

SMARTLOADCELL USER'S MANUAL

SmartLoadCells are wireless telemetric load cells that can be connected to Android smartphones via Bluetooth, and so the Smartphone will act as the display and the controller of the load cell. The SmartLoadCell application will transfer the phone to a very sophisticated precision measuring device.

General benefits of the SmartLoadCell concept:

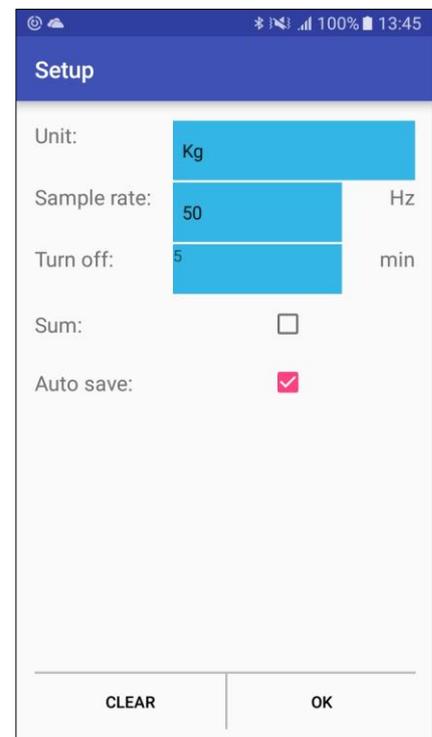
- Economical telemetric systems
- Smartphones have much bigger computing, graphical and memory capacity as any custom developed controller (and at lower cost)
- Smartphone can be used as background storage and stored data's are easy to transfer to pc via Bluetooth, wifi, internet or usb connection.
- SmartLoadCells are extra small and light.

GETTING STARTED

Application download: www.suretorque.eu / Useful information / Support / SLC-apk

System requirements: Android 4.4 or higher, 1 GB RAM, 1 GHz Processor.

1. Install the SmartLoadCell Android application on your device!
2. Start the application, then click "Add Cell" from the dropdown menu.
3. Touch the "Cell name" in cell, then select the device you want to connect from the list of the nearby Bluetooth devices. Then the application will get all the important SmartLoadCell parameters from the SmartLoadCell's memory (calibration data, load cell type, measuring range, etc.).
4. Repeat for all the devices wherewith you want to measure.
5. Personalize your settings (use point as decimal):
 - a) Select measuring unit
 - b) Select sample rate (6,25 - 400 Hz, recommended: 50-200 Hz)
 - c) Set turn off time (for automatic shut down after disconnecting, max. 120 min)
 - d) Check Sum if you want to sum all your cell's measurement datas.
 - e) Check Auto save box if you want to save all results automatic.

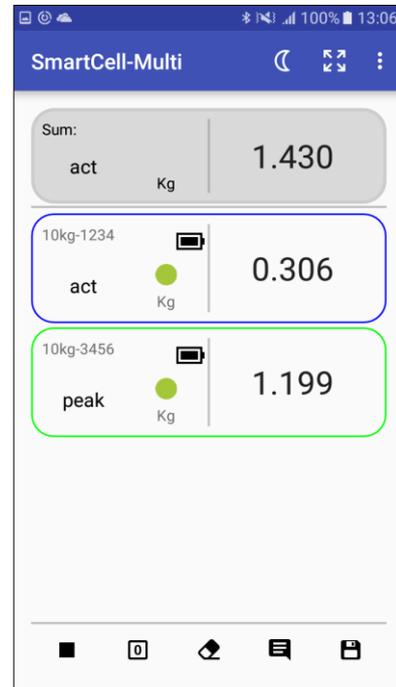


The screenshot shows the 'Setup' screen of the SmartLoadCell application. It features a blue header with the title 'Setup'. Below the header, there are several settings: 'Unit' is set to 'Kg', 'Sample rate' is set to '50' Hz, and 'Turn off' is set to '5' min. There are two checkboxes: 'Sum' is unchecked, and 'Auto save' is checked. At the bottom of the screen, there are two buttons: 'CLEAR' and 'OK'.

Before doing a test make sure that you use all the cells you added! Unused cells can cause issues. Delete the unnecessary ones by long press on the right hand side of the cell.

DOING A TEST

1. Make sure the unloaded value is 0. If not, hit (tare) button
- ▶ 2. Tap on the button to start recording
3. Perform your test. The recording last until hitting the button
4. After the test you may add a comment to the test. You can also add the same comment to more test with checking "Remember"
5. You may save the result with the button (unless you have set auto save)



FURTHER FEATURES

Hiting each cell's act or max will show either the actual or the maximum measurement value of the SmartLoadCell.

 The button on the Toolbar can increase the size of the cells for better view, if you have only one or two SmartLoadCell connected.

You can turn the main screen to nightmode with the  button for better vision at night(It affects only the main screen).

 The button on the main screen will clear the maximum values.

CLEAR button on the SETUP screen will clear all the setup parameters including the SmartLoadCell pairing.

Menu/History – All saved results can be reviewed. Results can be deleted one by one (or in bulk with hitting the trash button longer). Diagrams can be scrolled and zoomed.

Menu/Export to XML will create an export_11111_22222.xml file in the Download folder of your android device. Download file can be forwarded to PC via Bluetooth, email, internet or USB cable.

Status LED – Status LED has 3 states:



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- Green flashing – unit is ready to use, but unconnected
- Blue flashing – unit connected
- Red - charging

Shutting down the SmartLoadCell – To turn off select the turn off button on the main screen or keep the power button pushed for 10 seconds on the SmartLoadCell unit.

Charging – SmartLoadCells can be charged with any micro USB charger. While charging the status led on the unit will be red. Battery state can be monitored by hitting the battery icon on the main screen. Battery is enough for about 10 hours of operation. Please note that when battery is almost discharged, it is possible that you experience some spikes in the measurement. It is recommended not to discharge batteries under 10%.

On the PC - the included data manager program can:

- Convert results to csv-file (excel compatible)
- Display the results with diagrams

DATA MANAGER PROGRAM

Data manager program for pc can be downloaded in zip form from:

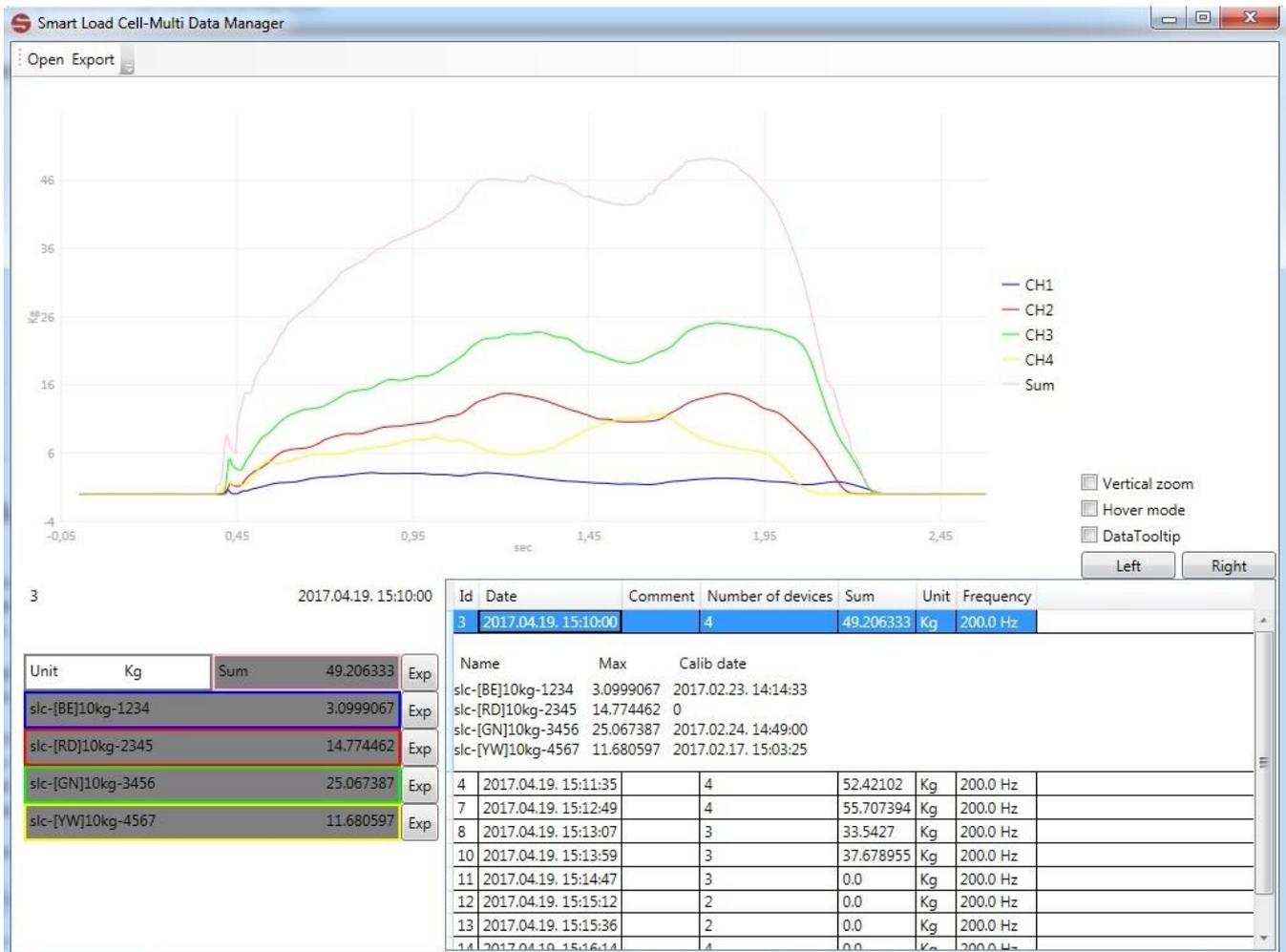
www.suretorque.eu / Useful information / Support / SLC_DAQ_1.0

link: http://www.suretorque.eu/userfiles/SLC_DAQ_1_0.ZIP

After opening an export.xml file, you can create a csv from the results with the Export menu.

With the program you may view all the measurement results saved in the xml. Individual results of each device can be export to csv with the Exp button at the end of each row.

You can zoom in or pan the diagram, but make sure before do them, to turn off the Hover mode and DataTooltip, because they can cause performance issues. Also for the best performance, turn off the diagrams you are not interested in by clicking on the device name at the left bottom part of the screen.



On the right bottom part of the window you can see a table. It lists all the measurements in the xml. By clicking on a row it shows more details, while double click on it will load the diagram of the measurement.

CALIBRATION

Load cells should be calibrated generally every year. Frequency of the calibration may be higher or lower upon the application and the stress of the load cell. If the measured values are outside of the tolerance range during the calibration, the load cell should be recalibrated.

Recalibration with loads:

1. Make sure all the calibration accessories are present and the SmartLoadCell is in the calibration position
2. Connect with only ONE Cell you want to calibrate. Delete all other cells
3. Enter the Calibration menu with typing the calibration password
4. Make sure the UNIT and the FULL LOAD are set correctly
5. Apply the +MAX load and press OK



6. Remove load and press OK again
7. If your SmartLoadCell requires negative load calibration too, repeat the last 2 steps with the negative load calibration too!

Advanced recalibration with mV/V values:

1. Enter the advanced load calibration password
2. Make sure the UNIT and the FULL LOAD are set correctly
3. Enter the provided mV/V value to the +MAX, +ZERO (and -MAX, -ZERO if provided)!
4. Hit Save to save the modified calibration data's!

Calibration password: _____

Advanced calibration password: _____

UNITS AND CONVERSATION

TORQUE

inlb: inch-pound

ftlb: foot-pound

Nm: Newton-meter

dNm: deci newton-meter - 0,1 Nm

Ncm: Newton-cm, - 0,01 Nm

LbfIn	LbfFt	Nm	dNm	Ncm	KgfcM
1	0.083	0.113	1.13	11.3	1.1521
12	1	1.356	13.56	135.6	13.8255
8.851	0.738	1	10	100	10.1972
0.885	0.074	0.1	1	10	1.0197
0.089	0.007	0.01	0.1	1	0.1020
0.86796	0.072	0.09807	0.98066	9.80661	1

FORCE

N: Newton

Lb: Pounds force

Kg: Kilograms force

T: Ton

N	Kg	Lbf	Ton
1	0.102	0.225	0.0001
9.807	1	2.205	0.001
4.448	0.454	1	0.00045
9806.81	1000	2204.6	1

TROUBLESHOOTING

SmartLoadCell unit connected, but it seems not measuring:

It may happen that the pairing is not successful at the first time. In this case disconnect and connect again.

If it won't help: enter MENU/SETTINGS and CLEAR the settings, then select Smart Cell again and wait until the cell data's are uploaded (Range value will be filled and status led turns from green to blue)



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measuring anything, anywhere

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Application was developed with English language settings. If you experience malfunction with different language setting, close the application, change language to English and run the application again.

SmartLoadCell application freezes – Enter settings/apps in on your Android device and force stop the application. If this doesn't help it is recommended to uninstall the application and then reinstall it again.

MAINTENANCE

SmartLoadCells are precision measuring devices, handle them with care! In normal case SmartLoadCells will not require any preventive or systematic maintenance.

Battery is to be changed if it wears out. Battery type: Nokia BL-5C, 1000 mAh. Battery is located under the cover of the SmartLoadCell unit. If cover is sealed, pay attention on sealing it with clear silicone when reclosing the cover!

ENJOY THE FREEDOM OF TELEMETRY!