ANYLOAD®

ACT1

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TECHNICAL MANUAL

V1.0.0

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Revision History:

Record with brief description of all revisions made to product or manual

Version	Date	Description
1.0.0	February 26, 2025	First public release version.

The most current version of this document, along with any software, firmware, and other product updates, can be found on our website:

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1. User Warning

1.1 Recommendations for Proper Use (Weighing Instruments)

- Keep the instrument away from heat sources and direct sunlight.
- Protect the instrument from rain, unless you are using a special IP-rated version.
- Do not wash the instrument with water jets, unless it is a special IP-rated version.
- Do not immerse the instrument in water.
- Avoid spilling any liquids on the instrument.
- Do not use solvents to clean the instrument.
- Do not install the instrument in explosive atmospheres, unless you have a special ATEX-certified version.
- If the operating temperature approaches its upper limit, space out the instruments to allow adequate airflow and prevent malfunctions (e.g., abrupt shutdowns or disconnections).

1.2 Recommendations for Proper Installation (Weighing Instruments)

The terminals indicated on the instrument's wiring diagram for earth connection must have the same potential as the weighing structure (i.e., the same earthing pit or grounding system). If this condition cannot be ensured, connect the instrument terminals (including the –SUPPLY terminal) to the weighing structure using an earthing wire.

The load cell cable must be routed separately to its panel input and must not share a conduct with other cables. Connect it directly to the instrument terminal strip without any interruptions or intermediate terminal blocks.

Install RC filters on solenoid valves and remote-control switch coils driven by the instrument.

Avoid installing inverters inside the instrument panel. If their use is unavoidable, install special filters for the inverters and separate them from the instrument using sheet metal partitions.

The panel installer must ensure appropriate electrical protection for the instrument, such as fuses and a door-lock switch.

It is recommended to keep the equipment on continuously to prevent condensation buildup.

Maximum Cable Lengths

- **RS485**: Up to 1000 meters using AWG24 shielded and twisted cables.
- **Analog current output**: Up to 1000 meters using AWG24 shielded and twisted cables.
- **Analog voltage output**: Up to 300 meters with 0.5 mm2 cable

1.3 Recommendations for Proper Installation (Load Cells)

For safety reasons, in static weighing applications, it is recommended to use load cells at a maximum of 70-80% of their nominal capacity, assuming the load is evenly distributed across the weighing structure.

If the load is subject to dynamic forces (e.g., handling forklifts, bridge cranes, or other mechanical lifting methods), consider further reducing the load percentage relative to the nominal capacity to ensure accuracy, longevity, and safety.

For weighing applications with dynamic loads, the installer must evaluate factors such as impact force, acceleration, frequency of load application, and thrust speed to ensure proper load cell selection and system reliability. These factors influence measurement accuracy and the overall durability of the weighing system.

Load Cell Installation

Load cells must be installed on rigid and stable structures that are properly aligned. To compensate for any misalignment of the support surfaces, it is essential to use appropriate mounting modules designed for load cells. These modules help ensure accurate measurements and system stability.

Cable Protection and Routing

When connecting multiple load cells in parallel, use a watertight junction box with a terminal block if necessary. Extension cables for the load cells must be shielded, routed individually in separate piping or conduits, and kept as far as possible from power cables to minimize electrical interference. For 4-wire connections, use cables with a minimum cross-section of 4×1 mm².

PROTECTION OF THE CELL CABLE

Use waterproof sheaths and sealed joints to protect load cell cables from moisture, dust, and environmental damage.

Mechanical Constraints and Environmental Factors

When piping is present, use hoses and flexible couplings with open-ended fittings and rubber protection to reduce mechanical constraints on the weighing system. If using rigid pipes, position any supports or anchor brackets as far as possible from the weighing structure, ensuring a minimum distance of 40 times the pipe diameter to prevent interference with accurate weight measurement.

WELDING

Avoid performing welding while the load cells are installed. If welding cannot be avoided, position the welder's ground clamp as close as possible to the welding point to prevent electrical current from passing through the load cell body, which could cause damage.

ENVIRONMENTAL AND MECHANICAL STABILITY

To ensure accurate and reliable measurements, weighing modules should be used with all load cells to compensate for misalignment of support surfaces. The system designer must implement protective measures to prevent lateral shifting or tipping due to:

- Mechanical shocks and vibrations
- Strong winds or environmental forces
- Seismic activity in the installation area
- Insufficient structural stability of the support framework

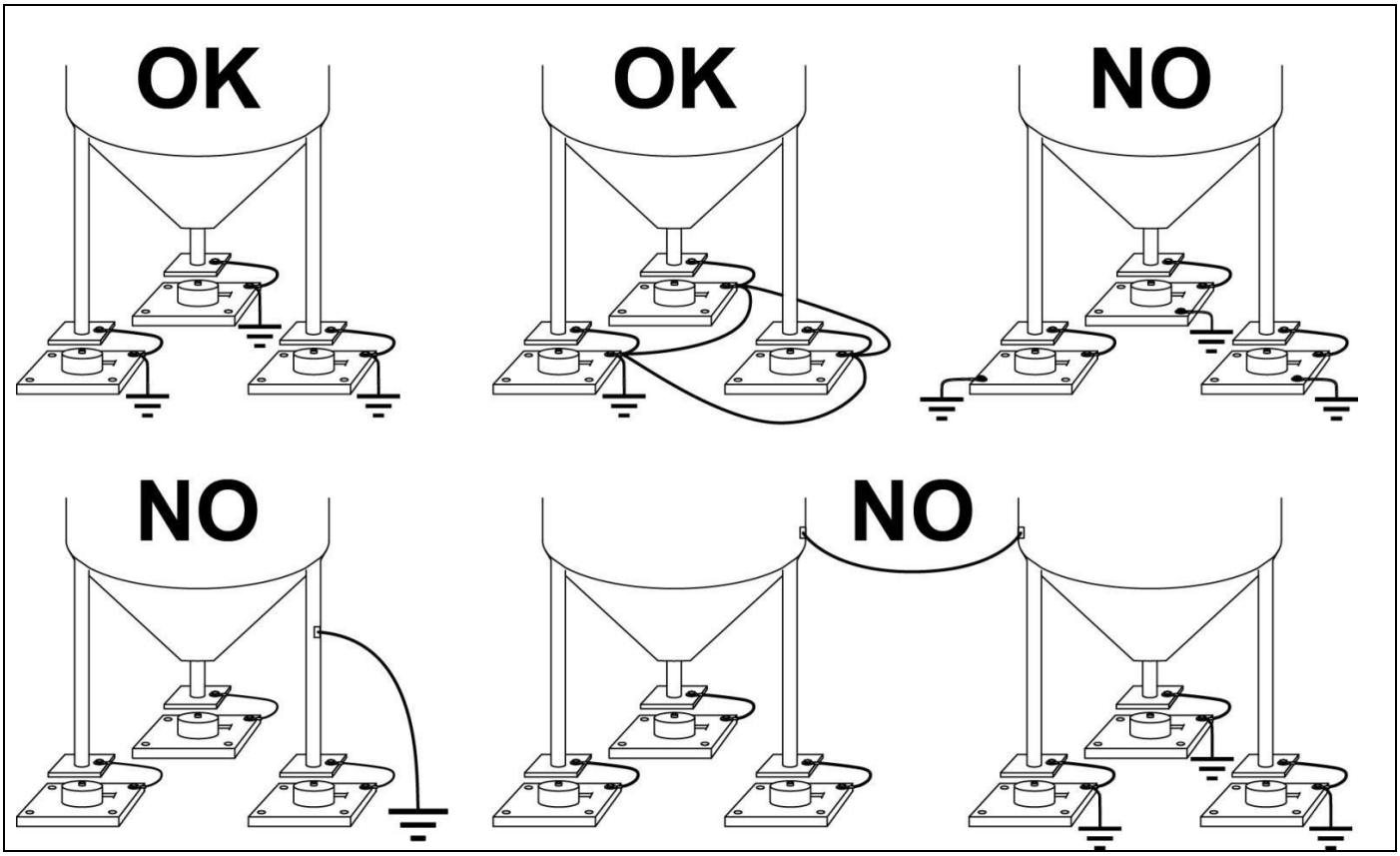
EARTHING THE WEIGHED STRUCTURE

To ensure proper grounding, use a copper wire with an appropriate cross-section to connect the upper support plate of each load cell to its corresponding lower support plate. Then, connect all lower plates to a single, dedicated earthing system.

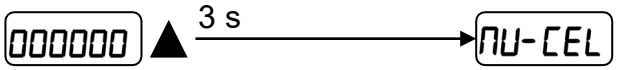
This setup prevents electrostatic charges—generated by friction between the product, pipes, and container walls— from discharging through the load cells, protecting them from potential damage.

While improper earthing may not immediately affect the operation of the weighing system, it can lead to long-term damage to both the load cells and the connected instrumentation.

FAILURE TO FOLLOW THE INSTALLATION RECOMMENDATIONS WILL BE CONSIDERED A MISUSE OF THE EQUIPMENT



1.4 Quick Load Cell Input Test



From the weight display, press and hold ▲ button for **3 seconds**. The display will show the load cell response signal in millivolts (mV) with four decimal places.

Example: A load cell with a 2.000 mV/V sensitivity will provide a response signal ranging between 0 and 10 mV, depending on the applied load.

1.5 Load Cell Testing

1.5.1 Load cell resistance measurement (use a digital multimeter):

- Turn off the instrument.
- Disconnect the load cells from the instrument and inspect the junction box for moisture caused by condensation or water infiltration. If moisture is present, dry the system or replace damaged components as needed.
- Measure the resistance between the positive signal wire and the negative signal wire. The measured value should match or closely align with the output resistance specified in the load cell data sheet.
- Measure the resistance between the positive excitation wire and the negative excitation wire. The measured value should match or closely align with the input resistance specified in the load cell data sheet.
- Check the insulation resistance between the shield and any other load cell wire, as well as between any load cell wire and the body of the load cell. This value should be higher than 20 MΩ to ensure proper insulation and prevent interference.

1.5.2 Load cell voltage measurement (use a digital multimeter):

- Turn on the instrument.
- Remove the load cell to be tested from underneath the container, or alternatively, lift the container support.
- Ensure that the excitation voltage across the two excitation wires of the load cell, as supplied by the instrument or amplifier, is **5 VDC ±3%**.
- Measure the response signal between the positive and negative signal wires by connecting them directly to the tester, ensuring that the reading is between **0 and ±0.5 mV** when no load is applied.
- Apply a load to the cell and verify that the signal increases accordingly.

IF ONE OF THE ABOVE CONDITIONS IS NOT MET, CONTACT THE TECHNICAL ASSISTANCE SERVICE.

2. Specifications

2.1 Key Features and Specifications

- Weight transmitters are compatible with 4- or 6-wire load cells and designed for back panel mounting on Omega/DIN rail.
- Dimensions: 25 × 115 × 120 mm.
- Six-digit semi-alphanumeric display, 8 mm height, 7-segment format.
- Four-key keyboard.
- RS485 serial port for connection to PC/PLC, supporting up to 32 instruments (or up to 99 with line repeaters).

2.2 Key Features and Specifications

Power Supply And Consumption	12/24 VDC ±10%; 5 W
No. Of Load Cells In Parallel And Supply	max 8 (350 ohm); 5 VDC / 120 mA
Linearity	< 0.01% F.S.
Analog Output Linearity (ACT1-ANA)	< 0.01% F.S.
Thermal Drift	< 0.0005% F.S./°C
Analog Output Thermal Drift (Act Only)	< 0.003 % F.S./°C
A/D Converter	24 bit (16000000 points)
Divisions (With Measurement Range ±10 Mv=Sens. 2 Mv/V)	±999999
Measurement Range	±39 mV
Max Sensitivity Of Usable Load Cells	±7 mV/V
Max Conversions Per Second	300 conversions/second
Display Range	±999999
No. Of Decimals / Display Increments	0-4 / x 1 x 2 x 5 x 10 x 20 x 50 x 100
Digital Filter / Readings Per Second	10 levels / 5-300 Hz
Relay Outputs	N. 3 - max 115 VAC; 150 mA
Digital Inputs	N. 2 - optoisolated 5 - 24 VDC PNP
Serial Ports	RS485
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 115200
Humidity (Non-Condensing)	85%
Storage Temperature	-30°C +80°C
Working Temperature	-20°C +60°C
Optoisolated Analog Output (Act Only) 16 Bit - 65535 Divisions	0-20 mA; 4-20 mA (max 300 ohm); 0-10 V; 0-5 V, ±10 V; ±5 V (min 10 kohm)

Relay Outputs	N. 3 - max 30 VAC, 60 VDC; 150 mA
Working Temperature	-20 °C +60 °C
Equipment to be powered by 12-24 VDC LPS or Class 2 power source.	

3. Electrical Connections

- It is recommended to ground the negative pole of the power supply.
- The instrument can power up to 8 load cells at 350 ohms, or up to 16 load cells at 700 ohms.
- For 4-wire load cells, connect EX- directly to REF- and EX+ directly to REF+.
- Connect the –SUPPLY terminal to the RS485 common of connected instruments if they receive AC power or have an optically isolated RS485.
- In an RS485 network with multiple devices, it enables the 120-ohm termination resistance on the two devices at the ends of the network, as described in the RS485 serial connection section.

3.1 Wiring Diagram

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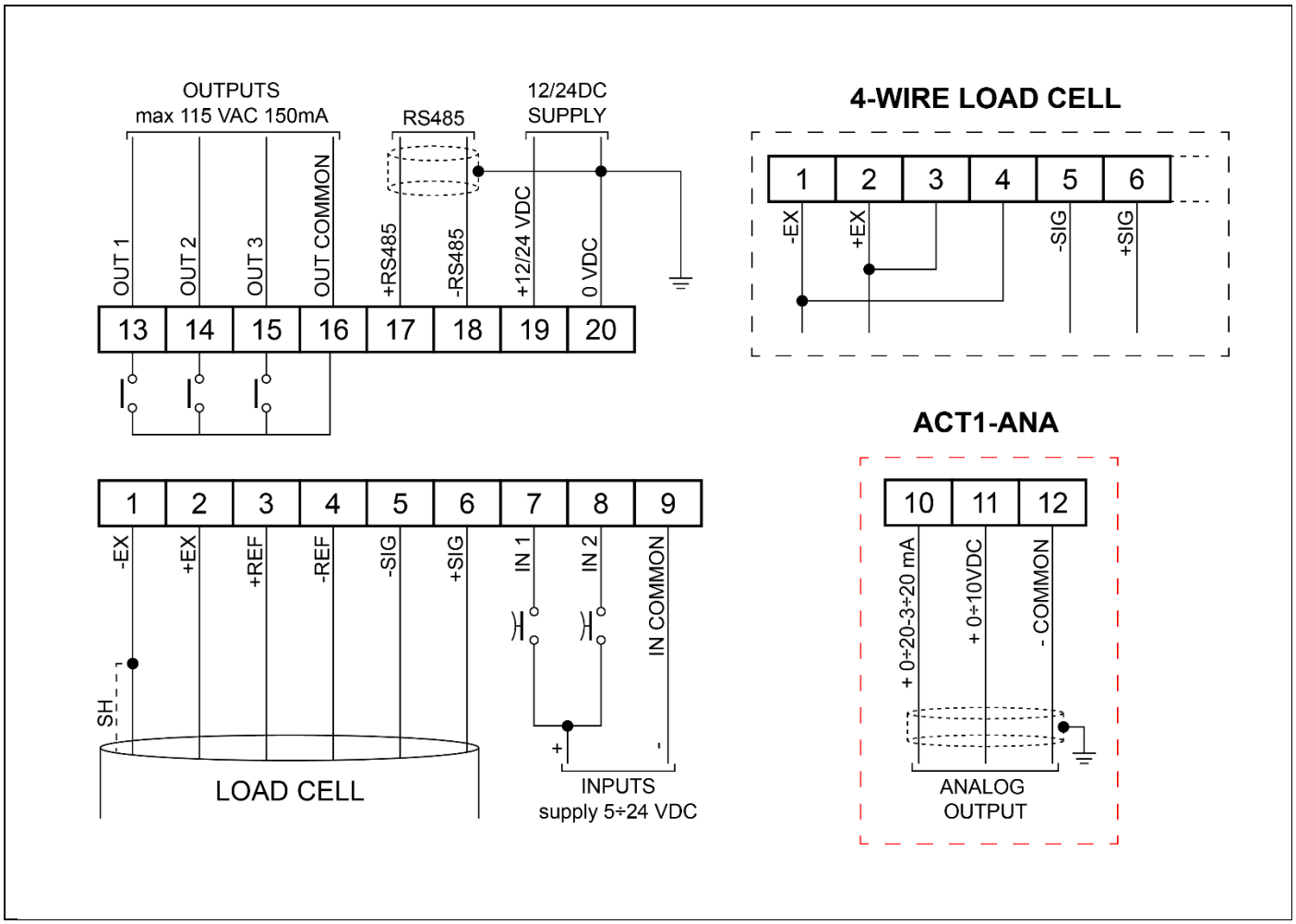


Three outputs, controlled by setpoint values or by a remote device via protocol.

Two inputs (default: Input 1 = Semi-Automatic Zero, Input 2 = Net/Gross) configurable for the following functions: Semi-Automatic Zero, Net/Gross, Peak, or Remote Control (see the Outputs and Inputs Configuration section).

3.2 Terminals Legend

1	-LOAD CELL EXCITATION (-EX)	**11**	+ANALOG OUTPUT 0-10 V (ACT Analog only)
2	+LOAD CELL EXCITATION (+EX)	**12**	-ANALOG OUTPUT COMMON (ACT Analog only)
3	+LOAD CELL REF/SENSE	**13**	OUTPUT No. 1
4	-LOAD CELL REF/SENSE	**14**	OUTPUT No. 2
5	-LOAD CELL SIGNAL	**15**	OUTPUT No. 3
6	+LOAD CELL SIGNAL	**16**	OUTPUT COMMON
7	INPUT No. 1 (+VDC min 5 V max 24 V)	**17**	RS485: +
8	INPUT No. 2 (+VDC min 5 V max 24 V)	**18**	RS485: -
9	INPUT COMMON (-VDC 0 V)	**19**	+SUPPLY (12/24 VDC)
10	+ANALOG OUTPUT 0-20 or 4-20 mA (ACT Analog only)	**20**	-SUPPLY (12/24 VDC) RS485: SHIELD, GND

4. LED and Key Functions

LED	Main Function	Secondary Function
NET	Net weight (semi-automatic tare or preset tare)	LED lit: Output 3 closed
0	zero (deviation from zero not more than ±0.25 divisions)	LED lit: Output 2 closed
	stability	LED lit: Output 1 closed
kg	unit of measure: kg	
g	unit of measure: g	LED lit: Input 2 closed
l	unit of measure other than kg or g	LED lit: Input 1 closed

*To activate the secondary LED function, during weight display press ↵ and hold down the keys and ▲ (press ↵ immediately followed by ▲).

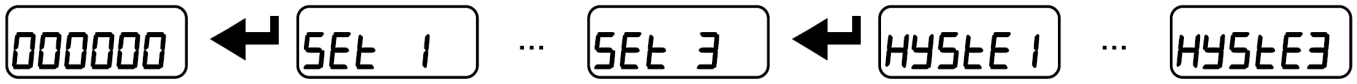
KEY	Short Press	Long Press (3 Sec)	Into Menus
✕	Semi-automatic zero	Tare resetting	Cancel or return to previous menu
◀	Gross -> Net	Net -> Gross	Select digit to modify or go to the previous menu item
▲		Gross weight: mV load cell test Net weight: temporarily display the gross weight	Modify the selected digit or go to the next menu item
↵	Setpoint and hysteresis settings		
↵ + ✕	General parameter settings (press ↵ immediately followed By ✕)		
↵ + ◀	Preset tare settings (press immediately followed by)		

i In menu mode, the LEDs light up in sequence to indicate that the display is not showing a weight value.

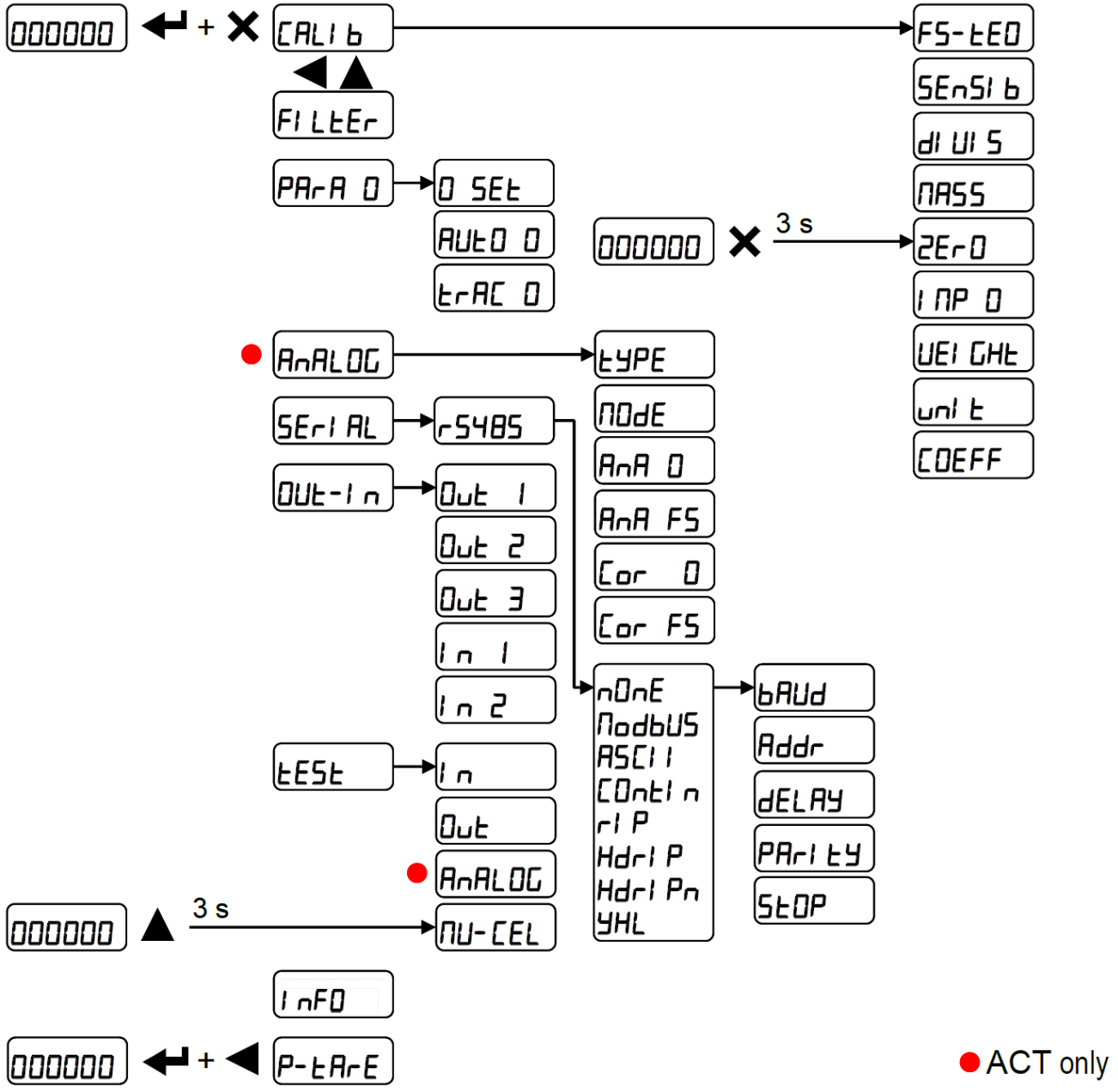
5. Configurations

In the menu mode, changes are applied immediately after pressing the ↵ key, with no further confirmation required.

5.1 Set Point



5.2 System Parameters



5.3 Configuring System Settings

From the weight display, press ↵ and ✕ simultaneously to access the parameter setting.

↵: To enter a menu/confirm the data entry.

▲: To modify the displayed figure or menu item.

◀: To select a new figure or modify the displayed menu item.

✕: To cancel and return to the previous menu.

5.4 Span Calibration (Theoretical Weights)

000000 ↵ + ✕ CALIb ↵ FS-tEO ↵ SEnSIb ↵ diUIS

To perform theoretical calibration, set the following parameters in sequence:

FS-tEO (default: dEMo): The system's full scale is determined by multiplying the capacity of a single load cell by the number of load cells used.

Example: If using 4 load cells of 1000 kg each, set the Full Scale to 4000 kg (1000 × 4).

The instrument is pre-configured with a theoretical full-scale value of **10000**

To restore factory values, set the full scale to **0**.

SEnSI b **Sensitivity** (default: 2.00000 mV/V) – This is a rated parameter of the load cell, expressed in mV/V. Enter the average sensitivity of all connected load cells. Acceptable range: 0.50000 to 7.00000 mV/V.

Example: For a system with 4 load cells having sensitivities of 2.00100, 2.00150, 2.00200, and 2.00250 mV/V, enter the average value:

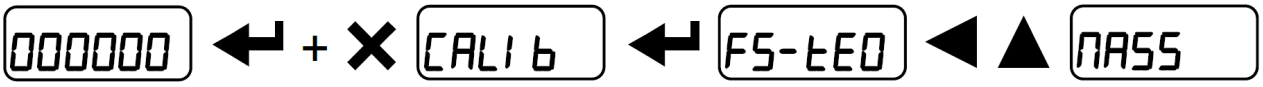
(2.00100 + 2.00150 + 2.00200 + 2.00250) / 4 = 2.00175 mV/V.)

diUI 5 **Division** – Defines the smallest weight increment displayed.

- It is automatically calculated by the system based on calibration, typically set to 1/10000 of the full scale.
- The value can be manually adjusted between 0.0001 to 100, with selectable increments of x1, x2, x5, or x10.
- Modifying the theoretical full scale or sensitivity will cancel the real calibration, making the theoretical calibration the only valid one.

- If the theoretical full scale matches the full scale recalculated during real calibration (see Real Calibration (With Sample Weights)), the system is operating with theoretical calibration. If the values differ, the system is using real calibration based on sample weights.
- Changing the theoretical full scale or sensitivity will reset all weight-related system parameters including setpoints, hysteresis, and other settings, to their default values.

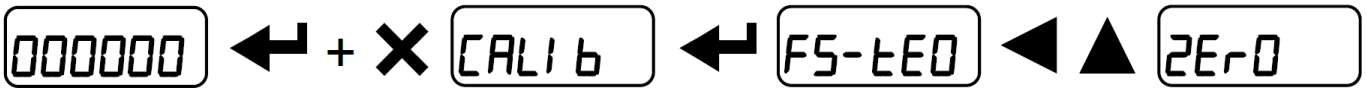
5.5 Maximum Capacity



MASS: The maximum displayable weight, adjustable from 0 to full scale (default: 0).

- If the measured weight exceeds this value by 9 divisions, the display will show " ".
- To disable this limit, set the value to 0.

5.6 Tare Weight Zero Setting



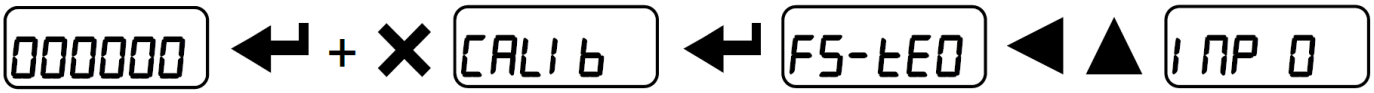
This menu can also be accessed directly from the weight display by holding down the ✕ key for 3 seconds.

Perform this procedure after setting the theoretical calibration data. This function is used to zero the weight of the empty system after commissioning and later to compensate for zero variations caused by product residues.

Procedure:

- Confirm the ZErO message by pressing ↵.
- The current weight value to be set to zero is displayed. During this phase, all LEDs will flash.
- Press ↵ again to confirm and store the zero value in permanent memory.
- Press ▲ to display the total accumulated zero adjustments, which represents the sum of all previous zero settings.

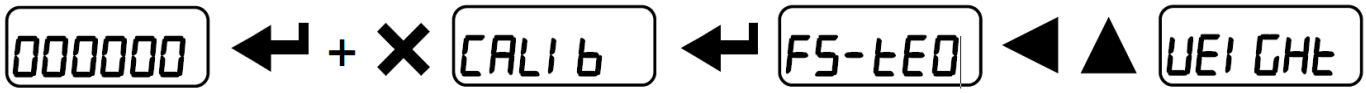
5.7 Zero Value Manual Entry



WARNING: Perform this procedure only if resetting the tare of the weighed structure is not possible, such as when the system contains product that cannot be unloaded.

Set the estimated zero value within the range 0 to 999999 (default: 0).

5.8 Span Calibration (Physical Weights)



After completing Theoretical Calibration and Tare Weight Zero Setting, this function allows fine- tuning calibration using sample weights of known value. It also enables correction of any deviations between the displayed and actual weight.

Calibration Procedure:

1. Place a sample weight on the weighing system. The weight should be at least 50% of the maximum capacity.

2. Confirm the "WEIGHT" message. The flashing value of the detected weight will be displayed, and all LEDs will be off.

3. If necessary, adjust the displayed weight using the arrow keys.

4. Confirm the adjusted weight. The corrected value will be displayed with all LEDs flashing.

5. Confirm again to save the calibration. The "WEIGHT" message will reappear. Press the display key repeatedly to return to normal weight display mode.

Example: For a system with a maximum capacity of 1000 kg and 1 kg division, two sample weights are available: 500 kg and 300 kg.

- Load both weights onto the system and adjust the displayed weight to 800 kg.
- Remove the 300 kg weight—the system should now display 500 kg.
- Remove the 500 kg weight as well—the system should read zero.

If the displayed values do not match expectations, there may be a mechanical issue affecting system linearity.

WARNING: Identify and resolve any mechanical issues before repeating the procedure.

- If the theoretical full scale matches the full scale recalculated during real calibration, the system is operating with theoretical calibration. If the values differ, the system is using real calibration based on sample weights.
- If the applied correction modifies the previous full scale by more than 20%, all parameters containing settable weight values will be reset to default.

5.9 Linearization Option On Max 8 Points

It is possible to perform weight linearization by repeating the calibration procedure up to eight times, using eight different sample weights.

The procedure ends when either the ✕ button is pressed, or the eighth value is entered. At this point, calibration values can no longer be modified, and a new real calibration will be required to make further adjustments. To start a new calibration, return to the weight display and then re-enter the calibration menu.

After confirming a sample weight, pressing the ▲ button will display the recalculated full scale, which is determined based on the highest entered sample weight and the load cell sensitivity set in the theoretical calibration. (SEnSI b).

5.10 Filter On The Weight

Setting this parameter helps achieve a stable weight display.

To increase stability, raise the filter value (**0 to 9**, default: **4**). Higher values provide a more stable reading but may slow response time.

Adjustment Procedure:

- Confirm the FI LtEr message to view the current filter setting.
- Modify and confirm the new value, then observe the weight display to check stability.
- If the display remains unstable, re-enter the **FILTER** setting and adjust again until the optimal balance between stability and responsiveness is achieved.

FILTER SETTINGS AND RESPONSE TIMES

The table below shows the relationship between the filter value, response time, and display/serial port refresh frequency.

Filter Value	Response Times (ms)	Display and Serial Port Refresh Frequency (Hz)
0	12	300
1	150	100
2	260	50
3	425	25
4 (default)	850	12.5
5	1700	12.5
6	2500	12.5
7	4000	10
8	6000	10
9	7000	5

5.11 Anti Peak

When the weight is stable, the anti-peak filter eliminates sudden disturbances lasting up to 1 second. To configure the filter, confirm the setting using ↵ and select one of the following options:

AntPOn: Anti-peak filter enabled (default).

AntPOF: Anti-peak filter disabled.

5.12 Zero Parameters

tES 0 (Range: 0 to full scale, default: 300; decimals may appear as 300, 30.0, 3.00, or 0.300) defines the maximum weight that can be reset to zero using an external contact, keypad, or serial command.

- If the current load is below this threshold, the system resets to zero.
- If the current load exceeds this threshold, the reset command is ignored, preventing accidental zeroing of significant loads.

5.13 Automatic Zero Setting At Power-On

AUtO (From 0 to 10% of full scale; default: 0): If the measured weight at startup is below the value set in this parameter, the system will automatically reset the weight to zero. To disable this function, set the parameter to 0.

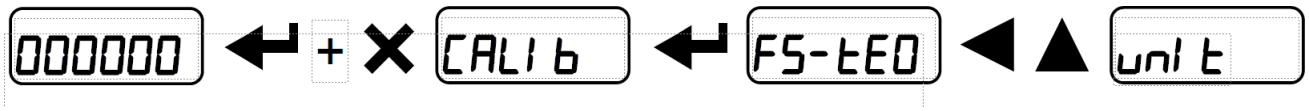
5.14 Zero Tracking

trAC 0 (From 1 to 5, default: None): When the weight value is stable and, after one second, deviates from zero by an amount equal to or smaller than the value set in this parameter (in weight divisions), the system automatically resets the weight to zero.

To disable this function, set it to nOnE.

Example: If the parameter dIUI 5 is set to 5 and trAC 0 is set to 2the weight will be automatically reset to zero for deviations of 10 divisions (dIUI 5 x trAC 0).

5.15 Unit Configuration

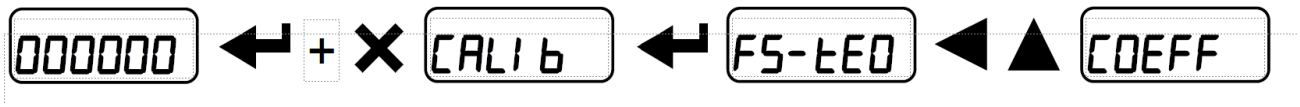


HI LOG	Kilogram
G	S grams
t	Tons
Lb	Pounds
nEUton	Newtons
LItrE	Litres
bAr	Bars
AtM	Atmospheres
PIECE	Pieces
nEU-M	Newton metres
HI LO-M	Kilogram metres
OtHEr	Other generic units not included in the list

For units marked with (*), it is possible to configure a display coefficient using the COEFF parameter (see the related section).

To activate COEFF it must be enabled by closing the COEFF input (refer to the Outputs and Inputs Configuration section for details).

5.16 Unit Configuration



The COEFF parameter adjusts the displayed value according to the set coefficient.

If one of the inputs is configured in COEFF (see **Outputs and Inputs Configuration**), closing the input will modify the displayed value based on the setting. When the input COEFF is open, the display will revert to the standard weight reading.

COEFF (Maximum value: 99.9999; default: 1.0000) determines the scaling factor applied to the display. Its effect depends on the selected unit of measure (unIt parameter). For details, refer to the **Setting Units of Measure** section.

If the unit of measure chosen is:

Lb	LB (pounds)	The displayed weight value will be multiplied by the COEFF parameter.
nEUton	Newton (N)	The displayed weight is multiplied by COEFF to convert it to Newtons.
LItrE	Litre (L)	COEFF should be set to the specific weight in kg/L, assuming the system is calibrated in kilogram.
bAr	Bar (bar)	The displayed weight is multiplied by COEFF to express pressure in bars.
AtM	Atmosphere (atm)	The displayed weight is multiplied by COEFF to express pressure atmospheres.
PIECE	Piece (PCS)	COEFF should be set to the weight of a single piece, enabling piece counting.
nEU-M	Newton Meters (N·m)	The displayed weight is multiplied by COEFF calculate torque in Newton meters.
HILO-M	Kilogram Meters (kg·m)	The displayed weight is multiplied by COEFF to calculate torque in kilogram meters.
OtHEr	Other (OTHER)	A generic unit of measure; the displayed weight is multiplied by COEFF for custom conversions.

WARNING: All other settings (setpoint, hysteresis, calibration ...) are expressed in weight value. If you want to convert them to the new unit of measurement, perform one of the following procedures for changing the system calibration.

Keep the COEFF set to 1.0000.

Example: A weighing system with four 1000 kg load cells is used for measuring olive oil, which has a specific gravity of 0.916 kg/L.

To calibrate the system in liters of olive oil:

Set the F. SCALE = (4 x 1000) / 0.916 = 4367)

This allows the system to display weight in liters instead of kilograms.

Additionally, by setting UNIT = Liter (see Setting Units of Measure section), the system will display "l" instead of "kg" on the screen.

Modifying Real Calibration for Other Units of Measure

To calibrate the system in a different unit, perform real calibration using a known quantity of the product in the desired unit (e.g., liters).

- Load a known quantity of the product (at least 50% of the maximum capacity) onto the scale.
- Enter the actual product quantity into the WEIGHT parameter, using the new unit (e.g., liters).
- If required, set UNIT = Liter (see Setting Units of Measure section) to display "l" instead of "kg" on the screen.

This procedure ensures that the system correctly measures and displays weight in the selected unit.

5.17 Outputs and Inputs Configuration

5.17.1 Outputs Configuration

By default, the outputs are set to: OPEn / SEt / GrOSS / POSnEG / OFF

Available Output Modes:

OPEn (Normally Open):

- The relay is de-energized, and the contact remains open when the weight is below the programmed setpoint value.
- Contact closes when the weight reaches or exceeds the setpoint value.

CLOSE (Normally Closed - NC):

- The relay is energized, and the contact remains closed when the weight is below the programmed setpoint value.
- The contact opens when the weight reaches or exceeds the setpoint value.

SEt: The contact switches based on weight according to the configured setpoint values (see Setpoint Programming section).

PLC: The contact does not switch based on weight but is controlled via remote protocol commands.

StAbLE: The relay switches only when the weight is stable (filtered and steady).

ALArM: The relay switches when an alarm condition is triggered, including:

- ERCEL (Load cell error)
- ER OL (Overload error)
- ER AD (A/D converter error)
- (Weight exceeds displayable range)
- ER OF (Offset error)
- The ALARM mode forces the relay to operate in CLOSE (normally closed) mode.

Additional Options for SET Mode

If the SET operation mode is selected, the following options are also available:

1. GROSS – The contact switches based on gross weight.
2. NET – The contact switches based on net weight. If the net function is not active, the contact defaults to switching based on gross weight.
3. POSNEG – The relay switches for both positive and negative weight values.
4. POS – The relay switches only for positive weight values.
5. NEG – The relay switches only for negative weight values.

By confirming with ↵, the setpoint operation can be configured when the setpoint value is 0:

OFF: The relay will not switch if the setpoint value is 0.

On: The relay will switch based on the following conditions:

- Setpoint = 0 and switching = POSNEG – The relay switches when the weight is 0 and switches again when the weight becomes non-zero, considering hysteresis for both positive and negative weights.
- Setpoint = 0 and switching = POS – The relay switches when the weight is ⩾ 0 and switches again when the weight goes below 0, considering hysteresis.
- Setpoint = 0 and switching = NEG – The relay switches when the weight is ⩽ 0 and switches again when the weight goes above 0, considering hysteresis.

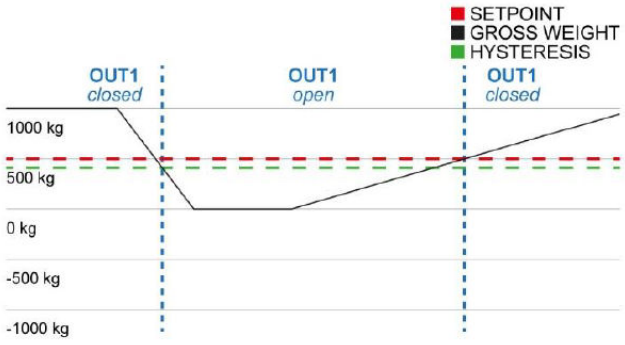
See examples on the following page.

Example:

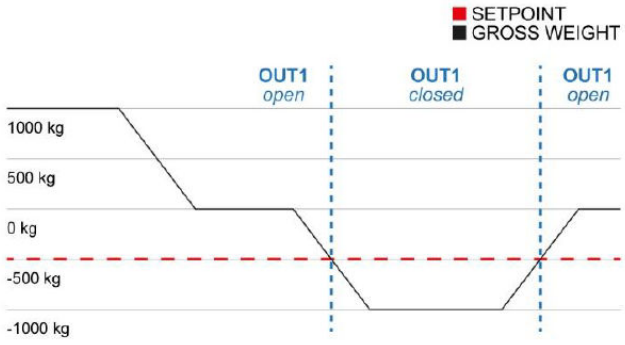
OUt 1 = OPEn / SEt / GrOSS / POS / OFF
SEt 1 = 500 kg; HYStE 1 = 0 kg

OUt 1 = CLOSE / SEt / GrOSS / POS / OFF
SEt 1 = 500 kg; HYStE 1 = 0 kg

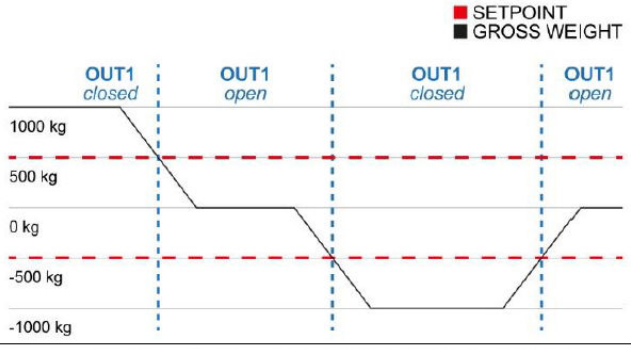
OUt 1 = OPEn / SEt / GrOSS / POS / OFF
SEt 1 = 500 kg; HYStE 1 = 100 kg



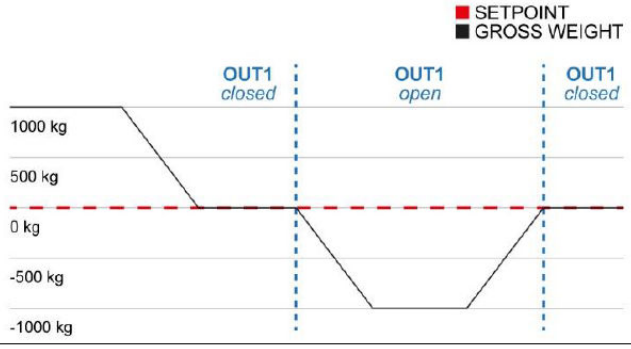
OUt 1 = OPEn / SEt / GrOSS / nEG / OFF
SEt 1 = 500 kg; HYStE 1 = 0 kg



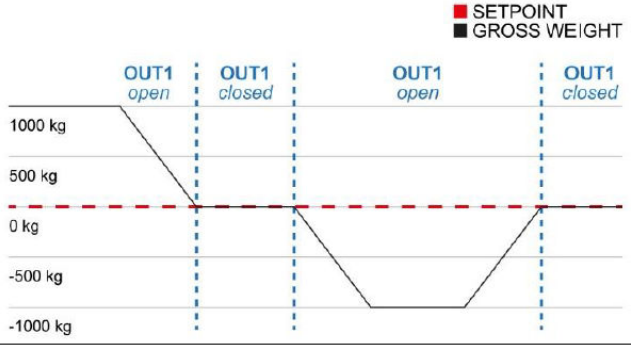
OUt 1 = OPEn / SEt / GrOSS / POSnEG / OFF
SEt 1 = 500 kg; HYStE 1 = 0 kg



OUt 1 = OPEn / SEt / GrOSS / POS / On
SEt 1 = 0 kg; HYStE 1 = 0 kg



OUt 1 = OPEn / SEt / GrOSS / POSnEG / On
SEt 1 = 0 kg; HYStE 1 = 0 kg



5.17.2 Inputs Configuration

Default: Input 1 = 2Er0 Input 2 = nE-L0

Available Input Nodes:

2nE-L0 (NET/GROSS):

- Short press (⩽1s): Performs a semi-automatic tare, and the display shows net weight.
- Long press (⩾3s): The display switches back to gross weight.

2Er0

- Short press (⩽1s): Resets the weight tzoero (seeWeight Zero-Setting for Small Variations (Semi-Automatic Zero) section).

PEAH

- When held closed: The display holds the maximum recorded weight.
- When released: The display returns to the current weight.

PLC

- No action is performed when the input is closed, but the input status can be read remotely via the communication protocol.

CONtIn (Continuous Transmission):

- No action is performed when the input is closed, but the input status can be read remotely via the communication protocol.

COEFF

- When input is closed: The displayed weight is adjusted based on the set coefficient (see Units of Measure and Coefficient Settings).
- When input is open: The display shows the standard weight value.

5.18 Semi-Automatic Tare (NET/GROSS)

The semi-automatic tare operation is lost when the instrument is powered- off and must be re- applied after restarting.

Performing a Net Operation (Semi-Automatic Tare):

1. Close the NET/GROSS input or press the ◀ key for less than 3 seconds.
2. The display resets to zero, and the NET symbol lights up, indicating that the instrument is now showing net weight.
3. To return to gross weight, hold the NET/GROSS input closed or press the key for 3 seconds.

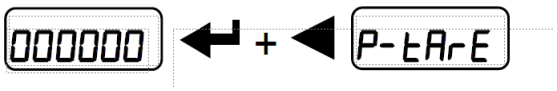
Example:

1. Place an empty box on the scale. The display shows the box weight.
2. Press the ◀ key, The display resets to zero, indicating net weight.
3. Add the product to the box. The display now shows only the product weight.
4. If additional products need to be added, repeat the process—each time the display will show the weight of the newly added product.

While the net weight is displayed, hold down the ▲ to view the preset tare. When the key is released, the display will return to net weight.

Semi-automatic tare is not allowed when the gross weight is zero.

5.19 Preset Tare (Subtractive Tare Device)



A preset tare value can be manually entered and subtracted from the displayed weight, if CP-tArE ≤ max capacity condition is met.

By default, the instrument displays the last programmed preset tare value. To apply it, press ▲ and ↵ to confirm.

After setting the preset tare, returning to the weight display will show the net weight (gross weight minus the preset tare value). The NET LED lights up to indicate that a tare has been applied.

To clear the preset tare and return to the gross weight display, hold down ◀ for 3 seconds or keep the NET/GROSS input closed for 3 seconds. The preset tare value will reset to zero, and the NET LED will turn off, indicating that the instrument is now displaying gross weight again.

While the net weight is displayed, hold down ▲ to temporarily view the gross weight. When the key is released, the display will return to net weight.

- If a semi-automatic tare (net) is entered, it is not possible to access the preset tare function.
- If a preset tare is entered, it is still possible to access the semi-automatic tare (net) function. The two tare values are added together.

5.20 Semi Automatic

By closing the SEMI-AUTOMATIC ZERO input, the weight is reset to zero. Alternatively, pressing the key will display StOrEP the message for 3 seconds. Pressing the key again confirms the zero reset.

This function is only allowed if the weight is below the 0 SEt value (see section RESETTABLE WEIGHT SETTING FOR SMALL WEIGHT CHANGES), If the weight exceeds this limit, the alarm t----- and the weight are not reset

The zero-setting is lost upon instrument power-off.

5.21 Peak Mode

By keeping the PEAK input closed, the display holds the maximum weight value recorded. When the input is opened, the display returns to the current weight.

To use this input for detecting sudden peak variations, the FILTER ON THE WEIGHT parameter to 0.

6. Analog Output

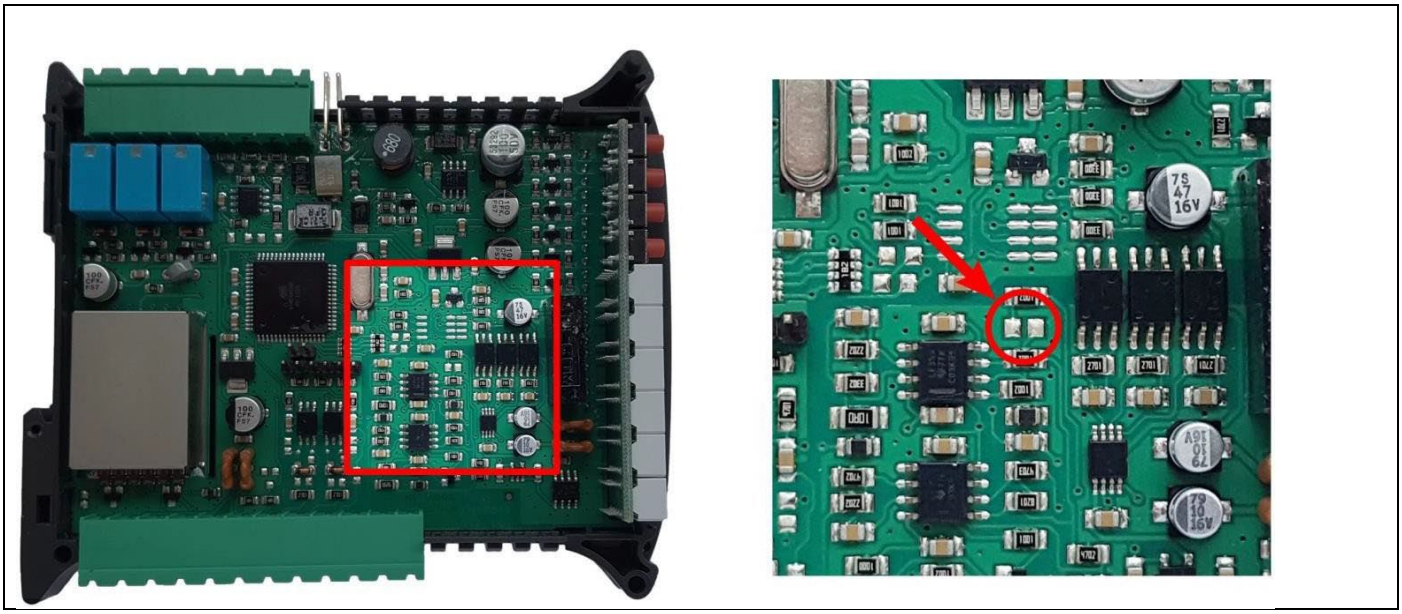
000000 ↵ + ✕ CALIb ◀ ▲ AnALOG

tYPE: Selects the analog output type from the following options: 4–20 mA, 0–20 mA, 0–10 V, 0–5 V, ±10 V, ±5 V (default: 4–20 mA).

For ±10 V and ±5 V outputs, a soldered jumper must be closed. This modification disables all other analog output options.

To enable these outputs:

1. Open the instrument.
2. Locate the soldered jumper on the printed circuit board, **as shown in the diagram below.**
3. Close the jumper by soldering the pads together with a drop of tin.



nOdE: Selects the analog output operating mode.

- GrOSS: The analog output varies based on the gross weight.
- nEt: The analog output varies based on the net weight.
- PLC: The analog output is controlled remotely (see Communication Protocols Manual).

AnA 0: Set the weight value at which the minimum analog output is required. Only enter a value other than zero if you need to limit the analog output range.

Example:

For a full-scale value of 10,000 kg, if you require 4 mA at 5,000 kg and 20 mA at 10,000 kg, set the minimum analog output weight to 5,000 kg instead of zero.

AnA FS: Set the weight value at which the maximum analog output is required. This value must match the setting in the PLC program (default: calibration full scale).

Example: If using a 4–20 mA output and the PLC program is configured so that 20 mA corresponds to 8,000 kg, set this parameter to 8,000 kg.

COr 0: If necessary, adjust the analog output to ensure the PLC correctly reads zero at the minimum setting.

- The "-" sign can be applied to the last digit on the left.

Example: If using a 4–20 mA output and the PLC or tester reads 4.1 mA instead of 4.0 mA at the minimum setting, set this parameter to 3.9 to correct the output.

COr FS: If necessary, adjust the analog output to ensure the PLC correctly reads zero at the minimum setting.

- If necessary, adjust the analog output at full scale to ensure the PLC correctly reads the value set in the ANA FS parameter.

Example: If using a 4–20 mA output and the PLC or tester reads 19.9 mA instead of 20.0 mA at full scale, set this parameter to 20.1 to correct the output.

Minimum and Maximum Values for Zero and Full-Scale Corrections:

Analog Output Type	Minimum	Maximum
0-10 V	-0.150	10.200
0-5 V	-0.150	5.500
±10 V	-10.300	10.200
±5 V	-5.500	5.500
0-20 mA	-0.200	22.000
4-20 mA	-0.200	22.000

NOTE: Reverse Analog Output Configuration (*See next page.)*

NOTE: Reverse Analog Output Configuration

The analog output can also be configured to operate in reverse mode, where the weight setting for analog zero (AnA 0) is greater than the weight setting for analog full scale (AnA FS) this configuration:

AnA FS

- The analog output increases toward full scale as the weight decreases.
- The analog output decreases as the weight increases.

Example: If using a 0-10V Output

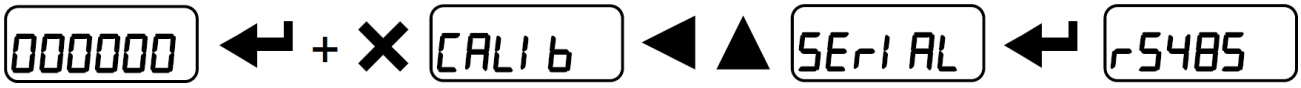
- AnA 0 = 10000 kg
- AnA FS = 0 kg

Weight (kg)	Analog Output (V)
0 kg	10 V
5,000 kg	5 V
10,000 kg	0 V

All analog outputs of the instrument are ACTIVE and SINGLE-ENDED, meaning they can only be connected to PASSIVE receiver devices.

- For voltage outputs, the minimum load resistance must be at least 10 kΩ.
- For current outputs, the maximum load resistance must not exceed 300 Ω.

7. Serial Communication Settings



nOnE : Disables all communication (default).

ModbUS : Enables MODBUS-RTU protocol; possible addresses range from 1 to 99 (see Communication Protocols Manual).

ASCII : ASCII bidirectional protocol; possible addresses: from 1 to 99 (see Communication protocols manual).

- MOduBO
- Mod td

CONtIn : Enables continuous weight transmission at a frequency set in the HERTZ parameter (10 to 300 Hz) (see Communication Protocols Manual).

- MOd t (set: PArItY = nOnE , StOP = I).
- Mod td (set: PArItY = nOnE ,StOP = I).

rIP : Continuous weight transmission protocol for remote displays, showing either net weight or gross weight, depending on the display configuration. Communication settings: Baud rate 9600, Parity None, Stop bits 1 (see Communication Protocols Manual).

HdrIP : This protocol allows continuous weight transmission to remote displays, displaying either net weight or gross weight depending on the display settings. (Baud rate: 9600, Parity: None, Stop bits: 1) (see Communication Protocols Manual).

HdrIPn : Continuous weight transmission protocol for remote displays (Baud rate: 9600, Parity: None, Stop bits: 1) (see Communication Protocols Manual).

YHL : Continuous weight transmission protocol.

bAUd : Baud Rate(1200, 2400, 4800, 9600, 19200, 38400, 115200; default: 9600).

Addr : Device address (from 1 to 99; default: 1).

HErtZ : The HERTZ parameter defines the maximum transmission frequency for weight data when using the CONTIN transmission protocol. Available frequency options include 10, 20, 30, 40, 50, 60, 70, 80, 100, 200, and 300 Hz (default: 10 Hz).

The maximum allowable HERTZ setting depends on the baud rate:

- 20 Hz with minimum baud rate 2400 baud.
- 40 Hz with minimum baud rate 4800 baud.
- 80 Hz with minimum baud rate 9600 baud.
- 100 Hz with minimum baud rate 19200 baud.
- 200 Hz with minimum baud rate 38400 baud.
- 300 Hz with minimum baud rate 38400 baud.

dELAY : Defines the response delay (0 to 200 ms, default: 0 ms). This is the time the instrument waits before replying to a command.

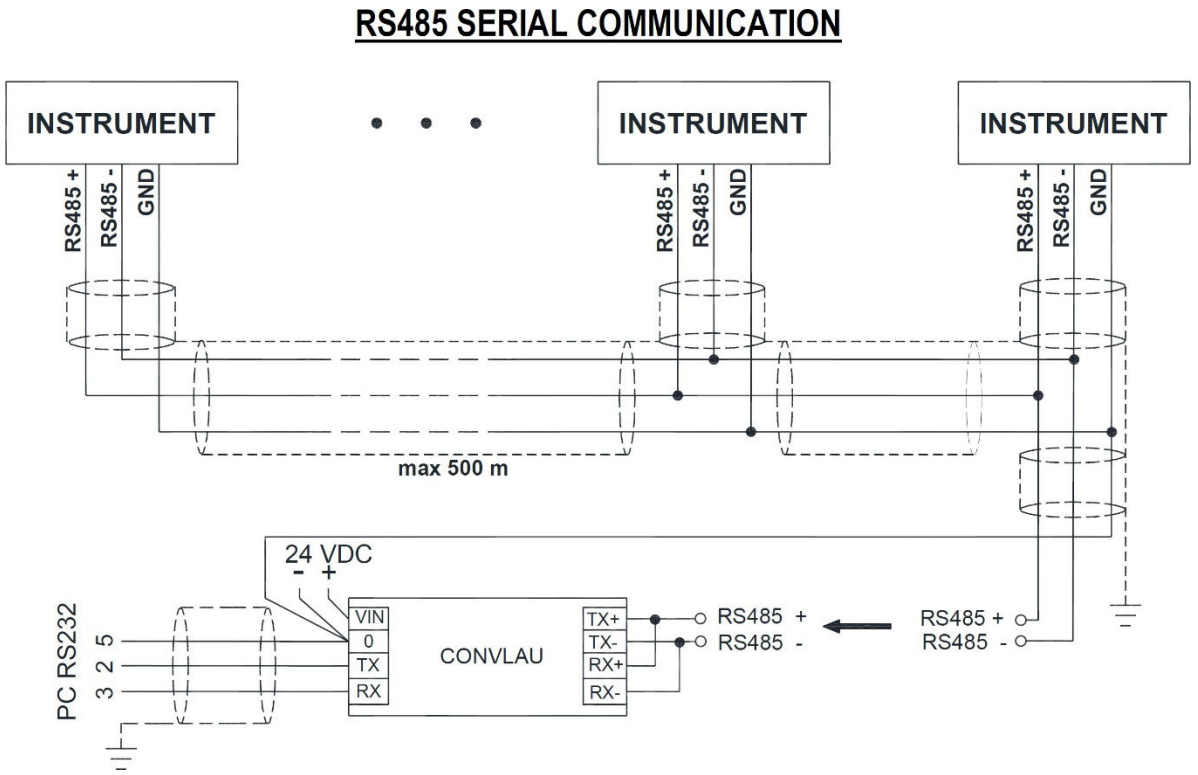
PArIty : Determines the error-checking method for serial communication:

- nOnE: no parity (default)
- EUEn: even parity
- Odd: odd parity.

StOP : Sets the number of stop bits used in transmission (1 or 2, default: 1).

For more information about protocols and methods of communication, request the proper manual to technical assistance.

7.1 RS485 Serial Communication



If the RS485 network exceeds 100 meters or if the baud rate is higher than 9600, two terminating resistors are required at both ends of the network.

To apply termination:

- Close the jumpers indicated in the diagram on the two furthest instruments in the network.
- If the network includes different instruments or converters, refer to their specific manuals to determine whether termination resistors are required.

Proper termination prevents signal reflections and ensures stable communication over long distances or at high baud rates.

7.2 RS485 to RS232 Direction Connection

A two-wire RS485 output can be directly connected to an RS232 input on a PC or remote display without requiring an RS485-to-RS232 converter. This allows for direct communication between the instrument and an RS232 device.

To establish this connection, follow the wiring method outlined in the diagram. Proper configuration of communication parameters (baud rate, parity, stop bits) is required to ensure compatibility between the RS485 device and the RS232 port.

Instrument		**RS232**
RS485 -	→	RXD
RS485 +	→	GND

7.3 Direction Connection Testing

Input Test:

In : Ensures correct input functionality. "**0**" is displayed for an **open** input, and "**1**" is displayed when the input is **closed**.

Output Test:

Out : Verifies output operation. Setting "0" ensures the corresponding output opens, while setting "1" ensures it closes.

Analog Output Option Test:

AnALOG : The analog signal will range between minimum and maximum values, starting from the minimum.

mA : Tests the current output.

VOLt : Tests the voltage output.

Milivolt Test:

mV-CEL : The analog signal will range between minimum and maximum values, starting from the minimum.

7.4 Info Menu

GEnrIC : The analog signal will range between minimum and maximum values, starting from the minimum.

- InStrN: Instrument Model
- SU CUd: Software Code
- FU UEr: Software Version
- SEr nu: Serial Number

8. Setpoint Configurations

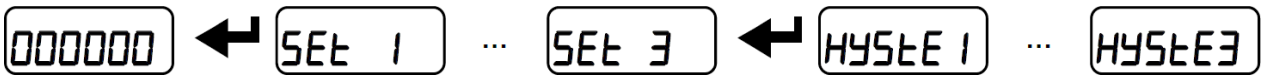
From the weight display, press ↵ to enter the setpoint setting menu.

↵ : To enter a menu/confirm the data entry.

▲ : To modify the displayed figure or menu item.

◀ : To select a new figure or modify the displayed menu item.

✕ : To cancel and return to the previous menu.



SEt Range: 0 to full scale (default: 0)

The setpoint defines the weight threshold at which relay switching occurs. When the measured weight exceeds the setpoint value, the corresponding relay activates.

The switching type (e.g., normally open, normally closed, hysteresis settings) can be configured in the Outputs and Inputs Configuration section.

HYStE Range: 0 to full scale (default: 0)

The hysteresis value is subtracted from the setpoint to determine when the relay deactivates as the weight decreases.

Example:

- Setpoint = 100
- Hysteresis = 10
- The relay activates when the weight exceeds 100.
- The relay deactivates when the weight drops below 90.

This prevents rapid relay switching due to minor fluctuations around the setpoint.

9. Setpoint Configurations

ErCEL	The load cell is either disconnected or incorrectly wired. The signal exceeds 39 mV, indicating that the A/D converter may be faulty or that the EX- and REF-, or EX+ and REF+ connections are missing for a 4-wire load cell. Incorrect or missing connections between excitation and reference terminals can also cause errors.
Er OL	Weight exceeds 110% of full scale.
Er Ad	A/D converter failure. Check load cell connections: contact technical support if the issue persists.
------	Weight exceeds maximum capacity by 9 divisions.
Er OF	Displayed weight exceeds the instrument's range (above 999999 or below -999999).
t-----	Weight is too high to allow zero setting.
MAH-PU	Appears in real calibration when the eighth sample weight entry has been reached.
Error	Parameter value is out of range. Press the designated key to exit without changes. Possible causes include exceeding the display's decimal limit, setting a value above the allowed maximum, sample weight verification mismatch, or analog output correction beyond permitted limits.
COLb	Menu items, keypad, or display are locked.
PSI dOn	The number cannot be displayed as it exceeds 999999 or is below -999999.
OrESnI	Gross weight is zero, preventing semi-automatic tare.
rE SUb	Communication issue with the fieldbus device.

Serial Protocol Alarms:

	ErCEL	Er OL	Er Ad	------	Er OF	t-----
MODE						
Bit LSB **Status Register MODBUS RTU**	76543210 xxxxxxx1	76543210 xxxx1xxx	76543210 xxxxxx1x	76543210 xxxxx1xx	76543210 On gross: xxx1xxxx On net: xx1xxxxx	The response to the zero command is a "value not valid" error (error code 3)
ASCII	O-F	O-L	O-F	O-L	O-F	&aa#CR
RIP*	O-F	O-L	O-F	O-L	O-F	O-F
HDRIP-N	_ERCEL	_ER_OL	_ER_AD	######	_ER_OF	O__SET
CONTIN	_ERCEL	_ER_OL	_ER_AD	^^^^^^	_ER_OF	O__SET

* For RIP remote displays, if the message exceeds five digits, the display shows - - - - - -

When an alarm is triggered, the relays open, and the analog outputs drop to their lowest possible value, as specified in the following table:

RANGE	**0-20 mA**	**4-20 mA**	**0-5 V**	**0-10 V**	**±10 V**	**±5 V**
Output value	-0.2 mA	3.5 mA	-0.5 V	-0.5 V	0 V	0 V

10. Reserved For Installer

10.1 Menu Locking

000000 ↵ CALIb This procedure enables you to restrict access to any menu on the instrument. To lock the menu, select the desired menu and press ✕◀▲ simultaneously for 3 seconds.

The display will indicate that the menu is C.CALIb

(the left point in the text denotes that this menu item is locked). If an operator attempts to access a locked menu, the system will deny access and display a message indicating the restriction. bLOC

10.2 Temporary Menu Locking

000000 ↵ CALIb Press ▲ and ◀ simultaneously for 3 seconds to temporarily unlock all menus, including those that were previously locked. Once you return to the weight display, the menu lock will automatically be reactivated.

10.3 Data Deletion And Program Selection

WARNING: These operations should only be performed after consulting technical assistance. Pressing ✕ will cancel the procedure and prevent any changes from being made.

Upon powering on the instrument, press and hold ✕ until the display shows PrOG. Then follow these steps:

1. When "PROG" is displayed, use the arrow keys to select **PASSU** Enter the **code 6935** and confirm.
2. Program Selection: Confirm PROG, then use the arrow keys to select the desired program.

bASE: Basic program with setpoint management only.

Select the appropriate approval status based on regulatory requirements:

- NOTLEG: Non-approved program.
- LEGAL: Approved program for single interval weighing.
- MULT-I: Approved program for multi-interval weighing.

Note:

For the approved programs listed above, please contact technical assistance to obtain the required manual and follow the correct approval procedures. You will need to provide the hardware code and serial number (see the Instrument Commissioning section for details).

If NOTLEG is not selected, choose the regulatory standard applicable to your region:

- OIML: Approved according to OIML standards.
- NTEP: Approved according to NTEP standards.
- INMETRO: Approved according to INMETRO standards.

Upon confirmation, the instrument will reset to its default settings, and all stored data will be erased.

If you do not have the specific manual for the newly selected program, you can request it from technical assistance to ensure proper setup and compliance.

10.4 Keypad Or Display Locking

To activate the lock function, press ✕ followed by ▲ and hold both keys for approximately 5 seconds. This operation can also be performed via the MODBUS and ASCII protocols.

FrEE : No lock is applied.

HEY : Keypad lock – When activated, pressing any key will display "BLOC" for 3 seconds, preventing any changes.

dI SP : Keypad and display lock – When activated, the keypad is locked, and the display will show only the instrument model instead of the weight. Pressing any key will display "BLOC" for 3 seconds.

Please **Contact Our Authorized Dealer** for Technical Assistance:

Notes:

V1.0.0
PN-250215

ISO 9001:2015 ISO 14001:2015 ISO 45001:2018

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