



SMART
SENSOR
BUSINESS

Solutions for the
AUTOMOTIVE
INDUSTRY



OUR PRODUCT RANGE LEAVES NOTHING TO BE DESIRED

Solutions and services for the automotive industry.

Many companies say they are “customer oriented” – at Leuze electronic, we go a step further. We offer specific and measurable added value in the areas of product usability, application know-how and service – to help make our customers more successful. With regard to our product developments, we systematically place emphasis on the especially good usability of all devices. As a specialist for sensor solutions in automotive industry, we also optimize our solutions for the requirements relevant here and offer an extensive product range from a single source. This offer is

rounded out by service that is closely aligned with our customers’ needs with focus on personal closeness and technical competence.

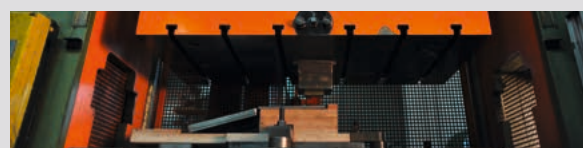
For more than 50 years, Leuze electronic has been developing, producing and marketing optoelectronic sensors and inductive switches, identification systems, image processing systems, data transmission systems and safety sensor systems for industrial automation. Leuze electronic is one of the world’s leading innovators for optical sensors in factory automation.



CONTENTS

Stamping plant

6



Vehicle body construction

16



Paint finishing system

20



Powertrain

24



Final assembly

32



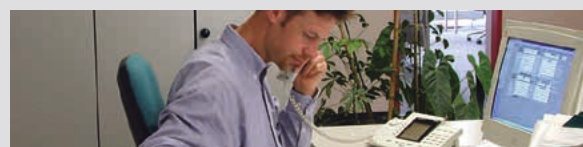
Machine Safety Services

44



Our services
and support

46

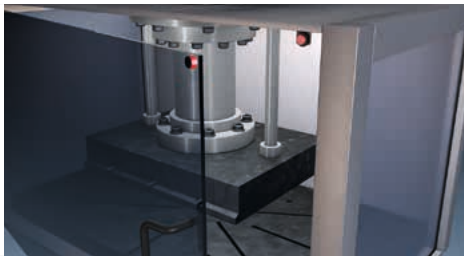


INTELLIGENT SOLUTIONS FROM A TO Z

Leuze electronic convinces with extensive application know-how for nearly every application in the automotive industry.

STAMPING PLANT

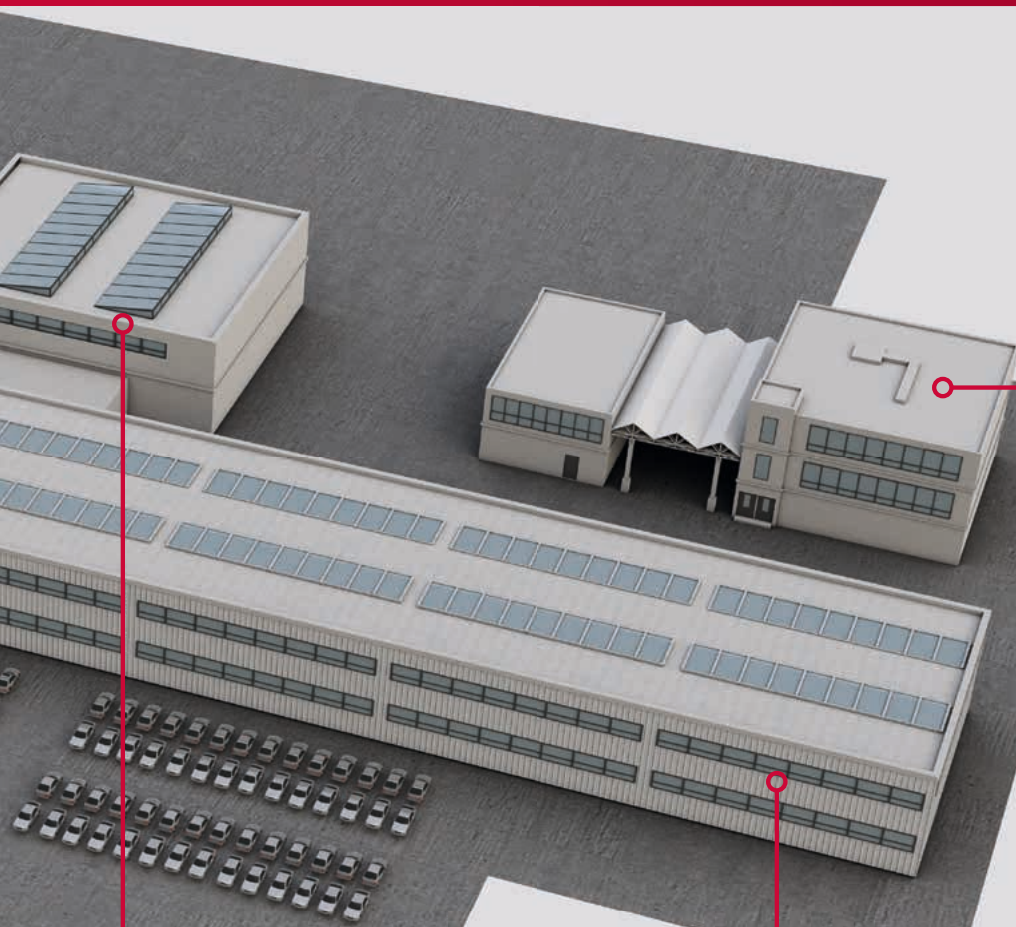
From plate to component.



FINAL ASSEMBLY

From individual parts to a fully-functional vehicle.





POWERTRAIN

So that it moves forward.



VEHICLE BODY CONSTRUCTION

From shaped sheet metal,
a complete car body is created.



PAINT FINISHING SYSTEM

Efficient corrosion protection
and aesthetic paint jobs.



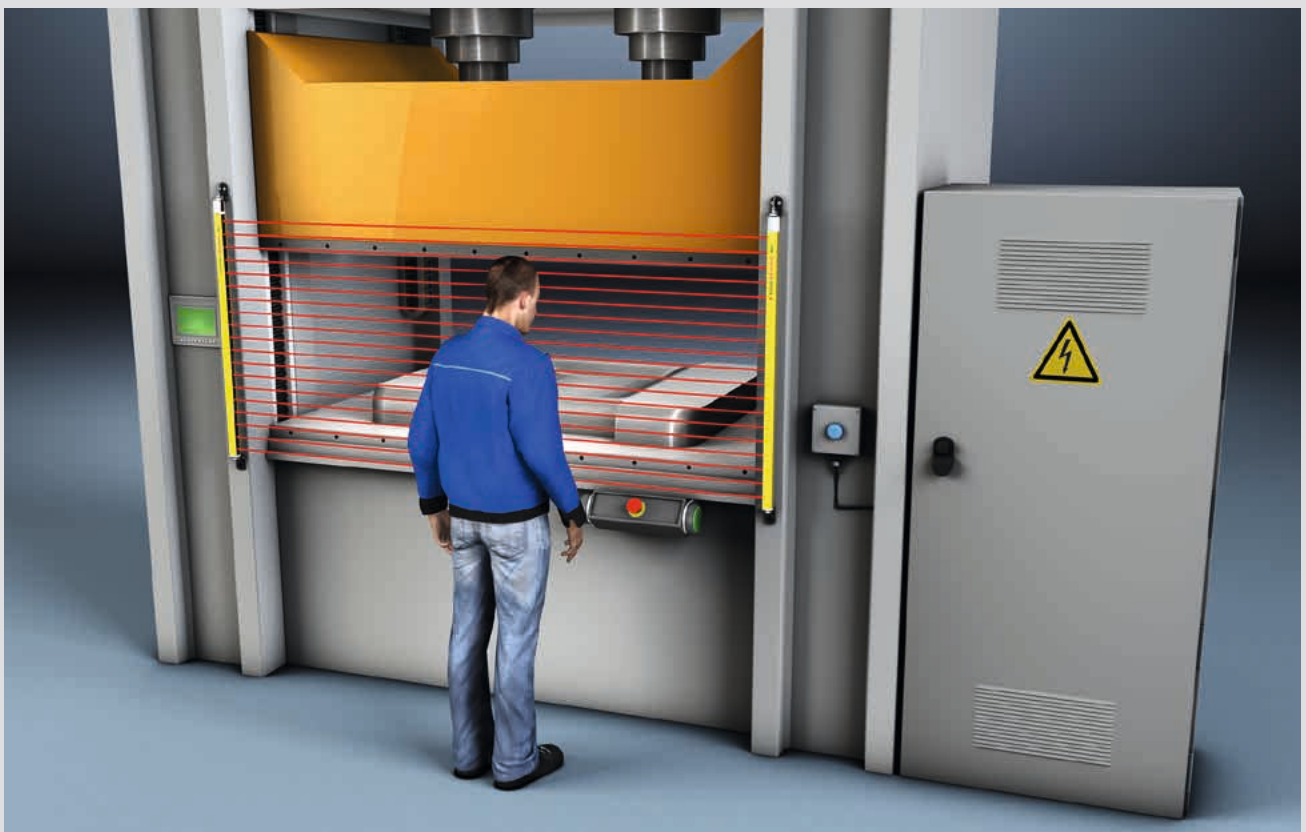
Stamping plant

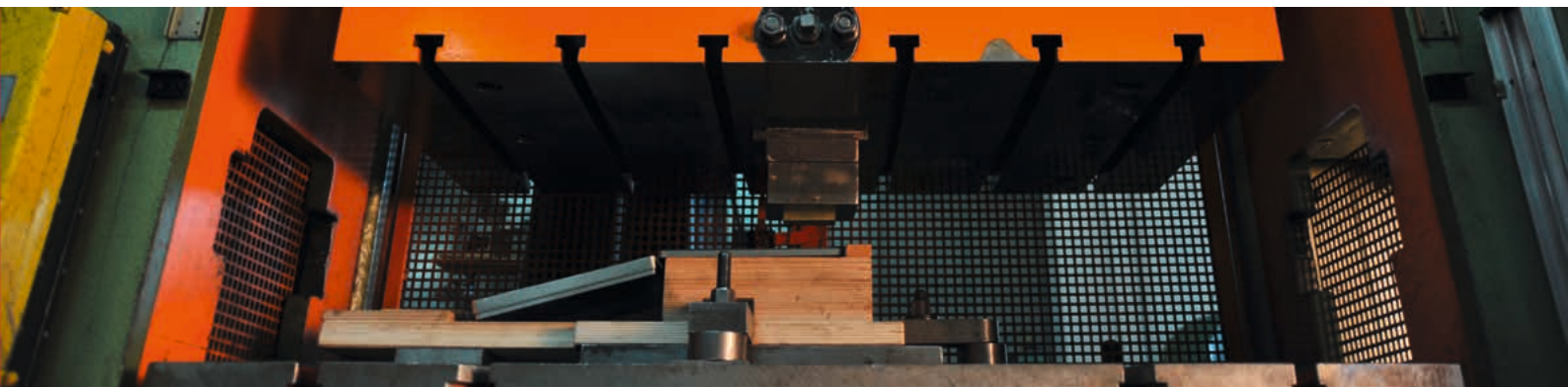
STAMPING AND MACHINING CENTERS

Well thought-out sensor solutions for the efficient operation of machine tools.

Today, stamping and machining centers are nearly fully automated and are controlled and monitored with the help of fast, heavy-duty sensors. The plates are transported directly from the coils to the press line at whose end the completed punched and formed pieces

are removed by robots. Modern production methods require that the sheet metal be marked, usually with a dot-peened 2D code, to allow the subsequent process sequence to be monitored with code readers.





Point of operation guarding for operators

Safety Light Curtain
MLC 500

**Safeguarding
against reaching
under / stepping
behind protection**
Safety light curtain
(host / guest)
MLC 500

Danger zone safeguarding on processing machines

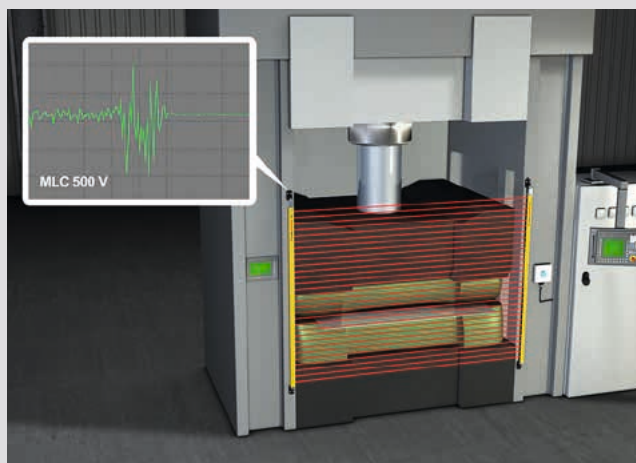
Safety laser scanner
RSL 400



- Reliable, interference-immune design
- Custom solutions through wide range of variants
- Optimum integration in the process sequence through easily selectable operating modes, e.g., fixed and floating blanking
- AS-i interface
- Also available as an especially vibration- and impact-resistant model

- Gapless safety at the host / guest transition for protection against reaching under with no dead space
- Simple and economical electrical installation since only one connection to the control is necessary
- Simple alignment through parallel display for host and guest
- Up to 5 m of distance between host and guest for optimum design of the stepping behind protection

- Scanning angle 270°
- Staggered operating ranges from 3 to 8.25 m
- Two autonomous protective functions
- Two safe switching output pairs
- Bluetooth, Ethernet TCP/IP
- Large plain-text display
- Various connection variants with M12 or cable
- One-step configuration



Access guarding

Multiple light beam safety device
MLD 500



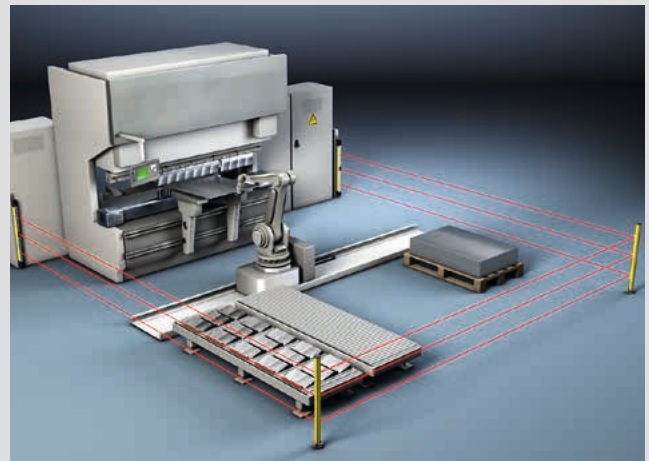
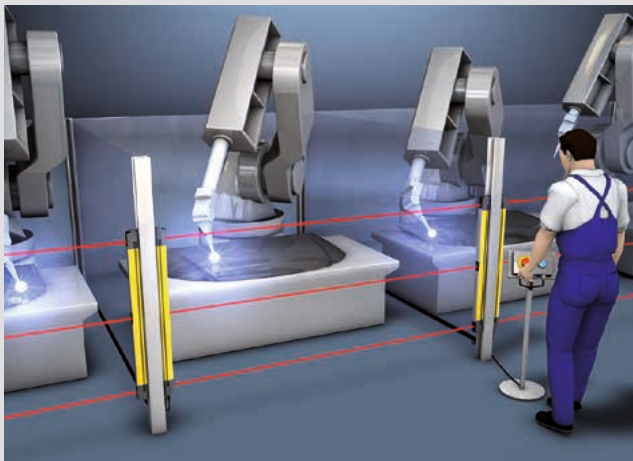
- Reliable, robust design
- Time-saving installation through simple selection of operating mode and easy alignment
- Efficient solutions for short distances of up to 8 m by means of transceiver (transmitter/receiver in one housing)

Access guarding of hydraulic press brake

Multiple light beam safety device
with deflecting mirror
MLD 500



- Large operating ranges offer efficient solutions for safeguarding long paths of up to 70 m, even around corners with multiple mirror columns
- Integrated laser alignment aid for time-saving alignment, especially when using mirror columns
- Simple configuration by means of wiring
- AS-i interface





Linking/evaluation of safety-relevant signals

Programmable safety controllers
MSI 100/200



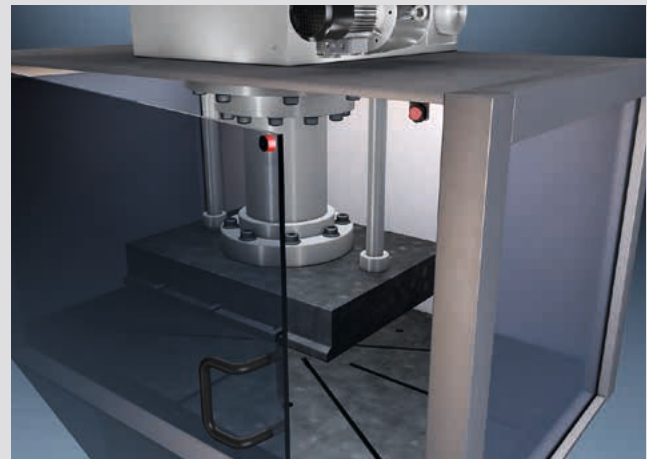
- Satisfies safety requirements in accordance with category ISO 13849, Cat. 4, PL e
- One safety PLC instead of multiple safety relays reduces costs and installation work
- Flexible adaptation to work steps or integration of E-Stop
- Simple device configuration via MSIsafesoft with device library (PLCopen-certified function blocks)
- Diagnostics functions

Monitoring of the closing state of doors

Safety switches and safety locking devices
S/L/MC/RD



- Safety switches for doors and covers for position monitoring and for protecting personnel
- Safety locking devices keep safety doors securely locked and thereby prevent unauthorized access or intervention by persons



Stamping plant

PARTS WAREHOUSES AND CRANE SYSTEMS

Sensor solutions for automating crane systems,
high-bay storage devices and shuttles.

Sensor systems by Leuze electronic are available for a wide range of industrial crane systems. In addition, for high-bay storage devices and for fast and highly flexible shuttles,

very reliable, space-saving and safe sensors are available for fine positioning, the detection of free spaces, presence monitoring and for collision prevention.





Data transmission

Data transmission
systems
DDLS 500



- 100 Mbit transparent data transmission of all Ethernet protocols such as PROFINET, EtherNet IP, EtherNet TCP/IP, EtherCat, UDP, etc.
- Laser alignment aid
- Monitoring of availability, velocity and distance
- Interference-free parallel operation with AMS 300i
- Integrated "one-man" alignment device
- Optionally with heating (down to -30°C)

Positioning

Measuring and switching
distance sensors
ODS 10, HT 10



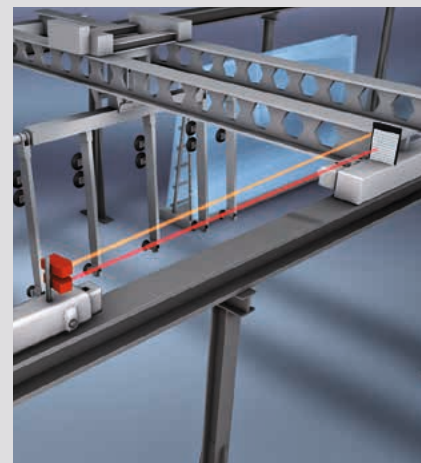
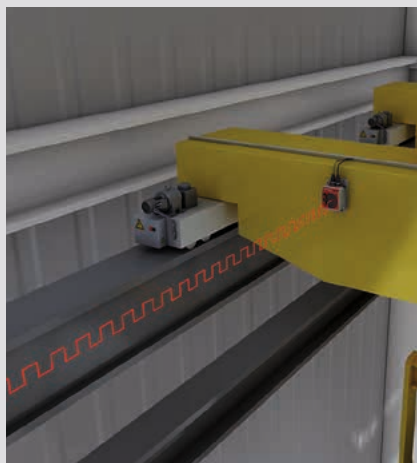
- Working range from 50 – 8.000 mm (25 m against reflective tape)
- Reliable detection of dark, glossy and colored objects
- Very high angle tolerance
- Maximum process reliability with prefailure message
- Status LED visible from above and from front
- Measuring with analog output and IO-Link
- Switching with up to 3 switching outputs and IO-Link
- Robust plastic housing with glass pane
- Laser class 1
- Operating temperature -40 to +50°C

Collision protection, Distance monitoring

Diffuse sensors
Retro-reflective
photoelectric sensors
SR 10, PRK 46C



- Long operating range up to 25 m
- Up to 3 switching outputs (SR 10)
- High function reserve guarantees high availability under extreme environmental conditions
- Very good ambient light suppression for uninterrupted operation
- Area monitoring via window function
- Function test via activation input
- Analog output (SR 10)



Final position monitoring

Cubic inductive sensors
IS 244



- Switching distances up to 40 mm for reliable detection at a distance
- Sensor field can be oriented in 5 directions
- Comfortable terminal compartment up to 2.5 mm²

Positioning

Bar code positioning systems
BPS 8



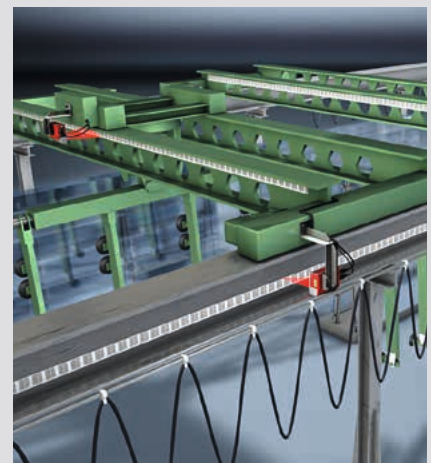
- Absolute positioning up to 10,000 m
- Curve-going, horizontally and vertically
- Degree of protection IP 67
- Simple attachment using special mounting device
- Various protocols on RS 232 or RS 485 via MA 8-xx
- Very compact design
- M12 connection technology
- Customer-specific configuration
- Up to a max. speed of 4 m/s
- Accuracy relative to bar code tape ± 1 mm

Positioning

Bar code positioning systems
BPS 300i



- Modularity: three selectable connection technologies, heating and display
- Monitoring of availability, velocity and distance to the tape via the interface, via warning output or online via WebConfig
- Fast, secure mounting and position-neutral replacement through **easymount** mounting technology
- Absolute positioning up to 10,000 m with reproducible accuracy of ± 0.15 mm
- Curve-going, horizontally and vertically





Positioning

Measuring sensors
AMS 300i



- Accuracy of ± 2 mm at 200 m (± 5 mm at 300 m)
- Speed measurement
- Interfaces: PROFIBUS, PROFINET, INTERBUS, DeviceNet, EtherNet IP, CANopen, EtherCAT, Ethernet, SSI, RS 232, RS 422, RS 485
- Diagnosis and prefailure messages
- Display in 5 languages

Manipulator control

Laser distance sensors
ROD4plus



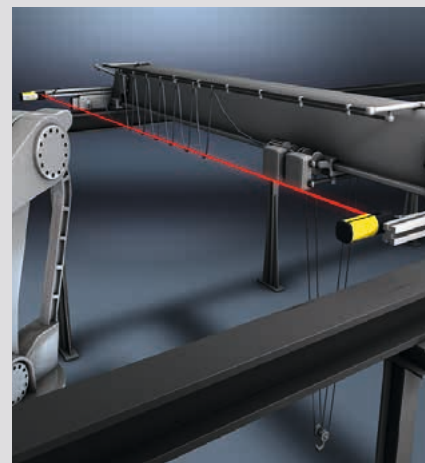
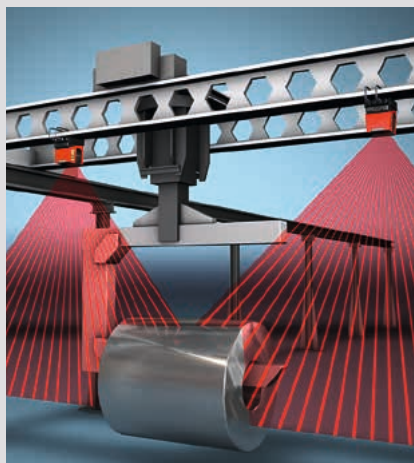
- Measurement range 0–65,000 mm
- Large scanning angle: 190°
- Fast: measurement data transfer through Fast Ethernet 100 Mbit, scanning rate 50 Hz
- Robust, surface-independent measurement

Collision protection

Single light beam safety
devices
MLD 500



- Configuration is performed simply by means of wiring, i.e. no software, PC or DIP switch are necessary
- Also, use at ambient temperatures as low as -30°C is possible
- Options: integrated laser alignment aid, AS-i interface, 7-segment display
- Simple device exchange by means of Plug & Play with no programming
- Range: 100 m



Stamping plant

DRIVERLESS TRANSPORTATION SYSTEMS

Reaching the goal safely with sensors.

The constantly increasing demands on the dynamics of floor-bound driverless transportation systems (DTS) in production plants require top performance from sensors. Particularly when many DTS are used simultaneously, they need to be “intelligent” in order to avoid

collisions and ensure smooth operation. Solutions from Leuze electronic protect danger zones, measure and transfer optical data from the vehicle and ensure real-time monitoring of the systems.





Data transmission

Data transmission systems
DDLS 500



- 100 Mbit transparent data transmission of all Ethernet protocols such as PROFINET, EtherNet IP, EtherNet TCP/IP, EtherCat, UDP etc.
- Laser alignment aid
- Monitoring of availability, velocity and distance
- Interference-free parallel operation with AMS 300i
- Integrated "one-man" alignment device
- Optionally with heating (down to -30°C)

Positioning

Measuring and switching distance sensors
ODS 10, HT 10



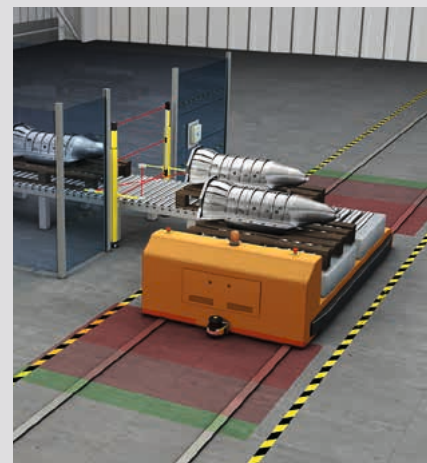
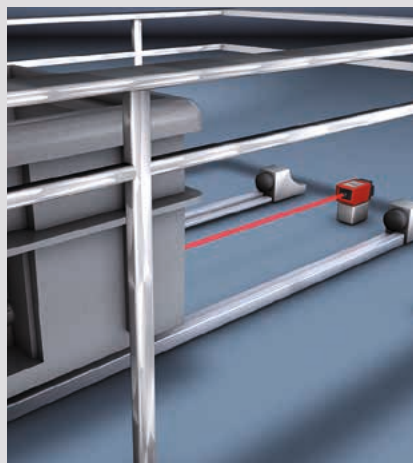
- Working range from 50–8.000 mm (25 m against reflective tape)
- Reliable detection of dark, glossy and colored objects
- Very high angle tolerance
- Maximum process reliability with prefailure message
- Status LED visible from above and from front
- Measuring with analog output and IO-Link
- Switching with up to 3 switching outputs and IO-Link
- Laser class 1
- Operating temperature -40 to $+50^{\circ}\text{C}$

Transport-path safeguarding for driver-less transportation systems and side-tracking skates

Safety laser scanner
RSL 400



- Scanning angle 270°
- Staggered operating ranges from 3 to 8.25 m
- Two autonomous protective functions
- Two safe switching output pairs
- Bluetooth, Ethernet TCP/IP
- Large plain-text display
- Various connection variants with M12 or cable
- One-step configuration



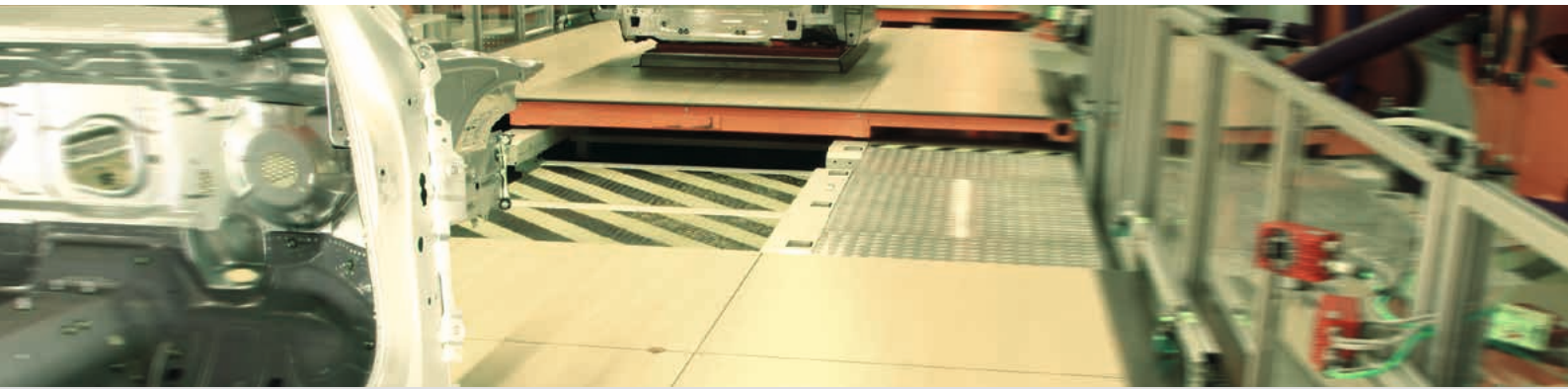
VEHICLE BODY CONSTRUCTION

From shaped sheet metal, a complete car body is created.

In body shell production, different body types are often produced on one welding line. This extremely high flexibility requires fast and highly precise sensors, e.g., for use on interchangeable tools. In addition, the sensors

used are also exposed to extreme mechanical stress due to flying welding sparks and regular cleanings with dry ice. Leuze electronic has developed solutions to meet these demands.





Point of operation guarding for operators

Safety Light Curtain
MLC 500

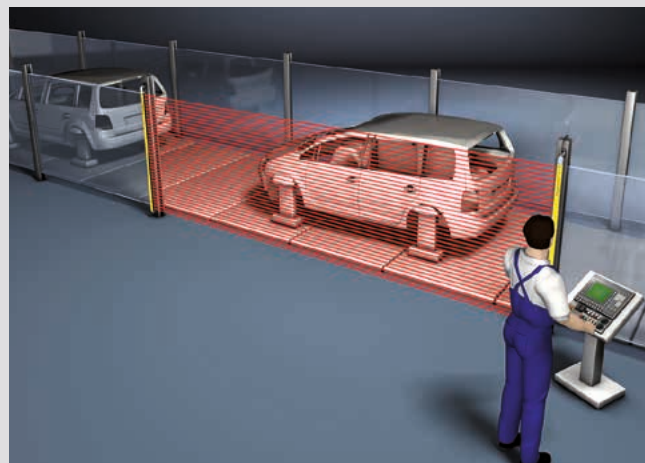
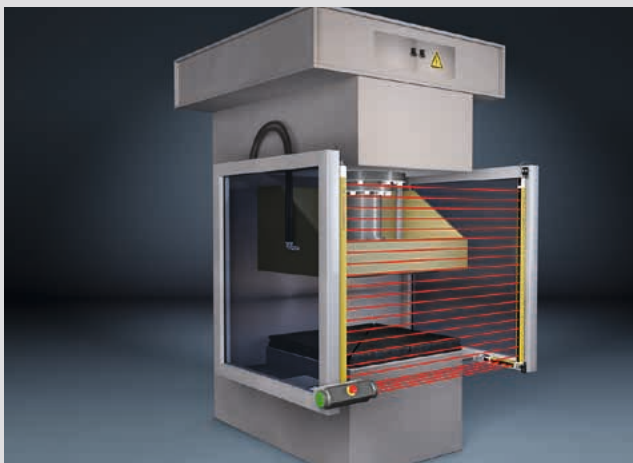
Safeguarding against reaching under as well as stepping behind protection

Safety light curtain (host / guest)
MLC 500



- Reliable, interference-immune design
- Custom solutions through wide range of variants
- Optimum integration in the process sequence through easily selectable operating modes, e.g., fixed and floating blanking
- AS-i interface
- Also available as an especially vibration- and impact-resistant model

- Gapless safety at the host / guest transition for protection against reaching under with no dead space
- Simple and economical electrical installation since only one connection to the control is necessary
- Simple alignment through parallel display for host and guest
- Up to 5 m of distance between host and guest for optimum design of the stepping behind protection



Transport-path safeguarding for driver-less transportation systems and side-tracking skates

Safety laser scanner
RSL 400



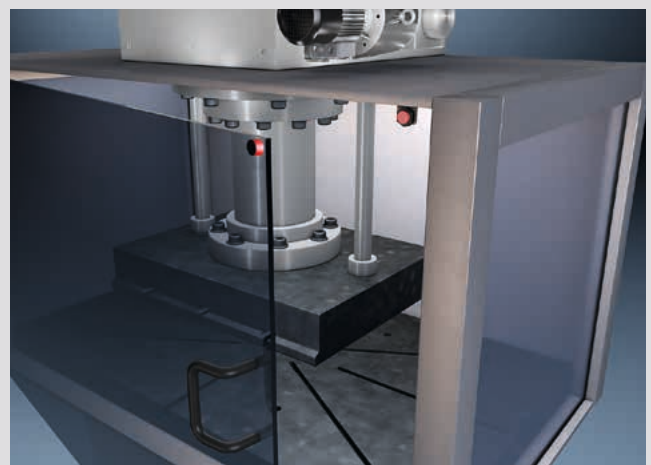
- Scanning angle 270°
- Staggered operating ranges from 3 to 8.25 m
- Two autonomous protective functions
- Two safe switching output pairs
- Bluetooth, Ethernet TCP/IP
- Large plain-text display
- Various connection variants with M12 or cable
- One-step configuration

Monitoring of the closing state of doors

Safety switches and safety locking devices
S/L/MC/RD



- Safety switches for doors and covers for position monitoring and for protecting personnel
- Safety locking devices keep safety doors securely locked and thereby prevent unauthorized access or intervention by persons





Thus safety becomes very simple

With the pre-mounted MLC-UDC sets, setting-up and starting-up of safeguarding are easier than ever before.

MLC-UDC – SAFETY LIGHT CURTAIN AND DEVICE COLUMN IN ONE SET

Pre-mounted safety light curtains in robust and flexible UDC device columns – you will get this if you decide on MLC-UDC. You do not need to put together individual components yourself to get a robust and optimally matched complete system.

The pre-mounted MLC-UDC sets for uncomplicated and quick start-up



EXTENSIVE SELECTION OF MUTING ACCESSORIES

Our extensive selection of accessories and pre-mounted muting sensor sets make installation with muting applications simple

- Device columns
- Pre-mounted muting sensor sets
- Muting indicators
- Display and control units
- Terminal boxes
- Cables

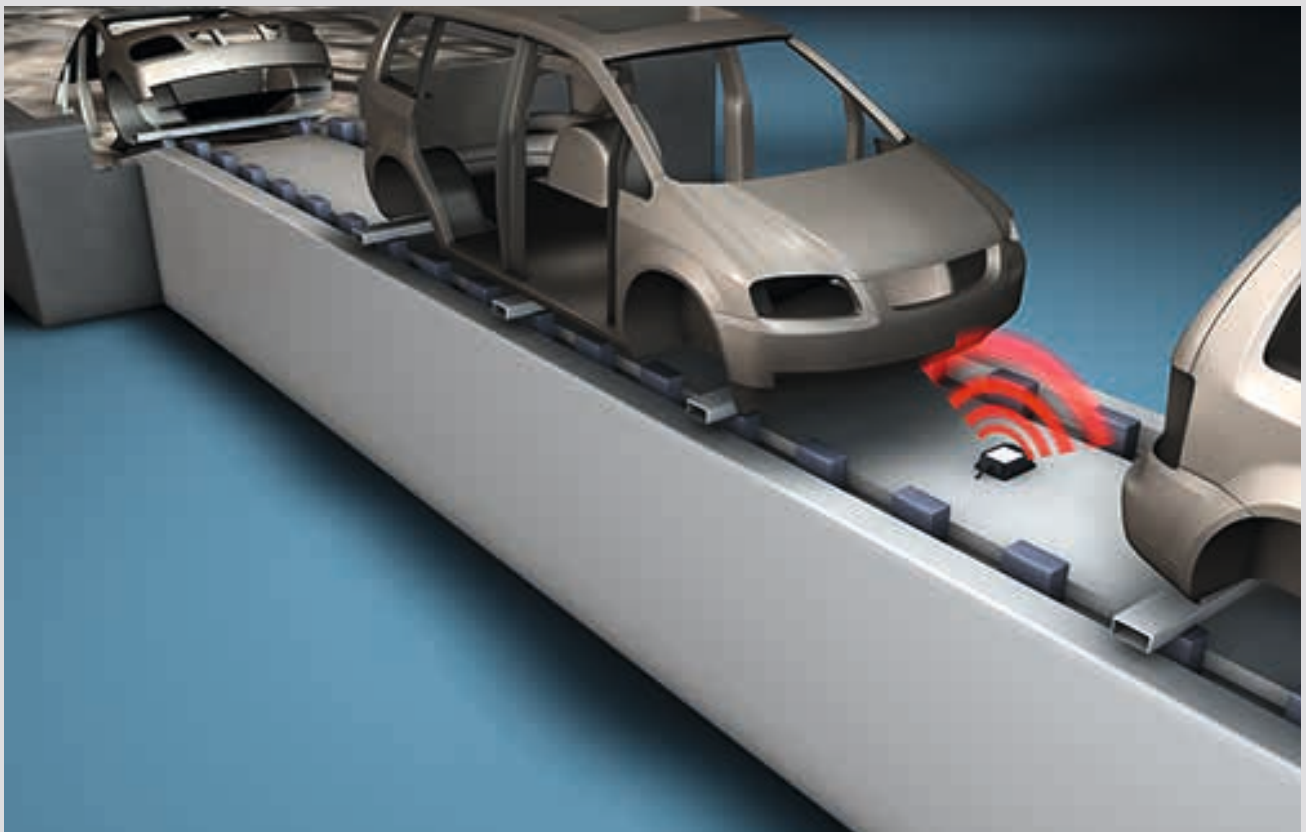


TELPHER LINES

Efficient corrosion protection and aesthetic paint jobs.

At the latest during the elaborate catalytic dip coating process, the vehicle bodies or skids have to be marked using RFID transponders, since these are the only ones that sustainably withstand the immersion baths and oven drying at up to 200 °C.

Powerful sensors, track-guided transport systems and camera systems are also essential for ensuring smooth processes and uniform results during the subsequent painting with robots.





Positioning

Bar code positioning systems **BPS 8**



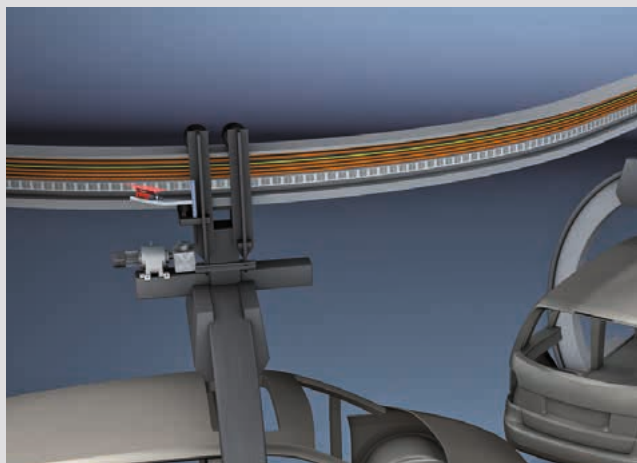
- Interfaces: RS 232 (other interfaces available via MA 8 or MA 200i)
- Absolute positioning up to 10,000 m with reproducible accuracy of ± 1 mm
- Max. speeds up to 4 m/s
- Curve-going, horizontally and vertically
- Simple attachment using special mounting device
- M12 connection technology
- Special labels permit the precise and problem-free positioning on/at switches
- Accuracy relative to bar code tape 8 ± 1 mm

Positioning

Bar code positioning systems **BPS 300i**



- Interfaces: PROFINET, PROFIBUS, SSI, RS 232, RS 422, RS 485
- Absolute positioning up to 10,000 m with reproducible accuracy of ± 0.15 mm
- Max. speeds up to 10 m/s
- Curve-going, horizontally and vertically
- Modularity: three selectable connection technologies, heating and display
- Monitoring of availability, velocity and distance to the tape via the interface, via warning output or online via WebConfig
- Fast, secure mounting and position-neutral replacement through **easy**mount mounting technology



Identification

Bar code readers

BCL 500i, BCL 600i



- Integrated interfaces
- Code reconstruction technology (CRT) for high system availability
- Integrated display
- Large read field even with small modules
- No focus adjustment necessary
- Multi-scan via PROFINET or Ethernet TCP/IP

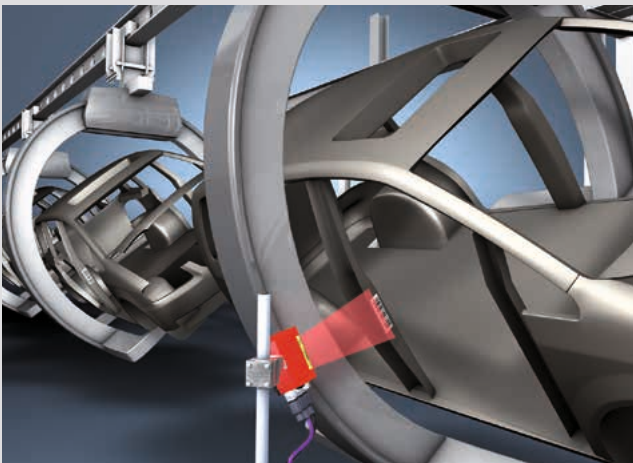
Collision protection

Laser diffuse sensor

HT 10



- Flexible selection of creeping movement and stop via two independently adjustable/teachable switching points
- Detection of reflective tape only, therefore not influenced by objects in the background or in the track area
- Scanning range limit: 0.05–25 m





Identification

RFID read/write systems

HFM 3500D, RFM 12/32/62



- Frequency: 13.56 MHz (HF) / 868 MHz (UHF)
- Max. reading distance: 400 mm (HF) / 5000 mm (UHF)
- Continuous detection via trigger function and no-read, even in the case of failure
- Secure identification without line-of-sight
- Flexible process control via data updates (write)
- Very flexible options for connection to the fieldbus interfaces
- Wide product spectrum of devices as well as matching transponders
- RFM 32 Ex-n with EX certification zone 2

Protection of the load pick-up and load drop-off areas

Safety laser scanner

RSL 400



- Safeguarding of expansive danger zones of up to 8.25 m
- Two autonomous protective functions by means of two safe switching output pairs
- Large plain-text display for easy-to-read status messages
- Bluetooth and Ethernet TCP/IP interface simplify commissioning
- Simple mounting and easy device exchange by means of separate connection unit
- Various connection variants with M12 or cable
- Time-saving, one-step configuration

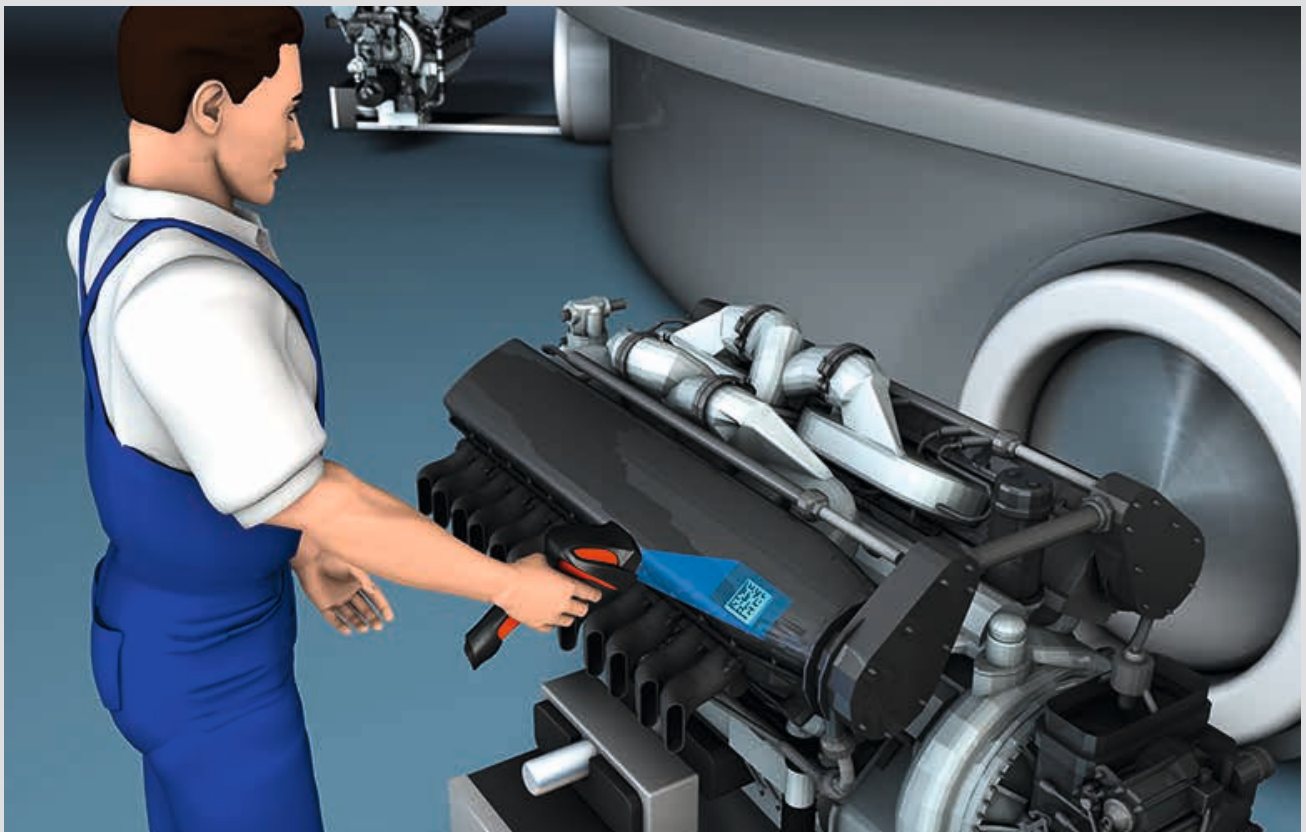


QUALITY ASSURANCE

Trust is good. Monitoring is better.

Highly modern safety solutions protect the quality assurance employees when they have to intervene in running processes and remove parts to be checked.

Thanks to our sensor solutions, faulty work pieces can be identified, registered and removed from the process during fully-automated procedures.





Identification (industrial fieldbus gateways MA 200i)

Modular connection unit



- Available for all common fieldbuses
- Perfected industrial housing design
- Dual-port Ethernet switch
- Integrated voltage supply for the device that is to be connected
- Multicolor, clearly visible LEDs to indicate the device and bus state

Identification (bar code)

Mobile code readers



- Bar code reading by touch
- Rough industrial use, up to IP 65
- Partially as wireless model via radio (Bluetooth)
- Wide range of hand-held readers for bar codes for a wide range of applications
- Extensive selection of accessories
- Can be integrated in all common fieldbus systems via MA 200

Identification (2D-code / RFID)

Ident systems



- Wide range of readers for 2D-codes
- HCR 6200, HS 65x8 optimized for directly marked parts
- Mobile combi-devices for mixed operation (RFID+1D-/2D-code)
- Extensive selection of accessories
- Partially as wireless model via radio (Bluetooth)



CONTINUOUS CONVEYOR

Secure and fast object detection.

Due to their high function reserves, our sensor solutions ensure the efficient and uninterrupted throughput of merchandise. Detail solutions specially tailored for the requirements of these applications ensure speedy commissioning and maximum reliability. The various reading principles of the devices, such as bar code,

2D-code, and RFID, guarantee maximum flexibility. Our sensors offer reliable detection and thus high system availability, especially with partially damaged codes, glossy, dark or stretch-wrapped packages and in harsh environmental conditions.





Object detection with light-band

Retro-reflective photo-
electric sensor
RK 46C.DXL3 VarOS



- 45–60 mm wide light-band with 7/14 mm resolution
- Reliable detection of all kinds of objects, even objects with openings
- Versatile use through 2 preselectable sensitivity levels and fine tuning with **easytune**
- Simple alignment via **brightvision®**
- One sensor for 50 mm detection – replaces multiple individual sensors or light barriers

Object detection with light beam

Photoelectric sensors
**318B, 5, 25B, 28,
46C series**



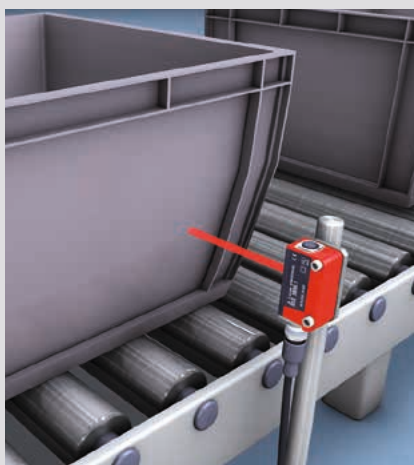
- Highest functional reliability even when soiled
- Simple alignment via **brightvision®**
- Simple fine alignment via **omnimount**
- Robust active ambient light suppression **A²LS**
- Functional reliability for tape- or shrink-wrapped pallets, bundles and containers with openings
- Simple integration through pre-mounted brackets, special cable lengths
- Development of customer-specific mounting brackets

Detection of workpiece holders

Inductive Switches
ISS 244, IS 240, IS 288



- Compact cubic designs for space-saving integration
- LED displays with all-round visibility
- Large switching distances up to 40 mm



Manipulator control

Measuring light section sensor

LPS 36, LES 36, LxS 36 HI



- For the measurement of moving objects and the creation of 3D information
- Calibrated system, measurement value display in mm
- Measurement range: 200–800 mm
- Length of laser line: max. 600 mm
- Measurement data transfer via Fast Ethernet, PROFIBUS, analog interface
- Optional incremental transmitter input
- Measurement time: 10 ms

Projection monitoring of the palette load

Switching light curtains

CSL 710, CSL 505



- Affordable dimension and contour monitoring for the entire area
- Measurement field heights from 35–3.100 mm
- Operating ranges up to 8 m
- Beam spacings 5, 12, 5, 25, 50, 100 mm
- Narrow design
- Plug & Play for simple installation
- Warning function when soiled

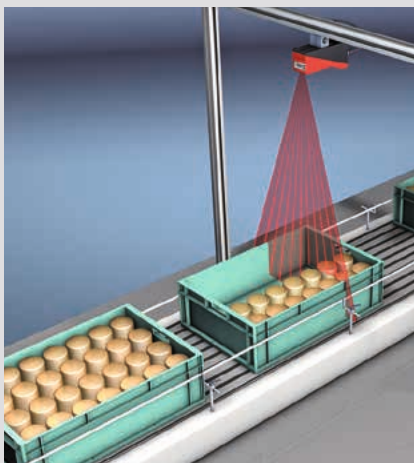
Width/height measurement

light curtains

CML 700i



- Integrated PROFIBUS, CANopen, RS 485 and IO-Link interface
- Short response time per beam (10/30 µs)
- Flexible fastening concept with standard profile for uncomplicated mounting
- Easy-to-read display with robust membrane keyboard and bar graph display for easy alignment
- Maximum measurement field length of 3,000 mm
- Sturdy metal housing also for use in rough industrial environments
- Ex model (zone 2/22)





Volume measurement

Complete system
LSC 200



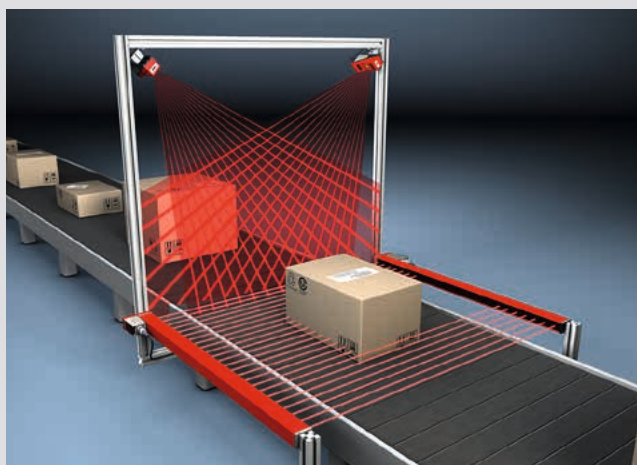
- Combine various sensors
- Measurement data filters can be adapted to the application
- Interfaces: EtherCat, Ethernet, PROFIBUS
- Detection of transparent objects
- Graphical user interface for commissioning
- Deformation monitoring
- Detection and output of the angular position
- Can be expanded with 1D- or 2D-code identification

Identification

Bar code readers
BCL 300i



- Reading distances 20 – 700 mm
- Modular connection technology by means of pluggable connection hoods with M12 connector, clamp connection or fixed connection cable
- Integrated fieldbus connectivity: PROFINET/PROFIBUS/Ethernet/multiNet (RS 232/485/422)/Ethernet IP
- Models: line scanner, deflecting and oscillating mirror
- Available as line/raster scanner
- Code reconstruction technology (CRT) for reliable identification of damaged codes
- Optional: display, heating models



Identification

Bar code readers

BCL 500i, BCL 600i



- Integrated interfaces
- Code reconstruction technology (CRT) for high system availability
- Integrated display
- Large read field even with small modules
- No focus adjustment necessary
- Multi-scan via PROFINET or Ethernet TCP/IP

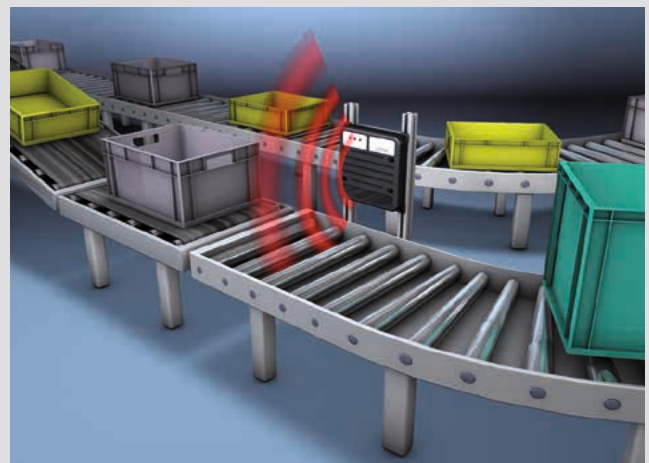
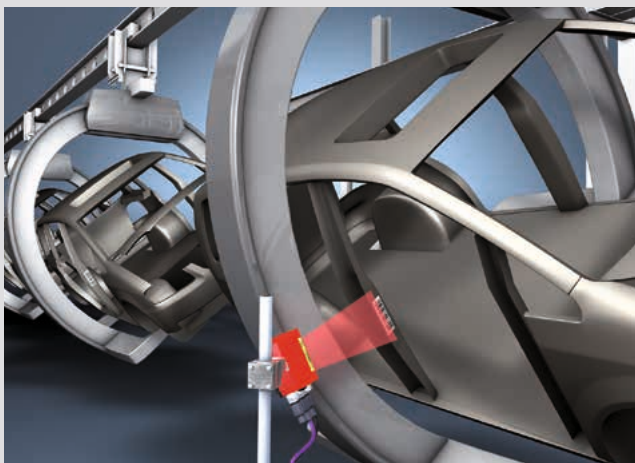
Identification

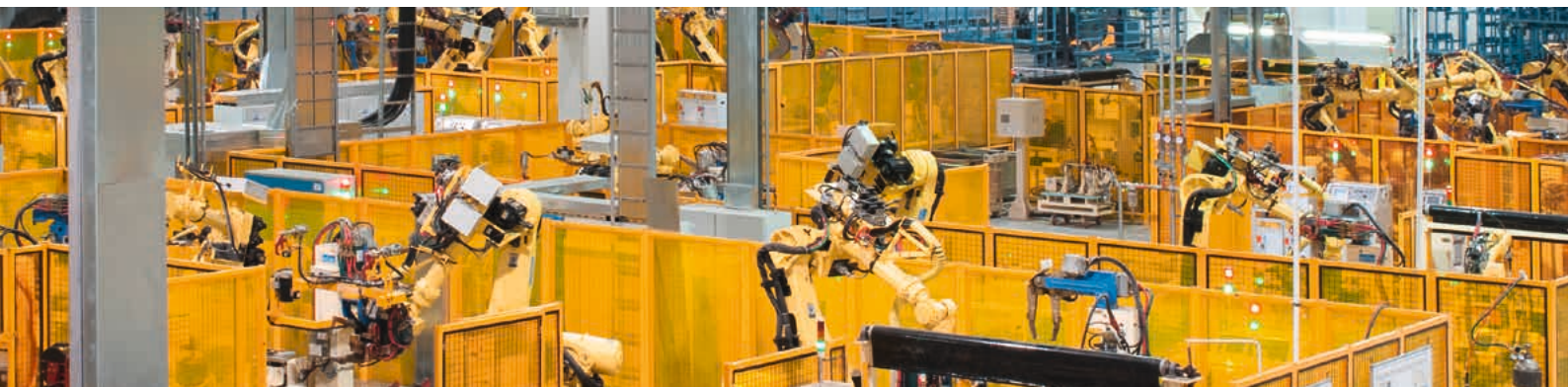
RFID read/write systems

HFM 3500D, RFM 12/32/62



- Frequency: 13.56 MHz (HF) / 868 MHz (UHF)
- Max. reading distance: 400 mm (HF) / 5000 mm (UHF)
- Continuous detection via trigger function and no-read, even in the case of failure
- Secure identification without line-of-sight
- Flexible process control via data updates (write)
- Very flexible options for connection to the fieldbus interfaces
- Wide product spectrum of devices as well as matching transponders
- RFM 32 Ex-n with EX certification zone 2





Access guarding without muting sensors

Safety light curtains **MLC**



- Allows the system to be very compact and thus saves valuable space
- High security against tampering and availability, as no additional sensors are necessary
- No alignment of the sensors necessary when changing the transport material
- MLC Smart Process Gating (SPG)

Access guarding

Multiple light beam safety devices **MLD**



- New 3-beam transceiver replaces more complex systems, making considerable reductions in costs possible
- Suitable for low-temperature environments down to -30°C
- Integrated muting functions – easily configurable without a PC
- Simple device exchange by means of Plug & Play with no programming
- Integrated AS-i interface (optional)
- MLD 300: type 2, SILCL 2, PL c
- MLD 500: type 4, SILCL 3, PL e

Safeguarding of pallet transfer stations

Muting accessories **Sets**



- Customized set variants for fast implementation of typical muting solutions (2-/4-sensor muting, parallel, sequential)
- Pre-mounted ready-to-use muting sensor sets facilitate installation
- Immediately ready for operation through optimal mechanical and electrical calibration
- Innovative design for modern machine and system construction



HIGH-BAY STORAGE DEVICES

Always fast and automatically to the right part.

Our sensors ensure a high throughput through dynamic and precise positioning when merchandise is placed into or removed from storage, even with ambient light interference. High reproducibility and simple alignment of the sensors translate into extremely short commissioning and repair times. Optical compartment

occupation checks and push-through protection reliably ensure protection of the stored merchandise in practical use. A complete package of solutions designed for the requirements of low-temperature applications ensures maximum availability even under these conditions.





Positioning (linear, curve-going)

Bar code positioning systems
BPS 300i



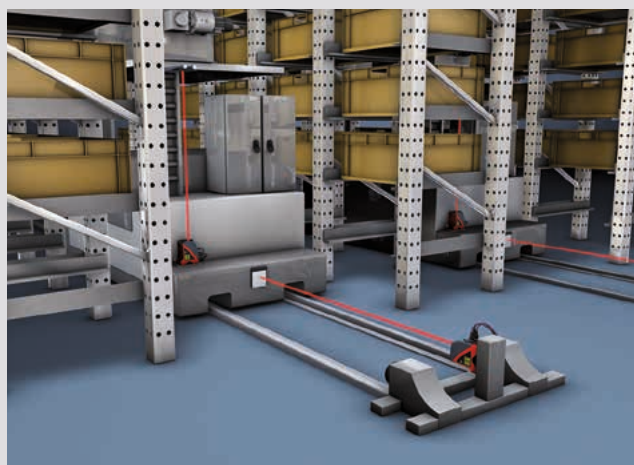
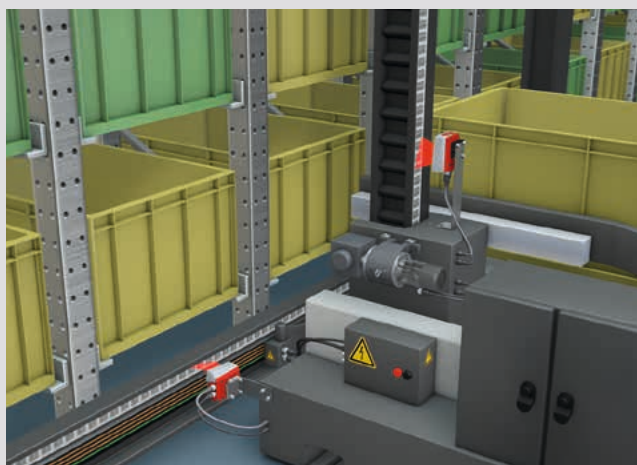
- Modularity: three selectable connection technologies, heating and display
- Monitoring of availability, velocity and distance to the tape via the interface, via warning output or online via WebConfig
- Fast, secure mounting and position-neutral replacement through **easymount** mounting technology
- Absolute positioning up to 10,000 m with reproducible accuracy of ± 0.15 mm
- Curve-going, horizontally and vertically
- Integrated interfaces PROFINET, PROFIBUS, SSI, RS 232, RS 422, RS 485
- Optionally with heating (down to -30 °C)
- Optional with display

Positioning (linear)

Laser distance measurement devices
AMS 300i



- Accuracy of ± 2 mm at 200 m (± 5 mm at 300 m)
- Speed output and monitoring
- Interfaces: PROFIBUS, PROFINET, INTERBUS, DeviceNet, EtherNet IP, CANopen, EtherCAT, Ethernet, SSI, RS 232, RS 422, RS 485
- Diagnosis and prefailure messages
- Display in 5 languages
- M12 connection technology
- Optionally with heating (down to -30 °C)
- Interference-free parallel operation with DDLS 500 or DDLS 200 optical data transceiver
- Simple alignment through decoupling of fastening and alignment mechanics
- SSI and PROFINET or SSI and PROFIBUS in one device



Compartment fine positioning in x- and y-axis

Smart cameras
LSIS 472i



- Accuracy in X- and Y-direction ± 2 mm
- Reduced sensor system and accessories for compartment fine positioning
- Integrated infrared illumination
- Integrated display available
- Simple configuration via webConfig
- Image transfer via FTP
- Integrated interfaces (RS 232 and Ethernet TCP/IP on board)
- In addition, RS 232 and Ethernet TCP/IP "on board"
- Interface connection via the MA 2xxi modular connection unit
- Heated models available

Bay positioning

Energetic diffuse sensors
HRTR 25B-XL, HT 46C



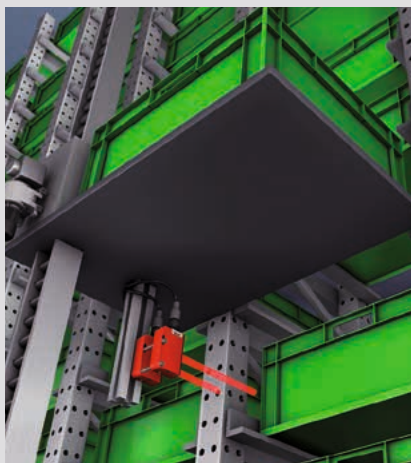
- Reliable detection of a wide range of profile types (e.g. sigma profile, etc.), colored and glossy surfaces
- Visible light spot for time-saving alignment
- Optimized beam path for reliable function for columns with holes

Shelf positioning Single or multi-depth

Diffuse sensors
HT 46C, HT 10



- Simple alignment through brightly visible light spot
- Precise switching behavior independent of background conditions
- Secure detection of a wide range of profile types and surfaces
- Up to three independent switching outputs
- Operating range up to 8 m





Compartment occupation check Push-through protection

Energetic diffuse sensors or
TOF technology
HT 46C, SR 10



- Secure detection of a wide range of pallets and containers
- Multiple switching points for multi-depth storage systems
- Secure push-through detection by means of precise switching point (window function) and fast line teach
- Up to three switching outputs (SR 10)
- Simple teaching thanks to large buttons
- Analog output (SR 10)

Clearance monitoring Load receptacle

Cubic Series
3B, 5, 25B, 46C series



- Highest functional reliability even when soiled
- Simple alignment via **brightvision®**
- Functional reliability for stretch- or shrink-wrapped pallets, bundles and containers with openings

Signaling of status information

Warning lights and
Signaling columns
C3, E4 and E7



Ready-made C3

- Slim column with 3 LED modules
- No assembly, fast mounting
- Delivery incl. 1 m cable, open ends

Modular E4 and E7

- Flexible configuration and mounting
- Mounting bracket for wall, post and horizontal mounting
- Vertical mounting: up to 5 modules
- Horizontal mounting: 2-sided, up to 10 modules
- Optional sound modules with the same high degree of protection



Safety gate monitoring and interlocking, roller end switch for final position monitoring, safety E-Stop button

Safety monitoring, interlocking, E-stop
L10, L100, L200, L300, S410, S200, S300 Series



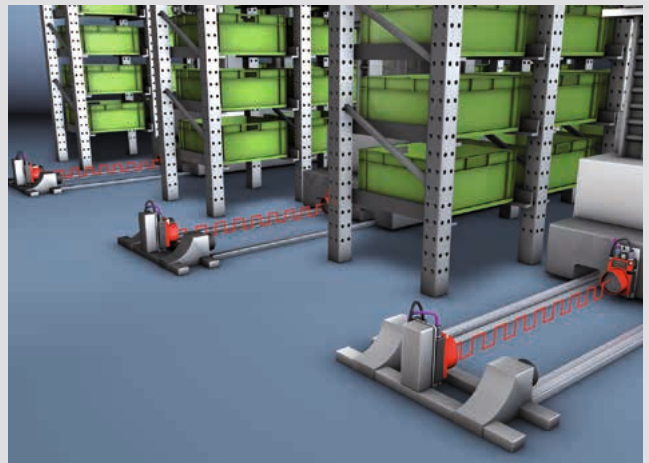
- Very high quality level, compact construction, 5 approach directions
- Wide selection of actuators for various applications
- Manual locking, switching-current reduction
- Magnetic- or spring-force actuation, auxiliary release (L100, L200)
- ESB200 safety E-Stop button
- Metal housing and degree of protection IP 67 (S300)

Data transmission

Data transmission systems
DDL S 200



- 2 Mbit transparent serial data transmission
- All internationally important interfaces available (e.g., PROFIBUS, CANopen, DeviceNet, etc.)
- Multifunctional control panel with bar graph
- Optionally with heating (down to -30°C)
- Not affected by ambient light
- Interference-free parallel operation with AMS 300i laser distance measurement device
- Integrated "one-man" alignment device





Data transmission

Data transmission systems **DDL 500**



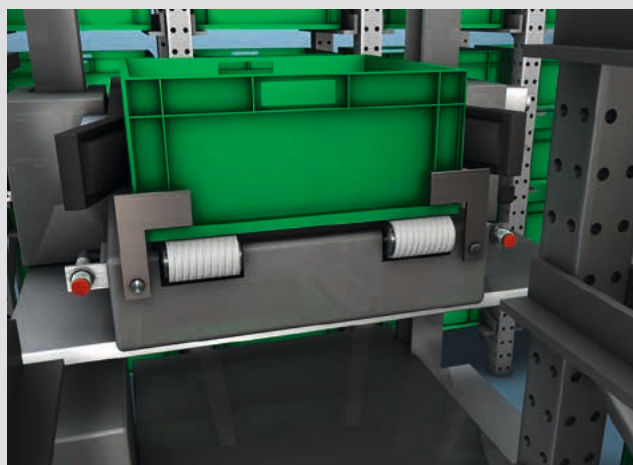
- 100 Mbit transparent data transmission of all Ethernet protocols such as PROFINET, EtherNet IP, EtherCat, etc.
- Laser alignment aid
- Monitoring of availability, velocity and distance
- Interference-free parallel operation with AMS 300i
- Integrated "one-man" alignment device
- Optionally with heating (down to -30°C)

Transport safeguarding

Inductive Switches **IS 208, 212, 218**



- Extensive portfolio with designs up to M30
- Scanning ranges up to 4 mm
- Compact housing for space-saving installations
- Pressure-proof full-metal housing for extreme environments, also resistant to cleaning agents
- Short designs available



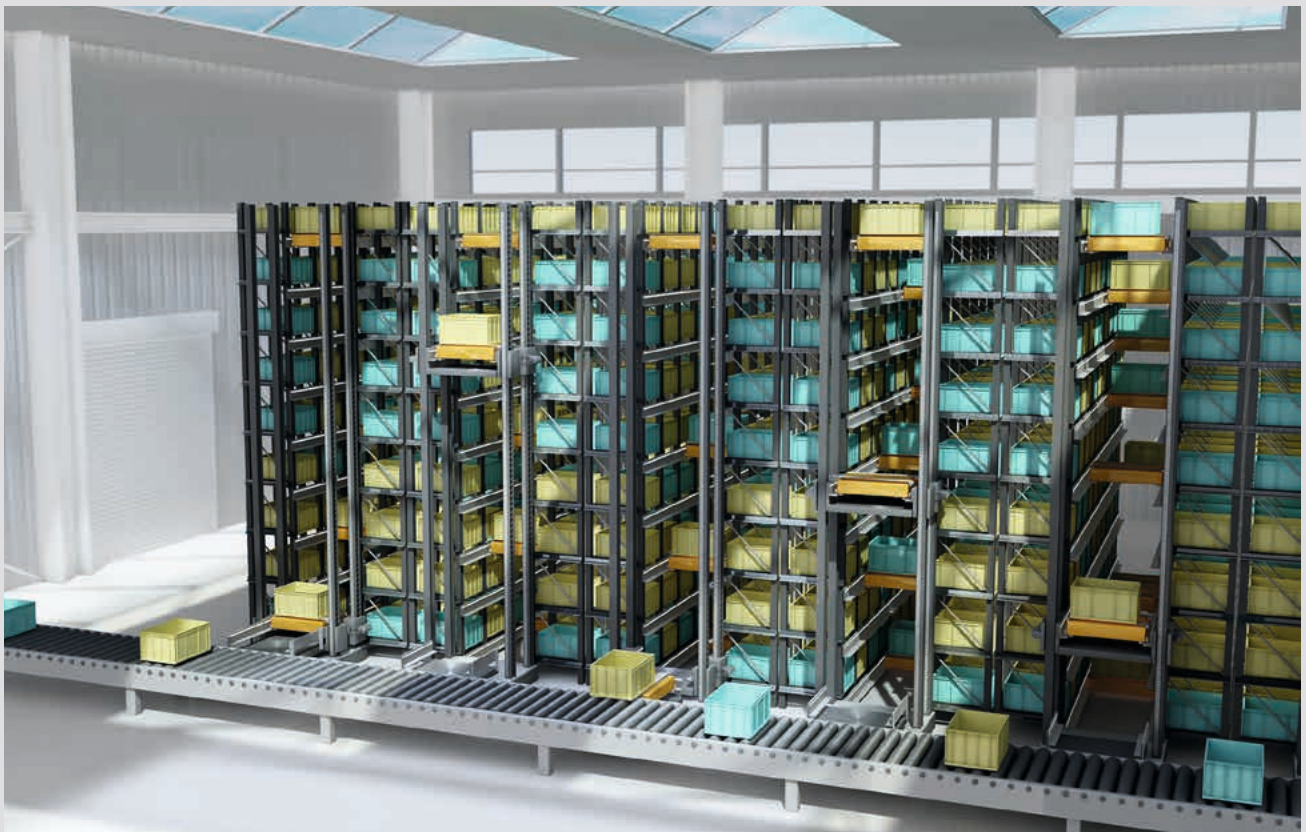
SHUTTLES

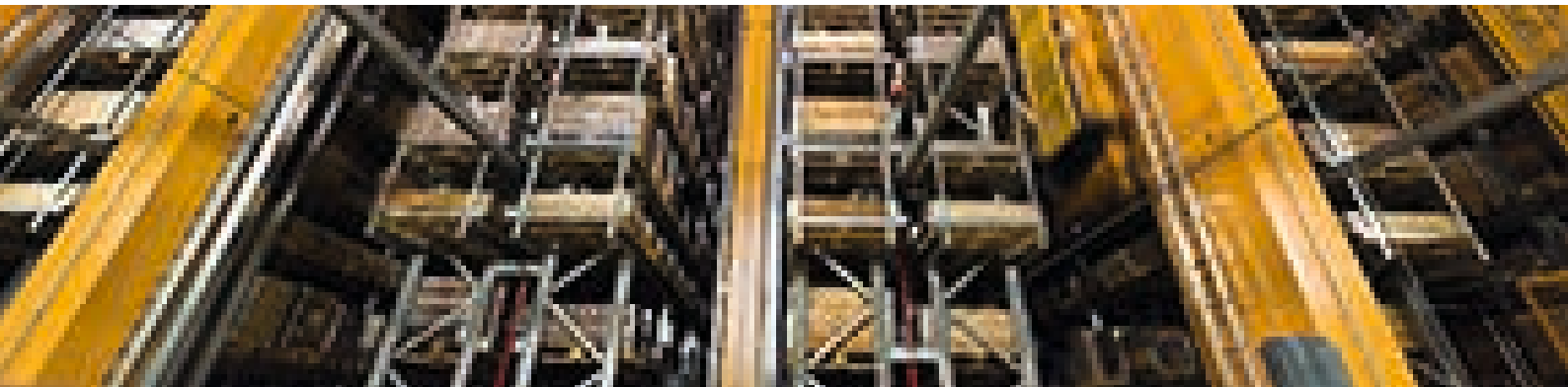
Quickly move goods in and out of storage.

For fast and highly flexible shuttles, very reliable, space-saving and safe sensors are needed for fine positioning, the detection of free spaces, presence monitoring and for collision prevention.

To move the individual shuttles to the optimum start position in the total system, sensors are

used that maintain contact with the stationary main computer and can thereby ascertain the current position in cycles on the order of milliseconds. For all of these tasks, we offer suitable sensors that are designed to be user-friendly so that they can be easily and quickly mounted and commissioned.





Collision protection (no obstructions in aisle)

Measuring and switching distance sensors
ODS 10, HT 10



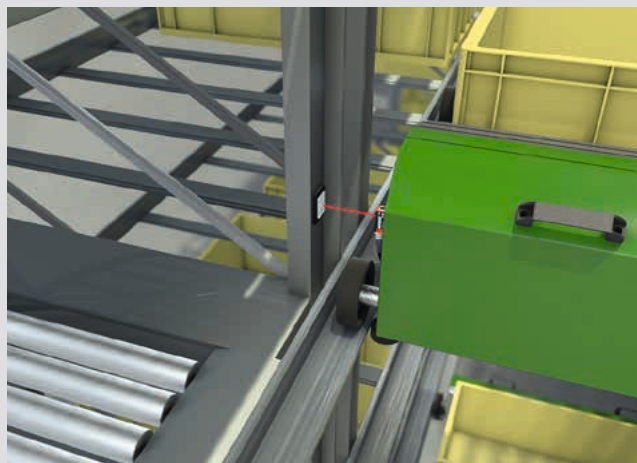
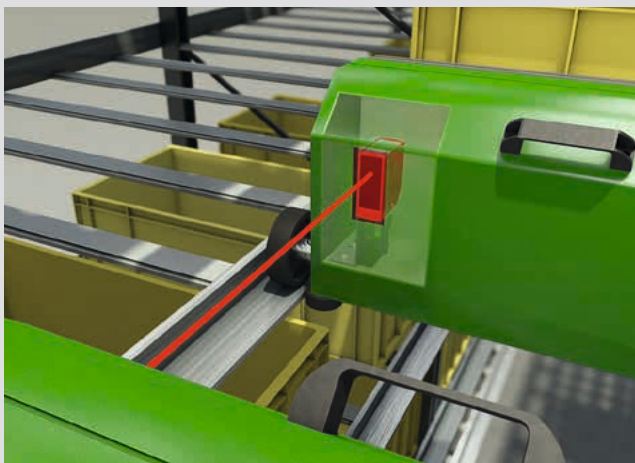
- Working range from 50 – 8.000 mm (25 m against reflective tape)
- Reliable detection of dark, glossy and colored objects thanks to **powerreserve**
- Very high angle tolerance
- Highest process reliability thanks to **availability** control with prefailure message
- Status LED visible from above and from front
- Measuring with analog output and IO-Link
- Switching with up to three switching outputs and IO-Link
- Robust plastic housing with glass pane
- Laser class 1
- Operating temperature –40 to +50 °C

Aisle end (referencing)

Miniaturized diffuse sensors and retro-reflective photoelectric sensors
PRK 3B, HRT 3B



- Simple alignment via **brightvision®**
- Very exact switching
- Reliable detection of marks thanks to **powerreserve**
- Functions at zero distance
- Compact design
- **A²LS** active extraneous and active ambient light suppression
- Simple, one-point teaching
- IP 67
- Energy savings through low power consumption



Overhang control

Miniaturized throughbeam and retro-reflective photoelectric sensors
LSR 2, PRK 2, PRK 5



- Very compact housing
12 x 8 x 23 mm
- Simple alignment through visible light spot
- Very small light spot for exact switching
- Very small minimum distance of 7 mm
- High switching frequency
- Glass optics and polarized light for reliable switching behavior with glossy surfaces
- IP 67
- Energy savings through low power consumption

Compartment occupation check, single and deep

Diffuse sensors
HRT 3, HRT(R) 25B



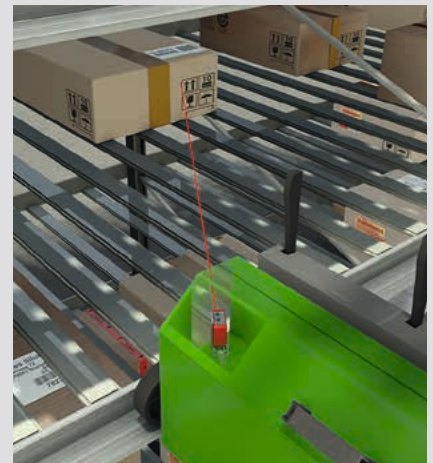
- Very high color and angle tolerance for reliable detection through **powerreserve**
- Excellent background suppression
- Not sensitive to soiling
- Also available with XL light spot
- Simple alignment via **brightvision®**
- **A²LS** active extraneous and active ambient light suppression
- Energy savings through low power consumption and activation input
- IP 67

Compartment occupation check, multiple and deep

Measuring and switching distance sensors
ODS 10, HT 10



- Working range from 50–8,000 mm (25 m against reflective tape)
- Reliable detection of dark, glossy and colored objects thanks to **powerreserve**
- Very high angle tolerance
- Status LED visible from above and from front
- Measuring with analog output and IO-Link
- Switching with up to three switching outputs and IO-Link
- Laser class 1
- Operating temperature –40 to +50 °C





Monitoring load pick-up, container position

Retro-reflective
photoelectric sensors
PRK 2, 5



- Very attractive price
- Simple alignment via **brightvision®**
- Reliable detection of products thanks to **powerreserve**
- No faulty switching in the case of reflective objects through use of polarization
- Compact design
- **A²LS** active extraneous and active ambient light suppression
- Integrated teach button
- IP 67

Detecting finger position

Inductive switches with
M8 housing
IS 208



- Larger operating ranges than the average available comparable types
- Short housing models available for use in confined spaces
- Standardized M8/M12 connection technology or cable for quick and fault-free commissioning
- Bright status LEDs at the connection with display of the function reserve (flashing LED)
- Robust metal housing for highest demands
- Correction factor-1 versions, miniature design and versions with increased scanning ranges

Detecting telescopic fork

Inductive switches in cubic
designs
IS 288



- Larger operating ranges than the average available comparable types
- For use in confined spaces
- Bright status LEDs at the connection with display of the function reserve (flashing LED)
- Robust metal housing for highest demands



Compartment fine positioning

Miniaturized laser diffuse sensor
HRTL 3B



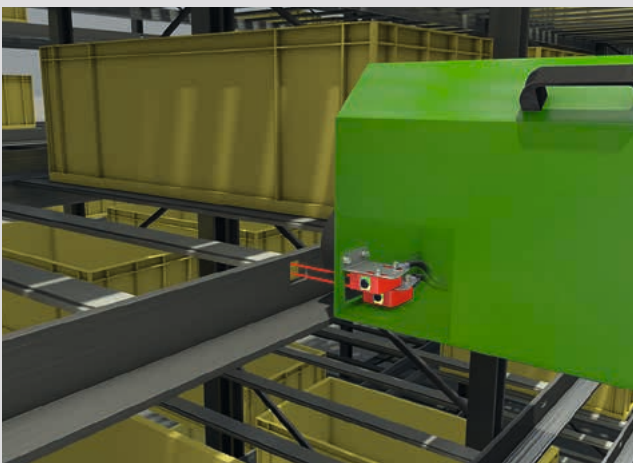
- Simple alignment via **brightvision®**
- Very exact switching
- Reliable detection of marks thanks to **powerreserve**
- Functions at zero distance
- Compact design
- **A²LS** active extraneous and active ambient light suppression
- Simple, one-point teaching
- IP 67
- Energy savings through low power consumption

Load presence

Sensor with background suppression,
energetic diffuse sensor
HRT 25, FT 5, 328



- Very high color and angle tolerance for reliable detection through **powerreserve**
- Excellent background suppression
- Additional foreground suppression, thereby allowing the sensor to be installed behind protective glass
- Switching range can be preset
- Not sensitive to soiling
- Highest process reliability thanks to warning output
- Also available with XL light spot
- Simple alignment via **brightvision®**
- **A²LS** active extraneous and active ambient light suppression
- Energy savings through low power consumption and activation input
- IP 67





Positioning and end of aisles

Measuring and switching distance sensors
ODS 10, HT 10



- Working range from 50 – 8.000 mm (25 m against reflective tape)
- Reliable detection of dark, glossy and colored objects thanks to **powerreserve**
- Very high angle tolerance
- Highest process reliability thanks to **availability** control with prefailure message
- Status LED visible from above and from front
- Measuring with analog output and IO-Link
- Switching with up to three switching outputs and IO-Link
- Robust plastic housing with glass pane
- Laser class 1
- Operating temperature –40 to +50 °C



TELPHER LINES

Telpher lines are also used in final assembly. The sensor solutions from Leuze electronic ensure intelligent positioning and safe-guarding here.

Product details: see pages 14 – 15



DRIVER-LESS TRANSPORTATION SYSTEMS / SIDE-TRACKING SKATES

Like in stamping plants and in vehicle body construction, driverless transportation systems are used during final assembly. Sensors from Leuze electronic bring them safely to their destination.

Product details: see pages 20 – 23

ALWAYS THE RIGHT SERVICE FOR YOUR PROCESS

Legal security and efficient safety at work are successfully combined quickly and easily with our range of services.



For many people, complex planning or engineering tasks or the management of functional safety make the set of issues related to safety at work a closed book. In the area of legal security in particular, information gaps often exist. With our extensive, qualified offer on safety at work, you are on the safe side legally and can fulfill all of your legal guidelines easily.

We support your service department and, in the event of limited resources, make available the appropriately qualified team. We work with our experts to ensure the safety of your machines and systems. Your production and service team is free to perform its actual tasks. Our offerings are accompanied by an extensive range of training courses tailored to your needs.

OUR SERVICE OFFERINGS INCLUDE



Status check
Safety technology
(MSSC)



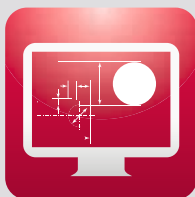
Status check
CE
(MCSC)



Risk analysis /
assessment
(MRAS)



Conformity
assessment of machines
(MCMS)



Development
support of
machine safety
(MSEN)



Safety inspection
(MSIN)

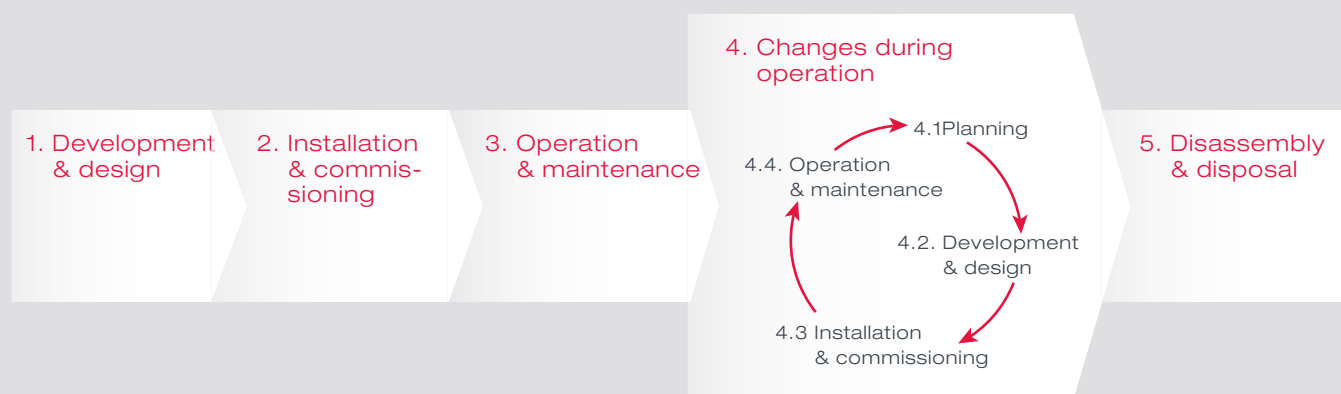


Functionality of
protective devices
(MSPT)



Validation and
verification of
safety functions
(MSVV)

STAGES OF A MACHINE LIFE CYCLE



THE RIGHT SERVICES AT A GLANCE

Services	1. Development & design	2. Installation & commissioning	3. Operation & maintenance	4.1. Planning	4.2. Development & design	4.3. Installation & commissioning	4.4. Operation & maintenance	5. Disassembly & disposal
Status check Safety technology		●	●				●	
Status check CE	●		●		●	●	●	
Risk analysis / assessment	●		●	●	●		●	●
Conformity assessment of machines	●			●	●			
Development support Machine safety	●				●			
Safety inspections		●	●			●	●	
Functionality of protective devices		●	●			●	●	●
Validation and verification of safety functions		●				●		

YOUR PARTNER ABOVE AND BEYOND THE PRODUCT

Our sensor people offerings are made complete with our additional services and extensive support.

WE ARE YOUR SENSOR PEOPLE

It is not without reason that we are known in the industry as the sensor people. We have always known that a technically demanding business such as the sensor business, in particular, can only function if we are a reliable partner to our customers. It is a matter of much more than technical excellence in the products – it

is a matter of a high level of knowledge about applications and technical relationships and the readiness to stand by our customers any time that they need us. Also part of this is a well-versed support department, such as the global presence of competent contact persons and the 24/7 availability of our customer help desk.

TRAINING & SUPPORT

- Product and standards training
- Application consulting
- Safety consulting
- Safety engineering

AFTER SALES SERVICES

- 24h helpline (in selected countries)
- Inspection Database
- Repairs and device replacement service
- On-site service

FIELD SERVICES

- Technical field service
- Start-up support
- Safety inspections
- Stopping time measurement

ONLINE SERVICES

- Web product selector
- Download services
- Webshop



OUR PROMISE TO YOU

SMARTER **PRODUCT USABILITY**

With regard to our product developments, we systematically place emphasis on the especially good usability of all devices. To this end, simple mounting and alignment are taken into account – just as the uncomplicated integrability of the sensors in existing field bus systems and easy configuration, e.g. via a web browser, are.

SMARTER **APPLICATION KNOW-HOW**

Whoever can do it all, can do nothing right. Which is why we concentrate on selected target sectors and applications. There, we are specialists and know all aspects inside out. For this purpose, we optimize our solutions and offer a comprehensive product range that makes it possible for our customers to obtain the absolute best solutions from a single source.

SMARTER **CUSTOMER SERVICE**

The technical and personal proximity to our customers, and a skilled, straight-forward handling of queries and problems, are among our strengths – and will remain so. Consequently, we will continue to expand our service offerings and, indeed, also forge ahead in new directions to persistently redefine the utmost in customer service. Whether on the phone, on the Internet or on-site with our customers – regardless of when and where the expertise of the sensor people is needed at any time.

Info at: **www.leuze.com**



SMART
SENSOR
BUSINESS

Katrin Rieker,
Sales Methods, Processes, Tools

Switching Sensors

Optical Sensors
Ultrasonic Sensors
Fiber Optic Sensors
Inductive Switches
Forked Sensors
Light Curtains
Special Sensors

Measuring Sensors

Distance Sensors
Sensors for Positioning
3D Sensors
Light Curtains
Forked Sensors

Products for Safety at Work

Optoelectronic Safety Sensors
Safe Locking Devices, Switches and Proximity Sensors
Safe Control Components
Machine Safety Services

Identification

Bar Code Identification
2D-Code Identification
RF Identification

**Data Transmission /
Control Components**

MA Modular Connection Units
Data Transmission
Safe Control Components
Signaling Devices
Connection Technology and Passive Distributors

Industrial Image Processing

Light Section Sensors
Smart Camera

Leuze electronic GmbH + Co. KG
In der Braike 1
73277 Owen / Germany
Phone +49 7021 573-0
Fax +49 7021 573-199
info@leuze.de
www.leuze.com