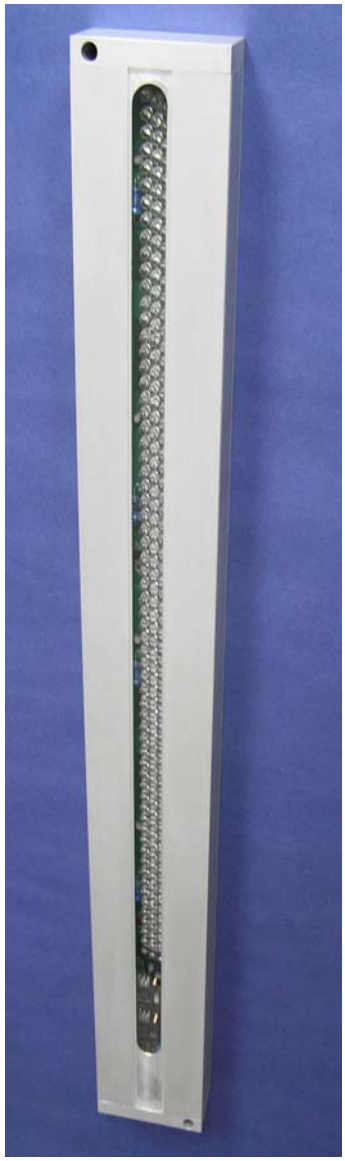
Sitronic

InfraScan® Series5000

INFRARED LIGHT CURTAIN (SCANNER) FOR NON-CONTACT MEASURING



Resolution 1.25 ... 10 mm

Measuring areas up to 1670 mm

Measuring distance up to 6 m

High clock rate of 100 kHz - short measuring cycles

Easy to mount and adjust

Programmable with *ScanView* software via the serial interface

Water and dust proof casing

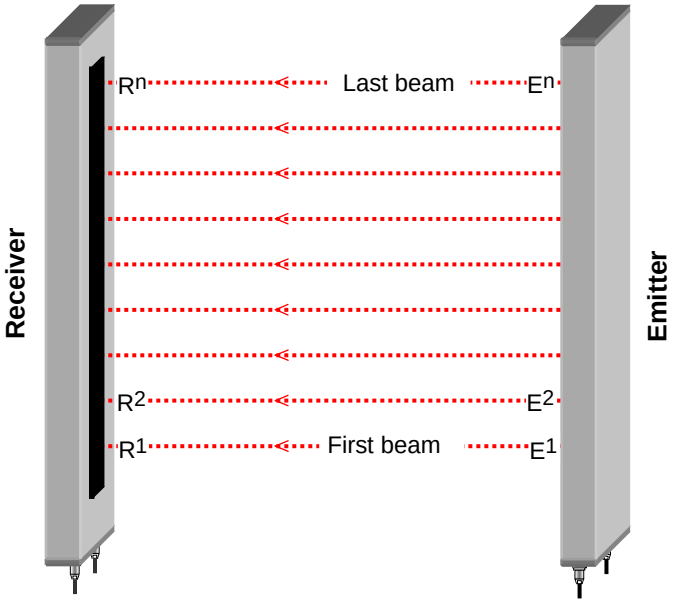
All standard data interfaces available

New: *BeamStream* Data Output

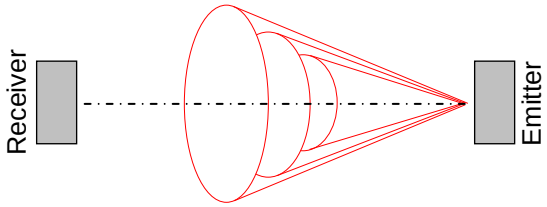
InfraScan® light curtains or scanners are electronic precision measuring instruments which operate on the basis of infrared light beams. Each measuring system comprises two casings, one containing the emitters, the other the receivers together the with the electronics for light pulse and data output control. No external units are required.

Together with the facing receivers, the infrared LEDs which are lined up next to one another inside the emitter unit, form a grid of absolutely parallel beams. This principle permits the recognition and measurement of all objects which attenuate infrared light or are impervious to it. The surface of the object or the distance between emitter and receiver has no effect on the measurement.

To perform the measurement, the individual infrared LEDs are activated in succession and the associated receivers are scanned at the same time. In other words light beam "1" is interrupted at the moment the imaginary line from transmitter "1" to receiver "1" is interrupted, since only the first receiver is scanned at the moment the first light beam is transmitted. This applies to the following beams accordingly, resulting in the formation of a "light grid" comprising invisible light beams arranged in parallel to one another.



As only the associated receiver of each infrared LED is activated, wide angle radiation is possible. The conical light beams ensure fault-free operation of the **InfraScan®** photoelectric barriers, even if they are exposed to severe vibration, and greatly simplifies adjustment when mounted.

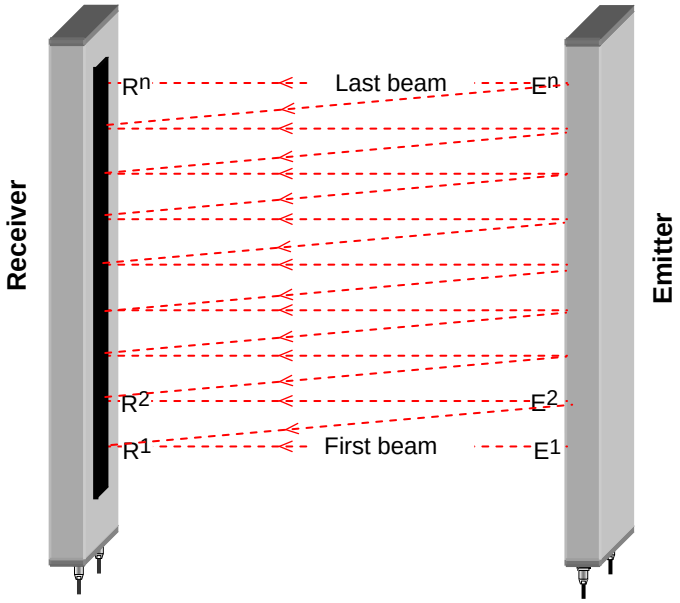


The light curtains **InfraScan®** utilize – depending on type and number of beams – a high scanning rate of 100 kHz. This is all the more important the quicker the target object is moved through the scanner and the more variable its shape is, particularly in the double or multi-direction measuring mode.

Since the individual light beams are parallel to one another, it is of no relevance to the measurement result whether the object is closer to the emitter or the receiver.

For some applications, however, a higher measuring accuracy or improved capability to detect very small objects may be desirable. For this purpose the function "double scanning" or "enhanced resolution" is available. The method used is to insert an additional beam, as it were, diagonally between the parallel beams.

The first beam runs, as with parallel scanning, from emitter "1“ to receiver "1“, the second beam, however, from emitter "1" to receiver "2“, the third beam from emitter "2" to receiver "2“ (i.e. is parallel again), and so forth. If we call n_p the number of beams for parallel scanning, the number of beams n_d for double scanning can be calculated by means of the formula: $n_d = 2\ n_p - 1$, i.e. 288 beams would result in 575 beams with a resolution of 1.25 mm (as compared with 2.50 mm for parallel scanning).



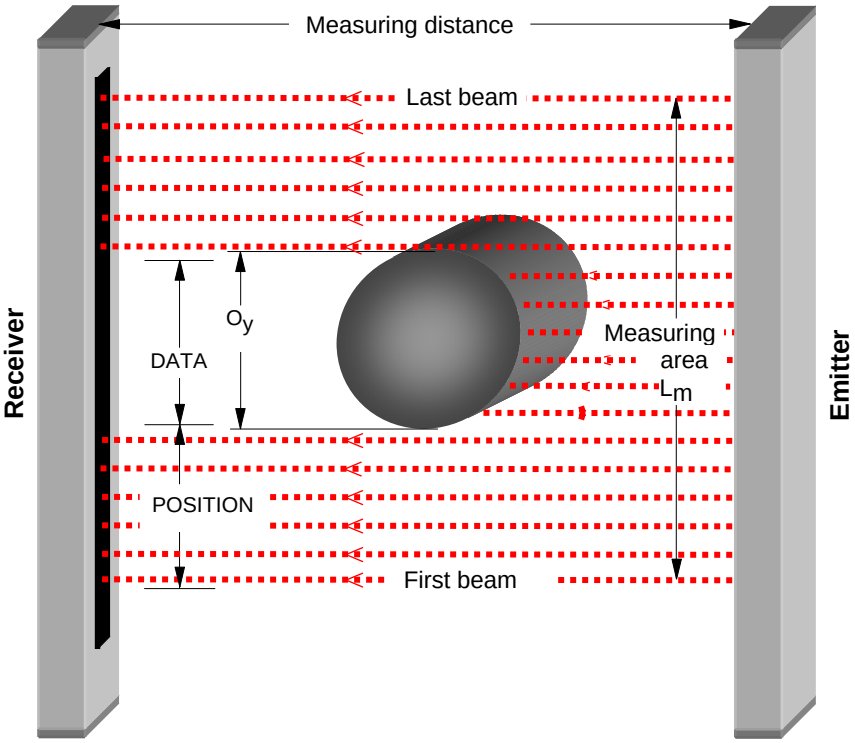
Some definitions of output:

DATA represents the measured size of an object as the number of broken beams or – multiplied with the resolution – in mm.

POSITION describes the first beam broken by the object in relation to the first beam. It can also be output either as number of beams or in mm.

The actual object size is named O_y and the difference between O_y and DATA is defined as the measuring deviation.

A beam spacing of 2.5 mm allows a measuring accuracy of ±0,5 mm (arithmetic mean calculated from 10 measurements), when the object moves "freely" within the measuring range.



The distance between transmitter and receiver is designated the **measuring distance L_m**. In order to guarantee good function at different distances (L_m can vary from 0.2 m to about 6m), it is possible to optimize the scanner by means of the *ScanView* software via the serial interface by setting emitter and receiver gain. Of course it is also possible to specify the measuring distance by using the appropriate ordering code.

Depending on requirement various interfaces are available. The most common interface and standard with the series 5000, is a serial interface RS422. For the direct connection to a PC optionally a converter to RS232 or USB is available. This allows for an easy installation and at the same time a very reliable and safe data transfer even with long cables.

Optionally the following outputs are available:

ANALOG output both for DATA and POSITION, programmable with the *ScanView* software to output a voltage signal 1-10V or a current signal 4-20mA respectively.

PARALLEL interface, 10 bits and SUM OUT, which can be used as a “switching output” and an **SSI interface** is available. By utilizing external modules any type of **BUS System** can be provided.

A special feature of the serial interface is the so-called *BeamStream* format. This output format allows to monitor and output the data of each individual beam, which otherwise is only possible with a DIRECT **SCAN** interface (also available if requested).

Data can not only be output in the so-called "**NORMAL-MODE**" (whereby DATA simply is the sum of all broken beams), but also in the Mode "**LARGEST BLOCKED AREA**" (only the **largest continuous "block" of interrupted beams** is output as **DATA**) or in the mode "**OVER ALL**". In the latter mode DATA represents the number of beams from the first to the last beam, independent of not interrupted beams in between.

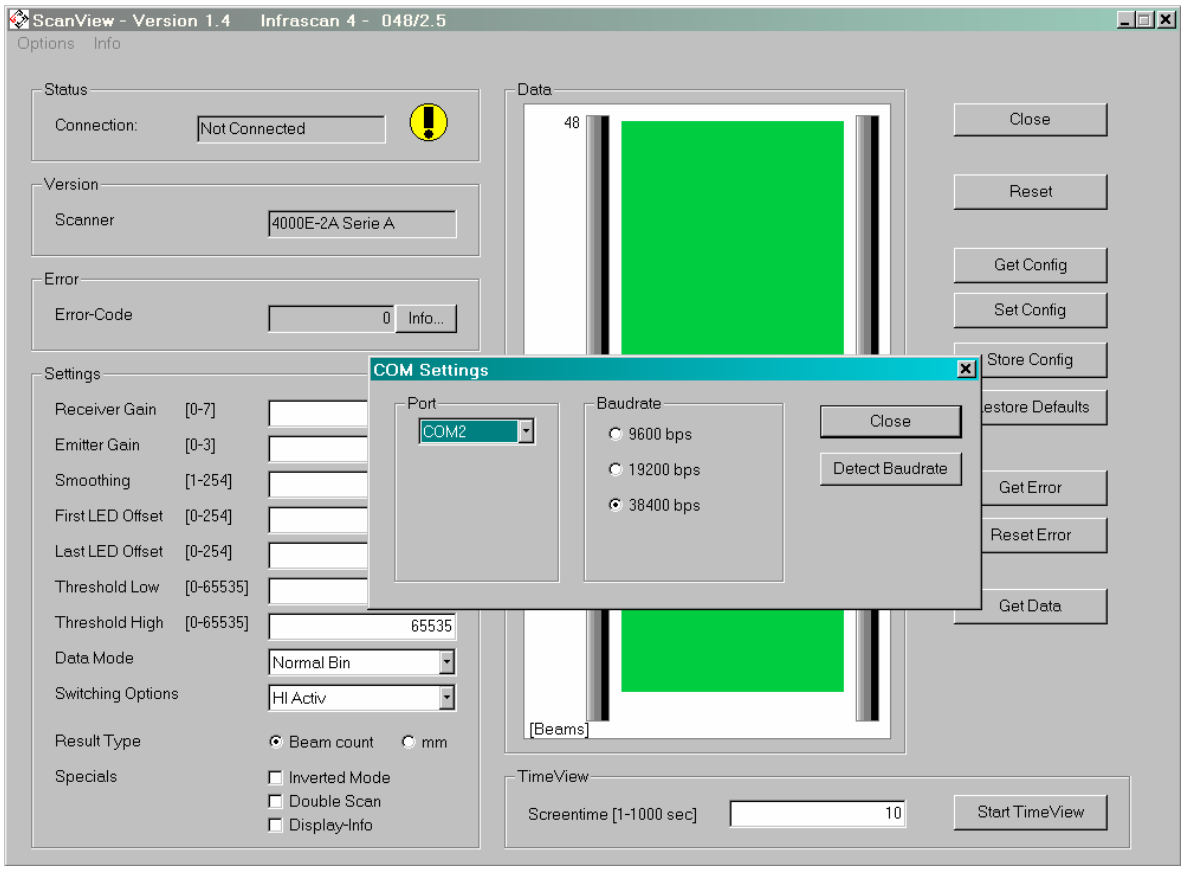
Another very practical function is the so-called "**SMOOTHING**". By means of this function it is possible to "blank" a certain number of beams or to determine a minimum size an object must have for the scanner to respond. Evaluation and output of DATA is in accordance to the programmed (pre-set) value of SMOOTHING.

The feature “INVERTED MODE” allows to measure very shiny objects, e.g. glass by counting the non-interrupted beams for calculating DATA.

All these parameters and more can be programmed by using the *ScanView* software mentioned above.

Independent of the Data output signals the outputs "1st Beam" and "Last Beam" are provided. These can be used to "suppress" false data caused by passing supports above or below the object or simply to indicate OVERFLOW.

By means of the ***ScanView*** software it is possible to program all aforementioned parameters via the serial interface of the scanner and a temporarily connected PC/Laptop/Notebook.
The following image shows the ***ScanView*** main menu. A more detailed description of the functions you can find in the manual. The ***ScanView*** software, as well as the manual you can download from our homepage www.sitronic.at.



For the actual programming an interface cable connecting the scanner with the serial interface is required. This cable is offered in two versions, with an RS232 converter and with a USB converter.

The following parameters are relevant for the ***InfraScan®*** Series 5000 and can be programmed or re-programmed respectively by means of the ***ScanView*** software:

Measuring distance optimization by means of the ***receiver gain*** (0-7) and ***emitter gain*** buttons (0-3). A table in the manual assists in finding the best possible combination.

SMOOTHING value with ***Smoothing*** button..

Active Scan Area. The actual scanning area can be reduced by using the ***First LED Offset*** or the ***Last LED Offset*** buttons.

Minimum and maximum value output by means of the ***Threshold Low*** and ***Threshold High*** buttons.

Data Mode can be set to “NORMAL”, “LARGEST BLOCKED AREA” or “OVER ALL”, each in Binary, BCD or Gray Code by means of the ***Data Mode*** button.

Output in mm or number of beams by means of the ***Result Type*** button.

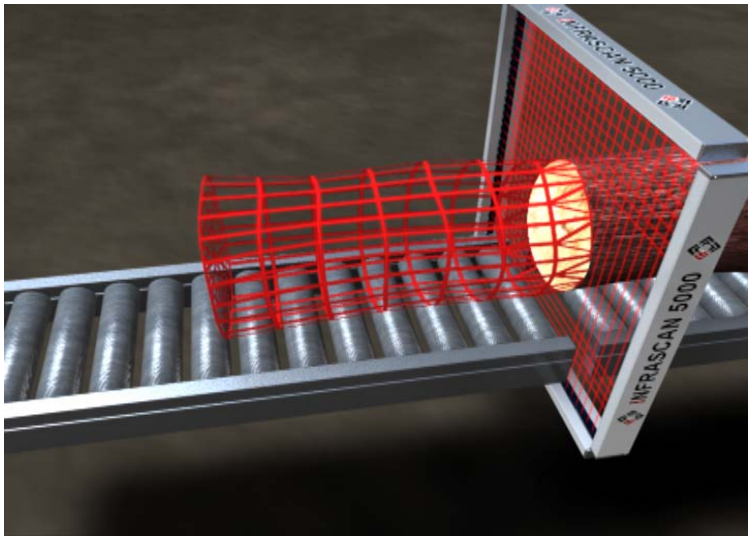
Double Scanning Mode by clicking on the ***Double Scan*** box.

Inverted Mode by clicking on the ***Inverted Mode*** box. This is used for measuring highly reflective objects, as e.g. glass or metal foils.

The measuring results can be directly monitored on the screen. It is also possible to screen the results over a set period (from 1 to 1000 seconds).

These scanners are very versatile and can be used in many fields.

A very popular application is profiling (measuring) logs in the wood industry.



The *InfraScan*® Series 5000 offers a selection of different measuring areas, resolution and data outputs.

SERIES	Type	Resolution	With double scanning	Measuring rnage [mm]	Measuring distance [m]	Casing	Data outputs					Smoothing
							Switching output	Serial	Parallel	SSI	Analog	
INFRASCAN 5xxx	5024/10	10 mm³	5 mm⁴	230	32 ranges from ca. 0,2 ... 6 m	Aluminum, anodized 40x80 mm, IP67	Integrated with parallel data output	RS 422⁷	**Optional** 10 bit data width, BINARY, BCD, Gray SUM OUT	**Optional**	**Optional** Single or double channel output Voltge or current programmable	Programmable
	5048/10			470								
	5072/10			710								
	5096/10			950								
	5120/10			1190								
	5144/10			1430								
	5168/10			1670								
	5048/5	5 mm³	2,5 mm⁴	235								
	5096/5			475								
	5144/5			715								
	5192/5			955								
	5240/5			1195								
	5288/5			1435								
	5336/5			1675								
	5096/2.5	2,5 mm³	1,25 mm⁴	237.5								
	5192/2.5			477.5								
	5288/2.5			717.5								
	5384/2.5			957.5								
	5480/2.5			1197.5								
	5576/2.5			1437.5								
	5672/2.5			1677.5								

For the complete range of products, technical data, software for download, news etc. please visit our homepage **www.sitronic.at**.

Technical Data

MECHANICAL DATA	
Housing material:	anodized aluminum window of glass protection IP 67
OPTICAL DATA	
Number of beams:	24 - 672
Beam spacing:	2.5 / 5 / 10 mm 1.25 / 2.5 / 5 mm with double scanning*
Measuring range:	230 – 1678 mm
Distance emitter ⇔ receiver:	32 ranges from 0.2 – 6 m standard
Wave length:	950 nm, infrared
ELECTRICAL DATA	
Power supply:	24 V ± 20%, ca. 1 A; max. ripple < 200 mV
Scanning frequency:	100 kHz
DATA modes	NORMAL, LARGEST BLOCKED AREA, OVER ALL, SMOOTHING 1 ... n
Output modes:	BINARY, BCD or GRAY coded, DATA and/or POSITION output In number of broken beams or in mm ***BeamStream*** format
INTERFACES	
Serial UART interface:	RS422 Standard 9,6 / 19,2 / 38,4 kBaud transfer rates 8 data bits, 1 stop bit, even parity converter RS422 ⇒ RS232 available
Optional:	
Parallel data interface:	10-bit data bus width, ca. 20 mA, short circuit proof
Control inputs:	
DATA or POSITION	24 V, ca. 3 mA at 24 V
HOLD (freezing Data)	24 V, ca. 3 mA at 24 V
Synchron Serial Interface (SSI)	24 V supply, output TTL, 12 bits
Analog output (1 or 2 channel):	Programmable by software (identical for both channels)
Voltage output:	0-10 V
Current output:	4-20 mA, 0-20 mA, 0-24 mA DATA or POSITION different for channel 1 and 2
Storage temperature:	-40°C ... 80°C
Ambient temperature:	-25°C ... 50°C

**In the centre between emitter and receiver*
Specifications are subject to change without notice.
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