



POSITION AND MOTION SENSORS



Rotary Encoders – Inclinometers – Linear Sensors – Sensor Components

Over 50 Years Experience with Position Sensors



POSITAL is a manufacturer of sensors for motion control and safety assurance systems. The company’s products, which include rotary encoders, inclinometers and linear position sensors, are used in a wide range of settings, from factory automation to mobile automation, healthcare and renewable energy. POSITAL is a member of the international FRABA Group. FRABA Group is a market-leading enterprise that makes use of advanced product design and production to ensure that its customers enjoy the benefits of technology leadership, choice, quality and competitive prices.

History

FRABA Group dates back to 1918, when its predecessor, Franz Baumgartner elektrische Apparate GmbH, was established in Cologne, Germany to manufacture relays. In 1973, FRABA introduced one of the first non-contact, absolute multiturn encoders. Since then, the company has played a trend-setting role in the development of rotary encoders and other sensor products.

Service and Production

POSITAL has a global reach with subsidiaries in Europe, North America and Asia – and sales and distribution partners around the world. Products are manufactured in advanced production facilities. The computer-guided, semi-automated production system tracks each device from order, through assembly and testing, to final delivery.

Other Brands of the Fraba Group Include:

> UBITO

Offers energy harvesting and signal generation components like Wiegand Sensors and Counting ASICs for rotary encoders (multiturn) and other applications (e.g. flow meters).

> CODORMO

Aims at revolutionizing the automation of commercial doors. Preventive maintenance, machine learning and internet of things are a few of the pillars of our innovations.

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Version 20240703

Wide Selection of Absolute Rotary Encoders



Absolute rotary encoders are capable of providing unique position values from the moment they are switched on. Even movements that occur while the system is without power are translated into accurate position values once the encoder is powered up again. Another advantage is their high number of variations. Absolute encoders can either be singleturn or multiturn with different resolutions and communication interfaces. The user also can choose from thousands of mechanical and connection configurations to meet their needs.

> Maintain Position Information

Even Without Power

> Compact Size

Down to Ø36 mm

> 15+ Communication Interfaces

Industry Classics and Latest Trends

> Programmable Parameters

To Better Fit your Application

> Wiegand Technology

No Battery, No Maintenance

> High Shock and Vibration Resistance

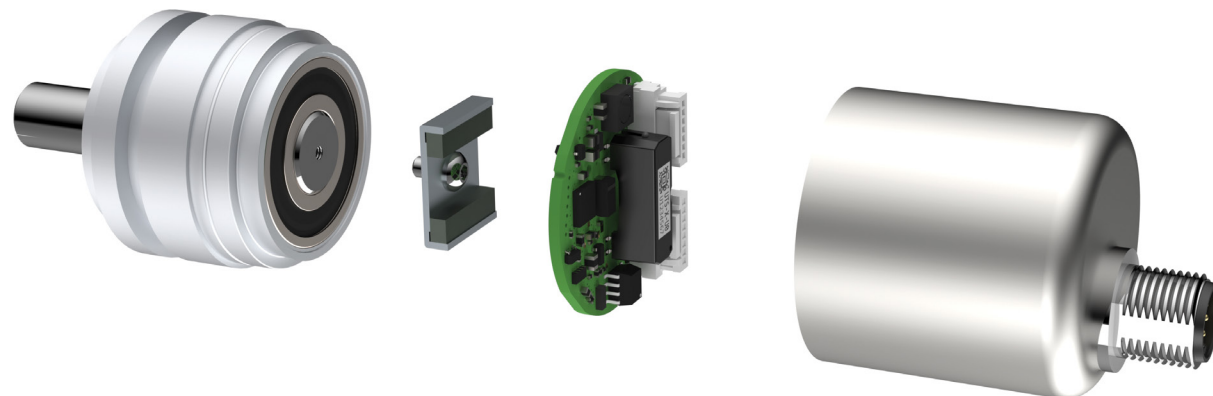
Insensitive to Dust and Humidity

> Heavy Duty Enclosures

Stainless Steel and ATEX Versions Available

> Safety Ready – Through Clever Design

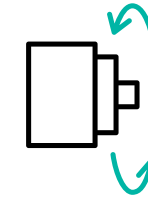
Diverse Redundancy Tandem Encoders



Main Variants

Motion control applications range from factory automation to control systems for mobile machines. They all have their specificities but still require precise, real-time information about the physical location of mechanical equipment. POSITAL's line of absolute encoders is designed to address seemingly all problematic you can face.

Singleturn Vs Multiturn



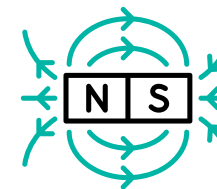
- > Singleturn: Shorter Housing
- > Multiturn: Up to 65,536 Revolutions

Variety of Interfaces



- > Ethernet Based
- > Fieldbus Classics
- > Analog, Parallel, SSI
- > IO-Link

Magnetic Vs Optical



- > Optical: High Resolution, Ideal for Magnetic Fields
- > Magnetic: Robust and Durable, No Battery, No Gear

Flange & Shaft Options



- > Solid or Hollow Shaft
- > Multiple Flanges Design to Fit All Applications
- > Couplings, Tethers, Adapters Available

Applications

IXARC absolute encoders always ensure reliable positioning; they never require a reference run which increases the safety and efficiency of the machines. Their compact size makes them ideal for applications ranging from healthcare equipment to factory automation.

Material Handling Logistics



- > Fieldbus and Ethernet Based Interfaces
- > Accurate Process Monitoring
- > Diagnostics LED with Increased Efficiency

Production Machinery



- > Large Variety of Interfaces
- > Wide Operation Temperature with Protection Class Up to IP69K
- > Reliable at Maximum Speed

Lithium Battery Equipments



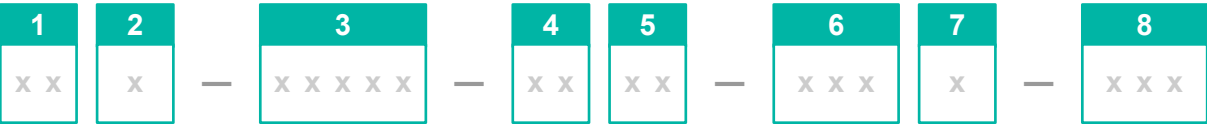
- > Ethernet Based Interfaces
- > Optimized Data Transmission
- > 16 bit Resolution


Oil & Gas




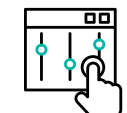
- > Certification with ATEX, IECEx, UL and CCC
- > Ex-proof "d" Flameproof Enclosure (Zone 1 & 21)
- > Ex-proof „nA“ Non Sparking (Zone 2 & 22)

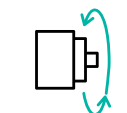
How to Select the Right Absolute Encoder for your Application

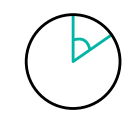


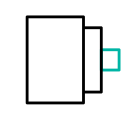
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1. Technology – Accuracy
Magnetic or Optical. Magnetic technology uses a permanent magnet while the latter uses an optical code-disc.
- 

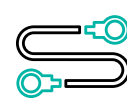
2. Certificate
CE and/or UL, ATEX Zone 1&21 and 2&22 as well as redundant technology available.
- 

3. Communication Interface
Represents the language used by the encoder to transmit the data to the master or the network.
- 

4. Revolution
Maximum number of turns. This parameter is indicated in bit, e.g., 14 bit (= 16,384 revolutions).
- 

5. Resolution
Number of steps (divisions) per turn. This parameter is indicated in bit, e.g., 12 bit (= 4,096 divisions).
- 

6. Mechanical Design
Describes the mechanical characteristics of the encoder: flange design and size, shaft diameter, options.
- 

7. Protection Class – Material
Informs about the protection level of the encoder against its environment (water & dust ingress).
- 

8. Connection Type
Describes the medium via which the encoder transmits the output signal over.

1 Accuracy (Technology)					
≤ 0.02° (Optical) ≤ 0.09° (Magnetic) ≤ 0.02° (Optical) + ≤ 0.09° (Magnetic)					
2 Certificate					
CE / UL		ATEX (1&21 + 2&22)		Redundant	SIL
3 Communication Interface					
Analog	SSI	Profibus	CANopen	J1939	
Ethernet/IP	EtherCAT	Profinet	Powerlink	Modbus TCP	
IO-Link	DeviceNet	Profisafe	CANsafe	Modbus RTU	
Parallel	BiSS-C				
4 Revolution (Number of Turns)					
Singleturn		Multiturn up to 31 bit			
5 Resolution (Steps per Turn)					
Programmable		Up to 18 bit			
6 Flange					
Flange Design		Hollow Shaft: Blind Hollow; Through Hollow		Solid Shaft: Clamping; Square; Synchro	
Flange Size		Ø 36; 58; 78		Ø 36; 38; 40; 42; 50; 58; 78; 115 Ø 52.3; 63.5; 80	
Shaft Diameter		Ø 6; 8; 10; 11; 12; 14; 15; 16 Ø ¼"; 3⁄8"; ½"; 5⁄8"; 1"		Ø 6; 8; 10; 11; 12 Ø ¼"; 3⁄8"; 1"	
Options		Clamping Ring, Set Screw		Shaft Flat, Double Flat, Keyway	
7 Material / Protection Class					
Aluminum – Steel	Stainless Steel V2A	Stainless Steel V4A			
IP64 / IP65	IP64 / IP65; IP67	IP67; IP68 / IP69K			
8 Connection Type					
Type	Cable	Connection Cap	Connector		
Orientation	Axial; Radial; Angular	Radial	Axial; Radial		
Range	1 m; 2 m; 5 m; 10 m	M12; Blind Plugs; Cable Glands	M12; M23; M27; MS16; D-Sub		
Option	LED	1 – 3 exits	1 – 3 exits; LED		



Programmable Incremental Encoders



Incremental rotary encoders generate an output signal each time the shaft rotates a certain angle. The number of signals (pulses) per turn, also called PPR, defines the resolution of the device. The internal components of an incremental encoder are much simpler than the ones of an absolute encoder. This fits the need of many applications for simple, cost effective solutions while still providing accurate positioning. They are available with common configurations such as A, B, Z, and inverted signals available as HTL (Push-Pull) or TTL (RS422). POSITAL magnetic encoders can all be configured via the UBIFAST configuration tool: helping reduce inventory levels.

> Programmable Pulse per Revolution

Any PPR from 1 to 32 768 Pulses

> High Performance due to Signal Processing

Phase Angle: $90^\circ \pm 6^\circ$

> Industry Leading Sensing Technology

Accuracy $\pm 0.0878^\circ$

> Programmable Output

Push-Pull (HTL) or RS422 (TTL)

> Magnetic Technology

Simple Design – No Code Discs

> High Shock and Vibration Resistance

Insensitive to Dust and Humidity

> Heavy Duty Enclosures

IP69K and Stainless Steel Versions Available

> Large Variety of Flange Configurations

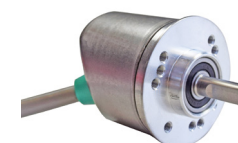
With a Range of Shaft Diameters



Main Variants

Our mission is to help our customers address all problems they can possibly face in the field. That is why we offer a wide range of mechanical and housing variations; ensuring a quality sensor that fits your needs.

Compact & Cost Effective



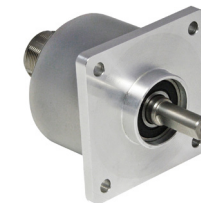
- > Ø36 - 58 mm Housing
- > Solid or Hollow Shaft
- > Connector or Cable
- > Highly Versatile

Through Hollow Shaft



- > Ø58 – 77 – 100 mm Housing
- > Shaft from 9.52 mm up to 44.45 mm (3/8" up to 1 3/4")

The Industry Classics



- > Cube Encoder
- > Square Flanges
- > Ø40 & 50 mm Clamping Flanges

Heavy Duty



- > IP69K
- > Stainless Steel Housing
- > Up to 300g Shock Resistance

Applications

IXARC incremental encoders are ideal for various industries due to their small size and excellent performance. Their economic magnetic design makes them ideal for motor feedback, material handling applications and OEMs.

Medical Equipment



- > Used in MRI and CT Scanner Tables
- > Height Positioning
- > Compact Sizes

Printing – Labelling



- > High Resolution Up to 32768 PPR
- > Reduced Power Consumption
- > Insensitive to Dust and Humidity

Steel Plant



- > Sensors for Tough Jobs
- > Hazardous Environments
- > High Pressure & Temperature Resistant


Factory Automation




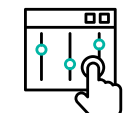
- > Programmable Resolution
- > Compact and Cost-Efficient Design
- > Large Variety of Mechanical Interfaces
- > Encoder Self Diagnostics

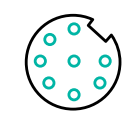
How to Select the Right Incremental Encoder for your Application




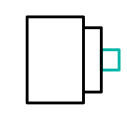
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1. Technology – Accuracy
Magnetic or Optical. Magnetic technology uses a permanent magnet while the latter uses an optical code-disc.
- 

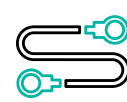
2. Certificate
All our products are certified CE and/or UL.
- 

3. Communication Interface
Indicates whether the encoder is programmable or not and what type of output driver is defined.
- 

4. Pin Out
Indicates whether the output signal presents an index channel and/or differential signals or not.
- 

5. Pulse Count
Number of steps (divisions) per turn. This parameter can be programmed from 1 to 32 768 PPR.
- 

6. Mechanical Design
Describes the mechanical characteristics of the encoder: flange design and size, shaft diameter, options.
- 

7. Protection Class – Material
Informs about the protection level of the encoder against its environment (water & dust ingress).
- 

8. Connection Type
Describes the medium via which the encoder transmits the output signal over.

1	Accuracy (Technology)			
	≤ 0.02° (Optical) ≤ 0.09° (Magnetic)			
2	Certificate			
	CE / UL	ATEX (1&21 + 2&22)	IECEX	CCC
3	Incremental Interface			
	Programmable	Push-Pull (HTL)	RS422 (TTL)	
4	Pin Assignment			
	A, /A, B, /B	A, B, Z	A, B, Z, /A, /B, /Z	
5	Pulse Count (PPR)			
	Programmable	1 – 32 768	0.125 – 8 (Fractional)	
6	Flange			
	Flange Design	Hollow Shaft: Blind Hollow; Through Hollow		Solid Shaft: Clamping; Cube; Square; Synchro
	Flange Size	Ø 36; 42; 58; 77; 100		Ø 36; 40; 42; 50 Ø 52.3; 57.15; 58; 63.5; 68; 80; 115
	Shaft Diameter	Ø 6; 8; 10; 11; 12; 14; 15; 16; 20; 25; 30; 38; 40; 42 Ø ¼"; 38" ½"; 58"; ¾"; 78"; 1"; 1 ¼"; 1 ½"; 1 58"; 1 ¾"		Ø 6; 8; 10; 11; 12; 15 Ø ¼"; 38"
	Options	Clamping Ring, Set Screw		Shaft Flat, Double Flat, Keyway 5 mm
7	Material / Protection Class			
	Aluminum – Steel IP64 / IP65		Stainless Steel V4A IP67; IP68 / IP69K	
8	Connection Type			
	Type	Cable	Connector	Terminal Box
	Orientation	Axial; Radial; Angular	Axial; Radial	
	Range	1 m; 2 m; 5 m; 10 m	M12; M23; MS12; MS14; MS16; MS18	



Absolute Multiturn Kit Encoders / Incremental Kit Encoders



Kit encoders are modular rotary encoders without integral ball bearings. Their compact and economical design is ideal for integration into other systems, such as robotic systems, stepper motors or servo motors. POSITAL's portfolio includes many multiturn versions without battery or gear. Fusion of sensing technologies results in unique designs with uninterruptable multiturn function, powered by Wiegand. No special equipment is required for the installation. There are various mechanical configurations starting from 22 mm outer diameter. Enhanced signal processing software enables high-resolution position measurement with excellent real-time performance.

- > **Compact Design**
22 mm or 36 mm Diameter

> **Absolute Measurement**
Up to 19 bit

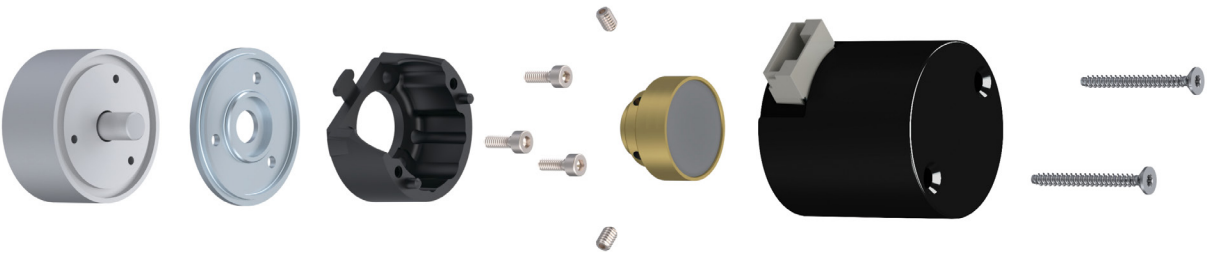
> **Open Source Interfaces**
Biss-C, Biss-Line, SSI, SPI

> **Incremental Kit Encoders**
Compatible to Common Standards
- > **Wiegand Technology**
Multiturn Without Battery or Gear

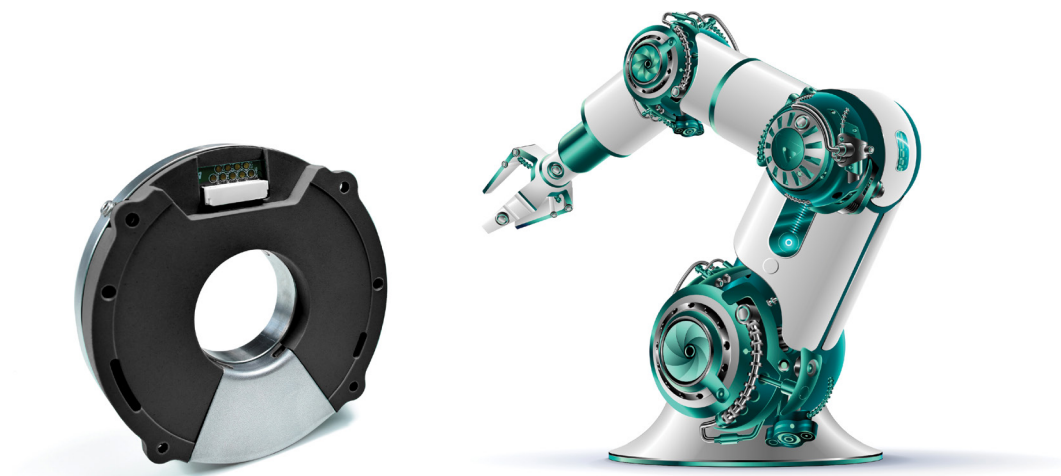
> **Easy to Install**
No Special Equipment or Skills Required

> **Mechanical Design**
Compatible With Common Bolt Patterns

> **Insensitive to Dust and Moisture**
-40°C to +105°C Temperature Range



Absolute Multiturn Hollow Shaft Kit Encoders



POSITAL's hollow shaft kit encoders offer a wide multiturn range without the need for a battery or gear system. They have a slim design of just 18 mm thickness. They offer a resolution of up to 19 bit and are designed for integration into hollow shaft motors and robots. In robotic systems, the hollow shaft design enables cables and compressed air to be routed inside of the robotic arm. The singleturn system is based on capacitive technology and is combined with POSITAL's proven Wiegand multiturn technology. Special tools or costly equipment are not required for the assembly of these kit encoders to motors.

- > **Hollow Bearingless Center Design**
With 30 mm and 50 mm Inner Diameter

> **Multiturn Without Battery or Gear**
Energy-Harvesting Wiegand Sensor

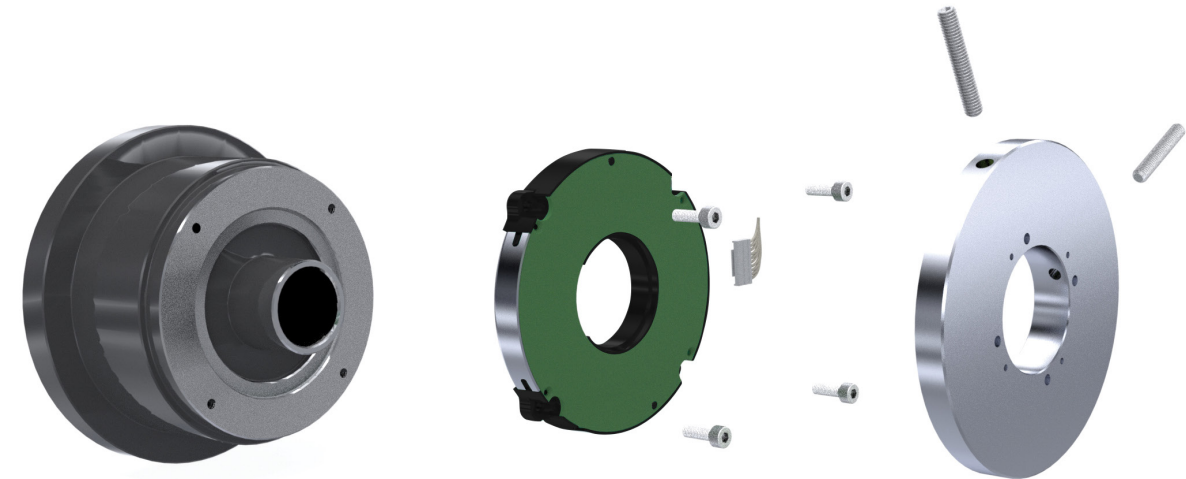
> **Singleturn Resolution**
Up to 19 bit

> **Open Source Interfaces**
BiSS-C, SSI
- > **Slim Design**
Thickness 18 mm

> **Easy to Install**
No Calibration or Special Equipment Required


> **Insensitive to Dust and Moisture**
Can be Installed in Any Factory

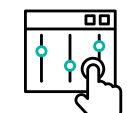
> **Optimal Mechanical Layout**
For Robotic Joints and Drives

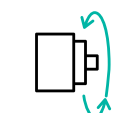


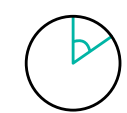
How to Select the Right Kit Encoder for your Application

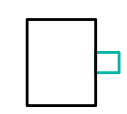



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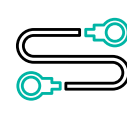
1. Technology – Accuracy
Magnetic and capacitive kit encoders provide up to 19 bit resolution.
- 

2. Communication Interface
BISS-C, SSI, BiSS-Line (4 and 2 wire), SPI and incremental interfaces are available.
- 

3. Revolution
A multiturn range of up to 40 bit is possible, 16 bit is common.
- 

4. Resolution
Up to 19 bit (Magnetic and Capacitive) or 1024 PPR (Incremental).
- 

5. Mechanical Interface
22 mm and 36 mm outer diameter for on axis magnetic versions, 30 or 50 mm inner diameter (hollow shaft).
- 

6. Magnetic Shield / Housing / Magnet Hub Shaft Adapter
Magnet hub shaft adapters are available with set screw and press fit installation.
- 

7. Connection Type
All kit encoders have JST connectors; housings with M12 connectors or cable clip are available.

Main Variants

POSITAL kit encoders offer you batteryless, cost-efficient solutions for fast motion control of servo or stepper motors and robotic systems. There are various mechanical configurations starting from 22 mm outer diameter that are compatible with common mechanical interfaces (bolt patterns).


Multiturn Kit-Encoder: On Axis

- 
- > From 22 mm Diameter
 - > No Battery – No Gear
 - > Robust & Easy to Install
 - > BiSS-C, BiSS Line, SSI
 - > -40 to 105 °C

Multiturn Kit-Encoder: Hollow Shaft

- 
- > Up to 50 mm Inner Diameter
 - > No Battery – No Gear
 - > BiSS, SSI, Incremental
 - > Robust & Easy to Install

Multiturn Module

- 
- > No Battery – No Gear
 - > Large Multiturn Range up to 40 bit
 - > SPI Interface


Incremental Kit-Encoder

- 
- > Compatible with Common Interfaces
 - > Up to 1024 PPR Resolution
 - > Easy to Install


Applications

POSITAL Kit Encoders are designed for integration into servo motors, stepper motors and robotic systems as used in many different applications. Examples:


AGV – Autonomous Guided Vehicle

- 
- > Multiturn Without Battery
 - > No Maintenance
 - > Robust – High Availability

Robotic Systems

- 
- > Very Slim Multiturn for Small Joints
 - > High Precision for Exact Positioning
 - > No Calibration

Linear Actuator

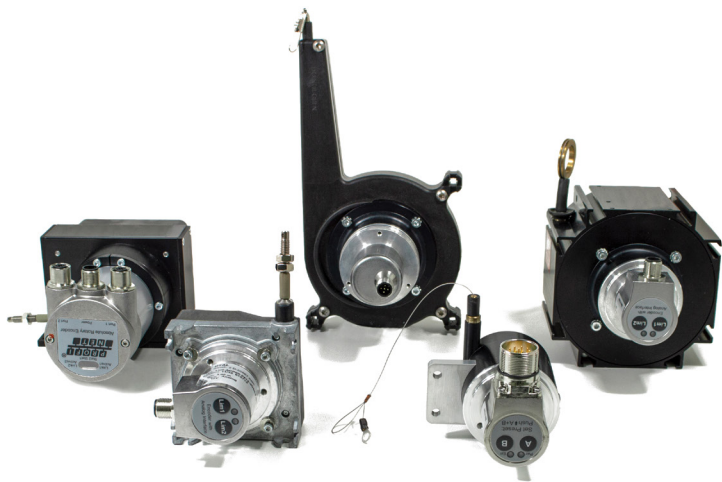
- 
- > Multiturn Range
 - > No Homing After Loss of Power
 - > Compatible With Common Interfaces

Stepper / Servo Motor

- 
- > Multiturn Without Battery
 - > Cost-Efficient Closed Loop Control

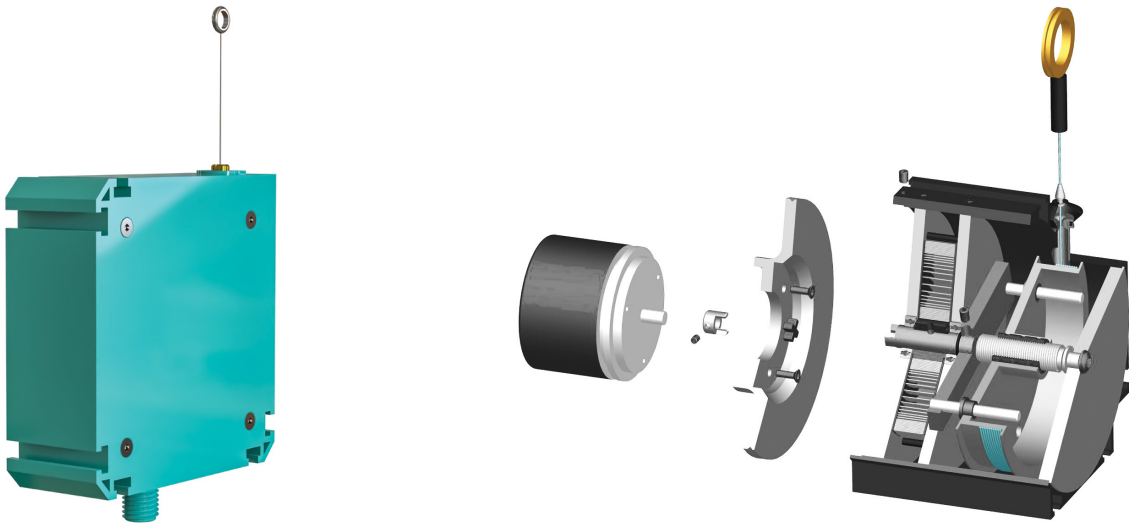


Versatile Linear Sensors



Draw wire sensors, also called cable pull sensors, are designed to perform linear position measurement using an encoder and thus providing high accuracy sensing. Connected to a draw wire, the encoder delivers a signal proportional to the cable that is pulled out. While pinion and racks require perfect alignment and soldering, a draw wire sensor offers an easy-to-install system with a large variety of interface options. Thanks to the powerful UBIFAST configuration tool, customers can define the needed resolution after selecting the desired measuring range. It therefore answers any type of application involving linear displacement.

- > **Wide Range of Measuring Lengths**
1 to 15 m (3' to 49')
 - > **Absolute Position Measurement**
15+ Communication Interfaces
 - > **High Linearity**
Even with Long Cycle Times
 - > **Define Your Own Measuring Length**
Scalable Analog Output
- > **Teach-in Functionalities**
No Software or Programming Required
 - > **Outdoor Application Ready**
With Protection Class up to IP69K
 - > **Safety Ready – Through Clever Design**
Tandem Redundant Encoders
 - > **Tilt and Linear Measurement in One Sensor**
When Combined with POSITAL Inclinometer



Main Variants

LINARIX linear sensors are available in many configurations to meet any application's requirements, from near clean room conditions to harbors handling arms and construction cranes. Options include a wide variety of outputs (including analog, fieldbus and Ethernet variants), heavy duty housings and compact designs.

Indoor Usage



- > Robust
- > Flexible Mounting
- > Acceleration up to 7g
- > Suitable for Demanding Environments



- > Highly Economical
- > Small Footprint
- > High Accuracy
- > OEM's Favorite

Outdoor Usage

Combination Tilt & Linear Sensor, up to 8 m



- > Length and Angular Position
- > High Linearity / Accuracy $\leq \pm 0.15\%$ FSO $\pm 0.10^\circ$
- > Suitable for Articulating and Telescopic Boom Lift Application

Variety of Interfaces

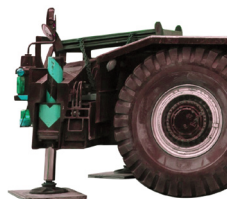


- > Ethernet Based
- > Fieldbus Classics
- > Analog, Parallel, SSI
- > IO-Link

Applications

LINARIX sensors provide highly reliable and precise measurements thanks to the accuracy of the absolute encoders in combination with high quality draw wire mechanics. Their rugged construction ensures reliable performance and long lifetimes even under extreme conditions. For example, articulation boom lifts and telescopic boom lifts present similar constraints: simultaneously managing angle and extension. POSITAL draw wire sensors with an integrated inclinometer offer single sensor which allows precise positioning while articulating your boom crane.

Construction Outriggers



- > Length and Height Measurement
- > High Resolution
- > Durable and Low-cost

Material Handling



- > Linear Accuracy up to 0.35 mm
- > Up to IP69K
- > -40°C to +85 °C

Cranes



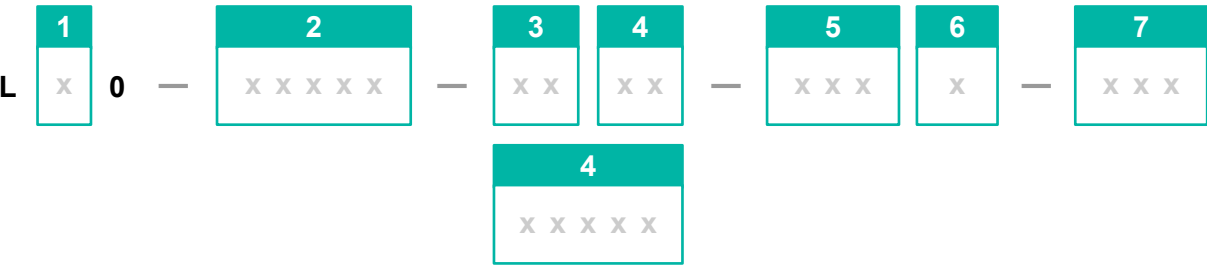
- > Rugged Draw Wire
- > Measuring Range from 3 m to 15 m
- > Resolution up to 4 μ m


Forklifts

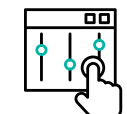


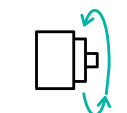
- > Compact and Cost Effective Design
- > Fieldbus and IO-Link Interfaces

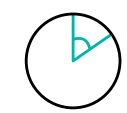
How to Select the Right Draw Wire Sensor for your Application

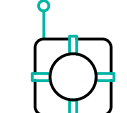



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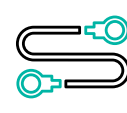
1. Technology – Accuracy
Magnetic or Optical. Magnetic technology uses a permanent magnet while the latter uses an optical code-disc.
- 

2. Communication Interface
Represents the language used by the encoder to transmit the data to the master or the network.
- 

3. Revolution
Maximum number of turns. This parameter is indicated in bit, e.g., 14 bit (= 16,384 revolutions).
- 

4. Resolution
Number of steps (divisions) per turn. This parameter is indicated in bit, e.g., 12 bit (= 4,096 divisions).
- 

5. Draw Wire (Measurement Range – Enclosure – Connection Orientation)
Characteristics of the draw wire adapter: measuring length, enclosure material, connection orientation.
- 

6. Protection Class
Informs about the protection level of the encoder against its environment (water & dust ingress).
- 

7. Connection Type
Describes the medium via which the encoder transmits the output signal over.

1	Technology				
	≤ 0.02° (Optical) ≤ 0.09° (Magnetic)		≤ 0.02° (Optical) + ≤ 0.09° (Magnetic)		
2	Communication Interface				
	Analog	SSI	Profibus	CANopen	J1939
	Ethernet/IP	EtherCAT	Profinet	Powerlink	Modbus TCP
	Parallel	DeviceNet	Incremental Programmable		
3	Revolution (Number of Turns)				
	Singleturn		Multiturn up to 31 bit		
4	Resolution (Steps per Turn)				
	0.1 mm/pulse (Incremental)		Programmable	16 bit	Draw Wire Only
5	Draw Wire				
	Measurement Range		1	15 m	
	Enclosure	Extruded Metal	Machined Metal	Plastic	
	Connection Orientation		Axial	Radial 2; 3; 4; 6; 8; 9; 10	
6	Protection Class				
	IP54	IP64 / IP65	IP67	IP69K	
7	Connection Type				
	Type	Cable	Connection Cap	Connector	
	Orientation	Axial; Radial; Angular	Radial	Axial; Radial	
	Range	1 m; 2 m; 5 m; 10 m	M12; Blind Plugs; Cable Glands	M12; M23; M27; MS16; D-Sub	
	Option	LED	1 – 3 exits	1 – 3 exits; LED	

Easily Define the Output of your Linear Sensor

With POSITAL's LINARIX draw wires, simply press the set one button, pull the cable up to the distance you want to measure, press the set two button, and let the cable retract. This allows for anyone to simply define their own draw wire output (i.e. 0-10 V at 0 to 5 m or 0 to 4.25 m) to match their application.



- > Easily Scale Your Measurement Range for Analog Versions
- > Programmable Versions Done Simply via UBIFAST
- > Large Variety of Interfaces: Analog, SSI, CANopen, IO-Link



Precise And Robust Tilt Sensors

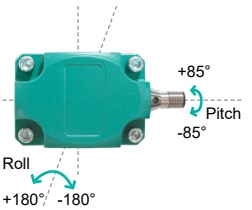


Inclinometers, also called tilt sensors, are designed to measure the angle of an object with respect to the force of gravity. These tilt or level meters determine the angle orientation in space with gravity as reference and output these values via the appropriate electrical interface. Inclinometers are easy to integrate to an application because there is no need for mechanical linkages other than the installation itself – a real advantage for design engineers. POSITAL's inclinometer portfolio offers solutions for different industries to tackle all application-specific challenges.

- > **Single and Dual Axis Measurement**
Up to 360° Single and Up to +/-180°
Dual Pitch and Roll
 - > **Horizontal or Vertical Mounting Orientation**
For the Perfect Fit
 - > **Analog and Digital Interfaces Available**
CANopen, SSI, J1939, ModBus RTU
 - > **Ex-Proof Versions Available**
For Mining or Oil and Gas Applications
- > **High Shock and Vibration Resistance**
Up to 200 g
 - > **Different Inclinometer Technologies**
Tackle the Challenges of Each Application
 - > **Durable & Robust Housing Concept**
Up to IP69K
 - > **Dynamic Inclinometers**
Ideal for Applications with Dynamic Movements
Extended Filtering Capabilities



Dynamic Inclinometer



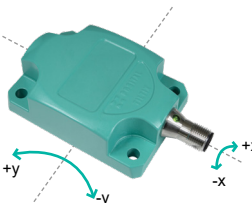
- > Accurate Measurement During Dynamic Movements
- > Output of Accelerations and Rate of Rotation

Static Inclinometers



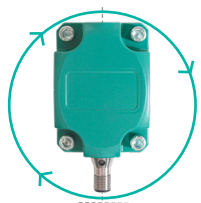
- > High Accuracy in Slow Moving Applications

Mounting Options
Horizontal Mounting



- > Dual Axis Output
- > Ideal for Levelling Tasks
- > Often Used on Chassis of Mobile Machines or Other Platforms

Vertical Mounting



- > Single or Dual Axis Output
- > Monitor Angles of Excavator Booms, Firetruck Ladders or Solar Panels

Applications

Inclinometers offer an easy and efficient way of monitoring spatial orientations without the need for mechanical linkages – a real advantage for design engineers.

Dynamic inclinometers output a clean measurement signal that can be used reliably on mobile equipment such as cranes, construction, mining, agricultural machinery and other applications where sudden movements, shocks and vibrations are likely to be encountered.

Static inclinometers can significantly improve operating safety in mobile machines, platform leveling or medical applications by continuously monitoring the tilt or inclination angles. Inclinometers are much easier to install and thus less expensive compared to rotary encoders, making them ideal for applications such as solar trackers, scissor lift tables, and aerial work platforms.

Excavator



- > Reliable Angle Measurement of Booms and Chassis
- > Able to Withstand High Shocks and Vibrations

Concrete Pump Truck



- > Stable Monitoring of Boom Angles
- > IP69K Protection for Outdoor Usage

Solar Energy



- > Accurate Angle Measurement for Alignment of Solar Panels Even During Large Temperature Fluctuations


Aerial Work Platform & Scissor Lift




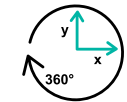
- > Platform Monitoring on Slow Moving Material Handling Equipment and Hoists

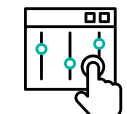
How to Select the Right Inclinometer for your Application




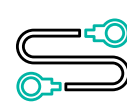
- 

1. Accuracy – Application/Technology
Depending on the application and measurement task a static or dynamic inclinometer with specific accuracy can be selected.
- 

2. Certificate
For most applications, a standard product without special certification is sufficient. POSITAL offers special product versions with ATEX certification for mining or oil-and-gas applications.
- 

3. Measurement Range
Different measurement ranges and mounting orientations can be selected, depending on the mounting position on the application.
- 

4. Communication Interface
POSITAL offers a wide range of commonly used interfaces from CANopen, SAE J1939, to Analog with different current or voltage outputs and Modbus RTU and SSI.
- 

5. Housing
Choose between cost-efficient fiber-reinforced plastic, heavy duty die-cast aluminum, zinc or a stainless steel V4A or aluminum ATEX housing.
- 

6. Connection Type
M12 connectors and PVC or PUR cable exits of different length are available. We offer dual connector variants with integrated T-coupler (Bus-in and Bus-out) that minimize cabling efforts and costs for BUS systems like CANopen or SAE J1939. Pigtail output for Deutschman or Superseal Connectors.

1	Accuracy (Technology)				
	0.10°	0.30°			
2	Certificate				
	ATEX Zone 1&21 (Oil+Gas)		ATEX Zone 1&21 (Mining)		CE / UL
3	Measurement Range (Customization Possible)				
	1 Axis	90°; 120°; 180°; 270°; 360°			
	2 Axes	± 10°; ± 20°; ± 30°; ± 40°; ± 60°; ± 80°; ± 90°			
	Pitch & Roll	± 85°/± 180° Vertical Mount			
		± 85°/± 180° Horizontal Mount			
4	Communication Interface				
	Analog	CANopen	J1939	SSI	Modbus RTU
5	Housing				
	Aluminum	Fiber	Zinc	Stainless Steel V4A	
		Reinforced Plastic			
6	Connection Type				
	Cable	1; 2; 5; 10 m			
	Connector	M12; 2 x M12 (m+f); 2 x M12 (m+m)			

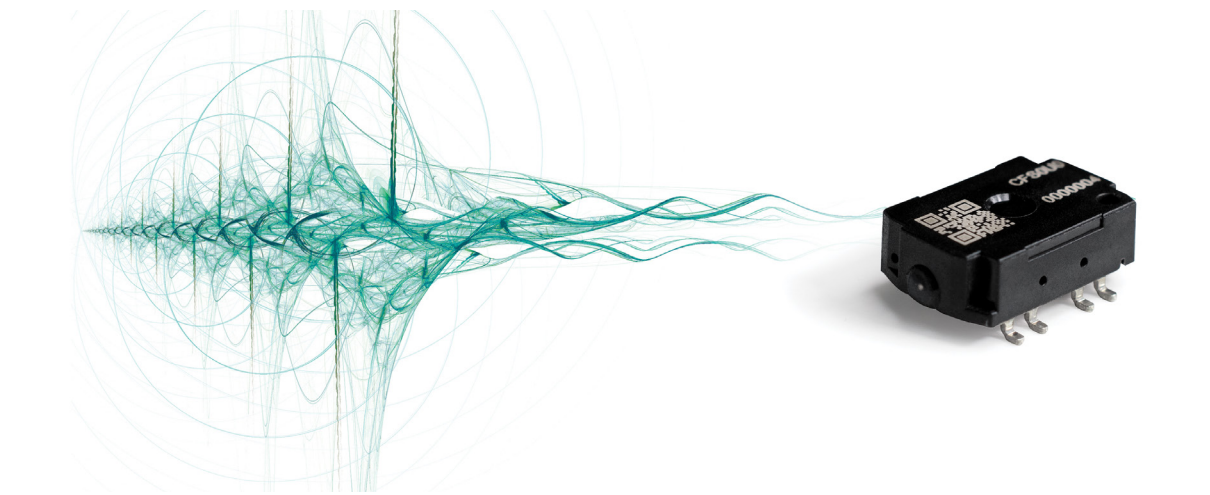
ATEX Explosion Proof Certified Inclinometers



- > Compliance with IECEx and ATEX Directives
- > Zone 1/21 Mining or Oil and Gas
- > Group I (Mining) Ex I M2 Ex e mb I Mb
- > Group II (Above Ground Operations)



Self-powered Magnetic Sensing and Pulse Energy Harvesting in One Package



Wiegand sensors offer magnetic sensing without the need for any external voltage or current to be applied. The material properties of the sensor mean that consistent pulses are produced every time the magnetic field polarity switches. In addition to magnetic sensing, ultra-low power electronics can be powered by harvesting the energy of a single pulse, or successive pulses can be stored to offset energy demand of circuits.

- > **Millions of Pulses, No Reduction in Energy**

Pulse Energy is Unaffected by Repeated and Continuous Use Over Time
- > **Frequency Independent Pulse Energy**

Consistent Energy Level Even at Extremely Low Frequencies of Magnetic Field Change
- > **Zero Mechanical Wear**

No Mechanical Elements & Non-Contact Sensing
- > **High Signal Noise Ratio**

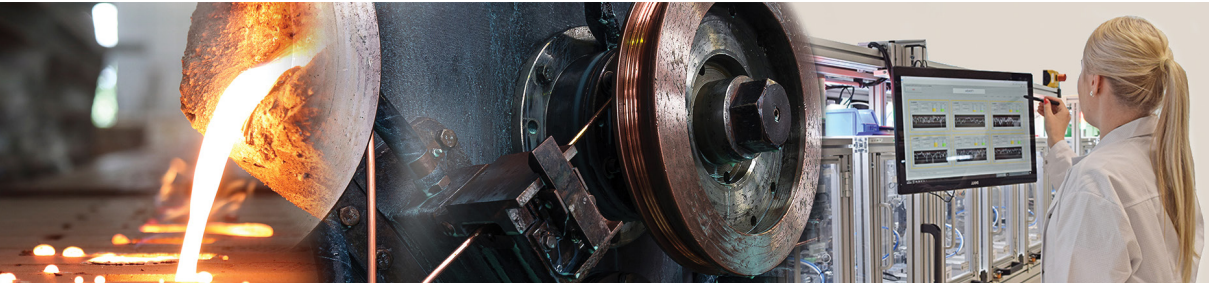
High Slew Rate & Pulse Voltage Provide Superior SNR to Other Magnetic Sensor Technologies
- > **High Triggering Frequency**

Consistent Pulse Width Means Events Can be Differentiated at Frequencies up to 40kHz
- > **The Wiegand Experts**

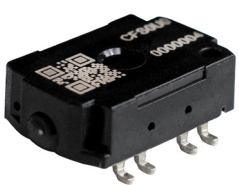
Entire Production Chain from Wire to Sensor

The Wiegand Experts

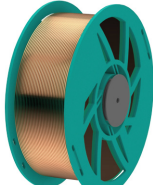
Having successfully implemented Wiegand technology since 2006, we took over wire production from the world's leading Wiegand wire manufacturer in 2013. The entire production chain from the melting of alloys through to the final production of Wiegand sensors and assemblies is controlled and optimized by our engineering and logistics teams, and continuous improvement of product quality and production efficiencies have pushed the possibilities of the technology. In 2021, UBITO was launched as a new brand to take Wiegand Technology into large new market segments.



Product Portfolio



- > **UBIPULS**
- Reliable, individually tested Wiegand Sensors and Energy Harvesters from 170 nJ to 10 μ J energy output.



- > **UBIWIRE**
- High-quality Wiegand Wire on Reel or Pre-cut, ready to use in customers' own applications.



- > **UBICYCL**
- Counting Systems with Energy Harvesting Logic ASIC & Wiegand Sensor. A perfect solution for encoder & flow meter manufacturers.



- > **UBI4IoT**
- Energy Harvesting Wireless Solutions. Contactless, Batteryless, Wireless Event-Triggered Sensing.

With significant expertise, proprietary production equipment, and a robust patent portfolio, UBITO offers high-quality products, along with engineering and intellectual property consulting services, to clients aiming to adopt and integrate Wiegand Technology. Our commitment to innovation and constant improvement led us to design our own counting ASIC – EHL in 2024, cementing our competence in Wiegand Technology. It is optimised to work with UBITO sensors, allows for more flexible counting system designs and is compatible with many singleturn technologies.

Applications

Pulsing / Metering



- > Flowmeters (Harvesting & Non-harvesting)
- > Tachometers
- > Proximity Sensors (Intrinsically Safe)

Condition Monitoring



- > Autonomous Wireless IoT Sensor Units
- > Preventative Maintenance
- > Self-powered

Power Transmission



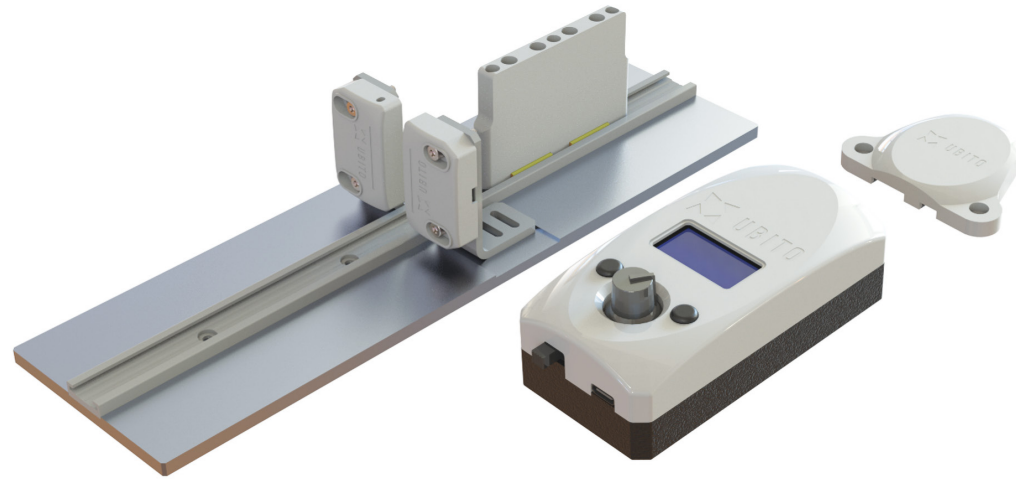
- > Low Frequency Wireless Power Transmission (e.g. Transcutaneous)
- > Kinetic Energy Harvest (e.g. Mag-drive Pumps)

Battery-free Multiturn



- > POSITAL Absolute Multiturn Encoders

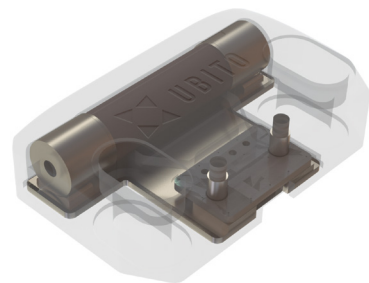
UBI4IoT – UBITO WINK (Wiegand IoT Node Kit)



UBITO WINK is a DevKit which is made to provide developers with the essential components for creation of energy-autonomous devices that can detect real-world events involving moving magnetic fields and transmit measurements wirelessly to a remote monitoring system.

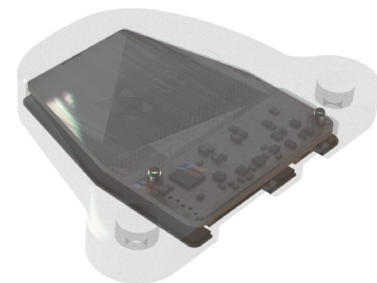
- > **No Batteries – Powered by Energy Harvesting**
- > **Wireless – Up to 50 Meters**
- > **Contactless – No Mechanical Wear**
- > **Supports External Sensors (e.g. Temperature, Magnetic Field)**
- > **Event Triggered**
- > **Not Sensitive to Speed**
- > **Customizable – Rotational & Linear**
- > **Easy to Use**

UBITO WINK consists of a slider mechanism with three magnets that ensure the alteration of the magnetic field for the operation of the following components:



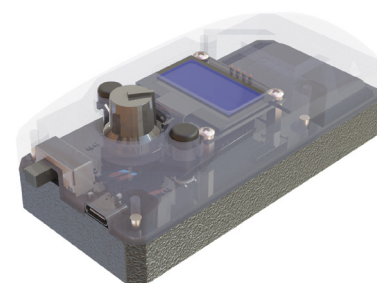
1 Wiegand Harvester

A transducer that generates about 10 micro-Joules of energy whenever the external magnetic field changes polarity by 180 degrees.



2 The Node

Responsible for power management, computing, reading external sensors & UWB communication. It sends signals to the Base when the Harvesters are triggered.



3 The Base

Responsible for receiving signals from the Node. It supports many protocols for seamless connectivity with other computers or cloud services.

Features:

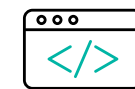
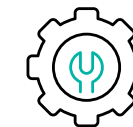


1. Connectivity

UBITO WINK transmits data between the Base and Node via UWB to the distance up to 50 meters. The Base can serve as a gateway as it supports interfaces such as Wi-Fi, GPIO, SPI, and USB Type-C.

2. Multi Sensing

Various external sensors could be connected, such as temperature, light, or magnetic field sensors.



3. Customization

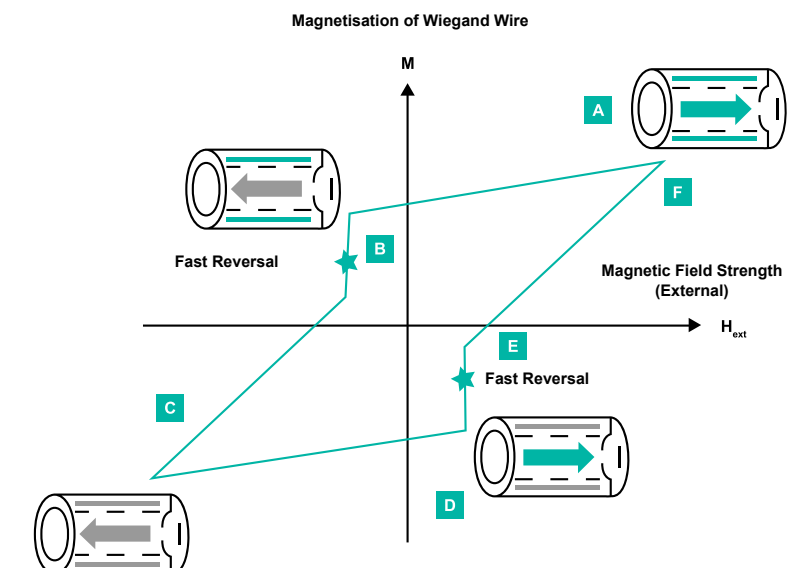
UBITO WINK is customizable. Users can build their own magnetic system, experiment with linear motion (a slider is already included), or create a rotation system.

4. Programmability

Both the Node and Base could be programmed to tailor the device for specific application cases.

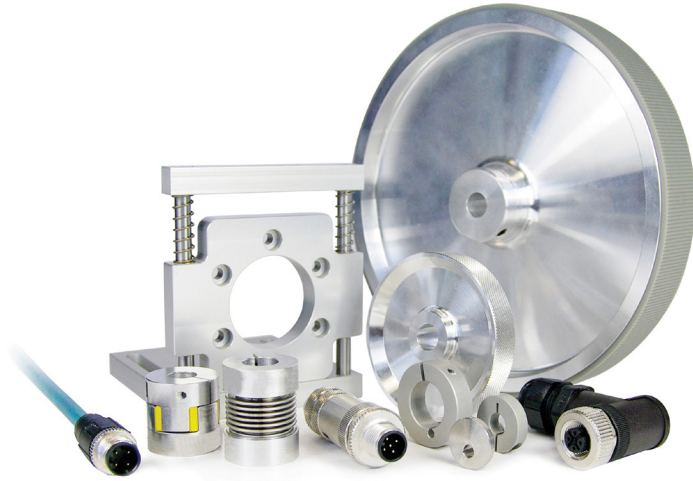
The Wiegand Effect

The Wiegand effect is a physical phenomenon discovered in the 1970's by an American inventor John Wiegand. Wiegand found that he could alter the properties of ferromagnetic wire so that it would switch abruptly between two stable magnetic polarity states. That is, when a sample of "Wiegand wire" is subjected to a reversing external magnetic field, it will initially retain its original magnetic polarity, but when the external field reaches a critical threshold, the polarity of the wire will suddenly reverse. This transition is independent from the speed of magnetic field reverse and takes place within a few microseconds. It can be harnessed to induce a pulse of electric current in a fine copper coil wrapped around the wire.



ACCESSORIES

The Right Accessory for Every Application



POSITAL offers a wide selection of accessories that simplify sensor installation and help to ensure a long and reliable service life for both the sensors and the machinery they are monitoring. Different industrial environments pose different challenges, which is why POSITAL is continuously adding new accessories to its portfolio. The quality of the accessories can be as important as the quality of the encoder or inclinometer therefore we encourage users to rely on field-tested POSITAL accessories.

1 Connectors and Cables



- > M12, M23 Female and Male Connectors
- > Straight and Right-Angled Connectors
- > Wide Range of Cable Diameter
- > Cables Lengths: 1 m to 10 m (Up to 30 m)

2 Couplings



Couplings are used to attach the encoder shaft to the machines' moving shaft.

- > Bellow Coupling (D1: 6, 8, 10 mm; D2: 6, 6.35, 8, 9.52, 10, 12 mm)
- > Jaw Couplings (D1: 6, 8, 10, 12 mm; D2: 6, 6.35, 8, 9.52, 10, 12 mm)
- > Disc Coupling (D1: 6, 10, 12 mm; D2: 6, 10, 12 mm)
- > Double Loop (D1: 10, 12 mm, D2: 8, 9.52, 10, 12, 12.7 mm)

3 Measuring Wheels



Measuring Wheels coupled with rotary encoders are a simple way to measure direct linear motion.

- > Wheel Circumference: 200, 304.8, 500 mm
- > Surface Structure: Cross-hatched Knurling; Smooth; Studded; Corrugated



ACCESSORIES

4 Draw Wire Adapters



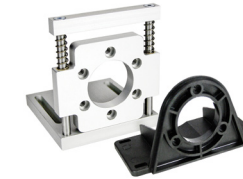
- > Lengths: 1.90, 2, 2.40, 3, 5, 6, 7.50, 10, 15, 30 m
- > Adapters & Accessories
- > Machined Metal, Plastic, Extruded Metal

6 Configuration and Interface Modules



- > UBIFAST Configuration Tool (for IXARC Encoders)
- > SSI2USB Interface Modules

5 Mounting Bracket and Adapter Flanges



- > Compatible with Synchro or Clamping (ø36, ø42, 58 mm)
- > Adapted Size: ø58, 63.5, 65, 67, 78, 80, 90, 100, 116 mm

7 Counters & Display Modules



- > Interfaces: Analog, SSI, Incremental
- > Outputs: Digital, Analog, Relay (Programmable)

8 Explosion Proof Accessories



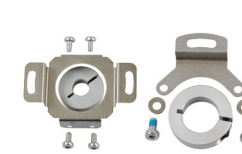
- > Ex-Proof Blind Plugs
- > Ex-Proof Cable Glands
- > Ex-Proof Draw Wires

9 Clamping Rings



- > Diameters ø6, 12, 15 mm
- > Stainless Steel and Aluminum

10 Torque Support



- > Tethers & Stator Couplings
- > Flanges: ø36 mm & ø58 mm
- > Adapted Size: ø42 – 150 mm

11 Clamp Discs



- > Secure Clamp Flange
- > Simple Zero-Point Setting
- > Centered or Eccentric Holes

12 Reducing Adapter



- > Blind & Thru Hollow Shaft
- > Reduced Diam.: ø6 – 14 mm
- > Material: Brass, Stainless Steel

13 Connection Caps



- > Interfaces: Profibus, CANopen, DeviceNet
- > Aluminum, Stainless Steel
- > Blind Plugs, Cable Glands, Connectors

WHY POSITAL?

Mass Customization



Online Product Configurator



POSITAL's online product finder allows customers to "build" their own sensors by specifying performance characteristics, mechanical features, and communications interfaces. These devices will then be custom-assembled through a computer-controlled manufacturing system that ensures quality, traceability and rapid delivery; all at prices comparable to mass-produced items.

1 Million Products

POSITAL encoders are based on a modular architecture that makes it possible for the company to offer an extremely wide range of configuration options. With a wide variety of mechanical options and programmable software features, POSITAL sensors can be installed in any application - from limited-space industrial environments to tough outdoor settings.

At Your Fingertips
1,000,000 Sensors

ENCODERMATCH



After many years of successfully replacing and retrofitting thousands of sensors, POSITAL has created an easy-to-use cross reference finder. Encodermatch allows you to find a replacement with only two pieces of information: the manufacturer and the product key. The database includes more than 20 international encoder manufacturers and over 1 million products. And the list is still growing!

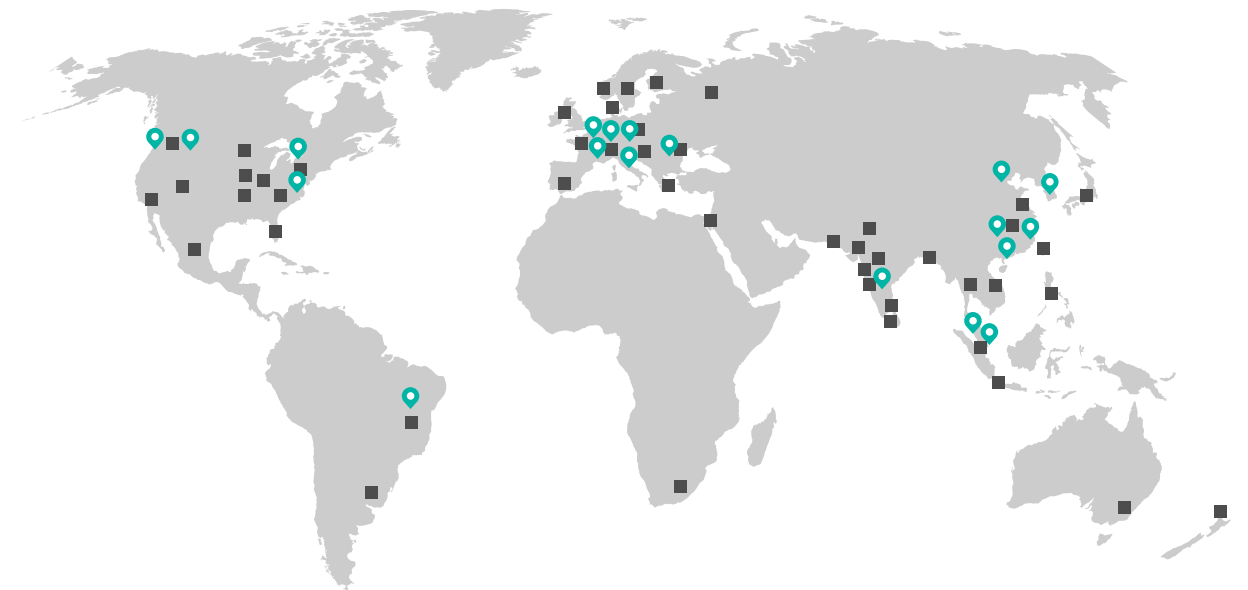
36 Month Warranty

All products sold under the POSITAL brand name include a 36 month (3 years) warranty from the date of shipping. This is an industry leading timeframe, supported by decades of experience with rotary encoders.

36
Month
Warranty



POSITAL WORLDWIDE



Sales and Support

FRABA GmbH
Cologne, Germany

FRABA Inc
Hamilton, NJ, USA

FRABA Pte
Singapore

福瑞博工业自动化
Shanghai, China

Manufacturing and Logistics

CONISTICS Sp. z o.o.
Slubice, Poland

FRABA SDN. BHD
Johor Bahru, Malaysia

FRABA GmbH
Aachen, Germany

Holding

FRABA B.V.
Heerlen, Netherlands

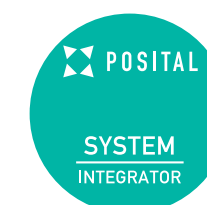
Research and Development

FRABA GmbH
Aachen, Germany

FRABA S.R.L.
Cluj-Napoca, Romania

Become a Partner

POSITAL is evolving and growing, entering new industries and new regional markets. Therefore, we are looking for new distributors: Distribution Partners, System Integrators and Registered Distributors. Our global distributor program clarifies which types of partnerships we are offering, along with their associated benefits and obligations.



Join Our Network!



www.posital.com

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