testo 164
Online data loggers

0572 1641 xx – testo 164 T1
0572 1644 xx – testo 164 H1
0572 1646 xx – testo 164 DC
0572 1648 xx – testo 164 GW (WLAN)
0572 1649 xx – testo 164 GW (LAN/PoE)

User manual

Contents

1 About this document

- The instruction manual is an integral part of the instrument.
- Keep this documentation at hand so that you can refer to it when necessary.
- Always use the complete original instruction manual.
- Please read this instruction manual through carefully and familiarize yourself with the product before putting it to use.
- Hand this instruction manual on to any subsequent users of the product.
- Pay particular attention to the safety instructions and warning advice in order to prevent injury and damage to the product.

2 Safety and disposal

2.1 Security

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 operate the instrument if there are signs of damage to the housing or connected cables.
- Dangers may also arise from objects to be measured or the measuring environment. Always comply with the locally valid safety regulations when carrying out measurements.
- 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 this documentation. Follow the prescribed steps exactly when doing the work.
- Use only original spare parts from Testo.

Batteries and rechargeable 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 charge batteries where there is a non-rechargeable battery system. Attempting to charge a non-rechargeable battery may cause gas to be produced or heat to be generated. That may lead to the escape of gases, an explosion and/or possibly to fire.

- With rechargeable batteries, never use chargers which are not suitable for the battery type. Suitable chargers for Testo products are to be found in the list of accessories.
- Do not short batteries.
- Do not disassemble or modify the batteries.
- Do not expose the batteries to strong shocks, water, fire or temperatures above 60 °C.
- Do not store the batteries near metal objects.
- Do not use leaking or damaged batteries.
- Batteries must be disposed of in accordance with the local and country-specific regulations. In order to prevent short circuits and the associated heating, lithium batteries must never be stored unprotected in bulk. Appropriate measures against short circuits are for instance inserting the batteries into the original packaging or a plastic bag, masking the poles or embedding them in dry sand.
- If there is any contact with battery fluid: Wash the affected areas thoroughly with water and consult a doctor if necessary.

Built-in batteries

⚠ DANGER

Risk of death!
The built-in battery can explode if it gets too hot.

- Do not expose the product to ambient temperatures above 85°C.

- Do not heat batteries above the permitted temperature or burn them. If a battery is heated, this may lead to the leakage of battery acid and/or to an explosion. Lithium batteries can, for instance, react very strongly in combination with fire. This may involve battery components being emitted with considerable power.
- Do not consume the battery; risk of burns due to hazardous substances. Keep new and used batteries away from children.
- Lithium batteries must be transported and shipped in accordance with the local and country-specific regulations.

Warnings

Always pay attention to any information denoted by the following warnings. Implement the precautionary measures specified!

⚠ DANGER

Risk of death!

⚠ WARNING

Indicates possible serious injury.

⚠ CAUTION

Indicates possible minor injury.

ATTENTION

Indicates possible damage to equipment.

2.2 Disposal

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

WEEE Reg. No. DE 75334352

3 Intended use

The testo 164 online data loggers record measurement values (temperature, humidity or door contact) and send them to the testo 164 Gateway via a proprietary wireless connection.

The gateway receives the measurement data from the testo 164 online data loggers via the proprietary wireless connection. The measurement values are sent to the testo Saveris Cloud via WLAN or Ethernet.

The testo 164 H1 humidity sensor must not be used in dusty environments, as the sensor could become contaminated.

The sensor is susceptible to pollutants and must be protected from exposure to volatile chemicals, acids, bases and cleaning agents.

The components of the testo 164 online data logger system are not designed for outdoor use when delivered. Outdoor use requires measures that reliably protect the product from environmental influences (e.g. moisture, sunlight). Please note that measures to protect against environmental influences can impair the performance of the system.

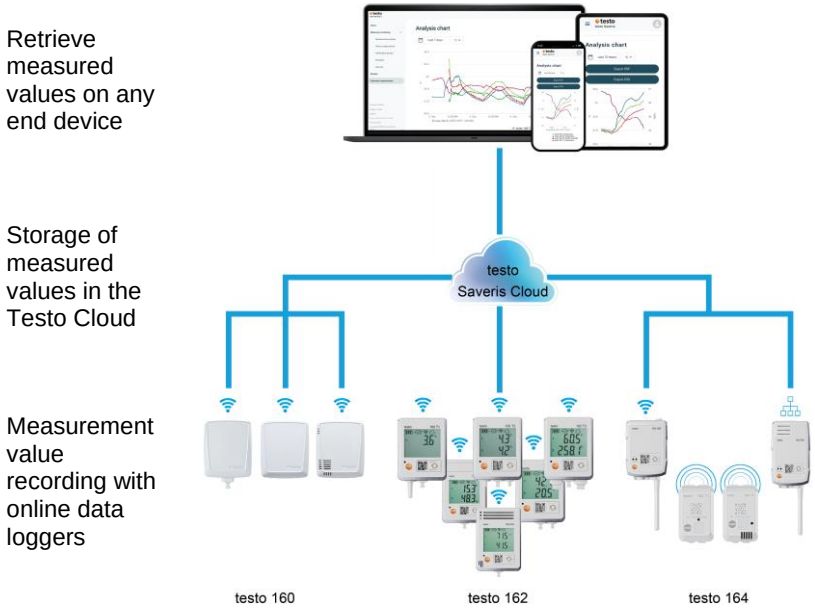
4 Product description

4.1 System overview

The testo 160 online data logger system is the modern solution for monitoring temperature and humidity values. Other measurement variables such as CO_2, atmospheric pressure, lux and UV can also be measured.

The testo 160 online data logger system consists of the hardware components (testo 160, testo 162, testo 164) as well as the testo Saveris Cloud and testo Smart App. The testo Saveris Cloud is the central data platform. Measurement values can be viewed and analyzed there.

The testo 160, testo 162 and testo 164 products offer you maximum flexibility thanks to their wide range of variants and can be easily combined and expanded in your testo account.



If limit values are exceeded, you can be alerted directly via push notification of limit value violations thanks to the testo Smart App. Alternatively, you can be notified by email or SMS.

You can access all measurement values and analysis functions anytime and anywhere using your internet-enabled smartphone, tablet or PC.

A valid license must be purchased to operate the online data logger in the cloud (Data Monitoring License).

The transmission of data from the online data loggers testo 164 to the Gateway takes place via Sub1-GHz communication.

For the transfer of data from the Gateway to the Cloud, a customer LAN or WLAN infrastructure is required (not part of the scope of delivery).

4.2 testo Account

The online data loggers (testo 160, testo 162, testo 164) require an associated testo account to ensure operation.

Each data logger operated there requires a testo Data Monitoring license.

4.3 testo 164 T1

	The testo 164 T1 is an easy-to-use online data logger for automated temperature monitoring with integrated sensor. Testo 164 T1 is a component of the testo 160 online data logger system. No additional cables need to be installed.

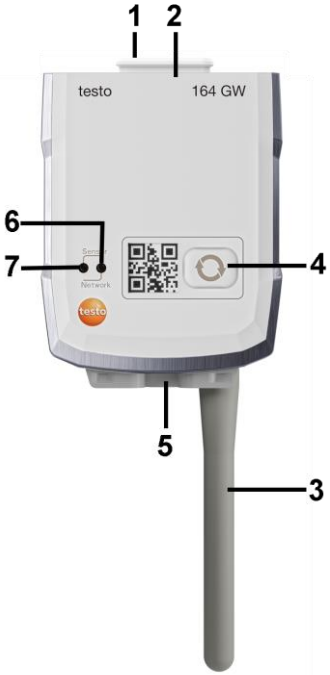
4.4 testo 164 H1

	The testo 164 H1 is an easy-to-use online data logger for automated temperature and humidity monitoring with integrated sensor. Testo 164 H1 is a component of the testo 160 online data logger system. No additional cables need to be installed.

4.5 testo 164 DC

	The testo 164 DC is an easy-to-use online data logger for monitoring doors (opening & closing). Testo 164 DC is a component of the testo 160 online data logger system.

4.6 testo 164 Gateway



1	IP protective cap over TCI connection	2	TCI[1] connector (connector for communication module)
3	Antenna for Sub1-GHz communication online data loggers	4	Connect key to establish connection mode to register the online data loggers
5	Micro USB connection socket for data exchange (connection data and service data) and power supply	6	Network LED
7	Sensor LED		

Explanation of icons

	Notice on the back of the unit: Refer to instruction manual

[1] Testo Communication Interface

4.6.1 Key functions

The Connect key on the Gateway has different functions depending on how long it is pressed:

Key operation	Function
Press the key <3 s.	Set the Gateway to connection mode for 3 minutes to connect new online data loggers.
Press the key >5 s.	Switch off the Gateway (for battery operation).
Press the key >20 s.	Reset the Gateway to factory settings.

4.6.2 Sensor LED

Signals communication with the online data logger:

Function	Signal	Colour
Connection mode	On continuously	Green
Connection mode cannot be initiated (no system time)	5 x prolonged flash	Red
New online data logger connected	2 x short flash	Green
30 online data loggers connected/no other connections possible (connection mode ended)	2 x short flash	Red
Connection mode ended → back to standard mode	Off	
Received data from online data logger	1 x short flash	Green
Standard mode	Off	

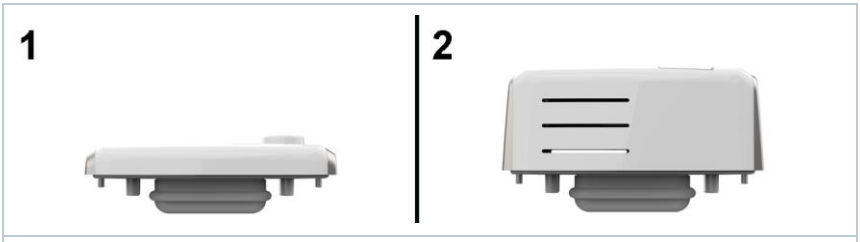
4.6.3 Network LED

Signals communication with the network/Cloud:

Function	Signal	Colour
Configuration mode (configuration data has been saved and the Gateway is connected with the Cloud.)	Alternate flashing	Orange/green
Configuration saved and connection available	5 s on	Green
No or incorrect configuration (no SSID or account ID)	Continuous fast flashing	Red
Configuration after 5 min with no connection (connection timeout)	1 x prolonged flash	Red
Connection not available - No connection via Ethernet cable - No WLAN connection Network or hardware error	Continuous rapid flashing	Red

Function	Signal	Colour
Communication with Cloud	2 x short flash	Green
FW update via radio	Alternate flashing	Green/red
Reset to factory setting	Alternate 5 x short flash	Orange/red
Weak battery voltage established (only when no batteries are inserted)	4 x short flash	Red

4.6.4 Communication modules



1	WLAN communication module (for Gateway 0572 1648)	2	LAN/PoE communication module (for Gateway 0572 1649)

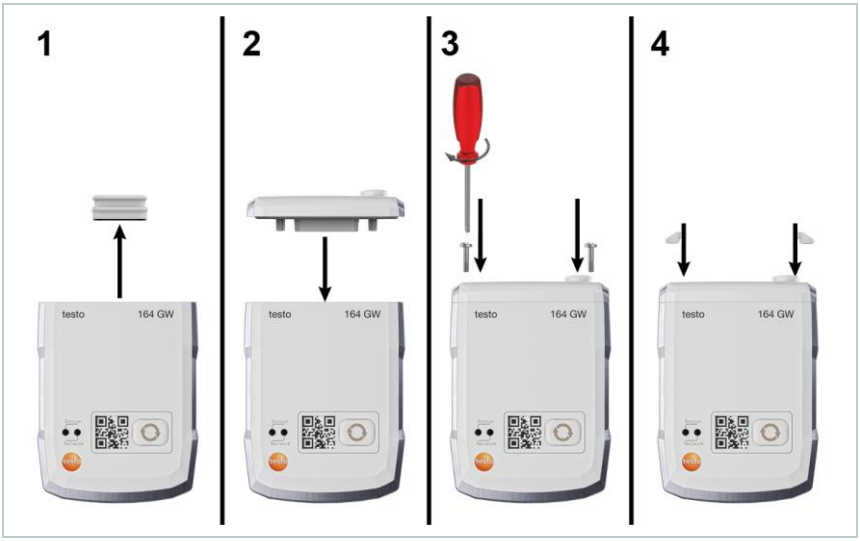
4.7 Logger functions and LED displays

Function	Action/key	Signal
Switching on online data logger	Press the key 1 s.	From deactivated state: Flashes green for 90 s. After 90 s: 1 x 3 s green → connection established to Gateway 1 x 2 s red → connection not established to Gateway Flashes green for 90 s. From shot-down mode: Flashes red for < 3 min. After < 3 min: 1 x 3 s green → connection established to Gateway LEDs off → no connection to Gateway, but still roaming

Function	Action/key	Signal
Manual measurement initiation (in operating mode)	Press the key 1 s.	2 x green flashing
Reset online data logger to factory settings/delivery status	Press the key >20 s.	Press key after 20 s: 4 x red flashing Then: 2 x green flashing and 2 x red flashing → reset performed 4 x red flashing → reset not performed
Activating sensor shut-down mode	Press the key >3 and <20 s.	1 x green flashing and 1 x red flashing (old logging data and configuration is saved, no new data is recorded)

5 Commissioning

5.1 Attaching the communication module



The picture shows an example of the installation of the WLAN communication module.

1. Remove the protective cap.
2. Place the communication module on the Gateway.
3. Attach the communication module to the Gateway using the screws.
4. Close screw openings with rubber plugs.

5.2 Connecting the antenna and mains unit

1. Remove the dummy plug from the USB port.

1.1 Optional: Insert batteries; see chapter “Replacing the batteries”.

2. Connect the mains unit using the USB cable.
3. Screw the antenna into the connection.

5.3 Creating a testo Account

If you do not yet have a testo account, register at: https://www.testo.com/login

Registration is also possible via the testo Smart App.

The testo Smart App is available for iOS devices in the AppStore or for Android devices in the Play Store.

Compatibility:

Requires iOS 13.0 or newer / Android 8.0 or newer, requires Bluetooth® 4.2.2.

5.4 Configuring the testo 164 Gateway

When using WLAN, make sure that a stable WLAN connection is available before you start configuring the Gateway.

If using Ethernet, make sure that the Ethernet connection of the Gateway is not blocked by a firewall.

The gateways can be integrated into your network and into your testo account in several ways:

- Commissioning via testo Smart App (via WLAN hotspot)
- Offline commissioning via PDF (via USB cable)

In networks with WPA2 Enterprise encryption, commissioning via the testo Smart App is not possible.

5.4.1 Commissioning via testo Smart App

To establish a connection via WiFi hotspot, you need a tablet or smartphone with the Testo Smart App already installed on it.

You can get the App for iOS instruments in the App Store or for Android instruments in the Play Store.

Compatibility:

Requires iOS 13.0 or later / Android 8.0 or later.

1 Open testo Smart App.

2 Select the application **Datalogger & Monitoring** | **Monitoring**.

3 Login or register in the testo account.

4 Select **Commissioning**.

5 Follow the step-by-step instructions.

5.4.2 Configuring the Gateway offline via PDF (via USB cable)

✓ The computer is switched on.

✓ The communication module is attached, screwed on and closed with cover caps.

1 Connect the Gateway to a computer using the micro USB cable.

▸ Gateway connection – computer connection is established.

2 Open “Saveris” folder.

3 Open **NetConf.pdf**.

▸ PDF form is opened.

4 Enter **Account ID**.
You can find this in your Cloud account.

5 Configure the network.

▸ Depending on the selected communication module, make the appropriate WLAN or LAN settings.

5.1 For WLAN use, configure the **Network Name (SSID)** and enter the encryption (**Security**) and password.

IMPORTANT

The WLAN password must not contain the following special characters:
>, <, “, ‘, &.

6 Select **Expert Mode** to check if the Gateway is configured for **DHCP** or static IP addresses (**Static IP**, standard setting).

6.1 For operation via static IP addresses, enter the valid network parameters (**Custom NTP Server**).

7 Save the entry on the Gateway.

▸ The dialogue opens for exporting the form data.

8 Select the external Gateway drive as the storage location and save the form data (configuration file WiFiConf_data.xml).

9 Remove the micro USB cable from the Gateway.

You can also save the configuration file locally on the computer and configure other Gateways more quickly by simply copying the XML configuration file to their memory.

10 Connect the Gateway to the power supply using the USB cable.

Do not use the computer as a power supply.

11 After rebooting, the Gateway starts connecting to the Cloud.

5.4.3 Required ports

The Gateway uses the MQTT protocol which communicates via TCP ports 1883 and 8883.

Releases are also required for the following UDP ports:

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

All ports only have to be released externally for communication to the Cloud. Bidirectional port releases are not required.

5.5 Connecting online data loggers with the Gateway

To connect the online data loggers to the Gateway, the online data loggers and the Gateway must be set to connection mode.

1. Briefly press the key on the front of the online data logger <3 s.
   - The online data logger is in connection mode for 90 s.
   - LED flashes green at one-second intervals.
2. Press the key on the front of the Gateways <3 s.
   - The Gateway is in connection mode for 3 min.
   - The sensor LED on the Gateway is lit up constant green.
   - When the new online data logger is connected, the sensor LED flashes green twice.

When installing online data loggers in refrigerated or deep-freeze rooms, the nature of the walls may lead to weakening of the radio signal. This may also affect the battery life.

5.6 License

After successfully commissioning the data loggers, you must book a valid license for operating the data loggers in the testo Saveris Cloud.

Make sure that you have a valid license for each data logger.

1. Open testo Cloud Account (in the testo Smart App or directly in the testo Saveris Cloud).
2. Open **Account-Informationen**.
3. Select **License Management**.

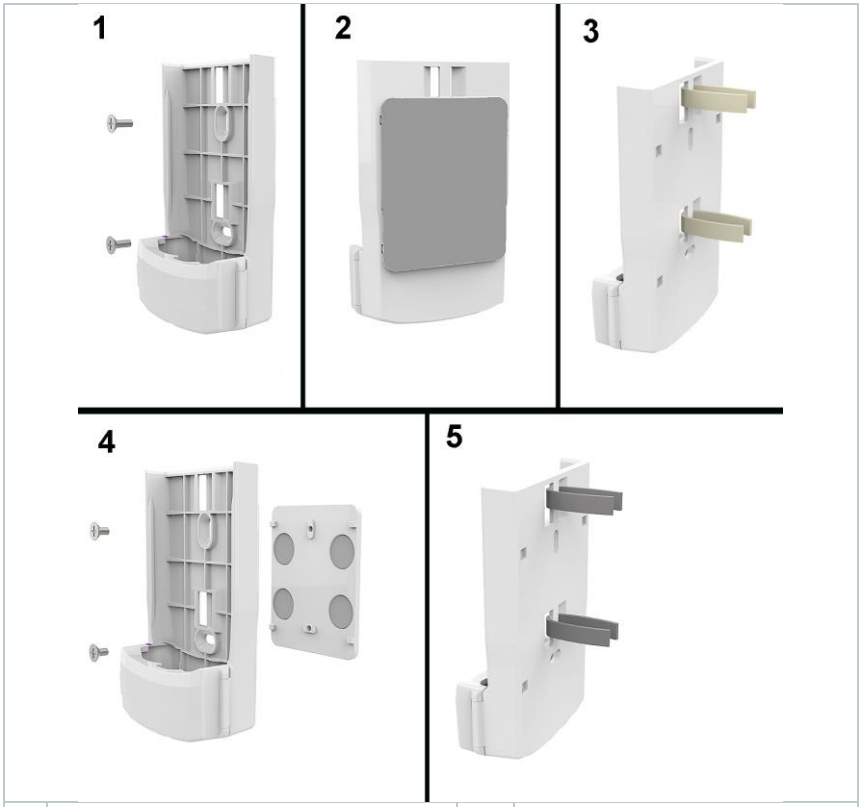
5.7 Configuration and operation of online-data loggers

The testo 160, testo 162 and testo 164 online data loggers can only be used and operated in conjunction with the testo Saveris Cloud.

Information on operating the data loggers (configuration, limit values, alarms, etc.) can be found in the notes and info boxes in the testo Saveris Cloud.

5.8 Attaching the wall bracket

The wall bracket ensures that the Gateway is kept securely in place.



1	Attaching the bracket using screws	2	Double-sided adhesive tape
3	Cable ties	4	Magnetic holder (optional)
5	Customer-specific fastening material, e.g. Velcro		

1 Mount the wall bracket at the designated location using suitable mounting materials.

5.9 Inserting the Gateway in the wall bracket

✓ Power supply, antenna and communication module are connected.

1 Insert the Gateway in the wall bracket.

2 Close the cover.

5.10 Mounting online data loggers

5.10.1 Wall mounting

The online data logger can be attached directly to most materials with adhesive strips.

The separately available wall bracket is used to attach the online data logger to materials where attachment by means of adhesive strips is not possible.

Select appropriate mounting materials according to the required mounting location. The wall bracket can be attached using suitable screws or cable ties.

⚠ DANGER

Risk of death!
Electric cables may get damaged.

- When fixing the wall bracket using screws, it must not be mounted directly on electrical systems.

When using adhesive tape, make sure that the substrate is clean and free of grease and use adhesive tape that is approved for use in the food sector.

IMPORTANT

Damage to online data logger possible.

- When mounting online data loggers, make sure that they are only mounted in splash-proof locations.

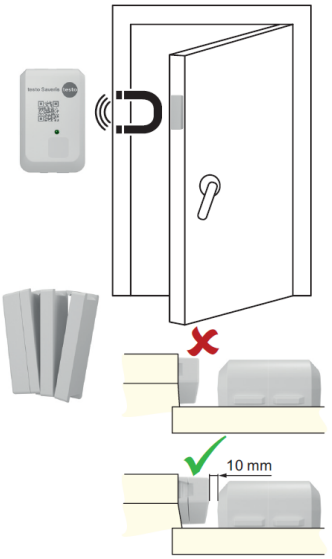
Do not mount the online data loggers at a height of more than 2 metres.

5.10.2 Door contact sensor

Adhesive strips can be used to mount the testo 164 DC.

Please pay attention to the following points when fixing the testo 164 DC:

- The magnet is mounted on the door.
- The sensor is mounted on the frame.
- The distance between sensor and magnet must not be more than 1 cm.
- Depending on the structural conditions, the magnet can be mounted either directly or using one or two spacers (included in the scope of delivery).



If the testo 164 DC is mounted on metal doors, this may lead to weakening of the signal.

6 Maintenance and care

6.1 Cleaning the online data loggers

Only use mild, commercially available, neutral/household cleaning agents (e.g. washing-up liquid) to clean the online data loggers. Do not use aggressive cleaning agents or solvents!

6.2 Cleaning the Gateway

Only use mild, commercially available, neutral/household cleaning agents (e.g. washing-up liquid) to clean the Gateway. Do not use aggressive cleaning agents or solvents!

6.3 Changing batteries

The gateway is powered by an external mains unit or PoE and the batteries only serve as a backup battery in case of failure of the regular power supply.

We recommend replacing the batteries after 3 years of operation at the latest.

1. Open the wall bracket cover.

2. Remove the Gateway.
3. Remove the power supply (USB).

4 Open the battery compartment cover using a suitable screwdriver.

5 Remove the battery compartment cover.

6 Remove spent batteries and insert new ones.

Ensure that you insert the batteries correctly.
The correct polarity is illustrated in the battery compartment.

7 Place the battery compartment cover on the housing of the Gateway.

8 Screw the battery compartment cover tightly onto the housing.

9 Reconnect the power supply (USB).

▸ The Gateway establishes a connection to the Testo Cloud; (LED flashes green).

⚠ CAUTION

Unwanted residual discharge when disposing of old batteries.

- Mask the poles of the old batteries in order to prevent an unintended residual discharge due to short-circuits during disposal.

6.4 Removing the batteries of the online data loggers for disposal

The testo 164 T1 and testo 164 DC online data loggers are equipped with a permanently installed battery to ensure the high protection class IP67.

It is therefore not possible to change the battery.

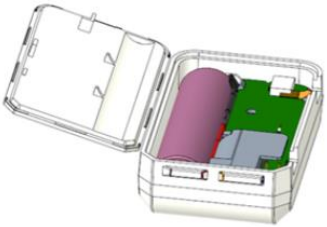
At the end of its service life, dispose of the product separately for electrical and electronic equipment (observe local regulations) or return the product to Testo for disposal.

The battery can be removed from the data logger for separate disposal.

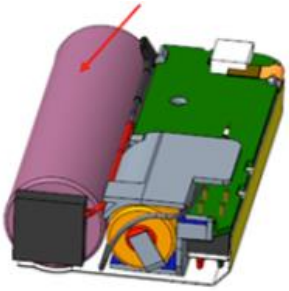
1 Remove the two soft plugs.

2 Break open the back of the housing..

3 Open the cover on the back of the housing.



4 Remove the circuit board and battery (red arrow) and dispose of them separately in accordance with local regulations.



⚠ CAUTION

Unintentional residual discharge when disposing of old batteries.

- Tape the terminals of the old batteries to prevent unintentional residual discharge due to short circuits during disposal.

7 Troubleshooting

7.1 Questions and answers

Question	Possible cause/solution
Can the Gateway also be used in networks with WPA2 Enterprise encryption?	The Gateway with WLAN communication module can be used in networks with the following WPA2 Enterprise encryptions. EAP-TLS, EAP-TTLS-TLS, EAP-TTLS-MSCHAPv2, EAP-TTLS-PSK, EAP-PEAP0-TLS, EAP-PAP0-MSCHAPv2, EAP-PEAP0-PSK, EAP-PEAP1-TLS, EAP-PEAP1-MSCHAPv2, EAP-PEAP1-PSK To integrate the Gateway into the WPA2 Enterprise network, proceed as follows: 1. Open the PDF file stored on the Gateway and generate a corresponding XML file by selecting the programming options step by step. 2. Copy your company-specific WPA2 Enterprise certificates and the generated .XML file to the Gateway mass storage via USB using drag and drop. 3. Please pay special attention to the correct spelling and to the suffixes of certificate names: **ca.pem, client.pem, private.key.** Check whether the certificate is available in a PEM or BASE64 format. Open the certificate using a text editor and check that you can see the string “-----BEGIN CERTIFICATE-----”. If you cannot see this string, the IT department or the user must explicitly export the certificate from the RADIUS server using BASE64 or convert it using openssl. There must be one certificate only, not a bundle, inside the file. 4. Please that the configuration of the Gateway is only fully applied after the USB connector has been removed.  Commissioning a gateway in a network with WPA2 Enterprise encryption is not possible via the testo Smart App, but only via USB.

Question	Possible cause/solution
The XML configuration file is not applied by the Gateway – what can I do?	Depending on the operating system, there may be difficulties with the data transfer if the configuration file name has been changed. Leave the default file name.
Error code E19	The configuration file **NetConf_Daten.xml** has an error or is incomplete. Use the **configuration PDF** to create a new configuration file and save this on the Gateway.
Error code E20	A WPA2 Enterprise EAP connection needs to be configured, but no CA certificate could be found. A CA certificate is essential. Save the CA certificate in PEM format under the name **ca.pem** together with the XML file on the Gateway.
Error code E21	The **ca.pem** certificate format is incorrect; (only applies to WPA2 Enterprise). Check whether the **ca.pem** certificate is available in a PEM or BASE64 format. Open the certificate using a text editor and check that you can see the string "-----BEGIN CERTIFICATE-----". If you cannot see this string, the IT department or the user must explicitly export the certificate from the RADIUS server using BASE64 or convert it using openssl. There must be one certificate only, not a bundle, inside the file.
Error code E22	A WPA2 Enterprise EAP-TLS connection needs to be configured, but no user certificate could be found; (only applies to WPA2 Enterprise). Save the user certificate in PEM format under the name **client.pem** together with the XML file on the Gateway.
Error code E23	The **client.pem** user certificate format is incorrect; (only applies to WPA2 Enterprise). Check that the **client.pem** user certificate is available in a PEM or BASE64 format. Open the certificate using a text editor and check that you can see the string "-----BEGIN CERTIFICATE-----". If you cannot see this string, the IT department or the user must explicitly export the certificate from the RADIUS server using BASE64 or convert it using openssl. There must be one certificate only, not a bundle, inside the file.

Question	Possible cause/solution
Error code E24	A WPA2 Enterprise EAP-TLS connection needs to be configured, but no private key could be found; (only applies to WPA2 Enterprise). Save the private key in PEM format under the name **private.key** together with the XML file on the Gateway.
Error code E25	The **private.key** certificate format is incorrect; (only applies to WPA2 Enterprise). Check whether the private key is available in a PEM or BASE64 format. Open the certificate using a text editor and check that you can see the string "-----BEGIN CERTIFICATE-----". If you cannot see this string, the IT department or the user must explicitly export the certificate from the RADIUS server using BASE64 or convert it using openssl. There must be one certificate only, not a bundle, inside the file.
Error code E26	There are four possible reasons for this error: • The access point (WLAN router) is outside the wireless range or is switched off. Check whether the access point is available. If necessary, change the location of the Gateway. • The network name (SSID) stored in the Gateway (online data loggers) is incorrect. Check the network name of the WLAN network. Use the **configuration PDF** to create a new XML configuration file with the correct network name and save this on the Gateway. • The access point of the WLAN network does not use one of the following encryption methods: WEP, WPA (TKIP), WPA2 (AES, CCMP). Configure the access point so that one of the supported encryption methods is used. • There is no Ethernet connection
Error code E32	The Gateway has received no IP address. There are two possible reasons for this error: • The network password is incorrect. Check the password of the WLAN network. Use the **configuration PDF** to create a new XML configuration file with the correct password and save this on the Gateway. • The access point (WLAN router) has a MAC filter or does not permit the integration of new devices. Check the settings for the access point.

Question	Possible cause/solution
Error code E36	The DNS could not be resolved: • The access point (WLAN router) is not connected to the internet. Check the access point's internet connection. or • The routing within the network infrastructure is not working. Check if too many terminal devices are logged into the access point.
Error code E52	Login failed! The Gateway is already registered in a Cloud account. Contact your authorised Testo Service to proceed further.
Error code E53	During configuration of the Gateway, an invalid account has been entered via the **Configuration PDF**. Check this out.

8 Technical data

8.1 Online data loggers

Measurement-specific data

Online data logger	testo 164 T1 0572 1641	testo 164 H1 0572 1644	testo 164 DC 0572 1646
Sensor type	Ambient temperature digital	Humidity and ambient temperature	Door contact
Measuring range	-30 ... +85 °C	-10 ... +50 °C 0 … 100 % RH (not for condensing atmospheres)[2]	-
Accuracy	± 0,5 °C	± 0,5 °C ≤ ± 5 % RH (0 .. <10 % RH) ≤ ± 3 % RH (10 .. <35 % RH) ≤ ± 2 % RH (35 .. <65 % RH) ≤ ± 3 % RH (65 .. <90 % RH) ≤ ± 5 % RH (90 .. 100 % RH) ≤ ± 1 % RH Hysteresis ≤ ± 1 % RH / drift per year ≤ ± 0.06 % RH/K (0 … 50 °C)	
Resolution	0,1 °C	0,1 °C 0,1 % RH	
Measuring cycle	1 min … 24 h	1 min … 24 h	
Response time	t90 (20K): < 20 min	t90 (20K): < 25 min	

CAUTION

Humidity sensor may be damaged!

- **After using the data logger for up to 60 hours in high-humidity areas above 80%, it must be brought to relaxation.**
- **Here, the conditions should be +25 °C +/- 5 °C and a relative humidity of 50 % +/- 10 %.**

[2] The humidity sensor has the highest accuracy between 5 °C and 60 °C, and between 20 % and 80 %RH. If the instrument is exposed to high humidity for a longer period of time, the measuring accuracy decreases. The humidity sensor is regenerated within 48 hours via storage at 50 %RH ±10 % and 20 °C ±5 °C.

Radio specific data

Online data logger	testo 164 T1 0572 1641	testo 164 H1 0572 1644	testo 164 DC 0572 1646
Radio frequency	Sub1-GHz		
Wireless range	For clear transmission path up to 120 m If clear transmission path obstructed up to 50 m		
General encryption methods	TLS encryption		

General data

Online data logger	testo 164 T1 0572 1641	testo 164 H1 0572 1644	testo 164 DC 0572 1646
Operating temperature	-30 ... +85 °C	-10 ... +50 °C	-30 ... +85 °C
Storage temperature	-30 ... +85 °C	-30 ... +60 °C (@ 20 … 60 % RH)	-30 ... +85 °C
Protection class	IP 67	IP 20	IP 67
Memory	300 readings		
Dimensions	62,6 x 38 x 17,5 mm	62,6 x 38 x 17,5 mm	62,6 x 38 x 17,5 mm
Weight (including batteries)	Approx. 44 g	Approx. 44 g	Approx. 44 g
Door contact			x
Cable length (including metal tip)			
Internal sensor	x	x	
External sensor			

Energy management

Voltage supply: lithium battery

(The information on the battery life applies to a measuring cycle of 15 minutes and a specified signal strength RSSI (radio signal strength indicator) greater than 15 % on average.)

Temperature	Battery life
-30 °C	Up to 10 years
-20 °C	Up to 10 years
0 °C	Up to 10 years
+25 °C	Up to 10 years
+65 °C	Up to 8 years

8.2 testo 164 GW (Gateway)

Feature	With mounted WLAN communication module	With mounted LAN/PoE communication module
Order number	0572 1648 XX	0572 1649 XX
Connections	Micro USB for voltage supply	
Dimensions (W x H x L)	69 x 101 x 29 mm	69 x 119 x 29 mm
Length of Sub1-GHz antenna	85 mm	
Weight	220 g	247 g
Power supply (standard operation)	5 V DC/2 A, external mains unit	
Power supply (emergency operation)	Batteries (not included in scope of delivery): 4 x AA AlMn batteries as backup battery For temperatures below +10 °C, we recommend using Energizer L91 Photo-Lithium (AA Mignon) batteries. Battery life: 6 h	
Protection class	IP 42 (Indication of closure of unused ports using rubber stoppers)	IP 30 (Indication of closure of unused ports using rubber stoppers)
Housing material	PC/PET (front side); ABS+PC+10% GF/PET(rear side)	
Storage temperature	-40 °C to +60 °C	
Operating temperature	0 °C to +50 °C	

Testo SE & Co. KGaA
Celsiusstraße 2
79822 Titisee-Neustadt
Germany
Telefon: +49 7653 681-0
E-Mail: info@testo.de
Internet: www.testo.com

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