TEWS
MEASURABLY BETTER

TEWS MW 55

Instructions for Use

Process and Laboratory Moisture Measuring

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240704EN
Art. 177489

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TEWS Elektronik GmbH & Co. KG
Translation of original operating manual - July 2024

Safety notes

This documentation describes the setup and operation of the TEWS MW 55 microwave measurement system (article number 177489).

This documentation describes various types of application relating to the measurement of moisture and density. The installation of the sensors and, if required, the connection of other optional peripheral devices depends on the positioning and requirements of the product to be measured. Therefore, separate documentation is provided.

Read this documentation before using the device. The documentation must be stored in the immediate vicinity of the device for future reference until the device is disposed of.

Status

The information in these instructions corresponds to the device status at the time of publication of this document. We reserve the right to make changes for technical progress.

Copyright information

Trademark notice

Excel, Microsoft and Windows are registered trademarks or trademarks of the Microsoft Corporation in the USA and/or other countries.

Intended use

The TEWS MW 55 is a fully automatic and contactless microwave measurement system for determining the moisture content and mass per unit area of a range of different products that are already packed in cardboard boxes or are processed in batches. It can also be used to monitor the quality of end products or for process control.

The system delivered may be used only for this purpose or the purpose stated in the order confirmation, taking into account the technical data. Utilisation other than for the intended use is not permissible. Smooth functioning and operating safety of the device can be ensured only if the general safety precautions, national regulations and the special safety instructions in these operating instructions are adhered to during operation.

Only the compliance with this information is valid as intended use. If the device is not operated in compliance with the manufacturer's operating manual, then the intended protection can be impaired.

Foreseeable misuse

Devices of the type TEWS MW 55 are not approved for use in a potentially explosive area and therefore must not be used in any potentially explosive area.

Use for the operation of toys or onboard an aircraft, a ship, or a satellite is prohibited.

Qualifications of operating personnel

Operating the device

To prevent malfunctions and damage to the measurement system and during production, this system must be operated only by appropriately qualified, trained personnel. The owner of the device is responsible for ensuring that appropriate training is provided, for example, for new personnel. The operating personnel must have read and understood the operating manual.

Installation

- The customer can perform the mechanical setup of the system and adjust the conveyor belt.
- The cable in the switch cabinet must be connected only by electrical specialists while the power plug is disconnected.
- TEWS staff perform the initial commissioning and configuration of the software, including the creation of the products to be measured.

Maintenance

Some maintenance must be performed only by electrical specialists (see “Service and maintenance”, page 71).

Unsafe conditions

This device has been built and tested in accordance with EN 62368-1 (2021-05) **Audio/video, information and communication technology equipment - Part 1** and has left the factory in a perfectly safe condition. If it is suspected that the device can no longer be operated safely, it must be taken out of service and marked appropriately to secure it against further use. The safety of the user can be compromised by the device if

- the TEWS MW 55, antennas or accessories show visible signs of damage,
- the device no longer works as intended,
- the power cable or the plug are damaged,
- the device has been dropped,
- the device was stored in unsuitable conditions for prolonged periods,
- the device was subjected to unsuitable transport conditions, or
- the device contains loose parts.

In case of doubt, the device must be sent to the manufacturer for repair or maintenance.

Changes

For reasons of safety, you are not permitted to make changes or alterations to the device without our permission.

The device must only be opened and modifications, servicing and repairs must only be carried out by authorized personnel.

Risk of death due to electric shock!
Power supply unit, line filter and surge protection modules are safety-relevant components and must not be opened or repaired!

Note:	The specified degree of protection is only guaranteed if the original connectors and sealing caps are used.

Danger during operation

Risk of death due to electric shock!
Do not immerse the TEWS MW 55 in water or other liquids or let it get into contact with these substances. Do not place receptacles filled with liquid, such as cups of coffee, on the TEWS MW 55. Electric shock hazard!

Disconnect the plug of the TEWS MW 55 from the mains socket:

- if you are not using the device for longer periods,
- before cleaning the device,
- before disassembling the device,
- when working on the TEWS MW 55, e.g. attaching peripherals or changing fuses,
- if there is an obvious malfunction during operation,
- in the event of a storm.

Always pull on the plug, not on the cable.

Risk of death due to electric shock!
To adhere to EMC and safety regulations, the device must be operated with the PE conductor connected.

Risk of death due to electric shock!
The door of the TEWS MW 55 must be closed during operation.
The key for the switch cabinet door must be stored with protection against unauthorised access.

The door of the TEWS MW 55 must be opened only by electrical specialists while following the five safety rules:

1. Disconnect
2. Secure against reactivation
3. Ensure that no voltage is present
4. Ground and short-circuit
5. Cover or cordon off neighbouring live parts

Risk of death due to electric shock!
Pressing the on/off switch **does not** de-energise the TEWS MW 55. For safety reasons, the TEWS MW 55 must therefore be fully disconnected from the mains by pulling the power plug before performing any work inside the device (such as establishing connections, for example). This work must only be carried out by authorized personnel.

Installation

The enclosure must be secured against tipping over during transport, setup and disassembly.

Risk of death due to electric shock!
Parts inside the TEWS MW 55 remain live even when the device is switched off. Before installation and maintenance work or modifications, the device must be disconnected from the power supply.

The TEWS MW 55 is intended only for use indoors and must be installed with protection from rainfall and splash water.

Connect the device to an AC outlet installed properly and with voltage corresponding to the “Technical data”.

Ensure that the electric cable cannot be damaged by sharp edges or hot objects. The electric cable must not be bent or crushed.

Risk of death due to electric shock!
To adhere to EMC and safety regulations, the device must be operated with the PE conductor connected.

The TEWS MW 55 is intended for fixed installation on a wall or load-bearing frame. In particular, it is not permitted to operate the switch cabinet while it is free-standing in an upright or horizontal position.

The device may only be installed in a vertical position with the top of the housing facing upwards.

If the external connectors are not connected during operation, storage or transport, the protective caps provided must always be attached. This is the only way to ensure the guaranteed degree of protection for the switch cabinet and prevent the connectors from becoming dirty.

The TEWS MW 55 weighs approximately 45 kg. Work in twos during the installation.

Maintenance

Risk of death due to electric shock!
Before maintenance work or cleaning with liquids, the device must be disconnected from the power supply.

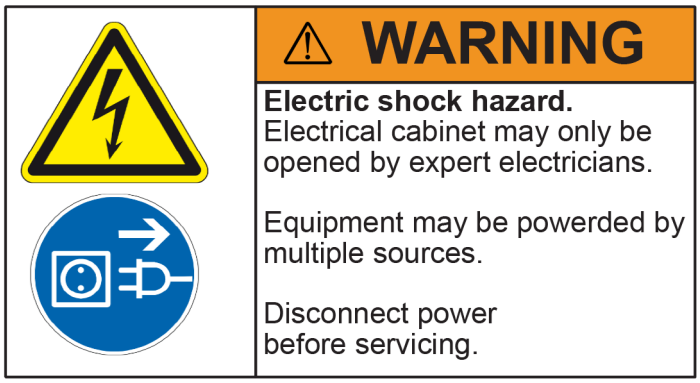
Power supply unit, line filter and surge protection modules are safety-relevant components and must not be opened or repaired!

Defective fuses must be replaced only by electrical specialists. Fuses must be replaced only with types that have the same characteristics.

For cleaning tasks, do not use abrasive cleaning agents or cleaning agents that contain solvents.

Safety-relevant signs on the devices

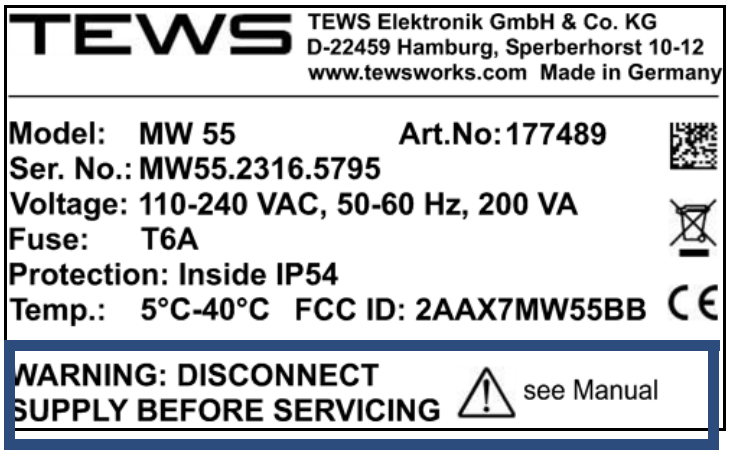
The following warning signs are attached to the left side of the TEWS MW 55:



Risk of death due to electric shock!
There are live parts inside the TEWS MW 55. Some parts inside the device remain live even when the device is switched off!
> The switch cabinet must only be opened by qualified personnel.
> Disconnect the mains plug before opening the switch cabinet.

Risk of injury due to heavy weight!
The device weighs 45 kg. Lifting or carrying the device may result in muscle or back injuries.
> Use lifting aids and the correct lifting technique when moving and installing the device.

The identification plate contains the following warning:



Warning: Disconnect supply before servicing

Before installation/deinstallation, service work or cleaning with liquids, you must disconnect the device from the power supply. Please refer to the corresponding safety information and work instructions.

Risk of damage to property

Ensure that there is sufficient distance from sources of heat such as heating plates, heater pipes, etc.

Do not use abrasive chemical substances, scouring material, hard sponges or similar implements for cleaning.

The touchscreen surface is very sensitive. Touch it only with your fingers or styluses designed specifically for this purpose. Do not use pens, screwdrivers or other sharp-edged objects.

Do not place any objects on the TEWS MW 55.

Disconnect the TEWS MW 55 from other devices before dismantling it. If applicable, pull out the plugs on the bottom of the device.

Writing conventions in this documentation

In this documentation, texts that require special attention are highlighted.

DANGER

DANGER - risk of death due to (source of danger, e.g. electric shock)
These safety instructions denote a danger with a high risk level that will result in death or serious, irreversible injury if the instructions are not observed.

WARNING

WARNING - risk of injury due to (source of danger, e.g. moving machine parts)
These safety instructions denote a danger with a medium risk level that can result in death or serious injury if the instructions are not observed.

CAUTION

CAUTION - risk of injury due to (source of danger, e.g. risk of tripping on exposed cables)
These safety instructions denote a danger with a low risk level that can result in minor or moderate injury if the instructions are not observed.

NOTICE

Notice:
These safety instructions denote information that must be observed in order to avoid damage to hardware or software or data loss.

Prerequisites:
In this manner, prerequisites are indicated that must be met before the next steps are taken.

Note: Texts marked in this way contain useful notes and further information.

Example: Examples emphasised in this way provide descriptions of concrete scenarios.

Terms that can be found on the **user interface** are highlighted in bold. This includes references to **other sections** in this documentation and references to other documentation.

Menu items are separated by arrow brackets:
Menu > **Submenu** > **New.**

Work steps are numbered in sequence.

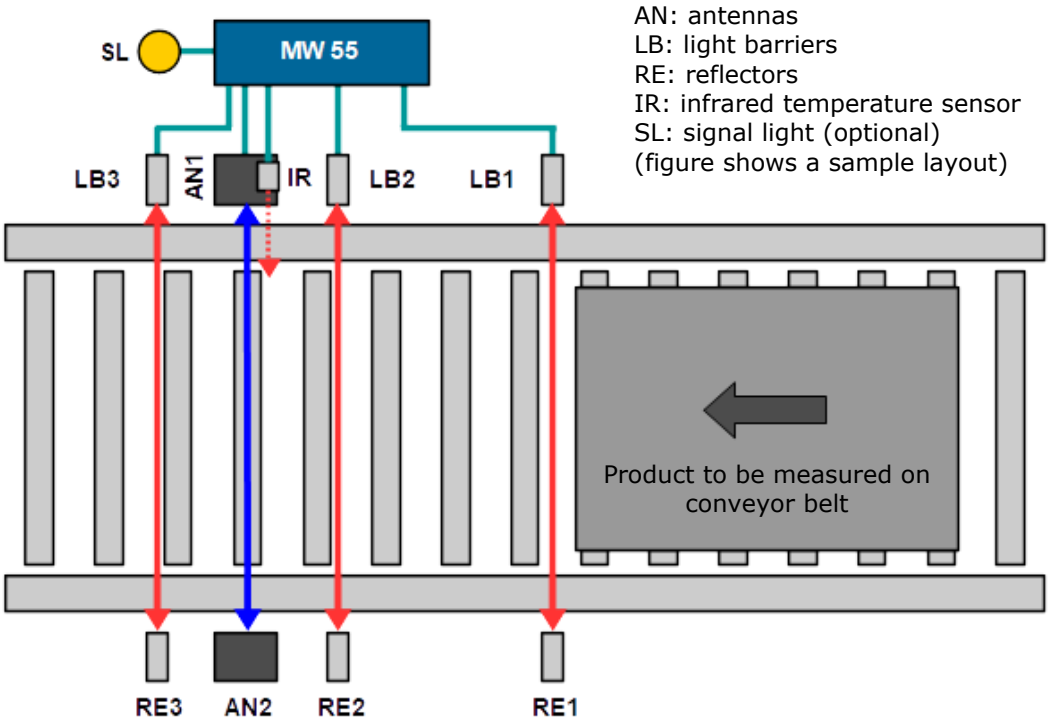
Product description

The TEWS MW 55 (article number 177489) is a self-contained, fully automatic and contactless microwave measurement system. It is used to determine the moisture content and mass per unit area in a variety of products that are already packaged in cardboard boxes or processed in batches. Additional scales or any other instrument to determine the mass of the goods are not required. If the dimensions of the product to be measured are known, the density can also be measured.

Together with the measured good, the TEWS MW 55 forms as closed a system as possible that, like the patented TEWS microwave technology, provides a structure for performing a continuity measurement. If there is no product in the measurement section, then no energy is present either.

The TEWS MW 55 can be used to monitor the quality of end products, perform goods receipt inspections or for reverse process control. With roughly 40 measurements per second, a TEWS MW 55 product scan covers around 80% of the material to be measured and enables 100% process control. The TEWS MW 55 is operated using an integrated touchscreen or through remote access. Data can be transmitted to the process controller.

The TEWS MW 55 consists of a switch cabinet (microprocessor-controlled measuring device), at least two antennas for measuring moisture content and surface dimensions, up to four light barriers with reflectors for identifying the product on the conveyor belt, temperature sensors for measuring the temperature of the product and the environment and an optional signal light.

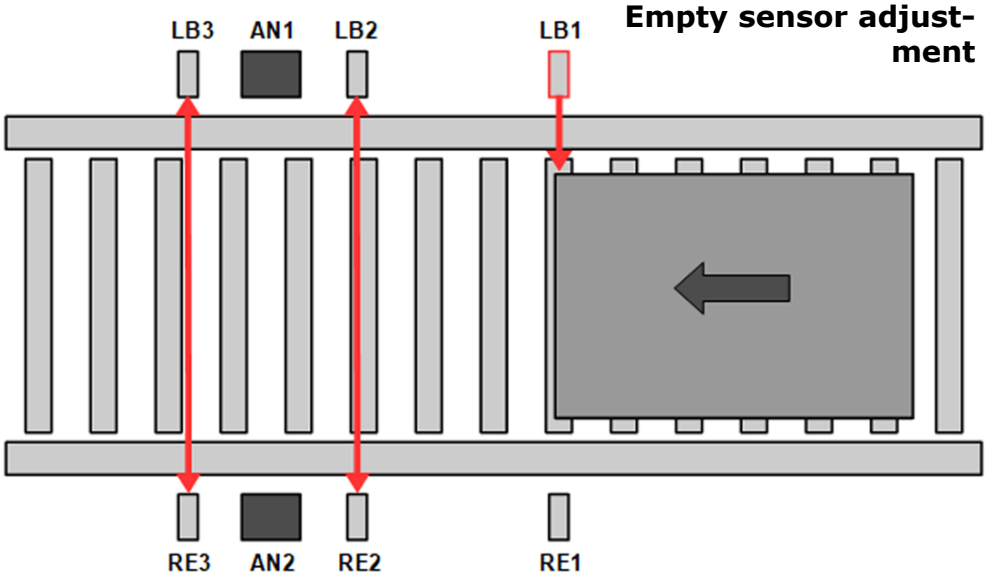


AN: antennas
LB: light barriers
RE: reflectors
IR: infrared temperature sensor
SL: signal light (optional)
(figure shows a sample layout)

Principle of the measurement process

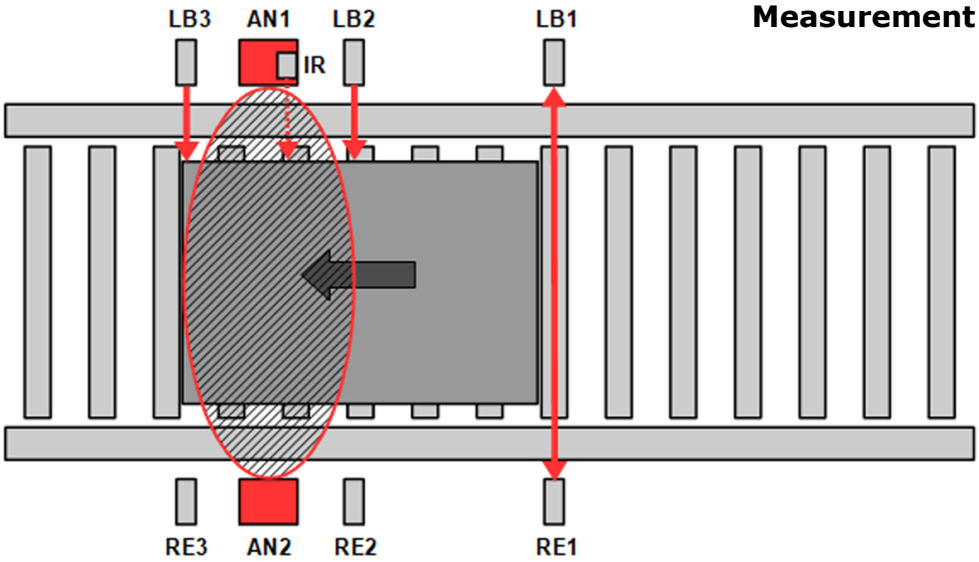
When the product passes the first light barrier, the measuring system automatically performs an empty sensor adjustment (if the two other light barrier sections do not contain a product).

Empty sensor adjustment



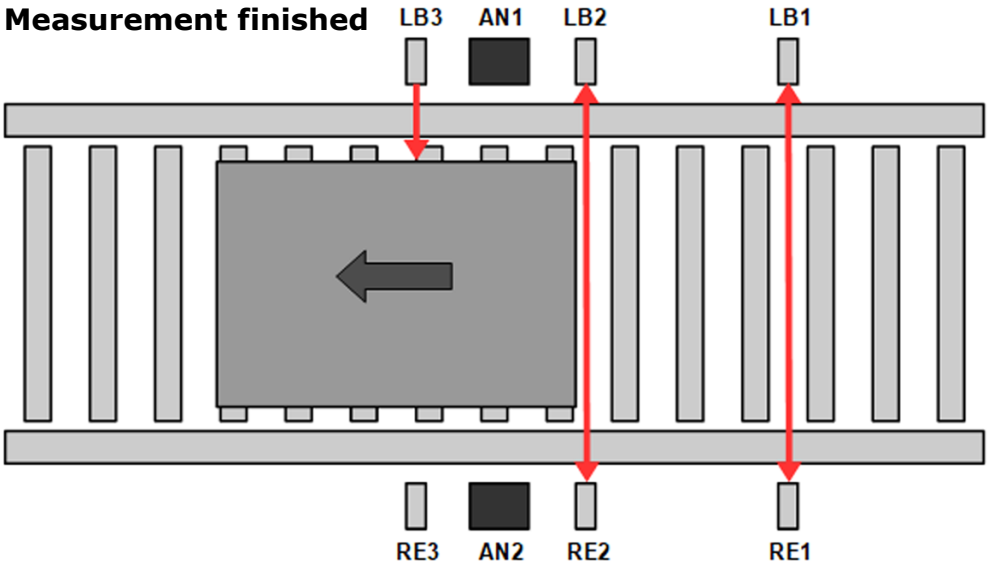
When the third light barrier is reached, the measurement is started. The antennas send microwaves through the measured object to measure the moisture level and surface dimensions of the product and the data is transmitted to the TEWS MW 55. The infrared sensor measures the product temperature. The display shows the measured values and, if there are discrepancies that exceed the tolerance range, a warning.

Measurement

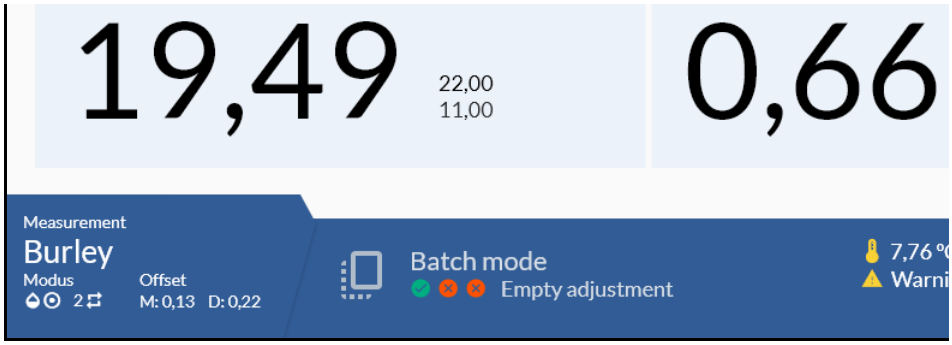


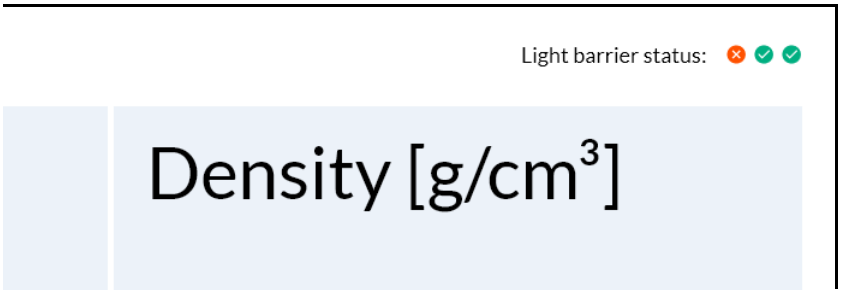
After the product has fully passed the second light barrier, the microwave power on the antennas is deactivated again and the measurement is finished.

Measurement finished



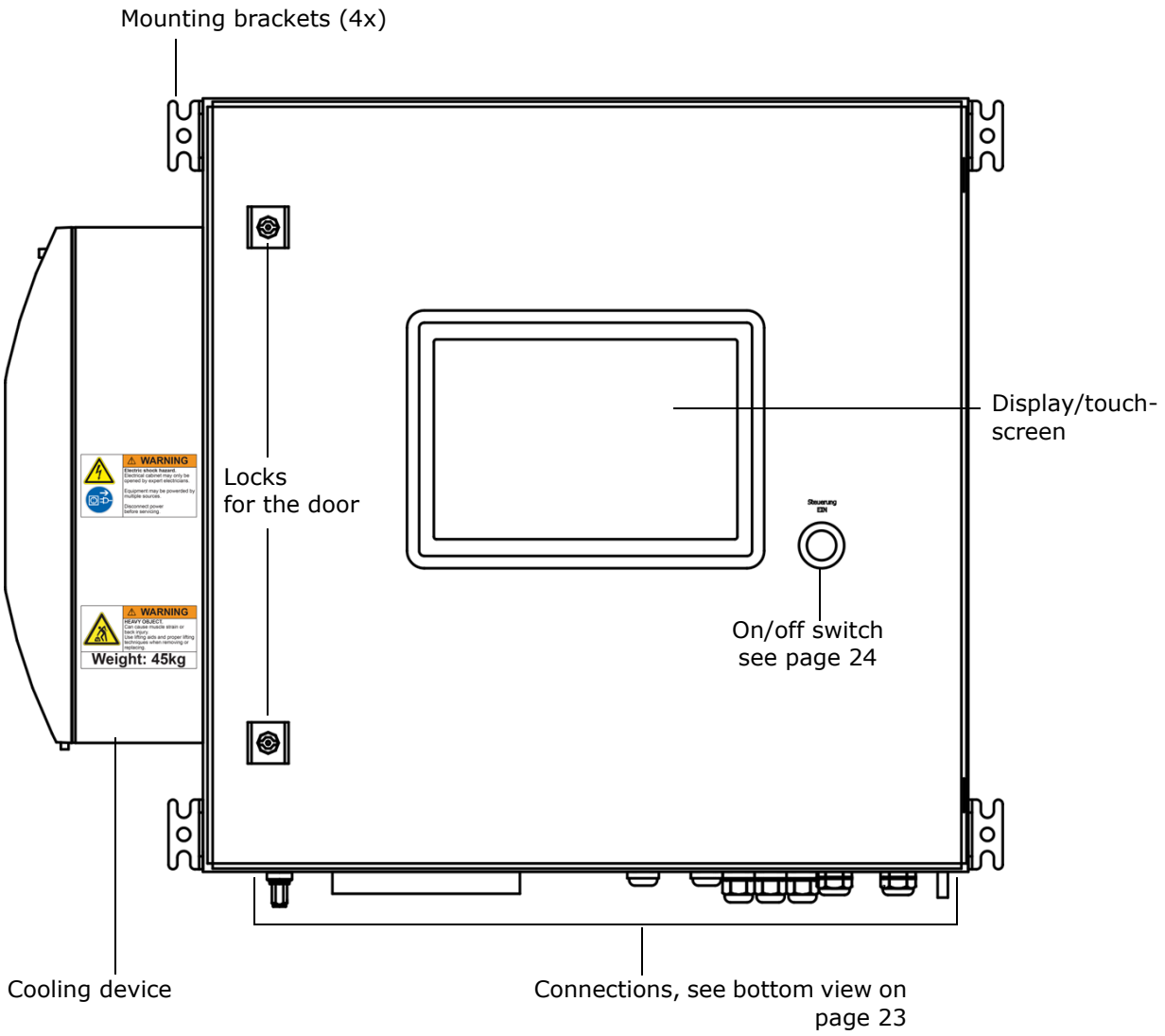
The status of the light barriers is also displayed in the bottom status line or in the top right corner when the display is in full-screen mode.





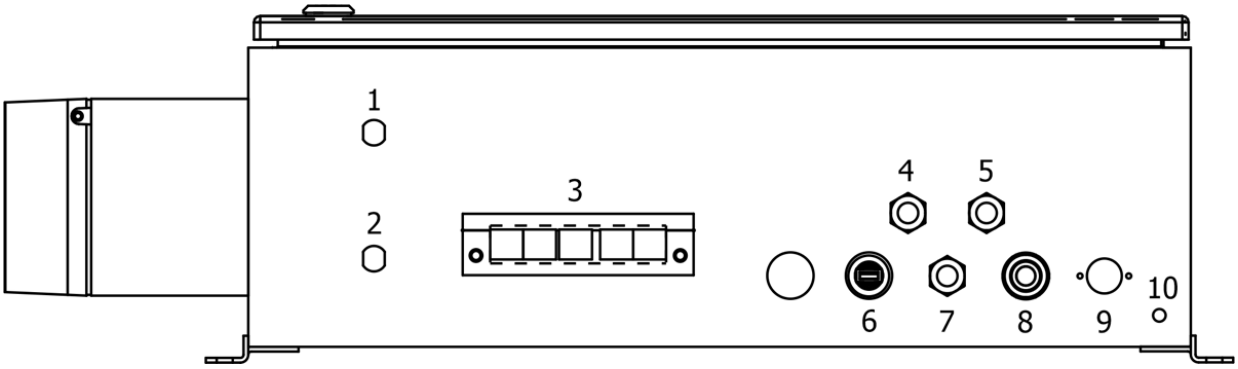
Device views

Front view



Product description

Bottom view



1, 2	Microwave ports for the antenna cables
3	Available openings for installing cables with plugs (e.g. Ethernet cable)
4, 5, 7	M16 cable bushings (e.g. for the connection cable for the light barriers)
6	USB port
8	M20 cable bushing
9	Power cable port
10	PE (protective earth conductor connection)

NOTICE

Notice:
Unused connections must always be closed with their designated protective caps (dummy plugs) during operation, storage and transport. This is the only way to ensure the guaranteed degree of protection for the switch cabinet and prevent the accumulation of dirt.

On/off switch

The TEWS MW 55 is switched on and off using the on/off switch. The LED of the switch indicates the various operating states:

Off	Device is switched off
Red	Device is starting up
White	System controller and check activated (interim state during activation)
Green	Device is fully ready for operation
Red flashing	Device is shutting down and switching off or Power failure (following a timeout, the device is shut down)

Cooling device

You can find information about the installed cooling device, such as the technical data for the cooling device and the meaning of the function and status LEDs, in the manual supplied by Rittal, the cooling device manufacturer.

Signal light

The one-segment signal light is a multicolour LED module that lights up in different colours depending on the operating state:

- Green: the moisture content and density of the product are within the defined limits
- Red: the moisture content or density of the product are not within the defined limits
- Yellow-orange: the standard deviation is too high
  Explanation: As the product passes through the system, multiple measurements are performed to ensure that the largest possible area of the batch or box is covered. A high standard deviation means that the values measured for a batch deviate significantly from each other, which indicates differing moisture penetration levels.

Note: The limits and the standard deviation are set in the **product settings** (see page 58).

The signal light is supplied with a mounting bracket and a 3 m connection cable for the connection to the TEWS MW 55.

Infrared sensor

The infrared sensor is used to take contactless measurements of the temperature of both the product and the environment. The scope of delivery of the CSLT15 infrared sensor includes:

- Adjustable mounting bracket
- Tube adapter with M12x1 internal thread
- Optional: air purge collar

Scope of delivery

TEWS MW 55, measuring station (article number 177482), consisting of:

- TEWS MW 55 microwave moisture and density measurement system (article number 177489)
- Light barriers
- Antennas and HF cable
- Infrared sensor
- One-segment signal light with base bracket, wall bracket and mounting tube
- Fastening elements
- Power cable

Installation

Installing the TEWS MW 55

Installation requirements

When positioning the TEWS MW 55, the maximum length of 3 m between the connection cables and the antennas must be taken into account.

When installing the TEWS MW 55, ensure the following minimum distances from walls or other objects:

	Minimum distance	Space required
On the side	200 mm for each	1160 mm
Above/below	200 mm for each	1000 mm
At the front	1000 mm (for opening the door and operating the device using the touchscreen)	1200 mm

The TEWS MW 55 can be mounted on the wall or on an appropriate load-bearing frame for the system. It weighs approximately 45 kg. When mounting the device, ensure that the load-bearing capacity of the wall or frame is sufficient.

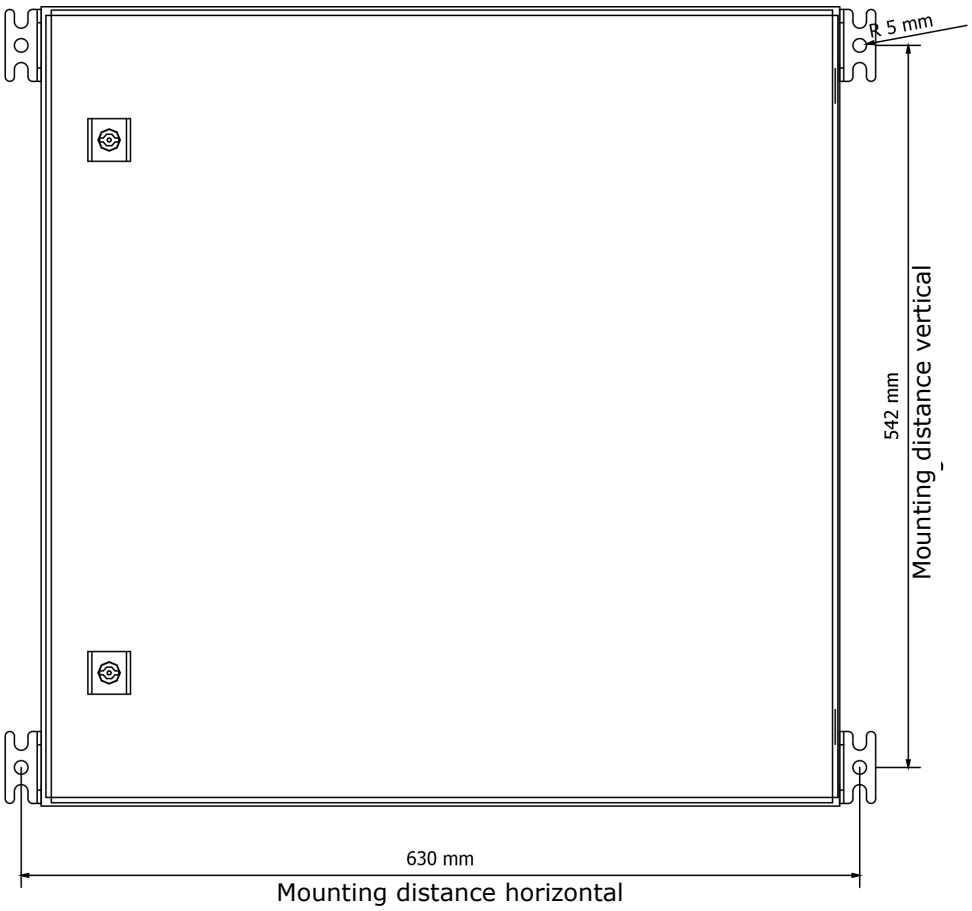
The TEWS MW 55 must always be fastened through the mounting brackets (see “Attaching the mounting brackets” on page 28) using all four designated screws.

Ensure that the installation areas are sufficiently flat and even.

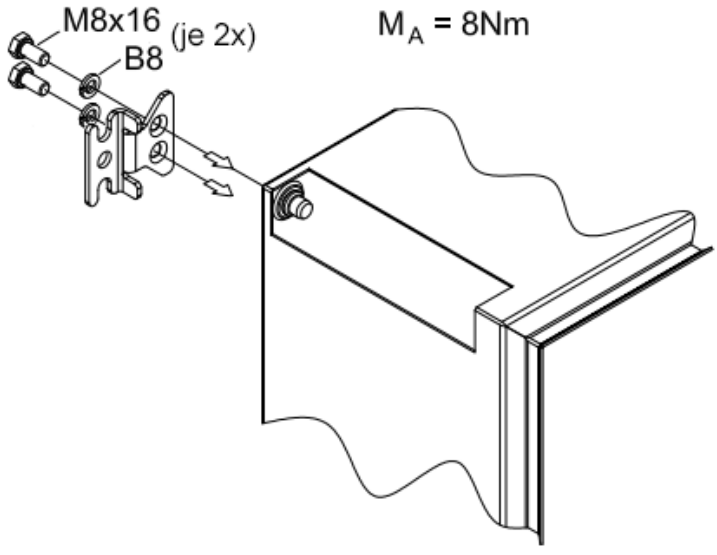
If the external connectors are not connected during operation, storage or transport, you must always attach the protective caps provided. This is the only way to ensure the guaranteed degree of protection for the TEWS MW 55 and prevent the connectors from becoming dirty.

The openings for the cooling device on the left-hand side of the TEWS MW 55 must not be covered.

Dimension drawing for installing the TEWS MW 55



Attaching the mounting brackets



Installing the antennas and light barriers

To ensure a high level of measuring accuracy for the TEWS MW 55 measurement system, you must determine the exact arrangement of the individual antennas and light barriers. The geometric arrangement of the individual components largely depends on the object measured and its external characteristics.

Installing the antennas

To ensure the highest possible level of measuring accuracy for the TEWS MW 55measurement system, note the following when installing the antennas:

- The antennas should be positioned at a height as close to the middle of the measured object as possible (see the figure on the next page: A).
- Behind and next to the antennas, a distance of at least 0.5 m must be maintained from other objects or persons.
- The antennas must be installed in a low-vibration position.
- To prevent the product from tilting the antennas, the antennas must not protrude into the active area of the conveyor belt (see the figure on the next page: B).
- For installations on a roller conveyor, ensure that the antennas are in line with one of the transport rollers to the greatest extent possible.

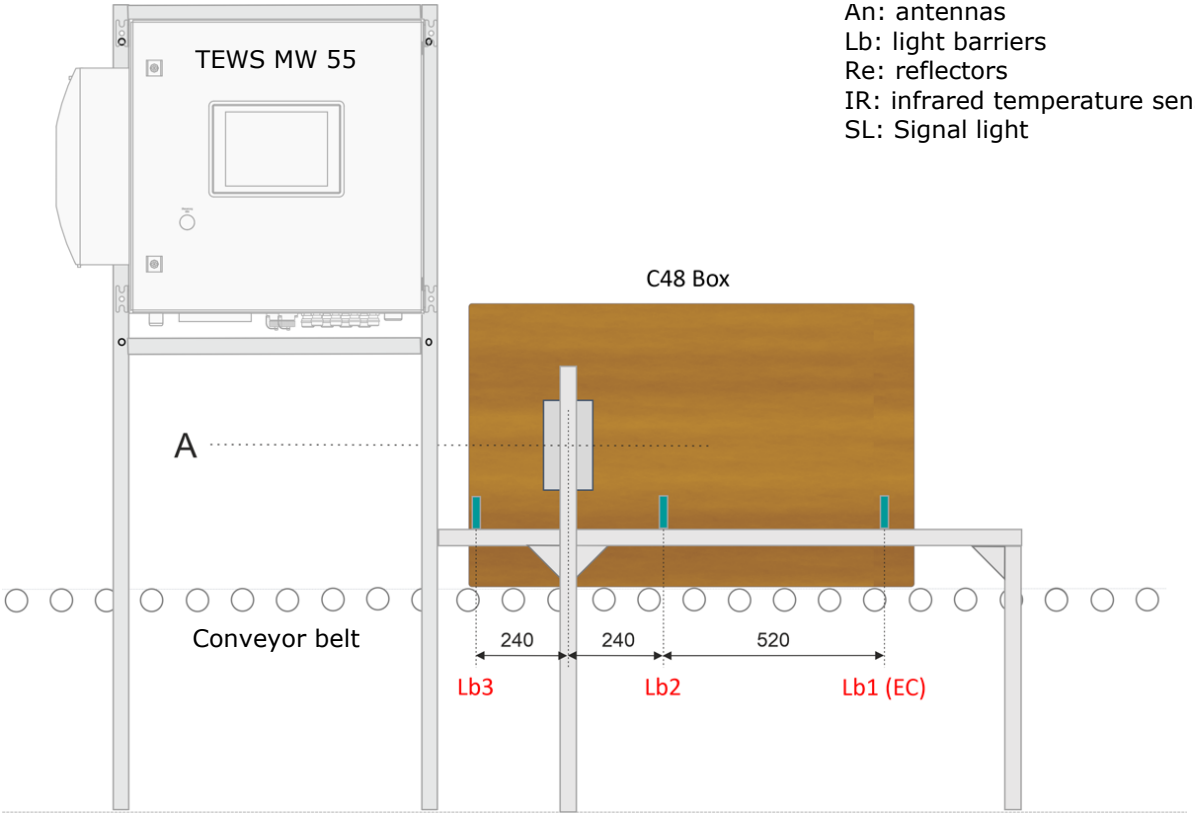
Installing the light barriers

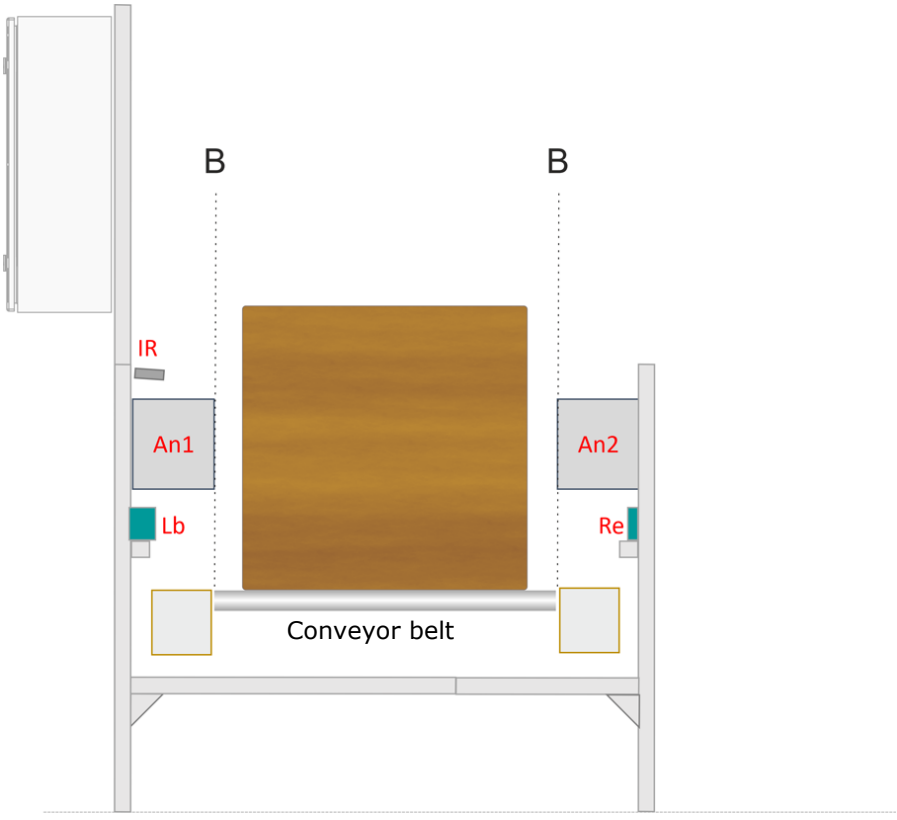
The precise position of the light barriers must be adjusted in test mode where necessary or during commissioning by TEWS staff.

Sample setup

A typical installation for measuring products in C48 cardboard boxes (780 x 1100 mm) is shown below. The clearances specified in the figure should be considered as rough guideline values.

An: antennas
Lb: light barriers
Re: reflectors
IR: infrared temperature sensor
SL: Signal light

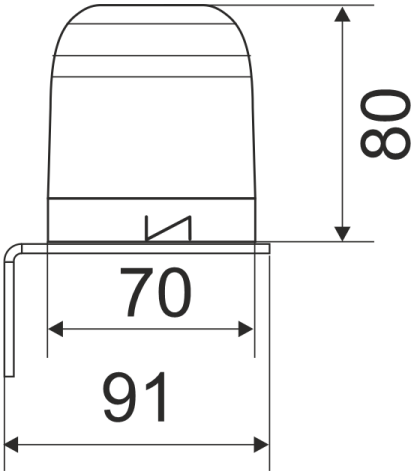




Installing the signal light

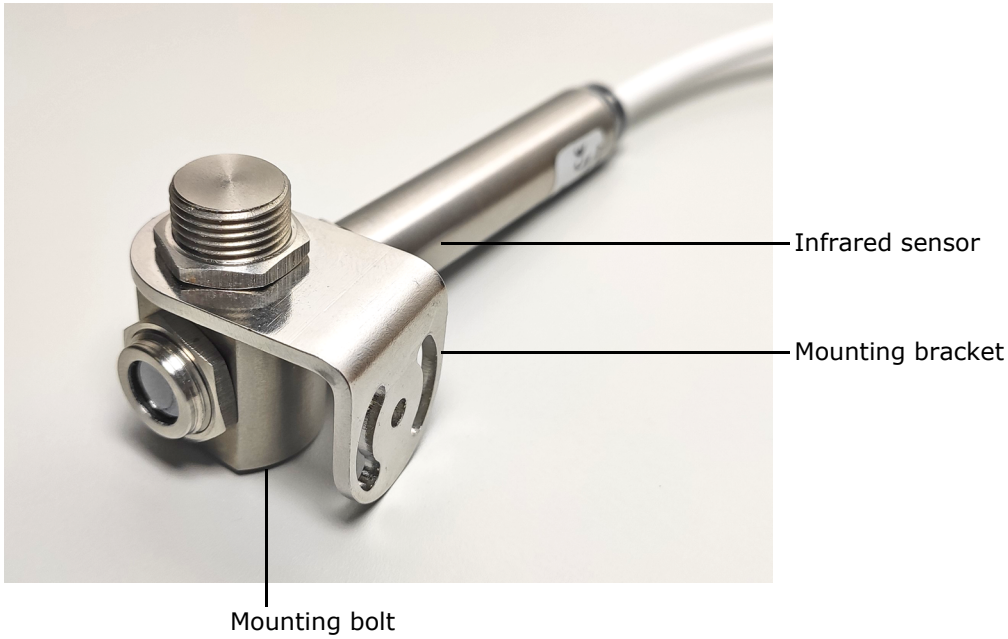
The signal light is delivered preconfigured and attached on the mounting bracket. It is installed on the frame using the mounting bracket. During positioning, take the cable length of 3 m for connecting to the TEWS MW 55 into account. The connection cable is guided through the opening in the mounting bracket.

Dimensions of the signal light on the mounting bracket



Installing the infrared sensor

The infrared sensor is delivered as a pre-assembled unit and is attached to the frame above the antenna using the mounting bracket.



Note:	The green LED (in the sensor head on the cable outlet) lights up when a temperature of 30 °C is exceeded. Once connected, this function can be used to align and check the function of the infrared sensor, as the measurement range can then easily be checked under normal ambient conditions by holding out your hand.

Connection

⚠ CAUTION

CAUTION - risk of injury due to exposed cables

Exposed cables can be a trip hazard.

Lay cables in a way that prevents trip hazards (for instance, by routing them through beams or under marked safety covers.

⚠ DANGER

DANGER - risk of death due to electric shock

Work on the electrical system must be performed only by electrical specialists while following the five safety rules.

Observe the sequence when connecting the cables.

Establish the connection between the TEWS MW 55 and the mains power supply as the final connection when the door of the TEWS MW 55 is closed.

Do not kink cables.

Install cables on the floor using the included spiral tubes (to protect against being stepped on).

Connecting the antennas

The antennas are connected to the TEWS MW 55 ports marked **MW Det** and **MW Gen** using the HF cables. The connectors must only be tightened by hand, not with a tool.

Connecting the light barriers

1. Guide the cables from the light barriers to the TEWS MW 55 and guide each through an M16 connection with a cable gland.
2. Connect in the TEWS MW 55.
3. Secure with cable glands.

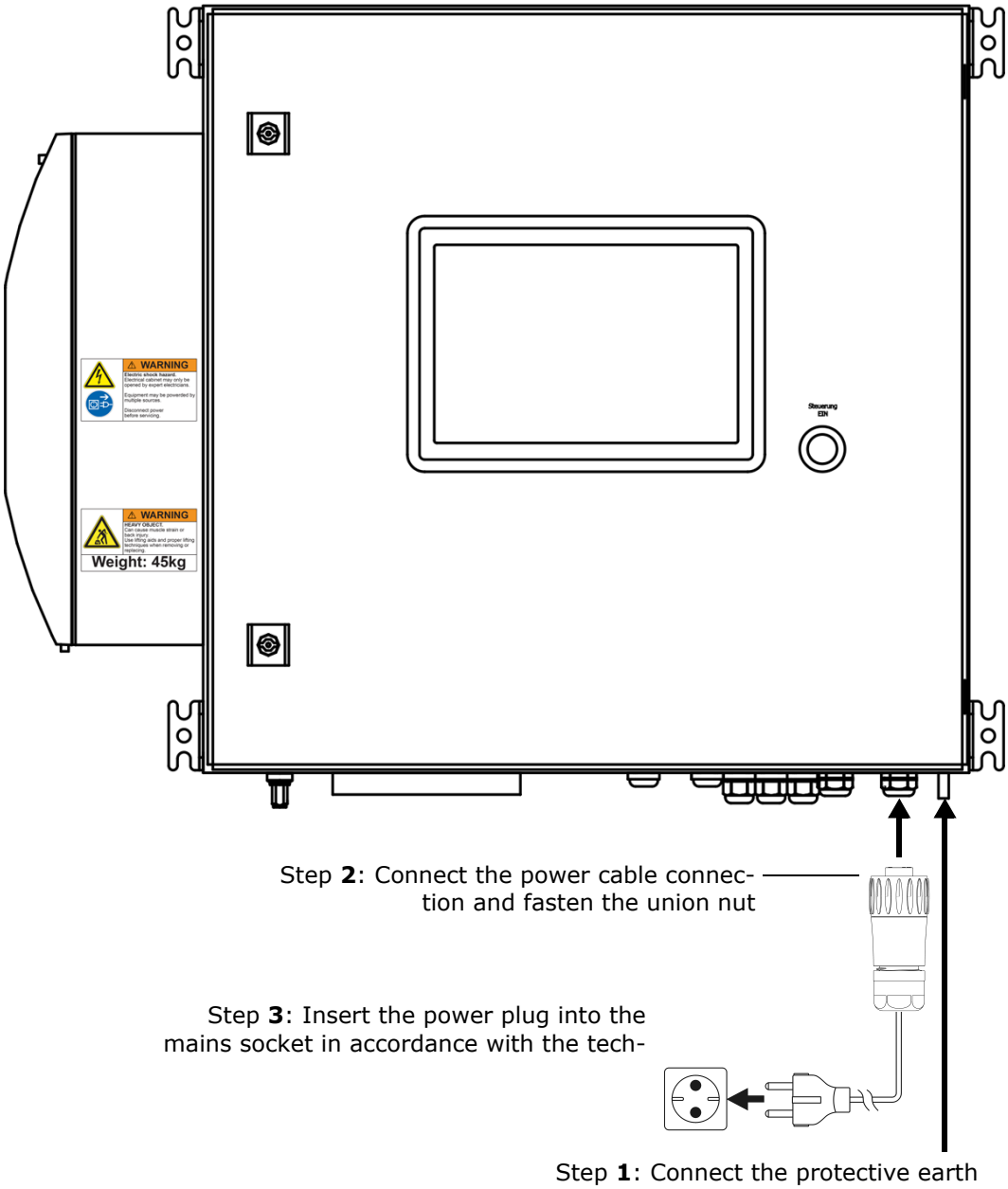
Connecting the signal light

1. Guide the cable from the installed signal light to the TEWS MW 55 and guide it through a connection with a cable gland.
2. Connect in the TEWS MW 55.
3. Secure with a cable gland.

Connecting to the mains

To adhere to EMC and safety regulations, the device must be operated with the PE conductor connected.

1. Screw the protective earth onto the connection marked with PE.
2. Connect the C16 plug of the power cable to the connecting socket of the TEWS MW 55 and secure it by fastening the union nut.
3. Insert the power plug into a socket whose data corresponds to the technical data for the power connection.



Commissioning

TEWS staff perform the initial commissioning and setup of the software, including the creation of the products to be measured.

Switching the device on and off

Switching on the TEWS MW 55

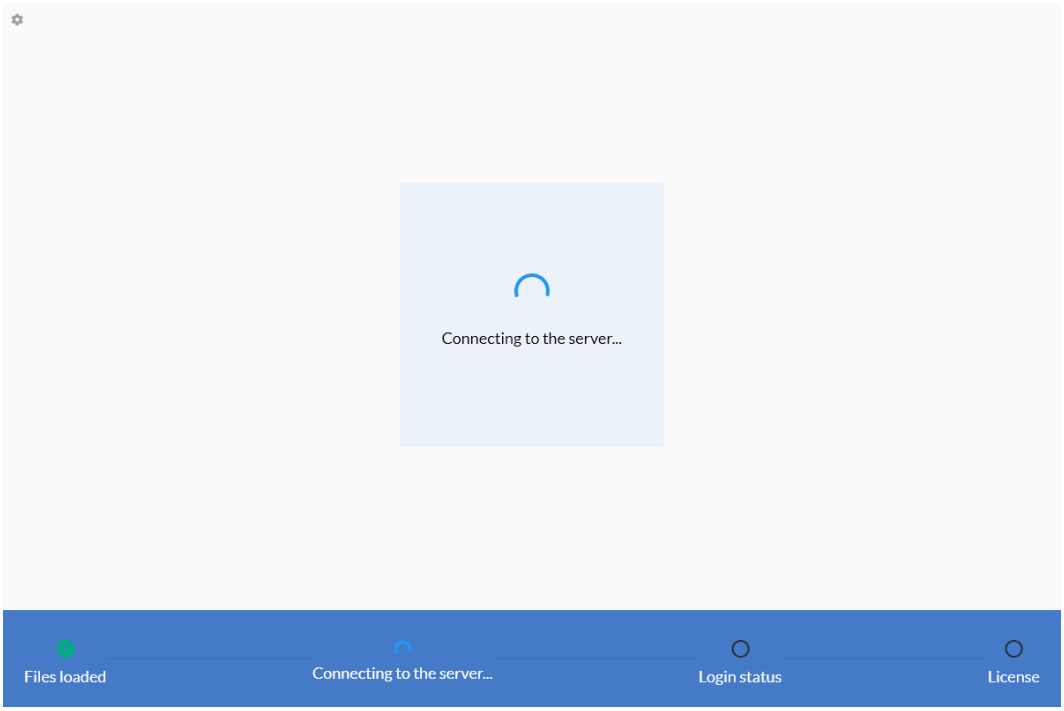
1. Switch on the TEWS MW 55 by pressing the on/off switch on the door of the TEWS MW 55. The TEWS MW 55 operating system and the integrated software start up.

   The on/off switch initially lights up red while the device starts up.

   After the device starts up (approx. two minutes), the on/off switch lights up white, which means that the system controller and check is activated.

   When the on/off switch lights up green, the device is fully ready for operation.

   The further progress of the device startup is displayed on the screen:

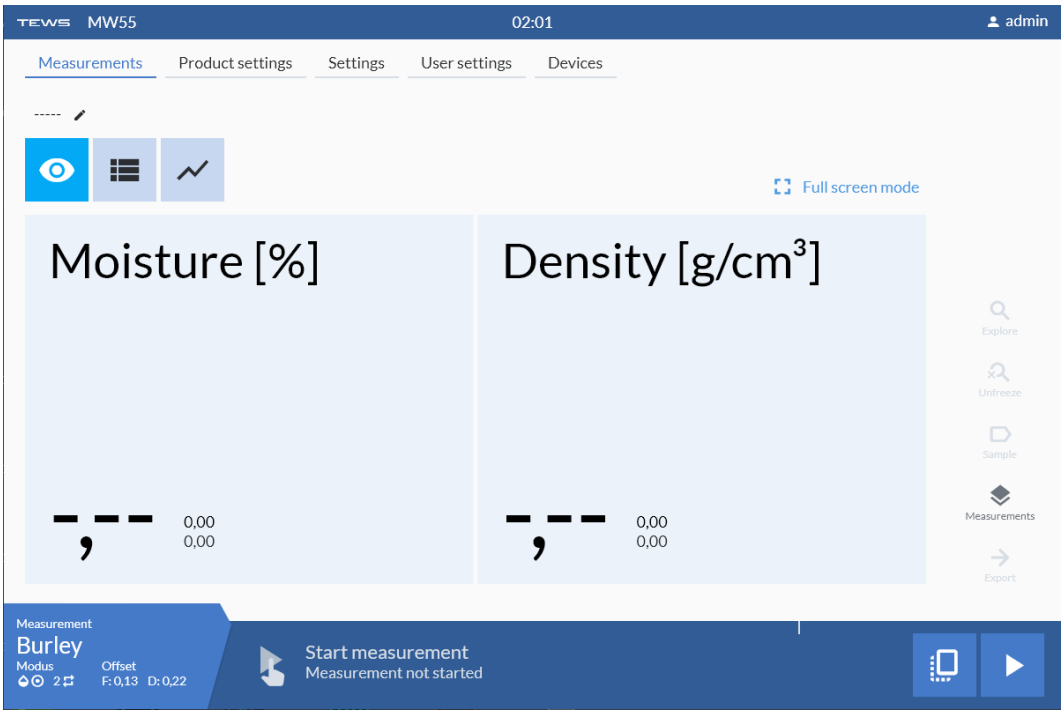


Once the files are loaded and the connection to the server is established, the login dialogue is displayed:

2. Enter your user name using the on-screen keyboard.
3. Press the **Password** field and enter your password.
4. Press **Sign in**.

Note: If a user is defined as the default user, the software automatically starts with the rights of this user. There is no need to login.
If none of the registered users are defined as the default user, the system asks you to enter a user name and password.
To enable you to log in when you start the device for the first time, you will receive a user name and password separately. We recommend that you change this password afterwards to prevent unauthorised access.

The user interface is displayed with the **Measurements** menu:



The settings that you can see and actions that you can perform depend on your user rights.

Recommendation: After switching on the device, wait a few minutes before taking the first measurements, as this allows the device to reach its optimum operating temperature.

Note:	If you log in as the user administrator, only the user settings are displayed. Other settings are unavailable.

Switching off the TEWS MW 55

The TEWS MW 55 is usually switched off during all longer pauses in the operation of the conveyor system.

1. Hold down the on/off switch on the TEWS MW 55 door for approx. two seconds.

   The on/off switch flashes red while the software shuts down. This process takes 30 seconds.

   In this period, the touchscreen displays a message counting down the time left in the process. You can press **OK** in the message: the shutdown process continues but you can still perform operations on the interface (saving the current measurement, for example).

Once the indicator light in the on/off switch goes out, the shutdown process is complete.

⚠ DANGER

DANGER - risk of death due to electric shock
If you are opening the door of the TEWS MW 55 for servicing purposes, the TEWS MW 55 must be shut off beforehand **and** then disconnected from the mains by pulling the power plug, because parts inside the device remain live even after it is shut down!

Switching off the TEWS MW 55 in emergencies/for servicing purposes

1. Disconnect the power plug from the mains socket.

   A message stating that the TEWS MW 55 is shutting down appears on the screen. The UPS inside the device now supplies the TEWS MW 55 with power for approx. five minutes to ensure that the software shuts down properly and to prevent damage.

⚠ DANGER

DANGER - risk of death due to electric shock
If you have to open the door of the TEWS MW 55, wait for an additional ten minutes after disconnecting the power plug to ensure that the UPS is deactivated.

Operating the software

You operate the software with the user interface on the TEWS MW 55 touch-screen. Touch the buttons directly with your finger or using specially designed pens.

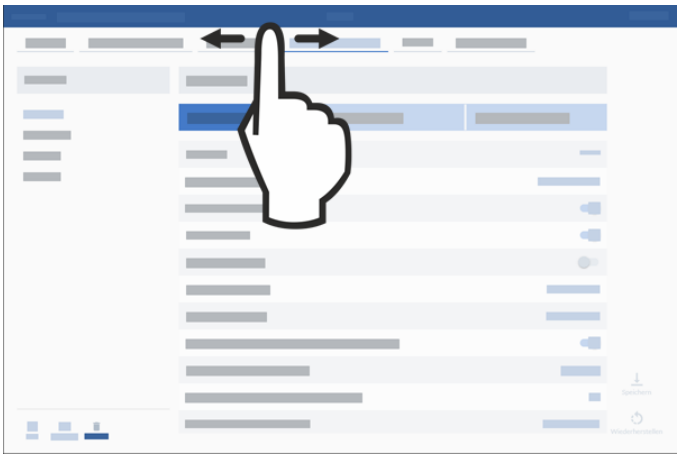
NOTICE

Never touch the screen with sharp-edged objects such as screwdrivers, ball-point pens, and so on. These might damage the surface.

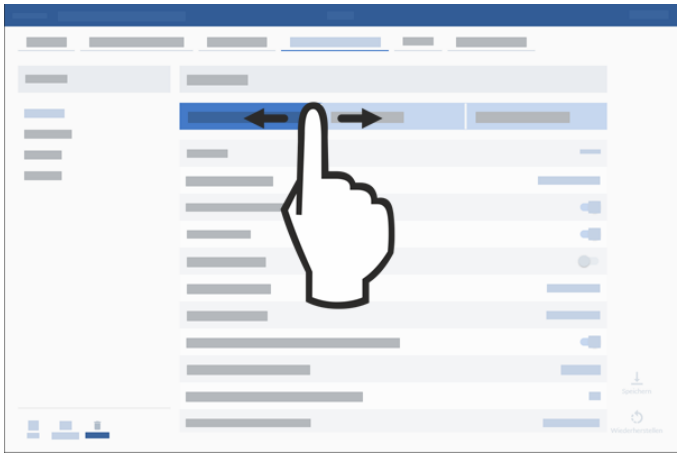
A keyboard in the input dialogues lets you enter letters and numbers. Press the flag icon to switch to the keyboard layout of a specific country.

To select a menu item or execute a command, press the relevant element:

Swipe across in the main menu to switch to the next or previous menu item:



Swipe across in the content area to switch between the individual setting options if necessary:

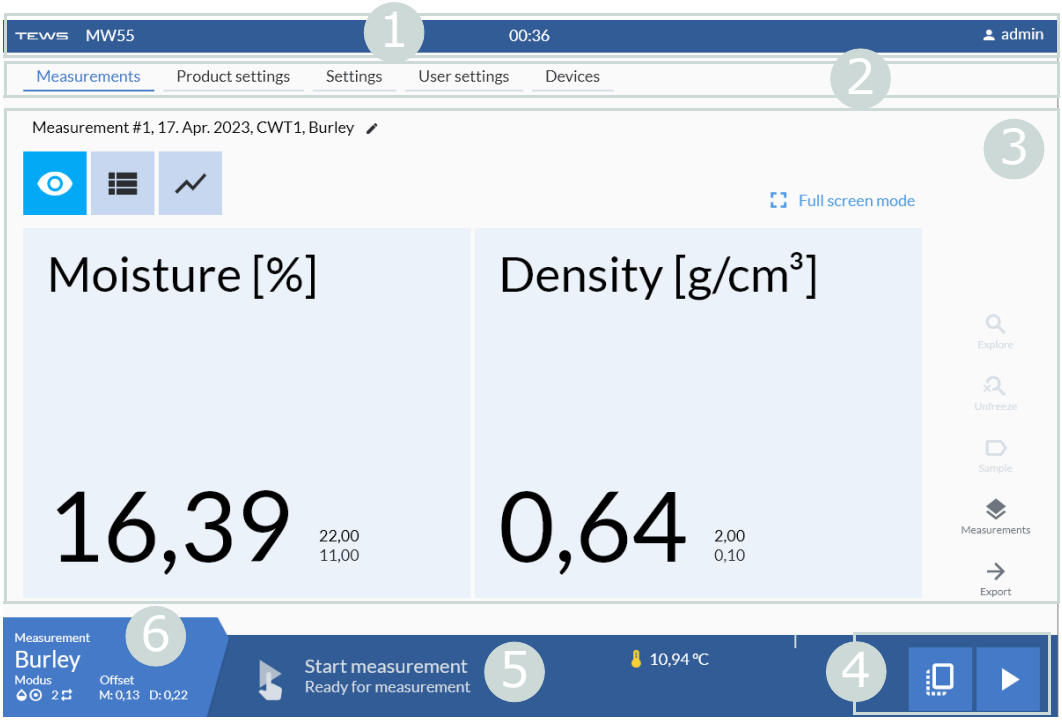


Swipe up or down in lists to view the entries that are not currently displayed (for example, in the list view for the measured values):

Drag on an area with two fingers to enlarge the specific area and view the details of the image, for instance:

Overview of the user interface

This chapter describes the functions of the TEWS MW 55 user interface. Once you log in successfully, the user interface for the software is displayed on the measurements window. The user interface is divided into several sections:



Note:	The menus displayed and functions that you can perform depend on the user rights assigned to you.

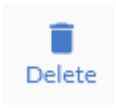
1	Header	Shows the device type and the time. On the right, there is a profile menu for logging out and shutting down the software.
2	Main menu	Menu items: **Measurements**, **Product settings**, **Settings**, **User settings**, **Devices**. You can access the menu items by pressing them or swiping right or left.
3	Content section	Content based on the menu item selected in the main menu (Measurements window, Settings dialogues). You can press the button to switch to **full-screen mode** in the Measurements window. The area on the right displays action menus with functions that apply to the content area (see "Action menus in the content area" on page 45).

4–6	Control bar:	
4	Controller	Start/stop and other actions
5	Status	Icon with command text (top line) and the current device status (bottom line). If system errors occur, messages and any links to relevant pages with relevant settings appear here.
6	Tab	Information about the measurement mode, the name of the selected product and the offset. Press to open the **Product selection** and search function.

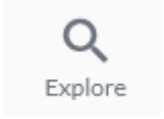
Buttons

Note: The buttons may be shown in different colours based on their status (activated/deactivated).

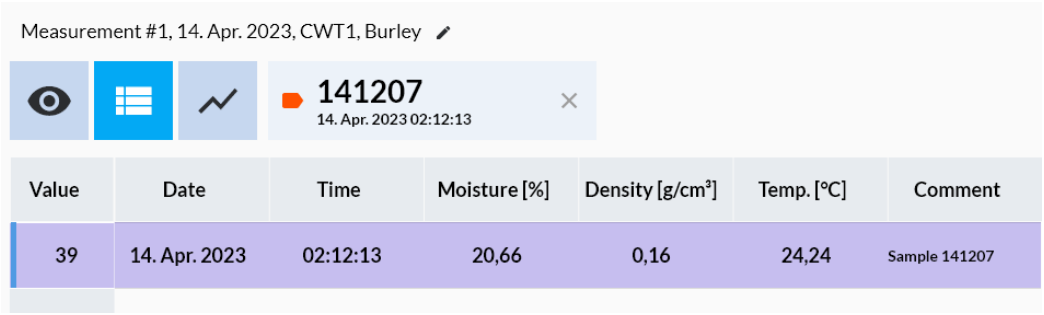
Button	Function
	Measurements window: measure/current measured values
	Measurements window: show value table
	Measurements window: show graphical view
	Empty sensor adjustment (see “Empty sensor adjustment” on page 56)
	Start measurement (see “Taking measurements” on page 47)
	Stop measurement
	Close window

Button	Function
	Select: Select highlighted data record
	Copy: Copy data record
	Delete: Delete data record
	New: Create new data record
	Restore: for example, when changing settings such as start mode
	Three-dot menu: Opens a sub-menu with additional menu items
	Option activated/deactivated
	Show list of valid licenses in the **Settings**

Action menus in the content area

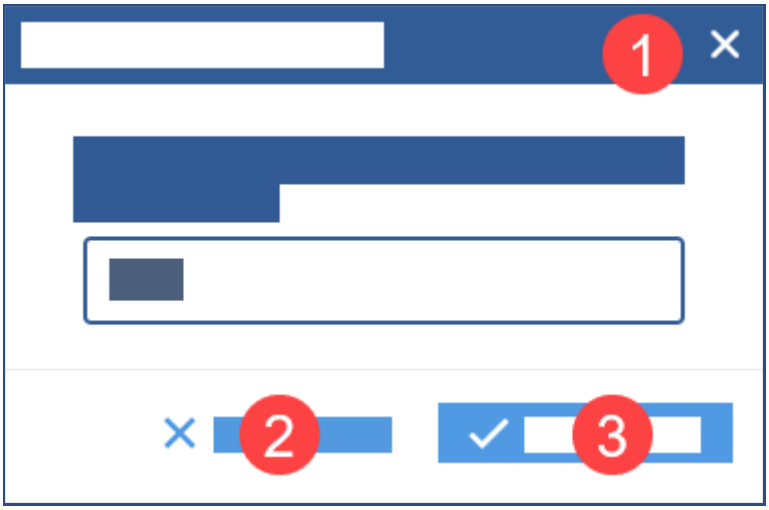
	During measurements, you can only view the last six measurements in the table view. You can press **Explore** to stop refreshing the view (however, the measurements continue to run in the background) and then view all the previous measured values by swiping up or down in the list.

Button	Function
	When you close the **Explore** function, the table view is refreshed and shows the latest measurements.
	If a batch is removed for assessment (to determine reference values, for instance), the corresponding measurement can be marked using this function. The six-digit sample number is entered in the comment field for this measurement so that it can be matched later. In addition, the last sample number is displayed with the date and time above the list to ensure that the removed batch can be labelled accordingly:
	Select and view the saved measurements (see “Saving measured values and viewing them again” on page 54)
	Export the current measured values as an XLSX file (see “Exporting measured values” on page 53)



Dialogues

Values and texts are entered in dialogues. These dialogues open in windows with a fixed size. The rest of the user interface cannot be accessed while a dialogue is displayed.



1 Close dialogue without saving

2 Cancel:
Close dialogue without saving

3 Confirm:
Apply the entered values and close dialogue

Taking measurements

Note:	TEWS staff perform the initial commissioning and configuration of the software, including the creation of the products to be measured.

1. Switch on the TEWS MW 55.
2. In the **Login** dialogue, enter your (user) **Name** and **Password**.
3. Select a product.
4. Press the start button to start the measurement.
5. Read the values.

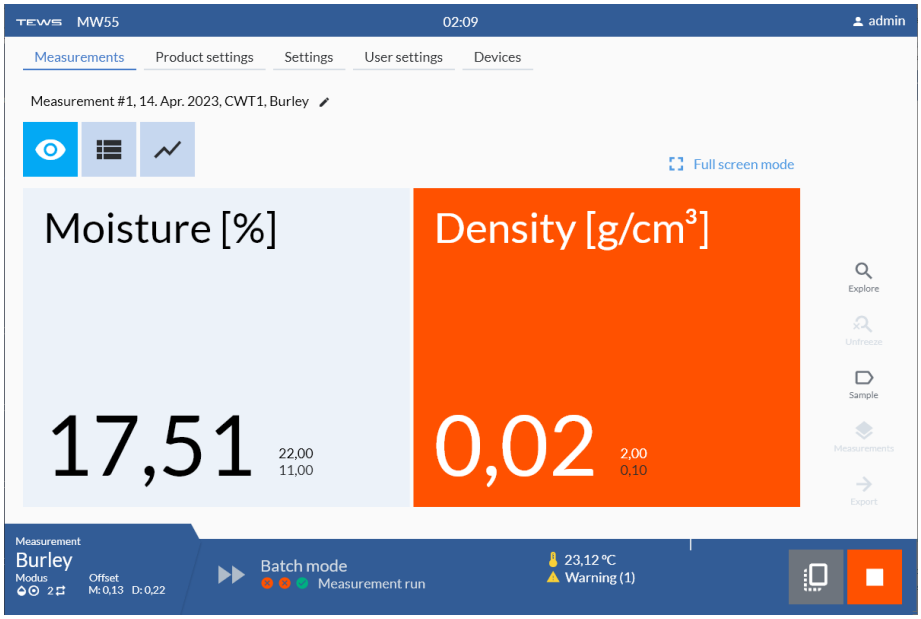
   The process is largely automatic.

   Persons responsible for taking measurements/monitoring measured values should note the following:

   – Values are measured and displayed automatically.

   – The empty sensor adjustment is usually performed automatically.

– The product is selected directly on the system using the touchscreen. If there are different products on the same line, this lets you respond to a change of product directly on the belt.
– The values view displays both the latest measured values and the upper and lower limit values defined in the product settings. If the values defined for the product are exceeded or fallen below, you receive a visual warning.



Measurement name

The name of the current measurement is displayed in the top left corner above the buttons for selecting the view and is formed from the number of the measurement, the current date, the device name and the product name.

If you want to change the name, press the pencil icon next to the name: An input dialogue opens in which you can edit the name or enter your own name.

Measurement process

The TEWS MW 55 generally works in start/stop mode. This means that you have to start the measurement at the beginning of the operation and stop it at the end of the operation. Measurements can be taken in two different ways:

- Continuous mode
  For a continuous product flow; empty sensor adjustment in the TEWS MW 55 must be performed manually in gaps in the product flow.
- Batch mode
  The measurements are triggered by light barriers. A measurement is started when the second and third light barriers are covered and stops as soon as one of the two is no longer covered. The first light barrier triggers an empty sensor adjustment if the second and third light barriers are not covered.

The settings are configured in the **Devices** menu (see “Devices” on page 69).

Note: The device can be configured so that the measurements are started automatically after the device starts up. To do so, either activate the option **Start batch mode automatically after initialization** or **Start continuous mode automatically after initialization** under **Settings** > **System information**.

Displaying the values

The measured values are displayed in various views that you can switch between using the buttons:

View of the latest values (default view)

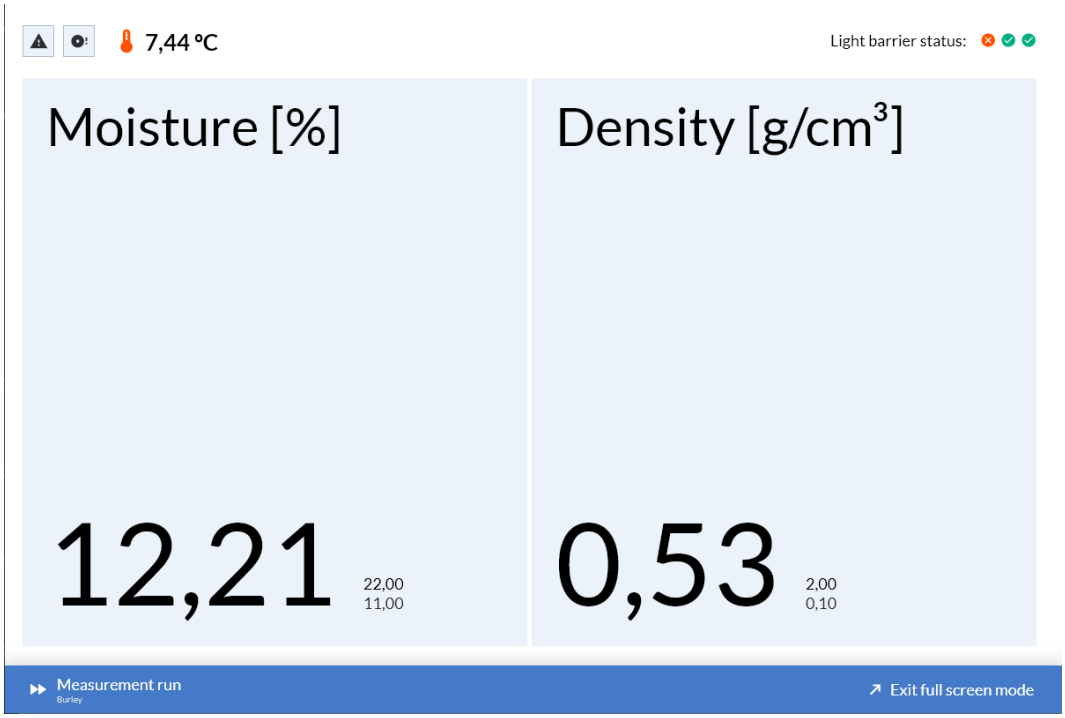
Table (table listing all the measured values)

Graph (graph displaying the moisture and density values over the course of the measurements)

Note: The table and graph can be displayed only when no measurements are being taken (that is, when the stop button has been pressed).

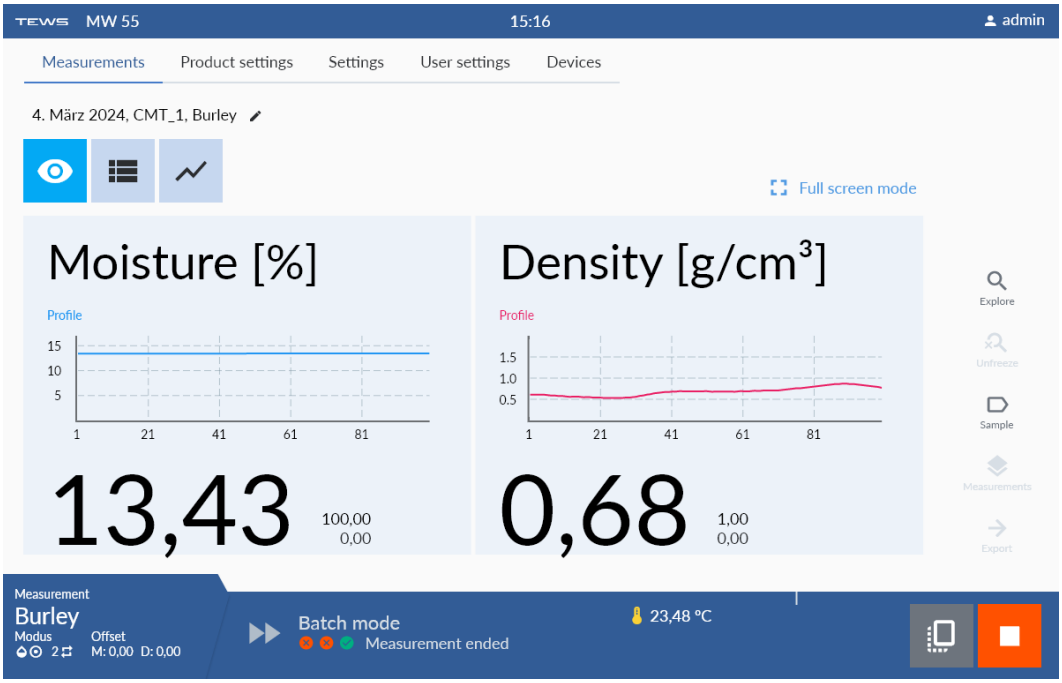
Current values

The values view continuously displays the measured values for moisture and density. You can press **Full screen mode** to enlarge the view of the values. The status bar is minimised and the menus are hidden to make it easier to read the values during measurement mode. Press **Exit full screen mode** to switch back to the overall view with the menus (this is required to log off, for example).



Note: If required, in the **System information** menu, you can set the configuration so that only the moisture values or only the density values are displayed or so that the software automatically starts in full screen mode.

If the **Show profile graph** option is activated under **System information** in **Settings**, the profile of the batch is displayed in the values view; that is, all the individual measurements for this batch are displayed in a graph:

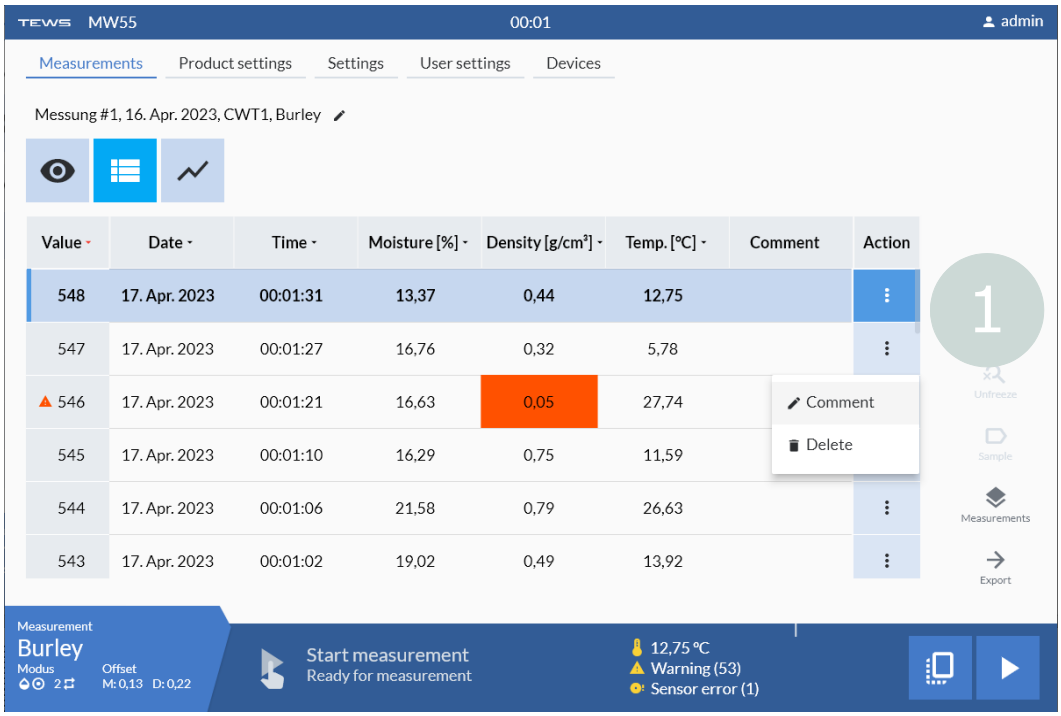


Table

The table displays up to six measurements together with their values. You can change their sorting by pressing the column headers.

You can swipe up and down with your fingers to view the previous or next measurements in the list.

You can press the buttons in the **Action** column to delete individual measurements or add a comment for the line [1]. To do so, you must stop the current measurement process.



Graph

The graph view displays the measurement results for moisture (blue) and density (red) over the course of the overall measurement process. On the right-hand side, you can see the values for the measurement point that is currently selected.

To display the values for a measurement point in the area to the right of the graph, you have the following options:

- Press the measurement point [1] in the graph.
- Switch between the measurement values using the forward/back buttons [3].

  You can press the arrow under **Comment** [2] to enter a comment for the value that is currently displayed.

Exporting measured values

You can use the export function to save measurements on a USB stick. This applies both to the current measurements and earlier measurements saved in the database (see "Saving measured values and viewing them again" on page 54).

Note:	You cannot perform exports while measurement mode is running. If you want to save the data in sub-folders on the USB stick, you must create the desired folder structure on the USB stick before inserting it into the TEWS MW 55.

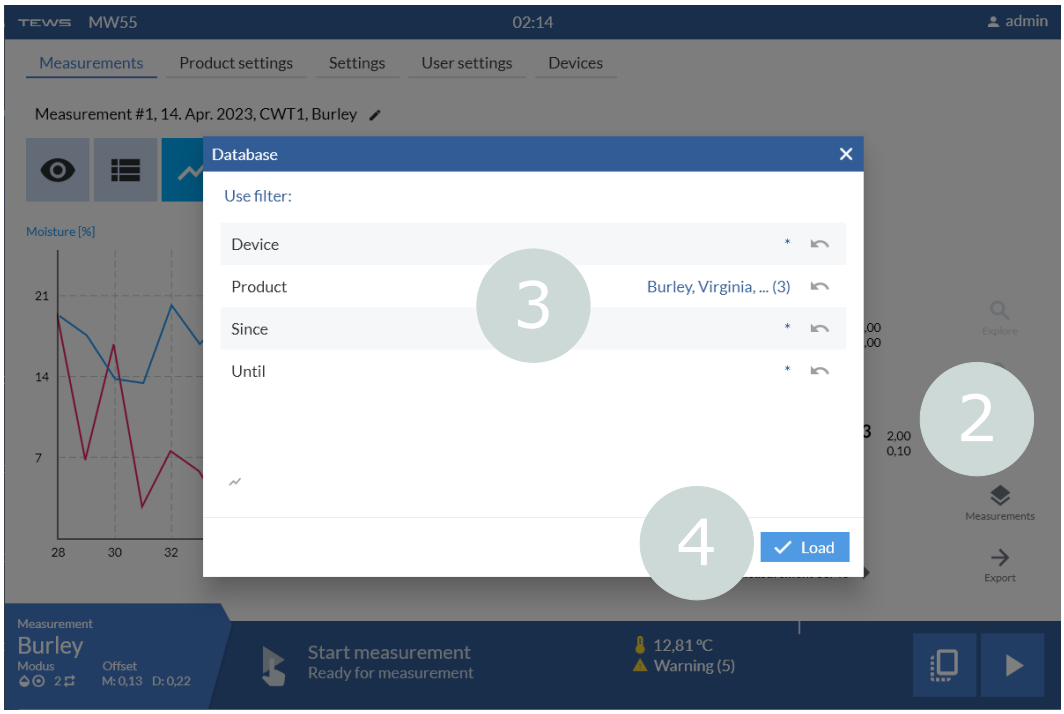
1. Insert the USB stick into the USB port on the bottom of the TEWS MW 55 (see page 23).
2. Press the stop button.
3. Press **Export**.
4. Enter a file name for the XLSX file using the on-screen keyboard and, if necessary, select one of the folders on the USB stick as the storage location.
5. Press **Save**:
   The measurements currently contained in the table are exported to an Excel file and saved on the USB stick.

Saving measured values and viewing them again

The measurements are saved automatically. You can reopen and view up to 10,000 measurements per product.

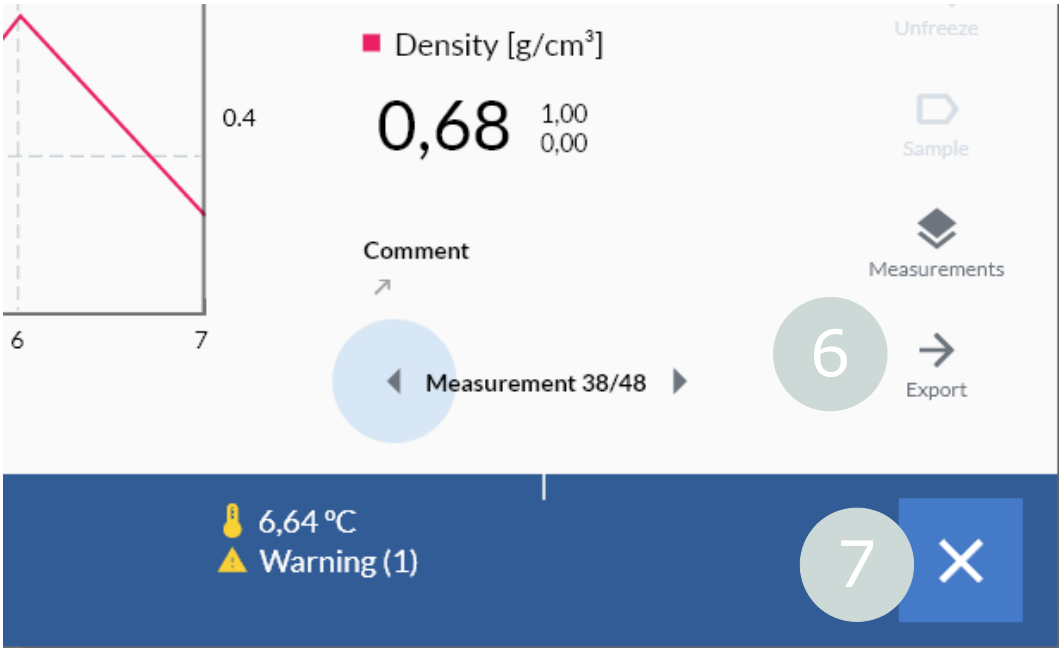
Note:	You cannot view saved measurements while measurement mode is running.

1. Press the stop button.
2. Press **Measurements**.
3. Set the database parameters for filtering the selection list:



Note:	A * in the selection means that all the available data is selected.

4. First, select the device and product and then set the date and time of the period in which you want to display the saved measurement series. Press **Load**.
5. The display now shows all the measurements saved with these parameters and you can switch between the values view, the table list of all the measurements and the graph view.
6. If required, you can export this data (see “Exporting measured values” on page 53).
7. To close the view of the saved measurements and return to measurement mode, press the close button in the bottom right corner.



Empty sensor adjustment

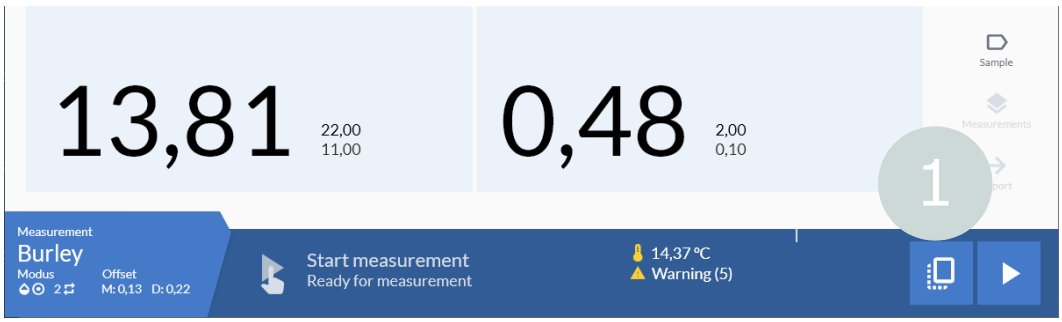
Regular empty sensor adjustments are required to ensure proper operation. In these adjustments, the TEWS MW 55 checks whether the sensor is "empty", i.e. whether the measured values are within a specific tolerance range around the value defined as "empty" (= soft empty sensor adjustment).

During measurements with the TEWS MW 55, the empty sensor adjustments are automatically performed by the system, which means you normally do not have to do anything.

Performing an empty sensor adjustment

1. To perform a manual empty sensor adjustment (e.g. for static measurements in the setup phase), press the empty sensor adjustment button.

Important! Ensure that the measurement section is actually empty!

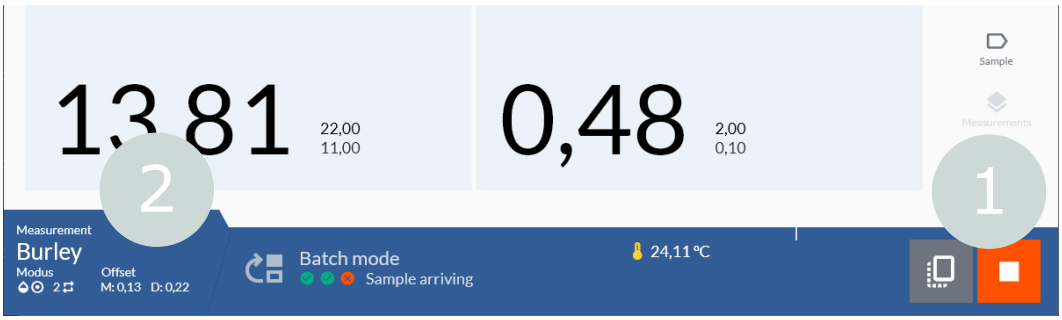


Product

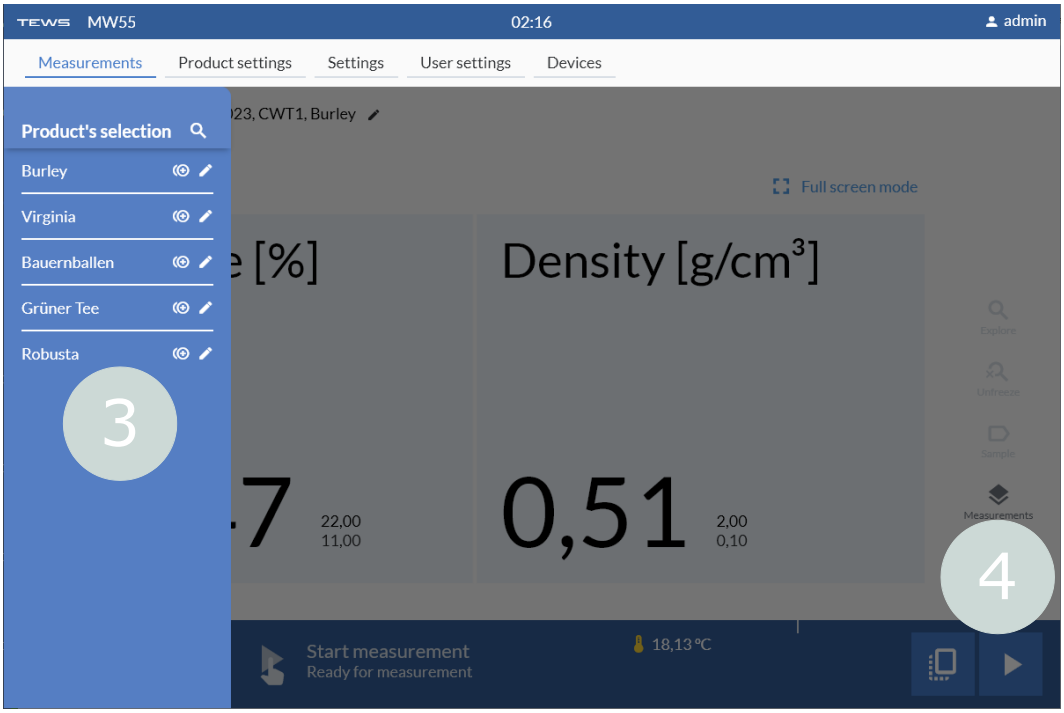
Changing the product

Note:	The product cannot be changed while the measurement is taking place.

1. Press the stop button.
2. Press the product name.



3. Select your required product from the list.
4. You can now start the measurement again by pressing the start button.



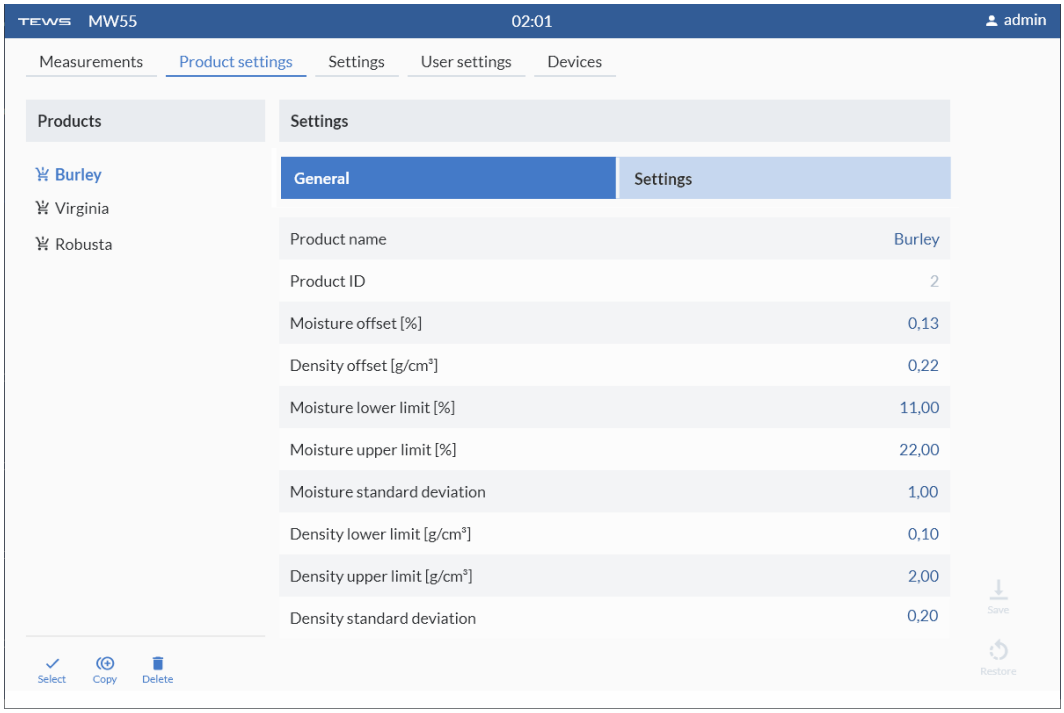
Changing product settings

General menu

The products for your area of application are created by TEWS staff during commissioning. You can create additional products or change the settings of existing products (for instance, you can define other limit values for deviations or correct the offset) in the **Product settings > Settings > General** menu.

You can use the entries for the upper and lower limits for the moisture and density to specify the values from which a warning is displayed on the screen or the signal light turns red.

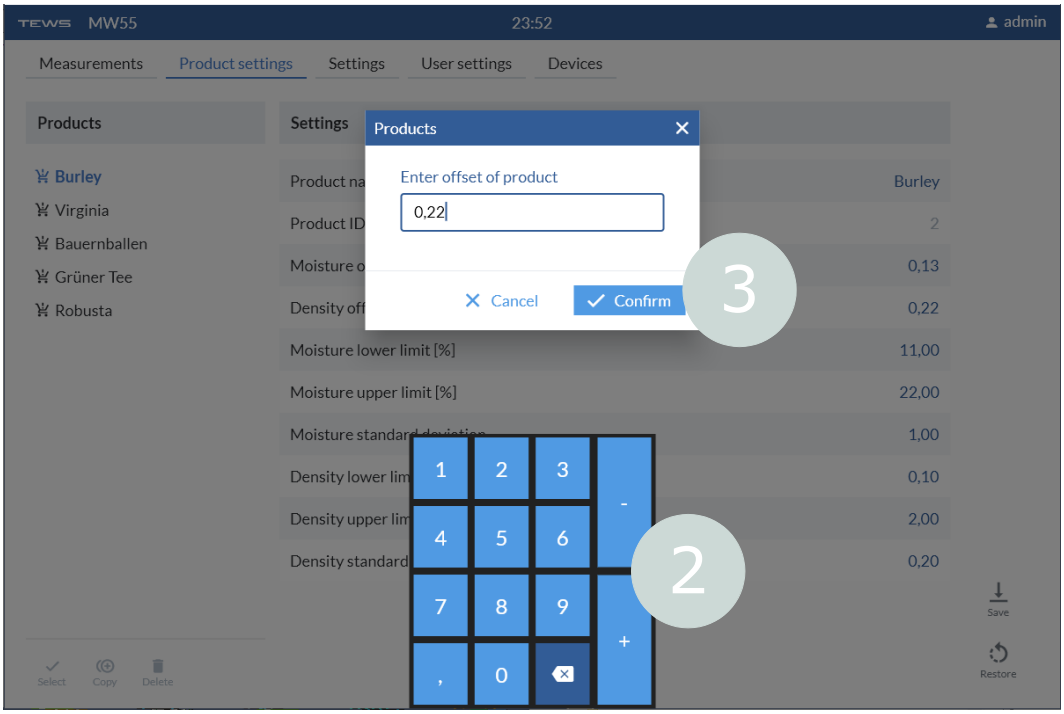
Moisture/density **standard deviation**: As the product passes through the system, multiple measurements are performed to ensure that the largest possible area of the batch or box is covered. A high standard deviation means that the values measured for a batch deviate significantly from each other, which indicates differing moisture penetration or density levels. If the standard deviation exceeds the value set here, the signal light turns yellow-orange.



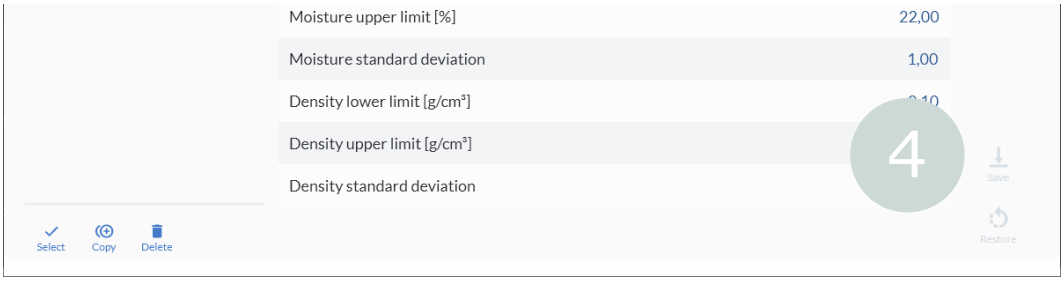
1. To change a value, press the line to be changed (for example, **Density offset [g/cm^3]**).

2. Enter your required value using the on-screen keyboard.

Note:	If a value was not previously defined for the offset, the dialogue automatically opens with the default value **0.0**.



3. Tap **Confirm**.
4. Once you have edited all the values to be changed, press Save.



Settings menu

Under Settings, you can find the calibration data for each product, for both the moisture and density. Calibration must be performed for each product for which moisture or density is to be measured.

The measurement procedure is an indirect procedure. It returns a value that is set in relation to the actual values through the calibration process.

The calibration data for the products is created and integrated into the system by TEWS staff. The settings can be adjusted if necessary. We recommend doing so only in consultation with TEWS.

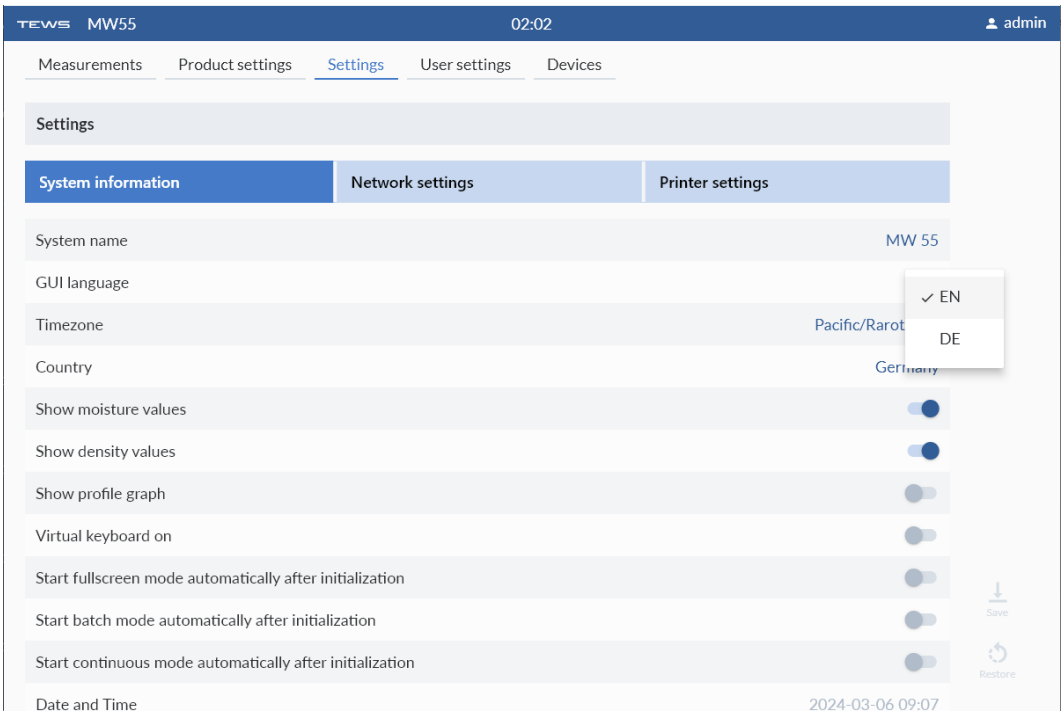
General device settings

You can change the following user interface views under **Settings** > **System information**:

- Device name
- Language
- Time zone
- Country
- Show/hide the moisture or density values
- Add the measurement profile graph view to the values view (see page 51)
- Automatically start the user interface in full-screen mode (see page 50)
- Automatically start batch mode or continuous mode (see “Measurement process” on page 49)
- Enable remote access
  Activate this option to enable access to the software from a different computer in the network. The title line is then displayed in red.

Changing the user interface language

1. Press the **GUI language** line.
2. Select your desired language setting.
3. To change language setting, the device must be restarted. Press **GUI reboot**.



Note: The display of separators in numerical values (point or comma) is controlled by the **Country** setting, not the **GUI language** setting.

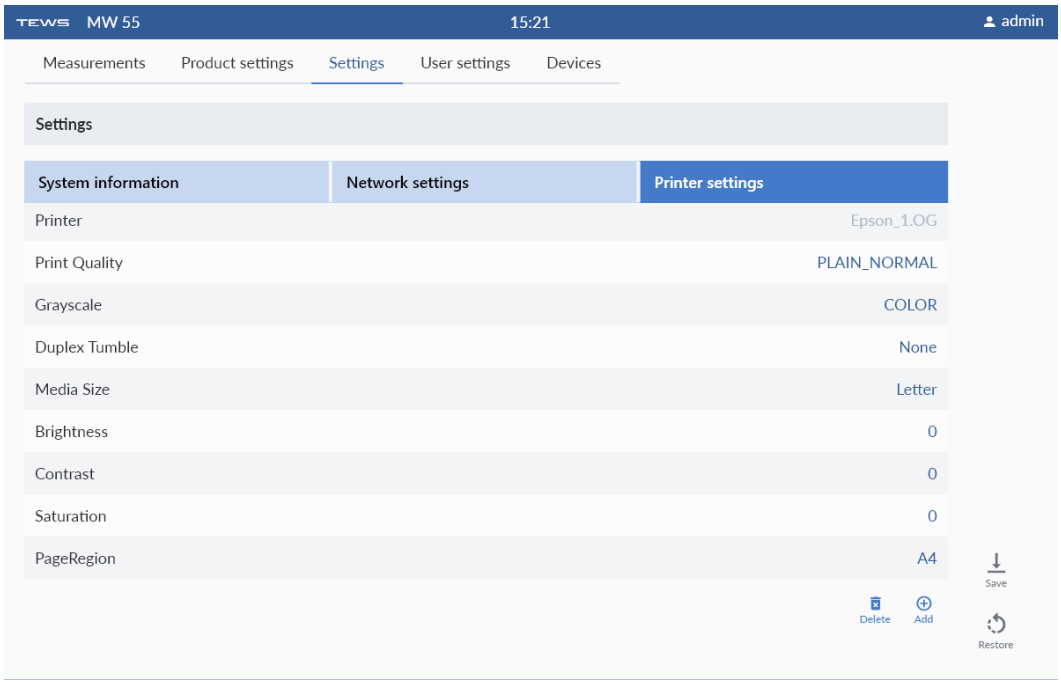
The date and time are set automatically based on the selected time zone and are updated by a time server if there is an active internet connection.

Configuring the network

TEWS staff establish the connection to your company network during commissioning. If there are any changes to your network, you can go to **Settings** > **Network settings** and change these settings.

Printer settings

Here, you can connect existing printers on the network to the system and change settings such as the paper format or resolution for created printers. The settings displayed depend on the selected printer.

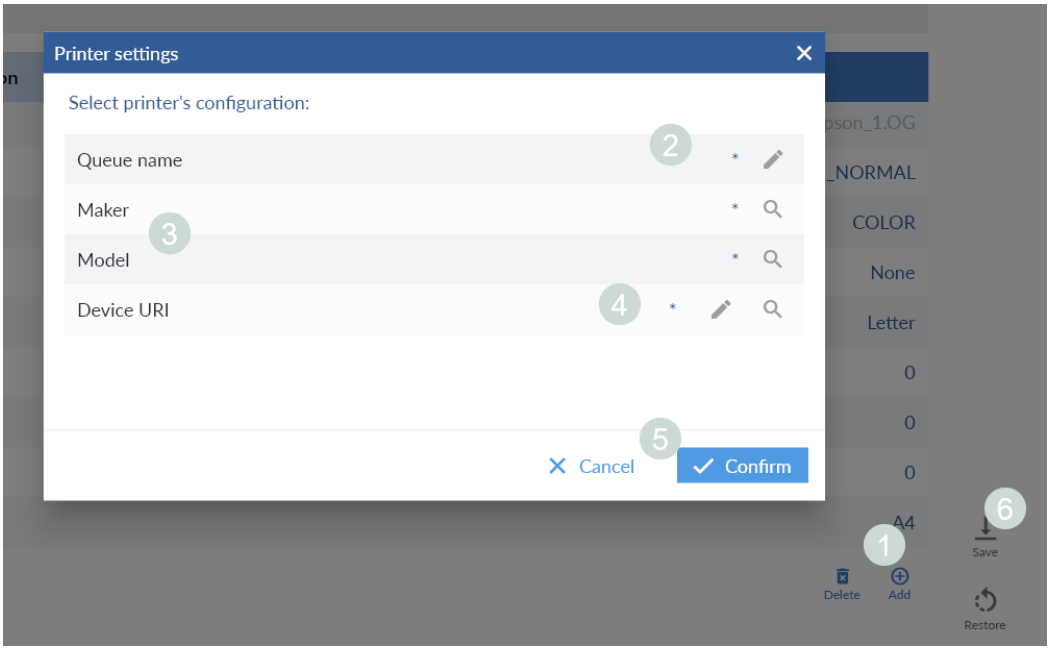


Selecting the printer

Press the top line with the printer name to open the selection dialogue, where all the printers created for your measuring device are displayed and you can select a different printer.

Creating a new printer

Note:	Press the pencil icon to open the on-screen keyboard and make an entry for the relevant field. Press the magnifying glass icon to open a list of the available entries; you can choose from these entries. The lists automatically extend down while you search through them.

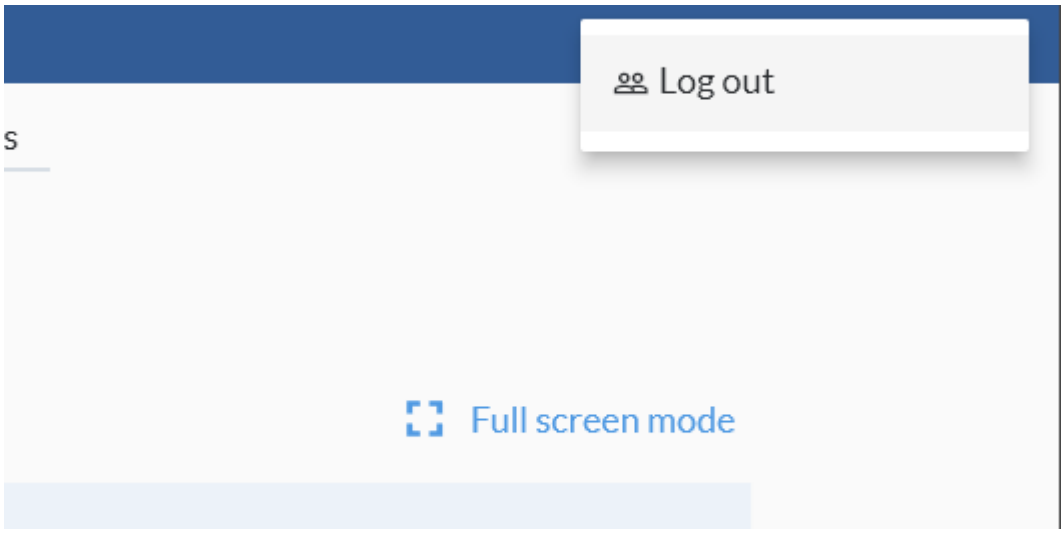


1. Press **Add**.
2. In the **Printer settings** dialogue, enter a name for the printer or the printer queue (with no blank spaces).
3. Select the printer brand from the manufacturer list and select the printer model from the device list to ensure that the correct printer driver is used.
4. Under **Device URL**, you can select the protocol and enter the IP address of the printer on the network if you know this data. Alternatively, you can also search through the list for the desired entry: The system shows all the printer queues that are currently available on your network.
5. Press **Confirm** to accept the new printer.
6. Press **Save** to save your changes.

Users

Logging out/changing user

To log out or log in with a different user account, tap the name of the user that is currently logged in in the top right corner and choose **Log out**. The software reboots and the login dialogue appears again.

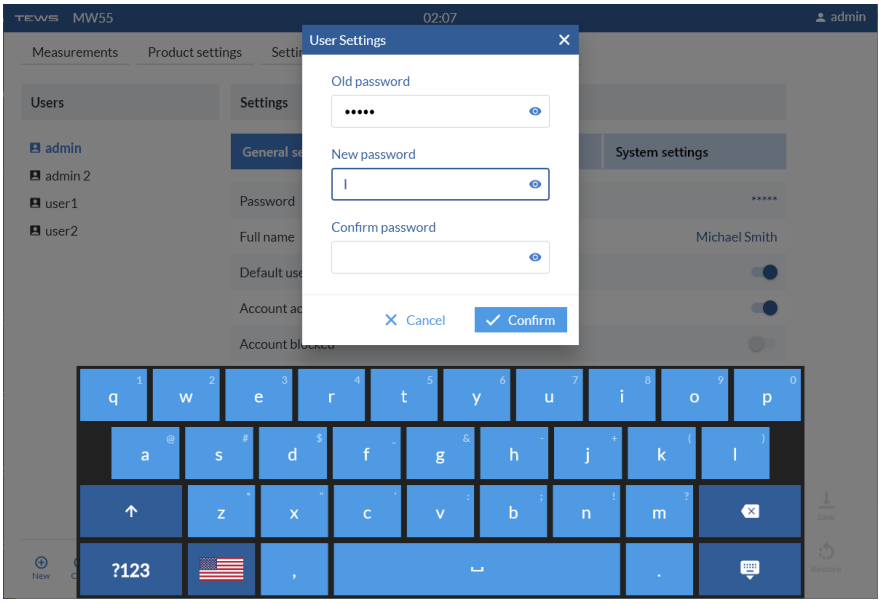


Changing the password

You are prompted to change your password at regular intervals based on the settings defined by your user administrator. However, you can change your password at any time regardless of this interval:

1. Press **User settings**.
2. Go to the **Password** line.
3. Enter your password in the **User Settings** dialogue and confirm your entry in the **Confirm password** field.

Note:	The password must be at least three characters long. For security reasons, the entry is displayed with *** as placeholders. If you want the entry to be in legible form, press the eye symbol to the right of the input field.



4. Press **Confirm** and then **Save** in the dialogue.

User settings

The software distinguishes between the **system administrator** and the **user administrator**. To edit the user settings, you have to log in as a user administrator. You can then only see the interface for editing the user settings; all the other functions are hidden. All the other users (including the system administrator) can only see their own settings in the user settings but cannot change them (exception: changing their own password).

Creating users

There are two ways to create users:

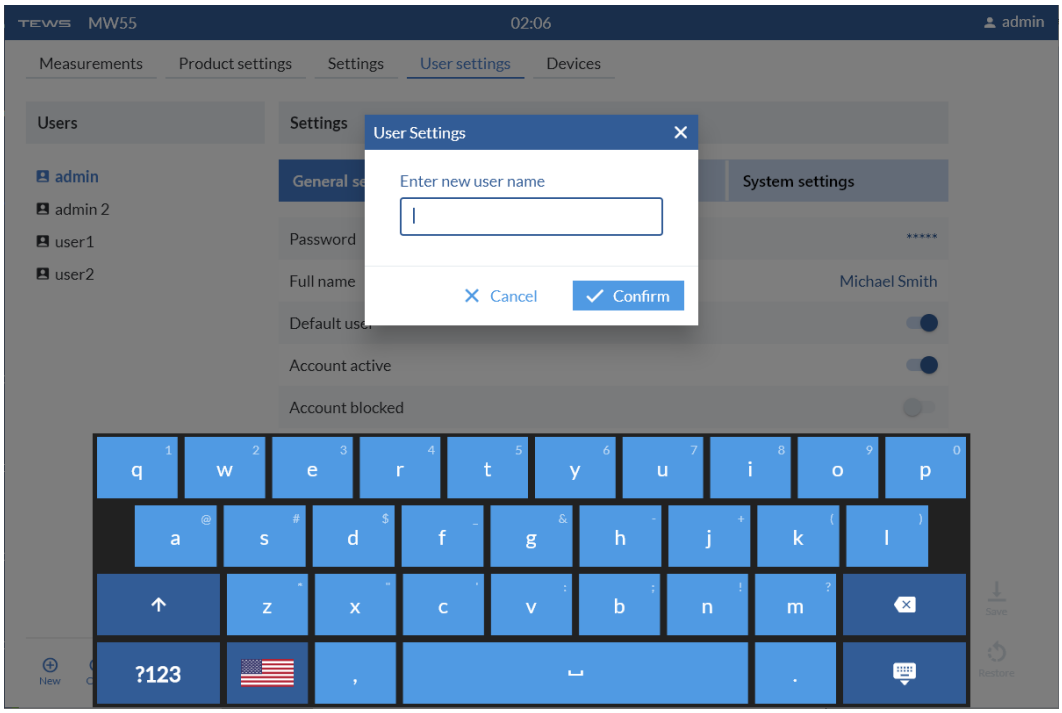
- You press **New**: In this case, the new user is created with the default settings and without access rights, and you configure all the settings on this basis.
- You select an existing user as a template and press **Copy**: In this case, you only have to change any settings that differ for this user.

Sample process:

1. Press **New**.

2. Use the on-screen keyboard to enter the user name that you want to display with the user in the overview on the left and with which the user logs in TEWS MW 55.

   The user name must be a minimum of 3 and maximum of 30 characters (no commas, semi-colons, and so on). This name is also shown in the top right corner of the display when the user is logged in and is the name with which the user logs in.

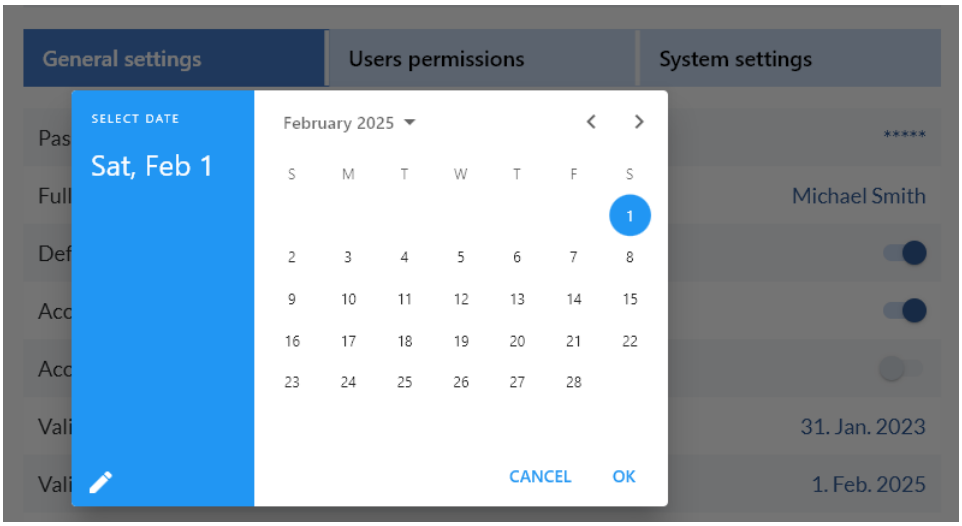


   The new user is now created under the specified name. The user account is activated by default.

3. You should now make the following changes in the general settings:

- Define a personal **password** for the new user
- Change the default user name with a full name entry for easier identification (**Full name**)
- Change the validity date for the user account
  The current date is entered in both fields by default. When you press the line,

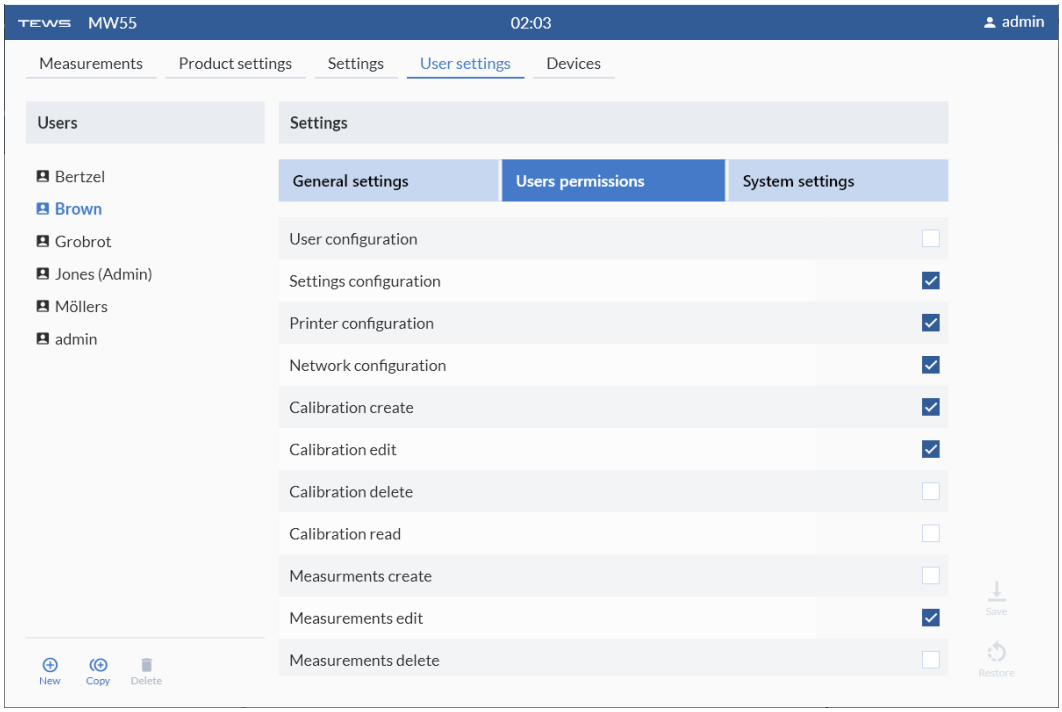
a calendar dialogue for selecting the date opens. You can switch this dialogue to a text input by pressing the pencil icon.



- For security reasons, users must change their password in regular intervals. This is required every 150 days by default, but you can also set different times for each individual user.
- The default settings for automatic logouts ensure that users with low-level access rights cannot access settings without authorisation because, for example, a user with administrator rights forgot to log out.

4. Assigning access rights: Press **User permissions** and select all the functions that you want to enable for the new user.

Note: If you activate the **User configuration** permission, all the other permissions are deactivated automatically because the user administrator is responsible only for the user settings and the assignment of rights.



5. Then press **Save**.

Deleting users

1. Select the user account to be deleted in the list.
2. Press **Delete**.
3. Choose **Confirm** in the confirmation prompt.

Note: As an alternative to deleting a user, you can also lock the account (by switching from **Account active** to **Account blocked**). You then do not have to create all the settings again if the user requires access to the system in the future.

Users – System settings

The **System settings** area under **User settings** shows you information about the user that is currently selected, such as the last time that the user logged in with his or her user account.

Creating a default user

If you want to go to measurement mode automatically without logging in when you start the device, you can define a user as the default user.

Activate the "Default user" setting for this user.

The next time that you switch on the TEWS MW 55, the user interface starts with the settings for this default user without requesting a password.

The default user then only has to log in with his or her user name and password if he or she logged out in the meantime or another user logged in.

For this default user, we recommend that you only activate permissions that are absolutely necessary for operation (for instance, read permissions) and deactivate all rights to change, delete or create data.

If you want to define a different user as the default user, you must first deactivate the setting for the current default user and then activate it for the new default user.

If no user is defined as the default user, the login dialogue is always displayed when you start the device.

Devices

In the **Devices** menu, you can manage various settings for the one device or multiple connected devices, such as the difference between batch mode and continuous mode (see page 49). These settings are adapted to your system by TEWS staff during commissioning and usually do not have to be changed.

Service and maintenance

Cleaning

⚠ DANGER

DANGER - risk of death due to electric shock!
Prior to cleaning, switch off the device **and** pull out the power plug.
Do not immerse the device in water or other liquids.

High-pressure cleaning is forbidden!
When using a high-pressure cleaner, water may enter into the device and cause an electrical hazard.

Where necessary/when dirty:

1. Switch off the TEWS MW 55 at the on/off switch (see "Switching off the TEWS MW 55" on page 39).
2. Disconnect the power cable from the power connection.
3. Clean the housing and screen with a slightly damp cloth. Water must not be allowed to enter the interior of the device. Then wipe the device dry.

   Do not use abrasive chemical substances, scouring material, hard sponges or similar implements for cleaning.
   Do not exert too much pressure when cleaning the touchscreen.

Regular maintenance (at least once per month)

- Check light barriers
  - Does the LED light up?
  - Check for correct alignment
  - Clean sensor window if necessary
- Check cables

  Check cables for damage, kinking or loose plugs
- Check the cooling device (if present) of the TEWS MW 55 for dirt and clean it if necessary. The time intervals for cleaning the cooling device depend on the level of contamination.

⚠ DANGER

DANGER - risk of death due to electric shock!
Parts in the device remain live even after switching it off at the main switch.

- The maintenance work on the cooling device must be performed only by electrical specialists when the device is de-energised.

You can find information about maintaining the cooling device in the "Inspection and maintenance" section of the manual supplied by Rittal, the cooling device manufacturer.

Software update

NOTICE

Software updates must be carried out only by authorized personnel!

You receive software updates on a USB stick from TEWS Elektronik.

Updates of the internal PLC must be performed only in coordination with TEWS Elektronik.

1. Insert the USB stick into the USB port on the bottom of the TEWS MW 55.
2. Switch off the TEWS MW 55 by holding down the on/off switch for approx. two seconds: when the on/off switch flashes red, the TEWS MW 55 is shut down (this process takes approx. 30 seconds).
3. Switch the device on again using the on/off switch.

   The update is automatically detected and installed.

Replacing fuses

⚠ DANGER

DANGER - risk of death due to electric shock!

Parts in the device remain live even after switching it off at the main switch.

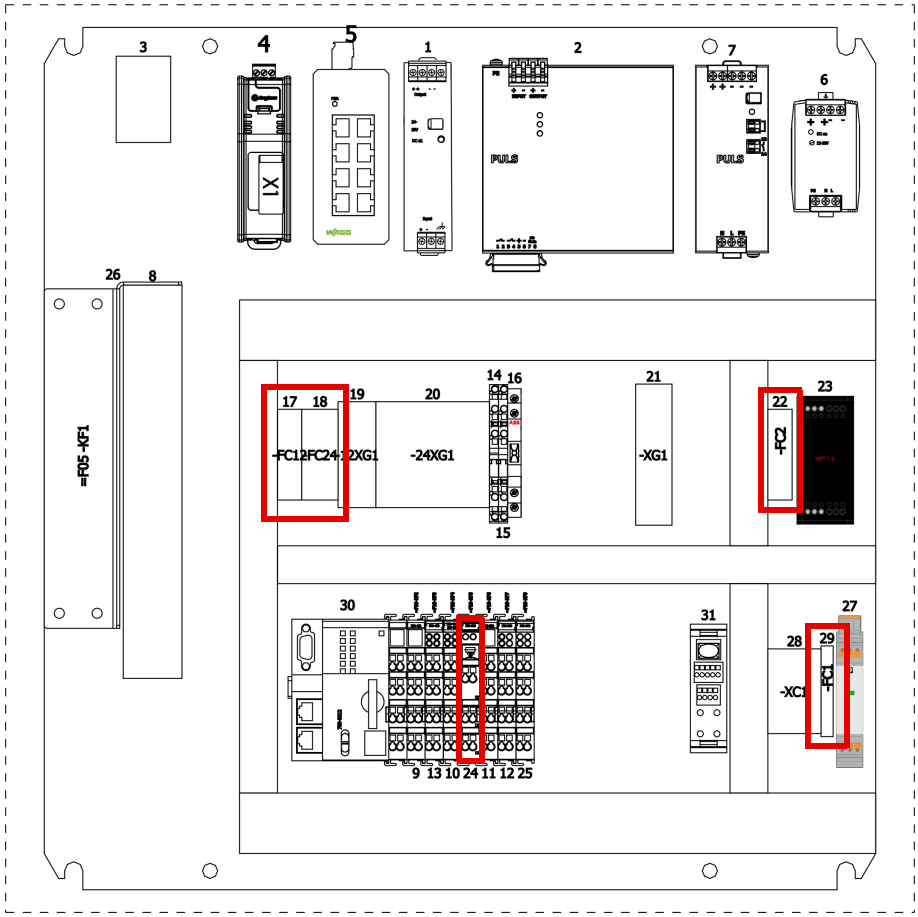
- Work on the electrical system must be performed only by electrical specialists.
- The five safety rules must be followed when doing so:

1. Disconnect
2. Secure against reactivation
3. Ensure that no voltage is present
4. Ground and short-circuit
5. Cover or cordon off neighbouring live parts

Fuses must be replaced only with types that have the same characteristics.

Overview of fuses

Fuse		Function	Number in the figure
FC1	6 A	Supply, 230 V, 50 Hz, I_n=3 A, $I_{max.}$ 10 A	29
FC2	6 A	Fuse for power supply units, 230 V AC	22
in Wago 750-610	6.3 A	Potential supply, 24 V DC	24
FC12	2 A	Fuse, control voltage, 12 V DC	17
FC24	6 A	Fuse, control voltage, 24 V DC	18



Automatic shutdown in the event of overheating or power failure

- If the temperatures in the TEWS MW 55 are too high (for example, because the air supply in the cooling device is obstructed), the shutdown process is initiated automatically.

  A message stating that the TEWS MW 55 is shutting down appears on the screen: "Internal temperature too high. Safety shutdown! Shutdown in 0:30 seconds"
- The shutdown process is also automatically initiated if the TEWS MW 55 power supply is interrupted (for example, if the power fails or the power plug is unintentionally disconnected).

  A message stating that the TEWS MW 55 is shutting down appears on the screen: "Power failure! Restore power supply or controlled shutdown in 0:30 seconds."

The UPS inside the device now supplies the TEWS MW 55 with power for approx. five minutes to ensure that the software shuts down properly and to prevent damage.

⚠ DANGER

DANGER - risk of death due to electric shock
If you have to open the door of the TEWS MW 55, wait for an additional ten minutes after disconnecting the power plug to ensure that the UPS is deactivated.

Remedy in the event of overheating

1. If possible, eliminate the cause of the overheating, for example, by cleaning the cooling device (see the manual supplied by Rittal, the cooling device manufacturer).
2. Let the TEWS MW 55 cool down for at least half an hour.
3. Switch the TEWS MW 55 on again. If the problem occurs again, please contact TEWS Elektronik.

Transport and storage

Keep the original packaging in which the device was delivered. If you need to transport or store the device later, you must use the original packaging. The following environmental conditions must be observed when storing or transporting the device:

Temperature: -20 °C to +60 °C
Rel. air humidity: max. 85%, non-condensing

NOTICE

The TEWS MW 55 is intended for wall-mounting and may not be operated in a horizontal position.

The enclosure must be secured against tipping over during transport, setup and disassembly.

Disposal

If you no longer want to use the device, you can return it to TEWS Elektronik.

If you are disposing of the device independently, note the following:

- You must not dispose of the device in the household rubbish. You must observe regional, national, and international regulations when disposing of the device or its components.
- The device may contain harmful substances. Any electrical components (PCBs, power supply units, transformers, coils, cables, and plugs) must be recycled after disassembly.
- After disassembly, all metal parts should be separated into the various metals and sent for recycling.
- You must hand over the device and its components to a recognised disposal agency.

The information provided here is based on current knowledge and experiences. It does not release the party disposing of the device from the obligation to observe the conditions and laws applicable at the time of disposal.

Technical data

Ambient conditions

Temperature range (operation)	5 °C to +40 °C
Temperature range (storage/transport)	-20 °C to +60 °C
Relative humidity	max. 85% (without condensation)
Degree of protection	IP54 (inside)
Protection class	1

Dimensions/weight

Dimensions (H x W x D) in mm	600 x 760 x 210 (housing without fastening materials)
Weight	approx. 45 kg (with cooling device)

Interfaces

USB	1x USB2.0 (non-isolated), max. cable length = 3 m
LAN	1x 10/100baseT (galvanically isolated)

Inputs/outputs

"Light barriers function" digital inputs	3x, "0"=-3 V to +5 V "1"=+15 V to +30 V, 5 mA input current,	non-isolated
"Conveyor belt signal function" digital input	1x, "0"= 0 to +10 V "1"=+16.8 V to +30 V, 10.5 mA input current,	isolated
"Outputs for multicolour signal light" digital outputs	3x, 24 V, active, max. 0.5 A per output, max. 1 A total,	non-isolated

You have the option of galvanically isolating the inputs and outputs.

You have the option of extending the number of inputs/outputs.

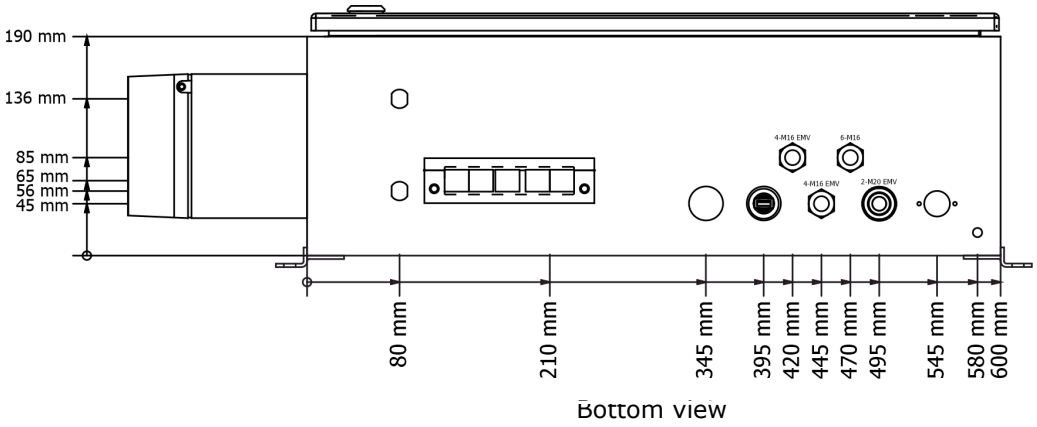
Electrical power supply

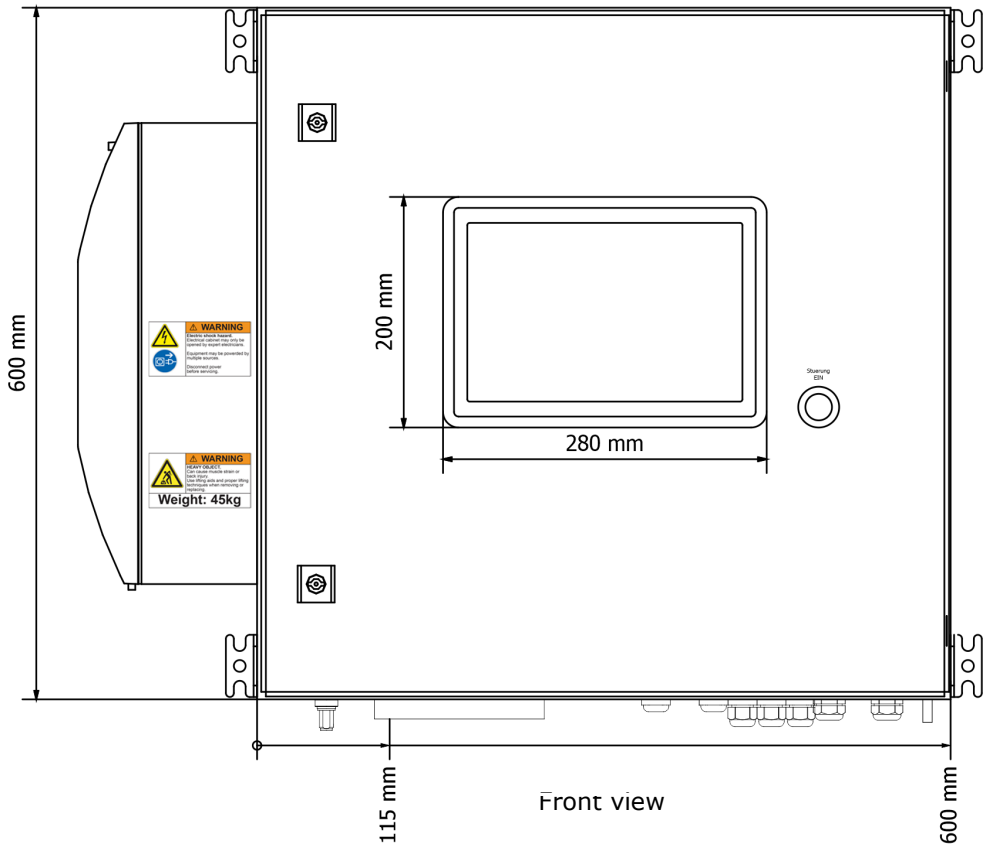
Switch cabinet, overall (dependent on design)	100 V AC to 240 V AC, 50/60 Hz, max. 180 W Fuse: 6 A medium time delay for all voltages
External components (light barrier, IR sensor, etc.)	24 V DC, max. 1A, supplied by the TEWS MW 55 Fuse: 1 A delayed
EMC/electrical safety	see "EU Declaration of Conformity" on page 81

This operating manual refers to the TEWS MW 55 device version with the article number 177489, which corresponds to the development version of MW 55 Option Bales & Boxes or MW-T 2.0.

Other features and specifications on request.

Dimensions of the TEWS MW 55





Addresses

Visit us on the Internet:

www.tewsworks.com

Send your general questions and suggestions to:

gethelp@tewsworks.com

The development, production, service, and sales departments can all be reached at the same address. This ensures that all problems can be resolved as quickly and easily as possible and guarantees customer-friendly service.

TEWS Elektronik GmbH & Co. KG
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Fax: +49 (0)40 - 55 25 75 9

Cooling device manufacturer:

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Auf dem Stützelberg
D-35745 Herborn
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Fax: +49 (0)2772 505 2319
E-Mail: info@rittal.de
www.rittal.com

EU Declaration of Conformity

For the product denoted in the following way:

Instrument Type: **Microwave Moisture and Density Measuring System MW 55 Article Number 177489**
equipped with:
Option Antenna Unit Dual Vivaldi or Option Antenna Unit Quadro-Vivaldi

It is hereby certified, that it corresponds to the essential safety regulations which are required according to the guidelines of the approximation of law of the member states concerning electromagnetic compatibility 2014/30/EU, the radio equipment directive 2014/53/EU and safety requirements 2014/35/EU.

For the evaluation of the certificate regarding to the electromagnetic compatibility, the following norms were referred to:

EN 302 065-4 V1.1.1 (2016-11)
EN 301 489-1 V2.2.3 (2019-11)
EN 301 489-33 V2.2.1 (2019-04)
EN 61000-4-2 (2009-12)
EN 61000-4-3 (2021-11)
EN 61000-4-4 (2013-04)
EN 61000-4-5 (2019-03)
EN 61000-4-6 (2014-08)
EN 61000-4-11 (2021-10)
EN 55032 (2016-02)
EN 61000-3-2 (2019-12)
EN 61000-3-3 (2023-02)

For the evaluation of the certificate regarding to the safety requirements, the following norm was referred to:

EN 62368-1 (2021-05)

Tested setup:
Measuring unit MW 55 Article Number 177489
2 antennas on a table
Cable for the antennas: coaxial cable “S04272B“, 3m
Module Lightbarrier MW 55 complete

This declaration is issued responsible for the manufacturer

TEWS Elektronik GmbH & Co KG
Sperberhorst 10
D-22459 Hamburg
Germany

by

i.A. Tews

A. Tews, Executive Manager Hamburg, April 2023

FCC Part 15 C

For the product denoted in the following way:

Instrument Type: **Microwave Moisture and Density Measuring System MW 55 Article Number 177489**
equipped with:
Option Antenna Unit Dual Vivaldi or Option Antenna Unit Quadro-Vivaldi
Module Lightbarrier MW 55 complete

It is hereby certified, that this device complies with Part 15 C related to Part 15.517 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 equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to part 15 C related to Part 15.517 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.

Tested setup:

Measuring unit MW 55 Article Number 177489
2 antennas on a table
Cable for the antennas: coaxial cable “S04272B“, 3m
Module Lightbarrier MW 55 complete

This declaration is issued responsible for the manufacturer

TEWS Elektronik GmbH & Co KG
Sperberhorst 10
D-22459 Hamburg
Germany

by

A. Tews, Executive Manager Hamburg, April 2023

RF Exposure Statement

For the product denoted in the following way:

Instrument Type: **Microwave Moisture and Density Measuring System MW 55 Article Number 177489**
equipped with:
Option Antenna Unit Dual Vivaldi or Option Antenna Unit Quadro-Vivaldi
Module Lightbarrier MW 55 complete

This device has been tested and found to comply with the requirements set forth in 47 CFR Part 15 for both fundamental emissions and unwanted emissions. These limits are designed to provide reasonable protection against any harmful interference when the device is operated in a commercial environment.

Modifying the device without TEWS authorization may result in the device being no longer compliant with FCC requirements. In that event, your right to use the device may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.
This device complies with the requirements set forth in FCC 47 CFR Section § 1.1307 addressing RF exposure from radio frequency devices. To maintain compliance, the minimum separation distance from the antenna to general bystander is 20 cm.

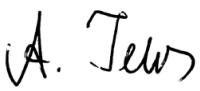
Tested setup:

Measuring unit MW 55 Article Number 177489
2 antennas on a table
Cable for the antennas: coaxial cable "S04272B", 3m
Module Lightbarrier MW 55 complete

This declaration is issued responsible for the manufacturer

TEWS Elektronik GmbH & Co KG
Sperberhorst 10
D-22459 Hamburg
Germany

by



A. Tews, Executive Manager Hamburg, April 2023

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