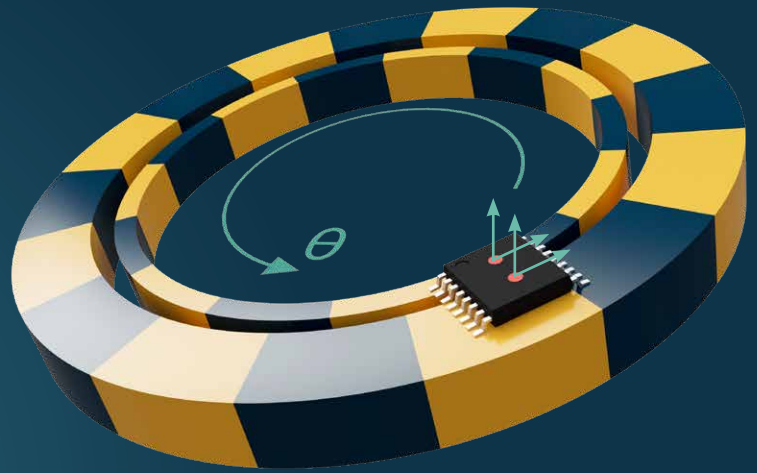Robotics

Popularize precise motion for robots
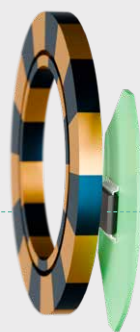
ARCMINAXIS™

Arcminaxis™ is a technology addressing the growing demand for affordable, high-precision position sensing in robotic joints. Combining multi-axis sensing with Vernier technology, it reduces the complexity and effort involved in assembling robotic joints.

The Arcminaxis Vernier sensing concept combines two sensing spots with orthogonal components

Patented Vernier magnet

Sensor IC
Operating software

Key features

- ⊘ Resolution up to 18 bits
- ⊘ Pitch-independent, one IC fits various magnets
- ⊘ High speed with fast SPI interface
- ⊘ Reduces the complexity involved in assembling robotic joints
  - · Large air gap sensor to magnet (1.5 mm nominal)
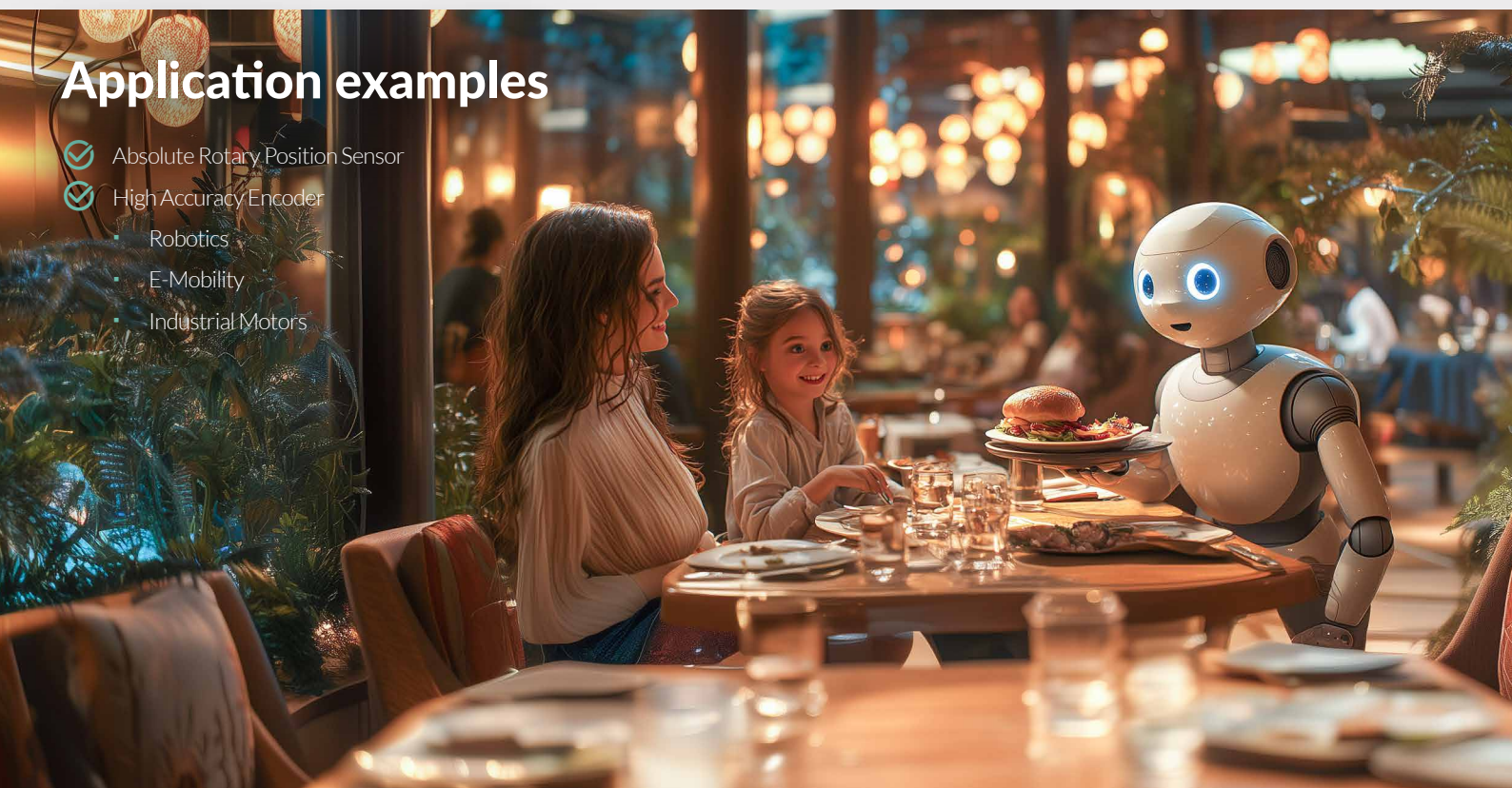 - · Generous magnet-sensor placement tolerance of ±0.5 mm

- ⊘ TSSOP-16 Sensor package
- ⊘ Supply 3.3 V
- ⊘ Temperature from -20 °C to 85 °C

384-0AA
F65806
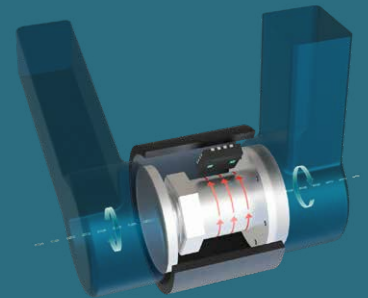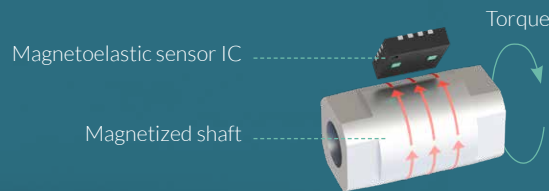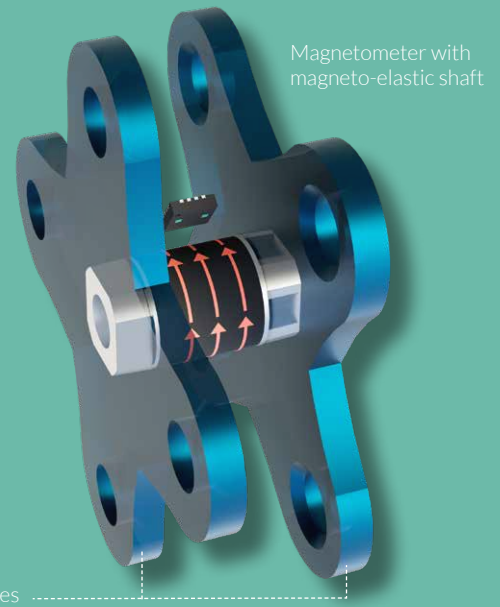X1-L

MLX90384

Application examples

- ⊘ Absolute Rotary Position Sensor
- ⊘ High Accuracy Encoder
  - · Robotics
  - · E-Mobility
  - · Industrial Motors

Ultra compact and contactless integrated torque sensing

Magnetometer with magneto-elastic shaft

ELAXIS™ MODULE

The Elaxis™ module is a compact torque sensing solution that comes as a two components set for your robotic joints: a magnetometer and a magnetoelastic shaft.
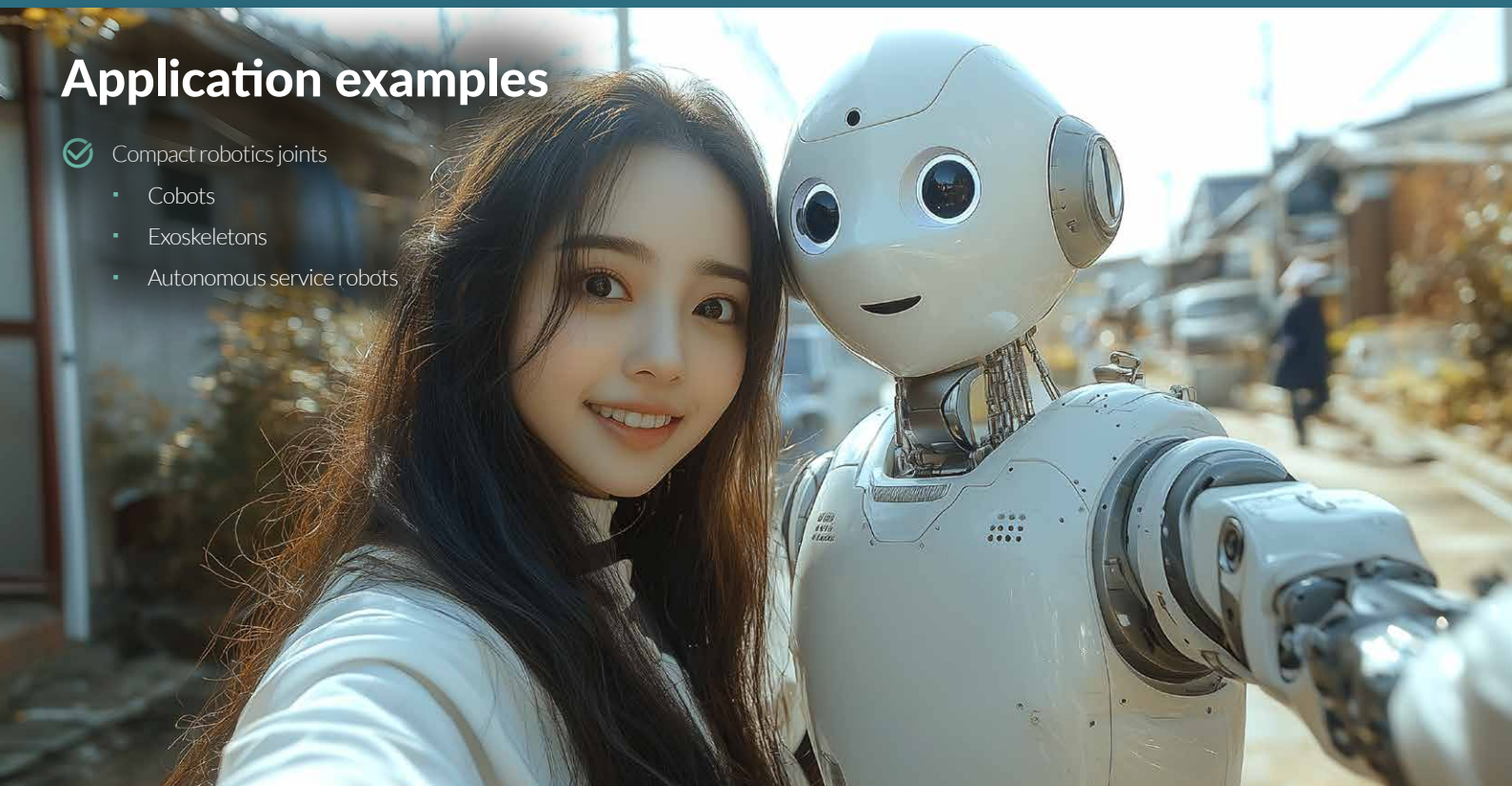
Adaptive flanges

Magnetoelastic sensor IC
Magnetized shaft
Torque

Key features

- ⊘ Single chip solution
- ⊘ Compact and lightweight shaft (15 mm length, less than 80 g)
- ⊘ Magnetoelastic torque sensing
  - Torque: <50 Nm
  - Resolution: 0.1% full scale

- ⊘ Robust & reliable
  - Contactless sensing
  - Stray magnetic field immunity
- ⊘ Linear output through I2C, SPI or Analog

Application examples

- ⊘ Compact robotics joints
  - Cobots
  - Exoskeletons
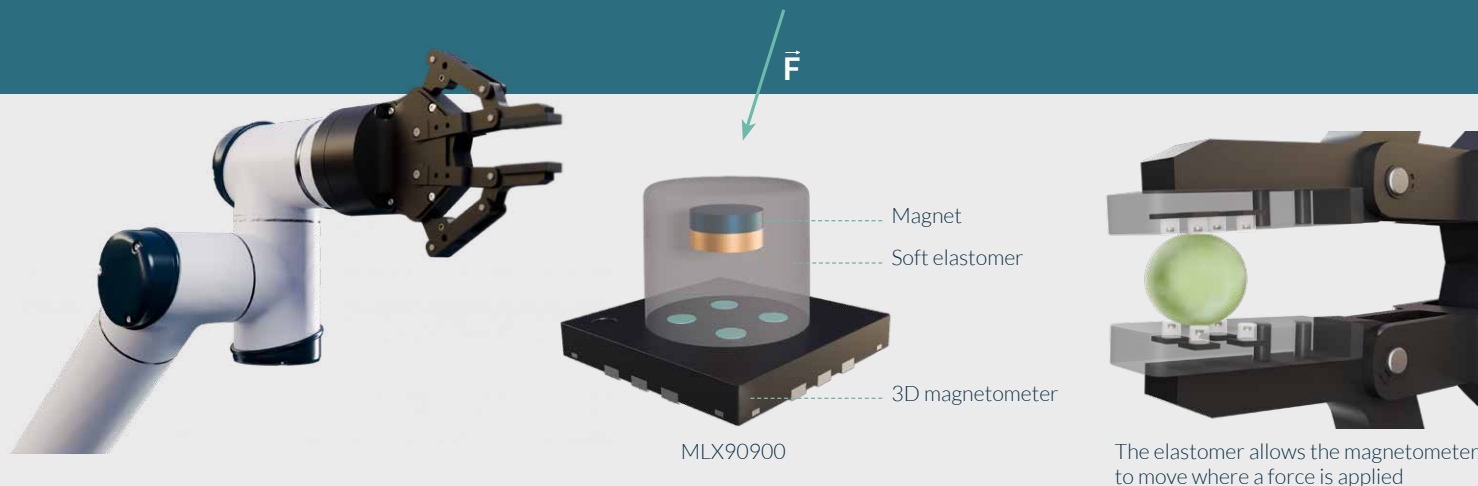 - Autonomous service robots

Give robots a sense of touch

TACTAXIS™

The MLX90900, a monolithic magnetic tactile sensor, is the core component of Melexis' Tactaxis™ tactile sensing solution. Tactaxis™ empowers robotic systems with enhanced tactile and force feedback capabilities, paving the way for robots to develop a sense of touch.

Triaxis® 3D magnetometer and a magnet embedded in an elastomer

$\vec{F}$

Magnet
Soft elastomer
3D magnetometer

MLX90900

The elastomer allows the magnetometer to move where a force is applied

Key features

- 3D force sensing
  - Normal force: 5 N
  - Shear force: 2 N
  - Accuracy: 10% full scale
  - Precision: 1% full scale
  - Resolution and Sensitivity: 10 mN
- Scalable into arrays
- Temperature from 0 °C to 85 °C

- Robust & reliable
  - Stray magnetic field immunity
  - Thermal stability
  - Harsh environment ruggedness
- Compact QFN-12 (6x6x5 mm^3)
- Flexible communication
  - I2C (< 1 Mbps)
  - SPI (< 10 Mbps)

Application examples

- Cobot and industrial grippers
- Humanoid robot hands
- Collision detection
- Prosthetic hands
- Exoskeletons
- Rehabilitation robots
- Medical robots

A.I.