The force in torque management

Operator's Manual

WrenchStar Multi

Manual 1230-01 Version 1.1
Crane Electronics Ltd

Notice

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UKCA MARKING

Crane Electronics Limited declares that the WrenchStar Multi has been assessed and complies with the UK regulatory requirements.

CE MARKING

Crane Electronics Limited declares that the WrenchStar Multi has been assessed and complies with the requirements of the relevant CE Directives.

COMPLIANCE

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installations. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNINGS AND SAFETY INFORMATION

IMPORTANT SAFETY INSTRUCTIONS

PLEASE READ THIS THOROUGHLY BEFORE USE. IMPROPER USE OF THIS PRODUCT COULD AFFECT THE SAFETY OF THE OPERATOR OR BYSTANDERS. IMPROPER USE COULD ALSO RESULT IN INCORRECT MEASUREMENT READINGS.

- **Read the manual completely before using the wrench.**
- Observe all equipment, system and manufacturer's warnings, cautions and procedures when using this wrench.
- Always operate, inspect and maintain this unit in accordance with all regulations (local, state, federal and country) that may apply.
- Maintain unit with care. Keep unit clean for better and safer performance.
- Please observe the max. torque limits of the wrench – Overtorquing can cause breakages.
- Do not remove any labels.
- Do not remove any screws or fixings from the wrench.
- Wrench must be stored in a dry place.
- It is advised that the batteries are removed from the wrench if it is to be stored for a period of more than 3 months.
- Do not immerse in liquids.
- Do not operate this product in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.
- Always operate the WrenchStar Multi with the approved battery pack.
- Only charge the battery/WrenchStar Multi when between +5°C and +40°C (+41°F to +104°F).
- Periodic recalibration is necessary to maintain accuracy (recommended on a yearly basis).
- A wrench which is out of calibration can cause damage to the tool or parts.
- If the capacity of the wrench is suspected to have been exceeded, the calibration must be verified before further use.
- If the wrench is dropped, the calibration must be verified.
- This unit contains no user serviceable parts. Only qualified Crane service personnel should replace or fit parts.
- Changes or modifications to the WrenchStar Multi not expressly approved by Crane Electronics Ltd could void the user's authority to operate the equipment.

- **Always use the appropriate Personal Protective Equipment for the tool used and material worked.**
- All users and observers must wear safety goggles.
- Good professional tool and fastener installation practices must be followed for personal safety and to avoid wrench damage.
- Ensure work pieces are secure. Use clamps or vices to hold work pieces whenever possible. Never use a damaged or malfunctioning tool or accessory with this unit.
- Keep body stance balanced and firm. Do not overreach when operating the tool. Anticipate and be alert for sudden changes in motion, reaction torque, or forces during the operation.
- Do not jerk; pull smoothly and approach final torque slowly and evenly. Stop pulling the wrench immediately when target torque is reached (as indicated by the LED light ring and vibration alerts).
- Always grip handle firmly in the centre of the grip. If two hands need to be used, place one hand on top of the other.
- Always pull; do not push.

- **WARNING Risk of flying particles.**
- Ensure the wrench and all adaptors, extensions, drivers and sockets are rated to match or exceed the target torque of the application.
- Use the correct size socket for fastener.
- Follow instructions for changing accessories.
- Do not use broken hand tools as sockets or accessories as these can cause injury.
- Do not use worn or cracked sockets or adaptors.
- Worn fasteners must be replaced before using the wrench.
- Excess force on a crowfoot or flare nut/lug adaptor could cause wrench slippage.
- Make sure the wrench adaptor is fully engaged on the fastener before pulling.
- Handle extensions must not be used on the wrench.
- Use the wrench solely for the tightening/untightening of threaded fasteners.
- When using a ratchet head adaptor, ensure the direction lever is fully engaged in the correct position, observing the direction of torque being applied.
- When using angle mode, ensure the fixture does not move independently of the fastener to ensure angle accuracy is maintained.
- To avoid damage, the wrench must be set in CCW mode to untighten a fastener and must be measuring torque.
- The wrench must not be used for tightening without being switched on, as this may damage the wrench.

- **Electrical shock can cause injury. Metal handle is not electrically isolated.**
- Must NOT be used on live electrical circuits.

PRODUCT DISPOSAL

Applicable in the EU and other European Countries with separate collection systems

The symbol shown here and, on the product, means that the product is classed as Electrical or Electronics Equipment and should not be disposed with normal commercial waste at the end of its working life.

The Waste of Electrical and Electronics Equipment (WEEE) Directive (2012/19/EU) has been put in place to recycle products using best available recovery and recycling techniques to minimise the impact on the environment, treat any hazardous substances and avoid the increasing landfill.

To enable this product to be disposed of properly i.e., cradle to grave, Crane Electronics is willing to accept the return of your product (at your cost) for recycling or alternatively, for more detailed information about recycling of this product please contact your local authority or the Distributor / Company where you have purchased the product.

Battery disposal to take place in line with the AMENDED BATTERIES DIRECTIVE 2013/56/EU. Batteries must ***not*** go to landfill. Check with local legislation.

Crane Electronics declares that this product does not contain any of the 191 Substances of Very High Concern (SVHC's) identified in the REACH Regulation in used articles make-up.

In Countries outside the EU:

If you wish to discard this product, please contact your local authorities and ask for the correct way of disposal.

Signed for & on behalf of **Crane Electronics Ltd.**

Name: **B. M. Etter**
Title: **Safety & Environmental Advisor**

Signature of Issuer: B. M. Etter

ABOUT THIS MANUAL

This manual covers the WrenchStar Multi. The WrenchStar Multi connects to the TorqueStar Pro data collector, TCI (Tool Control Interface) and TCI-2 via RF, and the TorqueStar Pro and Plus data collectors via cable. Please refer to corresponding manuals accordingly.

Actual screen shots or images represented in this manual may differ slightly from those on the actual product, depending on the version.

OVERVIEW

The WrenchStar Multi is a wireless production Wrench with audit capability when connected to the TorqueStar or Tool Control Interface (TCI) lineside controller. There is a variant that works with a cable connected to the TorqueStar. In this case there is no battery pack or RF. The power comes from the data collector. Torque and Angle data are transmitted as digital signals along the cable to the data collector.

The WrenchStar Multi reads the Torque and Angle values in real time and converts them to digital values. The WrenchStar Multi analyses the digital samples using measurement algorithms to calculate properties of the fastening. The WrenchStar Multi communicates the final fastening readings to the data collector using RF giving a range of approximately 10 metres*. If the WrenchStar Multi loses its link to the data collector, then it continues to work offline, storing up to 200 readings. It is simple to pair a WrenchStar Multi with a data collector or lineside controller.

The WrenchStar Multi contains its own power source which is a Lithium-Ion battery pack.

* The RF range depends on the environment in which the WrenchStar Multi and TorqueStar Pro are being used and the figure quoted is for a relatively metal free work space with the data collector in line of sight of the WrenchStar Multi.

PACKING LIST

The following items are supplied with the WrenchStar Multi dependent on model specification purchased.

1 x WrenchStar Multi with Battery and Cradle
1 x Quick Start Guide
1 x Calibration Certificate

Please ensure all items are present and notify Crane Electronics Ltd immediately of any shortages.

SPARES AND ACCESSORIES

WS1XS-0006-CRDCDX	WrenchStar Multi – Cable
WS1XS-0000-CRCNBX	WrenchStar Multi – Spare Battery
WS1XS-0000-CRCNXX	WrenchStar Multi – Wrench Cradle
WS1XS-0000-CRCNBC	WrenchStar Multi – Desktop Battery Charger
WS1XS-0000-C1CNBB	WrenchStar Multi – Spare Battery and Desktop Battery Charger

We also have a range of wrench heads and auto ID chips available. Please contact us for further details.

CARE AND STORAGE

Operating Temperature Range:
+5°C to +40°C

Storage Temperature Range:
+5°C to +40°C

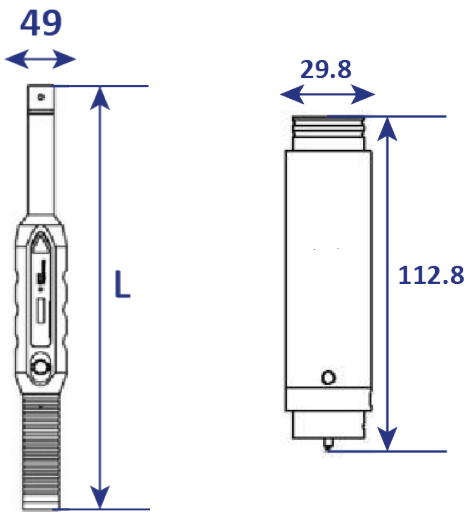
Humidity:
10-75% non-condensing.

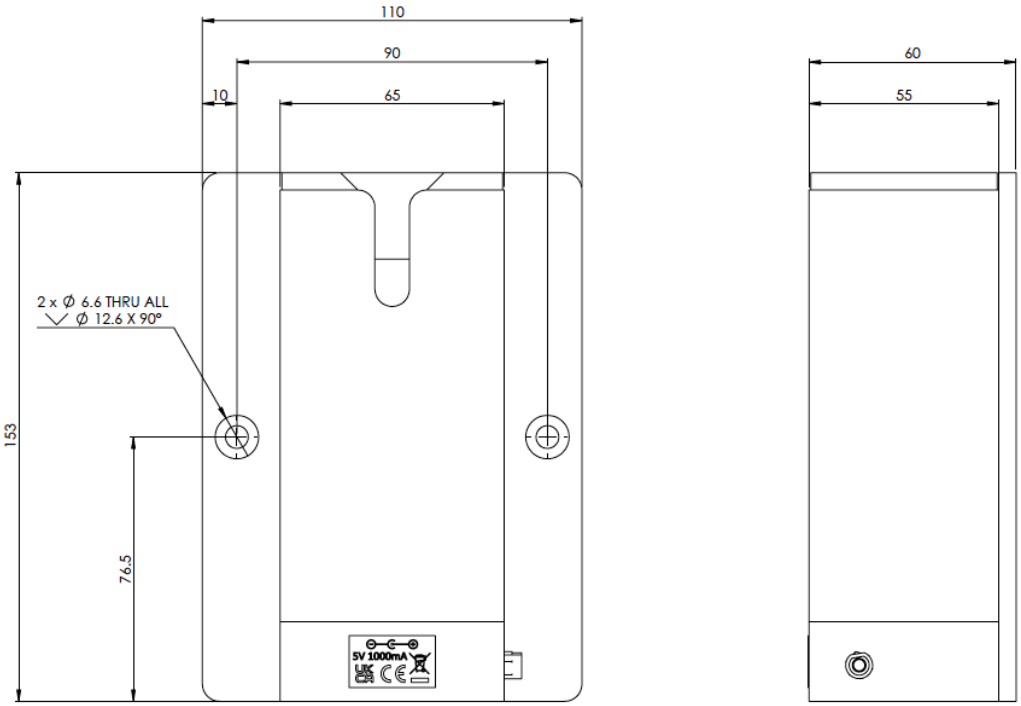
IP Rating:
IP40 (indoor use only)

The WrenchStar Multi may be wiped clean with a soft cloth.

WEIGHTS AND DIMENSIONS

Sales Code WSM plus Battery and Cradle	Range	Insert	Weight (gr)	Length (mm)
WS1JX-0010-C1DARX	10Nm DIN Insert	9X12 mm	833	380
WS1JX-0025-C1DARX	25Nm DIN Insert		904	380
WS1JX-0075-C1DARX	75Nm DIN Insert		914	395
WS1JX-0120-C1DARX	120Nm DIN Insert		967	395
WS1KX-0180-C1DARX	180Nm DIN Insert	14X18 mm	1474	613
WS1KX-0250-C1DARX	250Nm DIN Insert		1710	640
WS1KX-0340-C1DARX	340Nm DIN Insert		1925	788
WS1KX-0500-C1DARX	500Nm DIN Insert		3173	887
WS1AX-0010-C1FARX	10Nm Fixed Head	Fixed	720	330
WS1AX-0025-C1FARX	25Nm Fixed Head		725	330
WS1DX-0750-C1FARX	750Nm Fixed Head		5279	1178
WS1FX-1000-C1FARX	1000Nm Fixed Head		8527	1433
WS1FX-1500-C1FARX	1500Nm Fixed Head		10377	1921



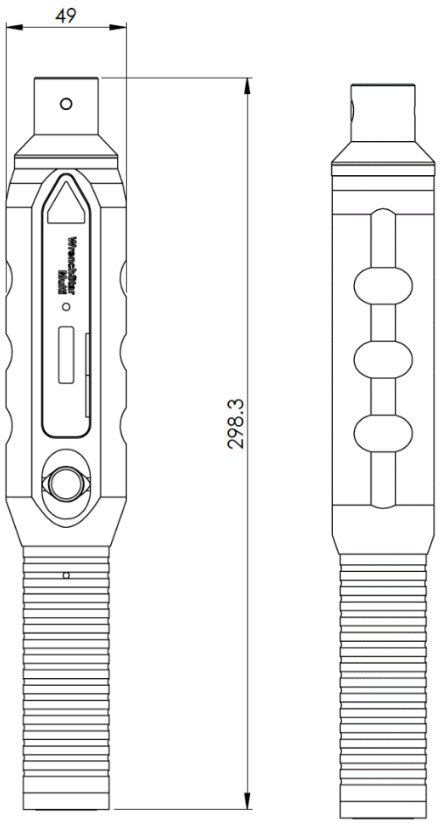


SHORT SHAFT WRENCHSTAR DIMENSIONS

There is also as short shaft version of the WrenchStar Multi available in 25 and 50 Nm versions. The short shaft WrenchStar Multi is designed for tightening applications in confined or enclosed spaces, where access with a standard sized torque wrench is not possible or problematic.

Dimensions: Shown on the image to the right.

Weight: 720g



SPECIFICATIONS

Physical Measurement:
Bi-directional torque and angle. Pulse count.

Measurement Modes:
Peak: Capture of highest Torque value during the cycle.
MoveOn: Capture of MoveOn point Torque during auditing of a tightened joint.
Yield: Special measurement algorithm for use with joints being taken into plastic region.
The Wrench supplies its torque range (span), PPR (for Angle), serial number, calibration due date.

Reading Storage:
The WrenchStar Multi can store up to 200 readings in Offline Mode.

LEDs:
The WrenchStar Multi has a charge LED used when charging battery pack and a status LED Light Ring for fastening status.

Torque Measurement:
Resolution to 0.006% of transducer span, sampled every 60 micro-seconds (16,667) per second.

Zero Stability:
< 0.02% FSD / °C

Static Accuracy:
+/-0.25% FSD (+/- 0.5% FSD for 10Nm Wrench)

Angle Measurement:
Sample every 1000 micro-seconds (1,000) per second

Frequency Response:
A low pass Bessel Filter is employed for conditioning the transducer signal to 'eliminate noise' from the tool measurement. Selectable from 75Hz to 4608Hz

Readings:
Readings are organised into Subgroups.

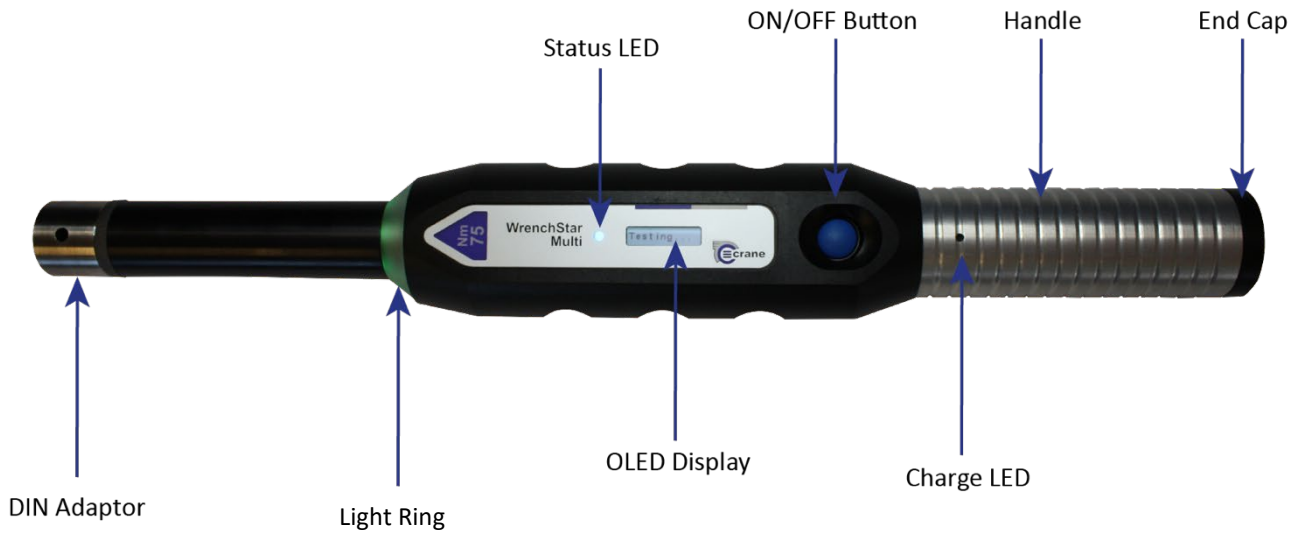
Battery Pack:
Re-chargeable Lithium-Ion battery. Capacity 2600mAh 3.7V
Weight 108.6g
Useable battery life of 10 hours with normal usage

Communication:
Communicates with an TorqueStar Pro using 2.400GHz RF or Cable
Communicates with a TorqueStar Lite/Plus via cable only.
Communicates with a TCI/TCI-2 using 2.400GHz RF with Open Protocol or Crane Protocol

Warranty:
1-year manufacturer's warranty

Display:
OLED 32 x 128 pixels white

FEATURES

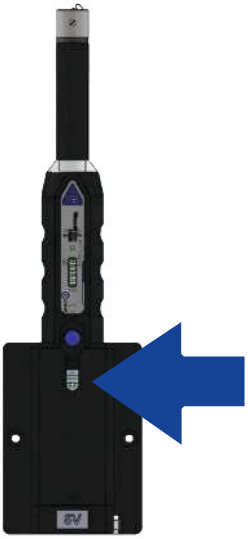


BATTERY & CHARGING

The WrenchStar Multi unit has a battery pack that contains a Lithium-Ion battery. From fully discharged the unit will require a maximum of 4 hours charge to attain maximum capacity.

The full capacity of the battery is 2600mAh which yields approx. 10 hours of normal use.

When a WrenchStar Multi is placed in the charging cradle, the charge indicator LED will illuminate with colour according to the charge status.



Charge Indicator LED Status

Red	=	Charging
Green	=	Charged
Off	=	No Charging

Charging the WrenchStar Multi

Wrench can be charged by inserting into the charging cradle.

Note. Alternative charging methods may become available in the future.

The WrenchStar Multi will monitor its battery level. If the battery level goes below 10% the status LED will flash Blue. If the status LED starts flashing it is recommended that the readings are immediately finished and the WrenchStar Multi taken back to the connected unit to upload any remaining readings. The WrenchStar Multi should be fully charged in a cradle before using. If the level goes to 0% the WrenchStar Multi will switch OFF. Charger voltage is 5V.

BATTERY WARNINGS

- Charge the WrenchStar Multi before use.
- Only charge the WrenchStar Multi in specified cradle.
- Keep battery pack terminals clean.
- Always store the battery pack in a dry place.
- Do not short circuit the battery pack.
- Do not disassemble the battery pack.
- Do not expose the battery pack to high temperature.

WRENCHSTAR MULTI BUTTON

The WrenchStar Multi Button has several functions:

- When the WrenchStar Multi is OFF pressing the Button for less than 1 second will turn the WrenchStar Multi ON.
- When the WrenchStar Multi is ON and the Button is pressed for approx. 2 seconds the WrenchStar Multi will go into Pairing Mode and the status LED will change to Purple.
- If the WrenchStar Multi is in pairing mode pressing the Button will take the WrenchStar Multi back to normal RF Mode and the status LED will change to Blue.
- If the WrenchStar Multi is ON and the Button is held for more than 5 seconds then the WrenchStar Multi will switch OFF.
- The WrenchStar Multi will switch OFF after 10 minutes of no activity. It can be turned back ON with a press of the Button. No activity means no Torque messages from the data collector and no Torque has been pulled.

LIGHT RING

During and after fastening the Light Ring will indicate the primary parameter status, which will be Torque except for Peak Angle Control, in which case it will be Angle.

Amber = LO
Green = OK
Red = HI

If the secondary parameter goes HI the Light Ring will go Red regardless of the state of the primary parameter. If MoveOn or Yield are not detected and Torque was LO or OK then an Amber flash sequence is shown (dash dot dot), otherwise if torque was HI, then a Red flash sequence (dash dot dot) is shown.

The Light Ring will start indicating the status as soon as the Torque goes above threshold.

When a new Job is received the Light Ring will cycle twice through sequence Amber, Green, Red to indicate a Job has been received and loaded. It will do the same when power up and the Job is already loaded.

When a Job is complete the Light Ring will continuously cycle through the sequence Amber, Green, Red whilst data is present.

ID HEADS/ADAPTER LENGTH COMPENSATION

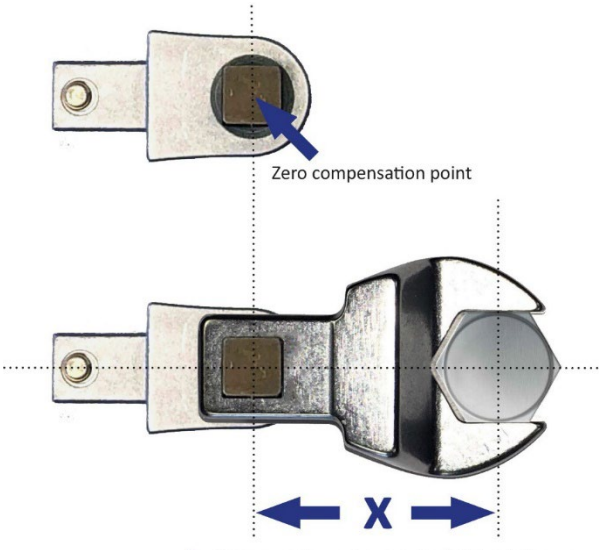
The WrenchStar Multi is compatible with the Crane 1-Touch ID Head recognition system, the Crane 1-Touch system allows the Wrench to compensate for special head designs that do not use the standard insert head dimensions.

The Crane 1-Touch Heads can be programmed with an ID from 1 through to 126, if there is no ID then the WrenchStar Multi will not use the ID system and treat the head as a standard insert head, with a critical compensation length of Zero.

The 1-Touch ID heads can be programmed with a compensation length, these lengths can be from 0 to 200 mm. When the Wrench recognises that there is an ID Head present, it will automatically compensate the Torque by the critical length programmed into the head.

The 1-Touch ID Heads can be programmed up to 4 times, therefore if the compensation value needs to be updated, this can be done up to 3 times. This programming is done by Crane Electronics.

Below is a diagram of how to calculate the critical length for an ID Head.



X = Compensation value required. Value is in mm.

POWER ON SEQUENCE

The following information will be displayed when you switch ON WrenchStar Multi:

- Crane logo
- s/w version 182-vx.x 161-vx.x
- Span in Nm
- Recalibration Date DD/MM/YY
- Battery level %
- WAIT if no job loaded.

Measure Mode (Peak, MoveOn, Yield)

Number of readings to go

To turn OFF, hold the Blue Button pressed until status LED turns off, then release the Button. To turn ON press the Blue Button.

DIAGNOSTIC MODE

During switch ON if the Blue Button is pressed 3 times in quick succession, the Wrench will go into Diagnostic Mode: -

The following information will be shown on the display. The number of taps is the number of taps on the Blue Button that will advance the display onto the next diagnostic function.

- Raw ADC from gauges 1 and 2.
  1 Tap
- Connected ADC
  1 Tap
- Zero offset
  2 Tap
- Gyro Type
  2 Tap
- Torque Track
  2 Tap
- Angle Track
  2 Tap
- Battery % level
  2 Tap
- Adaptor ID and length
  2 Tap
- Testing on display
  Status LED cycle Red, Green, Blue
  2 Tap
- Testing Light Ring cycle Red, Green, Amber
  2 Tap

- Testing
- Light Ring cycle Red, Green, Amber
  2 Tap
- Testing
- Vibration turning on and off
  2 Tap
- Number of over Torques and largest over Torque
  2 Tap

Start

WRENCH STATUS LED

- Black = Wrench powered Off
- Red = On and not paired
- Purple = Ready to pair
- Blue = Paired and RF in range
- Amber = Paired, received Job and not in range
- Green = Paired, received Job and in range of receiver
- Flashing between Blue and Amber indicates low battery

VIBRATION

The vibrator will be turned on when primary status becomes OK or either primary or secondary status becomes HI.

SERVICE AND CALIBRATION

To maintain precision and accuracy of the wrench, Crane Electronics recommend that customers have their wrenches calibrated every 12 months. If the wrench is used excessively, it may be that a calibration every 6 months is necessary.

CONTACT US

To get in touch with Crane Electronics, please go to https://crane-electronics.com/contact-us/

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