



► Safe automation of automated guided vehicle (AGV) systems

PILZ
THE SPIRIT OF SAFETY

We make your AGV system safe!

- Solution for safety and security
- Simply integrate and get started
- Includes a conformity assessment



► Safe automation and operation of automated guid

In order to ensure efficient processes in the logistics or production environment, the key is preventing downtimes. As your partner, we support you during the development of individual safety solutions for autonomous vehicles such as automated guided vehicles (AGVs) and AGV systems. Our many years of industry experience allow us to provide you with the best possible support when implementing your projects using our consulting expertise, safety components and complete solutions.



Visit our website
for more
information:

Webcode:
web0749

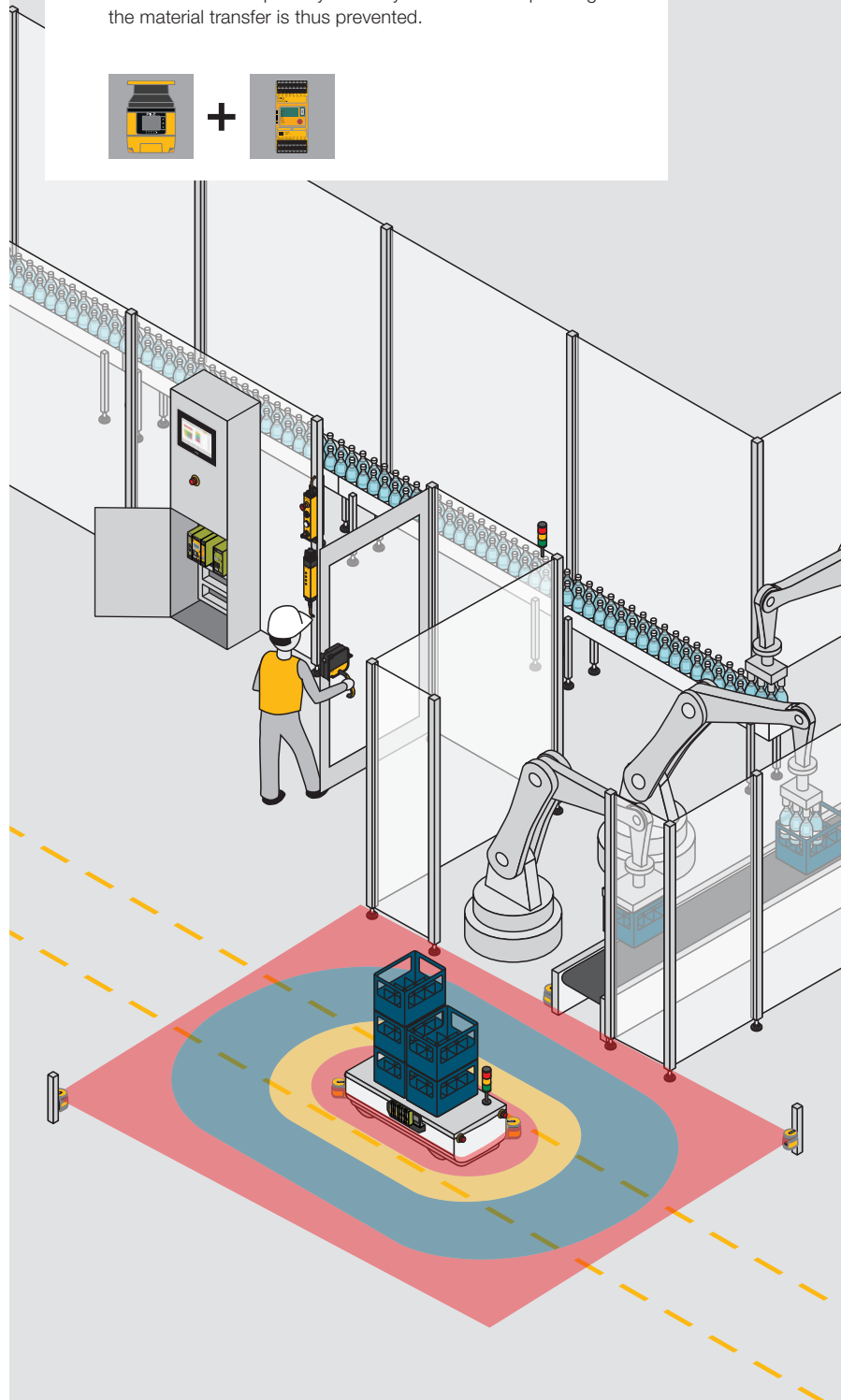
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As our partner, you benefit from the following advantages:

- Complete one-stop safety solution saves time and money
- Robust components lead to high availability
- Open interfaces for enhanced flexibility
- International conformity assessment, e.g. CE marking for the AGV systems and for the entire application where necessary, as well as training and consulting
- Holistic approach to AGV system applications: development of safety concepts in the design phase and project support up to commissioning
- Aligning the AGV system application with the requirements of ISO 3691-4

+ Stationary safeguarding of the material transfer between AGV system and robot

Depending on the position of the AGV system, the protected fields of the permanently installed safety laser scanners PSENscan are adapted dynamically. A machine stop during the material transfer is thus prevented.



► We make your AGV system safe!

We support you during the automation of your automated guided vehicle (AGV) or your AGV system with safety components or a complete solution. The offer includes safeguarding and productive area monitoring as well as a security solution to prevent unauthorised access to the AGV system. Taking a holistic approach, considering the vehicle and application in accordance with ISO 3691-4, we also take care of the conformity assessment (e.g. CE acceptance) and safe operation.



ROS

Collision protection for human and AGV system

The safety laser scanner PSENscan enables safeguarding and productive area monitoring of mobile platforms. PSENscan detects objects in the vehicle's path and provides maximum safety even at high speeds, without compromising productivity. Up to 70 protected fields enable dynamic protective field modifications when cornering or driving around obstacles. Adjustment of the protected field is performed by directly analysing the encoder inputs in the laser scanner.

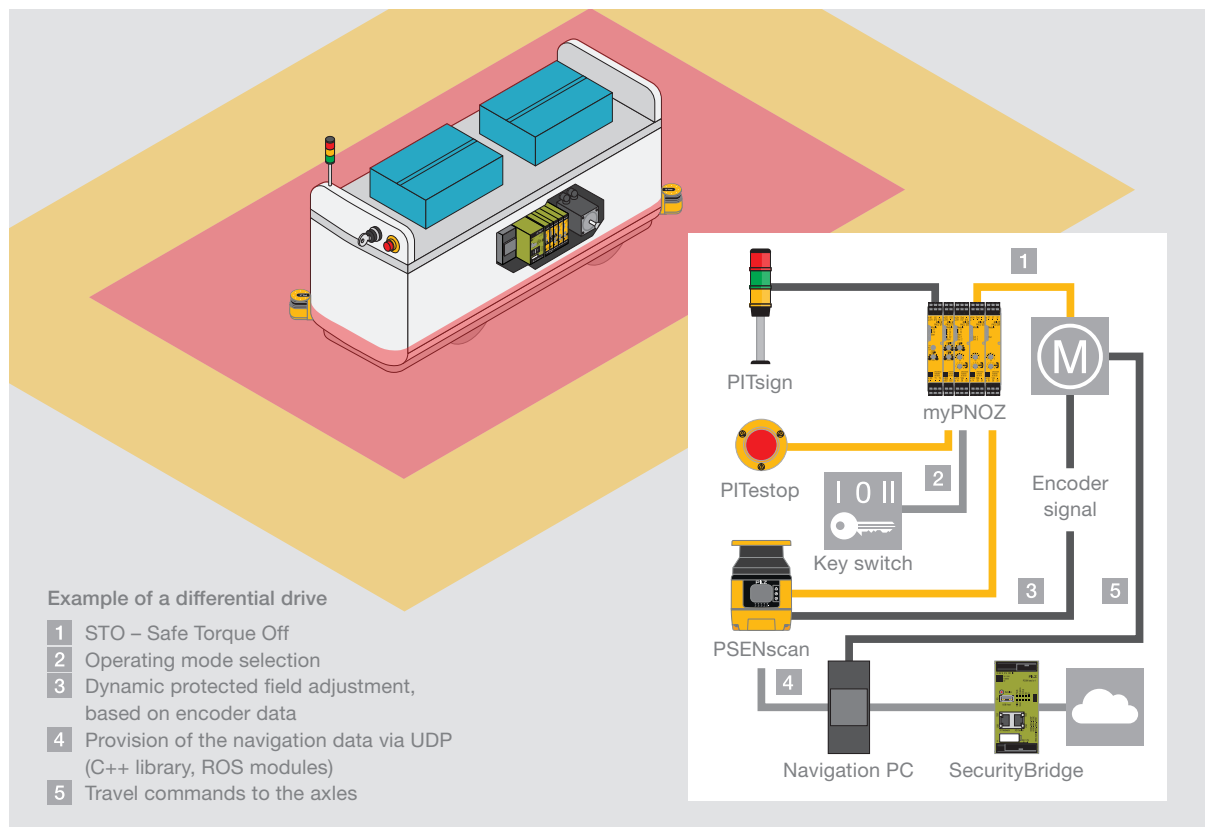
Detect, localise and navigate it all – safely!

In addition, the safety laser scanner provides the distance data for localisation and navigation. Open interfaces for the transmission of laser scanner data enable integration in your navigation solution. The data can be implemented directly via the C++ library or as ROS modules – meaning your individual mobile platform is ready for use immediately! Use this for your own SLAM algorithm (Simultaneous Localisation and Mapping). Maps of the environment are thus created for navigation, allowing the AGV system to avoid obstacles, for example.

Visit our website for more information:

Webcode:
web195352

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Example of a safe and flexible solution for differential drives



PSENscan



myPNOZ



Security Bridge



PITestop/PITsign

Type	Features	Order number
Safety laser scanner PSENscan	PSENsc ME 5.5 08-17 Master encoder model for area monitoring and the provision of data for navigation via C++ library and ROS ¹⁾ interface: compliant and approved in accordance with EN IEC 61496-1, Type 3, EN ISO 13849-1, PL d/Cat. 3, IEC 61508: SIL 2, series connection master for up to 3 subscribers, up to 4 encoder inputs	6D000034
Modular safety relay myPNOZ	myPNOZ.73.CKA360EB640XA445AA058AC011 Plug-and-play with the preconfigured safety relay	
Firewall Security Bridge	PCOM sec br1 PCOM, Security Bridge, VPN server for establishment of a VPN tunnel, supports X.509 certificates	311 501
Control and signal devices PITestop and PITsign	PITes1s PITestop E-STOP pushbutton IP65 with E-STOP symbol and logo, mounting hole: 22.3 mm	400 131
	PIT si3.1 indicator light unit PITsign indicator light unit red, yellow, green including LED, housing: IP65, for signalling various operating and plant statuses	581 190

¹⁾ Free download of the ROS modules: https://github.com/PilzDE/psen_scan_v2

Download the free white paper here. Just scan the QR code:



Use of laser distance data for robot localisation

Simply integrate, and you're ready to go!

When combined with the modular safety relay myPNOZ and the control and signal devices PITestop and PITsign, you get a cost-optimised solution thanks to the mutually compatible components.

The firewall Security Bridge ensures that no one can access the internal IT network of the mobile platform without authorisation during operation. As well as safe automation, we also have a comprehensive package of services enabling us to help you with the safe operation of automated guided vehicle systems.



► Safe AGV system application

Your requirements

As an operator or manufacturer of automated guided vehicles (AGVs) or AGV systems, you are bound by the specifications of ISO 3691-4. This defines the requirements for safety functions and specifies how the automated functions of the vehicles are to be validated. It specifies the required performance level for the vehicle monitoring functions, various operating modes and the brake control. When using AGVs or AGV systems, you must make sure that your system is not only safely designed but is also safely and above all productively used, taking all local conditions into account.

Our services

We take a holistic view of your AGV application. We get involved as early as the development of system concepts in the design phase and support your projects up to commissioning. This helps us to ensure that safety and productivity are guaranteed in the operation of your automated guided vehicle systems.

Your benefits at a glance

- You save time and money with us as your safety and automation partner for the complete application.
- We guarantee that your applications meet the requirements of ISO 3691-4. If necessary, we provide confirmation of this through the Conformity Assessment Procedure.
- We check the AGV safety starting in the earliest stages of the procurement process. This helps you to avoid additional costs and save time.
- We ensure that maximum safety is achieved whilst using only the functionally necessary components.
- Ideal supplement for a safe solution: our safety laser scanner PSENscan detects objects in the vehicle's path and provides maximum safety even at high speeds, without compromising productivity. The perfect solution for use on automated guided vehicles.



We make your AGV application safe. In every way possible!

Benefit from our complete package:

Design Risk Assessment (DRA)

- ▶ Review of the risk assessment from the AGV manufacturer (on-site or remotely)
- ▶ Check of key design features with regard to the use of the AGV
- ▶ Check of compliance with standards and regulations/ guarantee of compliance of the AGV with the legal requirements
- ▶ You will receive the following results from us:
 - Design Risk Assessment (DRA) for the AGV system, based on the design drawings as well as your information for the use of the AGV
 - AGV Design Review Report
 - List of necessary/recommended measures for increasing safety and productivity

Optional factory acceptance test at the manufacturer's site (FAT)

- ▶ Detailed validation of the most important safety functions of an AGV
- ▶ You will receive the following documents from us:
 - Detailed report of the factory acceptance test
 - List of necessary/recommended measures for increasing safety and productivity

This service is also interesting for AGV manufacturers. We offer consultancy on specific safety functions for navigation, control and braking or on speed monitoring and we provide you with the corresponding certificate of compliance for your customers.

Site Acceptance Test (SAT)

- ▶ Complete risk assessment of the entire AGV system application
- ▶ Check of all/selected AGVs that are in use
- ▶ Validation of the complete AGV application incl. examination of the environment
- ▶ Consultancy on all necessary measures for the users on-site
- ▶ You will receive the following documents from us:
 - Risk assessment
 - Site Acceptance Test report
 - List of measures


Download the free white paper here.



Safe operation of AGV systems

Training

By means of a training course, we offer a comprehensive insight into the correct operation of AGV systems at the workplace. You will receive all the information you need to know about the key requirements regarding the safety of AGV systems – also available as an in-house training course.

 Webcode:
web229656

Online information
at www.pilz.com

ed vehicle (AGV) systems



Access monitoring on multi-track transport systems

Vertically installed safety laser scanners PSENscan individually switch the protected fields depending on the pallet to ensure that long transport systems are reliably safeguarded. Combining with the safe small controller PNOZmulti 2 gives you a cost-effective complete solution.



Access monitoring with radar technology for material transfer

After loading the robot cell, the safe radar system PSENradar performs the enable of the robot cell so that no persons remain in the danger zone when the robot is restarted.



► Support

Technical support is available from Pilz round the clock.

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Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.



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