

ONE DIGITALSCALES.com

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A DIVISION OF MASTERLINE GROUP



447 HIGH CAPACITY CRANE SCALE

20,000 lbs – 300,000 lbs



One Digital Scales – toll free (800) 620-7811

www.OneDigitalScales.com

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ICS, LLC's products are intended for use in normal commercial applications. Applications requiring extended temperature range or unusual environment requirements such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional testing for such application

Limited Warranty

For a period of one (1) year from the date of purchase, ICS, LLC warrants the crane scales against defects in materials and workmanship. ICS, LLC will not honor this warranty (and this warranty will be automatically void) if there has been any:

1. Tampering or signs of tampering.
2. Use of AC power adapters and cables other than those originally supplied with the crane scales.
3. Repair or attempt to repair by anyone other than an ICS, LLC authorized technician.

This warranty does not cover and ICS, LLC will not be liable for, any damage or failure caused by misuse, abuse, acts of God, accidents, electrical irregularity, or other causes beyond ICS, LLC's control, or claim by other than original purchaser

TABLE OF CONTENTS

PRECAUTIONS.....	4
PREFACE.....	5
SCALE FEATURES.....	6
SCALE SPECIFICATIONS.....	7
INDICATOR SPECIFICATIONS.....	8
INDICATOR DISPLAY AND CONTROLS	
KEYPAD BUTTONS AND FUNCTIONS.....	8
ANNUNCIATORS.....	9
BASIC WEIGHING	
NORMAL WEIGHING.....	10
USING TARE.....	10
SPECIAL FEATURES	
UNITS SWITCHING (LB/KG).....	11
COUNTING.....	11
HOLD.....	12
PEAK HOLD.....	12
LIVE WEIGHT.....	13
SHOWING TOTALS.....	14
TROUBLESHOOTING	
ERROR MESSAGES.....	15
BATTERY OPERATIONS.....	15
DAIGNOSTIC ERRORS.....	16

PRECAUTIONS

1. Do not disassemble the scale. If any damage or defect occurs, contact ICS, LLC. Immediately for proper repair. Disassembly by anyone other than an ICS, LLC. Technician can void the factory warranty (see limited warranty disclaimer).
2. Do not overload scale beyond maximum recommended weight limit.
3. When charging scale, ensure that the charger is connected to a grounded outlet. This will minimize electricity static that could cause equipment defects or electrical shock.
4. When removing the charger from its electrical outlet, do not pull by the cord, this could cause electrical shock or fire.
5. When removing the charger from the charging port on the crane scale, ensure that the charger has been unplugged from its electrical outlet first. Do not remove charger plug, by pulling the cords, as this could damage the connector and possibly cause damage or fire upon next use.
6. To avoid fire hazards, do not operate or store the scale near flammable or corrosive materials, gas.
7. To avoid electrical shock or malfunction, prevent scale from being stored or operated in extremely wet or humid conditions.
8. Be sure to maintain a safe distance when weighing a load. Never stand directly under scale when a load is being weighed.
9. Avoid shock loading the scale (ensure that there is minimal or no slack when lifting a load. The sudden SNAP of a load pulling on the scale, could potentially cause damage to scale and/or lifting hardware.
10. Keep the scale away from any other electromagnetic generating devices as they may cause incorrect or false readings.
11. To ensure consistent and accurate readings, maintain periodic calibration checks by your ICS, LLC. Dealer.

PREFACE

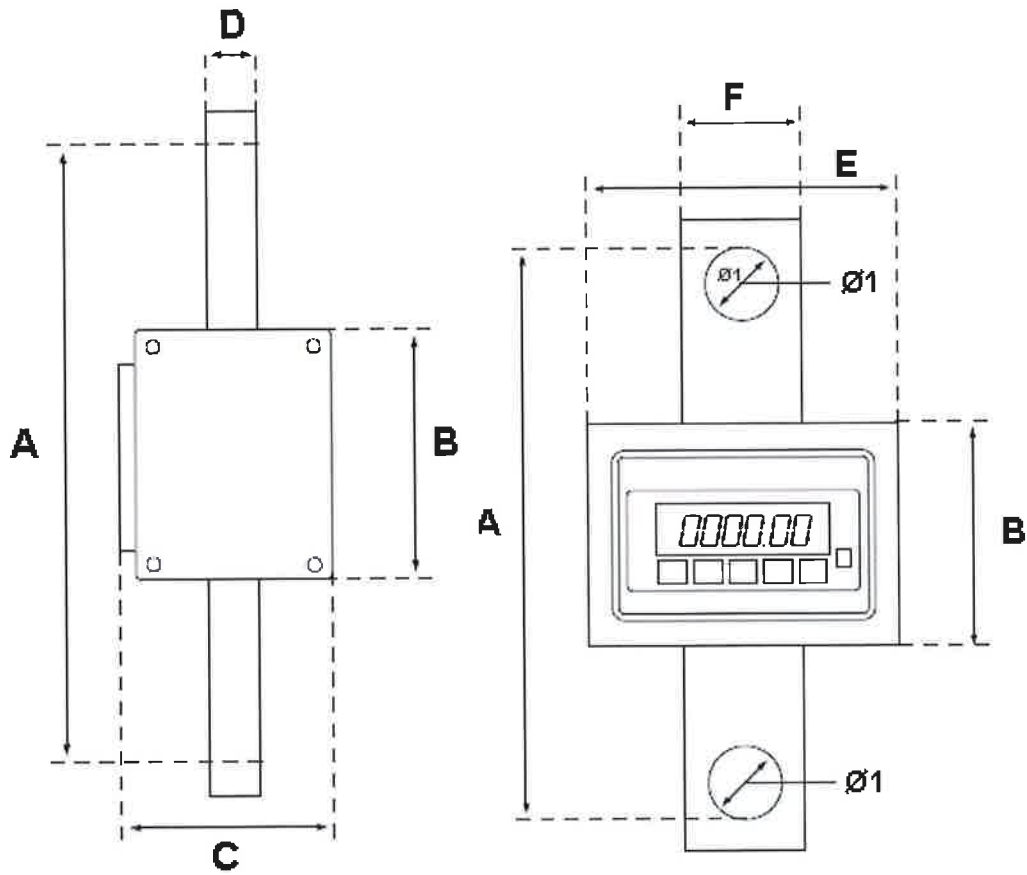
Thank you for purchasing you ICS, LLC. 447 series crane scale. This series was designed with reliability, functionality, quality, and performance in mind. We believe that whatever your overhead lifting needs are, they can be met by our outstanding line of crane scales.

This manual will help you with proper operation and care of the 447 series crane scales. Please keep this manual handy for future reference.

SCALE FEATURES

- Overload Capacity 500%
- NEMA 4 IP 65
- Full Tare Subtraction
- Auto Span Calibration
- Pounds And Kilograms Conversion
- 0.05% Accuracy Of Applied Load
- Automatic Overload Indication At 115%
- Solid Steel Construction
- Peak Hold, Hold
- Accumulation
- Counting Functions
- RS 232 and 4-20 mA Available
- Battery and Charger Included

SCALE SPECIFICATIONS



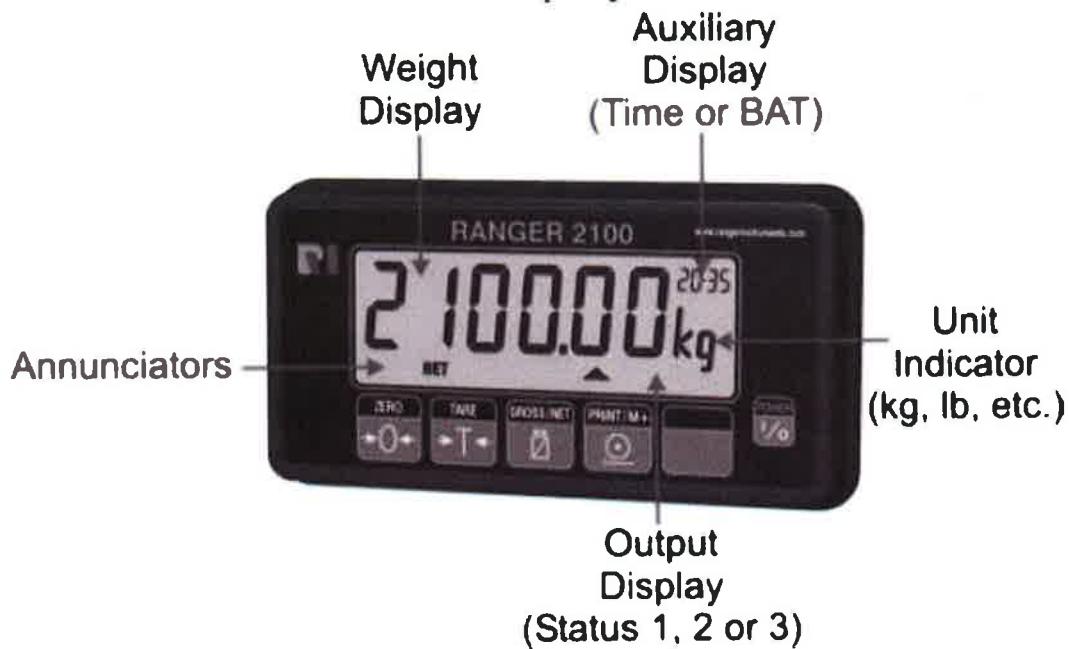
	447-50K	447-100K	447-150K	447-200K
A	16.5"	19.5"	19"	22"
B	7"	7"	8"	8"
C	6"	6"	6"	6"
D	1.5"	1.5"	2.1"	2.3"
E	11.5"	11.5"	13"	13"
F	3.625"	4.5"	5.5"	6.5"
Ø1	2.02"	2.81"	3.31"	3.8"

INDICATOR SPECIFICATIONS









Performance		
Display	Backlit alphanumeric LCD with six 27mm high digits	
Backlight	LED backlight with adjustable brightness	
Display Resolution	Up to 30,000 divisions, minimum of 0.25 μ V/division (Trade 6000 divisions at 1 μ V/division)	
Count-by	1, 2, 5, 10, 20, 50, 100 (Entered in Displayed Weight)	
Zero Cancellation	+ / - 2.0mV/V	
Span Adjustment	0.1mV/V to 3.0mV/V full scale	
Stability/Drift	Zero: < 0.1 μ V/ $^{\circ}$ C, Span < 10ppm/ $^{\circ}$ C, Linearity < 20ppm, Noise < 0.05 μ Vp-p	
Operating Environment	Temperature: -10 to +50 $^{\circ}$ C ambient, Humidity: <90% non-condensing	
Digital		
Setup and Calibration	Full digital with visual prompting in plain messages	
Memory Retention	Full non-volatile operation	
Digital Filter	Averaging from 1 to 100 consecutive readings	
Zero Range	Adjustable from +/- 2% to +/-20% of full capacity	
A/D Converter		
Type	24bit Sigma Delta	
Resolution	8,388,608 internal counts	
A/D Sync Filter	Selectable 25/30Hz, FIR filter > 80dB	
Load Cells		
Excitation	8 volts for up to 8 x 350 ohm load cells (6-wire + shield)	
Serial Comms (Software Option 0224)		
Serial output	Single RS-232 as automatic transmit, network or printer drive	
Power Input		
Standard	General	9 to 15VDC (60mA to 400mA depending on load cells and backlight) ON/OFF key with override and Auto-Off software
Variants	AC	AC Power: 110/240VAC 50/60Hz 10VA fitted in s/s housing
	DC	DC Power: 12-24VDC 10VA fitted in s/s housing
	Battery	Rechargeable: 12VDC Battery fitted in s/s housing (Refer to page 17 for more details of 2100 Indicator Variants.)
Dimensions		
Body size	189mm (L) x 99mm (H) x 23mm (D)	
Panel cutout	Flush mounted with cable holes drilled separately (template provided)	
Features		
Standard Features	Five point linearity correction	
	Assignable function key for operator use	
	3 remote inputs and lb/kg switching fitted as standard	
	Battery backed clock and calendar fitted as standard	

INDICATOR DISPLAY AND CONTROLS










KEYPAD BUTTONS AND FUNCTIONS

Key	Description
	<p>POWER: The Power key is used to turn the instrument ON and OFF.</p> <ul style="list-style-type: none"> • To Turn Instrument OFF: Press and hold the <POWER> key for three seconds (until the display blanks). • Operator Menu Setup: Press and hold the <POWER> and <ZERO> keys for two seconds. • Software Options: Press and hold the <POWER> and <FUNCTION> keys for two seconds.

Key	Description
	ZERO: The Zero key sets the display weight to gross zero, providing the weight is within the zero range of the instrument (Tare weight is cleared).
	TARE: The Tare key temporarily sets the weight on the instrument to be displayed as zero. Refer to Using Tare page 7 for more information.
	GROSS/NET: The Gross/Net key toggles the weight display between the Gross and the Net weight.
	PRINT/M+: The Print/M+ key sends data to the attached peripheral device. M+ indicates unit has a memory (ie. each printed weight is automatically added to the internal Total Weight).
	FUNCTION: This key is programmable to suit customer requirements. A key label identifying the special function will be attached. (Refer to page 10 for information on Special Functions).

ANNUNCIATORS

Symbol	Name	Description
	ZERO	Lit when the displayed reading is within $\pm \frac{1}{4}$ of a division of true zero.
	NET	Lit when the display reading represents NET weight.
	MOTION	Lit when the displayed reading is not stable.
	OVER	Lit when the weight is over setpoint target.
	PASS	Lit when the weight is between under and over setpoint targets.
	UNDER	Lit when the weight is under the setpoint target.
	ZERO BAND	Lit when the displayed weight is within the zero dead band setting.


BASIC WEIGHING

NORMAL WEIGHING

1. Ensure indicator is on and “Zero” annunciator is lit.
2. Secure item that is to be weighed properly to the scale.
(ie... lifting hardware, straps, shackles, ect...)
3. Lift item slowly to avoid shock loading scale.
4. Read the displayed weight.

USING TARE


1. Ensure that the “Zero” annunciator is lit and displaying “0”
2. Place lifting hardware or item to be tared on scale.

3. Press the “Tare” key. The image shows a rectangular button with the word 'TARE' at the top. Below the text is a stylized 'T' symbol with a horizontal line through it, and two small arrows pointing outwards from the vertical stem of the 'T'.
4. The indicator will display “0” and the “Net” annunciator will be lit.
5. Weigh the desired item.






6. Press the “Gross/Net” key The image shows a rectangular button with the text 'GROSS/NET' at the top. Below the text is a vertical bar with a horizontal line through it, resembling a stylized '1' or a scale indicator.
 to toggle between the net weight and the total weight.

SPECIAL FEATURES



UNITS SWITCHING (LB/KG)

<ul style="list-style-type: none">• Press the <UNITS> key to switch the display between kilograms and pounds.	
<p>Note: Printing and serial communications will use the units displayed (either lb or kg), but calibration weights and targets, etc., must be entered in the primary display units of the indicator.</p>	




COUNTING

<ul style="list-style-type: none">• Place the container on the weigh platform and press <TARE> if required.	
<ul style="list-style-type: none">• Place the sample pieces to be counted on the weigh platform.	
<ul style="list-style-type: none">• Press and hold the <COUNT> key for two seconds. The default number of pieces in the sample will be displayed.	
<ul style="list-style-type: none">• Use the <GROSS/NET> and <PRINT/M+> keys to alter the number of pieces.	 
<ul style="list-style-type: none">• Press <COUNT>. The current sample will be stored against the entered pieces. The letter p (for pieces) displays when in counts display.	
<ul style="list-style-type: none">• Press the <COUNT> key to toggle between the weight display and the counts display.	




HOLD

<ul style="list-style-type: none">• Press the <HOLD> key to hold the displayed weight at its current weight.	 A square button with a white top half containing the word "HOLD" and a black bottom half containing a white letter "H".
<ul style="list-style-type: none">• The displayed Units will flash to indicate that the reading is held.	
<ul style="list-style-type: none">• Press the <HOLD> key again to release the weight reading and return the display to normal weighing.	 A square button with a white top half containing the word "HOLD" and a black bottom half containing a white letter "H".




PEAK HOLD

<ul style="list-style-type: none">• Press the <PEAK> hold key to hold the largest absolute weight (either positive or negative). The 2100 compares the current weight reading with the stored peak and updates the peak reading whenever a larger weight is detected.	 A square button with a white top half containing the word "PEAK" and a black bottom half containing a white letter "P".
<ul style="list-style-type: none">• Press the <PEAK> key to toggle between the current weight and the peak weight.	 A square button with a white top half containing the word "PEAK" and a black bottom half containing a white letter "P".
<ul style="list-style-type: none">• Press and hold the <PEAK> key for two seconds to clear the peak value and reset back to zero.	 A square button with a white top half containing the word "PEAK" and a black bottom half containing a white letter "P".

LIVE WEIGHT

<ul style="list-style-type: none">• Move the animal onto the weigh platform.	
<ul style="list-style-type: none">• Press and hold the <LIVE WT> key for two seconds.	
<ul style="list-style-type: none">• '-----' is displayed until a reliable weight reading has been acquired.	
<ul style="list-style-type: none">• Once a weight has been determined the 2100 beeps to indicate how reliable the reading is.<ul style="list-style-type: none">-A single beep indicates that the sample is too unreliable and has been discarded.-A double beep indicates that the sample is reliable but is made up of many averages.-A triple beep indicates that the sample was taken as a result of no motion and is very reliable.	
<ul style="list-style-type: none">• Press the <LIVE WT> key to force the 2100 to take another reading if required.	
<ul style="list-style-type: none">• Once the animal is removed, the 2100 automatically clears the previous reading ready for the next animal and displays '-----' once more.	
<ul style="list-style-type: none">• Press and hold the <LIVE WT> key for two seconds to return the indicator to normal weighing.	
<ul style="list-style-type: none">• In normal weighing the Live Weight key operates exactly like a manual <HOLD> key. Press the key once to hold a weight and again to release it.	

SHOWING TOTALS

<ul style="list-style-type: none">• The <PRINT/M+> key is used not only to print the current weight but to add that weight to the current total.	
<ul style="list-style-type: none">• When the <TOTAL> key is pressed the 2100 displays count followed by the number of items in the total.	
<ul style="list-style-type: none">• After this the 2100 displays TOTAL followed by the current total weight.	
<ul style="list-style-type: none">• If counting is active QTY is also displayed along with the total quantity of items in the total.	
<ul style="list-style-type: none">• If the total weight is too large to display in six digits, the weight is shown in two sections labelled with the upper six digits displayed before the lower six digits.	
<ul style="list-style-type: none">• Press and hold the <PRINT/M+> key to cause the total accumulated weight to be printed and then cleared.	

ERROR MESSAGES

Error	Description
(U-----)	The weight reading is below the normal weighing range.
(O-----)	The weight reading is above the maximum capacity of the equipment.
(ZERO)(ERROR)	The weight is outside the zero range tolerance setting. See Note below.
(STABLE)(ERROR)	The scale motion has prevented a zero, tare or print operation from occurring. See Note below.
(QA)(DUE)	Quality assurance testing is due. Press any key to clear this warning for one hour.

Note: The **ZERO** and **STABLE** error messages are accompanied by a series of long beeps. The messages repeat until a key is pressed.

BATTERY OPERATIONS

BAT is flashed on the auxiliary display if the battery voltage falls below 11V. If the battery voltage falls below 10.5V the instrument automatically powers down.

DIAGNOSTIC ERRORS

Error	Description	Action
E0001	Power supply voltage too low.	Check supply
E0002	Power supply voltage too high.	Check scale / cables
E0004	Load cell excitation voltage too low. (8 volts for up to 8 x 350 ohm load cells)	Check scale / supply
E0008	Load cell excitation voltage too high. (8 volts for up to 8 x 350 ohm load cells)	Check scale / supply
E0010	Temperature outside limits. (-10 to +50°C ambient)	Check location
E0020	Scale build incorrect. (100 to 30000 grads).	Fix up scale build
E0100	Digital setup information lost.	Re-enter setup
E0200	Calibration information lost.	Re-calibrate
E0300	All setup information lost.	Enter setup and calibrate
E0400	Factory information lost. (FATAL)	Service
E0800	EEPROM memory chip failed. (FATAL)	Service
E2000	ADC out of range. Possible load cell or cable damage.	Check load cell cable
E4000	Battery backed RAM data lost.	Re-enter setup
E8000	FLASH program memory incorrect. (FATAL)	Service

The **E** type error messages are additive. For example, E0005(0001+0004) would indicate that both Excitation and Power Supply Voltage are low. The numbers add in hexadecimal as follows:

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - A - B - C - D - E - F
(For example, 2 + 4 = 6, or 4 + 8 = C)