Absolute Positioning.

Unique combination of 2-D camera and code tape—with 0.2 mm resolution up to 100,000 m.

PXV Data Matrix
Positioning System

Your automation, our passion.

PEPPERL+FUCHS

Camera-Based Linear Positioning

Outstanding Process Safety Even with Long Measuring Lengths

In applications where crane trolleys, push skids, monorail conveyors, freight elevators, or automated storage and retrieval systems are used, their positioning must be extremely precise and reproducible over long distances. The high-performance PXV positioning system from Pepperl+Fuchs is an innovative system offering the most reliable absolute detection on the market.

Long Service Life, Low Maintenance

Camera-based positioning systems are unsurpassed in terms of their simple handling. The unique PXV technology from Pepperl+Fuchs goes one step further—the combination of a 2-D camera and Data Matrix code tape makes it the best and most reliable absolute positioning system on the market. The noncontact operating principle and the absence of moving parts guarantee maintenance-free operation and minimal consequential costs. The high reliability of the devices prevents downtime and expensive system failures, and ensures maximum profitability for the operators due to the extremely long service life. The system is easy to install and offers the highest possible flexibility along the entire route—making it perfect for any individual application requirements.

Highlights

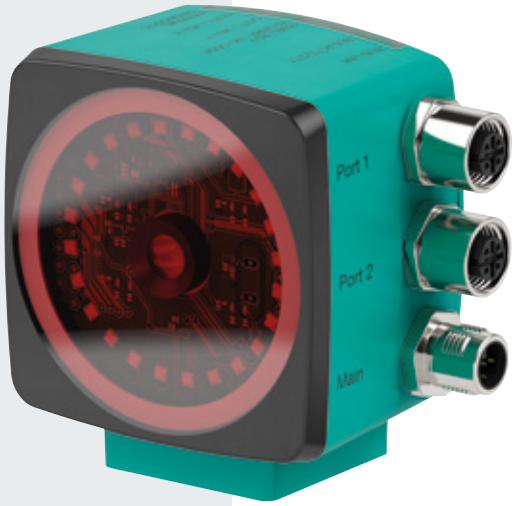
- Most reliable positioning/absolute detection on the market
- Provides precise position data at all times, even on complex routes
- Noncontact operation and the absence of moving parts ensure maintenance-free operation
- Extremely long service life
- Easy commissioning and quick installation

For more information, visit
pepperl-fuchs.com/pf-PXV

PXV Data Matrix Positioning System

For Maximum Performance in Absolute Positioning

With its unique combination of a 2-D camera system and multiredundant Data Matrix code tape, the PXV from Pepperl+Fuchs provides maximum precision in position detection and absolutely uncompromising process safety.



Easy Handling, Quick Commissioning

With the PXV, Pepperl+Fuchs offers a unique system consisting of a read head with modern camera technology and a highly flexible Data Matrix code tape. The high-tech read head has an internal illumination unit and is therefore extremely reliable at detecting position marks printed on the self-adhesive tape as 2-D Data Matrix codes, regardless of the ambient light conditions.

The extra-large reading window measures 120 × 80 millimeters and is able to read up to five of these codes simultaneously in just one read operation. As soon as only one code is detected in the reading window, precise position detection can be carried out. This also makes it possible to bridge large gaps in the code tape.

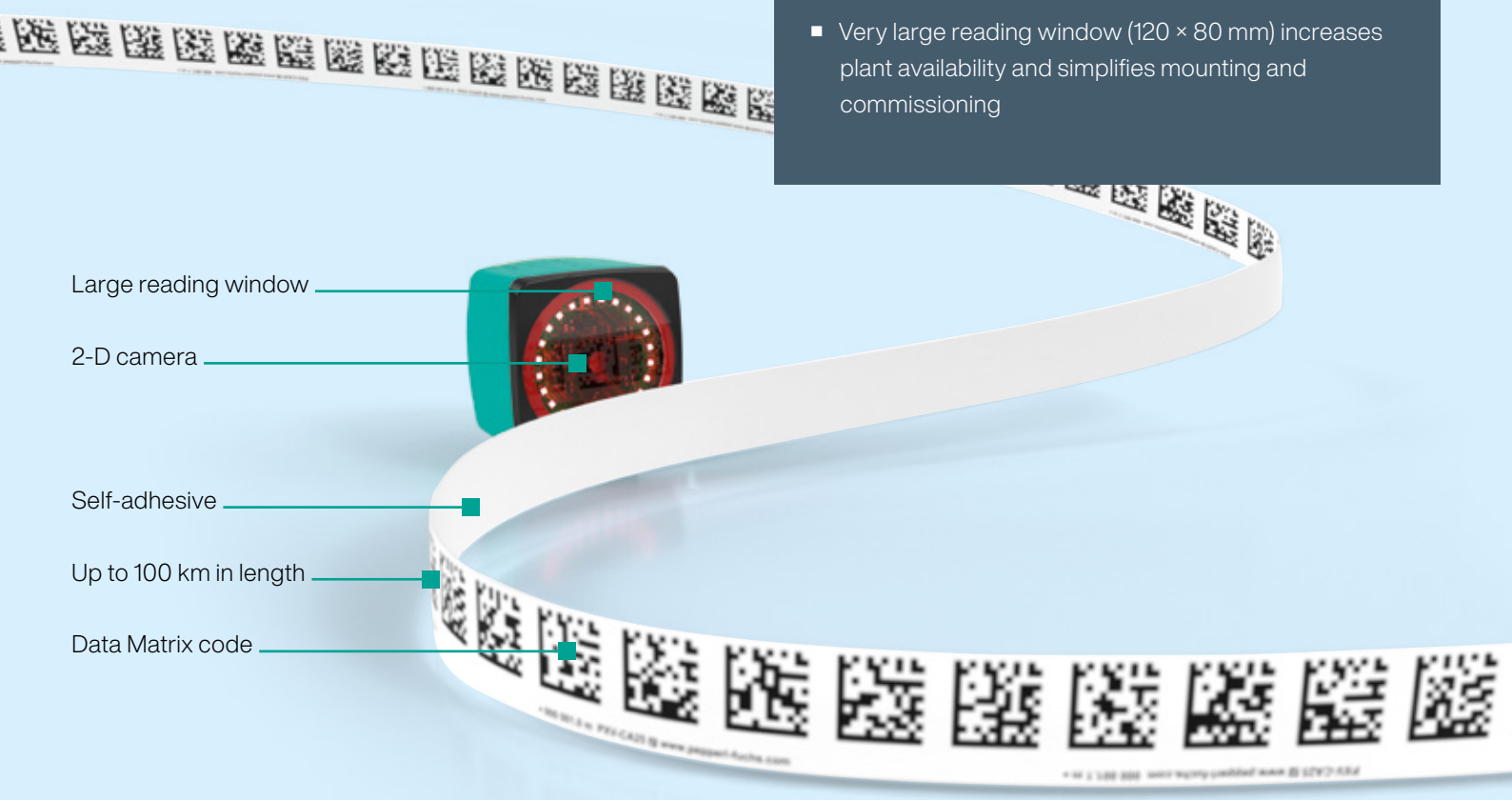
The use of several Data Matrix codes to carry information allows data to be displayed in a highly redundant manner—a level of multiple redundancy that makes the PXV extremely resistant to interference. Positioning in the Y direction can also be carried out at any time using Data Matrix codes.

Since the entire system is noncontact and requires no moving parts, it is completely maintenance-free and can be operated very cost-effectively. The device is comprehensive, can be easily parameterized, and the freely configurable inputs and outputs mean the device can be adapted as necessary to provide the optimal solution for each individual application.

Mounting is quick and easy; the PXV simply needs to be aligned at the nominal distance to the code tape and can be put into operation quickly. Parameterization is easy to do using Data Matrix control codes, a PC, or directly from the control panel.

Highlights

- Unaffected by contamination or damage to the code tape due to code redundancy and extra-wide reading window
- Quick commissioning through parameterization via Data Matrix control codes, a PC, or directly from the control panel
- Self-adhesive code tape with a length of up to 100,000 m
- Very large reading window (120 × 80 mm) increases plant availability and simplifies mounting and commissioning



Excerpt of Technical Data	PXV100-F200-R4-V19	PXV100S-F200-SSI-V19	PXV100I-F200-B25-V1D	PXV100Q-F200-B17-V1D	PXV100AQ-F200-B28-V1D
Measurement resolution	±0.2 mm				
Measuring lengths	0 m ... 10,000 m			0 m ... 100,000 m	
Free tolerances to the code tape	±50 mm ±30°	–40/+20 mm ±30°	±50 mm ±30°	±50 mm ±30°	±30 mm ±30°
Interface*	RS-485	SSI	EtherNet/IP	PROFINET	PROFIsafe
Options	–	S: Quick measuring rate	I: Infrared illumination (not visible)	Q: Output quality grade	AQ: Quality grade, colored tape

* Additional interfaces available on request.

PXV Data Matrix Positioning System

With Multiple Redundancies for Uncompromising Process Safety

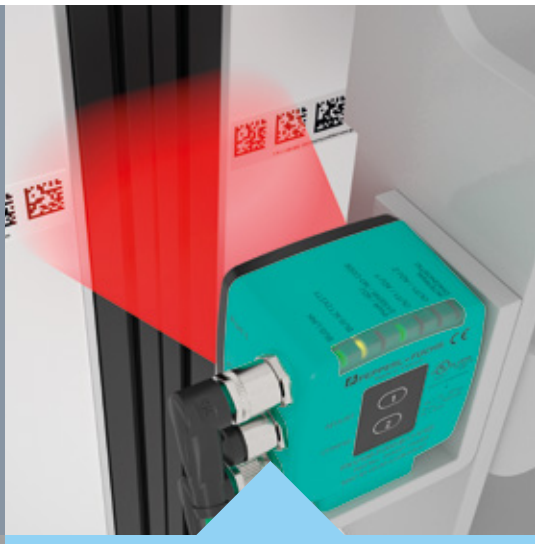
Durability and maximum insensitivity are the hallmarks of the Data Matrix code tape from Pepperl+Fuchs. Excellent redundancy also enables a high tolerance for contamination and damage, and ensures completely reliable processes.

Customized and Highly Flexible Configuration

The Data Matrix code tape is precisely tailored to suit the individual application and can be supplied in sections ranging from one meter to 100 kilometers in length. To apply the self-adhesive tape, simply remove the protective film and apply the code tape to a grease-free surface. The tape is highly flexible, meaning that not only can it be laid on straight routes, but if required by the application, it can also be installed in curves, circular shapes, slopes, or hollow shafts.

The read head travels parallel to the code tape and provides the X absolute position, a Y offset to the center of the code tape, the movement speed, and various status values with quality values that can be read out via the control panel. Even gaps of up to 75 mm and large Y tolerances have no effect on its performance.

Reliable processes even with contaminated codes



Exact absolute positioning with a ±0.2 mm measurement resolution over routes up to 100 km in length

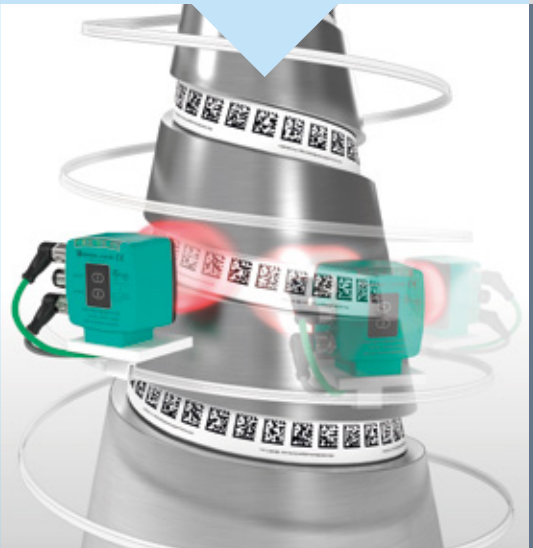
Reliable positioning even over gaps of up to 75 mm

Online Code Tape Generator: Quick Replacement for Short-Term Repairs

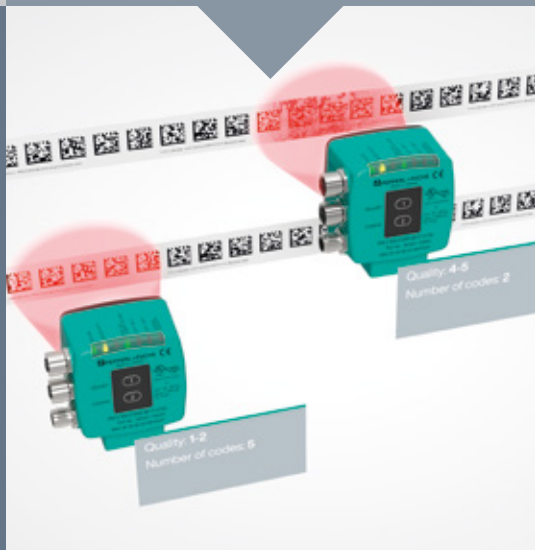
Despite its extremely high resistance, in isolated cases a Data Matrix code tape may be mechanically damaged during use. To completely eliminate downtime, the required part of the tape can be generated online using the code tape generator, printed out straight away, and applied directly to the affected location. At the same time, the section that needs to be replaced is reordered and the application can continue to run reliably and without interference until the replacement arrives.

High inclination tolerance of ±30° and depth of focus of 50 mm for very narrow curve radii, inclines, and declines

Continuous monitoring and contamination detection using data output for code tape quality and number of codes read



Maximum functional safety and route control through constant monitoring of the Y tolerance



Absolute Positioning System for the Optimal Application Solution

Sensor

Interfaces

PROFINET

EtherNet/IP

PROFIsafe

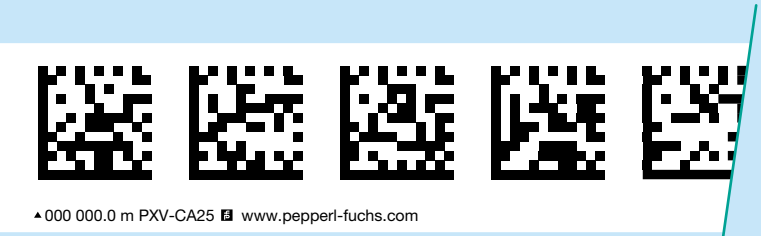
RS485

SSI

Additional interfaces available on request

Code Tape

Code Tape

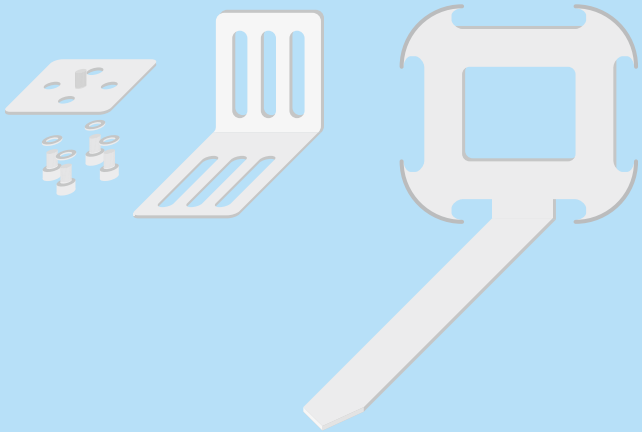


- Freely configurable start position
- Length up to 100 km
- Any combination can be printed or ordered
- The safePXV version meets the SIL 3/PL e standard with just one sensor

Accessories

Operating Software

Alignment and Mounting Aids



Options

SIL 3

safePXV version
up to SIL 3/PL e

10 ms

Quick measuring rate
10 milliseconds

IR

Infrared/invisible
illumination

Output of tape quality for
contamination detection

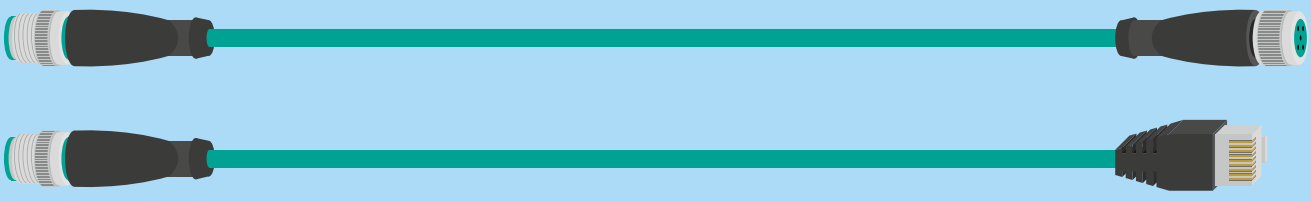
20 m/s

Travel speed 20 m/s

Event Markers

- Number range of 1 ... 999
- Up to 1 m per event marker number
- Switch outputs using events
- Numbers transmitted via data protocol
- Self-adhesive mounting directly next to the code tape

Connection Cable



Shielded connection cable, for all RS485, SSI, and fieldbus interfaces

Applications

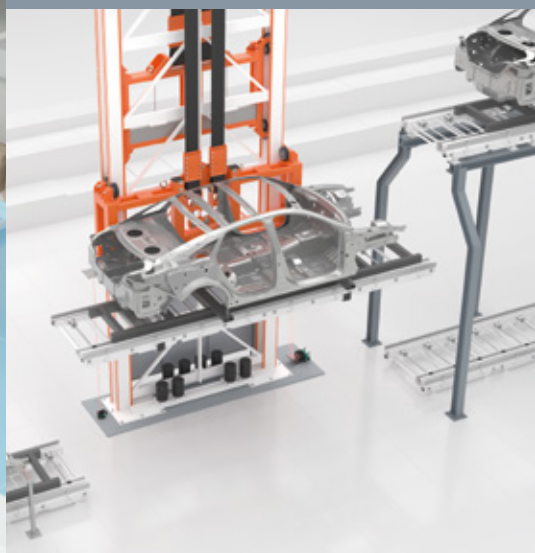
Exact Positioning for All Application Requirements

Automated storage and retrieval systems, or monorail conveyors with tracks measuring up to 100 kilometers, a position resolution of ±0.2 millimeters, and traverse distances in the X or Y direction—when it comes to high-precision absolute positioning over long, complex routes, PXV technology is ideal for meeting individual application requirements down to the smallest detail.

Excellent Reliability for Automated Storage and Retrieval Systems

Automated storage and retrieval systems are used to store or retrieve materials in high bays quickly and precisely. The safePXV positioning system with Data Matrix code tape is used to ensure highly reliable positioning in this application. The device can be used both horizontally in the aisles and vertically in the lifting axle area.

For this purpose, the Data Matrix code tape is installed on the mounting rail, while the 2-D read head is mounted on the chassis that moves parallel to it. Both the tape and the read head can be attached very quickly and easily. Because the system is noncontact and has no moving parts, it is extremely durable and does not require any costly maintenance intervals.

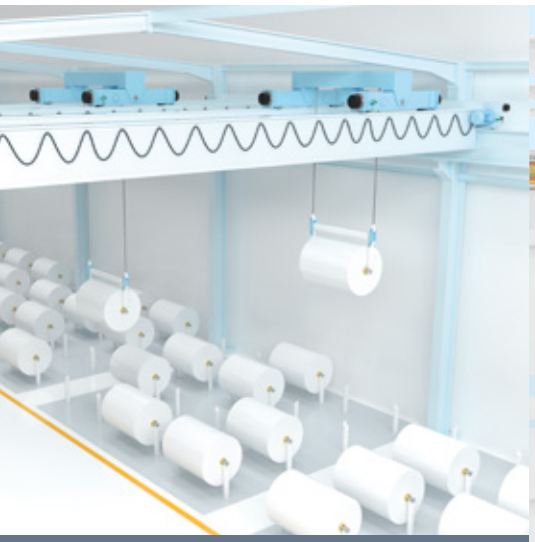


Precisely Determining the Absolute Position of Monorail Conveyors

Monorail conveyors (EHB—*Elektrohängebahnen*) are used to ensure smooth in-house transportation during the production process. An example of an important area of application for these systems is in the automotive manufacturing sector. Each EHB consists of a rail system with power rails and several EHB hangers. Depending on the route, the rail system consists of straight elements, curves, inclines, or declines, which are attached to the ceiling. To ensure maximum safety, transparent production, and quick analysis in the case of a fault, the central control system must know the exact position of the individual EHB hangers on the route at all times. The PXV cameras from Pepperl+Fuchs constantly pass on the absolute position to the affixed Data Matrix code tape—precisely and with the highest possible level of reliability.

Other Applications

- Automotive (skid, skillet, lifting gear/lifts, rotary tables)
- Warehousing and material handling (automated storage and retrieval systems, mobile robots)
- Machine building (assembly handling, rotary tables)
- Renewable energies (wind turbines)



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- Enterprise Mobility
- Hazardous Area Products and Solutions

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