

PWB Calibration Software for Encoders

(GUI Version 4)



1 Introduction

Thank you for purchasing a product from PWB Encoders!

Our Mini-Encoders, Encoder Wheels, Encoder Strips and customized Motor-Encoder-Assemblies are used million-fold in multiple industries and fields of application.

PWB encoders GmbH has always been very customer-oriented, and this ensures our worldwide growth. Our Marketing acts as interface between customer, development, distribution and production, and thus presents ideas for many innovations.

This user manual explains how to use the calibration tool AS25/50 BiSS/SSI/SPI. This calibration tool is needed to calibrate your encoder after mounting in your application, so that the best operating stability can be reached.

For calibration you need an encoder, interface type (see matrix 3.1) PWB xC and a USB cable, USB type A to USB type mini-B.

1.1 Description Encoder AS25/50

The AS 25/50 is a high-resolution, multi-functional absolute encoder. It offers a variety of common encoder interfaces. The AS 25/50 generates simultaneously position data as well as speed data. Thus, the encoder is ideal for positioning and rotation speed control. The AS 25/50 is based on radial Hall sensing of a two-track magnetic wheel by using the nonius principle. The differential sensing offers the advantage of effectively suppressing homogenous magnetic interferences. This is the reason why static fields don't have a significant influence on output signals.

1.2 Features

- Singleturn absolute encoder
- Magnetic sensing
- port output (absolute + incremental simultaneously)
- Interface:
 - SSI (synchronous serial interface) (up to 18 Bit)
 - BiSS® (bidirectional serial synchronous) (up to 18 Bit)
 - SPI (serial peripheral interface) (up to 18 Bit)
 - ABI (incremental interface) (up to 65.536 cpr)
 - UVW (commutation signals) (up to 16 pole pairs)
 - Sin/Cos (analog interface) (up to 64 periods)
- High protection class
- Compact size
- Bearing free
- High shock and vibration resistant
- Operating temperature: -20°C to +85°C
- Compliant EU-directive 2011/65/EU (RoHS)

1.3 Applications

- Motor feedback
- BLDC motor commutation
- Hollow shaft
- Multi-axis measurement systems





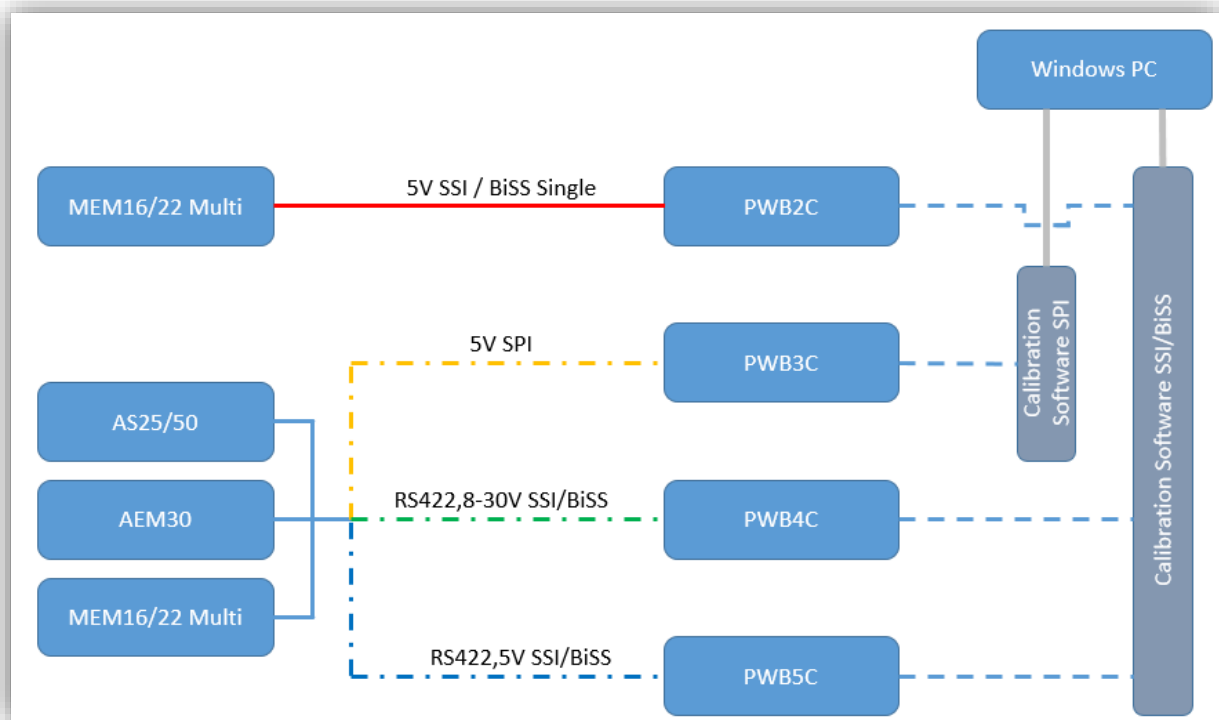
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3 First Steps

3.1 Software / Encoder Matrix

For our different types of encoders different programming boxes and software are needed for a successful calibration process. Take a look at the following matrix which shows the dependencies.



3.2 Download Software

There are two software installation-packages available:

- One package including LabView runtime engine (LV RTE) for operating systems without LabView runtime engine already installed.
- One package without LabView runtime engine.

3.3 System Requirements

- Operation System Microsoft Windows 10
- Multi Core Processor 2,2 GHz or higher and 32-Bit (x86)- or 64-Bit (x64)-Architecture
- At least 3 GB RAM, if using 32-Bit-Version, 4 GB for 64-Bit-Version
- Minimum 500 MB free Disk Space
- One free 2.0 USB Port

3.4 Installation of Software

1. Install the software by starting „Install.exe“. Follow installation routine. Older versions will be overwritten.
2. Install USB Driver you'll find in the extracted folder.

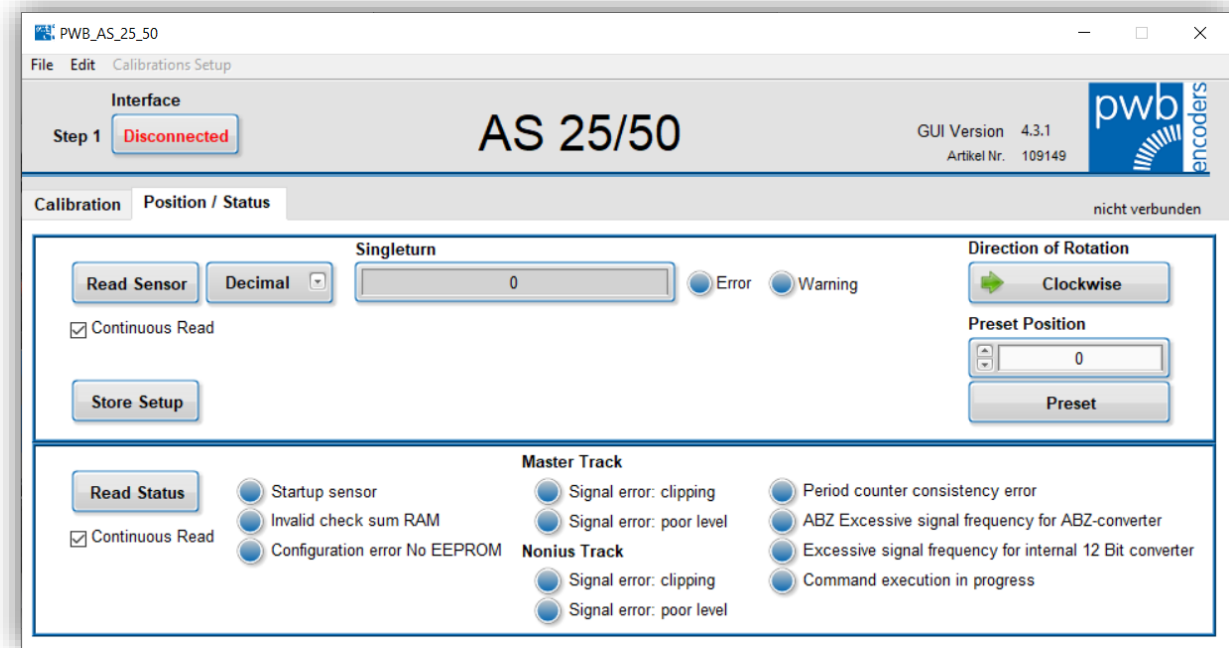
Install MB4U Driver-6.2_libusb1.0.21.exe for use with PWB4C Interface
Install MB5U Driver-6.2_libusb1.0.21.exe for use with PWB5C Interface
Install USB_MB3U_driver_ftdi21224.exe for use with PWB3C Interface

3.5 Connect Box to PC

Connect the Encoder to the Interface PWBxC and the box to your PC (USB3.0 cable required) maximum USB cable length 2 meters. For longer distances increase the length of the SUB-D cable (maximum 10 meters).



4 Automatic Calibration



4.1 Automatic calibration Step 1

After clicking the button „**Disconnected**“ (Step 1) the software will connect with the interface and the encoder. The button switches to “**Connected**” when all components are successfully connected.

4.2 Automatic calibration Step 2

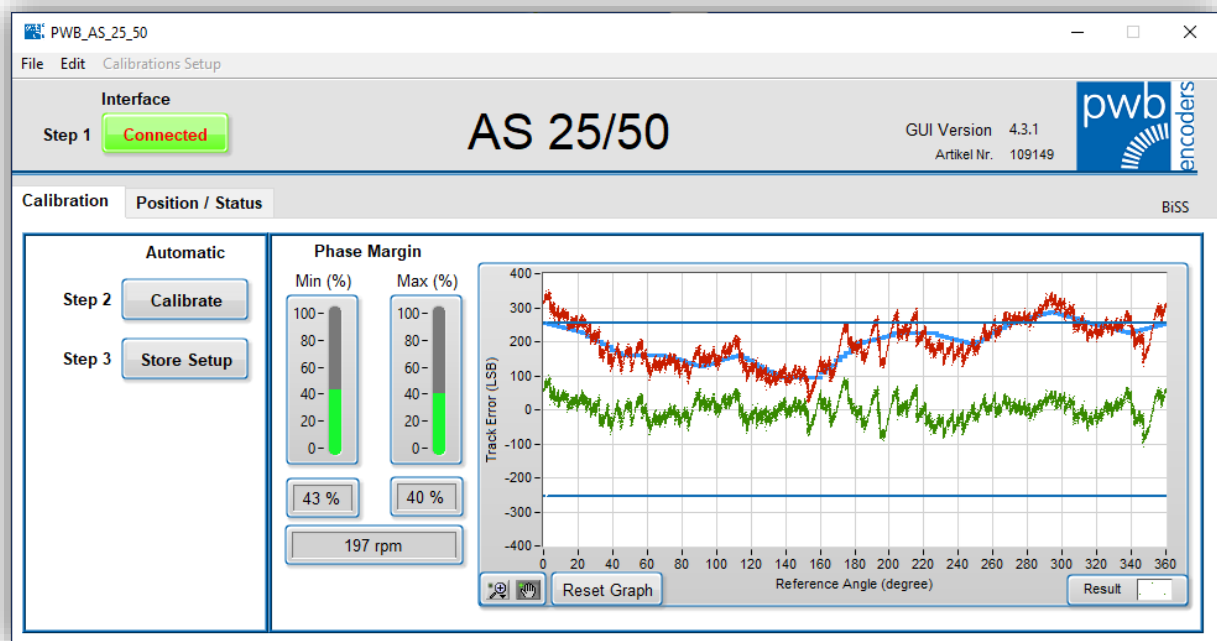
Start calibration of the encoder with magnetic wheel. Use button “**Calibrate**”
The magnetic wheel has to rotate continuously, if it moves slowly or stops, an error will be displayed. In that case, restart calibration.

4.3 Automatic calibration Step 3

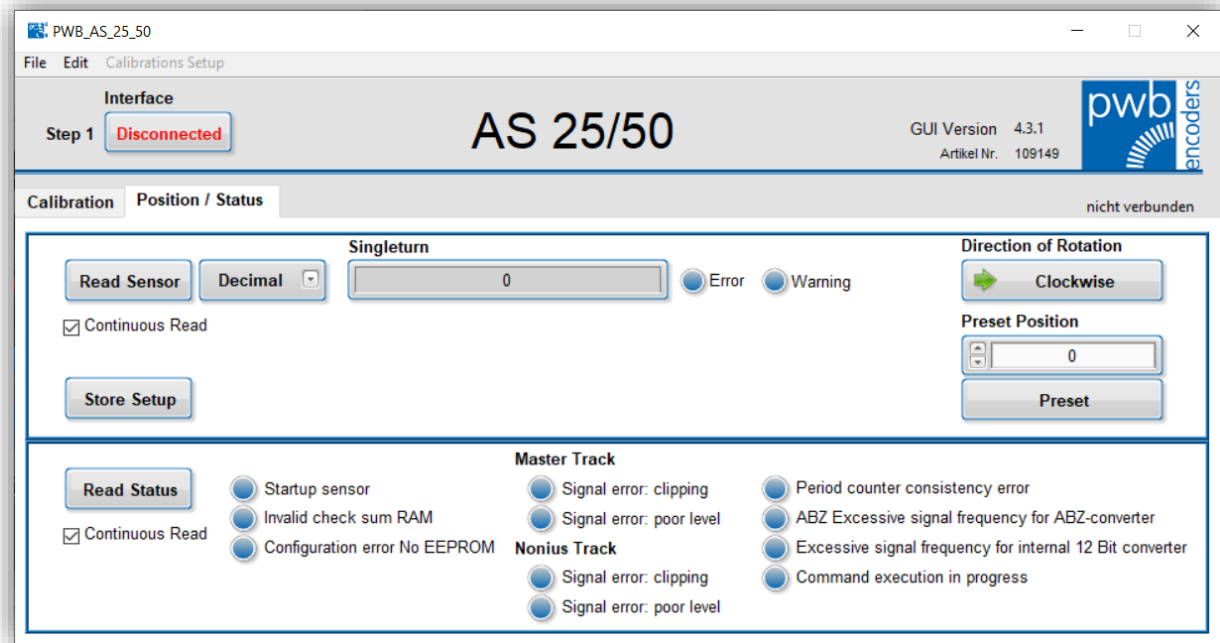
Click on “**Store Setup**” to save calibration results to the encoder. (Without saving calibration results will be lost.)

4.4 Successful calibration / Graph Display

If all manual measurements finished successful, the traveled angle area will be displayed and the quality of the signal is displayed as a graph. You can inspect the graph with the displayed tools, change line style and also export data to clipboard and Excel.



5 Position / Status Tab



- By clicking „**Read Sensor**“, actual values can be displayed.
- To display the “Singleturn” value in different number systems, select your desired from the dropdown “**Decimal**” button on the left
- By selecting “**Continuous read**” you can switch between permanent refreshing and one time updating of the singleturn value.
- With the button „**Direction of Rotation**“ you can switch between **Clockwise (CW)** and **Counterclockwise (CCW)**.
 - **CW**: Increasing value when turning clockwise, see shaft (mounting side)
 - **CCW**: Decreasing value when turning counterclockwise, see shaft (mounting side)
- When changing the direction of rotation, the displayed position value changes to its complementary value.
- With „**Set to Zero**“ the singleturn value set to 0 at the actual position. You have to save this modification via Calibration Step 3.
- Click „**Read Status**“ to display all actual errors occurred. Click “**Continuous Read**” to update errors permanent.

6 Backup

By clicking Edit → “**Generate Report**” you can save all actual values into a file.

7 Save settings to Encoder – Store Setup

If all values modified, save them to the encoders EEPROM via Step 3 “**Store Setup**” after that the program will close connection to the encoder and the interface.

8 Contact – Customer Service

For any questions or support please feel free to contact us!

PWB encoders GmbH
Am Goldberg 2
D-99817 Eisenach
Germany
Phone: +49 3691 72580-0
Fax: +49 3691 72580-29
Mail: info@pwb-encoders.com

9 IMPORTANT NOTICE

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PWB encoders GmbH reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services also datasheets at any time.