MANUAL ANYLOAD®

OCS Series

Electronic Crane Scale

- OCSA3 & OCSA4 General Purpose Crane Scales
- OCSB3 & OCSB4 Compact Crane Scales
- OCSC3 & OCSC4 Enhanced Crane Scales
- OCSG1 & OCSG2 Heat Resistant Crane Scales
- OCSM1 & OCSM2 Light Duty Crane Scales
- OCSZ Heavy Duty Crane Scale



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1. User Input

In this section, the operator will learn how to operate the scale properly either on scale or by its remote controller.

KEYS ON SCALE

	ON/OFF	ZERO	TARE	HOLD	2ND
Scale Configuration	Exit	\uparrow	\rightarrow	Confirm	Save
Calibration	Exit	\uparrow	\rightarrow	Confirm	Save
Power Adjustment	Exit	\uparrow	\rightarrow	Confirm	
System Info	Exit			Confirm	

KEYS ON REMOTE CONTROLLER

	Scale Configuration	Calibration	Power Adjustment	System Info
	\uparrow	\uparrow	\uparrow	
	\rightarrow	\rightarrow	\rightarrow	
	Confirm	Confirm	Confirm	Confirm
	\downarrow	\checkmark	\checkmark	
	÷	÷	÷	
OF1				
O F2				
G	Exit	Exit	Exit	Exit
	Save	Save		

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2. Advanced Operations

Operations section features the versatile and powerful functions for crane scale measurement. Most of the operations are accessible via dedicated remote controller. Some of the settings in the scale are protected by password to prevent unwanted settings modification. If you are not sure to do it, contact your local representative or dealership for technical support.

Action

- To enter SCALE CONFIGURATION MODE, press 2ND key on scale or on remote controller twice. The password message will display.
- \circ $\,$ To input SCALE CONFIGURATION password, use ZERO and TARE $\,$

keys on scale or and on remote controller.

• To confirm the password or inputted value, press HOLD keys on

scale or 💻 on remote controller.

To save and exit SCALE CONFIGURATION MODE, press 2ND key on

scale or 🚺 on remote controller.

• To exit **SCALE CONFIGURATION MODE** without saving, press ON/OFF key on scale or on remote controller.

To learn more how to input values or change the option, refer to User Input section in User's Guide.

Function

- In SCALE CONFIGURATION MODE, user can change the scale's metrology performance, like system measurement unit, auto and manual zero, automatic zero-tracking, anti-motion algorithm, and gravidity acceleration, etc.
- The screen will display the welcome message:



WARNING:

Parameters in SCALE CONFIGURATION are closely related to scale's metrology performance. It is NOT recommended to change anything in SCALE CONFIGURATION unless you are authorized from your local representative or dealership with the correct password.

Condition

 The scale must not in HOLD mode otherwise an error message hold will display.

AUTO-ZERO RANGE

- During the power-on procedure, the initial load on the scale will be automatically zeroed if the load is within the **AUTO-ZERO RANGE**.
- There are 6 options of AUTO-ZERO RANGE: "0%, "2%", "4%", "10%", "20%", and "100%" of Max. Cap.. When AUTO-ZERO RANGE is set to "0%" Max. Cap., the AUTO-ZERO function is disabled.
- The default AUTO-ZERO RANGE is set to "20%" Max. Cap..



MANUAL-ZERO RANGE

• After powering on, the scale can be zeroed manually by pressing ZERO

key on scale or on remote controller if the load's weight is in **MANUAL-ZERO RANGE**. Some models do not have zero key on scale, use the remote controller instead.

- There are 6 options of MANUAL -ZERO RANGE: "0%, "2%", "4%", "10%", "20%", and "100%" Max. Cap.. When MANUAL -ZERO RANGE is set to "0%" Max. Cap., the MANUAL -ZERO function is disabled.
- The default MANUAL -ZERO RANGE is set to "4%" Max. Cap..



ZERO-TRACKING RANGE

- ZERO-TRACKING function will zero the scale when weight reading is within the ZERO-TRACKING RANGE.
- There are 6 options of ZERO-TRACKING RANGE: 0.0 division, 0.5 division, 1.0 division, 1.5 division, 2.0 division, and 2.5 division equivalent to "0E", "0.5E", "1.0E", "1.5E", "2.0E", and "2.5E", respectively. When ZERO-TRACKING RANGE is "0.0E", the ZERO-TRACKING function is disabled.
- The default ZERO-TRACKING RANGE is set to 0.5 division, "0.5E"



NOTE:

Enabling Zero-Tracking will enhance temperature and drift performance of the scale

ACCELERATION DUE TO GRAVITY

- Adjust the GRAVITY ACCELERATION only when you use the scale in a place where acceleration of gravity is greatly different from the place where the scale was calibrated.
- **GRAVITY ACCELERATION** can be set from "9.700" to "9.899".
- The default **GRAVITY ACCELERATION** is set to "9.794".



USER-DEFINED UNIT

- The scale allows user to define a special unit as USER-DEFINED UNIT.
- USER-DEFINED UNIT can be set from "0.000" to "9.999".
- The default USER-DEFINED UNIT is set to "1.000".



NOTE:

A USER-DEFINED UNIT is an additional unit represents the unit defined by the user, aside from kg or lb. The conversion value is equivalent to the ratio against to its SYSTEM UNIT.

For example, assuming the scale's system unit is kg. If the USER-DEFINED UNIT is equivalent to 1.234 unit per 1kg then after switching to USER-DEFINED UNIT, the scale should display the 1000kg weight to 1234 user-defined unit.

After pressing 2ND key on scale or on remote controller, the scale will save current settings and will exit from SCALE CONFIGURATION MODE then automatically returns to WEIGHING MODE.



CALIBRATION

Action

To enter CALIBRATION MODE, press 2ND key on scale or on remote controller twice. Some models do not have 2ND key on scale, use the remote controller instead. Enter the password for calibration. (Note, this procedure should be done by qualified or authorized person to change the calibration settings. Ask the password from your local dealership or from technical support).



To input CALIBRATION password, press ZERO and TARE keys on scale or

📕 and 📄 on remote controller.

- To confirm the password, press HOLD key on scale or on remote controller.
- o To save and exit CALIBRATION MODE, press 2ND key on scale or

on remote controller.

• To exit CALIBRATION MODE without saving, press ON/OFF key on scale

or 😈 on remote controller.

To learn more on how to input values or change the option, refer to User Input section in User's Guide.

NOTE:

To meet some countries' metrology requirements, a Calibration plug is equipped which will be used to switch the scale from weighing mode to calibration mode.

Upon entering the Calibration mode, a message may display in the screen. This means that you need to switch the jumper of the calibration plug. Refer to the sample images for the mainboard of some of OCS models and locate the calibration jumper pin and the instructions to switch the jumper. In this model, the user must take off the front panel to access the plug.

After the calibration, put the jumper back to its original pin.

If your model does not have calibration plug, just enter the calibration password and proceed with the calibration process.



Function

- 0 When the scale needs to be recalibrated, user can recalibrate the scale in CALIBRATION MODE.
- The screen displays the welcome message: 0



NOTE:

It is NOT recommended to do the CALIBRATION unless you are authorized from your local representative.

Condition

The scale must not in **HOLD** mode otherwise, error message | hold 0 will display.



SYSTEM UNIT

- In contrast to the DISPLAY UNIT, the SYSTEM UNIT was set before it leaves the factory. It was set when the scale was calibrated at factory.
- Some models were set to metric scale's SYSTEM UNIT (kg by default) while some were set to imperial scale's SYSTEM UNIT (lb by default).

To switch between metric and imperial system, refer to the Display Unit Switch section.



Note: Some models may not have both lb and kg indicator. Some may have lb indicator or kg indicator only. For models with only one indicator, the light will turn off when the scale is switch to its alternate measurement unit (either in kg or lb).



MAXIMUM CAPACITY

Action

 To set the scale's MAXIMUM CAPACITY, select the capacity options. The parameter value will be multiplied by 1000 to get the maximum capacity value. For example, if it is set to FS 2 (see image below) then the scale will be set to have 2000 lb or 2000kg max capacity (it will not matter what unit you set at system unit).



WARNING:

Do NOT try to set maximum capacity bigger than the scale's actual capacity. Overloading may damage and break the scale. It is also dangerous and it may cause injury or fatality.

ZERO WEIGHT CALIBRATION



Action

- After pressing HOLD key on scale or on remote controller, the scale will detect current weight, displaying the below detection message.

	-	-	-	-	-
--	---	---	---	---	---

 ZERO WEIGHT CALIBRATION is finished when message is displaying.

ONE LOAD CALIBRATION



Action

- Put on the test weight, when the screen displays LaRdI.
- After pressing HOLD key on scale or on remote controller, the scale displays the below message, waiting for user's input of the load's weight value.



 After pressing HOLD key on scale or on remote controller, the scale will detect the load's weight and will display the below detection message.



• ONE LOAD CALIBRATION is finished when message

is displaying. To finish the calibration, press 2ND key on scale or **a** on remote controller.

Condition

- The load must be heavier than "0", (or "0.0" or "0.00", depending on the resolution) otherwise an error message _____ will display.
- The load must not be heavier than the scale's maximum capacity otherwise an error message will display.

NOTE:

It is recommended to use test weight or span calibration weight that is equal to scale's maximum capacity in calibrating the scale.

NOTE:

In most cases, one load calibration is enough but if high linearity performance of the scale is required then calibrate the scale using the multi load calibration like Two Loads Calibration or Three Loads Calibration.

TWO LOADS CALIBRATION



Action

- Put on the second weight, when the screen displays LaRdZ
- After pressing HOLD key on scale or scale on remote controller, the scale displays the first load's weight value, waiting for user's input of the second load's weight value.



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After pressing HOLD key on scale or on remote controller. the 0 scale will detect the second weight and will display the below detection message.





is displaying. To finish the calibration, press 2ND $\,$ key on scale or on remote controller.

Condition

- The second load must be heavier than the first load otherwise an error 0 message will display.
- The second load must not be heavier than the scale's maximum 0 capacity otherwise an error message will display.

NOTE:

If the scale will be calibrated with two loads, it is recommended to use a first test weight of 50% of scale's maximum capacity and then 100% of scale's maximum capacity for the second test weight.

THREE LOADS CALIBRATION



Action

Put on the third weight, when the screen displays 0



After pressing the HOLD key scale or on remote controller, the 0 scale displays the second load's weight value, waiting for user's input of the third load's weight value.

 After pressing HOLD key on scale or on remote controller, the scale will detect the third weight and will display the below detection message.



 THREE LOADS CALIBRATION is finished when the below message is displaying. The scale will exit CALIBRATION MODE automatically and will return to WEIGHING MODE.



Condition

- The third load must be heavier than the second load otherwise an error message _____will display.
- The third load must not be heavier than the scale's maximum capacity otherwise an error message will display.

NOTE:

If the scale will be calibrated with three loads, it is recommended to use a first test weight of 33% of scale's maximum capacity, 66% of scale's maximum capacity for the second and then 100% of scale's maximum capacity for the third.

POWER ADJUSTMENT MODE

Action

• To enter **POWER ADJUSTMENT MODE**, press 2ND key on scale

r 📕 on remote controller twice.

• To input **POWER ADJUSTMENT** password, press ZERO and TARE

keys on scale or 📕 and 📄 on remote controller.

- To confirm the password, press HOLD key on scale or emote controller.
- To save and exit **POWER ADJUSTMENT MODE**, press 2ND key on

scale or 🚺 on remote controller.

 To exit POWER ADJUSTMENT MODE without saving, press ON/OFF key on scale or on remote controller.

To learn more on how to input values or change the option, refer to User Input section in User's Guide.

Function

- System power needs to be adjusted when the scale is reset manually.
 User can adjust the system voltage in **POWER ADJUSTMENT MODE.**
- The screen displays the welcome message:



 After pressing HOLD key on scale or on remote controller, the scale displays current system voltage (or 6.50V if the scale has been reset), waiting for user's input of new voltage.



After pressing HOLD key on scale or

on remote controller, the

scale will save the new voltage and will return to WEIGHING MODE.



3. RS-232 Communication

The scale is equipped with a RS-232 serial input/output port which is intended for interfacing scoreboards, desktop indicator, hand-held data collector, computer, etc.

COMMUNICATION WAYS

- There are two options for communicating the scales and digital peripherals. Either in cabled or wireless way. For cabled way, the peripherals can be connected to the scale's full duplex communication port (optional) while for via wireless, the peripherals can communicate to the scale through its half-duplex wireless port (optional).
- Cable connection distance is up to 15 meters. Plug one end of the 9-pin D-type connector into the RS-232 socket at the rear of scale. Plug another end of the connector to your peripherals that support RS-232 communication.
- For wireless, the scale can work with peripherals over 500 meters on a condition that there is no obstruction between them.

RS-232 PROTOCOL

 The scale sends out data in the format of string. A string is consisting of 10 bytes, 1 byte for start flag, 1 byte for scale address, 5 bytes for LED data, 1 byte for indicator data and 1 byte for check sum, shown below:



Byte	ASCII	Default Value
flag of start	0x7F	0x7F
address of scale	user defined	0x00
data of LED1	according to display	according to display
data of LED2	according to display	according to display
data of LED3	according to display	according to display
data of LED4	according to display	according to display
data of LED5	according to display	according to display
data of indicator	according to display	according to display
check sum	according to all data	according to all data

Flag for start is always fixed at 0x7F.

Scale address is defined at **SCALE ADDRESS** in **COMMUNICATION SETUP**. Default address is set to 00 (0x00 in hexadecimal).

LED data is defined as below

ASCII	Dec	Hex	Display	ASCII	Dec	Hex	Display
'0'	48	0x30	0	'a'	97	0x61	H
'1'	49	0x31	1	'b'	98	0x62	6
'2'	50	0x32	2	'c'	99	0x63	Ĺ
'3'	51	0x33	3	'd'	100	0x64	d
'4'	52	0x34	4	'e'	101	0x 65	E
'5'	53	0x35	<u>5</u>	'f'	102	0x66	F
'6'	54	0x36	6	'g'	103	0x67	5
'7'	55	0x37	7	'h'	104	0x68	h
'8'	56	0x38	8	'i'	105	0x69	/
'9'	57	0x39	9	'j'	106	0x6A	٦
')'	41	0x29	0	'k'	107	0x6B	μ
Т	33	0x27	l.	'1'	108	0x6C	L
'@'	64	0x40	2	'm'	109	0x6D	n
'#'	35	0x23	3	'n'	110	0x6E	n
'\$'	36	0x24	\overline{Q}	'o'	111	0x6F	0
'%'	37	0x25	<u>S</u>	'p'	112	0x70	<u>P</u>
·^!	94	0x5E	<u>6</u>	'q'	113	0x71	9
'&'	38	0x26	7	'r'	114	0x72	
1201	42	0x2A	8	's'	115	0x73	5
'('	40	0x28	9	't'	116	0x74	E
	32	0x20		'u'	117	0x 75	U
1961	42	0x2A	8	'v'	118	0x76	
'~'	126	0x7E		'w'	119	0x77	
'-'	45	0x2D		'x'	120	0x78	
'_'	9 5	0x5F		'y'	121	0x79	
L		1	1	'z'	122	0x7A	=

Version 1		Version 2	
bit	indicator	bit	indicator
bit 0	kg indicator	bit 0	not defined
bit 1	b indicator	bit 1	STB indicator
bit 2	ZERO indicator	bit 2	TARE indicator
bit 3	not defined	bit 3	ZERO indicator
bit 4	TARE indicator	bit 4	lb indicator
bit 5	HOLD indicator	bit 5	kg indicator
bit 6	STB indicator	bit 6	HOLD indicator
bit 7	not defined	bit 7	not defined

Data of indicator has two formats, depending on the PCB version.

Check sum is the XOR sum of 7 bytes, 1 byte for Scale Address, 5 bytes for LED data and 1 byte for indicator data.

When **OUTPUT MODE** in **COMMUNICATION SETUP** is set to "2", the scale will be able to answer request with specified data.

Request shall consist of 4 bytes: 1 byte of flag of start, 1 byte of address of scale, 1 byte of request command, and 1 byte of check sum, showed below:

Byte	Hex	
flag of start	0x1B	
address of scale	user defined	
request command	0xAB	
	according to address of scale and	
check sum	request command	

Flag of start are always fixed to be 0x1B. Scale address is defined at **SCALE ADDRESS** in **COMMUNICATION SETUP.** Default address is set to 00 (0x00 in hexadecimal).

Request command is fixed to be 0xAB.

Check sum is the XOR sum of 2 bytes: 1 byte of Scale Address and 1 byte of request command.

4. Messages Illustration

Possible messages the scale displays are listed here

SC BL E	scale configuration	SCALE CONFIGURATION welcome
		message
<u>83 20</u>	a uto- z ero range	AUTO-ZERO RANGE
<u> </u>	m anual- z ero range	MANUAL-ZERO RANGE
<u>=e0.0e</u>	zero-tracking range	ZERO-TRACKING RANGE
<u>69</u> .794	gravity acceleration	GRAVITY ACCELERATION welcome
0.		message
Elbrt	c ali br a t ion	CALIBRATION
FS 2	full scale	MAXIMUM CAPACITY
LoRdO	load 0	ZERO WEIGHT CALIBRATION
LoRd I	load 1	ONE LOAD CALIBRATION
LoRd2	load 2	TWO LOADS CALIBRATION
LoRd3	load 3	THREE LOADS CALIBRATION
End	end	Save and exit
U Rdj	power adj ustment	POWER ADJUSTMENT welcome message

5. Appendix

OCS Series Crane Scale Passwords

Below is a list of modes that require password to access the scale functions.

Mode	Password
Scale Configuration	0258
Calibration	8416
System Info	1860
Power Adjustment	1123
Clear Overload Records	4321

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