Eilon Engineering
Weighing Systems Ltd.

www.EilonEngineering.com

Manufacturer of **Ron CraneMaster | Multi Point Wired and Wireless Load Monitoring**




50t
NASA
GSFC • KSC
DCM
LANDSAT

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Celebrating **40 years**
of measuring excellence



Celebrating 40 years of assuring optimal safety for advanced Load Monitoring and our unique Overload Prevention systems under our renowned trade names of **Ron Crane Scales™** and **Ron CraneMaster™** for industry in general and **Ron StageMaster™** geared towards the entertainment industry.

At Eilon Engineering, we pride ourselves on being an independent, family run company. Our greatest asset is our hand-picked team of highly professional and knowledgeable individuals. Through hard work, passion and dedication to our long term vision of unwavering commitment to safety and quality - they continuously improve our technology and maintain our reputation as a world leader in the field of load monitoring and safety.

In 1993 we pioneered the incorporation of wireless communication into our systems for easy and swiftly accessible load cell readings. We keep abreast of this constantly developing technology and bring on board all the most sophisticated advances.

I would like to take this opportunity to express my appreciation to all our loyal users who span the globe - from small companies to Fortune 500 corporations such as NASA, Spacex, Boeing, GE, Siemens and many others. We look forward to continuing to serve you and your company's needs and implement ever more innovative methods to enhance the safety of all your lifting and rigging activities.

Sincerely,

Eitan Eilon - President

About **Eilon Engineering**

For the last 40 years Eilon Engineering has specialized in the development and manufacture of Ron Crane Scales™ dynamometers and load cells - all innovative, state-of-the-art products incorporating the latest technologies. Ron Crane Scales™ has become renowned as a global market leader, with a wide-spread international reputation for excellence.

An uncompromising attitude towards safety, exceptionally high quality, reliability, and the introduction of unique features (extremely long battery life, compact dimensions, wireless communication and more), has brought thousands of repeat customers, including corporate giants such as NASA, Spacex, Boeing, GE, Siemens and many other large, medium sized and even small companies.

In 2005 Eilon Engineering decided to harness its extensive knowledge in advanced wireless communication together with its proven load cell technology to develop an **advanced multi-point load monitoring and overload prevention system**. This breakthrough launched the Ron StageMaster™ system, which quickly gained international recognition as well as earning it innovation awards at both LDI and PLASA.

Ron StageMaster™ is not only widely used all around the globe for stage applications, but also for complex, heavy lifting tasks where **load monitoring of multiple lifting points** is crucial under the brand name **Ron CraneMaster™**.

Our company philosophy is commitment to the following principles:

- To continuously strive to achieve and maintain the highest possible standards of safety and quality
- To retain our position as Technological leaders in the arena of Load Monitoring and Overload Prevention - through intensive, ongoing R&D
- To innovate ever more unique systems with an emphasis on usability and comfort
- To guarantee our staunch commitment to customer service excellence and quick response times to all inquiries

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All our products are manufactured in accordance with internationally recognized standards under our ISO 9001 quality approved registration.

The importance of **load monitoring**:

Crane scales, dynamometers and all other load monitoring devices are critically important for a number of reasons - first and foremost is safety:

Safety: Any time a load is lifted, the potential for overload exists. Accurate measurement is paramount in the prevention of dangerous overloads. Even when it is assumed that load parameters are known, dangerous overloads can still occur.

Here are a few scenarios:

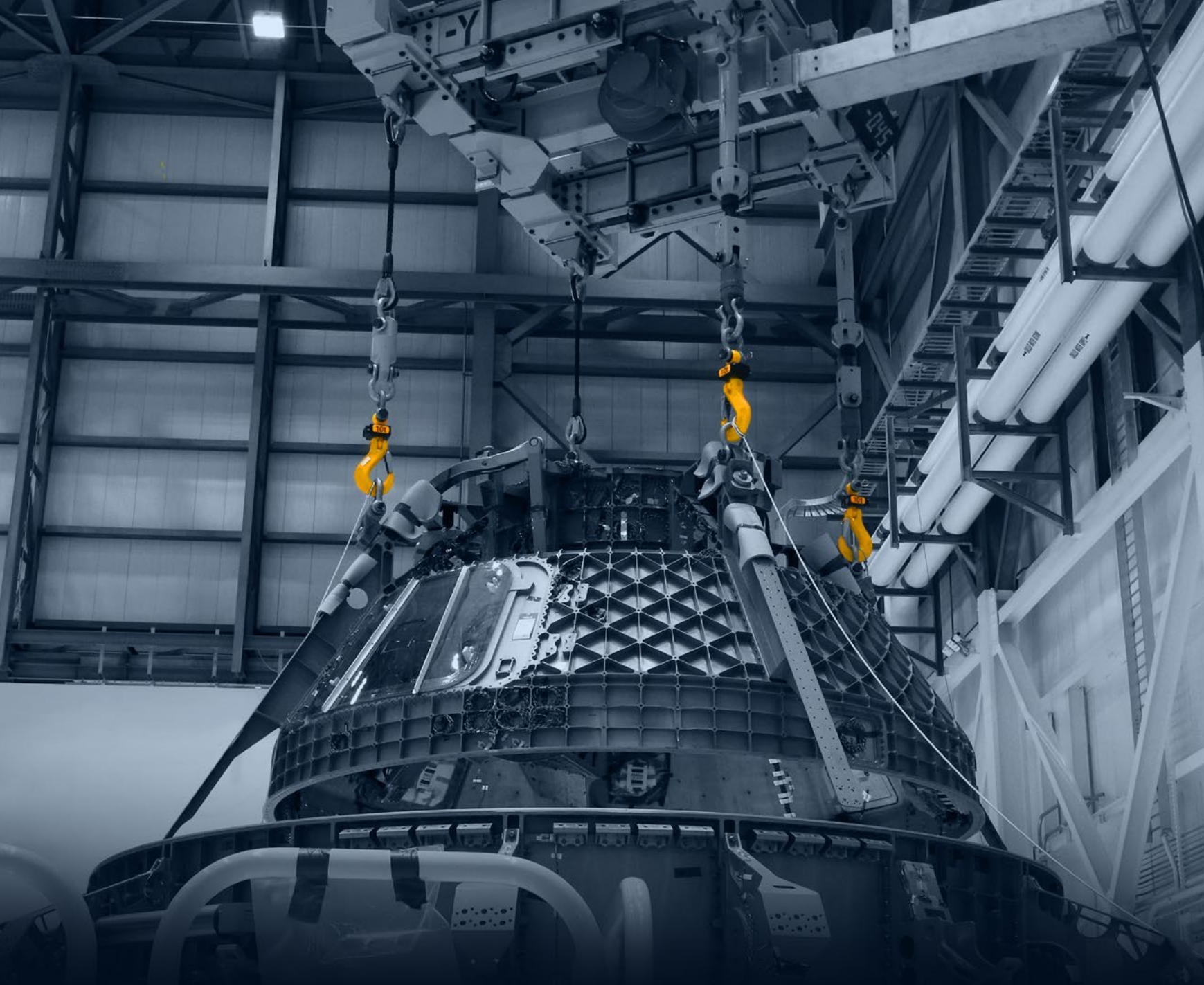
- Attempting to lift equipment which has not been freed from its anchor points
- Miscommunication between personnel responsible for lifting
- Addition of equipment after the load has been calculated and approved
- Off-center loading
- Uneven load distribution when using multiple lifting points can potentially cause accidental overload, Even if the lifted item's weight does not exceed the total load limitation.

Efficiency and cost reduction: In addition to safety, load monitoring can both increase efficiency and reduce costs:

- Precise weighing of incoming raw materials and outgoing shipments provides important data for inventory control
- Streamlining of manufacturing processes: every time a lift is performed, weight can be accurately measured
- Foundries can use load monitoring to carefully control the addition of "small additives", thereby preventing waste and affording the foundry greater control over the composition of their metal. Ladle load monitoring can show if there is still enough melted material left for an additional casting.

Ron CraneMaster **advantages**:

- Lightweight and portable
- Heavy duty designs with shock-absorbing mechanisms
- The exclusive use of high grade aerospace steel for load cell bodies
- Shackle holes offset 90 degrees to eliminate bending of the load cell - results in increased safety and accuracy
- Battery life of up to 2000 hours using common alkaline batteries (optional: up to 4000 hours on the wireless Ron 2501)
- Compact dimensions ensure minimal loss of headroom
- Short delivery time - in most cases 48-72 hours
- Reliable transmissions: Our wireless systems are programmed to ensure that the displayed value is identical to that transmitted
- Four decades in the market with repeat customers such as NASA, Spacex, Boeing, GE, Lockheed Martin, as well as numerous other customers



SAFETY ABOVE ALL

"Our uncompromising commitment to safety & quality enables us to continuously innovate and lead the Load Monitoring & Overload Prevention arena„

Eitan Eilon - President

Safety hazards in heavy, complex lifting

Statically Indeterminate Structures:

Any time there are more than two hoists on a beam or more than three hoists in a structure, it becomes statically indeterminate, resulting in an unpredictable load distribution. In most cases this will cause a load imbalance, in which some of the hoists may carry most of the load while others carry only a small part of the load.









The main safety issue with heavy, complex multi-point lifting:

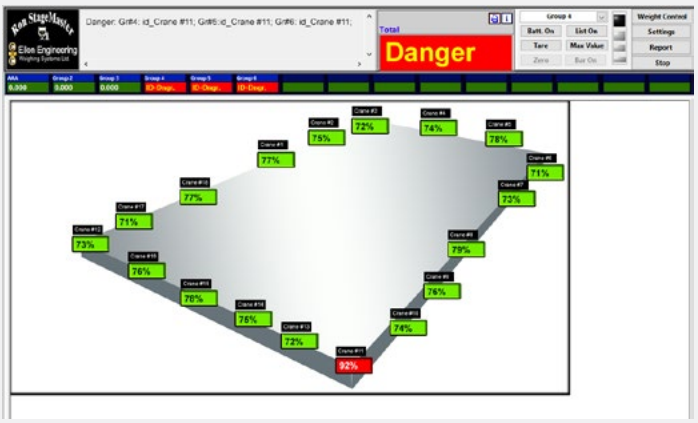
Maintaining safe load distribution across all lifting points, continuously. Even load distribution during multiple point lifting is only possible with the use of a real time load monitoring system.

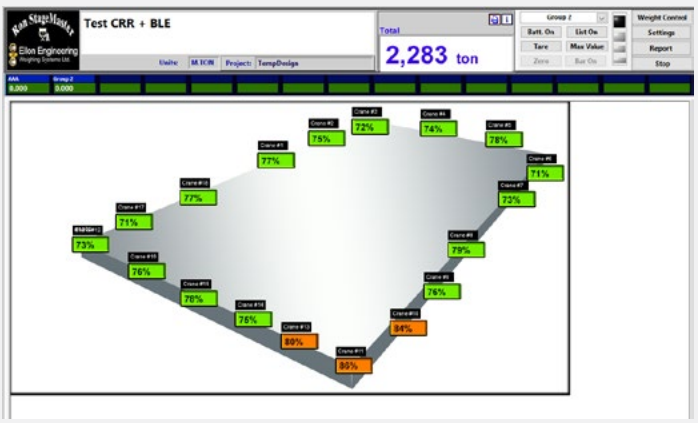
The solution:

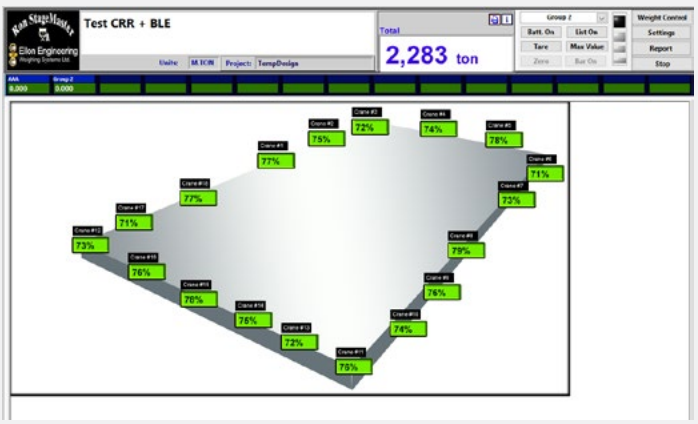
Real time relative load map



Important safety features of **Ron CraneMaster 6000** crucial for safe heavy complex lifting:







Real time relative load map:
As the lift begins, the loads on each lifting point will be displayed in real time on a laptop screen. The load must be performed slowly allowing for plentiful time for the coordinator to detect uneven load distribution. Upon detection of a load point that is carrying significantly more weight than other load points, the load must be redistributed among the neighboring load cells. Lifting must be stopped on the relevant crane, neighboring cranes will continue lifting until the load has been redistributed.

Low alloy steel load cells:
The use of aerospace quality low alloy steel load cells for high risk applications is vital.
The steel structure has proved itself to be much more reliable especially in extreme conditions.

Fatigue rated load cells:
All Eilon Engineering load cells are fatigue rated, an important feature especially for fixed and long-term installations. The load cell's ability to withstand successive load cycles for long periods of time without the risk of failure or damage to the steel, affords peace of mind for the user.

90° between shackle holes
Eliminates bending of the load cell thereby increasing safety and accuracy.

Why Choose **Ron CraneMaster**™?

(some advantages are specific to the wireless models):

SAFETY

• **Continuous load monitoring:** Up to 5000 hour battery life "always on" continuous monitoring. Absolutely no sleep or stand-by modes which are not acceptable from a safety perspective as continuous monitoring is crucial to prevent overloads.

• **Fatigue rated load cells:** All Eilon Engineering load cells are fatigue rated, an important feature especially for fixed and long-term installations. The load cell's ability to withstand successive load cycles for long periods of time without the risk of failure or damage to the steel, affords peace of mind for the user.

• **Reliable, independent data flow from each load cell:** Every load cell reports data independently and directly to the Central Receiver, eliminating the danger that damage to a single load cell will affect the rest of the system's ability to function. This feature is part of both our wired and wireless systems.

• **Wireless Multi-channel transmission** to ensure reliable and continuous load monitoring.

• **Verification mechanism:** An internal safety check ensures that the displayed data is always an exact match to that being transmitted by the load cells.

• **High quality materials:** Including load cells made of aerospace quality, high-strength alloy steel.

• **Perpendicular design:** 90° between shackle holes eliminates bending of the load cell thereby increasing safety and accuracy.

• **Proven wireless and load cell technology since 1976:** More than 30 years of innovative load monitoring for customers including major Fortune 500, aerospace companies and the largest venues and world tours.



FLEXIBILITY

• **Expandability:** Easily expandable by simply adding more load cells to an existing system.

• **Multiple system integration:** Different Ron StageMaster users can combine their load cells into one system when necessary, and one large system can be split into several smaller systems. Both wired and wireless load cells and various capacities and types (Hoist Integrated and Eilon Classic) can be used together.

• **Wide variety of frequencies available:** To suit various environmental conditions.

• **Easy installation:** Completely wireless system, plug and play with no cables required.

• **Wide variety of capacities:** Load cells available in any capacity up to 300t, 5:1, 10:1 and higher safety factors are available.







PERFORMANCE

- **Practically unlimited number of load cells:** Up to 200 load cells per laptop monitoring station and an unlimited number of monitoring stations.

- **Longer battery life:** Up to 5000 hour battery life with a transmission rate of once per second.

- **Longer transmission range:** Up to 2/3 mile / 1 km or more if required (optional).

- **Works with any controller** to provide automatic E-stop and overload/under-load alarm (visual and audible).

- **Slave-Master option:** For increased range, harsh conditions, and the ability to monitor several halls in one control room.

- **Tablet and smart phone compatibility** allows for portable browsing.

- **Real time load map:** All wireless and wired load cells are displayed on one laptop screen as a real-time load map, overlaid on the stage-plan layout, enabling the rigger to immediately identify the location of an overload and take swift preventative action. In addition, the set points enable immediate motor stop in case of an overload.

- **Multiple groups:** Up to 15 groups, each with its own overload setting and display.

- **Continuous unlimited data logging**: Downloadable data log of months of continuous measurements.

- **Group screen view:** For viewing individual group rigging plans, each with a specific background (included in orders of 50 load cells and up).

- **Real time cellular SMS alert** on overload occurrence.

Load Monitoring System

Ron CraneMaster™ 6000 G4 Wireless Eilon Classic - RSM 6000 G4 EC

TECHNICAL SPECIFICATIONS

R.F.: 2.4 GHz range – other ranges available.

R.F. transmission range: Up to 450'/150m in normal operation conditions (outdoors, line of sight). Longer transmission ranges are optional.

Safety Factor: 5:1 and 10:1 standard. Higher safety factors are available.

Safety features: Fatigue rated load cells that can withstand successive load cycles for long periods of time without the risk of failure or damage to the steel.

Proof load: 200%.

Accuracy: ± 0.1% of full range.

Capacities: 2t standard capacity with range of capacities from 0.25t to 5t and higher (up to 300t).

Display: Using a laptop or PC, the operator can monitor and control the loads of up to 200 load cells per monitoring station simultaneously, having on one single screen all the relevant information derived from the load cells: Sum (group sum and total structure sum), Max, Tare, Zero, Group (LC), Overload detection, Stage-plan layout, Low battery indication etc.

Functions: Sum, Max, Tare, Zero, Group (LC), Overload detection and alert (visual and audible), Low battery indication, Reports data base, User calibration, Group functions (Sum, Max, Zero, Tare, Overload and customized overload detection), Plan/layout archiving.

Additional Features: Tablet and smart phone compatible.

Units: Selectable units feature with the following choice of measurement readings: Tons, Kgs, Lbs.

Load Cell Material: Made of high-strength, aerospace quality low alloy steel, polyurethane coated.

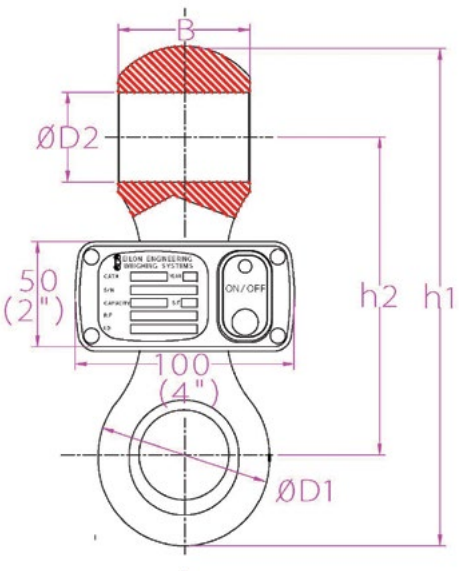
Power: 4 x AA 1.5 Volt Alkaline disposable batteries rated 3Ah for each load cell. Batteries will function up to 5000 hours. Optional 110/220 VAC operation .

Calibration: User calibration. Initial factory calibration, certified and fully traceable to NIST.

Temperature Range: Load cell: -15°F to +175°F / -25°C to +80°C.

Environmental: Weatherproof, Nema 4, IP 65. Higher sealing levels available.





Cat no.	Full range	Resolution		Load Cell weight		H1 (max.)		H2 (max.)		B (max.)		L		Ø D1 (max.)		Ø D2 (min.)		Matching anchor shackle size*
	tons	kgs	lbs	kgs	lbs	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch
S-005	0.5	0.2	0.5	0.3	0.7	125	4.9	92	3.7	16	0.7	100	4	31	1.3	17	0.66	1/2 7/16 3/8
S-01	1	0.5	1	0.3	0.7	125	4.9	92	3.7	16	0.7	100	4	31	1.3	17	0.66	1/2 7/16 3/8w
S-02	2	1	2	0.3	0.7	125	4.9	92	3.7	16	0.7	100	4	31	1.3	17	0.66	1/2 7/16 3/8
S-03	3	1	2	0.3	0.7	137	5.4	100	4	19	0.75	100	4	38	1.5	21	0.82	5/8 1/2
S-05	5	2	5	0.5	1	147	5.8	105	4.2	26	1	100	4	43	1.7	23	0.9	3/4 5/8
S-10	10	5	10	1.4	3.1	195	7.7	131	5.2	41	1.6	100	4	61	2.4	36	1.4	1 1/4 1 1/8 1
S-12	12.5	5	10	1.4	3.1	195	7.7	131	5.2	41	1.6	100	4	61	2.4	36	1.4	1 1/4 1 1/8 1
S-15	15	5	10	2.5	5.5	220	8.7	141	5.6	45	1.7	100	4	74	3	40	1.5	1 3/8 1 1/4 1 1/8
S-20	20	10	20	2.5	5.5	220	8.7	141	5.6	45	1.7	100	4	74	3	40	1.5	1 3/8
S-25	25	10	20	3.7	8	240	9.4	150	5.9	58	2.3	100	4	87	3.4	44	1.7	1 1/2
S-30	30	10	20	3.7	8	240	9.4	150	5.9	58	2.3	100	4	87	3.4	44	1.7	1 1/2
S-40	40	20	50	8	17	320	12.6	195	7.7	71	2.8	100	4	115	4.5	60	2.3	2 1 3/4
S-50	50	20	50	8	17	320	12.6	195	7.7	71	2.8	100	4	115	4.5	60	2.3	2
S-80	80	50	100	18	40	405	16.9	255	10	97	3.8	100	4	145	5.7	76	3	2 1/2
S-100	100	50	100	28	60	450	17.7	275	10.8	121	4.8	155	6.2	165	6.5	81	3.18	CROSBY No. 2160 125t
S-125	125	50	100	28	60	450	17.7	275	10.8	121	4.8	165	6.6	165	6.5	81	3.18	CROSBY No. 2160 125t
S-200	200	100	200	57	121	575	22.6	350	13.8	145	5.7	165	6.6	210	8.3	106	4.2	CROSBY No. 2160 200t
S-250	250	100	200	106	225	800	31.5	490	19.3	178	7.0	245	9.7	260	10.2	138	5.4	CROSBY No. 2140 250t or No. 2160 300t
S-300	300	100	200	106	225	800	31.5	490	19.3	178	7.0	245	9.7	260	10.2	138	5.4	CROSBY No. 2160 300t

› USE SHACKLES WITH S.W.L. (SAFE WORKING LOAD) EQUAL TO, OR GREATER THAN SYSTEM'S FULL RANGE.
› The company reserves the right to make changes without notice.

OPTIONS

- Additional channels: 2 standard channels – up to 4 optional channels (recommended for large numbers of load cells and/or harsh conditions).
- Set point, for integration of RSM system with any controller. Activates E-stop and/or audio visual alarm in case of overloads or underloads.
- Real time cellular SMS alert on overload occurrence.
- Single wire option for the wireless receiver.
- Slave and master CRRs: For increased range, harsh conditions, and the ability to monitor several halls in one control room.
- Group screen view: For viewing individual group rigging plans, each with a specific background (included in orders of 50 load cells and up).

All Types of **Central Radio Receivers** (CRR)

Receiver type	Photo	Receiver Description	Advantages	Housing
HHI		Hand Held indicator for Small Installations. Capable of displaying measurement from up to 8 individual load cells or the combined total of their loads.	Low cost, entry level indicator for small installations	Hand held ABS 1/2"" /12mm digits
PRR		Portable Radio Receiver. Allows for transmission of measurement data of up to 40 load cells to any smartphone or tablet. Loads can be displayed as a real-time load map, table or bar graph.	Advanced receiver with bluetooth communication for tablets and smartphones. Loads can be displayed as a real-time load map, table or bar graph.	Portable Radio Receiver Tablet / Smartphone
Basic		Basic Radio Receiver for use with laptops. Allows for display of measurement data of up to 8 load cells on a real time load map.	Entry level desktop receiver for small installations. Features real time load map and reporting. UPGRADABLE	Desk ABS L 199mm W 223mm H 72mm
Standard		Standard Radio Receiver for use with laptops. Allows for display of measurement data of up to 100 load cells on a real time load map.	Full featured desktop receiver. For medium sized installations. Real time load map	Desk ABS L 199mm W 223mm H 72mm
Premium		Premium Radio Receiver for use with laptops. Allows for display of measurement data of up to 200 load cells on a real time load map.	Full featured desktop receiver. For massive installations. Real time load map	Desk ABS L 199mm W 223mm H 72mm
DIN 19"		Rack Mountable Radio Receiver for use with laptops. Allows for display of measurement data of up to 200 load cells on a real time load map.	Full featured rack mountable radio receiver. Can be mounted in optional flight case. For massive installations, tours and venues. Real time load map	Rack mountable Metal L 482mm W 200mm H 66mm

* Number of channels determines the maximum number of load cells and signal reliabily in harsh environments.

** Slave Radio Receivers can be used to extend range, overcome harsh environments, increase number of load cells and/or allow for monitoring of several halls from central location (with Master/Slave option only)

Max. number of load cells displayed	Standard number of channels	Max. number of channels - optional*	Receiver's battery life (h)	Includes: Carrying case, laptop & software	Options		
					Max. Number of Slaves** (Requires Master/Slave option)	Set point, flight case, SMS	SD memory, Ethernet
Up to 8. The indicator can show each load cell's measurement individually or their combined total	1	1	30	x	x	x	x
Up to 40 load cells	2	2	40	x	x	x	x
Up to 8. Real time load map	2	2	From mains	✓	1	✓	x
Up to 100. Real time load map	2	2	From mains	✓	1	✓	x
Up to 200 load cells per monitoring station and unlimited number of monitoring stations. Real time load map	2	4	From mains	✓	2	✓	✓
Up to 200 load cells per monitoring station and unlimited number of monitoring stations. Real time load map	2	6	From mains	No carrying case - optional flight case	3	✓	✓

Crane Scales



Ron 3025
Crane Scale with 1”/25 mm display.



Ron 3050
Crane Scale with large 2”/50 mm display.



Ron 2501 Hook Type
Crane Scale with wireless remote display.



Ron 2125 Hook Type
Crane Scale with 1”/25 mm with attachable display.



Ron 2150 Hook Type
Crane Scale with 2”/50 mm attachable display.



Ron 2000 Hook Type
Crane Scale with remote display.

Overload Detectors and Load Cells



Ron 4000
Load Cell with Built in Amplifier



Ron 1000
Hook Type Overload Detector



Ron 1000
Standard Type Overload Detector



Ron 1000
Chain Type Overload Detector

Dynamometers



Ron 2000 Shackle Type
Dynamometer with remote display.



Ron 2150 Shackle Type
Dynamometer with 2”/50 mm attachable display.



Ron 2125 Shackle Type
Dynamometer with 1”/25 mm attachable display.

Wireless Dynamometers



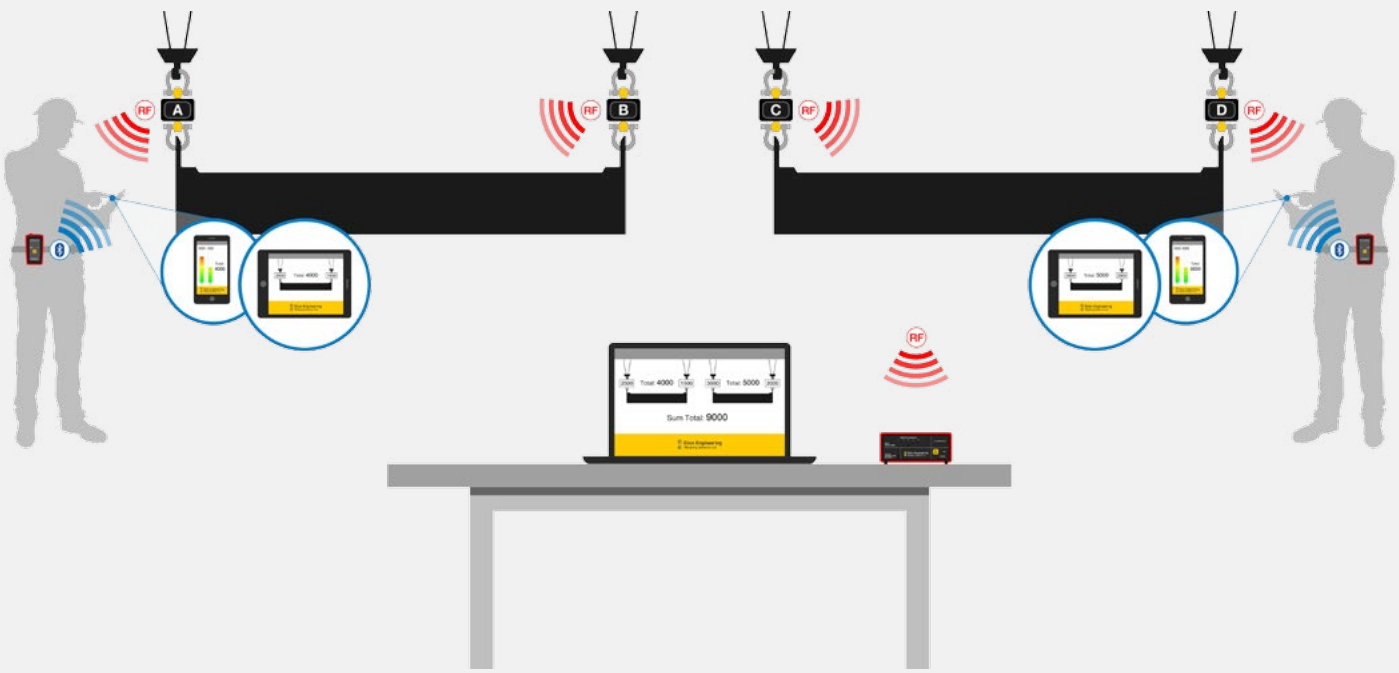
Ron 2501 Shackle Type
Dynamometer with wireless remote display.

Multiple Point Load Monitoring:

Monitor multiple load points simultaneously from your SMARTPHONE, TABLET or LAPTOP. Display their individual measurements, as well as the sum of multiple user - configurable points.

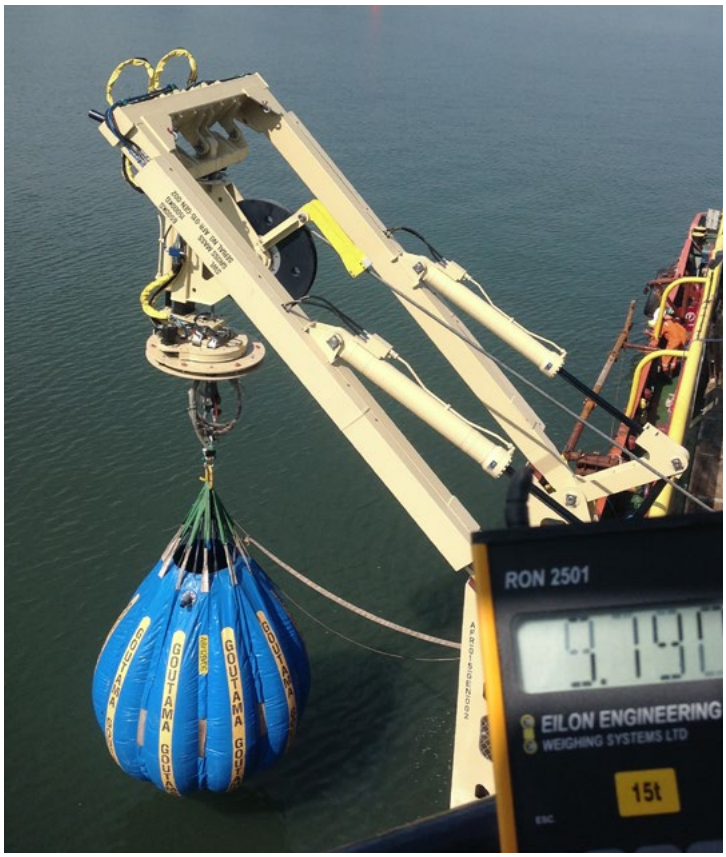
View all measurements as a **real-time load map**.

In addition, monitor up to 200 load points from a PC in your control room - using a real time load map, or monitor each load cell individually.



Applications & Customers

Proof loading



Weighing in foundries



Bollard pull test



Controlled cable tension



LOCKHEED MARTIN · BOEING · SAMSUNG · SIEMENS · Vestas · Ford · Honeywell

Weighing during manufacturing



Wind Turbine



Offshore applications



Dual point load monitoring



JOHN DEERE · U.S. AIR FORCE · HYUNDAI · NASA · GE · V.Ships · DAEWOO · ROLLS ROYCE

Eilon Engineering
Weighing Systems Ltd.

40 Years
OF MEASURING
EXCELLENCE



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