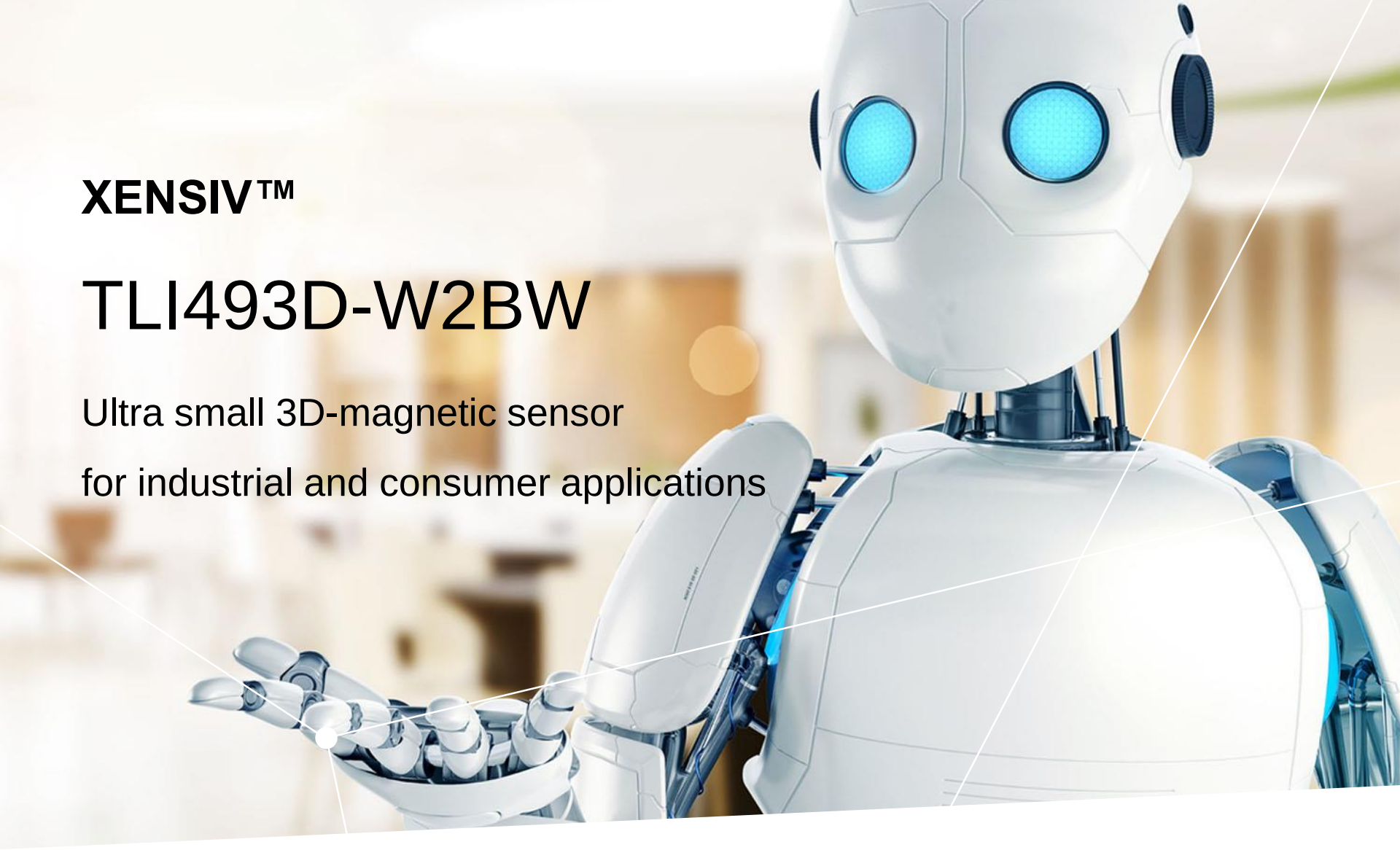


XENSIV™

TLI493D-W2BW

Ultra small 3D-magnetic sensor

for industrial and consumer applications

IFAG ATV SC MS P

Mar 2021

Agenda

1. TLI493D-W2BW key features and benefits
2. Application highlights with 3D and other magnetic sensors
3. Competitive advantage by using Infineon XENSIV™ Sensors

Agenda

1. TLI493D-W2BW key features and benefits
2. Application highlights with 3D and other magnetic sensors
3. Competitive advantage by using Infineon XENSIV™ Sensors

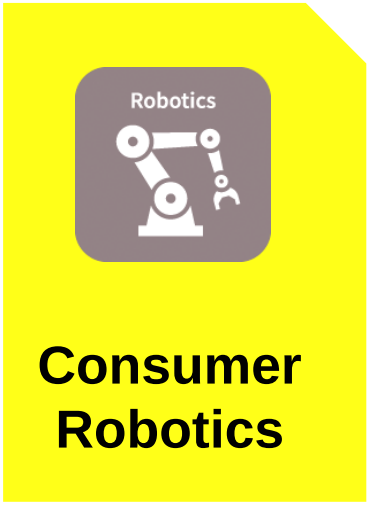
TLI493D-W2BW Key Features and Benefits

Key features	Key benefits	Value
Wake Up	› Allows power down of µC and application	**Extended battery runtime in application/ reduce battery size**
Ultra low power concept	› Power consumption adjustable between 7nA-3,4mA	
Accurate 3D magnetic measurement	› 3D sensing allows for high versatility (3D, 2D, long range 1D measurements)	**High magnetic accuracy allows to relax mechanical setup → overall system cost reduction**
	› 3.5% XY matching drift over lifetime and temperature	
Tiny WLB package - Halogen free	› Tiny WLB Package (1.13x0.93x0.59mm) allows small designs and full flexibility	**Address new applications requiring high accuracy and small form factors**
	› Fulfills halogen free requirements from consumer devices	
Large amount DI support material available (ANs, SW, simulation, Kits & boards, gadgets)	› Ease of design in, faster time to market	**Competitive advantage**

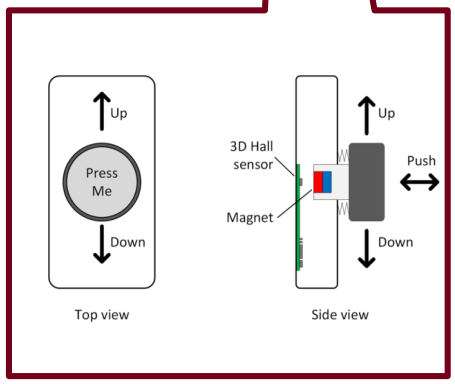
Agenda

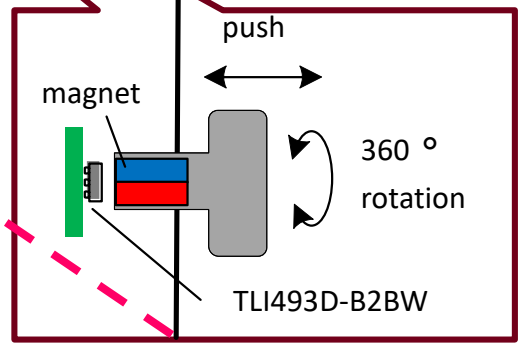
1. TLI493D-W2BW key features and benefits
2. Application highlights with 3D and other magnetic sensors
3. Competitive advantage by using Infineon XENSIV™ Sensors

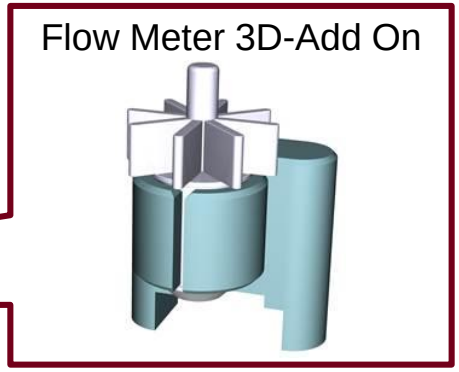
Applications



Coffee Machine







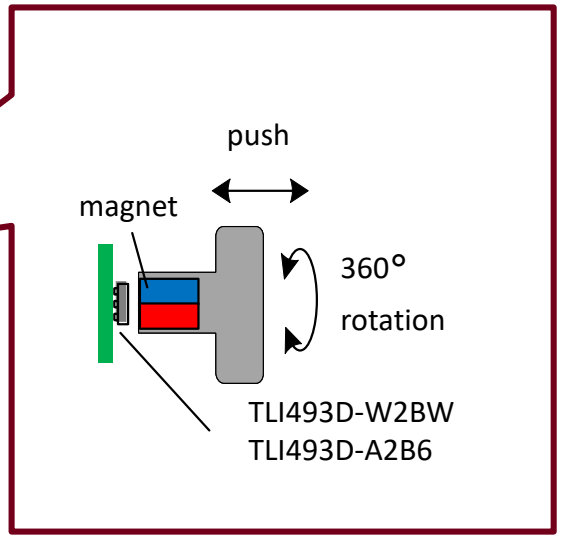
Application Description:

- HMI (**Hall** switch, 3D)
- Flow meter (Hall switch, 3D)
- **Water** level sensing (3D)
- Coffee grinder adjuster (3D, angle sensor)
- Flaps and drawer closing detection (Hall Switch)

Benefits:

- Extremely small size, slim PCB with new WLB package sensor
- Push and rotation functionality with a single sensor
- Contactless measurement principle minimizing wear and tear
- Full mechanic design flexibility with 3D Hall technology

Washing Machine, Tumbler



Application Description:

- HMI (Hall switch, 3D)
- Door contact (Hall switch)
- Load detection/weighting (Hall switch, 3D)
- Anti tumbling (Hall switch, 3D)

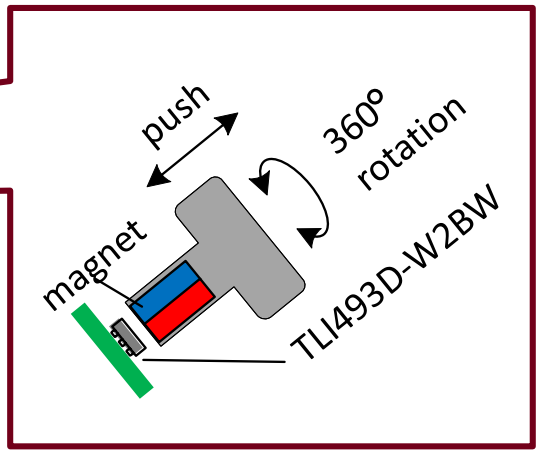
Benefits Magnetics:

- Contactless measurement principle minimizing wear and tear
- Better design flexibility as with mechanical/resistive solution

Additional Benefits 3D Sensor:

- Further improved mechanic design flexibility with 3D Hall technology
- Push and rotation functionality with a single sensor
- 3D sensor in WLB package: extremely small size, slim PCB design, high design flexibility (lateral, vertical)

Vacuum Cleaner



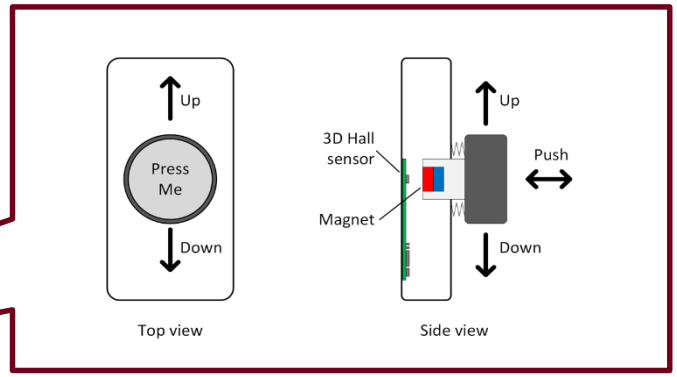
Application Description:

- HMI (Hall switch, 3D)
- Motor commutation (Hall switch)

Benefits:

- Extremely small size, slim PCB with new WLB package sensor.
- Push and rotation functionality with a single sensor
- Contactless measurement principle minimizing wear and tear
- Full mechanic design flexibility with 3D Hall technology

Application Example: Residential Aircon



Application Description:

- Door/window contact – disabling aircon on open window (Hall Switch)
- Flap position (Hall switch, 3D)
- HMI (Hall switch, 3D)

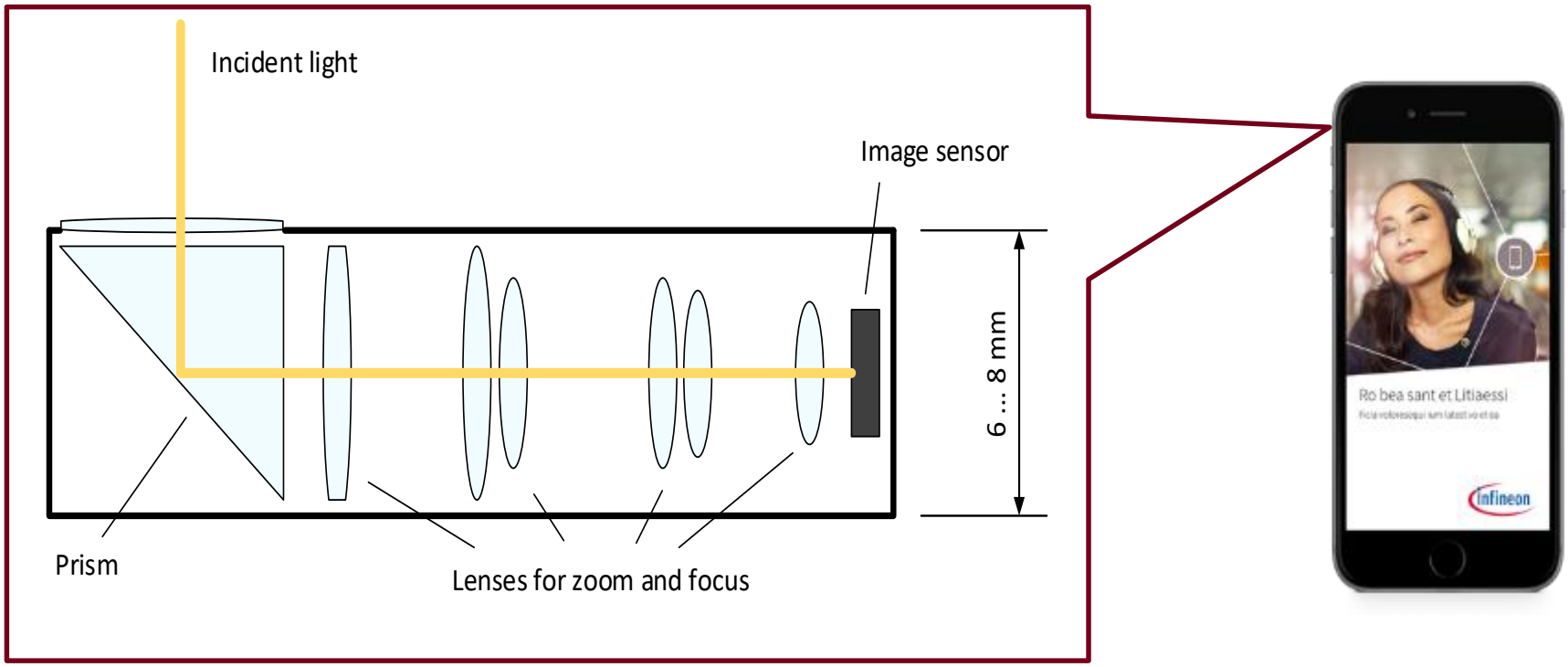
Benefits Magnetics:

- Contactless measurement principle minimizing wear and tear
- Better design flexibility as with mechanical/resistive solution

Additional Benefits 3D Sensor:

- Further improved mechanic design flexibility with 3D Hall technology
- Push and rotation functionality with a single sensor
- 3D sensor in WLB package: extremely small size, slim PCB design, high design flexibility (lateral, vertical)

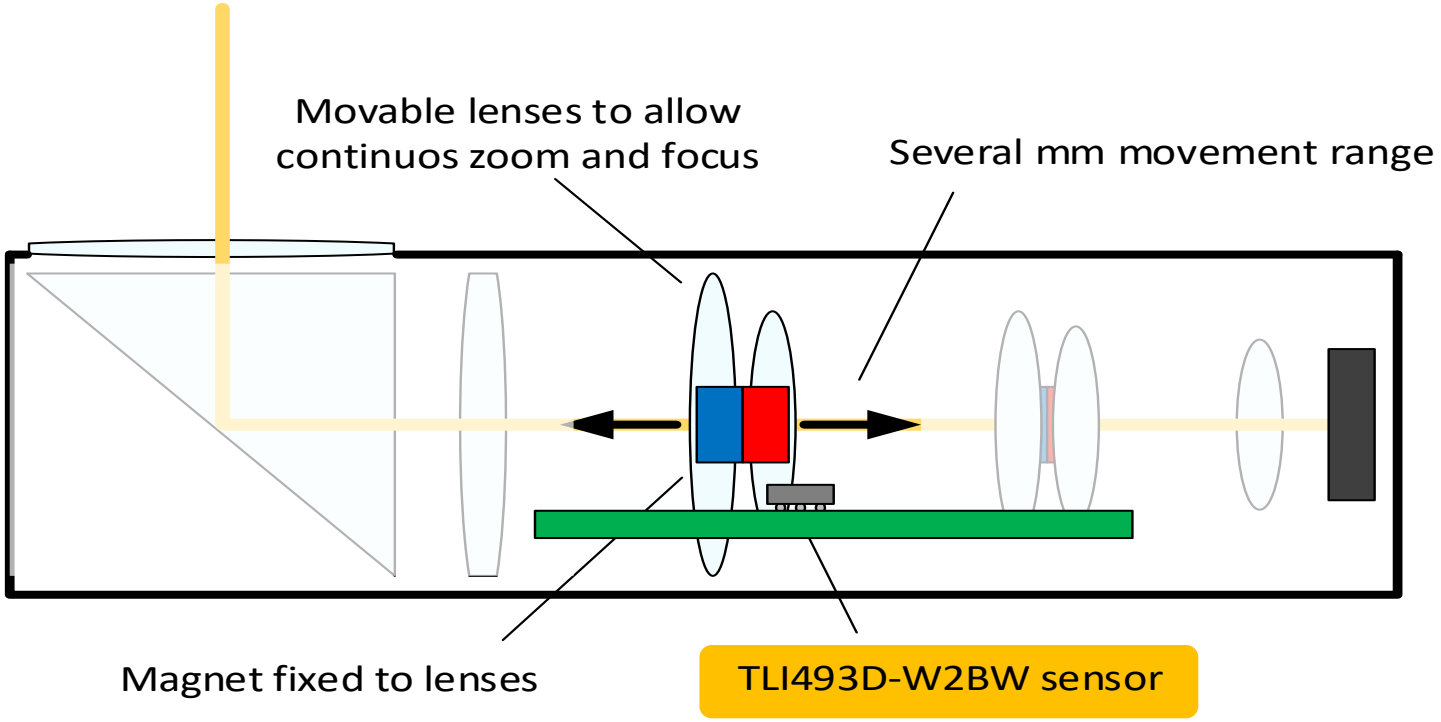
Camera Module in Smartphone
Lens Position Measurement



Application Description:

- State of the art mobile phones use folded optics to enable the vocal length needed for high zooming levels
- Several lenses are used to set the focus and zoom level of the camera
- For a continuous zoom the lenses can be moved and the position needs to be precisely measured

Lens Position Measurement with TLI493D-W2BW

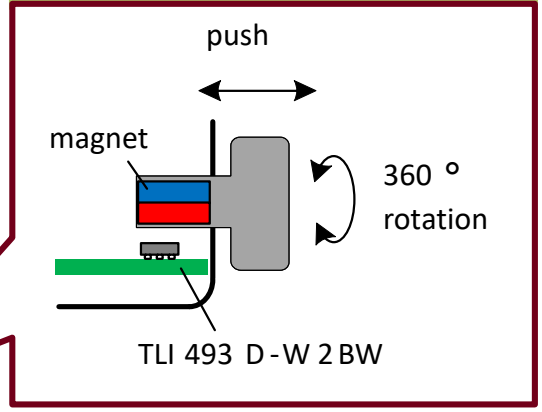


Benefits of Using TLI493D-W2BW

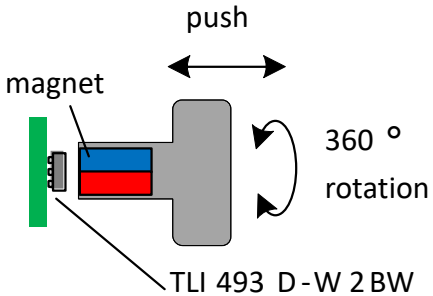
- A small magnet is fixed to the moveable lenses
- The 3D Hall sensor is mounted on a PCB fixed to the module
- The movement of the magnet is measured with the sensor

Smartwatch Crown or Seesaw

Alternative application No.1



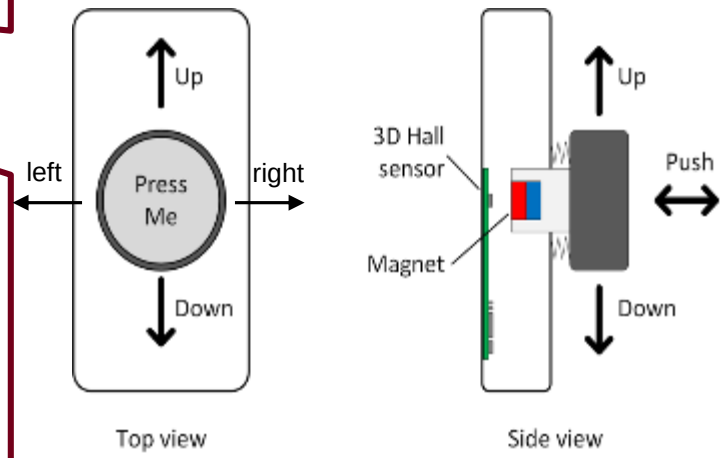
Alternative application No.2



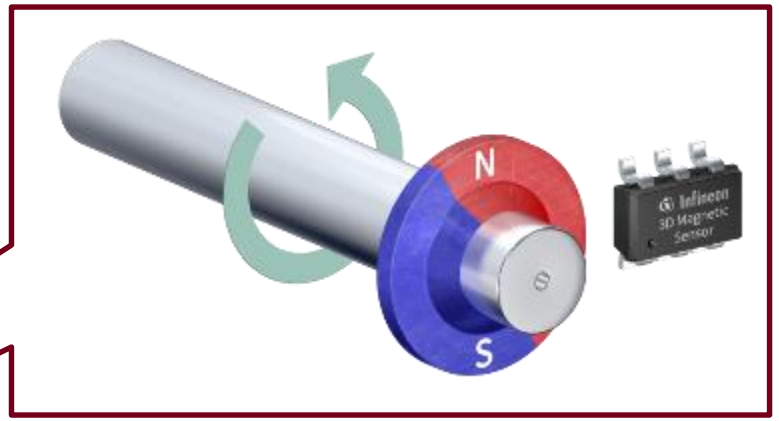
Benefits:

- TLI 493D-W2BW has extremely small size, slim PCB with new WLB package, which offers a high degree of flexibility in finding the best space/performance optimized solution.

Alternative application No.3



Consumer Robotics



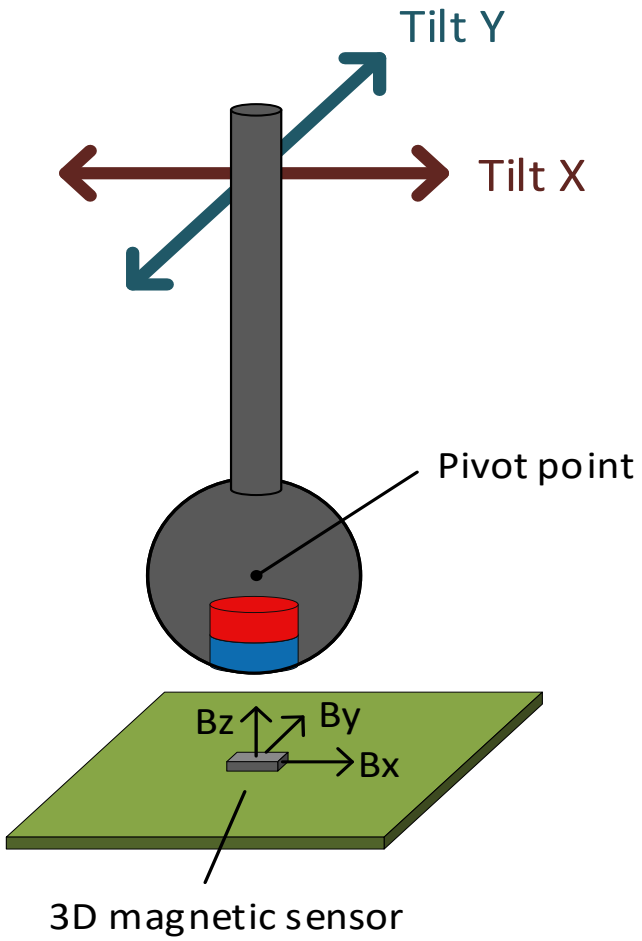
Application Description

- 3D magnetic sensor is used to flexibly measure the position of a mechanic joint or moveable parts
- A magnet is placed to one mechanical part and the sensor on the other

Benefits:

- Flexibility mounting with 3D principle (end of shaft, out of shaft, linear, …)
- Low power concept and wake-up mode for low current consumption
- High reliability with contactless measurement principle

Joystick



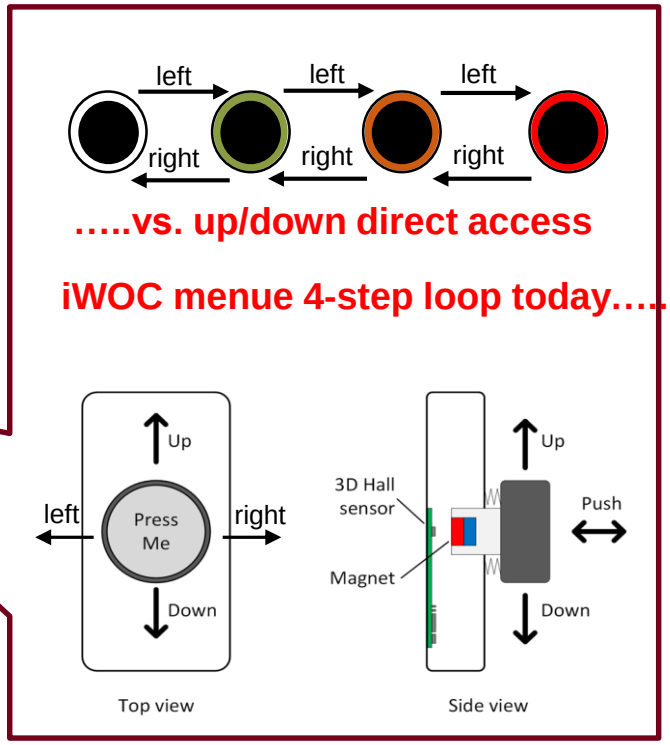
Application Description

- Small magnet is placed at joystick head
- The sensor is placed below to measure contactless the position of the Joystick
- Ball socket as well as gimbal mechanics can be used

Advantages of 3D Magnetic Sensors Over Resistive/Optical Solutions

- High accuracy – over temperature and lifetime
- Abrasion free, contactless – dust and humidity resistant
- High quality - for hassle-free operation over lifetime
- Redundancy – where needed

Consumer Control Elements – eBikes, ….



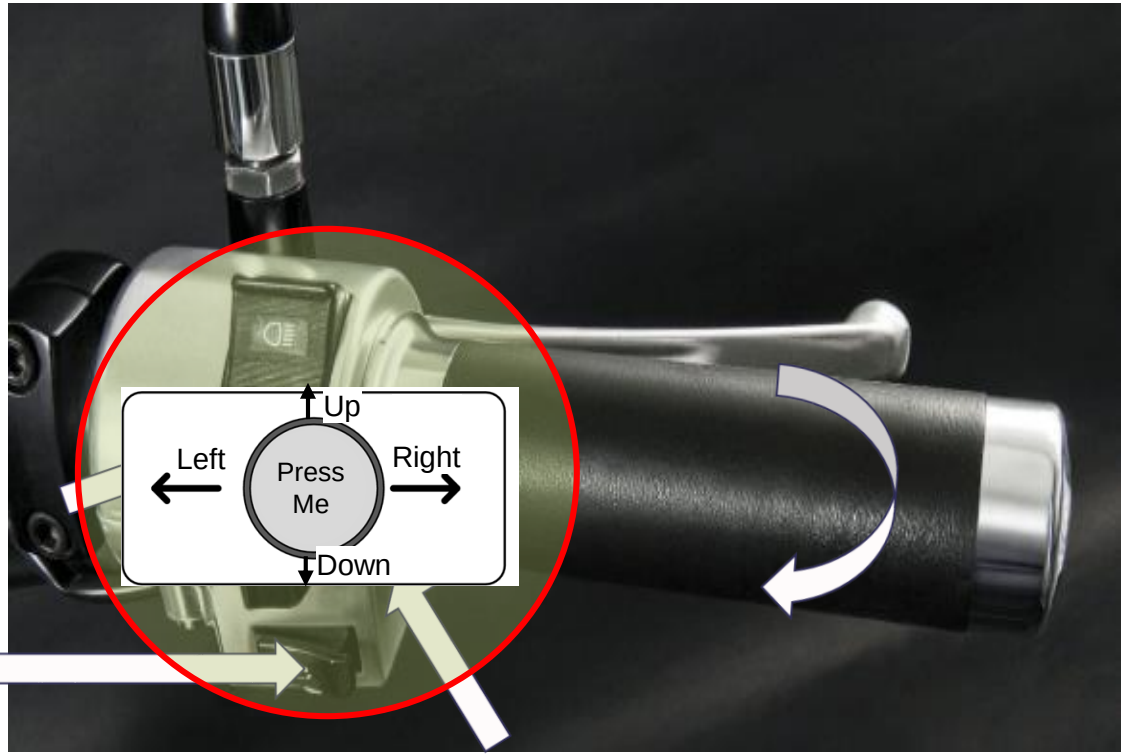
Application Description:

- Press = Switch on/off
- Change motor support = tilt up/down
- Change xxx = tilt left/right

Advantages of 3D Magnetic Sensors

- More intuitive usage (4-step loop → direct control)
- Improves user friendliness (e.g. support level 1 → “0” press once instead of 3 times)
- Increase reliability
- Low power features with TLI493D W2BW

2-Wheeler Handle Bar



Horn, Light High Beam (on/off):

TLE4964

Throttle Control (rotation detection)

- TLE4997/8
- TLx493D
- TLx5012B(D)
- TLE5501

Turn Indicator (Left, right, release):

- TLx493D
- TLE4964

Advantages of Magnetic Sensors Over Resistive/Optical Solutions

High accuracy – over temperature and lifetime

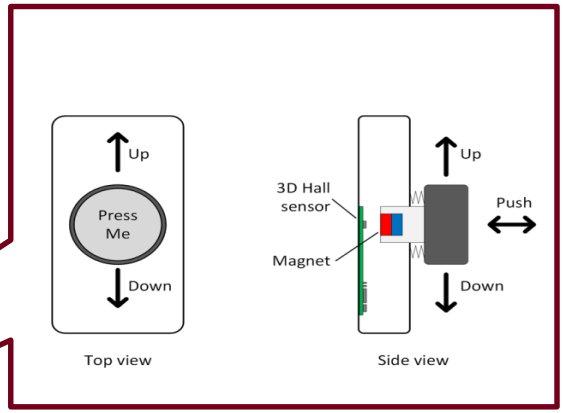
Abrasion free, contactless – oil and dust resistant

High quality - for hassle-free operation over lifetime

Redundancy – where needed

ISO26262 compliant product range

Power Tools



Application Description:

- "Speed" trigger (3D)
- Torque selector (3D, Hall switch)
- Direction selector (3D, Hall switch)
- BLDC motor commutation (angle, Hall switch)

Benefits Magnetics:

- Sensors in BLDC motor commutation – enhanced motor control and drive precision and efficiency

Additional Benefits 3D Sensor:

- Further improved mechanic design flexibility with 3D Hall technology
- Combine push and rotation functionality with a single sensor (e.g. torque + speed/direction)
- 3D sensor in WLB package: extremely small size, slim PCB design, high design flexibility (lateral, vertical)

Agenda

1. TLI493D-W2BW key features and benefits
2. Application highlights with 3D and other magnetic sensors
3. Competitive advantage by using Infineon XENSIV™ Sensors

Competitive Advantage by Using Infineon XENSIV™ Sensors

Hall Switches	Competitive Advantage	
TLx496x 	**Large portfolio with standardized packages**	→ Easy drop-in replacement
	Low power consumption	→ Enables energy efficient systems
	5V family available	→ Enables cost effective systems
	Small SMD and package + leaded options	→ Saves PCB space -enables compact systems, flexibility
	High supply voltage range (3,0 Volt to 32 Volt)	→ Cost-savings by eliminating the voltage regulator
	High load dump (42V)	→ Reduces external resistors
	Infineon's zero-defect commitment	→ Best-in-class field quality and OEM satisfaction

- Industry
- Consumer
- Automotive
- Hall Switches and Hall Latches available

3D Magnetic	Competitive Advantage	
TLx493D-AxB6 **TLI493D-W2BW** 	**Wake-up, ultra low power concept**	→ Extended battery runtime in application/ reduce battery size
	Accurate 3D magnetic measure-ment	→ High accuracy (3.5% XY matching drift) → relax mechanical setup → overall system cost reduction
	Tiny WLB package halogene free	→ package allows high flexibility in design and manufacturing

- Consumer
- Industry

Angle Sensors	Competitive Advantage	
TLx5012 **TLE5x01/09** 	**Broad portfolio analog/ digital**	→ Right product for almost any application and budget
	Accurate rotor position detection	→ High efficiency, silent run, controlled torque

- Consumer
- Industry

Large amount DI support material available (ANs, SW, simulation, kits & boards) → Ease of design in, faster time to market

Part of your life. Part of tomorrow.