**Manual Clinotronic S** 

# Manual

WYLER

## **Electronic Inclinometer**





WYLER AG Im Hölderli 13 8405 Winterthur Switzerland +41 233 66 66 www.wylerag.com wyler@wylerag.com

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## **1. Manual Clinotronic S**

## Introduction

## Before you start

Read this manual carefully before using the Clinotronic S for the first time.

Please also note the safety instructions.

Note♥: Mishandling or unintentional deletion of calibration data are prevented by Note♥

## Notev, Attention !, Warning!

To make your reading easier, the following references are used in this manual:

- "Note♥:" This highlights useful tips.
- "Achtung !:" This is to avoid mishandling or disadvantages



This indicates notes that are required by law.

## Manufacturer name and address

WYLER AG Im Hoelderli 13 8405 Winterthur Switzerland

 Phone
 +41 52 23 66 66
 www.wylerag.com

 Fax
 +41 52 233 53 20
 wyler@wylerag.com

**Representatives:** 

www.wylerag.com

Product brand and type designation

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## **Product brand**



## type designation:

\*Art. No. 015-S-XG45 without inserts



\*Art. No. 015-S-HG45 with two magnets on each side



\*Art. No. 015-S-PG45 with two M3 threads on all sides



\*Subject to change

## **Applicable documents**

The **CE Declaration of Conformity** can be found on our homepage at: www.wylerag.com at the product page Clinotronic S "Download".

## 2. Product description, technical data

## Measuring device, accessories

## The measuring device

- The housing of the Clinotronic S is made of black anodized aluminum.
- The four measuring bases are located in each of the quadrants (frame).
- The front and back are equipped with a plastic film.
   Screen area: The film is equipped with barely visible distance points against streaking when touched.
- The front consists of the color screen and the operating membrane keyboard
- On the right side is the USB-C port
- o As standard, the device is equipped with Bluetooth® BLE and the wylerCONNECT MINI
- An infrared (IR) trigger for data acquisition is also included
- The power supply consists of a replaceable, rechargeable 3.6V lithium-ion battery The access is on the left.
- $\circ~$  The device can be charged via the USB-C port and the included charging power supply (5V) or on laptop.



## Dimension, weight, type of protection, storage

## Standard accessories

- wylerCONNECTMINI (Bluetooth® BLE)
- USB power adapter and cable USB-A/USB-C
- Infrared(IR) trigger
- o Li-ion battery
- Plastic carrying case
- o Manual
- $\circ$   $\;$  Android App in Google Store, iOS App in Apple Store  $\;$

## Optional accessories www.wylerag.com

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## Mechanically

- Magnets below, above, left, and right.
- Threads M3 bottom, top, left, and right

#### Software

- o Interface software
- o Geometry measuring software
- Monitoring software
- Software tools

#### Calibration

o wylerMASTER

## Remote display

Android smartphone with installed App
 Power

- Extra Li-ion batteries
- o External charger for max two Li-ion batteries

Art. No. 015-S-HG45 Art. No. 015-S-PG45

## 3. Safety instructions

• The device complies with the applicable directives and standards

#### Consult:

- The current CE Declaration of Conformity Clinotronic S
- This instruction manual and the quick reference
- The type label on the back of the device

## Intended use

• The Clinotronic is designed exclusively for measuring inclination angles.

For this purpose, the device is placed on a flat, stable surface or held by hand

The measured value can

- be read directly on the screen
- be read by  $\mathsf{Bluetooth}^{\mathbb{R}}$  and app on smartphones as  $\mathsf{Android}^{\mathbb{R}}$  or  $\mathsf{iOS}^{\mathbb{R}}$
- be sent via Bluetooth<sup>®</sup> and wylerCONNECT MINI to a Windows computer

#### Attention 1: There are no other uses!

#### Not intended use!

- The device must not be used as a base, e.g. be used in a vise. The precision housing can be deformed and will be unusable.
- It must not be used under water, as the tightness class is insufficient and the device may suffer a short circuit inside.
- It must not be used in any way as a hammer as this damages the measuring surfaces, and the device is therefore no longer able to measure.
- The device must not be thrown. The aluminum housing can cause serious injuries and damage

## **Electromagnetic environment**

Note♥: The electromagnetic environment should be assessed before operating this equipment



Do not use this device near sources of strong electromagnetic radiation (such as unshielded, intentionally operated high-frequency sources), as these may interfere with proper operation.

## Additional information for FCC (USA) and IC (Canada)

## FCC part 15 and ICES-0003

## **Device Class A**

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". This Class A digital apparatus complies with Canadian ICES-0003.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

## Safety instructions lithium-ion batteries

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The lithium-ion batteries 3.6V are rechargeable Type of battery: **18650** 



Only the original type 18650 lithium-ion batteries may be used

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Lithium-ion batteries are only allowed to be charged with the supplied chargers. Lithium-ion batteries are only allowed to be charged under supervision.



Close the lithium-ion battery cover carefully, but not with heavy force! A rubber gasket is installed to provide a seal.



Note the current airline regulations regarding the transport of lithium-ion batteries in any baggage!



Do not immerse the device in water! The lithium-ion batteries are protected against overcharging and short circuiting. Underwater, the short-circuit protection is not ensured!

## **Frequency of calibration**

- The calibration schedule must be determined by the customer.
- Our non-binding recommendation:

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| In case of suspected damage: | immediately     |
|------------------------------|-----------------|
| For weekly use or more:      | every year      |
| For monthly use:             | every 2-3 years |

- WYLER AG operates a calibration center for the parameters length, planarity and angles according to EN / ISO / IEC 17025.
- The accreditation is carried out by METAS.

WYLER accreditation number: SCS 044



## 4. Prepare product for use

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## **Contents of case**



- 1 Case
- 2 Clinotronic S
- Lithium-ion batteries 3.6V, Type 18650 3
- 4
- USB power adapter Cable USB-A/USB-C 5
- Infrared (IR) trigger 6
- wylerCONNECT MINI 7
- Quick reference  $\rightarrow$
- Manual download at www.wylerag.com  $\rightarrow$

## Controls



- 1 Screen
- 2 On/Off
- 3 Menu Enter
- **4** Arrow button down Shortcut (hold 2 seconds) "Relative Zero"
- 5 Back/cancel
- 6 Lithium-ion battery lid
- 7 USB-C connection
- 8 Infrared (IR) trigger

## **Replacement of lithium-ion (Li-ion) batteries**

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 Remove battery lid, remove depleted Li-ion battery
 Insert fully charged Li-ion battery (nose forward) Close the lid. (Don't tighten too much)

#### Charging with power adapter or laptop



#### A Charging with power adapter

- Plug the charger into a power outlet (100-240V AC)
- Connect the Clinotronic S with the cable to the power adapter
- Note ♥: While charging, you can use the device in only limited ways. During the charging process, the specification of the device **can not** be guaranteed due to temperature development during charging. Charge the device before measuring!
  - The charging symbol appears in the upper right corner: <sup>I</sup>
  - The device will automatically start charging

The following states of charge appear on the screen for 100%: **••••** or 75%: **••••** or 50%: **••••** 

## Almost empty: 25%

- $\circ$  Charge the Clinotronic S as soon as possible until the symbol 100%  $^{ullet}$  appears.
- Loading time full capacity:

8 h

Typical usage time with radio switched on:
 backlight medium
 33 h

## B Charge via USB cable to the PC or laptop

- Connect the Clinotronic S with the cable to the PC or laptop
- $\circ$   $\;$  The Clinotronic S receives only a trickle charge with minimal power.
- This allows you to measure without heating up the Clinotronic S.
- Charge the device before measuring!

## 5. Operation

## **5.1 Configurations**

## As standalone

for immediate measuring and reading



Wireless with an Android  $\ensuremath{\mathbb{B}}$  or iOS  $\ensuremath{\mathbb{B}}$  smartphone and the free app "Clinotronic S" as a remote display



Minimum requirement for Android®: for iOS®:



Note ♥: The wylerCONNECT MINI connects up to seven Clinotronic S units with the Windows computer. Use our software products to collect and display data. Visit www.wylerag.com

Connected via cable (USB-C / USB-A) with a Windows computer

Note ♥: With the cable, you can update the firmware of the Clinotronic S via Windows computer. The corresponding firmware loader can be found at www.wylerag.com

## 5.2 Measurment bases

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The device is equipped with four (4) measuring bases with flat measuring surfaces

## **Horizontal application**



Measurement base below

Measurement base above



## Vertical application



## 5.3 Screen overview and keyboard

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 16 Back / Cancel within Menu: Move cursor to the left

## 5.4 Switching on/off, measuring range

## Switch On

• Press the button *The screen starts immediately*.

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Note ♥:The device starts with the last used settings

## Switch Off



## Measuring range

- The measuring range at new state or after factory reset: ~ 46.5°
- After wylerMASTER calibration (see chapter 5.9.2.3) : 45°

## **Over range**





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• "Device" contents:

| Brightness      | ₽.          |
|-----------------|-------------|
| Bluetooth®      | *           |
| Zapper teach-in | <b>(31)</b> |



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UNU.

Attention !: As the brightness level increases, the unit consumes more power.



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## 5.6.3 Zapper teach-in



- Press the zapper (Infrared trigger) until "OK" appears.
- The zapper (Infrared trigger) is identified.

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• When the zapper is pressed, the IR number appears in the top line for 1 second



Note ♥: You can "Teach-in" several devices with the same Zapper Application: Alignment with multiple devices simultaneously

5.7 Settings in "Units"

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"Units" contents:

|   | Unit               | digits         | Explanation  |
|---|--------------------|----------------|--|
| • | DEG°\'\"           | ## ° ## ' ## " | Degree - Minute - Second   |
| • | DEG°               | ##.###         | Degree decimal   |
| • | mm/m               | ### . ##       | Millimeter per Meter   |
| • | "\10"              | ##.####        | Inch per 10 Inch   |
| • | "\12"              | ##.####        | Inch per 12 Inch   |
| • | mRad               | ###.##         | Milliradiant   |
| • | Percent %          | ###.###        | Percent %  |
| • | per mille          | #### . ##      | Per mille ‰  |
| • | Gon                | ##.###         | 400 gon = 360°   |
| • | Artillery Promille | ###            | 1 A‰ = 360° / 6400   |
| • | mm/1435 mm         | #### .##       | Millimeter per self-selected base length in mm<br>(Preset: mm/1435mm, European standard gauge) |
| • | "/10.00"           | ###.###        | Inch per self-selected base length in inch   |
| • | Slope:1/xxx        | 1/#####        | bis 1/#.##### Slope / Sink parameter (without unit)  |

## 5.7.1 "Units"

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The digits and the unit adjusts according to your choice

Note ♥: Always check the unit at the beginning of a measurement!

## 5.7.2 Self-selected base mm/xxxx mm

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Note ♥: The unit **mm/xxxxmm** allows a freely selectable base length

• In the "Units" menu use

and U to select mm/1435mm

Note ♥: 1435 is the last selected value, hence it may be different.



Value adjustment menu:





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Y'

Absolute......**ABS**uses last measured zero deviationAbsolute Zero ......triggers reversal measurement (zero deviation)Relative Zero......current position becomes reference level (relative zero)



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## 5.8.2 Reversal measurement "Absolute Zero"

| Use | L | t |  |
|-----|---|---|--|

e U to enter the "Measurement" menu

**독 않** 



after that:

The menu now guides you through the reversal measurement

• Place the device on a **flat and stable** surface.  $\rightarrow$  Position **H** 



Note ♥: To get a reliable reversal measurement, the plateau should be aligned within +/- 0.06mm

Trigger the measurement H with the IR trigger S or with

Note  $\mathbf{v}$ : You can cancel this process at any time with  $\Theta$  and return to the measurement screen

Please wait, the device records a stable value H.

**ㅋ** 않



Attention !: Please do not touch the device until the measured value is recorded!



Now turn the device at the same position by 180°.  $\rightarrow$  Position H'

Trigger the measurement **H** with the IR trigger **S** or with •

Attention !: Please do not touch the device until the measured value is recorded!

| V0925 | Absolute Zero: H ' |   |
|-------|--------------------|---|
|       |                    |   |
|       |                    |   |
|       | ······             | 7 |
|       |                    | • |
|       |                    | ( |
|       |                    |   |

The device returns to the measuring mode immediately after reading the measured value H Attention !: The measurement mode "Relative Zero" is displayed with ABS at the bottom left

## 5.8.3 Temporary reference level "Relative Zero"

Use

to enter the "Measurement" menu

**독 않** 

In the "Measurement" menu, use



to select "Relative Zero"



after that:

The menu now guides you through the reversal measurement "Relative Zero"



Please wait, the device records a stable value  $\ensuremath{\textbf{H}}.$ 

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VAV/



Attention !: Please do not touch the device until the measured value is recorded!

The instrument will return to measuring mode immediately after reading the measured value H.

Attention !: The measurement mode "Relative Zero" is displayed with REL at the bottom left



The device has now set the current level to relative zero

Note ♥: Around the zero position, the inclination triangle including the algebraic sign can alternate between + and -.

This is not a malfunction.

Use to enter the "Settings" menu Use to select "Device Information" and Settings Device Units 🛆 Measurement Device Information after that: Device Info Device Information Advanced Settings "Device Info" contents: ٠ Firmware etc. **Device Information** Advanced Settings Note ♥: With  ${\cal Y}_{
m you}$  return to the "Settings" menu.

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**5.9 Device Info** 

## 5.9.1 Device Info

Use to enter the "Device Information" menu

#### **Device Information**

Device Name: Clinotronic S Serial Number: V0925 FW-Version: 9911 HW-Version: revC Measuring Range: 45,000° Measuring Resolution: 0.02mm/m Bluetooth address: 00.00.00.00.00.00

List of internal data. The firmware version changes when a firmware update has been made.

Note ♥: With ⊖ you return to the measurement mode.



ER

Attention !: In this menu, calibration data is affected! If you have any questions, please contact our local representative.





"Adv. Settings" contents:

| Disable local gravity | 0 |
|-----------------------|---|
| Use local gravity     | 0 |
| wylerMASTER           | 1 |
| Factory Reset         | R |

Reset local gravity to default 9.8065 m/s<sup>2</sup> Set local gravity Calibration with wylerMASTER (not included) Back to factory settings



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Note ♥: The values can only fluctuate between 9.7xxx and 9.8xxx

The device returns to measuring mode.

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Note ♥: The measurement mode shows the globe symbol as a sign of using the local gravity

| 5.9.2 | 2.2 Disable local gravity  |
|-------|--|
|       | In the "Device info" menu, use and to select "Advanced Settings".  |
| •     | Use V to select "Disable local gravity"                            |
|       | Adv. Settings<br>Use local gravity<br>WylerMASTER<br>Factory Reset |
|       | after that:  |
|       |  |
|       | 00°49'45''   |
|       |  |
|       | •  |
|       | DEG⁰\'\"   |

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The globe icon disappears, indicating that the value of 9.8065 is restored.



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## The calibration begins:

Note ♥: The menu will guide you through the process.

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Position the device on the wylerMASTER in position 1/21: - 50 °



Note♥: You can measure a failed calibration point again.

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Press  $2^{\circ}$  the last measurement is canceled. E.g. from O ° back to -5 °



• Carry out the calibration according to the above steps until the 21st (last) measurement.



- After step 21, the calibration is completed. Now the reversal measurement (Absolute Zero) automatically follows. Follow the instructions.
- Place the device on a **flat and stable** surface.  $\rightarrow$  Position **H**

| V0925 | Absolute Zero: H | •••• |  |
|-------|------------------|------|--|
|       |                  |      |  |
|       |                  |      |  |

Note ♥: To get a reliable reversal measurement, the plateau should be aligned within +/- 0.06mm

• Trigger the measurement **H** with the IR trigger **S** or with

Note V: You can cancel this process at any time with

크라

th $\bigcirc$  and return to the measurement screen

Please wait while the device records a stable value  $\mathbf{H}$ .



Attention !: Please do not touch the device until the measured value is recorded!



- Trigger the measurement H' with the IR trigger Y or with

٠

Attention !: Please do not touch the device until the measured value is recorded!

| V0925 Absolute Zero: H ' |   |
|--------------------------|---|
|                          | Ζ |
|                          | ſ |
|                          | l |
|                          | 7 |
|                          |   |
|                          |   |
|                          | ( |
|                          |   |



• The device automatically returns to measuring mode

Attention!: The device indicates ..... to show the wylerMASTER calibration applied.



Note ♥: If the device is in the wrong position, an error message "Wrong Position" appears.

1. Acknowledge this message with

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2. Position the device as required by the user interface..



Note ♥: The measuring range after a wylerMASTER calibration is 45 ° After a factory reset, the measuring range is slightly increased to about 46.7 °

## 5.9.2.4 Factory Reset

"Attention !:" The factory reset resets all settings back to factory settings including the wylerMASTER calibration and the local gravitational constant

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Attention !: The Clinotronic S now has its original data in memory. For a precise absolute measurement, please carry out a reversal measurement process as described in chapter 5.8.2.

**Factory Reset** 

No No

## 6. Specifications

| Technical specifications  |  |  |  |
|---|--|--|--|
| Measuring range   | ±45°   |  |  |
| Resolution  | 5 arcsec or 0.02mm/m   |  |  |
| Limit of error; <i>M</i> <sub>w</sub> = rad out; t=constant                                   | 0.04% M <sub>w</sub> / minimum 5 arcsec  |  |  |
| Drift / 24 h  | max 10 arcsec  |  |  |
| Response time   | ≤ 5 sec  |  |  |
| Mechanical accuracy of the housing  | Flatness of the measuring bases 0.01 mm<br>Rectangularity to the basic base 0.01 mm<br>Parallelism to the basic base 0.01 mm |  |  |
| Digital ouput USB-C   |  |  |  |
| <b>Power supply</b><br>- Lithium ion battery<br>- external power supply                       | 3.6V, 3333 mAh, (12 Wh)<br>5V (USB-C)  |  |  |
| Operating time at medium brightness, Bluetooth® activated                                     | 33h  |  |  |
| Charging time after complete emptying 8h  |  |  |  |
| Maximum power consumption during the charging process, incl. max brightness and Bluetooth® on | 500 mA, 5V   |  |  |
| Dimension (L x W x H)   | 100 x 75 x 30mm  |  |  |
| Weight of device / incl. accessories and case   | 400g / 850g  |  |  |
| Protection class  | IP64   |  |  |
| Storage temperature   | -20° to +60° C   |  |  |
| Operating temperature   | 0° to 40 ° C   |  |  |

## 7. Maintenance

## For safe operation

Store the device in a dry carrying case at a minimum of: - 20 ° C at a maximum of: +60 ° C

## Cleaning

• The device can be cleaned with commercially available alcohol-based cleaning agents and disinfectants.

## Troubleshooting

Please contact: WYLER AG Im Hoelderli 13 8405 Winterthur Switzerland Tel. +41 52 23 66 66 www.wylerag.com Fax +41 52 233 53 20 wyler@wylerag.com or The country representatives can be found at: www.wylerag.com

## **Repackaging before re-transport**

Ship the device in a carrying case in an additional cardboard box. Observe the regulations of your chosen transport company.

## Address customer service

If you have any questions, and if you are located in Switzerland:

#### WYLER AG Im Hoelderli 13 8405 Winterthur, Switzerland Tel. +41 52 23 66 66 Fax +41 52 233 53 20 www.wylerag.com wyler@wylerag.com

## For questions, if you are outside Switzerland in a country with a WYLER representative:

#### Country representatives: www.wylerag.com

#### Otherwise, contact us directly

## 8. Disposal

Decommissioning, disposal



- When decommissioning the Clinotronic S, note the local regulations for the disposal of electronic waste.
- The Li-ion batteries must be disposed of properly.

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## **Document version and release notes**

2.5. 2019 R1.1.1.DE Author: A.Schuhmacher