



**A strong team for securing the field.
The SICK Safety System PLS/LSI.**

SICK

Modern Safety Strategies from SICK.



What do industrial safety technology and game strategies in American football have in common? The answer is simple:

In football, the quarterback can only score when the defence is in position. The defence thus has two tasks in all situations during the game: to defend and to steer the game in the right direction. One of the main strategies used here is zone defence: the defender waits in the centre of his zone and only reacts when the ball is thrown into the zone.

The situation is no different for automated production or transport processes. In this case, intelligent protection systems must provide effective protection for personnel and plant in both stationary and mobile applications. At the same time production capacity must be kept as high as possible.

The "Zone Defence" strategy is also increasingly used here. The combination of the Laser Scanner PLS with the Laser Scanner Interface LSI is ideal for this purpose. Each PLS secures its zone and the LSI co-ordinates the defence.



- ① Detection zone
- ② Early warning zone
- ③ Surveyed area

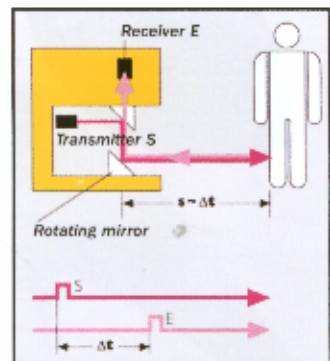




Irrespective of the position assigned to it, SICK's PLS proximity laser scanner fulfils its task with absolute reliability: the recording and securing of the surrounding area. Unaffected by magnetic fields, temperature variations or different reflective materials. And that since 1994. As a compact complete sensor, the PLS laser scanner requires no reflectors, separate receivers, or mechanical



devices. With minimum installation effort, an approved and recognised safety system (Cat. 3 in accordance with EN 954 and Type 3 in accordance with IEC/EN 61496) comes into being. The system uses light from an infrared laser to horizontally scan its surrounding area over a 180° arc up to a range of approx. 50 m. The secure protective field has a radius of 4 metres, the warning field approx. 15 metres.

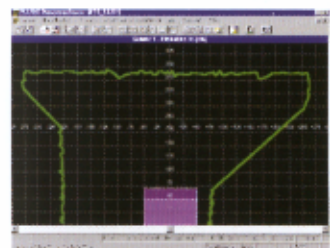


A maximum of four PLS with up to eight warning and protective fields on one or two machines can be controlled by the LSI laser scanner interface. In the case of stationary application, the warning and protective fields are switched by static binary signals, in the case of mobile applications both by static and also dynamic, e.g. speed- and direction-dependent signals.

All data is transmitted to the machine or vehicle controller via one or two independent,

protected outputs. The precise adjustment of the freely programmable and switchable warning and protective fields is performed, as has been the case up to now, on the PLS without the LSI – via a user-friendly interface under Windows on a PC or notebook.

And: PLS/LSI safety system is approved with the EU Design Test Certificate for protection of personnel and plant.



PLS/LSI: Easy parameter definition via Windows user interface.

More safety in stationary applications.



Automated production plants place high importance on the measures taken to protect personnel. The contact free safety system PLS/LSI fulfils these requirements quickly and flexibly. Thus, for example, pipes may be bent in different directions and lengths in the area around a pipe bending machine without presenting any danger to personnel. The PLS/LSI monitors all warning and safety areas.

Machine down-time for setting up can thus be shortened or is no longer necessary. Using the PLS/LSI system yields a measurable advantage compared to the use of the PLS Laser Scanner on its own. For example, in the case of a processing machine with two separate working areas. By using PLS and LSI with two monitoring fields, set up times are halved in comparison to the use of one PLS

and only one protective field. The machine operator can already start work in safe conditions whilst the other working area is set up.

Example Calculation 1 (stationary use):

Savings with LSI = 2 time units (33%)

Usage of one only PLS

1 Protective field

1 Machine Operator

1 Processing Machine with

2 Processing Areas

Processes:

1 x Set Up Left

1 x Set Up Right

1 x Process Left

1 x Process Right

2 x Machine Operator

Pause During Left/Right

Processing

6 Time Units

Usage of PLS + LSI

2 Protective fields (alternately)

1 Machine Operator

1 Processing Machine with

2 Processing Areas

Processes:

1 x Set Up Left

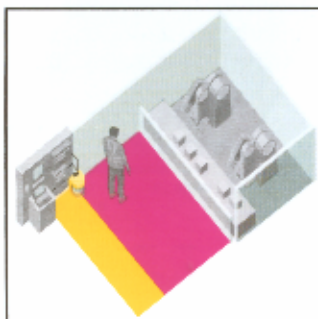
1 x Process Right

1 x Set Up Right

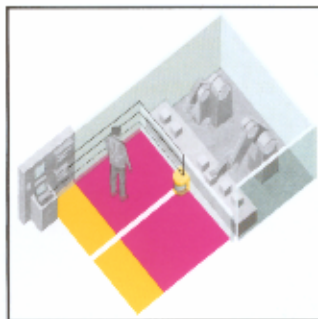
1 x Process Left

1 x Process Left

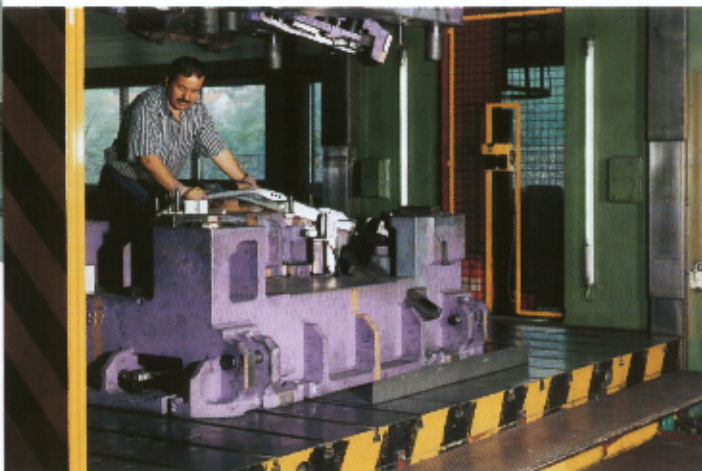
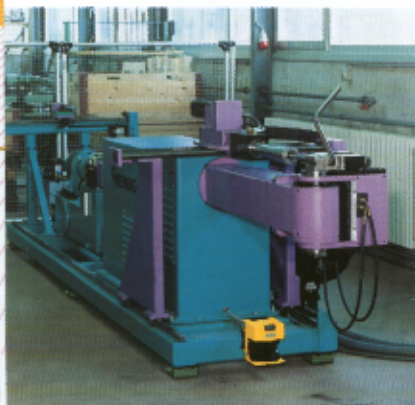
4 Time Units (without machine operator pause)



PLS/LSI with one protective field. The machine can only be started when the inner area is actually empty – i.e. when there are neither personnel nor tools in the hazard zone.



PLS/LSI with two protective fields. One machine can continue to be operated whilst the other is being set up. This results in clear time savings.



More productivity in mobile use.

Modern logistics solutions need a safety technology that time and again flexibly adapts the protective field to new conditions without disrupting processes or hindering vehicles and personnel.

Mobile transport systems with or without drivers are often underway in areas where other personnel and goods are on the move. The PLS/LSI safety system immediately adapts itself to the changing requirements, for example reduced vehicle speed before bends. It guarantees a solution for the protection of personnel and objects that is both safe and cost-effective.

A cost-utilisation calculation here also shows the clear advantages of the PLS/LSI system: plants with fixed protective fields (or bumpers) can be driven through at only one speed. However, variable

protective fields allow route-optimised speeds that are, on average, 10 % higher. This results in a cost saving of 10 % or a capacity increase of the same amount.

Example Calculation 2 (mobile use):

Savings with LSI: DM 82,000

Production Sequence with a Requirement for 10 FTS Vehicles

With Fixed Protective Fields:

10 Vehicles: DM 1,000,000

Utilisation = 100 % (max. speed for the entire stretch)

With Flexible Protective Fields:

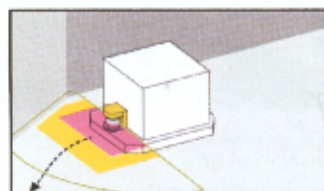
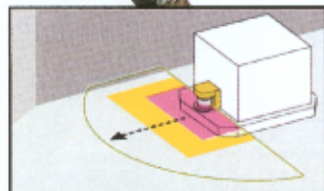
10 Vehicles: DM 1,000,000

10 LSI: DM 18,000 Utilisation = 110% (optimal speed for the entire stretch) corresponding to a production throughput of 11 Vehicles or

9 Vehicles: DM 900,000

8 LSI: DM 18,000

DM 82,000



PLS continually supports the on-board computer of the driverless AGV transport system with online data on the sampled surroundings. The AGV thus arrives rapidly and safely at its destination. The protective field protects personnel and vehicles from harm.

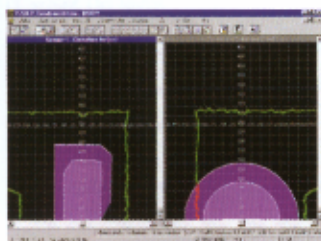


More safety in the team: LSI co-ordinates up to four PLS units.

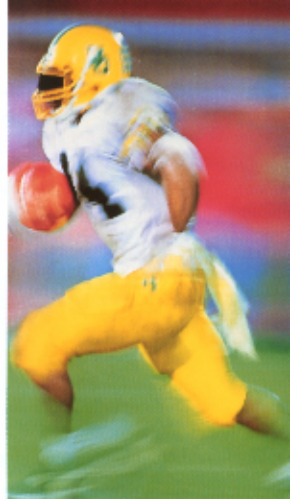
The uses of the PLS proximity laser scanner are multiplied by using the LSI laser scanner interface. Up to eight freely programmable warning and protective fields from up to four PLS devices can be controlled using one LSI. That is enough to secure one or two

machines. Retrofitting of existing PLS is easy, rapid and cost-effective. The necessary capital outlay will be rapidly amortised by the optimisation of productivity – higher speeds, shorter set-up times, increased flexibility.

Retraining is not necessary, adjustment is performed as for the stand-alone PLS via a PC, laptop or notebook.

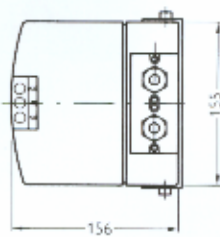
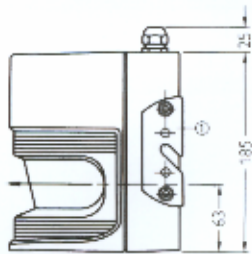


The PLS/LSI software can be operated without extensive training. Important functions can be called up via screen buttons.



Technical Data

PLS/LSI



① Mounting Shaft 1
(Accessories)

Technical Data

Secure Protective Field	Cat. 3 in accordance with EN 954 and Type 3 in accordance with IEC/EN 61496
Scanning Range	Max. 4 m radius
Trigger Time	PLS ≥ 80 ms + LSI ≥ 110 ms
Resolution	≥ 70 mm (at 4 m range)
Warning Field	
Scanning Range	Approx. 15 m radius
Measurement Range	
For Navigation (FTS)	
Scanning Range	Max. 50 m radius
Range Precision	± 50 mm
General Data	
Scanning Angle	Max. 180°
Power Supply	24 V $\pm 20\%$ / -30 %
Power Consumption	≥ 17 W, + Load on the outputs; max. 24 V (2 x 250 mA + 100 mA)
Laser Protection Class	1
Enclosure Type	PLS: IP 65; LSI: IP 20
Operating Temperature	0 to + 50 °C

LSI

