

Operator's Manual

WrenchStar Multi-e

Manual 1310-01 Issue 1

Crane Electronics Ltd



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UKCA MARKING

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



CE MARKING

Crane Electronics Limited declares that the WrenchStar Multi-e 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.

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: 

ABOUT THIS MANUAL

This manual covers the WrenchStar Multi-e and the wireless charging cradle. The WrenchStar Multi-e connects to the IQVu and TorqueStar Pro data collectors via RF, the TorqueStar Lite and Plus data collectors via cable and the TCI (Tool Control Interface) lineside controller, 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.

PACKING LIST

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

- 1 x WrenchStar Multi-e
- 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-0000-CRCNXE – Cradle and Inductive Charger

WS1XS-00JB-CRRXXE – Insulated Ratchet Adapter Head 9 x 12 Din to 3/8"

CARE AND STORAGE

Operating Temperature Range:

+5°C to +40°C

Storage Temperature Range:

-20°C to +50°C

Humidity:

10-75% non-condensing.

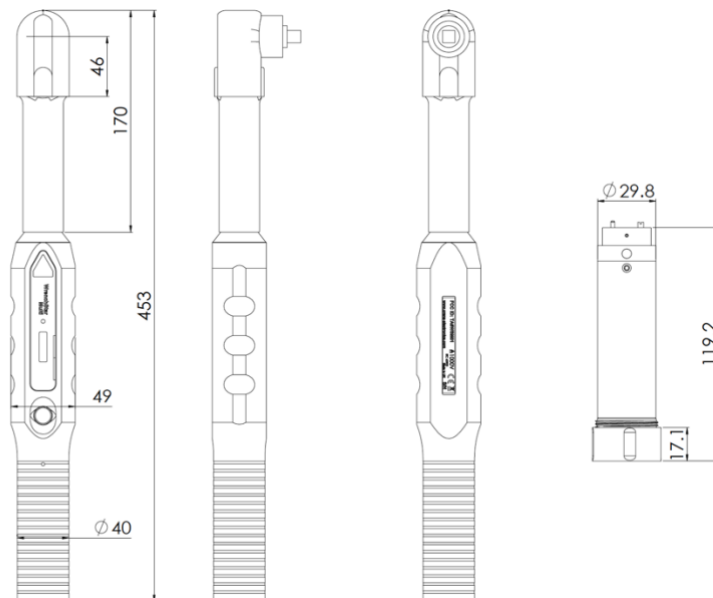
IP Rating:

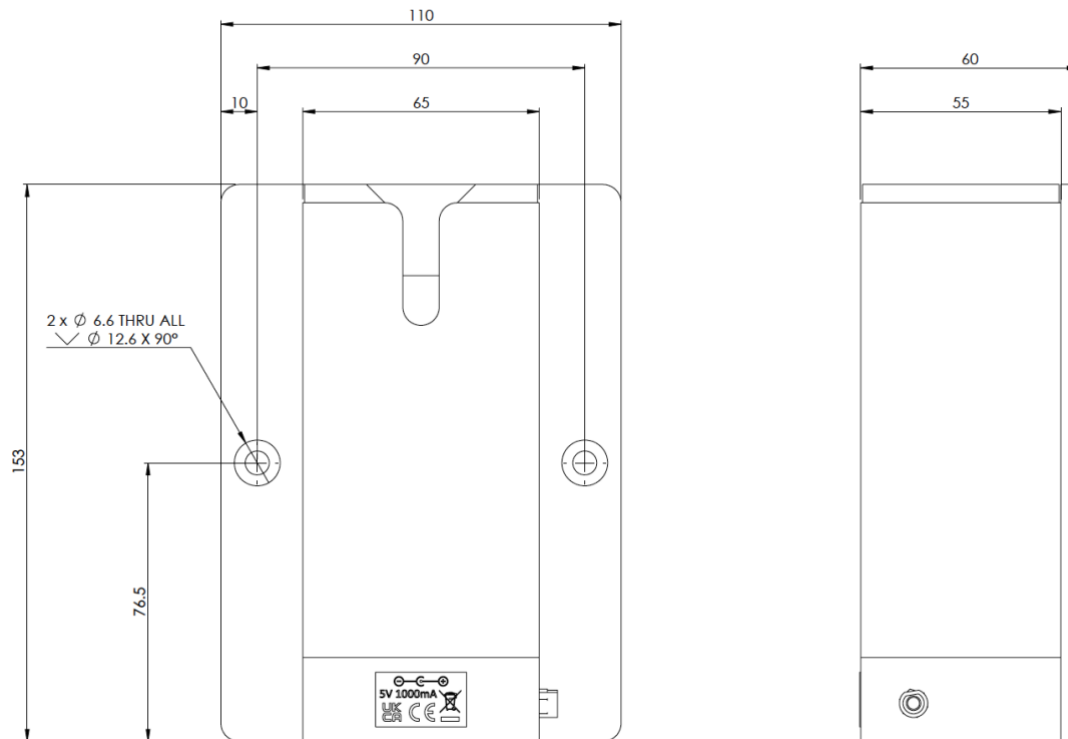
IP40 (indoor use only)

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

FEATURES AND DIMENSIONS

Sales Code WSM-e plus charging cradle	Range	Insert	Weight (gr)	Length (mm)
WS1JE-0010-C1DARX	10Nm WrenchStar Multi-e	Fixed Insulated Ratchet Adapter Head	1102	442
WS1JE-0025-C1DARX	25Nm WrenchStar Multi-e		1173	442
WS1JE-0050-C1DARX	50Nm WrenchStar Multi-e		1183	457
WS1JE-0075-C1DARX	75Nm WrenchStar Multi-e		1183	457
WS1JE-0100-C1DARX	100Nm WrenchStar Multi-e		1236	457





OVERVIEW – WRENCHSTAR MULTI-e

The WrenchStar Multi-e is a wireless production wrench specifically designed for the assembly of electric vehicles and sub-systems. The Wrenchstar Multi-e features a completely insulated shaft, head, body and handle, to prevent any short conditions when used. The WrenchStar Multi-e has audit capability when connected to the IQVu, TorqueStar or Tool Control Interface (TCI) lineside controller.

The WrenchStar Multi-e reads the Torque and Angle values in real time and converts them to digital values. The WrenchStar Multi-e analyses the digital samples using measurement algorithms to calculate properties of the fastening. The WrenchStar Multi-e communicates the final fastening readings to the data collector using RF giving a range of approximately 10 metres*. If the WrenchStar Multi-e 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-e with a data collector or lineside controller.

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

* The RF range depends on the environment in which the WrenchStar Multi-e and IQVu/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-e.

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-e can store up to 200 readings in Offline Mode.

LEDs:

The WrenchStar Multi-e has a:

Charge LED used when charging battery pack. 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

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

Wireless charging cradle:

5VDC 2000mA power supply

Qi/WPC technology chipset

FOD detection

Charge rate 800mA approx.

Communication:

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

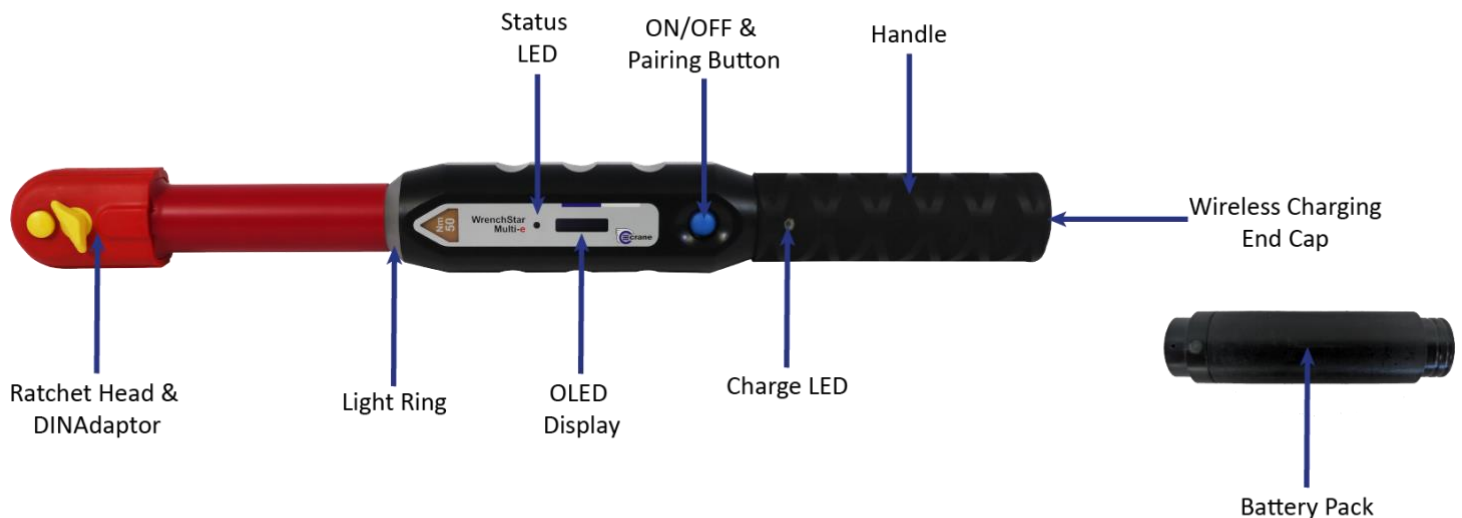
Warranty:

1-year manufacturer's warranty

Display:

OLED 32 x 128 pixels white

MAIN FUNCTIONS AND FEATURES



BATTERY

The WrenchStar Multi-e unit has a built-in battery pack that contains a Lithium-Ion battery. From fully discharged the unit will require an approximately 6 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-e is placed in the wireless charging cradle, the wireless charger chipset identifies that there is a suitable receiver within range and commences the charge cycle. Once this is complete, the charge indicator LED will illuminate with colour according to the charge status.



Charge Indicator LED Status

Red	=	Charging
Green	=	Charged
Off	=	No Charging

WARNINGS

- Maintain unit with care. Keep unit clean for better and safer performance.
- Changes or modifications to the WrenchStar Multi-e not expressly approved by Crane Electronics Ltd could void the user's authority to operate the equipment.
- Always operate, inspect and maintain this unit in accordance with all regulations (local, state, federal and country) that may apply.
- Do not remove any labels.
- Always use Personal Protective Equipment appropriate to the tool used and material worked.
- Keep body stance balanced and firm. Do not overreach when operating with the tool. Anticipate and be alert for sudden changes in motion, reaction torque, or forces during the operation.
- 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.
- Follow instructions for changing accessories.
- Do not operate this product in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.
- This unit contains no user serviceable parts. Only qualified service personnel should replace or fit parts.



Changes or modifications to the WrenchStar Multi-e not expressly approved by Crane Electronics Ltd could void the user's authority to operate the equipment.

BATTERY WARNINGS

- Charge the WrenchStar Multi-e before use.
- Only charge the WrenchStar Multi-e in specified cradle.
- Always store the wrench in a dry place.
- Do not disassemble the battery pack from the wrench. Batteries are to be replaced only by qualified service personnel.
- Do not expose the wrench pack to high temperature.

WIRELESSLY CHARGING THE WRENCHSTAR MULTI-e

The Wrenchstar Multi-e features wireless charging technology. The internal chipset utilises the Qi/WPC 1.2 protocol, which ensures efficient charging of the battery pack and features the ability to detect FOD for safety.

Charging the wrench to 100% takes approx. 6 hours depending on battery level. Wrench can be charged by inserting into the wireless charging cradle.

The WrenchStar Multi-e 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-e taken back to the connected unit to upload any remaining readings.

WrenchStar Multi-e should be fully charged in a wireless charging cradle before using. If the level goes to 0% the WrenchStar Multi-e will switch OFF. Charger voltage is 5V.



WRENCHSTAR MULTI-e BUTTON

- The WrenchStar Multi-e Button has several functions:
- When the WrenchStar Multi-e is OFF pressing the Button for less than 1 second will turn the WrenchStar Multi-e ON.
- When the WrenchStar Multi-e is ON and the Button is pressed for approx. 2 seconds the WrenchStar Multi-e will go into Pairing Mode and the status LED will change to Purple.
- If the WrenchStar Multi-e is in pairing mode pressing the Button will take the WrenchStar Multi-e back to normal RF Mode and the status LED will change to Blue.
- If the WrenchStar Multi-e is ON and the Button is held for more than 5 seconds then the WrenchStar Multi-e will switch OFF.
- The WrenchStar Multi-e 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.

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

POWER ON SEQUENCE

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

- 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.

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 (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

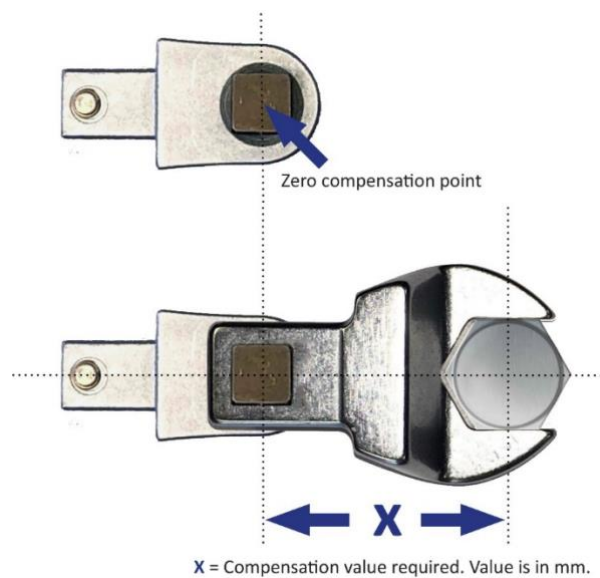
The WrenchStar Multi-e is compatible with the Crane 1-Touch ID Head recognition system, the Crane 1-Touch system allows the Wrench to compensate for special head designs that do not use the standard insert head dimensions.

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-e 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.



BATTERY CHARGE STATUS

Battery Charge Status will have 2 colours:

- Red = Charging
- Green = Charged
- No LED = No charging source present and running off battery power.

Battery Charge Status will be available even when the WrenchStar Multi-e is OFF. It will only be viewable when connected to a charging source.

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.


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