SENSOR THERM
MEMBER OF THE NYNOMIC GROUP

Pyrometers H422 / H433

2-Color High-Speed Pyrometers for Laser Control Processes

High-Speed Quality Measurements by

- Digital signal processing
- Optimized optical components

2-color high-speed pyrometers with PID controller for very fast non-contact temperature measurement and process control.

- **40,000 measurements per second**
  - to perform laser power control almost in real time
  - to react to complex workpiece geometries.
- **Shortwave spectral range**
  - optimized for LMD, LPBF or hardening measurements
- **Special motorized optics**
  - for easy adaptation to a laser head
- **Green laser targeting light**
  - as alignment aid to the laser spot of the laser head

Temperature range
from 700 to 2300°C

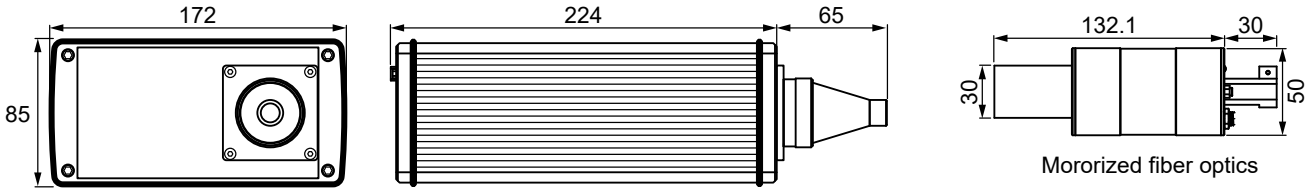
Response time / Exposure time
< 50 µs < 25 µs

Smallest possible spot size
0.8 mm

Technical Data

Model	H422	H433
Temperature range	700 – 2300°C	
Spectral range	1.4 – 1.8 µm	1.6 – 2.1 µm
Detector	2 x InGaAs	
Response time t_{90}	50 µs, adjustable up to 10 s	
Exposure time	25 µs	
Controller sampling time	25 µs to 25 ms (in 10 µs selectable)	
Uncertainty	Depending on signal strength: 0.5-1.5% of measured value in °C + 1K (ε = 1, t_{90} = 1 s, T_A = 23°C)	
Repeatability	Depending on signal strength: 0.2-0.6% of measured value in °C + 1K (ε = 1, t_{90} = 1 s, T_A = 23°C)	
5 analog outputs	0–10 V DC, load > 100 kΩ, resolution 0.0016% of the (adjusted) temperature (sub) range (16 Bit). 2-color temperature, 1-color temperature of channel 1 and 2, manipulated variable, signal strength.	
Serial interfaces	■ RS485 (4.8–921.6 kBd, half duplex), resolution 0.1°C / °F ■ Ethernet (100 Mbit/s)	
4 digital inputs (via supply voltage)	Laser targeting light on / off, PID controller start, load a set of parameters, start / stop of measured value recording.	
4 digital outputs (max. 100 mA)	Limit switch, exceeding the beginning of temperature range, device measuring readiness, device over-temperature, signal strength too low, 2 setpoint limits, temperature within a setpoint band, controller active, control process within limits or finished.	
Device parameters	2-color or 1-color temperature measurement (optionally of channel 1 or 2), temperature sub range, response time (0.025 ms–10 s), emissivity slope (0.800–1.200), emissivity (0.050–1.200), transmittance (0.050–1.000), spot size fill factor (0.050–1.000), device address (00–97), baud rate (4.8–921.6 kBd), temperature unit (°C / °F).	
Power requirement	24 V DC, max. 2.5 A; protected against reverse polarity	
Isolation	Common signal ground	
Optics	340 to 3000 mm focus range, adjustable aperture	
sighting method	Laser targeting light (green, λ=515 nm, P< 1 mW, laser class 2 to IEC 60825-1)	
Ambient temperature	10 to 35°C, motorized fiber optics: 10 to 55°C ; storage: -20 to 85°C	
Relative humidity	Non-condensing conditions	
Housing / protection class	Pyrometer: aluminum / IP50 to DIN 40 050 with connector; optics: stainless steel	
Weight	3300 g	
CE label	According to EU directives	
Scope of delivery	Device with desktop power supply, motorized focus optics, 5 m optical fiber, works certificate, RS485 to USB interface converter, operating manual, *SensorTools* software.	

Dimensions (in mm)



Mororized fiber optics

SensorTools Software

Communication and evaluation software included.

- Measured value display, graphically and numerically.
- Measured value recording incl. measuring parameters
- Motor focus setting
- View and compare up to 4 measurement data files simultaneously in the *SensorTools* Viewer
- Adjust all device settings
- Access to PID controller and settings
- Special recording settings: external start / stop, retroactive or extended recording via signal input
- Print or save pyrometer settings, or transfer settings to other devices or export to csv files
- Switch on / off laser targeting light

Sensortherm reserves the right to make changes in scope of technical progress or further developments.

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