E980

Sawmill

MANUAL

English

05-0602 Revision 4.1
System version 12.9

CONTENT

INTRODUCTION

Easy-Laser AB

Easy-Laser AB develops, manufactures and markets Easy-Laser® measurement and alignment equipment based on laser technology.

Intended use for the equipment is described in the technical data for each system. You find the technical data in the end of the manual.

Do not hesitate to contact us about your measurement problems. Our expertise will help you solve it in an easy way.

Limited warranty

This product is manufactured under Easy-Laser's strict quality control system. Should the product fail within three (3) years from the date of purchase under normal usage conditions, Easy-Laser will repair or replace the product free of charge.

1. Using new or refurbished replacement parts.
2. Exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product.

Proof of purchase date should be confirmed, and sent together with a copy of the original purchase document.

Warranty is valid under normal usage described in the user's manual appended with the product. The warranty comprises failure on Easy-Laser® product that could be related to material and/or fabrication errors. The warranty is valid only in the country of purchase.

The warranty is not valid in the following cases:

- If the product is broken due to mishandling or incorrect operation
- If the product has been exposed to extreme temperature, calamity, chock or high voltage.
- If the product has been modified, repaired or disassembled by unauthorized personnel.

Compensation for possible damage due to failure on Easy-Laser® product is not included in the warranty. Freight cost to Easy-Laser is not included in the warranty.

Note!

Before delivery of the product for warranty repair, it is the responsibility of the buyer to backup all data. Data recovery is not included in the warranty service and Easy-Laser is not responsible for data that may be lost or damaged during transit or repair.

Lithium Ion battery limited warranty

Lithium ion batteries inevitably lose power during their lifetimes, depending on usage temperatures and the number of charging cycles. Therefore, the internal rechargeable batteries used in the E-series are not included in our general 2-year warranty. There is a 1 year warranty for the battery capacity not to fall below 70 % (a normal change means that the battery must have more than 70 % capacity after more than 300 charging cycles). A 2 year warranty applies if the battery becomes unusable because of a manufacturing fault or factors that Easy-Laser AB could be expected to have control of, or if the battery displays abnormal loss of capacity in relation to use.

Safety precautions

Easy-Laser® is a laser instrument in laser class 2 with an output power normally less than 1 mW, which requires the following safety precautions:

- Never stare directly into the laser beam
- Never aim the laser beam at anyone else's eyes.

Note!

Opening the laser units can result in hazardous radiation, and will invalidate the manufacturer warranty.

If starting the machine to be measured would result in injuries, the possibility to unintentionally start it must be disabled before mounting the equipment, for example by locking the switch in the off position or removing the fuses. These safety precautions should remain in place until the measurement equipment has been removed from the machine.

Note!

The system should not be used in explosive risk areas.

Service and calibration

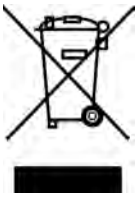
Easy-Laser products should only repaired or calibrated by a certified service centre.

Our main Service centre is located in Sweden. There are several local Service centres that are certified to carry out limited service and repair. Contact your local Service centre first before sending your equipment for service or repair. All Service centres are listed on our web site under Service and Calibration.

Before sending your measuring system to our main Service centre, please fill in the online Service and Repair report.

Disposal of old electrical and electronic equipment

(Applicable throughout the European Union and other European countries with separate collection programs)



This symbol, found on product or on its packing, indicates that this product should not be treated as household waste when disposed of.
It should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed correctly, you will help to prevent potential negative consequences to the environment and human health. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.

Manuals as PDF

You can download our manuals in pdf format from our website. The pdf's are also available on the USB memory stick that is delivered with most systems.

EasyLink

The new version of our database program EasyLink is available on the USB memory stick that is delivered with most systems. You can always download the latest version from easylaser.com>download>software.

Travelling with your measurement system

When travelling by airplane with your measurement system we strongly recommend that you check which rules apply for each airline company. Some companies/countries have limitations for checked baggage when it comes to items including batteries. For information about Easy-Laser® batteries, please see system unit details in the end of this manual. It is also good practice to remove the batteries from the equipment, when possible, e.g. D22, D23 and D75.

Specifications for built-in rechargeable batteries

Easy-Laser Part No.	Type	Voltage	Output	Capacity	Included in Part No.
03-0757	Li-Ion	3.65 V	41.61 Wh	10600 mAh	12-0418, 12-0700, 12-0748
03-0765	Li-Ion	3.7 V	2.5 Wh	660 mAh	12-0433, 12-0434, 12-0509, 12-0688, 12-0702, 12-0738, 12-0752, 12-0759, 12-0758, 12-0799, 12-0846
03-0971	Li-Ion	3.6 V	9.36 Wh	2600 mAh	12-0617, 12-0618, 12-0823, 12-0845
03-1052	Li-Ion	3.7 V	1.22 Wh	330 mAh	12-0746, 12-0747, 12-0776, 12-0777, 12-0791, 12-1054
12-0953	Li-Ion	3.7 V	7.4 Wh	2000 mAh	12-0944, 12-0943, 12-1028, 12-1029
12-0952	Li-Ion	7.3 V	41.61 Wh	5300 mAh	12-0961 (2 pcs)
12-0983	Li-Ion	3.7 V	7.4 Wh	2000 mAh	12-1026, 12-1027
N/A	Li-Ion	3.8 V	16.91 Wh	4450 mAh	12-1086

Compatibility

The E-series is not compatible with previous analogue units from the D-series. You can however continue to use previous brackets.

Disclaimer

Easy-Laser AB and our authorized dealers will take no responsibility for damage to machines and plant as a result of the use of Easy-Laser® measurement and alignment systems. If the system is not used as explained in this manual, the protection provided by the equipment may be impaired.

Copyright

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We might change and correct the manual in later issues without further information. Changes to the Easy-Laser® equipment may also affect the accuracy of the information.

June 2019

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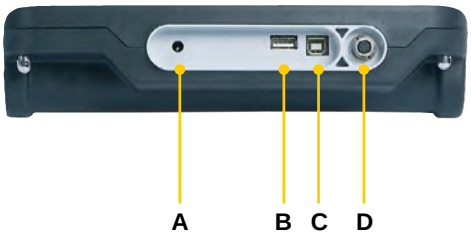
DISPLAY UNIT



A Connection for charger
B USB A
C USB B
D Easy-Laser® measurement equipment

Reset the Display unit

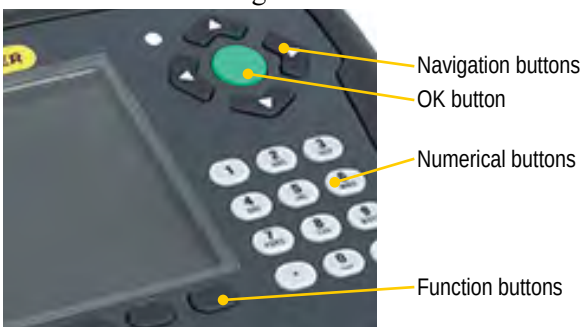
Press and hold the On/Off button to reset the Display unit.

Charger

Only the charger supplied by Easy-Laser may be used.
For more information, see *"Charger" on page 55.*

Navigation buttons

To navigate on the screen, use the navigation buttons. The selected icon is marked with a yellow frame. The navigation buttons are also used to move between the icons in a submenu and to change the values in the fields.



OK buttons

There are two green **OK** buttons and they both work in the same way. Press to select the currently selected icon for example.

Function buttons

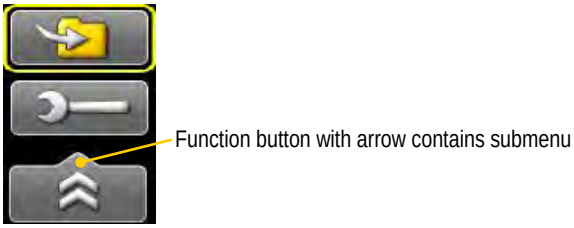
The icons above the function buttons change depending on which view is currently displayed on screen.

Below is a list of the most common icons.

	Back to previous view. Press and hold to leave current program.
	Back. There is no “previous view”. Leave the current program.
	More. Contains a submenu with general functions, such as (Control panel) and (Save file).

Submenus

The icons formed as an arrow contain a submenu. Use the navigation buttons to navigate in a submenu. Press to select.



Status bar

The Status bar contains additional information such as warning icon, current time and wireless connection.

There are also text messages regarding:

- The selected icon.
- Hints on what information you are expected to fill in.

Status bar icons

	Warning. Select the function button to get additional information regarding the warning.
	Warning. Displayed when the coordinates has been rotated in the detector. Go to Control panel to rotate coordinates.
	Hourglass. The Display unit is in the middle of a task.
	Display unit charging. Indicating that a power adaptor is plugged in.
	Display unit is low in battery.
	Measurement progress. Time depending on which filter you have selected.
	Selected filter.
	Peripheral. Indicates that a peripheral device is plugged in, such as a projector.
	Indicates that the wireless functionality is activated. The number beside indicates the number of wireless units connected.
	Printing report on thermal printer. The thermal printer is optional equipment.
	Printing performed OK.
	Printing problem.

Screen dump

It is possible to take screen dumps of what is currently displayed on screen. You can e-mail the screen dump or use it for reports.

Take a screen dump

1. Press and hold the numeric button period (.) for 5 seconds.
2. An hour glass is displayed on the status bar.
3. The screen dump is saved in the file system as a .jpg file. It is named with current date and time. Select  to open saved files. *See "Measurement file handling" on page 11*.

LED lights

Right indicator

Yellow	Flashing: The internal battery in the Display unit is charging.

Left indicator

Left indicator has several functions and colours:

Red/Blue	Quick flashing: Reprogramming the system.
Red	Flashing: Warning, for example low battery.
Blue	Flashing: Searching for detectors equipped with wireless functionality. Fixed light: Connected to detectors equipped with wireless functionality.
Green	Flashing: Display unit is starting. Fixed light: The internal battery in the Display unit is fully charged.
Light blue	Flashing: Backlight is off, but the Display unit is still on. Press any button to activate the Display unit.

Battery

Select ? to display the Battery view.

When finished working for the day, charge the whole system. Plug in the power adaptor to the Display unit and connect the measuring units (**maximum two**) by using cable. If you use a split box, it is possible to charge up to eight units at a time.

The E-series is **not** compatible with units from the D-series.

Charge the Display unit

The Display unit can be used from -10ºC to +50ºC. Charge the Display unit within the temperature range of ±0ºC to +40ºC.

Note!

If you shut the Display unit off while charging, it will charge faster.

Power adaptor

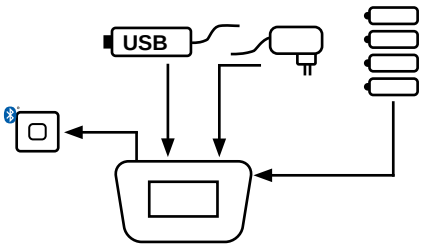
With the power adaptor plugged in, you can keep on working.

A PC via USB cable

While you have this connection, you can open the files in the Display unit via the explorer in your PC. However, the Display unit is locked.

Dry cell batteries

When you get a battery warning, insert four R14 dry cell batteries in the battery compartment. This will prolong the power of the Display unit so that you can finish your measurement. However, if the internal battery is completely empty, the dry cell batteries do not have enough power to start up the Display unit.



Charge the Detector/Measuring units

The Detectors and Measuring units are charged by the Display unit when connected by cable. If you are using wireless units, switch to cable when the battery in the Detector/Measuring unit is low.

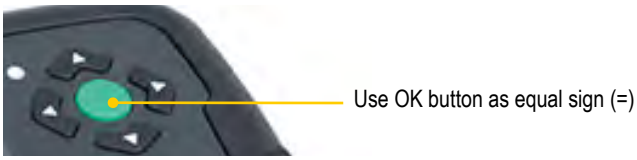
Charge the wireless units

The wireless units are powered by the Detector/Measuring units. To save energy, the wireless units will only connect when you are using a measurement program. There is no power switch on the unit. To switch off, simply unplug the unit.

Calculator

The calculator is found on the Start view and Control panel ( ).

1. Select and to open the calculator.
2. Use the numerical buttons and function buttons to enter values.
3. Use the button to compute.

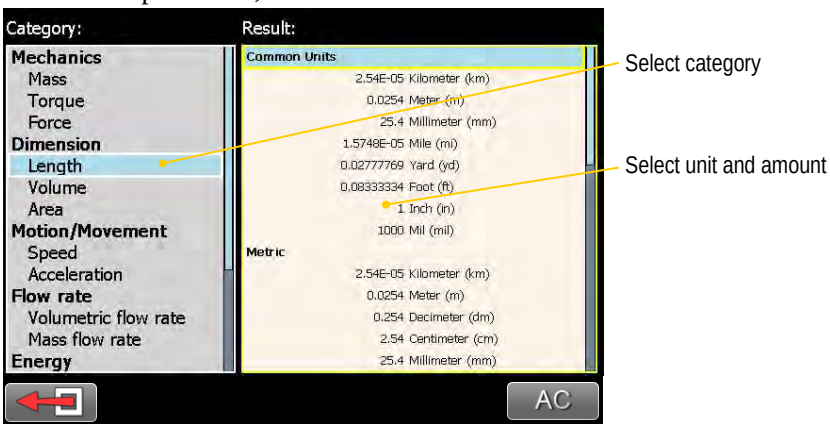


Unit converter

The unit converter is found on the Start view and Control panel ( ).

1. Select and to open Unit converter.
2. Select a category. Move using the navigation buttons up and down.
3. Press navigation button right. The result column is activated.
4. Select a unit to convert from.
5. Enter an amount. The other units are recalculated.

In the example below, one inch is selected.



Measurement **file handling**

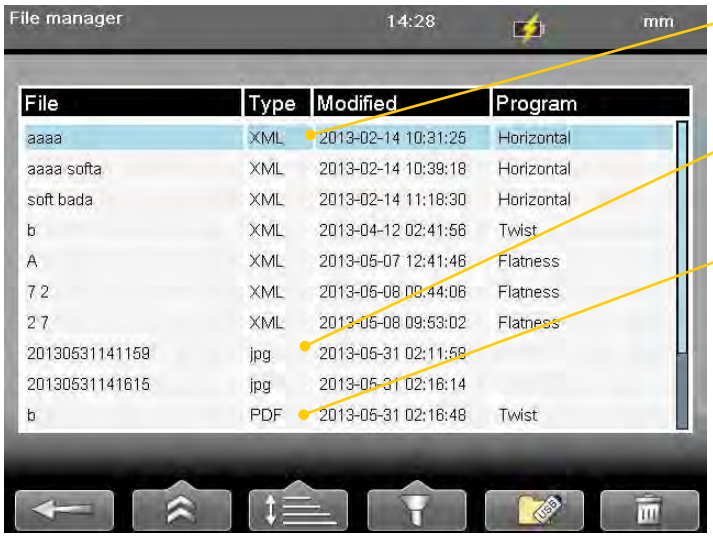
Save file

1. Select and to save your measurement.
2. Enter a file name. The date and time will automatically be added to the file name. The measurements that you save will be available to other users as well.
3. Press to save the file.

File manager

Select (found on the start view and Control panel) to open saved measurements. The File manager is displayed. Here you can easily see when and from which program the file was saved.

Press to open a measurement file.



xml
A measurement file.

jpg
"Screen dump" on page 8

PDF
A report. The PDF report can not be opened in the Display unit.
PDF is not available for E420.

Function buttons

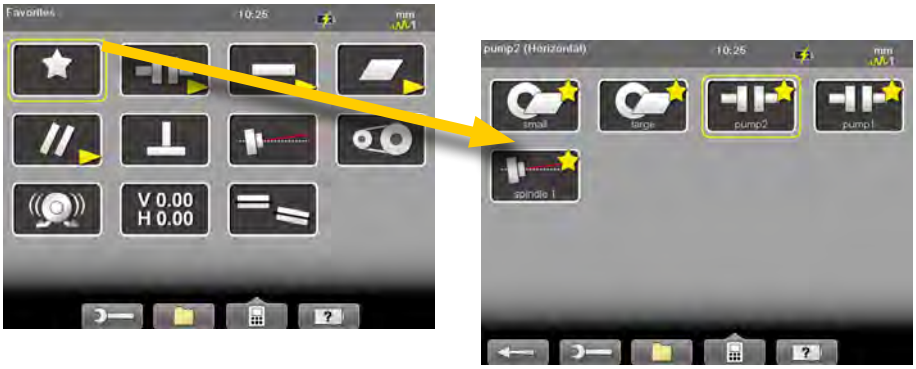
	Back to previous view.
	"Report" on page 14. *"Open file as template" on page 13.* *"Print file (Optional)" on page 14.*
	A...Z Sort files alphabetically. Sort files by measurement program. Sort by time.
	xml pdf jpg Show all files. xml Show only xml files. pdf Show only pdf files. jpg Show only jpg files. Show only Favourites. See *"Favourites" on page 12.*
	"Copy file to USB memory" on page 13.
	Delete files. Delete all **displayed** files or only selected file.

Favourites

It is possible to save a measurement as a Favourite. A Favourite can be used for example when you have many flanges or machines with the same dimensions. This way you do not have to enter the same distances or tolerances every time. When you have saved as Favourite, a new icon is displayed on the start screen.

Create a favourite

1. Select to open the File manager and select a file.
2. Select and to save the selected file as a Favourite.
3. Go to the start screen and select to see all favourites.
4. Press to open a Favourite. All distances are filled in.



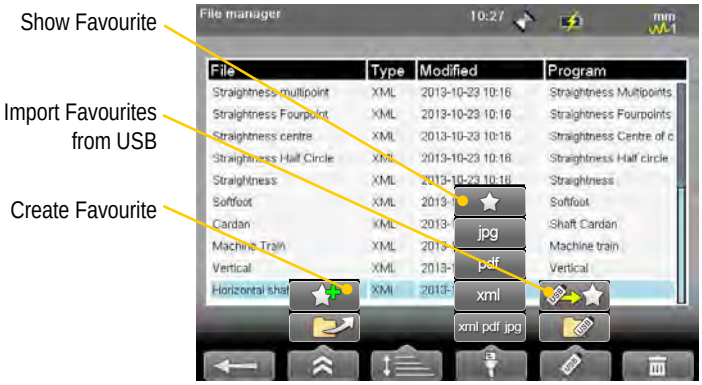
Import favourites

The favourite files are saved in the folder Favourites in the Display unit.

1. Plug in the Display unit to a PC and open the Favourites folder.
2. Copy the .FAV (favourite) file to the root of an USB memory stick.
3. Connect the USB stick to a Display unit and select and to import.

Delete favourite

1. Select to open the File manager and select a file.
2. Select and to show all Favourite files.
3. Select a file and .



Open file as template

You can open a saved measurement and use it to make a new measurement. This is very useful when you have many flanges or machines with the same dimensions for example. This way you do not have to enter the same distances every time.

1. Select (found on the Start view and Control panel). The File manager is displayed.
2. Select a file in the list and select . The Edit distance view is displayed.
3. Change distances if needed and proceed to measuring view.

Copy file to USB memory

You can easily copy a saved measurement or other files to a USB memory.

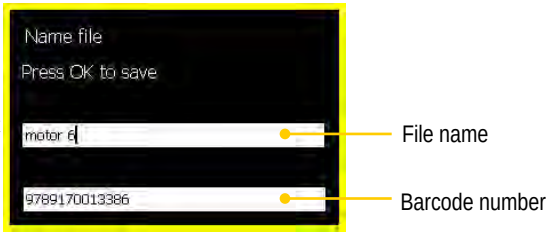
1. Insert a USB memory.
2. Select the file you want and select .
3. A folder is automatically created on the USB memory. The file is saved in the folder `\Damalini\archive\`.

Barcode

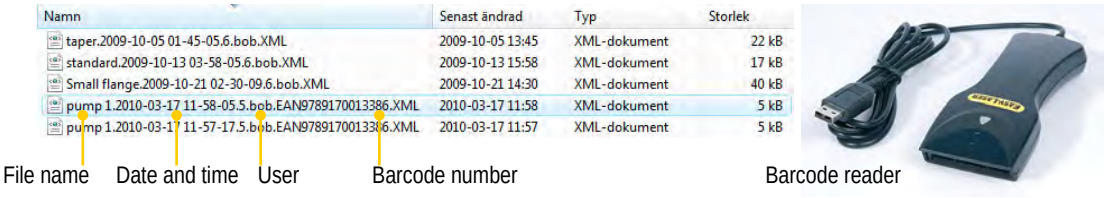
Save file with barcode

The barcode scanner is not included in all systems. The first time you measure a machine, you stick a barcode on the machine and save the measurement together with the scanned barcode. Next time you align the same machine, all you need to do is scan the barcode and all machine data is read.

1. Scan the barcode on the machine.
2. Enter a file name.
3. Press to save the file. All measurement data is saved together with the barcode.



The barcode number is added to the file name.
When you connect the Display unit to a PC the whole file name is shown:



Open file with barcode

- Start the Display unit and scan the barcode. The **latest** measurement that was made and saved with this barcode is automatically opened.

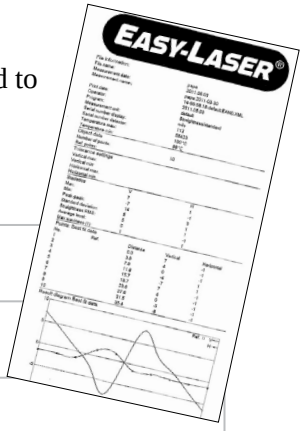
  OR

- Select to open File view. Scan the barcode on the machine. **All** measurements saved with this barcode are shown.

Print file (Optional)

Part no. 03-1004

The thermal printer is optional equipment.



1. Save the measurement. To print from a Shaft program, you need to open a saved measurement before you can print a report.
2. Connect the thermal printer and select and .
3. The progress is displayed on the status bar.

	Printing report on thermal printer.
	Printing performed OK.
	Printing problem.

You can also save a measurement, download the pdf-report to your PC and print the pdf-report.

Report

A report is generated and saved in the filing system. You can not open an old measurement and save it again (program Machine train is an exception to this). You can however generate a new report from an opened file. This means you can for example change the language and make a new report from the opened measurement. You can download the report to a PC and print it.

Company logo

You can replace the logo on the report with your own .jpg file.

1. Name your logo `logo.jpg`. The default logo has the proportions of 230x51 pixels.
2. Connect the Display unit to your PC using the USB-cable.
3. Place your image in the Display unit's folder `Damalini/custom/reports/logo`.

File extensions (for example .jpg) are often hidden in the Explorer window. To display file extensions do the following: Open an Explorer window and press Alt to show menu. Select Tools > Folder options. Click the View tab > Advanced settings > Clear the Hide extensions for known file types check box.

Date format

By default, the date and time format is set to Central European Time (CET).

You can change the date and time format used in your PDF reports.

Download file to PC

1. Start the Display unit. It is important to let it start fully before connecting the cable.
2. Connect the USB cable between the Display unit and PC.
3. While you have this connection, the Display unit is blocked.
4. View and/or copy the files to the PC.

EasyLink

You can also use our database program EasyLink to view the files on your PC. EasyLink is available on the USB memory stick that is delivered with most systems. You can always download the latest version from easylaser.com>lifecycle support>software download.

Control panel

Select and to open the Control panel. Some of the settings are personal and will be default next time you start the system.

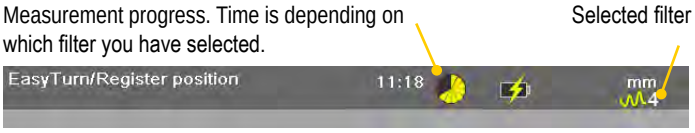
Note!
All settings are not available for all systems.

Filter

Select to open the Filter view.

The filter you select on the Filter view will be saved as a personal setting.

If the laser beam passes through air with varying temperature, this may influence the direction of the laser beam. If measurement values fluctuate, this could mean unstable readings. Try to reduce air movements between laser and detector by, for instance, moving heat sources, closing doors. If the readings remain unstable, increase the filter value (more samples will become available to the statistical filter).

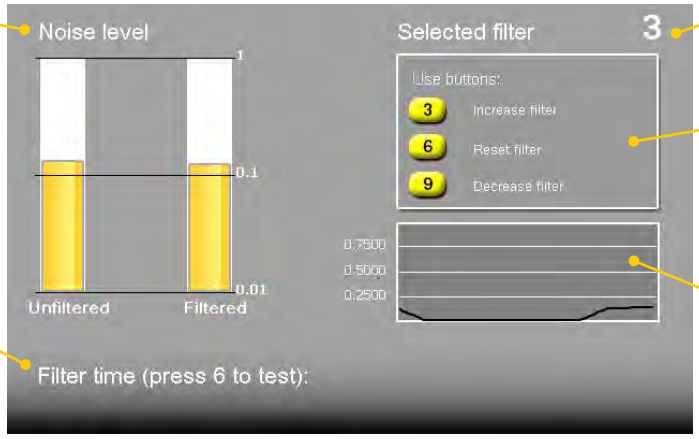


Select filter

Use as short a time as possible that still produces acceptable stability during the measurement. Default is set to **1**. Normally you will use a filter value of 1-3. If you set the filter type to 0, no filter will be used.

Use the numerical buttons 3, 6 and 9 to set the filter. In the Filter view but also when you are using a measuring program.

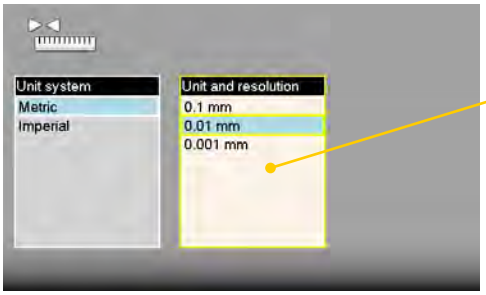
Use numerical buttons to select filter



Unit and resolution

Personal setting

Select to open the Units and resolution view. Use the navigation buttons to move between the fields. Set Metric or Imperial and which resolution you want to use. Default is set to 0.01 mm (0.4 mil). The selected unit is shown on the Status bar.



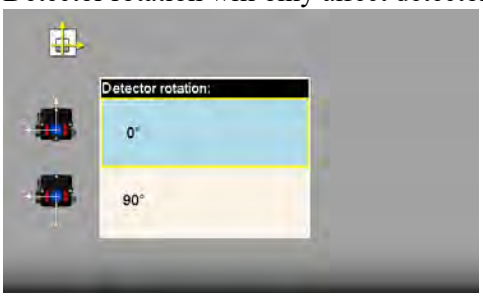
Note!

It is possible to select 0.0001mm only in the E940 system.
For E420, only 0.01mm is possible.

Detector rotation

Personal setting

The coordinate system can be rotated 90º. Select to open the Detector rotation view. When you have rotated the coordinates, a warning is displayed on the Status bar. Detector rotation will only affect detectors with two axis.

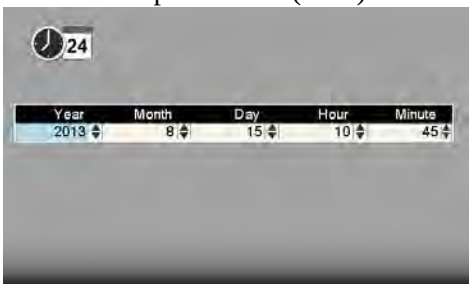


Detector rotation view

Warning displayed on Status bar

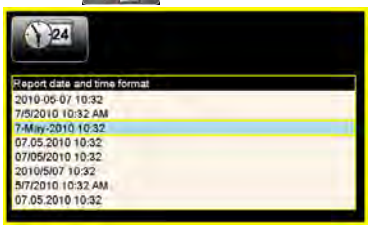
Date and time

Select to open the Date and Time view. Set the date and time. Default is set to Central European Time. (CET)



Date and time view

Select to set the date format used in your PDF reports.

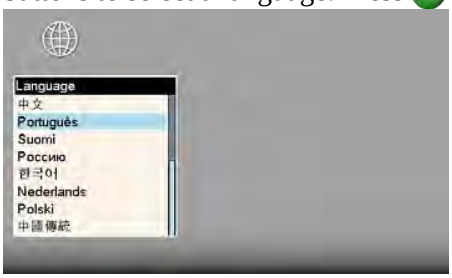


Date and time used in PDF reports

Language

Personal setting

Select to open the Language view. Default is set to English. Use the navigation buttons to select a language. Press to save changes.

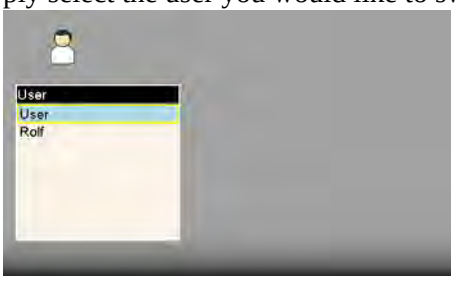


Language view

User

Select to open the Users view. A user account is used for storing your personal settings.

Use the function buttons to add or remove users. To switch user, simply select the user you would like to switch to and press .



User view

Backlight

Personal setting

Select to open the Backlight view. Use the navigation buttons to move between the fields. Press to save changes. When backlight is off, the left LED signal will flash to indicate that the Display unit is still on.

Backlight level

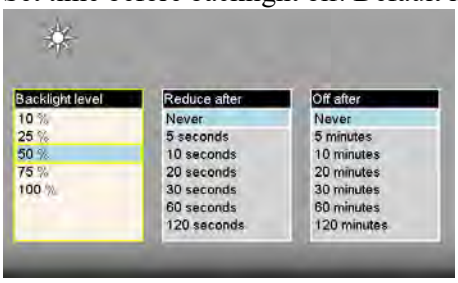
Adjust the backlight to make it easier to read in bright sunlight. Remember however that a high contrast consume more battery power. Default is set to 50%.

Reduce after

Set time before backlight reduction as a way to save energy. The Display unit will be dimmed, but is still on. Default is set to Never.

Off after

Set time before backlight off. Default is set to Never.

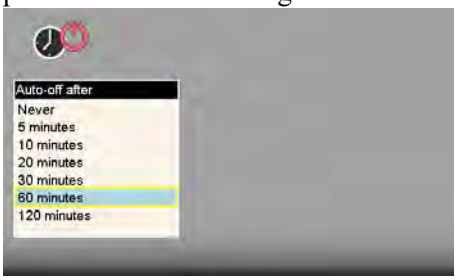


Backlight view

Automatic power off

Personal setting

Select to open the Automatic off view. Select how much time before automatic power off. Use the navigation buttons to select. Press to save changes.



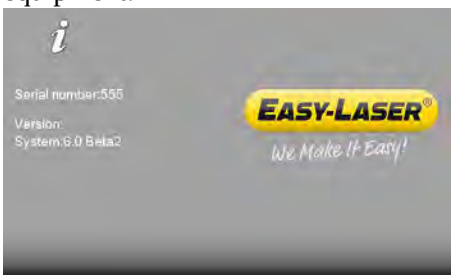
Automatic power off view

Note!

Measurements in progress will not be saved in the event of an Automatic power off.

Information

Select to display the information regarding serial number and version of the equipment.



Information view

VGA

(Not available on all systems.)

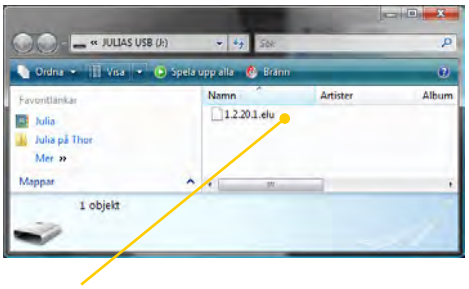
Makes it possible to show display unit screen image with a projector, for example in a training context. Must be factory installed on order.

Select to open the VGA view.

System update

Download update file

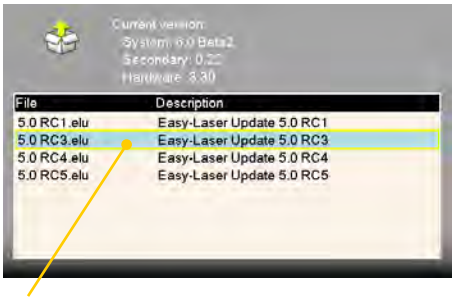
1. Go to easylaser.com>lifecycle support>software download.
2. Download the update file to your PC.
3. Unzip the file.
4. Copy the .elu file to the root of a USB memory.



Save .elu file on a USB memory.

Install update file

1. Start the Display unit. Make sure that the internal battery of the Display unit is charged. The battery symbol should be at least yellow.
2. Insert the USB memory in the Display unit. Do not remove the USB memory until the update is finished.
3. Select and to display the System update view.
4. Select the update file and press .
5. Select . The installation starts.
6. The Display unit will automatically restart when the installation is finished and the Main menu is displayed.



Select the .elu file.

Note!

During restart, the screen turns black for up to one minute. When the main menu is displayed, it can "freeze" (no response when you press buttons). If this happens, press the On/Off button for at least 15 seconds to restart the Display unit.

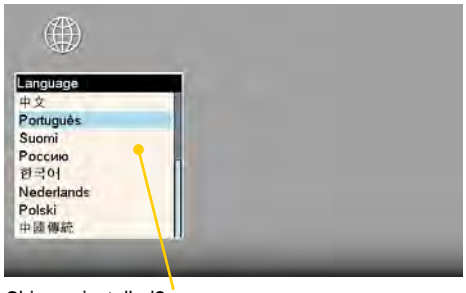
Main menu is automatically displayed after restart.

Font package

Some of the early E-series systems was not installed with Unicode fonts. To install the latest system updates, you need to install the font package with Unicode fonts.

Check if you need to install:

1. Select and to display the Language view.
2. Check if you have Chinese installed. **If Chinese is installed, you already have the correct Font package**. If not, please go to easylaser.com>lifecycle support>software download and follow the instructions above to install.



Chinese installed?
No need to update with Font package.

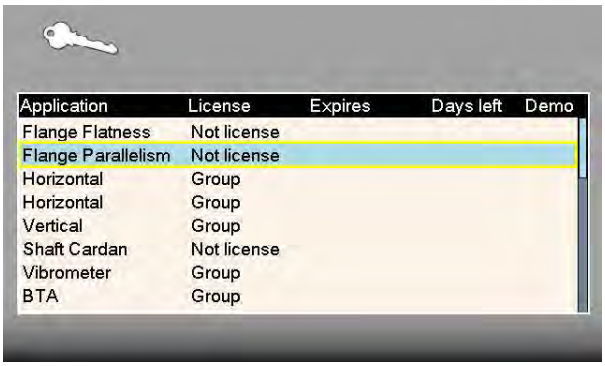
License

It is easy to upgrade your Display unit.

1. Contact your Easy-Laser® distributor if you wish to upgrade your Display unit.
2. An e-mail will be sent to you with information on how to download the update file.
3. Save the file to the root of the file system to a USB memory stick or directly to the Display unit.

Save file on USB

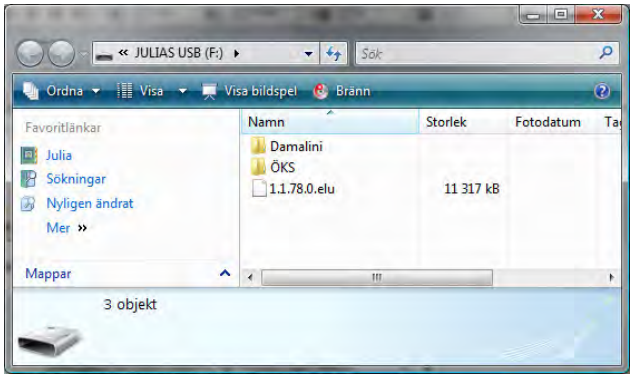
1. Save the downloaded license file to a USB memory stick.
2. Insert the USB memory stick in the Display unit.
3. Select and to display the License view.



4. Select to search for licenses.
5. Press to import license.

Save file to Display unit

1. Connect the Display unit to a PC.
2. Save the license file to the root of the Display unit's storage.



3. Select and to display the License view.
4. Select to search for the new license file. A window is displayed.
5. Disregard the text and select . The license file is installed and full functionality is achieved.

Set up wireless connection

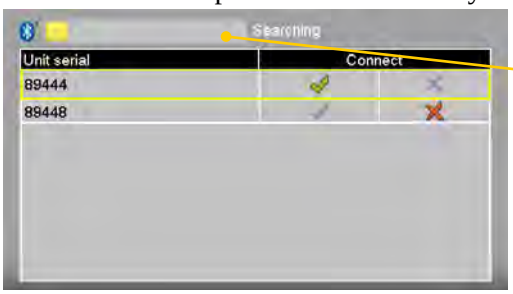
Wireless technology makes it possible for Display unit and Detector to exchange data without using cables.

Some detectors have built-in wireless funtionality, others have a separate unit that you attach to the detector. *Please see Technical data for more information*.

Set up

This is only necessary when adding new units to the list.

1. Select to open the wireless view.
2. Select to search for units.
3. The view is updated with the units you can connect to.



Searching for wireless units

4. Select the unit you want to connect to and select . The unit will automatically be connected when you start a measurement program.
5. Press to save changes and to leave the view.
6. Enter a measurement program. The Display unit will connect to the selected units. While connecting, the left LED indicator is flashing with a blue light which will turn to a fixed blue light once connected.
7. An icon on the status bar will indicate how many wireless units that are connected.

One unit connected

Function buttons

	Back to Control panel. Changes made in the table are saved.
	Search for wireless units.
	Cancel search. Use if your unit is already found.
	Remove a unit from the list.
	Connect the unit. The unit will automatically connect when you start a measurement program.
	Disconnect the unit. The unit will remain in the list.

Note!

Do not use a wireless unit and a cable at the same time.

Use only one wireless unit

Many of our systems are delivered with two Measuring units. In some cases you might want to use only one unit together with a laser transmitter. By default both units are set to “Connect ”. If the unused unit is set to “Connect ”, the system will keep on trying to connect to it, even if it is not plugged in.

1. Attach the wireless unit to the detector.
2. Select to open the wireless view.
3. Set the unit you want to use to .
4. Make sure that the other units are set to .
5. Enter a measuring program.

The Display unit will connect to the selected unit. This may take a couple of minutes.

Note!

Remove the wireless unit from the Measuring unit before putting the equipment in the carrying case. If attached, it will discharge the Measuring unit.

Wireless information

This device contains

FCC ID: PVH0946

IC: 5325A-0946

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions;

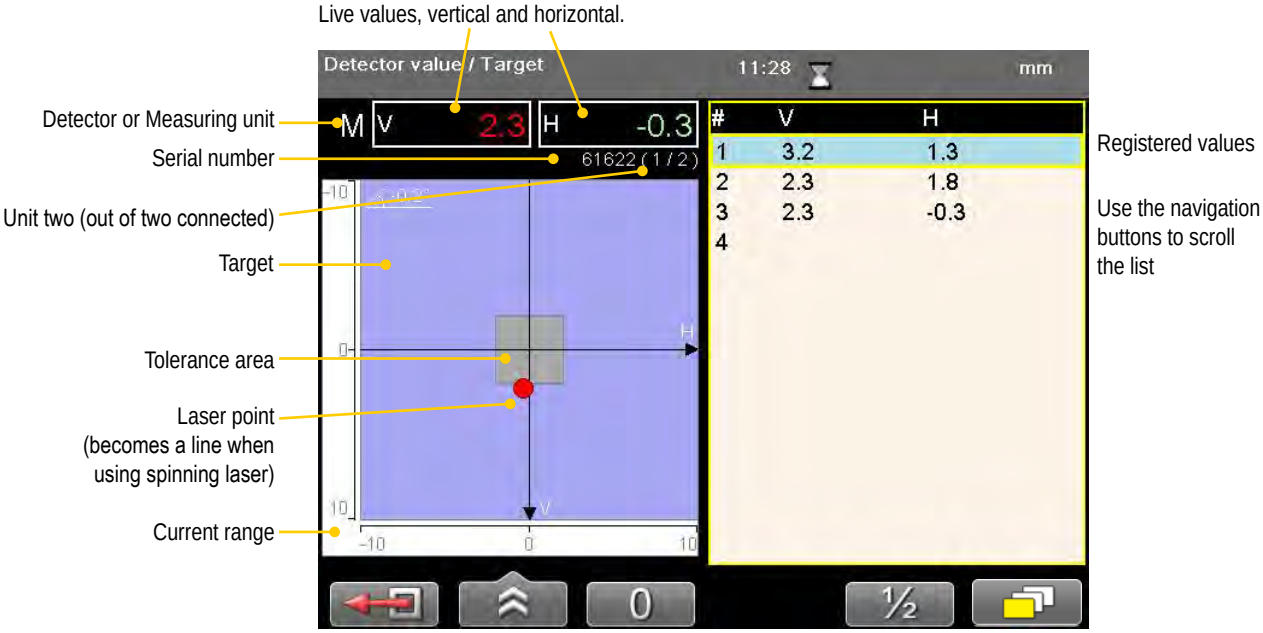
(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

PROGRAM VALUES

With the program Values, you can see live readings from the detectors. As default, a target and a table is displayed.

Press **OK** to register values.



Function buttons

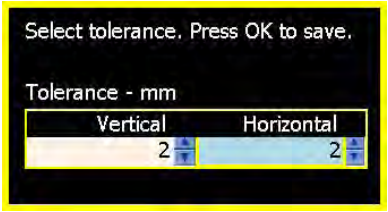
	Back, leave program.
	See "Control panel" on page 15. *See "Tolerance" on page 24.* *See "Zoom" on page 24.* Save file. *See "Measurement file handling" on page 11.* *See "Automatic recording" on page 26.* Delete registered values. Print report on thermal printer (optional equipment). *See "Streaming values" on page 27.*
0	Set current value to zero.
½	Halve displayed value.
1/1	Return to absolute value. Only available after zeroing or halving.
	Choose how to display values. Use left and right navigation button to switch between two or more detectors when only one target is displayed.

Note!

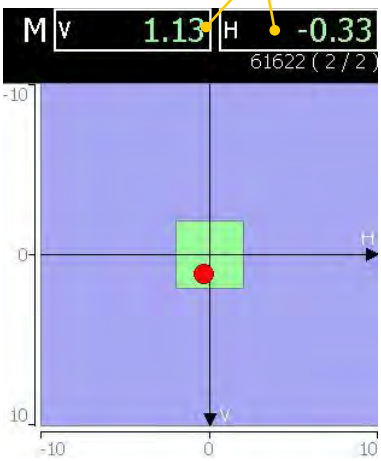
The M-unit can be used as a detector together with a laser transmitter. Do not use the S-unit for this.

Tolerance

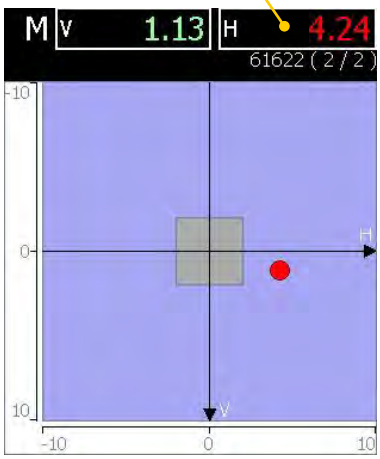
1. Select and to set tolerance.
   It is possible to set different tolerance in vertical and horizontal direction.
2. Use navigation buttons to move between the fields and to change the tolerance.
3. Press **OK**.



Live values and marking displayed in green when within tolerance.

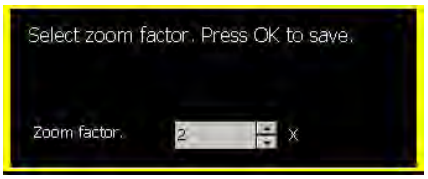


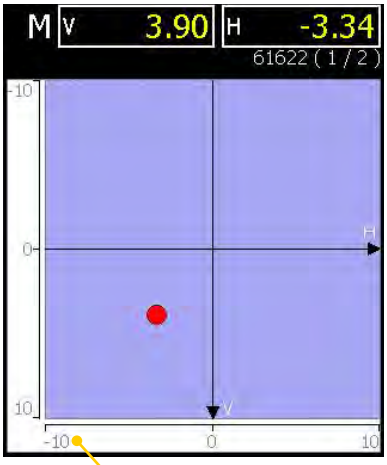
Live values displayed in red when outside tolerance.



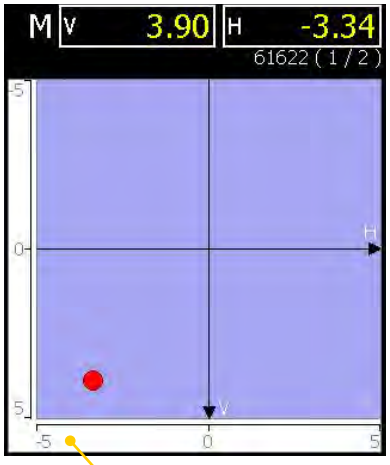
Zoom

1. Select and to zoom.
2. Select a zoom factor between 1–5. Use navigation buttons to increase or decrease zoom factor.
3. Press **OK**.





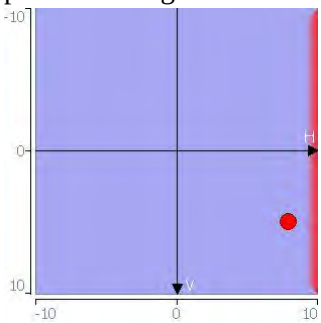
Default view



Zoom factor is set to 2

Edge warning

When the laser beam is close to the edge, the edge is “lit up” as a warning. It is not possible to register values when you see the edge warning.



Halve or Zero set value

Halve value

Select ½ to half displayed value.

Zero point of the PSD moves halfway towards the laser point.

Zero set value

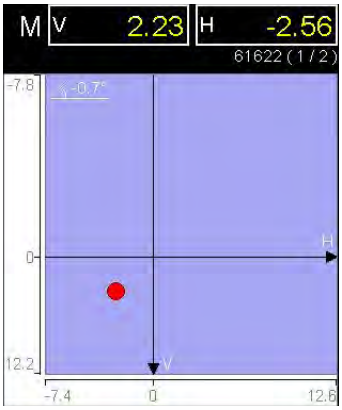
Select 0 to zero set displayed value.

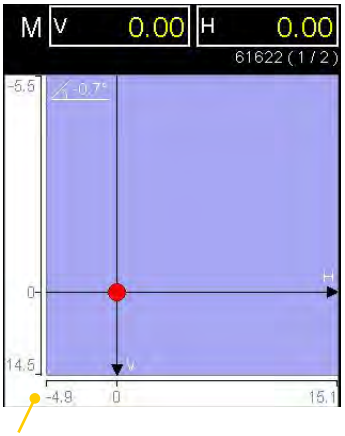
Zero point of the PSD moves to the laser point.

Absolute value

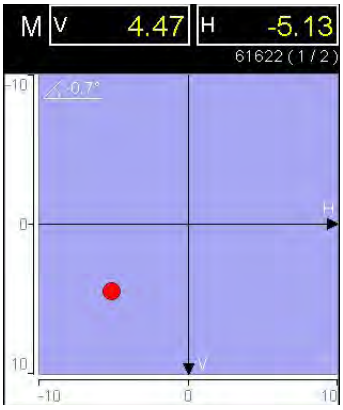
Select 1/1 to return to the absolute value.

Zero point of the PSD returns to the PSD centre.





Note the change of the current range



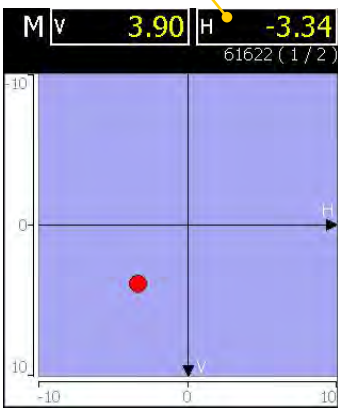
Live values – colours

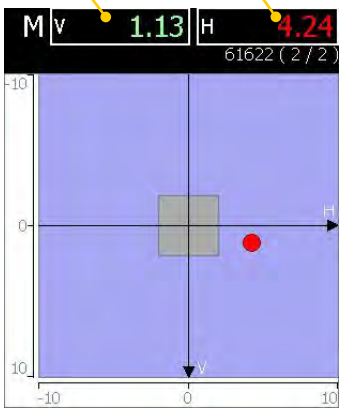
Live values are normally yellow

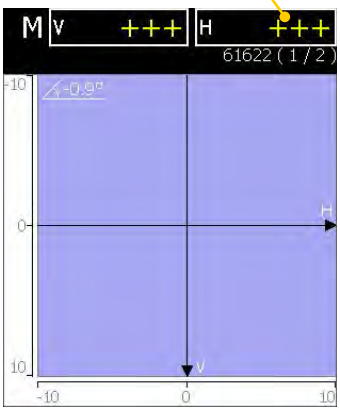
Green when within tolerance

Red when outside tolerance

Loss of signal, laser beam interrupted for example



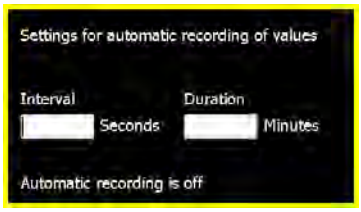




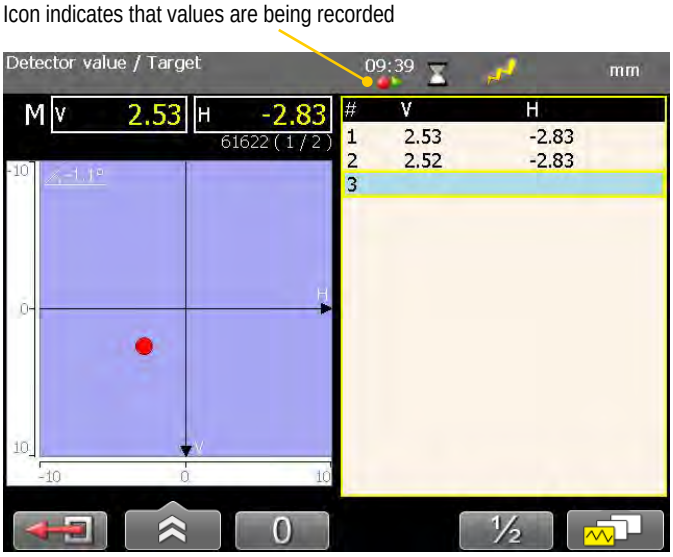
Automatic recording

In Values, it is possible to make automatic recording of values. This is very useful when you want to register values during a longer time period for example.

1. Select and to start automatic recording.
2. Set Interval.
3. Press navigation button “right”.
4. Set Duration.
5. Press **OK**. The recording will start and you can follow the progress on screen.



Icon indicates that values are being recorded



Views

You can decide how to display the current values. As default a target and a table is displayed, but you can choose to show only target for example.

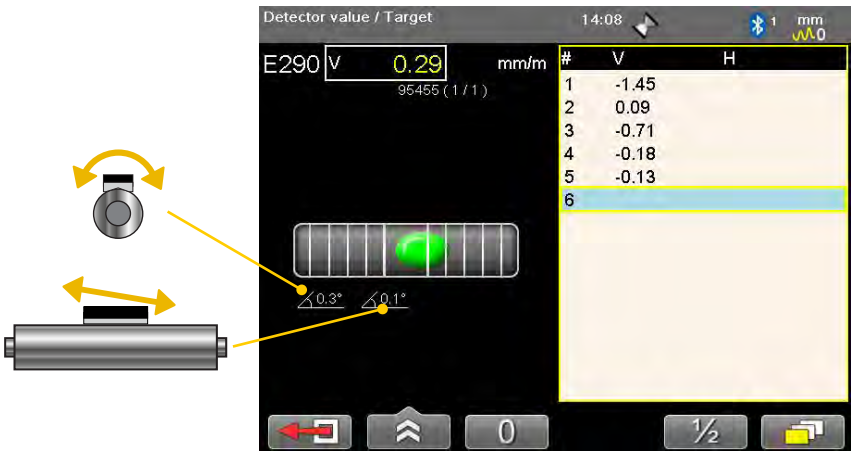
Select to display the different layout options, see image below.

Note!

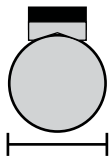
Use left and right navigation button to switch between two or more detectors when only one target is displayed.

Precision level E290 (Optional equipment)

Connect the Precision level, see *“Set up wireless connection” on page 21*.



When measuring a shaft using the Precision level, we recommend that the shaft is no larger than 100 mm in diameter.

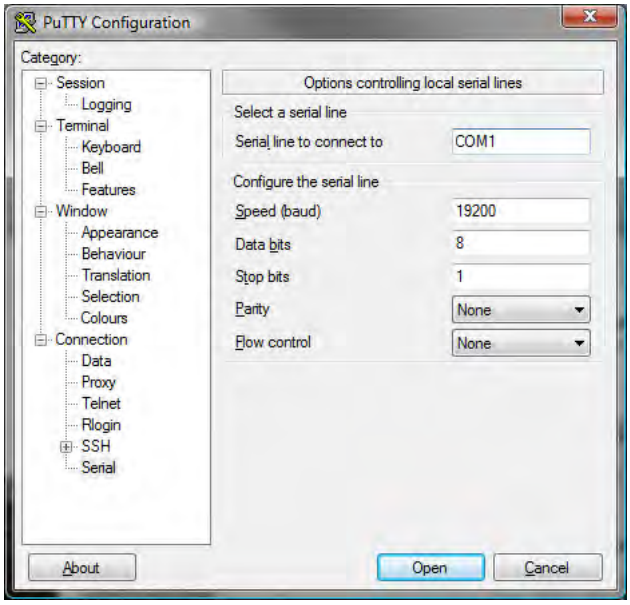


Max Ø100 mm

Streaming values

With the Streaming value functionality, you can transfer data from the Display unit. For this to work, you need a USB to USB Null Modem Cable, the USB cable delivered with the system does not work for streaming values.

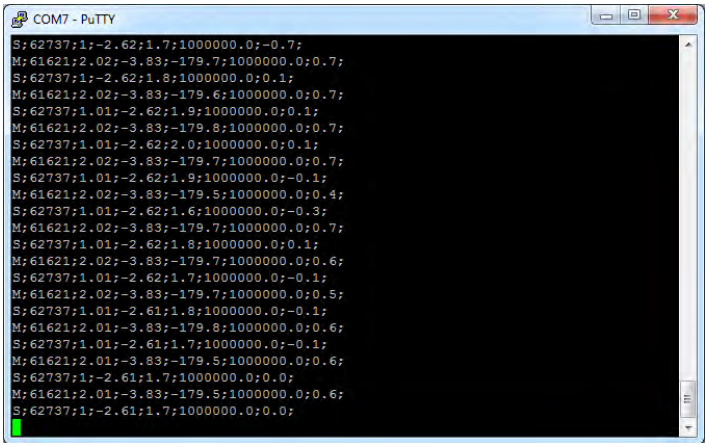
1. Connect the Display unit to the PC using a USB to USB Null Modem Cable.



The USB-to-USB null modem cable shows up as a Virtual Serial Port with the following properties:
19200 bps, 8n1 without flow control.

The port number can, for example, be found using the Device Manager. See ‘USB Serial Port’ under ‘Ports (COM and LPT)’.

2. Click Open.
3. Start the program Values in the Display unit.
4. Select and to start streaming values.
5. To stop, select .



In this example, PuTTY is used to show the streamed data

Data format

The data is sent as lines with semi colon separated values. Each line begin with a detector identification, S, M, Vib or BTA, followed by the detector serial number. The unit and resolution depends on the settings in the user profile.

Data from Vib: Vib;serial;LP;HP;G;

Data from BTA: BTA;serial;PSD1X;PDF2X;PDF3X;X axis angle;Y axis angle;Z axis angle;

Data from S: S;serial;PSD X; PSD Y; X axis angle;Y axis angle;Z axis angle;

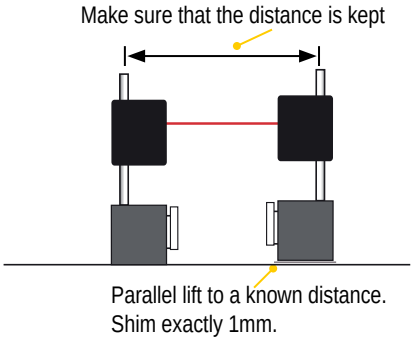
Data from M: M;serial;PSD X; PSD Y; X axis angle;Y axis angle;Z axis angle;

Calibration check

Use the program Values to check if the detector readings are within specified tolerances.

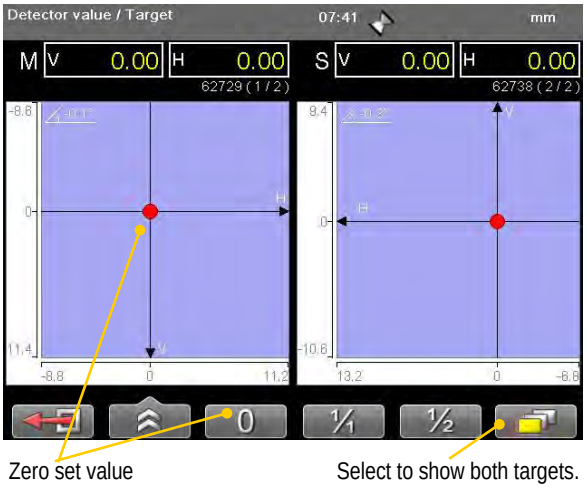
Quick check

1. Set the tolerance to 0.01 mm (0.5mil).
2. Select and show targets for both M- and S-unit.
3. Select 0 to zero set value.
4. Place a shim under the magnet base to lift the M-unit 1mm (100mils). The M-unit's reading shall correspond to the movement within 1% (1mil ± 1digit) (0.01mm ± 1 digit).
5. Remove the shim from the M-unit.
6. Select 0 to zero set value.
7. Make a mark to mark out the position of the detector.
8. Place the shim under the magnet base of the S-unit. The S-unit's reading shall correspond to the movement within 1% (1mil ± 1digit) (0.01mm ± 1 digit).

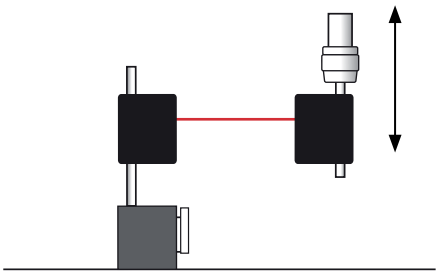


Note!

The shim must be exactly 1 mm. In this example it is only the M-unit that is checked.



Precision check



1. Fasten one unit in a machine tool.
2. Select 0 to zero set value.
3. Move the units a known distance is to use the movement of a machine tool spindle.
4. The fastened unit's reading shall correspond to the movement within 1% (1mil ± 1digit) (0.01mm ± 1 digit).

Note!

In this example it is only the unit fastened in the machine that is checked.

STRAIGHTNESS

The program Straightness is used for machine foundations, shafts, bearing journals and machine tools for example.

The basic principle for straightness measurement is that all measurement values will show the position of the detector unit relative to the laser beam. First, the laser beam is roughly aligned along the measurement object. The detector is then positioned on the selected measuring points and the values registered.

Work flow

Select  and  to start the Straightness program.

Preparations

Mount units

Rough align

 Show target

 Show reference target

Measure

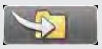
Press to register values.

Measurement table view

Measurement position view

Result

 Set tolerance

 Save

 Print report

 Set offset for reference point

 Set reference point

 Best fit around zero

 Best fit all positive

 Best fit all negative

 Waviness

Note!

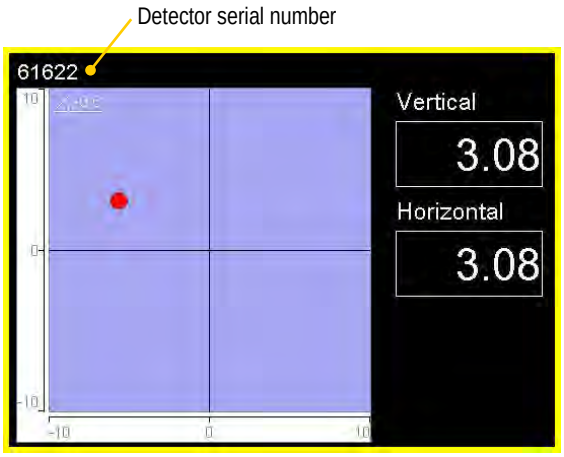
The M-unit can be used as a detector together with a laser transmitter.
Do not use the S-unit for this.

Show target

Select and to display a target. This is a quick way to see where the laser beam hits the target and how the detector is positioned. Select to close the target, or press .

Calculated and raw values

The values displayed here are **raw** values. When you measure, **calculated** values are used. Calculated values are based on the distance from first measurement point and selected reference points.

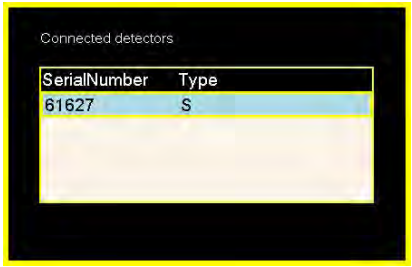


Function buttons

0	Zero set displayed value. Only zeroes the value while the target is opened.
1/1	Return to the absolute value.
1/2	Halve displayed value. Only zeroes the value while the target is opened.
	Close target. (Or press).

Show reference target

Select and #2 to display the reference target. The first time you select the command, a window is displayed. Select which detector you want to use as reference detector and press .



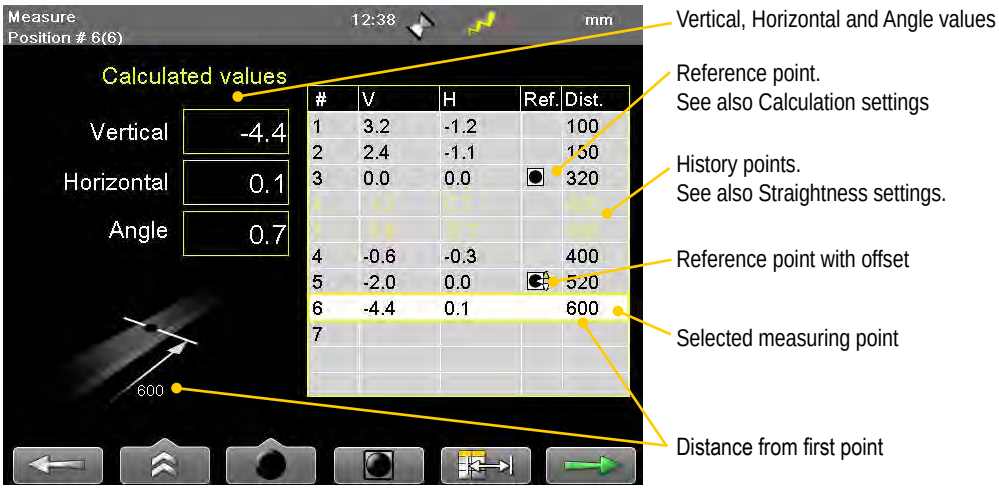
Function buttons

0	Zero set displayed value.
1/1	Return to the absolute value.
	Close target. You can also close by pressing .

See “Halve or Zero set value” on page 25.

Measure

1. Press . A window is displayed where you can enter the distance for the measurement point. If you leave the field empty, you can measure using “quickmode”.
2. Press to register a value. An hourglass is displayed while the value is registered.
3. Select to continue to Result view.

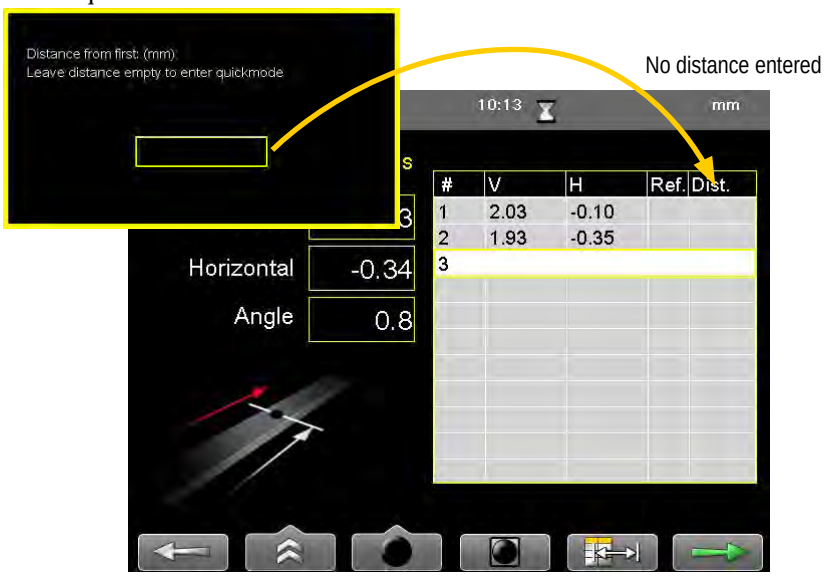


Function buttons

	Leave program.
	See “Control panel” on page 15. *See“Straightness settings” on page 42* **Show target**. **Show reference target**.
	Edit distance. Edit distance for selected point. **Add measuring point**. **Delete measuring point**. **Go to measuring point**. A window is displayed. Enter the point to which you want to go. **Set offset**. Set offset for selected reference point. Zero set displayed value. Only available before registering the first point. (Or press numerical button zero.) Return to the absolute value. Only available before registering the first point. (Or press numerical button 1.)
	Set reference point. *See “Result” on page 34.*
	Open Distance view, *see “Enter distances” on page 32.*
	Continue to Result view. Available when you have registered two points.

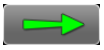
Quickmode

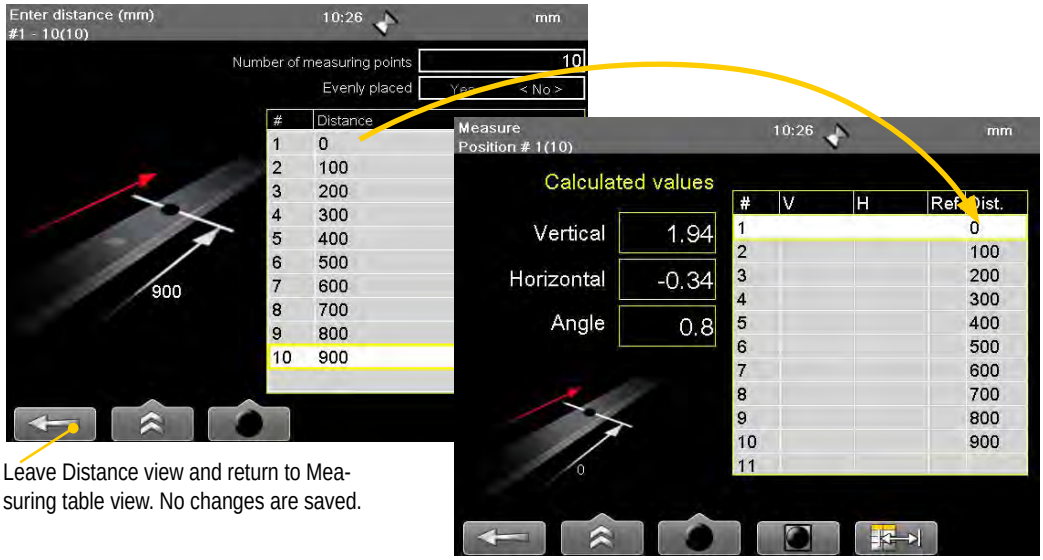
Quickmode means that you measure without entering any distances. Leave field empty to use quickmode.



Enter distances

Select  to open the Distance view. This is an easy way to fill in many distances. Do this before you have registered a value.

1. Enter number of measuring points. Press  .
   - Select if the points are evenly placed or not. Use navigation buttons left and right. If set to <YES>, you are prompted to fill in the distance between point 1 and 2.
   - If set to <No>, fill in each distance in the table.
2. Select  to save changes and return to Measuring table view.

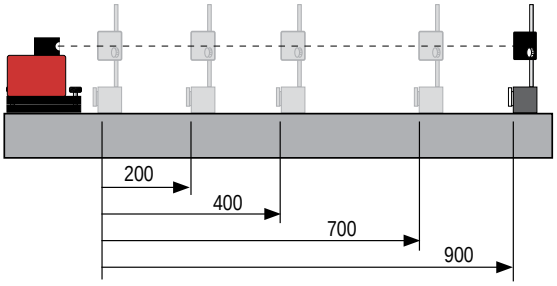


Note!

If you have registered values and open Enter distance view and make changes, your registered values will be deleted.

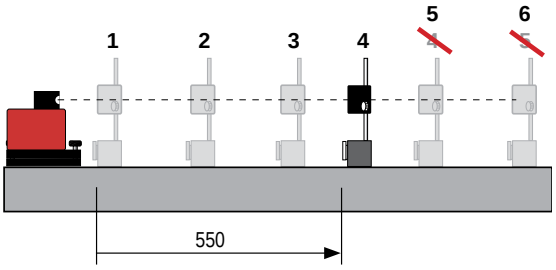
Add and delete points

Distances are always measured from the same point.



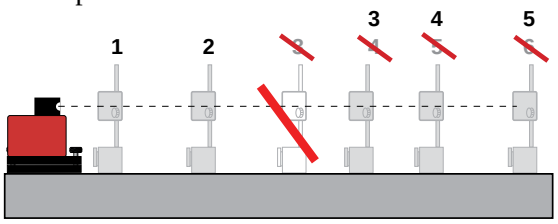
Add measuring point

Adding points between renumbers the existing following points. In this example, we add a new point after point number three.



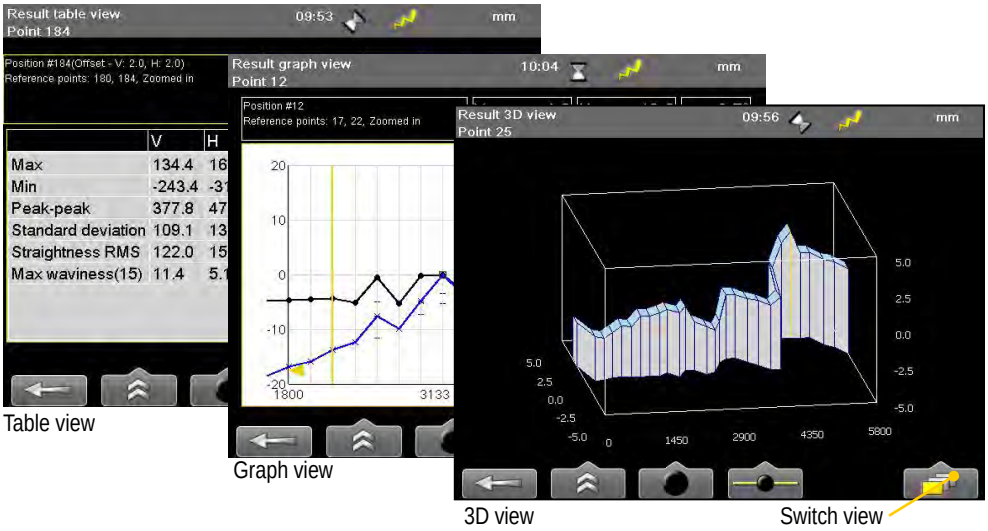
Delete measuring point

Deleting points between renumbers the existing following points. In this example, we delete point number three.



Result

The result can be displayed as graph, table or a 3D view. By default the table view is displayed. The function buttons are almost the same for all three views. Zoom is only available in Graph view. See following pages for more information regarding each view and its functions.

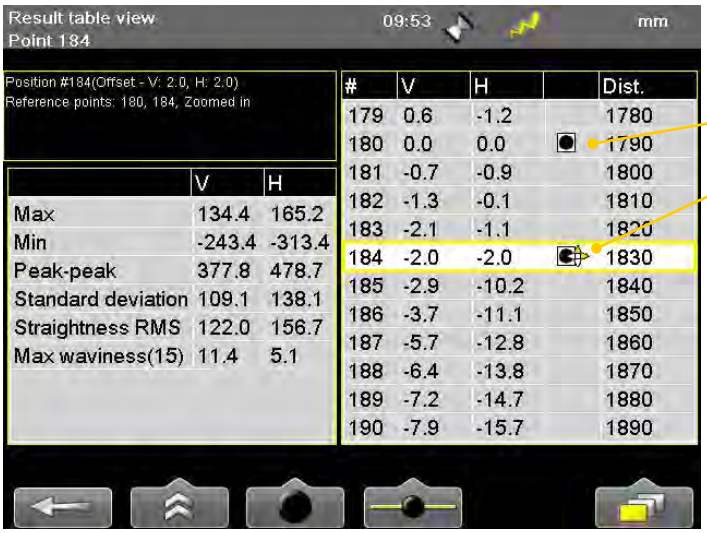


Function buttons

	Back to measure. To remeasure, select a point and then .
	Contains a sub-menu: *See "Control panel" on page 15.* *See "Straightness settings" on page 42.* **Save file**. *See "Measurement file handling" on page 11.* **Print report**. Save file and plug in printer (optional equipment). **Save report** (only when you have opened a saved measurement). **Set tolerance**. It is possible to set different vertical and horizontal tolerance. *See "Tolerance" on page 37.* **Zoom**. Only available in Graph view.
	Contains a sub-menu: **Go to measuring point**. A window is displayed. Enter the point to which you want to go. **Set offset for reference point**. *See "Calculation settings" on page 38.*
	Contains a sub-menu. *See "Calculation settings" on page 38.* **Raw data**. Return to original data. **Set as reference point**. **Remove as reference point**. The point itself is **not** removed. **Best fit around 0**. **All positive**. The best fit with all measurement points **above** zero. **All negative**. The best fit with all measurement points **below** zero. **Show waviness**.
	Views. Switch between table, graph and 3D view.

Result table view

Navigate using the navigation buttons. To remeasure, select a point in the list and select  .

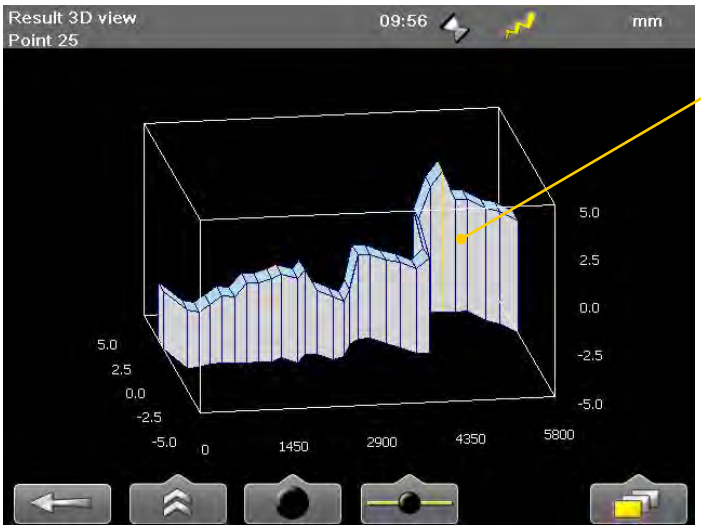


Max	The highest value.
Min	The lowest value.
Peak-peak	Difference between Max and Min value
Standard deviation	Average difference between Max and Min value.
Straightness RMS	Root Mean Square (Numerical Flatness)
Max waviness	Set waviness is shown in bracket. *See "Waviness" on page 41.*

Result 3D view

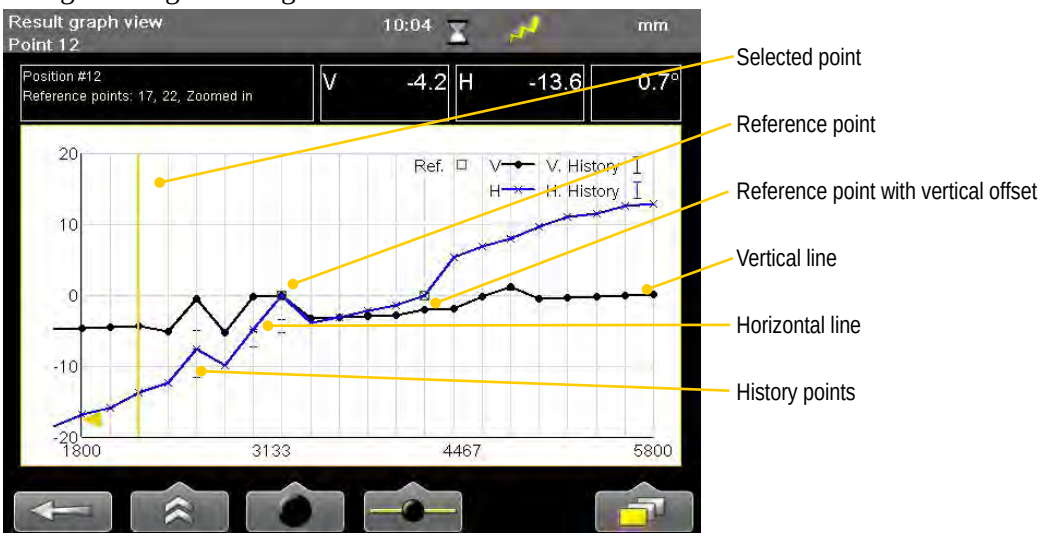
Navigate using the numeric buttons.

- Buttons 2, 4, 6 and 8 rotates the 3D view.
- Button 5 returns to the initial view.



Result graph view

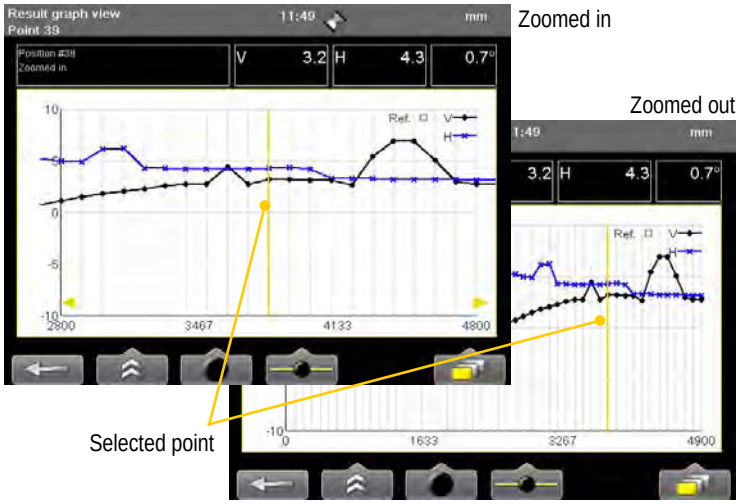
Navigate using the navigation buttons.



Zoom

It is possible to zoom in the graph view if you have registered more than 20 points.

Select a measurement point and select  and  . The graph is zoomed in around the selected point.



Scale using navigation buttons

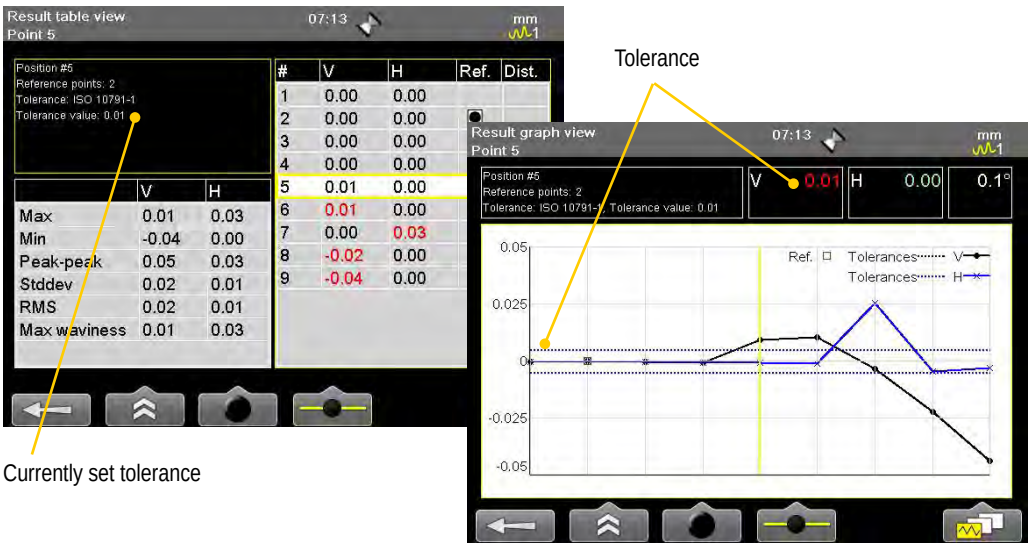
Press navigation button “Up” and “Down” to scale the result graph view.

Tolerance

1. Select  and  .
2. Select a predefined tolerance or create a custom tolerance. Press  .

Tolerance in graph and table view

- In the Table view, the values within tolerance are shown in black, values not within tolerance are red.
- In the Graph view, vertical and horizontal tolerances are colour coded.



Predefined tolerance

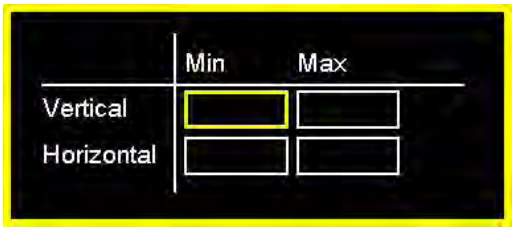
There are two ISO standard tolerances. The ISO tolerance is calculated automatically depending on which distances you have entered and interpreted in the same way as our custom tolerance.

Tolerance	Vertical Min	Max	Horizontal Min	Max
None				
Custom tolera				
ISO 10791-1	-0.005	0.005	-0.005	0.005
ISO 10791-2	-0.005	0.005	-0.005	0.005

Predefined tolerances

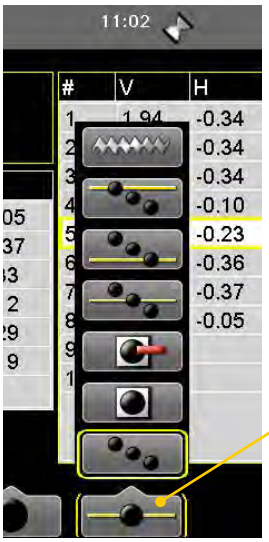
Custom tolerance

- Set vertical and horizontal tolerance. Press  to confirm.
- Select  to edit a custom tolerance



Enter custom tolerance

Calculation settings



Select to display sub-menu with different calculation settings.

Select to revert to original data. All calculations and reference points are removed.

Reference points

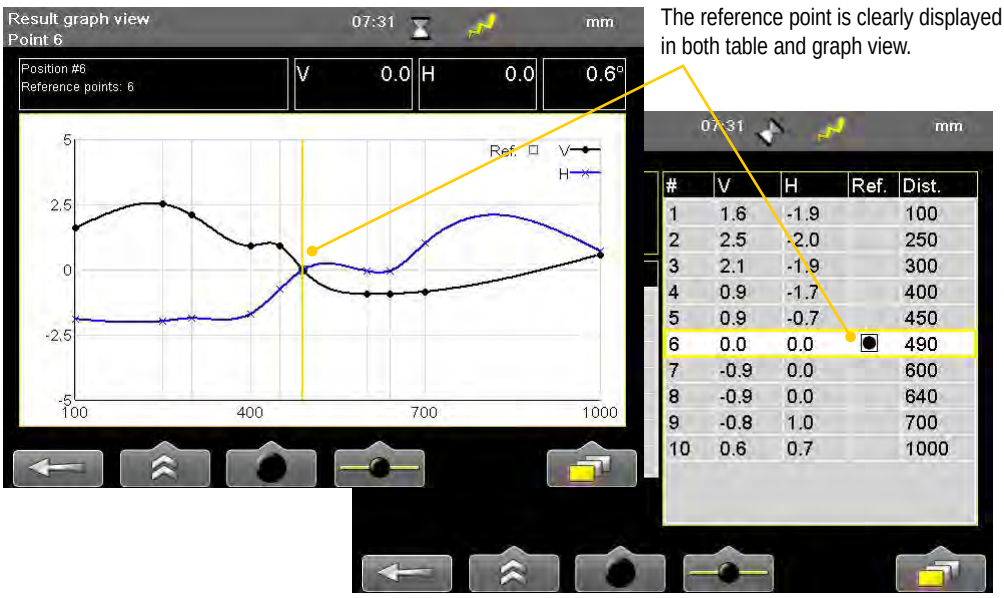
Select and to set selected point as reference point. You can set one or two reference points. To remove a reference point, select it in the table or graph and then select . The point itself is **not** removed. The reference points are clearly displayed in both table and graph.

Note!

You can also set and remove reference points by pressing the green button.

One reference point

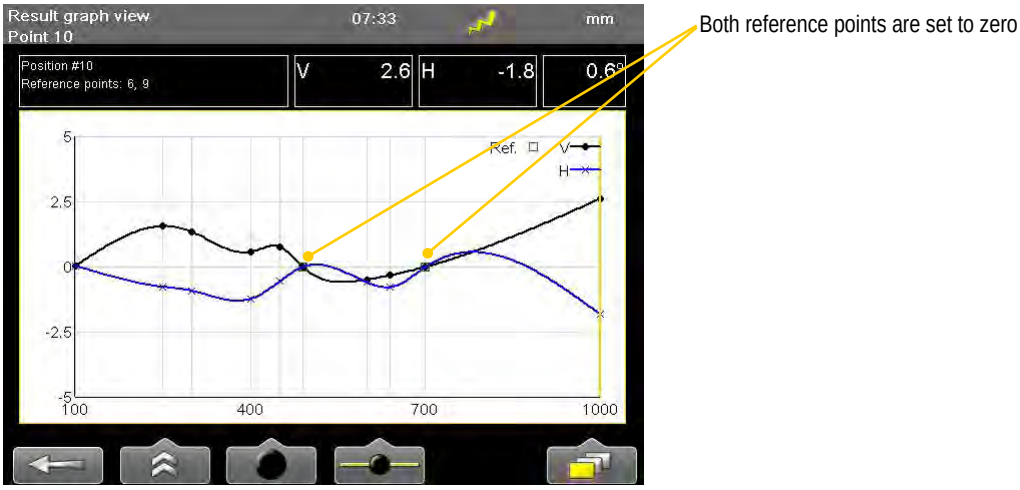
Setting a single reference point will offset all other measurement points based on the set reference point.



The reference point is clearly displayed in both table and graph view.

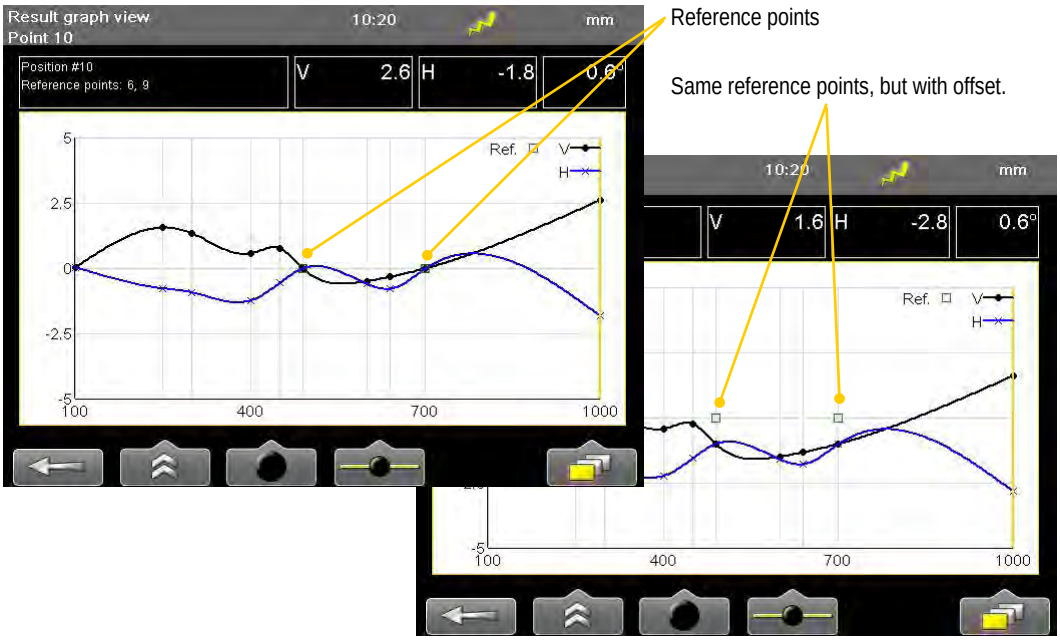
Two reference points

Setting two reference points will offset all other measurement points based on a reference line drawn between the two set reference points.



Reference point with offset

By using reference point offset it is possible to move the position of a reference point. This can be used for instance in turbine measurements to compensate for thermal expansion.



Best fit operations

All best three best fit operations will try to find a reference line where the peak to peak value of the measurement points is minimized. This can be used for instance to see if a surface is within given tolerances. The difference between the best fit operations is the offset that is set.

Best fit – around 0

This operation removes all reference points. Centre the values so that the maximum and minimum values are equally large.

Best fit – all positive

Removes all reference points.

The best fit with all measurement points above zero.

Best fit – all negative

Removes all reference points.

The best fit with all measurement points below zero.

Waviness

It may be insufficient to interpret the quality of a measurement by looking only at the measurement peak to peak value. Waviness is often used to detect large deviations. In some applications there might not be a problem with many small deviations, but one large will cause great problems. Bearings in diesel engines is one example.

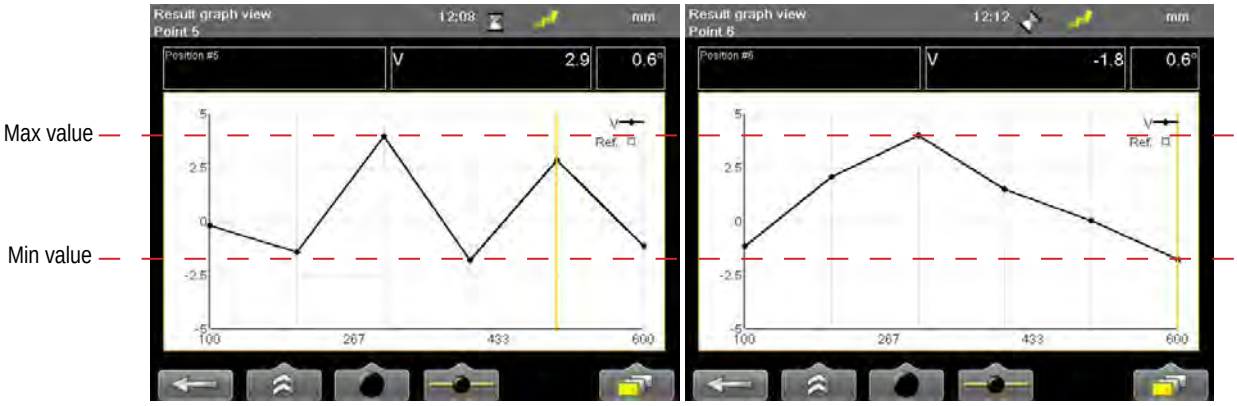
To set waviness, select  and  .

To show waviness graph, select  and  .

Example

The two surfaces in the example below have the same peak to peak value. However the first measurement is rougher than the second.

In many applications a smooth measurement is desired. Using waviness it is possible to indicate the smoothness of a measurement. In this example, the rougher measurement will get a waviness graph with higher values.



Two surfaces with same peak-to-peak value

Waviness calculation

The waviness number is calculated by letting a sliding set of reference points traverse the measurement values. The maximum absolute value between the reference points will determine the waviness number at the given position.

Waviness factor 1 checks the deviations between three measurement points. For example between points 1-3, 2-4 and 3-5 etc.

Waviness factor 2 checks the deviations between four measurement points.

Straightness settings

Select and to open Straightness settings.
For global settings, see “Control panel” on page 15.

Show/hide horizontal values

It is possible to hide the horizontal values. The horizontal values will still be registered, but not visible.

1. Select . A window is opened.
2. Select Yes or No. Navigate using the navigation buttons.
3. Press to confirm choice.

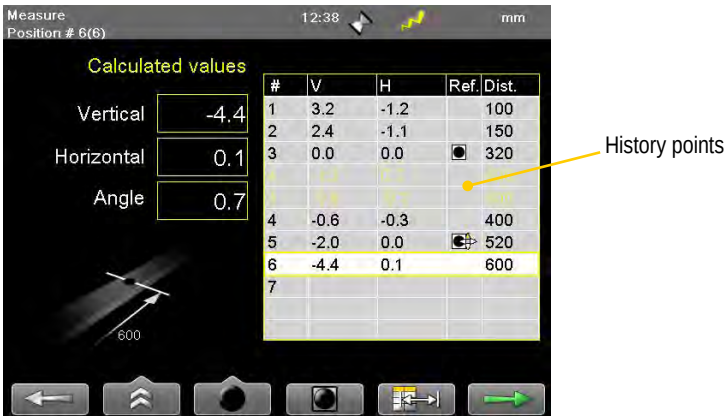
Note!

Only available when you use the program Straightness with a two axis detector.

Show history

If you remeasure a point, the old values are saved as history points. You can select to show or hide these points while measuring. It is only possible to select the latest registered value, not the history points. If you delete a point with history points, all its history is deleted as well. Default is set to hide. Even when set to “hide”, the history points are saved and can be viewed later.

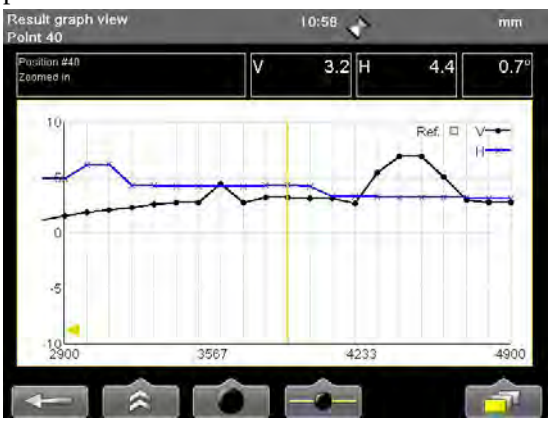
1. Select . A window is opened.
2. Select Yes or No. Navigate using the navigation buttons.
3. Press to confirm choice.



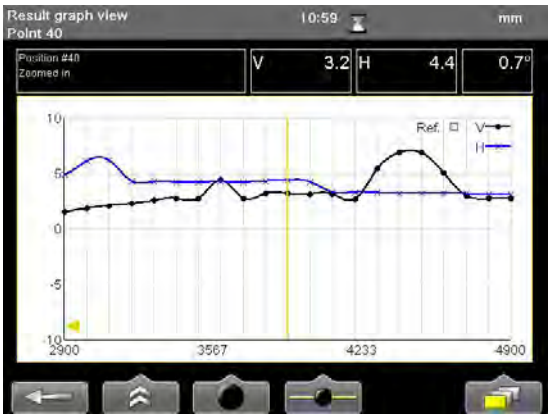
Smooth/sharp graph

1. Select . A window is opened.
2. Select Yes or No. Navigate using the navigation buttons.
3. Press to confirm choice.

When set to Smooth, the graph will find a smooth path between the measurement points.



Sharp

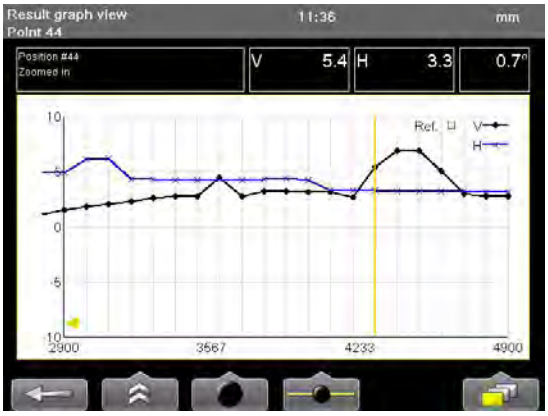


Smooth

Waviness settings

1. Select . A window is opened.
2. Select waviness factor. Navigate using the navigation buttons.
3. Press to confirm choice.

To show waviness in the result view, select and .



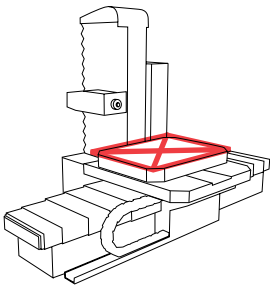
Graph view

Same measurement but with waviness

See "Waviness" on page 41.

FLATNESS

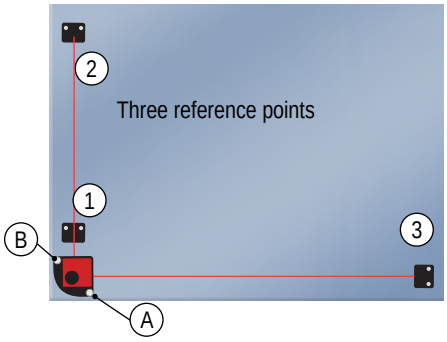
Program to measure flatness of machine bases, machine tables, etc.



Preparation

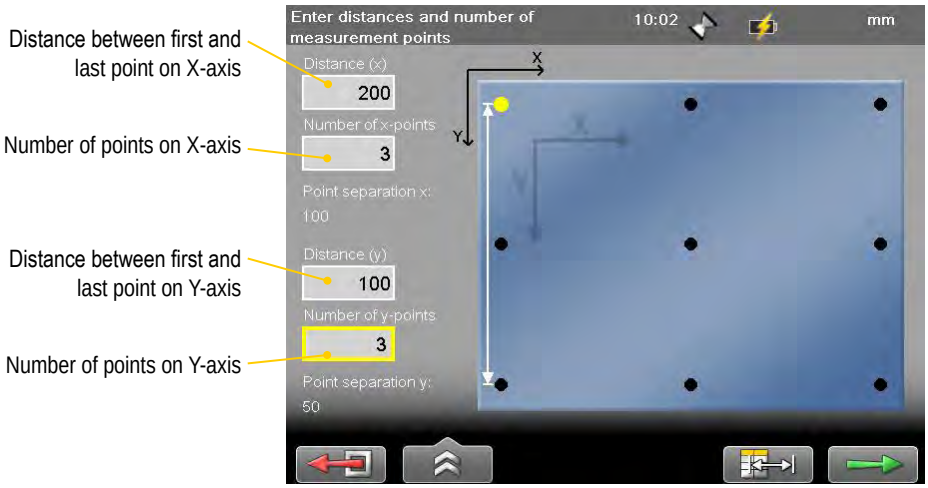
1. Mount the laser transmitter on the table.
2. Mount the detector close to the transmitter on the table (**1**).
3. Select  to open the program Flatness and enter distances.
4. Select  to open the target.
5. Select  to zero set the value. This is now reference point number one.
6. Move the detector to reference point number two (**2**).
7. Adjust the laser beam by using the screw (**A**) on the tilt table. Level to ± 0.1 mm.
8. Move the detector to reference point number three (**3**).
9. Adjust the laser beam by using the screw (**B**) on the tilt table. Level to ± 0.1 mm.

Repeat procedure until you have all three reference points within ± 0.1 mm.



Enter distances

Up to 500 measurement points can be handled.



Function buttons

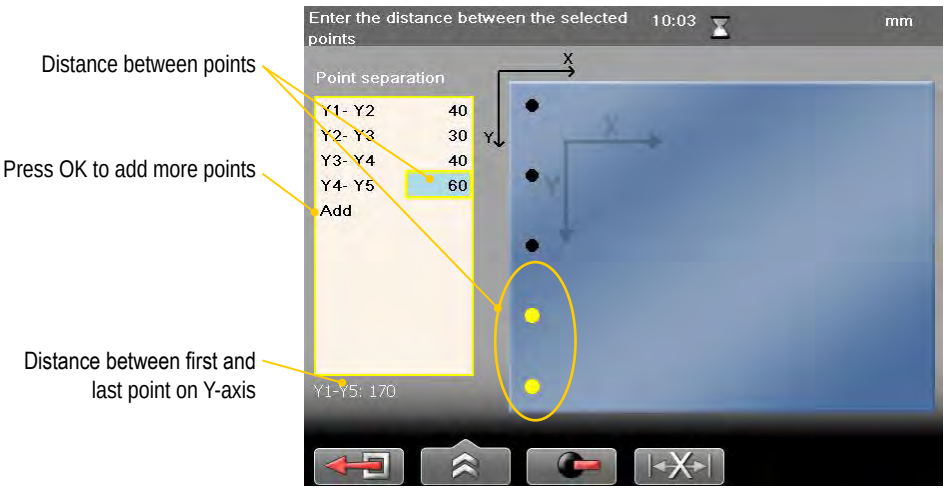
	**Back**. Leave program.
	 *See "Control panel" on page 15.*  *See "Tolerance" on page 47.*  **Show target**.
	Open distance table view. *"Distance table view" on page 46.*
	Continue to Measure view.

Note!

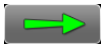
If one of your axis has more than six measurement points, make that the Y-axis. This will give you a better pdf-report.

Distance table view

Select  to open Distance table view. Use if the distances between points vary in X or Y axis.

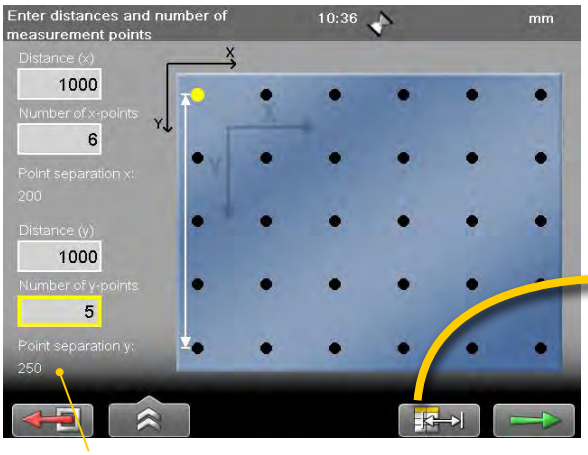


Function buttons

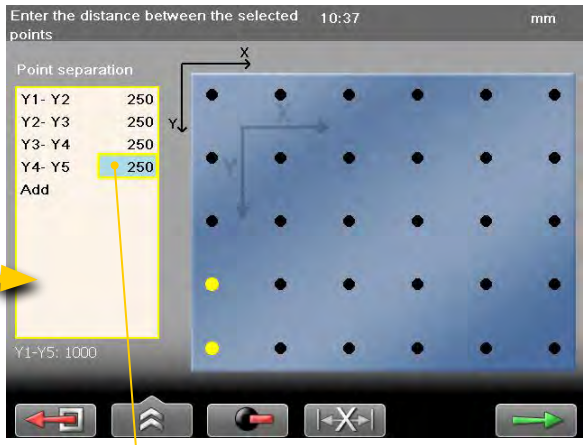
	Leave Distance table view and return to Distance view. No changes are saved.
	 *See "Control panel" on page 15.*  *See "Tolerance" on page 47.*
	Delete point. It is only possible to delete the last point in the list.
 	Toggle button. Enter distances for X or Y-axis.
	Continue to Measure view.

Note!

It is also possible to enter distances in the default distance view and switch to Distance table view. This is a fast way if you only need to change one out of many distances



Distance view (default)
Point separation is the same for all points



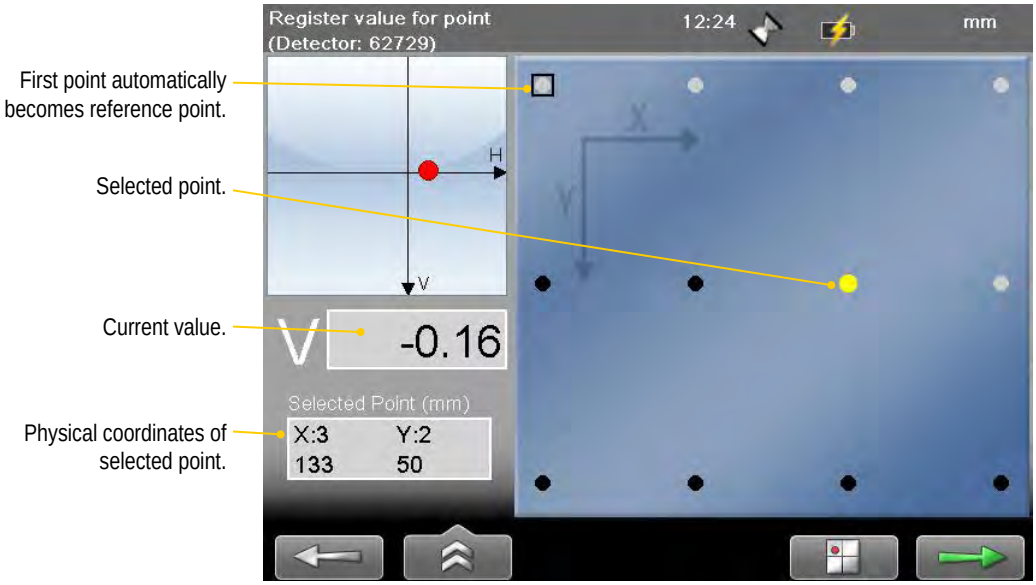
Distance table view
Change point separation if needed

Measure

Press to register values. It is possible to measure the points in any order. First measured point is set as reference point. When you have measured all points, the Result view is displayed.

Note!

The M-unit can be used as a detector together with a laser transmitter.
Do not use the S-unit for this.



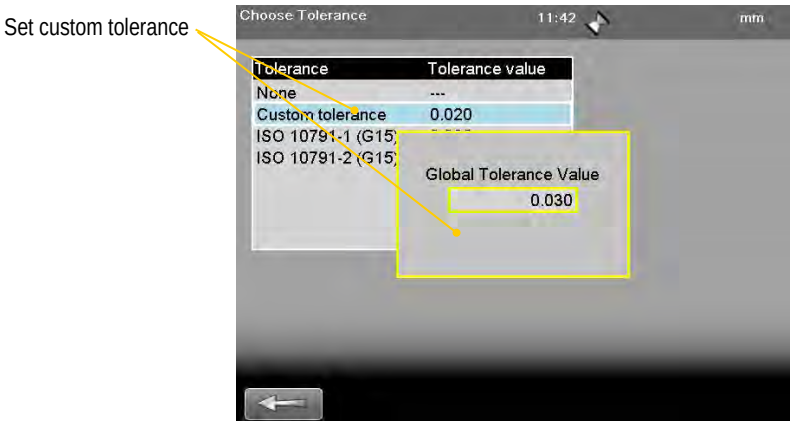
Function buttons

	Back. Return to enter distances.
	See "Control panel" on page 15. *See "Tolerance" below.*
	Measuring direction. Measure left to right or up and down.
	Show target. Useful if you want to rough align for example.
	Continue to Result view. Available when you have measured three positions.

Tolerance

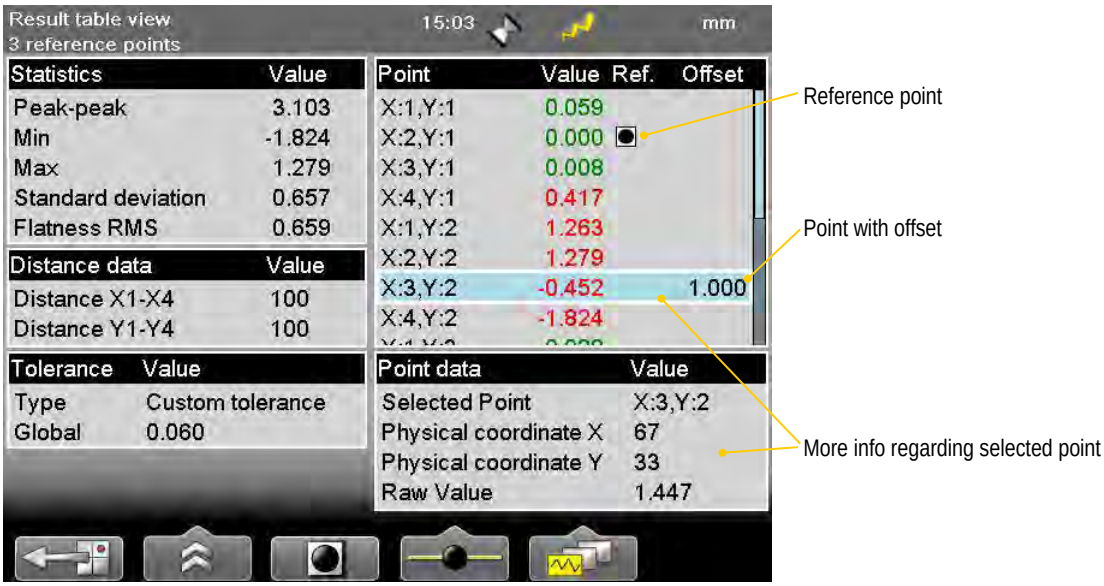
By default, the ISO standard is used. The ISO tolerance is calculated automatically depending on which distances you have entered. Only global tolerance is available.

Select to set custom tolerance.



Result table

Select  to open table view. Values outside the tolerance are displayed with red.



Function buttons

	Remeasure selected point.
	 *See "Control panel" on page 15.*  Set offset for selected point.  *See "Tolerance" on page 47.*  Save file, see *"Measurement file handling" on page 11.*
	Toggle button. Set selected point as reference point. Remove as reference.
	See *"Calculation settings" on page 50.*  Raw data. Revert to original data.  Three reference points are automatically set to zero.  Best fit around 0.  All positive. The best fit with all measurement points above zero.  All negative. The best fit with all measurement points below zero.
	 See *"Result 3D" on page 49.*  See *"Result grid" on page 49.*  See *"Result table" on page 48.*

Note!

To remeasure: select a measurement point and select  .

Result grid

Select  to open table view.

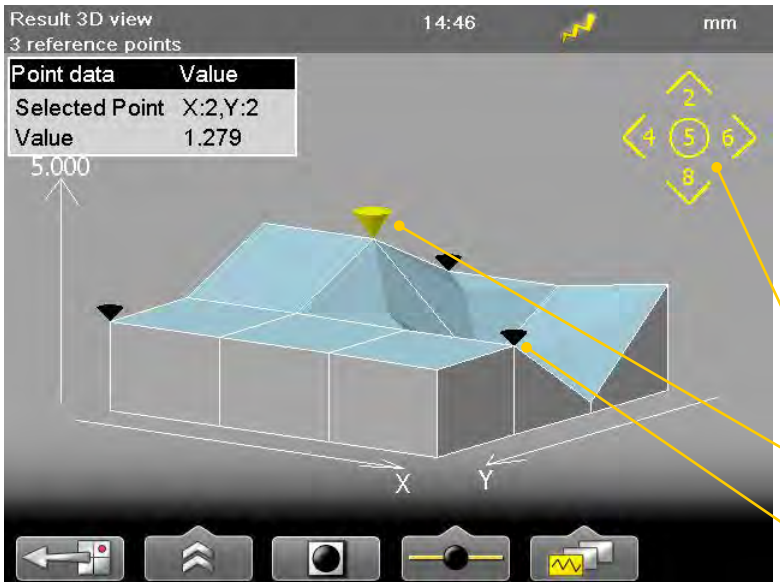
Red = values not within tolerance
Green = values within tolerance

Reference point

Result 3D

Select  and  to open 3D view. Only available when all points have been measured.

- Use the navigation button to select measurement points.
- Navigate using the numeric buttons.
  - Buttons 2, 4, 6 and 8 rotates the 3D view.
  - Button 5 returns to the initial view.



Use numerical buttons to rotate the image.

Yellow = selected point

Black = reference point

Calculation settings

Select  to display calculation settings. You can try different settings to see which one suits the best and analyze the measurement result directly in the Display unit. You can also save reports with different settings to analyze further later.

Reference points

The measurement values can be recalculated so that any three of them become zero references, with the limitation that a maximum of two of them are in line horizontally, vertically or diagonally in the coordinate system. (If there are three in line, it is just a line, and not a plane!). Reference points are needed when you are going to machine the surface.

Custom reference points

1. Select  to set currently selected point to zero.
2. Select one or three reference points. When you select a second reference point, the values are not recalculated. Set a third reference point to recalculate the values.
3. Select  if you want to return to raw data.

Set three reference points

1. Select  to set three reference points.
2. Select  if you want to return to raw data.

Best fit

Best fit around 0

When you perform a best fit calculation, the measurement object is tilted to the lowest peak to peak value. It is fitted as flat as possible between two planes where the average value is zero. Select  and  to calculate best fit around 0.

All positive

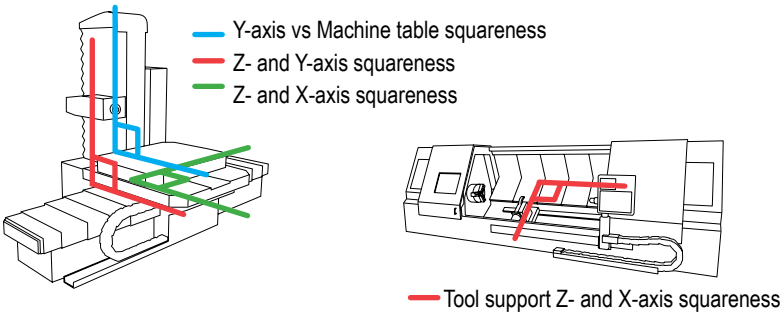
The measurement object is tilted as in a Best fit calculation, but the reference line is moved to the lowest measurement point. Select  and  to calculate the best fit with all measurement points above 0.

All negative

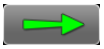
The measurement object is tilted as in a Best fit calculation, but the reference line is moved to the highest measurement point. Select  and  to calculate the best fit with all measurement points below 0.

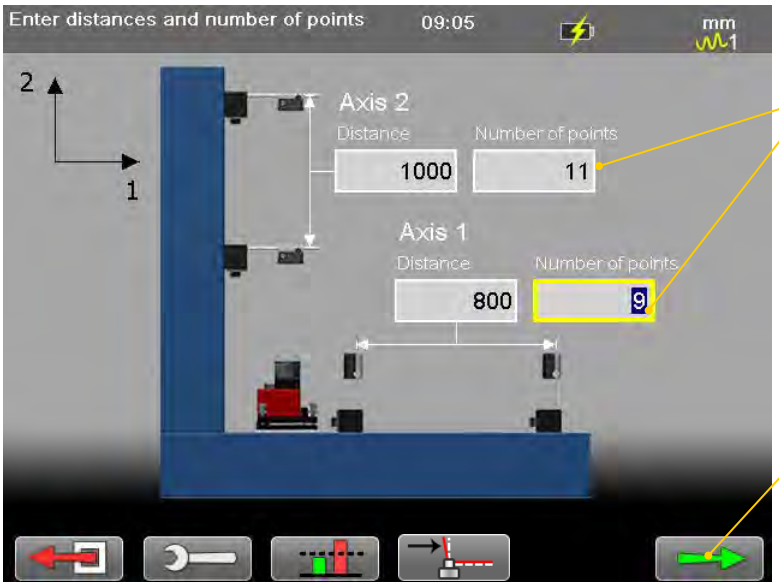
SQUARENESS

For measurement of squareness in machines and installations. The measurement values on the two surfaces are compared to each other. The values are recalculated to an angular value that shows any deviation from 90° that may occur.



Enter distances

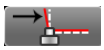
1. Enter the distance between the first and last measurement point.
2. Enter a number of measurement points, or leave the default number (2).
3. Select  to continue to Measure view.



The default number of measurement points is two.

Continue

Function buttons

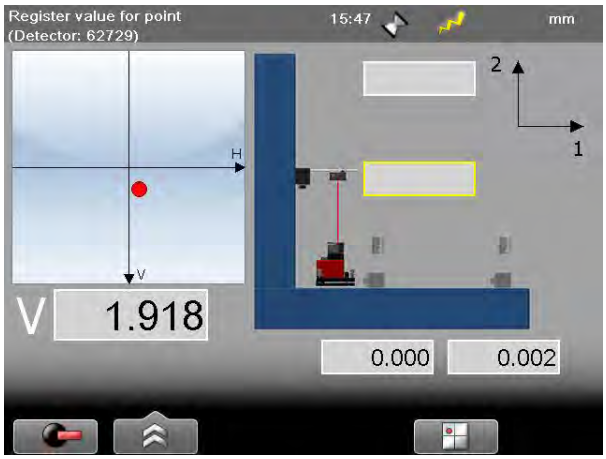
	**Back**. Leave program.
	*See “Control panel” on page 15.*
	*See “Tolerance” on page 54.*
	Squareness Compensation Value
	Continue to Measure view. Available when you have entered the distances.

Note!

The M-unit can be used as a detector together with a laser transmitter.
Do not use the S-unit for this.

Measure two points/axis

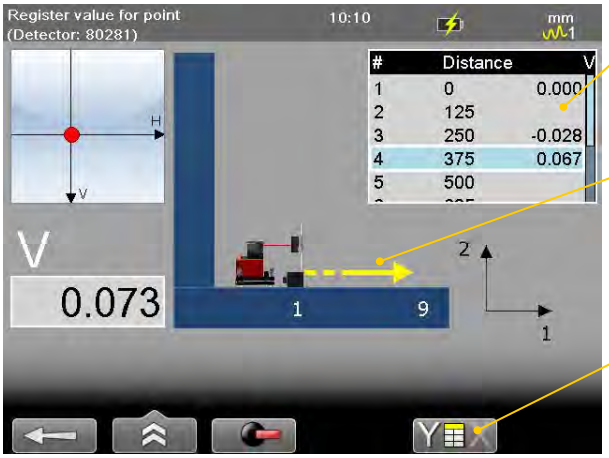
1. Place the detector on the X- or Y-axis. Use the navigation buttons to change the active measurement point.
2. Measure both points on the first axis. Press to register.
3. Move the detector to the second axis and deflect the laser beam.
4. Measure both points on the second axis. The result is automatically displayed.



Measure using multipoint

If you enter more than two measurement points, a table is displayed on the Measure view.

1. Place the detector on the X- or Y-axis. Select to switch axis.
2. Select if you wish to start the measurement far away from the laser.
3. Press to register points. Use the navigation buttons to skip points.
4. Select to continue to Result view.



Point that has not been measured.
You can not skip the first point.

Measurement direction

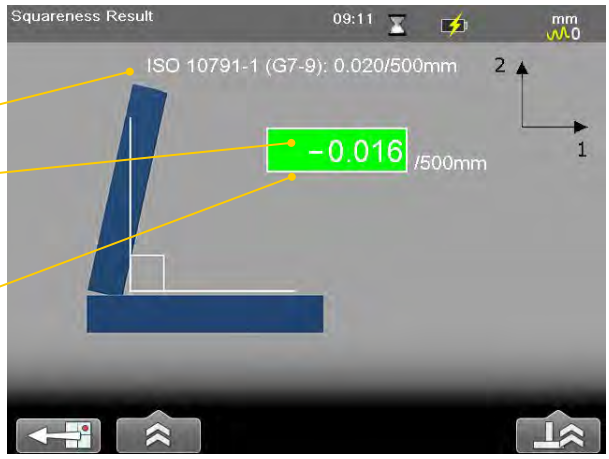
Measure X or Y axis.

Function buttons

	Back. Leave program.
	See "Control panel" on page 15. *See "Tolerance" on page 54.* Squareness Compensation Value. Show target. Useful if you want to rough align for example.
	Delete measurement point.
	Only for multipoint Toggle button. Start the measurement close to, or far from, the laser transmitter. Only available before you have registered the first position.
	Only for multipoint Toggle between measuring the X or Y axis.
	Continue to Result view.

Result

The measurement values are converted into an angular value, showing any deviation from 90°.



Selected tolerance

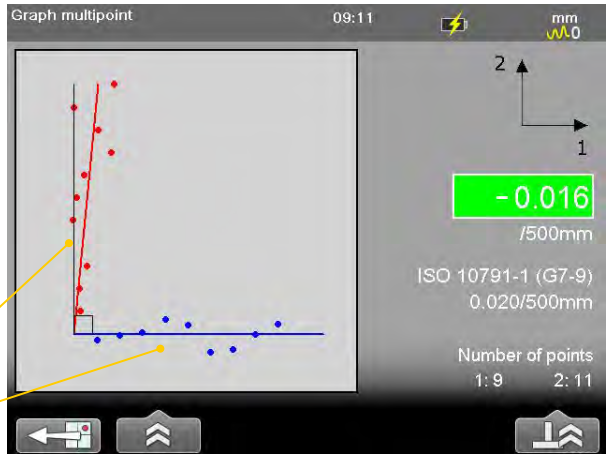
Angles smaller than 90° are shown as negative

Green = within tolerance
Red = not within tolerance

Result Multipoint graph

Select  and  .

- A reference line is fitted to the measured points on each axis, by means of a least squares optimization.
- Common length scale of both axis.
- Common point spread scale of both axis.



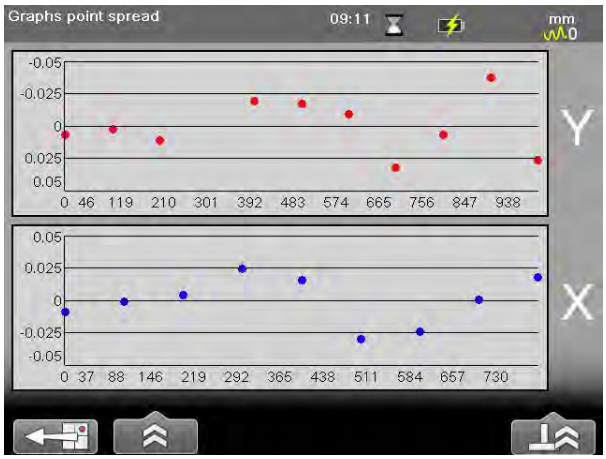
Red (Y-axis) = the inclination shows the direction of the angular error.

Blue (X-axis) = the reference axis.

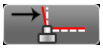
Result Multipoint spread

Select  and  .

- Shows the spread of the measurement points for each axis.
- The spread is shown around the calculated (least square) reference line.

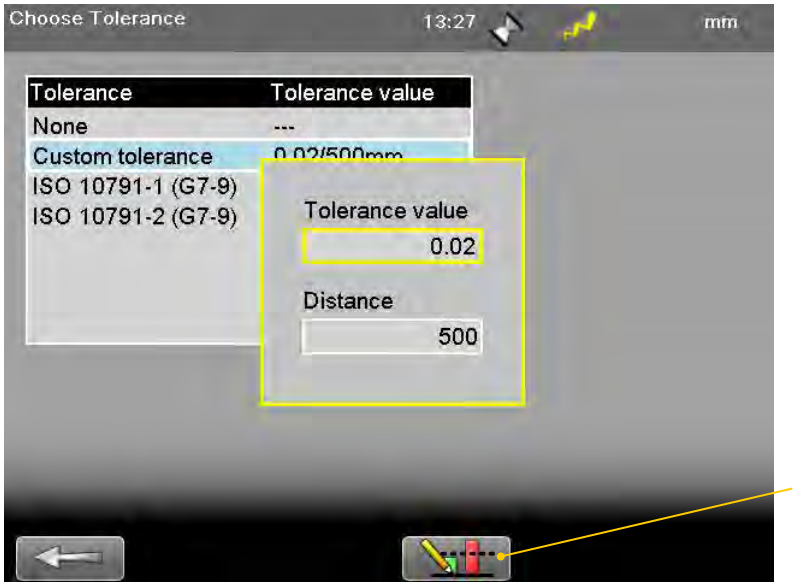


Function buttons

	Remeasure.
	 *See "Control panel" on page 15.*  Alter distance.  *See "Tolerance" on page 54.*  Squareness Compensation Value.  Save file, see *"Measurement file handling" on page 11.*

Tolerance

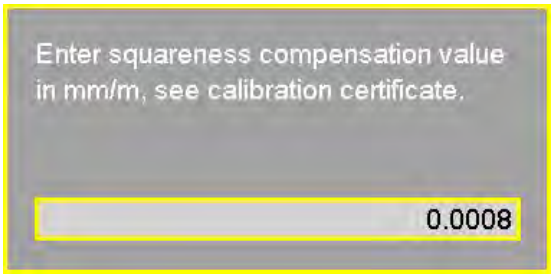
Select  to open Tolerance view. By default, the ISO standard is used.



Squareness Compensation Value

Squareness compensation value is used to compensate for the incorrectness of the laser. Note that the compensation value is only used on the D26 laser.

1. Select  to open Squareness compensation value view.
2. Type the Squareness compensation value and press  . This value is different for every laser transmitter and specified in the calibration certificate that is delivered with the laser transmitter. The unit is always in mm/m and will be automaticly recalculated when an other measuring unit is used.
3. If you do not have a Squareness compensation value you can leave this box empty and still get a good result on your measurement.

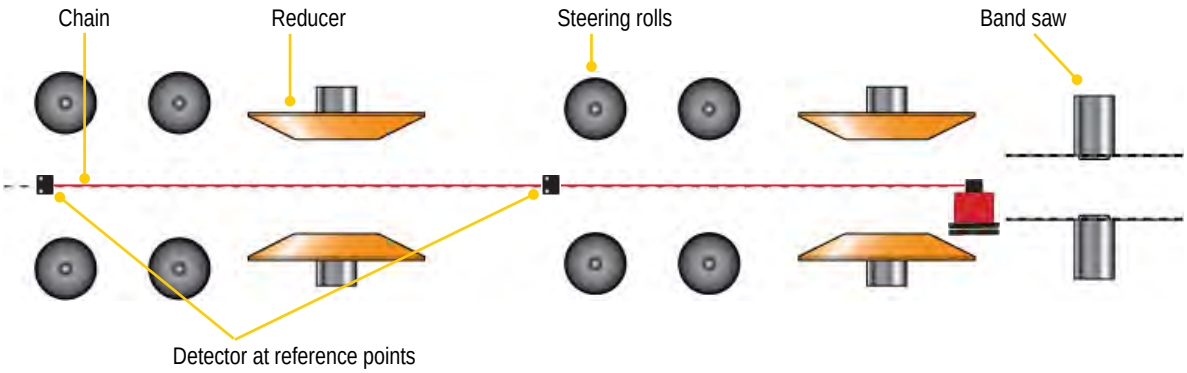


The Easy-Laser® E980 Sawmill system will help you increase efficiency and save money in your sawmill. The system measures straightness, flatness and squareness. It can be used equally well for circular saws and band saws.

Saw blade

Select V 0.00 H 0.00 to start program Values.

1. Mount the laser transmitter with the tilt table bracket.
2. Adjust laser beam to two reference points on the centre line.
3. Mount the detector on the magnet base with turnable head.
4. Mount detector on bracket on the saw blade.
5. Select 0 to zero set.
6. Rotate the saw blade a half turn.
7. Rotate the detector with turnable head and read value.



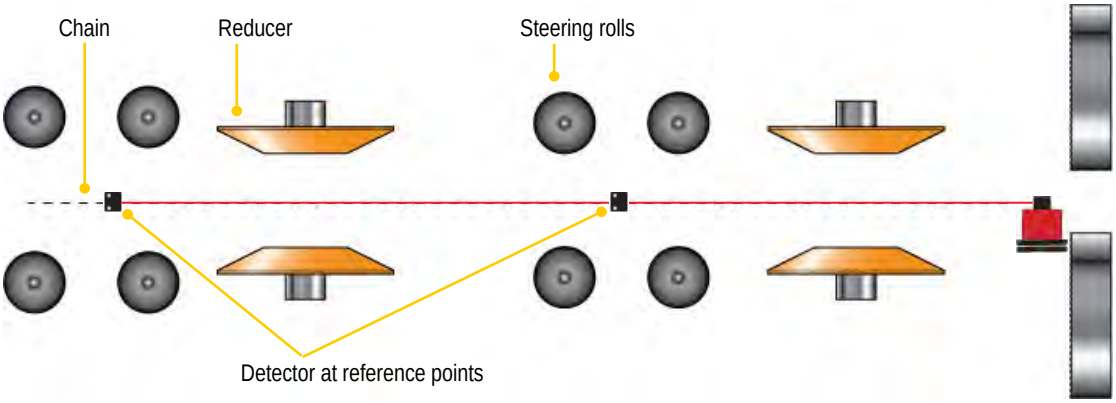
Note!

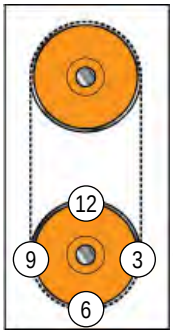
The reference points are usually marked out by the machine manufacturer.

Bandsaw

Select V 0.00 H 0.00 to start program Values.

1. Mount the laser transmitter with the tilt table bracket.
2. Adjust laser beam to two reference points on the centre line.
3. Rotate D23 90º using the turnable table.
4. Adjust the laser transmitter to water level.
5. Place the detector on position 9 o'clock.
6. Select 0 to zero set.
7. Measure on positions 3 and 12 o'clock on the lower wheel.
8. Adjust the upper wheel using the lower wheel as reference.





Rotate laser transmitter and place detector at position 9 o'clock

Note!

Here we show measurements using the program Values, but the program Straightness can also be used.

BATTERY PACKS

When not using cable to the measuring units, you can use our chargeable battery pack. The battery pack comes in two versions, with or without built-in wireless connection.

Battery pack with wireless

Part No. 12-0618

This Battery pack has built-in wireless functionality. For more information on how to set up and search for units, *see "Set up wireless connection" on page 21*.

The Battery pack's serial number is placed on the backside. This serial number is shown in the Display unit.

When the Battery pack run empty, the lights for Battery indicator and On/Off are switched off. However, the built-in wireless will still function as long as the Detector has some power left.

Battery indicator*

On/Off
Diode green when Battery pack is active.
Diode yellow when no unit is connected. The Battery pack will automatically shut off.

Wireless (only 12-0618)
Built-in functionality.
Diode yellow when attached correctly.
Diode blue when connection is established.

*** Battery indicator**

Constant green light
Battery pack full.

Flashing green light
Battery pack OK

Flashing red light
Battery pack low. Approx. 15 min. left to empty.

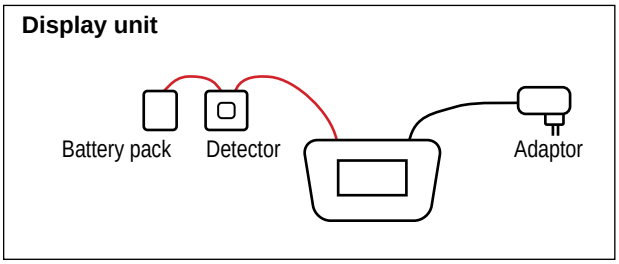
Battery pack empty and will shut down.

Charge battery pack

Using Display unit

It is possible to charge battery packs **without** wireless funtionality via the Display unit, one at a time. You can charge both a Detector and a battery pack by connecting the equipment as described in the image. If the Display unit is turned off while charging, the equipment will charge faster.

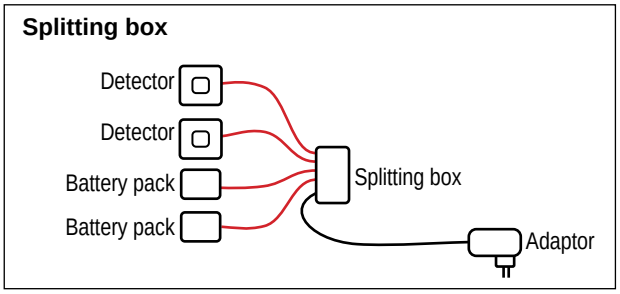
1. Connect the Display unit with the adaptor. The Display unit itself does not have enough power to charge the battery pack.
2. Use standard red cable to connect battery pack to the Display unit.



Using splitting box

When you have two battery packs or battery packs with wireless BT, you can use our splitting box (Part No. 12-0597).

1. Plug in the power adaptor to the splitting box. Use the standard power adaptor delivered with your system. All lights are lit up on the splitting box.
2. Plug in the battery pack and Detectors to the splitting box. Corresponding light is switched **off**.
3. When the battery pack is fully charged, the light is switched **on** again.

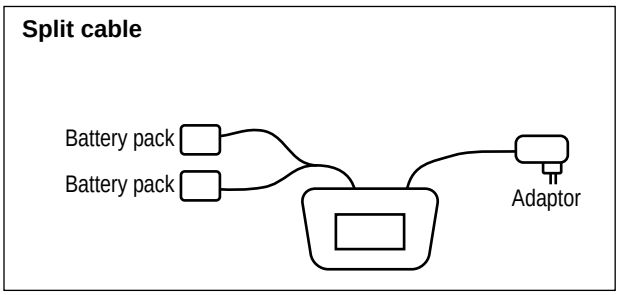


Using split cable

For two Battery packs or Battery packs with wireless BT, you can also use our split cable (Part No. 12-0725).

The split cable can only be used to charge the Battery packs, not as a “red cable”.

1. Plug in the power adaptor and split cable to the Display unit.
2. Plug in the battery packs.
3. When the battery packs are fully charged, the light is constant green on the Battery pack.



TECHNICAL DATA

System Easy-Laser® E980 Saw Mill, Part No. 12-0727

A complete system contains	
1	Display unit E51
1	Laser transmitter D23
1	Detector E5
1	Wireless communication unit
2	Large target
2	Electronic target
2	Bracket for electronic target
1	Shaft bracket
1	Set of rods 4x60mm
1	Rods 8x120mm
1	Rod bracket with turnable head
1	Magnet bracket long, with turnable head (sawblade)
1	Magnet bracket short, with turnable head (bandsaw)
1	D45 Magnet base with turnable head
1	Bracket for index table
1	Index table 90º for laser transmitter
1	Cables 5 m, extension
1	Cables 2 m
1	Measuring tape 5 m
1	Manual
1	USB memory stick
1	USB cable
1	Power adaptor (100–240 V AC)
1	Cleaning cloth for optics
1	CD with documentation
1	Hexagon wrench set
1	Rod tightening tool
1	Shoulder strap for Display unit
1	Carrying case

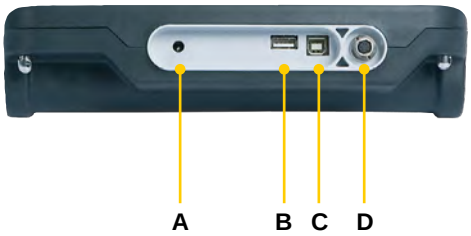
Laser transmitter on index table

System	
Relative humidity	10–95%
Weight (complete system)	20.7 kg [45.6 lbs]
Carrying case	WxHxD: 498x229x603 mm [19.6x8.9x23.7”]

Display unit E51

Part. no 12-0418

In the Display unit you are guided through the measurement procedure and can save and analyze the results.



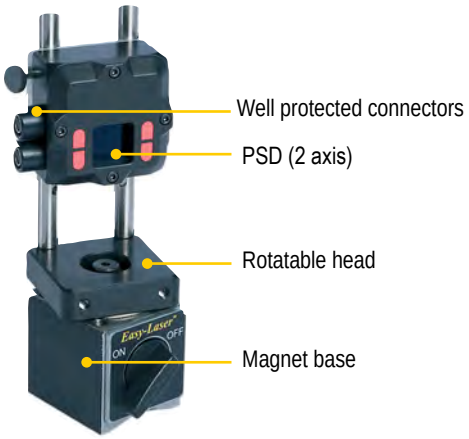
A Connection for charger
B USB A
C USB B
D Easy-Laser® measurement equipment

Display unit	
Type of display/size	VGA 5.7” colour
Displayed resolution	0.001 mm / 0.05 thou
Power management	Endurio™ system for unbroken power supply
Internal battery (stationary)	Li-Ion, Not restricted PI967, 3.7 volt, 43Wh, 11600 mAh
Battery compartment	For 4 pcs R 14 (C)
Operating time	Appro. 30 hours (Normal operating cycle)
Connections	USB A, USB B, Easy-Laser® units, charger
Storage memory	>100,000 measurements
Help functions	Calculator, Converter
Housing material	PC/ABS + TPE
Dimensions	WxHxD: 250x175x63 mm [9.8x6.9x2.5”]
Weight (without batteries)	1030 g [2.3 lbs]
Environmental protection	IP Class 65
Operating temperature	-10–50°C
Altitude	0-2000m
Designed for outdoor use (pollution degree 4)	
Cables	
Type	With Push/Pull connectors
System cable	Length 2 m [78.7”]
Extension system cable	Length 5 m [196.8”]
USB cable	Length 1.8 m [70.8”]
EasyLink™ data base software for PC	
Minimum requirements	Windows® XP and newer. For the export functions, Excel 2003 or newer must be installed on the PC.

Detector E5

Part no 12-0509

Detector E5 can work with both stationary and rotating lasers thanks to our Dual Detection Technology™. Connect to the display unit via cable or wireless (accessory). The magnet base has a rotating head to align the detector to the laser transmitter.



Detector	
Type of detector	2 axis PSD 20x20 mm [0.78” sq]
Dual Detection Technology™	Can detect both spinning and stationary laser beam
Resolution	0.001 mm [0.05 mils]
Measurement accuracy	Spin ±10µm ±1% / Stationary beam ±10µm ±2%
Inclinometers	0.1° resolution
Thermal sensors	± 1°C accuracy
Housing material	Anodized aluminium
Dimensions	WxHxD: 60x60x42 mm [2.36”x2.36”x1.65”]
Weight	186 g [6.6 oz]
Internal battery	Li-Ion, 3.7 volt, 2.5Wh, 660mAh
Environmental protection	IP Class 66 and 67
Operating temperature	-10–50 °C
Altitude	0–2000 m
Designed for outdoor use (pollution degree 4)	
Wireless connection unit (optional)	
Wireless communication	Class I BT Wireless Technology
Operating temperature	-10–50 °C
Housing material	ABS
Dimensions	53x32x24 mm [2.1x1.2x0.9”]
Weight	25 g [0.9 oz]
Magnet base with turnable head (for detector)	
Holding power	800 N
Rods for detector	
Length	60 mm / 120 mm (extendable) [2.36”/4.72”]

Angular prism (Optional)

Part no. 12-1136

For measurement of squareness and parallelism. A built-in penta prism deflects the laserbeam 90°. To keep the accuracy of the prism when measuring, the prism should be aligned to the center of and parallel to the laser beam.

Turning range	360°
Fine turning	0.1 mm/m [20 arc sec.]
Parallelism accuracy	±0.005 ±0.002/M mm/m [±0.005 ±0.007/F mils/inch] *
	* M is the measurement range in meters [m]. F is the measurement range in feet [ft].
Aperture size	18 mm [3/4”]
Knob and rod material	Stainless steel
Housing material	Anodized aluminium
Weight (with detector bracket)	860 g [1.9 lbs]