



HEIDENHAIN



ACCOM 4.0

User's Manual

Software for Machine Calibration
with an RVM 4000
Version 1.1.x

English (en)
07/2022

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1

Fundamentals

1.1 Overview

This chapter contains information about the product and this manual.

1.2 Information about the software

ACCOM 4.0 is a software for machine calibration. In combination with the RVM 4000 comparator system for rotary axes, you can record positioning processes of rotary axes and evaluate them in compliance with the applicable standards.

The measurement results can be used for the following applications:

- Quality check of the production results with rotary tables or tilting axes
- Internal quality check
- Creation of acceptance protocols
- Creation of compensation tables for machine tools with four or five axes

1.3 Documentation on the product

1.3.1 Validity of the documentation


This User's Manual is valid for version 1.1.0 of the ACCOM 4.0 software in combination with the RVM 4000 comparator system for rotary axes.

- ▶ Before using the documentation, make sure that the documentation and software version match.



If the version numbers do not match so that the documentation is not valid, you will find the current documentation for the product at www.heidenhain.com.

1.3.2 Notes on reading the documentation

 WARNING
<p>Fatal accidents, personal injury or property damage caused by non-compliance with the documentation!</p> <p>Failure to comply with the documentation may result in fatal accidents, personal injury or property damage.</p> <ul style="list-style-type: none"> ▶ Read the documentation carefully from beginning to end ▶ Keep the documentation for future reference

The following table lists the various parts of the documentation in their order of reading priority.

Document type	Description
Addendum	An Addendum supplements or supersedes the relevant contents of the Operating Instructions and the User's Manual. If an Addendum is included in delivery, then it has the highest reading priority. All other documentation content retains its validity.
Operating Instructions	The Operating Instructions contain all the information and safety precautions needed for the proper mounting and installation of the product. The Operating Instructions are included in delivery. The Operating Instructions have the second highest priority for reading.
User's Manual	The User's Manual contains all the information and safety precautions needed for the proper operation of the product according to its intended use. The User's Manual can be downloaded from the download area at www.heidenhain.com . The User's Manual has the third highest priority for reading.

Have you found any errors or would you like to suggest changes?

We continuously strive to improve our documentation for you. Please help us by sending your suggestions to the following e-mail address:

userdoc@heidenhain.de

1.3.3 Storage and distribution of the documentation

The User's Manual must be kept in the immediate vicinity of the workplace and must be available to all personnel at all times. The operating company must inform the personnel where the User's Manual is kept. If the User's Manual has become illegible, the operating company must obtain a new copy from the manufacturer.

If the software is passed on to any other party, the User's Manual must also be passed on to the new owner.

1.4 Target groups for the instructions

These instructions must be read and observed by every person who performs any of the following tasks:

- Software configuration
- Operation
- Service and maintenance

1.5 Notes in this documentation

Safety precautions

Precautionary statements warn of hazards in handling the device and provide information on their prevention. Precautionary statements are classified by hazard severity and divided into the following groups:

DANGER

Danger indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **will result in death or severe injury**.

WARNING

Warning indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in death or serious injury**.

CAUTION

Caution indicates hazards for persons. If you do not follow the avoidance instructions, the hazard **could result in minor or moderate injury**.

NOTICE

Notice indicates danger to material or data. If you do not follow the avoidance instructions, the hazard **could result in property damage**.

Informational notes

Informational notes ensure reliable and efficient operation of the device. Informational notes are divided into the following groups:



The information symbol indicates a **tip**.
A tip provides important additional or supplementary information.



The gear symbol indicates that the function described **depends on the machine**, e.g.

- Your machine must feature a certain software or hardware option
- The behavior of the functions depends on the configurable machine settings



The book symbol represents a **cross reference** to external documentation, e.g. the documentation of your machine manufacturer or other supplier.

1.6 Symbols and fonts used for marking text

In these instructions the following symbols and fonts are used for marking text:

Format	Meaning
▶ ... > ...	Identifies an action and the result of this action Example: ▶ Tap OK > The message is closed
■ ... ■ ...	Identifies an item of a list Example: ■ TTL interface ■ EnDat interface ■ ...
Bold	Identifies menus, displays and buttons Example: ▶ Tap Shut down > The operating system shuts down. ▶ Turn the power switch off

1.7 Further information

For detailed information on hardware and connection technology, refer to the following documentation:

- "RVM 4000 Operating instructions"
- "EIB 74x Operating instructions"
- "Cables and Connection Technology User's Manual"

2

Safety

2.1 Overview

This chapter contains important safety information needed for setting up and using the software.

2.2 General safety precautions

General accepted safety precautions, in particular the applicable precautions relating to the handling of live electrical equipment, must be followed when operating the system. Failure to observe these safety precautions may result in personal injury or damage to the device.

It is understood that safety rules within individual companies vary. If a conflict exists between the material contained in these instructions and the rules of a company using this system, the more stringent rules take precedence.

2.3 Intended use

The ACCOM 4.0 software is intended solely for the following use:

- Axis measurement of machine tools, rotary tables and tilting axes
- Evaluation of measured data

2.4 Improper use

Any use not specified in 'Intended use' is considered improper use. The company operating the device is solely liable for any damage resulting from improper use. Especially its use as part of a safety function is not permitted.

2.5 Personnel qualification

The personnel required for the individual activities to be performed on the product are indicated in the respective sections of these instructions.

The personnel groups are specified in detail as follows with regard to their qualifications and tasks.

Qualified personnel

The qualified personnel are trained by the operating company to perform advanced operation and parameterization. The qualified personnel have the required technical training, knowledge and experience and know the applicable regulations, and are thus capable of performing the assigned work regarding the application concerned and of proactively identifying and avoiding potential risks.

Electrical specialist

The electrical specialist has the required technical training, knowledge and experience and knows the applicable standards and regulations, and is thus capable of performing work on electrical systems and of proactively identifying and avoiding potential risks. Electrical specialists have been specially trained for the environment they work in.

Electrical specialists must comply with the provisions of the applicable legal regulations on accident prevention.

2.6 Obligations of the operating company

The operating company owns or leases the device and the peripherals. At all times, the operating company is responsible for ensuring that the intended use is complied with.

The operating company must:

- Assign the different tasks to be performed on the device to suitable, qualified and authorized personnel
- Verifiably train the personnel in the authorizations and tasks
- Provide all materials and means necessary in order for the personnel to complete the assigned tasks
- Ensure that the device is operated only when in perfect technical condition
- Ensure that the device is protected from unauthorized use

2.7 General safety precautions



The safety of any system incorporating the use of this product is the responsibility of the assembler or installer of the system.

The specific safety precautions required for the individual activities to be performed are indicated in the respective sections of this manual.

3

**Software
installation**

3.1 Overview

This chapter provides all of the information needed for downloading and properly installing the software on a computer.

3.2 System requirements

If you want to install ACCOM 4.0 on a computer, the computer system must meet the following requirements:

- Microsoft Windows 10 Version 1803 or higher
- At least 200 MB of available hard disk space
- Screen resolution of at least 1280 × 800 recommended

For communication with the EIB 74x, the corresponding TCP port on the PC must be enabled.



- Have an IT specialist configure the firewall to enable the required TCP ports.
- If you connect the EIB 74x with the computer via USB, ensure that the energy settings of Microsoft Windows enable a stable data transfer.

3.3 Installation

Downloading the installer

To install ACCOM 4.0, you need to download the installer from the HEIDENHAIN website ().

- ▶ Download the current version from **www.heidenhain.com/service/downloads/software/**
- ▶ Navigate to the Download folder of your web browser
- ▶ Unpack the downloaded file (with the extension *.zip) into a temporary storage folder
- > The **SetupACCOM.exe** installer is unpacked and available in the temporary folder

Installing ACCOM 4.0 under Microsoft Windows



In order to perform the installation, you need to log in to Microsoft Windows as an administrator.

- ▶ Double-click the installer file
- > The setup wizard opens
- ▶ Select the setup language
- ▶ Follow the setup wizard instructions
- ▶ Accept the license conditions
- ▶ Click the **Finish** button to complete the installation process.
- > ACCOM 4.0 has been installed successfully

Updating ACCOM 4.0



- In order to perform the update, you need to log in to Microsoft Windows as an administrator.
- Already activated license keys will be taken over during the update.

- ▶ Double-click the installer file
- > The setup wizard opens
- ▶ Select the setup language
- ▶ Follow the setup wizard instructions
- ▶ Accept the license conditions
- ▶ Click the **Finish** button to complete the installation process
- > ACCOM 4.0 has been updated successfully

3.4 Licensing

Before starting ACCOM 4.0, you need to request a license key and enable the Basic option of ACCOM 4.0 at first.

The advanced functionality of ACCOM 4.0 provided via the optional Plus modules is also controlled via license keys.

All licenses can be obtained via the HEIDENHAIN Sales department. You will receive a license key that activates the respective software option.



- The trial period starts on activation of the license key.
- All recorded data will also be retained after expiration of the license.

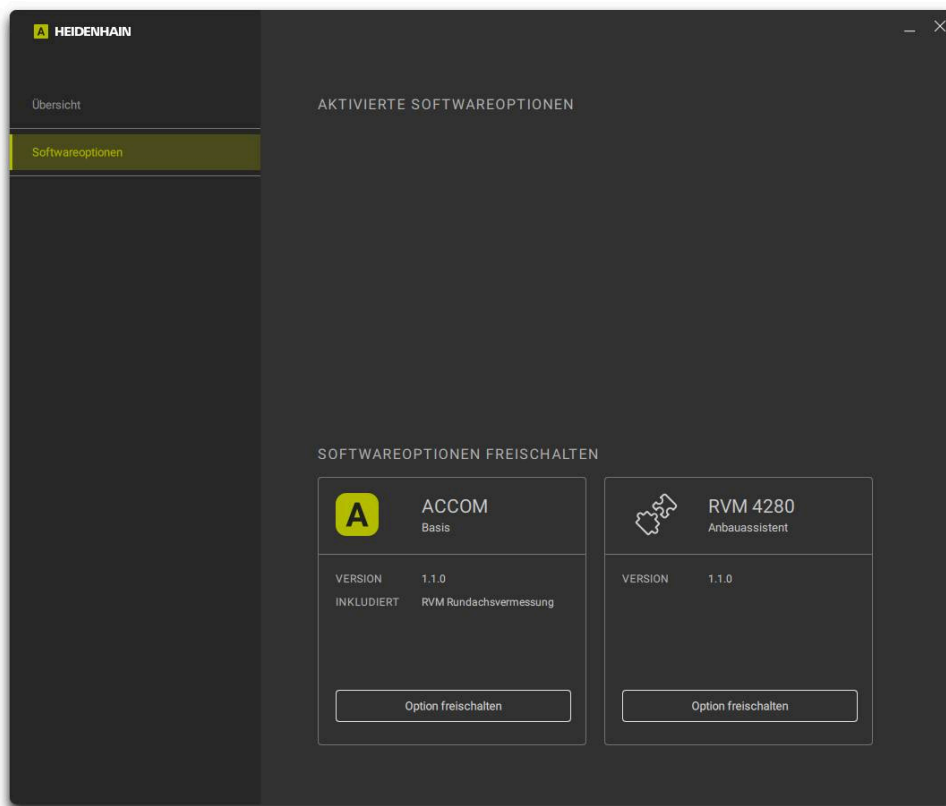


Figure 1: **UNLOCK SOFTWARE OPTIONS**

The following software options are available:

Option	Extended functionality	ID
1	ACCOM Basic	1376737-xx
2	RVM 4280 Mounting wizard	1376738-xx

Requesting the license key



The license key must be requested on the PC on which ACCOM 4.0 will be used later because the license key is connected to the PC.

- ▶ Start ACCOM 4.0
- > The opening screen with the **Overview** tab is displayed
- ▶ Click the **Software options** tab
- > The available software options are displayed
- > Under **UNLOCK SOFTWARE OPTIONS**, click **Unlock the option** for the desired software option
- > The **Unlock the option** dialog box appears
- ▶ Click **Request license key**
- ▶ In the dialog box, select the storage location in which you want to save the license key request
- ▶ Enter a suitable file name and click **Save**
- > The license request (XML file) is created and saved in the selected folder.
- ▶ Contact a HEIDENHAIN service agency and submit the file you created in order to request a license key
- > The license key is generated and submitted as an XML file by e-mail.

Uploading the license key from the license file

- ▶ Click **Activate license key**
- > The **Unlock the option** dialog box appears
- ▶ Click **Open the license file**
- ▶ Select the XML file with the license key in the file system
- ▶ Click **Open**
- > The license key is activated
- > The activated software option is displayed under **ACTIVATED SOFTWARE OPTIONS**

Renewing the license key



30 days before the license expires, a prompt will be displayed every time you start the software reminding you to request a new license.

- ▶ Start ACCOM 4.0
- > The opening screen with the **Overview** tab is displayed
- ▶ Click the **Software options** tab
- > The available software options are displayed
- > Under **ACTIVATED SOFTWARE OPTIONS**, click **Extend license** for the desired software option
- > The **Unlock the option** dialog box appears
- ▶ Click **Request license key**
- ▶ In the dialog box, select the storage location in which you want to save the license key request
- ▶ Enter a suitable file name and click **Save**
- > The license request (XML file) is created and saved in the selected folder.
- ▶ Contact a HEIDENHAIN service agency and submit the file you created in order to request a license key
- > The license key is generated and submitted as an XML file by e-mail.
- > Activate the license key as described under "Uploading the license key from the license file"

4

Basic operation

4.1 Overview

This chapter describes the user interface, operating elements and basic functions of the software.


4.2 Starting the software

To start the software:

- A** ▶ Double-click the ACCOM 4.0 shortcut on the Microsoft Windows desktop
- or
- ▶ Open it in Microsoft Windows with the following sequence
Start > HEIDENHAIN > ACCOM 4.0
- > The software is started

4.3 Exiting the software

To exit the software:

-  ▶ Click **Main menu** in the menu bar
- ▶ Click **Exit**
- > The **Exit** dialog box is opened
- ▶ Click **Yes**
- > If the software is connected to the EIB 74x, the connection is separated
- > The software is terminated.

4.4 Module selection

The module selection appears immediately after starting the software. You can select the desired measuring method and the encoder used.

The following modules are available in Software Version 1.1.0:

- **RVM Rotary axis measurement**
- **RVM 4280 Mounting wizard**

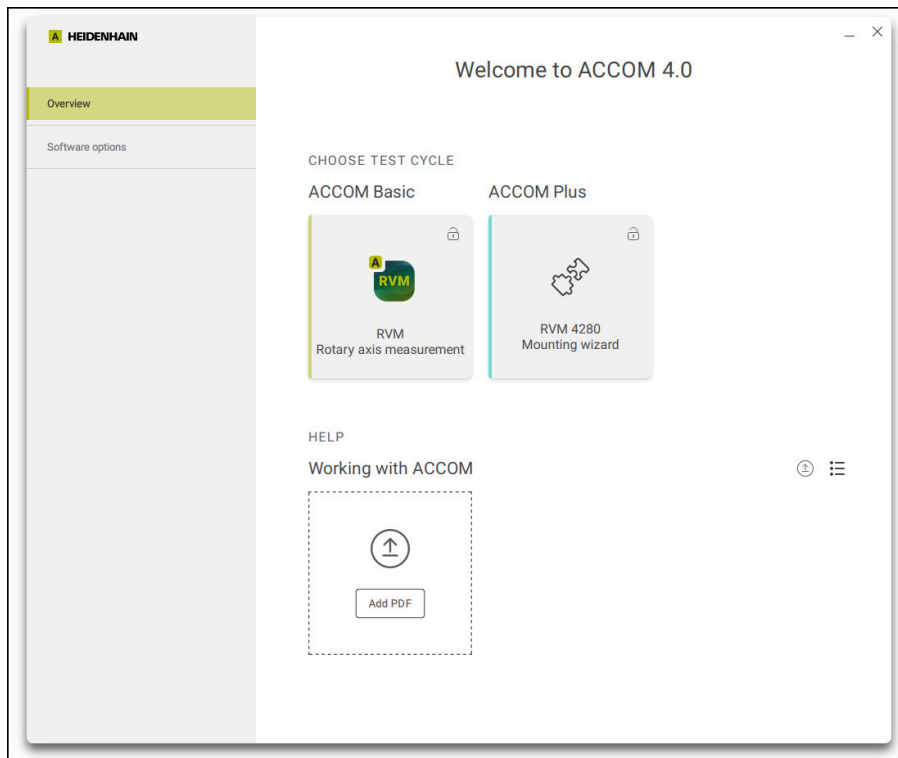


Figure 2: Module selection, **Overview** tab

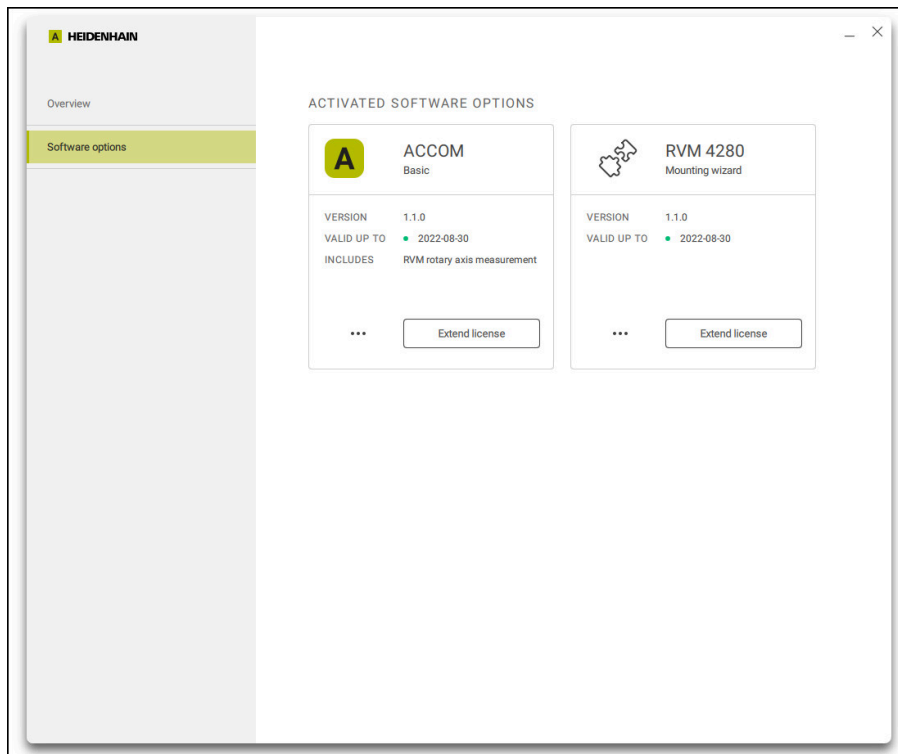


Figure 3: Module selection, **Software options** tab

4.5 Opening screen

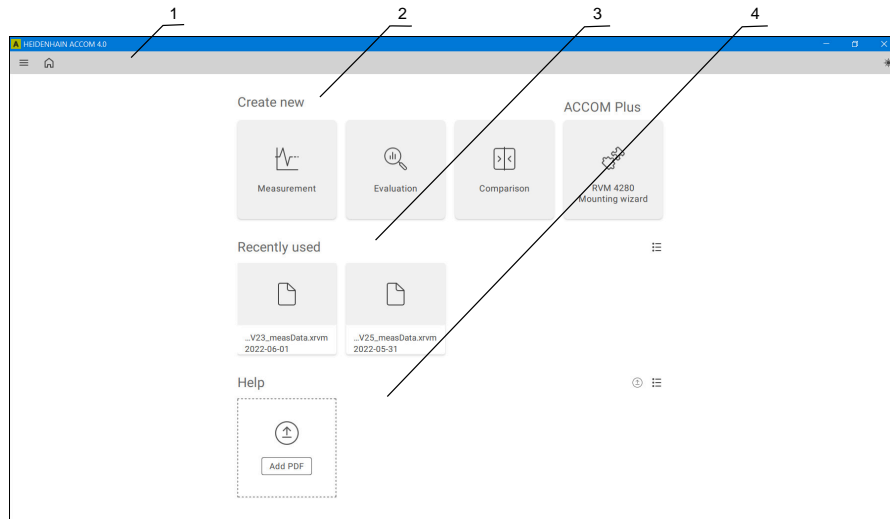










Figure 4: Opening screen





- 1 Menu bar
- 2 Selection of function: Measurement function, Evaluation function and Comparison function
- 3 File management
- 4 Help area

The opening screen and the functions show different operating elements that you can call via the menu bar.

Operating elements of the menu bar

Operating element	Function
	<p>Main menu Opening the main menu with various available functions</p>
	<p>Home Switch to the opening screen</p>
	<p>Open setup Opening saved setup files for measurements This operating element is displayed in the Measurement function in the Preparation submenu.</p>
	<p>Save setup as Saving of setup files for measurements This operating element is displayed in the Measurement function in the Preparation submenu.</p>
	<p>Export characteristic data Exporting characteristic data as TXT file This operating element is displayed in the Evaluation function.</p>
	<p>Print the report Printing a report of the evaluation data via the connected printer. This operating element is displayed in the Evaluation function.</p>
	<p>Open comparison file Opening saved files for comparison This operating element is displayed in the Comparison function.</p>
	<p>Light mode / Dark mode Changing the software representation</p>

Operating elements of the file management

Operating element	Function
	<p>Tile view Display of the files in tile view next to and below one another</p>
	<p>List view Display of the files in a vertical consecutive list view</p>
	<p>Add PDF Selecting a PDF file for the help area</p>
	<p>Delete Deleting a selected PDF file from the help area</p>

4.6 Main menu

Calling up

- ▶ Click **Main menu** in the menu bar
- > The main menu opens

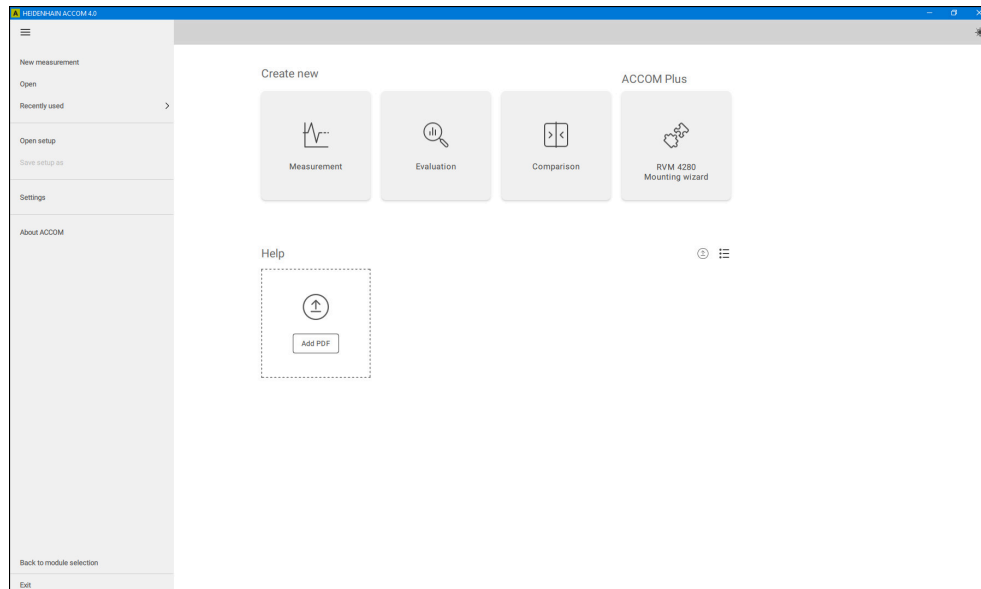


Figure 5: Main menu



Depending on whether you open the main menu via the menu bar of the **start page**, the **Measurement** function or the **Evaluation** function, individual menu entries are not available and are thus grayed out.

Menu item	Function
New measurement	Calling the Measurement function Further information: "Measurement", Page 33
Open	Opening an XRVM file for evaluation Further information: "Evaluation", Page 47
Recently used	Displaying the most recently used files for setup and evaluation
Open setup	Opening an XRVM file with prepared measurement parameters Further information: "Working with setup files", Page 44
Save setup as	Saving set measurement parameters as an XRVM file Further information: "Working with setup files", Page 44
Settings	Software settings, such as managing user accounts, language settings or resetting to the factory default settings Further information: "Settings", Page 75
About ACCOM	Displaying the software version and the licenses of the software used

4.7 Measurement function

The **Measurement** function allows you to prepare and perform a rotary-axis measurement.

Calling up

- ▶ Click **Measurement** in the selection of functions on the start page
- > The **Measurement** function is opened

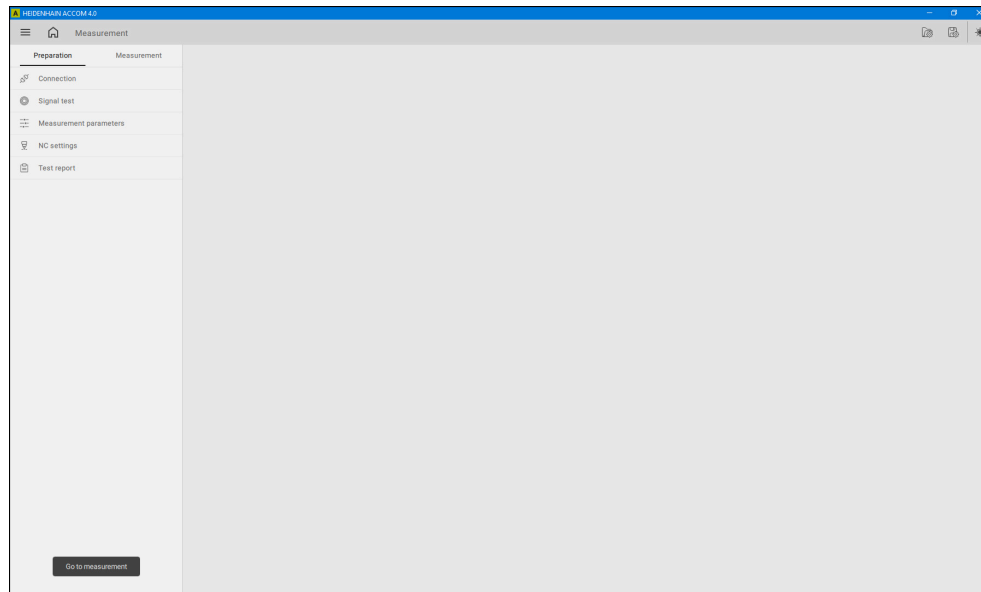


Figure 6: **Measurement** function

4.8 Evaluation function

The **Evaluation** function allows you to evaluate the measurement of a rotary axis and create a test report.

Calling up

- ▶ Click **Evaluation** in the selection of functions on the start page
- > The **Open** dialog box is opened

4.9 Comparison function

The **Comparison** function compares the evaluation results of two measurements.

Call

- ▶ Click **Comparison** in the selection of functions on the start page
- ▶ The **Comparison** function is opened

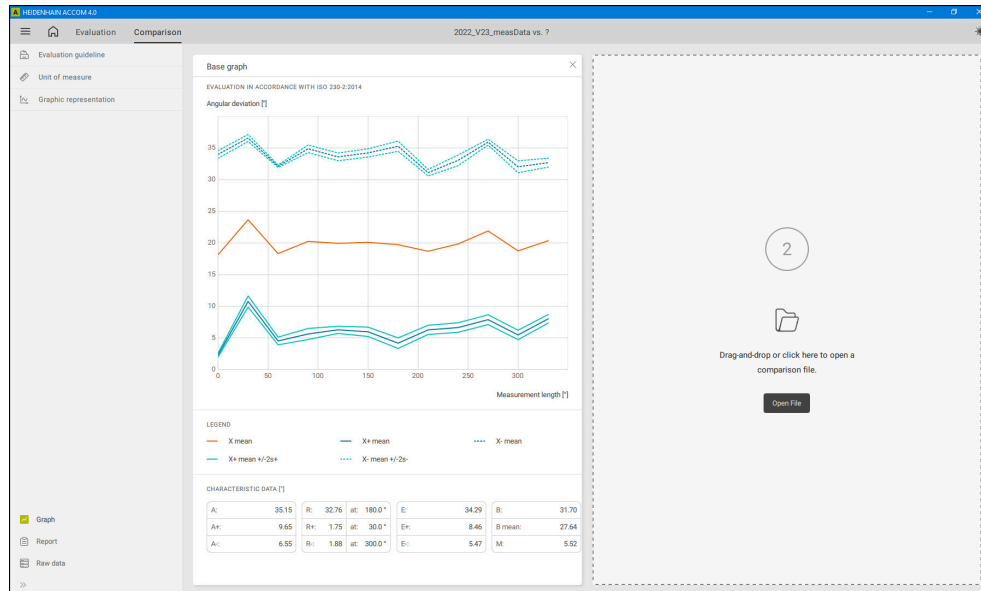


Figure 7: Comparison function

4.10 RVM 4280 Mounting wizard function

Use the optional **RVM 4280 Mounting wizard** function to set up an RVM 4280 encoder with the help of a wizard.

Call

- ▶ Click **RVM 4280 Mounting wizard** under **ACCOM Plus** in the selection of functions on the start page
- ▶ The mounting wizard is opened

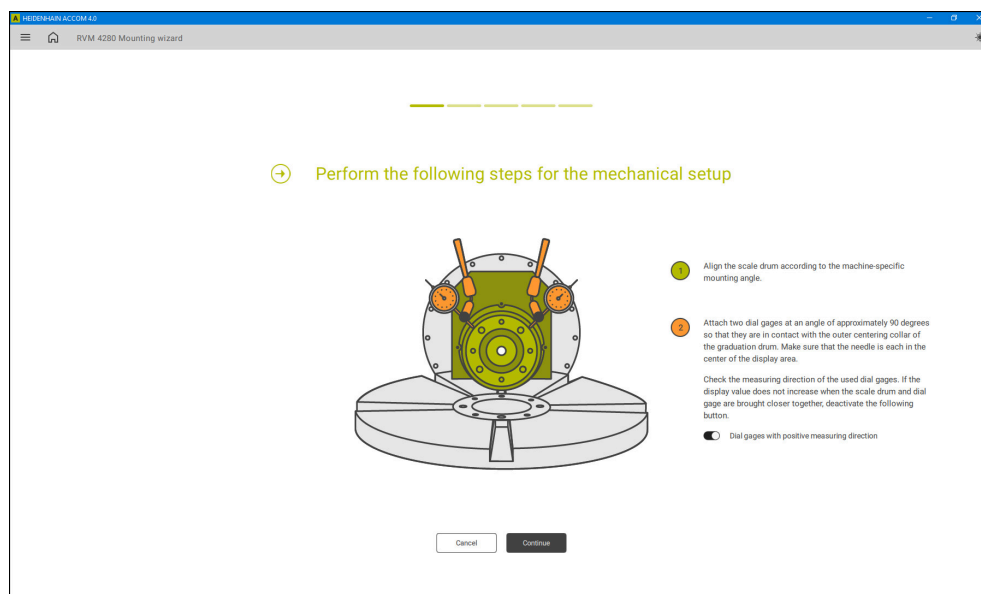


Figure 8: RVM 4280 Mounting wizard function

5

Measurement

5.1 Overview

This chapter describes the **Measurement** function.

The **Measurement** function includes the **Preparation** submenu and the **Measurement** submenu.

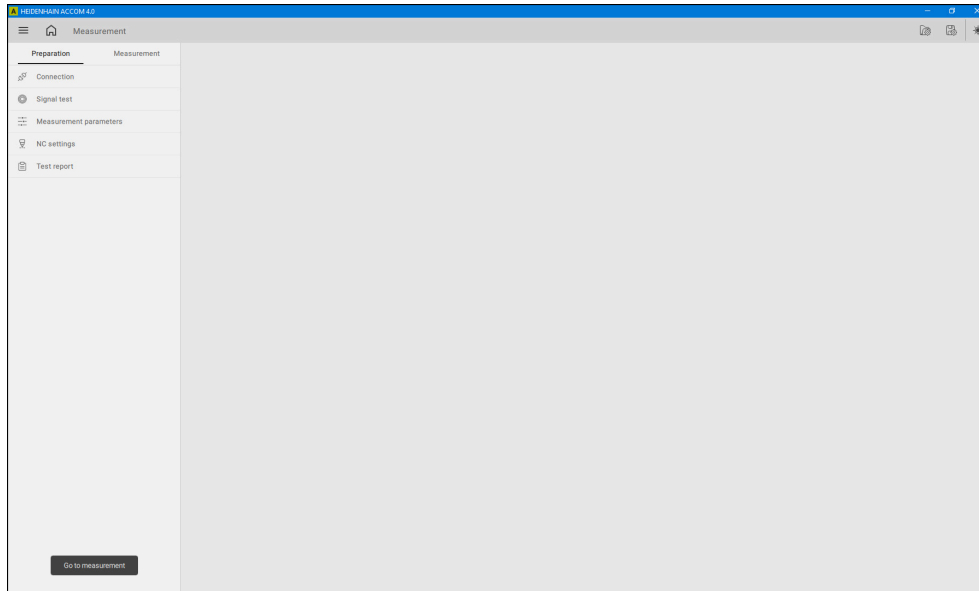


Figure 9: **Measurement** function

5.2 Preparing a measurement

Prerequisite: Before starting the measuring setup, thoroughly clean the area in which the measurement is to be conducted.

To prepare a measurement:

- ▶ Click the **Measurement** function in the opening screen
- > The **Measurement** menu is displayed
- ▶ To set the parameters for the encoder and the measurement, click the individual menu items in the **Preparation** submenu

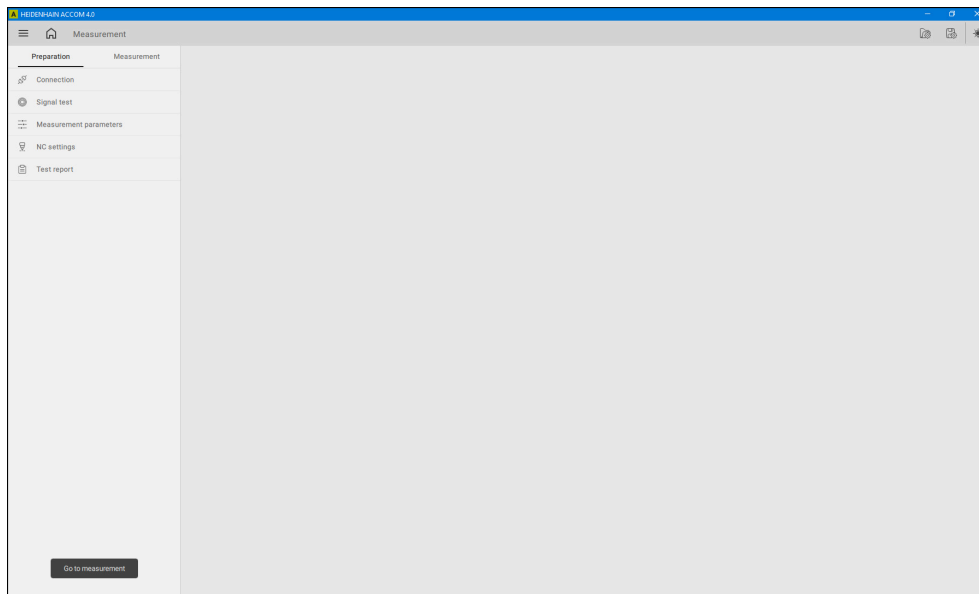


Figure 10: **Preparation** submenu



To prepare the measurement, edit the menu items of the **Preparation** submenu from top to bottom.

The menu structure of the **Preparation** submenu contains the following categories:

- **Connection**
- **Signal test**
- **Measurement parameters**
- **NC settings**
- **Test report**

When the measurement has been prepared, you can switch to the **Measurement** submenu.

5.2.1 Connection

To connect the software to the EIB 74x:

- ▶ Enter the IP address of the EIB 74x
- ▶ To activate an automatic connection, drag the slide switch to the right
- ▶ Click **Connect**
- > The result of the connection setup is displayed

5.2.2 Signal test

The signal test allows you to check the mounting quality of the comparative encoder. For this purpose, the electrical connections and the mechanical mounting are evaluated.

Proceed as follows:

- ▶ Click **Start signal test**
- ▶ Using the machine control, move the axis under test evenly and without reversing direction over the possible measuring range
- ▶ Click **Stop signal test**
- > The result is displayed
- > With an RVM 4180 or RVM 4280:
The encoder connected to the EIB 74x is detected and displayed



If the signal test fails, the signal test may have to be repeated.

5.2.3 Measurement parameters

You can specify the measurement procedure by defining the measurement parameters.





In order to avoid having to reenter the measurement parameters for the encoder and the measurement every single time a measurement is conducted, you can save the measurement parameters in setup files and reuse them.

Further information: "Working with setup files", Page 44



For some measurement parameters, you can call help texts with additional explanations via the ⓘ icon.

Measurement parameter	Explanation
Evaluation guideline	Selecting the evaluation guideline: <ul style="list-style-type: none"> ■ ISO 230-2:2014 (set as default) ■ VDI/DGQ 3441:1977 ■ ISO 230-3:2007
Test cycle ⓘ	Selecting the measuring method: <ul style="list-style-type: none"> ■ Standard cycle ■ Step cycle
Direction of measurement ⓘ	Selecting the direction of measurement: <ul style="list-style-type: none"> ■ Positive ■ Negative
Axis under test	Selecting the axis on which the measurement is conducted. A table axis is a C axis by default. The A axis or the B axis are tilting axes. <ul style="list-style-type: none"> ■ A ■ B ■ C

Measurement parameter	Explanation
Measurement procedure	<p>As standard parameter set is already preset for the measuring process.</p> <ul style="list-style-type: none"> ■ Number of cycles: 5 ■ Current position of RVM: 0° (to be read from the control) ■ Reversing angle: 0.5° ■ Dwell time: 2 s ■ Feed rate: 1000 °/min
Target positions	<p>Specifying the target positions at which measurements will be conducted</p> <p>1st point/step width</p> <ul style="list-style-type: none"> ■ Step width: Measurement distances in degrees; default setting 30° ■ Travel: The minimum value must be less than the maximum value; default setting 0° minimum; 330° maximum <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  Click Show target positions to display the set measuring positions </div> <p>User defined</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  Click Insert target positions to display the user-defined measuring positions </div>

Entering user-defined target positions

In the **Target positions** window, you can enter user-defined target positions.

Proceed as follows:

- ▶ In the **Target positions** measurement parameter, click **User defined**
- ▶ Click **Insert target positions**
- > The **Target positions** dialog box is opened

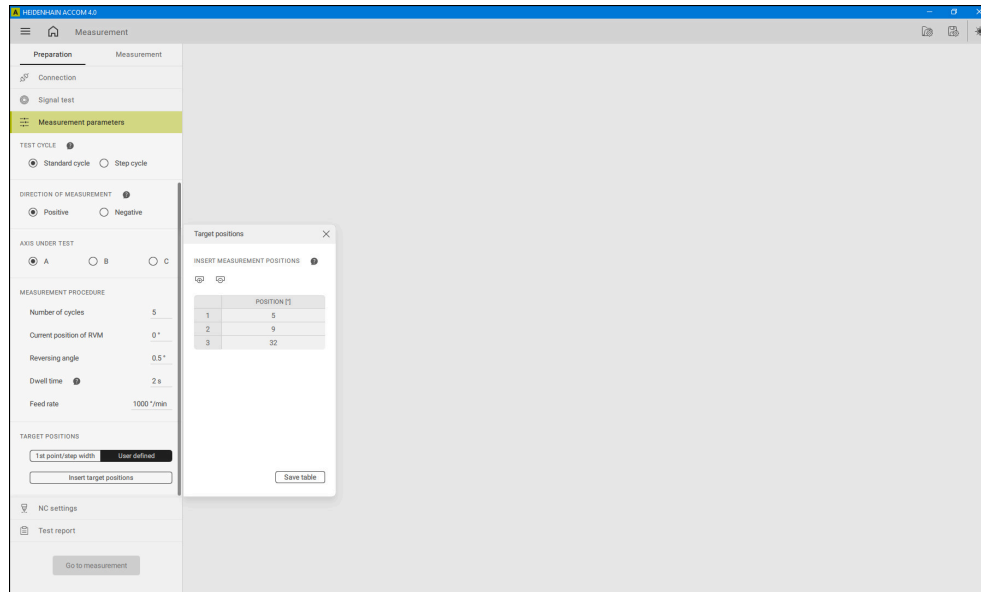


Figure 11: User-defined **Target positions**



- ▶ Click the 'Add row' icon to add a row



- ▶ Click the 'Delete row' icon to delete a row
- ▶ Click the Position column
- ▶ Enter the desired values via the keyboard
- ▶ Click **Save table**
- > The table is saved

5.2.4 NC settings

Parameters of the NC interface	Explanation
Mode	Setting of the format in which the NC program will be generated <ul style="list-style-type: none"> ■ HEIDENHAIN Klartext ■ DIN/ISO
M functions	Input of the M functions as M1 to Mxx. The M functions are partly control-specific. Known M functions are, e.g., M30 for 'Jump back to first block' and M9 for 'Coolant off' (relevant for DIN/ISO format) <ul style="list-style-type: none"> ■ In each block ■ Program start ■ Program end
Export NC program	Saving the NC program for transfer to a machine tool

Exporting an NC program

With the **Export NC program** function, you can generate an NC program for transfer to the machine tool. You can then transfer the program via TNCremo or a USB mass storage device.

- ▶ Click **Export NC program**
- ▶ Select the desired storage location in the dialog
- ▶ Enter the name of the NC Program
- ▶ Click **Save as**
- > The NC program is exported and saved in the storage location



Check the NC program for correctness before starting it on the machine and with the mounted encoder.

5.2.5 Test report

In the test report, you can enter various information about the customer, the machine type, the reference encoder and the measurement. After the measurement, the measured values are added to the test report.

- ▶ To open the test report, click **Test report**
- > The test report is displayed.

Figure 12: **Test report**

You can enter the following information in the test report:

Domain	Explanation
Miscellaneous	Information on Customer and Inspector
Machine name	Information on the machine on which the measurement is conducted, stating the Serial number and Year of manufacture
Note	Individual information on the measurement
Active compensation	Information on the measurement performance, such as Initial measurement or Verification measurement . Describes whether a compensation table for the axis under test is active. There is no active compensation for an Initial measurement . For a Verification measurement , a previously generated compensation is validated. Further information: "NC compensation table", Page 56
HEIDENHAIN reference encoder	Information on the reference encoder used, stating the Serial number and ID number
Position of axes	Current position of the linear axes X , Y and Z Current position of the rotary axes IV and V
Traverse paths	Traverse paths of the linear axes X , Y and Z Traverse paths of the rotary axes IV and V



You can enter the information in the test report in advance and reuse it as a setup file.

Further information: "Working with setup files", Page 44

5.3 Conducting a measurement

WARNING

Parts of the device may come off during measuring operation

Crushing and impact hazards due to moving parts

- ▶ Close any doors or covers

You can conduct a measurement in the **Measurement** submenu.

Prerequisite: Active connection to the EIB 74x.

To open the **Measurement** submenu:

- ▶ Click the **Measurement** submenu in the **Measurement** function
- or
- ▶ Click **Go to measurement** in the **Preparation** submenu,
- > The **Measurement** submenu is opened

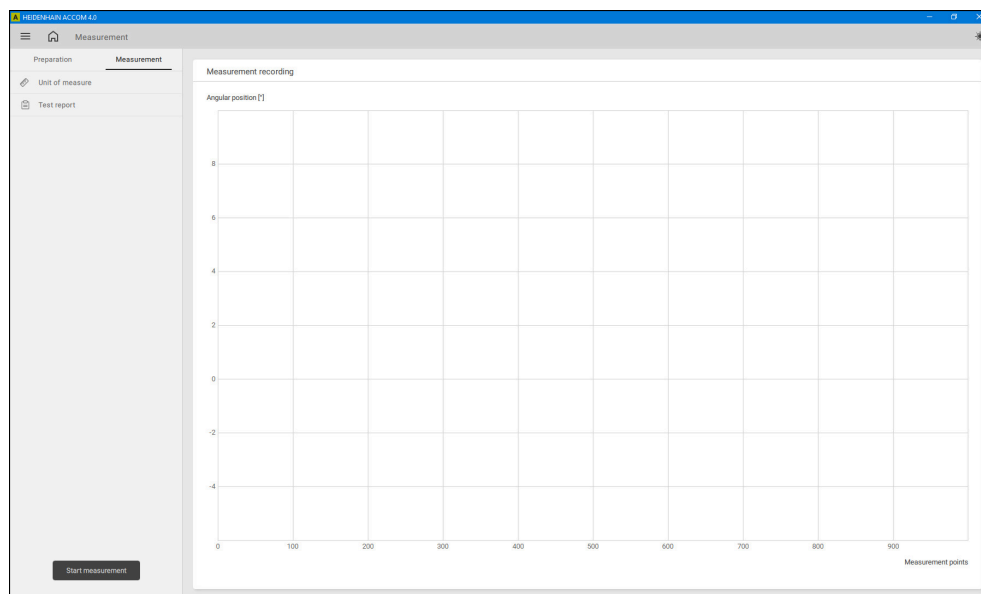


Figure 13: **Measurement** submenu

In the **Measurement** submenu, you can make the following settings:

- **Unit of measure**
- **Test report**

5.3.1 Unit of measure

First you need to specify the unit of measure for the output.

You can choose between the following units of measure:

- **Degree**
- **rad**

5.3.2 Test report

In the test report, you can enter various information about the customer, the machine type, the reference encoder and the measurement. After the measurement, the measured values are added to the test report.

- ▶ To open the test report, click **Test report**
- > The test report is displayed.

Figure 14: **Test report**

You can enter the following information in the test report:

Domain	Explanation
Miscellaneous	Information on Customer and Inspector
Machine name	Information on the machine on which the measurement is conducted, stating the Serial number and Year of manufacture
Note	Individual information on the measurement
Active compensation	Information on the measurement performance, such as Initial measurement or Verification measurement . Describes whether a compensation table for the axis under test is active. There is no active compensation for an Initial measurement . For a Verification measurement , a previously generated compensation is validated. Further information: "NC compensation table", Page 56
HEIDENHAIN reference encoder	Information on the reference encoder used, stating the Serial number and ID number
Position of axes	Current position of the linear axes X , Y and Z Current position of the rotary axes IV and V
Traverse paths	Traverse paths of the linear axes X , Y and Z Traverse paths of the rotary axes IV and V



You can enter the information in the test report in advance and reuse it as a setup file.

Further information: "Working with setup files", Page 44

5.3.3 Start measurement

You can start the measurement in the **Measurement** submenu.

Proceed as follows:

- ▶ Click **Begin Measure**
- ▶ Click **OK** in the dialog box
- > Measuring points and angle positions are recorded in the measuring log

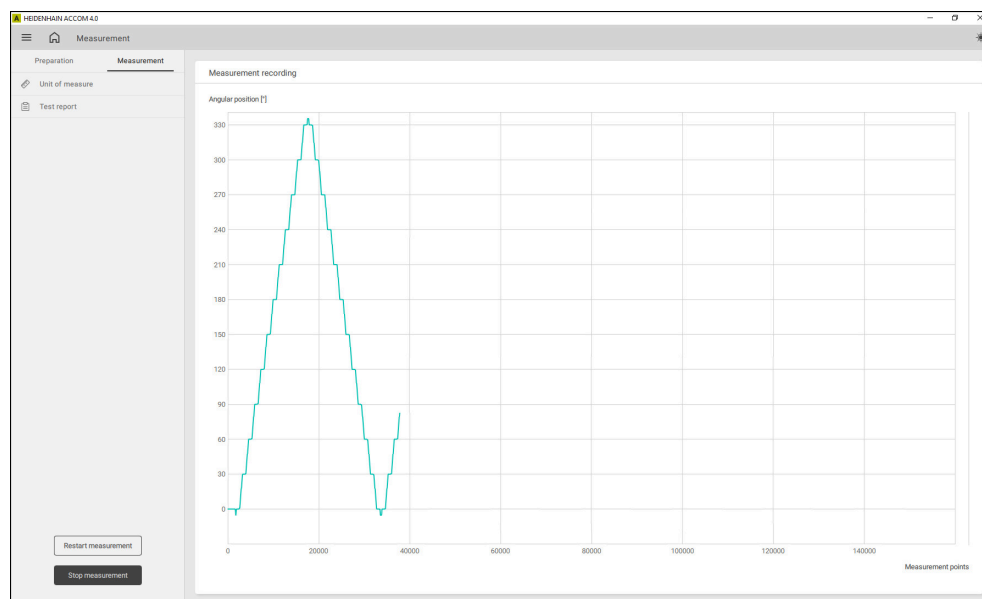


Figure 15: **Begin Measure**

During recording, you can stop or restart the measurement. After you have stopped the measurement, you can save the measured data.

5.3.4 Saving a measurement

After completion of the measurement, you can save the measurement result.

Proceed as follows:

- ▶ Click **Finish Measurement**
- ▶ Click **Save measurement**
- > The **Save as** dialog box is opened
- ▶ Navigate to the desired storage location
- ▶ Enter the file name
- ▶ Click **Save**
- > The XRVM file is saved

After saving, you can directly call up the evaluation via the displayed **Start evaluation** button.

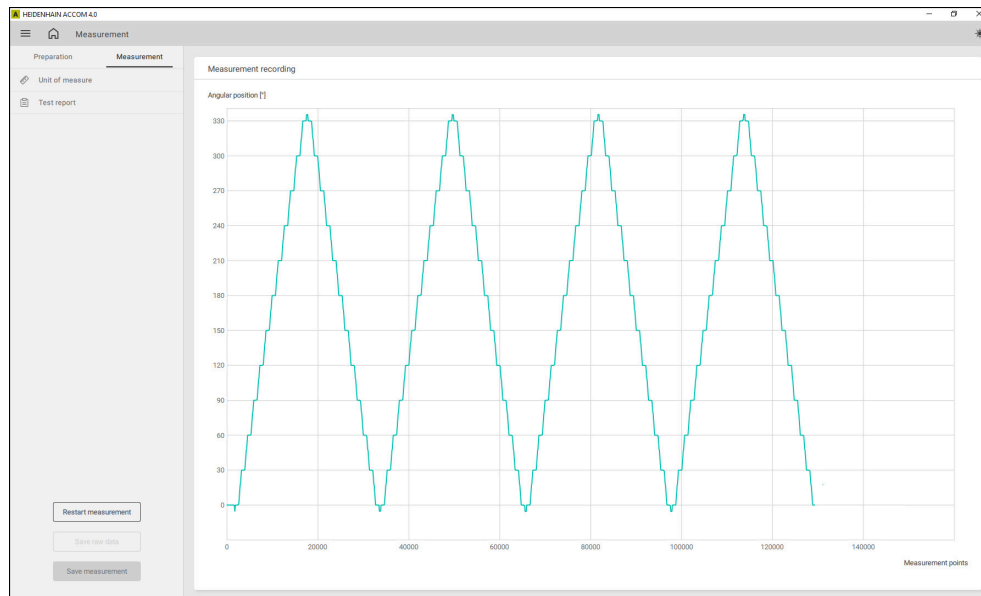


Figure 16: **Start evaluation** after saving

5.4 Working with setup files

Using setup files in XRVM format, you can prepare measurement parameters and test reports and reuse them as a template for further measurements.

Opening a setup file

To open an already prepared setup file:



- ▶ Click Main menu
- ▶ Click **Open setup**

or



- ▶ Click **Open setup** in the menu bar of the **Preparation** submenu
- > The **Open** dialog box appears
- ▶ Navigate to the corresponding storage location of the desired XRVM file
- ▶ Select the desired XRVM file
- ▶ Click **Open**
- > The setup file is opened

Saving a setup file

If you have entered measurement parameters or filled out a test report in the **Measurement** function, you can save these contents as a setup file.

To save a setup file:



- ▶ Click **Main menu** in the **Preparation** submenu
- ▶ Click **Save setup as**

or



- ▶ Click **Save setup as** in the menu bar of the **Preparation** submenu
- > The **Save as** dialog box is opened
- ▶ Navigate to the desired storage location of the XRVM file
- ▶ Enter the file name
- ▶ Click **Save**
- > The setup file is saved

5.5 Closing the measurement

To close the **Measurement** function:



- ▶ Click **Home**
- > A warning dialog box opens
- ▶ Click **Continue**
- > The opening screen is opened

6

Evaluation

6.1 Overview

This chapter describes the **Evaluation** function. The evaluation takes place after a measurement.



You can also perform a comparison directly after the evaluation.

Further information: "Comparison", Page 61

6.2 Opening a measurement for evaluation

You can open the **Evaluation** function in the opening screen. Select the previously saved file for the measurement you want to evaluate.

To evaluate a measurement file:

- ▶ Click **Evaluation** in the opening screen
- > The **Open** dialog box is opened
- ▶ Navigate to the storage location of the measurement file
- ▶ Click desired measurement file
- ▶ Click **Open**
- > The measurement file is opened in the **Evaluation** function

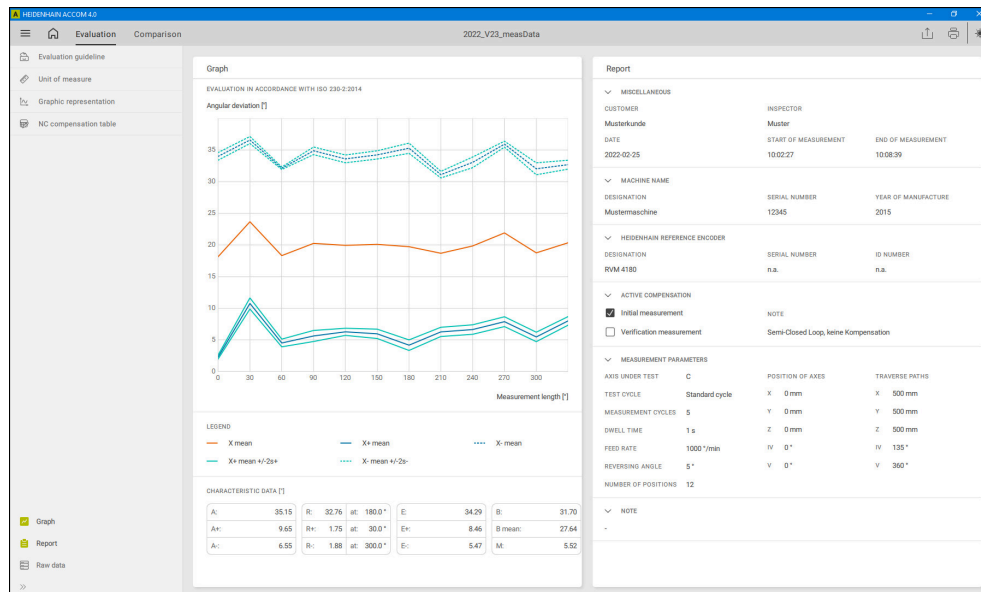








Figure 17: **Evaluation** function

You can also open the **Evaluation** function by proceeding with this directly after saving the measurement.

Further information: "Saving a measurement", Page 44

6.3 Showing an evaluation

The **Evaluation** function allows you to show or hide various displays.
The following displays are available:

Display	Explanation
 	Graph Click to show or hide the graph
 	Report Click to show or hide the report
 	Raw data Click to show or hide the raw data



To display a combination of several views, you can show two or three displays at the same time.

6.3.1 Graph



You can adapt the curves shown in the **Graph** display under **Graphic representation**.

Further information: "Configuring the evaluation ", Page 54

The following elements are shown in the **Graph** display:

Element	Explanation
Evaluation in accordance with...	Display of the measurement results as a graph according to the method selected under Evaluation guideline and the parameters selected under Graphic representation
Legend	Explanation of line types used in the measurement chart
CHARACTERISTIC DATA	Display of the characteristic data in the unit selected under Unit of measure

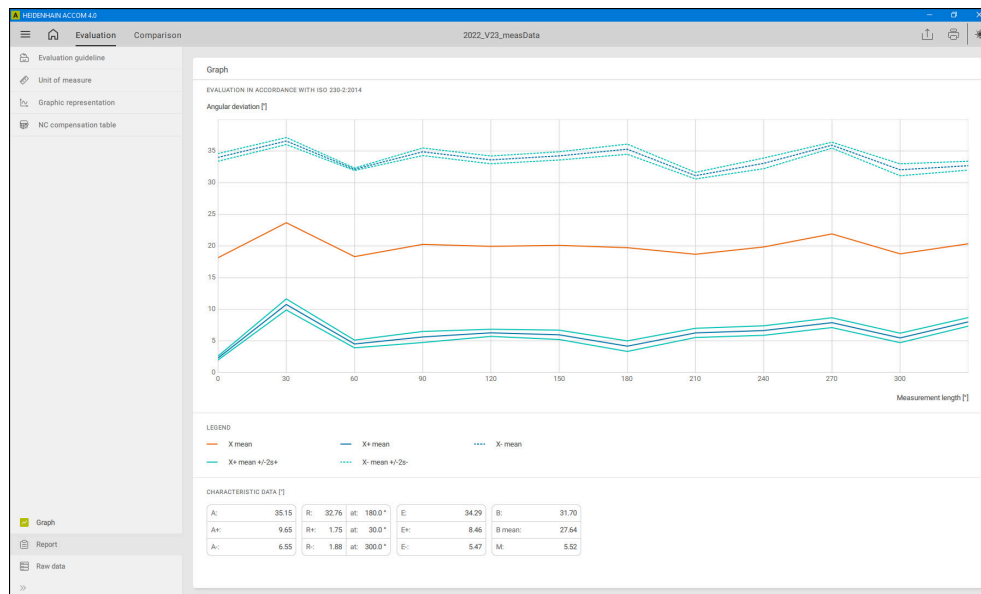


Figure 18: **Graph** display in the **Evaluation** function

Legend in accordance with ISO 230-2:2014

For the **ISO 230-2:2014** guideline, the following values are displayed under **Legend**:

Representation according to characteristic data

X mean	Mean value of X+ mean and X- mean
X+ mean	Mean value of the deviation in positive direction of rotation
X- mean	Mean value of the deviation in negative direction of rotation
X+ mean +/-2s+	Statistical deviation of X+ mean . The lines show the dispersion in positive direction
X+ mean +/-2s-	Statistical deviation of X- mean . The lines show the dispersion in negative direction

Representation according to single cycles

X+	Deviation of the individual measuring cycles in positive direction of rotation
X-	Deviation of the individual measuring cycles in negative direction of rotation

Legend in accordance with VDI/DGQ 3441:1977

For the **VDI/DGQ 3441:1977** guideline, the following values are displayed under **Legend**:

Sys. deviation	Mean value of the deviation in positive and negative direction of rotation
U	Hysteresis
Ps	Position variation range
Pa	Position error
P	Position uncertainty

Legend in accordance with ISO 230-3:2007

For the **ISO 230-3:2007** guideline, the following values are displayed under **Legend**:

e1(c,+)	Deviation of the first target position relative to start in positive direction of rotation
e1(c,-)	Deviation of the first target position relative to start in negative direction of rotation
e2(c,+)	Deviation of the second target position relative to start in positive direction of rotation
e2(c,-)	Deviation of the second target position relative to start in negative direction of rotation

6.3.2 Report

The **Report** display shows the data of the measurement report. The measurement report contains the following information:

Domain	Explanation
Miscellaneous	Information on Customer , Inspector , date and time of measurement
Machine name	Information on the machine on which the measurement was conducted, such as Designation , Serial number and Year of manufacture
HEIDENHAIN reference encoder	Information on the reference encoder used, such as Designation , Serial number and ID number
Active compensation	Information on the measurement performance, such as Initial measurement or Verification measurement . Describes whether a compensation table for the axis under test was active. There is no active compensation for an Initial measurement . For a Verification measurement , a previously generated compensation is validated. Further information: "Creating an NC compensation table for non-HEIDENHAIN controls ", Page 58
Measurement parameters	Information on the measurement parameters set before Further information: "Measurement parameters", Page 36
Note	Individual information on the measurement

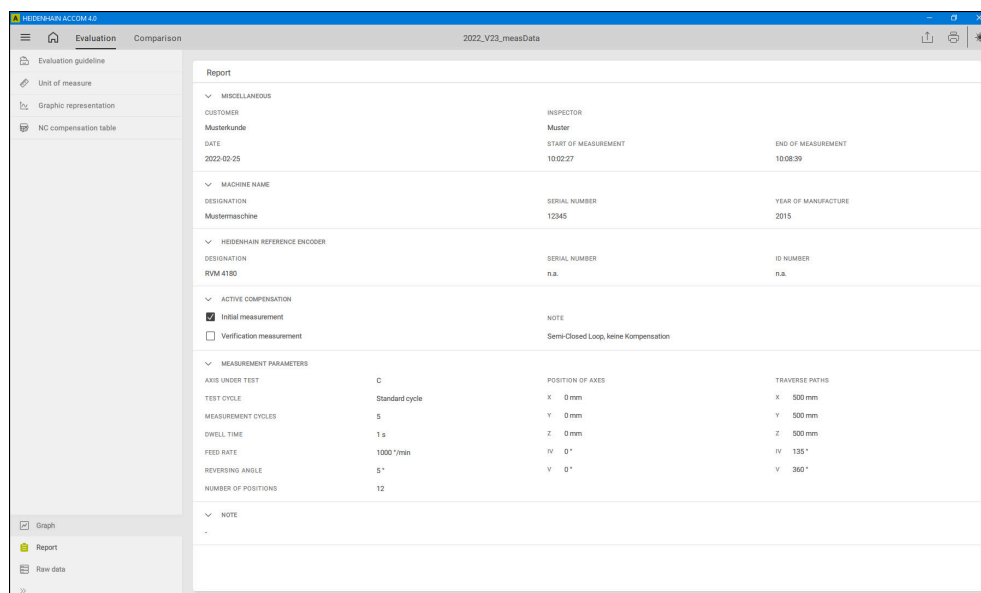


Figure 19: **Report** display in the **Evaluation** function

6.3.3 Raw data

The **Raw data** display shows a table with the target positions and measured values. The raw data provide the numerical values for the **Graph** display.

Raw data []

	TARGET POSITIONS	X MEAN	X+ MEAN	X- MEAN	HYSTERESIS
1	0°	18.15	2.30	34.00	31.70
2	30°	23.67	10.76	36.58	25.83
3	60°	18.32	4.51	32.12	27.61
4	90°	20.25	5.62	34.88	29.26
5	120°	19.04	6.27	33.60	27.33
6	150°	20.10	5.96	34.24	28.28
7	180°	19.73	4.17	35.29	31.12
8	210°	18.69	6.27	31.11	24.85
9	240°	19.84	6.63	33.06	26.42
10	270°	21.90	7.88	35.93	28.05
11	300°	18.75	5.47	32.94	26.57
12	330°	20.25	8.01	32.69	24.68

Figure 20: **Raw data** display in the **Evaluation** function

6.4 Configuring the evaluation

The **Evaluation** function allows you to configure the display parameters for the measurement evaluation.

The following representation parameters are available:

Representation parameter	Explanation
Evaluation guideline	Selecting the guideline for the representation of the evaluation <ul style="list-style-type: none"> ■ ISO 230-2:2014 ■ VDI/DGQ 3441:1977 ■ ISO 230-3:2007
Unit of measure	Selecting the unit of measure for the representation of the evaluation <ul style="list-style-type: none"> ■ Arc second ■ Degree ■ mdeg ■ mrad ■ µrad
Graphic representation	Mode of representation of the axes in the evaluation <p>Y axis</p> <ul style="list-style-type: none"> ■ Scaling of Y axis <ul style="list-style-type: none"> Auto: The Y axis is automatically scaled. All curves are displayed From... to...: The display area can be delimited by entering values <p>X axis</p> <ul style="list-style-type: none"> ■ Display for ISO 230-2:2014 and VDI/DGQ 3441:1977 <ul style="list-style-type: none"> Characteristic data: Representation based on the selected standard. Various curves are displayed Single cycles: Representation of each individual measurement in positive and negative direction ■ Display for ISO 230-3:2007 <ul style="list-style-type: none"> Position drift over cycles: Representation of the position deviation of the target positions in positive and negative approach direction over the entire measurement time. Display of measuring time in number of measuring cycles on the abscissa Position drift over time: Representation of the position deviation of the target positions in positive and negative approach direction over the entire measurement time. Display of measurement duration in time ■ Scaling of X axis <ul style="list-style-type: none"> Auto: The X axis is automatically scaled. The entire measuring range is displayed From... to...: The displayed measuring range can be enlarged or reduced by entering values

6.5 Export characteristic data

With the **Export characteristic data** function, you can export the characteristic data as a text file.

The characteristic data contain information on the positioning accuracy according to the selected evaluation guideline. This allows you to check whether your requirements for the encoder and machine are met. You can also use the characteristic data to monitor the accuracy of the axis over extended time periods.

To export the characteristic data:



- ▶ Click **Export characteristic data** in the menu bar
- ▶ Select the storage location in the **Save as** dialog box
- ▶ Enter a name for the characteristic data
- ▶ Click **Save**
- The characteristic data are exported and saved in the storage location

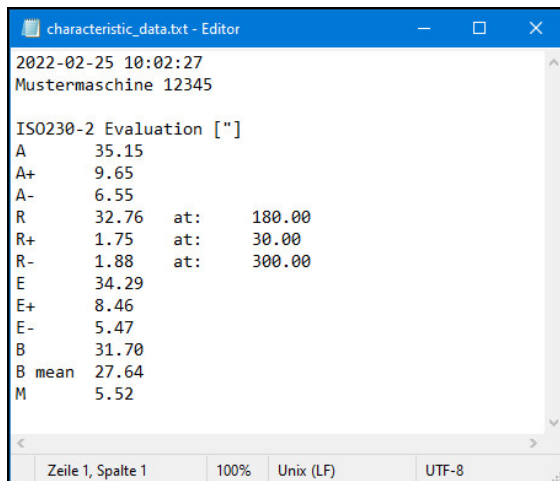


Figure 21: Example of characteristic data

6.6 Printing the report

You can print the measurement report on the installed printer.

Proceed as follows:



- ▶ Click **Print the report** in the menu bar
- ▶ In the **Print the report** dialog box, select the data that you want to add to the measurement report:
 - **Chart with characteristic data**
 - **Raw data**
- ▶ Click **Continue**
- The **Print** dialog is displayed
- ▶ Select the desired printer
- The measurement report and the additional data are output to the selected printer

6.7 NC compensation table



The **NC compensation table** is only available for measurements and evaluations as per **ISO 230-2:2014** and **VDI/DGQ 3441:1977** guidelines.

The **NC compensation table** function allows you to generate a compensation table from the measured values with the help of a wizard. This compensation table can be used by the machine control to improve the long-range accuracy of an axis.

- If you have a HEIDENHAIN control (TNC 640 or higher), you can download a COM file from the HEIDENHAIN control and select which parameters you want to change.
- If you do not have a HEIDENHAIN control, you can also generate a compensation table without a COM file. In this case you will create a TXT file with the compensation values that you can then transfer manually to your machine control.

6.7.1 Creating an NC compensation table for HEIDENHAIN controls

To create an NC compensation table for HEIDENHAIN controls:

- ▶ Click **Create NC compensation table**
- The **NC compensation table** dialog box with the wizard is opened

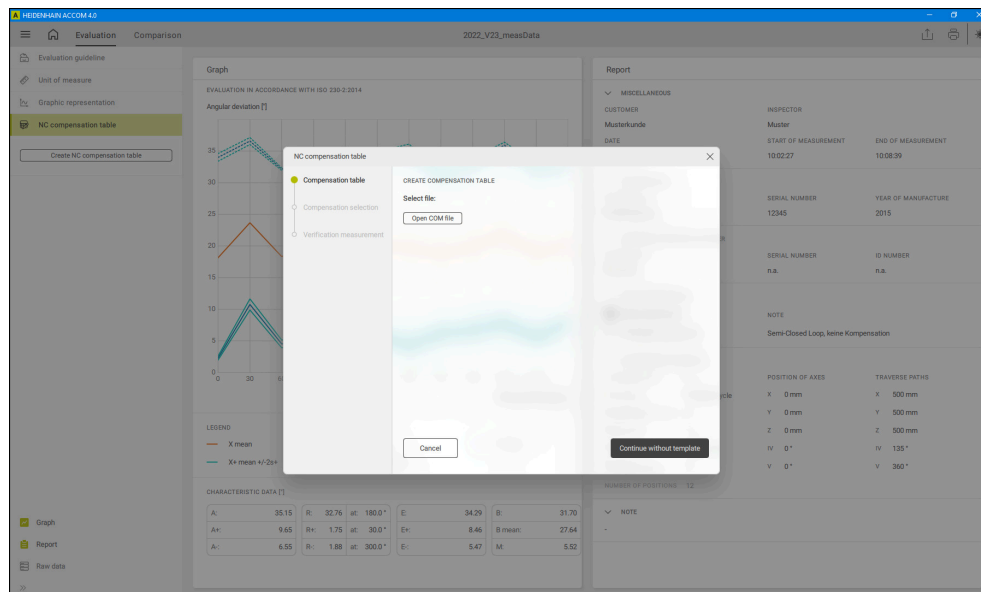


Figure 22: **NC compensation table** dialog box

Step: Create compensation table

- ▶ Click **Open COM file**
- The **Open** dialog box appears
- ▶ Navigate to the corresponding storage location of the desired COM file
- ▶ Select the desired COM file
- ▶ Click **Open**
- The COM file is opened
- ▶ Select the corresponding axis under **The following parameters were detected:**
- ▶ Click **Continue**
- The wizard jumps to the **Compensation selection** step

Step: Compensation selection

- ▶ Enter the following parameters:

Parameter	Explanation
Compensation values	<p>The compensation value is calculated from the measured values. By default the compensation value is calculated by averaging. If there is a preferred axis direction, you can select a different method (depending on the machine).</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Averaged value from forward and reverse cycles ■ Only forward cycles ■ Only reverse cycles
Compensation method	<p>If the COM file contains an arbitrary compensation table, you can overwrite the values. In this case the compensation table just serves as a template.</p> <p>If the measurement was already performed with an active compensation table for the axis under test, you have to add the compensation values and the already existing values.</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Absolute (overwrite) ■ Incremental (add)
Decimal separator	<p>Selecting the decimal separator being used</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Point ■ Comma
Additional compensation	<p>Select the Backlash compensation option if you want the hysteresis (backlash) of the measured axis to be corrected directly via the compensation table.</p> <p>The BACKLASH column will then be filled correspondingly.</p>

- ▶ Click **Save and continue**
- > The **Save as** dialog box is opened
- ▶ Navigate to the desired storage location
- ▶ Enter the file name
- ▶ Click **Save**
- > The compensation table is saved as a COM file
- > The wizard jumps to the **Verification measurement** step

Step: Verification measurement

After you have transferred the compensation table to the machine control, a verification measurement is recommended.

- ▶ Click **Start verification measurement** to start the verification measurement
- > The wizard jumps to the **Measurement** submenu of the **Measurement** function

Further information: "Start measurement", Page 43

6.7.2 Creating an NC compensation table for non-HEIDENHAIN controls

To generate an NC compensation table for non-HEIDENHAIN controls:

- ▶ Click **Create NC compensation table**
- The **NC compensation table** dialog box with the wizard is opened

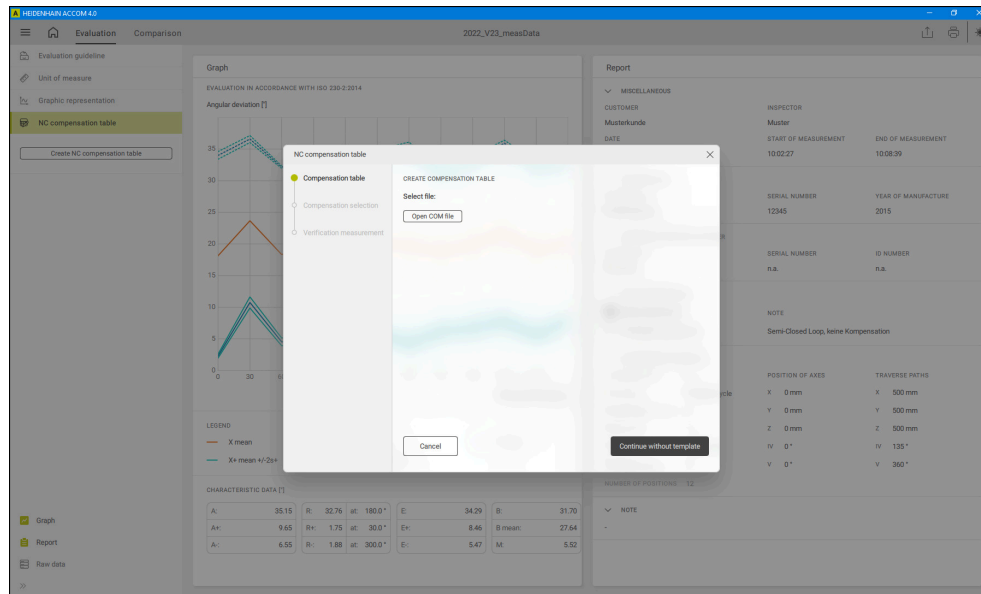


Figure 23: NC compensation table dialog box

Step: Create compensation table

- ▶ To start without a COM file, click **Continue without template**
- The wizard jumps to the **Compensation selection** step

Step: Compensation selection

- ▶ Enter the following parameters:

Parameter	Explanation
Compensation values	<p>The compensation value is calculated from the measured values. By default the compensation value is calculated by averaging. If there is a preferred axis direction, you can select a different method (depending on the machine).</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Averaged value from forward and reverse cycles ■ Only forward cycles ■ Only reverse cycles
Compensation method	<p>For a non-HEIDENHAIN-control, select Absolute (overwrite).</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Absolute (overwrite) ■ Incremental (add)
Decimal separator	<p>Selecting the decimal separator being used</p> <p>Selection:</p> <ul style="list-style-type: none"> ■ Point ■ Comma

- ▶ Click **Save and continue**
- > The **Save as** dialog box is opened
- ▶ Navigate to the desired storage location
- ▶ Enter the file name
- ▶ Click **Save**
- > The compensation table is saved as a TXT file
- > The wizard jumps to the **Verification measurement** step

Step: Verification measurement

After you have transferred the compensation table to the machine control, a verification measurement is recommended.

- ▶ Click **Start verification measurement** to start the verification measurement
- > The wizard jumps to the **Measurement** submenu of the **Measurement** function

Further information: "Start measurement", Page 43

7

Comparison

7.1 Overview

This chapter describes the **Comparison** function. The **Comparison** function compares the evaluation results of two measurements. Through a time response, the comparison can serve as an indication of wear or measurement errors, or compare the parameters before and after compensation.

The **Comparison** function compares the evaluation results of two measurements.



You can also open the **Comparison** function by proceeding with the measurement directly after the evaluation.

7.2 Opening measurements for comparison

You can open the **Comparison** function in the opening screen. Select two previously saved files that you want to compare.

If you perform a comparison directly after an evaluation, the evaluated file will be used as the first comparison file.

To compare measurement files:

- ▶ Click **Comparison** in the opening screen
- ▶ The selection fields for the first and the second comparison file are displayed
- ▶ Click **Open File**
- > The **Open** dialog box is opened
- ▶ Navigate to the storage location of the measurement file
- ▶ Click desired measurement file
- ▶ Click **Open**

or

- ▶ Drag the desired measurement file from the explorer to the selection field
- > The measurement file is opened in the **Comparison** function
- ▶ To open the second measurement file, if applicable, repeat these steps

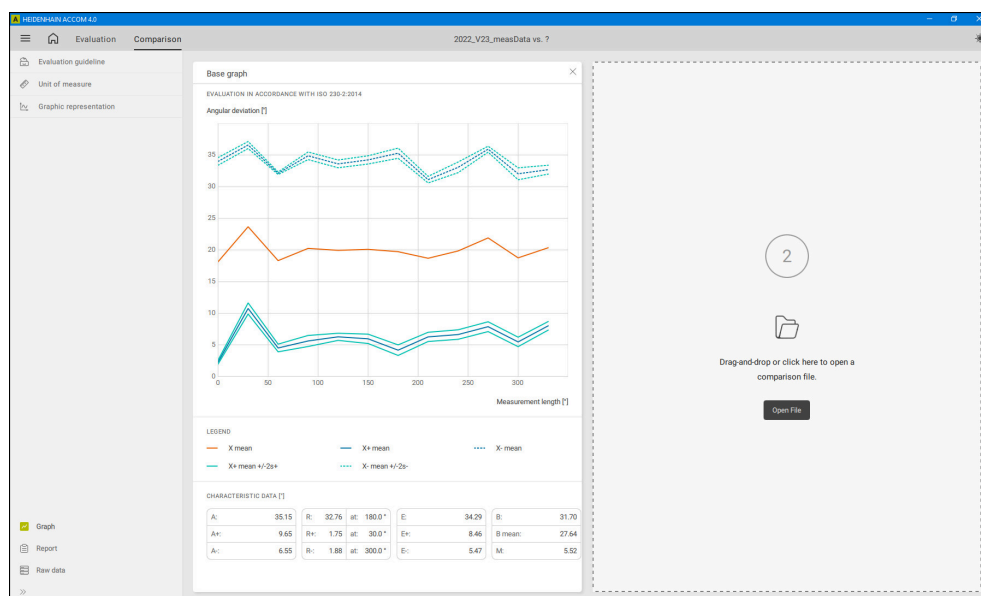





Figure 24: **Comparison** function

7.3 Displaying a comparison

The **Comparison** function allows you to individually show or hide various displays. The following displays are available:

Display	Explanation
	Graph Click to show or hide the graph
	Report Click to show or hide the report
	Raw data Click to show or hide the raw data

7.3.1 Graph

i You can adapt the curves shown in the **Graph** display under **Graphic representation**.
Further information: "Configuring the evaluation ", Page 54

The following elements are shown in the **Graph** display:

Element	Explanation
Evaluation in accordance with...	Display of the measurement results as a graph according to the method selected under Evaluation guideline and the parameters selected under Graphic representation
Legend	Explanation of line types used in the measurement chart
CHARACTERISTIC DATA	Display of the characteristic data in the unit selected under Unit of measure

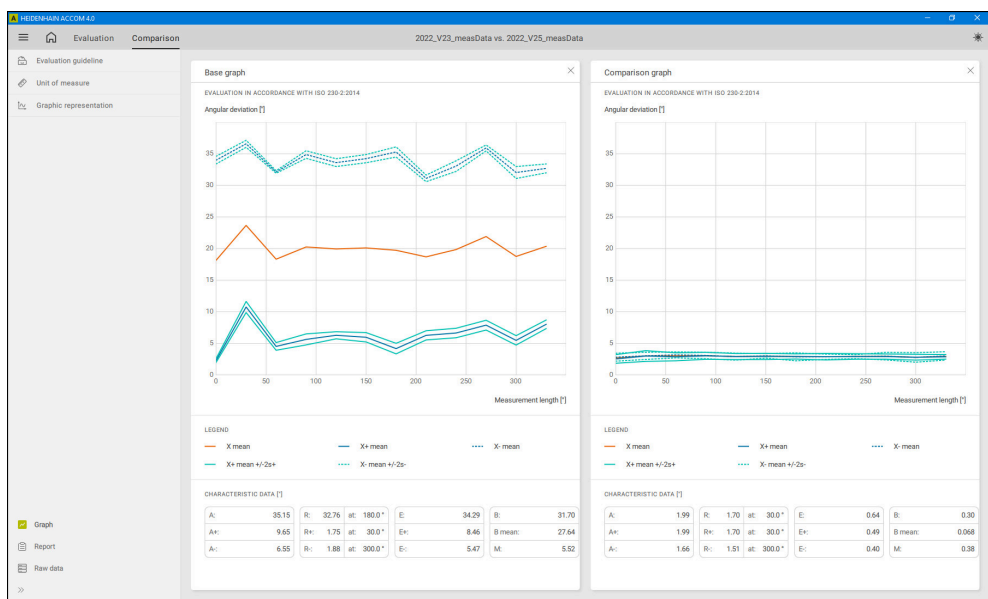


Figure 25: **Graph** display in the **Comparison** function

Legend in accordance with ISO 230-2:2014

For the **ISO 230-2:2014** guideline, the following values are displayed under **Legend**:

Representation according to characteristic data

X mean	Mean value of X+ mean and X- mean
X+ mean	Mean value of the deviation in positive direction of rotation
X- mean	Mean value of the deviation in negative direction of rotation
X+ mean +/-2s+	Statistical deviation of X+ mean . The lines show the dispersion in positive direction
X+ mean +/-2s-	Statistical deviation of X- mean . The lines show the dispersion in negative direction

Representation according to single cycles

X+	Deviation of the individual measuring cycles in positive direction of rotation
X-	Deviation of the individual measuring cycles in negative direction of rotation

Legend in accordance with VDI/DGQ 3441:1977

For the **VDI/DGQ 3441:1977** guideline, the following values are displayed under **Legend**:

Sys. deviation	Mean value of the deviation in positive and negative direction of rotation
U	Hysteresis
Ps	Position variation range
Pa	Position error
P	Position uncertainty

Legend in accordance with ISO 230-3:2007

For the **ISO 230-3:2007** guideline, the following values are displayed under **Legend**:

e1(c,+)	Deviation of the first target position relative to start in positive direction of rotation
e1(c,-)	Deviation of the first target position relative to start in negative direction of rotation
e2(c,+)	Deviation of the second target position relative to start in positive direction of rotation
e2(c,-)	Deviation of the second target position relative to start in negative direction of rotation

7.3.2 Report

The **Report** display shows the data of the measurement report. The measurement report contains the following information:

Domain	Explanation
Miscellaneous	Information on Customer , Inspector , date and time of measurement
Machine name	Information on the machine on which the measurement was conducted, such as Designation , Serial number and Year of manufacture
HEIDENHAIN reference encoder	Information on the reference encoder used, such as Designation , Serial number and ID number
Active compensation	Information on the measurement performance, such as Initial measurement or Verification measurement . Describes whether a compensation table for the axis under test was active. There is no active compensation for an Initial measurement . For a Verification measurement , a previously generated compensation is validated. Further information: "Creating an NC compensation table for non-HEIDENHAIN controls ", Page 58
Measurement parameters	Information on the measurement parameters set before Further information: "Measurement parameters", Page 36
Note	Individual information on the measurement

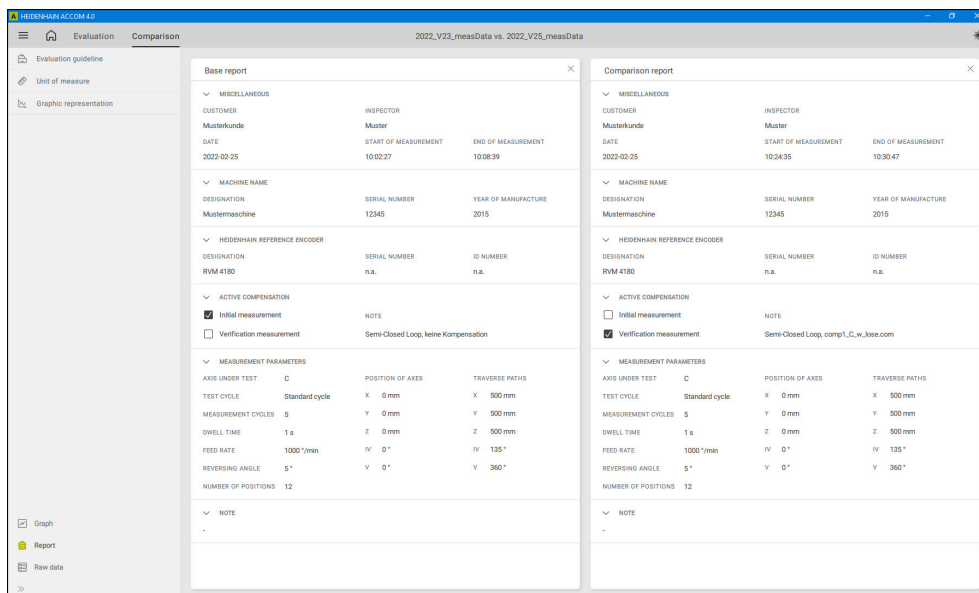


Figure 26: **Report** display in the **Comparison** function

7.3.3 Raw data

The **Raw data** display shows a table with the target positions and measured values. The raw data provide the numerical values for the **Graph** display.

TARGET POSITIONS	X-MEAN	X+MEAN	X-MEAN	HYSTERESIS	
1	0°	18.15	2.30	34.00	31.70
2	30°	23.67	10.76	36.58	25.83
3	60°	18.32	4.81	32.12	27.61
4	90°	20.25	5.62	34.88	29.26
5	120°	19.94	6.27	33.60	27.33
6	150°	20.10	5.96	34.24	28.28
7	180°	19.73	4.17	35.29	31.12
8	210°	18.69	6.27	31.11	24.85
9	240°	19.84	6.63	33.06	26.42
10	270°	21.90	7.88	35.93	28.09
11	300°	18.25	5.47	32.04	28.57
12	330°	20.35	8.01	32.69	24.68

TARGET POSITIONS	X-MEAN	X+MEAN	X-MEAN	HYSTERESIS	
1	0°	2.67	2.53	2.81	0.28
2	30°	3.01	2.99	3.02	0.030
3	60°	3.02	2.87	3.17	0.30
4	90°	3.05	3.02	3.06	0.057
5	120°	2.90	2.91	2.89	-0.018
6	150°	2.98	2.93	3.03	0.099
7	180°	2.89	2.93	2.86	-0.069
8	210°	2.88	2.89	2.88	-0.011
9	240°	2.91	2.92	2.90	-0.026
10	270°	2.94	2.90	2.97	0.069
11	300°	2.79	2.81	2.77	-0.040
12	330°	2.94	2.86	3.01	0.15

Figure 27: **Raw data** display in the **Comparison** function

7.4 Configuring the comparison

The **Comparison** function allows you to configure the display parameters for the comparison view.



Under **Graphic representation**, the scaling is adjusted automatically so that the two graphs are displayed completely. You can later change these values manually.

The following representation parameters are available:

Representation parameter	Explanation
Evaluation guideline	Selecting the guideline for the representation of the evaluation <ul style="list-style-type: none"> ■ ISO 230-2:2014 ■ VDI/DGQ 3441:1977 ■ ISO 230-3:2007
Unit of measure	Selecting the unit of measure for the representation of the evaluation <ul style="list-style-type: none"> ■ Arc second ■ Degree ■ mdeg ■ mrاد ■ μrad
Graphic representation	Mode of representation of the axes in the evaluation <p>Y axis</p> <ul style="list-style-type: none"> ■ Scaling of Y axis Auto: The Y axis is automatically scaled. All curves are displayed From... to...: The display area can be delimited by entering values <p>X axis</p> <ul style="list-style-type: none"> ■ Display for ISO 230-2:2014 and VDI/DGQ 3441:1977 Characteristic data: Representation based on the selected standard. Various curves are displayed Single cycles: Representation of each individual measurement in positive and negative direction ■ Display for ISO 230-3:2007 Position drift over cycles: Representation of the position deviation of the target positions in positive and negative approach direction over the entire measurement time. Display of measuring time in number of measuring cycles on the abscissa Position drift over time: Representation of the position deviation of the target positions in positive and negative approach direction over the entire measurement time. Display of measurement duration in time ■ Scaling of X axis Auto: The X axis is automatically scaled. The entire measuring range is displayed From... to...: The displayed measuring range can be enlarged or reduced by entering values

8

**RVM 4280
>Mounting wizard**

8.1 Overview

This chapter describes the **RVM 4280
Mounting wizard** function. With this function, ACCOM 4.0 supports you in mounting the RVM 4280 encoder accurately to a rotary table before the actual measurement is performed. This procedure prevents possible measurement errors.



The **RVM 4280
Mounting wizard** function is an auxiliary function and is not included in the software's standard range of functions.

Further information: "Licensing", Page 20

8.2 Executing the mounting wizard

Preparing installation

Before you start the mounting wizard, you have to mount the scale drum of the RVM 4280 encoder and the dial indicators.

- ▶ Mount the RVM 4280 encoder with the pertaining mounting bracket to the rotary table of the machine as described in the RVM 4000 Operating Instructions.
- ▶ Attach two dial indicators to the machine frame in such a way that they touch the encoder's centering collar at an angle of approx. 90° to each other and so that the indicator scales are easily readable.
- ▶ Check whether the needles of the dial indicators each are in the center of the display area after mounting

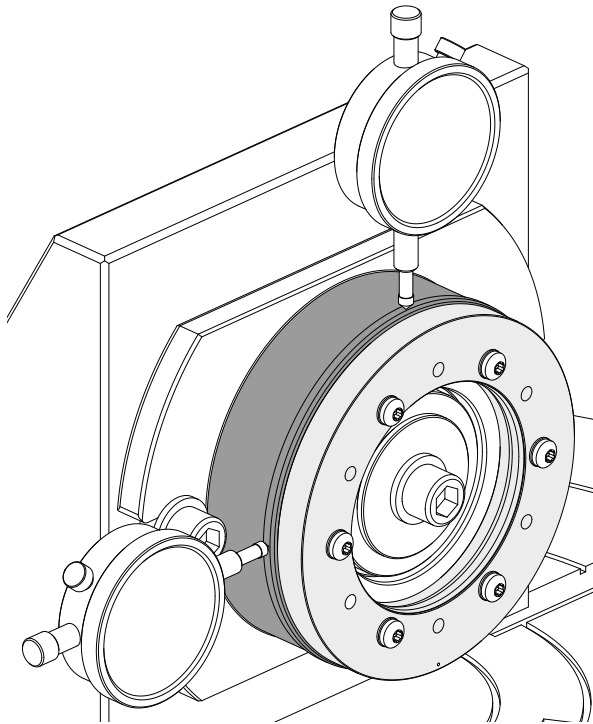


Figure 28: Mounting the Scale Drum

Starting the mounting wizard

- ▶ Click **RVM 4280 Mounting wizard** under **ACCOM Plus** in the selection of functions on the start page
- > The mounting wizard is opened
- ▶ Check whether the mechanical mounting is complete
- ▶ Check whether the dial indicators being used work with the positive (standard) or negative measurement direction; if necessary, enable the **Positive measuring direction from scale drum to dial gage** option
- ▶ Click **Continue**

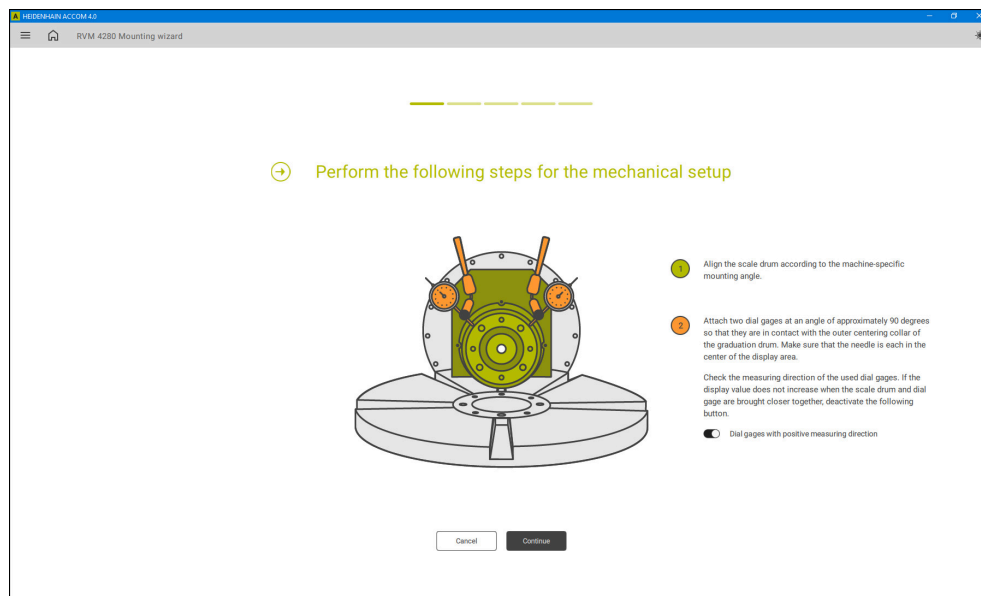


Figure 29: RVM 4280 Mounting wizard

Conducting measurements

- ▶ Read the axis angle of the tilting axis from the machine control and enter the value in the **Angle value** field.
- ▶ Enter the values of the dial indicators in the **Dial gage** fields. Press Return to conclude your entry
- ▶ Move the tilting axis by at least 60° with the machine control.

i If tilting by 60° is not possible, select the limits of the measuring range and a center position as reading positions in each case.

- ▶ Click **Continue**
- ▶ Repeat the measurements with a second and a third tilting axis position. When doing so, always move the tilting axis by at least 60°.
- ▶ After the third measurement, click **Analysis**

Evaluating an analysis

During the analysis, the position of the center of rotation of the scale drum relative to the rotary axis of the tilting axis is determined and evaluated as follows:

- **Mounting is ideal**
Measurement can start, the **Go to measurement** button is displayed
- **Mounting should be corrected**
The position is still within the specified runout tolerance Nevertheless mounting should be corrected to avoid negative effects on the measurement accuracy
- **Mounting must be corrected**
The position is outside the specified runout tolerance; therefore, mounting must be corrected



After mounting has been corrected, you always have to restart the mounting wizard.

Performing mounting correction

If mounting must be corrected, you can use the following values:

- **Analysis**
 - **Eccentricity**
Displayed for information; shows the deviation of the rotational axes from the tilting table and the scale drum of the encoder
 - **Target value Dial gage 1/2**
The position of the scale drum must be changed until these values are shown on the dial indicators
- Diagram and **Angle position selection**
Shows the direction of rotation for the position change; the display of the arrows depends on the respective measuring position
The measuring position can be selected depending on the accessibility (e. g., owing to machine parts) relative to the scale drum
- **Center of rotation of the scale drum**
Display of the positions
 - **Actual position**
 - **Target position**

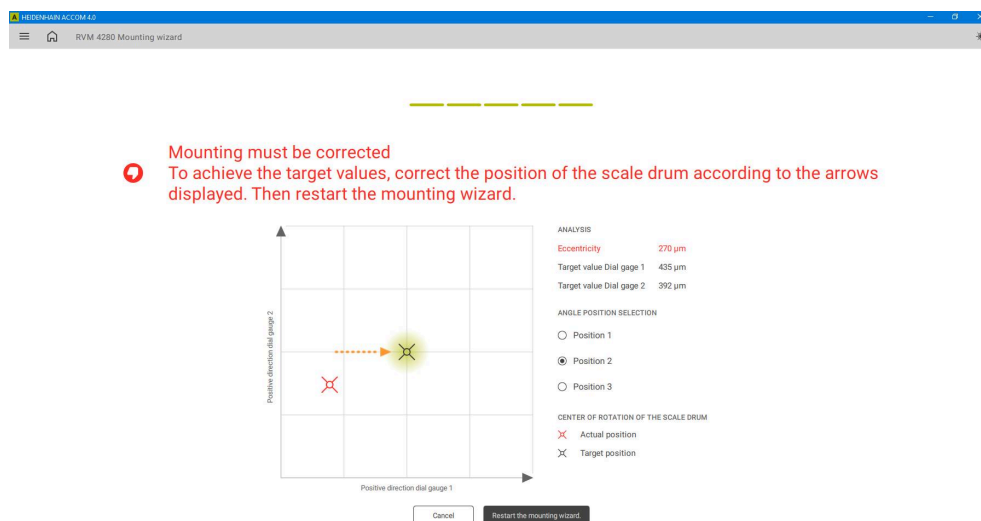


Figure 30: Example of compensation values

- ▶ Correct the position of the scale drum according to the arrows by slightly tapping with a rubber hammer until the specified target values on the dial indicators have been reached
- ▶ Click **Restart the mounting wizard**.
- ▶ Execute the mounting wizard again



- You can execute the mounting wizard until ideal mounting is indicated
- Once the mounting wizard has been completed again, you can see the position corrections that have been made in the representation under **Center of rotation of the scale drum**

9

Settings

9.1 Overview

This chapter describes settings for configuring the operation and representation mode.

9.2 Settings

You can open the settings in the **Main menu**. The following settings are available:

Parameter	Explanation
User	Selecting the user account. The Developer user account is only available to the manufacturer.
Language	Selecting the language of the user interface. In addition to German and English, other languages are available.
Reset	Resetting to the factory default settings. The following data are reset: <ul style="list-style-type: none"> ■ Language ■ Brightness mode ■ Settings under measurement/preparation ■ Saved setup files

9.2.1 Setting the language

In the factory default setting, the user interface language corresponds to the language used by Microsoft Windows. You can change to another language, if desired.

To set the language:



- ▶ Click **Main menu** in the menu bar
- ▶ Click **Settings**
- ▶ Click **Language**
- ▶ Select the desired language from the **Select language** drop-down list
- ▶ Click **Save**
- > The user interface is shown in the selected language

9.2.2 Resetting the settings

To reset the software to the factory default settings:

- ▶ Click **Reset** under **Settings**
- ▶ Click **Reset**
- ▶ Click **Reset** in the dialog box
- > All settings are reset
- > The software restarts automatically

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