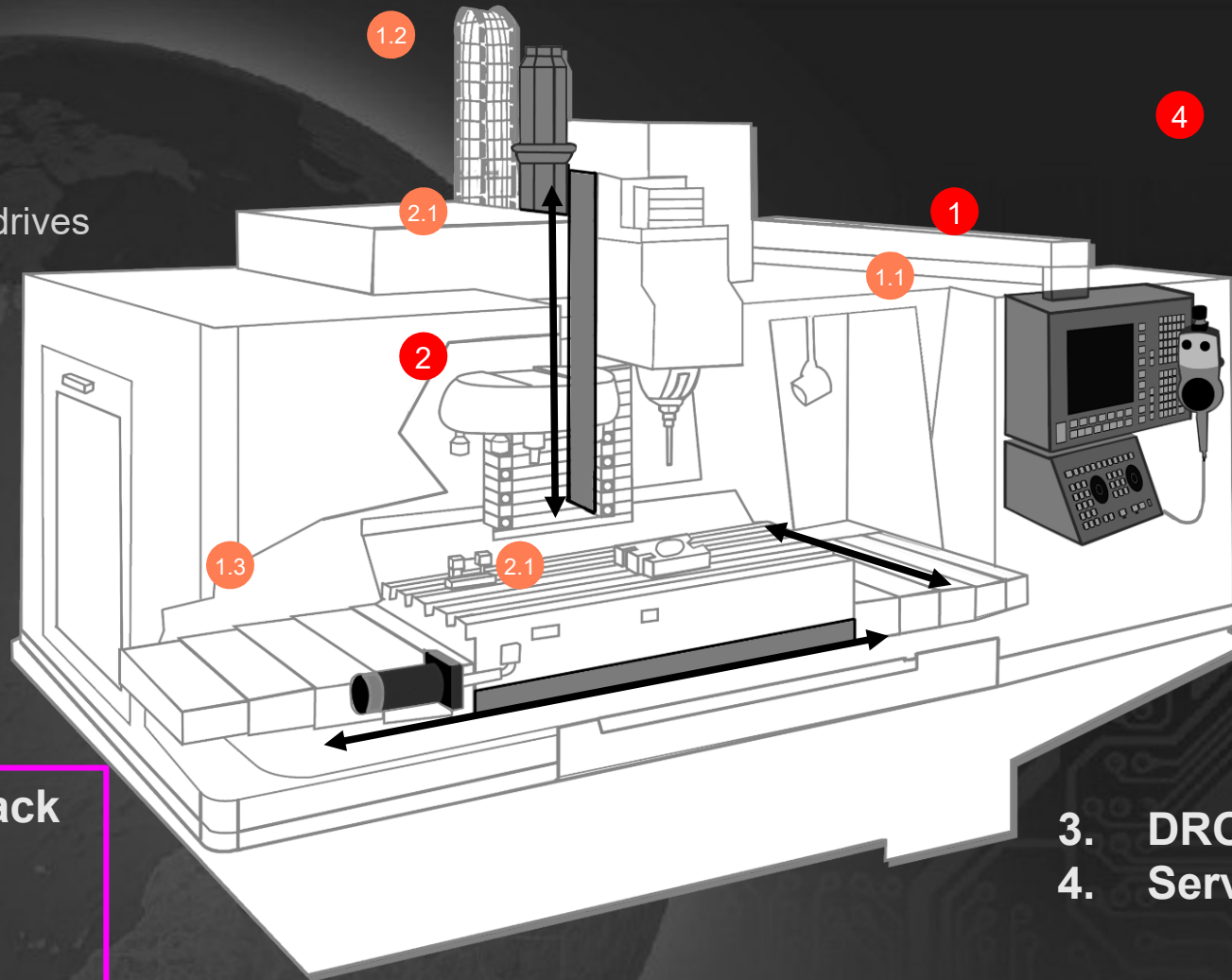


## 1. CNC systems

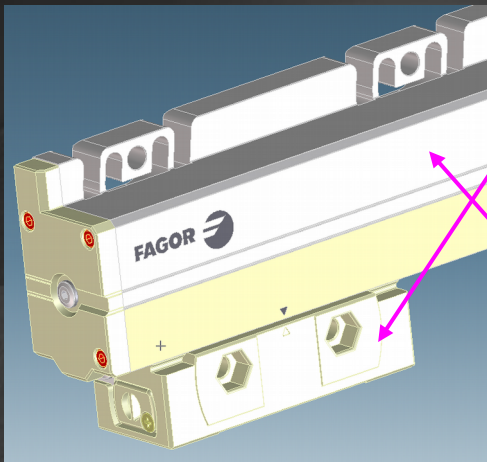
- 1.1 Numerical control
- 1.2 Spindle motor
- 1.3 Axis motors
- 1.4 Power supplies and drives



## 2. Optical Feedback Systems

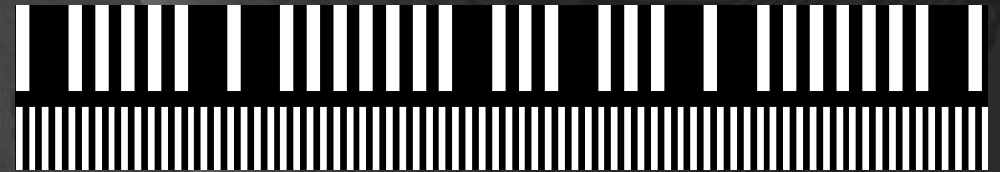
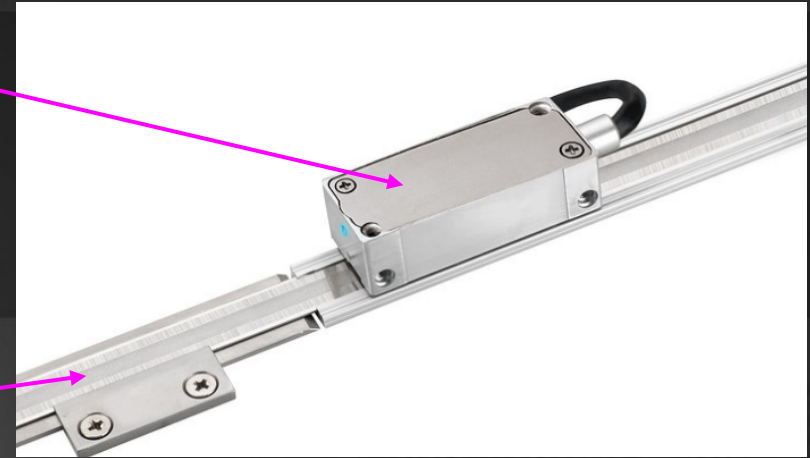
- 2.1 Enclosed / Open
- 2.2 Linear / Rotary
- 2.3 Incremental / Absolute

- 3. DRO systems
- 4. Service

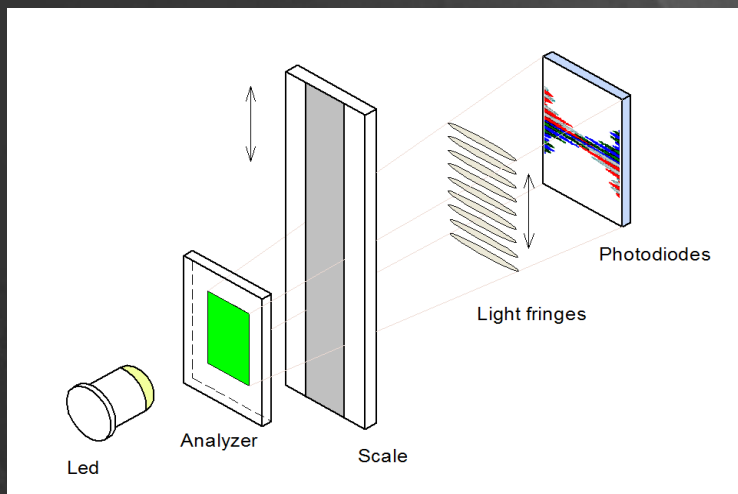


Reading Head (moving)

Scale (Fix)



Example of Scale: diffraction Grating  $\sim 20 \mu\text{m}$

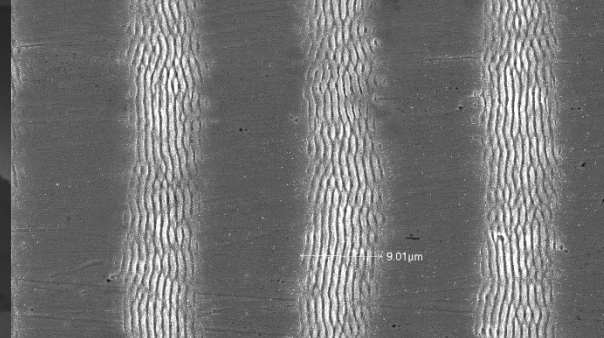
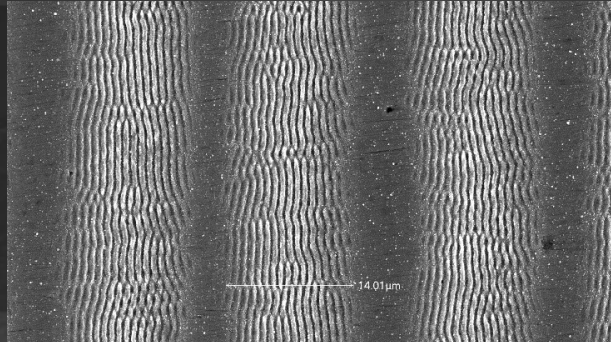


## WORKING PRINCIPLE

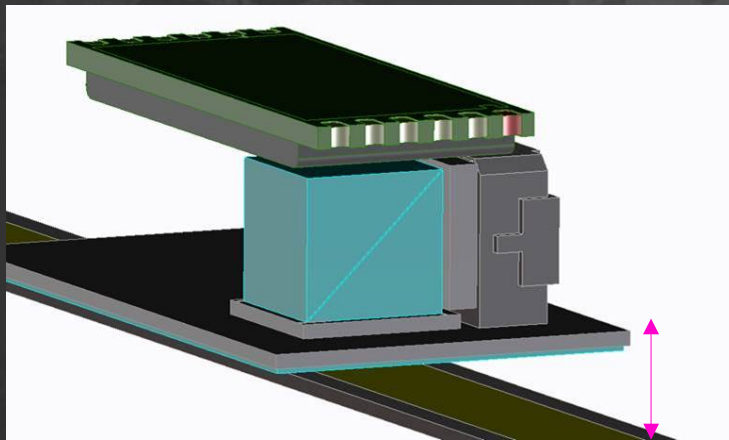
The optical interaction between the scale and the analyzer generates an optical pattern that is modulated according to the relative movement between the scale and the reading head.

Such optical modulated pattern is transformed into electrical signals to be sent to the Controller

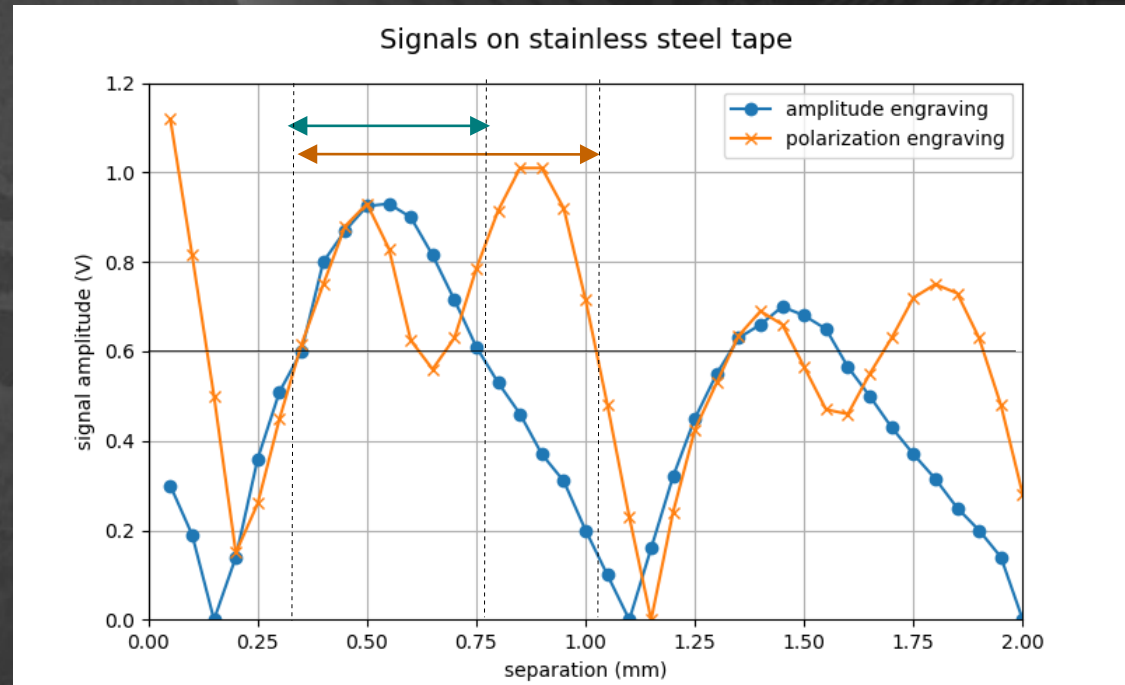
# Laser Texturization Application



The presence of LIPSS on steel tapes allows to extend the tolerances of the mounting process

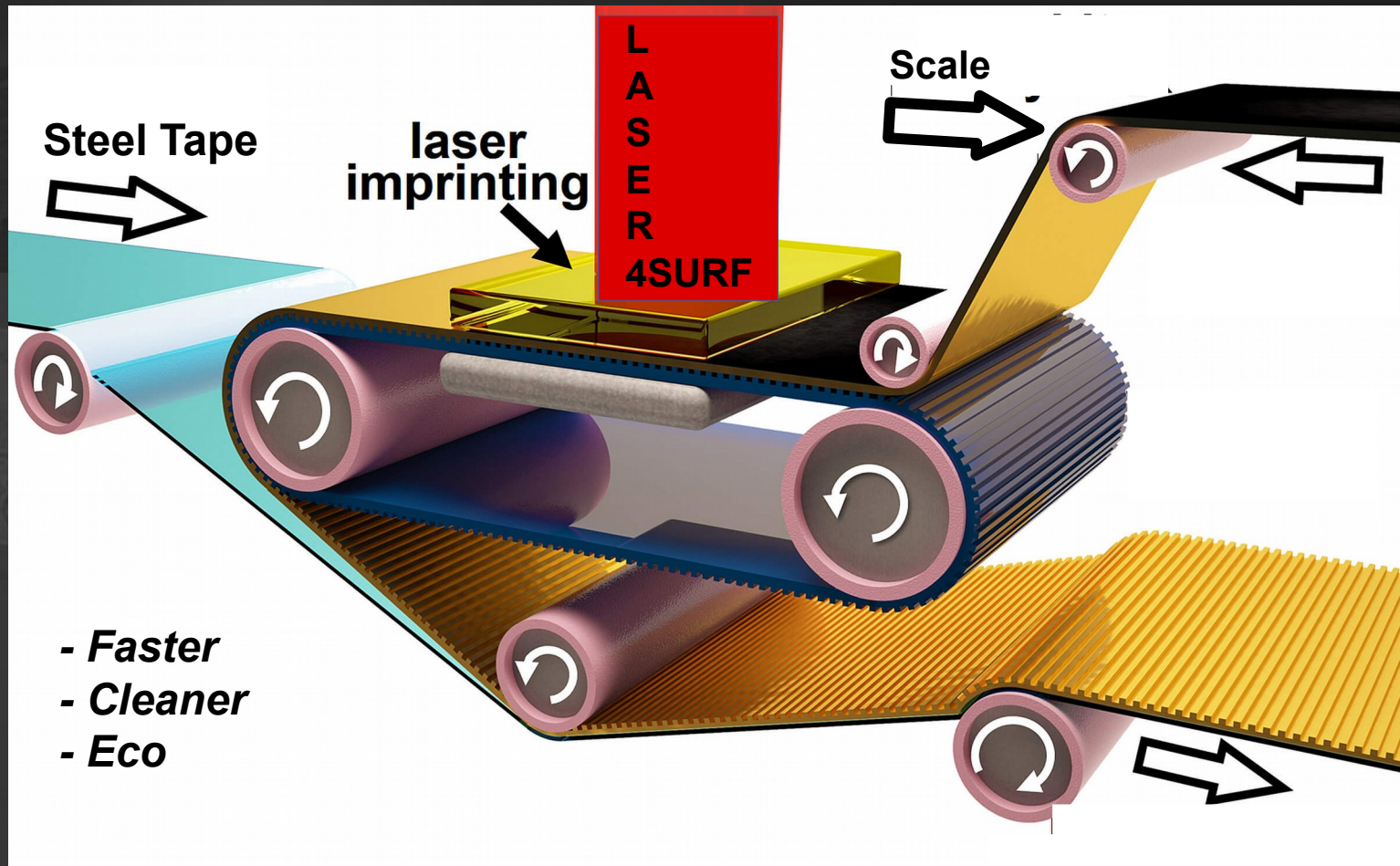


Gap between Scale and Reader Head



# Laser Texturization Application

## Continuous Laser Engraving Process



- Lipps: Phase, Amplitude and Polarization behaviour
- Quality and definition of the lines