

# 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.

Intralogistics Solutions by Pilz

Visit our website

Online information at www.pilz.com

for more information:

- 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.



As our partner, you benefit

- from the following advantages:Complete one-stop safety
- solution saves time and moneyRobust 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



# ed vehicle (AGV) systems



# 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.



### Example of a safe and flexible solution for differential drives

Features

PSENsc ME 5.5 08-17

PCOM sec br1

mounting hole: 22.3 mm

PIT si3.1 indicator light unit

<sup>1)</sup> Free download of the ROS modules: https://github.com/PilzDE/psen\_scan\_v2

PITes1s

Master encoder model for area monitoring and the provision of data for navigation via C++ library and ROS<sup>1)</sup> interface: compliant and approved in accordance with EN IEC 61496-1, Type 3,

master for up to 3 subscribers, up to 4 encoder inputs

PCOM, Security Bridge, VPN server for establishment

myPNOZ.73.CKA360EB640XA445AA058AC011

Plug-and-play with the preconfigured safety relay

of a VPN tunnel, supports X.509 certificates

EN ISO 13849-1, PL d/Cat. 3, IEC 61508: SIL 2, series connection

PITestop E-STOP pushbutton IP65 with E-STOP symbol and logo,

PITsign indicator light unit red, yellow, green including LED, housing: IP65, for signalling various operating and plant statuses

Туре

Safety laser

Modular safety

relay myPNOZ

Security Bridge

Control and signal

devices PITestop

and PITsign

Firewall

scanner PSENscan

PSENscan



myPNOZ



Security Bridge



PITestop/PITsign

#### 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.





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



Order

**number** 6D000034

311501

400 1 31

581 190

Use of laser distance data for robot localisation

# 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** Optional factory acceptance test Site Acceptance Test (DRA) at the manufacturer's site (FAT) (SAT) Detailed validation of the most Review of the risk assessment. Complete risk assessment of the from the AGV manufacturer important safety functions of entire AGV system application (on-site or remotely) an AGV Check of all/selected AGVs Check of key design features with that are in use regard to the use of the AGV You will receive the following Validation of the complete AGV Check of compliance with documents from us: application incl. examination of - Detailed report of the factory standards and regulations/ the environment guarantee of compliance of the acceptance test Consultancy on all necessary AGV with the legal requirements - List of necessary/recommended measures for the users on-site measures for increasing > You will receive the following safety and productivity > You will receive the following results from us: documents from us: - Design Risk Assessment (DRA) This service is also interesting - Risk assessment for the AGV system, based on for AGV manufacturers. We - Site Acceptance Test report the design drawings as well as offer consultancy on specific - List of measures your information for the use safety functions for navigation, of the AGV control and braking or on speed - AGV Design Review Report monitoring and we provide you - List of necessary/recommended with the corresponding certificate measures for increasing of compliance for your customers.

#### Training

safety and productivity

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.

#### Download the free white paper here.



Safe operation of AGV systems

#### Webcode: (h) web229656

Online information at www.pilz.com



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.

BLUECOMPETENCE Alliance Member

Sustainability Initiative





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