



1350 SERIES EXACTA 2

Operating Instructions

TOOL OVERVIEW

The 1350 Series Exacta 2 Digital Torque Wrenches are designed to work with the Global 400 and Global 400mp process monitor/process monitors. These wireless capable digital torque and angle wrenches are designed for industrial assembly use. The wrench is completely dependent on the Global 400/400mp for directions and torque results reporting. Once connected to the Global 400/400mp, the wrench keypad is disabled. This prevents inadvertent operator changes to parameters.

The 1350 Series Exacta 2 has four modes of measurement:

- Torque to Angle (T2A)
- Torque With Angle Monitoring (TAM)
- Peak
- Residual Torque

These tools are designed for ease of use. Operators simply pull to green, there are no buttons to push. The light bands turn yellow when approaching minimum torque. The display and audible beep signal the operator of the status for each fastening. Exceeding maximum torque causes the light bands to turn red and the audible beep changes to one long tone. Upon reaching the target torque measurement the 1350 Series handle vibrates. The 1350 Series Exacta 2 digital torque and angle wrench provides operator with visual, auditory, and kinesthetic guidance.

*Details on programming the tool through the Global 400/400mp process monitors are found in the process monitor manual. There are "how to" programming videos at www.srtorque.com. The 1350 Series Exacta 2 does not communicate with the Global 8.

Safety: Always wear appropriate personal safety equipment when operating this tool.

- Never use this tool for any purpose other than that for which it is intended.
- Never use the tool beyond its rated torque capacity.
- Never immerse the tool in liquids.

Wrench features include:

- Backlit LCD graphic display:
 - ▲ Press ▲ to increase the displayed value or scroll up
 - ▼ Press ▼ to decrease the displayed value or scroll down
 - ← Press ← to go to next screen in sequence or select the highlighted line
 - ⊙ Showing target torque and angle, as opposed to actual
 - ↻ Clockwise target or current torque direction
 - ↺ Counterclockwise target or current torque direction
 - ↻↺ Either target direction
 - 🔒 Keypad locked
 - 🔋 Battery charge level
- Status indicators – LEDs, buzzer, handle vibration
- Loading point indicated by plain ring in the middle of the grip

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BATTERY AND BATTERY CHARGER

Use of any battery packs not meeting SR NiMH rechargeable battery requirements could electrically or physically damage the tool and immediately voids the warranty.

Battery Pack Charger

An adapter is provided that allows the existing 1250 Series battery charger to be reused for charging the 1350 Series battery pack. Insert the adapter into the charger. Insert the battery pack into the adapter and twist the pack to lock it in place. The LED on the charger will turn red to indicate charging has started. Charging is complete when the LED turns green.

Battery Pack Installation

Unscrew the battery cap, insert a fully charged battery pack in the handle, then screw on the battery cap until snug. Do not overtighten.

INTERCHANGEABLE HEADS

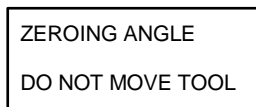
The 1350-Series Exacta 2 digital torque wrenches use the SR dovetail system. The tools are calibrated for use with SR Interchangeable Heads having a 1 7/16" (36.5mm) Common Centerline. Any SR heads with this centerline length may be used without affecting torque accuracy.

OPERATING INSTRUCTIONS

Getting Started

When powered on, the wrench will begin a starting routine and display:

- Zeroing angle.

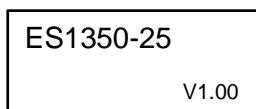


(For best results, set the wrench on a hard surface to zero the angle sensor.)

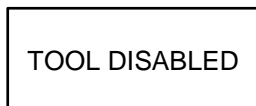
- Sturtevant Richmond logo.



- An identification screen displaying the model and firmware version.



- If the tool has not been learned into a controller or a parameter has not been selected for it, the following screen will be displayed.



- If a parameter has been selected for the tool, then an idle screen similar to the following will be displayed. The information displayed is different for each mode of operation.



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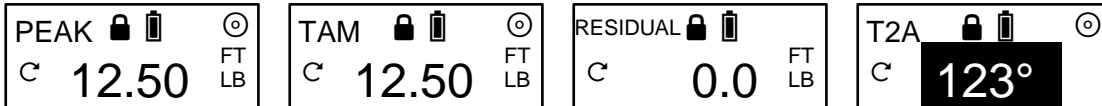
General Operation

Three phases of operation are repeated for each joint:

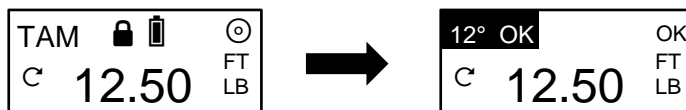
1. Idle: showing the measurement mode and target; waiting for torque.
2. Torque Applied: showing the Measurement Screen.
3. Torque Released: showing the Measurement Screen and waiting to clear.

Idle Screen

As shown below, the Idle Screen is somewhat different for each mode. Residual mode doesn't show target values. The target angle, not torque, is shown for T2A mode. Angle values are shown white-on-black.



Measurement Screen



- When torque is applied, the Measurement Screen replaces the Idle Screen.
- The large digits show the current peak torque or angle depending on the mode.
- The current angle of rotation is shown white-on-black.
- Status is shown for torque and for angle – OK, HI, or LO. (The target icon disappears.)
- Direction of measured torque is shown (clockwise or counterclockwise arrow).
- When torque is released, the digits show the final torque and angle measured. At the auto-clear timeout, the Idle Screen is shown again or “TOOL DISABLED” will be displayed if the batch is complete and lock on batch is active.

MODES

Settings Per Mode

The meaning of some settings may change depending on mode.

Peak Mode

Peak mode shows the current peak torque on the wrench until torque is released. Torque display begins at 4% of full scale torque capacity. Yellow LEDs light up in sequence as minimum torque is approached.

- Target Torque – Pull to this value to get a green LED.
- Minimum Torque – Status is OK between minimum and maximum torque. The LED turns green when torque is released if peak torque is between minimum and maximum torque.
- Maximum Torque – The red LED lights and the status is HI if the peak value exceeds this torque.

Residual Mode

Residual mode shows zero torque on the wrench until residual torque is detected, then it shows the residual torque until torque is released, with an OK status.

- Target Angle – The default is 3°. To look for the torque dip only, set the target angle to 0°.

Two methods may be applied to detect residual torque.

- On a soft joint, a pull through a small prescribed angle denotes that residual torque has been reached. The value at that exact angle represents the residual torque that was in the joint. A minimum of 3° is recommended but may be adjusted to reflect joint behavior.

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- On a hard joint, a dip in torque may be detected when applied torque breaks the joint loose momentarily. The value at the bottom of the dip represents the residual torque that was in the joint.

T2A Mode

In Torque to Angle mode, a joint is tightened to a prescribed target torque. Then the fastener is turned through an additional angle, intended to stretch the fastener and thus apply clamp load by an amount proportional to the angle.

As torque is applied, it is displayed in large digits, with an angle of 0°. One yellow LED lights when the Target Torque is reached. The display changes to angle in the large digits, starting at 0°. The other yellow LEDs light up in sequence as angle approaches its target.

- Target Torque – Pull to this value to get a yellow LED and start counting angle. This is typically the snug point on the joint (the point at which the head of the fastener has bottomed out).
- Target Angle – Pull to this angle to get a green LED and an OK status.
- Maximum Angle – The red LED lights and the status is HI if angle exceeds the maximum.
- Maximum Torque – While final angle is of primary interest, a check on final torque may be warranted as well (e.g., to detect a fastener that is too hard to stretch). For this reason, minimum torque and maximum torque are also be specified. Final torque must fall within this range to be acceptable.

TAM Mode

Torque with Angle Monitoring is an extension of Peak 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:

- Target Angle – This is the minimum angle needed before minimum torque is reached.

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CALIBRATION

The calibration process for the Exacta 2 tools has three sub-processes. The first is testing the tool to determine the “as found” condition. If the tool is out of calibration, then two subsequent processes are performed; calibration adjustment to bring the tool into calibration, and subsequent repetition of tool testing to assure that the adjustments were effective and the results are valid.

We strongly recommend that when performing the calibration process a torque tester of not less than 0.25% Indicated Value Accuracy be used, and that it be used in conjunction with a mechanical loader to obtain proper loading of the tool. We have designed these tools to be as hand-position insensitive as we can within other constraints, but the use of a mechanical loader is still recommended. The load applied during testing must be at the loading point on the grip indicated by the plain ring at the middle of the grip.

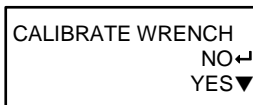
When calibrating and testing tools having the SR dovetail, it is recommended that the calibration be performed with the same Common Centerline Head Length (CCL) as the head length used in the original calibration (see the Interchangeable Heads section of these instructions). When changing the CCL, the wrench has internal formula that compensates for that change when modified by the Global 400 or Global 400mp.

We recommend that the tool be temperature stabilized before testing and that a fully charged battery pack be used during the procedure to assure that the tool does not suffer a loss of battery power during the process.

To begin any part of the calibration process, the tool must be placed in calibration mode by a controller. There are two ways that this can be accomplished:

1. Use the current controller to force the tool into calibrate mode.
 - a. From the Main Tools screen on the controller, highlight the tool to be calibrated and press the EDIT soft key. Then press the CALIBRATE soft key.
 - b. The tool to be calibrated is still associated with that controller.
2. Replace the tool with a backup tool.
 - a. From the Main Tools screen on the controller, highlight the tool to be calibrated and press the REPLACE soft key. Power on the other tool to learn it into the controller.
 - b. The tool to be calibrated is no longer associated with that controller but it will need to be learned into another controller to force it into calibration mode as described above.

When calibration mode is enabled, the CALIBRATE WRENCH screen will be displayed and calibration can be initiated through the keypad:

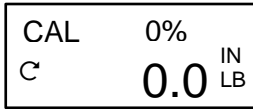


- Press ▼ to enter calibration mode. The Calibration Password screen appears.
- Enter the password using ▲ or ▼ to change the value of the digit. Press ← to move to the next digit. The default password is “3112”. After all four digits have been entered, press ← to submit the password for verification.
- The “CAL HEAD LENGTH” screen is displayed next. Press ▲ or ▼ to change the displayed value if it is not correct for the head being used. NOTE: Units are in mm.
- Press ← to accept the value and enter torque calibration mode.

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Torque Calibration Overview

The first calibration point, clockwise 0%, is displayed.



As torque is applied, a torque value will replace the target value.

Press ▼ to save a calibration point. The green LED will quickly flash to show acceptance of the point. Repeat as often as necessary until satisfied.

Press ▲ to go on to the next calibration point. The full torque calibration sequence is clockwise (CW) 0%, 100%, 60%, and 20%, followed by counterclockwise (CCW) 0%, 100%, 60%, and 20%.

After the last point is saved, the options are:

- Press ▲ to repeat the sequence to allow touchups.
- Press ← to enter angle calibration.
- Press ▼ to set calibration date and next calibration date.

Torque Calibration Procedure

Apply three 100% clockwise (CW) Full Scale (FS) loads to wrench.

Remove the torque load from wrench. Remove wrench from tester and hold in vertical position. Press **ZERO** on tester, then press ▼ on wrench to save the zero setting. Replace wrench on tester.

Press ▲ so "CAL 100%", "↻", and the target torque value appear on the display. Apply **100%** CW FS load to the unit. When the tester shows exactly **100%** CW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

Press ▲ so "CAL 60%", "↻", and the target torque value appear on the display. Apply **60%** CW FS load to the unit. When the tester shows exactly **60%** CW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

Press ▲ so "CAL 20%", "↻", and the target torque value appear on the display. Apply **20%** CW FS load to the unit. When the tester shows exactly **20%** CW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

Press ▲ so "CAL -0%", "↻", and "0.0 IN LB" appear on the display. Apply 3 full-scale loads to the wrench in the CCW direction.

Remove the torque load from wrench. Remove wrench from tester and hold in vertical position. Press **ZERO** on tester, then ▼ on wrench to save the zero setting. Replace wrench on tester.

Press ▲ so "CAL -100%" "↻", and the target torque value appear on the display. Apply **100%** CCW FS load to the unit. When the tester shows exactly **100%** CCW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

Press ▲ so "CAL -60%" "↻", and the target torque value appear on the display. Apply **60%** CCW FS load to the unit. When the tester shows exactly **60%** CCW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

Press ▲ so "CAL -20%" "↻", and the target torque value appear on the display. Apply **20%** CCW FS load to the unit. When the tester shows exactly **20%** CCW FS torque is applied, press ▼ on wrench to save the value. Unload the tool.

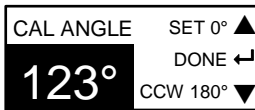
Press ▲ so "▲", "←", and "SET CAL DATES ▼" appear on the display. Press ▼ to set the calibration date.

"NEXT CAL ▲" and the date "mm/dd/yyyy←" appear on the display. Press ← to set the date. (The tool is now in angle calibration mode.)

Remove the wrench from the tester.

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Angle Calibration Procedure



Place wrench on an angle calibration fixture with handle to the right of the head.

Press the “SET 0° ▲” arrow key on wrench to set the 0° value.

Swing the wrench CCW 180°, press the “CCW 180° ▼” arrow key on the wrench to set the 180° value.

Swing the wrench CW 180°. The angle reading should display 0° +/-1°. If not, press the “SET 0° ▲” to set the 0° value.

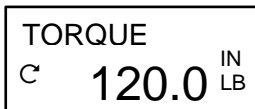
The sequence of CCW 180° and CW 180° may be repeated to allow touch ups to the recorded values.

Press ← to exit calibration. (The tool is now in torque check mode.)

Remove the wrench from the fixture.

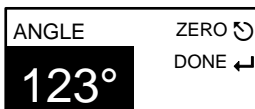
Accuracy Verification

There are two additional screens after angle calibration. The first is a torque check screen which puts the wrench in track mode to allow torque readings to be verified.



Press ← to exit and move to angle check mode.

The angle check screen displays the number of degrees the tool has been rotated. Press ↺ to zero the angle value at any time.



Press ← to exit the verification routine.

Power cycle the tool to exit calibration mode. This will also associate the tool with the controller again.

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ACCURACY CHARTS

Accuracy tables are based on +/-2% tolerance.

| Exacta 1350-5 – 5 Foot-Pound Capacity | | | | |
|---------------------------------------|--------------|--------------|--------|-------|
| Capacity Ft.Lb | % Full Scale | Torque In.Lb | + Tol. | -Tol. |
| 5 | 10 | 6 | 6.1 | 5.9 |
| | 20 | 12 | 12.2 | 11.8 |
| | 30 | 18 | 18.4 | 17.6 |
| | 40 | 24 | 24.5 | 23.5 |
| | 50 | 30 | 30.6 | 29.4 |
| | 60 | 36 | 36.7 | 35.3 |
| | 70 | 42 | 42.8 | 41.2 |
| | 80 | 48 | 49.0 | 47.0 |
| | 90 | 54 | 55.1 | 52.9 |
| | 100 | 60 | 61.2 | 58.8 |

| Exacta 1350-25 – 25 Foot-Pound Capacity | | | | |
|---|--------------|--------------|--------|-------|
| Capacity Ft.Lb | % Full Scale | Torque In.Lb | + Tol. | -Tol. |
| 25 | 10 | 30 | 30.6 | 29.4 |
| | 20 | 60 | 61.2 | 58.8 |
| | 30 | 90 | 91.8 | 88.2 |
| | 40 | 120 | 122.4 | 117.6 |
| | 50 | 150 | 153.0 | 147.0 |
| | 60 | 180 | 183.6 | 176.4 |
| | 70 | 210 | 214.2 | 205.8 |
| | 80 | 240 | 244.8 | 235.2 |
| | 90 | 270 | 275.4 | 264.6 |
| | 100 | 300 | 306.0 | 294.0 |

| Exacta 1350-75 – 75 Foot-Pound Capacity | | | | |
|---|--------------|--------------|--------|-------|
| Capacity Ft.Lb | % Full Scale | Torque In.Lb | + Tol. | -Tol. |
| 75 | 10 | 90 | 91.8 | 88.2 |
| | 20 | 180 | 183.6 | 176.4 |
| | 30 | 270 | 275.4 | 264.6 |
| | 40 | 360 | 367.2 | 352.8 |
| | 50 | 450 | 459.0 | 441.0 |
| | 60 | 540 | 550.8 | 529.2 |
| | 70 | 630 | 642.6 | 617.4 |
| | 80 | 720 | 734.4 | 705.6 |
| | 90 | 810 | 826.2 | 793.8 |
| | 100 | 900 | 918.0 | 882.0 |

| Exacta 1350-150 – 150 Foot-Pound Capacity | | | | |
|---|--------------|--------------|--------|--------|
| Capacity Ft.Lb | % Full Scale | Torque In.Lb | + Tol. | -Tol. |
| 150 | 10 | 180 | 183.6 | 176.4 |
| | 20 | 360 | 367.2 | 352.8 |
| | 30 | 540 | 550.8 | 529.2 |
| | 40 | 720 | 734.4 | 705.6 |
| | 50 | 900 | 918.0 | 882.0 |
| | 60 | 1080 | 1101.6 | 1058.4 |
| | 70 | 1260 | 1285.2 | 1234.8 |
| | 80 | 1440 | 1468.8 | 1411.2 |
| | 90 | 1620 | 1652.4 | 1587.6 |
| | 100 | 1800 | 1836.0 | 1764.0 |

| Exacta 1350-250 – 250 Foot-Pound Capacity | | | | |
|---|--------------|--------------|--------|--------|
| Capacity Ft.Lb | % Full Scale | Torque In.Lb | + Tol. | -Tol. |
| 250 | 10 | 300 | 306.0 | 294.0 |
| | 20 | 600 | 612.0 | 588.0 |
| | 30 | 900 | 918.0 | 882.0 |
| | 40 | 1200 | 1224.0 | 1176.0 |
| | 50 | 1500 | 1530.0 | 1470.0 |
| | 60 | 1800 | 1836.0 | 1764.0 |
| | 70 | 2100 | 2142.0 | 2058.0 |
| | 80 | 2400 | 2448.0 | 2352.0 |
| | 90 | 2700 | 2754.0 | 2646.0 |
| | 100 | 3000 | 3060.0 | 2940.0 |