LT3 Series
Long-Range Laser Distance Sensor
Diffuse Mode

- **Extremely long diffuse-mode range: 5 m with white targets, or 3 m with grey targets**
- **Banner's unique scalable analogue output automatically distributes the output signal over the width of the programmed sensing window**
- **Two independent outputs in each sensor, either two digital or one analogue and one digital**
- **Choose npn or pnp digital output(s); 0 to 10 VDC or 4 to 20 mA sourcing analogue output also available**
- **Digital output(s) can be used for precision background suppression**
- **Models with two digital outputs are selectable for pnp or npn**
- **Fast, easy-to-use integrated push-button TEACH-mode programming; no potentiometer adjustments**
- **Remote TEACH function for security and convenience**
- **Output response is programmable for three speeds**
- **Choose 2 m unterminated cable, or 8-pin *eurocon* swivel QD connector**
- **Rugged construction withstands demanding sensing environments; rated IEC IP67**

The LT3 uses pulsed time-of-flight technology to achieve unsurpassed performance. The laser pulses one million times per second. The microprocessor records the time required for each pulse to travel to the target and back to the sensor. Every millisecond, it averages one thousand pulse times and outputs a value from the microprocessor.

The sensor's long range enables it to detect very small features or parts, even when it is mounted well back from the hazards of a process.

This makes the LT3 a powerful tool for error proofing and die protection applications. The bright visible spot makes it easy to set up and align.

The LT3 laser sensor is not affected by wind, temperature or pressure changes and can be used on targets that are not perpendicular to the sensor. With non-shiny surfaces (flat paint, for example), the LT3 can sense targets up to 60° off of perpendicular.

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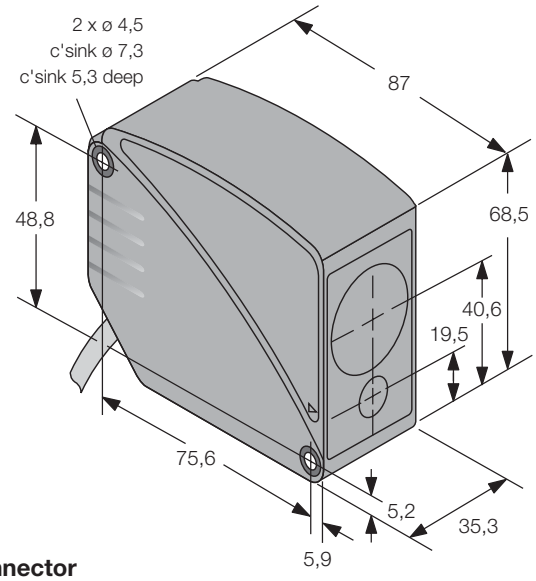
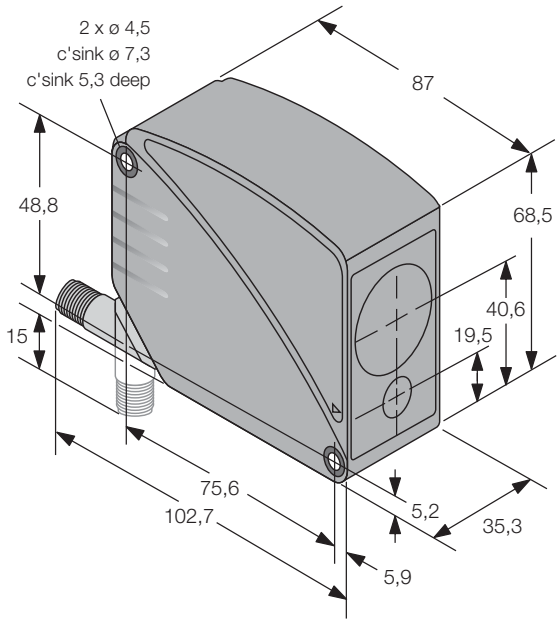
Wave length	
Visible red	658 nm
Typical beam diameter	6 mm at 3 m
Laser protection class (IEC 60825, EN 60825)	II
Sensing range	
Minimum window size	20 mm
90 % white card	0,3...5 m
18 % grey card	0,3...3 m
6 % black card	0,3...2 m
Adjustment	
Response speed	1, 10, 100 ms ON and OFF
Window limits (on sensor or remote TEACH)	analogue or digital output
Analogue output slope	positive or negative, depending on TEACH
Npn/pnp select	via wiring (digital-only models)
Supply	
Supply voltage	12...24 VDC
Ripple V_{pp}	≤ 10 %
No load current	108 mA max. at 24 VDC
Delay upon power up	1 s
Remote TEACH input	18 kΩ min. (65 kΩ at 5 VDC)
Protection	reverse polarity transient voltages short-circuit
Outputs	
Digital	pnp or npn, ≤ 100 mA
Analogue	0...10 VDC or 4...20 mA
Current output load	1 kΩ max. at 24 VDC
Voltage output load	2,5 kΩ min. impedance
Material	
Housing	ABS/polycarbonate blend
Lens (window)	acrylic
Protection class (IEC 60529, EN 60529)	IP67
Temperature range	0...+50 °C
Temperature drift	< 2 mm per °C
Cable	2 m, PVC 7 x 0,34 mm² (shielded)
Connector	*euro*con (M12 x 1) (8-pin)
Indicator LEDs	
Green	power ON
Yellow	digital output conducting
Red	target in sensing range signal strength
Yellow (speed)	response speed setting
Analogue/Digital models:	
Red/green TEACH	programming mode
Output 1	red: analogue output
Output 2	green: digital output
Digital-only models:	
Yellow TEACH	programming mode
Output 1 and 2	yellow

Dimensions [mm]

• **Cable**



• **Connector**



Wiring and Accessories

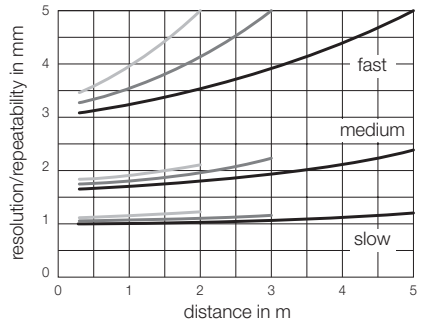
See page 3

LT3 Series

Long-Range Laser Distance Sensor

Resolution/repeatability in mm versus distance in m

Diffuse

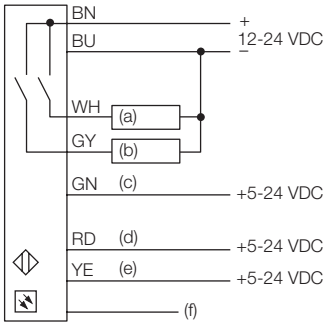


6 % black, 18 % grey, 90 % white

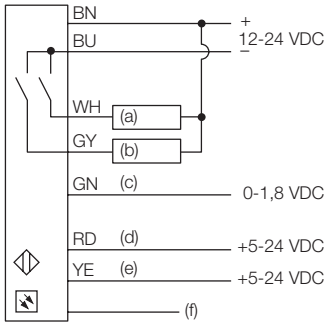
Max. range [m] 90 % white card	Output function	Analogue output	Connection	Type	Ident number
0,3...5	pnp	4...20 mA	cable	**LT3PI**	30 655 14
0,3...5	pnp	4...20 mA	connector	**LT3PIQ**	30 655 13
0,3...5	npn	4...20 mA	cable	**LT3NI**	30 655 11
0,3...5	npn	4...20 mA	connector	**LT3NIQ**	30 655 10
0,3...5	pnp	0...10 VDC	cable	**LT3PU**	30 655 08
0,3...5	pnp	0...10 VDC	connector	**LT3PUQ**	30 655 07
0,3...5	npn	0...10 VDC	cable	**LT3NU**	30 655 05
0,3...5	npn	0...10 VDC	connector	**LT3NUQ**	30 655 04
0,3...5	pnp/npn	–	cable	**LT3BD**	30 655 17
0,3...5	pnp/npn	–	connector	**LT3BDQ**	30 655 16

Wiring

pnp, 2 digital outputs

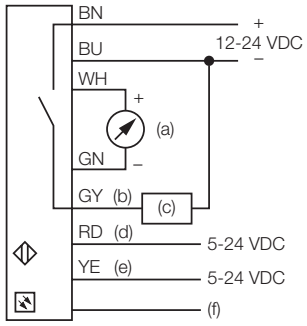


npn, 2 digital outputs

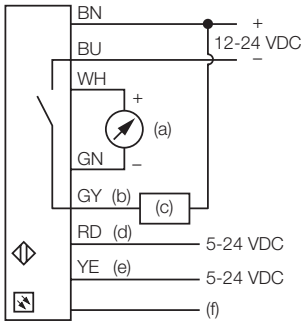


(a) load 1; (b) load 2; (c) output select; (d) laser control: beam enabled, connect to +5...24 VDC; 150 ms (slow), 60 ms (medium) or 51 ms (fast) delay upon enable when sensor is powered; (e) TEACH; (f) shield

pnp, analogue output



npn, analogue output



(a) 4...20 mA (current) or 0...10 VDC (voltage); (b) digital output; (c) load; (d) laser control: beam enabled, connect to +5...24 VDC; 150 ms (slow), 60 ms (medium) or 51 ms (fast) delay upon enable when sensor is powered; (e) TEACH; (f) shield

Accessories [dimensions in mm]

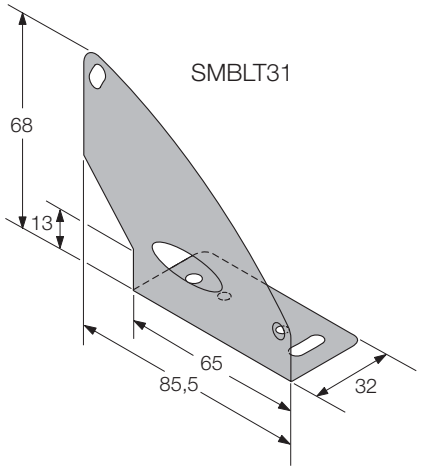
Brackets

SMBLT31	30 685 05	right-angle, stainless steel
SMBLT32	30 692 36	protective bracket

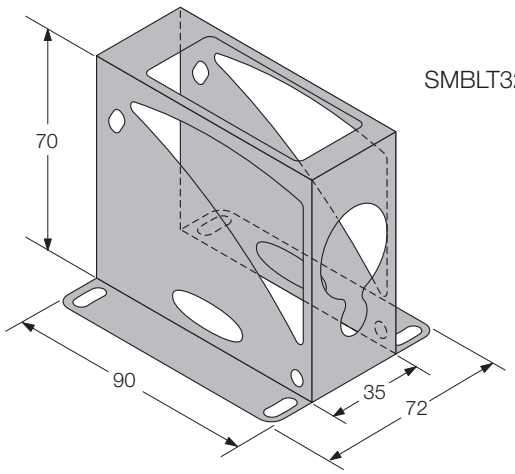
Connector

WAK8-2/P00	80 070 25	straight type, 8-pin

SMBLT31



SMBLT32



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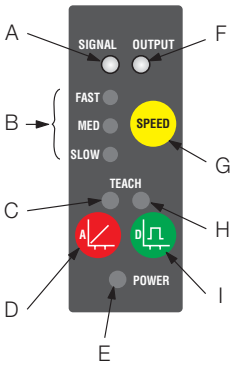
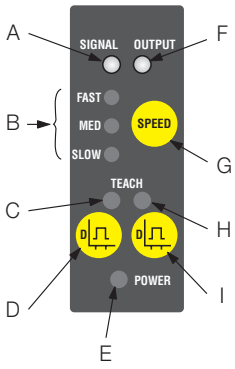
Indicator LEDs: analogue and digital outputs

A Signal LED
B Response speed indicators
C Analogue TEACH LED
D Analogue output programming push button
E POWER ON/OFF LED
F Output LED
G Response speed push button
H Digital TEACH LED
I Digital (switched) output programming push button



Indicator LEDs: two digital outputs

A Signal LED
B Response speed indicators
C Digital output 1 TEACH LED
D Digital output 1 programming push button
E POWER ON/OFF LED
F Output LED
G Response speed push button
H Digital output 2 TEACH LED
I Digital output 2 programming push button



	Digital output response time	Digital output hysteresis	Analogue voltage output response time (-3 dB)
Fast	1 ms ON and OFF	10 mm	450 Hz (1 ms average/1 ms update rate)
Medium	10 ms ON and OFF	5 mm	45 Hz (10 ms average/2 ms update rate)
Slow	100 ms ON and OFF	3 mm	4,5 Hz (100 ms average/4 ms update rate)

Linearity

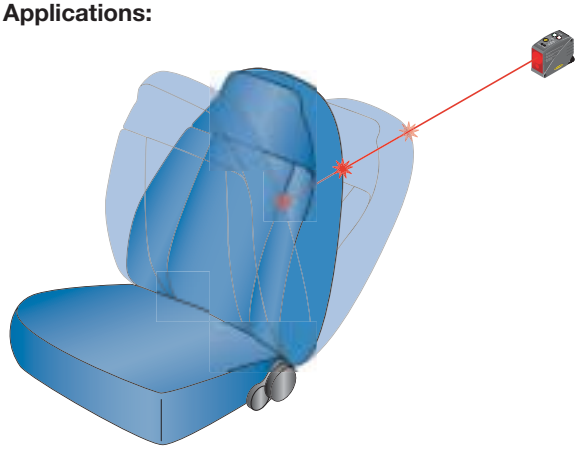
± 30 mm from 0,3 to 1,5 m
± 20 mm from 1,5 to 5 m

Colour sensitivity

90 % white to 18 % grey: < 10 mm
90 % white to 6 % black: < 20 mm

Application note: allow 30-minute warm-up for optimal performance.

Applications:



Auto seat range-of-motion

Objective: To accurately measure the range of motion of an auto seat back.

Sensor models: LT3 diffuse-mode sensor.

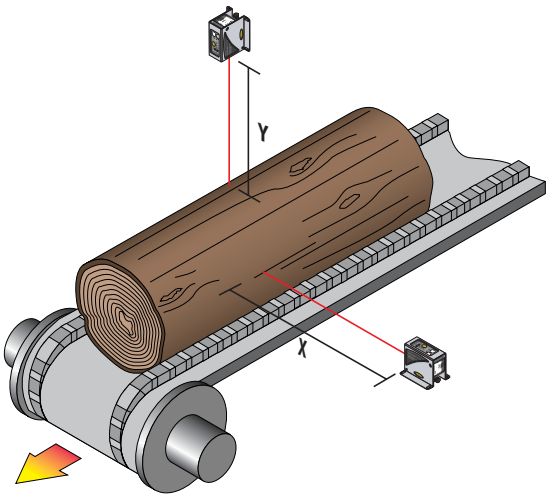
Operation: The user needs to verify that each auto seat manufactured in a plant adjusts to the correct, predetermined positions. With the seat positioned in a fixture, the LT3 measures the distance to the back of the seat when it is placed into three angles of recline.

Log profiling

Objective: Detect and calculate the diameter of each log as it passes on the conveyor belt.

Sensor models: Two LT3 diffuse-mode sensors with analogue/digital outputs.

Operation: The LT3 sensors are placed above and to one side of the conveyor, approx. 2 m from the log's surface. Each sensor sends a signal to a PLC, representing the distance from the sensor to the surface of the log. The PLC calculates the log's diameter, based on the known distances to each sensor.



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