



HEIDENHAIN

EIB 1512

Addendum

**Adjustment Process for
Position Calculation**



07/2020

1 Information about the Addendum

1.1 Document category

These instructions are an Addendum to the mounting instructions for the product. The Addendum supplements the information in the mounting instructions. All other information contained in the mounting instructions remains valid.

The document describes a one-off set-up process, during which the positions of two scanning heads are calculated using the EIB 1512. For the calculation, the EIB 1512 mathematically combines the two incoming sinusoidal signals (1 Vpp) to provide an outgoing EnDat signal.

1.2 Information on the product

Product designation	ID number
EIB 1512	667095-xx

ID label

The ID label is provided on the side panel of the product.

Example:



- 1 Product designation
- 2 Identification number (ID)

2 Adjustment procedure with two scanning heads



Be sure to have read and understood the documentation of the respective products before connecting the EIB 1512 with the scanning heads, the PWM, and the Adjusting and Testing Software.

NOTICE

Equipment damage due to disconnection of the plug connections under voltage

If you disengage the plug connections while voltage is applied, this can result in damage to all connected devices.

- ▶ Disconnect the connection between the product and the Adjusting and Testing Software after every adjustment step
- ▶ Switch off the PWM before disconnecting the cables

To combine the positions of two scanning heads mathematically, you have to carry out the following three steps in the corresponding order:

- **Step 1:** Mounting and adjustment of the scanning heads
- **Step 2:** Transferring the adjustment data
- **Step 3:** Calculating the position of the two scanning heads

2.1 Products and accessories

The following products and accessories are required for the adjustment process of the scanning heads with the EIB 1512:

Designation	ID number
TKN ERP 1000 disk/hub assembly	1126369-xx
or	-
TKN ERO 2000 disk/hub assembly	785130-xx, 785128-xx
2x AK ERP 1080 scanning head	1166688-xx
or	-
2x AK ERO 2080 scanning head	1279649-xx, 1301150-xx
2x adapter cable	372979-xx
Y-cable	1311163-xx
Adapter cable for EIB 1512	1036526-xx
PWM 20/21	731626-xx
Adjusting and Testing Software (ATS)	539862-xx

2.2 Other documentation

The following documents are available to you:

Documentation	ID number
Mounting instructions	
EIB 1512	669220-xx
AK ERP 10x0 scanning head	1226800-xx
Mounting wizard for AK ERP 1070/1080 scanning head	1196545-xx
or	
AK ERO 20x0 scanning head	1282751-xx
Mounting wizard for AK ERO 2070/2080 scanning head	1294570-xx
Operating Instructions	
PWM 20 and PWM 21 Operating Instructions	1125089-xx
User's Manual	
Adjusting and Testing Software (ATS)	543734-xx



The documents can be downloaded from the Infobase at https://www.heidenhain.de/de_EN/documentation/infobase/.

3 Mounting and adjustment of the scanning heads

3.1 Overview

In the first step of the adjustment process, you mount the two scanning heads on the graduated disk. Use the PWM and the Adjusting and Testing Software to perform the adjustment.

NOTICE

If the power supply range or the wiring is incorrect, there is a hazard of damaging the product and the encoder!

An incorrect power supply range or incorrect wiring / pin layout may cause damage to the product and the encoder.

- ▶ Note the power supply range of the connected encoder
- ▶ Verify that the connecting cable between the encoder and the product is correctly wired
- ▶ Unused pins or wires must not be assigned
- ▶ Do not engage or disengage the connecting cable between the encoder and the product while under power
- ▶ The connection of non-HEIDENHAIN encoders to the product and the operation of the product with non-HEIDENHAIN encoders are at the user's own risk

3.2 Mounting the scanning heads

Mount the two scanning heads one after the other on the graduated disk. To perform mounting correctly, connect the scanning heads to the PWM and the Adjusting and Testing Software.



Note the different mounting instructions for the ERP 1080 or ERO 2080 scanning heads for mounting.



If the range of traverse is limited or scale segments are used, mount the first scanning head close to the reference mark.

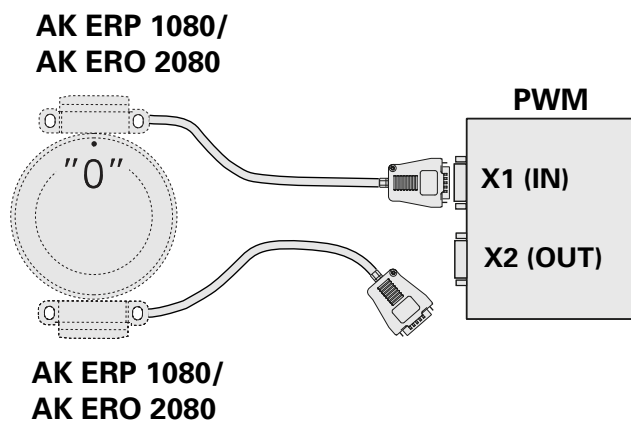


Figure 1: Connection diagram for mounting and adjustment of the scanning heads

3.3 Performing adjustment and diagnosis

Use a PWM unit and the Adjusting and Testing Software to perform the adjustment of the scanning heads. The mounting wizard of the Adjusting and Testing Software guides you step-by-step through the adjustment process.



Note the different mounting instructions for the ERP 10x0 or ERO 20x0 mounting wizard for the adjustment process.

Proceed as follows to connect the scanning head with the Adjusting and Testing Software:



- ▶ Connect the first scanning head to the PWM according to the connection diagram
- ▶ Switch on the PWM
- ▶ Open the PC application of the Adjusting and Testing Software
- ▶ Double-click **Connect encoder** in the function menu
- ▶ The Adjusting and Testing Software displays the **Encoder selection** dialog
- ▶ Enter the encoder ID in the **ID-number** field; the entry may be with or without a hyphen
- ▶ The determined encoder parameters are shown in the **Encoder data** field
- ▶ Click **Connect**
- ▶ The connection to the encoder is set up



Deactivate the HSP function in the Adjusting and Testing Software before performing the adjustment with the mounting wizard. By deactivating HSP, you get uncorrected signals.

Deactivate the HSP function as follows:



- ▶ Double-click **Incremental signal** under basic functions in the function menu
- ▶ Click **Deactivate HSP** in the control bar
- ▶ The blinking message **HSP off** is shown
- ▶ The diagram and displays are updated

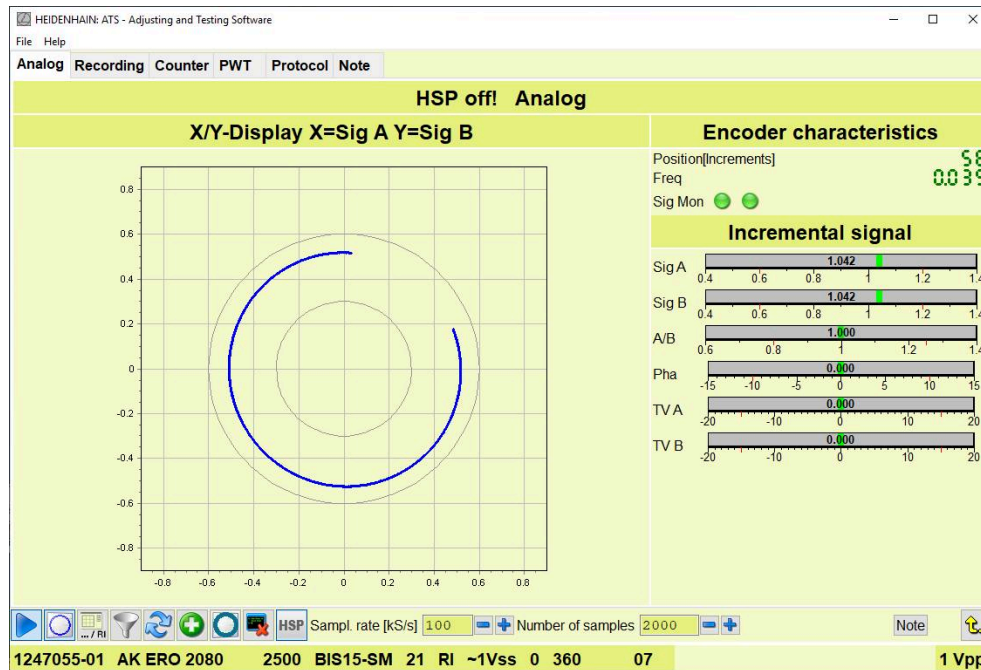


Figure 2: Deactivated HSP function

Perform the adjustment with the mounting wizard. Proceed as follows:

- ▶ Double-click **Mounting** in the function menu
- The mounting wizard is activated
- The Adjusting and Testing Software shows safety precautions
- ▶ Click **Next**
- The program guides you through the four mounting steps
- The adjustment values are saved permanently in the encoder
- ▶ Repeat the adjustment with the mounting wizard for the second scanning head

4 Transferring the adjustment data

4.1 Overview

In the second step, you mutually transfer the adjustment data of the two scanning heads. The step is intended to avoid errors, such as position errors.

4.2 Connecting both scanning heads

Use the Y-cable to connect the two scanning heads to a PWM and the Adjusting and Testing Software.

Connect the devices according to the connection diagram.

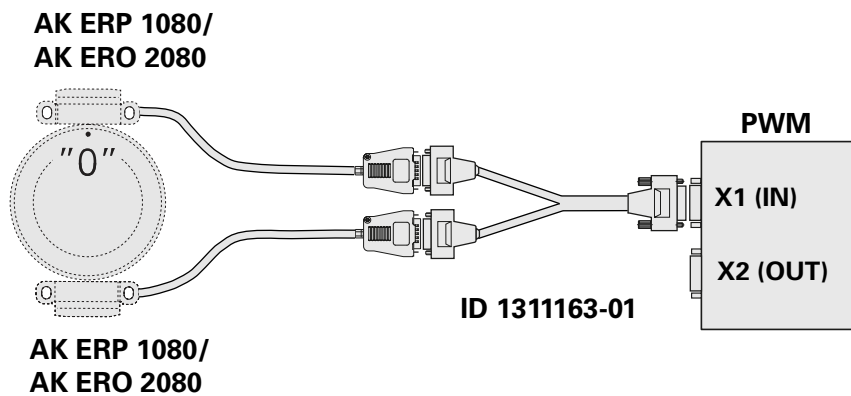


Figure 3: Connection diagram for scanning heads with Y-cable

4.3 Transferring adjustment data

To transfer the adjustment data between the scanning heads, perform the adjustment process with the mounting wizard of the Adjusting and Testing Software once again.



Note the different mounting instructions for the ERP 10x0 or ERO 20x0 mounting wizard for the adjustment process.

First, connect the scanning heads with the Adjusting and Testing Software:



- ▶ Use the Y-cable to connect the scanning heads to the PWM according to the connection diagram
- ▶ Switch on the PWM
- ▶ Open the PC application of the Adjusting and Testing Software
- ▶ Double-click **Connect encoder** in the function menu
- > The Adjusting and Testing Software displays the **Encoder selection** dialog
- ▶ Enter the encoder ID in the **ID-number** field; the entry may be with or without a hyphen
- > The determined encoder parameters are shown in the **Encoder data** field
- ▶ Click **Connect**
- > The connection to the encoder is set up

Proceed as follows to perform the adjustment with the mounting wizard of the Adjusting and Testing Software:

- ▶ Double-click **Mounting** in the function menu
- > The mounting wizard is activated
- > The Adjusting and Testing Software shows safety precautions
- ▶ Click **Next**
- > The program guides you through the four mounting steps
- > The adjustment values of the scanning heads are mutually transferred

The position of the reference pulse can vary considerably after the adjustment with the mounting wizard of the Adjusting and Testing Software. Therefore check the position in the PWT view.

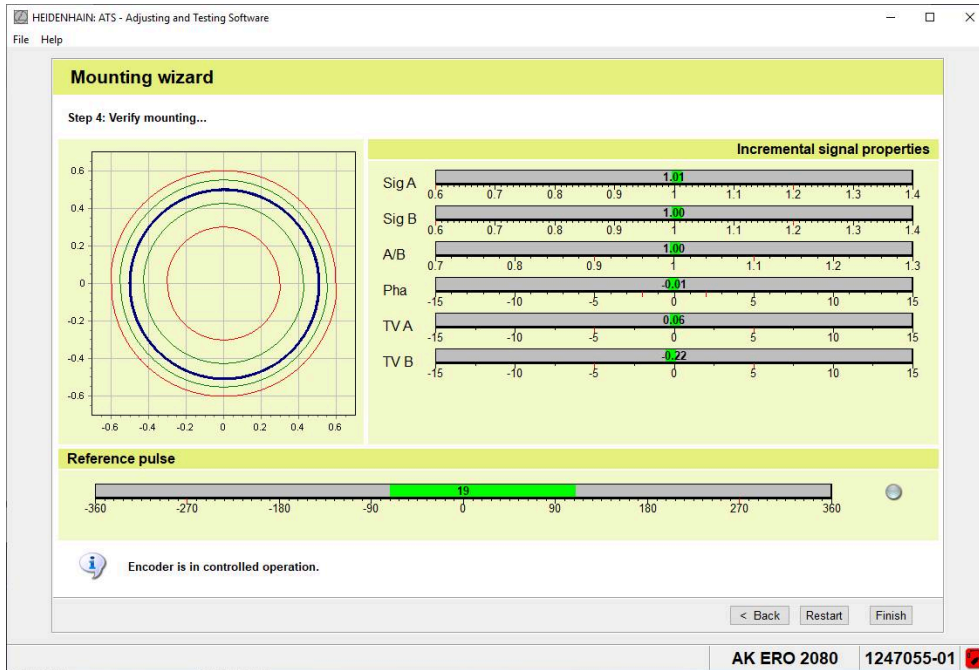


Figure 4: Position of the reference pulse in the mounting wizard

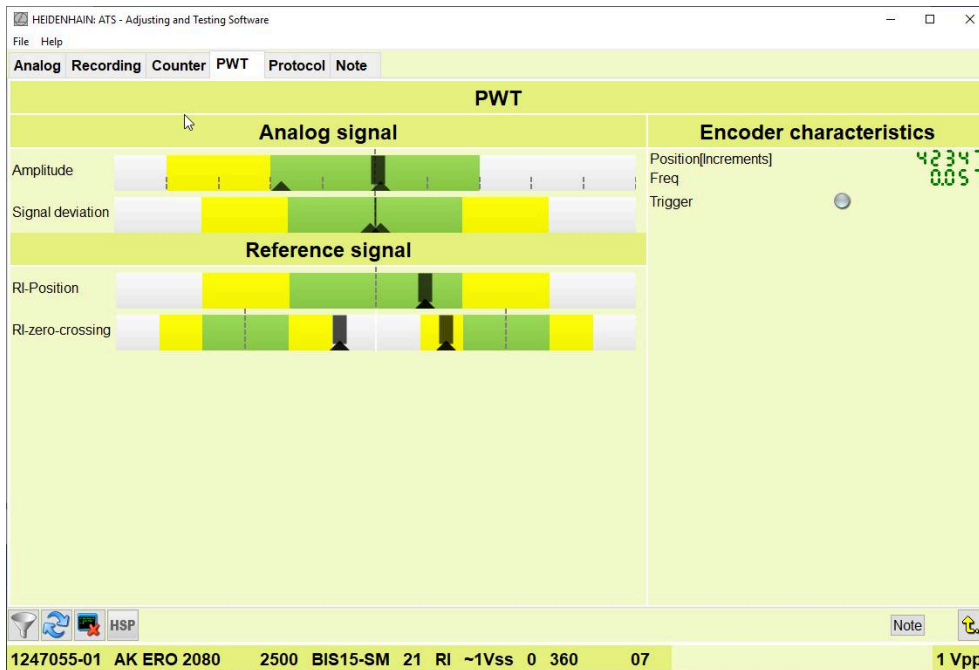


Figure 5: Checking the reference pulse in the PWT view

5 Calculating the position of the two scanning heads

5.1 Overview

In the last step, the EIB 1512 mathematically combines the positions of the two scanning heads. The signal calculation is carried out via EnDat.

5.2 Connecting the EIB 1512

Connect the scanning heads and the EIB 1512 with the PWM according to the connection diagram.

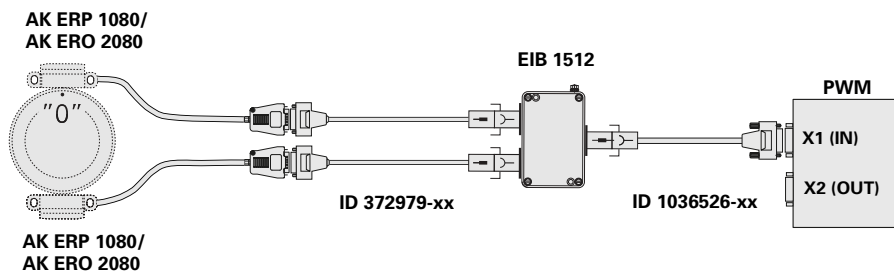


Figure 6: Connection diagram with the EIB 1512



Adhere to the connection diagram when connecting the first scanning head to the EIB 1512.

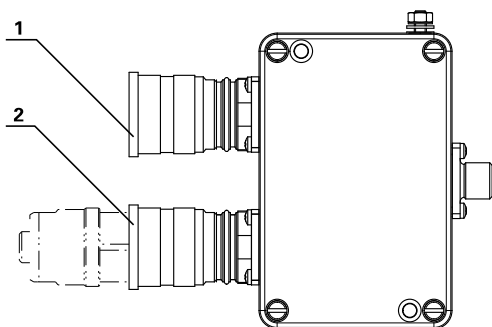



Figure 7: Dimension drawing for the EIB 1512

- 1 Mount the first scanning head here
- 2 Mount the second scanning head here

5.3 Checking the function of the overall system

Use the Adjusting and Testing Software to check the correct mathematical consideration of the two scanning heads. For this, you must first connect the Adjusting and Testing Software with the EIB 1512.

To establish the connection, proceed as follows:

- ▶ Connect the EIB 1512 to the PWM according to the connection diagram
 - ▶ Switch on the PWM
 - ▶ Open the PC application of the Adjusting and Testing Software
-
- 
- ▶ Double-click **Connect encoder** in the function menu
 - > The Adjusting and Testing Software displays the **Encoder selection** dialog
 - ▶ Click **Manual Settings**
 - > The Adjusting and Testing Software displays safety precautions
 - ▶ Click **Next**
 - > The Adjusting and Testing Software displays the encoder parameters that can be selected
 - ▶ Select the value "5 V" in the **Encoder supply voltage** section
 - ▶ Select the interface type "EnDat" in the **Encoder interface** section
 - ▶ Click **Next**
 - > The Adjusting and Testing Software displays safety precautions
 - ▶ Click **Connect**
 - > The connection to the encoder is set up
 - ▶ Double-click **Add on info position 2** under diagnostics in the function menu
 - > Position value 1 and position value 2 are displayed

A warning on the EnDat status is available in the Adjusting and Testing Software. To reset the warning, cross over the reference mark.

You can activate the absolute angle display for the position value.

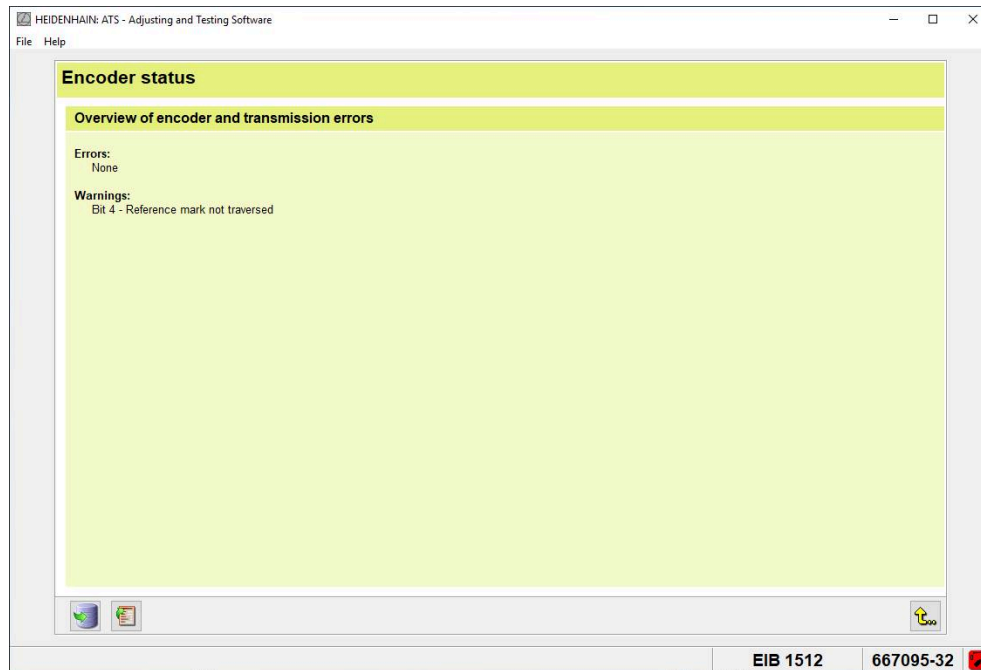


Figure 8: Warning on referencing

Behavior of the counting function

Position value 1 and position value 2 are close to 0 at first. With every revolution, only position value 2 returns to zero at the reference mark. The behavior of position value 1 is independent of this.

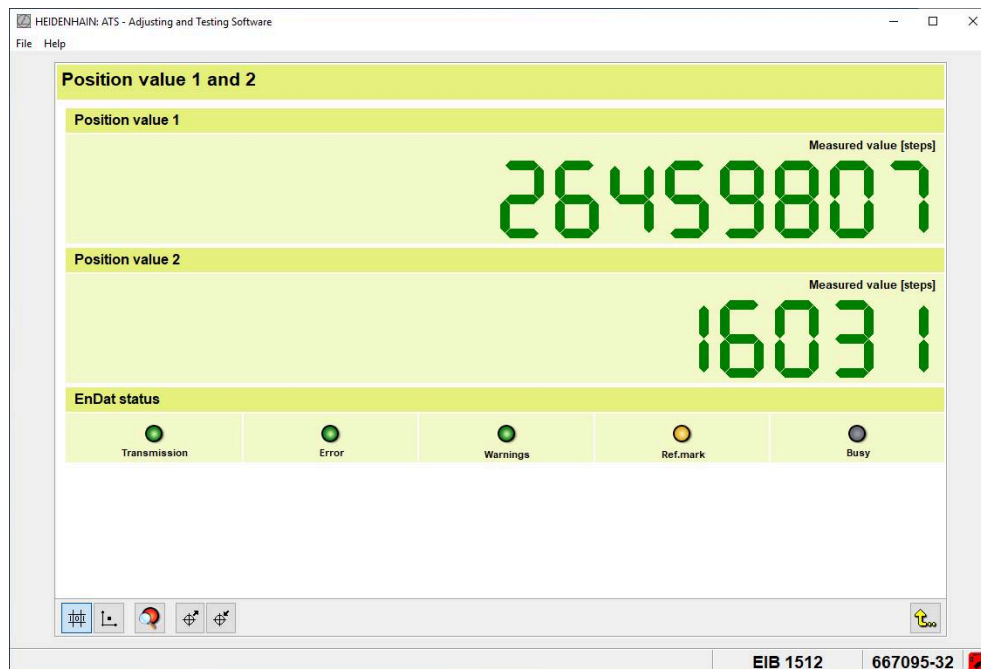


Figure 9: Behavior of position value 1 and position value 2 with the EIB 1512

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