Crane 96843 Tool Control Interface Lineside Controller User Manual

Contents

CRANE

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ADDRESS

Manufacturer: Address: Crane Electronics Ltd 3 Watling Drive Sketchley Meadows Hinckley Leicestershire LE10 3EY
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UKCA MARKING

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

CE MARKING

Crane Electronics Limited declares that the TCI 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.

PACKING LIST

The following items are supplied with the TCI.

- 1 x Tool Control Interface
- 1 x User Manual
- 1 x Quick Start Guide
- 1 x 5V PSU
- 1 x Ethernet Cable

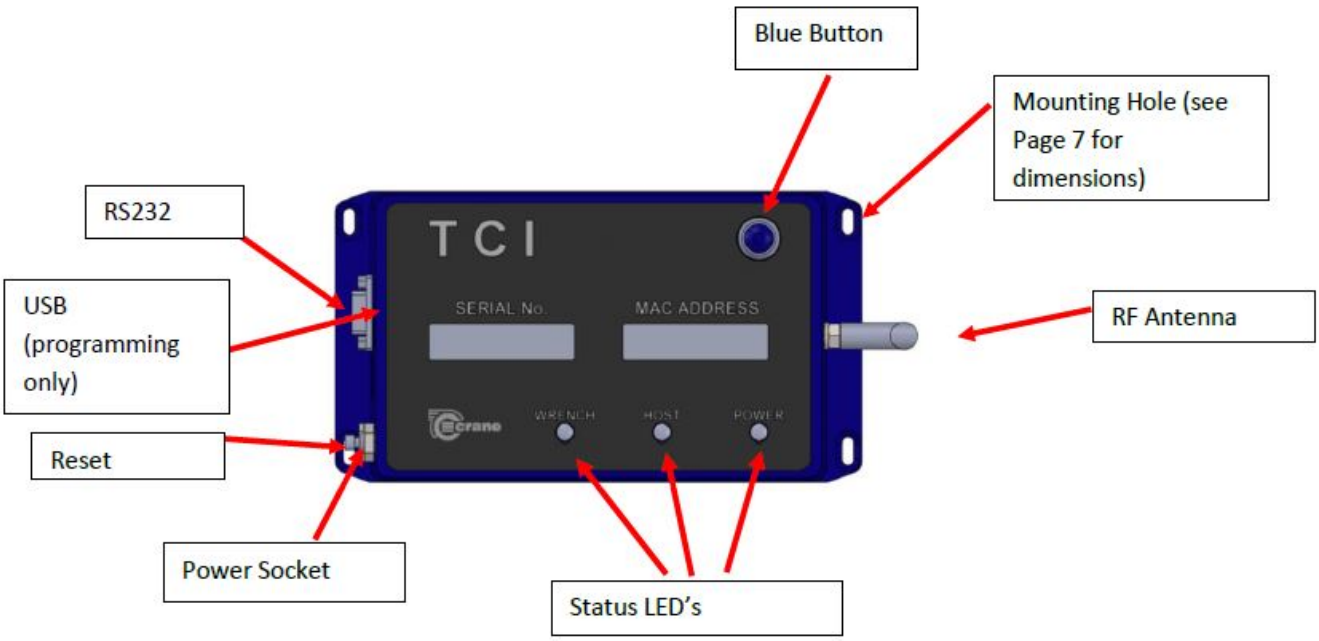
CARE AND STORAGE

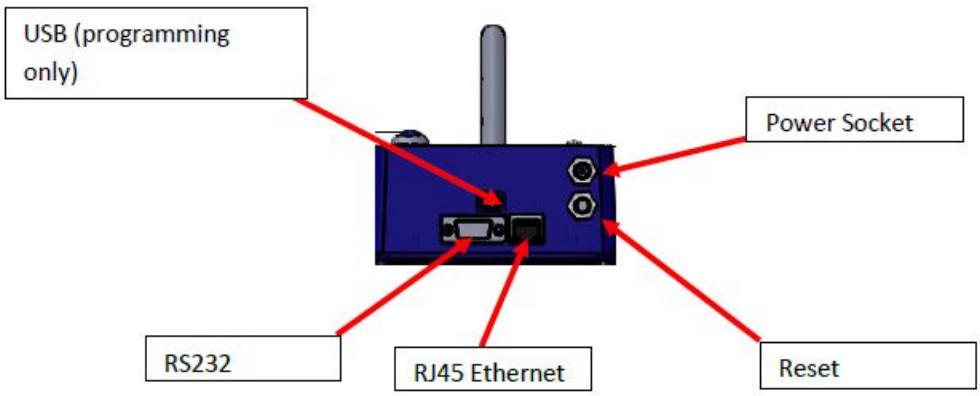
- Operating temperature range:-20 to +50 degrees C
- Storage temperature range -20 to +50 degrees C
- Humidity 10-75% non-condensing
- IP Rating:IP40 (indoor use only)
- The Tool Control Interface may be wiped clean with a soft cloth.

WARNINGS

- Maintain unit with care. Keep unit clean for better and safer performance.
- Changes or modifications to the Tool Control Interface not expressly approved by Crane Electronics Ltd could void the user’s authority to operate the equipment.
- Always operate Tool Control Interface with approved PSU.
- 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.

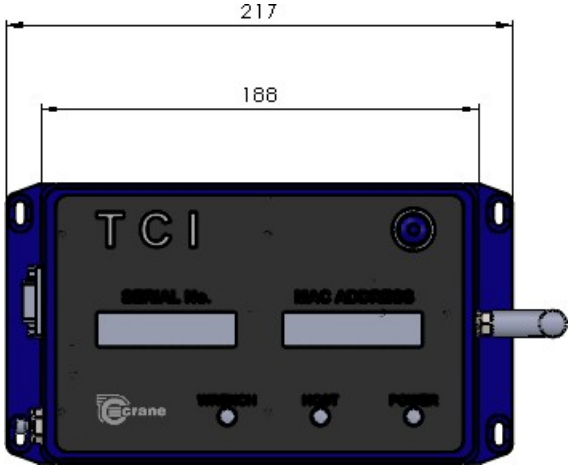
PRODUCT DESCRIPTION

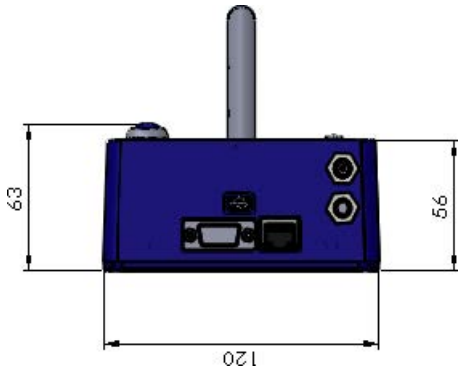




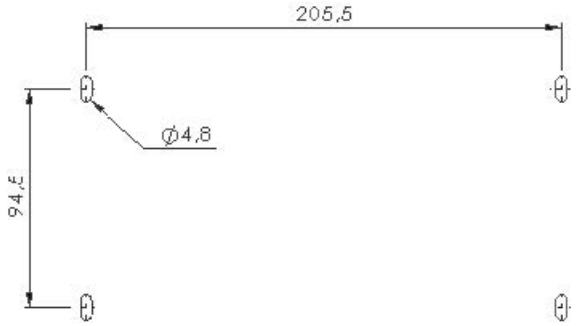
DIMENSIONS

Weight: 708g Construction: Aluminium housing containing printed circuit boards.





Mounting Details



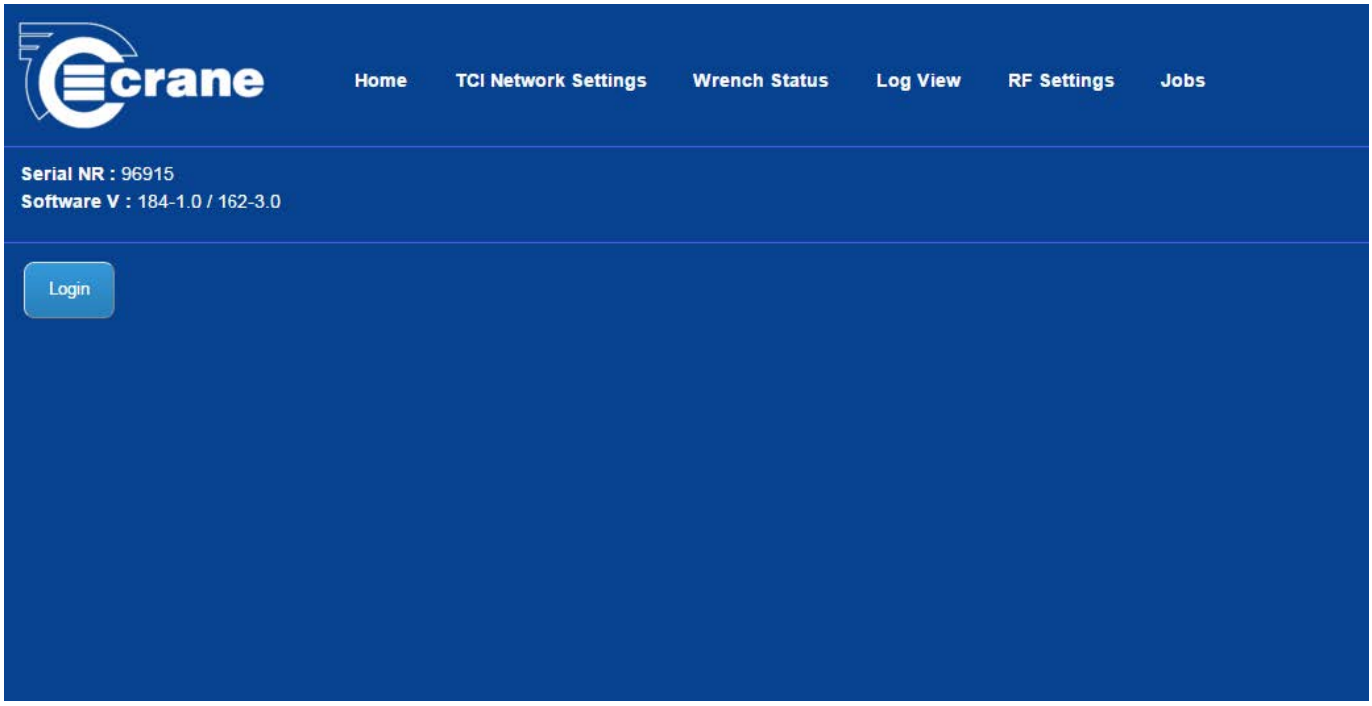
(TCI) SPECIFICATION

- Power: 5V +/-10% DC power supply 1000mA
- Ethernet: RJ45 socket
- Serial: 9-way D-type RS232 socket for serial connection to a PC in standalone mode.
- USB: Mini USB Cable for programming firmware.
- RF: 2400MHz antenna for RF Wrench communication that can be placed in different orientations. Low power 0dBm and uses worldwide ISM band (2400MHz).
  Transducer:
- Transducer: WrenchStar Multi.
- Number of Jobs: Stores 256 different Jobs, any of which can be selected and downloaded to WrenchStar Multi.
- Offline mode: Downloads a Job to a WrenchStar Multi and uploads results when the WrenchStar Multi is within range.
- Pairing: Can be easily Paired with WrenchStar Multi using a single push Button operation or via web Page.
- Construction: Aluminium enclosure
- Dimensions: 217mm x 120mm x 56mm
- Weight: 708g
- Mounting: Flange for mounting to a surface with 4 bolts. (See pg. 6)
- LEDs: Power Status Host communication (informs whether the communications is good, absent incorrect). Wrench communication (informs whether the WrenchStar Multi is Paired, in range or has a Job loaded).
- Operation: Accepts Open Protocol commands via Ethernet to select a Job and use with the Wrench (tool). Has Web Status Page that allows Ethernet properties, RF properties, logging of messages, and Wrench Status to be monitored. Wrench Status Web Page mirrors the LED Status on TCI and also shows last Torque and Angle

reading from Wrench plus its Torque Status (LO, OK and HI). Standalone mode – Jobs can be selected and results posted to PC or Web Page.

- Setup: Via Web Page or PC program “TCI Exchange”.

TCI Web Pages
When you first login to the browser, you will see the Home Page.
You can get back to the Home Page by clicking on the “Home” Icon at any time



There are 6 Web Pages that can be navigated to:

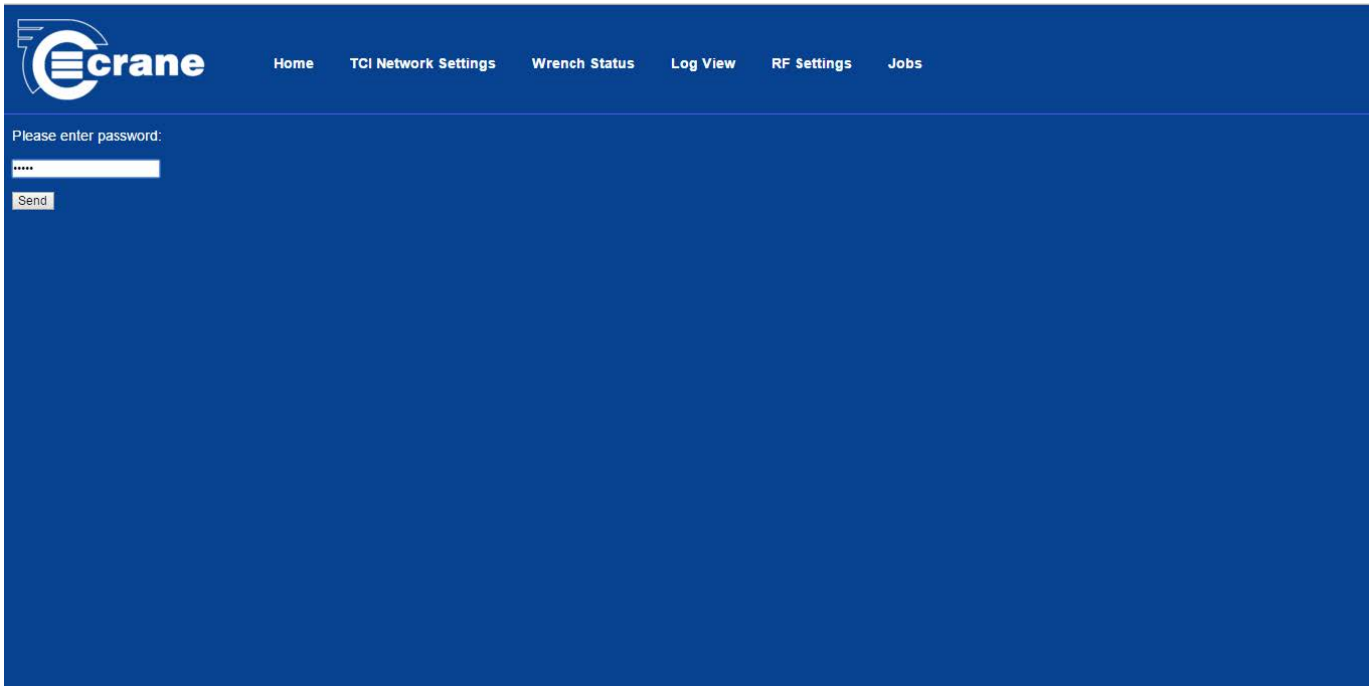
- Home
- TCI Network Settings
- Wrench Status
- Log View
- RF Settings
- Jobs Settings.

The Home Page will give the serial number of the TCI, and its current software versions for the main processor and RF module.

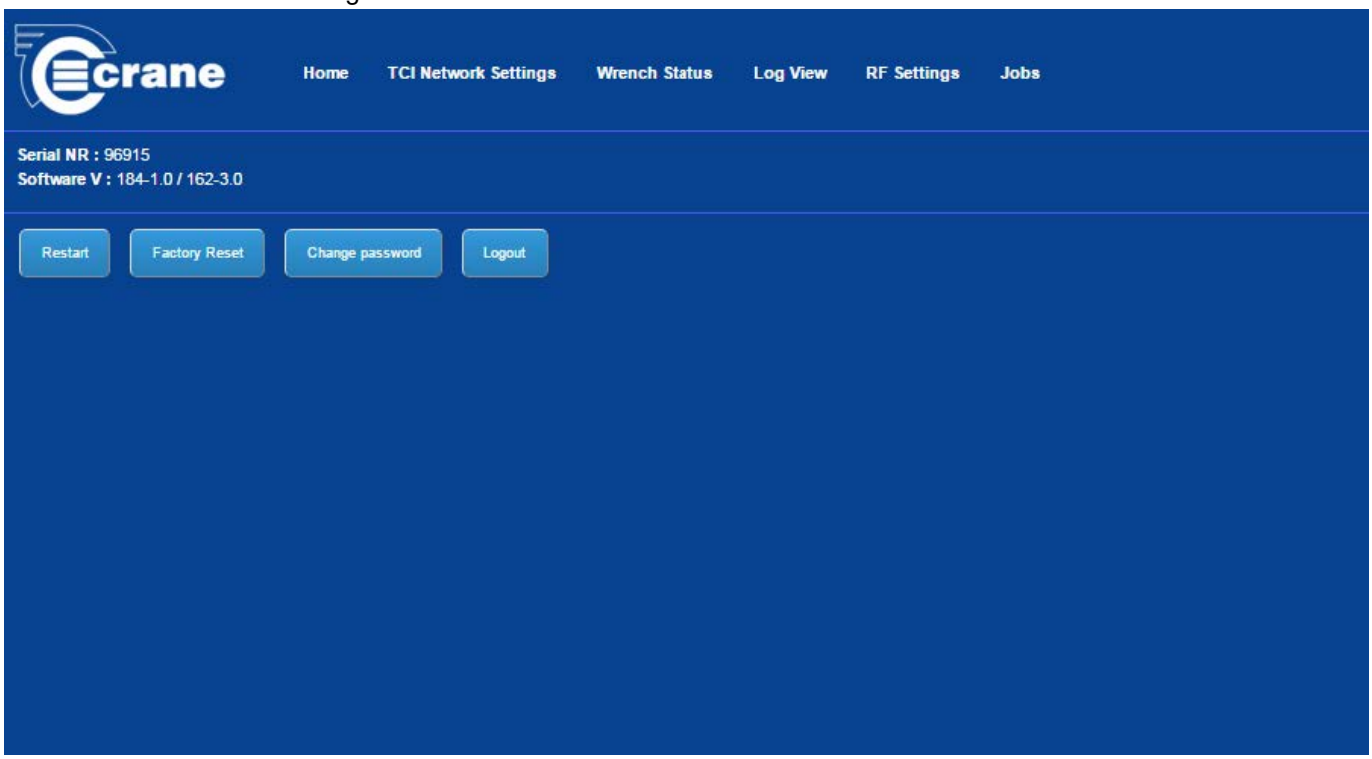
There are 2 Comms Modes

- Open Protocol (used by a variety of manufacturing systems)
- Standalone (when the factory network breaks down or if a simple manufacturing system)

The default IP and Port address is 192.168.0.101:80. The TCI returns to this IP address after a Factory Reset. Note: Before you plug the TCI into a corporate network, please involve the IT department to avoid IP conflicts. The Web Pages are viewable on common web browsers such as Internet Explorer 11 (min), Firefox and Chrome.



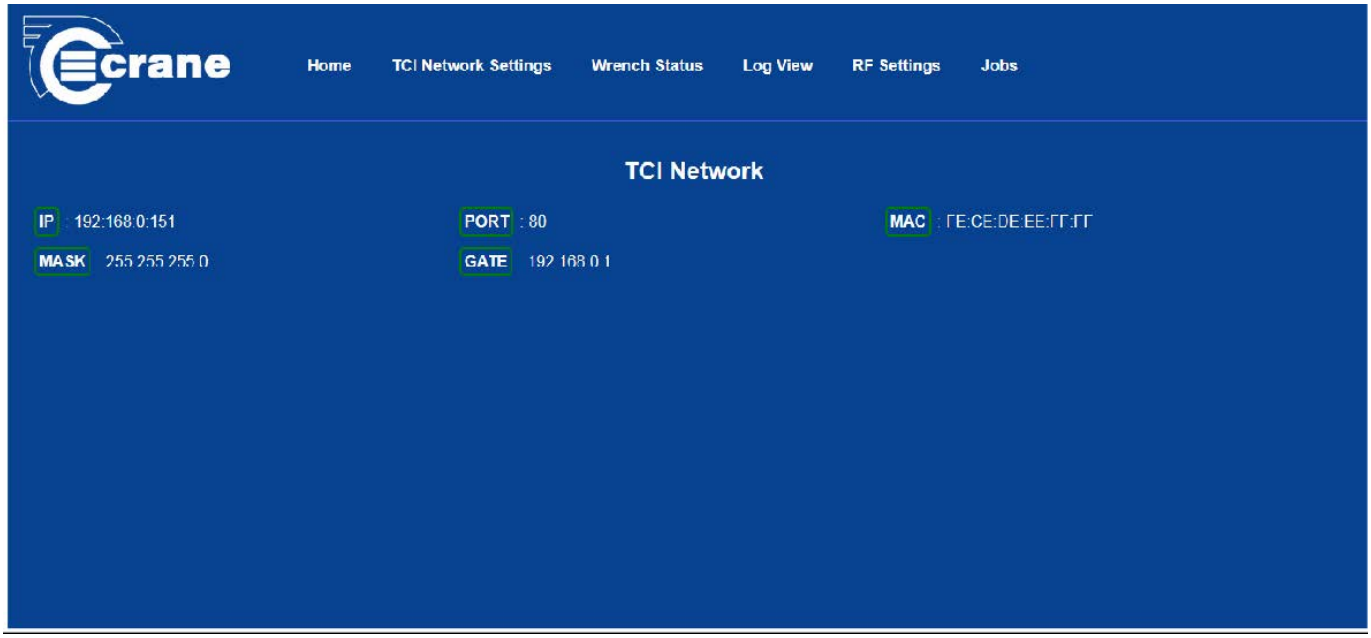
The default password is “Admin” and we advise that you change this by clicking on the “Change password” Icon once logged in as Admin due to the password only remaining active for 5 minutes, after this time it will need to be re-entered to continue Editing.



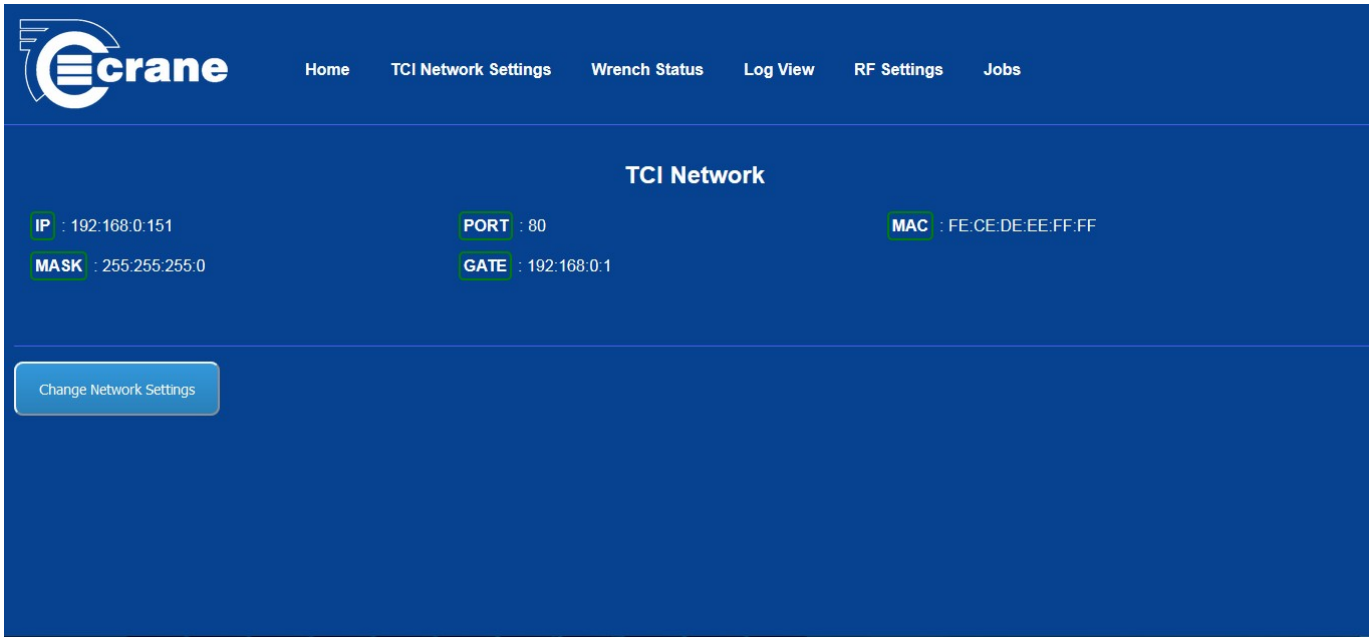
Once logged in, it is possible to perform a remote Factory Reset of the TCI. To manually perform a Factory Reset press and hold the Blue Button until all the LEDs are flashing (approx. 30 seconds). Release and re-press the Button within 10 seconds to confirm Factory Reset. Once a Factory Reset has been done the following happens:

- Jobs list cleared – Jobs will need to be re-entered.
- Sets password to Admin
- Erases Pairing information – WrenchStar Multi will need to be re-Paired.
- In Open Protocol it will be necessary to receive a Comms Start MID
- The browser IP addresses will be 192.168.0.101 and Port 80 for HTML.
- Port 4545 is the default Port for first Wrench (tool).

The TCI Network Settings Page is shown below:



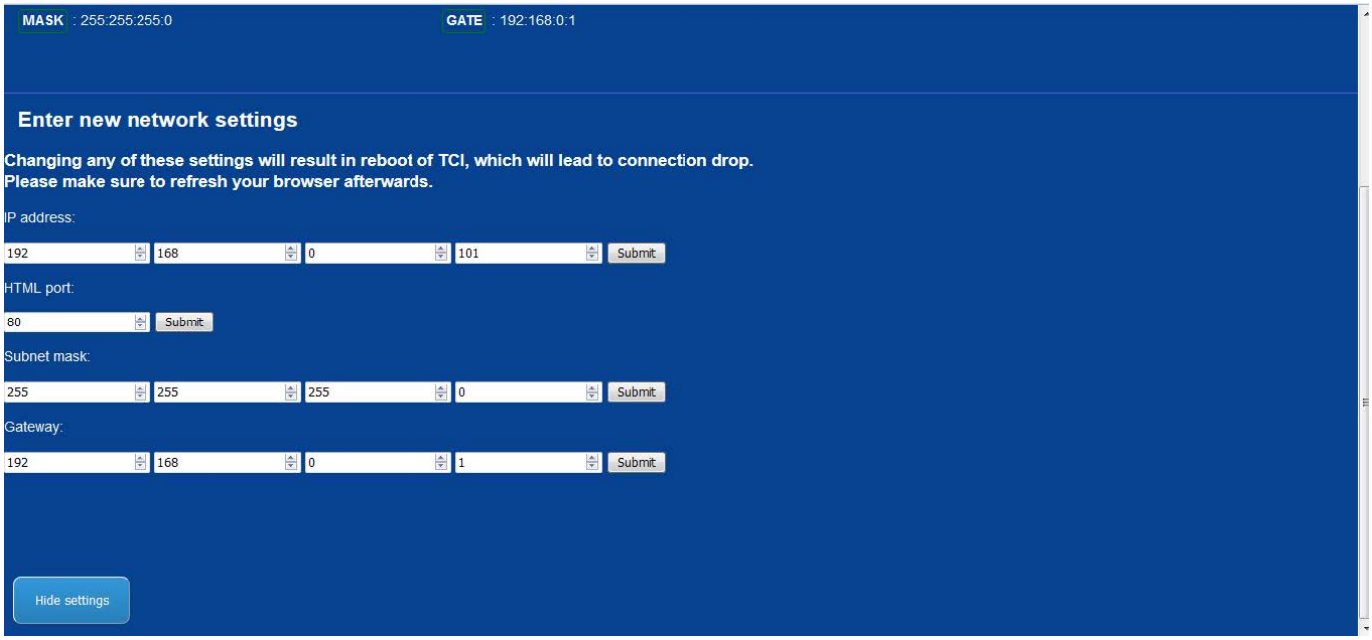
It shows the IP and Port address of the Web Pages. The unique MAC address of the TCI is shown. This cannot be changed. This is useful if the IT system needs to check a valid device is connected to a certain network node. If the user is logged in then the Web Page will show a “Change Network Settings” Button.



If this is clicked then you can Edit:

- IP Address
- HTML Port
- Subnet mask
- Gateway.

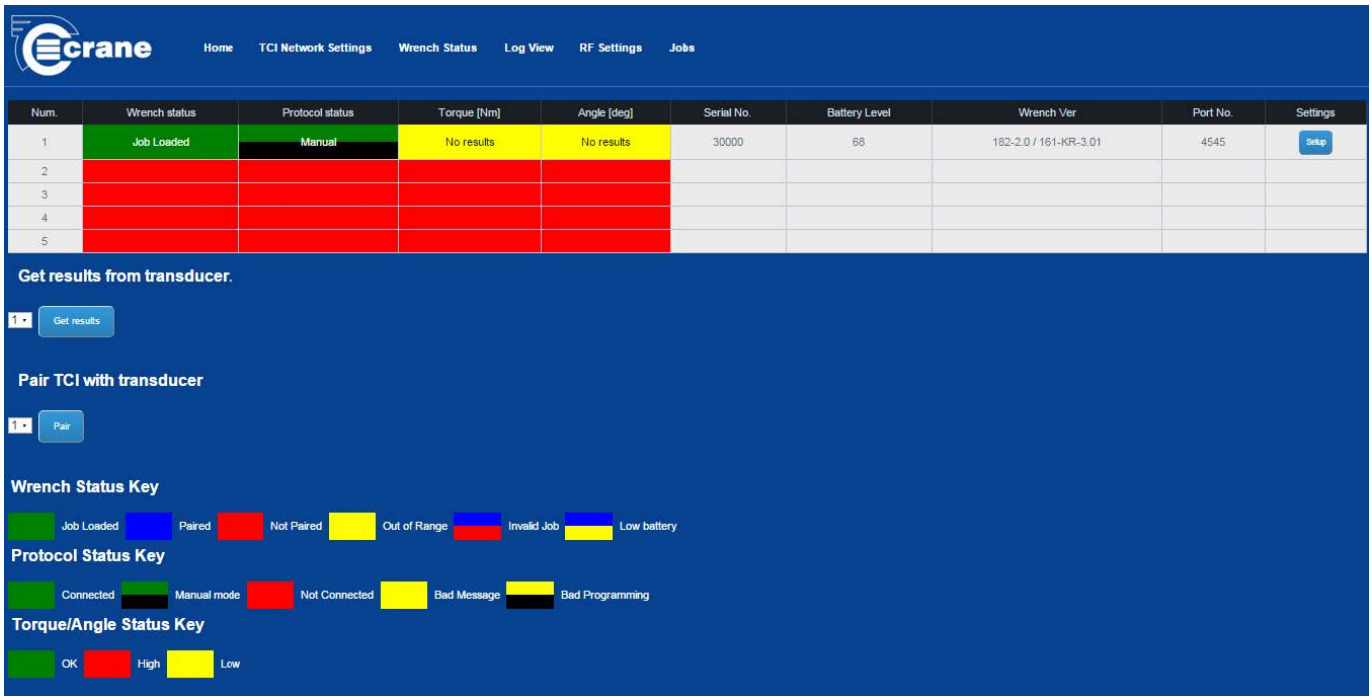
If the network settings are changed the TCI will re-boot itself which will cause the network connection to be dropped with the browser. The browser will need to be refreshed and of course set to the new IP and Port address.



The Edit entry warns you if the number entered is incorrect. IP address entry is from 0 to 255 Port entry is from 0 to 65353

The TCI Wrench Status Page is shown below

It shows the Status for up to 5 connected Wrenches. This is scheduled for implementation in 2016. Note: Info on Port 80 can be viewed at the same time as the measurement results are being transmitted to Port 4545.



Each column shows different information:

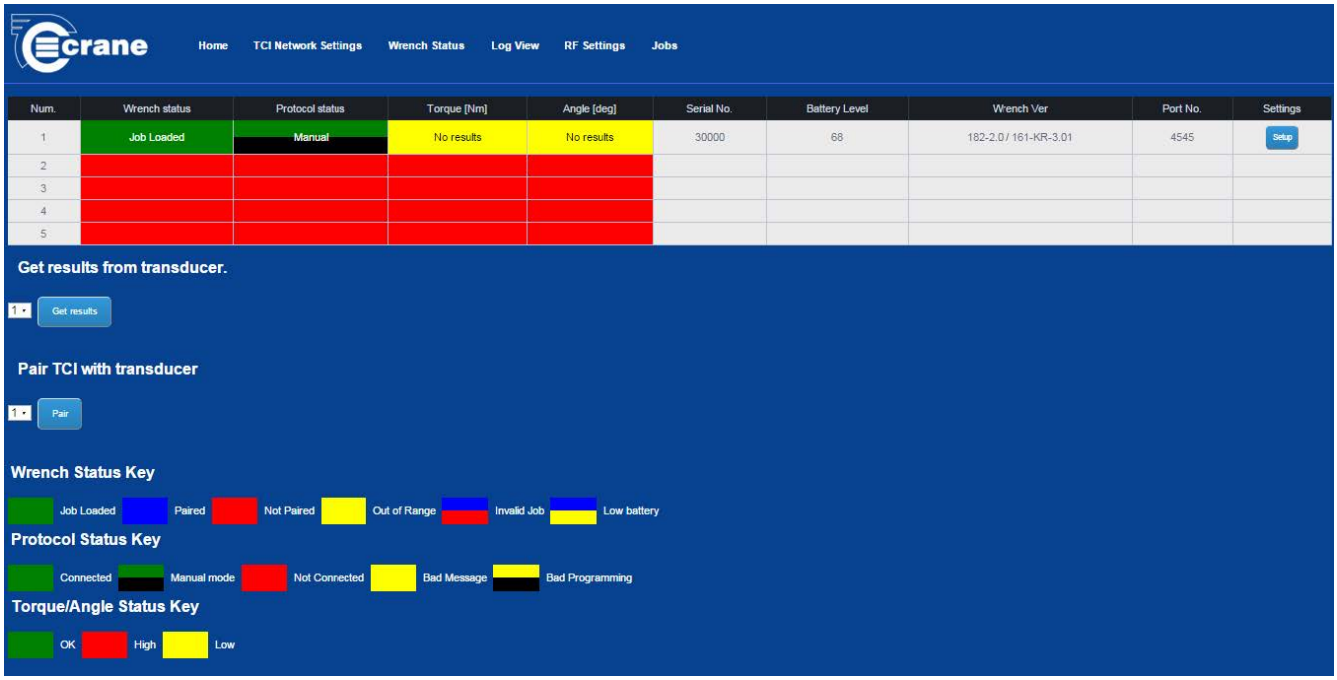
- Wrench Status – gives colour coded information about the current state of the WrenchStar Multi. The key for colours is shown at the bottom of the Page. These colours will match the Wrench Status LED on the TCI.
    - Note: The Out of Range – Yellow colour may also be seen if the WrenchStar Multi is turned off. This colour is only seen once a WrenchStar Multi is Paired as it is then regularly polled to check if it's present and has any off-line results.
    - The Red/Blue colour on the TCI indicates that you will see Wrench Status LED flashing between Red

and Blue.

- The Protocol Status – gives colour coded information about the current state of the host connection. The key for colours is shown at the bottom of the screenshot above. These colours will match the host Status LED on the TCI.
    - “Bad message” is an unrecognised host message
    - Will be “Connected” if a Start Comm MID was received and it continued to receive messages or a Keep Alive MID message.
- The Torque and Angle result for the last reading will be displayed and colour coded the same as the Light Ring on the WrenchStar Multi
    - Less than LSL = Amber
    - Okay = Green
    - Greater than USL = Red
- The rest of the information is only updated when initially connected to the WrenchStar Multi:
    - WrenchStar Multi serial number
    - WrenchStar Multi battery level
    - WrenchStar Multi software version
    - Port number. The Port which the WrenchStar Multi is communicating to the host on (each WrenchStar Multi has a unique Port ID for communication)

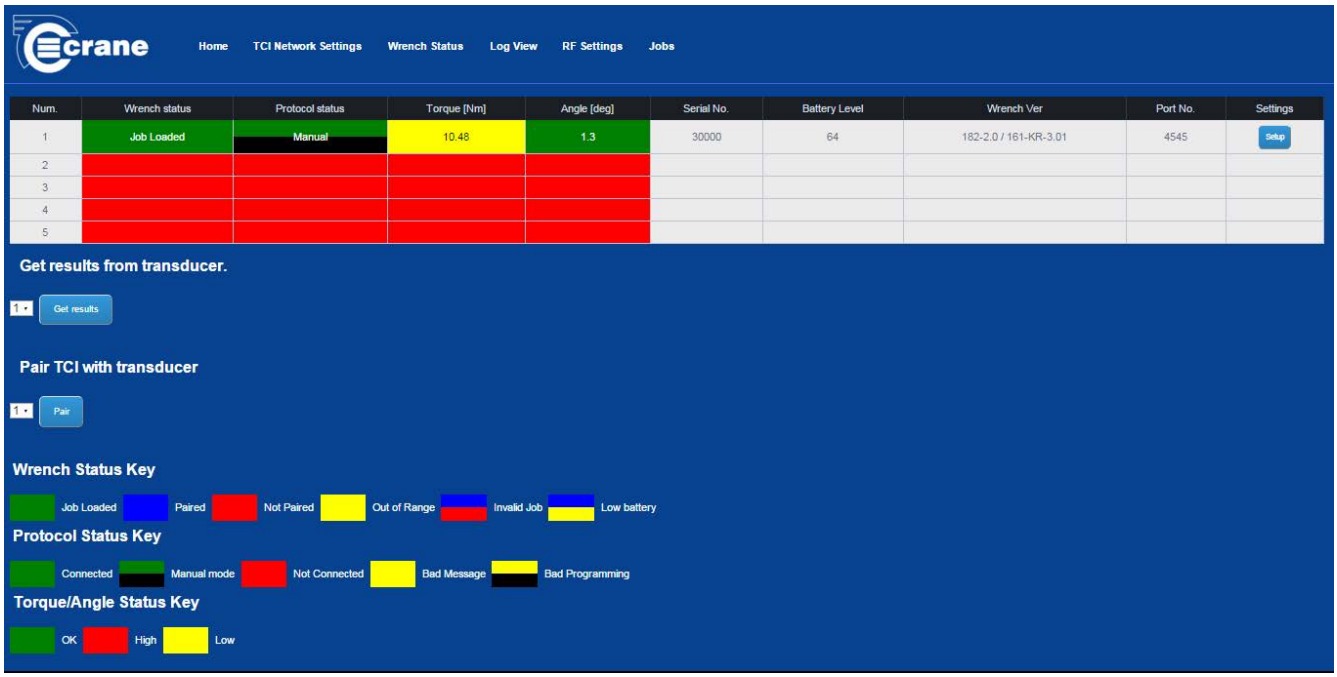
The following example of the Wrench Status Page shows: the Pair Transducer Button.

- First set the WrenchStar Multi into Pairing mode by holding its Blue Button until its Status LED turns Purple. Then press TCI Pair Button.



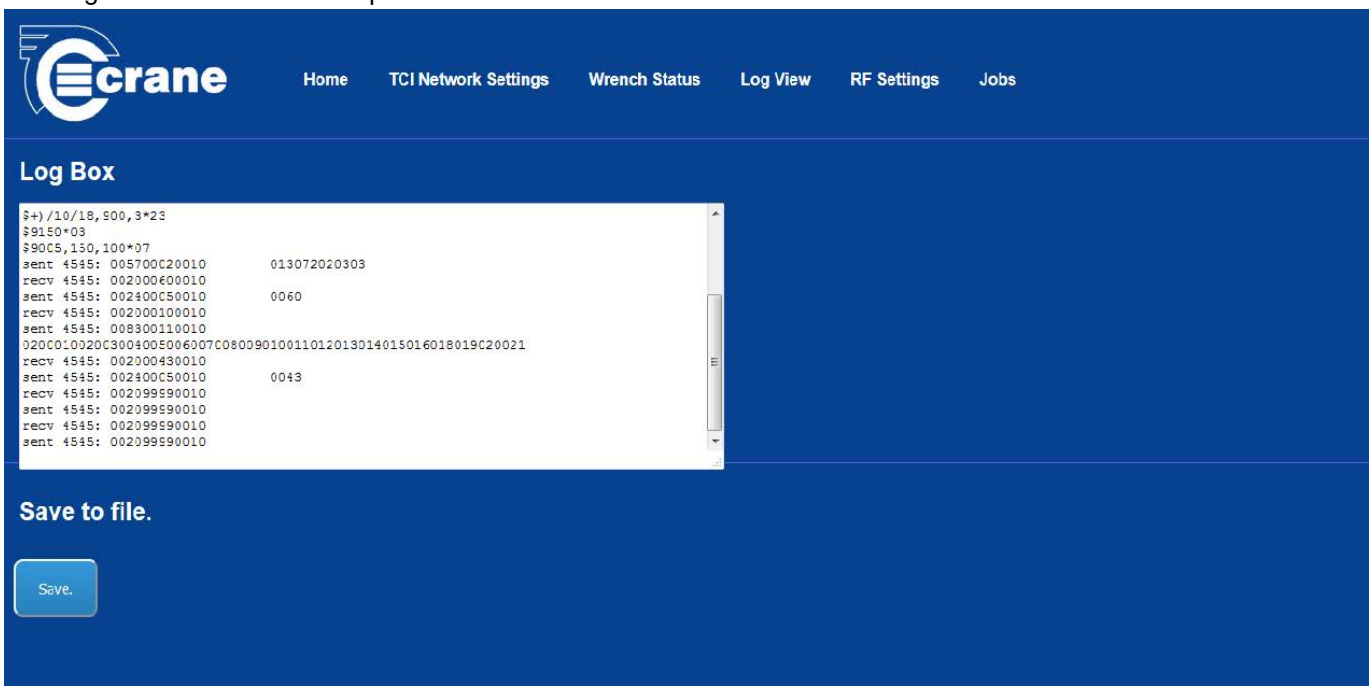
The following example of the Wrench Status Page shows:

- Its last result was a Torque of 10.48 Nm which was lower than LSL (Lower Spec Limit).



The TCI Log View Page is shown below:

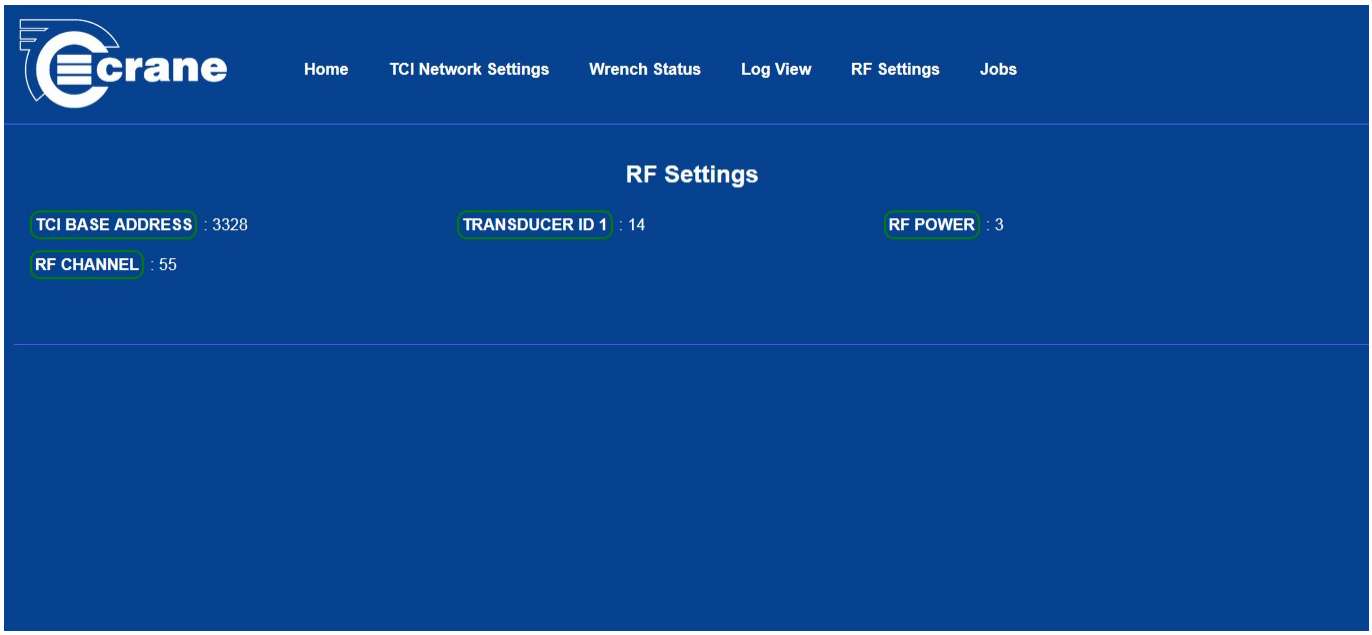
The TCI can log message information to help diagnose problems. The TCI has the option of viewing either host messages, or WrenchStar Multi messages, or both. The logging options are setup via TCI Exchange. The log information will appear in the “Log Box” which will display the latest messages or the last 1000 characters of messages if the TCI detects a problem.



The log text can be saved to a file (browse to requested folder) with the Save Button.

The TCI RF Settings Page is shown below:

The RF Settings Page allows the properties of the TCI RF to be altered.



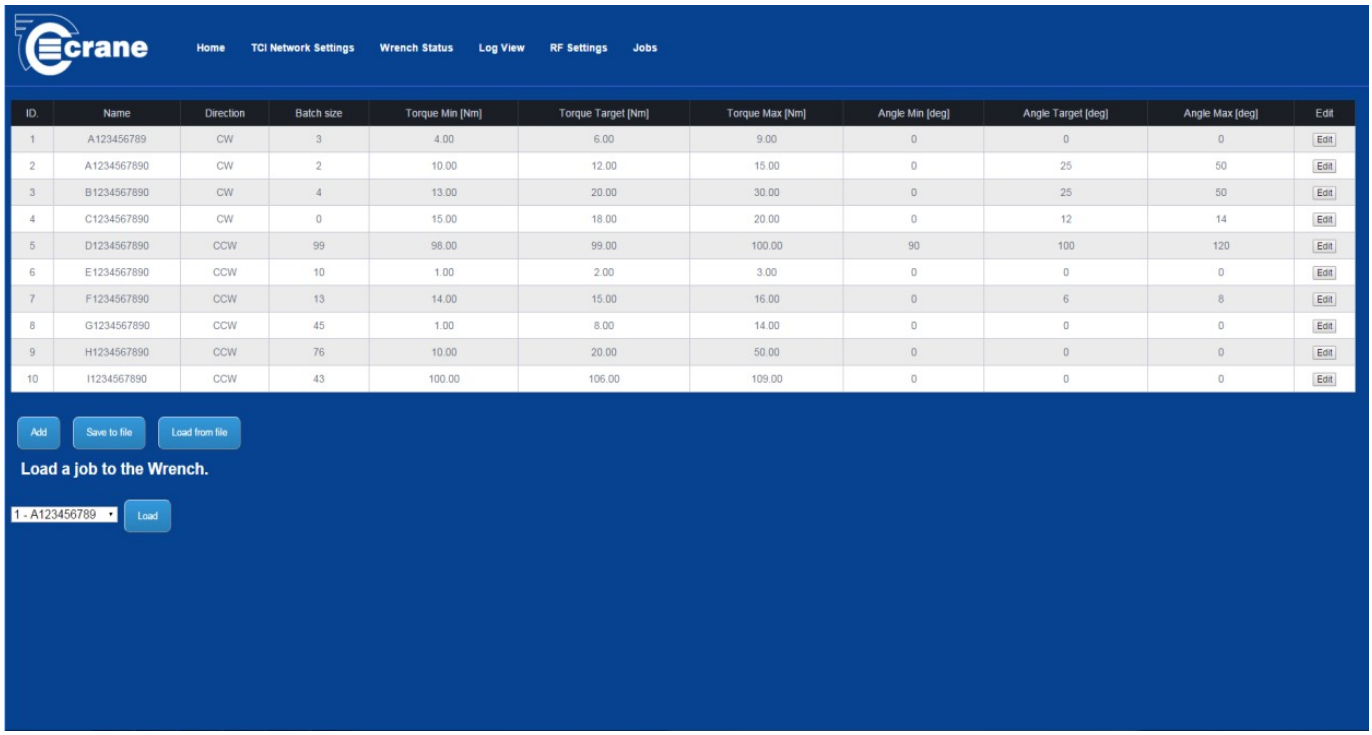
If the password has been entered the settings can be changed.

The TCI base address should be set between 1 and 65353. Each TCI should be given a unique base address so that WrenchStar Multi's Paired with a particular TCI will only communicate with that TCI and no other. The RF power typically gives the following ranges: 0 = 1m

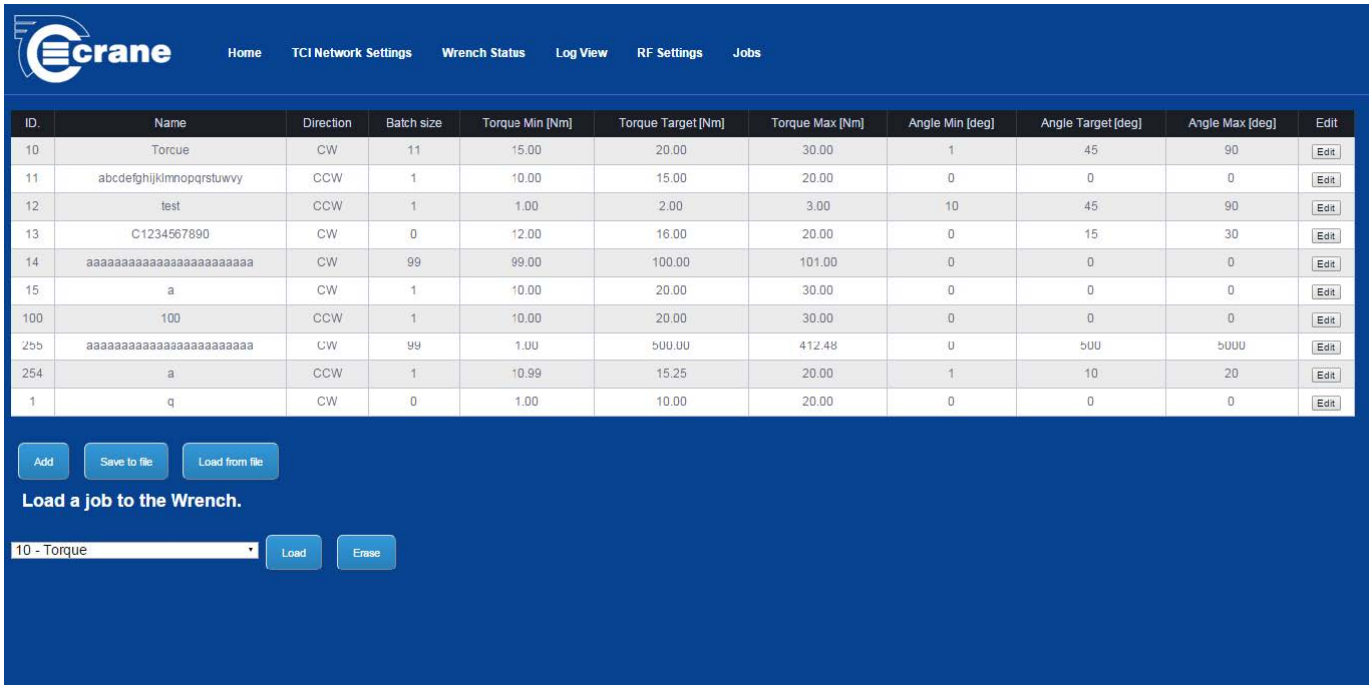
- 1 = 4m
- 2 = 9m
- 3 = 14m
- (Default = 3)

The RF channels refer to the 1MHz frequency band in the region 2400 to 2480MHz and can be 0 to 79. Channel 80 is reserved for Pairing. It is recommended that TCI's which are used in close proximity should be allocated different channels. During Pairing the TCI will allocate a unique ID to each Paired device, the next one available being shown on the Web Page. The TCI will only remember 5 Paired devices. It is recommended that you only Pair one WrenchStar Multi and TCI at a time to avoid confusion and keep them as close as possible when pairing.

The TCI Jobs Page is shown below:



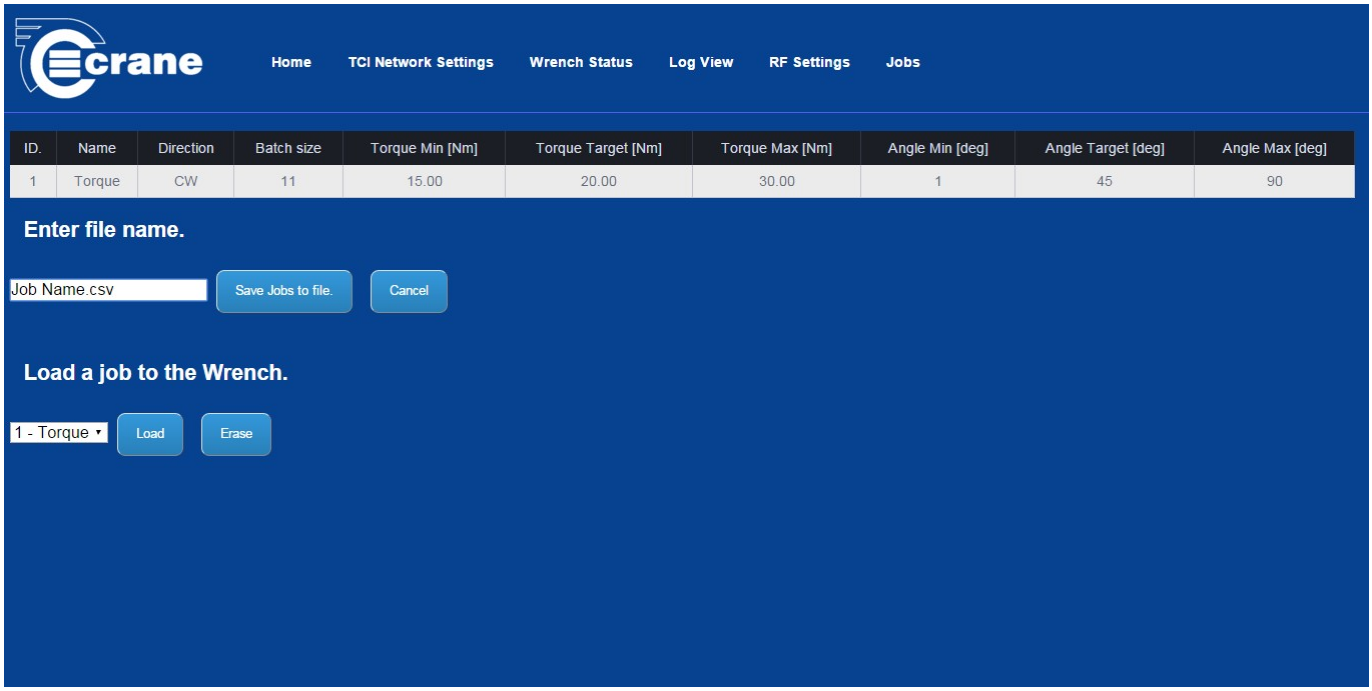
The TCI can store up to 20 Jobs.
There are two options to load Jobs on TCI. TCI Exchange or via the Web Page shown above. By clicking the Edit Button on a particular Job, it is possible to Edit its parameters.



The parameters that can be Edited are:

- Name (up to 25 characters)
- Direction (Note: Auto is not allowed)
- Batch Size (The WrenchStar Multi has the ability to remember readings when out of range of the TCI and the Batch Size informs the Wrench the maximum number of readings that it is allowed to take.)
- Torque Min is Torque LSL (Lower Spec Limit)
- Torque Max is Torque USL (Upper Spec Limit)
- Angle can also be Edited. If Angle is not required then set Angle limits to 0. The Angle will be reported as 0 in results.

The Jobs can be saved and loaded from a csv file using the Save and Load to File Buttons.



“Add” allows a Job to be added if there are less than 20 Jobs stored in the TCI.

TCI Exchange

TCI Exchange is a PC program that allows the TCI to be set up and diagnosed if there’s no access to Web Pages or the network is faulty.

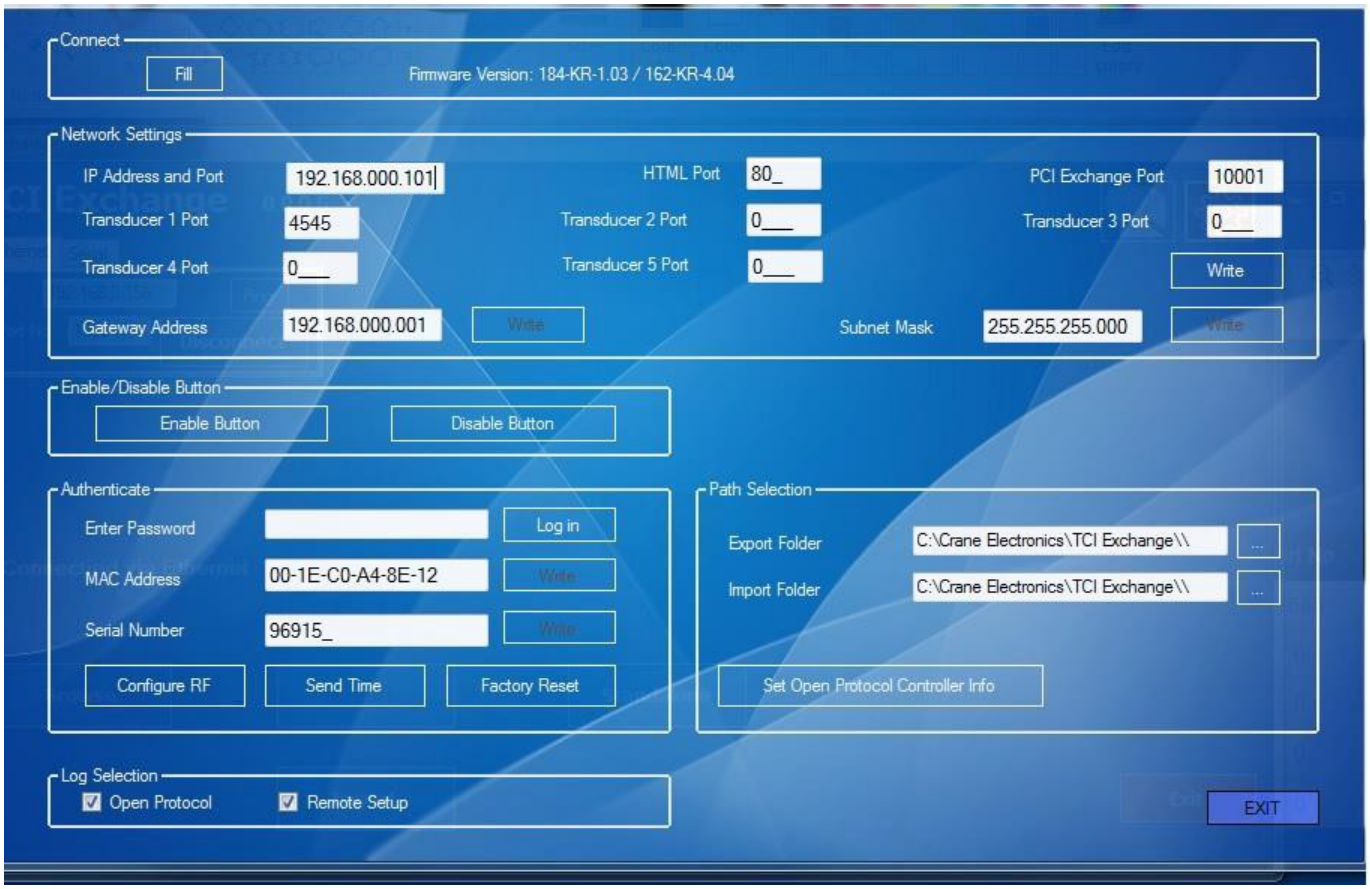
TCI Exchange main menu is shown below:

On the Home Page you have the option of serial or Ethernet connection to the TCI. The default Port number for Ethernet connection is 10001 and should not be confused with the default Port connection for the HTML web Pages which is 80. Note: TCI exchange can communicate with TCI at the same time as web browser is communicating to TCI Web Pages and Open Protocol is receiving results on the data Port. It should be remembered that the TCI has one fixed IP address (no DHCP) and this same IP address is used by:

- Web Page for set up and diagnostics.
- TCI Exchange for set up and diagnostics and standalone.
- Host device supporting Open Protocol.

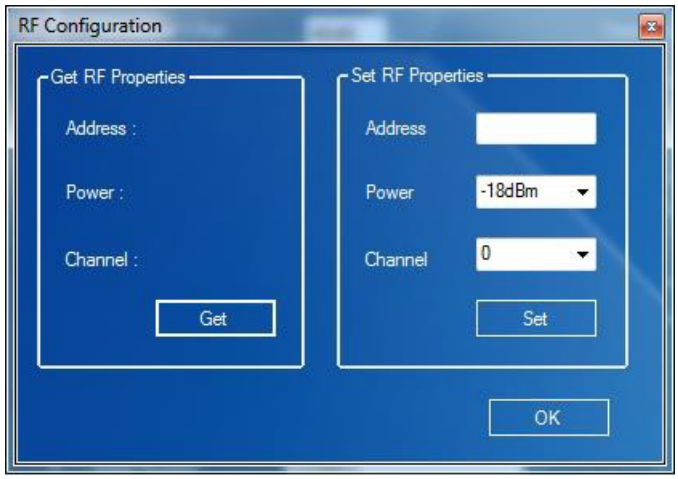
There is a Ping Button to confirm connection.
The serial communication requires an RS232 cable from the PC to the TCI. If the PC does not have RS232, then a USB to RS232 adaptor can be used. A folder can be set up for Jobs and Results using the Browse Button. The Import Button uses this folder to allow an Excel file containing the Job setup to be loaded to the TCI.The Export Button uses this folder to allow the Jobs currently in the TCI to be copied into an Excel file. This is a useful backup if you want to replace a TCI or have a second TCI doing the same work as the first TCI.

TCI Exchange Settings



Click the Settings Icon in the top right of the Home Page to access Settings Page shown above.

This is divided into several sections:
Connect – Clicking the Fill Button, will populate the Settings Page with the properties from the currently connected TCI. The Network Settings can be Edited and then written back to the TCI. Once written back you will need to re-connect with the TCI. The Blue Button (located on the outside of the TCI unit) can be disabled. This disables Pairing and factory reset from being done via the Blue Button. The Authenticate box is for Crane production use only and sets up a unique serial number and MAC address for each TCI. The TCI can be factory reset from the TCI Exchange but note that the connection will need to be re-established with the default IP and Port address (see Page 11 and 19). The log selection determines which log messages are sent to the TCI exchange from the TCI. The TCI Exchange saves these logs as text files for further inspection. The TCI Exchange can configure the RF Address (1), Power and (2) Channel (3) just like the Web Pages.



Web Page	TCI Exchange	Range
0	-18dBm	1m
1	-12dBm	4m
2	-6dBm	9m
3	0dBm	14m

The TCI supports Open Protocol and the reply to the Start Comm MID includes controller information. This may be required by the central system/database for compiling reports/specifying the next required Pset.

The following screen allows the required information to be stored in the TCI.

MID0002 starts communicating back and has 3 fields that can be populated:

Documents / Resources

	Crane 96843 Tool Control Interface Lineside Controller [pdf] User Manual 96843, Tool Control Interface Lineside Controller, 96843 Tool Control Interface Lineside Controller