

Operation Manual – Flex 4

Android



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1. Product description

1.1 General description

Smart Balance is an instrument for pressure- and flow measurements. The intended usage is checking- and documentation of water flow in heating- and cooling constructions. Smart Balance consists mainly of a Measuring Sensor and a Hand Terminal including the Balance program software. The Sensor measures differential pressure as well as temperature (optional) and communicates via Bluetooth with the Hand Terminal.

The Hand Terminal software comprises data of most of the existing balancing valves on the market. From the Hand terminal list of Balancing Valves, the operator choose the actual one (manufacture, model, dimension, position), giving the corresponding KV. This valve data together with measured DP are the basics for calculation of the correct flow which will be displayed on the Hand terminal screen.

Readings of balanced values with respective valve data can be stored and later shown on the Hand Terminal screen or at a PC screen that is synchronized with the Hand Terminal.

The Sensor has two connections for hoses that are to be connected over the measuring object. There is also a handle device on the Sensor for opening and closing of the measuring cell.

The Sensor has a rechargeable battery pack of 6.600 mAh. Charging is done via the enclosed battery charger.

Product description, cont'd

1.2 Unpacking.

A standard Smart Balance, consists of:

1. Carrying case
2. Measuring Sensor
3. Charger to Sensor
4. 2 pcs Measuring hoses.
5. 2 pcs Measuring needles
6. Allen keys
7. Manual
8. CD with Manual and software for Balancing Measuring program, Valve browser, Report Viewer and links to useful programs
9. Calibration protocol
10. Active license and accessories



Product description, cont'd

1.3 Technical data

Measurement Range

- Differential Pressure: 0-1000kPa.
- Static pressure: <1000kPa
- System Temp: -30 - +120°C

Measurement deviation

- Differential Pressure: <0,1% of Full Scale (of calibration pressure, 100kPa)
- Flow: as for differential pressure + valve deviation
- Temperature: <0,2°C

Battery capacity, operating and charge time

Sensor:

- Battery Capacity: 6.600mAh
- Operating Time: 35 hours, continuous duty
- Charging Time: 6 hours

Ambient temperature for the instrument

- During operation and charging: 0 – 40°C
- During storage: -20°C – 60°C

Humidity Ambient humidity: max 90%RH

Weight Sensor: 540gr Complete Case: 2,8kg

Open Space Range: >200m. >500m with antenna (option)

IP-class Sensor: IP65



2. Handling

The instrument Smart Balance is robust and easy to handle but should not be exposed to careless usage.

Avoid exposing the instrument to temperatures below zero degrees C if there is water in the Sensor.

To empty the Sensor just open the Sensor valve (by-pass position) and shake the Sensor.

If the instrument is not being used for a period, we recommend overhaul charging of Sensor.



3. Preparations - Measuring

3.1 Measuring Sensor.

Start the Sensor by pressing the *On/Off* button. A green led indicates that the Sensor with its' Bluetooth transmitter is "on".

Bluetooth connection to a Bluetooth object such as Android device is indicated by the blue led lighting.

Before connecting the Sensor to a flow system or balancing valve, an Offset calibration must be performed. See page 13.

Connect hoses to the Sensor's two pressure ports. Blue to blue and red to red. Connect measuring needles to hoses. Connect needles to the pressure outlets of the measuring object. Needle with red hose to pressure outlet with the higher pressure (often red marked) and needle with blue hose to the other (blue marked) outlet. After completed measurements, the Sensor is put "off" by pressing the *On/Off* button.

If the Sensor by any reason would jam or if it is not possible to establish a connection, the *Reset* function is to be used. Push the *Reset* button to perform a soft reset.





Preparations – Measuring, cont'd

3.2 Android Device

Smart Balance programs for the Android operative works on Android 2.3 and up.

The App can be downloaded directly into a Smartphone or Tablet.

A telephone call does not affect the measurement program, it continues to run while other Apps or functions is handled.

N.B. A **Soft-reset** at a Android device is made by a re-start of the operative.

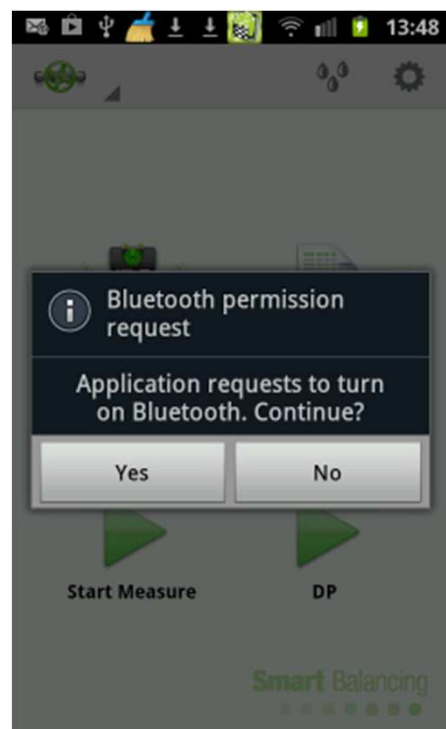
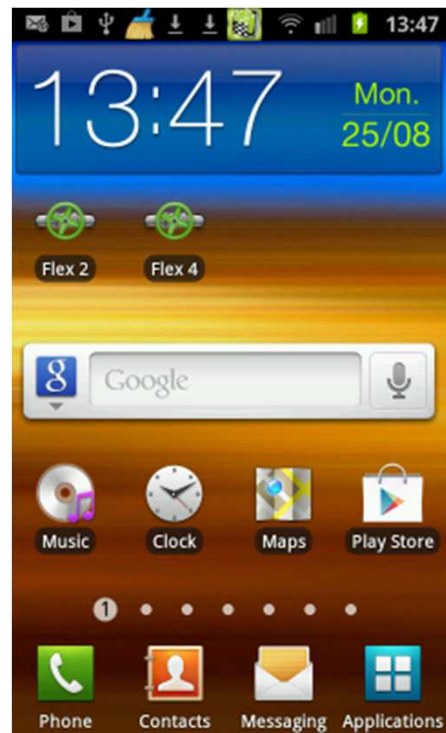


Preparations – Measuring, cont'd

The installed Smart Balance App is found among the Application programs of the device. When starting the Smart Balance program a Bluetooth permission request is opened, turn ON the Bluetooth at the Android device.

The main screen of the Smart Balance measuring program is now displayed, Connect sensor, Start Measure, Set Value and DP. See page 10.

To be able to browse the complete program, turn ON the measurement sensor, then tap connect sensor and scan. The sensor ID number will appear after a few seconds, tap the sensor ID. Connection between sensor and Android device is indicated by a sound signal and a battery icon at the top of the screen. See page 19.



Preparations – Measuring, cont'd

Tap the green valve Icon and the Main Menu is opened include Categories, Function Test, Valve Data, Graphs and Flow Calculator.

3.2.1 Categories.

3.2.2 Function Test.

3.2.3 Valve Data

3.2.4 Flow Calculator

Also Media and Settings are located at the top bar.

3.2.5 Settings

3.2.6 Media

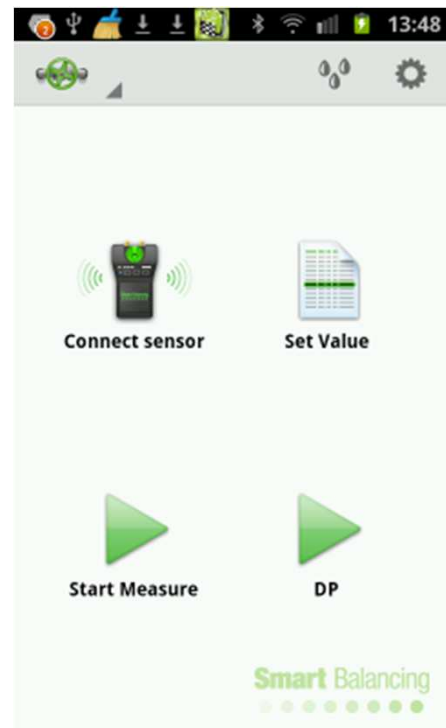
All these menus can be accessed at any point within the program, except at the full Graph display.

Home and Measurement are return tab's.

Also back-step at the Android device can be used to browse the program.

Graph & Log function – see page 29.

Project handling & Set Value – see page 37.



Preparations – Measuring, cont’d

3.2.1 Categories.

Measurement over a specific balancing valve at a site is characterized by its Category name and its identification number. Both Category name and ID number is free of choice.

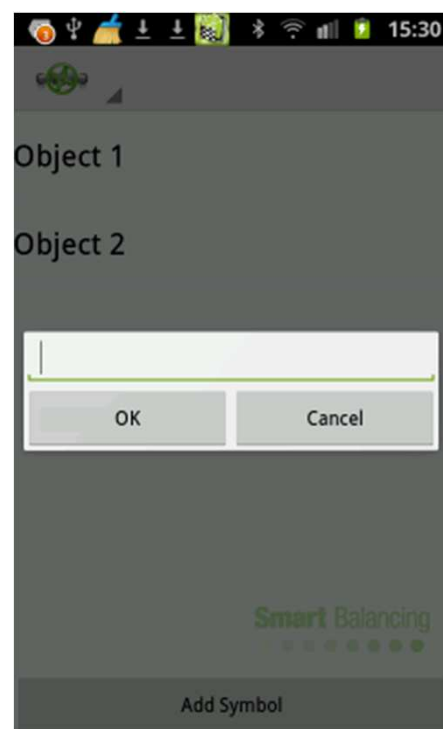
The Category name can be linked to for instance the site with an object name, Object 1, Object 2 etc.

The ID number can for instance be the actual valve ID number from the blueprint or a series of numerical values, rv1, rv2, rv3, etc.

At Categories it is possible to specify category names and these Categories will then appear during the Save procedure of a valve measurement. See page 24.

When the measurements are synchronised into the PC Report Viewer program the commissioning will be filed under its category name with the specific balancing valves as ID numbers.

The commissioning Balancing Report is generated by the Report Viewer program according to Category and ID number.



Preparations – Measuring, cont'd

3.2.2 Function Test

This menu consists of three tabs: Main, Offset calibration and Service.

Main

Under Main Sensor Data as well as the battery status of the Sensor is displayed. Model name, sensor serial number and program version.

Total battery capacity, used capacity and expected discharge time.

Tap and slide to the left to get to the Offset calibration tab.



Preparations – Measuring, cont'd

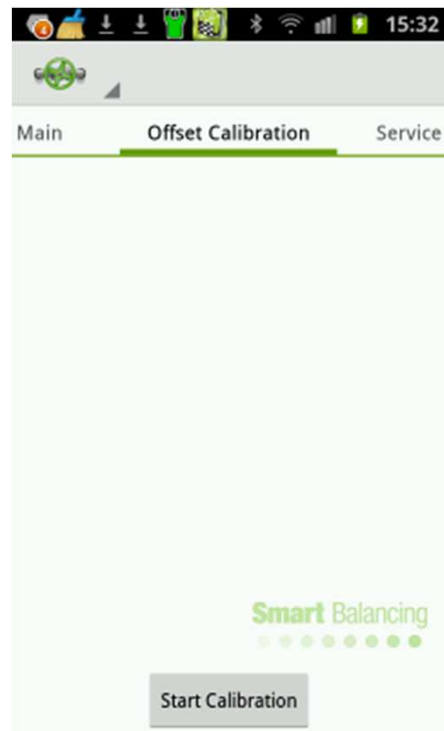
Offset calibration.

Offset calibration is performed in order to enable a correct measurement of the Static pressure in a flow system. The calibration also render higher accuracy when measuring DiffPressure and flow.

Offset calibration is performed when a Bluetooth connection between the Android device and the Sensor is established.

The Sensor pressure ports shall be at atmospheric pressure which means that **the Sensor shall not be connected to any balancing valve or flow system.**

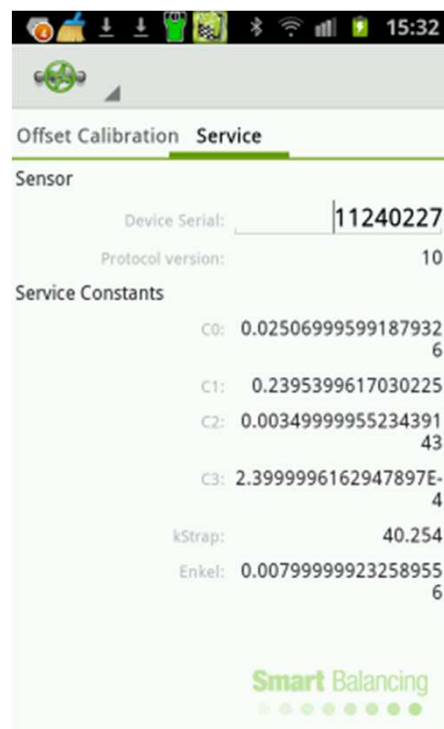
Start calibration by tapping *Start calibration*.



Service.

Service include Sensor specific data and constants. These are values carried by the actual Sensor and they are transferred from the Sensor to the program when connection is established.

The values are Sensor specific and differ from Sensor to Sensor.



Preparations – Measuring, cont'd

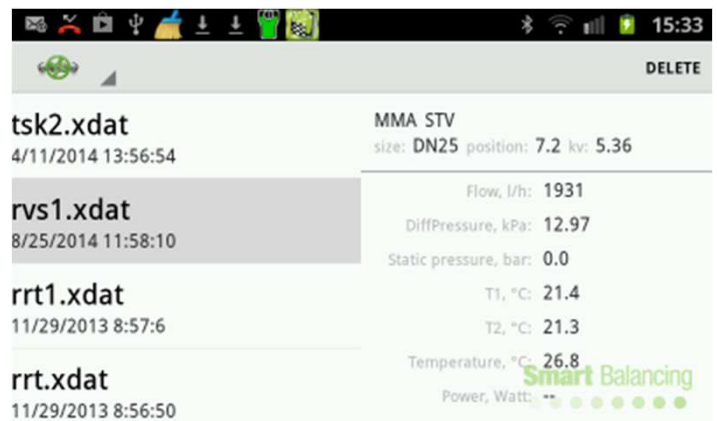
3.2.3 Valve Data.

Tap at Valve Data at Main Menu. The Valve Data screen shows all stored balancing valve measurements.

The measurements are listed according to ID number. Tap an ID number and the measurement values is displayed.

If the Android device is put horizontally both the ID list and the measurement values for a chosen valve is displayed.

To remove a measurement use the Delete function.



Preparations – Measuring, cont'd

3.2.4 Flow Calculator

At Flow Calculator a differential pressure and a chosen valve can be introduced. The position of the valve can be changed by the slide bar at the lower part of the screen.

Tap Continue and the Flow calculation from chart is displayed within a Graph.

The Flow Calculation can be opened during a measurement to check the relevance of a measured DP and Flow over the actual balancing valve.



Preparations – Measuring, cont'd

Tap and slide at the Graph to change position at the valve and check achievable Flow for a particular set up at the valve.

If the Android device is put horizontally both Graph and input frame is displayed. Tap and slide the position bar to change position at input frame and Graph.

Tap and slide at the Graph changes position and calculated Flow at only the Graph. Tap Continue at the input frame to return to original valve position.



Preparations – Measuring, cont'd

3.2.5 Settings

Auto Connect

If enabled the Auto Connect function automatically continuously search for a Sensor, if not the search is done once. The Sensor must be ON to be detected by the program.

Show picture

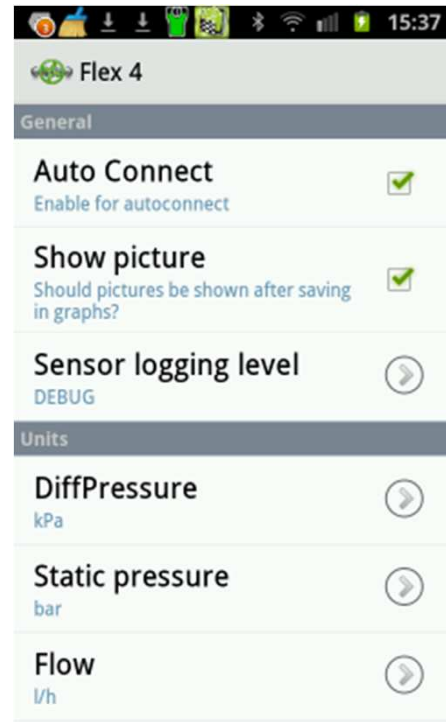
If enabled a screenshot of for instance a measurement or Graph is showed after the Save procedure of the screenshot.

Units

Settings of units for Differential pressure, Static pressure, Flow and Temperature.

About

Short information about the program.



Preparations – Measuring, cont'd

3.2.6 Media .

Media Data.

Here you find the different media that the valve manufacturer has correction factors for.

Choose Type of Media.

Choose concentration.

Manufacturer has specific correction factors within a temperature range. If measured or manually given temp is outside the range, the temp is not shown in temp area.

If you would like to know the temp, go back to Media Data, tap on General followed by water.

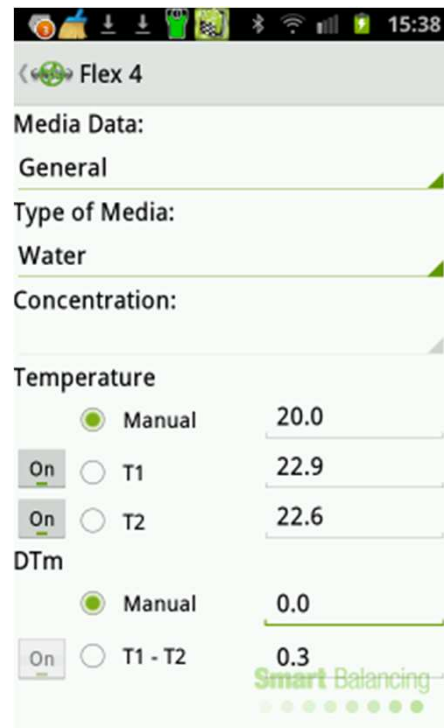
When a media correction factor is chosen it follows into the measuring window and correct the flow. If the next measurement is another media, including regular water, you must make corresponding correction.

Media menu also includes three different temperature presentations; Manual, T1 and T2.

On the left of the Measuring Sensor there are two connections for Temp probes, T1 and T2.

By using a Temp probe (option), connected to T1 or T2, you also get the temperature of the flow, presented in Media menu and in Measuring window.

Also, see page 28 – 30.



4. Measuring

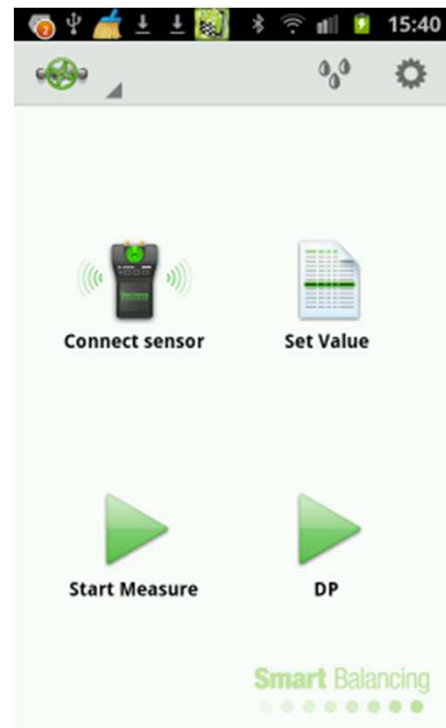
The Smart Balance program comprises two different measuring methods represented by 1 and 2.

Briefly, with Measuring Method 1 is the actual flow calculated, based on a given valve position (Kv-value) and measured DiffPressure.

With Measuring Method 2 a valve position is suggested based upon a given design flow.

Alternatively, if only DP information is required, use the “DP” short-cut”.

Tap Connect sensor, scan if necessary, then tap the ID number of the particular sensor to be connected.





Measuring – cont'd

4.1 Measuring Method 1.

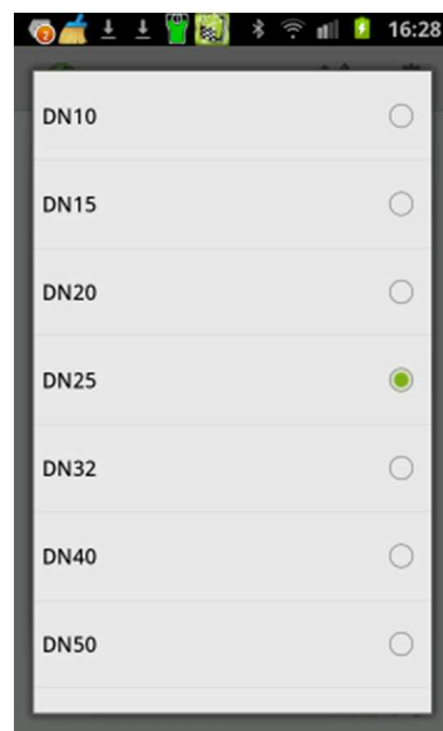
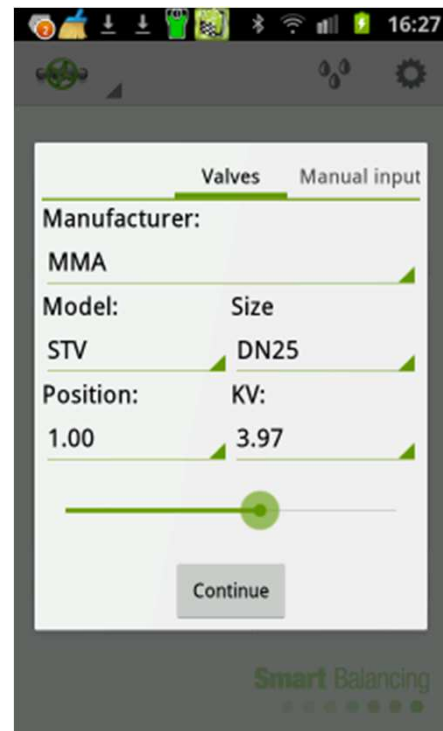
Tap Start Measure at the Smart Balance program display. Tap the arrow to the right of the respective drop box for *Manufacturer*, *Model*, *Size*, and *Position* and make your choices.

Choosing *Position* generates automatically corresponding *Kv*-value. Alternatively, choosing *Kv*-value generates automatically corresponding *Position* value.

The valve *Position*/*Kv* values can be changed by the slide bar.

If you want to state *Position* or *Kv*- value with other values then found in the drop-down list, you may use the Manual input function to enable flow calculation from a single *Kv* value.

When your choices are done, tap *Continue*.



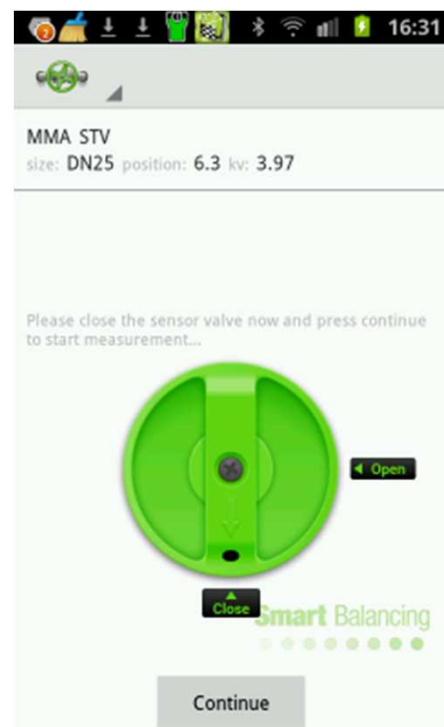
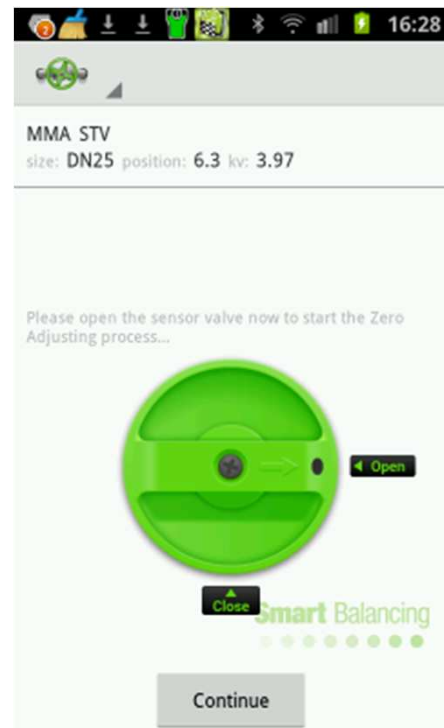


Measuring – cont'd.

Zeroing

Follow the instructions which means open the sensor by-pass valve. Zeroing is now done over the balancing valve at the flow system.

Tap *Continue* and follow the new instruction i.e. close the sensor by-pass valve and tap *Continue*.



Measuring – cont'd.

Following the last instructions you should now have the Measurement menu visible with all data on display, measurement and valve.

On top you will see *Flow* which is calculated from the measured differential pressure (seen below *Flow*) and the actual *Position* (*Kv*-value). Static pressure is measured when Zeroing over the valve. If you would like to measure the Static pressure again, go to the Main menu by tapping “Back step at the Android device”, or Home at the main menu.

Tap the circles or tap and slide the screen to move between Method 1, 2 and DP.

If a Design Flow value is at hand input this value at Design Flow and then tap Done at the keyboard. Design Flow is shown as a green horizontal line at the graphic presentation.

The Lambda value is defined as measured flow / design flow in percentage.



At the lower part of the screen; to the left a square icon that freeze the measurement values. Middle, Save measurement icon and to the right the Graphic display icon.

If the Android device is put horizontally both numerical and Graph screen is displayed.

Tap and slide to move between the numerical screen between Method 1, 2 and DP.

Tap and slide at the Graph to change valve Position or tap the Valve data bar at the top.

If you instead want to adjust the flow, turn the valve knob to a new position. As the position has been changed so has the KV value been changed (as well as the measured DP). This new info has to be included in the calculation, in order to achieve the new flow.



When the adjustment is completed, tap Save.



Measuring – cont'd.

A measurement over a valve can be displayed Graphically within the frame of the valve characteristic, standing or horizontally.

Tap and slide at the Graph to change Position.



Measuring – cont'd

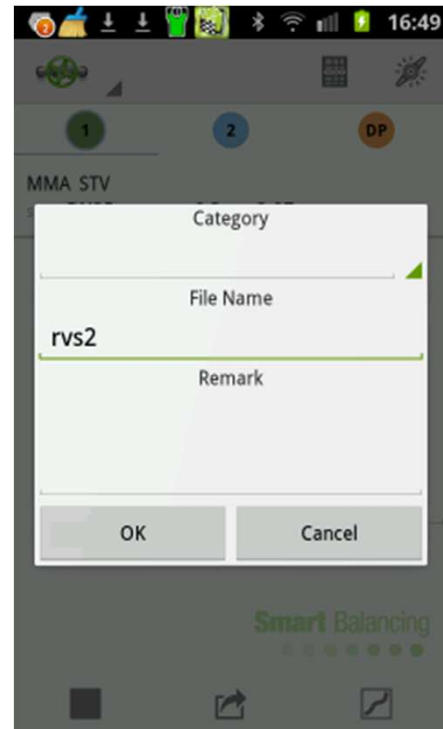
Tap the Save icon at the measurement screen, and a Category and ID (file name) input is displayed. Tap Category to choose a pre-set Category name. Use the keyboard to input an ID associated with the Category.

At Remarks you may add comments of your own choice. The comments will appear at the Balancing report generated by the PC Suite program Report viewer.

Now tap *Save* and the denominations with valve data and values are stored in the device.

Stored values etc. are available from the Main Menu's Valve Data (See Valve Data). If you don't want to save the data and values just tap *Cancel* and the Measuring screen is displayed again.

After tapping "Save" the Measuring window will be displayed and you may now start another balancing valve procedure at next valve in the system.

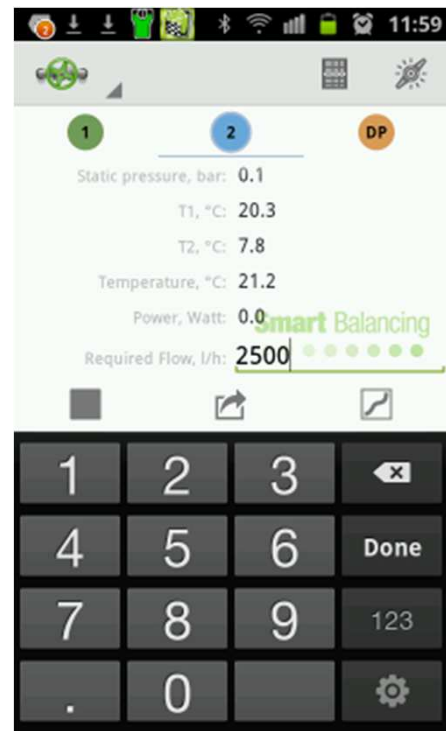


Measuring – cont'd

4.2 Measuring Method 2.

Tap or slide to Measuring Method 2. If a pre-set Flow value is at hand input this value at Required Flow and then tap Done at the keyboard.

A new valve Position in accordance with the pre-set Flow is calculated. Adjust the valve to the new Position, which will change the measured DP and Flow. Tap Done to repeat the calculation at the new Position. Normally it takes two calculation to reach the pre-set flow i.e. if measured Flow and pre-set Flow is not too far apart.



Measuring – cont'd

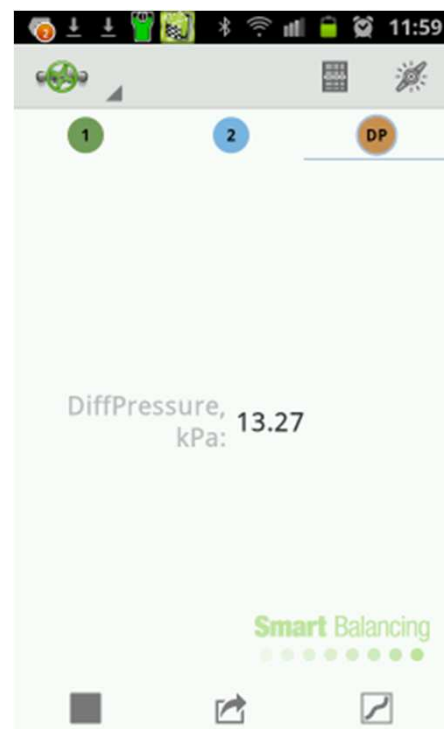
The Method 2 calculation to reach a Design, pre-set Flow can be done at horizontal device mode, which display the measurement as both numerical values and Graph.

The DP screen only display DP and there is a short-cut at the opening screen to the DP measurement. No valve manufacturer, model, size and position input has to be made when using this short-cut.



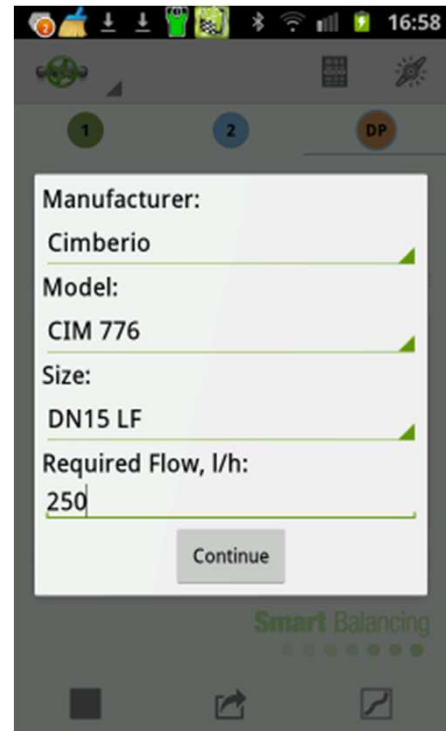
4.3 Dynamic Valves

At the upper right corner there is a Dynamic Valve Icon which opens a graphic measurement functionality for Dynamic Valves.



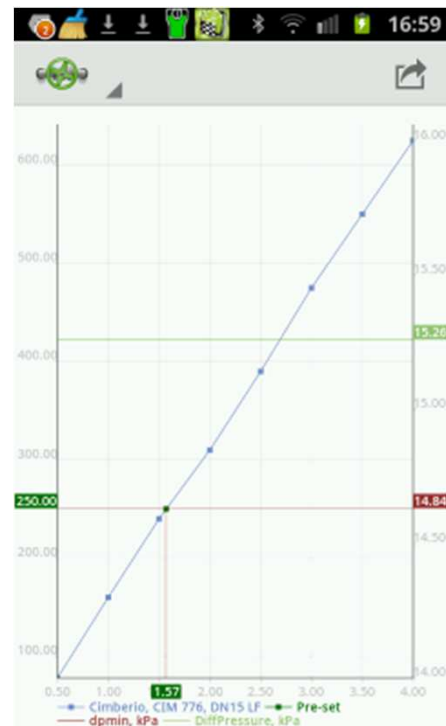
Measuring – cont'd

Choose Dynamic Valve and use the keyboard to input Design Flow value.



Design Flow and the diagram gives the Pre-set position and D_{pmin} for the Dynamic Valve.

Adjust the measured DP by for instance the pump so measured DP is higher than D_{pmin} at the least favored valve within the system.



5. DPT, combined DP & temperature measurement device

The DPT or contact thermometers are connected by cable at the left side of the measurement sensor.

T1 at the Red port

T2 at the Blue port

The DPT is a combined DP and temperature measurement device i.e. it is possible to measure DP and temperature in situ at the same time and at a specific measurement point.

Connect a DPT and a standard measurement needle at a balancing valve at the IN – flow pipe and connect these to the DP and Red temperature port at the sensor.

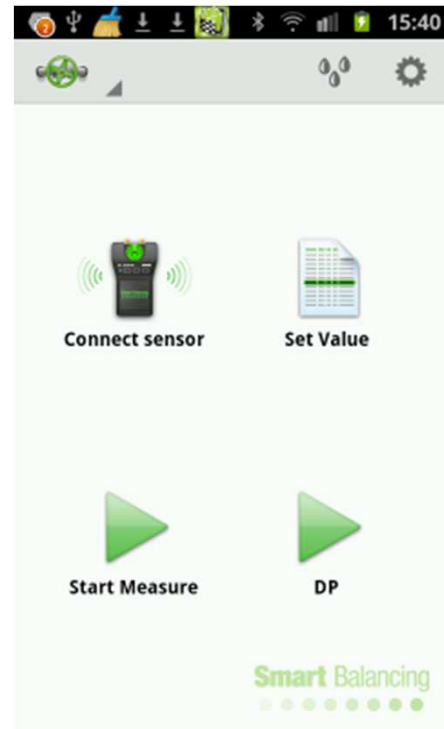
Connect a second DPT at a balancing valve at the OUT – flow pipe and connect the DPT cable to the Blue temperature port.

Note; the pressure tubes have quick fit connectors who act as Open/Close valves. Open when connected to for instance to a DPT and Closed when not connected.



6. Graph & Log function

The Graph and Log Settings are chosen at the Media menu. Tap the Media Icon, second to the right at the upper bar.

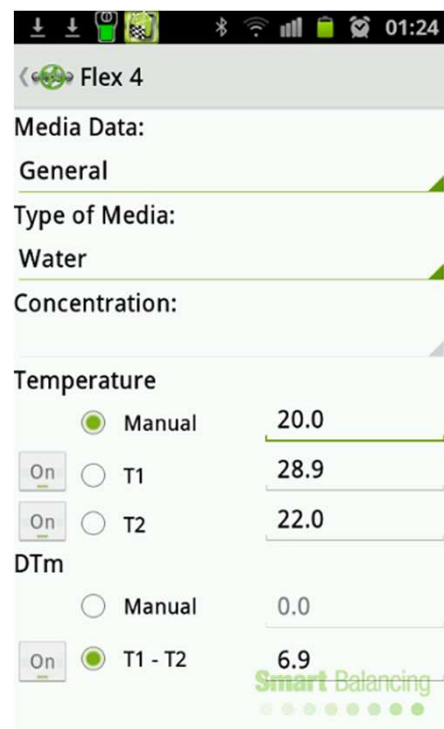


Temperature / Manual default value is 20 degree C, which means that calculations is done according to physical media parameters at 20 C.

Tag T1 and calculations is done according to the measured T1 temperature at the Media.

If temperature, T1 and T2 are measured it's possible to tag $DTm = T1 - T2$ as a calculation base for Power capacity of the Flow and Energy amount over a given time period.

If all Graph Icons are ON, T1, T2 and DTm will be displayed at the on-line Graph Log.



Graph & Log function

If DTm / Manual is tagged and a numerical value is entered, for instance 1 C, the Power capacity of the Flow will be calculated as Watt or kWatt per 1 degree Celsius.

Flex 4

Media Data:

General

Type of Media: Water

Concentration:

Temperature

<input checked="" type="radio"/>	Manual	20.0
<input type="radio"/>	T1	29.1
<input type="radio"/>	T2	22.0

DTm

<input checked="" type="radio"/>	Manual	1
<input type="radio"/>	T1 - T2	7.1

If T2 is tagged OFF then automatically DTm / T1 -T2 will be tagged OFF and only T1 will be presented at the on-line Graph.

Flex 4

Media Data:

General

Type of Media: Water

Concentration:

Temperature

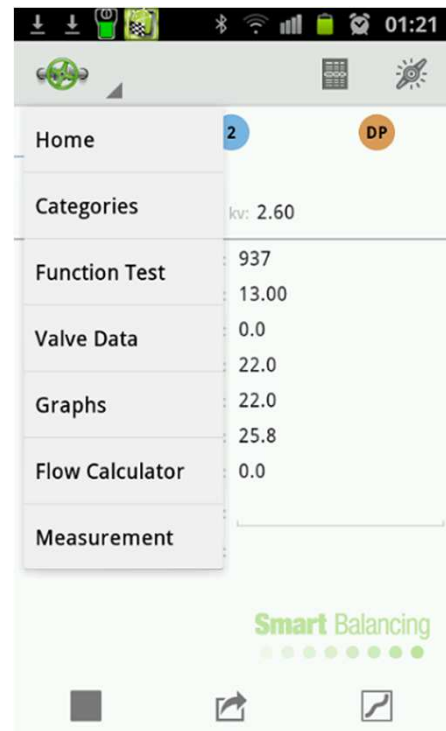
<input type="radio"/>	Manual	20.0
<input checked="" type="radio"/>	T1	24.0
<input type="radio"/>	T2	--

DTm

<input checked="" type="radio"/>	Manual	1
<input type="radio"/>	T1 - T2	--

Graph & Log function

Tap the Start menu and then Graphs, Flow is default Log .

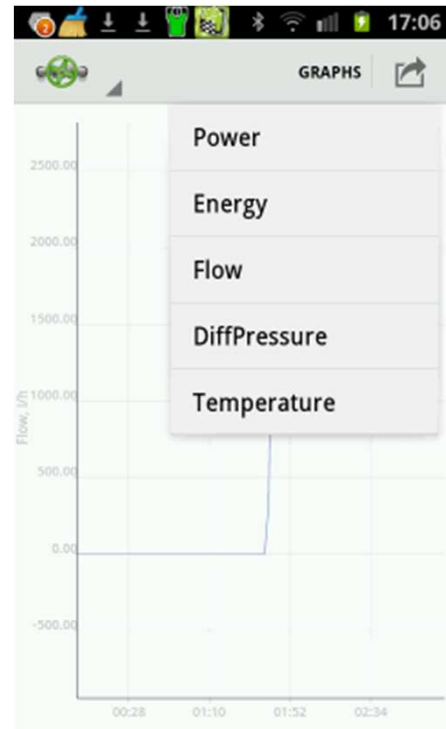


Tap twice at the screen surface to update the time axis.



Graph & Log function

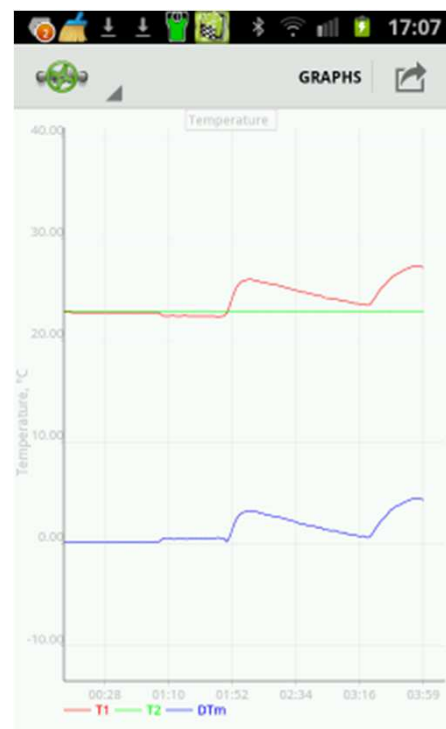
Tap Graphs and choose between Power, Energy, Flow, DP or Temperature Log.



Tap Temperature and T1, T2 and DTm is presented as an on-line Log.

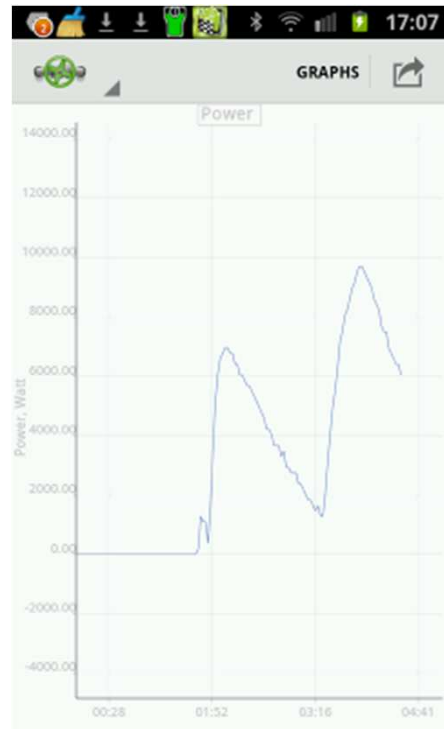
The Temperature can also be presented according to specific choices made at the Media Setting menu.

All on-line Graphs can be presented at terminal horizontal mode.



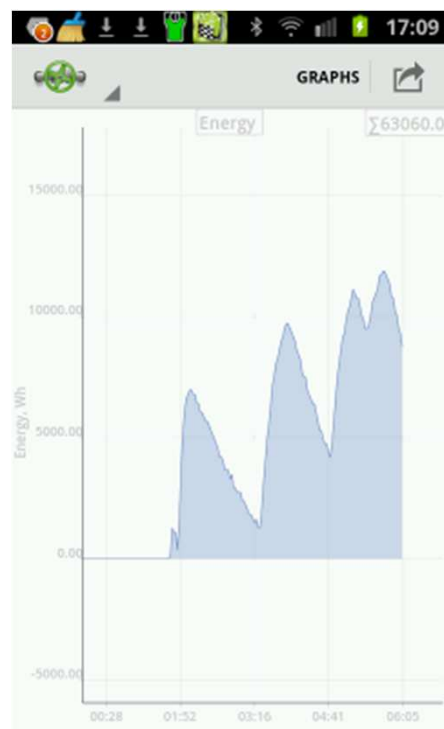
Graph & Log function

Tap Power and the Power capacity of the flow is presented, calculated from a temperature measurement, $DTm = T1 - T2$, or from manual input of a numerical DTm value, for instance $DTm = 1$ or 10 degree C.



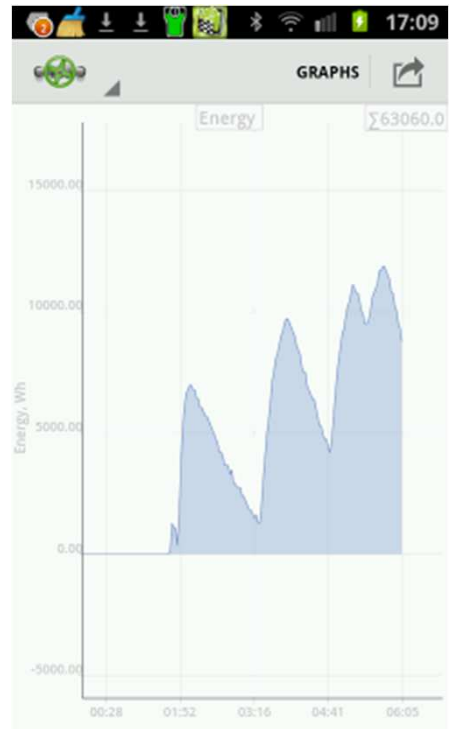
Tap Energy and the energy amount over the actual Log period is presented.

At the upper right corner of the diagram total energy amount of the Log period is presented as a numerical value, in Wh or kWh.



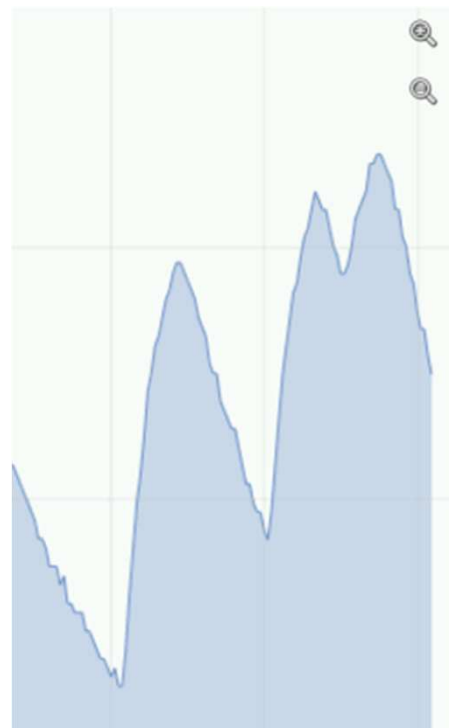
Graph & Log function

Tap the Save Icon at the right corner of the upper bar and the diagram is stored as a jpg screenshot.



It is possible to enlarge the Screenshot display to study specific details of the Log diagram.

Note; it is possible to Log over long periods, night time, days etc. However, it's important to set the terminal, Smartphone/Tablet battery save mode system accordingly i.e. not to shut down the terminal into any saving mode that will disconnect the Bluetooth connection between sensor and terminal.



7. Transferring of data - Hand Terminal to/from PC.

Data that has been stored in the Hand Terminal is available under *Valve Data*.

Valve Data is easily transferred to PC for further processing as transcription etc. A CD containing, for instance, *Support* is included in each complete Smart Balance. The "Support" program package enclose two different programs; *Valve Browser* and *Report Viewer (RV)*. The programs are downloaded from CD to PC as usual i.e. put the CD into the PC disc drive, click at *Support* and follow the instructions. Short cuts are automatically created at the desktop "Report Viewer", "Valve Browser" and "Projects" (folder for saved measuring and reports).

The PC Suite including Valve Browser & Report Viewer is a free download at the [Smart Balancing Products On-line Distribution Web site](http://www.smartbalancing.com/Support/Download). [www.smartbalancing.com / Support / Download](http://www.smartbalancing.com/Support/Download)

Product ID: BCF4

Key: no key is needed

Valve Browser is a graphic based valve display program. Position – KV curves are given for a vast number of valves from different manufacturers.

The program has 3 windows. *Valves*, where manufacturer, model and size is chosen. The graphical presentation of the chosen valve is displayed to the right. A theoretic differential pressure is stated at the upper rim of the graph. By clicking somewhere at the curve, flow and corresponding position and KV is displayed in yellow boxes. Flow at the right y-axis, position on the x-axis and KV at the left y-axis. A position may be saved by clicking *Save to History* and the actual valve settings is listed at the window below the graph. The Valve Browser is a unique information tool for getting expected values of flow under theoretical conditions of DiffPressure and position.

Report Viewer (RV) is the only program needed for creating and saving reports. To the left there is an area for all valves (measurements) that has been transferred from the Hand Terminals savings to the Report Viewer (IN-data). To the right you see the complete data of one of the valves from the left side. Tap on a valve on the left side and the valve's complete data is displayed in the right window. The left side valves are organized as a Windows-tree-structure and could consequently be managed with Windows commands (for example click right on mouse for creating a new folder when the cursor is in this area).

The top bar icons are described in the following pages.

Note: always open the Report Viewer program by right click at the desktop Icon and then click Run as Administrator.

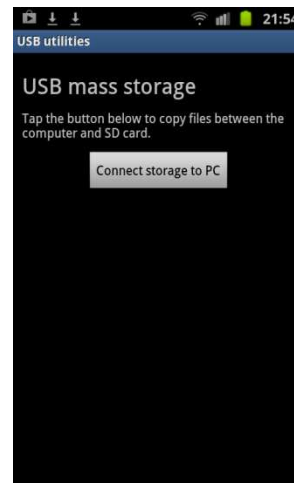
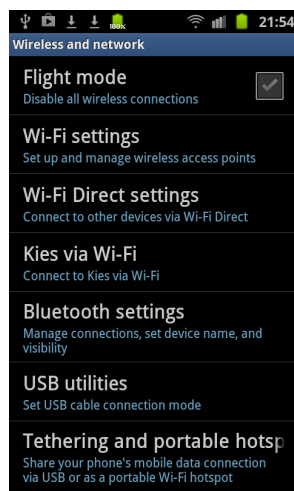
Transferring data to/from Hand Terminal to PC – cont'd

To transfer measurement data from Android Mobile to PC Report Viewer (RV) synchronize the terminal with the PC or Laptop. MTP (Media Transfer Protocol) synchronization is done automatically when a cable is connected between the Smartphone or tablet and the PC/laptop USB port.



At older Android operatives a USB synchronization can be done, according to the following schedule.

1. Connect the USB cable to the Laptop
2. Tap Settings/Wireless and network/USB utilities
3. Tap "Connect storage to PC"
4. Connect the USB cable to the Mobile
5. Tap "Connect USB Storage"



8. Project Handling & Set Value

Note: Click right at the Report Viewer Icon and open the Report Viewer as Administrator.

Large objects including considerable amounts of valves can be handled as a Project. Use the PC Suite support program Report Viewer (RV) to create a project. Click the Create Project button at the bar of the RV. Specify a project name at the pop-up and click OK.

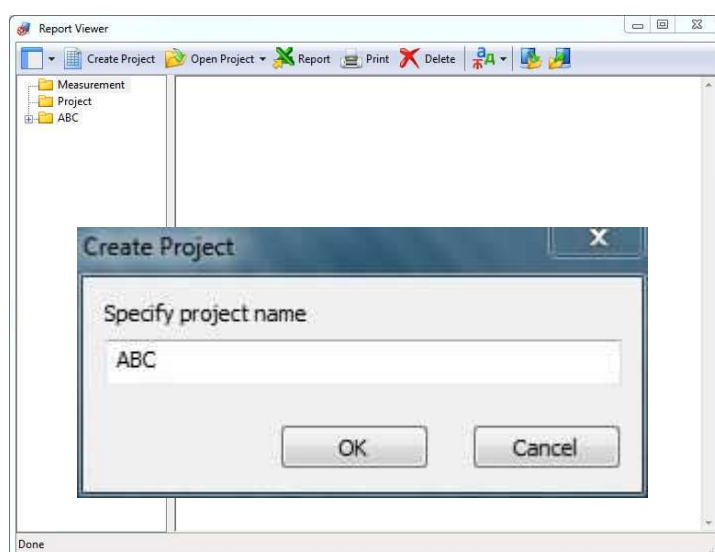
An excel balancing report template is opened. If the project blueprint and documentation is at hand the Valve ID numbers can be chosen from the blueprint and these numbers are used at the actual valves at the site. If not, input a series of numerical values at the Excel template. First column at the template.

Write the Valve Type name and valve size at the template.

If the Project include calculated Set Values, design values, write them at the Set Vale columns at the template. Calculated values can include DP, Flow, Valve Position and KV. Normally, Flow and Position are sufficient.

Click at Save at the Excel template and associated files are stored at the Valve Data folder at the PC/laptop.

Connect the Android Smartphone or Tablet to your PC/laptop via a cable. The project is automatically Synchronized to the Android device, See page 36.

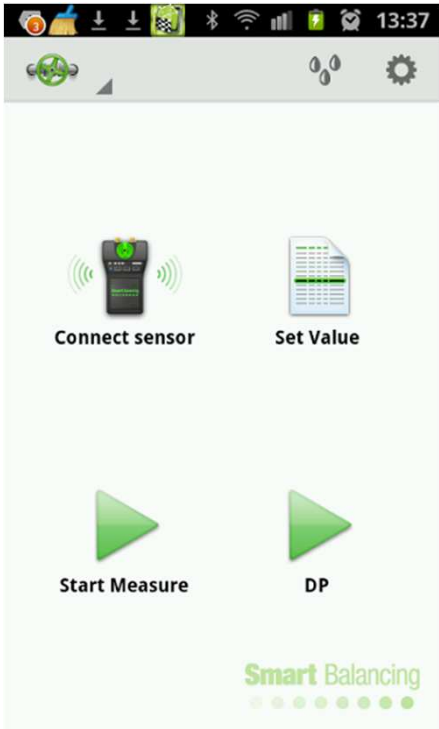


Balancing protocol													Setvalue				Measurement			
Valve IDnr	Object	Name/place	Valve Type	Size DN	Dp kPa	Flow l/h	Position Turns	Kv	Dp	Flow	Position Turns	Kv	Terminal	Remarks	Manual					
1			Astra	DN15		800	5													
2			Astra	DN15		1000	6													
3			Astra	DN32		2800	5													
4			130 Venturi	3/4in		1900	3													
5			130 Venturi	3/4in		2000	3													

Project Handling & Set Value

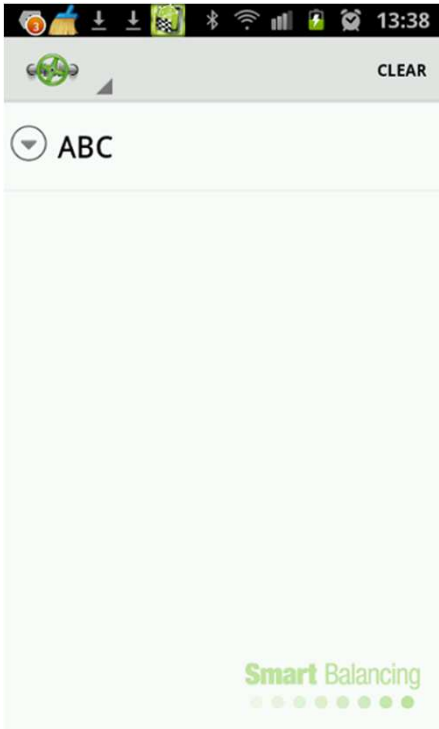
Open the Flex 4 Application at the Smartphone/Tablet and connect the Android terminal to a sensor.

Tap at the Set Value Icon.



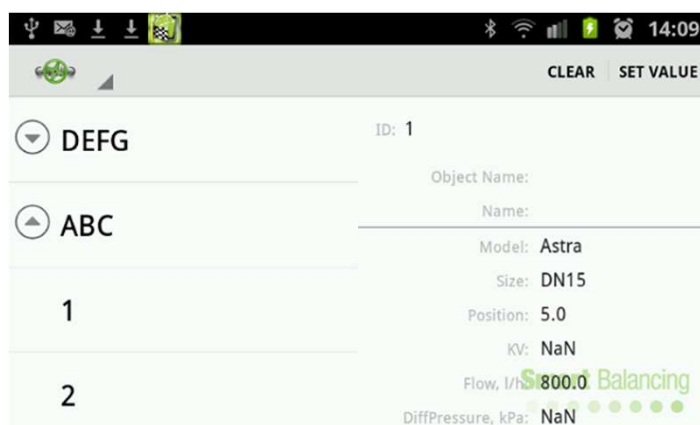
The Project is presented.

Tap the Project and the included valves are listed.



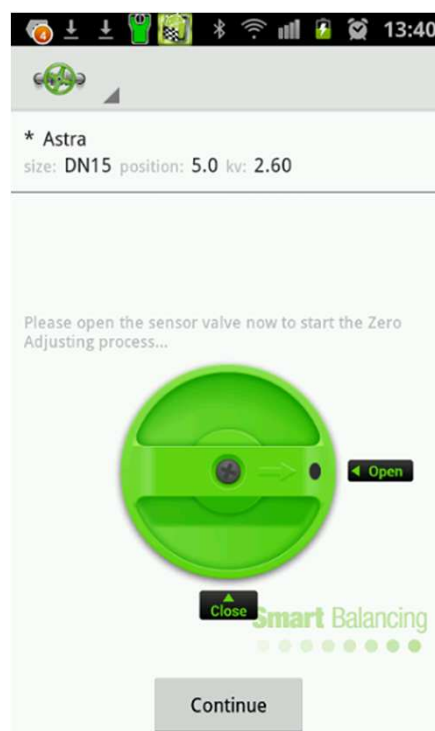
Project Handling & Set Value

Tap a Valve ID and keep the terminal at horizontal mode to get Valve data and Set Values presented.



Tap "SET VALUE" at the upper right corner of the Screen.

The Zeroing procedure starts and to the left of the manufacturer name an multiplication sign notify project valve status.



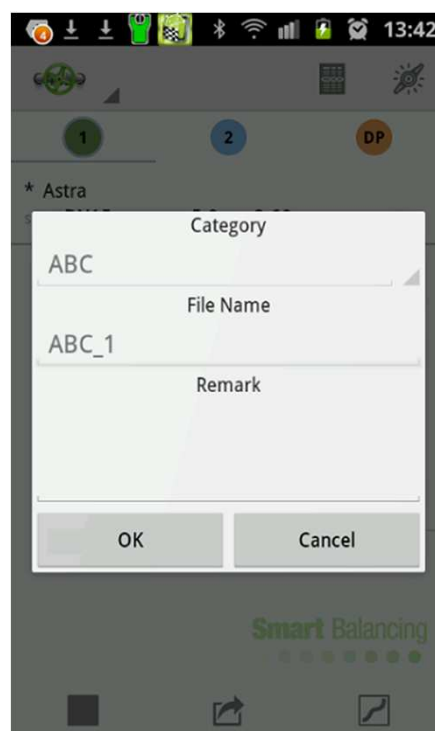
Project Handling & Set Value

The Measurement is presented at the screen.

The initial position of the Valve is given by the Set Values, adjust the Valve and to Store the measurement Tap the mid – Icon at the lower part of the screen.



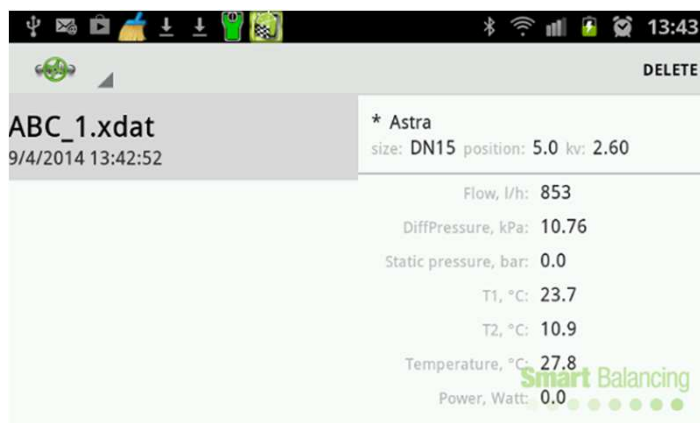
The Category and File name is set automatically due to the project status, the name and numerical value refers to the Project and can not be changed manually.



Project Handling & Set Value

Tap the Start Icon at the upper left corner (green valve) and then Tap Valve Data at the Dropbox menu.

The measurement data associated with the project valve No:1 is presented.



Proceed to the next valve within the Project and repeat the steps as described above.



Project Handling & Set Value

The measurement is presented, adjust the valve according to design flow and store the measurement.



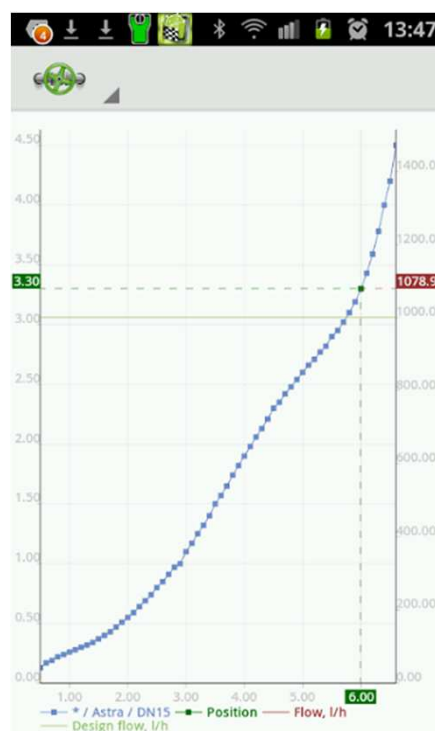
Slide the screen to the left.

Position, Flow and Kv is presented graphically within the specific valve curve. The dotted line.

The Set Value Flow is presented as a green horizontal line.

Tap and drag the dotted line so it coincide with the Set Value flow line.

A new position is given and adjust the actual valve according to the new position.



Project Handling & Set Value

When the project is finalized all measurements are stored at the Valve Data folder.

Connect the Android device to the PC or laptop with a USB cable. The measurement data will automatically synchronize over to the PC Suite, Report Viewer program.

Open the Report Viewer (RV).

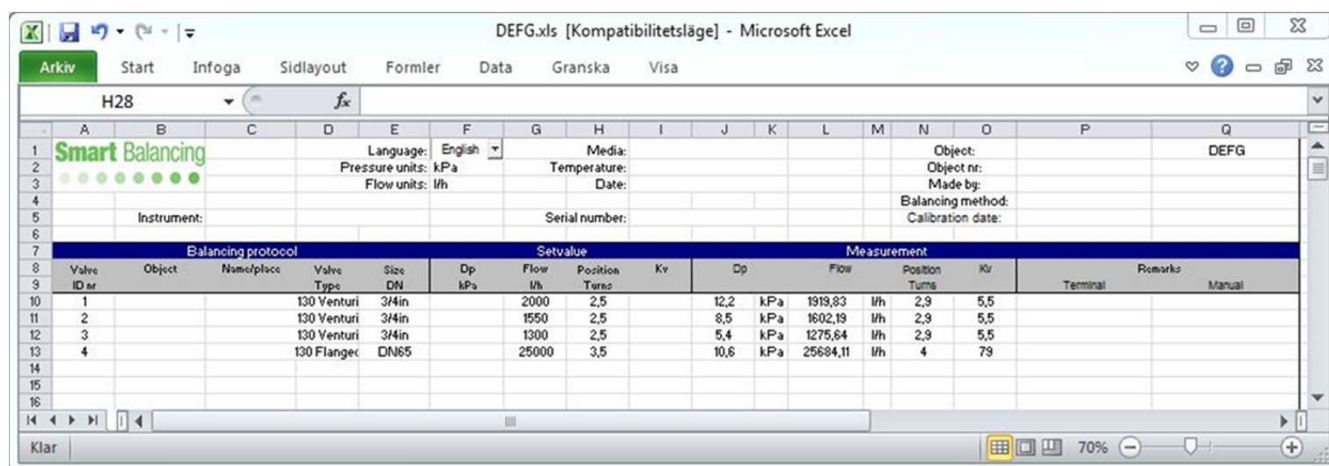
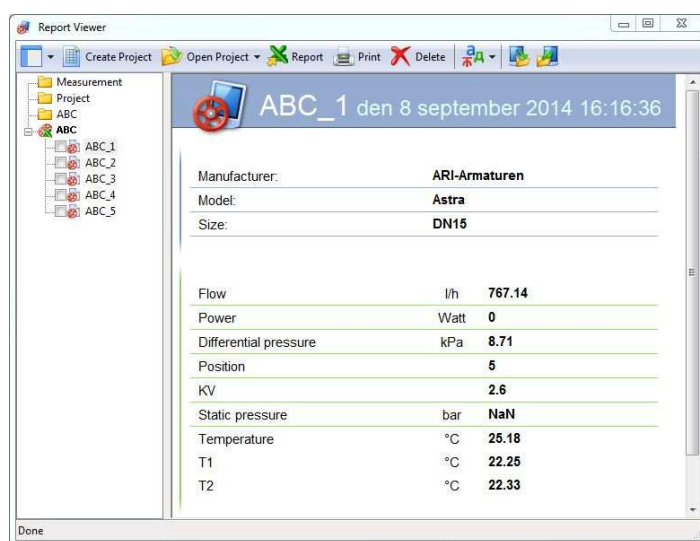
Note: Click right at the Report Viewer Icon and open the Report Viewer as Administrator.

Click at the green Excel Icon to the left of Project name.

The Project Excel Report Template is opened and now it include the measurements and previous input Set Values.

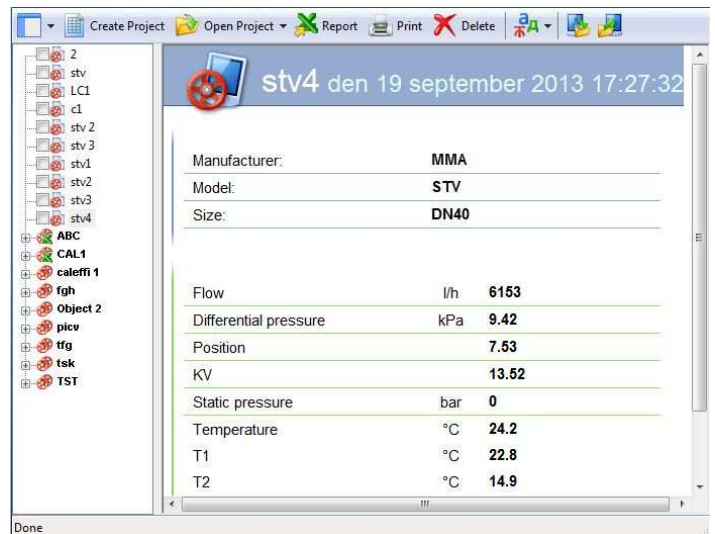
Tag the boxes to the left of the valve name, ABC_1 etc. Tap and drag the valves to chosen folder.

Click right at the tree area to create a new folder.



Project Handling & Set Value

Measurements are identified by their Category name and the valve ID.

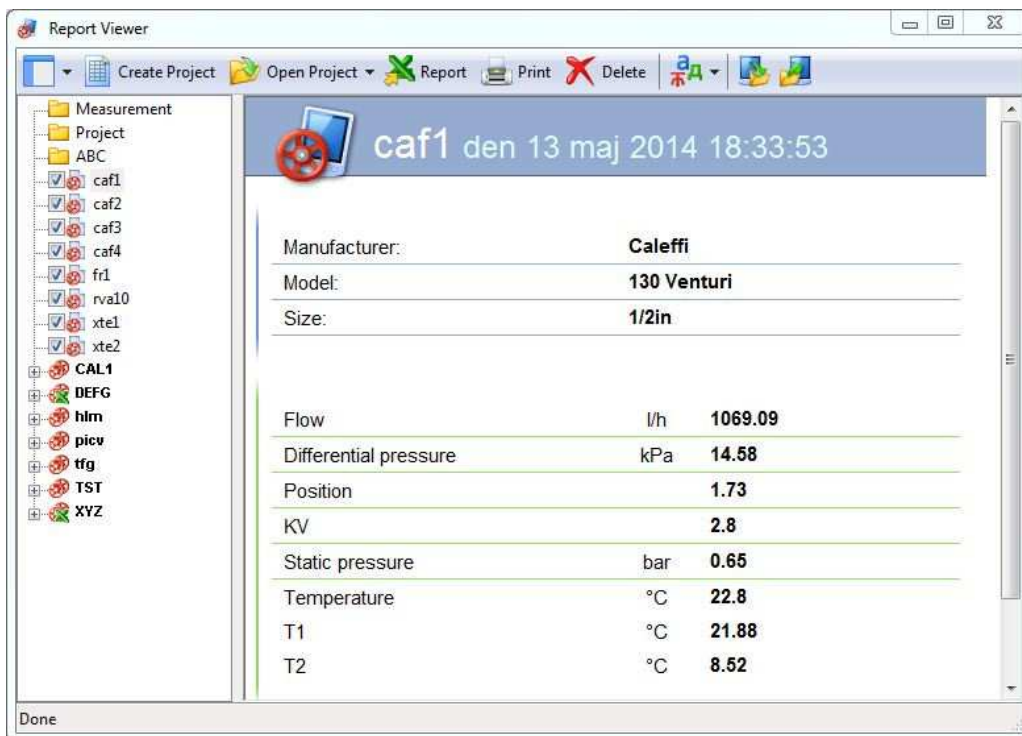


Project Handling & Set Value

After the field measurement has been done, synchronize the Android device/Mobile with the PC/Laptop and data will automatically transfer to the RV program.

To create the Excel Balance report tag the boxes at the ID icon of the specific Category and then click at Report at the top FV bar and a excel balancing report is opened..

To organize measurement in a tree structure, click right with the mouse at the RV list area to create a folder. Tap, tag and drag measurements into the folder.



The screenshot shows an Excel spreadsheet titled 'report.xls [Skrivskyddad] [Kompatibilitetsläge] - Microsoft Excel'. The spreadsheet contains a detailed balancing report with the following data:

Valve ID nr	Object	Name/place	Valve Type	Size DN	Dp kPa	Flow l/h	Position Turns	Kv	Dp kPa	Flow l/h	Position Turns	Kv	Terminal	Remarks	Manual
ca11			130 Venturi	1/2in		14,57961			14,57961	1069,0946	1,734742	2,8			
ca12			STV	DN10		13,13209			13,13209	795,020785	7,704528	2,193073			
ca13			Astra	DN15		1,164455			1,164455	274,371736	4,904329	2,5426			
ca14			Astra	DN32		0,563671			0,563671	686,96424	4,9	9,15			
fr1			Optima Compact	DN10 Low 2.5		13,21209			13,21209	150	0	3			
rva10			130 Venturi	1in		12,97065			12,97065	3471,65628	2,8	9,64	PK 40 kPa		
xte1			STV	DN25		0,862774			0,862774	320,632109	5,896074	3,451902			
xte2			STV	DN25		0,969642			0,969642	621,312699	7,873134	6,309638			

9. Two Sensor measurement

It is possible to handle and measure 2 sensors at the same time at one specific terminal, Smartphone/Tablet by using two different Application programs.

Open the Flex 2 App and connect it to sensor:1 and to a balancing valve within the system.

Tap the house Icon at the terminal, back to the Start screen of the terminal. The Flex 2 App is still running at the measurement menu.

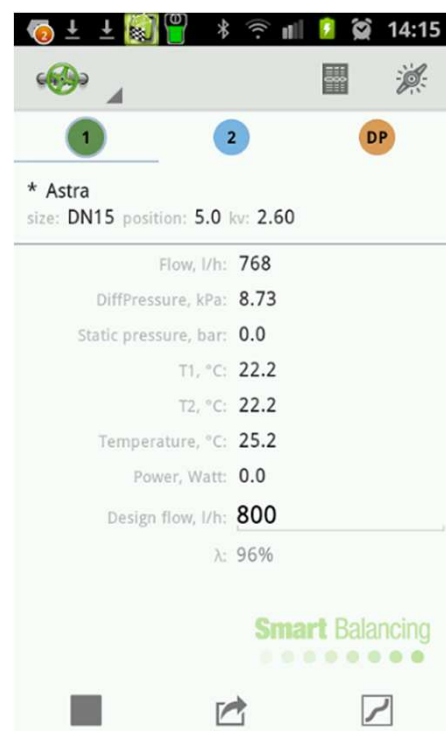
Tap the Flex 4 App and connect it to sensor:2 and to another balancing valve within the system.

Tap the house Icon at the terminal and then the Flex 2 Icon to switch back to the measurement menu of sensor:1.

Tap the house Icon at the terminal and then the Flex 4 Icon to switch back to the measurement menu of sensor:2

The terminal can't display two App screens at the same time, by using a two tap procedure it's possible to switch between two measurements.

Note: do not back-step out of a Application program, this terminate the Bluetooth connection. Use the terminal House Icon to switch between the App's.



10. Hand Terminals and accessories.

Using several Android devices

Any Android device having the Smart Balance Measuring program downloaded may use the same Sensor. This might be advantageous in an organization comprised by operators having their own Smart Phones.

For additional downloads please contact the supplier.



Accessories.

Smart Balancing offers extra accessories and parts. Please contact your supplier for information.



11. Upgrading and calibration.

Upgrading.

The Smart Balance App is programmed with data of most of the existing balancing valves on the market. The same data is also stored on the Smart Balancing CD; *Support, Valve Data*.

If you need to upgrade your App program with new valves data that can be done directly into the device and it's free of charge. The Flex 4 Application program is available at Google Play. If in doubt regarding the download procedure contact your supplier. The PC Suite support programs can also be downloaded at the Smart Balancing Products On-line Distribution Web site. The Product ID is BCF4 which must be written in the Product ID input box. The download is free of charge.



Calibration.

The EU has issued instructions and recommendations for calibration of this kind of instruments. On the Measuring Sensor there is a label indicating when the Instrument was calibrated last time and when it should be calibrated the next time. According to the AMA code, the date of calibration is to be mentioned in all balancing reports. Smart Balancing has of course the organisation to effect the necessary calibration as well as any other service of the instruments.



12. Warranty & Service

Smart Balancing Instrument AB offers up to 5 years warranty on Sensor. The condition for getting the benefit of the five years warranty is that the instrument is sent annually to Smart Balancing Instrument AB for necessary calibrations.

Our warranty conditions.

The warranty is valid for defects in construction, material or manufacture. During the warranty period, Smart Balancing Instrument AB undertake to remedy eventual defects by repair or exchange of product. In connection to such undertakings, the customer pays freight to Smart Balancing Instrument AB and Smart Balancing Instrument pays freight back to customer.

The warranty is valid on condition that:

- the defect has been reported to Smart Balancing Instrument AB
- purchase receipt or equal is enclosed
- the defect is not caused by negligence or erroneous/abnormal usage
- the defect is not caused by normal wear
- the instrument or parts of it have not been dismantled by a not authorized

workshop

Smart Balancing Instrument AB is not responsible for resulting damages that could occur as a consequence of an instrument function that has failed to appear.

The warranty does not comprise consumer goods such as batteries etc.

For service or/and calibration please send instrument to::

Smart Balancing Instrument SBI AB

Cedersdalsvägen 11

SE-186 40 Vallentuna

Tel: +46 8 – 514 306 96

e-mail: service@smartbalancing.com



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