

Operating Instructions

Version 2.01



HYDROMETTE BL COMPACT TF-IR 2



EN



GANN MESS- U. REGELTECHNIK GMBH

70839 GERLINGEN

SCHILLERSTRASSE 63

INTERNET: <http://www.gann.de>

Verkauf National: TELEFON 07156-4907-0
Verkauf International TELEFON +49 7156-4907-0

TELEFAX 07156-4907-40
TELEFAX +49 7156-4907-48

EMAIL verkauf@gann.de
EMAIL sales@gann.de



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Table of contents

1	Foreword	4
1.1	User Description	4
1.2	Intended use.....	4
1.3	Non-intended use	4
1.4	Explanation of the general warnings.....	5
1.5	Specific warnings	5
1.6	General safety instructions	6
1.6.1	Persons at risk	6
1.6.2	Preparation and start-up	7
1.6.3	Use / Operation	7
1.6.4	Maintenance and inspection	8
1.6.5	Troubleshooting	8
1.6.6	Disposal	8
2	Specifications.....	9
2.1	Technical Data of the Hydromette	9
2.2	Technical data of the TF-Stick 16 K-25	9
2.3	Prohibited Environmental Conditions	9
2.4	Measuring ranges and measurement tolerance of the TF-Stick 16 K-25	10
2.5	Measuring range and measurement tolerance of the infrared surface temp. sensor	10
2.6	Transport & Storage Conditions	10
3	General Information.....	11
3.1	Standards and Directives.....	11
3.2	Warranty.....	11
4	Description of the product	12
5	Device layout and button assignment.....	13
5.1	Display Symbols	14
5.1.1	Main menu symbols	14
5.1.2	Other symbols	14
5.2	Switch on device.....	15
5.3	Setting menus.....	16
5.3.1	Measuring Menu (main menu).....	16
5.3.2	Measuring mode selection	17
5.3.3	Laser Pointer / EM menu.....	20
5.3.4	Maximum value display.....	21

5.3.5	Minimum value display	22
5.3.6	Memory Menu.....	23
6	Other Functions.....	24
6.1	Use without TF-Stick.....	24
6.2	Automatic switch-off.....	25
6.3	Battery monitoring	25
7	Installation of the PC software GANN Dialog Pro.....	26
8	USB communication with a PC	28
9	Application Notes	29
9.1	Using the Hydromette BL Compact TF-IR 2	29
9.2	Measuring relative humidity	29
9.3	Equilibrium wood moisture content (EMC)	30
9.4	Measuring air temperature	30
9.5	Dew point temperature.....	30
9.6	Measuring using infrared temperature measurement technology (IR).....	31
9.6.1	General	31
9.6.2	Measuring using IR sensor.....	31
9.6.3	Emissivity	32
9.6.4	Measurement spot size	33
10	Accessories	34
11	Appendix.....	36
11.1	Dew Point Table	36
11.2	Emissivity table.....	37

1 Foreword

1.1 User Description

These instructions are intended for the end user of the product. The end user of the product is a person who has read and understood these operating instructions, is an experienced user of similar devices and is aware of all possible dangers and can act accordingly. The device may only be used by persons over the age of 14.

The device is intended for use by persons who have experience with moisture measurements.

All personnel involved in the operation, installation, inspection and maintenance of the product must be qualified to carry out the associated work. If the personnel concerned do not already have the required knowledge and skills, appropriate training and instruction must be ensured.

All local regulations must be complied with.

1.2 Intended use

The Hydromette BL Compact TF-IR 2 is a humidity and temperature measuring instrument that enables highly accurate measurements by connecting a humidity/temperature sensor. The Hydromette also has an IR surface temperature sensor. This combination of different measuring methods enables the Hydromette BL Compact TF-IR 2 to quickly and reliably assess dew point undershoots, or to detect borderline situations on surfaces such as walls, ceilings, floors and window and balcony door lintels. The integrated laser helps to locate the measuring point of the surface temperature measurement.

The Hydromette BL Compact TF-IR 2 may only be used for humidity and temperature measurements.

1.3 Non-intended use

The device is not intended for any applications that are not listed in these operating instructions.

The device, accessories, tools, software, etc. must be used in accordance with these instructions, taking into account the working conditions and the work to be performed. Using the product for work other than that for which it is intended will result in a hazardous situation.

The device may only be used together with the original accessories (see chapter 10, "Accessories"). The device must only be used within the specified performance limits as described in these instructions.

1.4 Explanation of the general warnings

The following danger levels are used in this operating manual to indicate potentially dangerous situations and important safety instructions:

Danger level	Description
 DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious irreversible injuries.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious irreversible injuries.
 CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injuries.
 Information	Indicates important information.

1.5 Specific warnings



CAUTION: The Hydromette BL Compact TF-IR 2 uses a laser in laser class 2 according to IEC 60825-1. People can be blinded by the laser. The laser must never be directed at people or animals. Do not look directly into the laser beam and avoid reflections on reflective surfaces.

1.6 General safety instructions

It must be ensured that the complete instructions and all safety instructions have been read and understood before using this device.

All instructions must be followed. This prevents accidents that can result in property damage or minor or moderate injuries.



All safety information and instructions must be kept for future reference and passed on to subsequent users of the product.

INFORMATION

The manufacturer shall not be liable for any damage to property or injuries to persons that can be attributed to incorrect handling or non-compliance with the safety instructions. In such cases, the warranty shall be void.

1.6.1 Persons at risk

Persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge must be supervised or instructed in the safe use of the device and understand the associated hazards.

Children must be supervised to ensure that they do not play with the device. The device is not a toy. There is a risk of swallowing small parts of the device (e.g. battery compartment cover) or an accessory (e.g. TF-Stick).

This device is not intended for use by persons with reduced physical, sensory or intellectual capabilities, or lack of experience and/or knowledge.



WARNING

Risk of suffocation, injury or permanent disability. The device must not be used by persons under the age of 14.

Risk of suffocation! Keep packaging away from children.

1.6.2 Preparation and start-up

Never store or place the device where it can fall or be drawn into water or other liquids.

To avoid the risk of electric shock, never immerse the device in water or other liquids.

Always remove all packaging before operating the device.



WARNING

Fire hazard!
Do not use a damaged device.

In the case of visible damage, strong odour development or excessive heating of components, the battery must be removed immediately, and the device must not continue to be used.

1.6.3 Use / Operation



CAUTION

Risk of damage. The device is a highly sensitive measuring instrument.
Only use the device in a controlled electromagnetic environment.

Risk of damage. Do not let the device drop onto hard surfaces. This can result in malfunctions or functional failures. Normal use of the device, without excluding hazards to the user, cannot be guaranteed.

The device is fragile.

To avoid overheating, the device must not be covered or used near heat sources or direct sunlight and only be used at ambient temperatures between 0 °C and 40 °C.

1.6.4 Maintenance and inspection



CAUTION

Remove the battery before cleaning the product. Do not use abrasive cleaning cloths or chemicals to clean the product as these can damage the surface.

Stop using the product in the case of visible damage, strong odour development or excessive overheating of components.

Only use original accessories.

Changes to the device and technical modifications are not permitted without the written consent of the manufacturer.

The device and particularly the mini-USB socket must not be sprayed directly or indirectly with water when cleaning.

1.6.5 Troubleshooting

Do not repair the device yourself. Contact the manufacturer if the device is not functioning properly.

1.6.6 Disposal

Electrical equipment, accessories and packaging must not be disposed of together with household waste (only for EU countries) and must be disposed of in compliance with the European Directive 2012/19/EU on waste electrical and electronic equipment and its implementation in accordance with national law. Electrical equipment that has reached the end of its service life must be collected separately and sent to an environmentally compatible recycling facility.

The WEEE symbol draws attention to the need for disposal.

The device contains a battery. Batteries must not be disposed of with normal household waste. They may contain toxic heavy metals and are subject to the hazardous waste ordinance. For this reason, dispose of the battery at a local collection point for the recycling of waste electrical and electronic equipment. Caution, there is a risk of explosion if the wrong type of battery is inserted. Handle used batteries according to the manufacturer's instructions.

2 Specifications

2.1 Technical Data of the Hydromette

Display:	LCD segment display with three lines
Display resolution:	0.1% for humidity 0.1 °C for temperature
Response time:	< 2 s
Storage conditions:	+ 5 to + 40 °C - 10 to + 60 °C (for a short time)
Operating conditions:	0 to + 50 °C - 10 to + 60 °C (for a short time) < 85% r.h., non-condensing
Power supply:	9 V block battery
Types that can be used:	Types 6LR61 and 6F22
Dimensions:	180 x 50 x 30 (L x W x H) mm (without TF-Stick) 210 x 50 x 30 (L x W x H) mm (with TF-Stick)
Weight:	approx. 170 g
Protection class:	III
Protection rating:	IP20

2.2 Technical data of the TF-Stick 16 K-25

Weight:	approx. 5 g
Diameter in the area of the mounting	8 mm
Diameter in the area of the measuring point	6.5 mm
Length:	52 mm
Protection rating:	IP20

2.3 Prohibited Environmental Conditions

- Condensation, humidity continuously too high (> 85% r.h.) and wetness
- Permanent presence of dust and combustible gases, vapours or solvents
- Ambient temperatures continuously too high (> +50 °C)
- Ambient temperatures continuously too low (< 0 °C)

2.4 Measuring ranges and measurement tolerance of the TF-Stick 16 K-25

Humidity:	0 ... 100% r.h. ±1.8% r.h. in the range 10 to 90% r.h.(*)
Air temperature:	-20 to 80 °C ± 0.2 °C in the range 10 to 60 °C(*)

2.5 Measuring range and measurement tolerance of the infrared surface temp. sensor

Surface temperature:	-40 to 380 °C ± 0.5 °C in the range 10 to 60 °C(*)
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(*) Typical sensor accuracy

2.6 Transport & Storage Conditions

The Hydromette BL Compact TF-IR 2 may only be stored in the packaging provided by the manufacturer or available from the manufacturer as an accessory. The manufacturer shall not accept any liability or warranty for damage that may occur to the device or to the sensor system as a result of non-compliance.



INFORMATION

In particular, avoid **keeping or storing the devices in foams** not supplied by the manufacturer, as these can damage the sensors due to possible outgassing and result in incorrect measurements.

3 General Information

3.1 Standards and Directives

This measuring instrument fulfils the requirements of the applicable European and national directives (2014/30/EU) and standards (EN 61010). Appropriate declarations and documentation are held by the manufacturer.

To ensure trouble-free operation of the measuring instrument and operational reliability, the user must carefully read and understand the operating instructions.

3.2 Warranty

The measuring instrument may only be operated under the specified climatic conditions. These are listed in chapter 2.1 "Technical Data of the Hydromette".

This measuring instrument may only be used under the conditions and for the purposes that it has been designed for. Operational reliability and functionality are no longer ensured if the device is modified or adapted. Gann Mess- u. Regeltechnik GmbH shall not be liable for any damage arising from such modifications or adaptations. The risk is borne solely by the user.

The measuring instrument and any accessories may only be properly used as described in these instructions. Keep the device and accessories out of the reach of children!

The device must not be stored or operated in air that is corrosive or contains solvents!

The notes and tables in these instructions regarding permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. Therefore, the manufacturer cannot guarantee the correctness. The conclusions to be drawn from the measurement results depend for each user on the individual circumstances and the knowledge gained from his professional experience.

The measuring instrument may be used in the residential and commercial sectors.

Gann Mess- u. Regeltechnik GmbH accepts no liability whatsoever for damage caused by non-compliance with the operating instructions or by breach of the duty of care during transport, storage and handling when operating the device, even if this duty of care is not specifically referred to in the operating instructions.

4 Description of the product

The Hydromette BL Compact TF-IR 2 is a precise thermo-hygrometer with infrared surface temperature sensor for many applications, e.g. surveillance of residential spaces, air conditioning systems, print shops, warehouses, etc. Further features are: Single-hand operation, integrated and plug-in measuring probes, 3-line LCD display for simultaneous display of three measured values such as humidity, dew point temperature and surface temperature.

This combination of different measuring methods enables the Hydromette BL Compact TF-IR 2 to quickly and reliably assess dew point undershoots, or to detect borderline situations on surfaces such as walls, ceilings, floors and window and balcony door lintels.

In addition to displaying the measured value, the device creates an audible signal when a critical surface temperature is detected.

If used in good time, this can prevent mildew formation or reliably assess the occurrence of condensation humidification.

The measuring probe is replaceable. Therefore, several measuring probes (plug-in TF-Sticks) can also be attached to different measuring points, and these can be interrogated quickly one after the other avoiding prolonged adjustment times.

The Hydromette BL Compact TF-IR 2 has a mini-USB port that can be used to download any firmware updates using the GANN Dialog Pro PC software.

An internal memory is available for storing data.

The silicone buttons give haptic feedback for important functions.

5 Device layout and button assignment



Figure 5-1: Front view of the Hydromette BL Compact TF-IR 2

5.1 Display Symbols

5.1.1 Main menu symbols

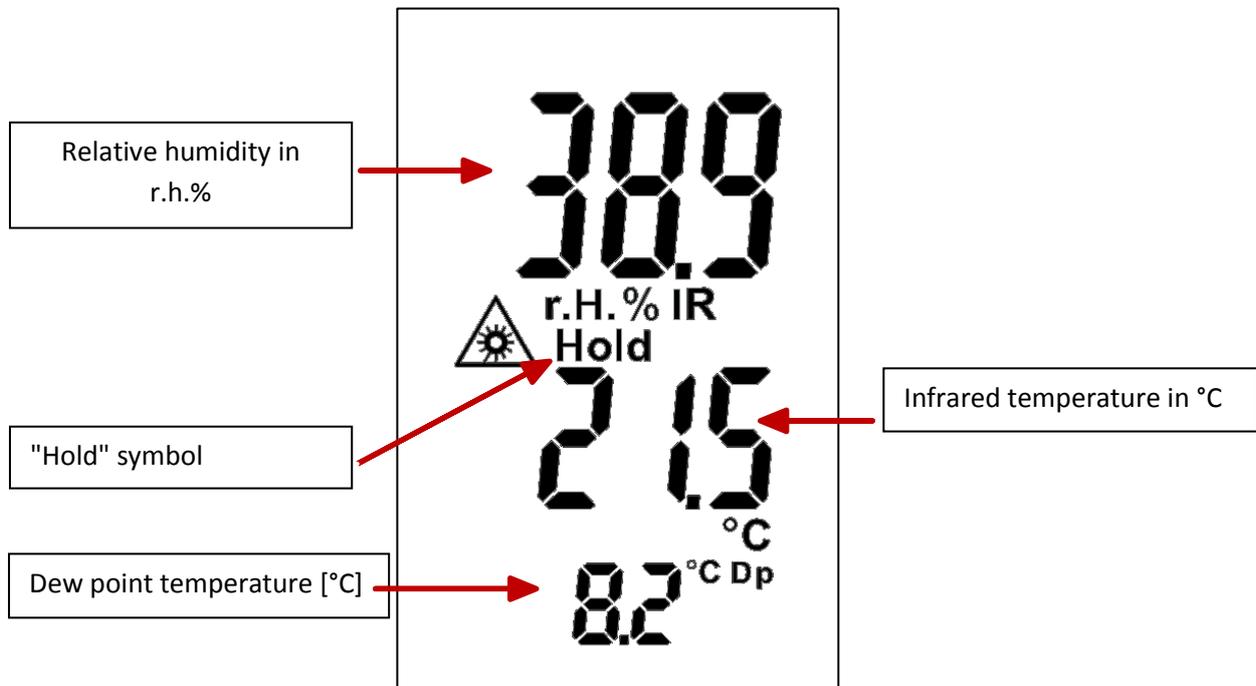


Figure 5-2: Main menu symbols

5.1.2 Other symbols

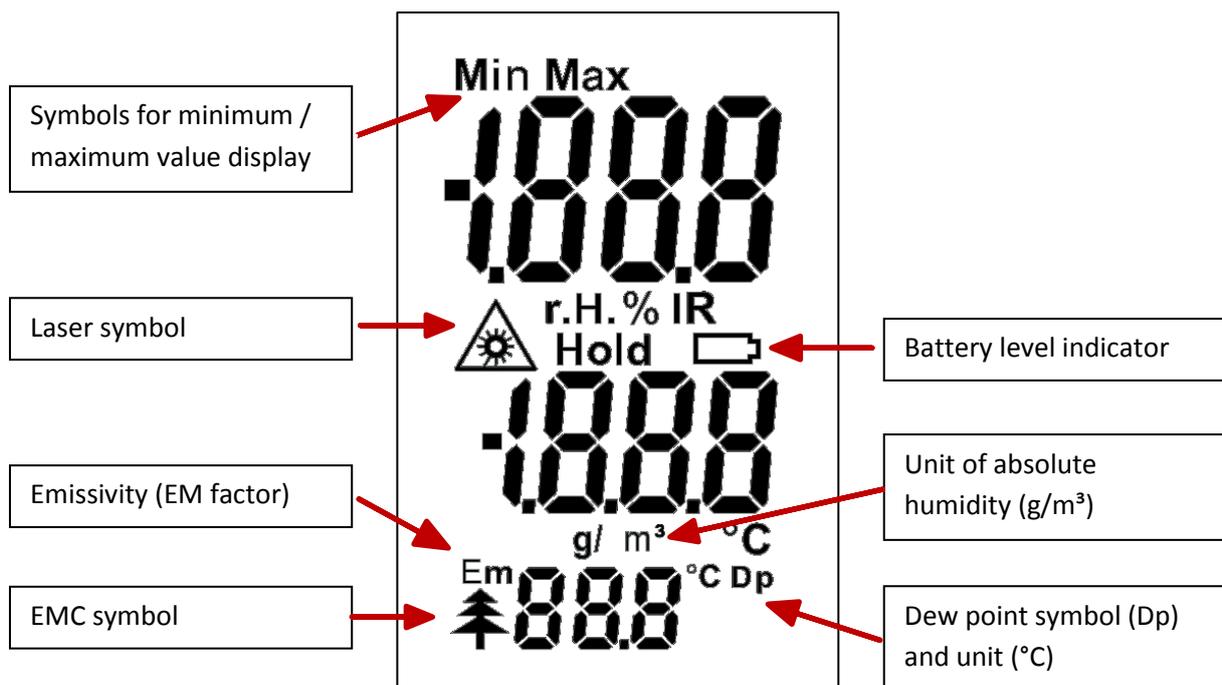


Figure 5-3: Other symbols

5.2 Switch on device

The Hydromette BL Compact TF-IR 2 is supplied with the TF-Stick 16 K 25 inserted as standard.

If the device is now switched on by pressing the "On" button, the device starts in the "Dew point IR" (rh / Ir / dp) measuring mode.

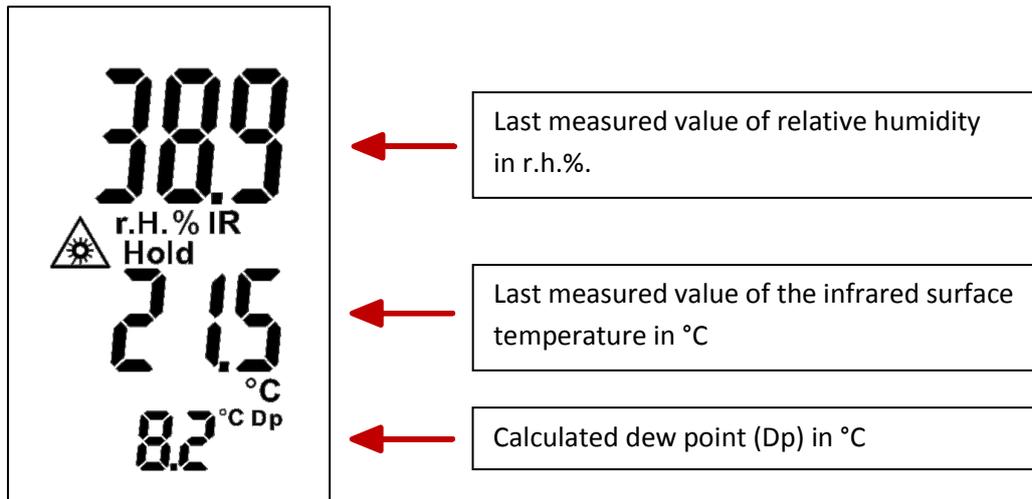


Figure 5-4: Standard Measuring Menu



If the TF-stick is not (correctly) inserted, the display "InP SEa" is shown when the measuring button is pressed and held down for a *long time (>2 seconds)*!

Figure 5-5: Error message, TF-Stick not detected

5.3 Setting menus

The following menu items can be selected one after the other by repeatedly pressing the "Down" button.

1. **Measuring Menu** (main menu): The measurement process can be performed here
2. **Measuring mode selection**: The different measuring modes can be set here.
3. **Laser Pointer / EM Menu**: This menu can be used to disable/enable the laser pointer and to set the emissivity (EM factor).
4. **Maximum value display**: The largest measured value is shown here.
5. **Minimum value display**: The smallest measured value is shown here.
6. **Memory Menu**: The last 5 measured values are stored here. The oldest value is overwritten after each measurement.

The menu items are selected in reverse order by pressing the "Up" button.

5.3.1 Measuring Menu (main menu)

After switching on, the device is in the Measuring Menu (main menu). The other menus can be accessed from here by pressing the "Up" or "Down" buttons.

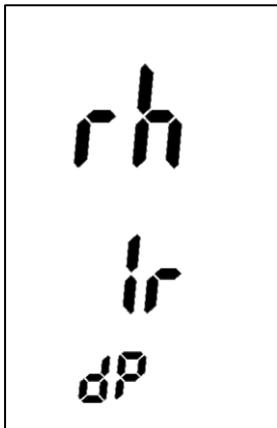
In the Measuring Menu, the last measured values are displayed according to the measuring mode selection made with the associated units and the note "Hold".

Pressing and holding the "M" button (*> 2 seconds*) starts a new measurement, the measured values adapt to the ambient climate. During the measuring process, the "Hold" symbol disappears from the display. After releasing the "M" button, the measured value is held and automatically stored in the ring memory. This overwrites the oldest stored value. The "Hold" symbol is displayed again.

If the new measured value is larger than the previous maximum value, "Max" flashes on the display. If the new value should be accepted, the "M" button must be pressed *briefly (< 1 second)*. If the value should not be saved, a new measurement can be started by pressing and holding (*> 2 seconds*) the "M" button without changing the previous maximum value.

If the new measured value is smaller than the previous minimum value, "Min" flashes on the display. If the new value should be accepted, the "M" button must be pressed *briefly (< 1 second)*. If the value should not be saved, a new measurement can be started by pressing and holding (*> 2 seconds*) the "M" button without changing the previous minimum value.

5.3.2 Measuring mode selection

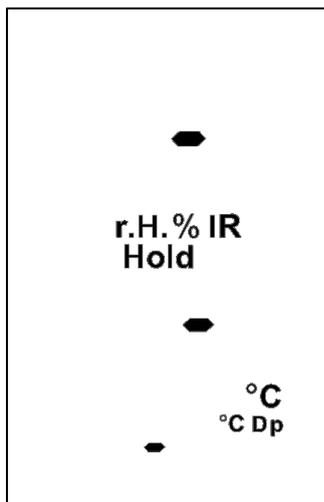


The device is delivered with the measuring mode "Dew point IR" (rh / lr / dp) as factory setting.

Figure 5-6: Display of the "Dew point IR" measuring mode

The device must be switched on and in the main measuring mode to be able to make the measuring mode settings. Press the "**Down**" button once to access the measuring mode selection. If the setting for the measuring mode should be changed now, the "**M**" button must be pressed *briefly* (< 1 second).

The measuring mode display flashes and can be set using the **Up** and **Down** buttons. The change is saved by *briefly* (< 1 second) pressing the "**M**" button again.



After confirming the change, the display automatically jumps to the measuring menu of the (newly) selected measuring mode. This removes the values of the previous measuring mode from the display. Any stored "**Max**" or "**Min**" values remain in the memory of the respective measuring mode.

Now a new measurement can be performed by pressing and holding (> 2 seconds) the "**M**" button

Figure 5-7: Display after a measuring mode change

The Hydromette BL Compact TF-IR 2 has 7 different setting modes. The selected mode changes the display of the measuring menu. Depending on the mode, the appropriate physical dimension is also

displayed. The measuring mode selection is designed as a ring menu, whereby the setting modes are scrolled through in the following order by pressing the "Up" button.

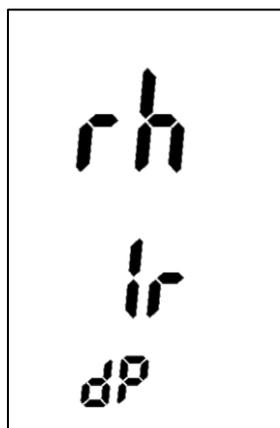


Figure 5-8: Measuring mode selection "Dew point IR"

Measuring mode "Dew point IR"

(rh / lr / dp):

The relative humidity (in r.h.%), the measured IR surface temperature (in °C) and the dew point temperature (Dp in °C) are displayed. The laser symbol is only displayed if the laser pointer is activated.

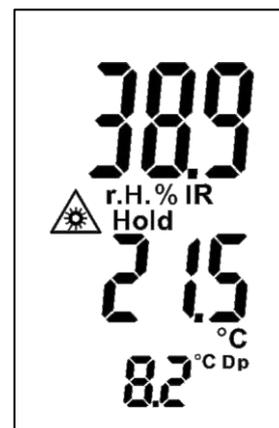


Figure 5-9: Measuring menu "Dew point IR"

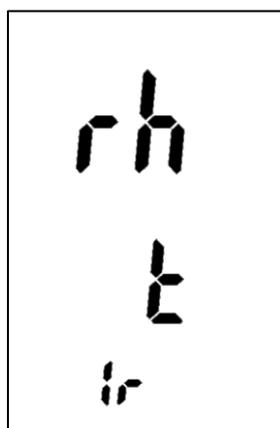


Figure 5-10:
Measuring mode selection
"Surface temperature IR"

Measuring mode "Surface temperature IR"

(rh / t / lr):

The relative humidity (in r.h.%), the air temperature (in °C) and the measured IR surface temperature (in °C) are displayed. The laser symbol is only displayed if the laser pointer is activated.

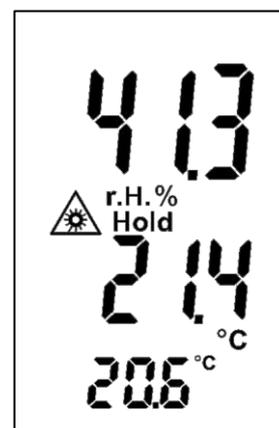


Figure 5-11: Measuring menu "Surface temperature IR"

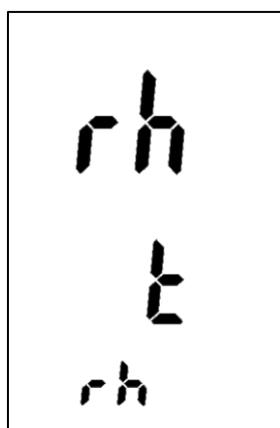


Figure 5-12: Measuring mode selection "relative humidity, rh"

Measuring mode "relative humidity, rh"

(rh / t / rh):

The relative humidity (in r.h.%), the air temperature (in °C) and the measuring mode symbol "rh" are displayed.

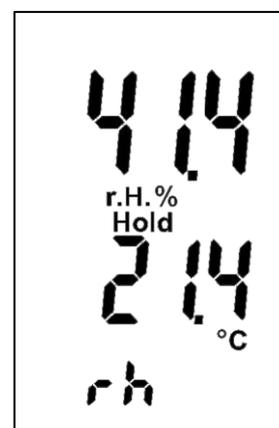


Figure 5-13: Measuring menu "relative humidity, rh"

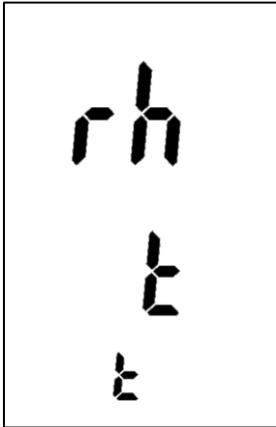


Figure 5-14: Measuring mode selection "air temperature, t"

Measuring mode "air temperature, t"
(rh / t / t):

The relative humidity (in r.h.%), the air temperature (in °C) and the measuring mode symbol "t" are displayed.



Figure 5-15: Measuring menu "air temperature, t"

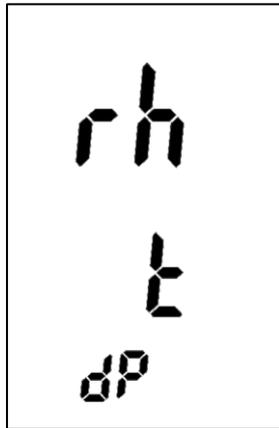


Figure 5-16: Measuring mode selection "Dew point, dp"

Measuring mode "Dew point, dp"
(rh / t / dp):

The relative humidity (in r.h.%), the air temperature (in °C) and the dew point temperature (Dp in °C) are displayed.



Figure 5-17: Measuring menu "Dew point, dp"

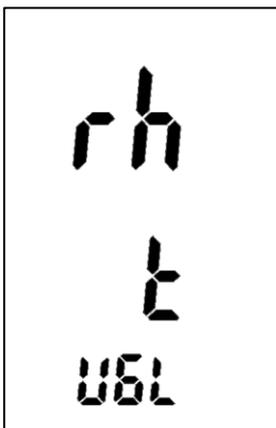


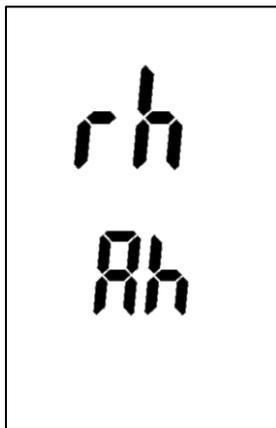
Figure 5-18: Measuring mode selection "Equilibrium wood moisture content, EMC"

Measuring mode "Equilibrium wood moisture content, EMC" (rh / t / EMC):

The relative humidity (in r.h.%), the air temperature (in °C) and the measuring mode symbol "Wood" with corresponding EMC value in weight% are displayed.



Figure 5-19: Measuring menu "Equilibrium wood moisture content, EMC"



Measuring mode "absolute humidity, Ah"
(rh / Ah):

The relative humidity (in r.h.%), the absolute humidity (in g/m³, i.e. grams of water in 1m³ of air) and the measuring mode symbol "Ah" are displayed.

Figure 5-20: Measuring mode selection "absolute humidity, Ah"

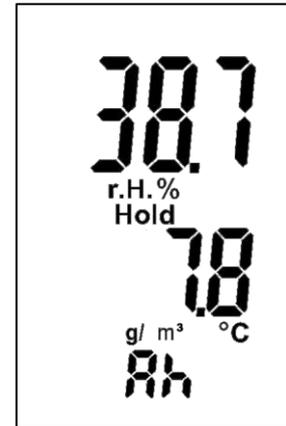


Figure 5-21: Measuring menu "absolute humidity, Ah"

5.3.3 Laser Pointer / EM menu



Laser warning notice:



This device is equipped with a Class 2 laser. Never point this laser beam directly or indirectly into the eye through reflective surfaces.

Laser radiation may cause irreversible damage to the eye. The laser beam must be deactivated when measurements are made near people.



"Off" or "On" indicates whether the laser pointer is switched off or switched on.

The laser pointer is only active when IR measuring mode is selected.

Set emission factor in %

Figure 5-22: Laser pointer and EM factor

The device is delivered with an emission factor of **95** as a factory setting. If the default settings for emissivity (EM factor) and/or the laser pointer should be changed, press the **"M"** button *briefly* (< 1 second). Emissivity (EM factor) and laser pointer display now start flashing.

EM factor adjustment:

The emissivity (EM factor) can now be set between 20% and 100% in steps of 1 using the **"Up"** and **"Down"** buttons. The change is saved by *briefly* pressing (< 1 second) the **"M"** button again.

An emission factor table can be found in the Appendix.

Laser pointer setting:

By *pressing and holding* (> 2 seconds) the **"M"** button, the state of the laser pointer can be changed from **"Off"** to **"On"** and vice versa. Press the **"M"** button *briefly* (< 1 second) to save the set status and return to the main menu.

5.3.4 Maximum value display



The highest measured value of a measurement series is displayed together with the **"Max"** display symbol

A dash at the position of the measured value indicates that there is no maximum value (yet). If an existing maximum value should be deleted, the displayed value must be selected by *briefly* (< 1 second) pressing the **"M"** button. The value flashes and can now be deleted by *pressing and holding* (> 1 second) the **"M"** button. A dash at the position of the measured value indicates the successful

deletion of the value. The device returns to the measuring mode by *briefly* (< 1 second) pressing the **"M"** button again.

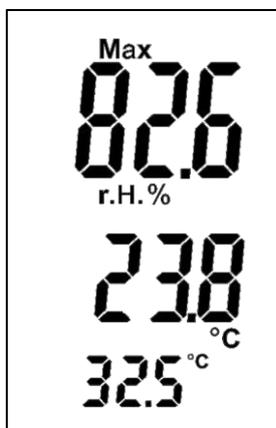


Figure 5-23: Maximum value display

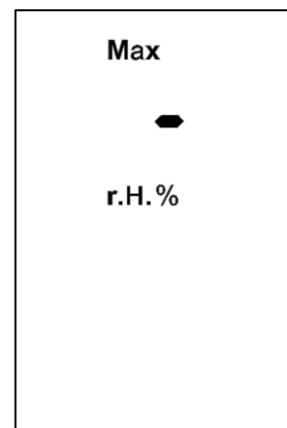


Figure 5-24: Deleted maximum value

Using the "M" button, a new measurement can then be carried out immediately.

The Hydromette BL Compact TF-IR 2 has 7 different setting modes. The selected mode changes the display of the measuring menu. Depending on the mode, the appropriate physical dimension is also displayed. According to the selected measuring mode and the associated physical units, the maximum values (and the minimum values) are also evaluated and saved. In detail, these are:

Measuring mode

"Dew point IR" (rh / ir / dp)
 "Surface temperature IR" (rh / t / ir)
 "Relative humidity" (rh / t / rh)
 "Air temperature" (rh / t / t)
 "Dew point dp" (rh / t / dp)
 "Equilibrium wood moisture content" (rh / t / EMC)
 "Absolute humidity" (rh / Ah)

Maximum and minimum value

Dew point in °C
 IR surface temperature in °C
 Relative humidity in r.h.%
 Air temperature in °C
 Dew point temperature in °C
 EMC value in weight%
 Absolute humidity in g/m³

5.3.5 Minimum value display



The lowest measured value of a measurement series is displayed together with the "Min" display symbol.

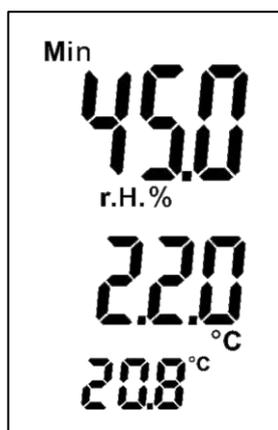


Figure 5-25: Minimum value display

A dash at the position of the measured value indicates that there is no minimum value (yet).

If an existing minimum value should be deleted, the displayed value must be selected by *briefly (< 1 second)* pressing the "M" button.

The value flashes and can now be deleted by *pressing and holding (> 1 second)* the "M" button. A dash at the position of the measured value indicates the successful deletion of the value.

The device returns to the measuring mode by *briefly (< 1 second)* pressing the "M" button again.

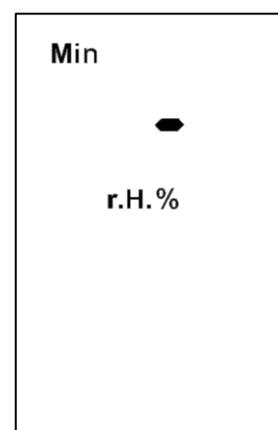


Figure 5-26: Deleted minimum value

Using the "M" button, a new measurement can then be carried out immediately.

5.3.6 Memory Menu

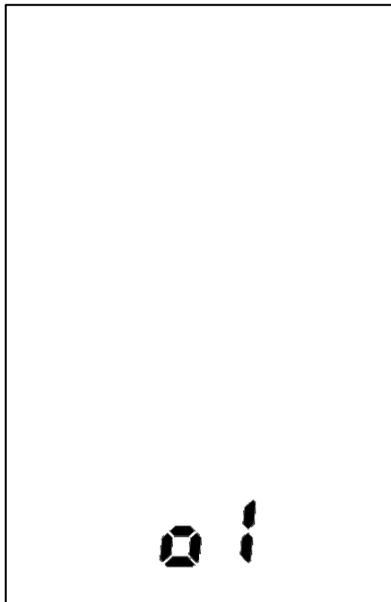


Figure 5-27: Memory location "o1"

As soon as the memory menu is selected, the ring memory symbol "o" and the associated memory location number "1", i.e. "o1", are displayed for approx. 2 seconds. The last measured memory value it contains is then displayed automatically.

The saved values displayed can be identified by the fact that there is no "Hold" symbol in the display.

By *briefly* (< 1 second) pressing the "M" button, the next memory location "o2" can be selected and the value it contains is displayed, etc.

If the "M" button is pressed (and held) for *longer than 2 seconds*, the display of the memory value vanishes, only the memory location number is displayed. This signals that the user is still in the Memory Menu and not in the Measuring Menu. The memory value is retained in the background.

After reaching the 5th memory location, the value of the 1st memory location is displayed again.

The last 5 measured values are automatically saved and stored in the memory locations "o1" – "o5". The last measured value is in memory location "o1". The memory is designed as a ring memory. As soon as a sixth measured value is recorded, the oldest measured value in memory location "o5" is automatically removed from the memory. Manual deletion of a memory value is not possible.

6 Other Functions

6.1 Use without TF-Stick

It is also possible to perform measurements with the Hydromette BL Compact TF-IR 2 without a TF-Stick inserted. The infrared sensor integrated in the device works independently. This ensures that surface temperature measurements are possible at all times.

Depending on the set measuring mode, the following displays must then be considered:

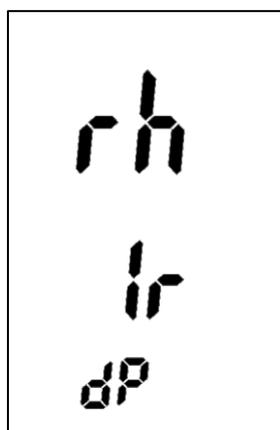


Figure 6-1: Measuring mode selection "Dew point IR"

Measuring mode "Dew point IR"
(rh / lr / dp):

The measured surface temperature is shown in the second line of the display.

The absence of an inserted TF-Stick is signalled by the display "InP SEn" instead of the display for the relative humidity (in r.h.%) and the dew point temperature (Dp in °C).

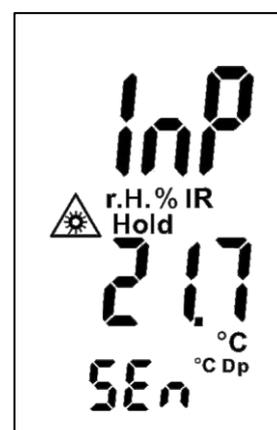


Figure 6-2: Measuring menu "Dew point IR" without TF-Stick

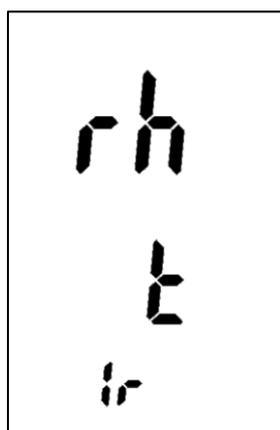


Figure 6-3: Measuring mode selection "Surface temperature IR"

Measuring mode "Surface temperature IR"
(rh / t / lr):

The measured surface temperature is shown in the third line of the display.

The absence of an inserted TF-Stick is signalled by the display "InP SEn" instead of the display for the relative humidity (in r.h.%) and the air temperature (in °C).



Figure 6-4: Measuring menu "Surface temperature IR" without TF-Stick

The minimum and maximum value displays are switched off in these measuring modes. We recommend using a TF-Stick to be able to use all available functions.

6.2 Automatic switch-off

If no button is pressed within approx. 90 seconds, the device switches off automatically. The current values are retained and are displayed again after the device is switched on again.

6.3 Battery monitoring

If the battery symbol  is shown in the display, the battery is dead and must be replaced.

A list of battery types that can be used can be found in chapter "**2.1 Technical Data**".

7 Installation of the PC software GANN Dialog Pro

The system requirements for the PC software GANN Dialog Pro are as follows:

- Operating system Windows 7 / Windows 8 / Windows 10 / Windows 11
- 2 GB free hard disk space
- 4 GB RAM memory
- USB port
- Minimum screen resolution 1280 x 800 (1920 x 1080 is recommended)
- Internet connection for software downloads, updates and upgrades

The PC software GANN Dialog Pro is available for download free of charge at the following link:

<http://download-ota.gann.de/dlg>

Detail information about the PC software GANN Dialog Pro can be found in the associated user manual.

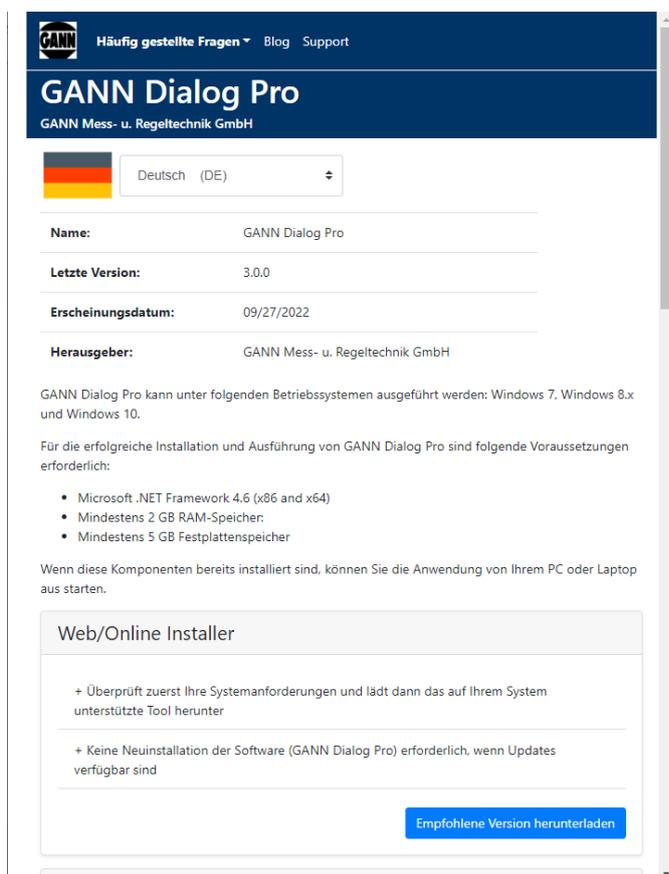


Figure 7-1: Download of the PC software GANN Dialog Pro

If you click on the "Download recommended version" button, you will be asked whether you want to download the software. Confirm this with "Save file" to start the download. Perform the installation steps of setup.exe.

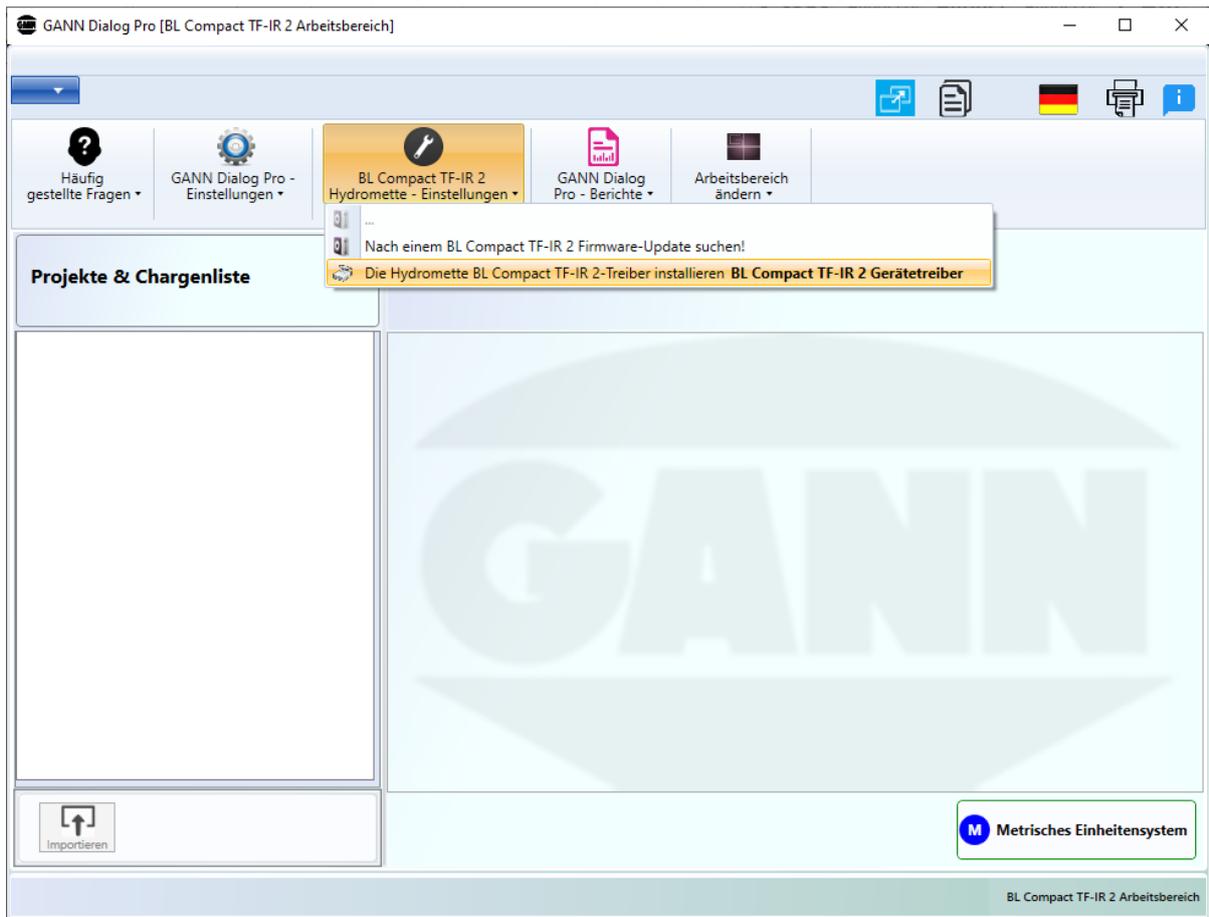


Figure 7-2: Download device drivers of the Hydromette BL TF-IR 2

To download the device drivers, the working range of the desired Hydromette must first be selected in the menu item "Select working range".

8 USB communication with a PC

The software "GANN Dialog Pro" must be installed before the Hydromette BL Compact TF-IR 2 is connected to a PC (see chapter 7, Fig. 7-1). GANN Dialog Pro includes the associated device drivers, which must also be installed (see chapter 7, Fig. 7-2).

If the Hydromette BL Compact TF-IR 2 is connected to a PC with Windows operating system when it is switched off, the Hydromette starts in USB mode. No measurements can be performed during the communication with the PC. The GANN Dialog Pro software now provides the possibility to update the firmware of the Hydromette BL Compact TF-IR 2 via the Internet. The Hydromette remains in USB mode after disconnecting the USB cable. The Hydromette will only restart in standard mode after it has been switched off and switched on again.

The USB connection must not be disconnected during the communication with the PC!



INFORMATION

If the connection is disconnected during a firmware update, the Hydromette BL Compact TF-IR 2 can no longer be started. In this case, the problem can be solved by reconnecting to a PC and installing the firmware. If it is not possible to install firmware on the device after several attempts, GANN Support must be contacted.

9 Application Notes

9.1 Using the Hydromette BL Compact TF-IR 2



INFORMATION

For particularly precise measurements, especially at temperatures below room temperature (20 - 25 °C) or if there are significant temperature differences between the intrinsic temperature of the measuring instrument and the ambient climate, the device should be exposed to the ambient climate for approx. 10 to 15 minutes or until the temperature has equalised. The sensor adapts to the respective climate even when it is not switched on.

Measure:

Press and hold the "M" button for longer than 2 seconds. A measurement process is carried out as long as the Measure button is kept pressed. After releasing the "M" button, the measurement process is interrupted and the "Hold" symbol is displayed.

9.2 Measuring relative humidity

The response speed of the sensor is very high, so that even small air flows (door gap, leaky window, etc.) influence the measured value display. An absolute standstill of the display can therefore only be achieved in a climate box. The sensor also adapts to the ambient climate in the storage state (device not switched on).

The response time of the humidity sensor in slightly moving air at an ambient temperature of 20 to 25 °C is approx. 20 seconds for 90% of the humidity difference and approx. 30 seconds for 95% of the humidity difference. By swivelling the device (venting the sensor), the setting time can be shortened when there is no air flow or the air speed is low.

Measurements below 20% r.h. and above 80% r.h. should preferably not be taken over a prolonged period of time. Other measurement falsifications can occur due to shielding with body parts (e.g. hand) as well as blowing or speaking/breathing in the direction of the sensor.

Attention:

The sensor is not designed for continuous measurements above 80% r.h.

9.3 Equilibrium wood moisture content (EMC)

Equilibrium wood moisture content is the moisture content adopted by the wood when it is exposed to constant climate (constant humidity and constant temperature) for sufficiently long time.

The device can simultaneously display relative humidity, temperature, and equilibrium wood moisture content. This makes it easier for parquet installers and interior finishers to assess whether wooden components may be exposed to the existing ambient climate or whether damage to the wood, such as cracking, shrinkage or swelling, is to be expected.

9.4 Measuring air temperature

The response speed of the sensor is very high, so that even small air flows (door gap, leaky window, etc.) influence the measured value display. An absolute standstill of the display can therefore only be achieved in a climate box. The sensor also adapts to the ambient climate in the storage state (device not switched on).

The setting time of the air temperature sensor in moving air is approx. 3 minutes for 90% of the temperature difference.

False measurements can arise from shielding with body parts (e.g. hand) as well as blowing or speaking/breathing in the direction of the sensor.

Attention:

The measuring instrument may only be exposed to temperatures above 50 °C for short periods.

9.5 Dew point temperature

The dew point is the temperature at which the air is saturated with water vapour. The relative humidity is then 100%. If this dew point temperature is undershot, the moisture contained in the air condenses on a component / surface. The dew point temperature is generally lower than the air temperature, except at 100% r.h. where both temperatures are the same.

The display of the calculated dew point in the measuring modes "Dew point IR" (rh / Ir / dp) and "Dew point, dp" (rh / t / dp) is based on the relative humidity and air temperature parameters. A dew point table for calculating condensation is also provided in the Appendix.

9.6 Measuring using infrared temperature measurement technology (IR)

9.6.1 General

All bodies with a temperature above "absolute zero" (= 0 °K or -273 °C) emit infrared radiation, also known as thermal radiation. The intensity of this thermal radiation, taking into account the emissivity, is considered a measure of the surface temperature. The infrared measuring head receives the emitted heat radiation without contact and converts it into a voltage signal.

Advantages compared to contact measurement using a mechanical sensor:

- Very fast response or measuring time.
- No heat removal at the object being measured.
- No damage or contamination of the measuring surface.
- Measurement of live or moving parts possible

9.6.2 Measuring using IR sensor

If measurements are taken for more than 10 seconds in the immediate vicinity of hot or cold parts (exhaust pipe, radiant heater or ice / refrigeration unit), the measured value may be falsified. After approximately 10 minutes waiting time (temperature equalisation of sensor housing and ambient temperature), the measurement can be repeated. To achieve accurate measurements, the temperature of the measuring instrument must match the respective ambient temperature.

To avoid measurement errors and to prevent the device from being damaged, you should...

- ... not press the sensor opening of the probe directly onto the object to be measured.
- ... not measure in air that contains vapours or is heavily contaminated.
- ... not measure through very hot air (shimmering heat).
- ...not measure objects that are exposed to direct sunlight (shade these objects).
- ...not measure objects located in immediate vicinity of equipment radiating large amounts of heat (interrupt thermal radiation).
- ...not expose this high-quality measuring instrument to very high or low temperatures (e.g. transporting the device in the boot of a car).
- ... not expose the unit to high humidity (condensing).
- ... not measure in the immediate vicinity of electromagnetic or electrostatic sources (HF generators, electric motors, ignition voltages etc.).

9.6.3 Emissivity

The Hydromette *BL Compact TF-IR 2* provides manual emissivity adjustment in the range of 20% to 100%. An emissivity table can be found in the Appendix.

The measuring instrument is set to a default emissivity of 95%. This value applies to most building materials, plastics, textiles, papers and non-metallic surfaces. The following list is used to estimate the emissivity, which is influenced, among other things, by the gloss and roughness of the object to be measured. Emissivity is reduced on smooth and glossy surfaces while it is increased on rough and matt surfaces. As the emissivity for metals ranges from 10% to 90% depending on the surface (glossy, oxidised or rusted), an exact measurement is not possible. We therefore recommend using special stickers (IR 30/E95 **order no. 5833**) made of paper with a factor of 95% for metals or glossy metallic surfaces and objects with different emissivity values.

Mathematical correction of the temperature measured value using emissivity requires the ambient temperature and the coefficient of the temperature equalisation between measuring probe and ambient temperature to be known.

The following applies to the correction:

$$T_{Measurement\ Object} = T_{Environment} + \frac{(T_{Display} - T_{Environment}) \times 100}{Emissivity\ (\%)}$$

9.6.4 Measurement spot size

The measurement spot diameter depends on the distance and is 5 mm immediately before the probe opening. By increasing the distance (A) of the measuring instrument from the object to be measured, the measuring spot diameter (D) increases proportionally in the ratio of approx. 6:1. With a distance (A) of 250 mm, the measurement spot diameter (D) is 46 mm. For the measuring distance (A) between the surface to be measured and sensor, we recommend using 20 to 50 mm. The respective diameter can be determined using the figure below.

A = Distance to the object to be measured

D = Measurement spot diameter

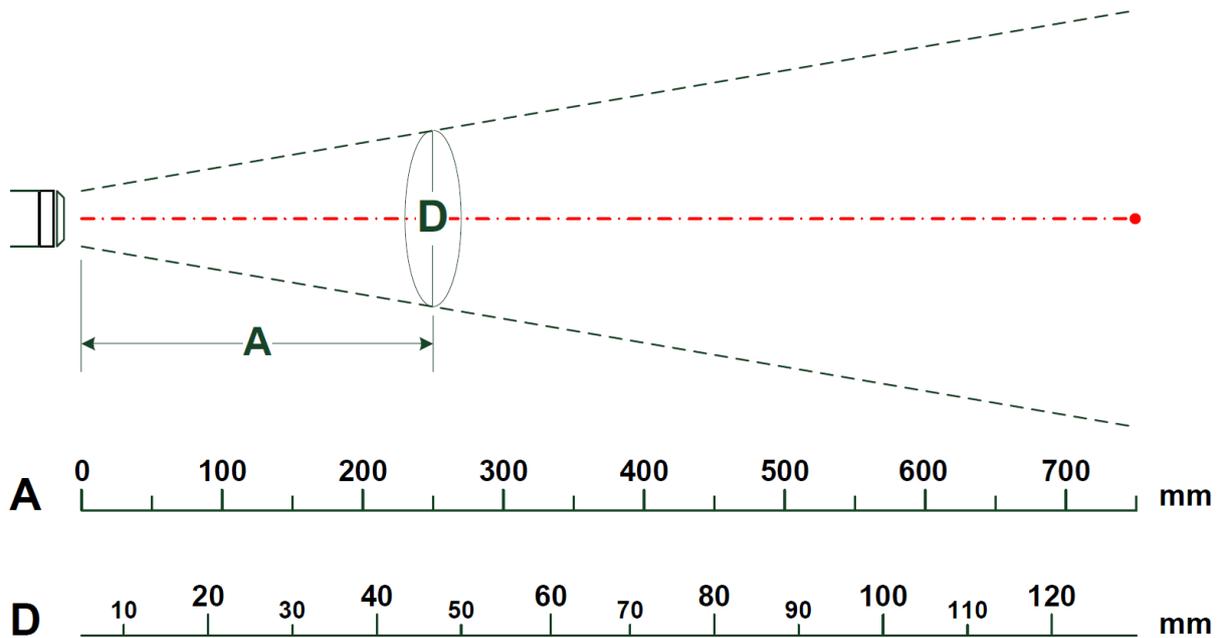


Figure 9-1: Measurement spot size depending on distance

10 Accessories

TF-Stick 16 K 25 – without filter - (order no. 31003262)



Humidity:	0 to 100% r.h.	10 to 90% r.h. ($\pm 1.8\%$ r.h.)*
Temperature:	-20 to +80 °C	0 to +60 °C (± 0.2 °C)*

TF-Stick 16 K 25 M – with metal filter - (order no. 31003264)



Humidity:	0 to 100% r.h.	10 to 90% r.h. ($\pm 1.8\%$ r.h.)*
Temperature:	-20 to +80 °C	0 to +60 °C (± 0.2 °C)*

TF-Stick 16 K 25 P – with PTFE filter - (order no. 31003266)



Humidity:	0 to 100% r.h.	10 to 90% r.h. ($\pm 1.8\%$ r.h.)*
Temperature:	-20 to +80 °C	0 to +60 °C (± 0.2 °C)*

(*) Typical sensor accuracy

The TF-Stick 16 K-25 is included as standard in the scope of delivery of the Hydromette BL Compact TF-IR 2. Other TF-Sticks can be purchased from us. The TF-Sticks 16 K-25, 16 K-25 M and 16 K-25 P differ in the different filters for protection against dust and moisture.

Connection cable MK 26 – Length: 1.80 m (order no. 31016920)



For device connection to a USB port.

Connection cable MK 18 – Length: 1.80 m (order no. 31016720)



For connecting a TF-Stick to a Hydromette with integrated jack socket 2.5 mm.

11 Appendix

11.1 Dew Point Table

Air temperature °C	Dew point temperature in °C at a relative humidity of:							Saturation moisture = amount of water in g/m ³
	30%	40%	50%	60%	70%	80%	90%	
30	10.5	14.9	18.5	21.2	24.2	26.4	28.2	30.4
28	8.7	13.1	16.7	19.5	22.0	24.2	26.2	27.2
26	7.1	11.3	14.9	17.6	19.8	22.3	24.2	24.4
24	5.4	9.5	13.0	15.8	18.2	20.3	22.2	21.8
22	3.6	7.7	11.1	13.9	16.3	18.4	20.3	19.4
20	1.9	6.0	9.3	12.0	14.3	16.5	18.3	17.3
18	0.2	4.2	7.4	10.1	12.4	14.5	16.3	15.4
16	-1.5	2.4	5.6	8.2	10.5	12.5	14.4	13.6
14	-3.3	-0.6	3.8	6.4	8.6	10.6	12.4	12.1
12	-5.0	-1.2	1.9	4.3	6.6	8.5	10.4	10.7
10	-6.7	-2.9	0.1	2.6	4.8	6.7	8.4	9.4
8	-8.5	-4.8	-1.6	0.7	2.9	4.8	6.4	8.3
6	-10.3	-6.6	-3.2	-1.0	0.9	2.8	4.4	7.3
4	-12.0	-8.5	-4.8	-2.7	-0.9	0.8	2.4	6.4
2	-13.7	-10.2	-6.5	-4.3	-2.5	-0.8	0.6	5.6
0	-15.4	-12.0	-8.1	-5.6	-3.8	-2.3	-0.9	4.8

Dew point temperatures depending on air temperature and relative humidity for condensation calculation.

11.2 Emissivity table

Material	Condition	Temperature*	Emissivity (EM factor)
Aluminium**	Non-oxidised	25	2
		100	3
	Heavily oxidised	100	20
	Highly polished	100	9
	Slightly polished	100	18
Asbestos			95
Asphalt			95
Lead**	Oxidised		28
	Bare metal	230	6
Stainless steel**	Matt		60
	Oxidised		16
Ice	Surface		100
Iron**	Enamelled		88
	Oxidised		80
	Corroded		64
	Nickel-plated, matt		12
	Nickel-plated, polished		6
	Zinc-plated		27
Soil	Dry		92
	Humid		95
Paint	Black, matt		96
	Black, glossy		92
	Other colours		95
	Clear coat		87
Gypsum	Bulk material		81
	Processed		91
Glass	Flat		94
	Convex	100	80
	Concave	100	82
Gold**			2
Graphite			98

Material	Condition	Temperature*	Emissivity (EM factor)
Rubber	Dark		95
	Bright		86
	Hard		88-95
	Soft		67-84
Casting**	Grey cast iron		94
	Cast iron, polished		21
Skin		38	98
Wood			80-90
Lime			30-40
Lime mortar			93
Copper**	Highly polished		7
	Heavily oxidised		78
Marble			93
Brickwork			95
Brass**	Polished		5
	Oxidised		60
Nickel**	Polished		5
	Oxidised		32
Porcelain			93
Plaster	Lime plaster		92
Sand			90
Snow		-10	85
	Smooth		95
Bolts**			85
Silver**			3
Steel**	Oxidised		80
	Rolled		24
Tar			83
Water			96
Brick	Clay brick		93
Tin**			5

*(no value given in the "Temperature" field indicates that the values shown are valid for a standard temperature of 20 °C)

** (metals cannot be measured accurately due to their surface (e.g.: oxidised/polished surface → emissivity between 2 and 100%)) We therefore recommend using the paper sticker (IR 30/E95 **Order No. 5833**) with emissivity of 95%. This makes exact measurement of the object temperature possible.



-Subject to technical changes-

Date: October 2022



GANN MESS- U. REGELTECHNIK GMBH

70839 GERLINGEN SCHILLERSTRASSE 63 INTERNET: <http://www.gann.de>

Verkauf National: TELEFON 071 56-4907-0 TELEFAX 071 56-4907-40 E-MAIL: verkauf@gann.de

Verkauf International: TELEFON +49-71 56-4907-0 TELEFAX +49-71 56-4907-48 E-MAIL: sales@gann.de