



RICE LAKE SCT-4X-MODBUS TCP IP Weight Transmitter User Guide

[Home](#) » [RICE LAKE](#) » RICE LAKE SCT-4X-MODBUS TCP IP Weight Transmitter User Guide 

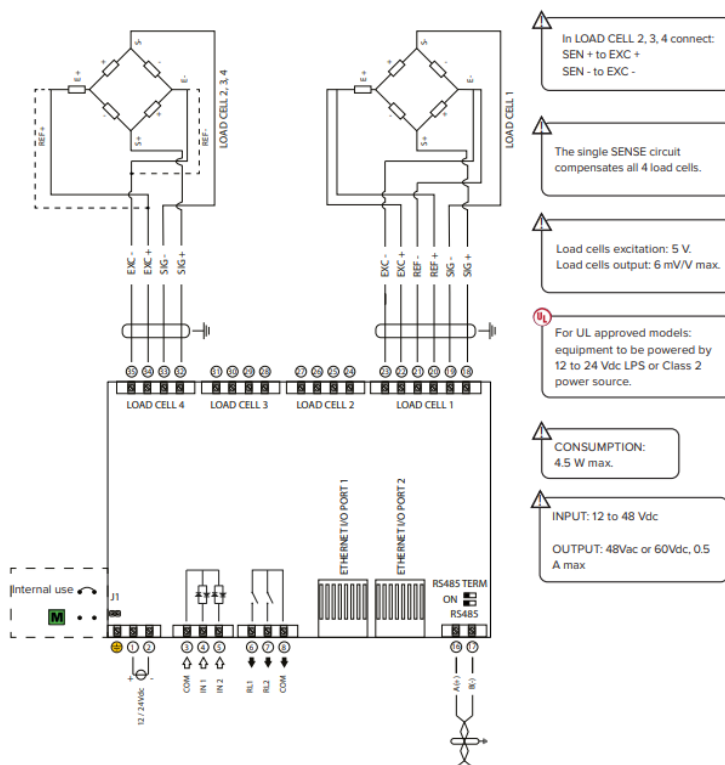
Contents

- 1 RICE LAKE SCT-4X-MODBUS TCP IP Weight Transmitter User Guide
- 2 Electrical Schematic
- 3 Key Functions
- 4 Indicator Light Descriptions
- 5 Configuration Menu
- 6 Function Mode
- 7 . Maximum Scale Capacity, Increment and Decimal Point Settings
- 8 Zeroing Mechanical Tare (pre-tare zeroing)
- 9 Inputs Settings
- 10 RS485 Port
- 11 Load Cell Exclusion (for dependent channel systems)
- 12 Example:
- 13 Programming Errors
- 14 Modbus TCP
- 15 MODBUS TCP REGISTERS – CH / ind.ch (1 SCALE)
- 16 MODBUS TCP REGISTERS – ch (4 SCALES)
- 17 DEVICENET REGISTERS FOR COMMAND SENDING
- 18 EXAMPLE 1
- 19 EXAMPLE 2
- 20 Documents / Resources
 - 20.1 References

RICE LAKE SCT-4X-MODBUS TCP IP Weight Transmitter User Guide

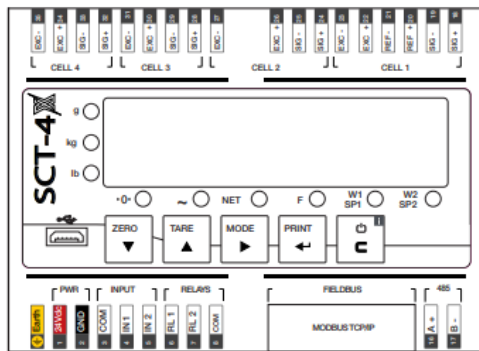


Electrical Schematic



Manuals are available from Rice Lake Weighing Systems at www.ricelake.com/manuals
Warranty information is available at www.ricelake.com/warranties

Key Functions



Configuration menu	
▼	Decreases digit / Scrolls down.
▲	Increases digit / Scrolls up.
▶	Enters the setup. Selects digit to modify.
◀	Enters a step / Confirms.
C	Clears / Exits a step (no save).

Weighing mode	
▼	Clears the displayed gross weight.
▲	Short press: executes semiautomatic tare. Long press: allows to enter known tare.
▶	Long press: switches between scales (only in Mode 2 "ind. Lh").
◀	Short press: executes data transmission on the printer serial port. Long press: Setpoint configuration.
C	ON/Standby of the instrument.

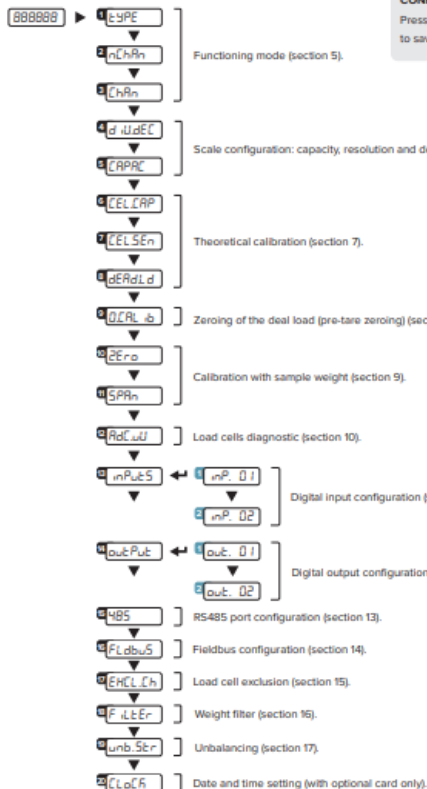
Indicator Light Descriptions

0.0	Weight on zero.
~	Unstable weight.
NET	A tare is active.
F	A function is active.
W1 SP1	Digital output 1 is active.
W2 SP2	Digital output 2 is active.

Configuration Menu

1. Reboot the weight transmitter
2. Press the key when display shows the 888888 message

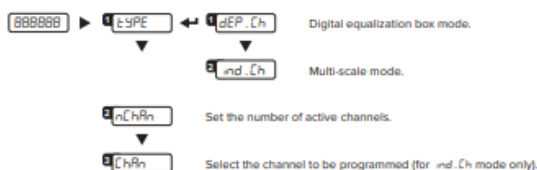
1. Reboot the weight transmitter
2. Press the **►** key when display shows the 888888 message:



HOW TO EXIT THE MENU AND SAVE YOUR CONFIGURATION

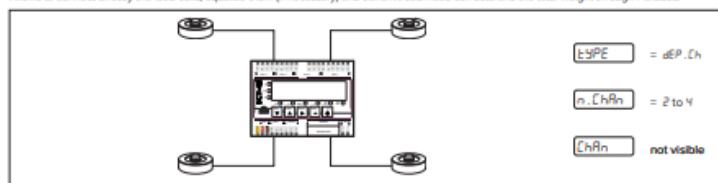
Press **C** key repeatedly until **SAVE?** appears; press **◀** to save or press **C** to exit without saving.

Function Mode



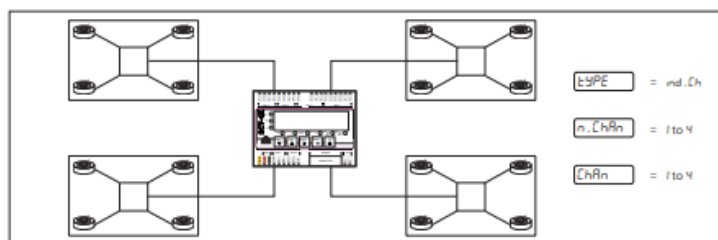
MODE 1 "DEP.CH"

Allows to connect directly the load cells, equalize them (if necessary) and transmit each load cell data and the total weight through Fieldbus.



MODE 2 "IND.CH"

Allows to manage up to 4 independent scales and transmit all data of each scale through Fieldbus.



. Maximum Scale Capacity, Increment and Decimal Point Settings

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d U.dEC Set the decimal point position and the minimum scale increment^{**}
 (0.00 1 - 0.002 - 0.005 - 0.01 - 0.02 - 0.05 - 0.1 - 0.2 - 0.5 - 1 - 2 - 5 - 10 - 20 - 50)

CAPRC Set the maximum scale capacity^{**} (max 999999 g)

Examples:
 For a 60000 lb scale, with 2 lb increment:
 d U.dEC = 2
 CAPRC = 60000

For a 10000 g scale, with 0.1 g increment:
 d U.dEC = 0.1
 CAPRC = 10000.0

For a 3000 lb scale, with 0.05 lb increment:
 d U.dEC = 0.05
 CAPRC = 3000.00

^{**} Increment = the amount that the scale will increment by as weight is added or removed.
^{**} Maximum capacity = the maximum weight that can be measured using the scale you are creating.

7. Theoretical Calibration

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CEL CAP Set the total load cells capacity (up to 999999).

CEL SEN Set the load cells sensitivity (up to 999999)

DEAdLd Dead load weight (from -9999.9 to 99999.9).

1. Set in **d U.dEC** and **CAPRC** (section 4).

4. Enter in **DEAdLd** step. The display shows the theoretical dead load value. Modify the value and/or confirm with .

2. Set in **CEL CAP** the total load cells capacity (sum of the nominal load cell capacities).

5. Save calibration (Press **C** key many times until **SLEEP** message will appear, then press to confirm).

3. Set in **CEL SEN** the theoretical signal value of the load cells .

MODE 1 "DEP.CH"

Insert in **CEL SEN** parameter, the load cells sensitivity sum value:
 $(mV/V \text{ cell1}) + (mV/V \text{ cell2}) + (mV/V \text{ cell3}) + (mV/V \text{ cell4})$

MODE 2 "IND.CH"

For each scale to calibrate, insert in **CEL SEN** parameter the average sensitivity value of the load cells:

$$\frac{(mV/V \text{ cell1}) + (mV/V \text{ cell2}) + \dots + (mV/V \text{ celln})}{n}$$

Zeroing Mechanical Tare (pre-tare zeroing)

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0LR Ld Zeroing of the pre-tare (or mechanical tare).

This functionality allows to zero the weight of the scale structure (e.g. empty silo, conveyor, etc.) without changing the calibration in memory.

9. Calibration with Sample Weight

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ZEro Zero point acquisition.

SPRn Sample weight acquisition.

1. Unload the scale.

4. Enter the **SPRn** step, type the span weight value and press to adjust.

2. Enter the **ZEro** step to adjust the zero point.

5. Save adjustment (Press **C** key many times until **SLEEP** message will appear, then press to confirm).

3. Load the scale with span weight.

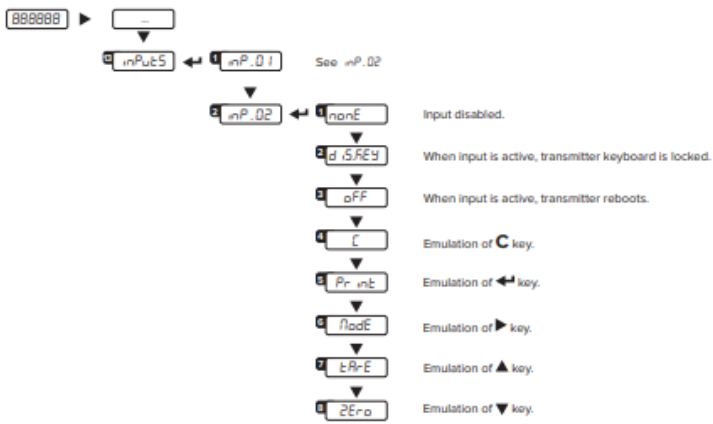
10. Load Cell Diagnostics (µV/V)

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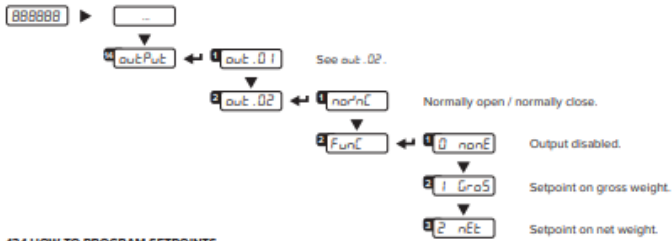
RdC .uU It allows to verify signal of each channel. It must be included into the range 0 to 3 mV/V. Signal have to be stable and it have to increase by increasing the weight on the scale.

With more channels connected, it's possible to scroll between channels with keys and .

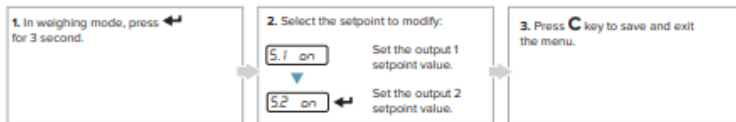
Inputs Settings



12. Outputs Settings



12.1 HOW TO PROGRAM SETPOINTS



RS485 Port



The RS485 port is configured by default to communicate in Modbus RTU (section 18).

14. Fieldbus Settings



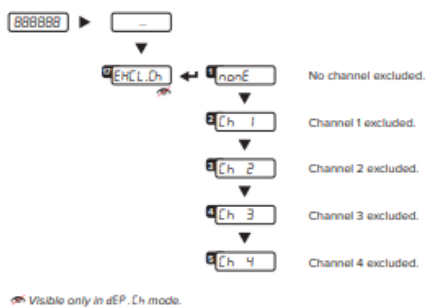
Set the IP address:



Load Cell Exclusion (for dependent channel systems)

If a load cell is broken, it's possible to temporarily exclude the channel where it is connected and continue to weigh, pending replacement.

! WARNING: this operation reduces the accuracy of the weighing system. We recommend use for liquid weighing or in applications where the load is evenly distributed.



16. Weight Filter



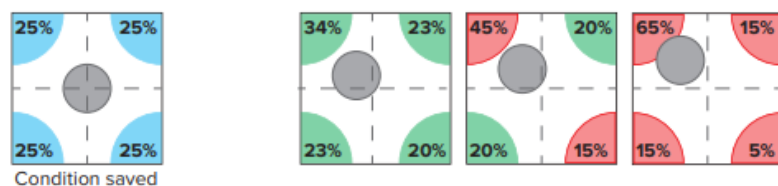
The active weight filter is displayed, alternating with the weight value.
Press ▲ and ▼ keys to scroll through the available filters (from slowest to fastest, F1 to F10).

17. Unbalancing



Visible only in dEP.Ch mode.

Example:



The unbalance condition is signalled via Modbus / Fieldbus or a digital output (refer to the complete manual to set the output).

This function is only available if EXCL.CH = NoNE.

Use this function only in systems where the load is evenly distributed

Programming Errors

MESSAGE	DESCRIPTION	SOLUTION
preC.	Calibration error	First calibrate the zero point (zero), then proceed with sample weight acquisition (span) (section 9).
Err.pn	Calibration error	Check the connection of the load cell. Verify the load cell signal is stable, valid and greater than the previously acquired point.
Er 11	Calibration error	Increase the calibration weight.

Er 12	Calibration error	Check the signal from the load cell increases when weight is incremented on the scale.
Er 37	Calibration error	Repeat calibration and verify capacity and division have been correctly set.
Er 39	Instrument not configured	Transmitter needs to be configured.
C.er.36	Calibration error	Verify the signal from the load cell is not negative.
C.er.37	Calibration error	Verify the signal from the load cell is not negative.
Err.mo	Weight unstable	Check in adC.uv parameter that the signal is stable. If the connection of the cells is with 4 wires, check that the sense jumpers are inserted.
adC.err	A/D converter error	Converter failure. Reboot the instrument.
Cel.err	Global load cell error	Signal anomaly: check the load cells connection.
Er.Cel.1 ... Er.Cel.4	Load cell error	Signal anomaly: check the indicated load cell connection.

Modbus TCP

MODBUS TCP REGISTERS – CH / ind.ch (1 SCALE)

Data	Register	DESCRIPTION
<i>Gross weight</i>	30001	Bytes 1, 2, 3 and 4 contain the Gross Weight value.
	30003	
<i>Net weight</i>	30005	Bytes 5, 6, 7 and 8 contain the Net Weight value.
	30007	

Input status register	30009	Bit 15 (msb)	Active channel.	Bit 15	Bit 14	Active channel.	
		Bit 14	Active channel.				
		Bit 13	No function.	0	0	Channel 1	
		Bit 12	No function.	0	1	Channel 2	
		Bit 11	No function.				
		Bit 10	No function.				
		Bit 9	No function.	1	0	Channel 3	
		Bit 8 (lsb)	Status of input n. 2.	1	1	Channel 4	
			Status of input n. 1.				
		Bit 7 (msb)	1 = Scale unloaded (gross weight = 0). Tare PT (1 = PT tare is active). Tare (1 = Tare is active). Overload condition (0 = No; 1 = Overload). Underload condition (0 = No; 1 = Underload). Weight Stability (0 = Unstable; 1 = Stable). Gross Weight Polarity (0 = "+"; 1 = "-"). Net Weight Polarity (0 = "+"; 1 = "-").				
		Bit 6					
		Bit 5					
		Bit 4					
		Bit 3					
		Bit 2					
		Bit 1					
		Bit 0 (lsb)					
		Command status register	30011	Last received command.			
Bit 7 (msb)	Last command result. Last command result. Last command result. Last command result. Counting of processed commands. Counting of processed commands. Counting of processed commands. Counting of processed commands.						
Bit 6							
Bit 5							
Bit 4							
Bit 3							
Bit 2							
Bit 1							
Bit 0 (lsb)							
		No Function.					

<i>Output status register</i>	30013	Bit 7(msb)	No function.
		...	...
		Bit 2	No function.
		Bit 1	Digital output 2 status (0 = OFF; 1 = ON). Digital output 1 status (0 = OFF; 1 = ON).
		Bit 0(lsb)	
<i>Selected page</i>	30015	Shows the value of the selected page (3001).	
<i>μV Channel 1</i>	30017	Bytes 16 and 17 contain the μV value of the channel 1.	
<i>μV Channel 2</i>	30019	Bytes 18 and 19 contain the μV value of the channel 2.	
<i>μV Channel 3</i>	30021	Bytes 20 and 21 contain the μV value of the channel 3.	
<i>μV Channel 4</i>	30023	Bytes 22 and 23 contain the μV value of the channel 4.	

MODBUS TCP REGISTERS – ch (4 SCALES)

Data	Register	DESCRIPTION	
<i>Status register scale 1</i>	30001	Bit 15(msb) Bit 14	Not used. Not used. Not used. Scale active (0 = “no”; 1 = “yes”). Decimals (00 = 0; 01 = 1; 10 = 2; 11 = 3) Unit of Measure (00 = “g”; 01 = “kg”; 10 = “t”; 11 = “lb”).
		Bit 13	
		Bit 12	
		Bit 11	
		Bit 10	
		Bit 9	
		Bit 8 (l sb)	

		Bit 7(msb) Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 Bit 0 (l sb)	Tare PT (1 = PT tare is active). Tare (1 = Tare is active). Net Weight Polarity (0 = "+"; 1 = "-"). 1 = Scale unloaded (gross weight = 0). Overload condition (0 = No; 1 = overload). Underload condition (0 = No; 1 = underload). Stability (0 = "unstable"; 1 = "stable"). Gross Weight Polarity (0 = "+"; 1 = "-").			
Status register scale 2	30002	Same as Status register scale 1.				
Status register scale 3	30003	Same as Status register scale 1.				
Status register scale 4	30004	Same as Status register scale 1.				
Input status register	30005	Bit 15(msb)	Active channel. Active channel. No function.			
		Bit 14				
		Bit 13				
		Bit 12				
		Bit 11	No function. No function. No function.			
		Bit 10	Status of input n. 2. Status of input n. 1.			
		Bit 9				
		Bit 8 (l sb)				
		No function.				
Command status register	30006	Same as Command status register page 10.				
Output status register	30007	Same as Output status register page 10.				
Selected page	30008	Shows the value of the selected page (2000).				
Gross weight	30009					

<i>scale 1</i>	30010	Bytes 16, 17, 18 and 19 contain the Gross Weight of scale 1.
<i>Gross weight scale 2</i>	30011	Bytes 20, 21, 22 and 23 contain the Gross Weight of scale 2.
	30012	
<i>Gross weight scale 3</i>	30013	Bytes 24, 25, 26 and 27 contain the Gross Weight of scale 3.
	30014	
<i>Gross weight scale 4</i>	30015	Bytes 28, 29, 30 and 31 contain the Gross Weight of scale 4.
	30016	

DEVICENET REGISTERS FOR COMMAND SENDING

Data	Register	DESCRIPTION
<i>Command</i>	30001	Main available commands:
		Value Command 00 Hex No command 01 Hex Scale zeroing
		02 Hex Tare
		03 Hex Preset Tare
		0A Hex Setpoint 1 setting 0B Hex Setpoint 2 setting
		19 Hex Digital output setting
		22 Hex Reboot the weight transmitter
<i>Parameter 1</i>	30002	First parameter of the command. Parameter is always expressed in absolute mode (no decimals, no sign).
	30003	
<i>Parameter 2</i>	30004	Second parameter of the command. Parameter is always expressed in absolute mode (no decimals, no sign).
	30005	
	30006	Used in advanced configuration, refer to the complete Fieldbus manual for further information.
	...	
	30016	

EXAMPLE 1

For zeroing the weight on the scale:
Set the command in byte 2

Register	Value
30001	01 Hex

EXAMPLE 2

For setting a preset tare of 1000 lb:

1. Set the tare value in parameter 1 (byte 3, 4, 5, 6)
2. Set the command in byte 2

Register	Value
30001	03 Hex
30002	00 Hex
30003	03E8 Hex

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References

-  [Rice Lake Weighing Systems](#)
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