



OPERATING INSTRUCTIONS KIT CONFIGURATION TOOL WITH GUI



- Compact format box with easy plug and play connection
- Only a USB connection with the PC needed
- Easy to integrate in existing setups
- An additional software makes it possible to run the Kit Encoder main functions
- Easy way to do the calibration, preset, pulse testing and filter setting with the Kit Encoder
- Additional possibility to read out the temperature and kit encoder firmware version

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Version Date: 23.03.2026

Version Number: 2.4

Authors: JKP

Reviewer: KMA, KNE

Valid for:

Kit Configuration Tool

With software version SW V.3.0.0.

Kit encoder with BiSS C interface (Type KxD-BCxxB-xxxx-xxxx-xxx)

Kit encoder with SSI interface (Type KxD-SxxxB-xxxx-xxxx-xxx)

User Annotation

Please note that no responsibility is assumed by POSITAL for any consequences arising from the use of this material. This document is not intended as an instruction manual for untrained personnel.

POSITAL welcomes all readers to send their feedback about the product and this document.

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1. Electrical Connection

The Kit Configuration Tool can be connected to encoders of the types:

- Kit encoder with BiSS C interface (type KxD-BCxxB-xxxx-xxxx-xxx)
- Kit encoder with SSI interface (type KxD-SxxxB-xxxx-xxxx-xxx)

Article number Kit Configuration Tool Set and additional adapter cable

10047799	KIT CONFIGURATION TOOL KCB-VA + Adapter Cable Set for 36 mm kit
10055547	KIT CONFIGURATION TOOL KCB-VA + Adapter Cable Set for 22 mm kit
10058366	KIT CONFIGURATION TOOL KCB-VA + Adapter Cable Set for CCD-SSI HS Kit
10079692	KIT CONFIGURATION TOOL KCB-VA + Adapter Cable Set for 20 mm kit
10048949	Kit Configuration Tool - Adapter Cable for KxD-BC/Sx 36 mm Kit
10072645	Kit Configuration Tool - Adapter Cable for KxD-BC/Sx 36mm (M12)
10055145	Kit Configuration Tool - Adapter Cable for KCD-BC/Sx 22mm Kit
10058091	Kit Configuration Tool - Adapter Cable for CCD-SSI HS Kit
10078948	Kit Configuration Tool - Adapter Cable for KTD-BC/Sx 20mm Kit



In case Kit Configuration Tool is used for configuration of KCD-XX03B-XXXX-XXXF-XXX (Ø 22 mm), to prevent an encoder kit from electrical damage, please ensure, that only KIT CONFIGURATION TOOL KCB-VA produced not earlier than after the 19th week of 2020 (on the product label indicated as 19/20) and that the appropriate adapter cable is used. If an older version is available, please, contact us to arrange an update.

1.1 Connector

Connector Type Encoder Kit Interface: Ø 36 mm BM04B-GHS-TBT (JST) / M12 8pin
 Ø 22 mm BM08B-NSHSS -TBT (JST)
 Ø 20 mm BM08B-SRSS-TB (JST)

Connector Type on On-Axis Absolute Kit Encoder side: BM08B-GHS-TBT (JST)

Pin No.	Function	Remark
1 (blue)	GND	
3 (grey)	UART Rx/Tx	TTL Level
8 (red)	VCC	+5V

Table 1: JST connector allocation of On-Axis Absolute Kit Encoders

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Connector Type on Hollow Shaft Absolute Kit Encoder side: SM10B-GHS-TB (JST)

Pin No.	Function	Remark
8 (blue)	GND	
3 (grey)	UART Rx/Tx	TTL Level
7 (red)	VCC	+5V

Table 2: JST connector allocation of Hollow Shaft Absolute Kit Encoders

Connector Type on Kit Configuration Tool side: D-Sub High Density 15 pin female

Pin No.	Function	Remark
11 (blue)	GND	
10 (grey)	UART Rx/Tx	
15 (red)	VCC	+5V

Table 3: D-Sub High Density 15 pin connector allocation

1.2 Electrical Characteristics

Item No.	Parameter	Symbol	Min.	Typ.	Max	Unit	Remark
	Input Voltage		4,5	5	5,5	V	via USB
	Input Current				100	mA	
	Short circuit protection		YES				
	Output Voltage encoder			12		V	
	UART Voltage		3,3	5	5,5	V	

Table 3: Kit Configuration Tool electrical characteristics.

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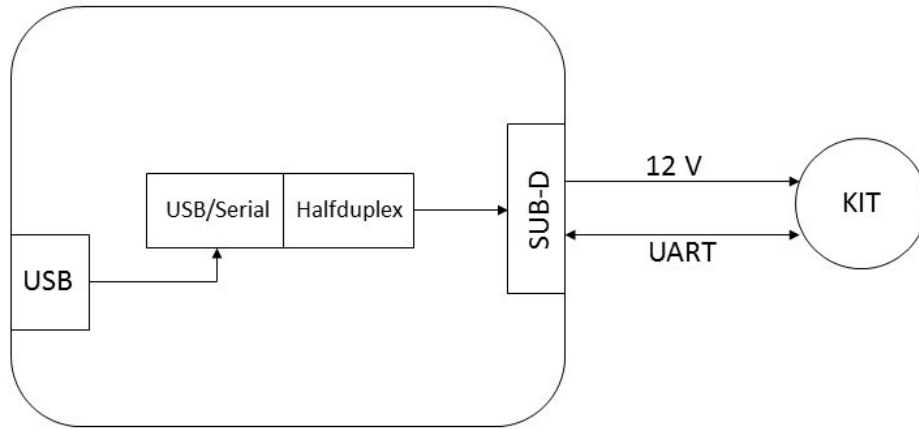


Figure 1: Kit Configuration Tool Overview

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2. Software

2.1 Installation

For the software execution the Labview Run-Time Engine 2015 SPI (32 bit) is required. For installation, use the Kit Configuration Tool Installer and start the "setup.exe". It will automatically install the Labview Run-Time on your PC. To connect with the Kit Configuration Tool, the FTDI driver for the FT232R chip is required. The installation of the Windows driver will start automatically after the installation of the Kit Configuration Tool software. For other operation systems, it can be downloaded from the FTDI Chip Homepage (Link: <http://www.ftdichip.com/Drivers/D2XX.htm>). After the installation the setup.exe in the folder can be started.

2.2 Connection with the Kit Encoder

After connecting the Kit Configuration Tool with the kit encoder and via USB with the PC, the "Connect" button has to be activated. After a successful connection, the green light "Device connected" will turn on and the status display will show the actual temperature, firmware version, serial number and the content of the error and warning register. For further information about the error and warning register value, please have a look at the Kit Encoder manual. With the refresh button, the values will be updated. To disconnect, the "Connect" button needs to be pressed again.

In case of connection failure, an error message will appear.

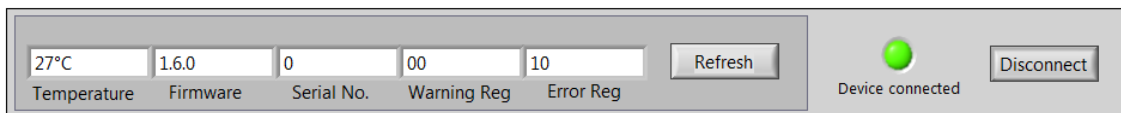


Figure 2: Status display

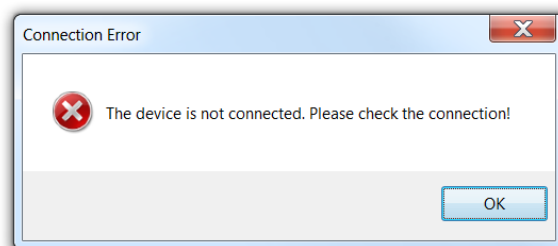


Figure 3: Connection Error message

2.3 Function Overview

The Kit Configuration Tool software is an easy way to perform the set up of the main functions of the Kit Encoder.

- Calibration
- Preset
- Wiegand Pulse Test
- Filter Selection
- Register Communication

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- Firmware Update

To run above mentioned functions, the Kit Configuration Tool must be connected to the Kit encoder.

2.4 Start Page

When the software is initialized, the start page will appear. From there you can navigate to POSITAL website, for further information materials, e.g. manuals and datasheets for Kit Configuration Tool or Kit Encoder.

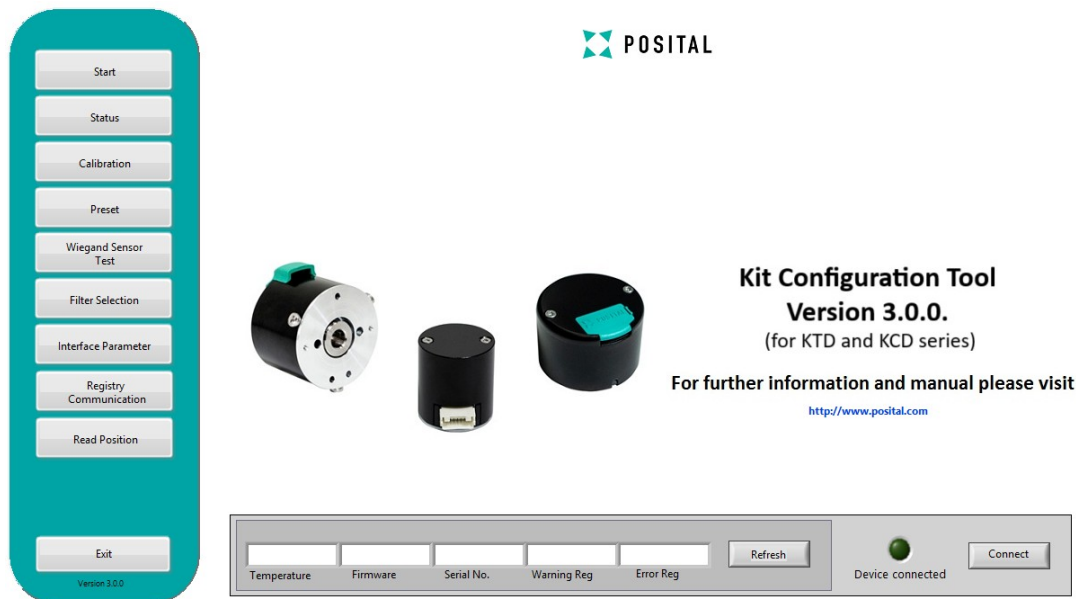


Figure 4: Start Page

2.5 Status

For reading the content of the error and warning register, go to the page “Status”. By activating the “Read Status” button, the error and warning register will be read. The value is in hexadecimal format. “Bit 0...7” in the error field describes possible errors and “Bit 0...2” in the warning field shows the warnings. The following tables explain the meaning of the bits.

Error Bit	Description	
0	FRAM Error	
1	Multiturn Error	
2	Singleturn Error	
3	Temperature Sensor Fault	
4	Magnetic Field too low	e.g. detect missing magnet
5	Not used	
6	Not used	
7	Not used	

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Warning Bit	Description	
0	Temperature too high	Set at $T \geq 125^{\circ}\text{C}$, clear warning at $T < 123^{\circ}\text{C}$
1	Not used	
2	Not used	

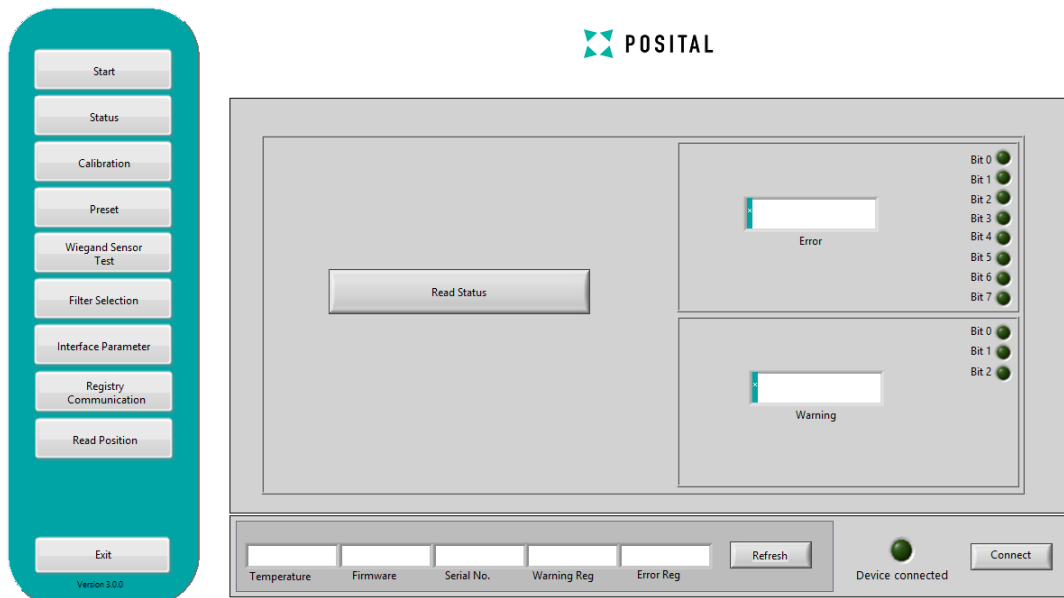


Figure 5: Status reading

2.5 Calibration

The electronic calibration of the BiSS kit encoder is required to improve the measurement accuracy of the kit encoder after installation. The calibration of the fully mounted sensor requires rotation of the motor shaft at constant speed of 500 rpm, where deviation of angular velocity should be less than 2 rpm. For further information, refer to Kit Encoder Manual.

Calibration Procedure

The calibration is performed by carrying out the following sequence:

1. Initiate the procedure with the button “Start Calibration” in the main calibration window

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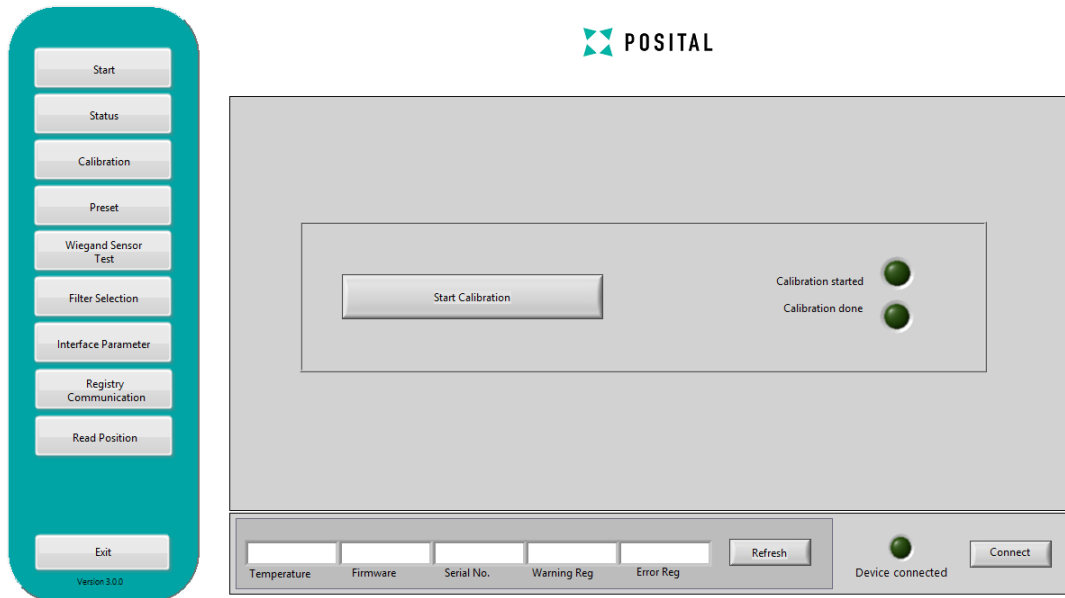


Figure 6: Calibration main window

2. A pop-up window will give a signal to begin the rotation of the motor in CCW direction. The motor should be run at constant rotational speed of 500 rpm ± 2 rpm. Once established, confirm with "OK" button.

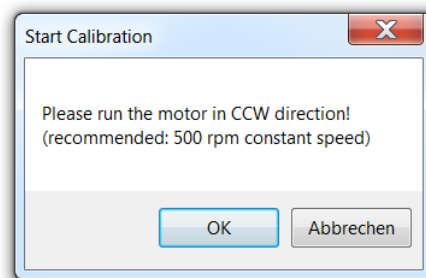


Figure 7: Start Calibration CCW direction

3. The calibration status window will appear. Please wait until the "CCW done" light turns on. The execution will take about 3 seconds.

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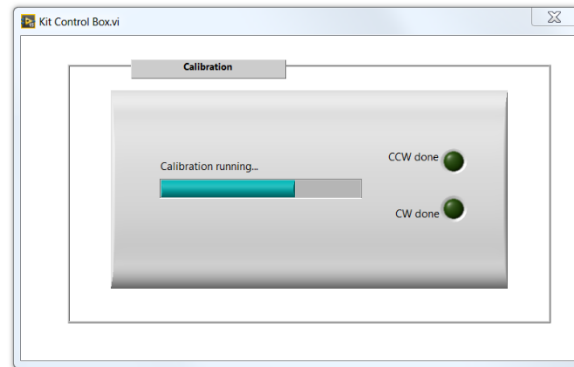


Figure 8: Calibration status windows

4. Run the motor in CW direction. Once motion is established, confirm with “OK” button in the pop-up window.

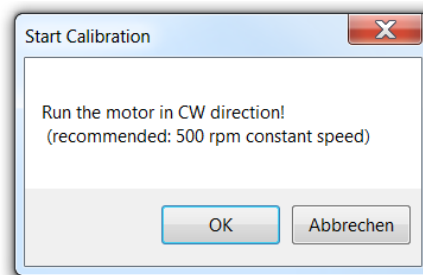


Figure 9: Start Calibration CW direction

5. After CW direction calibration was successfully finished, the “CW done” light in the status window will turn on. In the main calibration window, the “Calibration done” light will turn on. The calibration is now successfully completed.

If the calibration was not successful, an error message will pop up. The most plausible reasons are:

- Wrong direction of rotation
- Temperature out of range
- Lost connection

2.6 Preset

The preset function is used to set the absolute position to a desired value. By manufacturer default setting the preset value is defined to zero. To set preset to zero, the button “Preset” must be activated. The light “Preset done” will turn on after the preset was successfully nullified.

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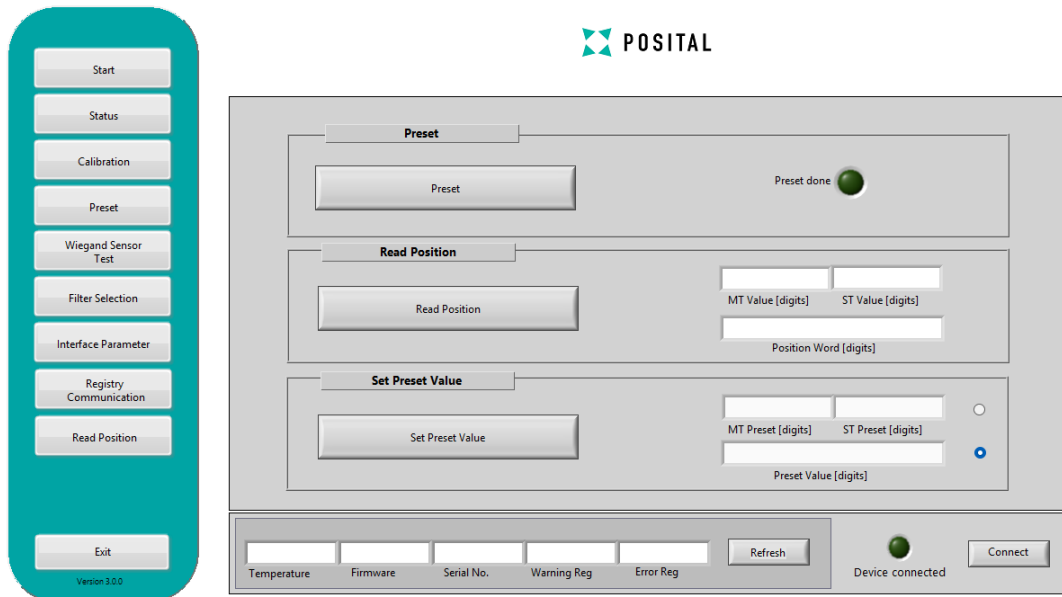


Figure 10: Preset main window

The preset value is also programmable. To change the preset value, two configuration methods are possible. A consistent value may be used for positioning tasks while a split value is easier to use for rotor position calibration.

The two methods are described in the following example :

Example for half a turn 0.5 decimal → 180°

Desired preset value:

Multiturn value = 4 decimal, equal to $4 \cdot 2^{17} = 524288$ in digits

→ Range of value [0.....524287] = 524288 steps

Singleturn value = 0.5 decimal, equal to $0.5 \cdot 2^{17} = 65536$ in digits

→ Range of value [0.....65535] = 65536 steps

Singleturn value in degree = $\frac{\text{Singleturnvalue (digits)}}{2^{17}} \cdot 360^\circ = 180^\circ$

The lower radio button must be activated to set one consistent value.

For calculation of the single value Preset Value [digits] you can use following formula:

Preset Value [digits] = Multiturn value in digits + Singleturn value in digits

Preset Value [digits] = 589824

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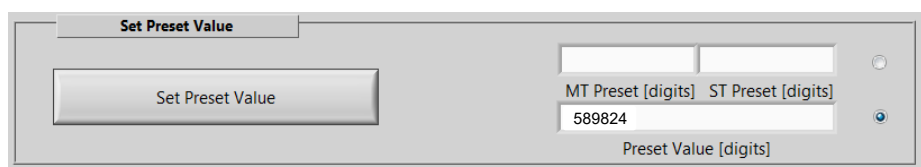


Figure 11: Entering the Preset value

For entering the preset value as split in single- and multi-turn part separately, the upper radio button must be activated. The lower 17 bits of the position value represent the single-turn part value in digits, while the upper 16 bits represent the multiturn value in digits.



Figure 12: Entering the preset value as ST and MT split value

Change the Preset Value

1. Choose the format in the “Set Preset Value” field. For entering the value separated in multi- and single turn value, the upper radio button must be activated. For entering the value in position word format, the lower radio button must be activated.
2. Enter the preset value in Single turn and Multiturn Value separated format or in the position value format.
3. Push the “Preset” button and wait until the light “Preset done” turns on.
4. To check the preset, the position can be read by activating the “Read Position” button. The value should be successfully updated.

2.7 Wiegand Sensor Testing

The BiSS C kit encoder uses a magnetic Wiegand counter to provide absolute multiturn values. The software integrated Wiegand sensor test measures Wiegand sensor properties, by analyzing Wiegand pulses for 515 motor shaft revolutions. The test must be carried out for both clockwise (CW) and counterclockwise (CCW) rotations.

Wiegand Sensor Test Procedure

Calibration procedure is performed by carrying out the following sequence:

1. Start the Wiegand Sensor Test with the button “Start Wiegand Test” in the Wiegand Sensor Test main window. The “Test started” light will turn on.

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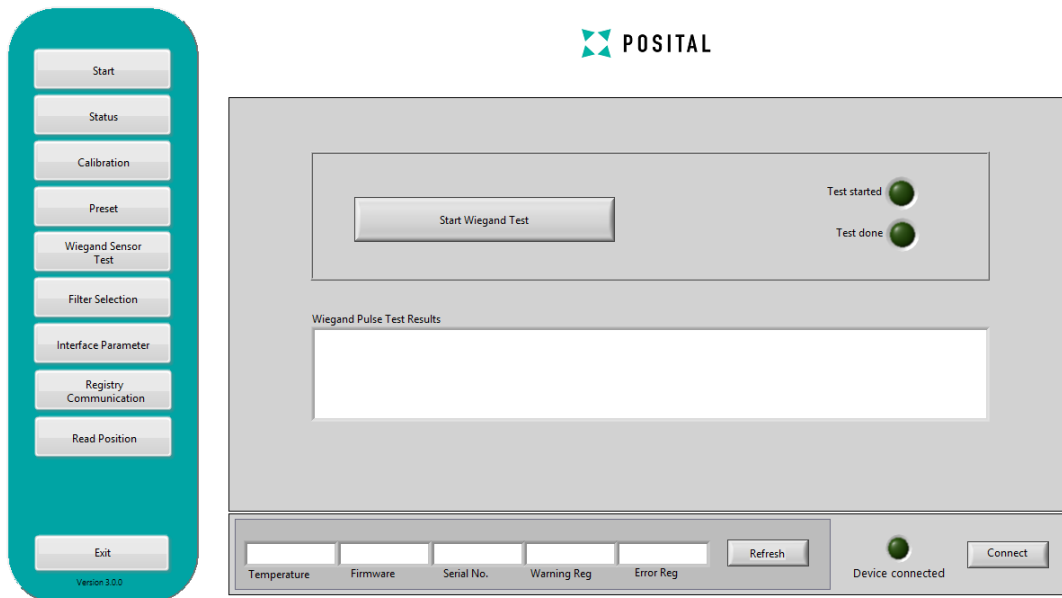


Figure 13: Wiegand Sensor Test main window

2. A pop-up window will give a signal to begin the rotation of the motor in CCW direction. The motor should be run at constant rotation speed of 500 - 2000 rpm. Once established, confirm with “OK” button.

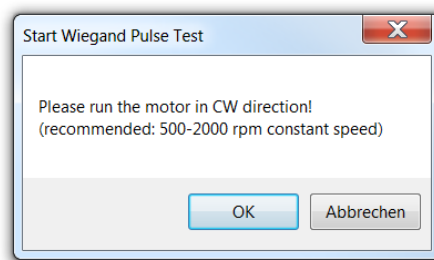


Figure 14: Start Wiegand Pulse Test in CW direction

3. The Wiegand Sensor Test status window will appear. The “CW running” light will turn on. Please wait until the “CW done” light turns on. The execution will take about 60 seconds.

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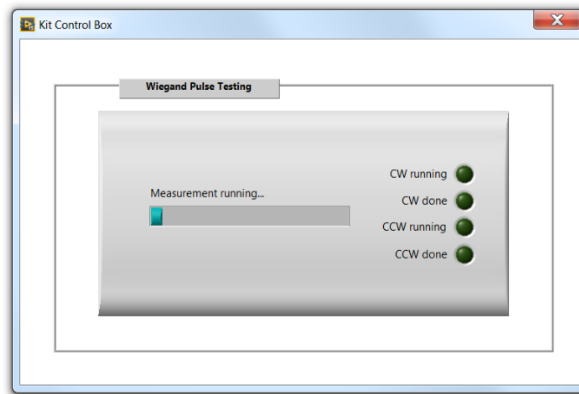


Figure 15: Wiegand Sensor Test status window

4. Run the motor in CCW direction. Once the motion is established, confirm with “OK” button.

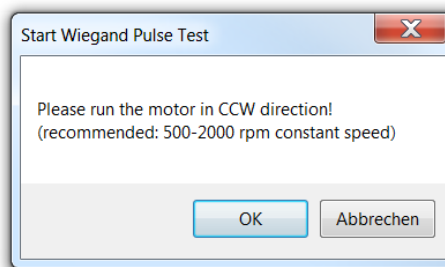


Figure 16: Start Wiegand Pulse Test CCW direction

5. After the CCW direction testing is finished successfully, the “CCW done” light in the status window will turn on. In the main Wiegand Sensor Test window, the “Test done” light will turn on and the results will be shown in the result panel. The average pulse height of the analyzed pulses and its standard deviation is saved for CW and CCW direction. A Wiegand pulse height average minus 4x standard deviation greater than 5.3 V is recommended for operation.

If the Wiegand Sensor Test was not successful, an error message will pop up. In this case, please check if the device is connection and the rotational speed and direction are correct.

2.8 Filter Selection

The Kit encoder offers two different filter options:

- **Balanced (default)**

This filter provides a very well-balanced relation of signal noise and dynamic behavior.

- **Dynamic**

This filter provides position values with short latency, but increased signal noise. Therefore, this filter is suitable for very fast and dynamic motor control loops.

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For the KTD series there is the additional filter option:

- **Low Noise**

This filter provides position values with reduced dynamic performance but decreased signal noise.

The current filter setting can be checked with the “Read Filter” button. To change the filter, please select the one in the list and confirm with “Change Filter”. If the change was successful, the “Filter changed” light will turn on.

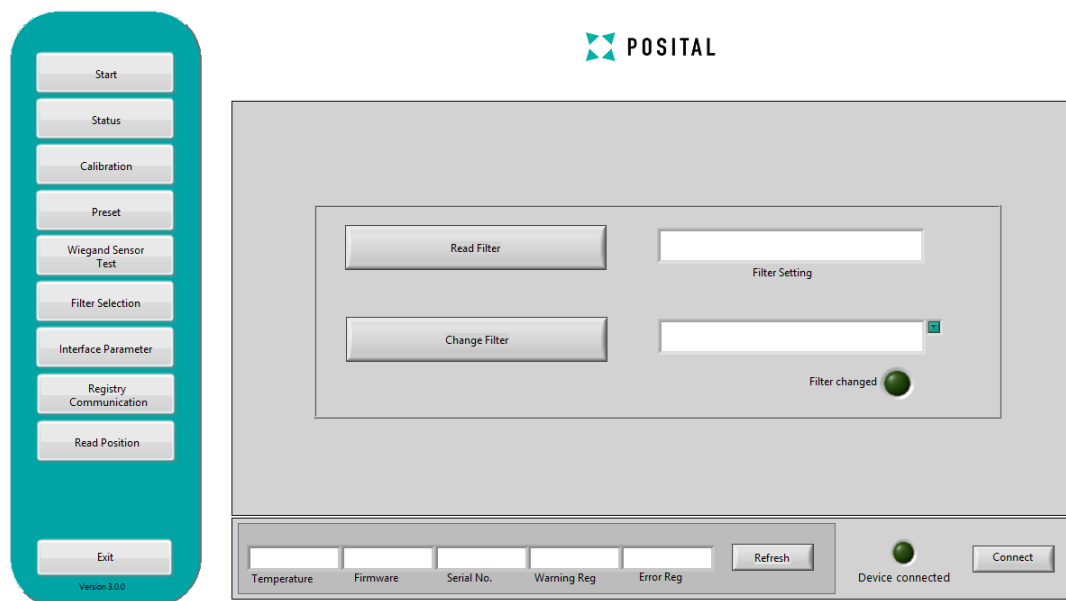


Figure 17: Filter selection main window

2.9 Register communication

To manually read from or write to any register, a register communication function is available in the software. All inputs, including the register address and—when writing—the desired value, must be entered in hexadecimal format. For further information about register communication, the BiSS-C Kit Encoder manual is recommended.

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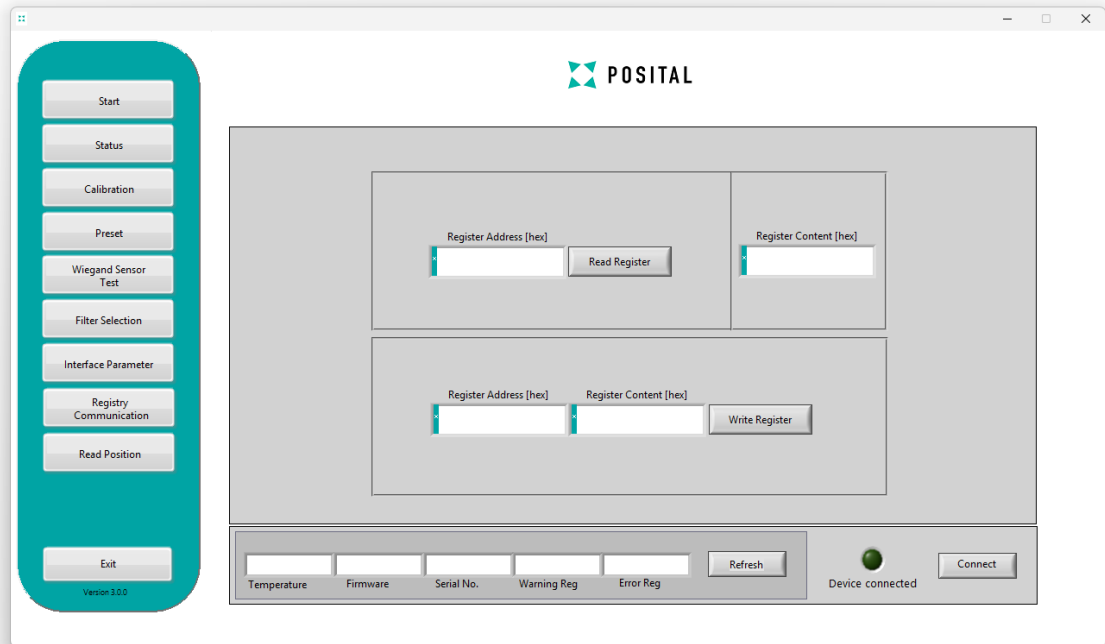


Figure 18: Register communication main window

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2.10 Read Position

Continuous position reading can be performed with the function “Read Position”. This option is only supported after 2.0.0. release of the Kit Configuration Tool Software.

To open the read position window, activate the button “Start Position Reading”.

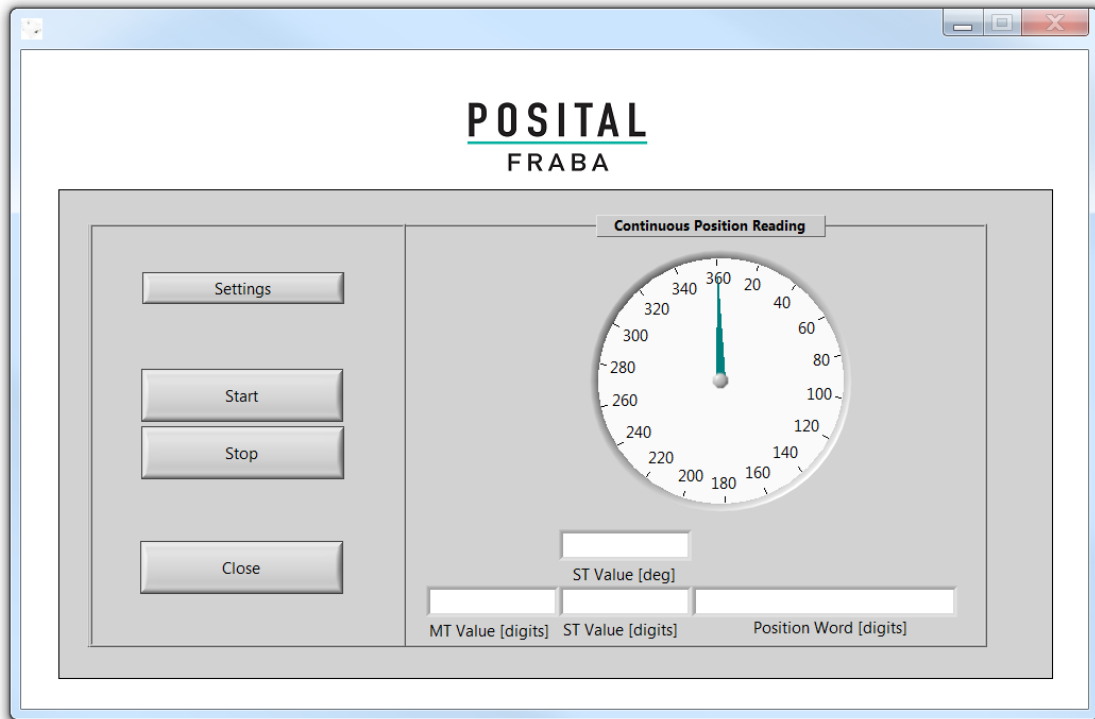


Figure 19: Read Position window

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The position readout supports different resolutions. When pressing the “Start” button, the software automatically reads the encoder resolution from the registers and uses it to calculate the multiturn (MT) and singleturn (ST) values, as well as the resulting position.

If the detected resolution is incorrect for any reason, it can be manually adjusted under “Settings”. Please ensure that the resolution is read only once when pressing “Start”. If a different encoder with another resolution is connected, the measurement must be restarted by pressing “Stop” and then “Start” again to update the resolution.

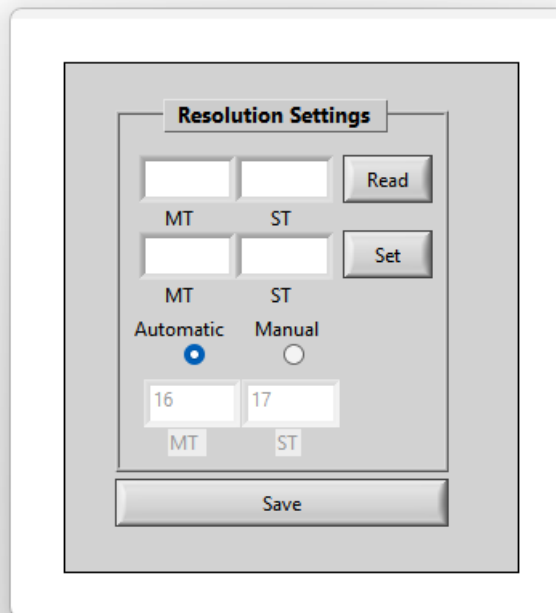


Figure 20: Read Position Settings (KTD series)

If the exact resolution is unknown, it can be retrieved using the “Read” function.

When the “Automatic” mode is selected, the system applies the default resolution parameters.

To define custom values, switch to “Manual” mode, enter the desired MT (Multiturn) and ST (Singleturn) resolutions, and confirm by pressing “Save”. This function is only compatible with the KTD series. Once saved, the settings window will close automatically.

After pressing the “Start” button in the main read-out window, the Single Turn, Multiturn, and the combined position value are displayed continuously.

The Single Turn value is represented in both degrees and digital counts.

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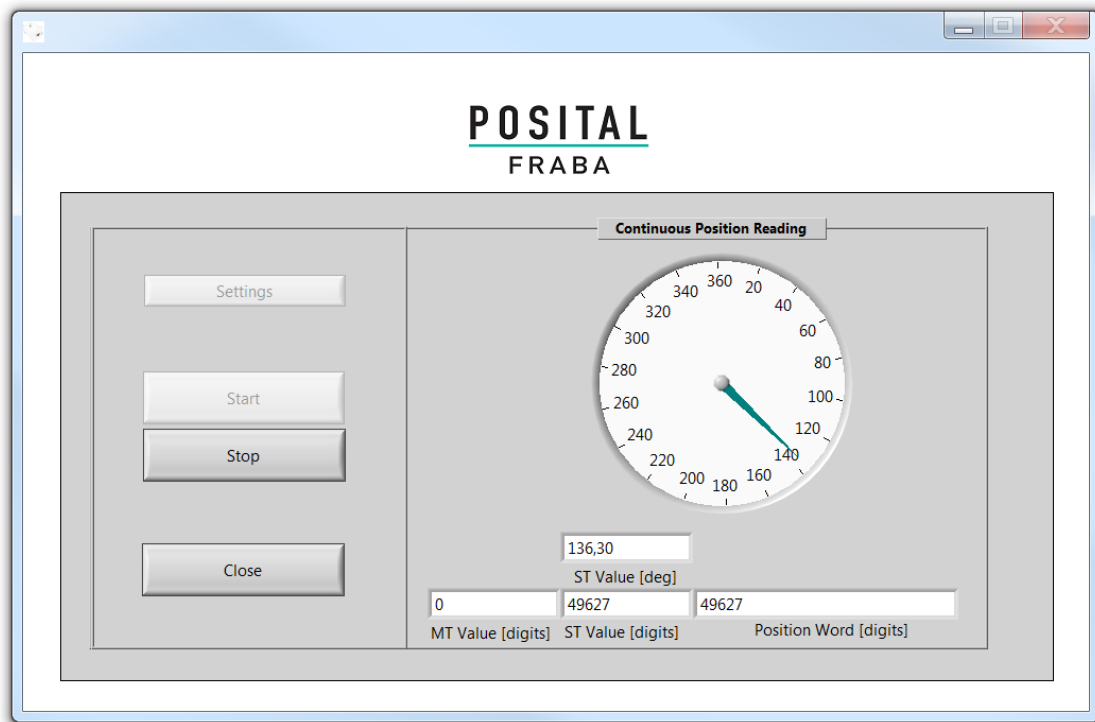


Figure 21: Contionous Position Reading

For the default settings with a Single Turn resolution of 17 Bit Singelturn and 16 Bit Multiturn these values are calculated as shown in the following example:

Example for half a turn 0.5 decimal → 180°

Multiturn value = 4 decimal, equal to $4 \cdot 2^{17} = 524288$ in digits

→ Range of value [0.....524287] = 524288 steps

Singleturn value = 0.5 decimal, equal to $0.5 \cdot 2^{17} = 65536$ in digits

→ Range of value [0.....65535] = 65536 steps

$$\text{Singleturn value in degree} = \frac{\text{Singleturnvalue (digits)}}{2^{17}} \cdot 360^\circ = 180^\circ$$

The gauge will also show the Single turn value in degree format.

To stop the continuous reading you can press the “Stop” Button or close the window with “Close” button.

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2.11 Update Firmware

To upgrade the firmware, you can use the “Update Firmware” function. This option is only supported after 2.0.0 release of the Kit Configuration Tool Software. For KCD series a .bin file, for KTD series a .hex file, is needed.

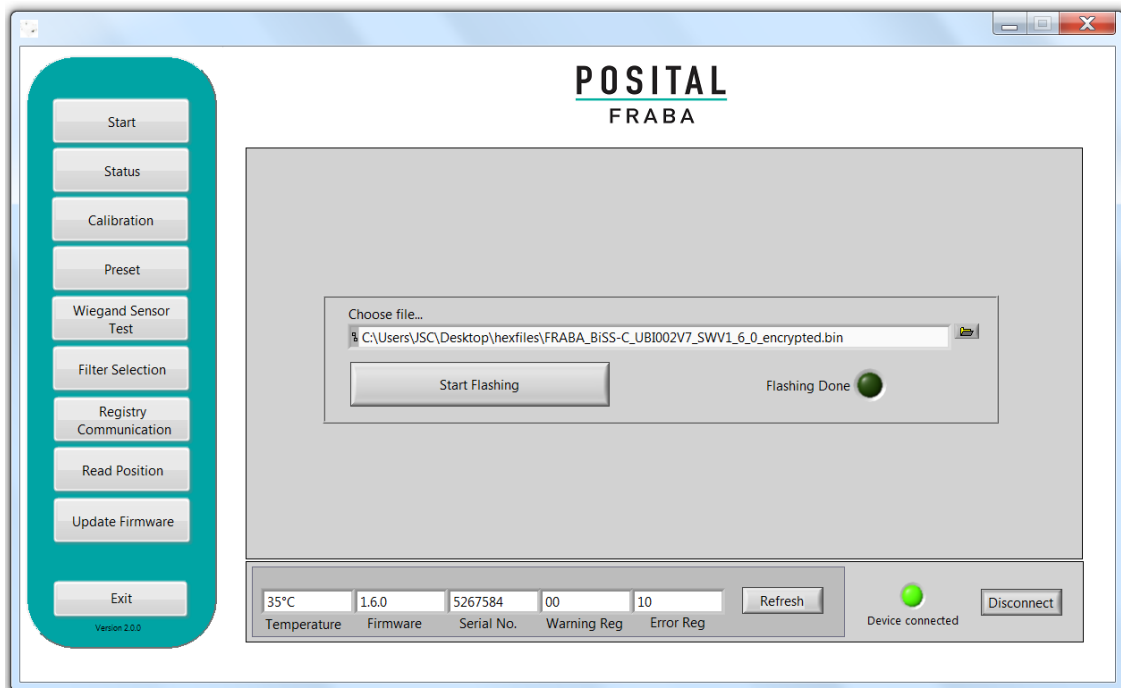


Figure 22: Update Firmware

You can choose a firmware file with “Files” button. After choosing the firmware file, activate the button “Start Flashing” and the flashing process will start. Manufacturing data e.g. the serial number, filter settings or customer data will not be changed.

After a successful flashing process, the “Flashing Done” light will turn on.

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3. References

[1] Fraba Posital: MANUAL IXARC KIT ENCODERS WITH BISS C INTERFACE Rev 4.2, 28.03.2018.

4. History

Softwareversion 1.0.0, released 18-10-01, first version

Softwareversion 1.0.1, released 19-08-16, bugfix for higher version numbers

Softwareversion 2.0.0, released 20-09-10, firmware updating function, start page, status function to read out the error and warning register, continuous position read out, overworked status bar to read out error, warning and serial number register

Softwareversion 3.0.0, released xx-xx-xx, compability with KTD series, new functions for setting resolution, added low noise filter