

SENSORTECHNIK MANUAL

INTRODUCTION

Attention, important safety advice!

Do not switch on the sensor until it is completely mounted on the machine and the laser sources are aligned to the conveyor. The switched on sensor sends invisible laser radiation during the measuring procedure. The sources of laser are activated only when the conveyor is moving. This condition is indicated by the blinking red signal lamp.

When the conveyor is not moving, the sources of the laser are switched off automatically. This state is indicated by the red signal lamp with a short flashing signal, followed by a long pause. However, to guarantee maximum safety, while the sensor has current supplied, always avoid looking directly into the optical outlets.

NOTE: Welding current flowing through the sensor unit causes damage to the optical belt scale!

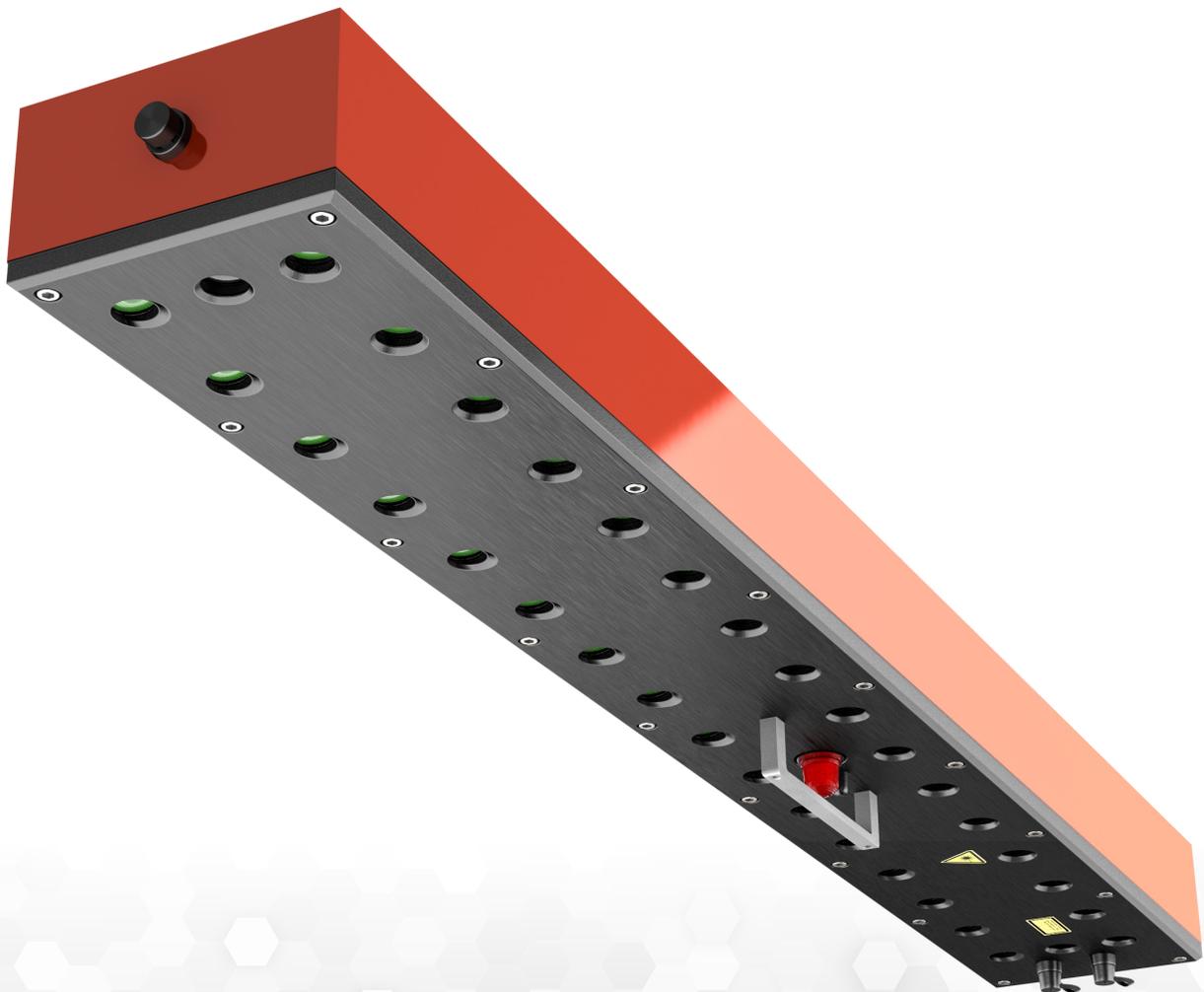


TABLE OF CONTENTS

SECTION 1	Extent of Delivery	PG 4
SECTION 1	Installation of the Optical Belt Scale System	PG 6
2.1	Installing the inductive proximity switch sensor	PG 6
2.2	Connecting the Power Supply cable	PG 7
2.3	Mounting of Sensor unit	PG 7
2.4	Connecting the cables with the system	PG 10
SECTION 3	Getting Started with the Mobile Phone	PG 11
3.1	Inserting the battery	PG 11
3.2	Powering on the Mobile Phone	PG 12
3.3	Set User Interface Language	PG 13
3.4	Set Date & Time	PG 14
SECTION 4	Start of SensorManager Application	PG 14
4.1	Connecting to Sensor Unit	PG 15
4.2	Setting Time & Date of Sensor Unit	PG 15
	Configuration of Drum Diameter	PG 16
	Calibration Run	PG 16
	Input Master Data	PG 17
	Start New Measurement	PG 18
SECTION 5	Adjusting	PG 19
	Start test measurement	PG 19
	Setting the Span adjust	PG 21

SECTION 1	Extent of Delivery	PG 4
SECTION 1	Installation of the Optical Belt Scale System	PG 6
2.1	Installing the inductive proximity switch sensor	PG 6
2.2	Connecting the Power Supply cable	PG 7
2.3	Mounting of Sensor unit	PG 7
2.4	Connecting the cables with the system	PG 10
SECTION 3	Getting Started with the Mobile Phone	PG 11
3.1	Inserting the battery	PG 11
3.2	Powering on the Mobile Phone	PG 12
3.3	Set User Interface Language	PG 13
3.4	Set Date & Time	PG 14

SECTION 4	Start of SensorManager Application	PG 14
4.1	Connecting to Sensor Unit	PG 15
4.2	Setting Time & Date of Sensor Unit	PG 15
	Configuration of Drum Diameter	PG 16
	Calibration Run	PG 16
	Input Master Data	PG 17
	Start New Measurement	PG 18
SECTION 5	Adjusting	PG 19
	Start test measurement	PG 19
	Setting the Span adjust	PG 21
SECTION 6	Measurements	PG 22
6.1	Print measurements	PG 22
6.2	Print downloaded measurements	PG 23
6.3	Send measurements as email attachment	PG 24
6.4	View downloaded measurement as Excel Spreadsheet	PG 24
6.5	Location of exported XLS File on mobile phone	PG 25
6.6	Copying the XLS File to your desktop over USB Cable	PG 25
SECTION 7	System Settings	PG 26
7.1	Admin (Login/Logout)	PG 26
7.1.1	Change Login Password	PG 26
7.2	Configuration	PG 26
7.3	Clock	PG 26
7.4	Language	PG 27
7.5	Memory	PG 27
7.5.1	Clear Memory	PG 27
7.6	Units	PG 28
7.6.1	Setting the specific weight of a material	PG 28
7.7	Print-Settings	PG 29
7.8	Pairing and selecting the printer	PG 29
7.9	System	PG 30
7.10	Diagnostic Report	PG 30
7.11	Set sensor name	PG 30
SECTION 8	Thermal Bluetooth Printer	PG 31
8.1	Loading Paper	PG 31
SECTION 9	Safety Instructions Laser Class	PG 32
9.1	Warning	PG 32

SECTION 1 – EXTENT OF DELIVERY

Extent of Delivery

With your purchase of the Sensorteknik Optical Belt Scale, you can expect to receive the following equipment and accessories:

	<p>1. Sensor Unit</p>
	<p>2. CAT B15Q mobile phone including charging unit 110/220V, USB/charging cable, USB charger unit for 12V/24V</p>
	<p>3. Thermal Printer including charging unit 110/220V and thermal paper (how may rolls?)</p>
	<p>4. Mounting Frame and Bolts 6 - M8 Hex bolts</p>
	<p>5. Inductive Sensor and support bracket</p>
	<p>6. Inductive Sensor cable, two sizes, 0.5^m and 2.5^m (1.64' / 8.2')</p>
	<p>7. Power Cable, two sizes, 2.5m and 15m (8.2 Feet / 49.21 Feet)</p>
	<p>8. Optional DC/DC Converter 12V/24V 10A including cables (Technical Data U In: 11V – 14.5V, U Out: 24 V, limited to 26V, I Out: 6A)</p>

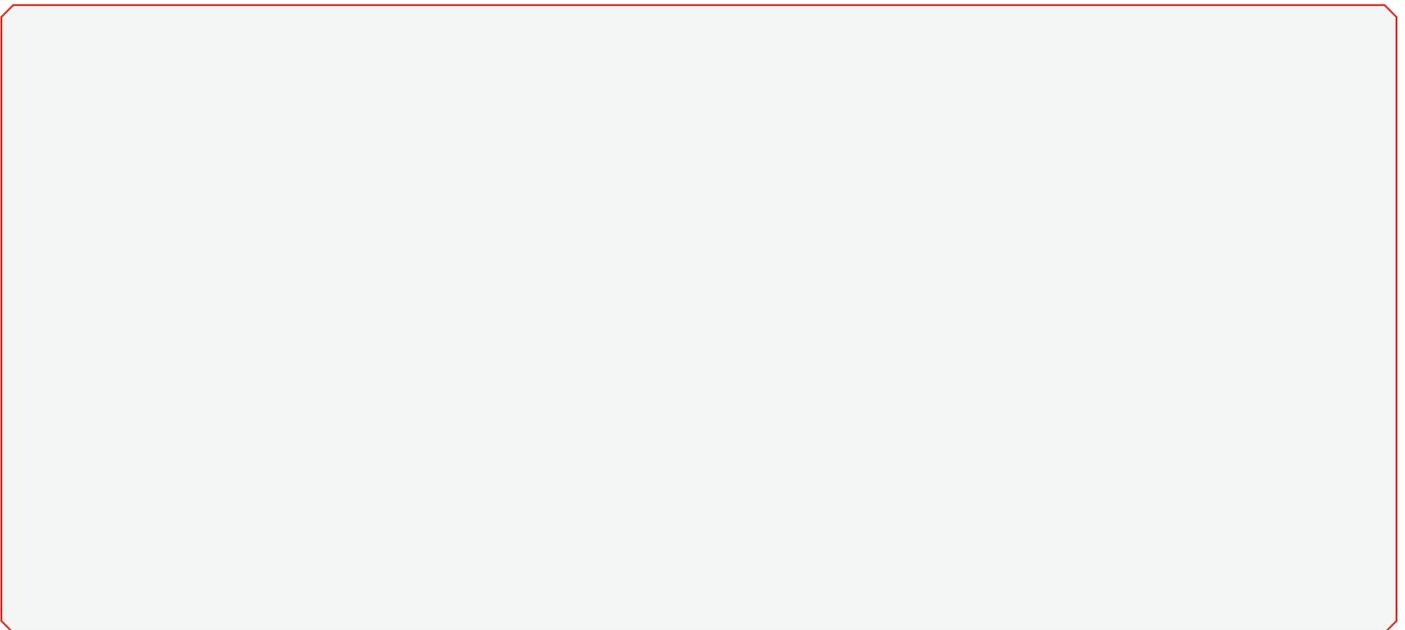
Installation of the Optical Belt Scale System

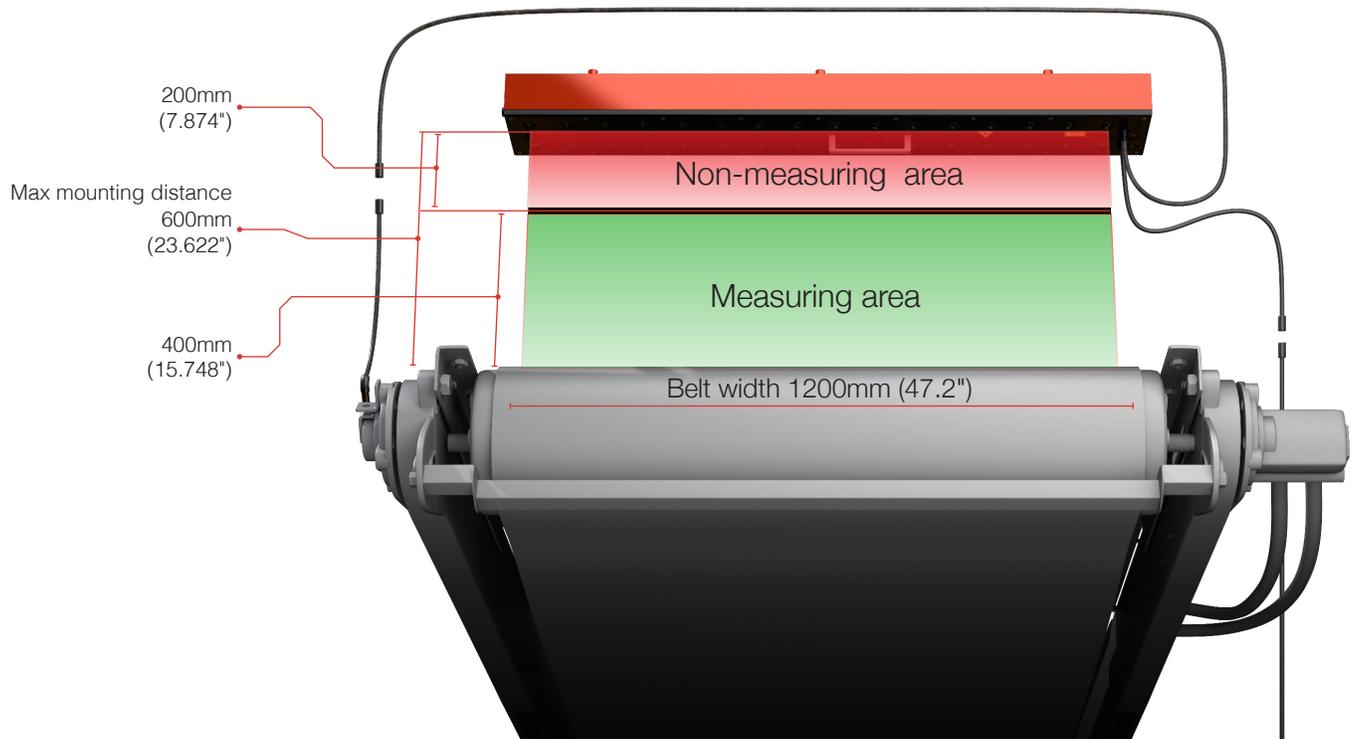
The successful installation of the Sensorteknik Optical Belt Scale System includes 5 steps, to be performed in order.

2.1 Installing the inductive proximity switch sensor

The inductive sensor is needed to measure the drum speed and has to be mounted in a good position on the drive pulley of the belt conveyor. Please refer to image

The inductive sensor on the bracket and the impulse sensor on the conveyor drum shaft must be aligned that they pass each other at a distance of 3-5mm (0.18 – 0.197")





2.2 Connecting the Power Supply

Connect the power supply cable (Cable D) to the power source. The optical belt scale requires a 24V DC 5 A power source.

Power Supply Cable (table)

Pin 1 / brown wire	+24V DC
Pin 2 / blue wire	-24V DC (GND)

2.3 Mounting the Sensor Unit

The sensor is affixed onto the frame with 6 M8 hex bolts, which are included with the unit. (See Image #)

Mounting Height: Be sure not to exceed the maximum mounting height of 660mm (23.62"). A mounting position of 600mm / 23.62" allows for material measurement with a height of 400mm / 15.758" on the belt. If the mounting height falls below 600mm / 23.62", it will narrow the full measuring range.

To Power on the sensor, connect power supply cable C to the sensor and to the power supply cable D

Positioning the Sensor: After powering on the sensor, two red laser dots will be visible for about 5 minutes. Use these two dots, which are marketing the active measuring line, to position the sensor accordingly the pictures (check intent). The sensor has to be positioned above the apex of the roller. Use the two red laser dots (one on each side of the sensor) to check whether they match the point of contact between the belt and drum exactly. (Can we visually illustrate this point?)

*** Please make sure that the sensor is mounted in the right direction, running the direction of the conveyor! ***

The following table shows which sensor fits best based on Conveyor belt width:

Sensor	Conveyor Belt Width (mm)	Conveyor Belt Width (Inches)
600	400 – 600	15.7 – 23.6
800	600 – 800	23.6 – 31.5
1000	800 – 1000	31.5 – 39.4
1200	1000 – 1300	39.4 – 51.2
1400	1300 – 1600	51.2 – 63.0





Connect the inductive sensor to the measuring sensor using the both data cables A & B. The sensor is then connected to the 24V Cd/5 A power source using both the power supply cables C & D. If the sensor is used in conjunction with a 12 Volt powered system, the DC/DC converter E has to be used. It is advised to connect the sensor to the power supply at the ignition so that the sensor is only turned on when the ignition is on and the plant is running.

***While mounting all cables, please ensure they can't be damaged or compressed when the plant is working, or when the plant is being transported i.e. the conveyors are folded.*

Please find the occupancy of the Power Supply Cable D:

Power Supply Cable D	
Pin 1 / brown wire	+ 24V DC
Pin 2 / blue wire	- 24V DC (GND)

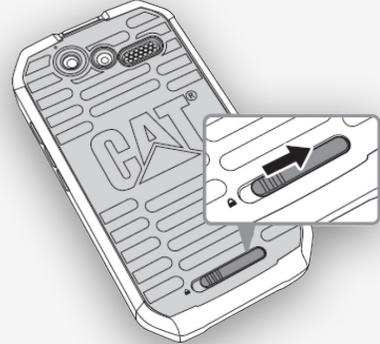
While mounting all cables pls ensure that they can't be damaged or squashed when the plant is working or when the plant is being transported i.e. the conveyors are folded.

Getting Started with your Mobile Phone

The handheld device allows you to conveniently monitor your production, store data and manage your operations.

3.1 Inserting the Battery**1**

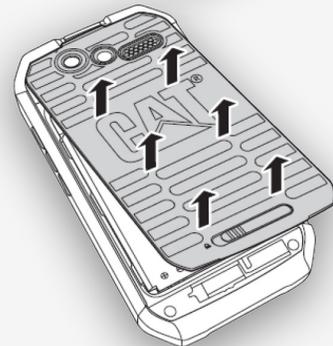
Slide the back cover latch to the unlock position.

**2**

Hook your fingertip under the back cover.

**3**

Lift the back cover.

**4**

You now have access to the battery compartment. Insert the battery. Make sure the contacts of the battery are aligned with the connectors in the battery compartment.



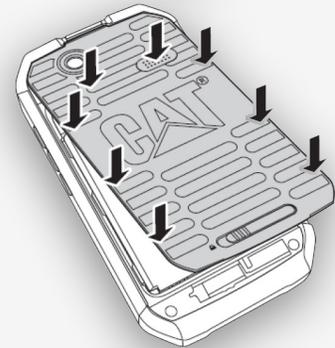
5 Make sure the rear cover has the exterior panel facing outwards.



6 Engage the hooks on the top of the back cover with the designated slots on your phone



7 Push the rear cover firmly to secure it into place. Note: Be careful not to bend the lugs/catches/hooks on the battery cover



8 You now have access to the battery compartment. Insert the battery. Make sure the contacts of the battery are aligned with the connectors in the battery compartment.



3.2 Powering on the SmartPhone



To power on the phone, press the power button located on the top right side of the phone.

Key functions at your fingertips:

Power button	Press to turn on your mobile phone.
	Press and hold to open the phone options menu.
	Press to lock or wake the screen when your mobile phone is on.

Home Key Functions:

Home Key	Press at any time to display the Home Screen. A long press of the Home Key will launch Google Search or Google Now.
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Menu Key Functions:

Menu Key	Touch to open a menu with options that relate to the current screen or application.
	A long press of the Menu Key will list the recent applications used.
	A short press of the Menu Key from the Home screen will display all screen and icon settings.

Back Key Functions:

Back Key	Touch to display the previous screen you were working in.
	Use to close on-screen keyboard



Boot screen



Home screen

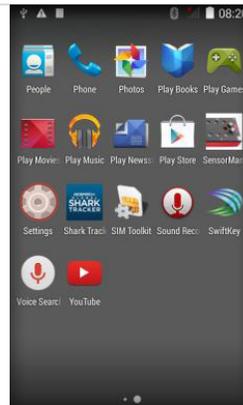
3.3 Set User Interface Language



1. Touch icon to display all apps



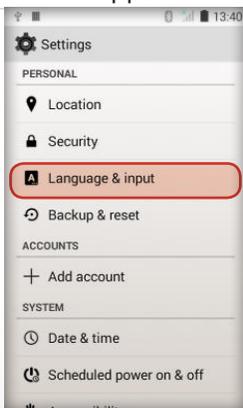
2. Swipe left to next page



3. Touch "Settings"



4. Scroll down



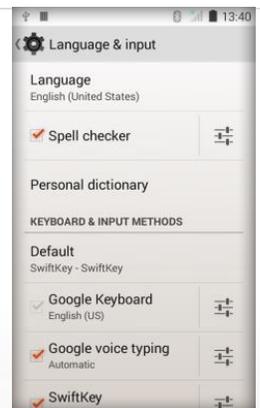
5. Touch language & input



6. Touch language

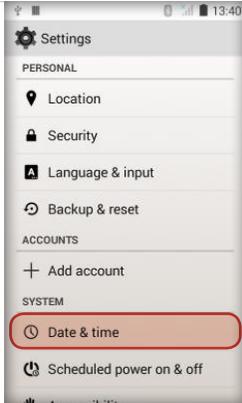


7. Select language

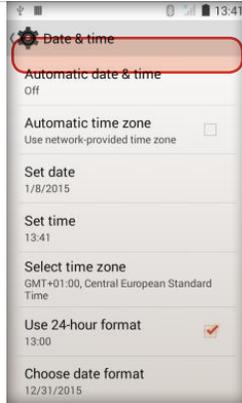


8. Touch here to go back

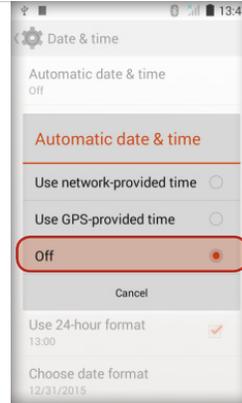
3.4 Set Date & Time



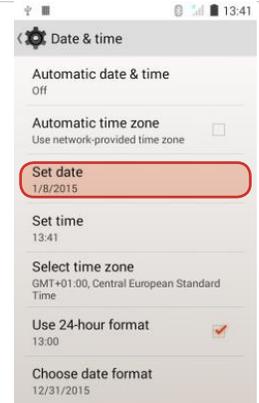
1. Touch "Date & Time"



2. Touch "Automatic Date & Time"



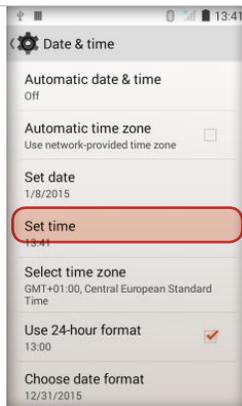
3. Select "off"



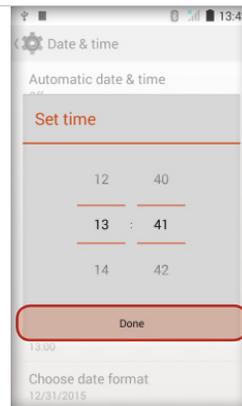
4. Touch "Set date"



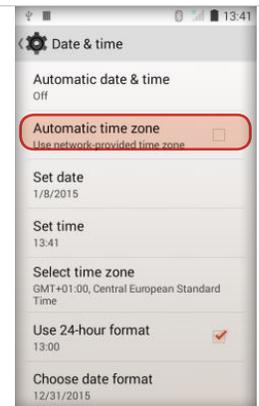
5. Set Date and touch "Done"



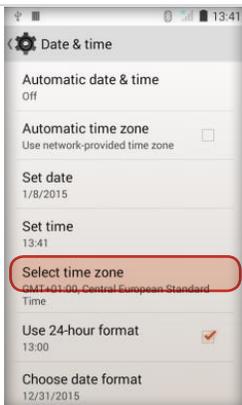
6. Touch "Set time"



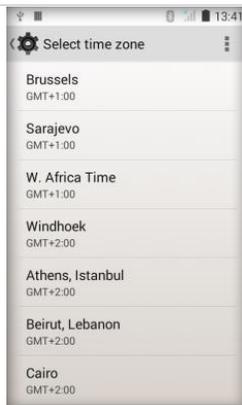
7. Set time and touch "Done"



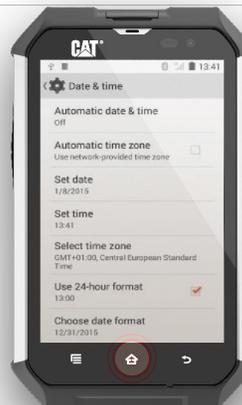
8. Uncheck "Automatic time zone"



9. Touch "Select time zone"



10. Select your "Time zone"



11. Touch "Home key"



12. Back at Home screen

SECTION 4 START OF SENSORMANAGER APPLICATION

4.0 Start Of Sensormanager Application



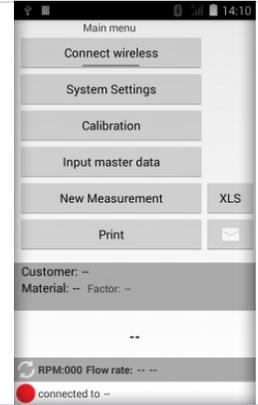
1. Touch "SensorManager" icon to start app



2. Touch "Allow" to turn on Bluetooth



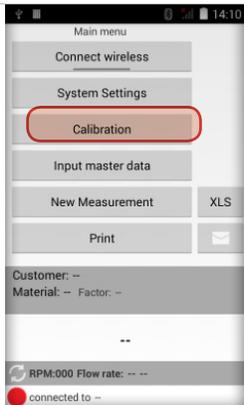
3. Wait while Bluetooth turns on



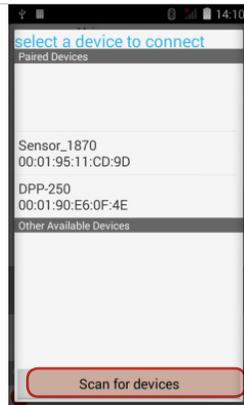
4. Green: Connected
Red: disconnected

4.1 Connecting to Sensor Unit

If Android asks for a pairing code for the Sensor then use following Bluetooth pairing code: hsbt00000



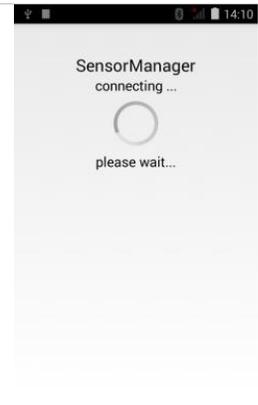
1. Touch "Connect wireless"



2. Touch "Scan for devices"



3. Touch "select Sensor_XXX"

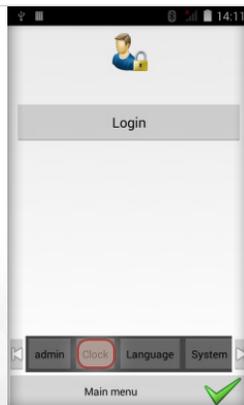


4. Connecting to Sensor_XXX?

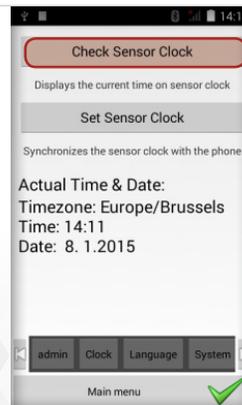
4.2 Setting Time & Date of Sensor Unit



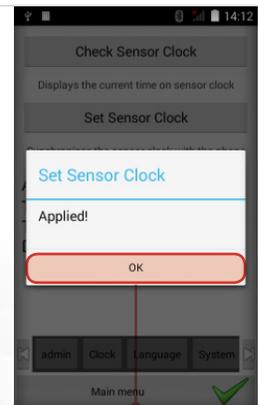
1. Touch "System settings"



2. Touch "Clock"

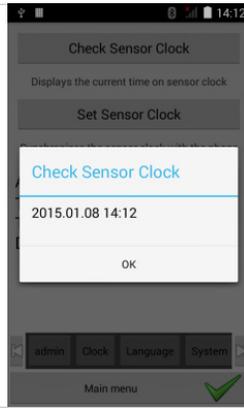
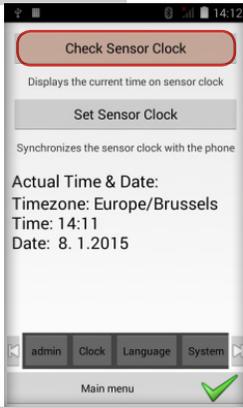


3. touch "Set Sensor Clock"



4. Confirm with "OK"

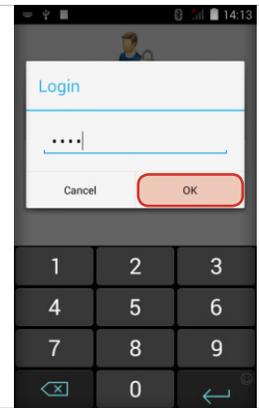
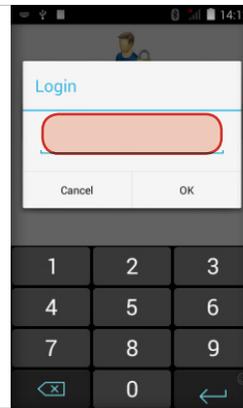
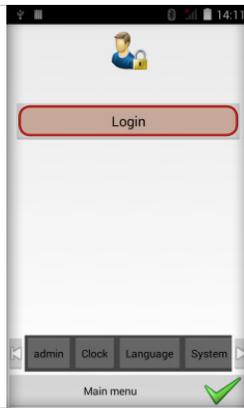
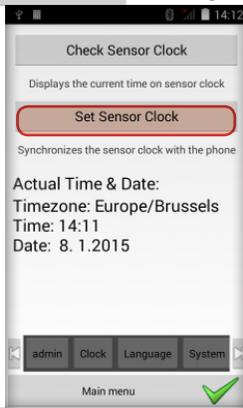
4.2 Setting Time & Date of Sensor Unit



6. Touch "Check Sensor Clock"
It shows the actual time & date on sensor unit"

7. Check if the time & date is up to date and confirm with "OK"

4.3 Configuration of Drum Diameter

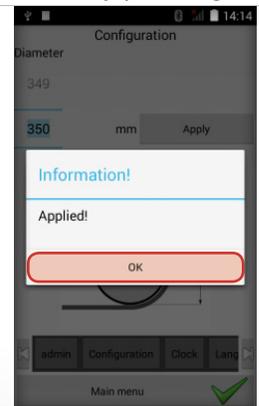
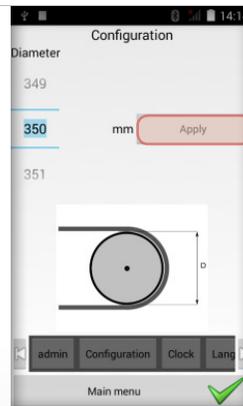
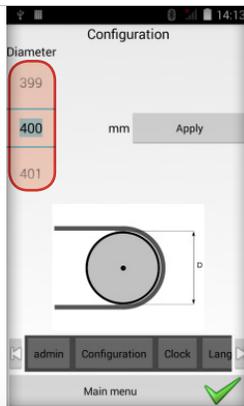
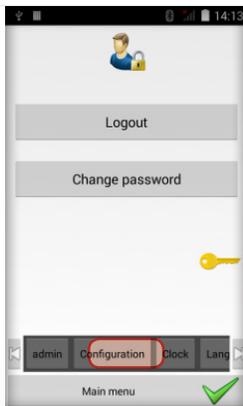


1. From Sensor Home screen, at the bottom left, Select "Admin"

2. Touch "Login"

3. Tap the password field and type in your password

4. Type in "0000" as the password
Confirm my pressing "OK"



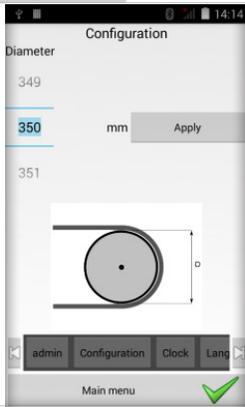
5. At the bottom, touch "Configuration"

6. Adjust the drum diameter by scrolling up or down

7. Once correct diameter selected, touch "Apply"

8. Confirm with "OK"

4.3 Configuration of Drum Diameter



9. Touch the green check to get back into the main menu
2 touch “Login”

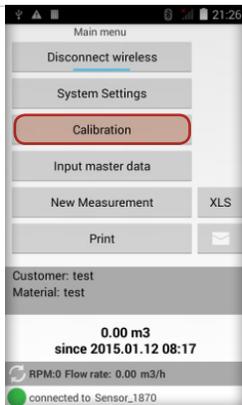
The most accurate way to determine the roll diameter is to measure the perimeter of the drum and acquire the diameter mathematically by dividing with Pi (3.14). The diameter includes the rubber coating of the roll, but does NOT include the conveyor belt.

4.4 Calibration Run

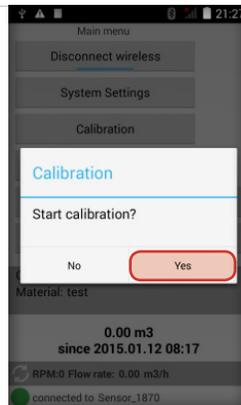
Hint: prior to the start of a new calibration run please ensure that the SensorManager is connected to the sensor!

It has to be ensured, that the EMPTY conveyor belt is running at working speed (sensor has to be in measuring state, red signal lamp is blinking once per second)

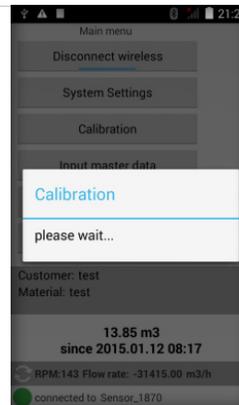
The conveyor belt must be clean and free from deposits of feeding material.



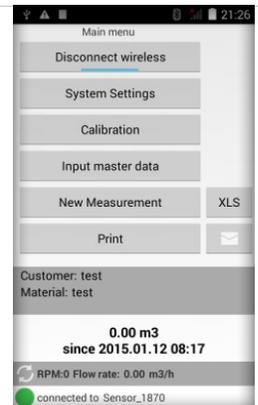
1. Touch “Calibration”



2. Confirm with “Yes”



3. Calibration has started



When a calibration run has been started, the red signal lamp starts to flash with fast repetition followed by a short period of steady burning signal lamp.

The calibration run is finished when the sensor enters its measuring state with the red signal lamp blinking every second once.

4.5 Input Master Data

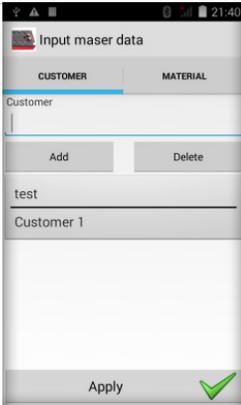
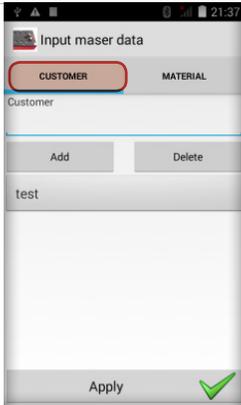
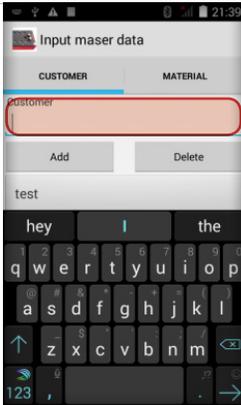
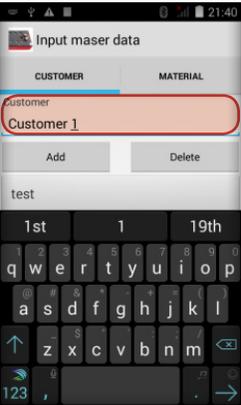
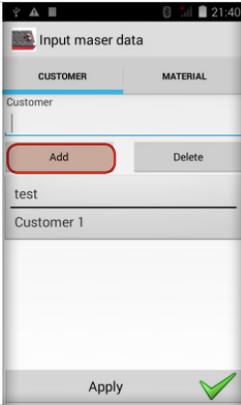
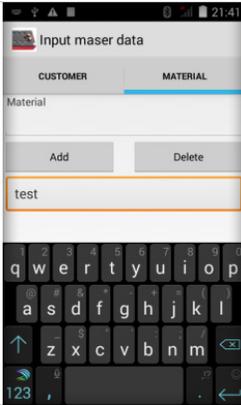
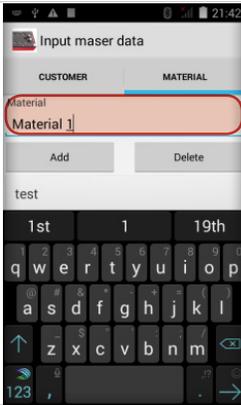
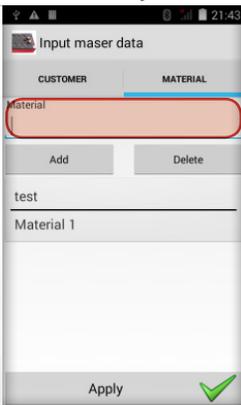
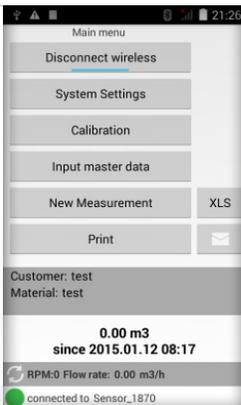
If a customer or material name are not yet listed in the master data, the data record has to be added.

First of all, we have to choose the group in which the new data record is to be added (Customer or Material)

Now a description can be added to the text field by using the displayed on-screen keyboard.

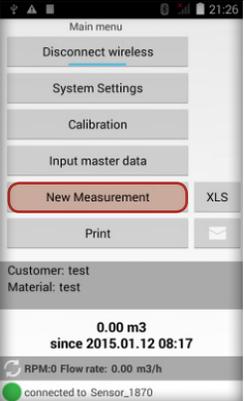
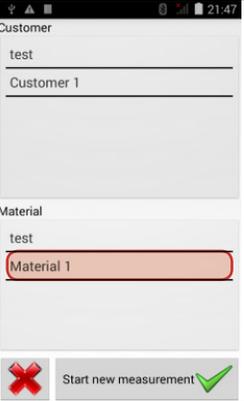
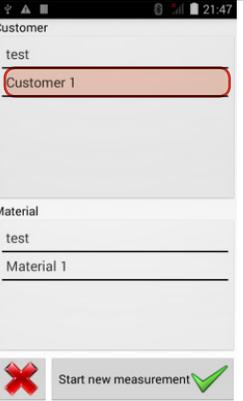
By clicking the “Add” button, the new description is added to the list.

You can change back to the main menu by clicking the confirmation symbol in the bottom right corner.

4.5 Input Master Data			
			
1. From the Sensor home screen, touch “Input Master Data”	2. Wait while it downloads the master data list	3. Select the “Customer” tab, located top left	4. Tap into the text input field, and the on-screen keyboard will be displayed
			
5. Using the on-screen keyboard, type in the Customer Name	6. Select “Add”, and touch the [key image] back key once to close the on-screen keyboard	7. You have successfully added a Customer to the Data list.	8. Type in the material name
			
9. Select “Add” and touch the “back” key once	10. Material 1” is added to the list	11. The new master data list is sending to the sensor unit	12. Sending is accomplished and you are in the main menu.

4.6 Start New Measurement

To start a new measurement with the new entered customer name and material name you have to select once those and touch the “Start new measurement” button.

			
<p>1. From the Sensor home screen, touch “Input Master Data”</p>	<p>2. Master data list is downloading</p>	<p>3. Select material</p>	<p>4. Select customer</p>
			
<p>5. Confirm with “Start new measurement”</p>	<p>6. Here you can see the configuration of the current measurement</p>	<p>7. Displays the start time & the volume of the current measurement</p>	

Now the sensor will remember this configuration and will measure all further production with this settings until you change it.

****NOTE** – Ensure that the measured volume which is displayed on the main menu keeps stable at zero while the empty conveyor belt is running. If the m³ value doesn’t keep at zero, please call the Sensorteknik service line 555-555-5555

SECTION 5 ADJUSTING

For the measuring adjustment, you will need a truck like in the image shown, or a container (see images). The capacity of the container or the truck must be at least 7m³. Measure the distances: A, B and C.

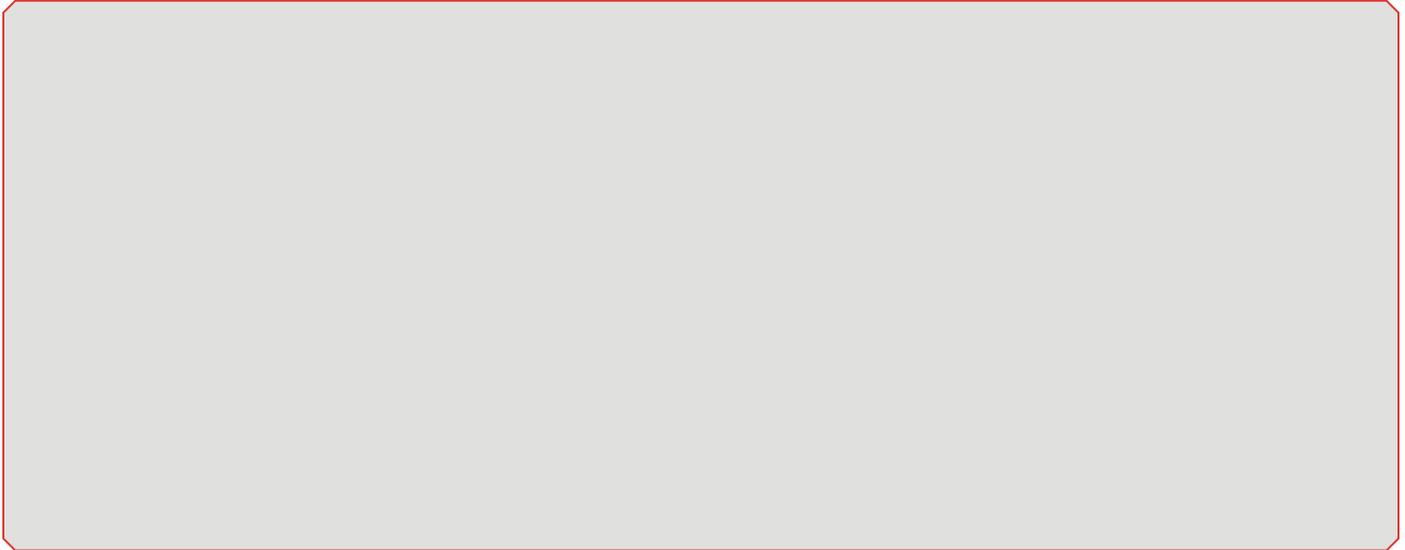
Calculate the volume of the container : $V = A \times B \times C$

5.1 Start Test Measurement

Ensure that you have started a new measurement and the span adjustment factor of the material is set to 100% and it keeps stable at 0m³ (zero) on an empty running belt. (How to set the span adjust, see Section 5.2 on Page #)

Start feeding material and fill up the container (or truck) until it is full. Flatten the material in the container, but make sure the material is NOT compressed or packed during the flattening. (See diagram)

After the known volume of material has run through the sensor and you have measured 3 separate times, you should have 4 volume amounts:



1	Container Volume = The volume of the container / trailer used in the measurement test
2	Volume 1 = The value shown on the SensorManager after the 1st measurement
3	Volume 2 = The value shown on the SensorManager after the 2nd measurement
4	Volume 3 = The value shown on the SensorManager after the 3rd measurement

From the 3 test measurements (Volume 1-3), you can find the Total Average, by averaging the 3 measurements. It can be calculated using the following formula:

$$\text{Total Average [m}^3\text{]} = (\text{Volume 1} + \text{Volume 2} + \text{Volume 3})$$

$$\frac{\quad}{3}$$

The Span Adjust factor is calculate using the following formula:

$$\text{Span Adjust [\%]} = 100 + (\text{Container Volume} - \text{Total Average})$$

Example: $\frac{\quad}{(\text{Total Average} / 100)}$

•	Container Volume = 10m³
•	Volume 1 = 10.34
•	Volume 2 = 10.3
•	Volume 3 = 10.2

$$\text{Total Average [m}^3\text{]} = (10.34 + 10.3 + 10.2) = 30.84 = 10.28\text{m}^3$$

3

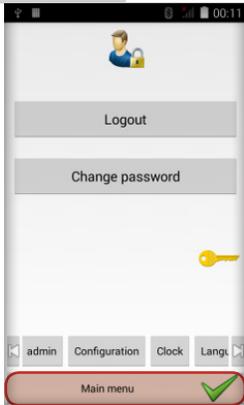
3

5.2 Setting the Span Adjust

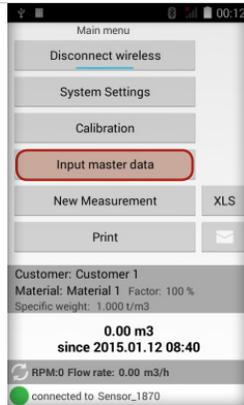
To enable the span adjust register page, connect to the sensor, go to the system settings and login as administrator. Default (factory setting) password is "0000" (note* All Zeros)

<p>1. Touch "System Settings"</p>	<p>2. Select "Admin" tab located in the bottom left corner</p>	<p>3.Touch "Login"</p>	<p>4. Tap the input field</p>
<p>5. Type in the default password: 0000</p>	<p>6. Confirm with "OK"</p>	<p>7. Long click onto the yellow key icon</p>	<p>8. Tap into the input field</p>
<p>9. Type in: 4957</p>	<p>10. Tap into the input field "0"</p>	<p>11. Type in: "1"</p>	<p>13. Confirm with "OK"</p>

5.2 Setting the Span Adjust



13. Touch "Main menu"



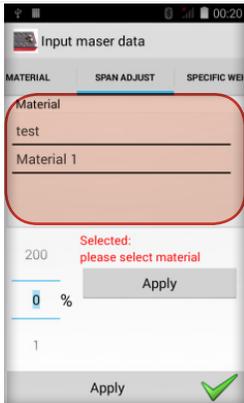
14. Touch "Input master data"



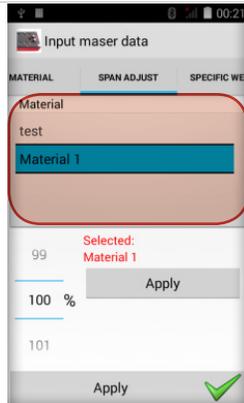
15. Scroll to the left by swiping



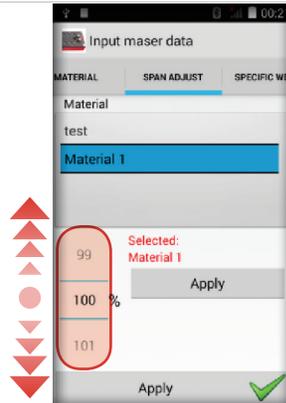
16. Select "SPAN ADJUST" tab



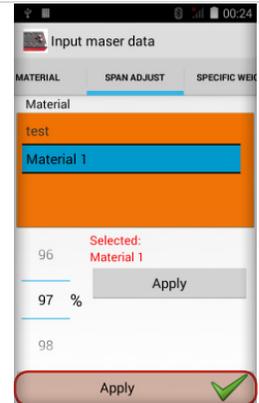
17. Select the material



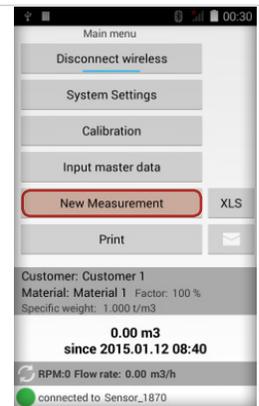
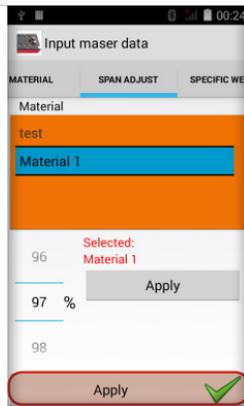
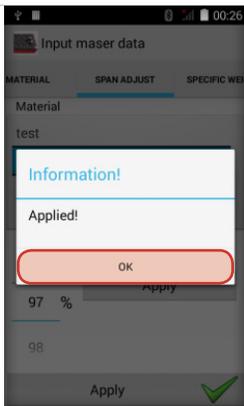
18. Select the material



19. Change the value by scrolling up or down



20. Touch "Apply" to confirm the value



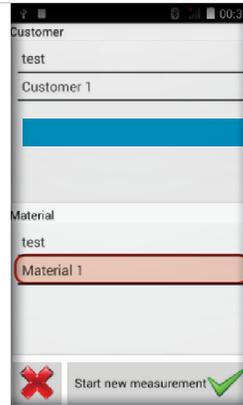
5.2 Setting the Span Adjust



25. The new master data is downloaded from the sensor



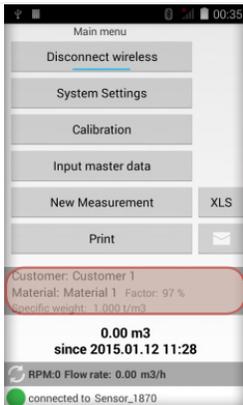
26. Select the customer



27. Select the material which was adjusted before



28. Touch "Start new measurement"



30. Measurement started with the new span adjust factor 97%

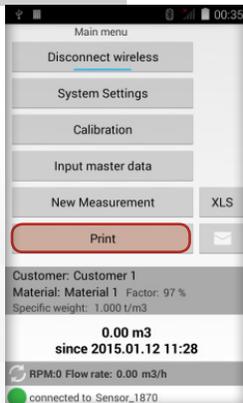
Now you can do a control measurement to check the measured volume.

If you have still difference between the measured volume and the real volume, then you have to repeat the adjustment.

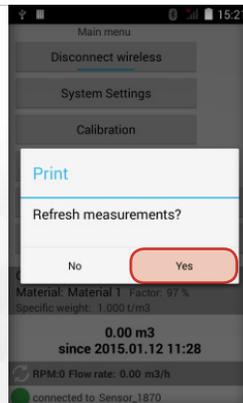
These steps must be repeated with each different material.

6 MEASUREMENTS

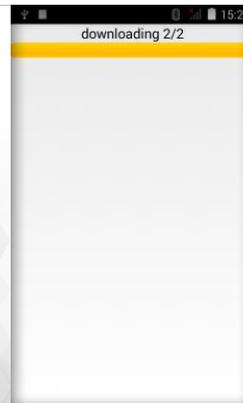
6.1 Print measurements



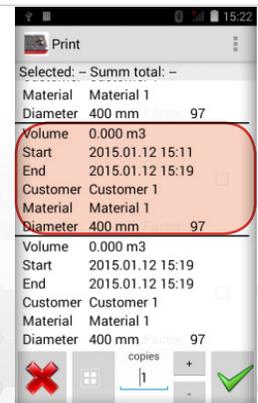
1. Touch "Print"



2. Select "Yes"

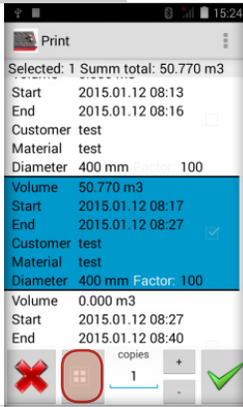


3. Latest measurement s are downloading



4. Tap on a measurement to select

6.1 Print measurements



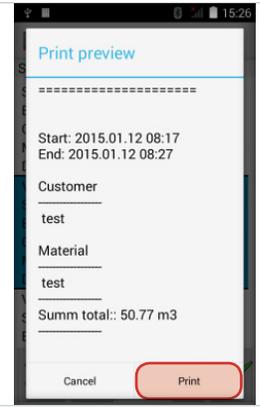
5. Selects all measurements on same day



6. Number of copies to print



7. Confirm to show the preview



8. Select "Print"



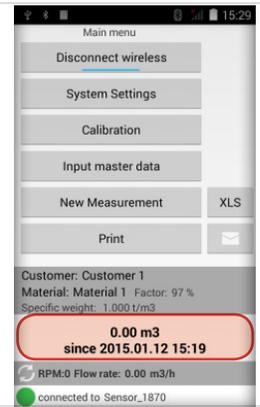
9. Power on printer and select "OK"



10. Connecting to the printer and printing

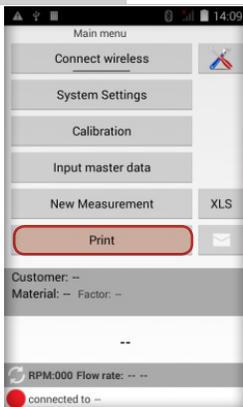


11. After printing reconnecting to the sensor unit

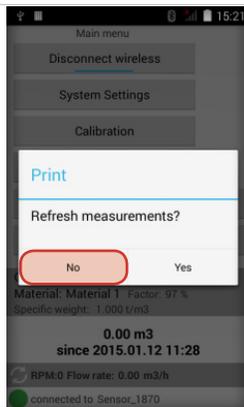


12. Reconnected to the sensor unit

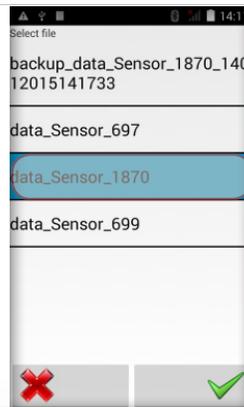
6.2 Print downloaded measurements



1. Touch "Print"



2. Select "No"



3. Select data file

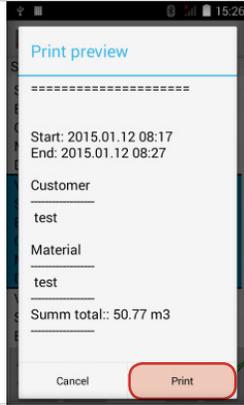


4. Tap on a measurement to select

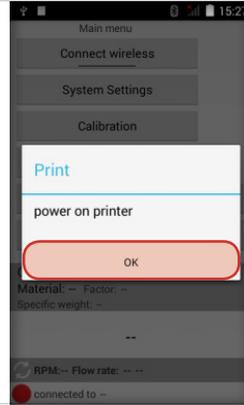
6.2 Print downloaded measurements



7. Confirm to show the preview



8. Select "Print"

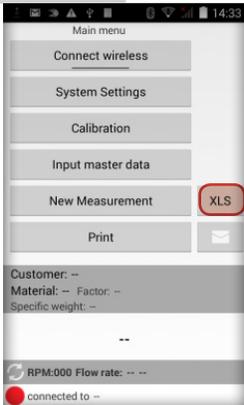


9. Power on printer and select "OK"

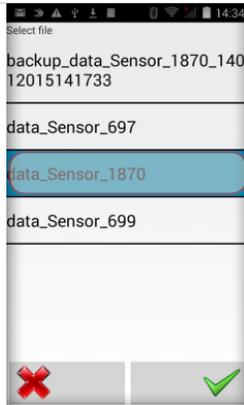


10. Connecting to the printer and printing

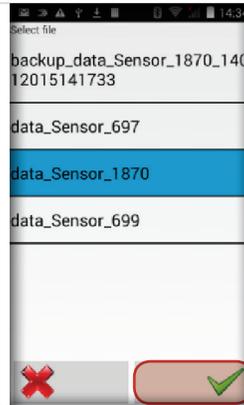
6.3 Send measurements as e-mail attachment



1. Touch XLS button



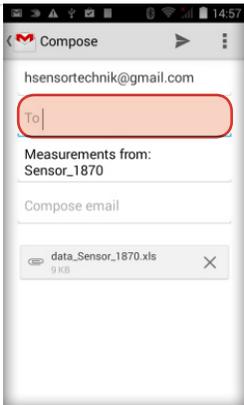
2. Select data file to send



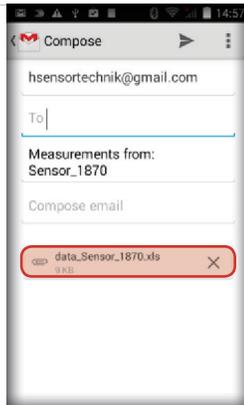
3. Confirm



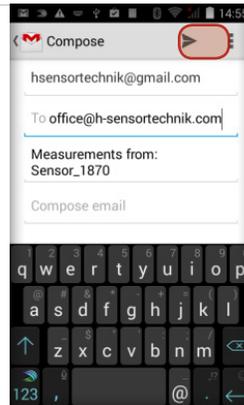
4. Select your e-mail app to send. (Here Gmail)



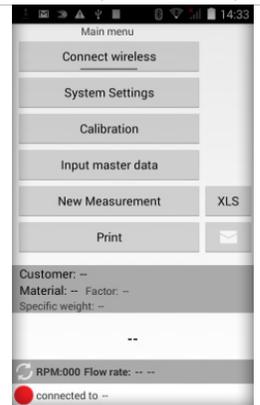
5. Type in recipients e-mail address



6. Data file attached to the e-mail

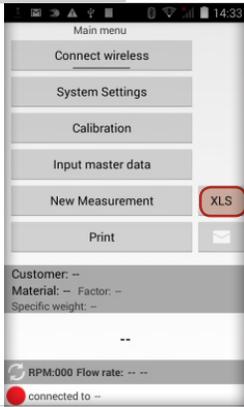


7. Touch send icon to send

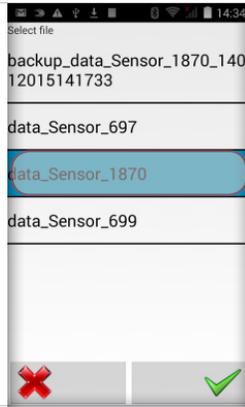


8. Sends e-mail & returns to main menu

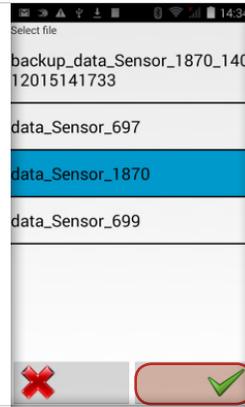
6.4 View down loaded measurement as Excel spreadsheet



1. Touch XLS button



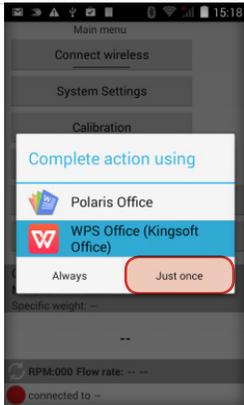
2. Select data file to view



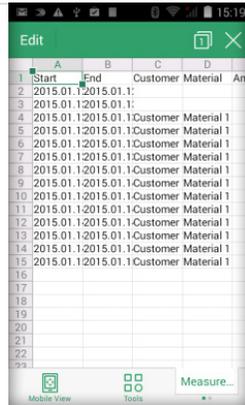
3. Confirm



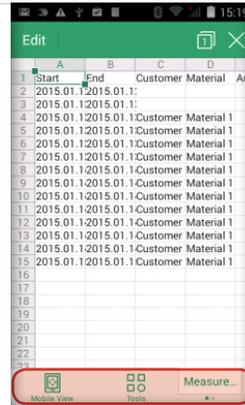
4. Select your office app to view XLS-file. (Here WPS.)



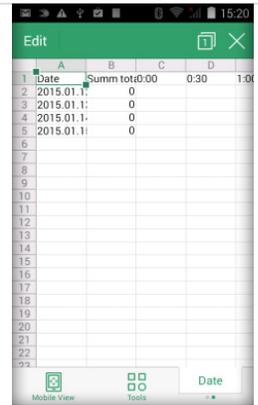
5. Select "Just once"



6. Measurement spreadsheet



7. Swipe here to switch to Data view



8. Data spreadsheet

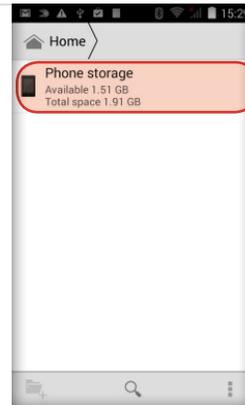
6.5 Location of exported XLS-File on the mobile phone



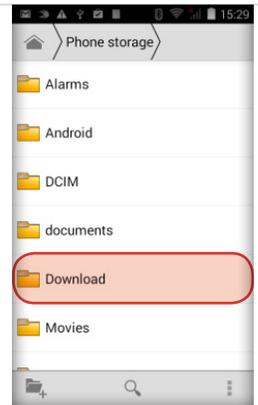
1. Touch icon to display all apps



2. Select File Manager

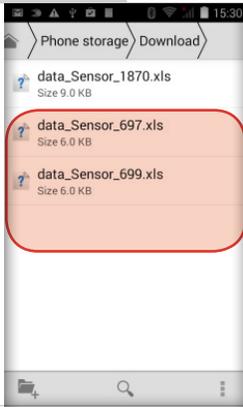


3. Touch "Phone storage"



4. Touch "Download"

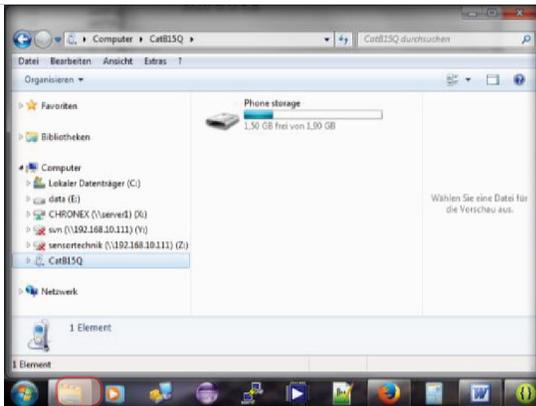
6.5 Location of exported XLS-File on the mobile phone



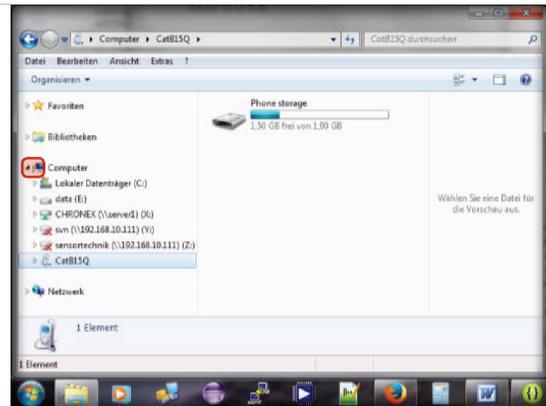
5. Measurement files name format: data_Sensor_###.xls
xls ###: number of the sensor

6.6 Copying the XLS-file to your desktop over USB-Cable

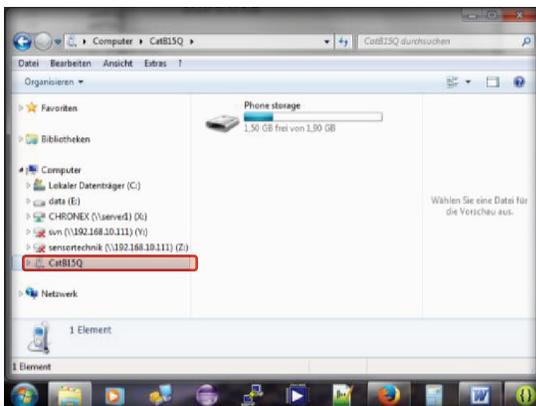
1. Connect your mobile phone with the supplied USB-cable



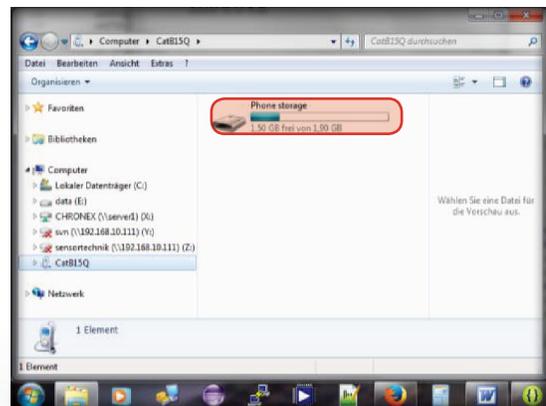
2. Start "Windows Explorer"



3. Expand "Computer"



4. Click onto "CatB15Q"

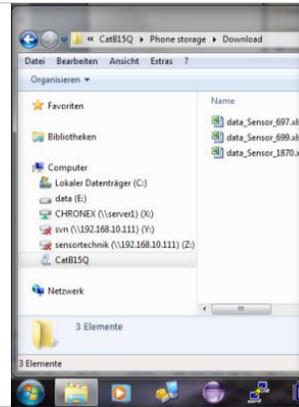


5. Double click onto "Phone storage"

6.6 Copying the XLS-file to your desktop over USB-Cable



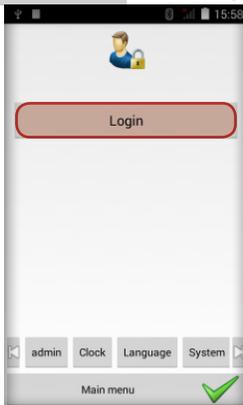
5. Double click onto "Download"



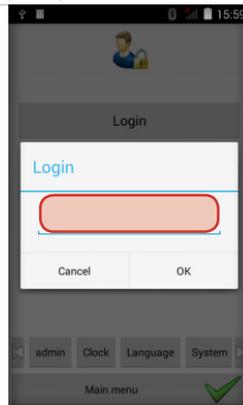
6. Copy the file & paste it to your desktop

7 SYSTEM SETTINGS

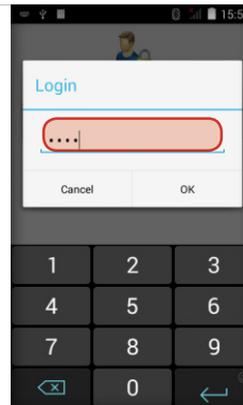
7.1 Admin (Login/Logout)



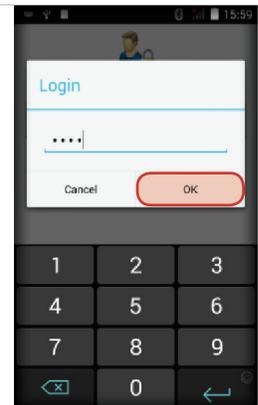
1. Touch "Login"



2. Tap into the input field



3. Type in the default password: 0000

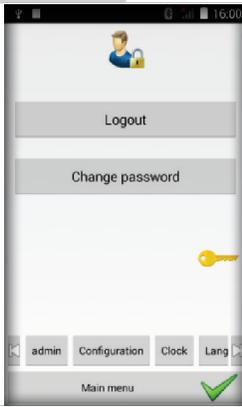


4. Confirm with "OK"

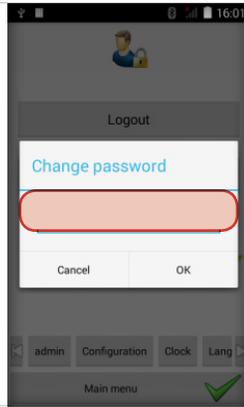


5. You are logged in

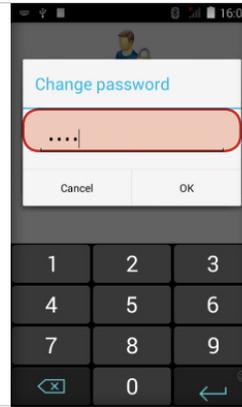
7.1.1 Change Login Password



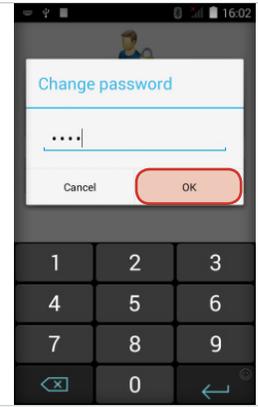
1. Touch “Change password”



2. Tap into the input field



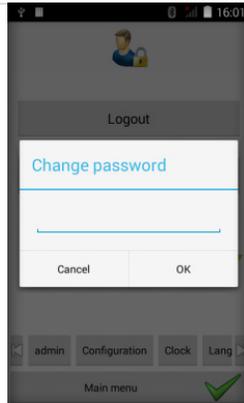
3. Type in the new password



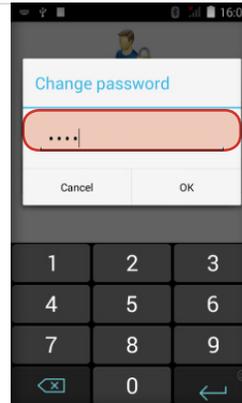
4. Confirm with “OK”



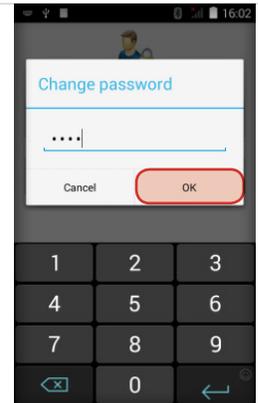
1. Touch “Change password”



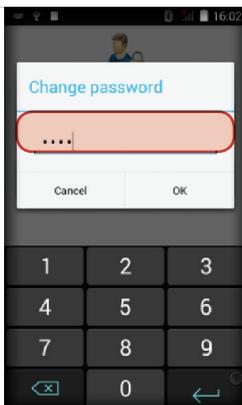
2. Tap into the input field



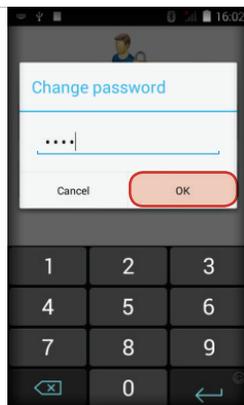
3. Type in the new password



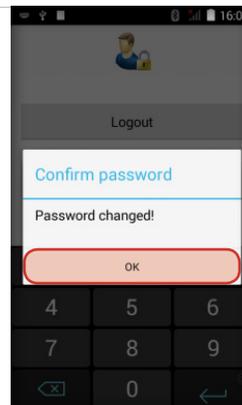
4. Confirm with “OK”



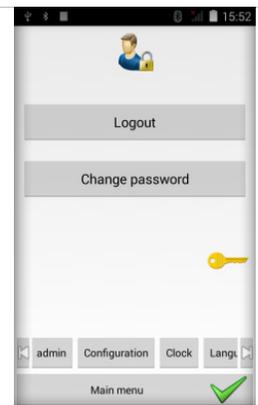
5. Type in the new password again for confirmation



6. Confirm with “OK”



7. Confirm with “OK”



8. The password is changed now

7.2 Configuration

See chapter 4.3

7.3 Clock

See chapter 4.2

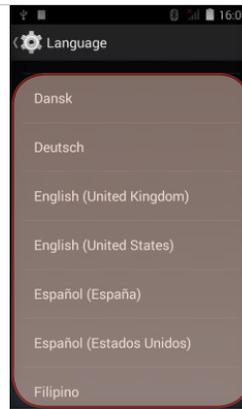
7.4 Language



1. Touch "Language"

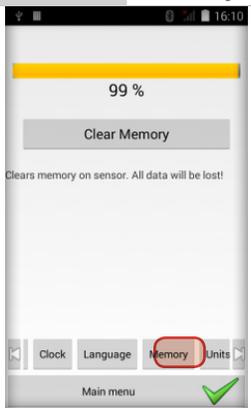


2. Touch "Change Language"

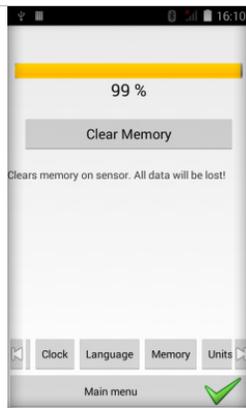


3. Scroll and select your language. This changes the UI-Language of Android and if your language is not available in SensorManager App, then English will be used in the App. The UI-Language of Android will be displayed in the selected language.

7.5 Memory

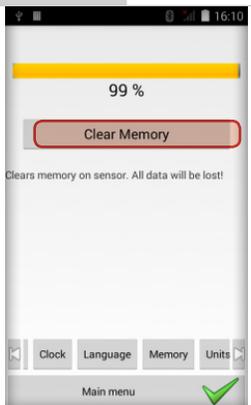


1. Touch "Memory"

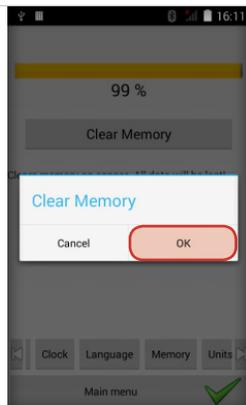


2. 99% of the memory is still available

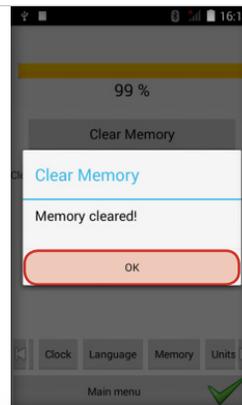
7.5.1 Clear Memory



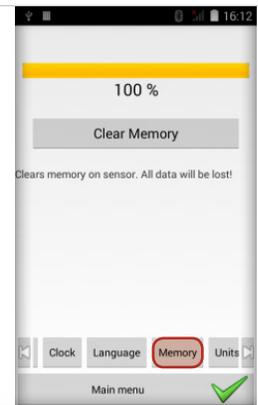
1. Touch "Clear Memory"



2. Select "OK"



3. Select "OK"

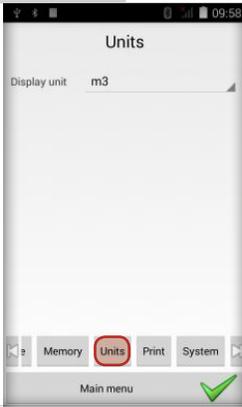


4. Touch "Memory"

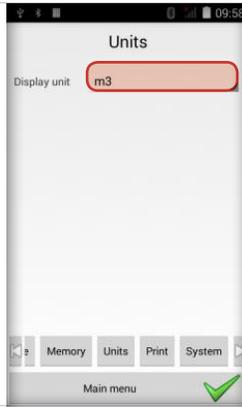
When the memory is cleared a backup file is stored from the data which were downloaded on to the mobile phone.

Hint: Be sure that you have downloaded all measurements before clearing memory!

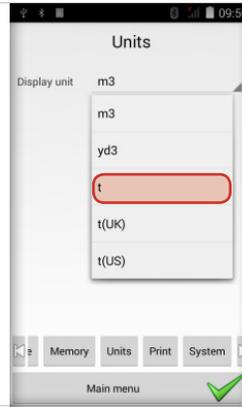
7.6 Units



1. Touch "Units"



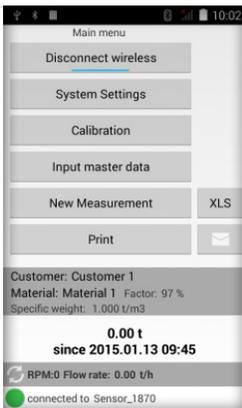
2. Tap on to the selection list



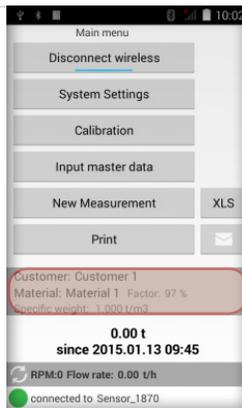
3. Select the unit "t" (as an example)



4. Confirm



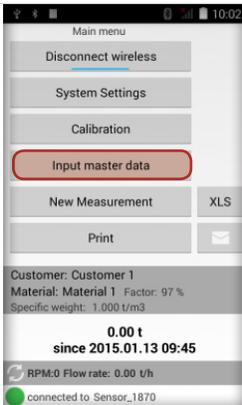
5. The unit is now "t"



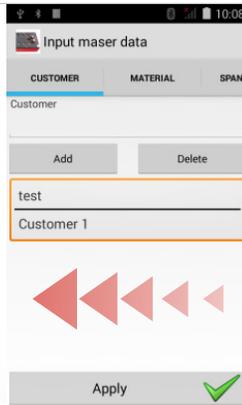
6. The spec. weight of the material will be displayed here

7.6.1 Setting the specific weight of a material

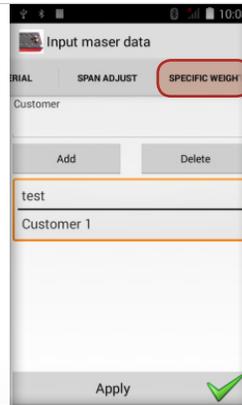
Be sure that you are logged in!



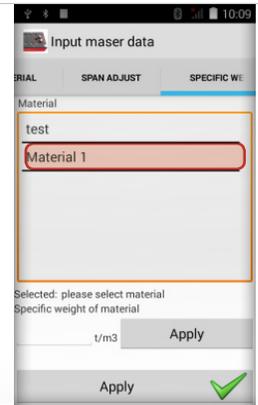
1. Touch "Input master data"



2. Scroll to the left by swiping



3. Select "SPECIFIC WEIGHT"

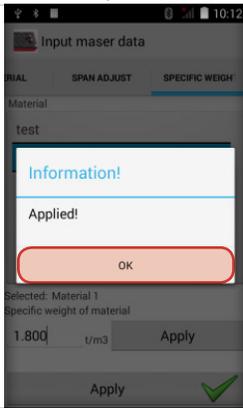


4. Select the material

7.6 Units



5. Tap to edit



9. Touch "OK"



13. Select customer



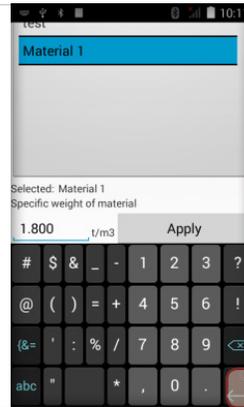
6. Type in the new value



10. Touch "Apply" to save



14. Select material



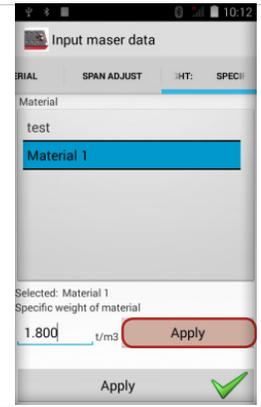
7. Touch enter



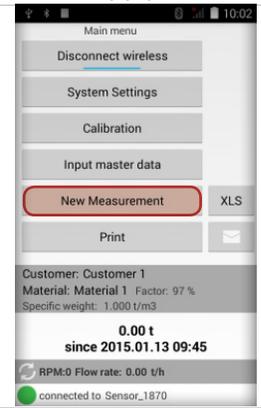
11. Data are sending



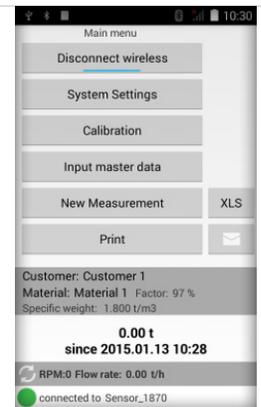
15. Touch "Start new measurement"



8. Touch "Apply" to confirm



12. Touch "New Measurement"



16. Now it's measured with the new spec. weight value

7.7 Print-Settings

Print head editor:

Max.5 lines of text can be printed out

Sensor name will be printed

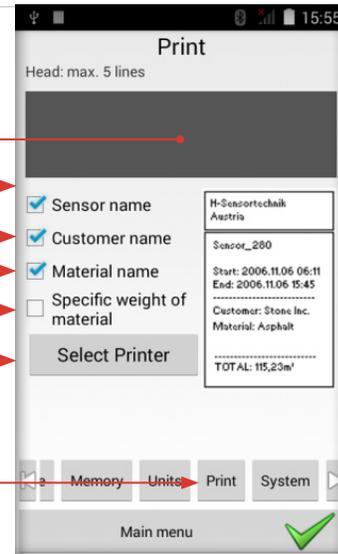
Customer name will be printed

Material name will be printed

Specific weight will be printed

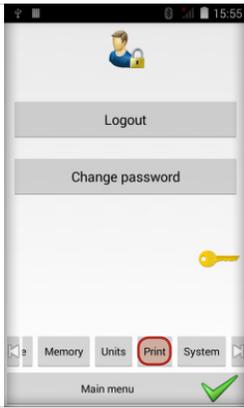
Printer selection button: To pair and select the printer

Touch "Print"



7.8 Pairing&Selecting the printer

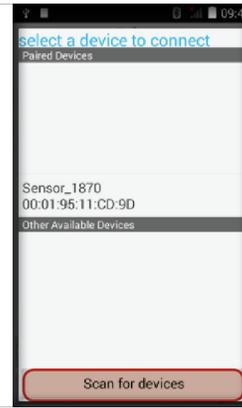
Make sure the printer is powered on



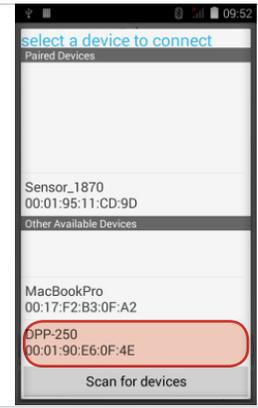
1. Touch "Print"



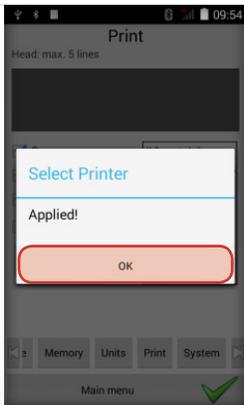
12. Touch "Select Printer"



3. Touch "Scan for devices"



4. Select DPP-250

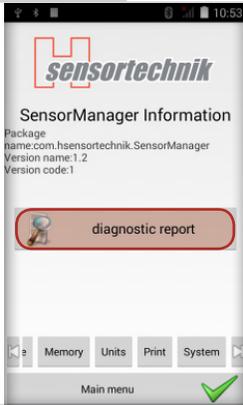


5. The printer is paired and selected

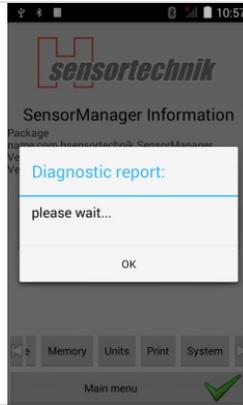
Hint: If a pairing code is requested then use following PIN-code: 0000 for Bluetooth pairing

7.9 System

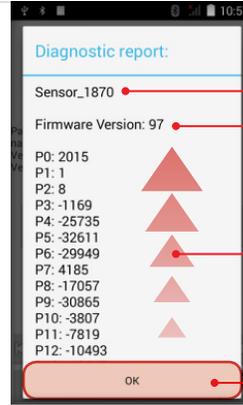
7.10 Diagnostic report



1. Touch "Print"



2. Wait...



Sensor name

Firmware version

Parameter-list. Scroll up to see all values.

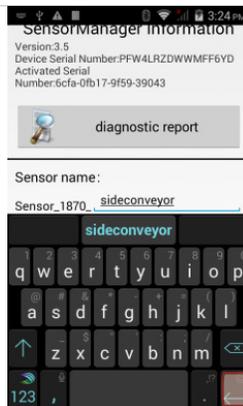
Close with "OK"

7.11 Set sensor name

Additional to the sensor name "Sensor_###" an information text can be set.



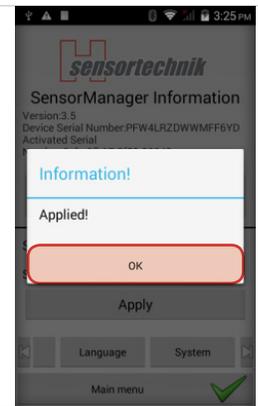
1. Tap into the edit field



2. Type in the name and click onto return



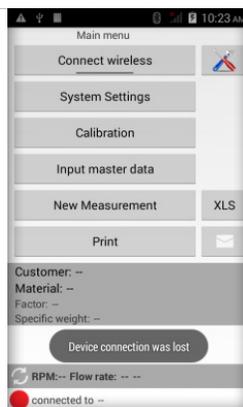
3. Click onto "Apply"



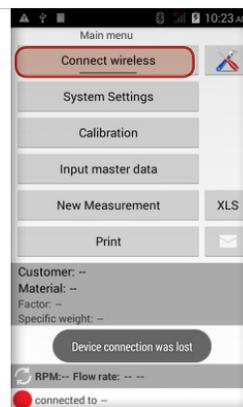
4. Confirm "OK"



5. Click onto „Main menu“



6. The connection to the sensor will be disconnected



7. Click onto „Connect wireless“



8. You can see the new sensor name



8.1 Loading paper

The DPP-250 uses a drop-and-load design making paper loading easy and trouble free. To load paper, simply lift up the paper cover latch and drop in the new roll as shown in the steps below.

1

Slide the paper cover latch to unlock the paper cover as shown in the figure.



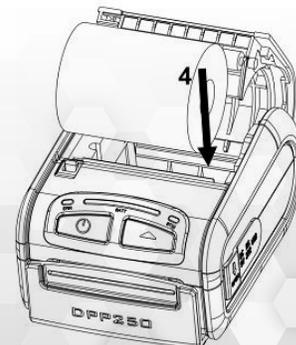
2

Lift the paper cover latch to open the paper cover as shown in the figure.



3

Insert a new roll of thermal paper as shown in the figure. Be sure to pull at least 12 mm or more of paper above the top of the printer before closing. Close the paper cover until it snaps lock. Slide paper cover latch to lock the cover in place.



9 SAFETY INSTRUCTIONS LASER CLASS

9.1 Laser Class of Device

According to IEC 60825-1 : 2007 the sensor is classified as laser equipment of class 3B. Invisible laser radiation is emitted.

Pulse output	$P_{\max} = 60 \text{ mW}$
Pulse duration	$t_{\text{pulse}} = 400 \mu\text{s}$
Wavelength	$\lambda = 785 \text{ nm}$
Pulse repetition rate	$f_{\text{rep}} = 200 \text{ Hz}$

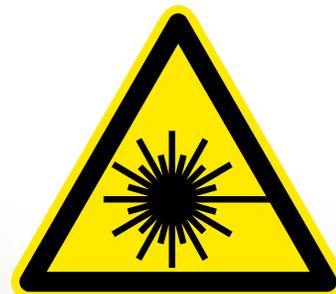
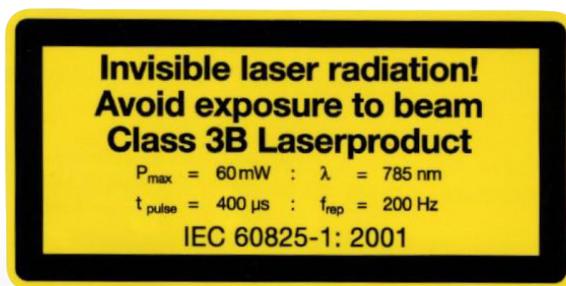
9.2 WARNING

Laser radiation of class 3B is emitted as soon as the device is working!

Therefore, the following items must be ensured before starting up the device:

<ul style="list-style-type: none">• The sensor may only be started if it is duly attached (please see sensor mounting). Otherwise all persons concerned must wear safety goggles.
<ul style="list-style-type: none">• Belt run must not be simulated.
<ul style="list-style-type: none">• The laser beam path must be limited by an impact surface and must not radiate unlimited into the open.
<ul style="list-style-type: none">• No reflecting surfaces may be mounted in the laser beam path which might lead to reflections! (For optical path see Fig. 5).
<ul style="list-style-type: none">• During operation the operating personnel and other persons must not look directly into the emitted beams!
<ul style="list-style-type: none">• The safety instructions demanded in the standard for the use of devices of laser class 3B must be complied with.

The following warning signs must be applied at the device:



10 SERVICING AND CLEANING

The sensor is basically service free, only from time to time lenses and windows have to be cleaned. They can be cleaned with a cotton cloth.

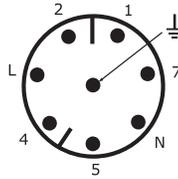


11 SPARE PARTS

Position	Part #	Description
1	150600	Optical Belt Scale S600
1	150800	Optical Belt Scale S800
1	151000	Optical Belt Scale S1000
1	151200	Optical Belt Scale S1200
1	151400	Optical Belt Scale S1400
1	150604	Optical Belt Scale -MultiLink ML600
1	150804	Optical Belt Scale -MultiLink ML800
1	151004	Optical Belt Scale -MultiLink ML1000
1	151204	Optical Belt Scale -MultiLink ML1200
1	151404	Optical Belt Scale -MultiLink ML1400
2	151205	Frame high for 600-800mm
2	150601	Frame high for 1000-1200mm
2	151401	Frame high for 1400-1600mm
2	151203	Frame low for 600-800mm
2	151201	Frame low for 1000-1200mm
2	151206	Frame low for 1400-1600mm
3	110030	Power supply cable 2,5m
3	110130	Power supply cable 2,5m-MultiLink
4	110031	Power supply cable 15m
4	110132	Power supply cable 15m-MultiLink
5	110029	Inductive switch cable 2,5m
6	130007	Inductive switch cable 0,5m
7	130017	Inductive switch
8	130015	Holder for inductive switch
9	130022	Indicator for inductive switch
10	110077	Cup square neck bolt DIN603 8.8-M10x25 galvanized
11	110080	Spring washer DIN137B M10 waved, galvanized
12	110078	Hexagon nut DIN982 Kl.8 M10 galvanized
13	110076	Hexagon head screw DIN933 8.8-M10x35 galvanized
14	110079	Spring washer DIN137A M8 galvanized
15	110075	Hexagon socket head cap screw DIN912 -M8x20 galvanized
16	110143	Large diameter washer 8,4x30x1,5 A2, stainless
17	140000	Mobile Handheld
18	140007	Car-USB-Charger for Handheld 12V und 24V
19	140001	Bluetooth thermo printer
20	120008	Paper roll for printer
21	130019	DC/DC converter 12V -> 24V
22	130020	AC/DC converter 230V -> 24V
23	110081	User manual

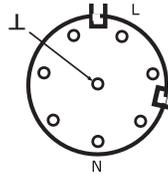
12 CONNECTOR & CABLE CONFIGURATIONS

12.1 Power supply connector on Sensor



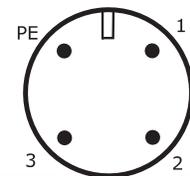
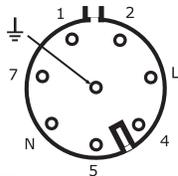
Pin #	Signal	Signal direction	Signal Info
1	Power supply 0 VDC (GND)	GND	GND internal connected to housing via reverse battery protection diode
2	Power supply +24 VDC	Input	+24VDC +- 20%, I _{max} = 3,5A
L	Not connected	n.c.	n.c.
4	RS-422 / Bluetooth mode selector	Input	“high” +24 VDC = RS-422 mode “low” 0V = Bluetooth mode
5	RS-422 sensor out -	differential output	Use only in RS-422 mode
N	RS-422 sensor out +	differential output	Use only in RS-422 mode
7	RS-422 sensor in +	differential output	Use only in RS-422 mode
⏏	RS-422 sensor in -	differential output	Use only in RS-422 mode

12.2 Inductive switch connector on Sensor



Pin #	Signal	Signal direction	Signal Info
L	+12 VDC	out	Power supply inductive switch
N	Signal	in	Signal receive from inductive switch
⏏	0 VDC	out	Power supply inductive switch

12.2 Inductive switch connector on Sensor

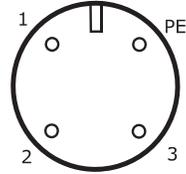


Pin #	Signal	Signal direction	Pin #
1	0 VDC (GND)	blue	2
2	+24 VDC	brown	1
L	Not connected		PE
4	Not connected		
5	Not connected		
N	Not connected		

12.2 Inductive switch connector on Sensor

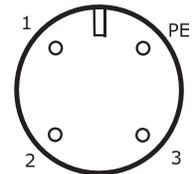
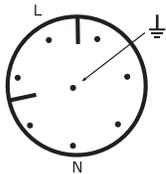
Pin #	Signal	Signal direction	Pin #
7	Not connected		
⏚	Not connected		

12.4 Power supply cable 15m



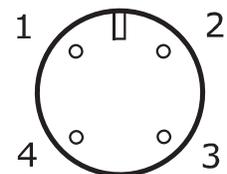
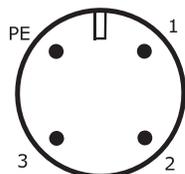
Pin #	Signal	Lead color
1	+24 VDC	Brown
2	0 VDC (GND)	Blue
PE	Not connected	

12.5 Inductive switch cable 2.5m



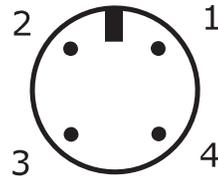
Pin #	Signal	Signal direction	Pin #
⏚	+12 VDC	Brown	1
	0 VDC	White	2
N	Signal	Yellow	3
	Not connected		PE

12.6 Inductive switch cable 0.5m



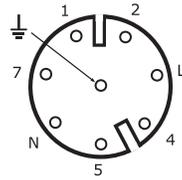
Pin #	Signal	Signal direction	Pin #
1	+12 VDC	Brown	1
2	0 VDC	Blue	3
3	Signal	Black	4
PE	Not connected		2

12.7 Inductive switch



Pin #	Signal
1	+12 VDC
2	Not connected
3	0 VDC
4	Signal

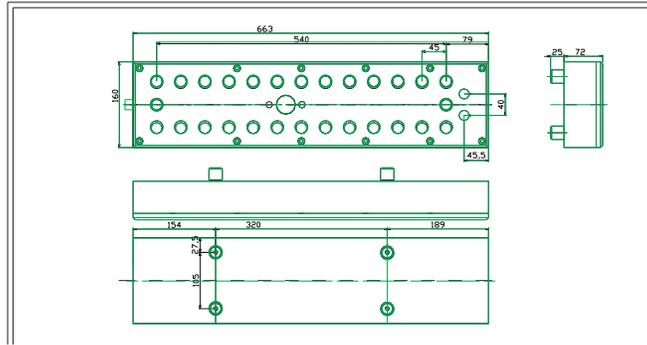
12.8 Data cable 3m

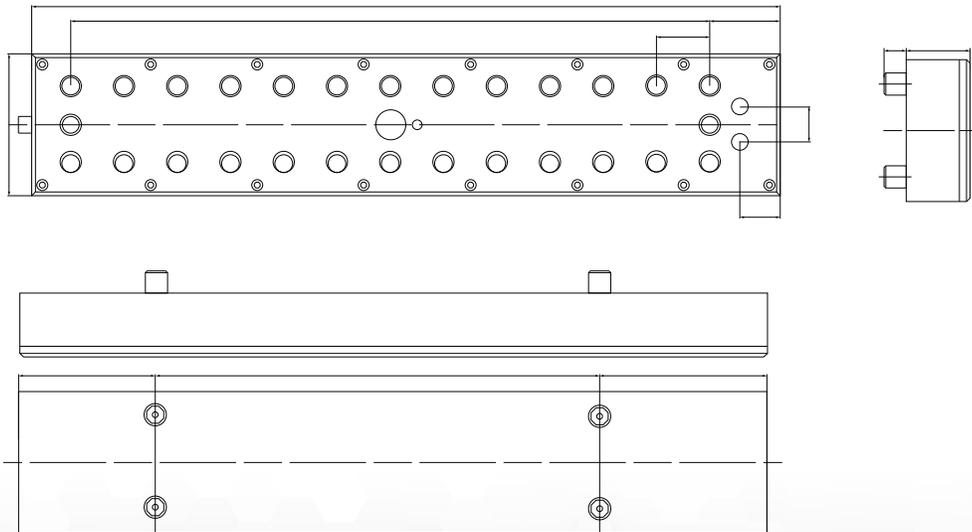


Pin #	Signal	Signal direction	Signal Info	Lead color
1	Power supply 0 VDC (GND)	GND	GND internal connected to housing via reverse battery protection diode	Green & white
2	Power supply +24 VDC	Input	+24VDC +- 20%, I _{max} = 3,5A	Red
L	Not connected	n.c	n.c	n.c
4	RS-422 / Bluetooth mode selector	Differential output	“high” +24 VDC = RS-422 mode “low” 0V = Bluetooth mode	Blue
5	RS-422 sensor out -	Differential output	Use only in RS-422 mode	Gray
N	RS-422 sensor out +	Differential output	Use only in RS-422 mode	Pink
7	RS-422 sensor in +	Differential output	Use only in RS-422 mode	Green
⏏	RS-422 sensor in -	Differential output	Use only in RS-422 mode	Yellow

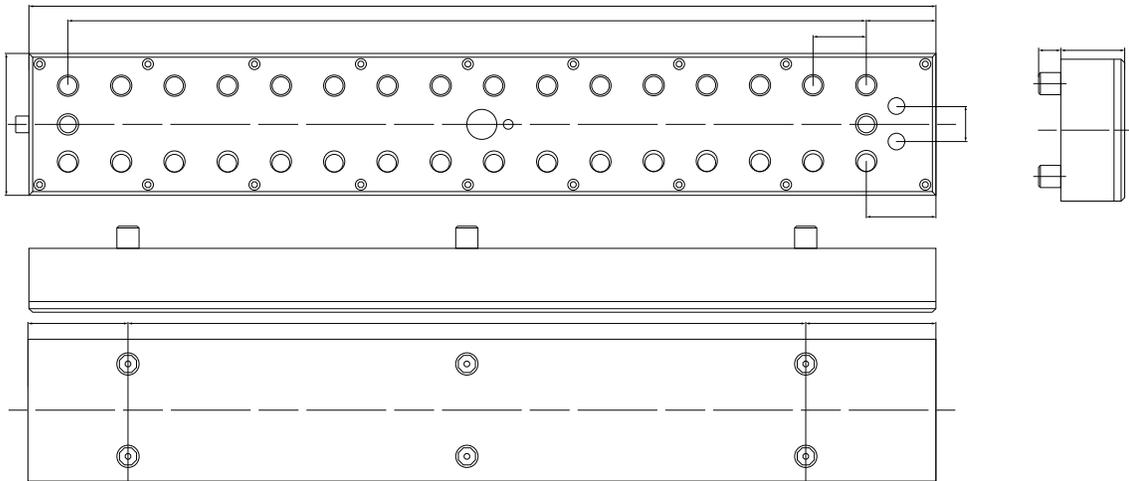


13 Drawings

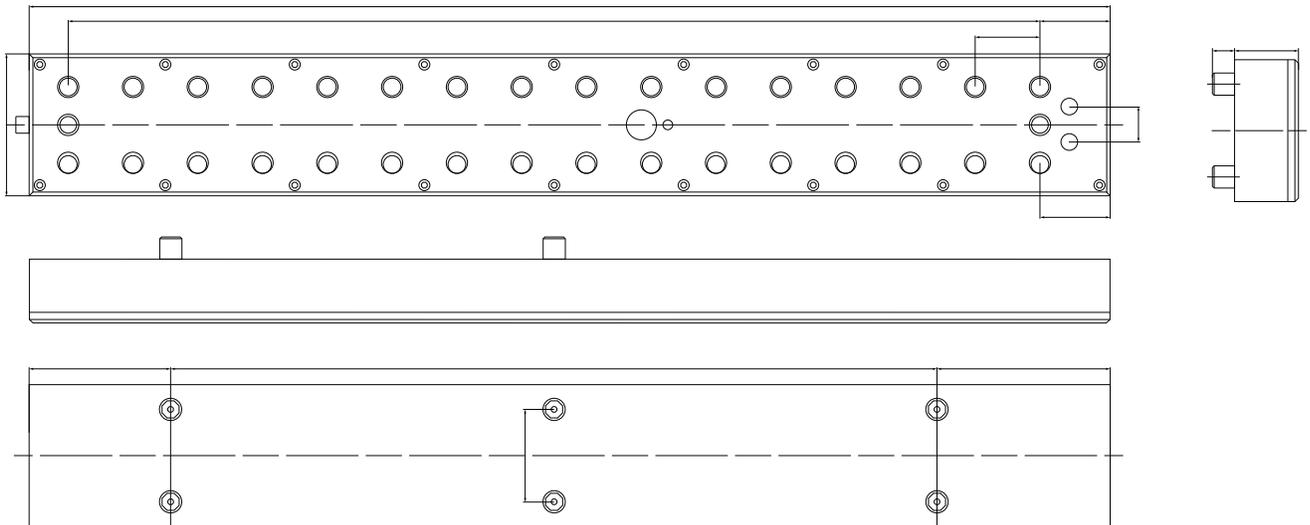


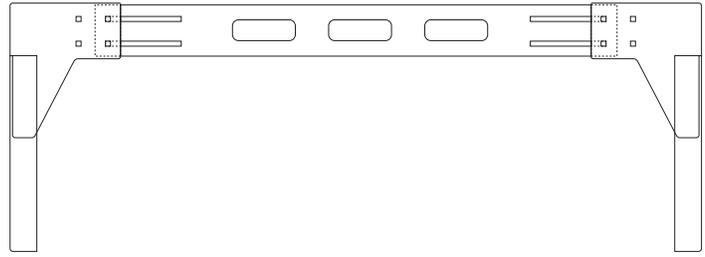
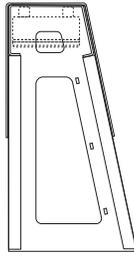


S1000



S1200





BLUETOOTH ANTENNA INSTALLATION

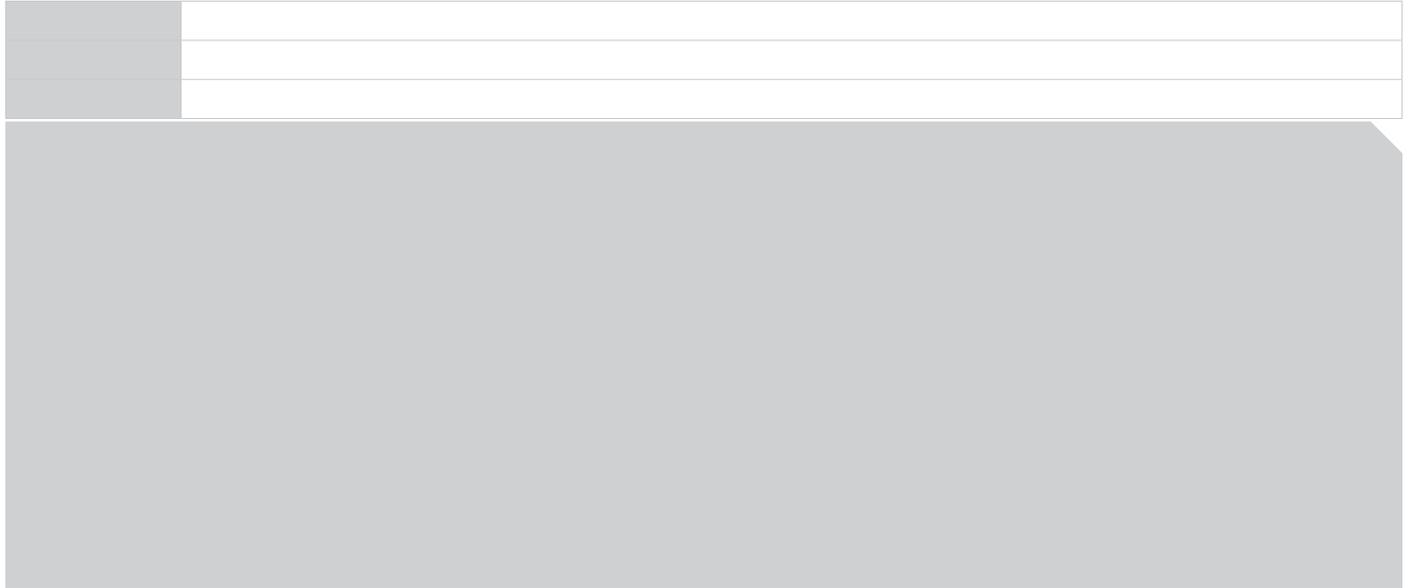
- 1 Remove the small Bluetooth antenna
- 2 Connect the new antenna with the extension cable to the sensor



USING RS-422 CONNECTION

To prevent the system against damage, caused by voltage differences between power and data lines, we propose to keep the sensor cable shorter than 5m.

Dangerous voltage differences occur when the lens heaters of the sensor are automatically switched on at temperatures lower than 10°C



Data rate:	19,2 Kbps
Power requirement Sensor:	24V, <200mA when lens heaters " off " <3,5A when lens heaters " on " (<10° C)
Power requirement Adam converter:	+10 to 30 V unregulated 1W max.

** Please pay attention to the correct connection of the data converter. -The converter has to be powered on the short cable side (max 5m)*

PROTOCOL DESCRIPTION

For Sensor Firmware >= v100

Serial Interface Settings

Baud :	115200
Databits:	8
Parity :	None
StopBit:	1

Command from Computer device to Sensor (awaiting answer)

start token	"\$" followed by command
end token	!" (not necessary by commands without arguments)
parameter seperator	"," (only used for commands with more than 1 parameter)
example	"\$R" - Command "R" without arguments "\$C255!" - Command "C" with argument "255" "\$C255;255!" - Command "C" with 2 arguments

Answer from Sensor to Handheld

start token	"#"
end token	"\n" (LineFeed LF decimal value 10)
example	"#Ok\n"

Real Time Clock Communication Description

Getting RTC value from Sensor

Command: "\$RTC"

Answer: "#Year_Flash;Month_Flash;Day_Flash;Day_RTC;Hour_RTC;Minute_RTC\n" Description: All values are from data type "unsigned short". The *_Flash date represents the reference date when the RTC day/hour/minute counter was set to 0. The *_RTC values represent the RTC counter till *_Flash date.

Example: "#2007;10;24;6;12;48\n" (represents 30.Okt.2007 12:48)

Setting RTC value on Sensor

Command: "\$SYear;Month;Day;Hour;Minute!" in format "\$SYYYY;MM;DD;hh:mm!"

Answer: "#RTCF\n" (if new reference date was flashed, see System Parameter 0-2)

"#RTCS\n" (if reference date is still up to date)

HISTORY DATA

History Data is stored in flash memory in 64 Byte Blocks.

To transfer the history data from sensor to handheld, the XModem protocol (with Checksum Error detection) is used. To maximize performance the data is sent in binary format. Two characters of the XModem stream represent a short (2 Byte) value.

The transfer is initiated via the Command "X" followed by 1 parameter. This parameter defines how many data packets (each 64Byte long) are transmitted.

Example :

"\$X125!" - sends the latest 125 data blocks via XModem (one file with 125 * 64 byte length)

1	y_f	Year	reference date	short (2Byte)
2	m_f	Month	reference date	short (2Byte)
3	d_f	Day	reference date	short (2Byte)
4	d	Days	time since reference date	short (2Byte)
5	h	Hours	time since reference date	short (2Byte)
6	m	Minutes	time since reference date	short (2Byte)
7	Data1	Volume	volume of material in m ³	short (2Byte)
8	Data2	Information	Data block information	short (2Byte)
9	Data3	Factor	Current correction factor	short (2Byte)
10	Data4	Length	Belt length / rotation impulse	short (2Byte)
11	Data5	Specific weight	Specific weight [kg/m ³]	short (2Byte)
12	Data6	--	--	short (2Byte)
13	text	Material, Customer	16 chars material name + 24 chars customer name	char(40Byte)
			SUM	64 Byte

History Start

Command: "\$HS"

Answer: "#HC\n"

Description: Returns start address of history region in hexadezimal format (e.g. 100000)

History End

Command: "\$HE"

Answer: "#HC\n"

Description: Returns end address of history region in hexadezimal format (e.g. 1AFFFF)

History Index

Command: "\$HI"

Answer: "#HI\n"

Description: Returns the address the next data block is written to. (address of write cursor) (e.g. 1001A0)

Clear History Data	
Command:	"\$HC"
Answer:	"#HC\n"
Description:	Clears internal history data

COMMAND DESCRIPTION

Start new measurement	
Command:	"\$NM00000!"
Answer:	"#NM\n"
Description:	Starts a new measurement (volume is set to 0) without changing Customer/Material

Start new measurement with new Customer/Material Name	
Command:	"\$NM00100; ABCAAA;01450!"
Answer:	"#NM\n"
Description:	Starts a new measurement (volume is set to 0) and changes Customer/Material

Example:	"\$NM00100; ABCAAA;01450!"
Material name:	ASPHALT***** (16 chars)
Customer name:	H-SENORTECHNIK***** (24 chars)
Correction factor:	00102 = 102/100=1.02
Specific weight:	01450

Start Adjustment	
Command:	"\$ADJ"
Answer:	"#ADJ\n"
Description:	Starts an adjustment

Get measured Volume	
Command:	"\$VOL"
Answer:	"# VVVV.VV/YYYY/MM/DD/dd/hh/mm \n"
Description:	Returns the measured Volume of this measurement
	<p>V = volume in m3 with two decimal places, separated by a dot '.' Timestamp : Y = Year M = Month D = Day Time since Timestamp : d = day h = hour m = minute Time of measurement start : Timestamp + Time since Timestamp</p>

If volume of one measurement exceeds 9999.00 it starts at 0 again

So take care, if this value is polled sequential, for example to calculate m3/hour! Be sure that: Volume t2 >= Volume t1

Example answer of sensor:	#0012.65/2006/9/20/8/10/7\n
----------------------------------	-----------------------------

Set System Parameter (Parameter Write)	
Command:	"\$PWpppp;vvvv!"
Answer:	"#p;v\n"
Description:	Sets Parameter p to Value v (both x and v have to be 4 digits long !)
Example:	\$PW0019;01200!

Get System Parameter (Parameter Read)	
Command:	"\$PRpppp!"
Answer:	"#v\n"
Description:	Returns the value of specified parameter
Example:	\$PR0016!

SYSTEM PARAMETERS

Hint: The only parameter which has to be set directly is parameter 19. It is important to set this parameter to the correct value before a calibration run or measurement is started. Otherwise it is not possible to calculate the correct volume,

So be sure to set the parameter 19 to the correct perimeter of the conveyor drum.

e.g.	diameter of conveyor drum = 400mm -> perimeter = 400mm * π = 1257mm send command "\$PW0019;01257!"
-------------	--

All system parameters are stored in a non-volatile flash memory.

(Flash Config Section)			
0	CFG_RTCY	realtime clock year	(set by Command \$\$)
1	CFG_RTCM	realtime clock month	(set by Command \$\$)
2	CFG_RTCD	realtime clock day	(set by Command \$\$)
3-18	CFG_OFFSETZ	offset of zero line table 3-18	(DO NOT CHANGE!)
19	CFG_BLTL	belt length per rotation in mm	perimeter of roll (d * π)
20	CFG_BLTL	empty volume	(DO NOT CHANGE!)
21	CFG_SUNLMT	sunlight level	25 (DO NOT CHANGE!)
22	CFG_FACTOR	factor	1000 (DO NOT CHANGE!)
23	CFG_FACKEY	unique factor key	(NOT USED)
24	CFG_INT	interrupt controller	10 (DO NOT CHANGE!)
25	CFG_BTNAME	bluetooth friendly name	(DO NOT CHANGE!)
26	CFG_GAP	gap between measuring beams	60 / 73 (DO NOT CHANGE!)
27	CFG_FL	first laser in use	0 (DO NOT CHANGE!)
28	CFG_LL	last laser in use	15 (DO NOT CHANGE!)
50	CFG_ICNT	Interrupt counter	Read only

(Flash Config Section)			
51	CFG_PWRD	Power down counter	Read only
53	CFG_BLC	Blind laser count	Read only
54	CFG_M3H	Actual m3/h	Read only
57	CFG_RPM	Rotations per minute	Read only
60	CFG_VER	Firmware version	Read only

SAMPLE APPLICATIONS FOR RS422

LCD Display with m³ (with minimal requirements)

Parameter 19 has to be set to the corresponding conveyor drum diameter. (see Section "System parameters"). If the sensor is always mounted on the same conveyor/drum this parameter has to be set only once. No user input is necessary.

User input

Button 1	Sends command "\$ADJ" to start a calibration run. User has to monitor the sensor which indicates a calibration run by a flashing red light.
Button 2	Sends command "\$NM00000;XX!" to reset volume to zero.
Computer device	
	Sends command "\$VOL" every 3 seconds and displays the VVV.VV digits on the LCD display.

Every power ON a new measurement is started automatically and the volume starts at zero. So the user only has to power ON the conveyor/sensor and the volume is displayed on the LCD.

If user wants to reset volume to zero, he has to push button 1.

Display of m³/hour

Same as sample above, with the following changes:

	Poll the volume v1
	Poll the volume 30seconds later v2
	If (v2 > v1) calculate the increase and multiply by 120 (30sec * 2 = 1min * 60 = 1 hour)
	Display calculated m ³ /h

The check if(v2 > v1) is necessary to avoid the display of a wrong value when volume hits 9999.99 and starts at zero again.

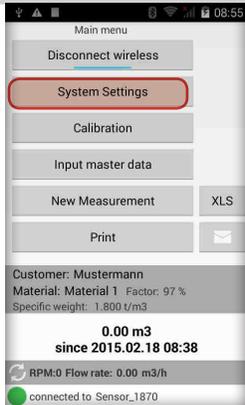
The 30 seconds interval was determined as a compromise between accuracy and stability.

The power supply on the mainboard is OK when 4 red LED's are on.

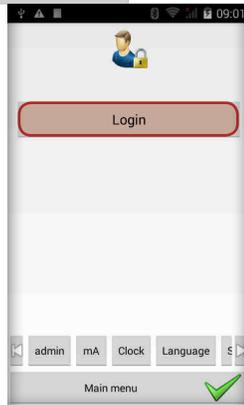


MINIMUM VOLUME PER ROTATION

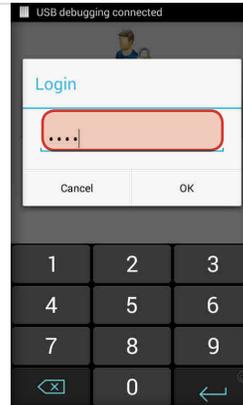
Minimum volume per rotation



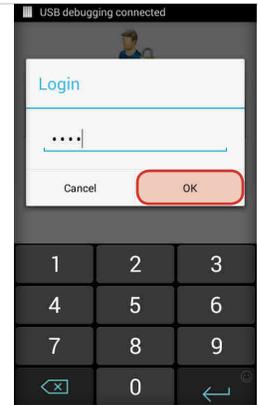
1. Touch "System settings"



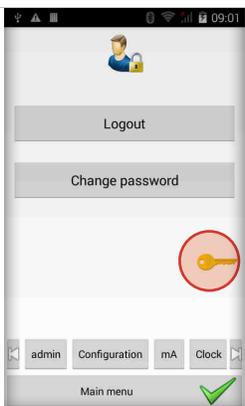
2. Touch "Login"



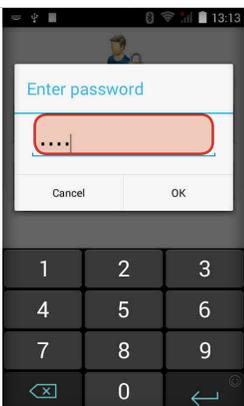
3. Type in the default password: 0000



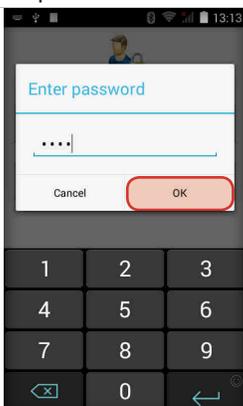
4. Confirm with OK



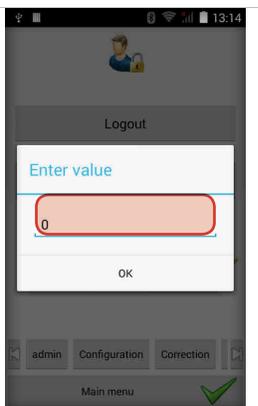
5. Long click onto the yellow key icon



6. Type in the password: 4968



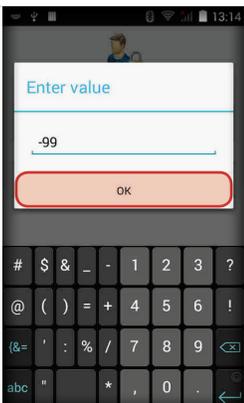
7. Confirm with OK



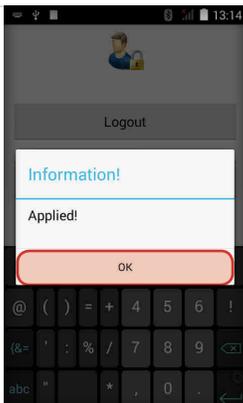
8. The preset value will be displayed. Default value: 0



9. Type in the value



10. Confirm with OK



11. Confirm with OK

The minimum Volume / Rotation is controlling the sensitivity of the optical belt scale.

After a change of this value a calibration run must be done.

Description of the values:

0 ->	Standard value is used. The standard value is calculated automatically
+100 ->	Double standard value
- 99 ->	Maximum sensitivity

LASER BEAM & POWER SUPPLY WARNING

If this symbol appears on the display an error code is received from the sensor. To read the error codes, you must click the error warning button.

The error warning button shows two types of errors:

1	Laser beam warning
2	Power supply warning

1	Laser beam warning
----------	--------------------

Laser beam warning window appears with the code as example: 0101000000000001

The laser beam warning code has 16 characters consisting of a combination "0" and "1". Every character position represents one laser beam.

Meaning of error codes:

"0"	= Good signal strength level
"1"	= Bad signal strength level

Example 1:	1000000000000001
	Laser beam number 1 and laser beam number 16 has bad signal strength level.

Example 2:	0101000000000000
	Laser beam number 2 and laser beam number 4 has bad signal strength level.

To reset the laser beam warning you have to clean the windows and the lenses of the sensor. Switch it off and on. Check if the error appears again. If yes, then check if the lenses and windows are not fog up on the inside. If yes, then call H-Sensortechnik GmbH-Service.

2	Laser beam warning
----------	--------------------

Power supply warning window appears with the code as example: 2

The code 2 means that the voltage was two times below 15V. If this happens 5 times the code will be 5.

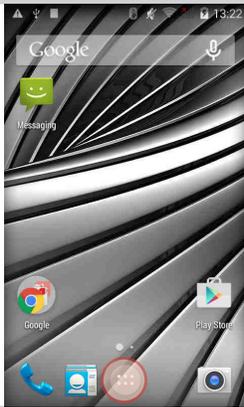
This can happen also during engine starting, where the starter takes a lot of power and the voltage drops below 15V.

To reset the power supply warning you have to switch it off and on. If it appears again you should check the power supply and the power supply cables.



SENSORMANAGER APPLICATION INSTALLATION VIA GOOGLE PLAY STORE ON CATB15Q

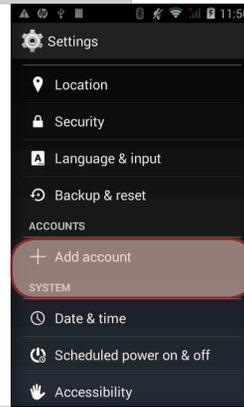
Ensure that your mobile phone has internet connection



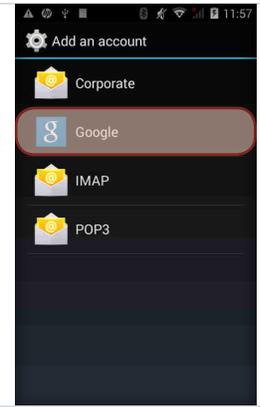
1. Touch here to see all apps



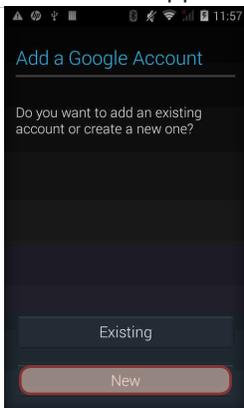
2. Touch "Settings" icon



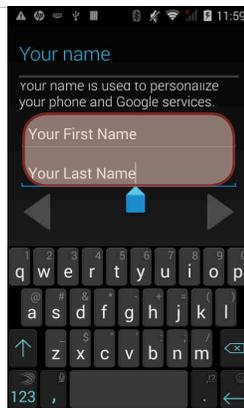
3. "+ Add account"



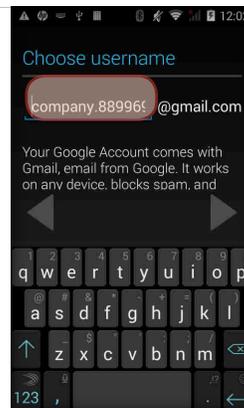
4 Touch "Google" icon



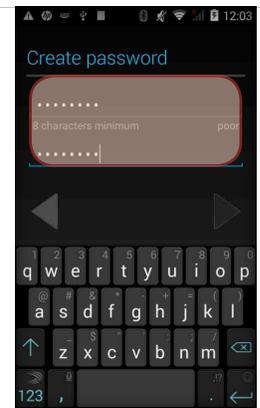
5. Touch "New"



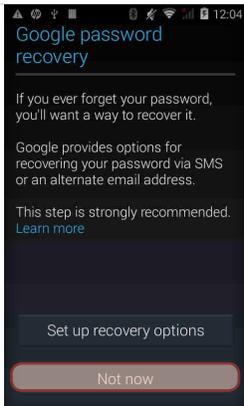
6. Type in your name and click next



7. Choose and type in username and click next



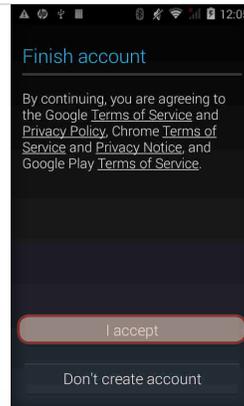
8. Create password and click next



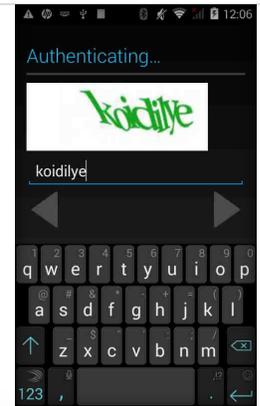
9 Select "Not now"



10. Click next

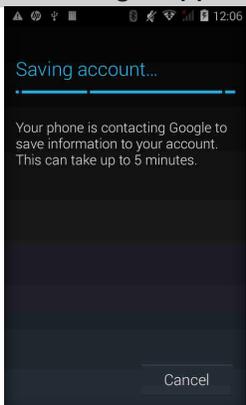


11. Select "I accept"

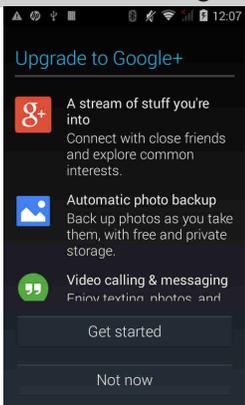


12. Authenticate with retying the Captcha and click next

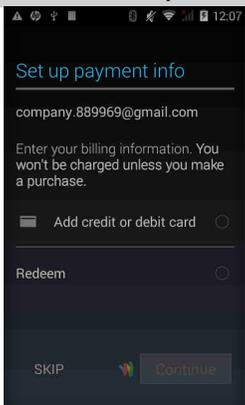
Sensormanager Application Installation Via Google Play Store On Catb15q



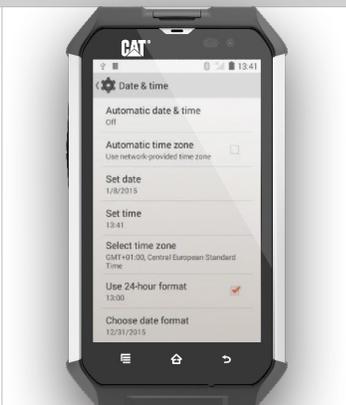
13. Saving...



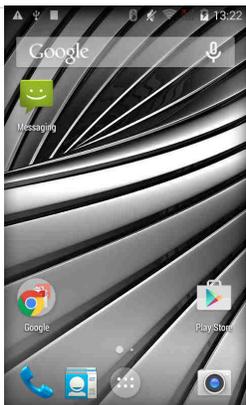
14. Select "Not now"



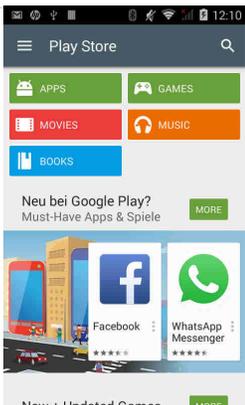
15. Select "SKIP"



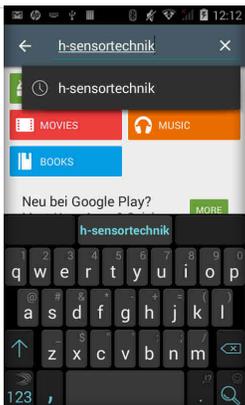
16. Click home button



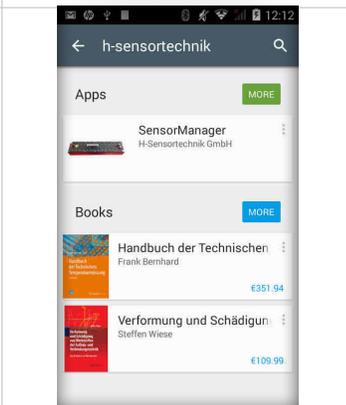
17. Start "Play Store"



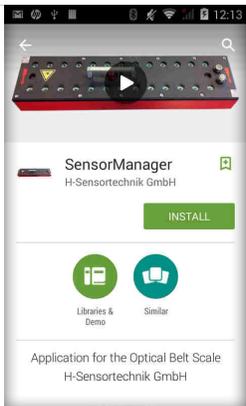
18. Click search button



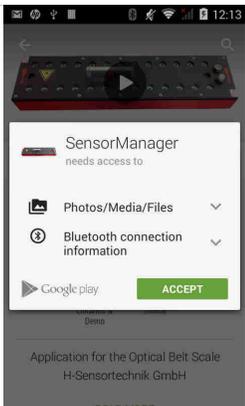
19. Search for h-sensortechnik



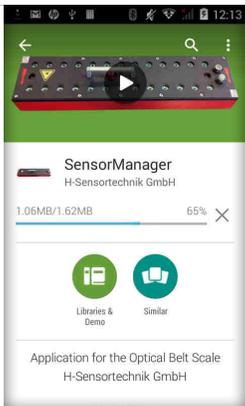
20. Select "SensorManager"



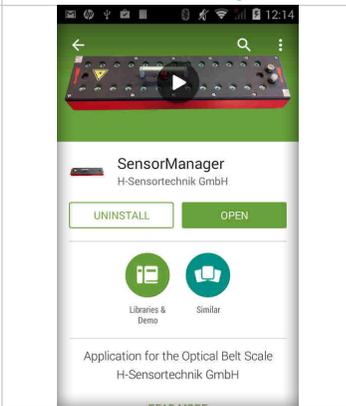
21. Click "INSTALL"



22. Click "ACCEPT"

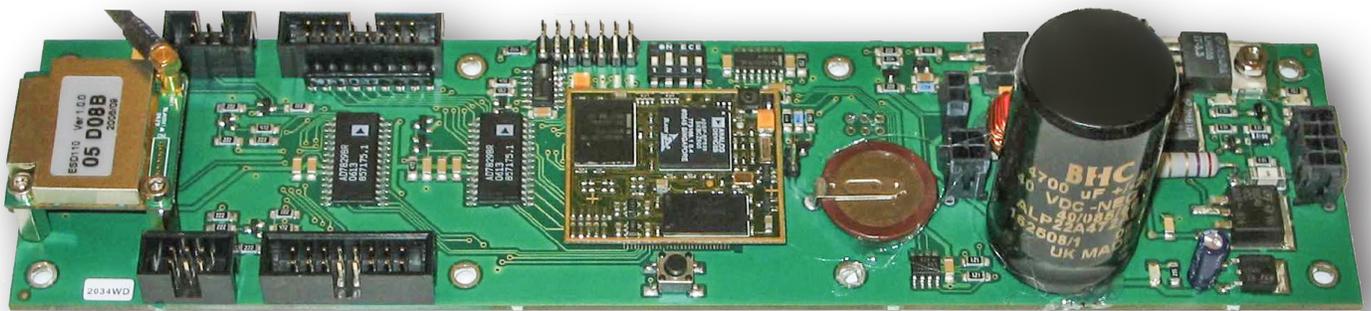


23. Downloading...



24. Installation complete

HOW TO REPLACE THE BLUETOOTH MODULE

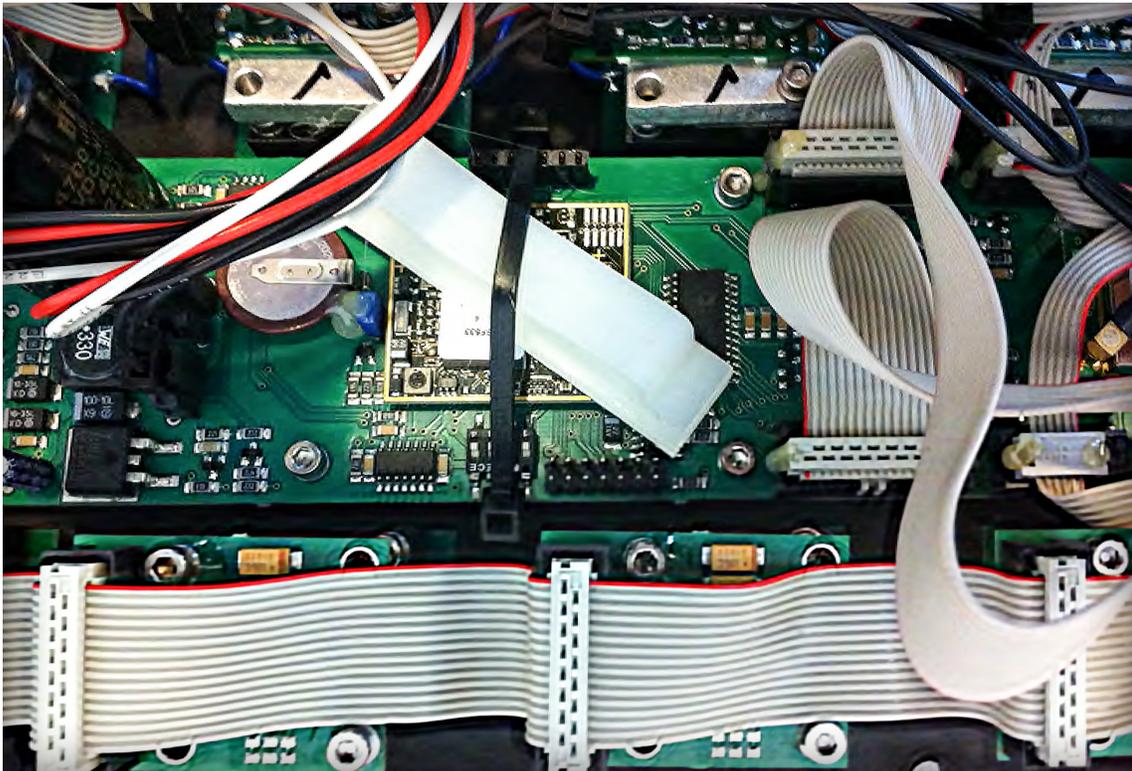


HOW TO PLUG OUT AND PLUG IN THE CPU

1 Open the cover



2 Unplug the CPU

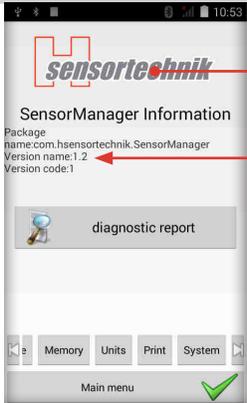
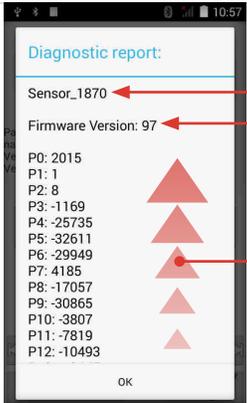


FIRMWARE UPDATE

Caution: Do not switch OFF the sensor while firmware update is in progress! Doing so may damage the sensor.

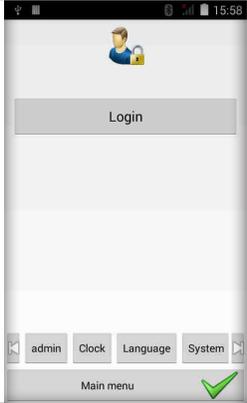
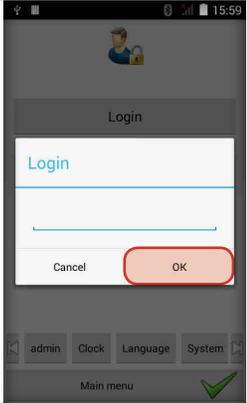
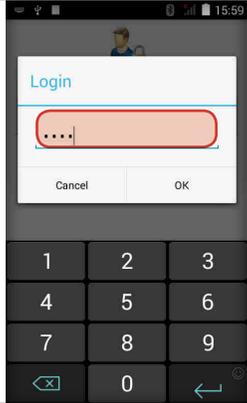
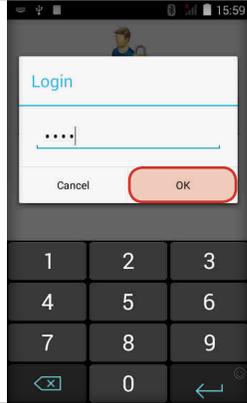
When a firmware update is done from a firmware version older than version number 97, it is required to clear the sensor memory to ensure flawless operation.

To check your actual firmware version number, go to system setting and click the diagnostic report button on the system tab page. After a few seconds a diagnostic report is shown. In the second line you will find your firmware version number. Diagnostic report

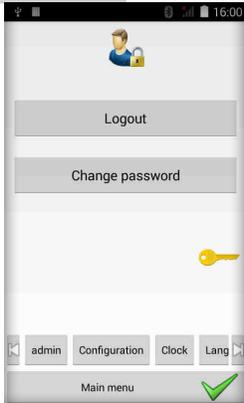
Firmware Update	
	
1. Touch "diagnostic report"	2. Wait...
	3. Close with "OK"

Be sure to download/print your measurement data from the sensor before you continue with the next steps.

The corresponding firmware version is delivered with every version of the SensorManager. To start the firmware update, connect to the sensor, go to system settings and login as administrator. Default (factory set) password is "0000".

Login			
			
1. Touch "Login"	2. Tap into the input field	3. Type in the default password: 0000	4. Confirm with "OK"

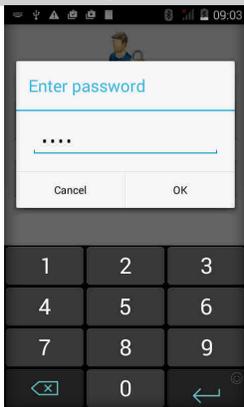
Login



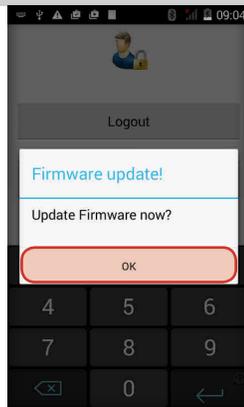
5. You are logged in

When you are successfully logged in, you will find a key icon on the on the bottom right corner. Long clicking on this icon will open a password input dialog. Use password "1045" to start the firmware update. A progress bar will appear and the firmware is copied to the sensor. The red lamp on the sensor will light up permanently and continue it's normal blinking when firmware update is done.

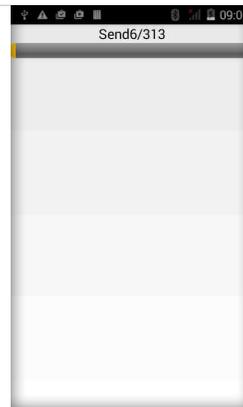
Firmware Update



1. Type in the password:
1045



2. Confirm with "OK"



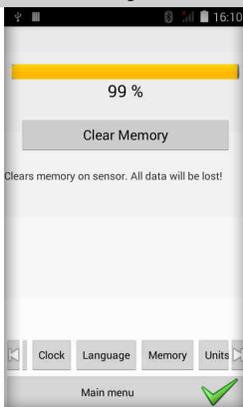
3. Firmware is sending to
the sensor

When firmware update is finished, power-cycle the sensor. (Power OFF and ON again)

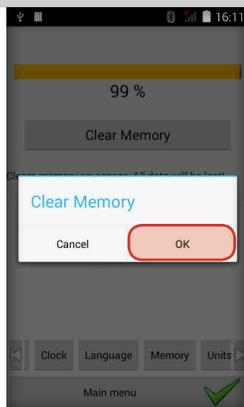
When the sensor is running in its normal mode (standby or measuring) connect to it, login as administrator and clear the sensor memory.

(you can skip this step, if you already use a firmware version newer than version number 96)

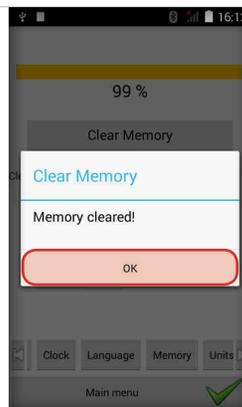
Clear Memory



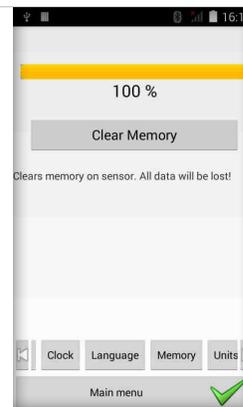
1. Touch "Clear Memory"



2. Select "OK"



3. Select "OK"



4. Touch "Memory"

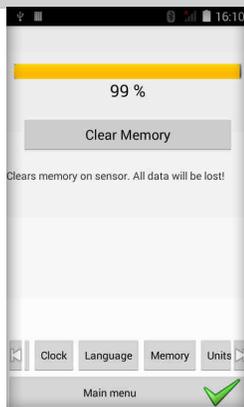
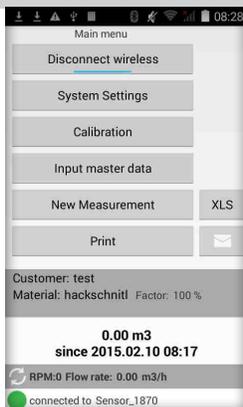
When the memory is cleared a backup file is stored from the data which were downloaded on to the mobile phone.

Hint: Be sure that you have downloaded all measurements before clearing memory!

Now you can start a new measurement and continue your work.

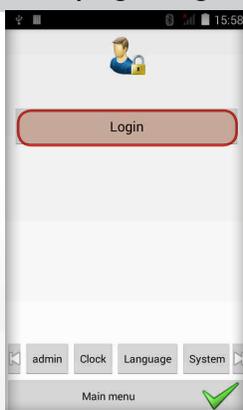
4-20 MA ANALOG OUTPUT & DIGITAL PULSE OUTPUT CONFIGURATION

1. Connect to the sensor

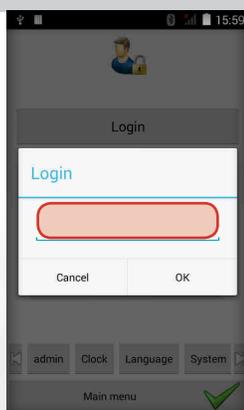


Connect to the sensor, go to system settings and login as administrator. Default (factory set) password is "0000".

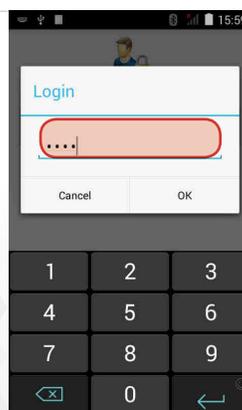
2. Admin(Login/Logout)



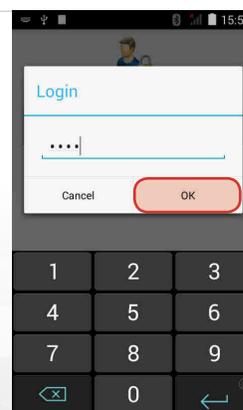
1. Touch "Login"



2. Tap into the input field

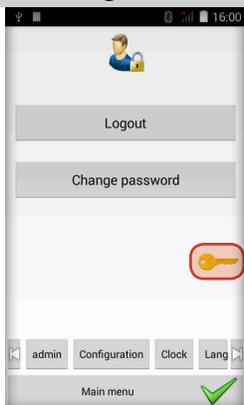


3 type in the default password: 0000

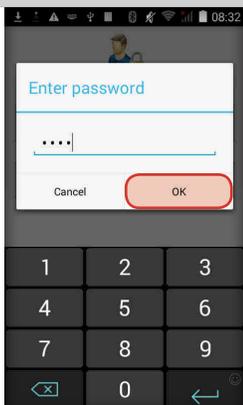


4. Confirm with "OK"

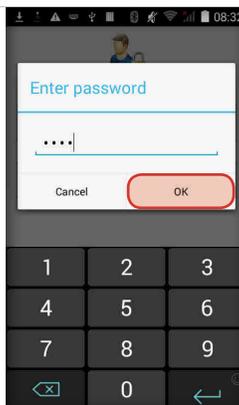
3. Activating the "mA"-Tab page



1. Long click on the key icon



2. Input 3125



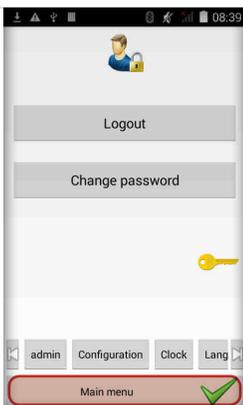
3. Confirm with "OK"



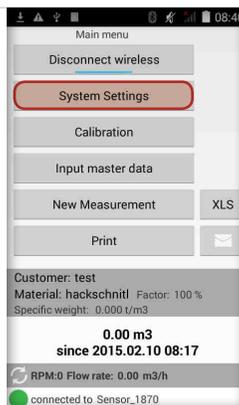
4. Input "1"



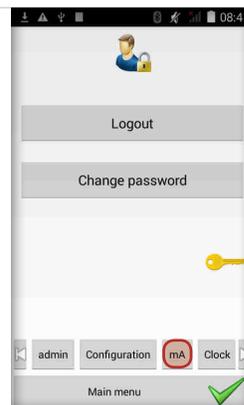
5. Confirm with "OK"



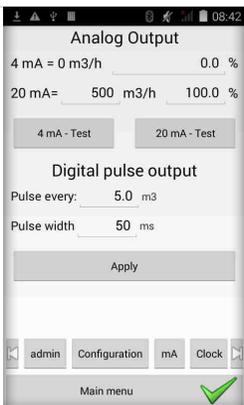
6. Touch "Main menu"



7. Touch "System Settings"



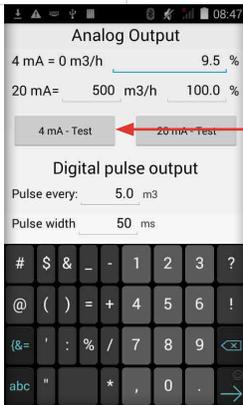
8. Touch "mA" button



4-20mA PORT CONFIGURATION

mA Configuration

- 1 Connect a mA-Meter to the output pins of the 4-20mAport.
- 2 Type in the % value for the 4mA = 0m³/h



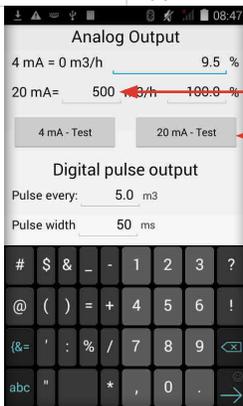
As an example 9.5 %

"4 mA - Test" button Send test value 3 seconds to port

- 3 Click once the "4mA-Test" button and check the current on the port with the mA-Meter. Repeat this step until you measure 4 mA.

20 mA Configuration

- 1 Connect a mA-Meter to the output pins of the 4-20mAport.
- 2 Type in the m³/h value to set the maximum m³/h value for the 20 mA

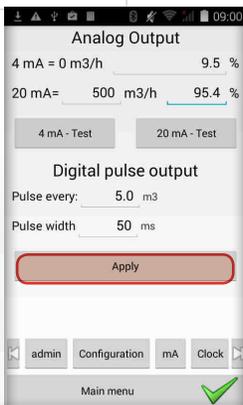


As example 95.4%

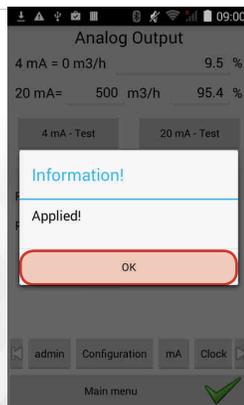
As example 500 m³/h

"20 mA - Test" button Send test value 3 seconds to port

- 3 Type in the % value for the 20 mA and click once the "20mA-Test" button and check the current on the port with the mA-Meter. Repeat this step until you measure 20 mA.
- 4 Press "Apply" button to save the settings



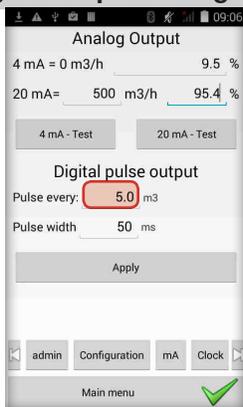
Press "Apply"



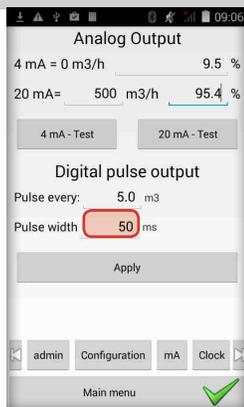
Confirm with "OK"

When all the steps above have been finished successfully the sensor must be switched OFF and ON to start with the new settings.

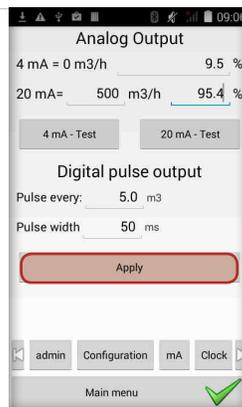
Digital Output Configuration



1. Type in the one pulse per m³ value



2. Type in the pulse width in ms



3. Click "Apply" button to save the settings

When all the steps above have been finished successfully the sensor must be switched OFF and ON to start with the new settings.

MultiLink Cable Configuration

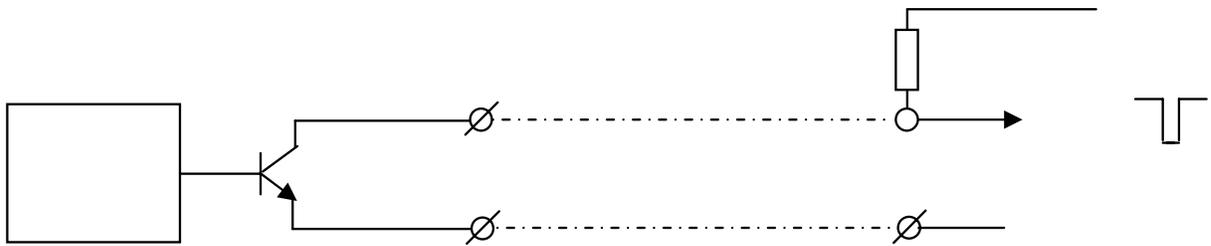
4-20mA Interface cable for Sensor

Cable Type: UNITRONIC-Cable LIYCY

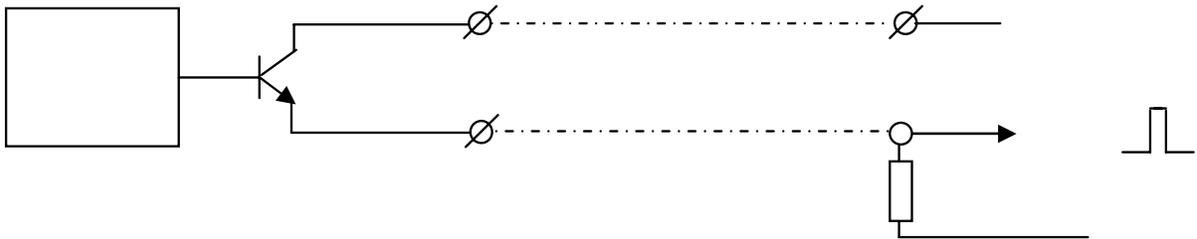
Sensor Connector	Signal	Signal direction	Signal info	Lead color coding
PIN				
12	NC	NC	NC	Pink
11	4-20 mA	Output	Active +, opto-coupled	red/blue
10	4-20 mA	Output	Active +, opto-coupled	gray
9	Pulse/Volume	Transistor output	Open collector (E), opto-coupled	pink/gray
8	Pulse/Volume	Transistor output	Open collector (E), opto-coupled	white
7	RS422 Data sensor output +	Differential output	Use only in RS422 - mode	brown
6	RS422 Data sensor output -	Differential output	Use only in RS422 - mode	green
5	RS422 Data sensor input +	Differential output	Use only in RS422 - mode	yellow
4	RS422 Data sensor input -	Differential output	Use only in RS422 - mode	violet
3	RS422/Bluetooth mode selector	Input	+24V = RS422 - mode 0V = Bluetooth - mode	blue
2	Power +24V/ DC	Input	+24VDC +- 20%, I _{max} =3,5 A	red
1	Power 0V(GND)	GND	Housing via reverse battery protection diode	black

7 Signal "Pulse/Volume"

Var. 1

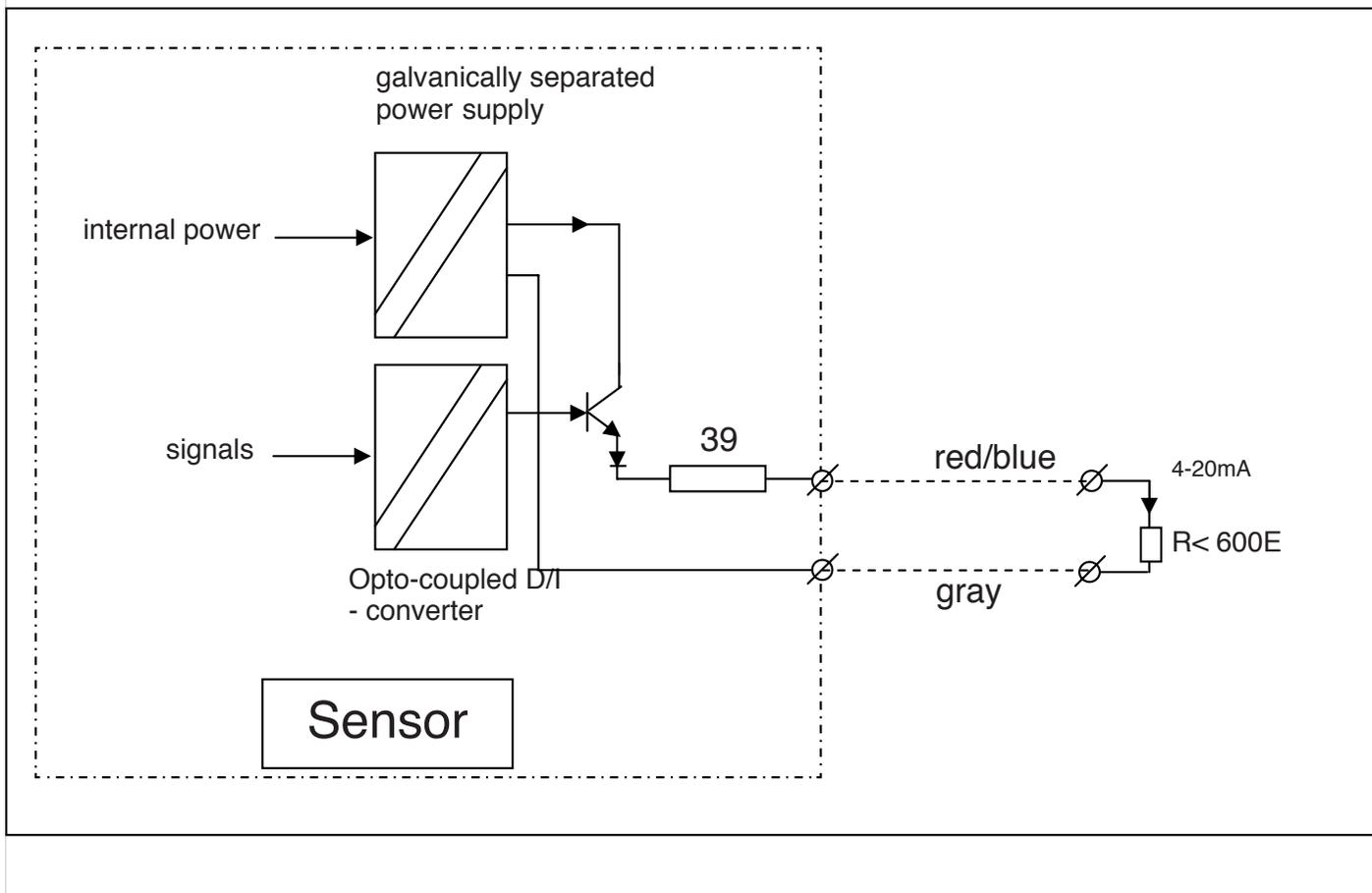


Var. 2



Var. 3 How to connect a relais





Change measuring width

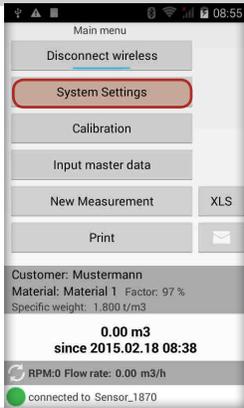
Changing the Sensor Setup (measuring range) is a “hidden feature”. Perform the following steps to activate the Sensor Setup page.

Connect to the sensor, go to system settings and login as administrator. Default (factory set) password is “0000”.

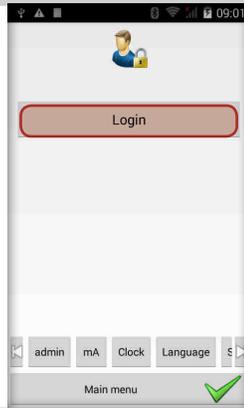
<p>1. Touch "System settings"</p>	<p>2. Touch "Login"</p>	<p>3. Type in the default password: 0000</p>	<p>4. Confirm with "OK"</p>
<p>5. Long click onto the yellow key icon</p>	<p>6. Type in the password: 5288</p>	<p>7. Confirm with "OK"</p>	<p>8. Type in: 1</p>
<p>9. Confirm with "OK"</p>	<p>10. Touch "Main menu"</p>	<p>11. Touch "System settings"</p>	<p>12. Touch "Setup"</p>

Change measuring width	
	<p>Measuring width in mm</p> <p>First active laser beam</p> <p>Number picker for first active laser beam selection</p>
<p>13. Click the "Apply"</p>	<p>Touch "Apply" to save the settings</p>
	<p>WARNING: <i>Limitation of the measuring range does not switch off the unused laser beams!! Therefore it is very important to prevent an uncontrolled radiation of the laser- light by setting an optical cover or shield close to the laser-windows. An improper use of this function will result in wrong measuring data! Use this function with care and under the guidance of H- Sensortechnik!</i></p>
<p>Confirm with "OK"</p>	

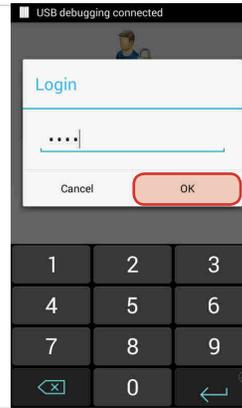
Setting the end points correction



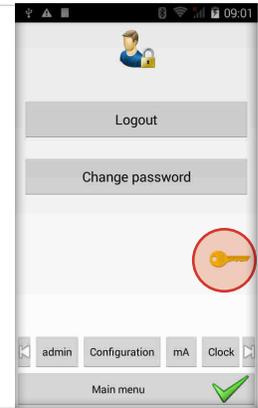
1. Touch "System settings"



2. Touch "Login"

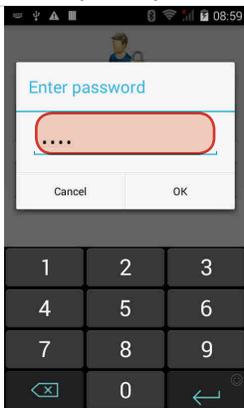


3. Confirm with "OK"

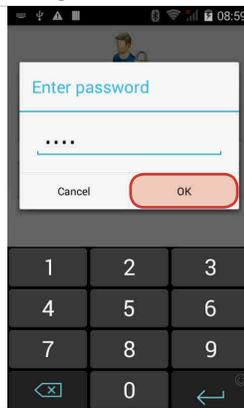


4. Long click onto the yellow key icon

When you are successfully logged in, you will find a key icon on the on the bottom right corner. Long clicking on this icon will open a password input dialog.



5. Type in the password: 5379



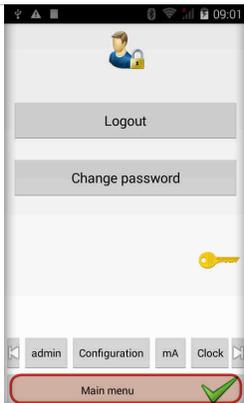
6. Confirm with "OK"



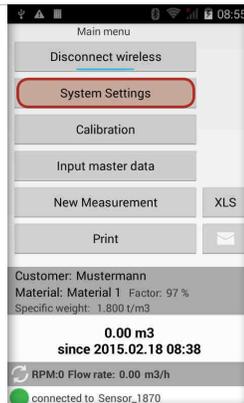
7. Type in: 1



8. Confirm with "OK"

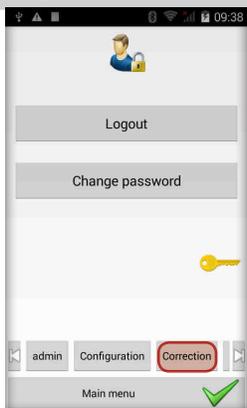


9. Touch "Main menu"

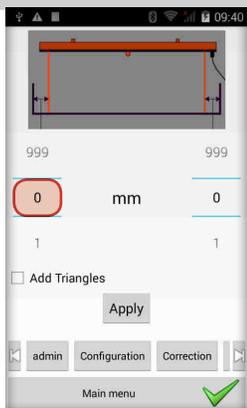


10. Touch "System settings"

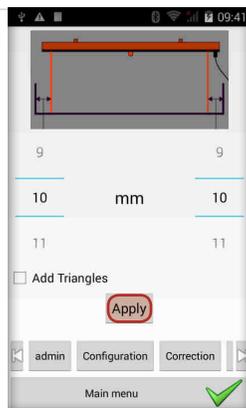
Setting the distance to the walls



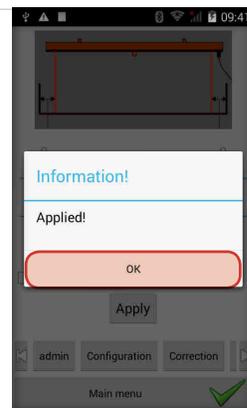
11. Touch "Correction"



12. Use the number picker to set the distance to the walls

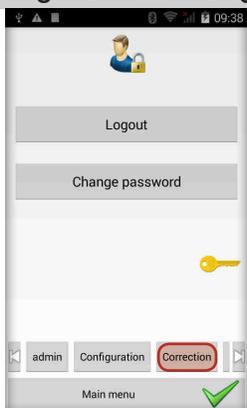


13. Click onto „Apply“ to save the settings

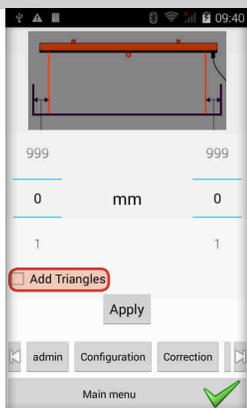


14. Confirm with "OK"

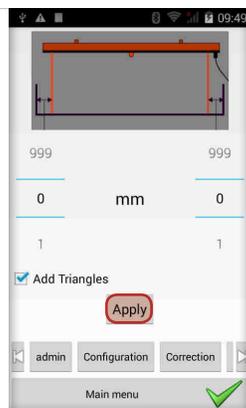
Setting the "Add Triangles" Option



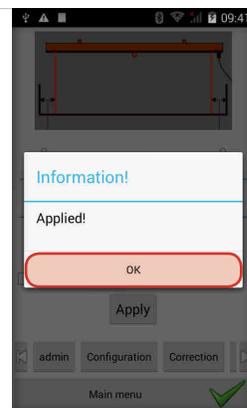
15. Touch "Correction"



16. Check the add "Triangles" option



17. Touch "Apply" to save settings

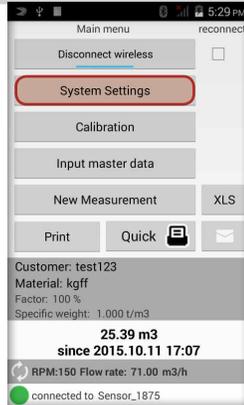


18. Confirm with "OK"

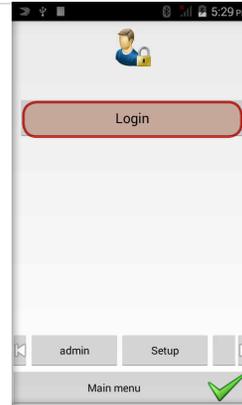
HOW TO SET SYSTEM PARAMETERS MANUALLY



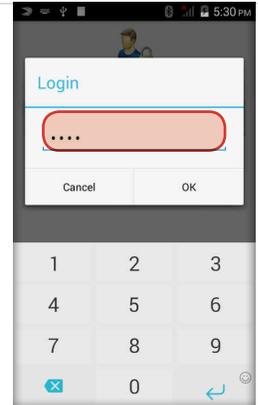
1. Connect to the sensor



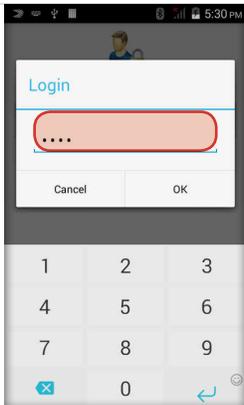
2. Touch "System settings"



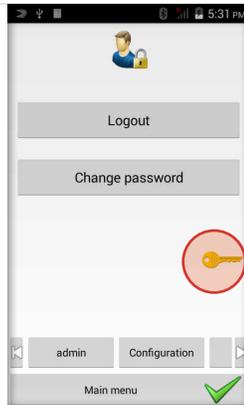
3. Touch "Login"



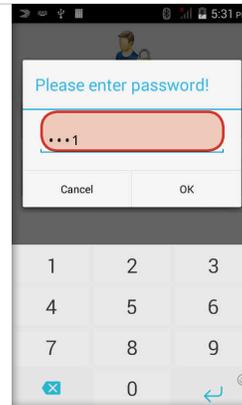
4. Type in the password: 0000



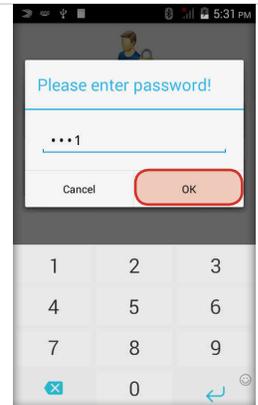
5. Confirm with "OK"



6. Long click on to the yellow key symbol



7. Type in the password: 7851



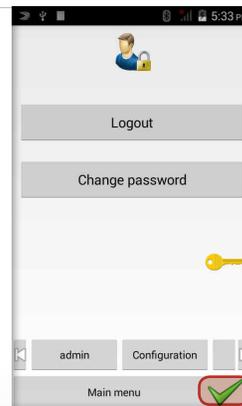
8. Confirm with "OK"



9. Change the value to 1



10. Confirm with "OK"

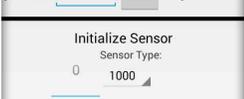
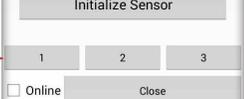


11. Touch green check to go in to the main menu



12. Touch the tools icon

Overview of page 1 of tools

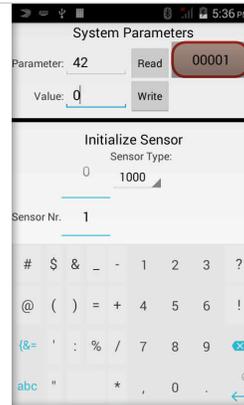
Parameter number: values from 0 to 49		Read parameter from the sensor
Parameter value		Info box
Page 1		Write parameter value to the sensor
		



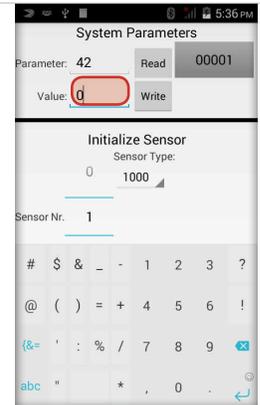
1. Set the parameter number to "42"



2. Touch "Read" button



3. The actual value 1 is shown in the info box



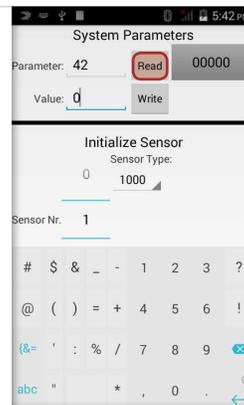
4. Change the parameter to "0"



5. Touch "Write" to save the parameter value



6. Write is confirmed with "Done"



7. Touch "Read" button to check the saved value of the parameter



8. The new value is read and shown in the info box

