



**Data loggers**  
**testo 160 TH**  
**testo 160 THE**  
**testo 160 THL**  
**testo 160 IAQ**  
**testo 160 E**

Short instructions



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Please read this instruction manual through carefully and familiarize yourself with the product before putting it to use.

You will find detailed instructions in the login area of the respective Testo solution at: [www.testo.com/login](http://www.testo.com/login).

# 1 Safety and waste disposal

## 1.1 About this document

### Use

- The instruction manual is an integral part of the instrument.
- Pay particular attention to the safety instructions and warning advice in order to prevent injuries or damage to the product.
- Keep this document to hand so that you can refer to it when necessary.
- Always use the complete original instruction manual.
- Hand this documentation on to any subsequent users of the product.



In order to be able to use certain functions of this instrument (in particular the measurement data management), you need to accept the testo Cloud terms and conditions of use, which you will find below the login of the respective testo application at [www.testo.com/login](http://www.testo.com/login).

## 1.2 Symbols and writing standards

Display	Explanation
	Hint: basic or further information
1. 2. ...	Action: several steps, the sequence must be followed.
▶	Result of an action
✓	Requirements

### 1.3 Safety

#### General safety instructions

- Only operate the product properly, for its intended purpose and within the parameters specified in the technical data. Do not apply any force.
- Do not commission the instrument if there are signs of damage on the housing.
- Dangers may also arise from the systems being measured or the measuring environment: Always comply with the locally valid safety regulations when carrying out measurements.
- Temperatures given on probes/sensors relate only to the measuring range of the sensors. Do not expose handles and feed lines to temperatures in excess of 70°C (158°F), unless they are expressly authorized for use at higher temperatures.
- Do not carry out any contact measurements on uninsulated, live parts.
- Do not store the product together with solvents. Do not use any desiccants.
- Only perform maintenance and repair work on this instrument that is described in the documentation. Follow the prescribed steps exactly. Use only original spare parts from Testo.

#### Batteries

- Improper use of batteries may cause destruction of the batteries, injuries due to current surges, fire or the escape of chemicals.
- Only use the batteries supplied in accordance with the instructions in the instruction manual.
- Do not short-circuit the batteries.
- Do not take the batteries apart and do not modify them.
- Do not expose the batteries to heavy impacts, water, fire or temperatures in excess of 60 °C.
- Do not store the batteries near any metal objects.
- In the event of contact with battery acid: rinse affected areas thoroughly with water, and if necessary consult a doctor.
- Do not use any leaky or damaged batteries.

## 1.4 Warnings

Always pay attention to any information marked with the following warning notices along with warning pictograms. Implement the specified precautionary measures!

### CAUTION

Indicates possible damage to equipment

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## 1.5 Waste disposal

- Dispose of spent batteries in accordance with the relevant legal specifications.
- At the end of its useful life, send the product to the separate collection for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.

# 2 Description of the instrument

## 2.1 Use

The testo 160 TH, THE, THL, THG, IAQ and E data loggers are handy measuring instruments for measuring temperature, humidity, CO<sub>2</sub> concentration, illuminance and UV.



The external probes S-TH, S-LuxUV and S-Lux are only approved in conjunction with the testo 160 THE and testo 160 E data loggers.

You can find further information about proper use in the instruction manual for the testo 160 data loggers or online beneath the login of the respective testo application:

[www.testo.com/login](http://www.testo.com/login).

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## 2.2 Overview

### 2.2.1 testo 160 TH, 160 THE, 160 THL, 160 E



Use the testo 160 TH data logger to carry out temperature and humidity measurements.



Use the testo 160 THE data logger to carry out temperature and humidity measurements. The external probes S-TH, S-LuxUV and S-Lux can also be connected.



Use the testo 160 THL data logger to carry out temperature, humidity, lux and UV measurements.



The external probes S-TH, S-LuxUV and S-Lux can be connected to the testo 160 E data logger.

testo 160 TH	testo 160 THE	testo 160 THL	testo 160 E
1	Internal sensor for temperature and relative humidity		
2	USB connection		
3	Connector socket for external sensor		
4	Connector socket for external sensor		
5	UV sensor		
6	Lux sensor		

## 2.2.2 testo 160 IAQ



Use the testo 160 IAQ data logger to carry out temperature, humidity, carbon dioxide concentration and atmospheric pressure measurements.



Element	Element
1 Status LED	2 Display
3 Air quality light	4 CO <sub>2</sub> sensor
5 QR code	6 Key
7 USB connection	8 Internal sensor for temperature and relative humidity

## 3 Commissioning

### 3.1 Inserting into / removing from the wall bracket

- 1 - Insert the unlocking tool into the unlocking opening.



- 2 - Push back the locking pin using the unlocking tool.

- 3 - Pull the data logger up and out of the wall bracket.



### 3.2 Starting up the data logger



The data loggers must only be mounted vertically. Here, the connections must point downwards. In the case of data loggers with a display, you need to pay attention to the reading direction. Otherwise, the measuring accuracy might be diminished.

- 1 - Open battery compartment cover.



- 2 - Remove battery safety strip.

- 3 - Close the battery compartment.



The IAQ data logger has a higher energy requirement. This reduces the minimum measuring cycle to 5 minutes when battery-operated.



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Operation via mains unit is therefore recommended. An appropriate USB cable can also be purchased as an accessory.

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Only for testo 160 E and testo 160 THE:

The external probes must be connected **before** logging into the Cloud for the first time. If an additional probe is to be connected at a later stage, the data logger must first be logged out of the Cloud. The external probe can then be connected and the data logger logged in again.

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## 3.3 Logging into the Testo Cloud



You need an account for the Testo Cloud. If you have not yet set this up, please sign up at <https://www.museum.saveris.net>.

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For your new testo 160 WIFI data logger to be able to connect to your account in the Testo Cloud, it requires the three following pieces of information at minimum:

1. The ID of your account in the Cloud. You will find this in your account under the menu item **Configuration - Account ID**.
2. The network name of your WIFI (SSID), which the WIFI data logger will use to connect to the internet.
3. The password for this network.

Storage of this information on the WIFI data logger is called "Configuring the WIFI data logger". Four different options are available for this process.

### 3.3.1 Configuration via the Setup assistant

The Setup assistant in the web interface of the Testo Cloud is provided to assist you when you take your first steps with commissioning the testo 160. It can help you with logging in WIFI data loggers.

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To be able to carry out the configuration, you need to be logged into the web interface at <https://www.museum.saveris.net>.

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- Click on the  symbol above the menu bar.



The Setup assistant launches and assists you with the configuration. Follow the instructions there.

### 3.4 Status LED signals

The following table provides an overview of the meaning of the various status LED signals of the testo 160 WIFI data logger.

Signal	Description
LED does not flash (TH, E, THE, THL)	Sleep mode
LED flashes green every 30 seconds (IAQ)	Normal state
LED flashes green at one-second intervals (for 5 min, then 1 long red flash)	Configuration mode (hotspot) - press button > 3 sec
LED gives 2 red flashes	Connection to WIFI failed (incorrect SSID, incorrect SSID password, incorrect account ID or incorrect account password, attempt to log the testo 160 E into the Cloud without any external probes connected.)
If XML is correct, LED gives 1 long green flash If XML is incorrect, LED gives 3 red flashes	Configuration via USB/PDF
LED gives 2 green flashes	Connection to WIFI and Cloud successful
LED gives 1 long red flash	Alarm activated due to limit value violation
LED gives 5 green flashes	Reset WIFI data logger to factory settings Press key > 20 sec
LED gives 1 green flash (measurement data collected)	Send measurement data to the Testo Cloud (website): press key < 3 sec
LED gives 2 short green flashes (measurement data transmitted)	Measurement data transmitted successfully
LED gives 4 red flashes	Batteries spent
LED flashes alternately green and red	Firmware update via USB or wireless

### 3.5 Calibration

testo 160 WIFI data loggers come with a factory calibration protocol as standard. For museums, we recommend having an annual test carried out by Testo Customer Service. Moreover, there is an option of having ISO certificates

created for the WIFI data loggers. These can be implemented by Testo Industrial Services (TIS).

## 4 Technical data

### Measurement-specific data



The humidity sensor attains the highest degree of accuracy in temperatures between + 5 °C and + 60 °C and 20% to 80% RH. If the instrument is exposed to higher humidity for a long period of time, this can falsify the readings by up to 3% RH. After 48 hours at 50% RH  $\pm$  10 % and +20 °C  $\pm$  5 °C, the sensor regenerates by itself.

#### CAUTION

##### Damage to the humidity probe

- The probe must never be exposed to a humidity level of 100 % RH for longer than 3 days.

WIFI data loggers	testo 160 TH	testo 160 THE	testo 160 E
Order number	0572 2021	0572 2023	0572 2022
<b>Temperature measurement</b>			
Measuring range	-10 °C to 50 °C		see ext. probes
Accuracy	$\pm$ 0.5 °C		
Resolution	0.1 °C		
<b>Humidity measurement</b>			
Measuring range	0 to 100% RH (non-condensing)		see ext. probes
Accuracy	$\pm$ 2% RH @ 25 °C & 20 to 80% RH $\pm$ 3% RH @ 25 °C & <20% RH & >80% RH $\pm$ 1% RH hysteresis $\pm$ 1% RH/year drift		
Resolution	0.1% RH		
<b>Lux measurement</b>			
Measuring range		see ext. probes	see ext. probes
Accuracy			
Resolution			
<b>UV measurement</b>			
Measuring range		see ext. probes	see ext. probes
Accuracy			
Resolution			

WIFI data loggers	testo 160 IAQ	testo 160 THL
Order number	0572 2014	0572 2024

## 4 Technical data

WIFI data loggers		testo 160 IAQ	testo 160 THL
<b>Temperature measurement</b>			
Measuring range	0 °C to 50 °C		-10 °C to 50 °C
Accuracy	± 0.5 °C		± 0.5 °C
Resolution	0.1 °C		0.1 °C
<b>Humidity measurement</b>			
Measuring range	0 to 100% RH (non-condensing)		0 to 100% RH (non-condensing)
Accuracy	± 2% RH @ 25 °C & 20 to 80% RH ± 3% RH @ 25 °C & <20% RH & >80% RH ± 1% RH hysteresis ± 1% RH / year drift		± 2% RH @ 25 °C & 20 to 80% RH ± 3% RH @ 25 °C & <20% RH & >80% RH ± 1% RH hysteresis ± 1% RH/year drift
Resolution	0.1% RH		0.1% RH
<b>Lux measurement</b>			
Measuring range			0 to 20,000 lux
Accuracy			DIN 5032-7 Class C-compliant or: ± 3 lux or ± 3% of the reading (based on the external reference DIN 5032-7 Class L)
Resolution			0.1 lux
<b>UV measurement</b>			
Measuring range			0 to 10,000 mW/m <sup>2</sup>
Accuracy			± 5 mW/m <sup>2</sup> or 5% of the reading (based on the external reference at 22 °C)
Resolution			0.1 mW/m <sup>2</sup>
<b>CO<sub>2</sub> measurement</b>			
Ambient humidity	0 to 99% RH (non-condensing)		
Measuring range	0 to 5,000 ppm		
Accuracy	± (50 ppm + 3% of the reading) (@ 25 °C) Battery-operated: ± (100 ppm + 3% of the reading) (@ 25 °C)		
Resolution	1 ppm		
<b>Pressure</b>			
Measuring range	600 to 1100 mbar		

WIFI data loggers	testo 160 IAQ	testo 160 THL
Accuracy	± 3 mbar @ 22 °C	
Resolution	1 mbar	



The time between the system warning "Battery almost discharged" and "Measurement data stop" is at the most one day during standard operation and a measuring cycle & communication cycle of 1 min (day & night) (battery type: Varta Industrial).

### WIFI-specific data

WIFI data loggers	testo 160 TH	testo 160 THE	testo 160 THL
Order number	0572 2021	0572 2023	0572 2024
<b>WIFI</b>			
Standard	802.11 b/g/n		
Security	WPA2 Enterprise: EAP-TLS, EAP-TTLS-TLS, EAP-TTLS-MSCHAPv2, EAP-TTLS-PSK, EAP-PEAP0-TLS, EAP-PEAP0-MSCHAPv2, EAP-PEAP0-PSK, EAP-PEAP1-TLS, EAP-PEAP1-MSCHAPv2, EAP-PEAP1-PSK; WPA Personal, WPA2 (AES), WPA (TKIP), WEP		

WIFI data loggers	testo 160 IAQ	testo 160 E
Order number	0572 2014	0572 2022
<b>WIFI</b>		
Standard	802.11 b/g/n	
Security	WPA2 Enterprise: EAP-TLS, EAP-TTLS-TLS, EAP-TTLS-MSCHAPv2, EAP-TTLS-PSK, EAP-PEAP0-TLS, EAP-PEAP0-MSCHAPv2, EAP-PEAP0-PSK, EAP-PEAP1-TLS, EAP-PEAP1-MSCHAPv2, EAP-PEAP1-PSK; WPA Personal, WPA2 (AES), WPA (TKIP), WEP	

### Technical data for a secure wireless LAN



#### Ports

The testo 160 WIFI data loggers use the MQTT protocol, which communicates via port TCP 1883 and 8883.

These UDP port approvals are also required:

- Port 53 (DNS name resolution)
- Port 123 (NTP time synchronisation)

All ports only have to be able to communicate externally to the Cloud. No bi-directional port approvals are necessary.



During the initial configuration, it is possible to select whether DHCP or Static IP is used (select Expert mode for the corresponding information). (Not possible in the Setup assistant.)



### testo 160 application

The testo 160 application is accessible via a normal, up-to-date browser (www). The standard TCP ports http (80) and https (443) are used.

### General data

WIFI data loggers	testo 160 TH	testo 160 THE	testo 160 THL
Order number	0572 2021	0572 2023	0572 2024
Operating temperature	-10 °C to 50 °C		
Storage temperature	-20 °C to 50 °C		
Protection class	IP20		
Measuring cycle	Depends on the Cloud licence Basic: 15 min to 24 h / Advanced 1 min to 24 h flexible		
Communication cycle	Depends on the Cloud licence Basic: 15 min to 24 h / Advanced 1 min to 24 h flexible		
Memory	32,000 readings (sum of all channels)		
Voltage supply	4 x AAA batteries 1.5 V Alternatively mains unit via USB connection		
Battery life	18 months At +25 °C, 15-minute measuring cycle and 6-hour communication cycle (depending on the WIFI structure)		
Dimensions	64 x 76 x 22 mm	64 x 76 x 22 mm	64 x 92 x 24 mm
Weight including batteries	94 g	94 g	113 g

WIFI data loggers	testo 160 IAQ	testo 160 E
Order number	0572 2014	0572 2022
Operating temperature	0 °C to 50 °C	-10 °C to 50 °C
Storage temperature	0 °C to 50 °C	-20 °C to 50 °C
Protection class	IP20	

















WIFI data loggers	testo 160 IAQ	testo 160 E
Measuring cycle	Depends on the Cloud licence Basic: 15 min to 24 h / Advanced 1 min to 24 h flexible (mains operation) Advanced 5 min to 24 h flexible (battery operation)	Depends on the Cloud licence Basic: 15 min to 24 h / Advanced 1 min to 24 h flexible
Communication cycle	Depends on the Cloud licence Basic: 15 min to 24 h / Advanced 1 min to 24 h flexible	
Memory	32,000 readings (sum of all channels)	
Voltage supply	4 x AA batteries Alternatively mains unit via USB connection	4 x AAA batteries 1.5V Alternatively mains unit via USB connection
Battery life	12 months at +25 °C, 15-minute measuring cycle and 8-hour communication cycle (depending on the WIFI reception quality)	18 months at +25 °C, 15-minute measuring cycle and 6-hour communication cycle (depending on the WIFI reception quality)
Dimensions	82 x 117 x 32 mm	64 x 76 x 22 mm
Weight including batteries	269 g	96 g

## 5 Authorizations



The use of the wireless module is subject to the regulations and stipulations of the respective country of use, and the module may only be used in countries for which a country certification has been granted. The user and every owner has the obligation to adhere to these regulations and prerequisites for use, and acknowledges that the re-sale, export, import etc. in particular in countries without wireless permits, is his responsibility.

Product	Mat.-No.	Date
testo 160 TH	0572 2021	07.11.2019
testo 160 E	0572 2022	07.11.2019
testo 160 THE	0572 2023	07.11.2019
testo 160 THL	0572 2024	07.11.2019
testo 160 IAQ	0572 2014	07.11.2019

Country	Comments										
Australia	 E 1561										
Belarus	Authorized										
Brazil	<table border="1"> <tbody> <tr> <td>testo 160 TH</td> <td>             Agência Nacional de Telecomunicações            00844-18-04701         </td> </tr> <tr> <td>testo 160 E</td> <td>             Agência Nacional de Telecomunicações            01829-18-04701         </td> </tr> <tr> <td>testo 160 THE</td> <td>             Agência Nacional de Telecomunicações            00854-18-04701         </td> </tr> <tr> <td>testo 160 THL</td> <td>             Agência Nacional de Telecomunicações            00848-18-04701         </td> </tr> <tr> <td>testo 160 IAQ</td> <td>             Agência Nacional de Telecomunicações            00853-18-04701         </td> </tr> </tbody> </table>	testo 160 TH	 Agência Nacional de Telecomunicações 00844-18-04701	testo 160 E	 Agência Nacional de Telecomunicações 01829-18-04701	testo 160 THE	 Agência Nacional de Telecomunicações 00854-18-04701	testo 160 THL	 Agência Nacional de Telecomunicações 00848-18-04701	testo 160 IAQ	 Agência Nacional de Telecomunicações 00853-18-04701
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	testo 160 E	 Agência Nacional de Telecomunicações 01829-18-04701									
	testo 160 THE	 Agência Nacional de Telecomunicações 00854-18-04701									
	testo 160 THL	 Agência Nacional de Telecomunicações 00848-18-04701									
testo 160 IAQ	 Agência Nacional de Telecomunicações 00853-18-04701										
Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.											
Canada	Contains IC : 21461-LSD4WF0459 TH/E/THE/THL: IC: 6127B-0572202X IAQ: IC: 6127B-05722014 IC Warnings										



Country	Comments
China	Testo 160 TH: CMIIT ID: 2017DJ4557 Testo 160 E: CMIIT ID: 2017DJ4559 Testo 160 THE: CMIIT ID: 2017DJ4564 Testo 160 THL: CMIIT ID: 2017DJ4547 Testo 160 IAQ: CMIIT ID: 2017DJ3243
Europa + EFTA	 <hr/>  The EU Declaration of Conformity can be found on the testo homepage <a href="http://www.testo.com">www.testo.com</a> under the product specific downloads. <hr/> <p>EU countries: Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY).</p> <p>EFTA countries: Iceland, Liechtenstein, Norway, Switzerland</p>
Japan	  211-160704 Japan Information
Malaysia	testo 160 IAQ: Authorized
Pakistan	Authorized
South Africa	ICASA Radio Equipment Type Approval Number: testo 160 IAQ: TA-2018/075
South Korea	 testo 160 TH: R-CRM-te2-05722021 testo 160 THL: R-CRM-te2-05722024 testo 160 IAQ: R-CRM-te2-05722014 KCC Warning
Turkey	Authorized
United Arab Emirates	Authorization Number: ER57487/17
USA	Contains FCC ID: N8NLS4WF0459 TH/E/THE/THL: FCC ID: WAF-0572202X IAQ: FCC ID: WAF-05722014 FCC Warnings

## 5 Authorizations

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Country	Comments	
Wi-Fi-Module	Feature	Values
	WLAN Range	100 m
	WLAN type	LSD4WF0459-01D0
	WLAN radio class	Accord with the standard of IEEE 802.11b/g/n
	Company	Lierda Technology Group co., LTD
	RF Band	2412-2472MHz
	Transmitter Power	13.42dBm

### IC Warnings:

This instrument complies with Part 15C of the FCC Rules and Industry Canada RSS-210 (revision 8). Commissioning is subject to the following two conditions:

- (1) This instrument must not cause any harmful interference and
- (2) this instrument must be able to cope with interference, even if this has undesirable effects on operation.

Cet appareil satisfait à la partie 15C des directives FCC et au standard Industrie Canada RSS-210 (révision 8). Sa mise en service est soumise aux deux conditions suivantes :

- (1) cet appareil ne doit causer aucune interférence dangereuse et
- (2) cet appareil doit supporter toute interférence, y compris des interférences qui provoquerait des opérations indésirables.

### FCC Warnings:

Information from the FCC (Federal Communications Commission)

#### For your own safety

Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

### FCC warning statement

This equipment has been tested and found to comply with the limits for a Class C digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cable must be used in order to comply with the emission limits.

### **Warning**

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.

### **Japan Information:**

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

### **KCC Warning**

해당 무선 설비는 운용 중 전파혼신 가능성이 있음.



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