LEADING THE WAY

POSITION GUIDED VISION (PGV)
Innovative engineering spans the factory floor

Companies throughout the world constantly strive to improve their processes, streamline production, and improve overall efficiency. To do so, they must keep abreast of the latest emerging technologies and innovations.

A leader in advanced sensing and positioning technologies for over 50 years, Pepperl+Fuchs’ detailed coordination of customer feedback and product development has created an extensive array of products that continually evolve to meet the needs of modern manufacturing.

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.
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 band, 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.”

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

Technical Information

<table>
<thead>
<tr>
<th>Product</th>
<th>PGV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length colored tape</td>
<td>No limit</td>
</tr>
<tr>
<td>Length DM code tape</td>
<td>10,000 m</td>
</tr>
<tr>
<td>Code type</td>
<td>Data Matrix code/color band</td>
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<tr>
<td>Maximum speed</td>
<td>6 m/s</td>
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<tr>
<td>Resolution</td>
<td>±0.2, ±1 or ±10 mm</td>
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<tr>
<td>Read distance</td>
<td>100 mm</td>
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<tr>
<td>Depth of focus</td>
<td>± 20 mm</td>
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<tr>
<td>Reading field</td>
<td>120 mm x 80 mm</td>
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<tr>
<td>Radius</td>
<td>≥ 0.5 m</td>
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<tr>
<td>Temperature range</td>
<td>-20 °C ... 60 °C</td>
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<tr>
<td>Interfaces</td>
<td>RS485, PROFIBUS, PROFINET, CANopen and EtherNet/IP</td>
</tr>
<tr>
<td>Model number</td>
<td>PGV100-F200A ~...</td>
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</table>
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.

Control Codes

Data matrix positional tape laid in parallel with the solid route-tracking tape generates precise, fraction-of-a-millimeter accurate absolute linear and horizontal carrier feedback. Turns, stops, and starts are among many actions initiated by 15 mm x 15 mm data matrix control code squares that are also installed alongside the tracking strips. One thousand unique control codes are available which can initiate 1,000 different user-specified actions.
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 - 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.

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.

Data matrix positioning strips allow +/- 0.2 mm absolute positional resolution.
Plug-and-Play control compatibility

It isn’t only the system component installation 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. And 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 the smallest driverless transport systems. 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.
YOUR APPLICATION. OUR CHALLENGE.

PROCESS INTERFACES
- Intrinsically safe barriers
- Signal conditioners
- Fieldbus infrastructure
- Remote I/O systems
- HART interface solutions
- Wireless solutions
- Level measurement
- Purge and pressurization systems
- Industrial monitors and HMI solutions
- Explosion protection equipment
- Solutions with process interfaces

INDUSTRIAL SENSORS
- Proximity sensors
- Photoelectric sensors
- Industrial vision
- Ultrasonic sensors
- Rotary encoders
- Positioning systems
- Inclination and acceleration sensors
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- Logic control units

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