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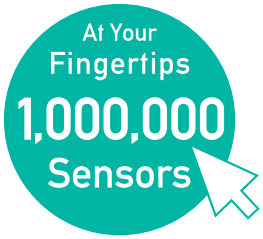
WHITE PAPER

Programmable Encoders 2.0

Programmable incremental encoders (rotation sensors) have proven to be popular over the past several years since the measurement characteristics of the device (number of pulses per rotation, output level, etc.) can be modified through a software update without requiring any changes to physical components. Now however, the engineers at POSITAL have taken the programmability concept to a whole new level with the new generation of IXARC rotary encoders. These new sensors:

- Provide both incremental and absolute encoder functions on a common hardware platform
- Are available in a vast range of mechanical configurations and connector types – literally thousands of models are offered.
- Are available in very compact 36 mm versions – small enough to fit in the palm of your hand!
- Are supported by comprehensive configuration management tools that can be accessed by end users over the full working life of the encoder
- Can be programmed by any WiFi-enabled electronic device



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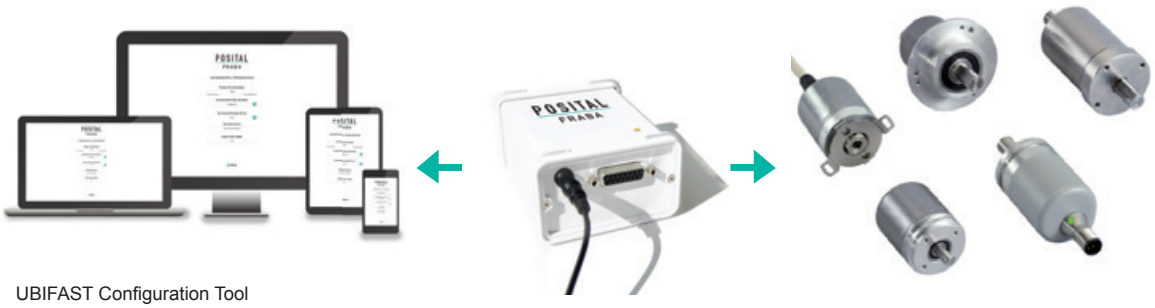


UBIFAST Configuration Tool

Benefits of Programmable Encoders

Encoders are used to monitor positions and motion within machines in many different industries. They are an essential interface between the mechanical components and the control system of a machine, so that functional requirements are as diverse as the range of applications. This diversity has led to a huge variety of available incremental and absolute encoders. Customers of POSITAL for example can chose from more than 280,000 different encoder models. Managing this diversity is important for users, distributors and manufacturers since a large catalog would mean a large inventory of devices. With programmable encoders, much of the variety in measurement characteristics can be accommodated through software changes so that the range of hardware devices needed is significantly reduced. Distributors or system integrators can stock a limited number of hardware versions and still meet customer requirements quickly and efficiently. This means that users and distributors can reduce their stock levels and spare-parts inventories significantly. Prior to delivery or installation, the encoder's measurement characteristics can be set up quickly. Moreover, the same device can be easily updated at some future time if the machine is changed or upgraded.

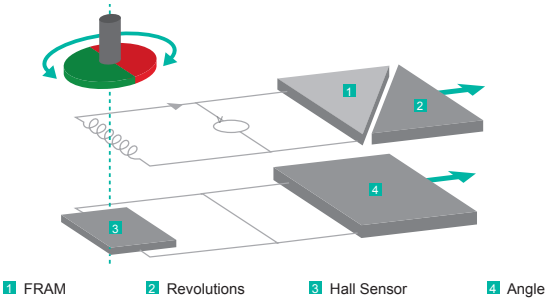
No Software Installation − Configuration Using Any WiFi Enabled Device

POSITAL's new UBIFAST configuration tool includes a WiFi hotspot and webserver. It fits into any small bag and is easy to connect to the encoder through accessory cables provided by POSITAL. Once powered, any WiFi-enabled smartphone, tablet or laptop computer can connect to the WiFi hotspot and the configuration interface will automatically open up in the web browser - no app, no software installation, no Internet connection required! Any web browser − such as Safari, Internet Explorer, Firefox or Chrome − can be used to display the graphical user interface. The user will be guided in three simple steps through the configuration. Drop down menus and a numeric input field for the number of pulses per revolution (PPR) allow a fast and convenient selection of configuration parameters. After the request has been sent to the encoder, the final configuration will be verified automatically and confirmed to the user.

Professional Configuration Management over the Whole Lifecycle

Once the encoder has been configured, it is extremely useful to keep records of the configuration. This is especially important for the end user, since a spare part might be required many years later. At this point of time, hand written notes on the label might be difficult to read and the system integrator who did the original setup might no longer be available. Most programming tools on the market are unable to save and manage records of configuration data so that they will be unavailable when they are needed. A unique feature of POSITAL's UBIFAST programming technology is an automated transmission of configuration data to POSITAL's ERP database, even when there is no Internet connection on site. Every POSITAL encoder carries a unique and unambiguous serial number and POSITAL will keep records of all configurations that have been set up during the lifetime of the each encoder. The automated transmission of configuration data could not be easier: Once the last step of configuration

Magnetic Rotary Encoder



Magnetic Measuring Principle

is done using the web browser, just one additional click will create an email in the default email client installed on the device. This email can remain in the outbox for days or weeks until the user is back in a location with Internet access. When POSITAL receives this email, the data will be automatically imported into the ERP system and create a new record in the configuration history of the device identified by the serial number. In case a spare part is required, this record can be retrieved and used to manufacture an encoder with an identical configuration. It can also be provided to the nearest distributor or system integrator who could retrieve a matching device from their stock, enter the appropriate software parameters and deliver the completed unit directly to the end user. A patent application covering the unique UBIFAST configuration approach for position sensors has been filed recently.

Incremental or Absolute? Or Both? Decide Later!

Traditionally, incremental and absolute encoders have been built around very different design concepts. Moreover, features like resolution or multiturn capability have been defined by different components such as code discs. IXARC encoders from POSITAL are based on an entirely different approach. All electronic components of a multiturn encoder are integrated on a single 35 mm PCB. No backup battery is required as this technology is capable of generating a sufficient amount of energy to record complete revolutions when the shaft of the encoder is turned. This energy generation does not depend on rotational speed. As a result, the encoder can be rotated for an indefinite number of times over long periods – with or without external power being available – without losing track of its absolute position. (This technology has been used successfully by POSITAL since 2005.) A powerful micro controller and signal processing platform within the encoder is used to create incremental output signals and calculate absolute position data that are transmitted on via an SSI interface for absolute measurements, and TTL or HTL interfaces for incremental readings. By changing the software configuration this encoder platform can become a pure incremental encoder, a singleturn encoder, a multiturn encoder or an encoder with SSI+Incremental output.

Configurable Parameters

Five different rotation measurement modes can be configured, using the common hardware platform:

- Incremental only
- SSI singleturn
- SSI multiturn
- SSI singleturn + incremental
- SSI multiturn + incremental

Absolute encoder parameters that can be selected include:

- Singleturn resolution
- Number of turns
- Code (gray or binary)
- Code sequence
  (clockwise or counter-clockwise increasing)
- Preset value (output value the encoder should show when zero set pin is pressed)

Incremental encoder parameters that can be selected include:

- Pulses per revolution (any number 1 to 16384)
- Incremental output driver
  Push Pull (HTL) or Line Driver (TTL)

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Over 280,000 Models Available!

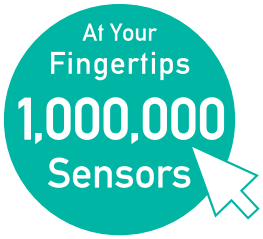
Large Variety of Hardware Options – Easy To Select

POSITAL's programmable encoder are available in a very large variety of mechanical configurations, including 36, 40, 42, 48 and 58 mm flanges and a variety of shaft types (solid shaft, or blind hollow shaft versions with a range of shaft diameters) to ensure compatibility with all common standard in America, Asia and Europe. Radially or axially positioned connectors and cable outputs are both available. Heavy duty versions with an IP protection class of up to IP69K and up to 300 g shock resistance are available in both aluminum and 316L grade stainless steel housings. The online product finder at www.posital.com helps users navigate this wide range of available models and provides more than 280,000 specific data sheets in 11 different languages.

Save Time And Money – Start Today!

The UBIFAST configuration technology comes free of charge with POSITAL encoders and will be added to other POSITAL position sensors soon. Since a small number of devices can be programmed to take on a wide range of measurement tasks, distributors of incremental encoders can reduce their inventory levels by up to 80%. OEM customers using a variety of different incremental and SSI encoders can now cover different applications with a small number of devices, greatly simplifying supply chain and inventory management. System integrators can decide at the last minute how to tailor the encoder to specific requirements on site and initiate the purchase of the encoders while final design requirements are still under discussion. End users can receive spare part from a distributor or system integrator quickly, reducing both downtime costs and shipping costs.

Author: Ingo Moench, Date: July 1st 2015



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