

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, 4 GB ROM

Application can be used both with 1 and 2 channel SmartLoadCell systems. By 2 channel systems both channels must be configured and a primary channel must be selected.

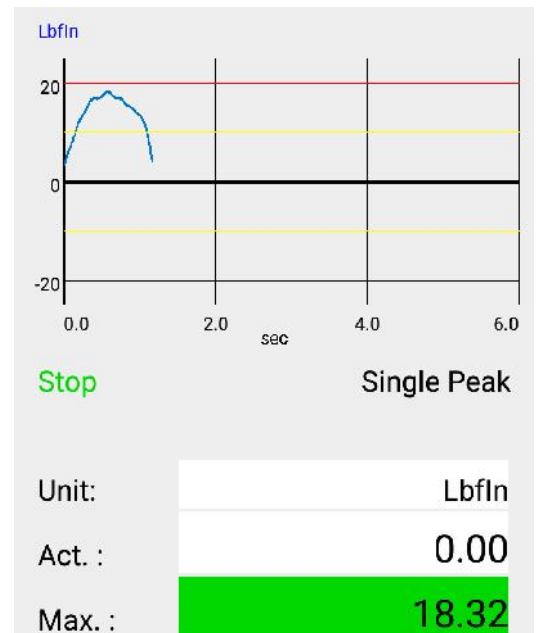
1. Install the SmartLoadCell Android application on your device!
2. Pair your SmartLoadCell with your device and connect. When pairing, all the important SmartLoadCell parameters will be uploaded to the phone from the SmartLoadCell's memory (calibration data, load cell type, measuring range, etc.)
3. Personalize your settings (use point as decimal):
 - a. Choose measuring mode



Continuous – records all measuring points from start to stop

Result: maximum value.

This mode is ideal for monitoring longer procedures with several peaks

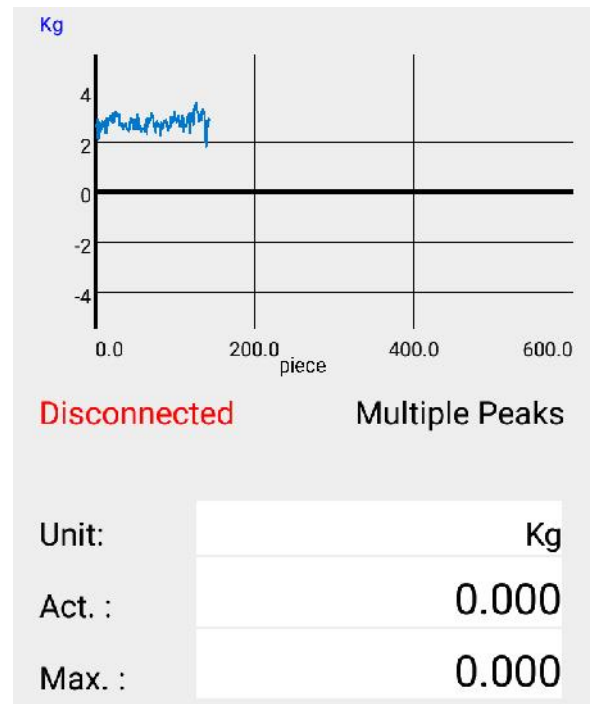


Single peak – Measurement stops automatic after the 1st peak.

Result: maximum value

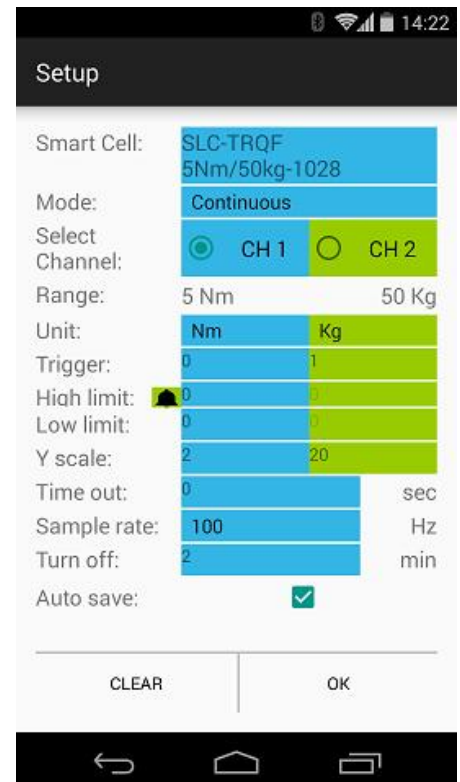


Double peaks – Measurement stops automatic after the 2nd peak.
Results: Max1, Max2



Multiple peaks – Records only the maximum values of the test cycles – 1 test cycle is represented by 1 point on the diagram. This test is generally used for testing hundreds of cycles
Result: maximum of the peaks

- b. Select measuring unit
- c. Set trigger level – Trigger level is a load level that starts and stops the measurement recording - "start-stop signal" of the measurement. As long as the measured value is under the trigger, recording will not be started. Measurement will be stopped (or paused), if the measured value drops under the trigger level. Recommended level is between 2-15% of the expected maximum value.
- d. If you need range checking, set high and low limits. Values will be displayed with different colors:
 - blue – under range
 - green – in range
 - red – over range
 (by 2-channel unit select the "primary" channel too)





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It is possible to switch on a sound signal for the exceeding of the high limit with the ring button.

- e. Set time out (relevant only in double peaks mode) – This time defines how long the instrument waits for the start of the second peak's measurement. If time out elapses without value over the trigger, MAX2 will be 0.
- f. Set Y scale for the diagram's scaling (default setting is the maximum of the cell, recommended value is a little above your expected maximum)
- g. Select sample rate (6,25 – 400 Hz, recommended: 50-200 Hz)
- h. Set turn off time (for automatic shut down after disconnecting)
- i. Check Auto save box if you want to save all results automatic

DOING A TEST

1. Make sure the unloaded value is 0. If not, hit TARE button
2. Tap the diagram area to start recording
3. Perform your test
Continuous and multiple tests can be stopped by tapping the diagram area again. Single and Double peak tests will be stopped automatically.
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 save button (unless you have set auto save)

FURTHER FEATURES

CLEAR button on the main screen will clear the screen

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:

- 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
- Make statistical analysis of the results
- Create report from the individual results or from the statistical analyses

DATA MANAGER PROGRAM

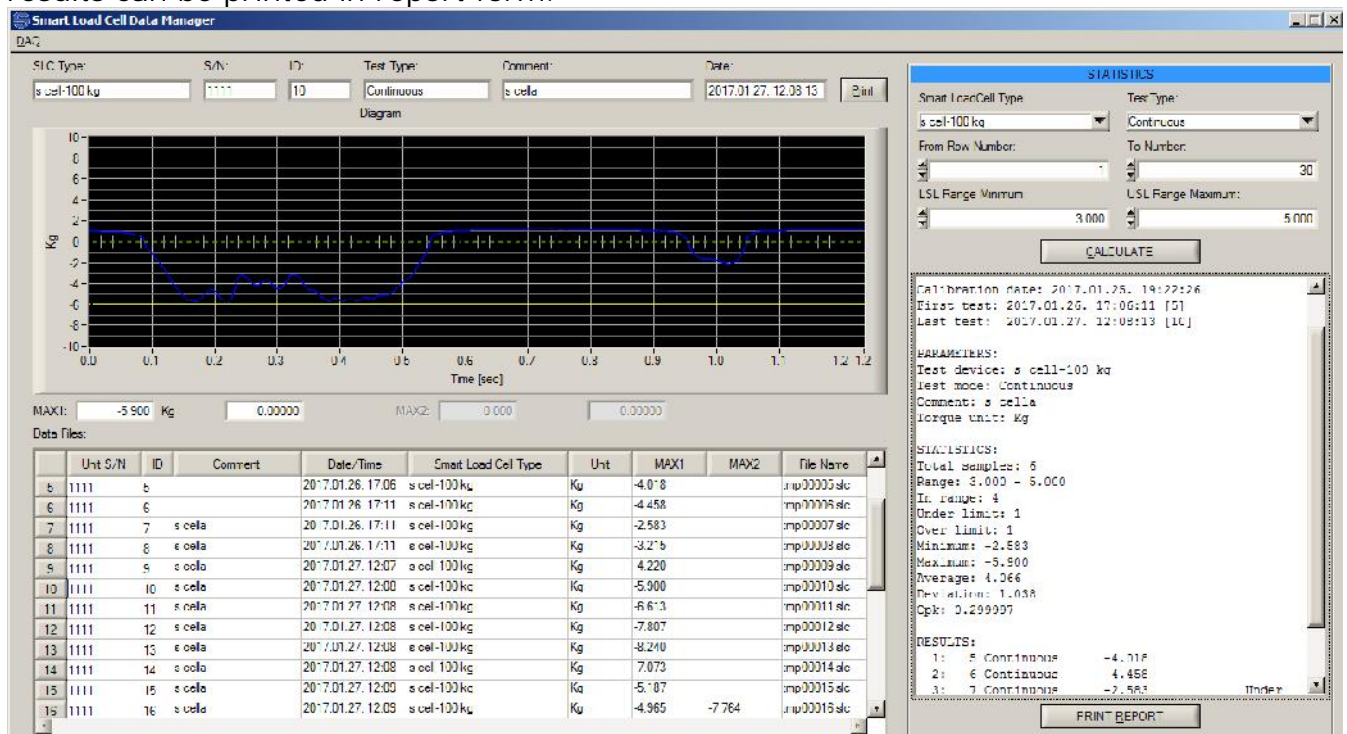
Data manager program for pc can be downloaded in zip form from:

www.suretorque.eu / Useful information / Support / SLC_DAO_1.1

link: http://www.suretorque.eu/userfiles/SLC_DAO_1_1_0.ZIP

When opening an export.xml file, a csv file will be created from the results.

With the program you may view all the measurement results saved in the xml. Individual results can be printed in report form.



On the right side of the window you can select and filter the results and make statistics on the filter. Statistics can be printed in report form as well.

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. Enter the Calibration menu with typing the calibration password
3. Make sure the UNIT and the FULL LOAD are set correctly
4. Apply the +MAX load and press OK



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5. Remove load and press OK again
6. 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

Lbfl n	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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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!