RON **2501** WIRELESS DYNAMOMETER

Eilon Engineering

5.2

Ron 2501

Shackle Type

* Shackles not included on
  shackle type systems

Hook Type

* Shackle and Hook included
  on hook type systems

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Phone 1-888-778-8064 • Web www.eilon-engineering.com
E-mail: info@eilon-engineering.com

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General Cautions and Warnings

The following cautions and warnings, system specifications, and user instruction sheets should be read carefully before attempting to use this Eilon Engineering product.

Products are supplied with the express understanding that the purchaser and/or user are thoroughly familiar with their correct application and proper use. Eilon Engineering will assume no responsibility for the misuse or misapplication of any of its products.

In addition to these guidelines, the user must also comply with general safe operating practices when using the system e.g. when weighing during lifting.

The load limit rating, a.k.a. capacity, indicates the maximum force or load a system can carry under normal working conditions. Overloading or placing a load on the system above its rated capacity is dangerous and is therefore STRICTLY PROHIBITED except during the system's annual safety testing. This testing must be performed by qualified personnel and allows the system to be overloaded up to 25% of its rated capacity, no more than once per year.

Eilon Engineering will accept no liability for damage caused by the product being used in excess of the working load limit or from abuse.

Opening, attempting to open, or any attempt to repair the system by unauthorized personnel (without written authorization) will nullify the warranty as well as the manufacturer's liability and could be dangerous. Refrain from doing so and contact an Elion representative should any problem with the system arise.

When measuring loads using a shifted zero with the tare function, the actual load is the value indicated on the readout plus that of the shifted zero or tare.

For best results, it is recommended to turn your system on 10 minutes prior to measuring.

The system is designed for static loading. Eilon Engineering or other qualified

engineering personnel should be consulted before using the system to measure dynamic loads.

Avoid bending, twisting, side loading and off-axis loading.

When connecting the load cell in order to measure forces or loads, special care should be taken in choosing appropriate shackles or other connecting accessories that will permit free movement and prevent bending moments and twisting in the load cell.

Always use shackles with a S.W.L. (Safe Working Load) equal to, or greater than the system's rated capacity.

Check the system thoroughly before use, including the lifting accessories which are included with some Ron systems. Do not use a damaged system.

We recommend that the system is checked occasionally by lifting a known weight. Further, the system should be sent back to the manufacturer or to an authorized service center for general examination once every year.

System calibration should at first be performed annually in an authorized laboratory unless local laws, regulations, or other policies require alternative intervals. Once the user becomes familiar with the particular needs of their system, the need for calibration may vary.

Between calibrations, the user can verify whether the systems are still calibrated correctly by using a known weight.

Calibration verification and adjustment must be performed with extreme care. An erroneous calibration adjustment will result in false readings, which could be dangerous.

If there is any doubt as to the reliability of the load indication, do not use the system with an unknown load. To check its reliability, use a known load preferably with a value of more than 50% and less than 100% of the system's rated capacity. <u>Never use a weight that is more than the rated capacity</u>.

The permitted temperature range appears in the Ron system specifications.
Do not allow the system to overheat or fall below the minimum permitted temperature, as doing so may be dangerous and cause damage.

Take particular care not to expose the system to ionizing radiation.

Local environmental conditions such as extreme temperatures (those that exceed the stated temperature range in the system specifications), chemical materials, radio transmissions or other magnetic radiation may interfere with the system's reliability causing a false reading which could prove dangerous. Avoid using the system under such conditions.

The system is not explosion-proof and should not be used in hazardous areas.

Unless otherwise specified, Eilon Engineering products are not legal for trade.

Each system consists of a load cell with its own indicator (excluding 1000 & 4000 models).

Important: If you own several systems, make sure that each load cell is used with its original indicator. Load cells and indicators are calibrated as matched pairs and are non-interchangeable.

Important:

At all times, it is the responsibility of the user of this equipment to ensure that normal safety precautions are observed. No amount of safety features and engineering can be a substitute for common sense and a desire to work safely.
The Ron 2501 relies on wireless communication. Like all wireless devices it is susceptible to interference and other reception issues.
The system will display TR.ERR during such communication problems. When TR.ERR is displayed the system will be unable to detect overloads. We recommend that a prolonged TR.ERR be handled as if an overload was occurring.
Take extra care when TR.ERR is displayed.

Ron systems are prohibited by the manufacturer and/or seller to be used in any nuclear or similar site where nuclear and/or radioactivity and/or ionizing radiation (henceforth radiation) exists. Ron systems may not function well in any space where radiation exists. If despite this warning the user uses the system in radiation, he/she is waiving any right of claim against the manufacturer and/or seller concerning direct or consequential damages or loss resulting from the use of Ron systems in violation of the above restrictions, and the user assumes full responsibility and liability to waive any subrogation claim rights by the insurer to such claim against the manufacturer and/or seller. This restriction does not apply to areas that are deemed safe for people to work in.

Eilon Engineering Limited Warranty

Eilon Engineering Ltd. load meters and overload detectors are built in accordance with listed specifications. Eilon Engineering Ltd. also guarantees that all its products are thoroughly inspected and performance tested prior to shipment.

If any appropriately maintained part proves to have been originally defective in materials or workmanship within the Warranty Period explicitly stated in the Eilon Engineering Ltd. literature that accompanies the product, Eilon Engineering Ltd. will replace or repair the part at no charge at the sole discretion of Eilon Engineering Ltd.

This warranty specifically excludes shipping costs.

The warranty shall be null and void if any repair or modification is performed on the system, or if any attempt has been made to open any part of the system by any parties other than those specifically authorized by Eilon Engineering Ltd.
Batteries are not covered by this warranty.

The system supplied comes factory calibrated and is accompanied by the relevant certification. All Eilon systems are built to enable user adjustment and calibration. As such, our accountability for the state of calibration is limited to the time when the system is received by the user, thus excluding calibration from this warranty.

Eilon Engineering Ltd. reserves the right to change materials or designs without notice when in its opinion such changes will improve its product.
These warranties exclude all other warranties, express or implied.

Eilon Engineering Ltd. will not, in any event, be liable for incidental or consequential damages.

The distributor is solely responsible for ensuring that this warranty is delivered to his sub-distributors and to their ultimate customers or users.

1. General Description

Ron Crane Scale and Dynamometer basic information.

The Ron 2501 is available either as a Shackle or Hook Type. The system consists of a Load Cell and an indicator.

The indicator includes a 6 digit 0.5" (12 mm) LCD display and front panel standard with a nine button keypad.
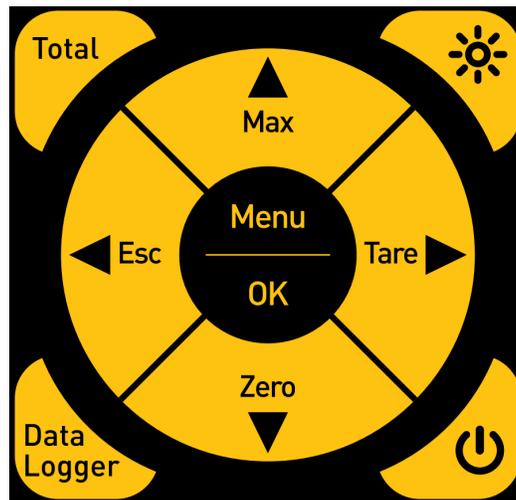
The system includes 2 AA disposable 1.5V alkaline batteries. Continuous operation of the system while using batteries rated 3AH will result in at least 2000 hours of battery life (more than two months). Occasional use will extend the battery life up to several years.

The following are available options:
- Rechargeable batteries (instead of disposable) with a charger.
- A specially fitted carrying case.
- Digital RS-232 or RS-485 output for communication with computers, printers or data   acquisition devices.
- Additional 1" (25mm), 2" (50mm) and 5" (125mm) displays.
- Totalizer: stores/displays a total of selected loads.
- Automatic/Manual Data Logger: Records measurement to indicator memory for later download to PC. (Up to 50,000 measurements)
- Rope falls multiplier, user selectable
- Wireless communication to additional display or PC

2. Basic Operation

Basic operation of Ron systems and helpful tips and tricks

Before operation, be sure the shackles you intend to use are appropriate for the system (see shackle specification table). Press the ⏻ key to turn the system on. The display will read BATT, then the percentage of remaining battery life of the indicator and then the load cell, followed by the unit of measurement.

M. TON (Metric Tons)
S. TON (Short Tons, American tons, 2000 Lbs)
LBS
K.NTON (Kilo Newton)
DECA.N (Deca Newton)
N.WTON (Newton)
KG

The current weight value will then be displayed.

Before loading the system, press Zero until **ZERO** is displayed.

The system should then read **GROSS** then **0**.

Once use of the system has been completed, press the ⏻ key to power down. Return both the load cell and indicator to their carrying case or another appropriate safe place of storage.

2.1 - General operation of the keyboard:

When pressing a key, the system responds with a short audio signal (a beep) followed by a change to the display. For example, if one presses the Max key, **MAX** will be displayed. The key should be pressed continuously until the beep is heard. Exceptions are turning the system on or off which does not require a long press. Also, when several keys are pressed in sequence as part of a code during calibration, the visual signal will only appear

upon completion of the code, but the beep will still follow each valid key press. If the passcode is not accepted, the display will read **COD.E.R**. In this case, a new attempt should be made. (See Calibration for more.)

2.2 - Tare

Switching between Gross and Net modes

The system features a Tare function that enables the user to ensure the display reads 0 even though there may be weight on the system such as from a sling, shackles or a container. This capability makes the system easy to use as it eliminates the need for the operator to subtract the weight of the container, etc. when only the net amount of the load is required.

To use the tare mode, load the system with the desired container and then press `Tare`. The screen will display **NET**, then the value of 0. The system is now in Net mode. To exit out of Net mode, press `Tare` again.   **GROSS** will appear indicating that the system is back in Gross mode. The system will show **NET** on the screen about once every minute as a reminder that it is in Net mode. Note that switching between Gross and Net modes will clear the MAX (see MAX section).

CAUTION:

When measuring loads using a shifted zero applied and/or with the tare function applied, the real load is the value indicated on the readout **plus** that of the shifted zero or tare. Take this into account to avoid accidental overloads.

2.3 - Max (a.k.a. Peak Hold)

Checking the maximum registered load value

The system features a MAX (aka PEAK HOLD) function. MAX will store the maximum weight that the system has detected since it was last powered on or since the Gross/Net mode was changed.

Press the `Max` key until the display shows **:M:AX**. It will then display the current maximum load the system has registered since the last time the MAX was reset. The weight will be displayed for approximately two seconds with colons in between the digits. These simply serve as a visual indicator that the displayed value is the stored

max and not the current weight. The system will go back to the current value then a beep will sound indicating that the system is ready for a new operation.

The MAX memory is cleared every time the system is powered down or the mode is changed between Net and Gross or Zero is applied. The MAX will also be reset if the unit of measurement is changed (see UNITS section).

2.4 - Overload Warnings

Two level visual overload warning

The system features a two level visual overload warning. When loaded to 100% of its maximum capacity and up, the displayed weight will flash on and off continuously. Should this occur, the lift should be <u>terminated immediately</u> and the current load set down.

Should the system be drastically overloaded (130% of max capacity), DANGER (short for danger) will appear on the display. Only when the system is <u>completely unloaded</u> and the measured value reduced to zero will the DANGER message disappear.

Should this occur, it is critical that the Ron system and all accompanying rigging accessories are checked by an authorized inspector before being used again.

The system will display TR.ERR during communication problems. When TR.ERR is displayed the system will be unable to detect overloads. We recommend that a prolonged TR.ERR be handled as if an overload was occurring.
Take extra care when TR.ERR is displayed.

Please note that both overload warnings remain functional at the same levels (100% & 130% of full capacity) whether the system is in Gross or Net mode. This means that when TARE is used, you may see an overload warning at a displayed value that is less than 100% of capacity.

<u>All overloads are dangerous to personnel and should be avoided at all costs.</u> Overloading the system can also result in costly damage to the system itself.

2.5 - Battery Care

Maintenance of Ron 2501 batteries for top performance

The standard system is powered by two AA 1.5V disposable alkaline batteries in bothe the indicator and load cell.

Batteries rated 3AH will result in at least 2000 hours of battery life (more than two months of continuous use). Occasional use will extend the battery life up to several years. Optional extended battery life: 4000 hours.

The display will show **LO:BAT** when the batteries need to be replaced. Once **LO:BAT** is displayed, you still have several hours of operation left. If the battery level gets too low, the system will automatically power down in order to avoid damage from low voltage.

When the system is turned on, the batteries' energy level is displayed as a percentage e.g **100%**. Battery level can also be checked from the menu.

Replacing the batteries

Indicator:

Use a screwdriver to remove the back cover of the indicator. Gently remove the battery holder from the indicator being careful not to damage the wiring. Replace the batteries with two fresh AA 1.5V disposable alkaline high quality high energy batteries.

Load Cell:

Use a screwdriver or your thumbs to loosen the screws of the panel on the back of the load cell.

Accessing the battery compartments
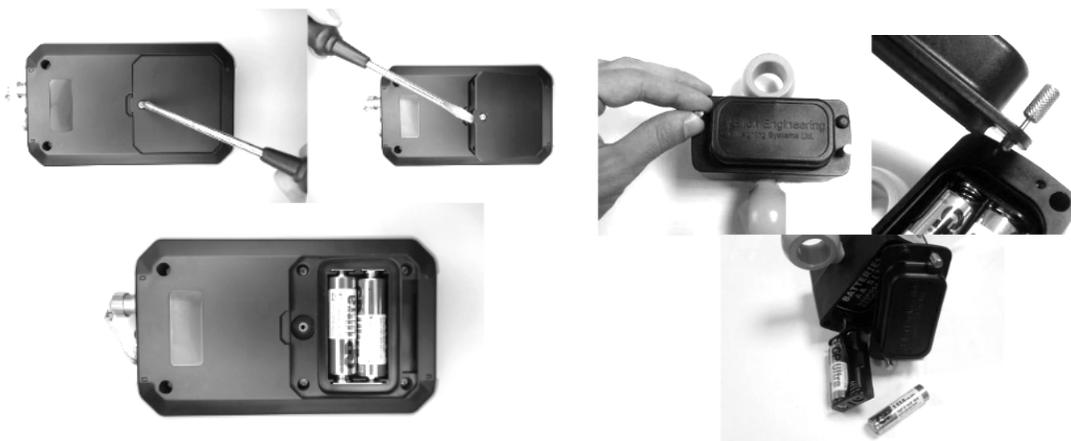
2.5.1 - Rechargeable Batteries

Though we recommend standard alkaline AA batteries, rechargeable batteries are offered. This option includes 2 AA NiMH 2700 mA rechargeable batteries. The system is supplied with a external wall charger.

The batteries should be charged:
1.   Prior to using the unit for the first time.
2.   Before use, if more than two months have passed since the last charge.
3.   When **LO:BAT** (low battery) is displayed on the screen.

A full charge will take 10-14 hours.

Store bought rechargeable batteries may be used. Choose NiMH AA size 1.2V rechargeable batteries (minimum 1800mAH or higher) and a standard charger.

Due to the difference in battery voltage, rechargeable batteries will display a biased energy level. For example, fully charged NiMH batteries will only show an energy level of 80% rather than 100% and will normally show a value about 20% less than the actual level.

WARNING

It is dangerous to charge disposable batteries and may result in the batteries exploding. If you are using disposable batteries in a system sold with rechargeable ones, please remove the charger from the system's carrying case or place of storage in order to prevent potential accidents.

3. Calibration

Performing additional calibration and adjustment to the system

Note
It is recommended that calibration be performed by authorized and skilled personnel only! It should be performed using an accurate known weight or in a laboratory.

Unless otherwise required by local laws, it is recommended that the system be calibrated annually. The weight used in the calibration <u>must not exceed the system's capacity</u>.

3.1 Best Practice for Calibration

It is recommended that calibration and adjustment are performed using a known weight that is <u>80%</u> of the system's maximum capacity. This will give the best and most accurate results. A known weight between 80% – 100% of capacity may be used but <u>never a weight greater than the capacity</u>.

It is recommended that the system be turned on for at least 10 minutes prior to calibration.

If the system includes a dampened display/averaging, the dampening should be shut off before calibrating (see Dampened Readings section). The system is protected by two different codes to prevent calibration by unauthorized personnel.

3.2 Performing Calibration

<u>Access the Menu:</u>
Press and hold the **Menu/OK** button.
Using the arrow keys scroll to CALIBR. and press OK
The system will display CODE?
Press **ESC + OK** <u>simultaneously</u> until you hear the beep.
The system will display CODE?
Press **TARE**.
The display will show the current units in use e.g. Lbs, M. TONS etc. and will then display LOAD.0. At this point all weight/force must be removed from the system.

Once the system is unloaded, press **OK**. The display will flash WAIT for a few seconds and then L.VALU (load value). This means that the load of a known weight intended for calibration is ready to be applied.

Once the known weight has been applied (lifted), press **OK**. The display will show APPLY followed by the max capacity of the system. Using the arrow keys ▲▼, set the load value you intend to use for the calibration. If no key is pressed for 8 seconds, the system will exit out of calibration mode and you will have to start again from the beginning. Once the load value on the display matches that of the known weight currently loaded, press **OK**. The display will flash WAIT and then OK. This means the system has successfully been adjusted and the display will return to the standard measuring screen.

At any time, you may press ◄ **ESC** to exit out of the calibration process. The display will read OK and then revert back to the main measuring screen.

Multi Point Calibration:

Access the Menu:

Press and hold the **Menu/OK** button until a beep is heard

Using the arrow keys ▲▼ scroll to CALIBR. and press OK

The system will display SEL. ID (Select ID) and then will display ID. X (X will be the ID of the load cell to be calibrated)

Using the ▲▼ arrows will allow you to change the ID

Press **Menu/OK**

The system will display CODE?

Press **ESC + Menu/OK** simultaneously until you hear the beep.

The system will display CODE?

Quickly press **TARE**.

The display will show the current units in use e.g. Lbs, M. TONS etc. and will then display LOAD.0.

At this point all weight/force must be removed from the system.

Once the system is unloaded, press **OK**.

The display will flash WAIT for a few seconds and then L.VALU (load value).

This means that the load of a known weight intended for calibration is ready to be applied.

Important Note: Known weight must be at least 80% of the load cells capacity. (e.g for a 1000 kg capacity system at least 800 kg must be used)

Once the known weight has been applied (lifted), press **OK**. The display will show APPLY followed by the max capacity of the system.

Using the arrow keys ▲▼, set the load value you intend to use for the calibration.

If no key is pressed for 8 seconds, the system will exit out of calibration mode and you will have to start again from the beginning.

Once the load value on the display matches that of the known weight currently loaded, press **OK**.

The display will flash WAIT and then OK.

This means the load cell has successfully been adjusted and the display will return to the standard measuring screen.

Repeat the procedure above for each load cell.

At any time, you may press **ESC** to exit out of the calibration process. The display will read OK and then revert back to the main measuring screen.

4. Configuration

Using the various available features and options for the Ron 2501

Settings can be accessed through the Menu.

To access the Menu press and hold

Once you see the first function displayed you may use the up arrow ▲ or down arrow ▼ keys to scroll through all of the available option on the system.
To enter into the calibration procedure, you will be required to enter an additional code (see CALIBRATION section 3.0).

At any time you may press ◄ **ESC** to exit a menu.

4.1 Backlight

The Ron 2501 is equipped with a backlight for use in low light environments.

The backlight is activated using the 🔆 button.

Use of the backlight greatly reduces the battery life.

To change the backlight settings, access the menu and use the ▲▼ keys scroll to BACKL. Press **OK**.
There are two setting than can be configured:
- TIME - Configure how long the backlight will remain on after the backlight button is pressed. If set to ALWAYS the backlight button will toggle the backlight on and off.
- BRIGHT - Set the brightness of the backlight. The higher the brightness the shorter the battery life will be when using the backlight.

4.2 Units, user selectable

Press and hold Menu/OK

Use the arrow keys ▲▼ to scroll through the available options until you see UNITS and press **OK**.

The current unit in use will be displayed. Use the arrow keys again and scroll to the desired unit of measurement.

The available units are:
Lbs   K.NTON (Kilo Newtons)
DECA.N (Deca Newtons)   N.WTON (Newtons)
KG   M. TON (Metric tons)
S. TON (Short tons)

When the desired unit appears on the screen, press **OK**.
The display will flash OK, show the select unit, and then revert back to options menu.
You may select another option or press ◄**ESC** in order to exit from the options menu.

4.3 Time - setting the real time clock

Enter into the options menu by following the instructions in section 4. Use the arrow keys ↑↓ to scroll through the available option until you see TIME and press OK.

The display will read YEAR. Press **OK** again and you will see 20:00 (meaning the year 2000) with the rightmost two digits blinking. Use the arrow keys ↑↓ to select the current year and press **OK**.

The screen will read OK and then MONTH. Press **OK** and the display will show four digits with the two leftmost digits blinking. This is the month. Use the arrow keys again to select the month and press **OK**.

Continue with this process again for the day, hour, and minute. Press ◄**ESC** to finish setting the clock and exit back to the options menu. You may select another option or press ◄**ESC** again in order to exit from the options menu.

4.4 RS-232 Digital Output Communication Data (Optional, if included)

Possible baud rates: 9,600 - 19,200 - 38,400 - 115,200.
Length: 8 bits
Stop bits: 1 bit
Paring bit: none

Data output modes:

The RS-232 output on Ron systems has two modes of data output that are selectable by the user: on demand and continuous stream.

The first will send a signal at a rate of about once per second when in use. The second will send data only when there is a change in value detected by the indicator.

Mode Selection

Press and hold the **Menu/OK** button until a beep is heard

Use the arrow keys ▲ ▼ to select RS232 from the options menu and press **OK**.
 Use the arrow keys again and select the desired output mode:
D. MAND (on demand)
CONT. (continuous stream)
CHNGS. (upon value change)
Press **OK**. The display will show OK and revert back to the options menu. Press **ESC** again to exit the options menu.

On demand mode:

To output data to a PC/printer when the RS-232 is set to on demand mode, simply press **OK/Menu** while a load measurement is displayed.

Continuous mode:

There are two continuous modes. Each system is factory set to one or the other.
1. Continuous - unconditional constant flow(default): the displayed value will be output at a rate of about once per second.

2. Changes - upon value change: the displayed value will only be output when there is a change in the reading. If there is a steady change in value, a reading will be output at

a rate of about once per second. If there is no change to the load value, no data will be output.

When the system is first turned on, it will output a lead section of six lines. The first five of these are the system's owner identification info and must be factory set. If no instructions were given at the time of ordering, these lines will be blank. Each line includes up to 60 characters.

A printed data record line includes the following:

1.   The load (up to 5 digits)
2.   The unit of measurement
3.   TARE mode: NET or GROSS
4.   Function: LOAD = reading taking directly from indicator.
           MAX (PEAK HOLD) = max value reading
           TOT. # = reading from totalizer memory. Value and number of loads
           D.L. 1 = reading #1 from Data Logger memory
           D.L. 2 = reading #2 from Data Logger memory
           D.L. etc.
5.   DATE & TIME

Baud Rate Selection

Press and hold the **Menu/OK** button until a beep is heard

Use the arrow keys ▲ ▼ to select RS232 from the options menu and press **OK**.
Use the arrow keys ▲ ▼ to select BAUD.R, and press **OK**

The display will show the current baud rate in use. Use the arrow keys again to scroll through the available rates:

115,200 – 38,400 – 19,200 – 9,600

Press **Menu/OK**. The display will show OK, the selected baud rate, and then revert back to the options menu. Press **ESC** to exit the options menu.

Electronic specifications:

Transmission rate: 9600 bps or higher
Byte type: hexadecimal
Length of each byte: 8 bits
Parity: none   Flow control: none   Stop bit: 1
Line information content: 10-19 designations (see # in table).
Line Length in bytes varies and depends on which object in the range of possibilities is actually activated.

TABLE 1.0 Ron TRANSMISSION RS-232 PROTOCOL - Indicator to PC/Printer

Tx direction	#	Designation	Function	Possibilities Range	Length In Bytes
	1	LOAD	Value of measurement	Data	1-7
	2	tab	space	tab	1
	3	UNITS	Measurement units	KG	2
				S.TON	5
				DECA .N	6
				K.NTON	6
				LBS	3
				LB.*10	6
				S. TON	5
				M. TON	5
	4	tab	space	tab	1
	5	TARE	Exclusion of fixed weight	Net	3
				Gross	5
	6	tab	space	tab	1
	7	FUNCT	Current indicator command: data	Data	4
			Maximum measured this session	Max	3
			Data Logger	D.L .xxx	5-8
			Totalizer	Tot .NN	6
			Set point1,Set point 2	S.P1./ S.P2	10
	8	tab	space	tab	1
	*9	YY	Year	Year	2
	*10	Space	Space	Space	1
	*11	MM	Month	Month	2
	*12	Space	Space	Space	1
	*13	DD	Day	Day	2
	*14	Space	Space	Space	1
	*15	HH	Hour	Hour	2
	*16	Space	Space	Space	1
	*17	MN	Minute	Minute	2
	18	0x0d	(Carriage return (next line	0x0d	1
	19	0x0a	Start new line	0x0a	1

* APPLICABLE ONLY WHEN REAL TIME CLOCK (RTC) OPTION IS INSTALLED.

Fig # 1A WIN2000 HyperTerminal output file of a session of continuous measurements over a few seconds (RTC not installed, Data Logger installed) :				**Fig. # 1B** scanned printout of Ron with RTC and Data Logger installed :

<table>
<tr><td colspan="4">

LOAD	UNITS	TARE	FUNCT.
0.000	M. TON	Gross	DATA
0.000	M. TON	Gross	DATA
0.000	M. TON	Gross	DATA
0.000	M. TON	Gross	DATA
0.000	M. TON	Gross	DATA
0.000	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.000	M. TON	Net	DATA
0.000	M. TON	Net	DATA
0.000	M. TON	Net	DATA
0.000	M. TON	Net	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
0.315	M. TON	Gross	DATA
1.015	M. TON	Gross	DATA
1.010	M. TON	Gross	DATA
1.715	M. TON	Gross	DATA
1.710	M. TON	Gross	DATA
1.710	M. TON	Gross	DATA
1.710	M. TON	Gross	DATA
ID			
-0.335	M. TON	Gross	D.L.1
0.385	M. TON	Gross	D.L.2
1.390	M. TON	Gross	D.L.3
0.315	M. TON	Gross	D.L.4
1.015	M. TON	Gross	D.L.5
1.715	M. TON	Gross	D.L.6

</td><td>

Eilon Engineering

Industrial Weighing Systems Ltd.

e-mail: info@ron-crane-scales.com

Web site: www.ron-crane-scales.com

LOAD	UNITS	TARE	FUNCT.	YY MM DD HH MN
5330.	LBS	Gross	DATA	07 05 29 14 41
0.	LBS	Net	DATA	07 05 29 14 41
5970.	LBS	Net	MAX	07 05 29 14 39
12225.	LBS	Gross	TOT.3	07 05 29 14 42
	ID			
0.948	M. TON	Gross	D.L.1	07 05 28 16 33
0.026	M. TON	Net	D.L.2	07 05 28 16 33
2.622	M. TON	Net	D.L.3	07 05 28 16 40
2160.	LBS	Gross	D.L.4	07 05 29 09 39

</td></tr>
</table>

FIGURE 1.0 Each measurement generates only one line.

RS-232   Gnd

(CONNECTOR FACE ON RON INDICATOR)
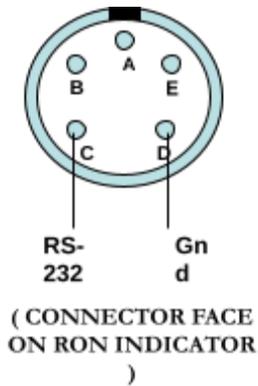
(ON RON RS-232 INTERFACE CABLE FROM INDICATOR)

4.5 Totalizer (Optional, if included)

The totalizer is available as part of the data logger option or as a stand-alone option. The stand-alone version does not include the RS232 output for downloading data to a PC. The totalizer memory can hold roughly 25,000 load values and these can be stored in load groups whose combined totals will be separate from one another.

To store a load in the system's memory, press **TOTAL**. The display will then show TOTAL and then N# (this # is the current total number of loads in the memory for the current group of loads). The display will read ADD followed by N# (this # will be the current load just stored, one number higher than the former N#). Finally it will display the combined total of all loads stored in the group before going back to the standard display screen.

A special "filter" in the totalizer program prevents the user from mistakenly adding the same load twice. This is a very practical feature, because if the operator is unsure if he has already added the current load, he just has to try to add it. If it has already been entered, the system will reject it.

This "filter" is based on the fact that a load reading of zero must be sensed by the system in between loads. If the system does not find a zero value before the current load is entered into the totalizer, it will reject it. Zero for this purpose is between 3% and -3% of the system's capacity. The totalizer will reject duplicate loads by displaying DOUBLE followed by IGNOR.

The system will only accept loads having the same Tare mode i.e. GROSS or NET. If the first load to be entered in the totalizer memory is NET, then no GROSS loads will be accepted. In such a case, ERR.34 will be displayed.

The totalizer can store several groups of loads. After one or more loads are recorded into the memory the user may press **TOTAL** then **ESC** to start a new group of loads. The display will show NEW. Upon storing new loads, the N# that appears will start again at zero. Note that in order to start a new load group, the system must be at a zero reading (between 3% and -3% of full scale). If this is not the case, the DOUBLE/IGNORE message will be displayed.

At any time the user may press and hold **TOTAL** to see the current sum of loads of the current load group.

4.6 Manual Data Logger (Optional, if included)

The standard data logger (D.L.) stores measurements in the indicator's internal memory. Data logger is capable of storing up 50,000 lines

Each single line of data stored in the D.L. memory includes:
- The unit of measurement (Lbs, Kg, kN etc.)
- The tare condition (gross or net)
- The line number in the memory (1, 2, 3 etc.)
- Time and date of capture

Each entry is stored manually by the user by executing a command. Once the maximum number of lines has been reached according to the memory's capacity, the D.L. will start over and #1 and write over the previous data. The operator should consider what the maximum realistic amount of lines needed in a weighing session will be. For example, a perfect 10 minute Bollard Pull test requiring one measurement every 30 seconds, would require only 20 lines.

Manual Data Logger Operation

A) **Storing the load value currently displayed on the screen during system operation:**
Press **DATA LOGGER** and then press **OK**. The display will flash OK and then revert back to the current load value. The reading has now been stored in the D.L. memory

B) **Storing a MAX reading in the D.L. memory:**
Press **DATA LOGGER** then press **MAX**. The display will flash OK and then revert back to the current load value. The current MAX reading has now been stored in the D.L. memory. Note: MAX readings will appear as D.L. MAX under the function (FUNCT) column when output to a PC/printer.

C) **Clearing data logger memory**
Press and hold the **Menu/OK** button until a beep is heard. Use the arrow keys▲ ▼ to select DATA.L from the options menu and press **OK**. Use the arrow keys▲ ▼ to select CLEAR

D) Downloading the stored info to PC/serial printer:

Note that for a PC, you will need to use a terminal emulator such as Microsoft's HyperTerminal™.

Press and hold the **Menu/OK** button until a beep is heard. Use the arrow keys▲▼ to select DATA.L from the options menu and press **OK**. Use the arrow keys▲▼ to select OUTPUT

Ideally, the D.L. data should be output while the handheld indicator is still connected to the load cell. However, the indicator may be used alone to output the readings if need be. When turning the indicator on while not connected to the load cell, wait for the screen to show ESC. Then you may output the data with the commands above.

4.7 Automatic Data Logger (Optional, if included)

Note: The system must be equipped with the RS-232 digital output and the Real Time Clock.

The automatic data logger (ADL) automatically logs ongoing weight values, repeatedly, in a time interval (T) that is set by the user. Along with the weight value, a data line includes:

- The unit of measurement (Lbs, Kg, kN etc.)
- The tare condition (gross or net)
- The line number in the memory (1, 2, 3 etc.)
- The date and time that the weight value was recorded
- Function: ADL. MX, ADL. MN, ADL. AV.

If the system includes the ADL, the display will show ADL.OF after the indicator is turned "on". The ADL functions in time intervals (T) set by the user.

To start logging press **DATA LOGGER** and then **ESC**. Display: ADL. ON
To stop logging press **DATA LOGGER** and then **ESC**. Display: ADL. OFF

Time Interval (T) selection

Press and hold the **Menu/OK** button until a beep is heard. Use the arrow keys▲ ▼ to select DATA.L, press **Menu/OK.** Use the arrow keys▲ ▼and select T.VALUE
Press: **OK**
Display: DAY
Press: **ENTER**
Display: 0000 – The two digits on the left will be blinking. Use the arrows keys to select the number of days.
Press: **ENTER**
Display: OK, then HOUR
Press: **ENTER**
Display: 0000 - Now the two digits on the right will be blinking. Use the arrow keys to select the hours.

This procedure continues, enabling the user to select the time interval (T) by selecting:
Days (up to 31) and/or
Hours (up to 24) and/or
Minutes (up to 60) and/or
Seconds (up to 60)

Once the selection is completed, press **ESC** to exit and return to the options menu.

4.8 Multiple Wire Rope Falls (Optional, if included)

Enter into the options menu by following the instructions in section 4. Scroll to MULTI and press **ENTER**. This display will show the number of times the load value will be multiplied by (number of rope falls). Use the arrow keys ▲ ▼ to change the number (1-20). Press **ENTER**. The display will flash OK, then the number selected, and will then revert back to the options menu. Select another option or press **ESC** to exit the options menu.

This function is designed to enable the system to be used when the load cell is connected to a single load suspending cable in a multi-cable suspended loading. An example would be when the load cell is connected to the dead end of a multiple wire rope falls crane. The multi option helps the user by multiplying the measured weight by the number of wire ropes the load is actually suspended by.

The load cell senses one wire rope fall in a crane reeving of four wire rope falls; the system will multiply the sensed load by four and display the result.

The system will multiply the sensed load by any number selected by the user to suit the actual reeving arrangement for a given set up. The overload threshold levels also receive the correct values which are the measured threshold levels multiplied by the number of falls.

The set points are also multiplied by the multi number automatically.

Best Practice

When weighing with multiple rope falls, the friction created by the pulleys will have an effect on the displayed load. This friction will always be in opposition to the direction of the load's movement. When lifting, the displayed value will be that of the load + the force of the friction. When lowering, the opposite will be true and the displayed value will be less than the actual load. We recommend that measurements are taken either <u>only</u> while lifting, or <u>only</u> while lowering the load, with the latter being preferred. This will minimize the error in the displayed load.

4.9 Dampened Reading aka Averaging

To switch on the dampening mode, press **ZERO + TARE** simultaneously. The display will show AVR.ON.

To switch off the dampening mode, press both keys again. The display will show AVR.OF.

When calibrating the system, avoid using dampening, i.e. turn off the dampening mode.

The dampening option is effective mainly in cases where instability in the lifted load is cyclical, such as in a load that swings in the manner of a pendulum. In this case the dampening option can find the real weight in a relatively short amount of time, before the load stops swinging. In fact, if the load is in constant motion, this will be the only practical way to find the load's true weight.

In cases where the load changes randomly the dampening option is very limited in its performance, especially when high rates of change are involved.

The dampening option calculates the average load based on the measurements taken over a given number of seconds (here called T). When measuring begins, the first reading will show after about one second. After two seconds, the display will show a reading based on the average of the readings from the first two seconds. After three seconds, the displayed reading will be the average of the first three seconds. This will continue for the first T seconds.

After T seconds and onward, the display will show an updated reading about once per second based on the average of the readings from the previous T seconds. The interval T can only be set in the factory. It is set as standard to 5 seconds but can be set to any number of seconds according to the customer's request.

4.10 Connector Cables

5 Pin Sealed Circular Connector:

RS-232
C. RS-232
D. GND RS-232
E. –

RS-485:
A. NO
B. NO
C. A (RS-485)
D. A (RS-485)
E. GND

4.11 Multiple Load Cells With Single Indicator

The Ron multi-cell system can support up to 8 load cells. The indicator receives the individual weight data from all the factory-matched load cells that are included in a specific multi-cell system.

The standard Ron 2501 indicator receives data from a single load cell at a standard rate of about once per second. It is synchronized with the load cell signal to be open to receiving data for only a few milliseconds and closed to the data for the rest of the time. It is closed to data transmission more than 90% of the time, thus saving energy and enabling it to function for more than 2000 hours before the load cell and the indicator batteries need to be replaced or recharged.
In the multi-cell system, the receiver is continuously open to data transmissions resulting in a much shorter battery life of only about 100 hours. The load cells in the multi load cell system will last, as in the standard Ron 2501, more than 2000 hours.

Switching between individual load cells and SUM display:
Pressing **ESC** will cycle through all of the currently active load cells.
After the last active load cell, the sum total of all active load cells will be displayed.

If there is an overload in a particular load cell, the display will show OVL.##, with the number being that of the overloaded cell.

If there is an extreme overload the display will show DNG.##.

If there is a communication problem, the display will show T.ER.##.

Deactivation Load Cells:

Enter the menu by pressing and holding the **Menu/OK** button until MENU is displayed
Use the arrow keys to select ID and press **Menu/OK**.
The display will read ID#:ON Scroll through the available ID with the arrow keys (▲ ▼).

To switch the status press **TARE**.
The display will show the new status (ID#:ON) or (ID#:OFF).

To move to the next load cell press the Up or Down arrow keys (▲ ▼)

In this way you can change any of the load cells to be active or inactive. To exit press **Menu/OK**. This display will read OK and then return to the standard measuring screen.

<u>Zeroing load cells</u>:
Use the **ESC** key to cycle through the load values of the load cells until you reach that of the cell to be zeroed. Press **ZERO**. The screen will read ZERO, GROSS, then revert to the main measuring screen with a 0 value indicated.

<u>Calibration</u>:
Calibration is done according to instruction in the Calibration section. Calibration for each of the load cells is done separately. In order to calibrate a specific load cell, deactivate all the other load cells that are designated to your multi-cell system. After completing the calibration, do not forget to reactivate the load cells that you require for weighing.

5. Troubleshooting

1. <u>The system will not turn on:</u>

   a) After the system has been turned off, you must wait a few seconds before turning it on again. Try again after waiting about 10 seconds.

   b) Open the battery compartment cover. Check the battery connection and wiring.

   c) Remove the batteries and replace them in the holder to improve contact.

   d) Replace the batteries

2. <u>The system will not turn off:</u>

Disconnect and reconnect the batteries. Turn the system on and then try turning it off. If it does not switch off, it can still be used until you have an opportunity to send it to an authorized service center. With full batteries, the system will function for more than 3 months (or more than 2 months with rechargeable batteries) if left on continuously. If you leave it turned on but unloaded (0 shown on the display) the system will go into power saving mode and battery usage will be halved.

3. <u>**DANGER** sign displayed when not overloaded</u>:

a) Completely unload the system and press the **ZERO** key.
b) Turn the system off. After waiting approximately 15 seconds, turn it on again.

4. <u>The system freezes and does not react to changes in force or to keyboard commands:</u>

a) Disconnect and reconnect the batteries. If the fault recurs frequently, send the system to a service center.

5. <u>**TR.ERR is displayed**</u>:

This means that there is a communication issue between the load cell and indicator
When TR.ERR is displayed the system will be unable to detect overloads.
Take extra care when TR.ERR is displayed.

   a) If this occurs consistently, reduce the distance between indicator and load cell.
   b) Replace batteries in load cell
   c) The system should be checked in an authorized service lab.

6. <u>The system switches itself off</u>:

a) Check the batteries (see battery care section).
b) Try to operate the system without the extension cable as per #5. If this is the problem, replace the cable. If the problem persists, send the system to be checked in an authorized service laboratory.

6. Error Table

Error codes that may appear on the Ron 2501 indicator display

Error No.	Description	E=Eilon only S=User Serviceable
E1, E2, E3	EEprom Erron Read/Write	E
001	Calibration or EEprom memory error	E
002	Calibration Baud Watch Timer	E
003	Scrolling Capacity 10% higher than allowed. Recalibrate. Do not load the system with a weight higher than the test load.	S
005	ZeroTracing	E
007	Totalizer sum value overflow. Reset the Totalizer according to manual. Only applicable if Totalizer was ordered	E
008	Data Logger memory overflow. Reset according to manual (see Data Logger). Only applicable if Data Logger was ordered	S
009	Data Logger or Eeprom error. Reset "Data Logger" according to the manual	S
010	Data Logger already active. Wait 5 seconds and Reset Data Logger.	S
011	Eeprom failure	E
015	Active Real time Clock (RTC) power. Check/Replace battery.	
020	RS232 or SetPoint still active - wait several seconds and try again.	S
25-26	Eeprom ON/OFF Write/Read.	E
31-34	Reset according to manual (see Totalizer).	S
40	Tare attempted above capacity.	
45	Zero Setting: Zero value above 30% of capacity. Reset zero value.	S
46	(Multi) Zero = Sum, Tare = Sum	S
49-59	Keyboard error. A key has been pressed more than 3 seconds or problem with connectors. Check connectors.	S
60-61	Check manual (see Tare). Never use Tare if there is no Tare.	S
070	Multiplication factor failure (see manual Multi-Load).	S
090	Temperature3 > MAX above 80 deg. Celsius	E
100	Wrong DecPoint	E
102	Data logger does not exist. Read manual.	S
103	Menu: Time. Real Time Clock received incorrect data. See manual.	S
104	Check baudrate according to manual.	S
111	Failure in initial callibration	E
118	Watch Dog Trigger	E
132	Init WatchTimer	E
150	Units: Capacity > 99999	S

7. Suitable Shackles

The following table lists suitable shackles for various capacities of Ron dynamometers and load cells

Capacity in metric tons	Crosby shackles (USA)	C.M. shackles (short tons) (USA)			Van Beest (The Netherlands)	Yoke
		size	cap. in short tons	model		
	G209A				G5261	
1	$^3/_8$"	½"	$3^1/_3$	M650A		8-807-10
2	$^3/_8$"	½"	$3^1/_3$	M650A		8-807-10
3	½"	½"	$3^1/_3$	M650A	3.3t	8-807-13
5	$^5/_8$"	$^3/_4$"	7	M652A	5t	8-807-16
10	1"	$1^1/_8$"	15	M655A	12.5t	8-807-26
12	1"	$1^1/_8$"	15	M655A	12.5t	8-807-26
15	$1^1/_8$"	$1^1/_4$"	18	M656A	15t	8-807-28
20	$1^3/_8$"		-		21t	8-807-36
	G-2140				G-5263	
25	$1^1/_2$"	$1^1/_2$"	30	M857A	30t	8-808-38
30	$1^1/_2$"	-	-		30t	8-808-38
40	$1^3/_4$"	2"	50	M858A	40t	8-808-45
55	2"				55t	8-808-50
85	$2^1/_2$"				85t	
	G-2160				P6033	
100 / 125	125t				125t	
200	200t				200t	
250	250t				300t	
300	300t				300t	

Attention! Use shackles with S.W.L. (Safe Working Load) equal to, or greater than the system's maximum capacity.

When ordering shackles, it is strongly recommended to verify the maximum shackle pin diameter and the dimension between pin holes to fit the load cell.

Eilon Engineering Ltd reserves the right to make changes in design, specifications, and price without notice.