

# Steel Industry Temperature Monitoring

Infrared Temperature Measurements in Harsh Environments



Pyrometers in Metal Rolling and Steel Applications

- Rugged Heavy-Duty Measurement IR Sensing Equipment
- Line Scanning Systems
- Portable IR Thermometers

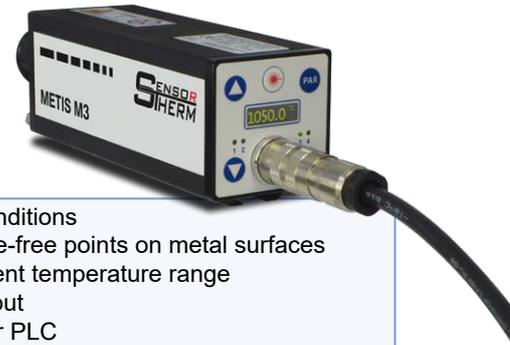


## Flexible Pyrometer Measuring Systems

Sensortherm pyrometers are modern infrared measuring devices for industrial applications that use state-of-the-art processor technology and fully digital signal processing to measure with the highest accuracy, even measuring objects with low emissivities. They are used for temperature monitoring or control of heating or cooling.

Many model variants with useful equipment are used:

- 2-color pyrometers or standard radiation pyrometer models adaptable for all application conditions
- Peak picker, minimum and average storage for highest temperature of scale-free points on metal surfaces and for quick detection of present temperature range
- 2 high resolution 16 bit analog outputs (0/4 to 20 mA) for exact measuring signal output
- Serial high-speed interface (up to 921 kBaud) for communication with a PC or PLC
- 3 configurable inputs / outputs for remote control or alarm output functions

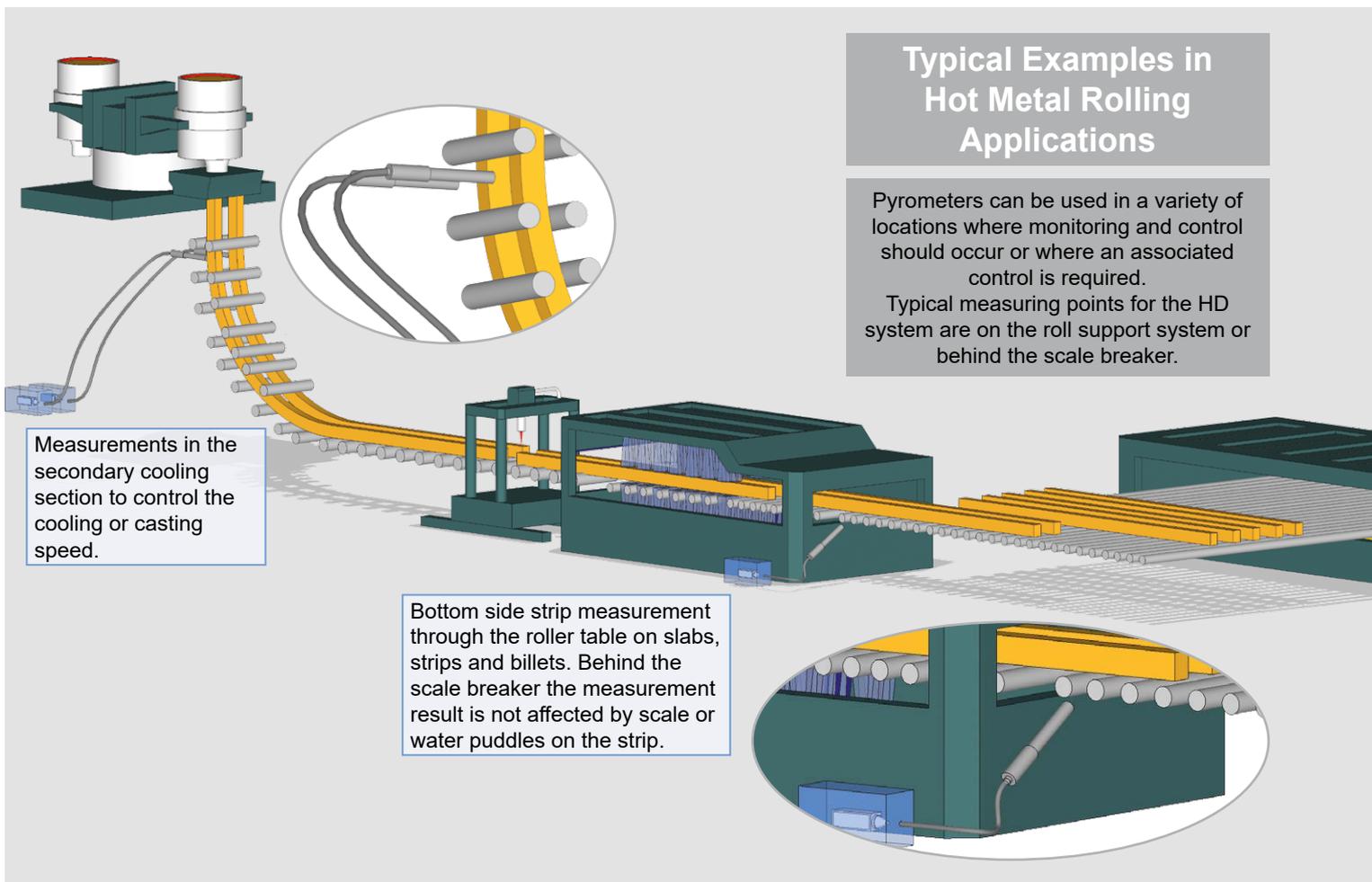
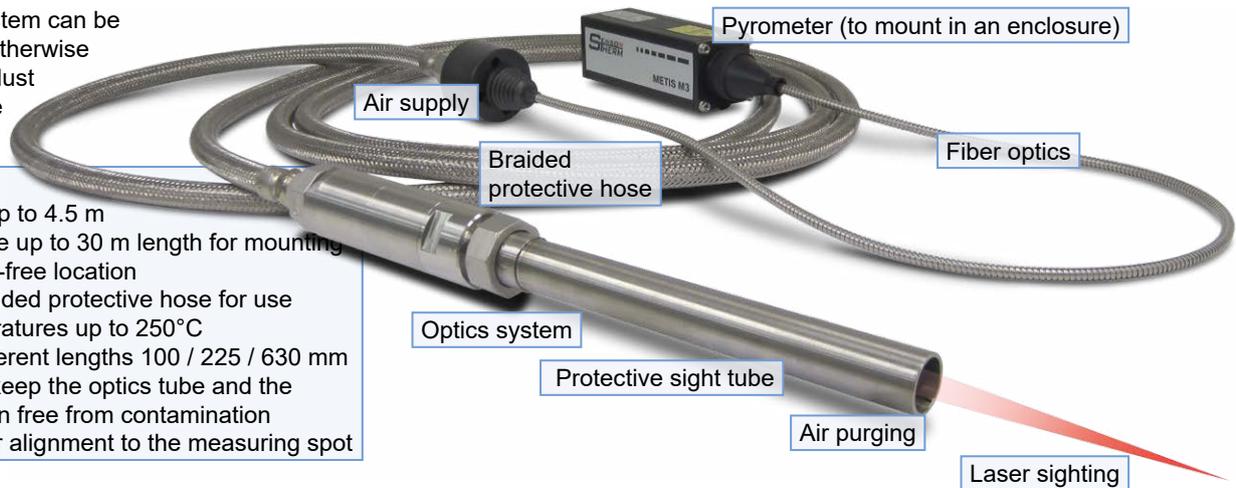


For use in harsh conditions, the pyrometers are integrated into heavy-duty housings, allowing among other things to perform measurements in the steel industry.

## Heavy-Duty Stainless Steel Measuring System

The fully encapsulated system can be installed in places where otherwise heat radiation, water and dust make it difficult to measure precisely.

- Customizable long measuring distances up to 4.5 m
- Braided protective hose up to 30 m length for mounting electronics in a hazard-free location
- Optics system and braided protective hose for use in high ambient temperatures up to 250°C
- Protection tubes in different lengths 100 / 225 / 630 mm
- Air purging system to keep the optics tube and the pyrometer field of vision free from contamination
- Laser targeting light for alignment to the measuring spot



### Typical Examples in Hot Metal Rolling Applications

Pyrometers can be used in a variety of locations where monitoring and control should occur or where an associated control is required.

Typical measuring points for the HD system are on the roll support system or behind the scale breaker.

Measurements in the secondary cooling section to control the cooling or casting speed.

Bottom side strip measurement through the roller table on slabs, strips and billets. Behind the scale breaker the measurement result is not affected by scale or water puddles on the strip.

## Line Scanners

Pyrometers with line scanner continuously swivel the pyrometer's measuring field back and forth to record all temperatures on this line. It is used in conjunction with the peak picker of the pyrometer to detect and display the maximum value of a of a target being scanned. Thus, the temperature is detected even if cold scale would falsify the measurement or the measurement object moves back and forth.



Scan angle and scan frequency adjustable

- Peak temperature measurements over a wide scan area
- Measurement of thin wires
- Temperature detection of scale-free points on scaled metal surfaces
- Temperature detection measurement of hot spots
- Peak temperature detection of slabs, billets, steel strips

Laser sighting

## Line Scanners

Line scanners continuously swivel the measuring field of the pyrometer back and forth, thereby creating a temperature profile of the material to be measured. Measured in the run, thus obtaining a 3D profile of the temperature. Thus, it can be used e.g. to detect multiple billets or measure temperatures in the center or at the edge of a passing slab.

- Up to 16 measuring zones, individual adjustable with angular position and scanning speed
- Provides separate temperature information of measured temperature, maximum, minimum or average temperature
- Fine adjustable scanning motor with extremely long life for continuous 24/7 operation
- Temperature profiles of the objects via analog and digital signal outputs, separated to each zone

16 adjustable measuring zones

Laser sighting

Protective housing

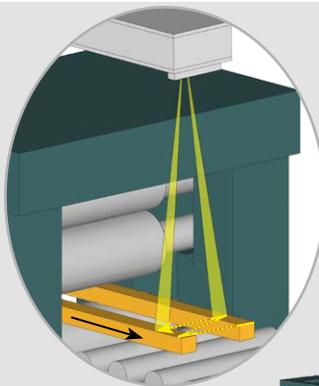
Water cooling

Air purging

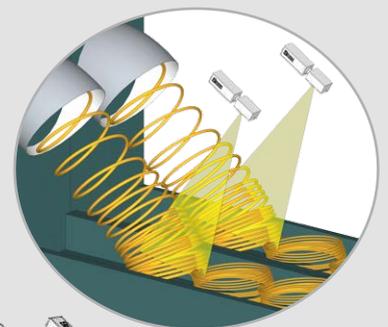
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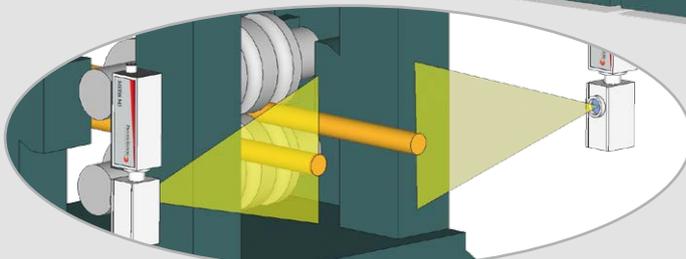
Typical scanner measuring points are at the reheat furnace exit, roughing stands, or Stelmor section.



Scanning of rods for peak temperature detection



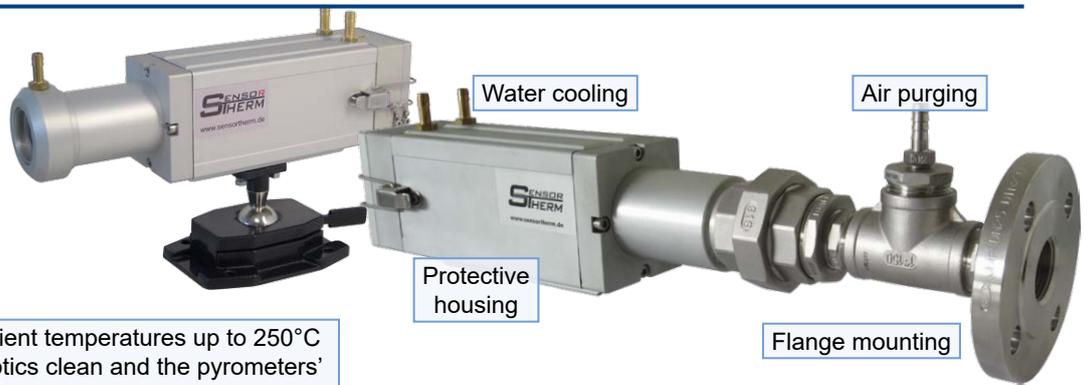
Scanning hot wire loops on the laying head



Scanning of wires for peak temperature detection

## Well Protected

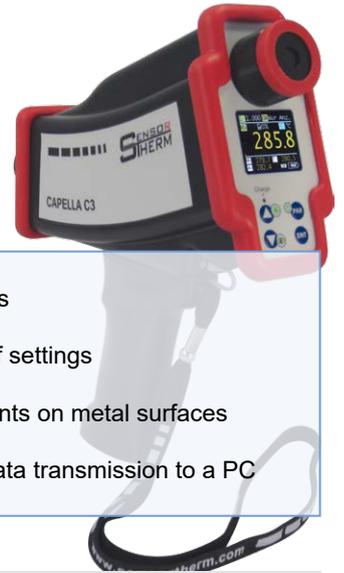
Depending on the ambient conditions, a cooling housing can be cooled with air or water, thus enabling the use of the pyrometer in much higher ambient temperatures. It can be attached directly to a mounting flange or provided with a optics air purging adapter.



- Pyrometers can be used in ambient temperatures up to 250°C
- Air purging systems keep the optics clean and the pyrometers' fields of vision free from contamination

## Portable Pyrometers

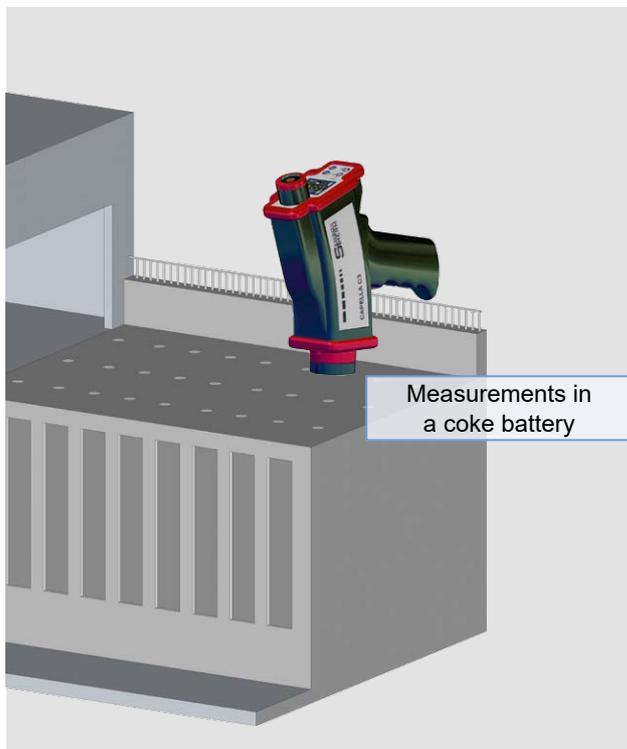
The Capella 2-color handheld pyrometer is suitable for the inspection of stationary pyrometers and for fast measurements on moving and still material due to the first-class technical data. The integrated measurement value memory allows the subsequent evaluation.



Focusable up to 10 m

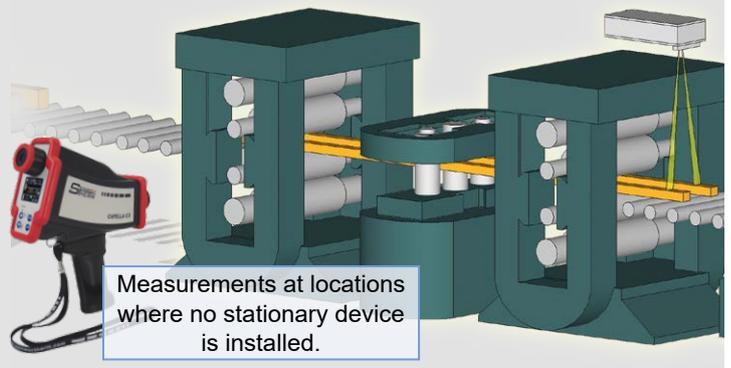
- 2-color or 1-color radiation pyrometer models
- Through-lens view finder and green laser targeting light
- Customizable display with easy mode or complete
- Huge data storage capacity
- Minimum and average storage, peak picker
- Robust aluminum housing with rubber bumpers
- Bluetooth and USB connectivity
- Modern Lithium-Ion technology

adaptable for all application conditions for easy sighting of hot and cold surfaces for just measuring info or multiple information and quick change of settings for up to 32000 measurement data for highest temperature of scale-free points on metal surfaces designed for long term durability for device charging via USB and easy data transmission to a PC for long duration operation



## Examples in Hot Metal Applications

Portable infrared thermometers also measure temperature over long distances and can be used to verify accuracy of fixed, online process pyrometers.



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

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