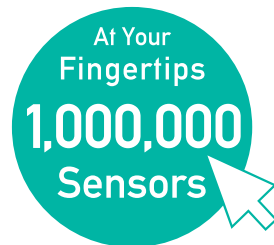
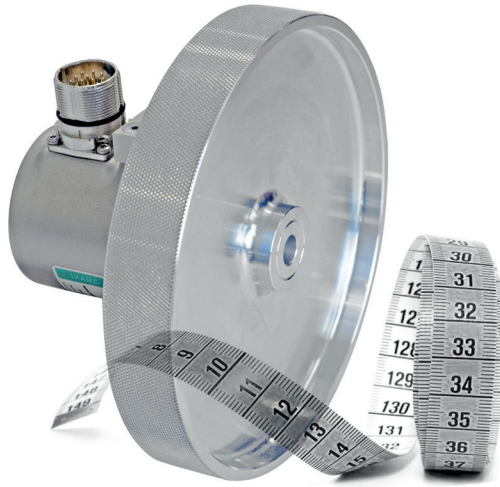
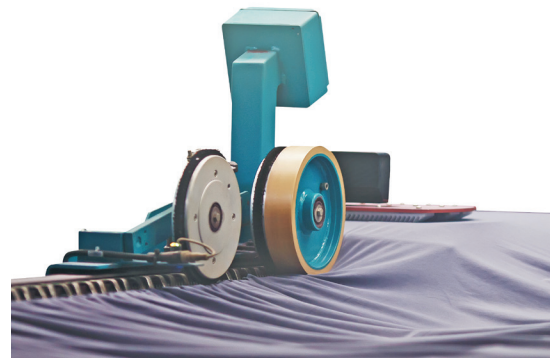




MEASURING WHEEL ENCODER



The One Stop Encoder Shop

TYPICAL APPLICATIONS

Velocity Measurement

In today's highly automated production lines, conveying plays the critical role of deterministically transporting materials throughout various production processes. Conveyor velocity and position are two measurable elements that can help assure repeatable synchronization between various conveying systems.

The most common solution-of-choice for velocity measurement being an incremental encoder with measuring wheel, running directly on the conveyor belt or surface of measured material. A spring loaded mounting appurtenance that applies pressure to measuring wheel face, has shown to be effective in mitigating the potential for "slippage" between measuring wheel and material being measured.

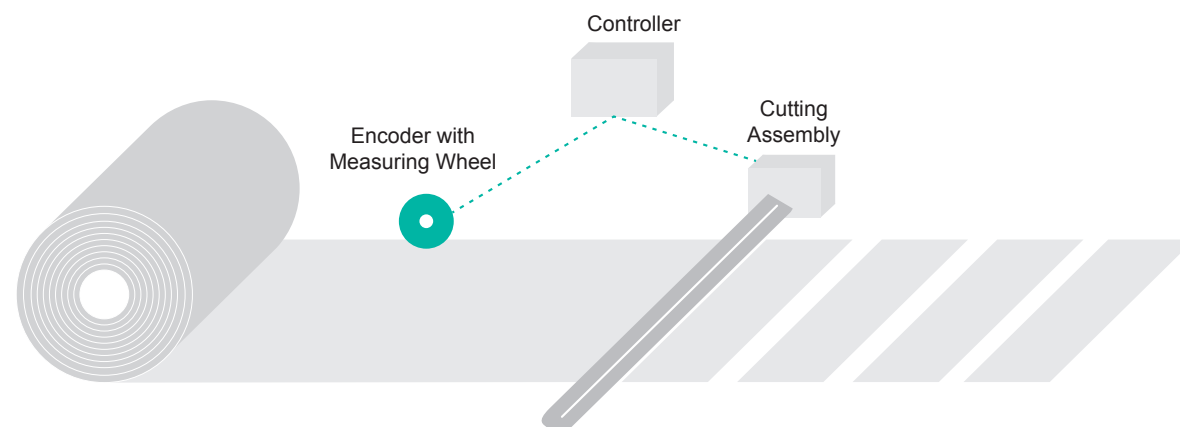
- **Synchronization of Different Conveying Systems**
- **Constant Speed of Conveyor Belt Monitoring**
- **Different Contact Surface Material/Pattern Required**


Cut to Length

Cut-to-length applications are commonly found in a broad range of industries such as food processing, wire & cable, corrugated paper, metal fab, converting, woodworking, to name just a few. As objects or materials are conveyed, precise dynamic position measurement is required to produce consistent cuts, resulting in consistent products and reduced material scrap.

Unlike other approaches such as an encoder mounted directly to the conveyor drive motor, a measuring wheel solution is not subject to mechanical drive train position errors such as gearbox backlash and hysteresis. While velocity measurement has historically been solved with incremental encoders, position measurement applications can effectively utilize absolute encoders as well.

- **Accurate Measuring Required**
- **Programmability Enables Selection of Optimal Line Count**
- **Different Electrical Interfaces Required**

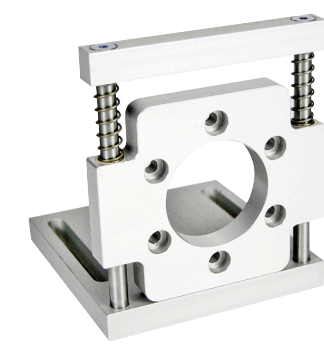

KEY COMPONENTS

Measuring Wheels

Aluminum measuring wheels for precise length measurement of various materials, are available with different surfaces such as cross-knurled, smooth, studded and corrugated. Precise wheel and bore concentricity's plus optimized wheel mass, combine to produce high measurement accuracy results. Resistance to oils, fuels, ozone and weather influences, plus optimal wear values even under high mechanical pressure, compliments the systems accuracy with the addition of robustness and reliability as well.

Circumference: 200mm; 500mm and 12 inches

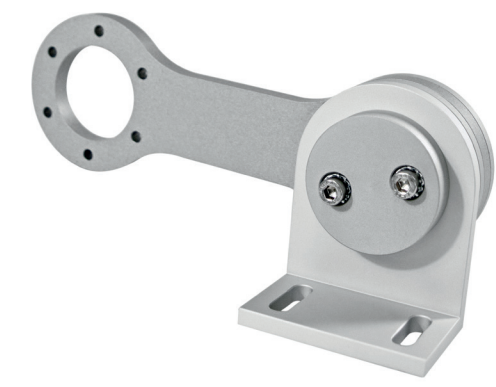
The circumference of the measuring wheel and encoder PPR, determine pulses per foot (or meter) of linear travel. The facing material of the measuring wheel and exerted pressure, determine consistent wheel traction. All of these specifications and variables are critical in achieving optimal measurement accuracy.


Spring Loaded Mounting Brackets

Precision engineered dual spring tensioning bracket with 6 mounting holes, combined with a measuring wheel of 305 mm (12") or 500 mm circumference, enables optimal positioning of the encoder over the conveyor belt or measured material. The precisely-tuned suspension guarantees a consistent pressure of the measuring wheel on the object. The dual spring design applies perpendicular and equal pressure on the material being measured. This assures accurate measurement in applications where material flows in both directions.

Spring Loaded Arm

The spring loaded pivot arm combined with a measuring wheel is optimally suited to ensure precise and reliable length measurement, while providing a greater degree of spring travel range over that of the dual spring design. The 6 mounting holes, each 60° off set on a 48 mm pitch circle, along with the flexibility of the slotted foot bracket to be mounted on either side of the pivot arm, provides a diverse array of encoder alignment and mounting configurations. Additional flexibility is derived from individual adjustability of the bimodal spring and clamp fastening mechanisms.



MAKE A MEASURING WHEEL SOLUTION FOR YOUR APPLICATION

MAKE A MEASURING WHEEL SOLUTION FOR YOUR APPLICATION

Step 1 Measuring Wheel		Step 2 Mounting Brackets		Step 3 Rotary Encoder
Wheel Circumference 1)	Surface Profile 2)	Mounting Design	Flange Design	Interface
<ul style="list-style-type: none"> 200 mm ±0.2 500 mm ±1 304.8 mm ±0.5 (12") 	<ul style="list-style-type: none"> Knurling (ALU) Smooth (PUR) Studded (PUR) Corrugated (PUR) 	Spring Loaded Mounting Brackets for Clamping Flange	<ul style="list-style-type: none"> 58 mm Clamping Flange 10 mm Solid Shaft 	Variety of Electrical Interfaces: <ul style="list-style-type: none"> Incremental Analog or Serial Outputs Fieldbus Industrial Ethernet
		Spring Loaded Mounting Brackets for Synchro Flange	<ul style="list-style-type: none"> 36 mm Synchro Flange 10 mm Solid Shaft 	
		Spring Loaded Pivot Arm	<ul style="list-style-type: none"> 58 mm Clamping Flange 10 mm Solid Shaft 	
		Spring Loaded Pivot Arm for Synchro Flange	<ul style="list-style-type: none"> 36 mm Synchro Flange 10 mm Solid Shaft 	

Design Consideration

- 1) Check accuracy calculation (next page) to assure that your selected Measuring Wheel circumference + encoder resolution will produce the required linear measurement system accuracy.
- 2) Proper Measuring Wheel surface selection strikes the balance of optimizing wheel traction, while avoiding destruction of more delicate, scratch-prone measured surfaces and materials.

Measuring Wheel Surface Profile	Application Surface									
	Cardboard	Wood	Textiles	Rubber	Plastic	Paper	Wire	Glass	Steel	
Knurled Alu	■	■	■	■	■					
Smooth PUR	■	■	■				■		■	
Studded PUR	■	■				■	■			
Corrugated PUR	■	■	■		■	■		■		



Distance Calculation:

- Wheel Circumference [C]: E.g. 200mm
- Encoder Resolution Per Revolution [PPR]: E.g. 1000
- Distance Per Pulse = $C/PPR = 200/1000 = 0.2$ mm per pulse.
- For a cut to length application of wood, we would like to cut in every 600mm length, $600/0.2 = 3000$ pulse. When the encoder gets every 3000 pulse, the slicer should make a cut.

Accuracy Calculation:

- Accuracy calculations based on wheel and encoder used Wheel Circumference [C]: E.g. 200mm ± 0.2mm
- Accuracy UCD Encoder: 12 Bit, $\sim 0.088^\circ$
- As per the length of arc formula: $S = 2\pi r \times \theta/360$
- The Accuracy of Measuring Wheel Encoder = ~ 0.05 mm

Whether your measuring wheel encoder application requires velocity or position feedback (or both!) the encoder's single turn PPR plays a critical role in overall system performance.

POSITAL's programmable encoders bundled with UBIFAST configuration tool enable control system engineers maximum flexibility at time of component selection. The ability to fine-tune PPR (1 to 16,384) or change Output Type on-site at time of encoder installation and machine commissioning, can also be the difference between on-time completion or project delay.



POSITAL measuring wheel encoders combined with POSITAL digital panel meters can make for a powerful, convenient, cost-effective solution.

Common Applications Include:

- Display real-time data to Machine Operator
- Control outputs to fire status alarms
- Localized control for conveyor E-stop
- Conversion of encoder signal to analog
- Serial output for export to Host system

POSITAL DPM's can be configured for a wide variety of standard encoder output types and simple logic and control function options.



PRODUCT FINDER

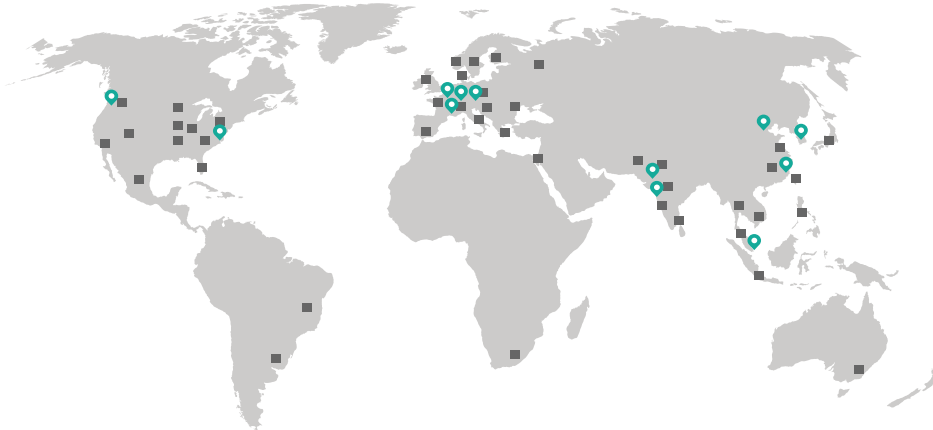
POSITAL Accessories – Product Selection Made Easy

- Access by all Mobile Devices, No Special App Needed
- Find the Right Accessory on the Go
- Product Documentation Accessible with a Few Clicks





OVER 50 YEARS EXPERIENCE WITH POSITION SENSORS



FRABA Group

FRABA is a group of enterprises focused on providing advanced products for the motion control and industrial automation markets. POSITAL has been a leading manufacturer of industrial rotary encoders for over 50 years, and has expanded its business to tilt and linear motion sensors. Other FRABA Group subsidiaries include VITECTOR, which focuses on protection sensors to guard doors and production machine covers. FRABA group is an innovator in product design and manufacturing processes and a pioneer of Industry 4.0.

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. A computer-guided semi-automated production system tracks each device from order, through assembly and testing, to final delivery.

Stand Alone Encoder Business

POSITAL's unique online product finder provides access to a huge variety of solutions without the need of specialist knowledge. Thousands of easy-to-browse specific datasheets are available in 11 languages. The traditional practice of customization has been replaced by this new approach. Even with one million unique configurations available, products are ready to ship within 5 working days.

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