SMARTLOADCELL USER'S MANUAL

Smart Load Cell TRQ4
manual desktop torque tester

Serial numbers:

TRQ4 torque tester: ST-E……

Date of purchase: …………………...

Warranty: 3 years

TRQ4 DESKTOP TORQUE TESTER

Download: www.suretorque.eu / Support / Downloads / SmartLoadCell_Single application – v_1.14.5 – apk
http://www.suretorque.eu/media/wysiwyg/download/slc_v1.14.5.apk
System requirements: Android 6.0 or higher, 1 GB RAM, 1 GHz Processor, 4 GB ROM
Install the SmartLoadCell Android application on your device!
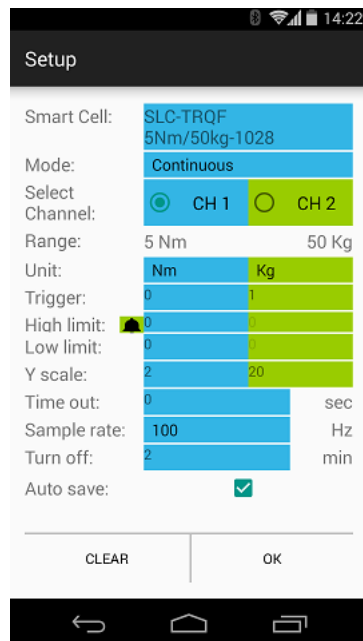
SETUP – QUICK OVERVIEW

To turn on your TRQ4 device, press and hold the power button on the label on the left side. The green LED with start blinking once it has turned on.

TRQ4 torque testers have built in LCD screens. They display the current and the peak values (Actual and Maximum). To change the setup of the screen, connect your device to an Android smartphone using the SmartLoadCell application.

Personalize your settings: Enter menu / setup
Pair your SmartLoadCell with your device and connect (SLC app / Settings menu). The blue LED will start blinking after a successful connection, then all the important SmartLoadCell parameters will be uploaded automatically to the phone from the TRQ4's memory (calibration data, load cell type, measuring range, etc.)

			RECOMMENDED SETTINGS
Smart Cell:	SLC-TRQF 5Nm/50kg-1028		TRQ4
Mode:	Continuous		single peak / double peaks (continuous)
Select Channel:	⦿ CH 1	◯ CH 2	
Range:	5 Nm	50 Kg	
Unit:	Nm	Kg	Lbfln (or any other)
Trigger:	0	1	1-3 Lbfln
High limit:	🔔 0	0	optional
Low limit:	0	0	optional
Y scale:	2	20	cca 25 Lbfln
Time out:	0	sec	2-5 sec (for double peaks mode)
Sample rate:	100	Hz	100-400 Hz
Turn off:	2	min	5-30
Auto save:	☑		

After pressing OK button, all the changes will apply on the phone and on the device's screen too. For example when changing the measuring unit, or measuring Mode.

LCD SCREEN FEATURES

The built in LCD screen is designed to show the most important information in a similar way as in the Android application. Only a few initial settings are needed (measuring unit, trigger, high and low limits, sample rate, and turn off time), and then the device is ready to be used without the smartphone as well.

Touchscreen functions:

- Press the **Conti/Peak** button to change between Continuous and Single Peak modes

- Press the **Run/Stop** button or the **middle of the screen** to start / stop a test

- Battery icon indicates the battery charge level

- Press **rotate icon** to rotate screen upside down.

- If high and low limits are set, results will be colored accordingly (see later)

- Press and hold the **middle of the screen** for at least 1 second, to **tare** the actual value

1. Set clamping fingers to the diameter of your sample. Make sure clamping fingers are set symmetrical to ensure centered grip of the container. TRQ4 is aquiped with quick lock clamping table that enables super quick sample change:


Hold   Released

2. Make sure the unloaded value is 0. If not, hit **TARE** button, or press and hold the middle of the touchscreen for at least 1 second (on TRQ3).
3. Tap the diagram area to start recording.
4. Perform your test
   Continuous and multiple tests can be stopped by tapping the diagram area again. Single and Double peak tests will stop automatically.
5. After the test you may add a comment to the test (on the phone). You can also add the same comment to more tests with checking "Remember" field in the comment window and with selecting "auto index" you can even add an increasing index to the same comment
6. You may save result with the save button (unless you have selected auto save). In auto save mode results will be saved automatically if TRQ4 is connected to the phone.

Measuring modes:

Run   Continuous

Unit:	LbfIn
Act. :	0.00
Max. :	18.19
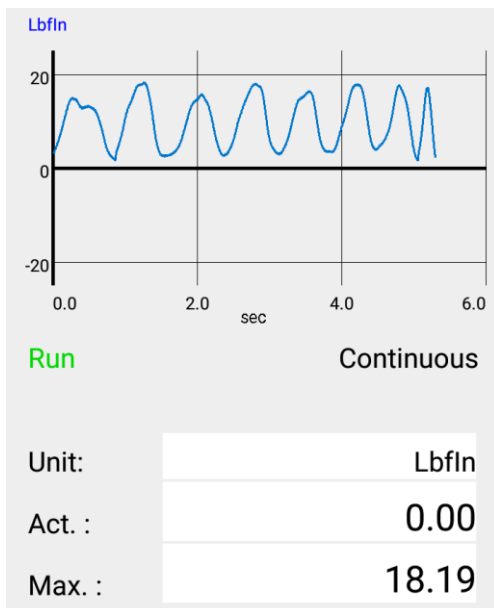
**Continuous** – records all measuring points from start to stop
Result: maximum value.
This mode is ideal for monitoring longer procedures with several peaks **as chuck torque testing**

Stop   Single Peak

Unit:	LbfIn
Act. :	0.00
Max. :	18.32
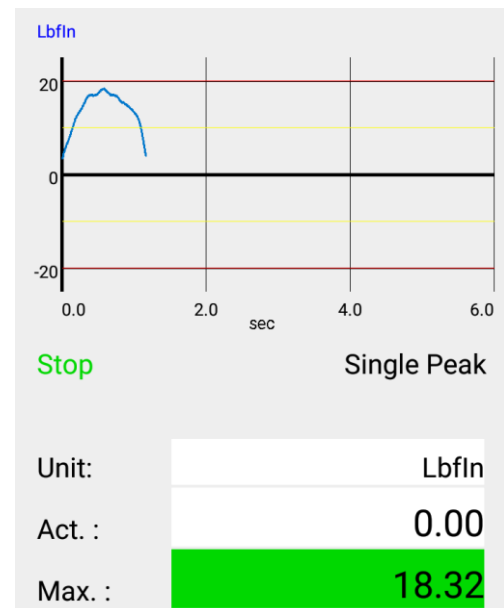
Single peak – Measurement stops automatic after the 1st peak.
Result: maximum value
This mode is ideal for monitoring short procedures with only 1 peak **as cap release torque testing**

Stop   Double Peaks

Unit:	LbfIn
Act. :	0.00
Max. 1:	13.94
Max. 2:	9.22
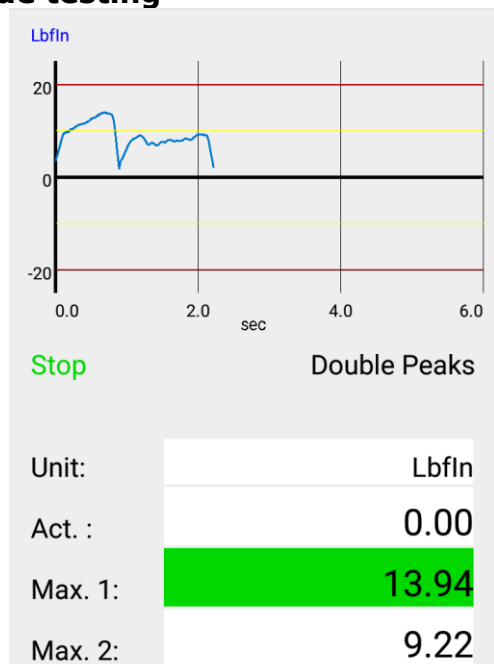
Double peaks – Measurement stops automatic after the 2nd peak.
Results: Max1, Max2
This mode is ideal for monitoring short

Disconnected   Multiple Peaks

Unit:	Kg
Act. :	0.000
Max. :	0.000
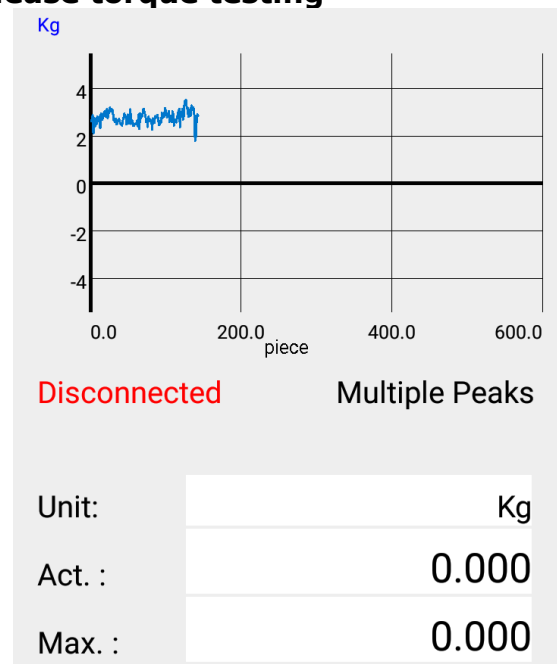
Multiple peaks – Records only the maximum values of the test cycles – 1 test cycle is represented by 1 point on the diagram. This test is generally used for

procedures with 2 discrete peaks **as cap release and warranty ring break torque testing**

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). For the TRQ3 displayed model it also means a standby time. If the touchscreen is not touched for the set time interval, the device will automatically turn off.
7. Check Auto save box if you want to save all results automatically. The Android application will also save those measurements, which were started on the touchscreen of the TRQ3 (if the device is connected, and auto save is on).

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. Once the charging is finished, the red LED will turn off. 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%.

Attention! Please always fully charge your device when putting it away for a longer period.
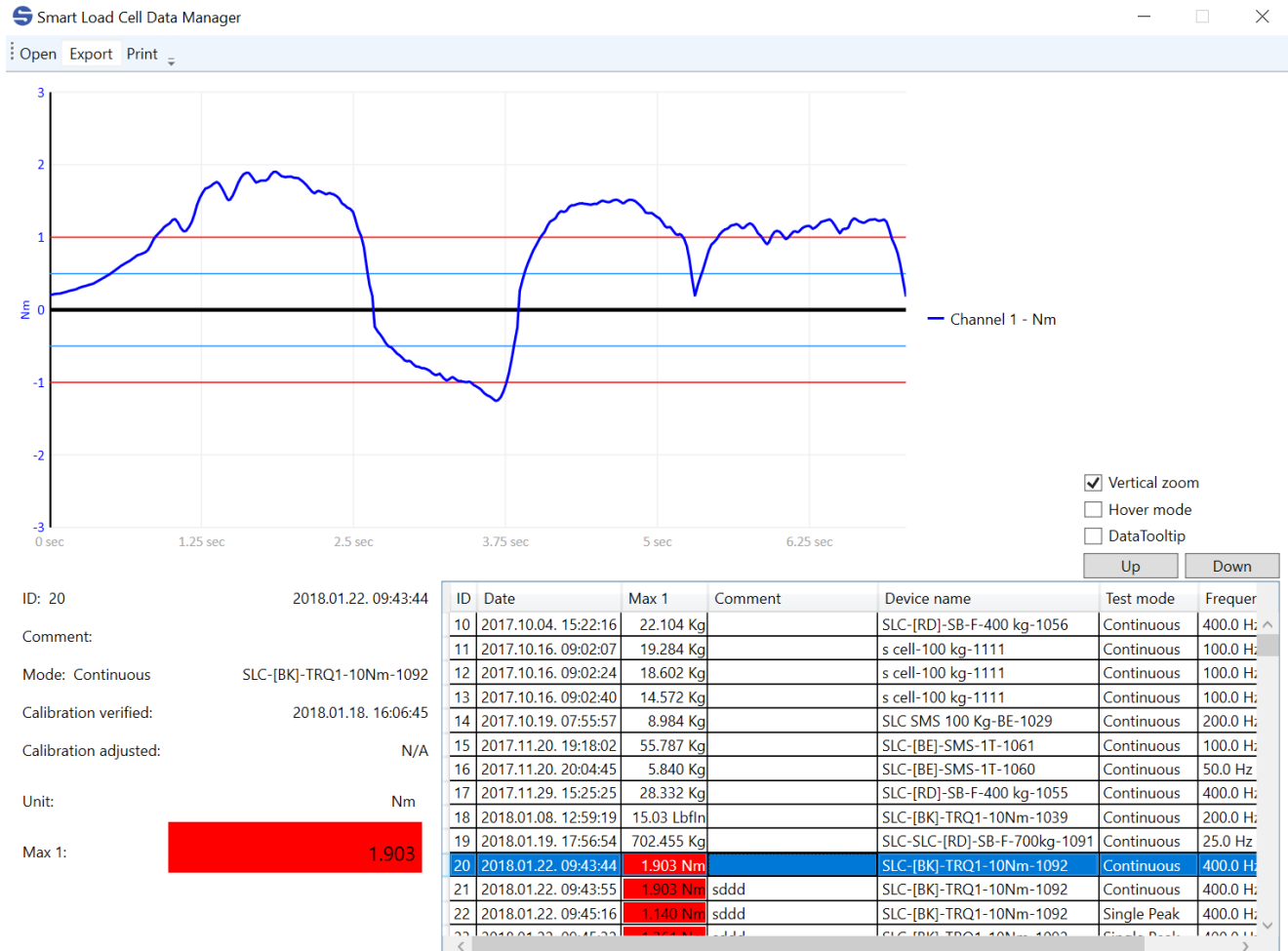
DATA MANAGER PROGRAM

Data manager program for pc can be downloaded in zip form from:
www.suretorque.eu / Useful information / Support / SLC_DAQ_1.1
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 TRQ3:
1. Assemble the calibration kit
2. Mount TRQ4 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 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: 84326501

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 is 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

SmatLoadCells are precisions 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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