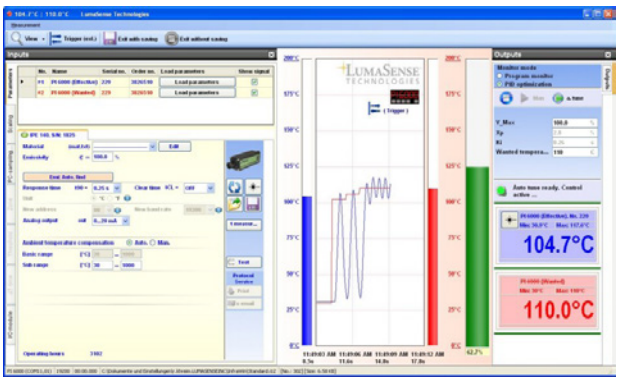
Further special functions are adjustable for example controllers or TV parameters on instruments available with these functions. Changes are transmitted directly to the pyrometer.

Measurement with Color Bar

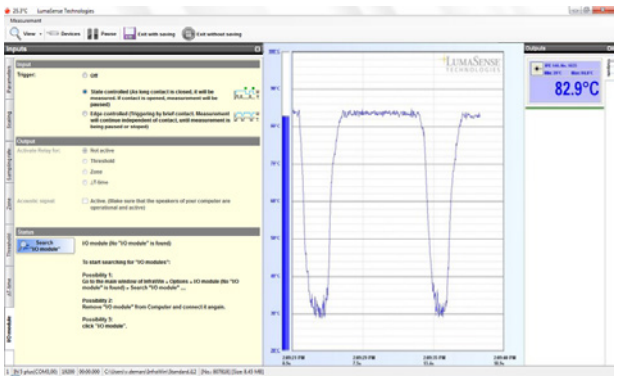
In this window a temperature value for the upper or lower limit can be adjusted numerically or with the mouse. The acquired minimum and maximum value is indicated as well as the inner temperature of the pyrometer. The emissivity is changeable during the measurement at any time.

Infrared Calculator

After input of the aperture and the focused spot size per datasheet, the calculation of spot sizes at non-focused distances is possible.



Measurement with Internal Temperature of radiation temperature and internal instrument temperature. Parameters can be changed during the measurement.



I/O Module allows users to trigger measurement externally and gives a potential free output contact.

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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