

Sensors for steelworks

Proxitron

SENSORS MADE IN GERMANY



Sensor technology at the highest level

Sensors for steelworks

About us

We are a traditional company, globally active in the field of sensor technology with more than 35 years of experience. We develop and manufacture our product solutions exclusively at our site in Germany. Especially for applications in steelworks we have developed sensors which work reliably even under extreme conditions. Our sensors are maintenance free and have a long lifespan. We commit ourselves to your individual requirements, be it through adjustments of a proven serial product (e.g. a different cable length) or a complete custom model. We realise your requirements for you. Through collaboration, competence and solution orientation.

Certified quality

We are ISO-certified. We never compromise when it comes to quality. We place the highest value on quality in the selection of material, the design and manufacture of our products.



Sensors for steelworks

Sensors perfectly adapted to extreme conditions



Piros Infrared Sensors

Infrared sensors (Hot Metal Detectors) are used for the detection of hot objects. To do this, the sensors use the infrared radiation emitted by hot materials which is received by an optical system in the sensor. If this radiation exceeds a threshold set in the device (response temperature), the device switches.

This happens extremely fast and allows the safe monitoring of rapid processes. Response times of up to half a millisecond can be realised. The principle of the infrared sensor allows the detection of hot objects even at a great distance. Infrared sensors are used wherever inductive sensors cannot be mounted due to the high temperature.

Versions

- different fields of view
- with fiber optic cable and separate optic

Unique characteristics

- extremely quick response time (0,3 ms)
- adjustable response temperature
- for ambient temperatures up to 600 °C
- different operating voltages and outputs
- various housings and connection variants
- stainless steel housing
- complete range of accessories
- replacement of existing AEG protection tube systems with three separate optic systems, two separate optic systems or one optic system for IR radiation detection.



Pyrometer

Pyrometers enable a non-contact temperature measurement on objects through detection of infrared radiation. The intensity of the infrared radiation depends on the temperature of an object. The infrared radiation is received by an optical system and further processed by an appropriate sensor element. The incoming infrared radiation is converted into an electrical signal whose size changes in relation to the radiation intensity. In this way, this electrical signal is directly proportional to the temperature of the object and can be used as a measurement value. An integrated microprocessor processes the measured value and provides a linearised industrial analog output signal.

Versions

- with fiber optic cable
- with cooling jacket
- different housings

Unique characteristics

- for object temperatures up to 2500 °C
- measurements through flames possible
- for metal, non-metal, glass
- robust and maintenance free
- resistant to shock and vibration
- various optics available



Light Barriers

Light barriers are the classics when it comes to sensors for object detection. All versions of light barriers achieve a very high range, even in a dusty and dirty environment. The functionality of the thru-beam sensor is easily explained: the transmitter sends out a signal which is caught by the receiver. This sensor principle is applied to both, thru-beam sensors, where a lightway is built up directly between transmitter and receiver and retro-reflective sensors, where the light of the transmitter travels via a reflector to a receiver.

A modified kind of this principle is the diffuse sensor. The light from the transmitter is reflected back directly from the surface of the object to the receiver. Proxitron thru-beam sensors are perfectly suited for detection of hot and cold objects. The receiver reacts only to the modulated light signals of the transmitter. The sensors are resistant to the infrared radiation of other heat sources and can be used for object detection in ovens as well.

Versions

- Thru-beam sensor
- Retro-reflective sensor
- Diffuse sensor
- Laser light barrier
- Light grid
- With fiber optic cable and separate optic

Unique characteristics

- max. range 2500 m
- for ambient temperatures up to 600 °C
- fast response time (1ms/1000 Hz)
- contamination control
- high functional reliability
- LED signalization
- complete range of accessories



Inductive Proximity Switches

These sensors have been designed for ambitious applications in steel mill areas. The high switching distance allows the metal detection where other sensors are overstrained. They have been developed especially for rough areas. High ambient temperatures or a chemical surrounding are no problem for these sensors. The Teach-In function is available for most of the sensors. The predamping by metals in the active area of the sensor must be considered constructive and needs to be compensated with an adjuster. Proxi-Teach versions read their environment and adjust the operating distance automatically by one touch. The key benefit of the proximity switch is that it is not sensitive to water and pollution.

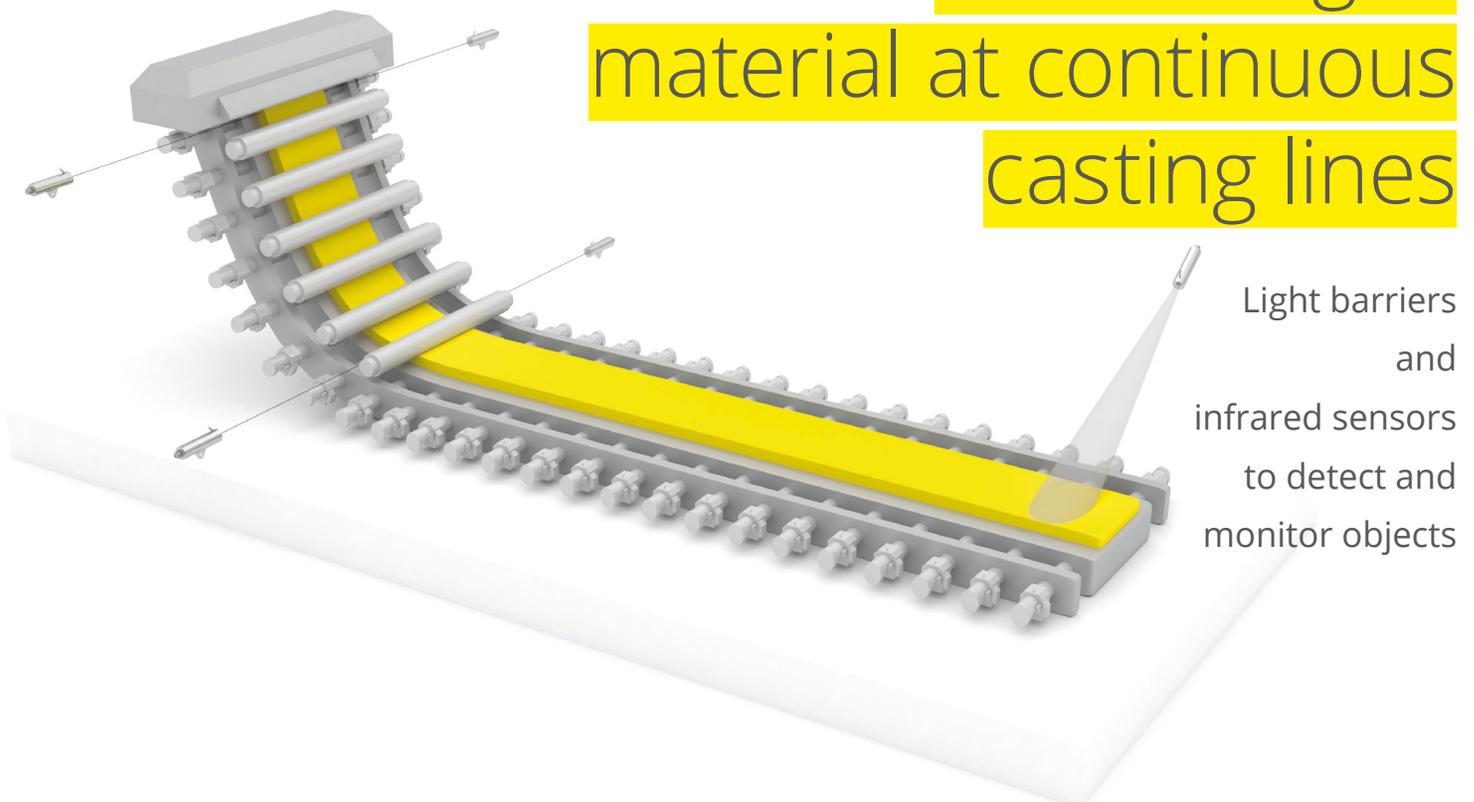
Versions

- various housing shapes
- any cable length available

Unique characteristics

- for ambient temperatures up to 230 °C
- for sensing distances up to 250 mm
- resistant to wet surroundings and fast change of temperature
- suitable for aggressive surroundings (chemical)
- suitable for applications in hot and cold rolling mills

Monitoring of material at continuous casting lines



Light barriers
and
infrared sensors
to detect and
monitor objects

Continuous casting lines, block casting lines, and billet casting lines continuously deliver semi-finished products for further processing in the rolling train. Proxitron light barriers, Piro infrared sensors and pyrometers are ideally suited for material recognition and monitoring in the area of the cut-to-length line and recognition of the approaching piece.

The sensors are designed for use under the harsh and extreme conditions in this segment of a steel mill that is so crucial for the quality of the steel. You can get different types of light barriers and infrared sensors from Proxitron depending on the application and the prevailing ambient temperature. For extreme temperatures (up to 600 °C), you can choose between devices with optical fibre variants or with a cooling housing (200 °C). An affordable variant in a durable stainless steel housing (75 °C) can be used for less extreme conditions. At the same time, the actuation temperature of Proxitron infrared sensors can be flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C.

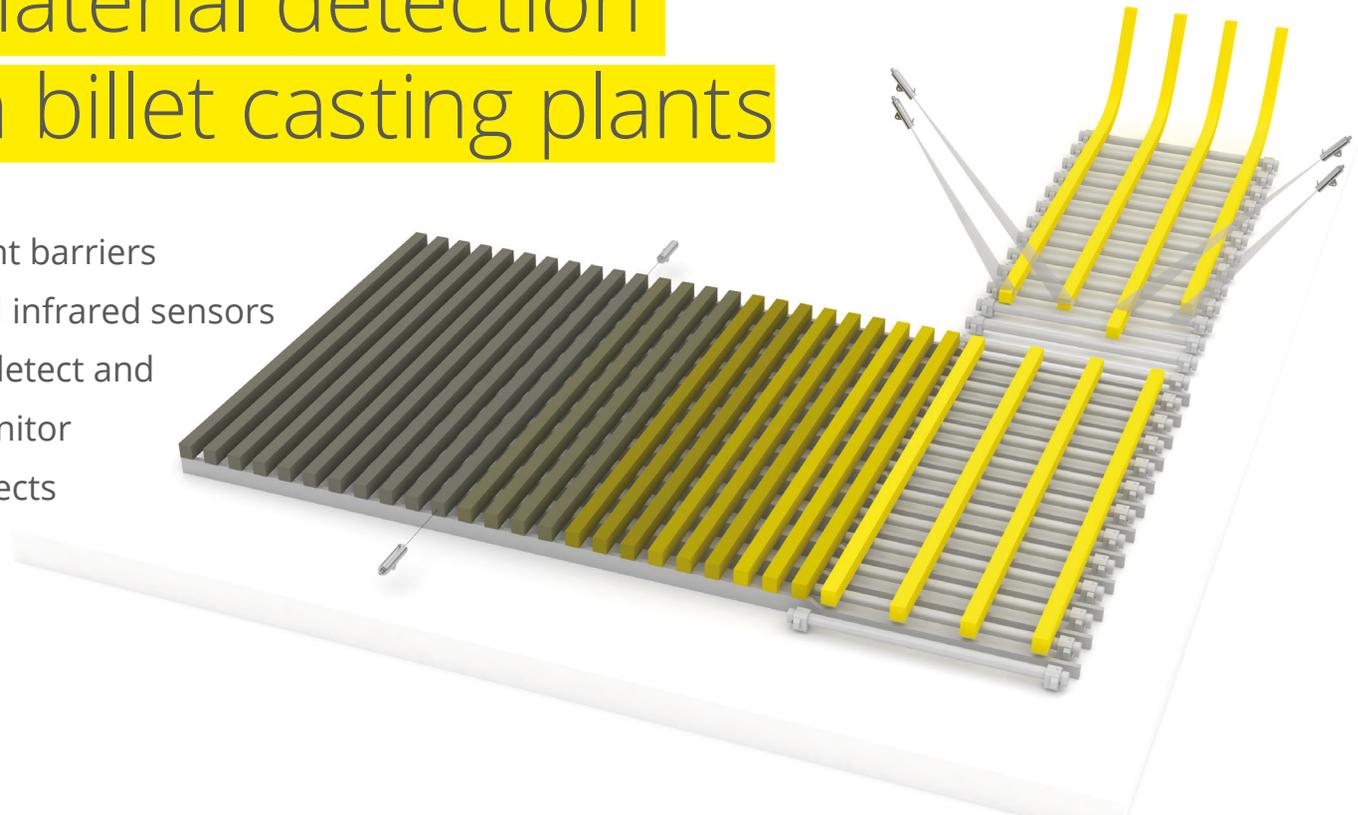
We offer optional air flushing for the lens, a laser adjustment aid for quick alignment, and comprehensive accessories for quick and secure mounting and protection of the devices.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period
- Application consulting / analysis

Material detection in billet casting plants

Light barriers
and infrared sensors
to detect and
monitor
objects



Billet casting lines continuously deliver semi-finished products for subsequent further processing. Proxitron light barriers, Piros infrared sensors of the type OSA with optical fibre cable and a lens (OAF), and Proxitron pyrometers are ideally suited for detection of the material directly in the hot area on the billet casting line. The lenses can be continuously exposed to ambient temperatures of up to 600 °C.

Depending on the field of view and distance to the object, they monitor a narrowly defined range. In this manner, a combination of several sensors can monitor a multitude of billets at different positions within a small space. The cooling bed is a classic application for Proxitron light barriers for recognition of whether end positions are occupied. The light barriers detect both hot and cold material and are nearly impervious to contamination thanks to their functional reserve.

Light barriers and infrared sensors from Proxitron are available in different types depending on the application and the prevailing ambient temperature. For extreme temperatures (up to 600 °C), you can choose between devices with optical fibre variants or with a cooling housing (200 °C). An affordable variant in a durable stainless steel housing (75 °C) can be used for less extreme conditions.

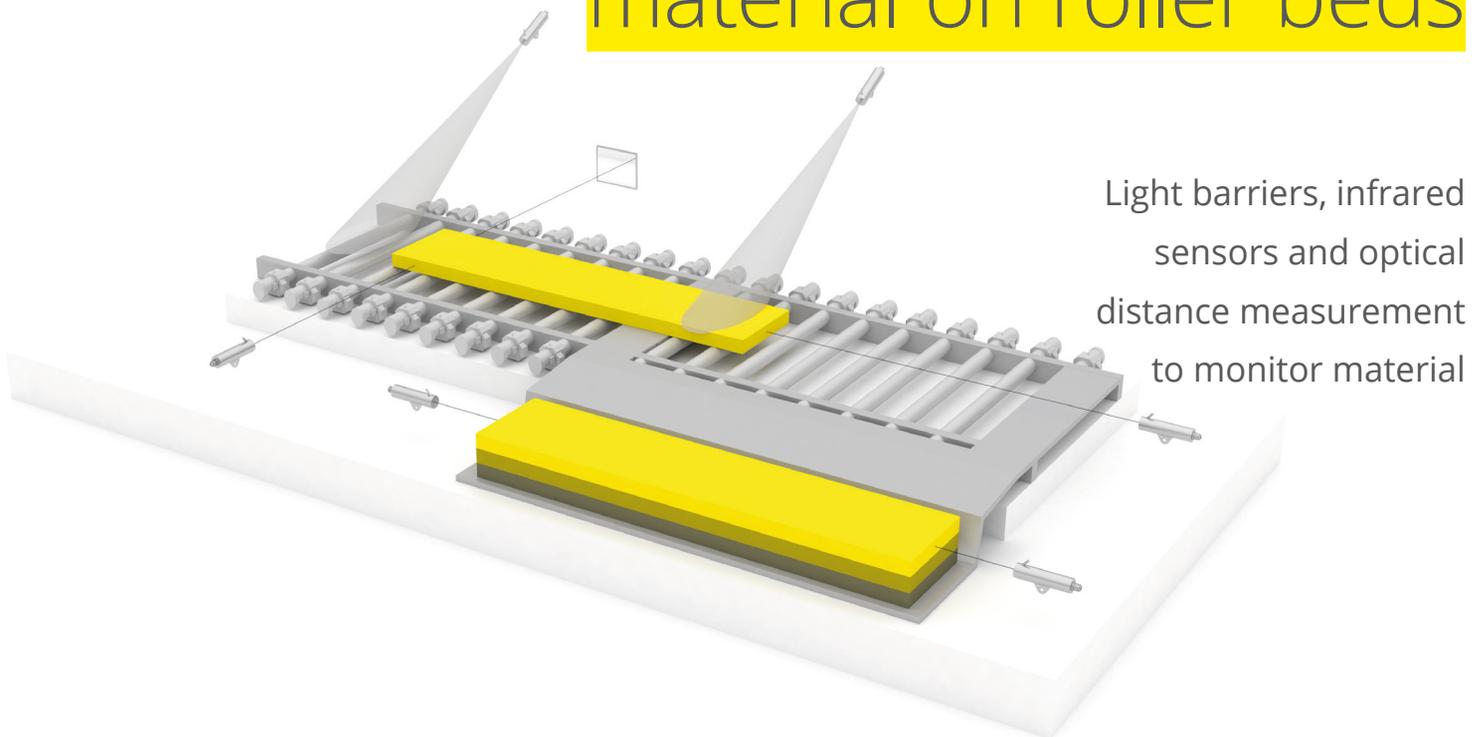
We offer our durable swivel stand HM2 for secure mounting of all systems. By means of the laser light unit, which can be quickly adapted for alignment, commissioning of the infrared sensors or light barriers takes place quickly and precisely.

The actuation temperature of Proxitron infrared sensors can be flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C. We offer optional air flushing in order to keep the lenses free from soot and scale.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period
- Application consulting / analysis

Monitoring of rolled material on roller beds



Light barriers, infrared sensors and optical distance measurement to monitor material

Roller conveyors are used for the transport of slabs, billets, or sheets in steel mills and hot rolling mills. Depending on the rolled product, individual loads of up to 30 tons or more can be conveyed. In hot rolling mills, for example, the rolled product may not come to a stop, otherwise the conveyor rolls could get damaged. Therefore, the rolled product is constantly in movement until it is cooled down or it has arrived at the next processing step. The movement, positioning, and control of the rolled product must be continuously monitored and checked.

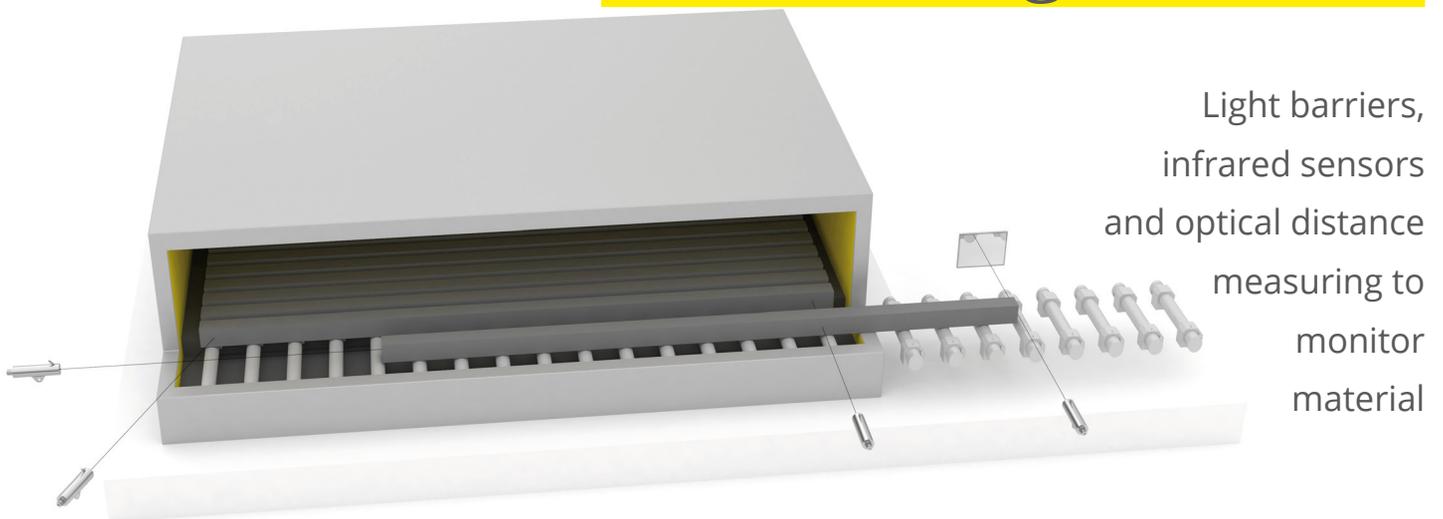
Proxitron light barriers, Piros infrared sensors, and pyrometers are ideally suited for material recognition and monitoring in the area of the roller conveyor. The position or dimensions of the slab can be determined and measured using light barriers or the LMB optical distance measurement. You can also use thru-beam sensors, retro-reflective sensors, diffuse sensors and infrared sensors from Proxitron, depending on the application and prevailing temperatures. For extreme temperatures (up to 600 °C), you can choose between devices with optical fibre variants or with a cooling housing (200 °C). An affordable variant in a durable stainless steel housing (75 °C) can be used for less extreme conditions. The actuation temperature of Proxitron infrared sensors can be

flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C. We offer optional air flushing in order to keep the lenses free from soot and scale.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
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- Provision of samples for a test period
- Application consulting / analysis

Loading and charging at reheating furnaces



The reheating furnace is a fundamental component of many production processes for the manufacture of semi-finished material, including in the production of seamless pipe. After consistent heating of the blocks, the mandrel bar is introduced to a hollow block. The hollow block is then fixed in the flanging press and then pushed by multiple roller cages in an additional shaping stage on the push bench. The diameter of the bloom produced in this manner is then enlarged so that the mandrel can be removed (detaching mill). In order to be able to guarantee the further processing, the bloom that has already cooled during the last processing stage is heated up again in the reheating furnace. Then the bloom is stretched to the desired diameter in the stretch reducing mill and cut to the order length by the saw.

Proxitron infrared sensors and light barriers monitor and check this upstream production process at a number of positions, such as the roller conveyor, the cold saw, the rotary hearth furnace, the rotary forge mill, the flanging press, the push bench, the detaching mill, the hot saw, and the reheating furnaces, and thus assure a smooth and fault-free progression. The reheating furnaces are especially challenging due to the high temperatures that are prevalent there.

Proxitron reflective light barriers of the type LRA and LRB with reflectors reliably monitor the loading and feeding of the reheating furnace with billet or bloom. The exact position-

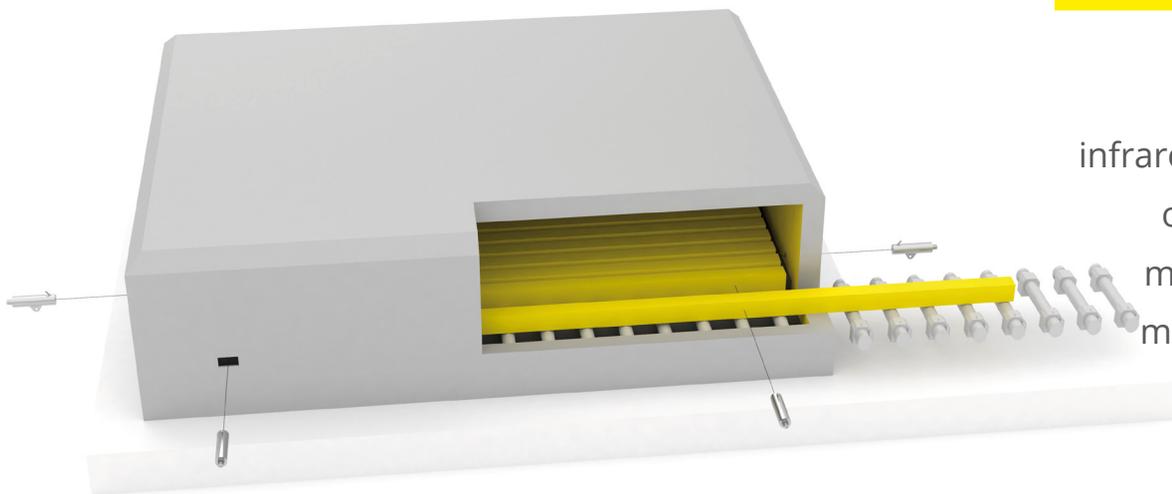
ing takes place with the LMB optical distance measurement. You can also get different types of thru-beam sensors, retro-reflective sensors, diffuse sensors, LMB optical distance measurement and Piros infrared sensors from Proxitron, depending on the application and ambient temperatures. For extreme temperatures (up to 600 °C), you can choose between devices with optical fibre variants or with a cooling housing (200 °C). An affordable variant in a durable stainless steel housing (75 °C) can be used for less extreme conditions.

The actuation temperature of Proxitron infrared sensors can be flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C. We offer optional air flushing in order to keep the lenses free from soot and scale.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
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- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period
- Application consulting / analysis

Output of reheating furnaces



Light barriers,
infrared sensors and
optical distance
measurement to
monitor material

The material that has already been cooled in the preceding work steps is heated up again in heating furnaces for the further processing steps.

Proxitron infrared sensors and light barriers monitor and check these upstream production processes at a number of positions, such as the roller conveyor, the cold saw, the rotary hearth furnace, the rotary forge mill, the flanging press, the push bench, the detaching mill, the hot saw, and the reheating furnaces, and thus assure a smooth and fault-free progression.

The reheating furnaces are especially challenging due to the high temperatures that are prevalent there.

The discharge of the heated bloom or billet is monitored by light barriers of the type LAA/LSA 600. The position and distance measurement can take place with optical distance measurement, which works reliably on material with temperatures up to 1300 °C.

You can also get different types of thru-beam sensors, retro-reflective sensors, LMB optical distance measurement, and Piros infrared sensors from Proxitron, depending on the application and prevailing ambient temperatures. For extreme temperatures (up to 600 °C), you can choose between

devices with optical fibre variants or with a cooling housing (200 °C). An affordable variant in an indestructible stainless steel housing (75 °C) can be used for less extreme conditions.

The actuation temperature of Proxitron infrared sensors can be flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C. We offer optional air flushing in order to keep the lenses free from soot and scale.

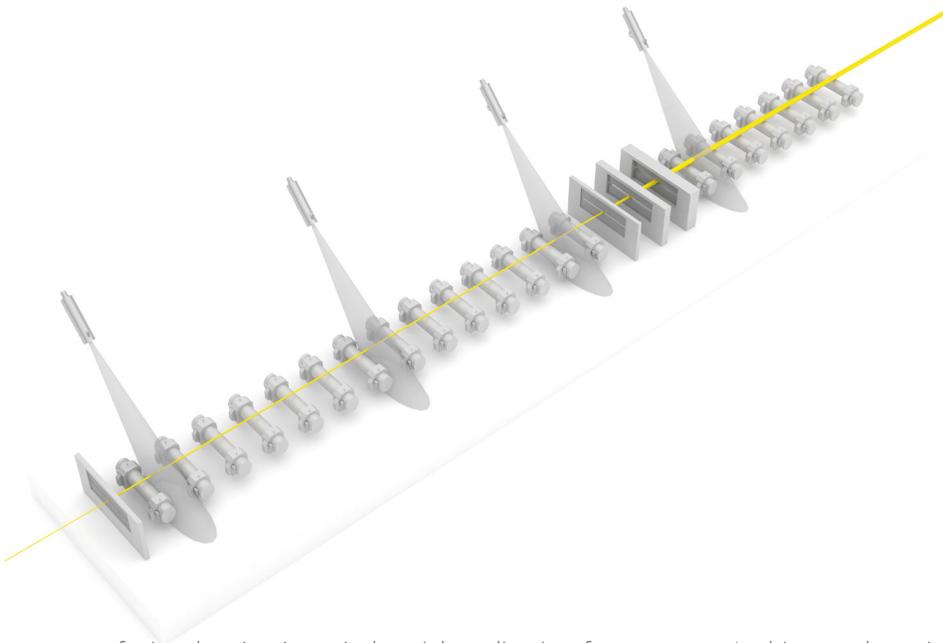
Piros pyrometers and/or infrared thermometers from Proxitron can be exposed to ambient temperatures up to 250 °C and detect or check the temperature of the material before and/or after discharge from the reheating furnace with a measuring range of up to 2500 °C.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period

Monitoring of wires at wire drawing

Infrared sensors to
monitor material



The process of wire drawing is an industrial application for production of a wide variety of wires. Wires are warm-rolled in an initial step, then cold-formed in subsequent process steps. Various processes, such as indirect compression or profile rolling, have established. With indirect compression the diameter of the wire is reduced by drawing it through a drawing ring having a smaller diameter. The reduction of the diameter takes place in multiple stages. In each stage the diameter of the wire rod is reduced by only about a half millimetre.

On the other hand, profile rolling enables production of rectangular wires or wires with a complex cross-section in multiple rolling stages over partially profiled rollers.

Infrared sensors from Proxitron monitor the production process and detect wire breaks, as well as the start and end. Since the speed is approximately 30m/s, this must take place extremely quickly. Due to the high radiated heat of the rolled product and its small dimensions, we recommend the use of an infrared sensor of the type OSA with separate optic. The evaluating unit is connected to the lens with an optical fibre cable (lengths of up to 20 m). The lens itself can be exposed to temperatures of up to 600 °C.

In this way, detection can take place in the immediate vicinity of the wire and faults due to environmental influences such as steam or water are prevented.

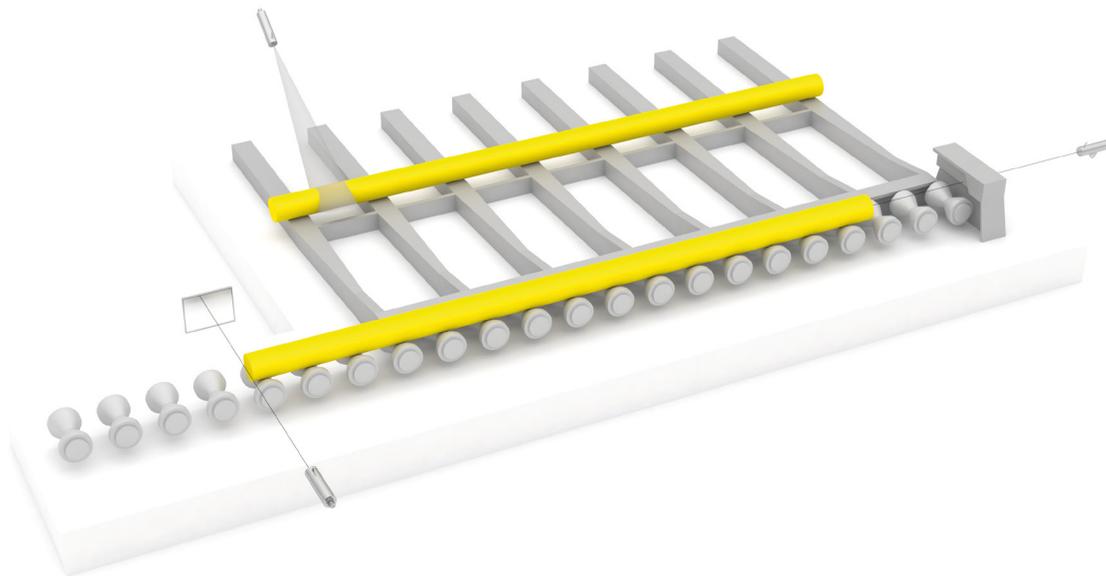
The actuation temperature of Proxitron infrared sensors can be flexibly adapted to the temperature of the object from cold 250 °C to hot 900 °C. We offer optional air flushing in order to keep the lenses free from soot and scale.

Like in many steel and metallurgical applications, pyrometers/ infrared thermometers from Proxitron supervise the production process with contact-free measurement of the temperature of the material - with an ambient temperature up to 250 °C and a measuring range up to 2500 °C.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensor with fiber optic cable: Response temperature adjustable from 400 °C - 900 °C
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period

Monitoring of long materials on roller bed



Light barriers and optical distance measuring to monitor material

Long products comprise pipes, rods, profiles, etc. The precise position and positioning as well as the length measurement of the product play an essential role in the production of long products in the scope of the rolling process and the transport - i.e. from the cooling bed.

Piros infrared sensors and light barriers from Proxitron monitor and check these production processes and ensure a smooth and fault-free progression.

Thru-beam sensors and retro-reflective light barriers signal the passage of the long product at a specific position and, in combination with other devices, such as the Proxitron LMB for laser distance measuring, enable the exact positioning and length measurement of the object at temperatures up to 1300 °C.

Pyrometers/infrared thermometers enable contact-free measurement and monitoring of the temperature of the material, which is essential for the quality of the end product, and can withstand the same harsh conditions as any other special sensor from Proxitron.

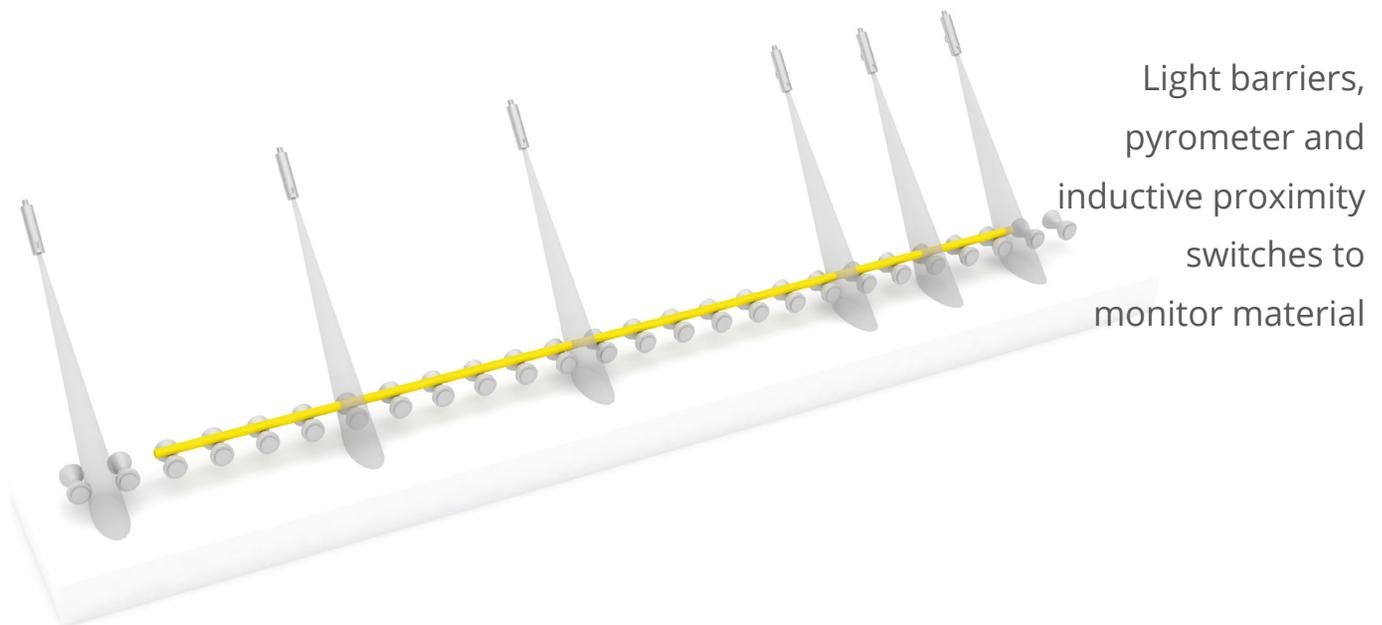
You can also scale thru-beam sensors, retro-reflective sensors, diffuse sensors, laser distance sensors and infrared sensors from Proxitron depending on the application and the prevailing ambient temperature. For extreme temperatures (up to 600 °C), you can choose between devices with optical fibre variants or with a cooling housing (200 °C).

An affordable variant in a durable stainless steel housing (75 °C) can be used for less extreme conditions.

Your benefit, your advantages

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period

Monitoring of transport and storage



Light barriers,
pyrometer and
inductive proximity
switches to
monitor material

The transport and storage of warm and cold material in steel or hot rolling mills or other processing industries is a complex challenge. Various areas for production, transport, storage in flat storage, shelf storage, or packaging use different technologies for transport which are optimised for each sub-area. In addition to roller conveyor systems, circulating trolley systems, cold strip lines, lifting bar conveyors, chain conveyors, lifting tables, rotary tables, cavity roller stations, shearing lines, and inspection lines are used. Each of these systems has different requirements for object recognition and detection, based on the change in shape after each processing step, the function of the processing step, or the altered material properties, such as the temperature or surface.

Proxitron supports you with various sensor solutions during the entire production process or product route. Our sensors help you achieve flexibility during the entire product route and optimal integration into control systems.

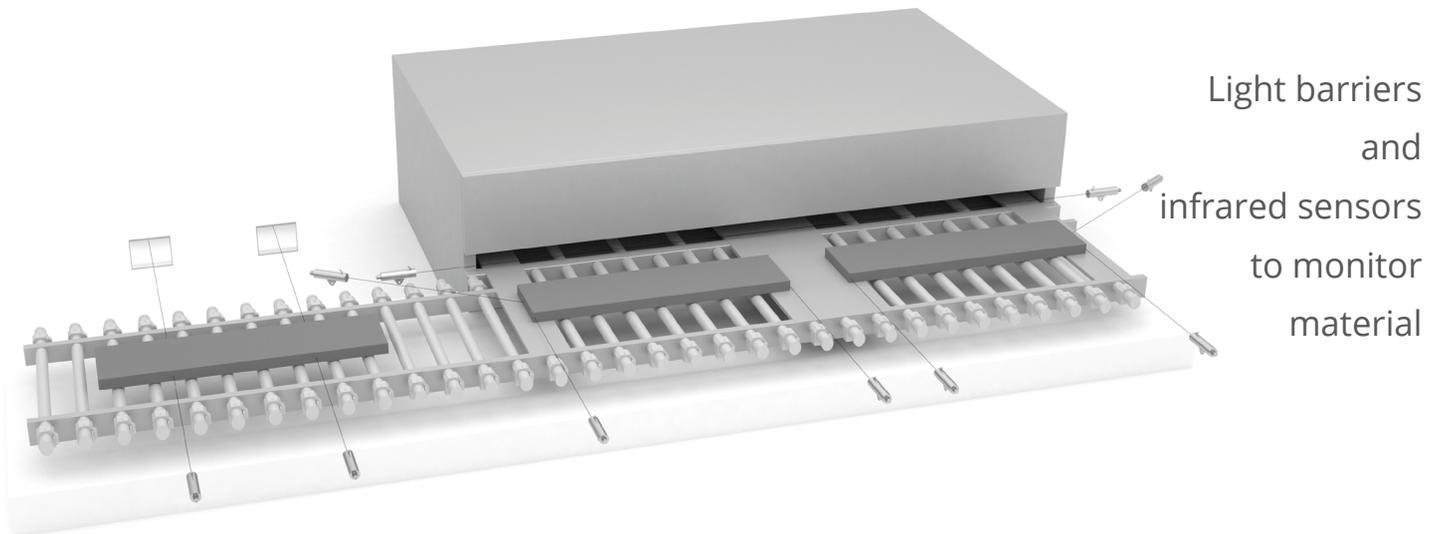
In addition to our light barriers, infrared sensors, pyrometers/ infrared thermometers and laser distance measuring systems, our inductive special sensors and proximity switches are used worldwide, especially in steel and hot rolling

mills. In the process, the contact-free detection, determination of distances, or measurement of temperature on hot objects are just the first advantages Proxitron sensors offer. They feature a special design for operation under extreme conditions and long service life.

Your benefit, your advantage

- Maintenance-free
- High availability
- extremely robust
- Inductive proximity switches with Teach-In function
- Light barriers with extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period
- Application consulting / analysis

Rolled hot band and plate mill



After the semi-finished material - e.g. a block - had been heated to the rolling temperature in a walking beam furnace, it is rolled to a defined measurement in the blooming train. This measurement is the tapping for the finishing train. Each end rolled product has its own tapping cross-section, which is related to the calibration, profile and individual passes on the rolls.

Proxitron infrared sensors in the compact version or with a fibre cable and separate optic for high ambient temperatures up to 600 °C, are used worldwide for product monitoring in this area.

In addition, the OIL high-temperature infrared sensor protective tube system can be used in areas where detection from above is difficult due to heavy steam formation and the use of water. The protective tube system can be integrated into the roller conveyor from below.

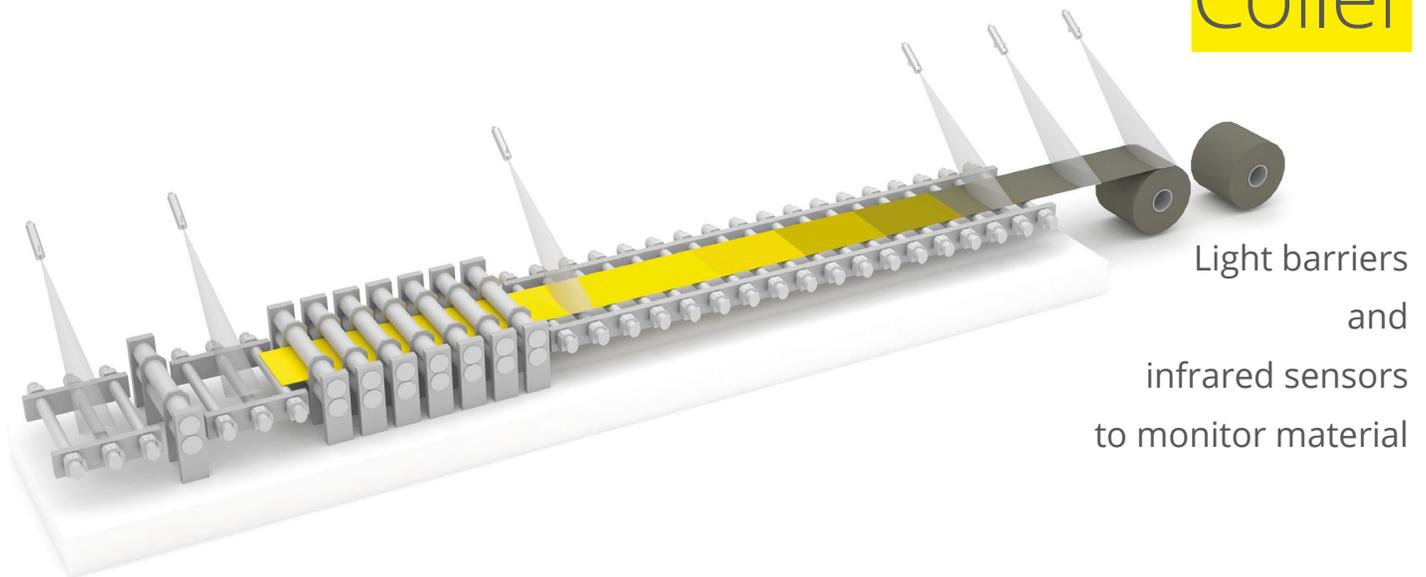
Additional to the special sensors from the inductive range, pyrometers from Proxitron monitor and measure contact-free the temperature of the material, which is essential for the quality of the end product. Pyrometers from

Proxitron can be exposed to the same harsh ambient conditions as light barriers and infrared sensors and have a measuring range of up to 1800°C.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period

Finishing train and Coiler



In hot rolling mills the steel is rolled or reduced to a specific measurement (flat product) from a semi-finished material, such as slabs, in the blooming train. It is in the finishing train that the rolled product receives the surface quality necessary for further processing. At the end of this process, there is often a surface inspection with subsequent cooling section and coiler. Proxitron light barriers are used to detect the head and foot of the hot strip. The light barriers can be scaled depending on the installation location and prevailing ambient temperature. Infrared sensors monitor and check for the presence of an object in a specific position and pyrometers and/or infrared sensors measure the temperature of the rolled product on the cooling section and upstream from the coiler.

In addition to our light barriers, infrared sensors and pyrometers, our inductive special sensors and proximity switches are used especially in steel and hot rolling mills worldwide. The contact-free detection of objects - e.g. during the coils transport - is just the first advantage Proxitron sensors offer. They feature a special design for operation under extreme conditions and long service life.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Infrared sensors: response temperature adjustable from 250 °C - 900 °C
- Light barriers: extreme functional reserve
- 35 years of application experience worldwide
- Cost-optimised with scaling depending on the installation location
- Provision of samples for a test period
- Application consulting / analysis

Pilger mill in tube rolling mills

Infrared sensors to monitor
hot objects

The increasing flexibility of production lines requires a high adaptability of sensors. Continually changing object geometries, different temperatures and very high radiation or surrounding temperatures are no rarity. In a pilger mill these rough conditions are common, for example in the production of seamless steel pipes. The raw steel blocks, each weighing a few tons, are heated up first in a round oven at a temperature of 1300 °C. After descaling of the surface, the steel block is prepunched in a hole press with a force equal to 2000 t. In the next cross rolling mill the growing pipe rotates between two rollers that are positioned at an angle to each other. The punching is widened to the size of the mandrel diameter.

The sensor that was installed at this application is the Piros infrared sensor OKA 2038.38 G with tube OL 19. The signal of the infrared sensors controls the movement of centering device and abutment. The point of view is restricted by the tube and prevents disturbances by steam in the cooling phase. An optimum adaptation to the operating conditions is given due to the adjustable response temperature. The Piros with self-learning response temperature (Auto-Teach function) is suited to continually changing conditions. The OKA is a compact sensor with a stainless steel housing and resists surrounding temperatures of up to 75 °C. The use of a

cooling jacket increases its temperature resistance up to 200 °C. Alternatively, sensors with a fibre optic cable can be used, which withstand ambient temperatures up to 600 °C without cooling. Different optics are available.

Your benefit, your advantage

- Maintenance-free
- High availability
- Extremely robust
- Response temperature adjustable from 250 °C - 900 °C
- Recognition of radiation of hot objects at great distances



Walking beam furnaces are used for heating slabs, billets, or rods prior to the rolling process. The goods which are to be heated are moved inside a walking beam furnace. The temperature in a walking beam furnace can normally reach up to 1,200 °C. How can the hot material be detected under these extreme conditions? Hot metal detectors can't help, since the material temperature is not significantly different from the furnace temperature. Proximity switches cannot be used because of the high temperatures involved. Light barriers may be used to avoid costly mechanical solutions that require touching the material directly inside the furnace. Light barriers can detect the positioning and allocation of the goods without contacting them, and can control the movement inside the furnace.

Nevertheless, high background radiation levels and interruptions caused by different layers of hot air complicate object measurement inside tunnel and annealing furnaces. Conventional light barriers are often over-strained in these cases. However, the combination with the 600 series of Piros light barriers has proved to be reliable. These sensors have been used for tracing materials in steel mills for years, and their performance under tough conditions is proven.

The basic version LAA 600 (transmitter) with LSA 600 (receiver) features a barrier range of up to 2,500 m, which guarantees an extremely high level of operating reserve and are designed for ambient temperatures up to 70 °C. The

transmitter and receiver are also available with a cooling jacket housing or with a fiber optic cable and separate optics for ambient temperatures up to 600 °C, depending on installation conditions.

In a pipe application at the world's market leader for premium pipe solutions, Proxitron successfully installed its LAA 600.3 transmitter and LSD 600.38GV receiver together with a fiber optic cable and a OACF 154 optic. The light barrier signal in the system stops the pipe moving inside the furnace and monitors the allocation of the walking beam. The test function of the transmitter enables the function of the light barrier to be tested without detecting an object, which thereby permits simulation of different system states.

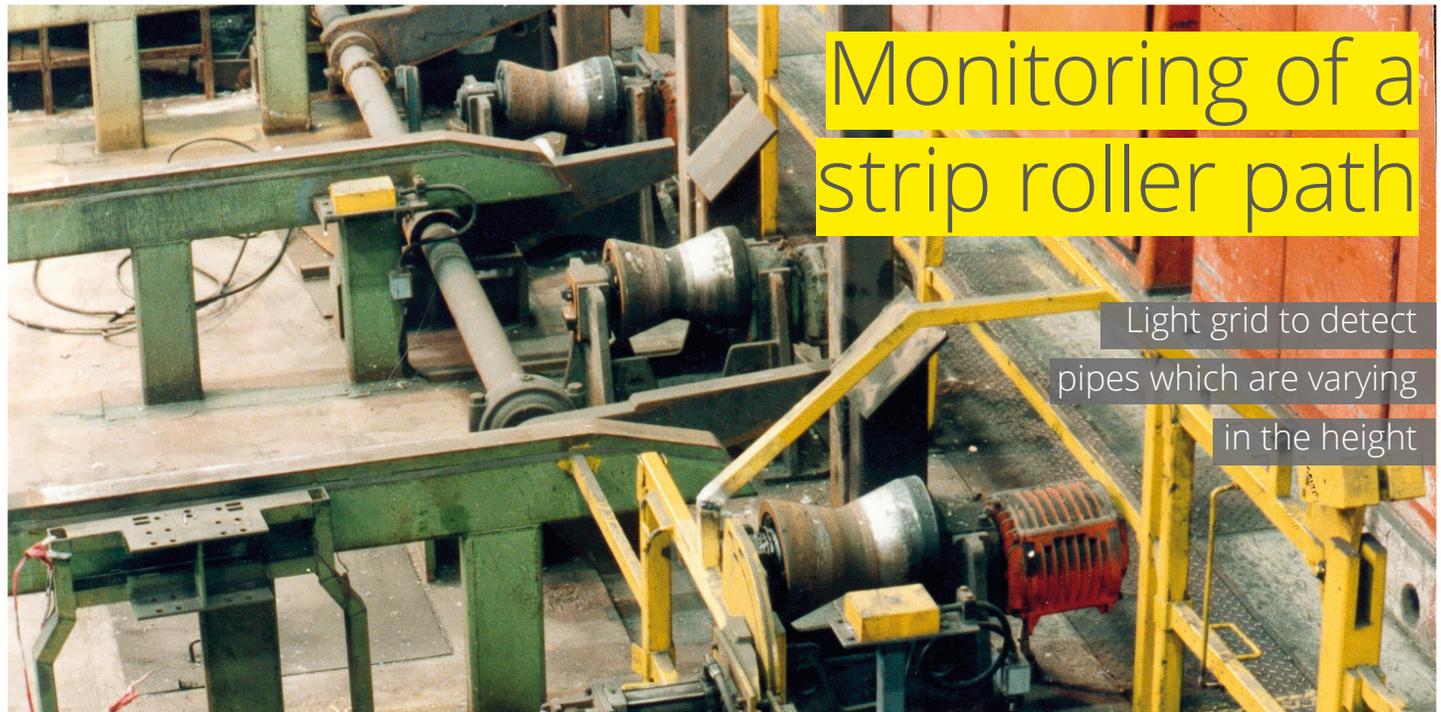
In this case, this combination is expanded with the HL 133 furnace window. The Proxitron furnace window prevents possible flame exhaust due to over-pressure to protect the transmitter and the receiver optics. The contamination control also notifies in case the minimal operating reserves are not reached, thereby enabling timely intervention if contamination is increasing and the light barrier is in danger of malfunctioning.

Your benefit, your advantage

- Max. range 2500 m
- Ambient temperature up to +600 °C
- Extremely fast (1 ms/ 1000 Hz)
- Extremely high functional reserve

Monitoring of a strip roller path

Light grid to detect pipes which are varying in the height



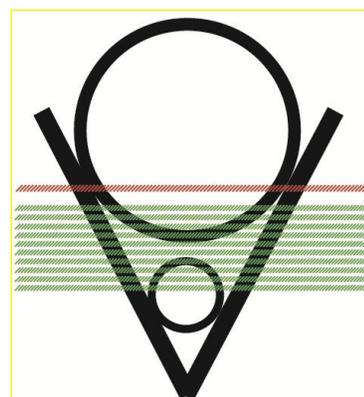
The exactness of the tube length measurement depends on the capability for reproduction to detect the tubes beginning and end. A tube rolling mill needed length measurement directly at the conveyor track of the subsequent production. An easy commissioning, high repeatability and an integrated error monitoring were in demand. As there are tubes of different sizes in process, they have decided on the Proxitron light grid.

Different tube diameters lead in a V-conveyor to a very divergent height position of the pipe.

Therefore the tube beginning and end can't be detected with a light barrier (in drawing red). However, the Piros light grid detects objects in a field within the barrier height (in drawing green). This ensures the safe detection of the tubes, even if the tube diameter changes.

If a tube is detected by the light grid, the counter in the system control is set to zero. By means of an incremental rotary transmitter which runs with the tube, exact length measuring up to +/- 1mm is possible. The Piros light grid works as a light barrier with 10 single lines in the grid of 8 mm. The invisible infrared radiation between transmitter and receiver scans a height of 75 mm on entering material. A contamination output at the light grid ensures a reliable production even under extremely dusty or dirty conditions. The intermittent short circuit protection protects both

outputs in case of overload. Proxitron light grids are available with a barrier width up to 1400 mm.



Your benefit, your advantage

- Barrier width 1400 mm
- Adjustable measuring rate
- Contamination output
- Minimum object size: 15 mm Ø



Temperature measurement on highly oscillating objects always poses a challenge to companies. Also when the ambient temperature rises up to 250 °C, the instrument must work reliably. The company Proxitron recently had to face a similar challenge. A steelwork (with ambient temperature up to 200 °C) needed a sensor for the temperature measurement of the casting stream of liquid steel. While being poured into the mould, the casting stream fluctuated as to quantity and speed, so that the use of a traditional pyrometer was not possible.

The problem was solved with the ratio pyrometer OKSL Q18.194 S10. The pyrometer ensures reliable measurement even at low coverage of the measurement surface. Its special optic guarantees a precise result starting from 10% spot coverage through an object. The temperature of the casting stream, the intensity and position of which can vary, is captured and measured; this makes an optimal control of the casting process possible. Moreover, the response time of 5 ms allows its use in applications where fast measuring process is a must.

With the integrated laser-pilot light the pyrometer can be aligned at any time – also during measurement – on the object.

The ratio pyrometer can be used not only at casting of liquid metal; it is particularly suitable also for temperature measurement in the wire production, as wire similarly has no defined measuring position, if not guided precisely.

Your benefit, your advantage

- 10 % coverage of the measurement surface
- Response time of 5 ms
- Low emissivity
- Up to 250 °C ambient temperature



Reliable monitoring of material on a roller path needs every rolling mill. The material itself or gaps shall be recognised, regardless of environmental factors like steam or soiling, to guarantee an efficient and undisturbed production. A steelwork in Germany recently came up with the following situation and asked Proxitron for help: With sensors placed at different positions on a 50 m long and 800 mm wide roller path they wanted to identify the presence of steel profiles of different sizes. Due to the different profile dimensions and their undefined position, the whole widths of the roller paths need to be monitored; however they wanted to avoid working with several single sensors. The application of optical sensors was also excluded on account of possible soiling.

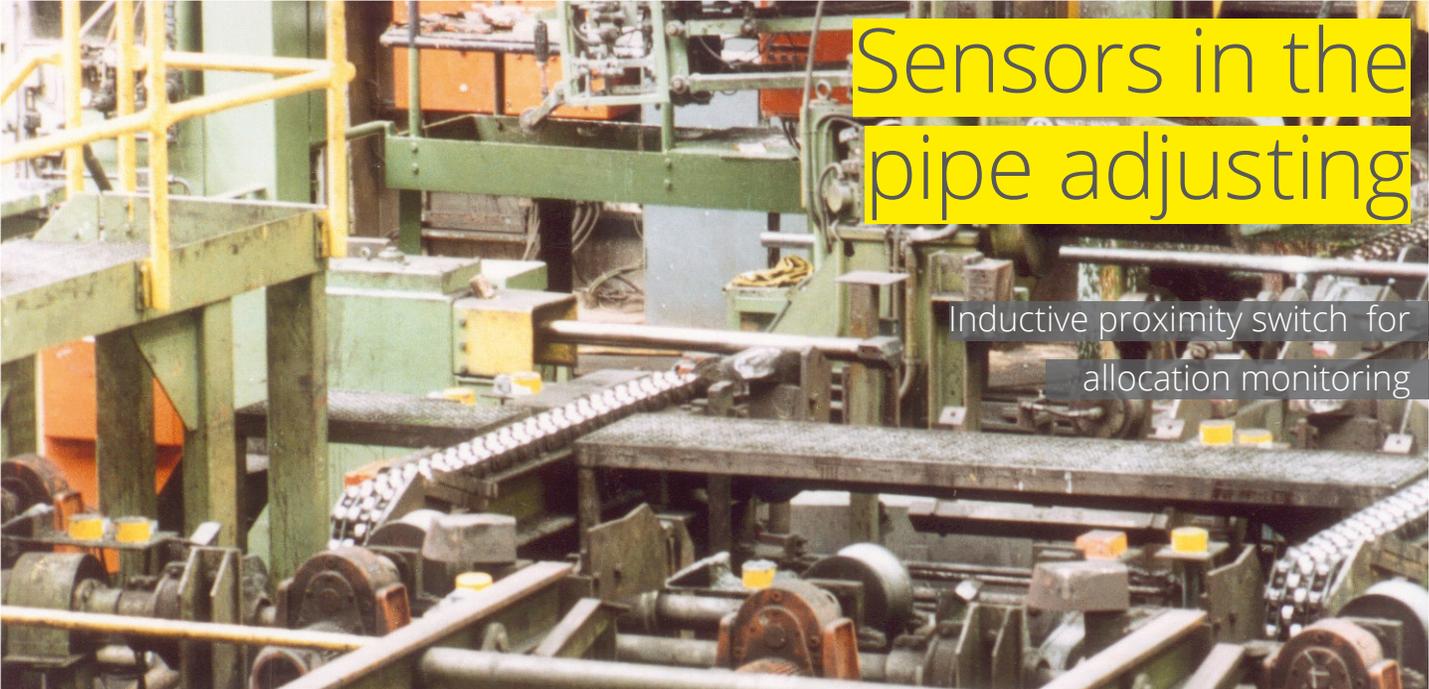
After examination of the application on site, a surface sensor of the type IKU 281 was used. The application of a surface sensor is more efficient and more reliable than using several single sensors. The surface sensor delivers a switch signal regardless of the position of the profile on the rolling path, and the effort of wiring, installation and commissioning is minimised. The IKU 281 allows the monitoring of a rolling path of 800 mm width and has a switch distance up to 250mm. The inductive sensor principle allows a troublefree operation even with strong soiling of sinter. The high switch

distance protects the sensor against mechanical damages by oscillations of the material transported on the rolling path. The sensor is optimised by the integrated Proxi-Teach function: With one keystroke the sensor recognises the existing installation terms and sets the most possible switching distance under these conditions. The setting achieved ensures a reliable operation even if the ambient temperature varies.

In other positions other Proxitron surface sensors with different geometries were used to achieve an optimum adaptation to different roller path dimensions.

Your benefit, your advantage

- Monitoring of roller path and conveyor tracks
- Detection of metals, e.g. pipes, profiles
- High resistance to contamination
- Variations for different widths of roller paths
- Self-calibration with Teach-In function by one key stroke
- Several connection variants

A photograph of an industrial pipe adjusting machine. The machine is complex, with various rollers, guides, and structural frames. A long metal pipe is being processed. Several yellow cylindrical sensors are mounted on the machine's frame. The background shows more industrial equipment and a yellow safety railing.

Sensors in the pipe adjusting

Inductive proximity switch for allocation monitoring

Sensors must be resistant and need to operate smoothly under harsh conditions in the industry. The sensors function cannot be affected by dust, steam, heat or cold. Proxitron inductive proximity switches meet these requirements, such as in the pipe adjusting in tube production.

After production, tubes are cut to length in the pipe adjusting. The sensors used here must operate reliably under difficult conditions, such as heavy contamination. Companies choose the Proxitron sensor IKNR 060T.38 MG since it works well in these conditions. The sensor does not experience any functional limitations despite being completely covered by a thick layer of encrusted dirt and metal chips.

Thanks to the non-contact detection of metals, the sensor operates wear-free and the 60 mm sensing distance protects the sensor from mechanical damage when oscillation of the tubes occurs. The large metal mounting flange ensures secure mounting without much effort and the connection is very convenient and easy due to the cable connection box. Proximity switches with Proxi-Teach (Teach-In function), as the sensors used here, detect the existing installation conditions and adjust to the optimum switching distance at the touch of a button.

Your benefit, your advantage

- Teach-In function
- Resistant to water and dirt
- Wear-free
- High switching distance
- Short circuit proof and reverse polarity protection
- Various connection options
- Cable protection conduit fitting