Operator's Manual

TR150

Manual XXXX-XX Issue 2
Crane Electronics Ltd

Notice

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ADDRESS

Manufacturer:	Crane Electronics Ltd
Address:	3 Watling Drive Sketchley Meadows Hinckley Leicestershire LE10 3EY
Tel:	+44 (0)1455 25 14 88
Technical Support:	support@crane-electronics.com
Sales:	sales@crane-electronics.com

UKCA MARKING

Crane Electronics Limited declares that the TR150 has been assessed and complies with the UK regulatory requirements.

UK CA

CE MARKING

Crane Electronics Limited declares that the TR150 has been assessed and complies with the requirements of the relevant CE Directives.

CE

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: B. M. Etter

ABOUT THIS MANUAL

This manual covers the TR150. Actual screen shots represented in this manual may differ slightly depending on version. For information on the operation of a TR150 please refer to its own manual.

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

INTRODUCTION

The TR150 Portable Strain Display Load Cell/Torque transducer readout is a microprocessor based portable instrument designed to interface with any full bridge sensor with an output sensitivity of up to 50mV/V. Bridge resistances from 85Ω upwards can be used with the TR150.

User functions available on the TR150 include:-

- Range Selection
- Display Hold/Freeze
- Gross/Net indication selection
- Peak Hold selection
- Trough Hold selection
- Shunt Cal check

The TR150 is powered by two internal non-rechargeable AA alkaline batteries.
There is an option to have rechargeable alkaline batteries, which can be charged without the need for removing them from the TR150.

USER OPERATION

Important Note

The unit is supplied calibrated to a particular torque cell. All user functions are available via the front keypad. Do not attempt to re-calibrate the TR150, unless you are authorised and have the equipment available to do so.

There are six push buttons on the front panel of the TR150, which are available for use in normal operation. Each of these is described below:-

Front Panel Button	Function of Button in Normal Operation Mode
	To switch the TR150 ON or OFF press and hold the  button
	The **RANGE** button allows the user to toggle between two independent scales. The range that has been selected is highlighted by an annunciator.
	The **HOLD** button allows you to hold/freeze the current display value when the button is pressed. Pressing the **HOLD** button again releases the display. The **HOLD** annunciator is illuminated when in the **HOLD** mode, and the display will flash, to alarm further that the user is not viewing instantaneous display values.
	The **GROSS/NET** button, when pressed, allows the user to toggle between displaying the Gross or Net display values. This can be useful in many applications where it is necessary to display the change in display value from a certain part of the measurement range. When in **NET** mode the **NET** annunciator is lit. When in **GROSS** mode, the **NET** annunciator is not lit.
	The **SHUNT CAL** button allows the user to press this at any point in time. The standard unit shunts a 100kΩ resistor across the negative excitation and negative signal connections. If this is performed at the end of the calibration procedure, then a figure can be noted, so the user can check calibration accuracy or connection integrity. The button has to be held down to operate. When held down the SHUNT CAL annunciator is lit and the display will flash, to alarm further that the user is not viewing instantaneous display values.
	When the **PEAK** button is pressed the display will show the last Peak reading. To reset the Peak readings press the **PEAK** and **TROUGH** buttons simultaneously. When in **PEAK** mode the **PEAK** annunciator will be lit and the display will flash, to alarm further that the user is not viewing instantaneous display values. To turn off Peak mode press the **PEAK** button.
	When the **TROUGH** button is pressed the display will show the last Trough reading. To reset the Trough readings press the **TROUGH** and **PEAK** buttons simultaneously. When in **TROUGH** mode the **TROUGH** annunciator will be lit and the display will flash, to alarm further that the user is not viewing instantaneous display values. To turn off the Trough mode press the **TROUGH** button

OPERATION FEATURES

NORMAL DISPLAY OPERATION

The TR150 has a full 7 digit display, which is pre-scaled by Crane Electronics. The unit can display the instantaneous, peak or trough values. It is also possible to hold the display value (this only operates when not in peak or trough mode).

The display update rate, decimal point position and resolution is preset.

The TR150 has two independent ranges. All values set in one range are totally independent from the other.

Switching the TR150 On/Off

The TR150 is switched ON or OFF by pressing and holding down the  button for 3 seconds.

The unit will automatically switch itself off after a preset time, if there is no keyboard activity.

RANGE Button

The range feature allows for the setting of two totally independent setup ranges to be selected, if required. To switch between ranges simply press the range button.

An annunciator is lit to identify which range has been selected.

HOLD Button

The hold button allows the user to freeze the display when it is pressed. When pressed again the display returns to it's normal operating mode. When in hold mode the display will flash and the hold annunciator will be lit, to ensure that this feature is not accidentally turned on without the user noticing.

The hold feature can not be used when the TR150 is in either peak or trough hold mode.

GROSS/NET Button

The gross/net button, when pressed, toggles between the gross and net display values. This enables the user to zero the display (by putting the TR150 into net mode) and displaying the change in display value from that point.

This is useful for certain weighing applications where a tare weight exists, which can be removed by putting the TR150 into net mode.

SHUNT CAL Button

The shunt calibration button, when pressed, puts an internal 100kΩ resistor across the –ve excitation and –ve signal of the sensor, generating a simulated output from the sensor, therefore giving a simulated display value. This can be pressed immediately after the sensor has been calibrated with the TR150 and noted down for later reference. The value noted can be used to get an idea of the calibration accuracy at a later date, or for checking the integrity of the sensor and sensor cabling.

The shunt calibration resistor can be changed to suit specific requirements. It is suggested that a 15ppm ±0.1% tolerance resistor is used.

PEAK Button

When pressed this button puts the TR150 into peak mode. This will display the highest display reading and hold it on the display until it is reset or a higher value is reached. To reset the peak display, press the peak and trough buttons simultaneously. In peak mode it is possible to capture peaks at a rate of up to 25Hz. To turn off the peak mode, press the peak button.

TROUGH Button

When pressed this button puts the TR150 into trough mode. This will display the lowest display reading and hold it on the display until it is reset or a lower value is reached. To reset the trough display, press the peak and trough buttons simultaneously. In trough mode it is possible to capture troughs at a rate of up to 25Hz. To turn off the trough mode, press the peak button.

RS232 Port Connections (WHEN SUPPLIED AS AN OPTION)

The output format is ASCII. The display value is passed to the RS232 port each time the display updates, with a carriage return at the end of each data string. The string information is as follows:-

Baud Rate	=	9600 baud
Stop bits	=	1
Parity	=	None
Data bits	=	8

ELECTRICAL CONNECTION INFORMATION

Sensor Connections

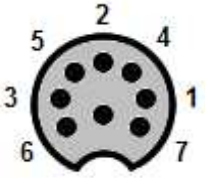
The standard sensor connection is a 5 pin 723 series Binder connector. The sensor connector is also used as a charging socket, when the re-chargeable alkaline battery option has been ordered, the wiring for this is detailed below:-

PIN 1	+ve Excitation
PIN 2	-ve Excitation, TEDS Common
PIN 3	+ve Signal
PIN 4	-ve Signal
PIN 5	+ve TEDS

RS232 Port Connections

If the TR150 has been ordered with the optional RS232 output, then this will be available via a 8 pin 723 series Binder connector. The wiring for this is as detailed below:-

PIN 1	Tx
PIN 2	Rx
PIN 3	Gnd

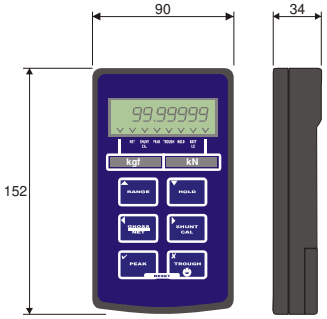


SPECIFICATIONS

Performance	Input Type:	Strain Gauge Full Bridge Sensors
	Input Range:	Up ±5mV/V (±50mV/V can be supplied, with factory set option)
	Non Linearity:	±0.005% FSD
	Thermal Drift:	<25 ppm/˚C
	Excitation Voltage:	5Vdc (±4%), 59mA maximum current
	Minimum Bridge Resistance:	85Ω (4off 350Ω sensors in parallel)
	Internal Battery:	2off AA size alkaline, access via sealed rear compartment
	Battery Life:	45 hours (Typical 450 hours in low power mode), with 350Ω sensor
	Update Rate:	Up to 40mS (can be set in configuration menu)
Indication	Display Type:	7½ digit LCD display, 8.8mm high digits
	Display Resolution:	1 part in 250,000 at 1Hz update rate 1 part in 65,000 at 10Hz update rate
	Annunciators:	Low Battery warning; peak; trough; hold; net; shunt cal; range
Control Variables	Front Panel User Keys:	Tactile Keys with recessed rims for:- ON/OFFSwitches TR150 power on/off RANGE Selects between two ranges HOLD Hold the current display value, press again to release GROSS/NET Zero's display (±100% range) SHUNT CAL Generates simulated input for indicator testing PEAK Enables peak hold TROUGH Enables valley/trough hold
	Settable Parameters:	Tare/Zero value; display resolution/decimal point position; display update rate; low power mode; auto power off;
Mechanical	Electrical Connection:	5 pin Binder socket (mating plug supplied)
	Physical Size:	See drawing below
	Weight:	260 grams
	Legends:	Insert legends for engineering unit identification (supplied)
Environmental	Operating Temperature:	-10˚C to +50˚C
	Environmental Rating:	IP65 (when mating plug fitted)
	Enclosure Type:	ABS, dark grey (Leather Carry Case Optional)
	Safety/Low Voltage Directive	73/23/EEC amended by 93/68/EEC To IEC 1010-1:1990, EN 61010 – 1 – 1993 89/336/EEC
	EMC Directive	EN 50 081 – 1 : 1992 (Light Industrial)
	Emissions	EN 50 081 – 2 : 1992 (Heavy Industrial) pr EN 50 093 : 1991
	EMC Emissions	EN 50 082 – 1 :1992 (Light Industrial) EN 50 082 – 2 :1992 (Heavy Industrial)

MECHANICAL DIMENSIONS

The Case is Registered Design No. 3021311



CONTACT US

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

Crane Electronics Inc - if you are based in North America (Canada, USA, Mexico)

1260 11th Street West
Milan
Illinois 61264
USA

+1 309-787-1263
salesusa@crane-electronics.com
supportusa@crane-electronics.com
serviceusa@crane-electronics.com
www.crane-electronics.com

Crane Electronics Ltd - if you are based in the UK, Europe, Asia, Africa, or Middle East

Watling Drive
Sketchley Meadows
Hinckley LE10 3EY
United Kingdom

+44 (0)1455 25 14 88
sales@crane-electronics.com
support@crane-electronics.com
service@crane-electronics.com
www.crane-electronics.com

Crane Electronics GmbH - if you are based in Germany, Austria and Switzerland (German speaking)

Im Rank 5
73655 Plüderhausen
Germany

+49 (0) 7181 9884-0
salesDE@crane-electronics.com
supportDE@crane-electronics.com
serviceDE@crane-electronics.com
www.crane-electronics.com