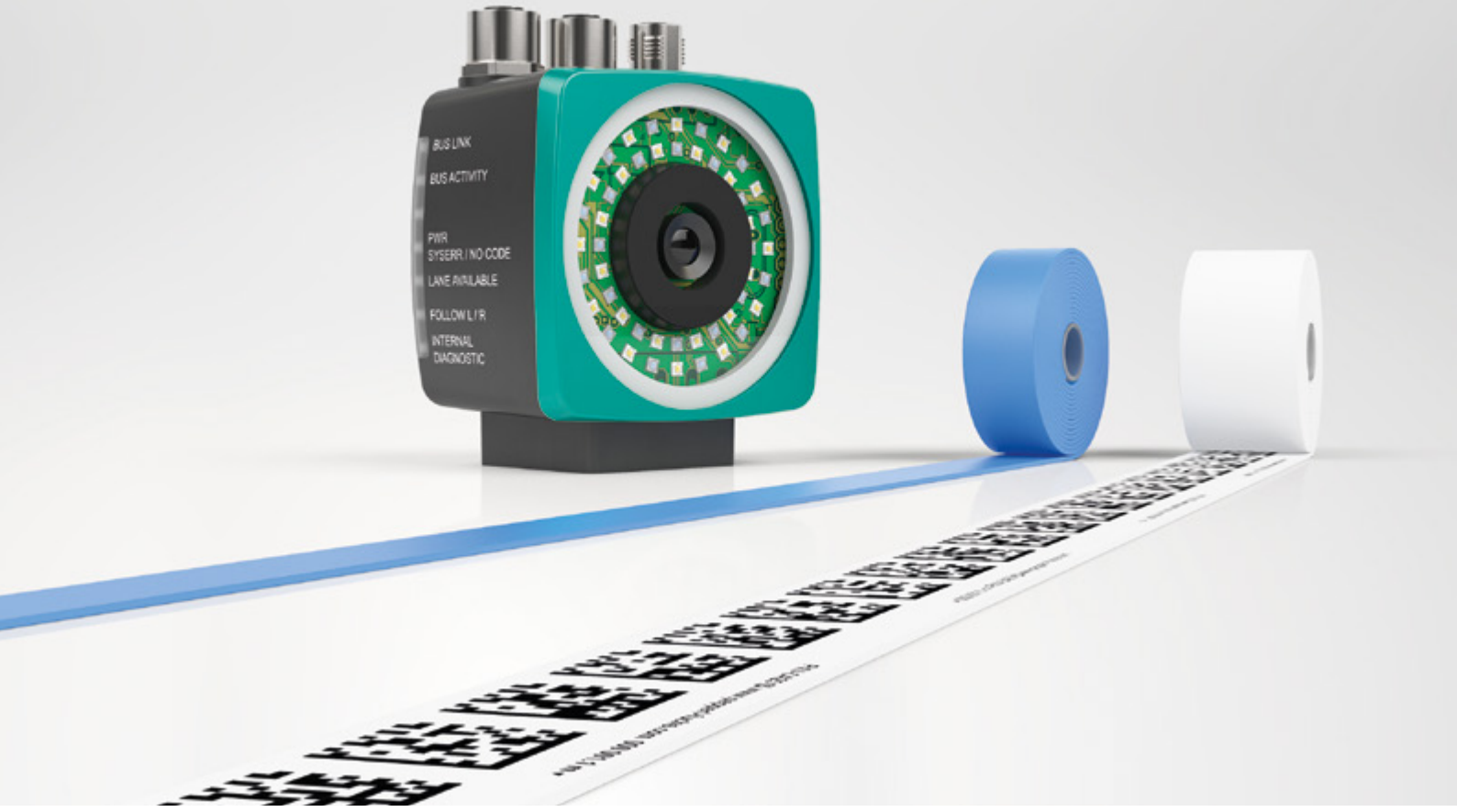
Leading the way.
Reinventing positioning.
Revolutionizing navigation.

Position Guided Vision (PGV):
Positioning System for Automated
Guided Vehicles



Your automation, our passion.

PEPPERL+FUCHS

Technology

Innovative Engineering Spans the Factory Floor

Competitive pressure, error-free processes, and outstanding quality—the demands on modern factory automation are growing steadily. In response to market demands, Pepperl+Fuchs is developing creative solutions that are setting new standards for modern technology.

Automated Guided Vehicle (AGV) Control Advances with Data Matrix Technology

Data Matrix codes, which pack a tremendous amount of digital information in a postage stamp-sized footprint, can be found in seemingly endless commercial and consumer areas. But their full potential in industrial automation applications is only now being tapped. By integrating this powerful technology into traditional AGV control, material handling is elevated to an entirely new level.

The Pepperl+Fuchs PGV is the world's first Data Matrix-based positioning tracking and control system. Using an advanced industrial 2D camera, the PGV not only guides a carrier along its coded or colored path, it also offers an integral identification solution to initiate starts, stops, and turns and an absolute encoding system capable of positioning the carrier with sub-millimeter precision.

The system features excellent immunity to dirt, scuffing, and ambient light interference, ensuring maximum uptime and system availability.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Position Guided Vision

Three Control Devices in One Housing

The versatile PGV camera simultaneously scans and processes data from three different floor-mounted initiators: the solid “travel path” navigation stripe, the high-resolution absolute positional tape, and the decision-initiating control code (identification) segments.

More Than Just Vehicle Navigation

Incredibly powerful and with no moving parts to loosen or wear, the PGV system not only navigates, positions, and controls, it also provides valuable, real-time feedback of the carrier speed, vehicle turn angles, turn direction, and overall system “health.”

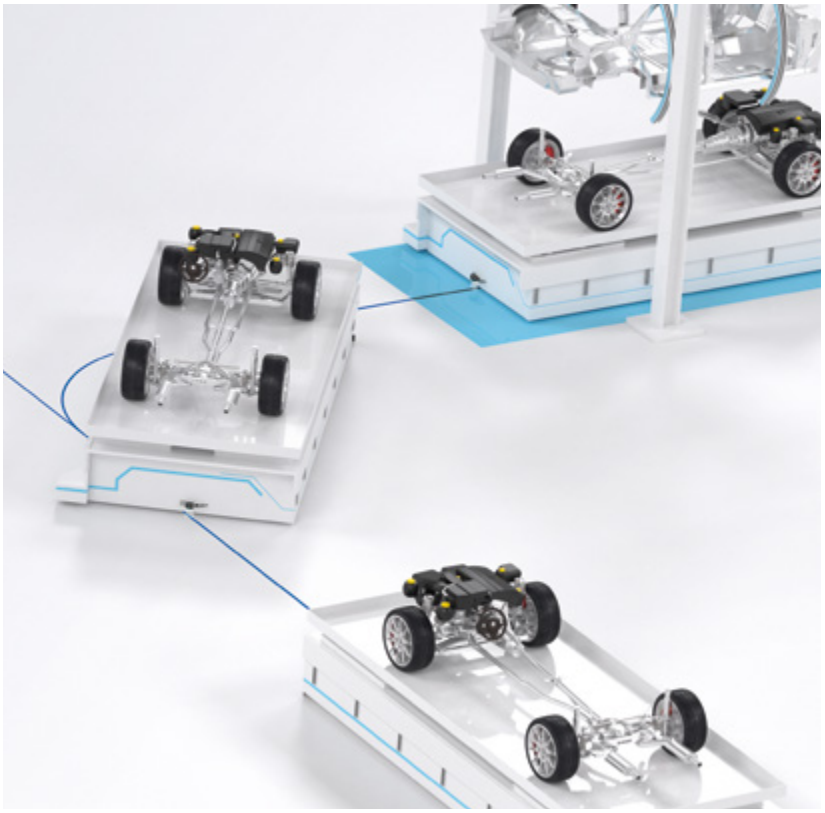
Technical Information	
Product	**PGV**
Length colored tape	No limit
Length DM code tape	10,000 m
Code type	Data Matrix code/colored tape
Maximum speed	8 m/s
Resolution	±0.2, ±1 or ±10 mm
Read distance	100 mm
Depth of focus	± 20 mm
Reading field	120 mm x 80 mm
Radius	≥ 0.5 m
Temperature range	–20 °C … +60 °C
Interfaces	RS485, PROFIBUS, PROFINET, CANopen
Model number	PGV*F200*

Highlights

- Reliably detects different colored route-tracking tape/ paint and Data Matrix codes even on highly reflective surfaces
- Excellent extraneous light immunity, > 100,000 lux, eliminates additional contrast tape
- Wide scan window coupled with the 2D Data Matrix technology provides seamless navigation over damaged or dirty tape
- Compact housing fits in the smallest AGVs
- Easy mounting and installation with plug-and-play connectivity
- Compatible with most industrial protocols

Accurate and Reliable Alignment Feedback

The PGV camera's wide scan window allows the carrier to seamlessly traverse route branches, intersections, and bends. The ability to negotiate tight curves and to achieve travel speeds up to 6 m/s maximizes the AGV's throughput and overall process efficiency. Every aspect of the carrier movement is transferred to the system controller in real time. Linear movement feedback is provided with +/- 0.2 mm resolution in both the vertical and horizontal planes.



Scanning of the Data Matrix identification/control code initiates the AGV turn.

Exact Positioning and Reliable Navigation

The PGV uses Data Matrix codes for various functions. Turns in the AGV's route can be initiated with Data Matrix control codes. Exact positioning of the AGV is easy with Data Matrix code tape. Navigation via tag mode is also available: the AGV receives navigation information exclusively from Data Matrix codes, which are attached to the ground in a fixed pattern.

The absolute position code allows precise frame and body alignment in a chassis marriage system.

Position Guided Vision

Designed for Factory Floor Realities

In addition to performing flawlessly even when the tracking tapes are adhered to the most glossy/reflective surfaces, the PGV's high shutter speed and proprietary vision algorithm ensure error-free, reliable performance.

Route-Tracking Flexibility

The wide evaluation window and high-resolution camera are capable of scanning a broad range of solid route-tracking strips. Widths from 10 mm to 40 mm, in any color, are scanned with equal reliability. There is no need for a contrasting background tape. Additionally, moderately dirty or damaged tapes can still be read with no loss of accuracy.

Simple Installation and Modification

The installation of all PGV adhesive-backed tape couldn't be simpler. Just peel away the backing strip and adhere it to the floor. Painted lines are also perfectly suitable for AGV guidance. Solid strips of any color or reflectivity can be used, and there is no need for a contrasting background tape. Marked tracks no longer in use can easily be painted over.

Data Matrix positioning strips allow +/– 0.2 mm absolute positional resolution.

Grid navigation on Data Matrix tags.

Route-tracking strip widths from 10 to 40 mm are reliably evaluated.

Seamless evaluation of damaged or dirty tracks.

Strip readability is unaffected by background color or gloss.

Plug-and-Play Control Compatibility

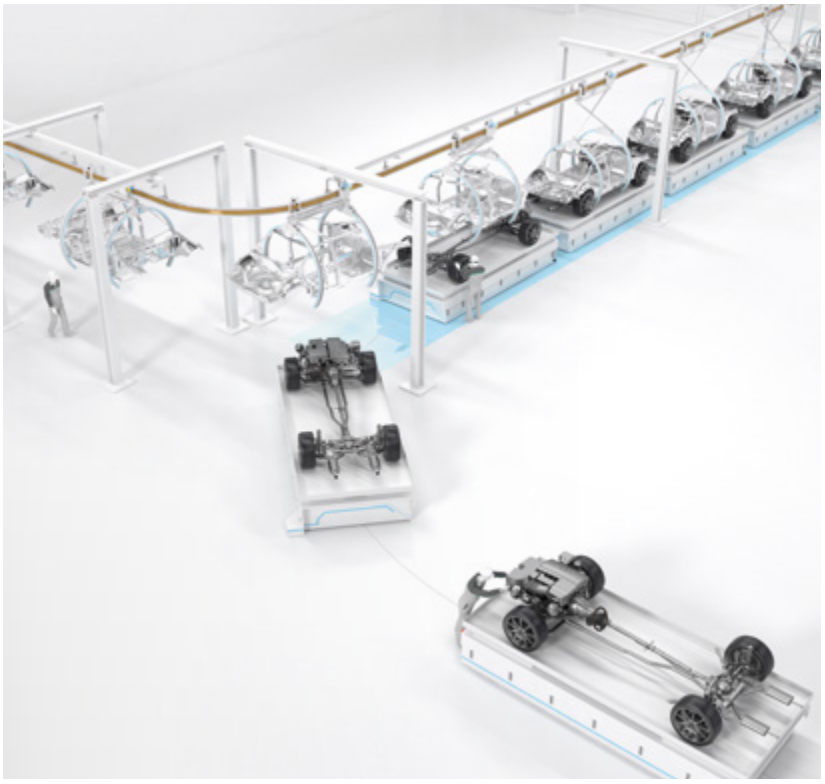
The system component installation isn't the only feature that makes the PGV ideal. Control communication is plug-and-play and compatible with a wide variety of common industrial protocols.

No Separate Communication Interfaces Required

All necessary control communication as well as switching inputs and outputs are integrated in the scanner housing, ensuring the fastest possible data processing. Customized system parameterization can be accomplished via PC interface or with integral pushbuttons.

Compact Design Fits in Tight Spaces

The compact PGV positioning system design allows installation in small automated guided vehicles. A completely solid-state design with no moving parts, this system offers exceptional service life and minimal maintenance costs. In addition, the IP67-rated housing makes route tracking in outdoor areas possible.



SIL 3/PL e Absolute Positioning with Just One Sensor

For the first time, **safe**PGV enables SIL 3/PL e-compliant safe absolute positioning with just a single sensor. The new safety technology is based on the combination of a special 2D read head and multi-color Data Matrix code tape. This unique combination enables the sensor to deliver safe data without comprising the advantages of traditional PGVs.

For more information, visit
www.pepperl-fuchs.com/safe-navigation

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- Inclination and Acceleration Sensors
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