SCT-1SX-AN
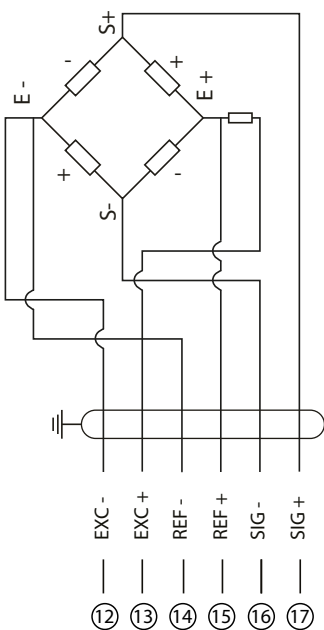
Quick Start Guide

RICE LAKE ®
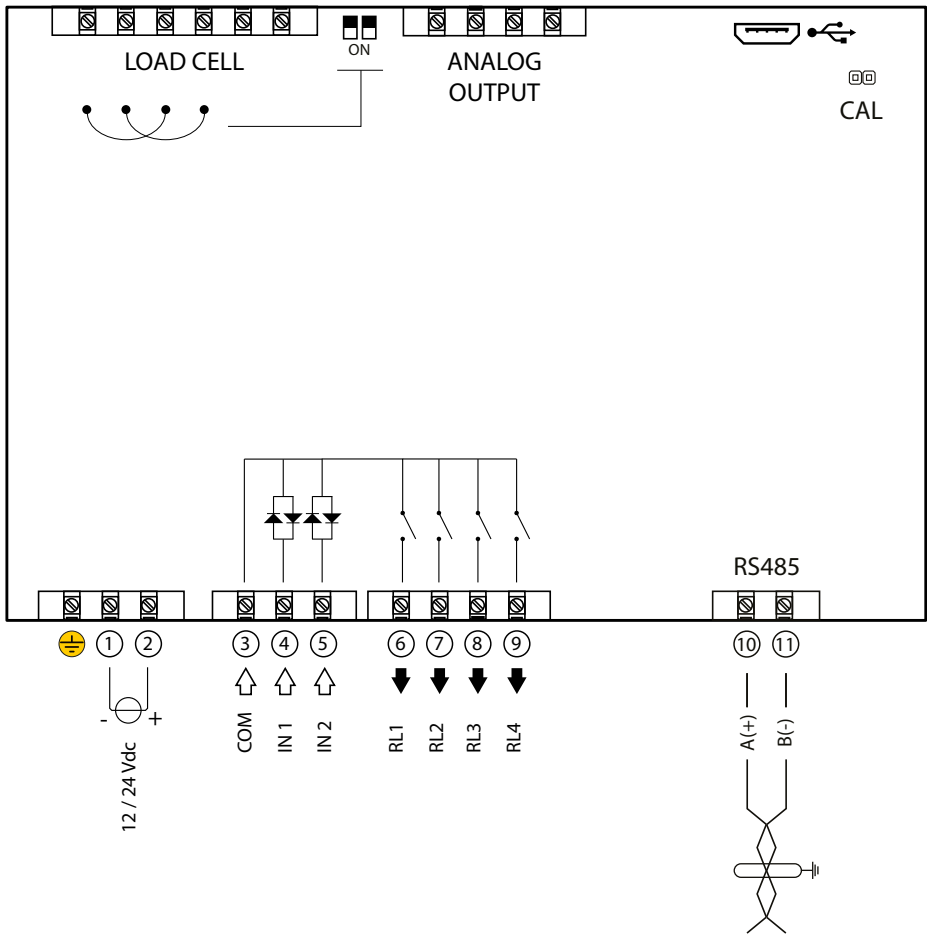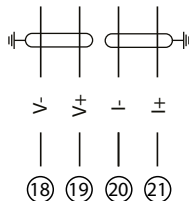W E I G H I N G   S Y S T E M S
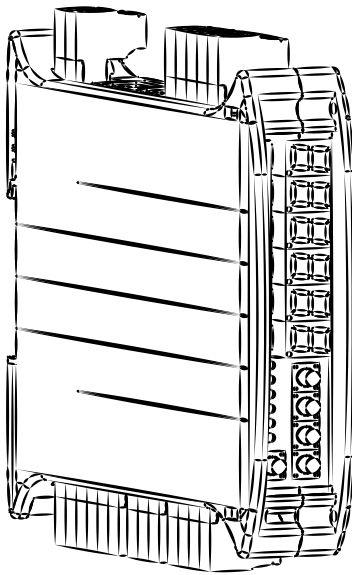
1. Electrical Schematic

Load cells excitation: 5 V.
Load cells output: 6 mV/V max.

INPUT: 12 to 48 Vdc

OUTPUT: 48Vac or 60Vdc, 0.5 A max

For UL approved models: equipment to be powered by 12 to 24 Vdc LPS or Class 2 power source.

CONSUMPTION: 2 W max. (without load cells).

S+
E -
E +
S-

EXC - EXC + REF - REF + SIG - SIG +

⑫ ⑬ ⑭ ⑮ ⑯ ⑰

V- V+ I- I+

⑱ ⑲ ⑳ ㉑

LOAD CELL   ON   ANALOG OUTPUT

CAL

Internal use

M

- / +
12 / 24 Vdc

⊕ ① ②   ③ ④ ⑤   ⑥ ⑦ ⑧ ⑨   ⑩ ⑪
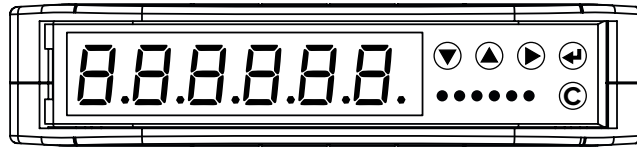
COM IN 1 IN 2   RL1 RL2 RL3 RL4   A(+) B(-)

RS485

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

2. 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.
▶	Activates / deactivates the function.
↵	Short press executes data transmission on the printer serial port. Long press: Setpoint configuration.
C	ON/Standby of the instrument.

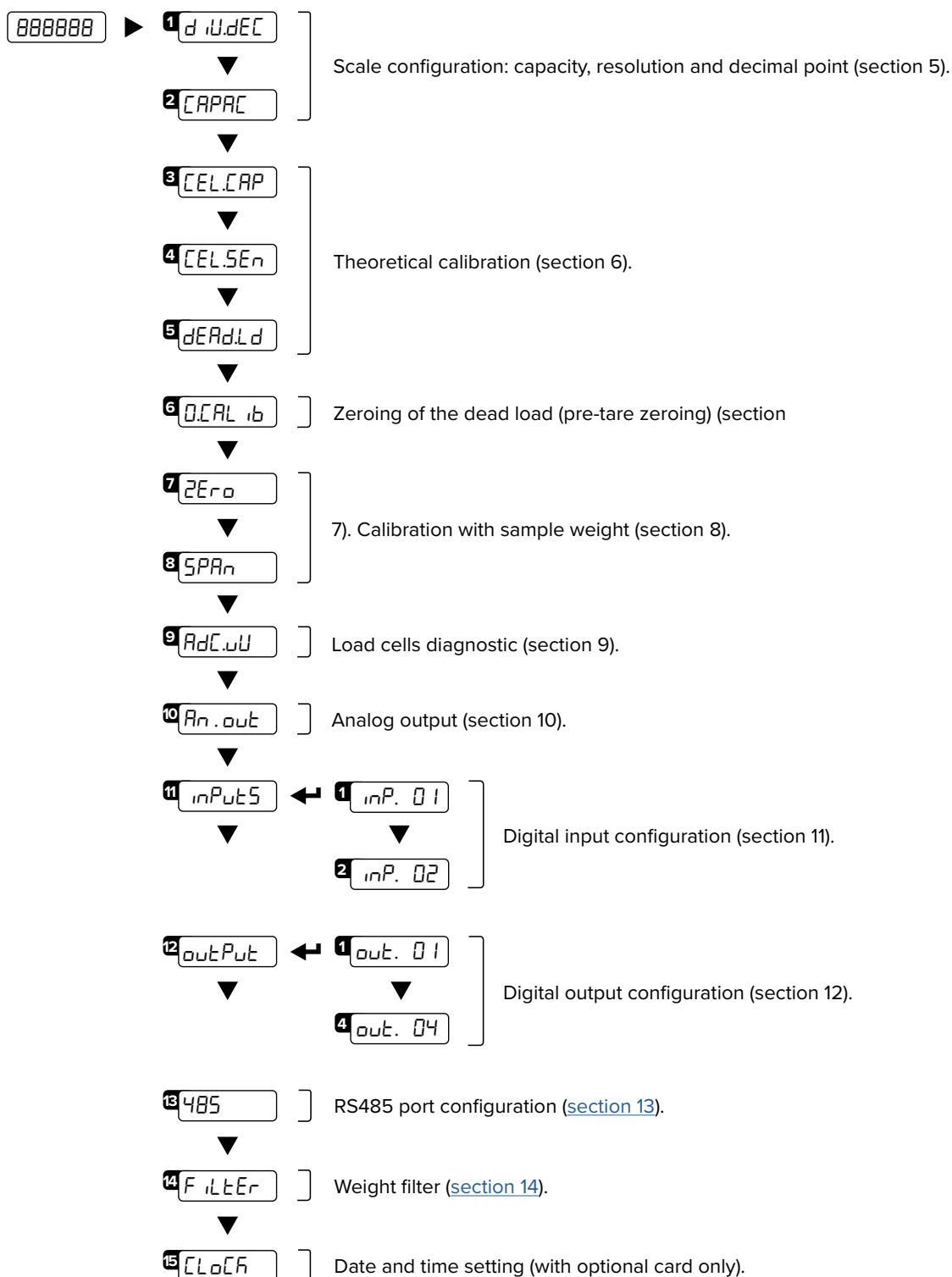## 3. Indicator Light Descriptions

1	Weight on zero.
2	Unstable weight.
3	A tare is active.
4	A function is active.
5	Digital output 1 is active.
6	Digital output 2 is active.

4. Configuration Menu

1. Reboot the weight transmitter

2. Press the ▶ key when display shows the *888888* message:

888888 ▶ **1** *diU.dEC* ▼ **2** *CAPAC*	Scale configuration: capacity, resolution and decimal point (section 5).
3 *CEL.CAP* ▼ **4** *CEL.SEn* ▼ **5** *dEAd.Ld*	Theoretical calibration (section 6).
6 *O.CALib*	Zeroing of the dead load (pre-tare zeroing) (section
7 *2Ero* ▼ **8** *SPAn*	7). Calibration with sample weight (section 8).
9 *AdC.uU*	Load cells diagnostic (section 9).
10 *An.out*	Analog output (section 10).
11 *inPutS* ⏎ **1** *inP. 01* ▼ **2** *inP. 02*	Digital input configuration (section 11).
12 *outPut* ⏎ **1** *out. 01* ▼ **4** *out. 04*	Digital output configuration (section 12).
13 *485*	RS485 port configuration ([section 13](#)).
14 *FiLtEr*	Weight filter ([section 14](#)).
15 *CLoCh*	Date and time setting (with optional card only).

HOW TO EXIT THE MENU AND SAVE YOUR CONFIGURATION

1. Press **C** key repeatedly until *SAUE?* appears; press ⏎ to save or press **C** to exit without saving.

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5. Maximum Scale Capacity, Increment and Decimal Point Settings

$\boxed{888888}$ ▶ **1** $\boxed{d\,iU.dEC}$ Set the decimal point position and the minimum scale increment*[1]
(0.001 - 0.002 - 0.005 - 0.01 - 0.02 - 0.05 - 0.1 - 0.2 - 0.5 - 1 - 2 - 5 - 10 - 20 - 50).

▼

2 $\boxed{CAPAC}$ Set the maximum scale capacity*[2] *(max 999999).*
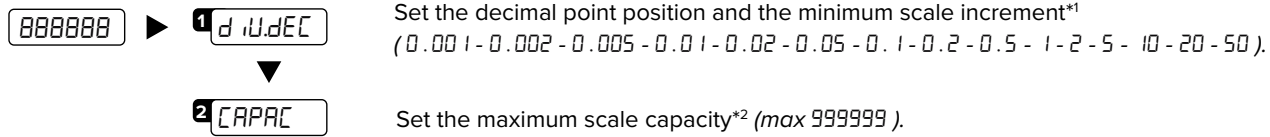
Examples:

For a 60000 lb scale, with 2 lb increment:
d iU.dEC = 2
CAPAC = 60000

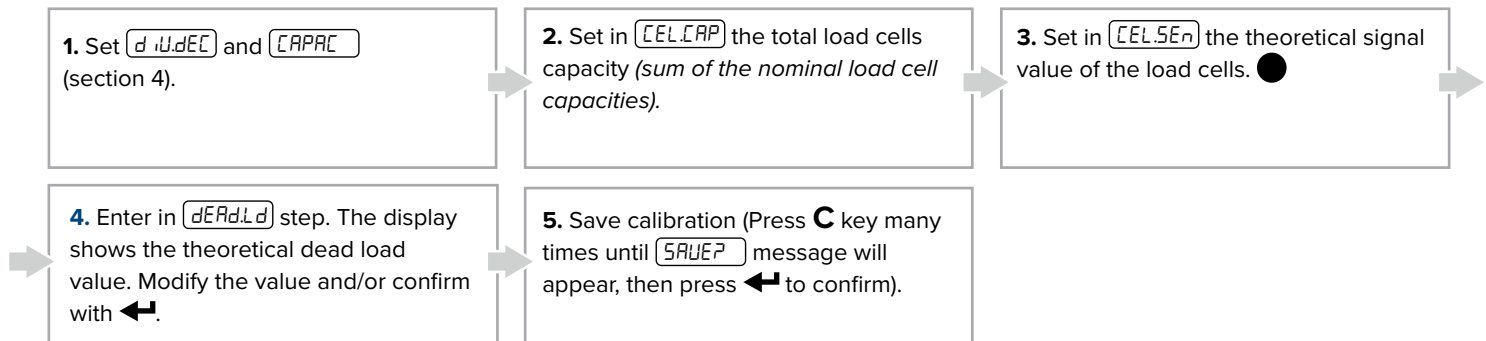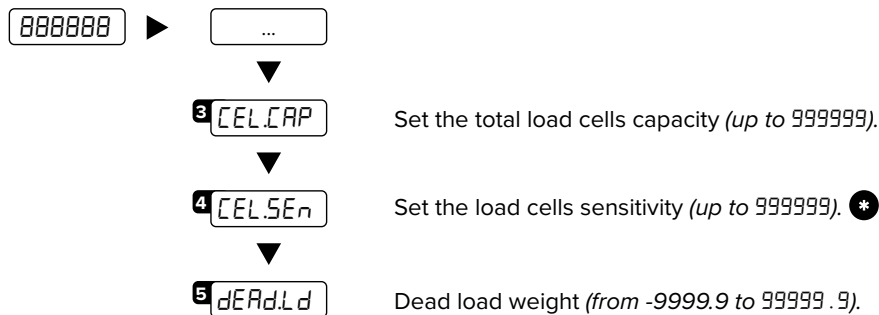For a 10000 g scale, with 0.1 g increment:
d iU.dEC = 0.1
CAPAC = 10000.0

For a 3000 lb scale, with 0.05 lb increment:
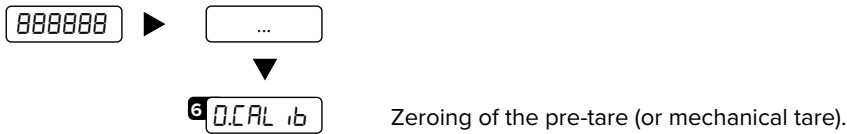d iU.dEC = 0.05
CAPAC = 3000.00

*[1] *Increment = the amount that the scale will increment by as weight is added or removed.*
*[2] *Maximum capacity = the maximum weight that can be measured using the scale you are creating.*
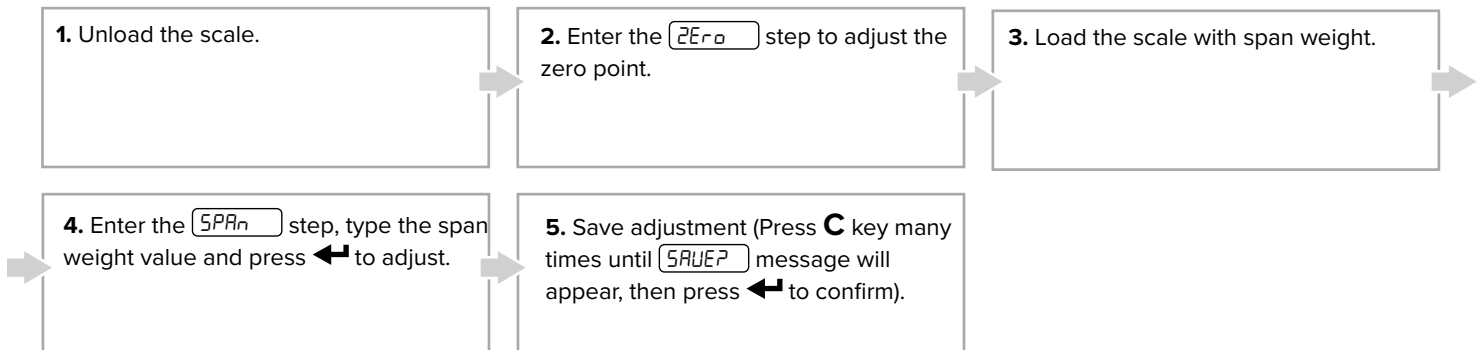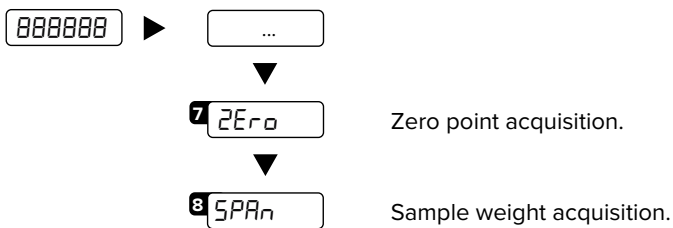
6. Theoretical Calibration

$\boxed{888888}$ ▶ $\boxed{...}$

▼

3 $\boxed{CEL.CAP}$ Set the total load cells capacity *(up to 999999).*

▼

4 $\boxed{CEL.SEn}$ Set the load cells sensitivity *(up to 999999).* ✴

▼

5 $\boxed{dEAd.Ld}$ Dead load weight *(from -9999.9 to 99999.9).*

1. Set $\boxed{d\,iU.dEC}$ and $\boxed{CAPAC}$ (section 4).

2. Set in $\boxed{CEL.CAP}$ the total load cells capacity *(sum of the nominal load cell capacities).*

3. Set in $\boxed{CEL.SEn}$ the theoretical signal value of the load cells. ●

4. Enter in $\boxed{dEAd.Ld}$ step. The display shows the theoretical dead load value. Modify the value and/or confirm with ↵.

5. Save calibration (Press **C** key many times until $\boxed{SAUE?}$ message will appear, then press ↵ to confirm).

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7. Zero Mechanical Tare (pre-tare zeroing)

`888888` ▶ `...`

▼

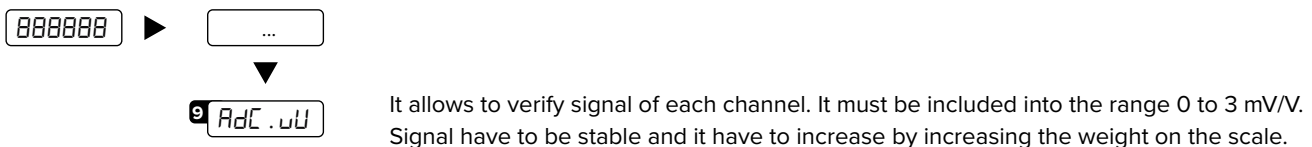**6** `0.CAL ib`   Zeroing of the pre-tare (or mechanical tare).

This functionality allows to zero the weigh of the scale structure (e.g. empty silo, conveyor, etc.) without changing the calibration in memory.
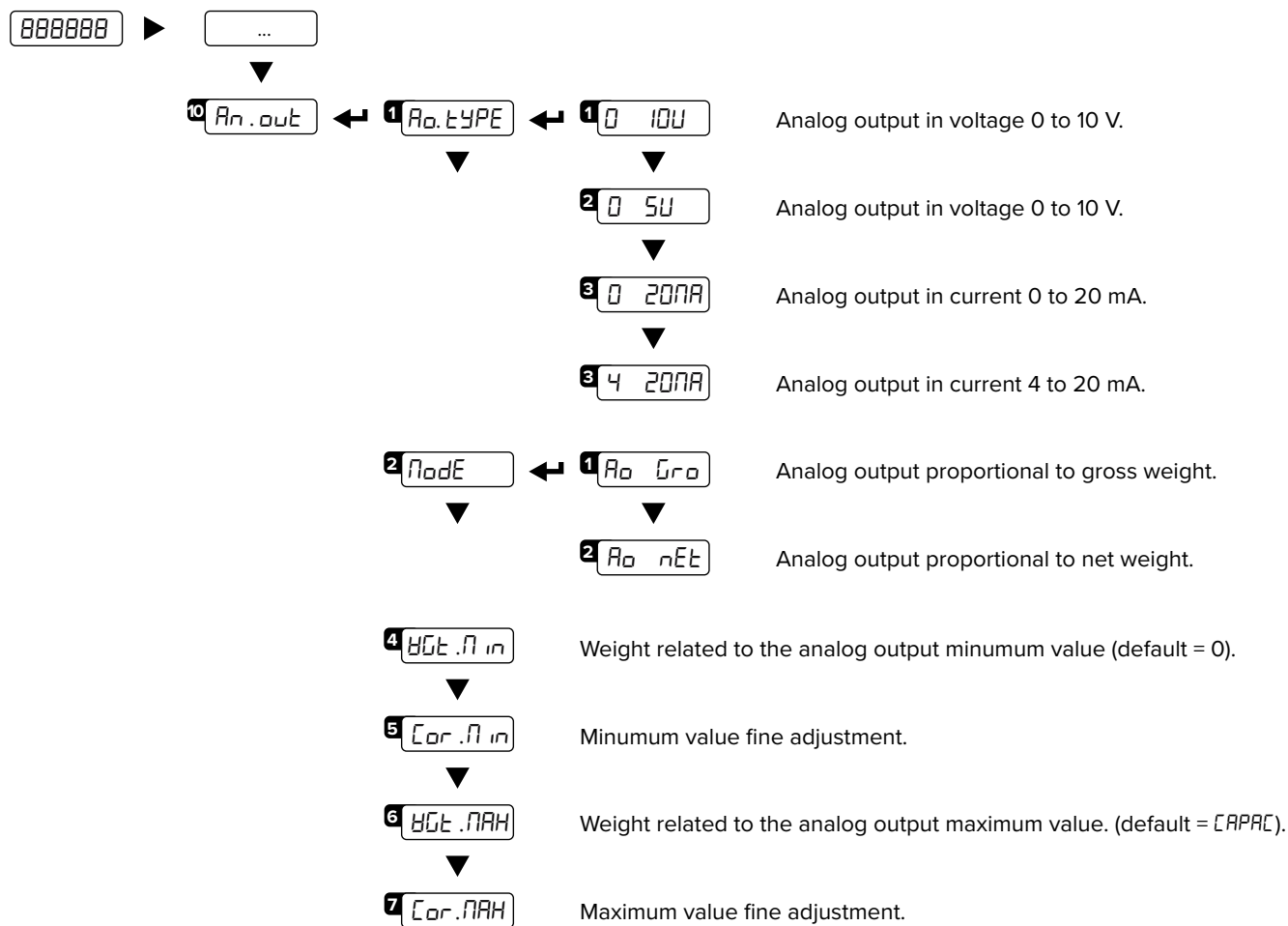
8. Calibration with Sample Weight

`888888` ▶ `...`

▼

7 `2Ero`   Zero point acquisition.

▼

8 `SPAn`   Sample weight acquisition.

1. Unload the scale.	**2.** Enter the `2Ero` step to adjust the zero point.	**3.** Load the scale with span weight.
4. Enter the `SPAn` step, type the span weight value and press ⏎ to adjust.	**5.** Save adjustment (Press **C** key many times until `SAUE?` message will appear, then press ⏎ to confirm).	

9. Load Cell Diagnostics (µV/V)

`888888` ▶ `...`

▼

9 `AdC .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.

10. Analog Output

[888888] ▶ [...]

▼

[10 An.out] ◀┘ [1 Ao.type] ◀┘ [1 0   10U]   Analog output in voltage 0 to 10 V.

▼   ▼

[2 0   5U]   Analog output in voltage 0 to 10 V.

▼

[3 0   20MA]   Analog output in current 0 to 20 mA.

▼

[3 4   20MA]   Analog output in current 4 to 20 mA.

[2 ModE] ◀┘ [1 Ao   Gro]   Analog output proportional to gross weight.

▼   ▼

[2 Ao   nEt]   Analog output proportional to net weight.

[4 HGt.M in]   Weight related to the analog output minumum value (default = 0).

▼

[5 Cor.M in]   Minumum value fine adjustment.

▼

[6 HGt.MAH]   Weight related to the analog output maximum value. (default = CAPAC).

▼

[7 Cor.MAH]   Maximum value fine adjustment.

10.1 ANALOG OUTPUT FINE ADJUSTMENT

1. Connect a multimeter to pin 19 (+) and 18 (-) for the voltage analog output or 21 (+) and 20 (-) for the current analog output.
2. Follow the procedure:

A. Enter the parameter Cor.0.	**B.** Check the value on the multimeter 0.06 V	**C.** Use ▲ and ▼ keys to increase or decrease the output value on the multimeter. By keeping the ▲ or ▼ key pushed, the value will change faster. Confirm with ◀┘ .
D. Repeat the operation from point "**A**" for Cor.MAH parameter.	**E.** Save setting (Press **C** key many times until [SAUE?] message will appear, then press ◀┘ to confirm)	

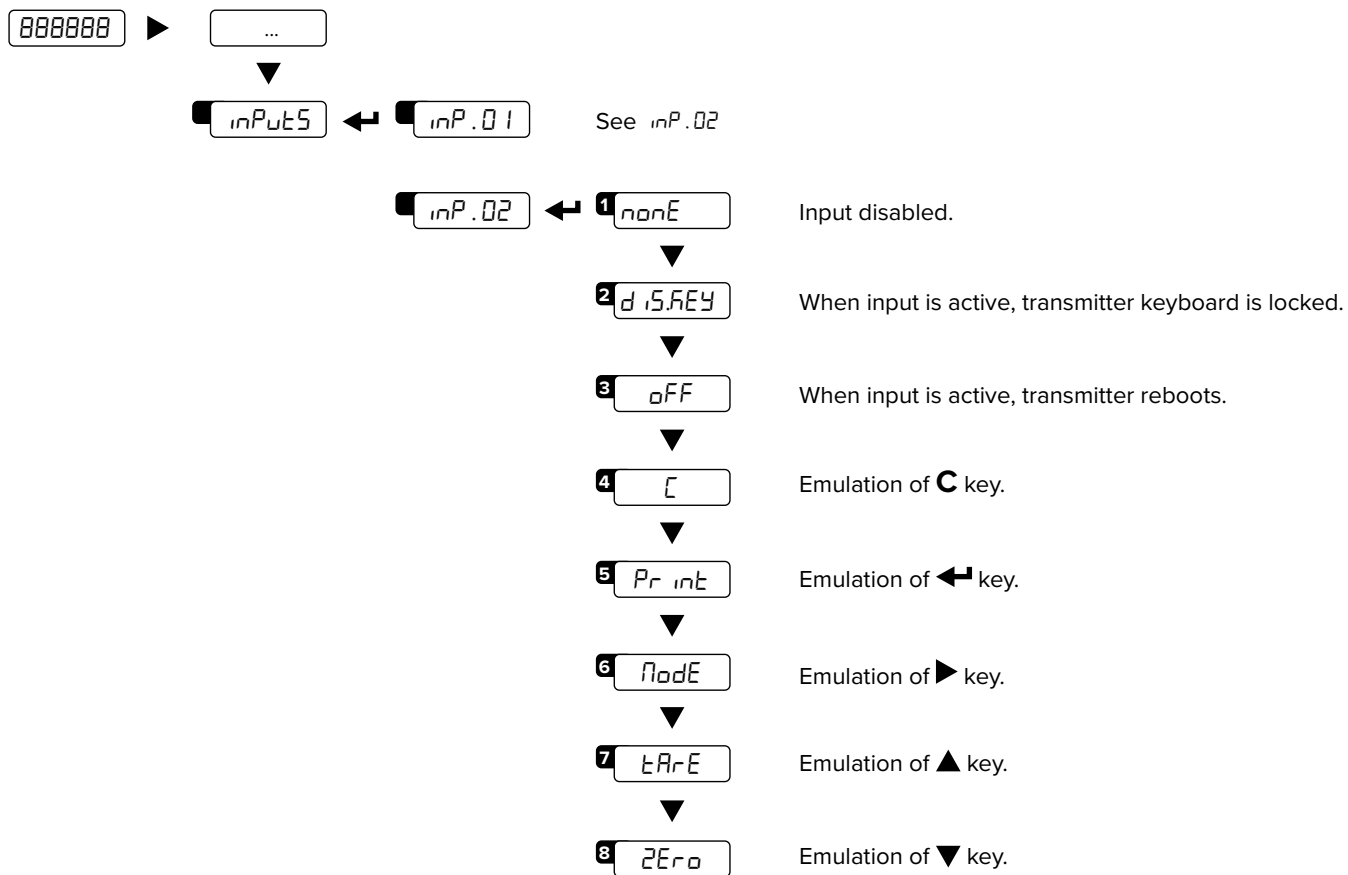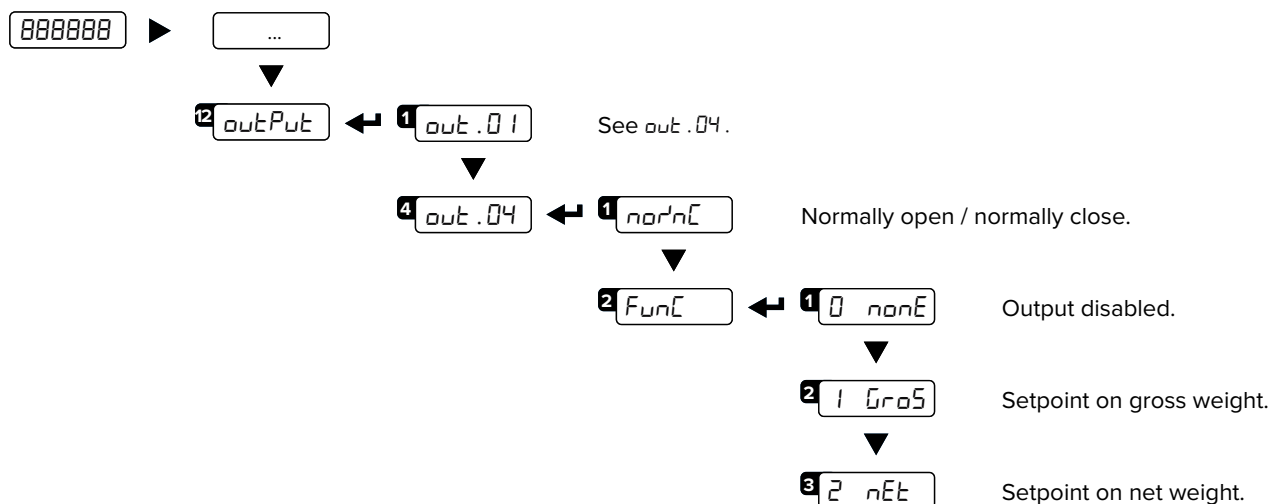Rice Lake
WEIGHING SYSTEMS

10.2 EXAMPLES

Setting analog output to gross weight 10 V, for a 1000 lb scale:

• Connect a multimeter to pins 21 (+) e 20 (-).

• Select `0- 10  U` in the parameter `Ao .tYPE`.

• Select `Ao  Gro` in the parameter `ModE`.

• Select the channel (if necessary) in the parameter `ChAn`.

• Set the weight at 0 V in the parameter `UGt .M in` (default = 0 lb).

• Set the weight at 10 V in the parameter `UGt .MAH` (default = 1000 lb).

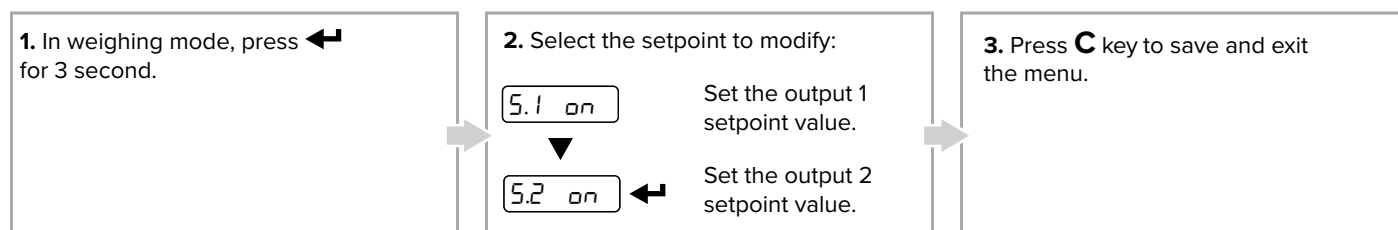• Correct, if necessary, the output values as shown in section **10.1**.

Setting analog output on net weight 4 20 mA, for a 20000 lb scale:

• Connect a multimeter to pins 19 (+) e 18 (-).

• Select `4- 20 .MA` in the parameter `Ao .tYPE`.

• Select `Ao  nEt` in the parameter `ModE`.

• Select the channel (if necessary) in the parameter `ChAn`.

• Set the weight at 4 mA in the parameter `UGt .M in` (default = 0 lb).

• Set the weight at 20 mA in the parameter `UGt .MAH` (default = 20000 lb).

• Correct, if necessary, the output values as shown in section **10.1**.
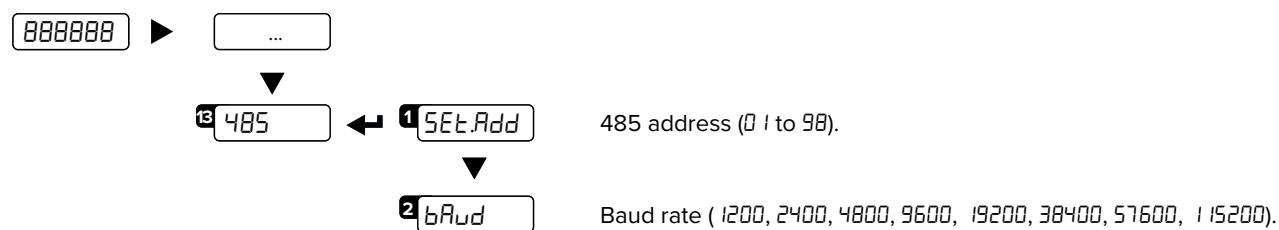
11. Input Setting

`888888` ▶	`...`

▼

`inPutS` ↵ `inP.01`   See `inP.02`

`inP.02` ↵ **1** `nonE`   Input disabled.

▼

2 `d iS.HEY`   When input is active, transmitter keyboard is locked.

▼

3 `oFF`   When input is active, transmitter reboots.

▼

4 `C`   Emulation of **C** key.

▼

5 `Pr int`   Emulation of ↵ key.

▼

6 `ModE`   Emulation of ▶ key.

▼

7 `tArE`   Emulation of ▲ key.

▼

8 `ZEro`   Emulation of ▼ key.

12. Output Settings

| 888888 | ▶ | ... |

▼

12 outPut ↩ **1** out.01   See out.04.

▼

4 out.04 ↩ **1** nor'nC   Normally open / normally close.

▼

2 FunC ↩ **1** 0 nonE   Output disabled.

▼

2 1 GroS   Setpoint on gross weight.

▼

3 2 nEt   Setpoint on net weight.

12.1 HOW TO PROGRAM SETPOINTS

| **1.** In weighing mode, press ↩ for 3 second. | **2.** Select the setpoint to modify:

5.1 on   Set the output 1 setpoint value.

▼

5.2 on ↩   Set the output 2 setpoint value. | **3.** Press **C** key to save and exit the menu. |

13. RS485 Port

| 888888 | ▶ | ... |

▼

13 485 ↩ **1** SEt.Add   485 address (01 to 98).

▼

2 bAud   Baud rate (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200).

i

The RS485 port is configured by default to communicate in Modbus RTU (section 16).

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14. Weight Filter

```
[ 888888 ]  ▶    [      …      ]
                        ▼
              14 [ F ıLŁEr ]
```
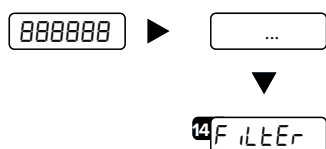
The active weight filter is displayed, alternating with the weight value.
Press ▲ and ▼ keys to scroll through the available filters (from slowest to fastest, F1 to F11).

15. Programming Errors

MESSAGE	DESCRIPTION	SOLUTION
PrEC.	Calibration error	First calibrate the zero point (ZEro), then proceed with sample weight acquisition (SPAn) (section 9).
Err.Pnt	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.Not	Weight unstable	Check in AdC.uU 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.

16. Modbus

16.1 MODBUS REGISTERS

Data	Register	DESCRIPTION			
Gross weight	30001	Gross Weight value.			
	30002				
Net weight	30003	Net Weight value.			
	30004				
Input status register	30005	Bit 15$_{(msb)}$ — Active channel. / Bit 14 — Active channel. / Bit 13 — No function. / Bit 12 — No function. / Bit 11 — No function. / Bit 10 — No function. / Bit 9 — Status of input n. 2. / Bit 8$_{(lsb)}$ — Status of input n. 1.	**Bit 15**	**Bit 14**	**Active Channel**
			0	0	Channel 1
			0	1	Channel 2
			1	0	Channel 3
			1	1	Channel 4
		Bit 7$_{(msb)}$ — 1 = Scale unloaded (gross weight = 0). / Bit 6 — Tare PT (1 = PT tare is active). / Bit 5 — Tare (1 = Tare is active). / Bit 4 — Overload condition (0 = No; 1 = Overload). / Bit 3 — Underload condition (0 = No; 1 = Underload). / Bit 2 — Weight Stability (0 = Unstable; 1 = Stable). / Bit 1 — Gross Weight Polarity (0 = "+"; 1 = "-"). / Bit 0$_{(lsb)}$ — Net Weight Polarity (0 = "+"; 1 = "-").			
Command status register	30006	Last received command.			
		Bit 7$_{(msb)}$ — Last command result. / Bit 6 — Last command result. / Bit 5 — Last command result. / Bit 4 — Last command result. / Bit 3 — Counting of processed commands. / Bit 2 — Counting of processed commands. / Bit 1 — Counting of processed commands. / Bit 0$_{(lsb)}$ — Counting of processed commands.			
Output status register	30007	No Function.			
		Bit 7$_{(msb)}$ — No function. / ... — ... / Bit 2 — No function. / Bit 1 — Digital output 2 status (0 = OFF; 1 = ON). / Bit 0$_{(lsb)}$ — Digital output 1 status (0 = OFF; 1 = ON).			
µV	30111	µV value.			

16.2 MODBUS REGISTERS FOR COMMAND SENDING

Data	Register	DESCRIPTION
Command	40232	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	
Parameter 1	40233 40234	First parameter of the command. Parameter is always expressed in absolute mode (no decimals, no sign).
Parameter 2	40235 40236	Second parameter of the command. Parameter is always expressed in absolute mode (no decimals, no sign).

EXAMPLE 1

For zeroing the weight on the scale:

2. Set the command in byte 2

Byte	Value
1	00 Hex
2	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

Byte	Value
1	00 Hex
2	03 Hex
3(MSB)	00 Hex
4	00 Hex
5	03 Hex
6(LSB)	E8 Hex

Notes

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W E I G H I N G   S Y S T E M S