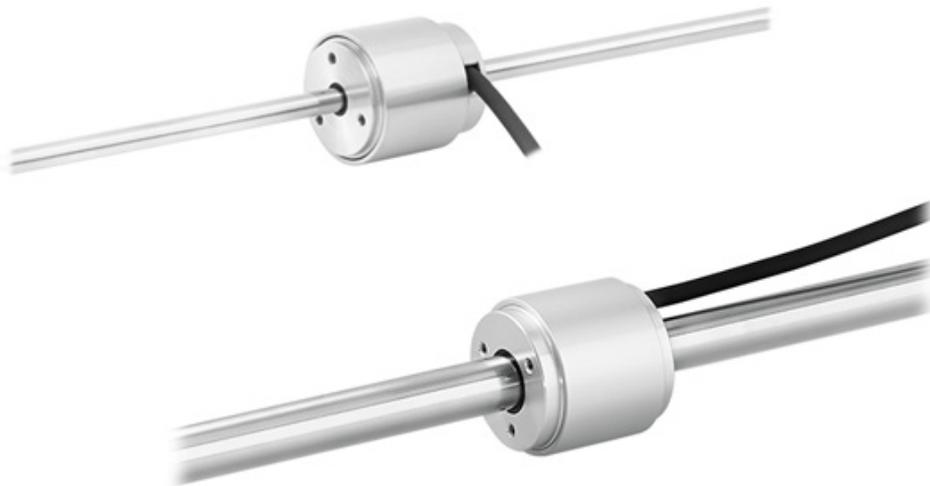


# LinACE™ in-axis absolute linear encoder system



## Abstract

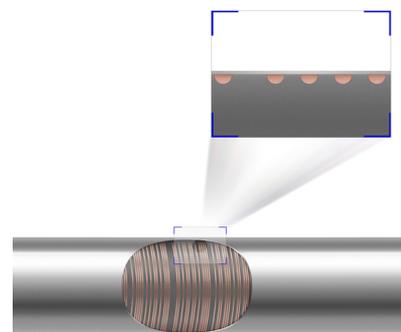
**LinACE** is a unique absolute linear encoder system that uses a solid steel rod as a code carrier or scale. It is designed to be integrated into the servomechanism as a transducer, providing accurate measurements with excellent resolution and repeatability. It can be used as a control device or integrated directly into hydraulic, pneumatic, electromechanical actuators and linear motors as a position or velocity feedback element.

Whether you are building a 3D printer, a flight or driving simulator, medical or laboratory equipment, or a voice coil actuator, you may face challenges such as limited mounting space or where to place the tape-like scale, as well as requirements for high repeatability and high resolution.

If you need a position measurement with a resolution of up to 0.5  $\mu\text{m}$  and an accuracy of up to 5  $\mu\text{m}$ , LinACE is the perfect solution.

Another great advantage of the **LinACE** is that it is a true absolute encoder. This means that the exact position is known immediately after switching on, without any movement, limit switch or reference mark.

The compact readhead detects and evaluates the modulation of the magnetic field on the coded hard-chrome-plated solid steel rod.



This opens up completely new possibilities for installation and mounting in various devices.

The position of the encoder is maintained even if the shaft rotates during forward and backward movement.

## Direct on-the-spot-encoding

The implementation of LinACE technology represents a step forward from indirect position measurement through a parallel encoder system (Fig. 1) to direct on-the-spot encoding (Fig. 2) by the novel **in-axis absolute linear system**.

By replacing the main actuator shaft with a hard-chrome plated LinACE coded shaft, the encoder becomes part of the actuator and enables measurements in the axis of motion. This results in higher accuracy and a reduction of system components.

Fig. 1: Parallel encoder position measurement

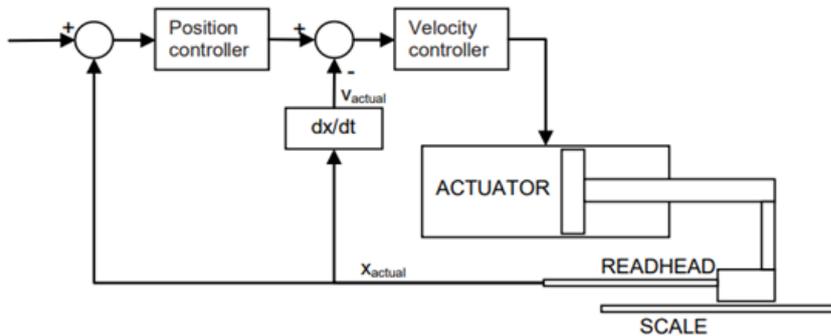
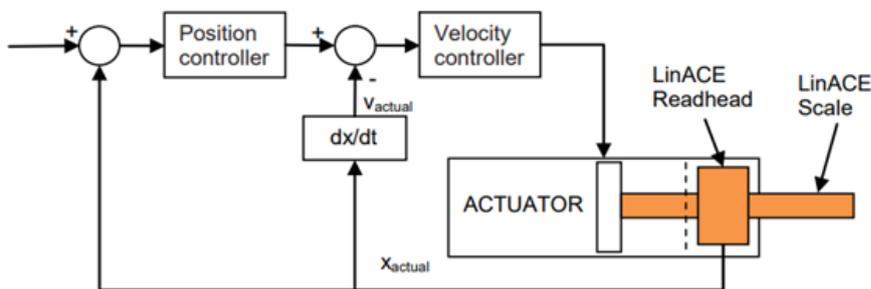


Fig. 2: In-axis encoder position measurement



## LinACE application examples

The Paternoster company is engaged in the development and production of hydraulic systems.

In 2012, a double material feed cylinder with a built-in LinACE encoder was installed in the closed-loop servo-hydraulic press for sintered compounds. A precise and reliable encoder is required for the **smooth positioning** of a hydraulic cylinder.

LinACE is part of a control system that ensures better product consistency by controlling both the compression displacement as well as compression force.

The cylinders have been operating continuously and faultlessly since 2012.

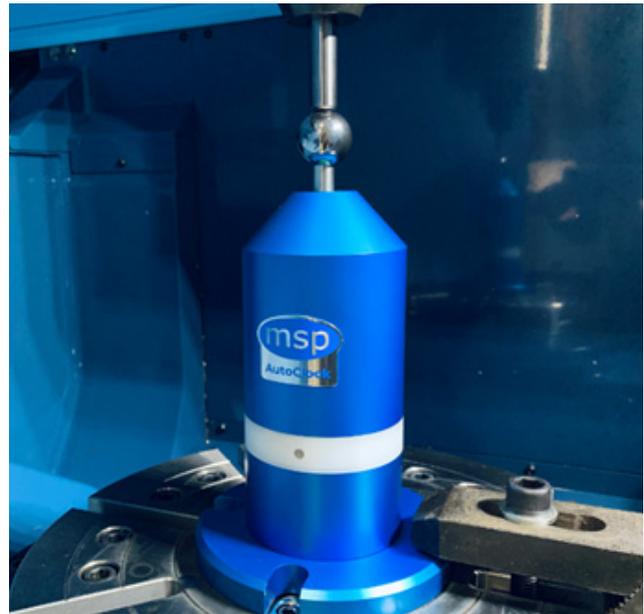


Another application example is **AutoClock** by the British company Metrology Software Products (MSP).

AutoClock is the first product on the market that automatically determines the position of a calibration sphere in the CNC machine tool, as part of the on-machine **probe setup process** and calibration.

Benefits of the product include:

- Micron-accurate measurement of the sphere position for an error-free process
- Automated upload of the result to the controller for 24/7 lights-out automation
- Generation of a result in less than three minutes for minimum machine downtime
- Removal of safety issues associated with entering the machine volume



## About LinACE

LinACE encoders operate over a wide temperature range and are highly resistant to shock and vibration.



Although these encoders operate on the principle of magnetic field sensing, they have excellent resistance to stray magnetic fields. The hard-chrome plated coded shaft is not magnetised and cannot be damaged by stray magnetic fields.

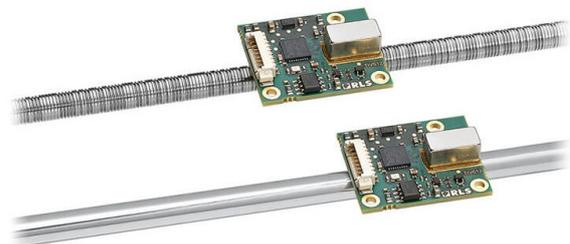
Communication options include BiSS, SSI, Asynchronous Serial Interface and Pulse Width Modulation.

Digital outputs have several advantages over analogue. They are less susceptible to electromagnetic interference, allow for a built-in advanced self-monitoring function that

continuously checks various internal parameters, and can even employ error detecting codes such as CRC.

Error reports, warnings and other status signals are available via digital communication interfaces. All this results in higher reliability, especially when longer cables are used.

You can choose from three different coded shaft diameters to find a perfect solution for your application: 6 mm, 8 mm and 12 mm diameter.



The **LinACE flat board sensor module** is available for applications with limited space.

## Head office

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