

SMARTLOADCELL USER'S MANUAL

Smart Load Cell TRQ1/TPL torque / top load tester family



Serial numbers:

TRQ1 torque tester: ST-E.....

TPL-..... Top Load tester: ST-E.....

Date of purchase:

Warranty: 3 years

TRQ1 TORQUE- AND TPL TOP LOAD TESTER KIT



INSTALL

Download: [www.suretorque.eu / Support / Downloads / SmartLoadCell_Single - v_1.9.1 - apk](http://www.suretorque.eu/Support/Downloads/SmartLoadCell_Single-v_1.9.1-apk)

http://www.suretorque.eu/media/wysiwyg/download/slc_s_v1.9.1.apk

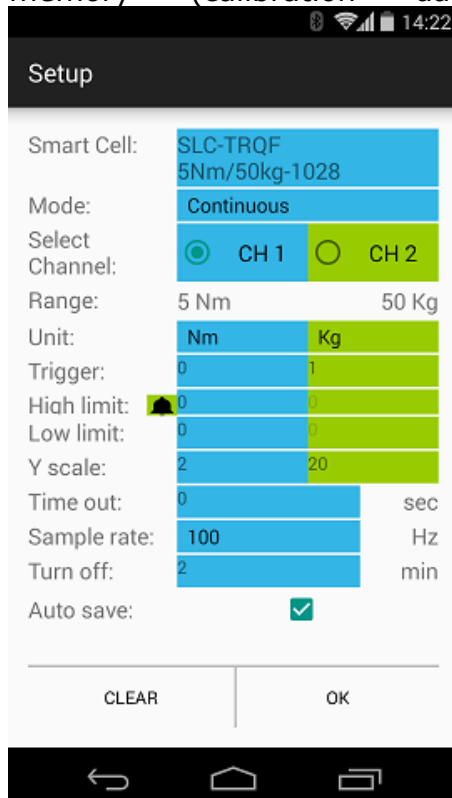
System requirements: Android 4.4 or higher, 1 GB RAM, 1 GHz Processor, 4 GB ROM

Install the SmartLoadCell Android application on your device!

SETUP – QUICK OVERVIEW

Personalize your settings: Enter menu / setup

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.)



RECOMMENDED SETTINGS:

TPL1	TRQ1
Single peak	Chuck torque: continuous Cap release: single or double p
kg	Lbfin
1 - 3	0.5 - 3
optional	optional
optional	optional
30 kg	25 Lbfin (20-30)
-	2 - 5 - in double peak only
100 - 400	100 - 400
5 - 30	5 - 30

TPL3 & TPL4 SETUP

TPL3&TPL4 are having digital displacement control. This means that the displacement of the unit is measured and a displacement stop trigger can be defined for the test.

We recommend to use TPL3&TPL4 with the following settings:

 <p>Smart Cell: SLC-[RD]-TPL3-30kg-1149 Mode: Single Peak Select Channel: CH 1 Range: 30 Kg 10 mm Unit: Kg mm Trigger: 1 High limit: 0 Low limit: 0 Y scale: 30 10 Time out: 0 sec Sample rate: 100 Hz Turn off: 2 min Auto save: <input type="checkbox"/> Advanced: <input type="checkbox"/></p>	<p>TPL3 / TPL4</p> <p>Single peak</p> <table border="0"> <tr> <td>Kg</td> <td>mm</td> </tr> <tr> <td>1-3</td> <td>-</td> </tr> <tr> <td>optional</td> <td>-</td> </tr> <tr> <td>optional</td> <td>-</td> </tr> <tr> <td>30</td> <td>10</td> </tr> <tr> <td>-</td> <td>-</td> </tr> <tr> <td>100-400</td> <td>100-400</td> </tr> <tr> <td>5-30</td> <td>5-30</td> </tr> <tr> <td>optional</td> <td>optional</td> </tr> <tr> <td>YES</td> <td>YES</td> </tr> </table>	Kg	mm	1-3	-	optional	-	optional	-	30	10	-	-	100-400	100-400	5-30	5-30	optional	optional	YES	YES	 <p>Advanced Setup</p> <p>Send to: Not selected yet Stop on: Displacement Stop trigger: 2 mm</p>	<p>Advanced setup -</p> <p>Displacement</p> <p>2-4 mm</p>
Kg	mm																						
1-3	-																						
optional	-																						
optional	-																						
30	10																						
-	-																						
100-400	100-400																						
5-30	5-30																						
optional	optional																						
YES	YES																						

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 stop 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" field in the comment window
5. You may save the result with the save button (unless you have selected auto save)

TRQ1

When changing adapters on the TRQ1 (cap fitment support or neck fitment) the mounting bolt torque should be 1.5-2 Nm!

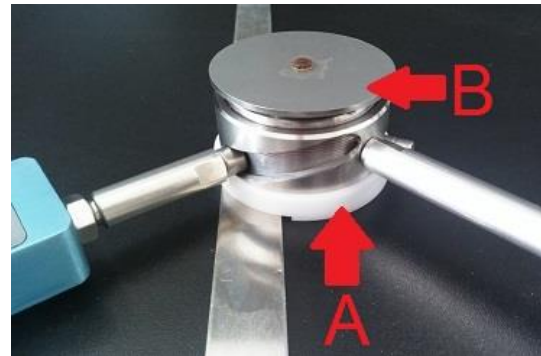
TPL

When testing with the TPL make sure the TPL unit is in level and centered!

- Never lay the TPL unit directly on the spikes to avoid the erosion of the spikes – use plastic or aluminum spacers like the ones we provide:



Flat base disc



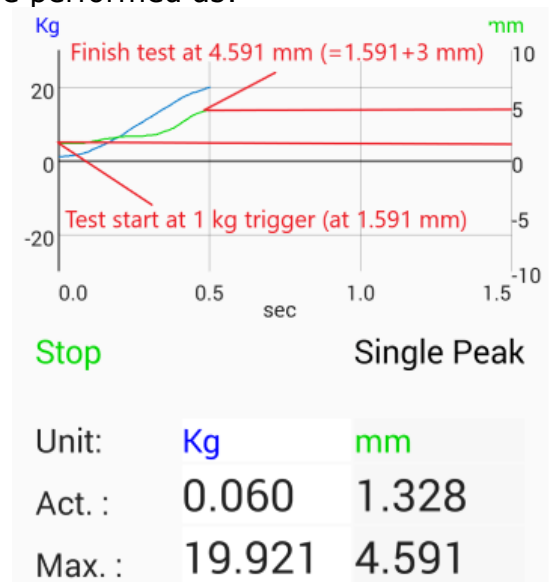
Stepped base disk (A)
Head plate (B) for bigger chucks

- Usually there is about 1 mm height difference between the starwheel and the neck guide – This difference must be equalized with spacers under the TPL unit
We recommend to use 2 plastic spacers, whereof the one that comes on the spike is 1 mm thinner.

TPL3&TPL4

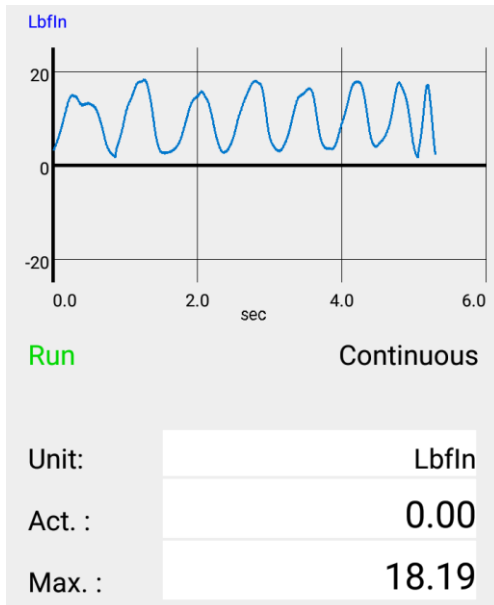
With the above settings of the TPL3&4 the test will be performed as:

- Tap the graph area to start the test
- When starting to lift the chuck the test will be started when force exceeds the FORCE TRIGGER (eg. 1 kg) and this triggers the start of the displacement measurement.
- When the displacement is changed by the preset Stop trigger displacement (eg 3 mm – set in the Advanced setup) the measurement is stopped
- Force result is going to be the Force measured at the maximum preset displacement (2 mm in our example)
- During the test you will see that the test let say at 1,5 mm and will be stopped at 4,5 mm

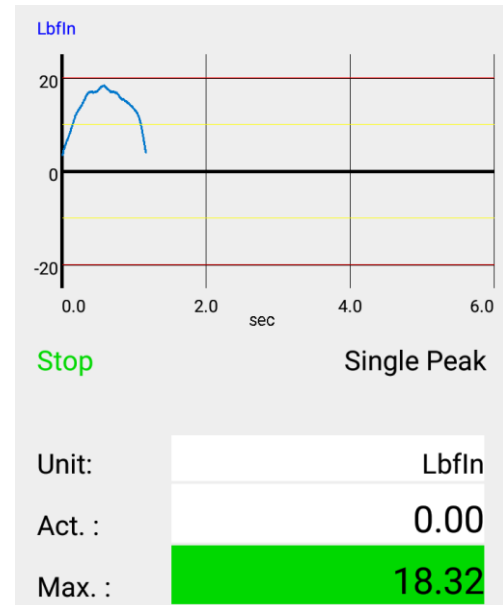


SETUP – A LITTLE MORE IN THE DETAILS

Measuring modes:



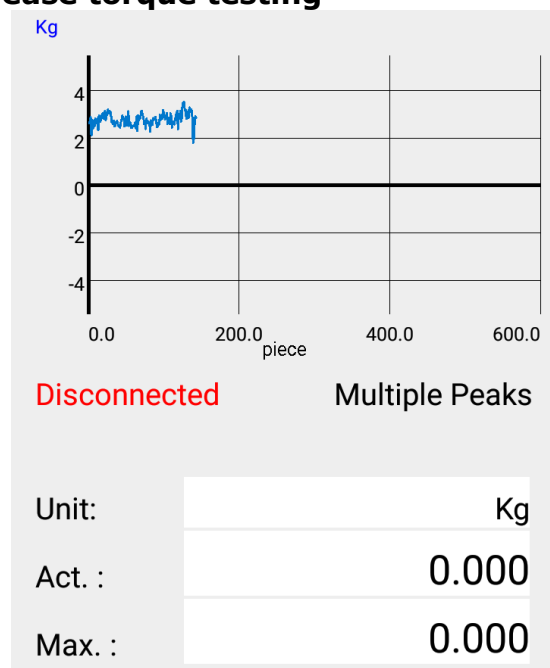
Continuous – records all measuring points from start to stop
Result: maximum value.
This mode is ideal for monitoring longer procedures with several peaks **as chuck torque testing**



Single peak – Measurement stops automatic after the 1st peak.
Result: maximum value
This mode is ideal for monitoring short procedures with only 1 peak **as cap release torque testing**



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

This mode is ideal for monitoring short procedures with 2 discrete peaks **as cap release and warranty ring break torque testing**

diagram. This test is generally used for testing hundreds of cycles
Result: maximum of the peaks

1. Select measuring unit
2. 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. 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)
It is possible to switch on a sound signal for the exceeding of the high limit with the ring button.
3. 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.
4. 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)
5. Select sample rate (6,25 – 400 Hz, recommended: 50-200 Hz)
6. Set turn off time (for automatic shut down after disconnecting)
7. Check Auto save box if you want to save all results automatic

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.

Status LED – Status LED has 3 states:

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

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.

SHUTTING DOWN

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

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%.

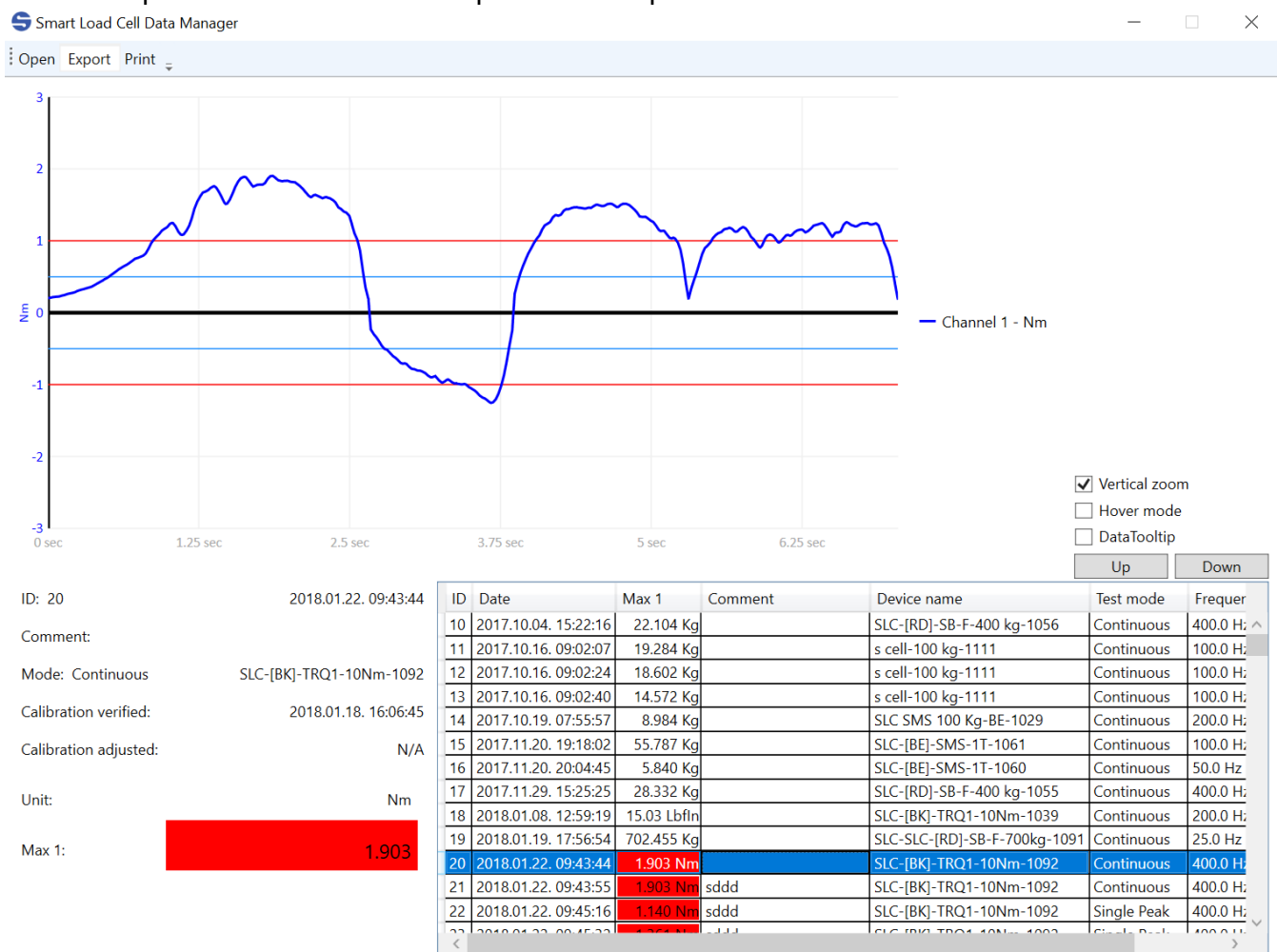
DATA MANAGER PROGRAM

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

[www.suretorque.eu / Useful information / Support / SLC_DAQ_1.1](http://www.suretorque.eu/Useful%20information/Support/SLC_DAQ_1.1)

link: http://www.suretorque.eu/media/wysiwyg/download/SLC_Single_DAQ_2_1_2.zip

With the program you may view all the measurement results saved in the xml. Results can be exported in csv format or printed in report form.

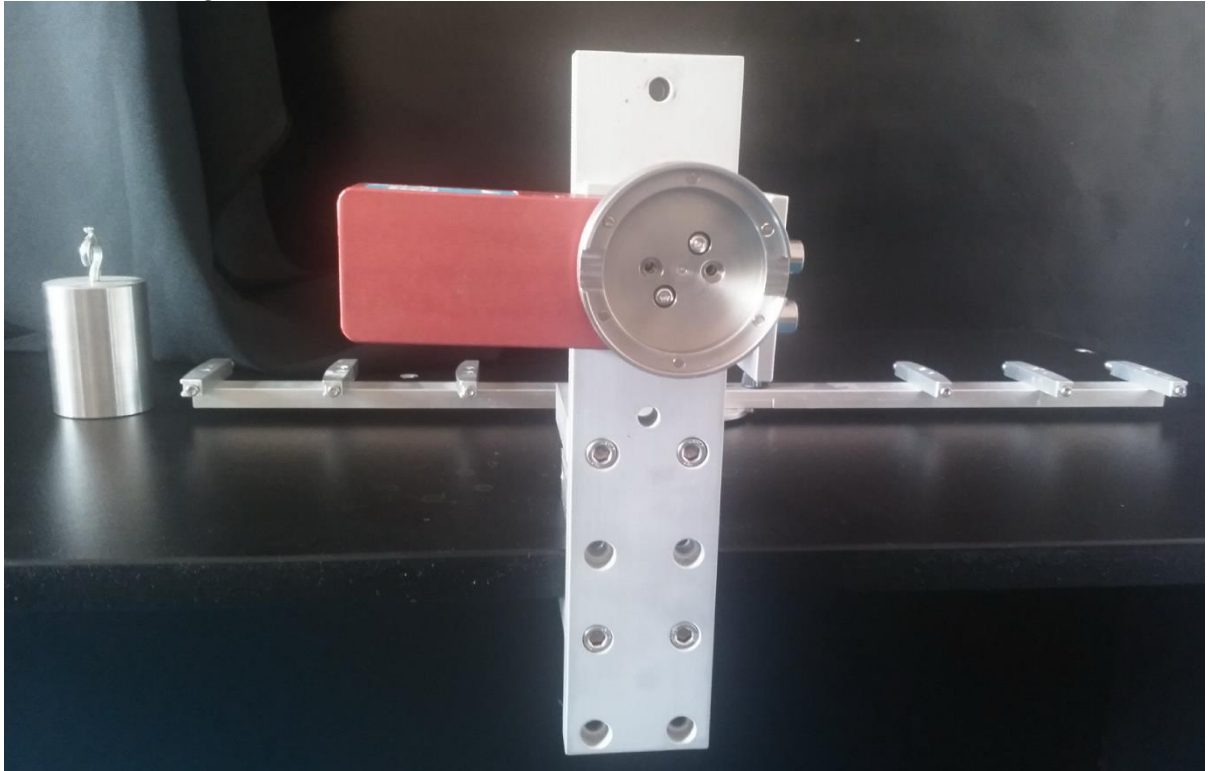


CALIBRATION

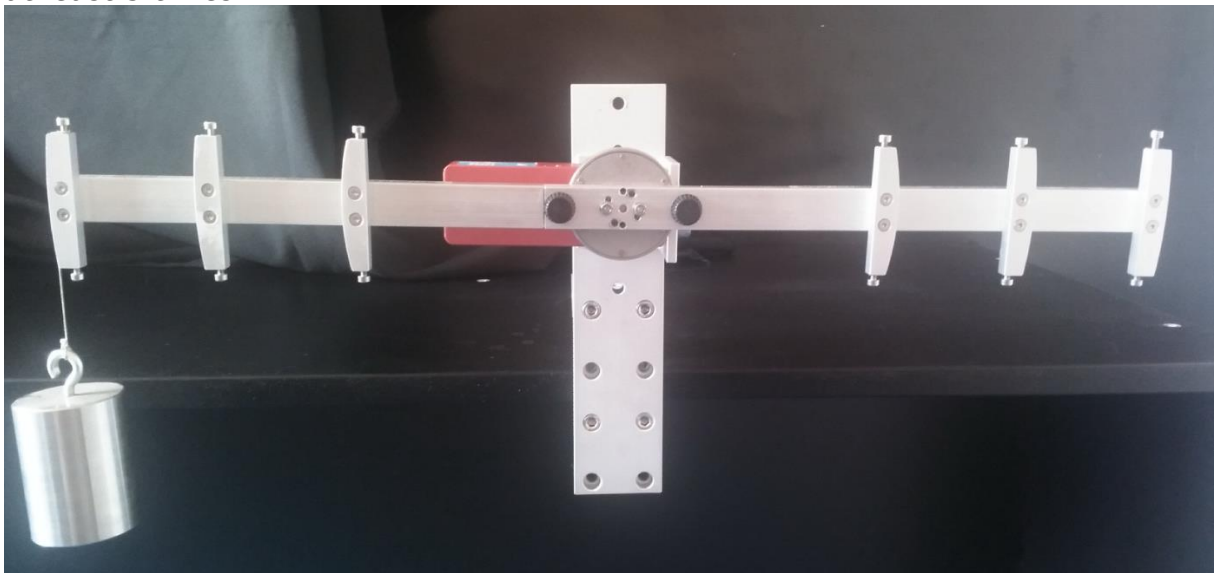
Load cells' calibration should be generally checked (verified) every year. Frequency of the calibration check may be higher or lower upon the application and the stress of the load cell. Load cell must be recalibrated only in the case, if the measured values are outside of the tolerance range during the calibration check.

Calibration check / calibration of the TRQ1:

1. Assemble the calibration kit
2. Mount the TRQ1 on the calibration stand



3. Apply the calibration bar in the place of the torque fitment. Mounting bolt torque: 1.5-2.0 Nm
4. Stress the load cell first – apply about 20 LbIn(2Nm) torque changing to both direction for 5-6 times
5. Make sure the unloaded torque reading is 0 – if not, hit TARA
6. Apply torque by hanging the weight on both sides to different positions and repeat at least 3 times



7. If the measured values are within the tolerance range (+/-1%), calibration is ok. If not, load cell must be recalibrated

Recalibration with loads:

1. Make sure all the calibration accessories are present and the SmartLoadCell is in the calibration position
2. Set sample rate to 50Hz
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: 10562348

Advanced calibration password: _____

UNITS & 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)

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.

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.

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!

CONTACT

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