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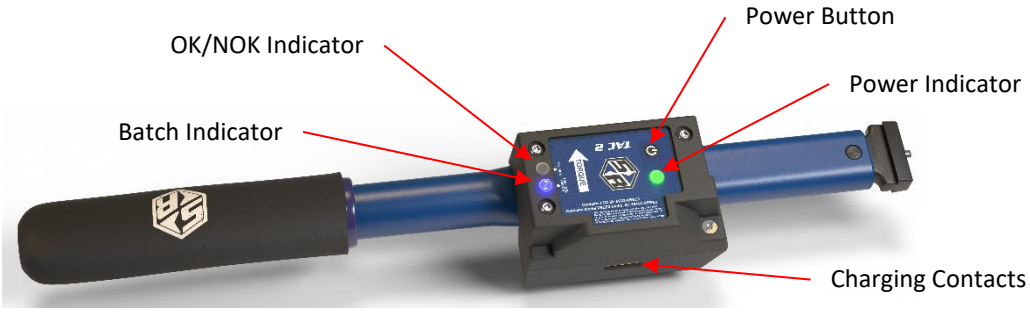
TAC2 FM 2.4 GHz Wireless Click Wrench
Operating Instructions

Sturtevant Richmont TAC2 FM 2.4 GHz click wrenches are designed and manufactured to provide consistent torque application in multiple manufacturing and maintenance applications. They meet or exceed the requirements of ASME B107.300 and ISO 6789. This tool is designed with an integrated rechargeable battery. The battery is recharged by placing the tool on the charger.

Features

Bidirectional Measurement (Mechanical click in clockwise direction only.)
Traceable Results with Global 400, Global 400mp, and TCVe2
Two Modes of Operation: Peak Torque and Torque with Angle Monitoring (TAM)
Three Indication LEDs: OK/NOK, Batch/Tool Selector, and Power



Accuracy

Torque: CW +/-4% and CCW +/-6% of the preset value from 20% to 100% of rated capacity.
Angle: +/-1° at angular velocity > 10°/sec < 180°/sec.

Environmental Conditions

This tool is intended for indoor use.
Operating/Storage Temperature: 32°F to 122°F (0°C to 50°C)
Operating/Storage Maximum Relative Humidity: 95% non-condensing
Maximum Altitude: 2000 meters

Electrical Ratings

Tool Battery Voltage: 1.2 V ⎓ 1 A Max.

Important User Information

The user shall consult this documentation in all cases where this caution symbol ⚠ is marked. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Safety

- ALWAYS wear safety glasses and all other required safety equipment when operating this tool.
- Do NOT exceed the rated capacity of the wrench.
- Do NOT use this wrench for any purpose other than that for which it was designed and manufactured.
- Never immerse the tool in liquids.

Power

Press the ⏻ button to power on the tool. To power off the tool, press and hold the ⏻ button until the power LED lights red, then press the ⏻ button to confirm power off.

Modes of Operation

The TAC has two modes of operation: Peak Torque and Torque with Angle Monitoring (TAM). When communicating with a controller, the tool can report the click torque (torque value at the point the tool "clicked") and the peak torque (peak torque value after torque was released). TAM mode will also report the angle of rotation of the fastener from the snug point (the point at which the head of the fastener has bottomed out). Refer to the Parameter Settings section for details on defining parameters.

Interchangeable Heads and Dovetail

These tools use the SR dovetail system. The tools are calibrated for use with SR Interchangeable Heads having a 1 7/16" (36.5mm) Common Centerline. Any SR heads with this centerline length may be used without affecting torque accuracy.



If a different head length is used, the controller parameter head length must be modified. Failure to do so will generate incorrect torque output during use.

Radio Communications - 2.4 GHz Communication Overview

These tools use the 2.4GHz band for communication with the controller. As with all radio communications, there are limits on the distance at which reliable bidirectional communication may be obtained. Physical barriers such as steel framing, sheet metal and other objects that impede radio waves can significantly reduce the reliable communication distance. Another factor affecting the reliability and distance is the radio environment in which the unit will be used. The controller and tool may operate on any of the 15 channels these products use.

The radio modules in the controllers and tools used with them comply with the IEEE 802.15.4 standard. The channel numbers loosely match the channels used by the IEEE 802.11b/g WLAN standard. For the most reliable communication between the Sturtevant Richmont controller and the tool in an 802.11b/g LAN environment, it is usually best to choose a channel for the controller and tool that is separated from the channel of the LAN. Refer to the controller user manual for the specific frequencies being used.

Establishing RF Communication With Sturtevant Richmont Controllers

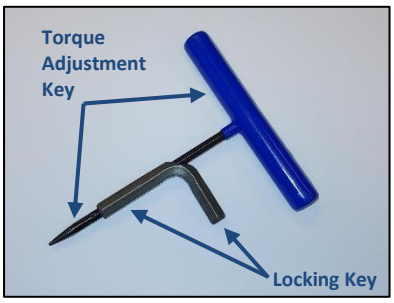
The transceiver in the controller and the one in the torque wrench each have radio identification numbers. When communication between the two is first established, the numbers are exchanged and stored in memory. The controller and tool will thereafter ignore communications from other radios until the number stored in memory is replaced with a different identification number.

Under all conditions, the controller and the tool must be on the same radio channel. If the channel on the controller is changed and the channel on the tool is not, they will not communicate or will cease communicating if they have previously been associated with each other. To establish communication with the controller, it is necessary to follow the instructions included with the specific controller to be used. Refer to the Global 400, Global 400mp, or TCVe^2 user manual for details.

When the controller is in Learn mode, power on the tool to begin the learn sequence. Once the "Learned tool information summary" is displayed, press SAVE to complete the learn sequence.

Torque Setting

A torque tester of +/- 1% indicated value accuracy or better, a Sturtevant Richmont CART (Combination Adjusting and Release Tool shown at right), and an interchangeable head having the same common centerline length as the head that will be used in assembly and capable of engaging the tester are required for setting the click torque value.



1. Insert the Torque Adjustment Key fully into the rear of the wrench so the hex engages the adjustment nut. Do not engage the Lock Key. Rotate the Torque Adjustment Key slightly clockwise to disengage the adjustment nut from the lock nut.
2. Slide the Lock Key in until it engages the lock nut. You may need to rotate the lock key slightly to align it with the internal hex of the lock nut. Rotate the Lock Key counterclockwise several turns to assure the lock nut is fully disengaged from the adjustment nut and that there is sufficient travel available for the adjustment nut to attain the desired torque setting.
3. Install the interchangeable head on the wrench. Engage the wrench to the tester and click the wrench once or twice while noting the readings. To adjust the wrench to a higher torque setting, rotate the Torque Adjustment Key clockwise. To adjust the wrench to a lower torque setting, rotate the Torque Adjustment Key counterclockwise. Torque adjustments should be made in small increments with several checks made between each movement of the Torque Adjustment Key.
4. Once the desired torque has been attained, hold the Torque Adjustment Key steady and rotate the Lock Key clockwise until the lock nut firmly engages the torque adjustment nut, locking it in place. Remove the CART from the wrench and perform a final torque check on the tester. When the reading matches the desired torque and the lock nut is firmly engaged to the torque adjustment nut, the procedure is complete.



Note: Any time the mechanical torque setting is adjusted, the tool must be power cycled or the parameter resent so the electronics can determine the new zero load point. Performing the peak adjustment routine may also be needed to realign the digital peak torque measurement.

LED Indication

Once the tool has been preset, the interchangeable head installed, and the radio transceiver has been associated with the controller, the tool must be assigned a parameter before it can be used. Refer to the controller user manual for complete details. When the tool is receiving the parameter, the blue LED will flash.



Note: It is important not to move the tool during the first second of the blue LED flashing so that the tool can initialize properly. Movement during this time may produce inaccurate measurement results.

In normal operation, the tool will emit a strong tactile and sound impulse when it clicks. The tool will also provide audible feedback with a beeper and visual feedback through LEDs. The various LED indications are shown in Table 1.

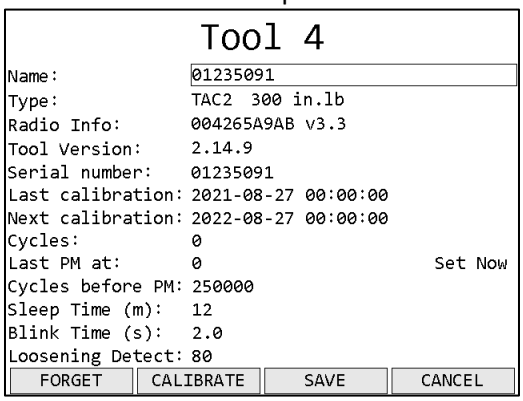
Table 1: LED Indication	
OK/NOK LED Color	**Meaning**
Orange-flashing	Low battery
Orange	Approaching minimum torque/torque within specification before click is sensed (see note below)
Green-flashing	Tool powering up (lasts for 5 seconds)
Green	Accepted tightening; Minimum torque/Minimum angle met and click detected
Green	Accepted tightening; Minimum torque/Minimum angle met and dwell time expired
Red	Rejected tightening; Maximum torque/Maximum angle exceeded
Red	Rejected tightening; Minimum torque/Minimum angle not met and dwell time expired
BATCH LED Color	**Meaning**
Blue-flashing	Parameter received from controller; this can be set to blink for up to 65 seconds. The flashing blue LED will turn off once torque is applied.
Blue	Batch complete
POWER LED Color	**Meaning**
Green	⏻ button is pressed.
Green-flash	The tool is powered on (flashes every 3 seconds)
Orange-flash	The tool is in sleep mode (flashes every 3 seconds)
Red-flash	The tool is out of controller radio range (flashes every 3 seconds)
Red	Tap ⏻ button to confirm power off.
Red-flash (rapid)	Power off confirmation.

Note: An orange OK/NOK LED after torque is released indicates that target torque has not been reached. After the dwell time expires, the tool will qualify the event, change the LED to green or red, and transmit the result to the controller.

Tool Settings

Some tool settings may be modified after the tool has been learned into the controller. Go to the Tool Edit screen or use Global Manager to access these settings:

- Sleep Time – Set the amount of time in minutes before the tool will enter low power mode. This can be disabled by setting the value to 0. Default is 12 minutes.
- Blink Time – Set the amount of time in seconds the blue LED will flash upon being enabled by a parameter sent from the controller. Blinking will stop when the timer expires or the tool senses torque applied. Default is 2 seconds.
- Loosening Detect – Set the percentage of minimum torque the tool rejects a result if torque is seen in the opposite direction after exceeding minimum torque in the desired direction. This is disabled by setting the value to 0. It is also disabled when the parameter direction is set to "Both". Default is 80%.



Parameter Settings

A parameter specifies a tool to run and some settings to use with it such as the measurement mode, batch size, and minimum/maximum torque. Each mode has slightly different settings.

Peak Torque Mode measures the current peak torque on the wrench until torque is released. If torque is between the minimum and maximum settings, the tightening event will be qualified as OK. Settings in this mode include:

- Target Torque –This is typically the torque that the tool is set to click at. The OK/NOK LED turns green at this point.
- Minimum Torque – This is the minimum acceptable torque for the joint. The OK/NOK LED will turn orange as the measured torque approaches this value. It will stay orange until the target torque is met or torque is released and the dwell timer has expired, at which point the LED will turn green.
- Maximum Torque – This is the maximum acceptable torque for the joint. The OK/NOK LED turns red at this point.
- Auto Clear Time (ACT): This controls the amount of time after torque is released before the tool reports the result to the controller.
- Dwell Time (DT): This controls the amount of time allowed to reposition the tool and reapply torque before the result is qualified.

TAM mode is an extension of Peak Torque mode, adding the ability to detect cross-threaded fasteners, double hits on a joint, and the like. Primarily, it adds the constraint that a fastener must turn through a minimum angle before minimum torque is reached. TAM mode uses the same settings as Peak mode, plus:

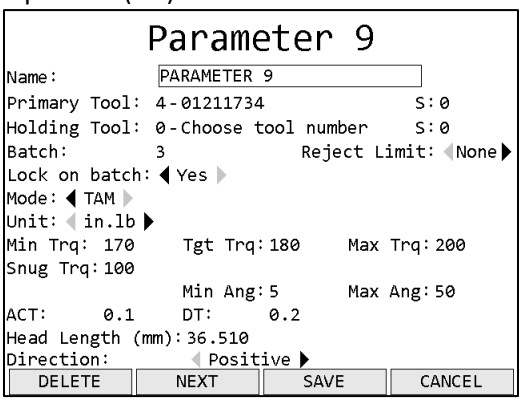
- Snug Torque – This is the torque value at which angle measurement starts. This is typically set to the point at which the head of the fastener has bottomed out.
- Target Angle – This is the minimum angle needed before minimum torque is reached. The OK/NOK LED will turn red if minimum torque is reached before minimum angle.
- Maximum Angle – This is the maximum acceptable angle. The OK/NOK LED will turn red if angle exceeds this setting.

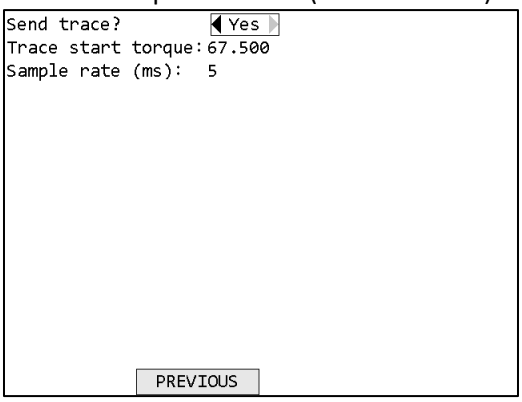
Although this tool will only click in one direction, digital torque measurement can be made in both directions. The direction field of the parameter defines the functionality of the tool.

- Positive: The tool clicks and measures torque in the clockwise direction. The result is rejected if loosening torque is detected.
- Negative: The tool does not click but measures torque in the counterclockwise direction. The result is rejected if loosening torque is detected.
- Both: The tool clicks in the positive direction and torque is measured in both directions. The final result is reported as a positive value (CW) or a negative value (CCW) based on the direction of torque at the end of the event. Loosening detection is disabled.

The tool is able to provide trace curve data for each event. The following details pertain to the Global 400 or Global 400mp. The TCVe2 has similar functionality. Pressing “NEXT” in the parameter setup will display the trace data settings screen.

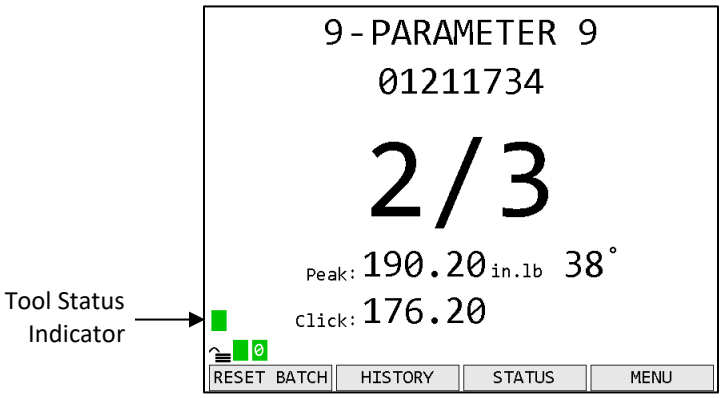
- Send trace: “Yes” activates trace curve data collection. Default is “No” (off).
- Trace start torque: Defines the torque value at which trace data will start being collected.
- Sample rate (ms): Amount of time in milliseconds between samples. Default (and minimum) is 5 ms.



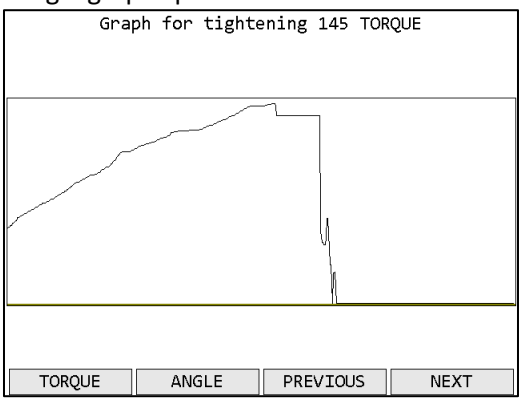


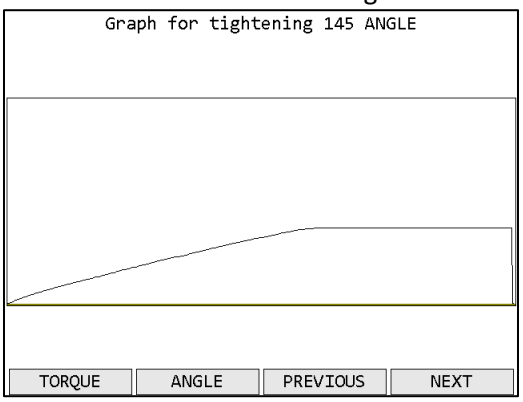
Results

After the result is reported to the controller, the Click torque, Peak torque, and angle (if applicable) are displayed on the controller.

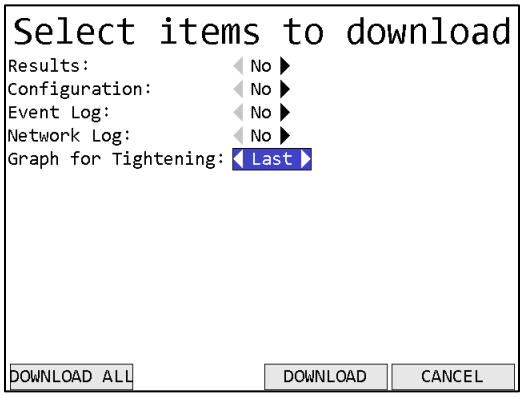


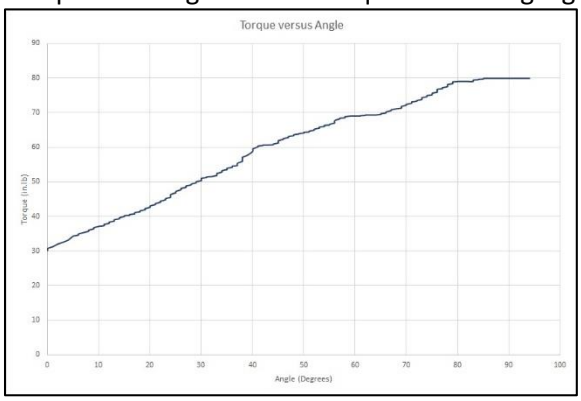
The tool then sends the trace data, if enabled. The Tool Status Indicator will turn blue while the tool is sending the data. The time it takes to transmit this data depends on the number of data points captured. The torque and angle graphs may be viewed by pressing “STATUS” then “GRAPH”. Softkeys are used to switch between the torque and angle graphs plotted versus time. Press “NEXT” or “PREVIOUS” to move through all collected graphs.





A CSV file for each set of trace curve data may be downloaded from Global Manager or by inserting a USB stick into the Global. Once this data is downloaded, it can be manipulated to generate a torque versus angle graph.





Troubleshooting

Problem	Possible Causes	Possible Solutions
Tool does not power up (no LED indication).	Battery is low.	Place tool on charger until the battery is fully charged.
	Battery is damaged.	Contact the factory.
	Damaged battery holder.	Contact the factory.
The OK/NOK LED is flashing orange.	Battery is low.	Place tool on charger until the battery is fully charged.
The controller does not show new calibration dates.	Calibration dates only update when a tool is learned in.	Forget the tool and learn it back in to the controller.
LED is orange after the tool clicked.	Parameter target torque is set higher than the click point.	Decrease the value of the parameter target torque.
	Click point is set too low.	Increase the mechanical torque setting on the wrench.
	The joint is soft.	The electronics may not detect the click on a soft joint.
Tool blue LED is not flashing when a parameter is selected.	Tool has gone into sleep mode.	Move the tool to exit sleep mode.
	Battery has died.	Place tool on charger until the battery is fully charged.
	Blink Time is set to zero.	Increase the Blink Time value.
Digital output value is not accurate.	Mechanical click value was adjusted after receiving a parameter.	Recalibrate the spring compensator.
	Tool is out of calibration.	Calibrate the tool.
Graph of trace data does not show on controller.	Tool is still sending trace data.	Allow time for the tool to complete sending all of the data.

Care and Maintenance

This wrench should be cleaned with a soft cloth dampened with water. Do not immerse this tool in liquid or use any solvent other than water to clean the tool.

Presetting, Calibration and Repair

Factory presetting and calibration from our ISO 17025 Accredited Calibration Laboratory are available. Calibration and verification are performed using the SR Connect PC application. Contact your SR distributor for details. Parts and factory repair are also available. All repairs are to be performed by factory trained technicians or the factory only.

Additional Information

Additional information is available at ***www.srtorque.com***. You can also call customer service at 1-847-455-8677 or send e-mail to customerservice@srtorque.com.