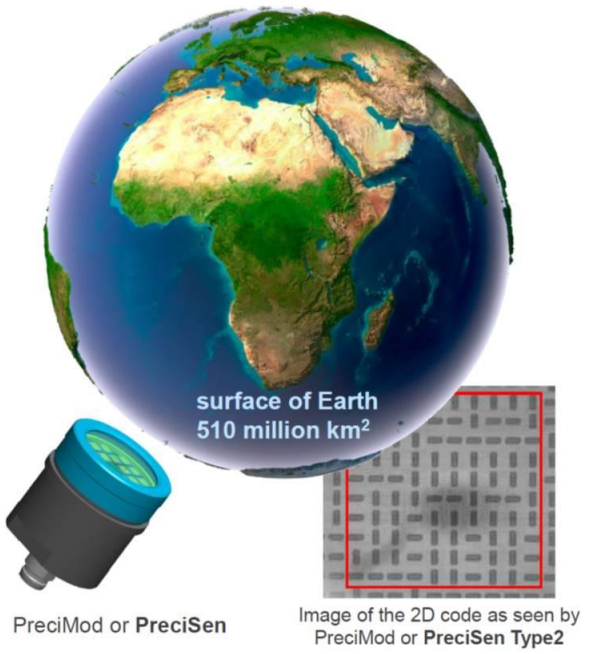
PreciLabs

Nanometer precision absolute 2D position over 510 million km²

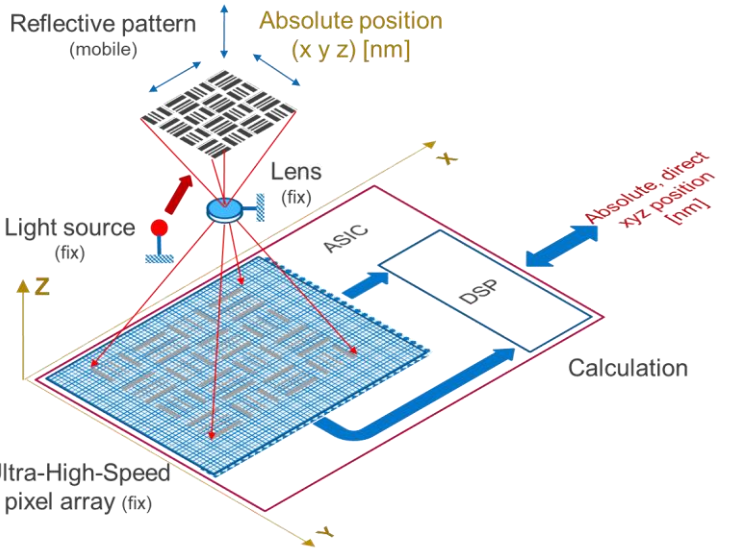
PreciLabs proprietary **2D absolute position encoding and real-time 2D absolute position decoding** techniques (patent pending) enable the reading of the 2D absolute position of a 2D absolute code printed on a surface:

- **High Precision (sub-nanometer)**
- **Very high position refreshment cycle (>100kHZ)**
- **Large sensor/scale travel speed (200m/s)**
- **Practically infinite scale dimension (>500e6 km²)**
- **Best in class error detection and correction**
- **Scale damage and/or contamination up to 50%**
- **Highest safety integrity level**
- **Compensation of static and dynamic tolerances**
- **Easy, low-cost printing and installation e.g. self-adhesive tapes in arbitrary lengths / segments**
- **Compact, low-cost, single-ASIC solutions**
- **Condition monitoring, early detection of failure**
- **Deformation sensing**
- **LASER marking reading on shiny steel surface (e.g. hydraulic piston rod)**
- **Can serve Multi-dimensional, 2-6D absolute position sensing**



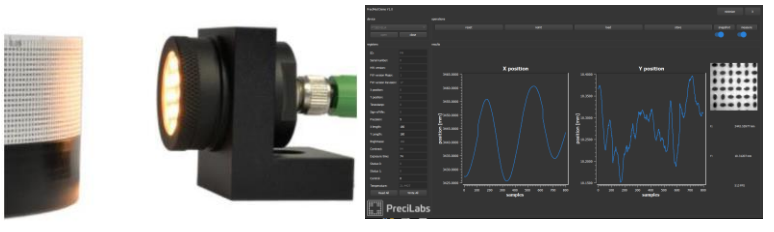
Typical Parameters	Units	PreciMod	PreciSen
Pattern pitch	mm	0.1-10	0.1-10
Resolution / precision	um	0.001-1	0.001-1
Accuracy	um	0.1-1	0.1-1
Absolute position refresh rate	kHz	0.1-1	20-100
Scale/sensor travel speed	m/s	10-100	10-200
Scale-to-sensor distance	m	0.003-1	0.003-1

PreciMod is standard components solution (Production NOW)
PreciSen is a a custom Asic solution (2021 Production)



Hydraulic Piston Elevator position

PreciLabs Absolute 2D Position Sensors are offered as PreciLabs branded products for system integrators or White Label product to sensor manufacturers. The modularity of the design offers different connectivity protocols and the option to design custom enclosure around the PreciLabs sensor module hardware. For higher volume application, PreciLabs provides a reference design based on PreciLabs position sensing components and firmware.



Demonstrator

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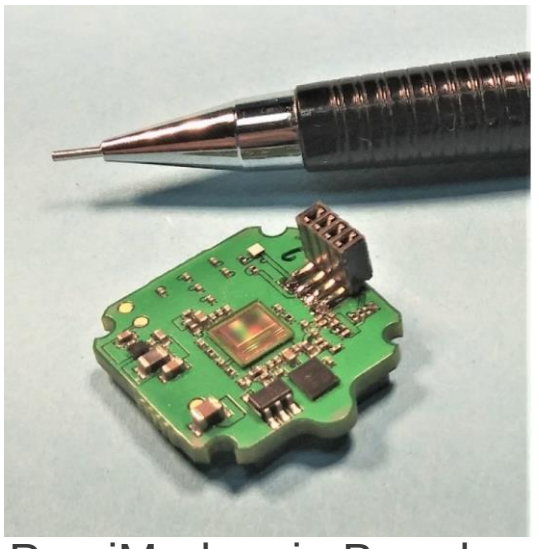
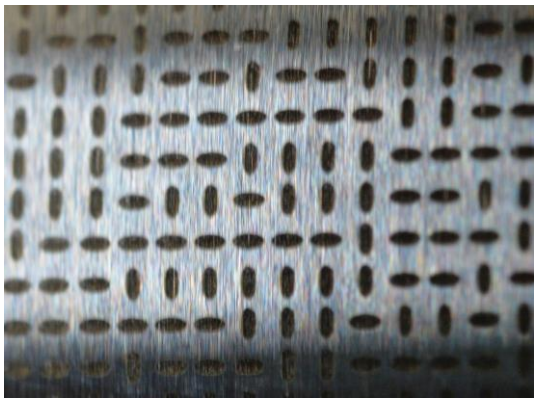
Application examples:

- Hydraulic piston position (e.g. forklift trucks, construction machines, mining, etc.)
- Elevator cabin position
- Elevator motor angular position (>23bit/revolution (b/rev))
- Moving Stages 2D-6D position *(we can use also the printed 2D code for 3D-6D)*
- Conveyor position in factory automation
- Assembly lines in factory automation
- Three dimensional 3D robot / forklift track position for warehouse order preparation system
- Storage rack position
- 1D-2D cutting machines (e.g. wood, steel, plastic)
- Precise crane position
- Torque sensing
- Deformation, load sensing, condition monitoring of machine parts, early detection of failure



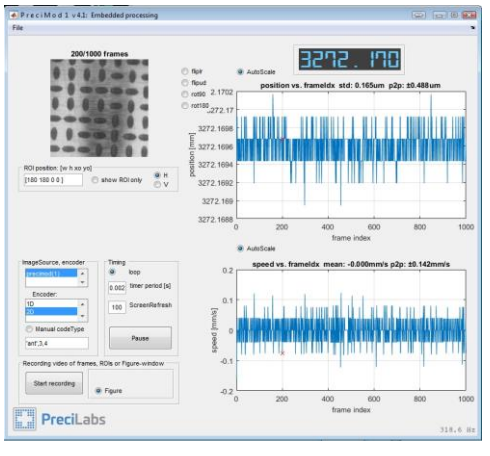
PreciMod main Board

Integrated module



0.5mm pitch, 2D laser marking example

reads <<1ppm error rate during a life-time test (2 million strokes) of a hydraulic piston rod with contaminated oil



Field Test Analysis tools

precision = 0.165 um on an 500um pitch laser marking of the piston rod

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