Instruction manual

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1. Identification

1.1. Type Description

Type Description	gamma+

1.2. Release-Nr. (Software), Edition of Manual

Release-Nr.	
Edition of Manual	1.0

1.3. Name and Address of Manufacturer, Imprint, Copyright

Name and Address of Manufacturer	HOECHSTMASS Balzer GmbH Wiesenstr.13 D-65843 Sulzbach / Germany
Imprint	Telephone: +49 (0)6196 - 5005 0 Telefax: +49 (0)6196 - 5005 55 E-Mail: info@hoechstmass.com Internet: www.hoechstmass.com
Copyright	© Copyright 2020 – All content, especially texts, photos and graphs are copyright protected. All rights, including the reproduction, publication, editing, and translation remain reserved, HOECHSTMASS.

2. Basic information

The gamma+ measures objects electronically and transfers the measurement results to a terminal via Bluetooth connection.
The user may not carry out unauthorized changes on the gamma+, as this leads to the expiration of the manufacturer's declaration.

To ensure correct measurements and avoid damages of the gamma+, the user must consider all notes and warnings contained in this user manual. Original spare parts and component parts, that are authorized by the manufacturer, ensure a correct use of the gamma+. The warranty expires in case other parts are used.

This user manual contains relevant notes for the appropriate usage of the gamma+. The separate notes have following meaning:

	**CAUTION**
	Warns against damaging the gamma+ in case the relevant precaution is not carried out!

	**NOTE**
	Notes in the user manual must be respected!

3. Product Description

3.1. Technical Data

Nominal voltage:	5V DC
Battery:	750 mAh Li-Po
Running time:	16 h
Recharging time:	2-3 h

Radio connection:	Bluetooth 3.0
Reach:	Approx. 10 m

Compatible operating system	Windows (recommendation: Windows 10, min. 7) MacOs Android iOS

Firmware Update	by service tool program and a Windows PC

Housing:	128 x 62 x 39 mm (hook inside) 137 x 62 x 39 mm (hook outside)
Display:	1.54“ OLED (128 x 64)
Measuring tape:	Tape width 12 mm Tape length 150 cm (alternative: 300 cm)
Weight:	118 g

Accuracy:	+/- 1 mm

Operating temperature:	-20 – +65° C -4 – +149° F

3.2. Structure and General Functions

The gamma+ is a measuring tape which records measured values electronically and transmits the data via Bluetooth to a terminal, e.g. the PC. It can be used for any type of measurement in dry and dust-free spaces.

In the following the structure and general functions of the gamma+ are described. The gamma+ consists of a housing with a display, a pull-out measuring tape and a hook, that can be extended and retracted.

3.3.1 Housing: Buttons and Micro-USB port

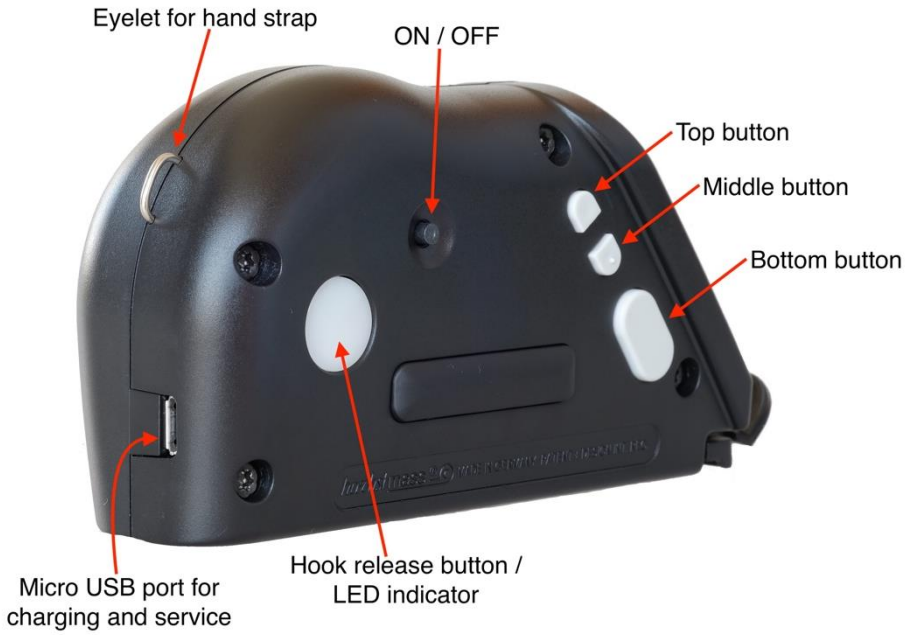

Figure 1 Buttons and Micro-USB port

The buttons are used to operate the gamma+.

ON/OFF	Press briefly to switch on/off gamma+
Hook release button/LED indicator	Press briefly to extend the hook. The button also serves as LED indicator
Top/Middle/Bottom button	The functionality of these buttons can be defined in the menu (see chapter 3.5.5). They also serve to navigate through the menu *(Top*

	button = up; Middle button = down; Bottom button = OK)

Use the Micro-USB port for charging with an appropriate charging cable (see chapter 3.4) and for firmware updates (see chapter 3.5.8).
You can affix a hand strap in the eyelet if needed.

3.3.2 Brake, Display and Hook

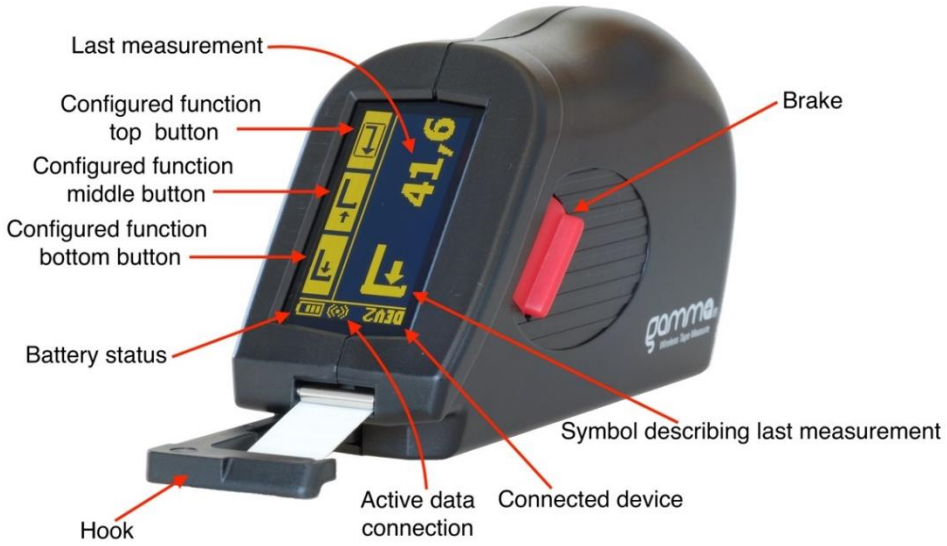

Figure 2 Brake, Display and Hook

Press the red toggle switch to activate the brake and hold the measuring tape in the current position. After releasing the brake, you can pull the measuring tape again – the current position is detached.

Press the *Hook Release Button (= LED indicator)* to extend the hook below the measuring tape and to use it as a measuring reference. When you do not need the hook anymore, you can push it back into the housing manually.

When switched on, the display shows the current measuring value as well as the chosen configuration. The current battery level and the connection state as well as the connected device is shown, if applicable.

3.3.3 The measuring edges

With the hook you can measure different objects precisely and use different measure reference points. Depending on the configuration, you can choose

the front or back housing edge, the inner or outer hook edge as measuring edge.

Figure 3 The measuring edges

3.3. Charging the internal battery

Please find the appropriate charging cable in the scope of supply. Plug it into the Micro-USB port to charge the battery of the gamma+.

ⓘ	**Note**
	In case you want to use another charging cable please ensure that the gamma+ is supplied with a constant voltage of 5 V and with charging power of minimum 500 mA.

The battery symbol on the display indicates the charging process as follows:

LED flashes orange	gamma+ is getting charged (when gamma+ is off)
LED lights green	Battery full

gamma+ can be used during the charging process. The charging of the empty battery with the provided charging cable takes about 2-3 hours. Afterwards you can use the gamma+ with one full battery charge for around 16 hours in continuous operation.

ⓘ	**NOTE**
	You can also charge the gamma+ over the USB port of your PC or Mac. Please ensure that the USB port supports the gamma+ with minimum 500 mA.

⚠	**CAUTION**
	By using an improper charger the gamma+ could be damaged.

3.4. The status LED and signal tones

The status LED and the signal tones serve to alert the user of various operating states.

Turn on	After **turning on**, the LED **lights up red** until the initialization of gamma+ is completed.
Establishing the Bluetooth connection	While the gamma+ is trying to **establish the Bluetooth** connection, the **LED lights up blue**. After the **connection is made**, there is a **beep** and the **LED turns off**. If **no connection** could be made within 25 seconds, gamma+ will terminate the connection attempt (the **blue LED goes out**) and enter manual mode.
Turn off	During **turning off** a **beep** will sound and the **LED** lights **red**.
Measuring	A successful measurement by pressing the **measuremeng button** will be indicated by the **LED** light turning **green** and a **short beep sound**.
Charging / Battery	With a remaining **charging capacity of less than 10 %** the **LED flashes red**. During **charging**, the **LED flashes yellow**. When the gamma+ is **fully charged**, the **LED will turn green**.
Disconnection	When the **data connection** to the terminal **is interrupted**, a **repetitive beep sounds** and the **LED flashes red**.

The signal tones and the LED can be switched off in the setup menu under *device settings* (see chapter *3.5.3).*

3.5. Menu tree

Please find the structure of the menu in the following:

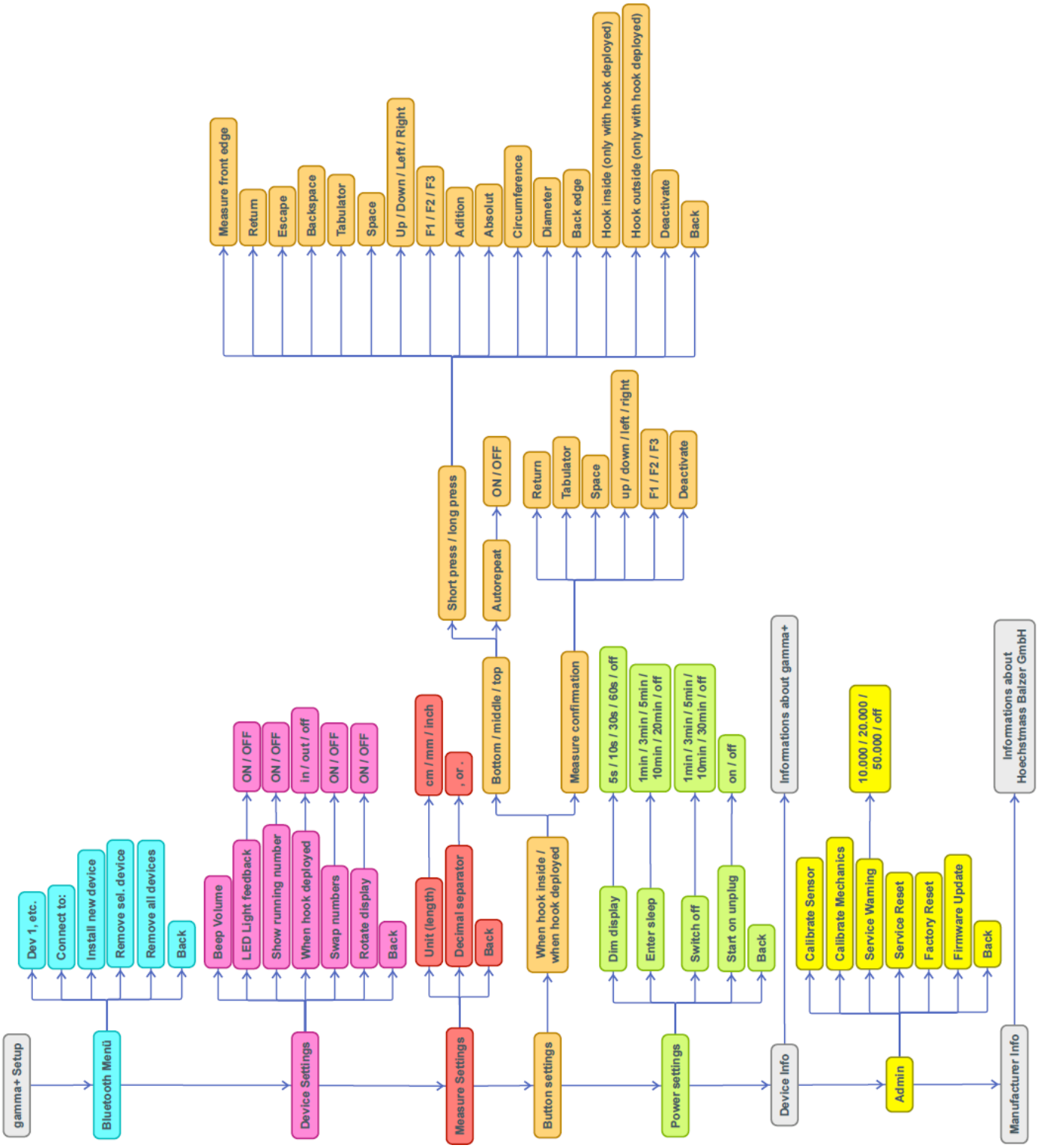

Figure 4 The menu tree

3.5.1. Setup menu

To access the setup menu turn on the gamma+ with the *ON/OFF button* while pressing the *Top button*.
Hold down the *Top button* until the setup menu appears on the display. In the setup menu you can make all settings on the gamma+. In the following, we go through each item of the setup menu.

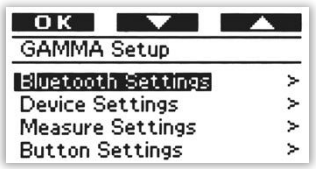

Figure 5 The setup menu

To move through the menu, use the *Top* and *Middle buttons*. By pressing the *Bottom Button/OK* you can enter a submenu or change a setting.

Figure 6 Exit the setup menu

3.5.2. Bluetooth settings

In the Bluetooth settings you can establish a Bluetooth connection as well as manage existing terminals. You can find the detailed description about how to establish a Bluetooth connection in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

a. Dev.:

By pressing the *OK button* repeatedly, you can choose between the paired devices. In the upper line is the name of the device, below the MAC address. In total, up to 15 different devices can be stored in the Dev. List. **The supplied USB Bluetooth stick counts as one device, no matter how many devices you connect with the stick.**

Figure 7 Bluetooth settings - manage terminals

b. Connect to:

You can choose between the following connection options:

- *Off* – When gamma+ is turning on, no Bluetooth connection is established to the device.
- *Selected* – When gamma+ is switched on, an active connection is established to the device selected under Dev. (This setting is recommended if you only work with one device or the connected devices are changing very rarely).
- *Menu* – Each time you switch the gamma+ on, a query will appear asking with which of the installed devices a connection should be established (this setting is recommended for frequent changes of the terminals).

c. Install new Device:

Here you can pair a new device with the gamma+ and add it to the Dev. list. The connection process starts immediately after selecting the menu item (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** for more details).

Maximum 15 different devices can be stored in the Dev. list. If you want to connect more devices, you must remove already paired devices according to section d. Remove sel. Device.

d. Remove sel. Device:

The selected device in the Dev. list (section a.) will be deleted.

Figure 8 Bluetooth settings

e. Remove all Devices:

Every installed device will be deleted from the list.

f. Back:

Go back to the main menu, select *Back* or simply press the *ON/OFF* button.

3.5.3. Device Settings

In the sub menu *Device Settings* you can adjust general settings of the gamma+.

a. Beep Volume

The volume of the acoustic signal can be adjusted in 3 steps or completely silent. Press the *Bottom Button/OK* as often as you reach the desired step 1-3 or silent (=0).

Figure 9 Device Settings 1/2

b. LED Light feedback

You can activate LED Light feedback if you wish to receive feedback via the LED after the performed measuring. The LED will then light after a successful measure and transfer of the measured values. This functionality is useful in a noisy environment if the acoustic signal cannot be heard.

Figure 10 Device Settings 2/2

c. Show running number

Here you can deactivate that the measured value is shown on the display (in upper right corner). In quality control, the number is often disabled to prevent any adjusted measuring.

d. When hook deployed

With this setting, you can select the edge to which the measured value shown on the display refers when the hook is extended. The small arrow in front of the dimension visualizes the selected setting during the measurement. For clarification, please see the following examples:

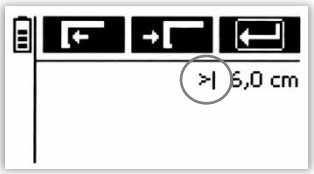

Figure 11 Hook edge outside

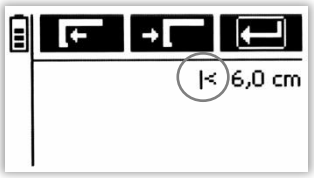

Figure 12 Hook edge inside

e. Swap numbers

In the delivery condition the small number on the top right always shows the current value. The big number shows the last taken measure. If the big number shall show the current taken value, it can be set here.

f. Rotate display

Here you can choose to rotate the display by 180 degrees, which for example could be helpful for left-handers.

g. Back

Choose *Back* or button *ON/OFF* to go back to the setup menu.

3.5.4. Measure Settings

In the sub menu *Measure Settings,* you can set the measure properties.

a. Unit

The following units of measurement are available: cm, mm, inch

Figure 13 Measure Settings

b. Decimal Separator

You can choose whether the decimal numbers are separated by a point or a comma.

c. Back

Choose *Back* or button *ON/OFF* to go back to the setup menu.

3.5.5. Button Settings

With the button settings you can choose which functionalities the buttons on the gamma+ should have. Also, you can set different key presses.

a. Key Assignment Top, Middle und Bottom

You can assign the buttons *Top*, *Middle* and *Bottom* each a short and a long key press. Both keystrokes offer a wide variety of functions and simulated keyboard keys. If needed, the individual buttons can be deactivated.

Figure 14 Button Settings - When hook inside/outside

You can assign the keys differently when the hook is retracted and when it is extended. This means that you have 6 assignment options (3 buttons x 2 short/long press) with the hook retracted and 6 assignment options with the hook extended.

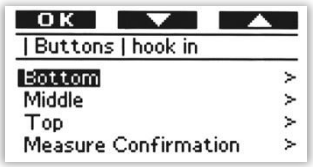

Figure 15 Button Settings - Choose Button

The *ON / OFF* button cannot be programmed.

Figure 16 Button Settings - Choose key press

ⓘ	**NOTE** During operation, the short press function or key assignment selected for the respective button is shown on the display. The long press key assignment is displayed after the long key press (approx. 1s).

You can choose between following functions:

Measure: With this function, the measure between the front edge of the housing and the 0-line is determined and shown on the display. When connected to Bluetooth, the measured value is also transmitted to the terminal (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** + 5.2).

Figure 17 Button Settings – Measure and Return

Back edge: With this function, the measured value between the 0-line and the back edge of the housing is determined. To make this measurement possible, the back edge was designed to be rectangular.

Figure 18 Button Settings – Diameter and Back edge

Addition: By pressing the button *Addition*, you add up several measures without transferring them to the terminal. **When using this function, the long press on the button *Addition* is converted into a send key. This means that all desired measured values are added using the short press and then transferred to the terminal with a long press.** (see chapter 5.6).

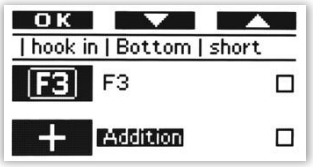

Figure 19 Button Settings -F3 and Addition

Absolute: With this function you temporarily move the 0-point anywhere on the tape. After that, all dimensions before the set 0-point are minus values, and all dimensions after the 0-point are plus values. You can exit this function by completely running in the tape and pressing the button *Absolute* again. This function is often used to take comparative measurements against a reference measure. For further explanation see chapter 5.6.

Figure 20 Button Settings - Absolute and Circumference

Circumference and Diameter (Figure 20 and 22): To measure circumference, thread the tape between the case and the retracted hook.
The measurement error, which is caused by the fact that the measuring tape is in this case not applied with the 0-line and on the other hand by the fact that between the hook and the tape outlet is a distance, is corrected by the selection of these two functions (further information in chapter 5.5)

Hook inside / Hook outside: These two measuring edges on the inside and outside of the hook are only available if the hook is extended. When the hook is extended, the measuring edge changes automatically from the front edge of the housing to the inner or outer edge of the hook (see chapter 5.4).

- Hook inside, for example, you can use for measurements inside a stretched waistband.
- With Hook outside you can press the measuring tape flat on the measuring table and place it exactly on the object to be measured with the outer edge of the hook. This function is useful for very thin textiles.

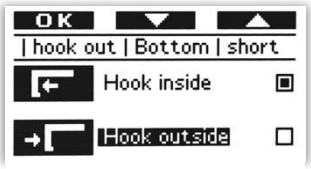

Figure 21 Button Settings - Hook inside/outside

b. Available, simulated keystrokes

Gamma+ may simulate keystrokes on the connected device.
The options are:
Return, Escape, Backspace, Tab, Space, Up, Down, Left, Right, F1 through F3.
As an example, you can see the keyboard assignments *Up* on the top button, *Down* on the middle button and the Measure function on the *Bottom* button.

Figure 22 Simulated Keystrokes

c. Measure Confirmation

Here you can select which simulated key press at the selected terminal the button *Measure* carries out after measuring.
The options are: Return, Tab, Space, Up, Down, Left, Right, F1 to F3 and deactivated.
Example: If *Return* is selected and the measure is transferred to an Excel spreadsheet, then the cursor jumps down one cell after transfer. If Tab is selected, the cursor jumps one column to the right in Excel. Just like pressing a key on the keyboard of your device.

d. Autorepeat short press

Here you can select whether the measuring tape automatically transmits a measured value at regular intervals (approx. 1 s) to the terminal when the *Measure* key is pressed continuously.

	NOTE

ⓘ	If this function is selected, no further key assignment can be set to long press.

e. Back
Press *Back* or button *ON/OFF* to go back to the setup menu.

3.5.6. The Power Settings

With the Power Settings you can choose settings to lower energy consumption. Through pressing the *Bottom Button*, the options of each setting are scrolled through sequentially.

a. Dim display
With the setting *Dim display,* you set the time after which the display illumination will be dimmed to protect the battery and the display.
Options: 5s / 10s / 30s / 60s / off

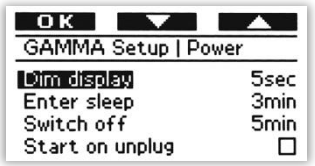

Figure 23 Power Settings

b. Enter Sleep
Select after which time of not being used, the gamma+ should switch into an energy-saving mode. The display and the measuring sensor switch off, the radio module goes into an energy-saving mode but keeps the connection to the terminal upright. By pressing one of the buttons and pulling the tape, the gamma+ is immediately ready to use again!
Options: 1min / 3min / 5min/ 10min / 20min / off

c. Switch off
Select the time after which the gamma+ turns off completely.
Options: 1min / 3min/ 5min / 10min / 30min / off

d. Start on unplug
When activated, the gamma+ turns on automatically when you unplug the micro USB cable.

e. Back
Chose *Back* or button *ON/OFF* to go back to the setup menu.

3.5.7. Info Menu

In the Info Menu you can see specific manufacturing information about your gamma+.

a. Serial No.

Shows the serial number of the gamma+.
(please specify if you have any questions for customer service).

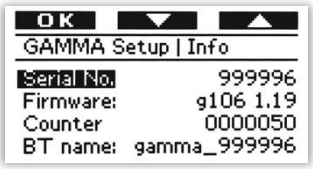

Figure 24 Info Menu

b. Firmware

Shows the installed firmware version.
(please specify if you have any questions for customer service).

c. Counter

Shows the number of measurements you have already taken.

d. BT name

This is the name of your gamma+ in your Bluetooth menu on your device.

e. Back

Choose *Back* or button *ON/OFF* to goback to the setup menu.

3.5.8. Admin Menu and Firmware Update

In the Admin menu, only the first 4 menu items are of interest to the user.

a. Calibrate Sensor

With this menu item you can recalibrate your gamma+ and the measuring tape module in 3 steps. For clarification see also chapter 6 *Maintenance and Calibration* as well as the corresponding video at the homepage.

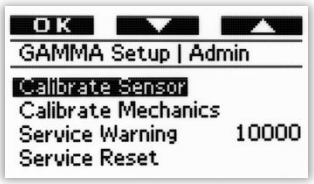

Figure 25 Admin Menu

Following steps are carried out during calibration. For this process you need a reference measuring tape with displayed measure units.

Step 1 In the first step (Calibrating electronics) the code on the gamma+ tape is compared with the sensor. Pull the tape slowly out of the housing until 100 % has been reached, than press ok. Let the tape run all the way back and press ok once again.

Step 2 Now you are asked how many mm forerun the tape has. Forerun is the distance between the back end of the fitting and the 0-line on the tape. The standard version has 15mm forerun (-15mm on the display). With the two buttons on the top you can increase or decrease in mm increment. The middle of the shown scale is 0mm, meaning there is no forerun and the measuring scale starts at the back end of the fitting.

Step 3 Please compare the 1m mark of the tape measure with the reference scale. The functionality is basically the same as in Step 2. The center of the scale shown on the display is 1m. If the 1m mark on the reference scale is behind the 1m mark on the tape measure, then the correction value has to be moved into the positive range. If the reference meter is shorter than the 1m mark on the measuring tape, then the correction value has to be moved into the negative range.

ⓘ	**NOTE**
	When changing the measuring tape module, calibration is strongly recommended! We also recommend calibration at regular intervals, e.g. during maintenance / cleaning.

b. Calibrate Mechanics

If you receive one of the warning messages (as per figure 28 and 29) regarding the position of the hook or brake, even though they are in the correct position (hook fully extended or retracted, brake not applied), you can calibrate the end positions of the mechanical components in this menu item. Simply follow the instructions on the gamma+ display.

Figure 26 Warning: Brake acitvated

Figure 27 Warning: improper hook position

ⓘ	**NOTE**
	We recommend to calibrate the mechanical components after each change of the measure tape module.

c. Service Warning

You have the option of setting a counter to be reminded of a due service. A “service” can be, for example, cleaning or replacing the measuring tape module. You can choose if you want to be informed about an upcoming maintenance after 10,000, 25,000, 50,000 measures or if you do not want to be informed at all. The best setting for the counter depends on your application and the materials to be measured. If for example the materials make a lot of dust, then it is advisable to clean the inside of the housing more often, so that the mechanics and the sensor remain clean.

Figure 28 Service Warning

If the set number of measurements has been reached, the warning (see figure 30) is displayed on the gamma+ each time it is switched on. This disappears after a few seconds and you can continue to work.
After performing maintenance, reset the counter with *Service Reset*.

d. Factory Reset

Here you get back to the factory settings.

ⓘ	**NOTE**
	All your personal settings will be reset and the installed devices will be deleted!

e. Firmware – Update

From time to time we provide you with a new firmware version. You can find information about this on our homepage www.hoechstmass.com **Products / electronic measuring tapes / gamma+.**
In urgent cases we will inform you about the update by email.

To perform a firmware update you need:

- the corresponding firmware file (homepage)
- the service tool (homepage)
- a USB cable
- a Windows computer

Currently, it is only possible with a Windows PC to perform a firmware update on your gamma+.
Please also watch the corresponding video on our homepage!

Process Firmware – Update

1. Connect the gamma+ to the PC using a USB cable
2. Select *firmware update* in gamma+ in Setup_Menu / Admin
3. Start the service tool
4. Wait until the Comport has been recognized
5. Select Comport (You can find the number in the device manager in Connections and Name USB Serial Port (com xx)
6. Import the new firmware file into the program (click on the 3 dots and select the firmware in the file system)
7. Press Upload and wait until the update is finished and the gamma+ starts again
8. Now you can disconnect the USB cable
9. Do a Factory reset (Important)

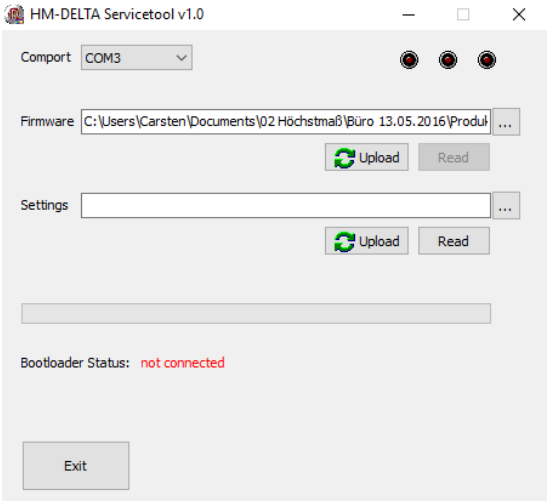

Figure 29 Firmware Update

4. Preparation for usage

4.1 Unpack, Check Scope of Supply

Check the scope of supply after delivery. The scope of supply contains:

- The gamma+ measuring tape
- Charger
- Charging cable
- Bluetooth stick

4.2 Establishing Bluetooth Connection

You can use your gamma+ with all operating systems that support a connection with a Bluetooth keyboard (e.g. Windows, OS X, iOS, and Android). In total, 15 different devices can be paired with the gamma+ at the same time.

If you want to use your gamma+ with the included USB Bluetooth stick on different devices, you still need to pair each device separately with the gamma+ and select it later in the Dev. list before use (see chapter 3.5.2*)*.

In the following, we walk you through the process of connecting the gamma+ named gamma_999997 with a PC running Windows 10.

Step 1 Go to the Setup menu and the sub menu Bluetooth Settings, select the item *Install new device* with the *Bottom button / OK*.

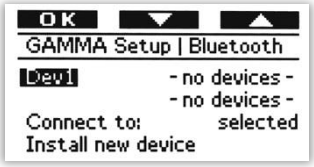

Figure 30 Establish Bluetooth Connection

Step 2 After pressing *Install new device*, the gamma+ will be visible for about 2 min to pair with a terminal. First, install the new device in gamma+ and then start the search process on the PC. On the screen of the gamma+ you will now see an expiring time bar and the serial number of the gamma+. Please select the corresponding gamma+ on your PC.

Step 3 Now select *Add a Bluetooth device* in the PC settings under the menu item *Bluetooth and other devices*. The PC then searches for all Bluetooth devices that are in range. Be sure to select the gamma+ with the correct serial number. For clarification see the screenshots below. The options to be clicked are highlighted in light gray.

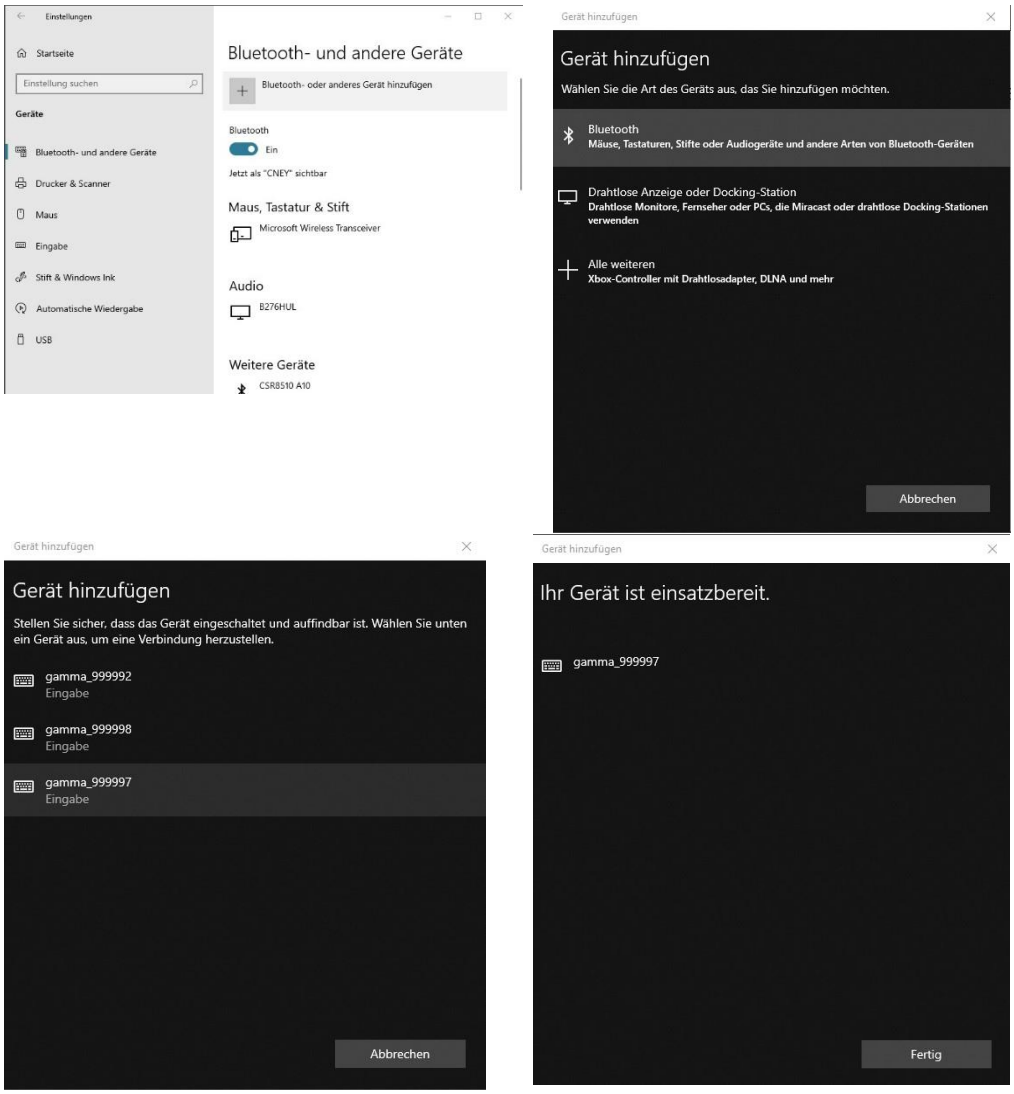

Figure 31 Establish Bluetooth Connection at terminal

Step 4 In the Bluetooth menu of the gamma+, the name of your PC appears behind Dev.1 after the successful connection.

Step 5 Select the desired connection option (Standard selected)

Figure 32 Display on gamma+ after successful Bluetooth Connection

Working with a USB Bluetooth stick and multiple PCs

The first connection to your Bluetooth stick is made as described in the previous section. In the Bluetooth menu, the Bluetooth stick has the name of the PC name, with which it was connected to the gamma+ for the first time. If you would like to connect the gamma+ to another PC via this stick, remove the stick from the first PC and insert it into the second PC. You may have to wait a bit until the new PC recognizes the stick and is ready to connect. Now turn on

the gamma+. The gamma+ recognizes the Bluetooth stick with the name of the at first connected PC name. After a moment, the PC screen will ask if you want to add a device.

Click with the mouse on this message.

In the next step, the Bluetooth menu of the PC automatically opens and asks if you want to allow the gamma+ to be paired with the PC. Please click here to allow.

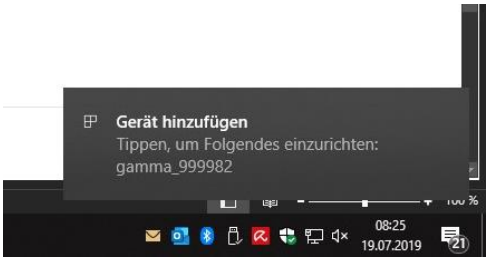

Figure 33 Pair gamma+ with PC/Bluetooth stick

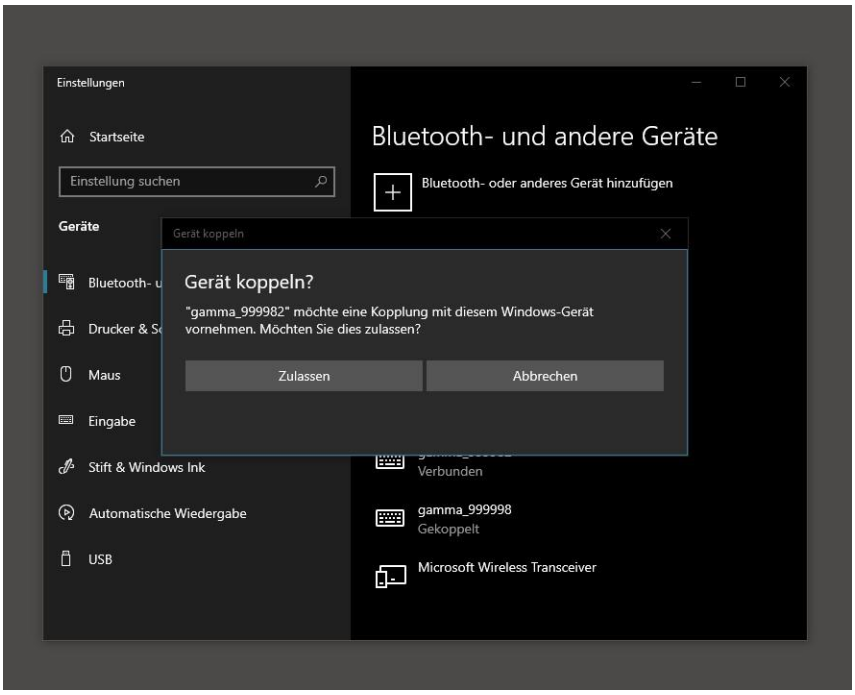

Figure 34 Allow Pairing with gamma+

ⓘ	**NOTE**
	Currently this procedure only works reliably with Windows 10.

4.3 Storage after usage

Store the gamma+ in a dry and dust-protected environment. If possible, also mind during usage that dust is not getting into the housing. If dust cannot be avoided in the measure environment, maintenance and cleansing is advised regularly (see chapter 6).

5 Working with the gamma+

After turning the gamma+ on with the *ON/OFF button* the message “pull tape” appears on the display. In order to calculate the 0-point, you have to pull the tape some cm and retract it again. The message disappears and you can start with the measuring.

⚠	**CAUTION**
	Keep in mind not to be statically loaded during the work with gamma+. This could damage the gamma+ irreparably!

5.1 The measuring section

All measurements are taken between the 0-line and the **selected measuring edge**. In the example below, the distance between the 0-line and the front edge of the housing is measured.

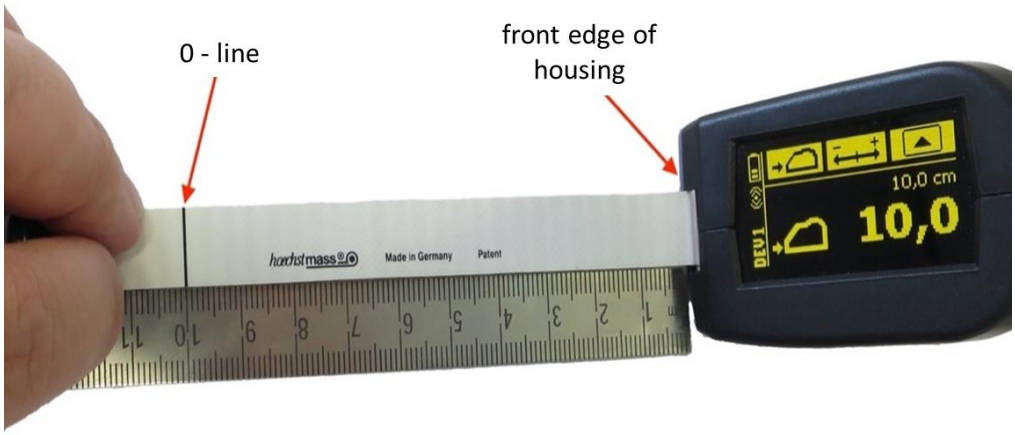

Figure 35 The measuring section

5.2 The gamma+ display

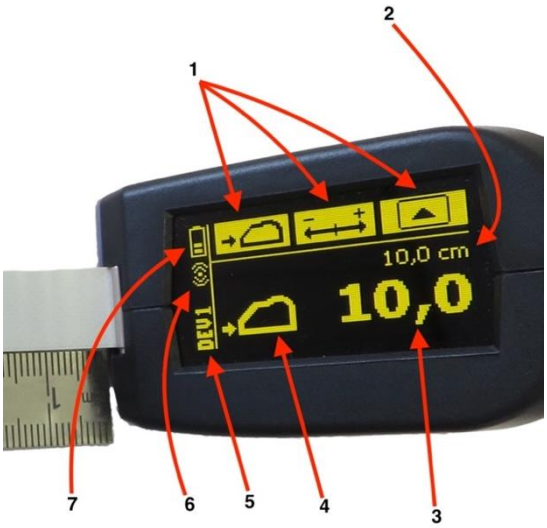

Figure 36 The display

1. Visualization of the key assignments for a short press (for *Top/Middle/Bottom Button*)
2. Small measurement value, which always indicates the current distance between the 0-point and the front edge of the housing.
   When the hook is extended, a symbol in front of the measurement indicates which edge of the hook the measure refers:
   I< Inner edge >I Outer edge
3. Last measured value taken
4. Last used measuring edge (for diameter, circumference and addition the respective symbol is displayed instead of the measuring edge)
5. Connected terminal
6. Existing radio connection
7. Battery Status

5.3 The Brake

With the help of the brake, the winding device of the measuring tape can be blocked. It allows the user to place the measuring tape exactly on the object to be measured. After placing the measuring tape, release the brake and move the measuring edge to the measuring position.

Figure 37 The brake

ⓘ	**NOTE**
	With activated brake no measurements are possible!

5.4 The measuring edges

Front housing edge / measure tape outlet (standard measure)
After measuring, a symbol of the used measuring edge appears on the display (here: outline of the gamma+ with the arrow on the measuring tape outlet)

Figure 38 Front housing edge

This measuring edge is particularly suitable for thicker or double-layered textiles.

Figure 39 Measuring of thicker textiles

Inner hook edge
For example, this measuring edge is suitable for stretched internal dimensions. When the hook is extended, the button assignments change automatically. The lower button is then occupied for measurements on the inner edge. After pressing the button, the corresponding visualization appears on the display.

Figure 40 Inner hook edge

Outer hook edge
Suitable for very precise measurements or measurements on very thin materials. The measuring tape can be positioned exactly on the material with the hook.
Please see figure 44 and 45 for more clarity.

Figure 41 Outer hook edge

Figure 42 Measuring failure because of large distance between objects and measuring tape outlet

Figure 43 Precise measuring with hook possible

5.5 Measuring circumference and diameter

To measure circumferences and diameters, the measuring tape must be threaded behind the retracted hook. To this, pull the tape out of the housing a little longer than the circumference to be measured. Next, you lock the brake and thread the band as shown in figure 46. Put the measuring tape properly around the object to be measured and releases the brake. The easiest way to loosen the tape after the measurement is to let the hook extend.

Figure 44 Thread the measuring tape behind the hook

Figure 45 Measuring circumference

Figure 46 Measuring diameter

5.6 Add up and absolute measurements

Add up

Adding is often used to double dimensions but can of course also be used to add several sections to a total distance. To use the add up, assign the function *Addition* to one of the buttons (see chapter 3.5.5).

With a short press on the button after each measuring section in a row, the sections are added. A long press transfers the result of the addition to the terminal.

Example below: 26,4cm (short press) + 22,7cm (short press) = 49,1cm (long press transfers end result)

Figure 47 First section

Figure 48 Second section

Absolute measurements

In quality control, where dimensions are often compared with a target dimension, the 0-point can be placed on the reference or target dimension. In our example the trouser leg should have a width of 25 cm. This means that the 0-point was placed on exactly 25 cm. If a pant leg is 25.5 cm wide, then +0.5 appears on the display (and is transmitted to the end device).

Our sample pants, however, only has a width of 24.5 cm and thus results in an deviation of -0.5cm.

Figure 49 Absolute measurements

6 Maintenance and Calibration

It is recommendable to clean gamma+ at regular intervals and to check the general condition of the measuring tape and guide rollers. If you would like gamma+ to remind you of the service, please set the counter (admin menu) to the desired number of measurements. After reaching the set measurements, you will receive a message on the display each time you switch the gamma+ on. This disappears after a few seconds, so you can continue working despite the due service.

6.1 Opening of the housing and removing of the measuring tape

Step 1: Open the Housing
Open the housing by unscrewing the 4 screws.

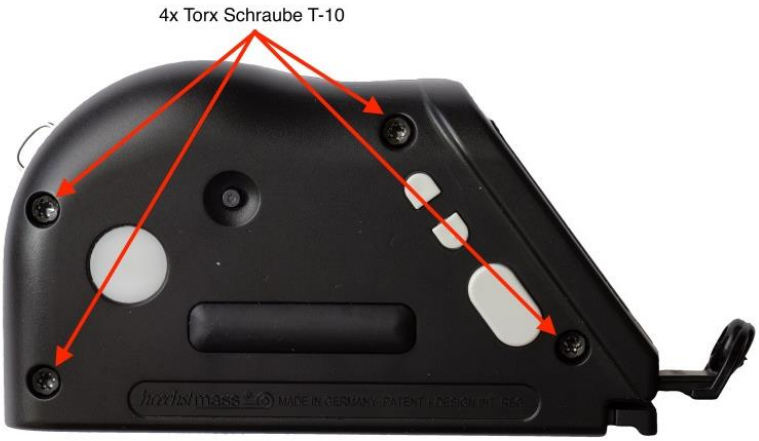

Figure 50 Open the housing

Schritt 2: Remove the housing shell with the brake

After unscrewing the screws, place the gamma+ on the button side and carefully lift the housing shell with the brake.

Figure 51 Remove housing shell

An overview of the inside

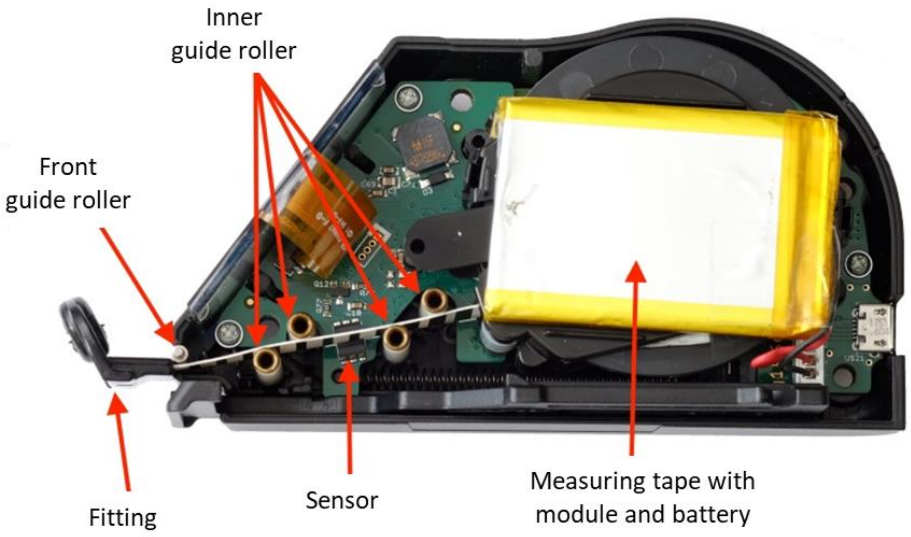

Figure 52 Overview inside

Step 3: Remove the measuring tape module

Pull the measuring tape slightly out of the housing (1 cm) with your left hand, then lift the measuring tape module together with the battery. Now you can run the measuring tape into the module. Place the module to the right on the table. Do not tear on the cable!

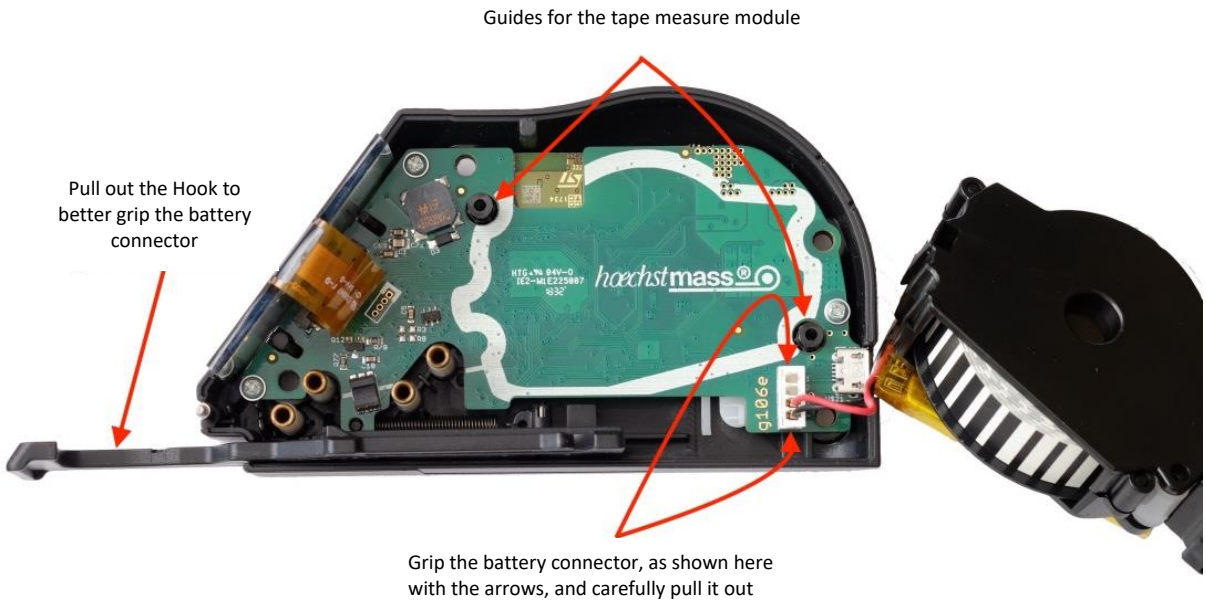

Figure 53 Remove measuring tape module

Now please extend the hook. Next, you can grasp the battery plug with your thumb and index finger as shown in the illustration above and unplug the plug.

6.2 Cleaning

Carefully clean the board side with gentle compressed air. You can also use a soft brush.

⚠	**CAUTION**
	Please use compressed air that is suitable for cleaning keyboards and electronic components to ensure that the parts are not destroyed during cleaning.

Look at all the guide rollers. If these are heavily soiled or cannot be turned, the rollers should be replaced! You should also check the measuring tape and module. If the tape measure or the plastic roller on the module is heavily soiled or worn, the tape measure module should also be replaced.

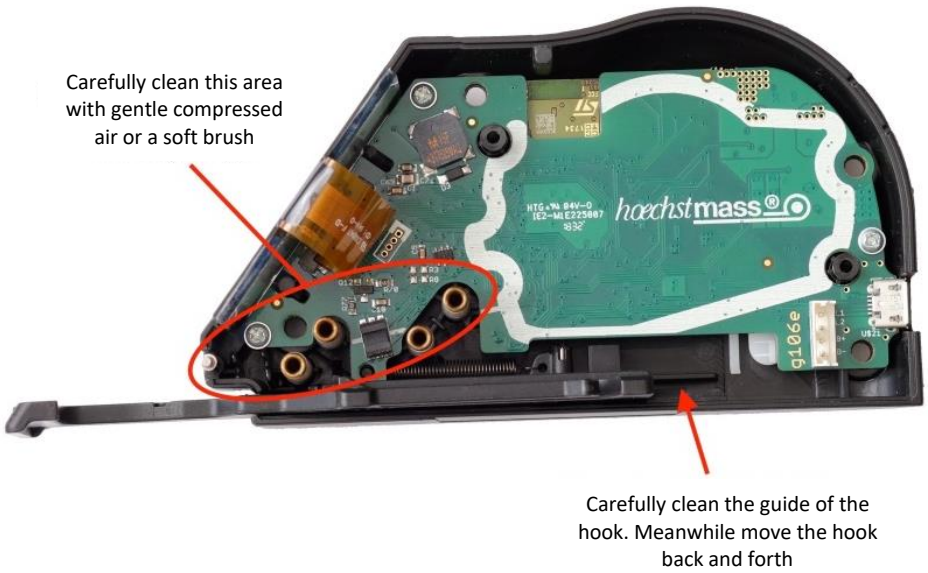

Figure 54 Cleaning of gamma+

Also clean the housing shell.

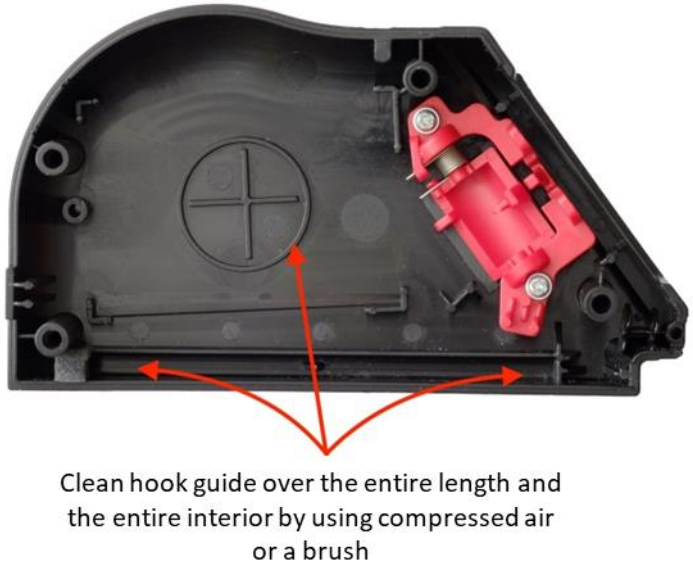

Figure 55 Cleaning housing shell

6.3 Assembly

First plug the battery plug back into the socket. The plug can be easily inserted only in one direction, do not use force! The gamma+ will turn on when the plug is plugged in. Please turn it off again before continuing.

ⓘ	**NOTE** When assembling, make sure that the module is seated in its guides, that the measuring tape runs smoothly between the inner guide rollers, inside the fork of the sensor and below the front guide roller.

After inserting, carefully pull out the measuring tape and make sure that it runs completely straight through the sensor between the module and the front roller

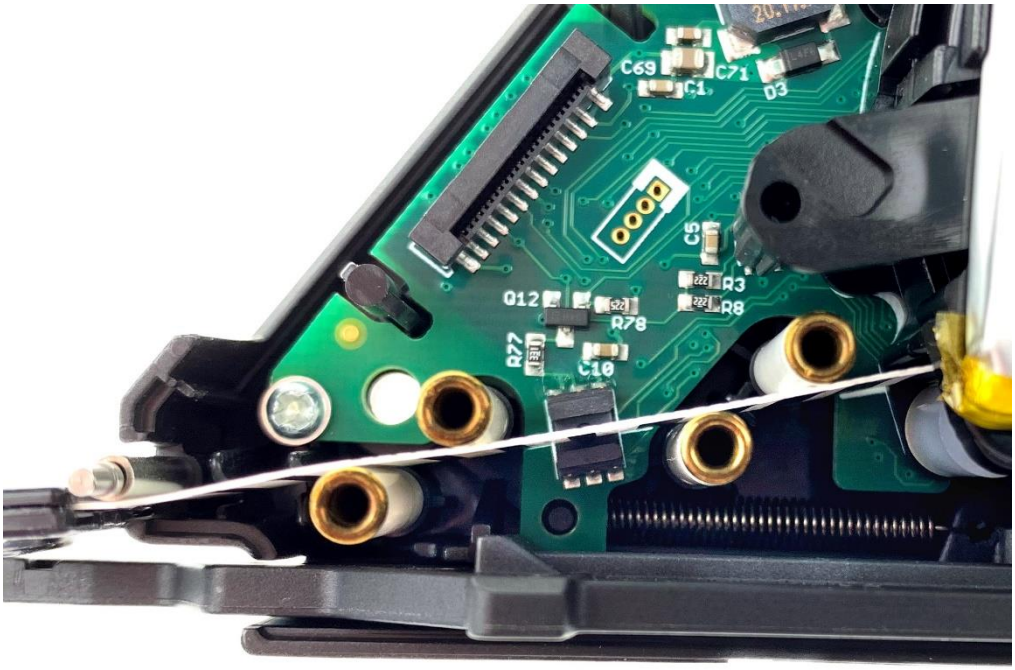

Figure 56 Measuring tape inside the housing

To assemble the housing shells, put the shell with the board on the table surface. Hold the other housing shell with the brake with small distance directly above the board-side of the housing shell. Next, put the housing shell with the brake vertically straight on the housing shell on the table. Thereby press the display **slightly** to the inside, so it doesn't tilt during the assembly.

Figure 57 Housing shell with board (on the left) and housing shell with brake (on the right)

After assembling the housing shells, pull on the measuring tape to check whether it can be pulled easily. If everything is ok, insert the screws and tighten them hand tight.

6.4 Calibration

After changing the measuring tape module, the new measuring tape and the mechanical components should be calibrated! Please follow the instructions in this manual and watch the corresponding video on our homepage.

6.4.1 Calibrate Sensor / Tape

The sensor and the measuring tape are calibrated in 3 steps.

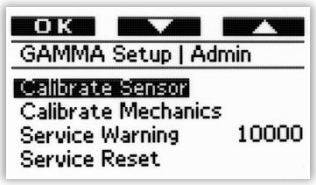

Figure 58 Calibrate Sensor

1. After selecting the menu item mentioned above, you will be asked to pull the tape out of the housing.

Figure 59 Calibrate Sensor - Pull tape

Pull it as evenly as possible and not too fast out of the housing until it reaches 100%.

Figure 60 Pull out tape evently until 100 % is reached

When 100% is reached, the confirmation appears. Press OK to continue.

Figure 61 Calibrating electronics done

Let the tape measure run all the way into the case and press OK again.

Figure 62 Calibrate tape

Now the actual calibration begins.

2. In the first step, please enter the length of the forerun (zero offset). The standard, and also shown in Figures 65 and 66, is a 15mm forerun.

Figure 63 Forerun indication

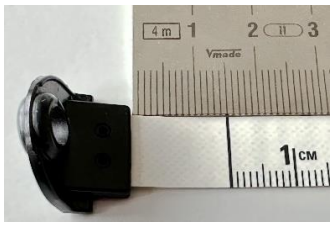

Figure 64 Practical example of measuring the forerun

3. To calibrate the tape, please compare the tape measure with your reference scale.

   If the meter on the reference scale is longer than the meter on the tape measure, please correct it by mm increments as shown in Figures 67 and 68.

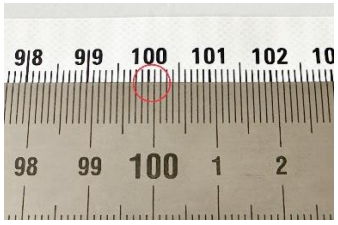

Figure 65 1m on the reference scale is 1mm longer than on the tape measure

Figure 66 Adjustment +1mm in the calibration menu

   If the meter on the reference scale is shorter than the meter on the tape measure, please correct it by mm increments as shown in Figures 69 and 70.

Figure 67 1m on the reference scale is 1mm shorter than on the tape measure

   After confirming the adjustment with OK, you will receive a summary with details of the zero offset and the selected correction value.
   Please press OK again, you will be back in the admin menu.

Figure 68 Adjustment -1mm in the calibration menu

6.4.2 Calibrate mechanics

After changing the measuring tape module or in the event of an unjustified warning of the position of the hook or brake, the mechanical components should be calibrated. This is done in 3 steps.

1. Push the hook inside the housing and press the *OK button.*

Figure 69 Calibrate mechanics - step 1

2. Deploy the hook through pressing the *hook release button* and press the *OK button*.

Figure 70 Calibrate mechanics - step 2

3. Activate the brake and press the *OK button*.

Figure 71Calibrate mechanics - step 3

7 Error states and Troubleshooting

Error state	Steps for troubleshooting
Disconnection Bluetooth	Check if one of the following causes for the disconnection is met: - Distance to terminal is too long - Bluetooth is disabled on the terminal - Thick wall between gamma+ and terminal
Improper Hook Position	Ensure that the hook is completely retracted or extended and push/pull it into the end position. If the error still appears, you have following options: - Calibrate mechanics (see chapter 6.4.2) - Carry out cleaning (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**) - Contact the service
Brake is activated	If the brake is released, but the warning appears, you have following options: - Calibrate mechanics (see chapter 6.4.2) - Carry out cleaning (see chapter 6) - Contact the service
Battery cannot be charged	If the battery cannot be charged, carry out following steps: - Use another charger or charging cable - Check if the USB port is dirty and clean it carefully with a brush - Contact the service
Dimensions are not measured correctly	Check if the barcode on the downside of the measuring tape is in a good state. If not, exchange the measuring tape modul (see chapter 6). Further options are: - Clean the sensor (see chapter 6) - Contact the service

8 Important information/Disposal

Protect the device from moisture. Do not submerge the device in water.

Avoid contact with hand creams or similar, these could damage the plastic parts and affect negatively the life of the measuring tape.

Dispose the device according to the EG Guideline WEEE (Waste Electrical and Electronic Equipment). If you have any questions, please contact the local authority responsible for disposal.

9 Declaration of conformity of the manufacturer

This product complies with the following EU directives:

- RE-Richtlinie 2014/53/EU
- RoHS-Richtlinie 2011/65/EU

You can request the full EU conformity assessment by sending an email to info@hoechstmass.com.

Name and address of the manufacturer:

Hoechstmass Balzer GmbH
Wiesenstraße 13
65843 Sulzbach / Ts.

Tel.: 06196 500 50