ENGLISH ENGLISH ENGLISH ENGLISH

User Manual
version 1.04

TLM8

CE 2014/30/UE

EN55022:2010 EN61000-6-2:2005 EN61000-6-4:2007

SYSTEM IDENTIFICATION

CE-M APPROVED EN45501:2015-2014/31/EU-OIML R76:2006

KEY TO SYMBOLS

Below are the symbols used in the manual to draw the reader's attention:

Warning! Risk of electrocution.

Warning! This operation must be performed by skilled workers.

Read the following indications carefully.

Further information.

GUARANTEE

24 months from the delivery document date. The guarantee covers only defected parts and includes the replacement parts and labour. All shipping and packing costs are paid by the customer. It is possible to have the repair in guarantee on condition that the returned product has not been transformed, damaged or repaired without authorization. No guarantee is applicable on returned products without the original label and/or serial number. No guarantee against misuse.
Batteries: Laumas provides 1 year guarantee from the date of delivery note, against material defects or battery manufacturing faults.

Disposal of Waste Equipment by Users in Private Households in the European Union

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. It is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help preserve natural resources and protect human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local waste disposal Authority or the equipment retailer.

TABLE OF CONTENTS

USER WARNINGS 1
RECOMMENDATIONS FOR CORRECT INSTALLATION OF WEIGHING INSTRUMENTS . 1
RECOMMENDATIONS FOR CORRECT INSTALLATION OF THE LOAD CELLS 1
LOAD CELL INPUT TEST (QUICK ACCESS) 3
LOAD CELL TESTING 3
MAIN SPECIFICATIONS OF THE INSTRUMENT 4
TECHNICAL SPECIFICATIONS 5
KEYS AND SYMBOLS FUNCTIONS 6
MENU MAP 7
SETPOINT 7
SYSTEM PARAMETERS 7
DISPLAY VISUALIZATIONS UPON INSTRUMENT SWITCH-ON 9
PROGRAMMING OF SYSTEM PARAMETERS 9
FILTER ON THE WEIGHT 9
ANTI PEAK 10
ALIBI MEMORY (ONLY FOR INSTRUMENTS WHERE THIS OPTION IS AVAILABLE) 11
ALIBI MEMORY READING 11
OUTPUTS AND INPUTS CONFIGURATION 12
SEMI-AUTOMATIC TARE (NET/GROSS) 13
PRESET TARE (SUBTRACTIVE TARE DEVICE) 14
SEMI-AUTOMATIC ZERO (WEIGHT ZERO-SETTING FOR SMALL VARIATIONS) 14
PEAK 15
ANALOG OUTPUT 15
SERIAL COMMUNICATION SETTING 16
RS485 SERIAL COMMUNICATION 18
DIRECT CONNECTION BETWEEN RS485 AND RS232 WITHOUT CONVERTER 18
AUTOMATIC DIAGNOSTICS OF LOAD DISTRIBUTION 19
TEST 20
EVENTS LOG 21
INFO MENU 21
SETPOINT PROGRAMMING 22
USE WITH W SERIES INSTRUMENTS 23
CONNECTION TO THE WEIGHT INDICATOR 23
ADDITIONAL MENU MAP 24
TLM8 REMOTE CONTROL 25
REMOTE KEYPAD LOCKING 25
ADDITIONAL ALARMS 25
ALARMS 26
PRINTING EXAMPLES 28
INFORMATION ON TYPE-APPROVED INSTRUMENTS IN THE EUROPEAN UNION 30

DECLARATION OF CONFORMITY - EU 31

USER WARNINGS

RECOMMENDATIONS FOR THE PROPER USE OF WEIGHING INSTRUMENT

- Keep away from heat sources and direct sunlight
- Repair the instrument from rain (except special IP versions)
- Do not wash with water jets (except special IP versions)
- Do not dip in water
- Do not spill liquid on the instrument
- Do not use solvents to clean the instrument
- Do not install in areas subject to explosion hazard (except special Atex versions)

RECOMMENDATIONS FOR CORRECT INSTALLATION OF WEIGHING INSTRUMENTS

The terminals indicated on the instrument's wiring diagram to be connected to earth must have the same potential as the weighed structure (same earthing pit or earthing system). If you are unable to ensure this condition, connect with an earthing wire the terminals of the instrument (including the terminal – SUPPLY) to the weighed structure.
The cell cable must be individually led to its panel input and not share a conduit with other cables; connect it directly to the instrument terminal strip without breaking its route with support terminal strips.
Use "RC" filters on the instrument-driven solenoid valve and remote control switch coils.
Avoid inverters in the instrument panel; if inevitable, use special filters for the inverters and separate them with sheet metal partitions.
The panel installer must provide electric protections for the instruments (fuses, door lock switch etc.).
It is advisable to leave the equipment always switched on to prevent the formation of condensation.

MAXIMUM CABLE LENGTHS

- RS485: 1000 metres with AWG24, shielded and twisted cables
- Analog current output: up to 500 metres with 0.5 mm^2 cable
- Analog voltage output: up to 300 metres with 0.5 mm^2 cable

RECOMMENDATIONS FOR CORRECT INSTALLATION OF THE LOAD CELLS

INSTALLING LOAD CELLS: The load cells must be placed on rigid, stable in-line structures; it is important to use the mounting modules for load cells to compensate for misalignment of the support surfaces.

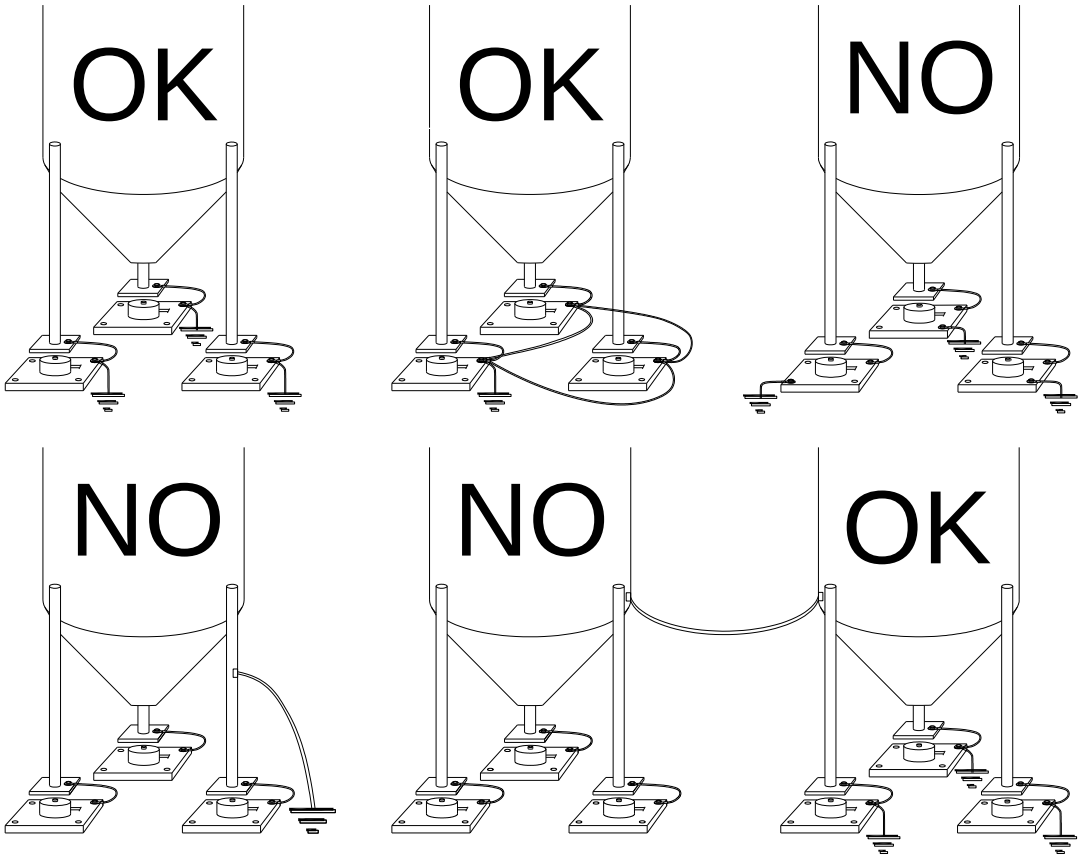
PROTECTION OF THE CELL CABLE: Use water-proof sheaths and joints in order to protect the cables of the cells.

MECHANICAL RESTRAINTS (pipes, etc.): When pipes are present, we recommend the use of hoses and flexible couplings with open mouthpieces with rubber protection; in case of hard pipes, place the pipe support or anchor bracket as far as possible from the weighed structure (at a distance at least 40 times the diameter of the pipe).
WELDING: Avoid welding with the load cells already installed. If this cannot be avoided, place the welder ground clamp close to the required welding point to prevent sending current through the load cell body.

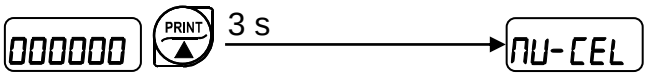
WINDY CONDITIONS - KNOCKS - VIBRATIONS: The use of weigh modules is strongly recommended for all load cells to compensate for misalignment of the support surfaces. The system designer must ensure that the plant is protected against lateral shifting and tipping relating to: shocks and vibration; windy conditions; seismic conditions in the installation setting; stability of the support structure.

EARTHING THE WEIGHED STRUCTURE: By means of a copper wire with suitable cross-section, connect the cell upper support plate with the lower support plate, then connect all the lower plates to a single earthing system. Electrostatic charges accumulated because of the product rubbing against the pipes and the weighed container walls are discharged to the ground without going through or damaging the load cells. Failure to implement a proper earthing system might not affect the operation of the weighing system; this, however, does not rule out the possibility that the cells and connected instrument may become damaged in the future. It is forbidden to ensure earthing system continuity by using metal parts contained in the weighed structure.

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



LOAD CELL INPUT TEST (QUICK ACCESS)



From the weight display, press ▲ for 3 seconds: the top of the display shows the gross weight; the bottom shows the response signal of each load cell expressed in mV with three decimals.
Example: a load cell with 2.000 mV/V sensitivity provides a response signal between 0 and 10 mV.

LOAD CELL TESTING

Load cell resistance measurement (use a digital multimeter):

- Turn off the instrument.
- The value between the positive signal wire and the negative signal wire must be equal or similar to the one indicated in the load cell data sheet (output resistance).
- The value between the positive excitation wire and the negative excitation wire must be equal or similar to the one indicated in the load cell data sheet (input resistance).

Load cell voltage measurement (use a digital multimeter):

- Turn on the instrument.
- Take out the load cell to be tested from underneath the container, or alternatively, lift the container support.
- Make sure that the excitation of two wires of the load cell connected to the instrument (or amplifier) is 5 VDC ±3%.
- Measure the response signal between the positive and the negative signal wires by directly connecting them to the tester, and make sure that it is comprised between 0 and 0.5 mV.
- Apply load to the cell and make sure that there is a signal increment.

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

MAIN SPECIFICATIONS OF THE INSTRUMENT

Weight transmitter with 6-wire load cells inputs suitable for assembly on back panel fitted Omega/DIN rail. Dimensions: 148x92x60 mm. Backlit LCD graphic display, 128x64 pixel resolution, 60x32 mm viewing area. 5-key keypad.
16 bit analog output (tension or current).
RS485 serial port for connection to: PC/PLC up to 32 instruments (max 99 with line repeaters) by ASCII Laumas or ModBus R.T.U. protocol, remote display, printer. Optional: integrated Profibus DP, DeviceNet, CANopen, Profinet IO, Ethernet/IP, Ethernet TCP/IP, Modbus TCP, RS232/RS485, SERCOS III, PowerLink, CC-Link output.

8 independent channels:automatic detection of connected load cells.
Digital equalization: load cell response uniformed via software.
Load distribution: graph showing the weight percentage on each load cell.
Automatic diagnostics: load distribution check to detect any faults.
Events log: storage of the last 50 events: calibrations, zero-settings, errors, equalizations.
Alarm Relay: outputs can be set to switch in case of alarm.

TECHNICAL SPECIFICATIONS

POWER SUPPLY and CONSUMPTION **(VDC)**	12/24 VDC ±10%; 5 W
NO. OF LOAD CELLS IN PARALLEL and SUPPLY	max 16 (350 ohm); 5 VDC / 240 mA
LINEARITY	< 0.01% F.S.
ANALOG OUTPUT LINEARITY	< 0.01% F.S.
THERMAL DRIFT	< 0.0005% F.S./°C
ANALOG OUTPUT THERMAL DRIFT	< 0.003 % F.S./°C
A/D CONVERTER	8 channels, 24 bit (16000000 points), 4.8 kHz
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	600 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	11 levels / 5÷600 Hz
RELAY OUTPUTS	N. 5 - max 115 VAC; 150 mA
DIGITAL INPUTS	N. 3 - optoisolated 5 - 24 VDC PNP
SERIAL PORTS	RS485
BAUD RATE	2400, 4800, 9600, 19200, 38400, 115200
HUMIDITY (non condensing)	85%
STORAGE TEMPERATURE	-30°C +80°C
WORKING TEMPERATURE	-20°C +60°C
ANALOG OUTPUT 16 bit - 65535 divisions	0÷20 mA; 4÷20 mA (max 400 ohm); 0÷10 V; 0÷5 V (min 2 kohm)

METROLOGICAL SPECIFICATIONS OF TYPE-APPROVED INSTRUMENTS	
APPLIED STANDARDS	2014/31/EU; OIML R76:2006; EN45501:2015
OPERATION MODE	single interval, multi-interval, multiple range
ACCURACY CLASS	III or IIII
MAX NUMBER OF SCALE VERIFICATION DIVISIONS	10000 (class III); 1000 (class IIII)
MINIMUM INPUT SIGNAL FOR SCALE VERIFICATION DIVISION	0.2 µV
WORKING TEMPERATURE	-10°C +40°C

KEYS AND SYMBOLS FUNCTIONS

KEY	Short press	Long press (3 s)	Into menus
→0← ESC	Semi-automatic zero		Cancel or return to previous menu
TARE ◀	Gross → Net	Net → Gross	Select figure to be modified or go to previous menu item.
PRINT ▲	Weight print	mV load cell test	Modify selected figure or go to next menu item
MENU ENTER	Setting setpoint and hysteresis		Confirm or enter in submenu
MENU ENTER + →0← ESC	Setting general parameters (press MENU ENTER immediately followed by →0← ESC)		
MENU ENTER + TARE ◀	Setting preset tare (press MENU ENTER immediately followed by TARE ◀)		
TEST	Load distribution display		

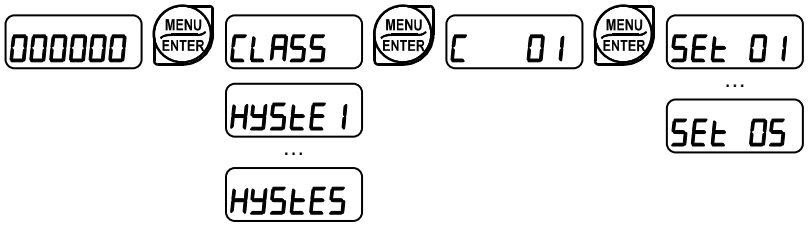
SYMBOL	Function
NET	net weight (semi-automatic tare or preset tare)
→0←	zero (deviation from zero not more than ±0.25 divisions)
◣◢	stability
kg	unit of measure: kg
g	unit of measure: g
1 2 3	current range in multiple range or multi-interval instruments

i The symbols are activated in sequence within the menus to indicate that the display is not showing a weight.

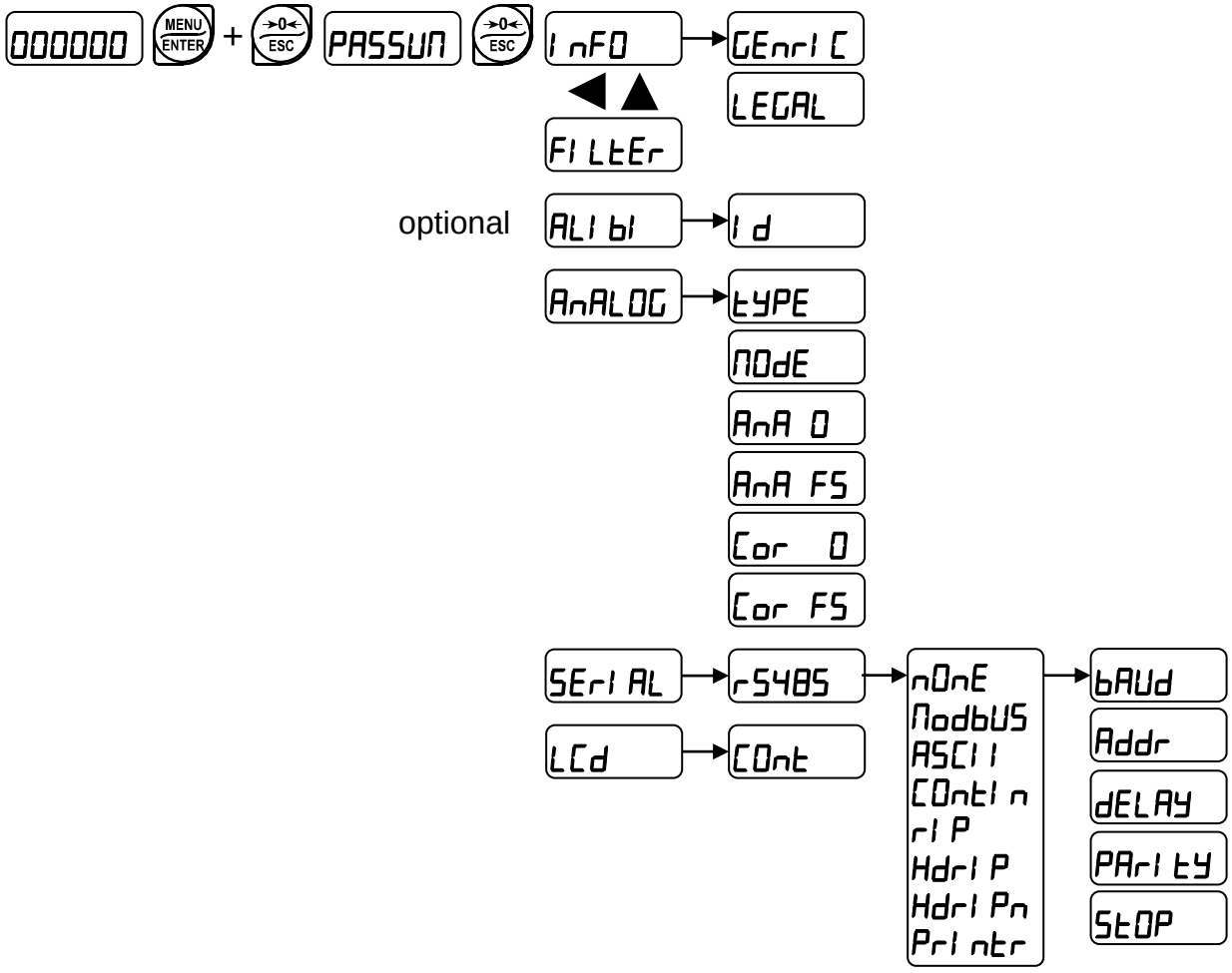
MENU MAP

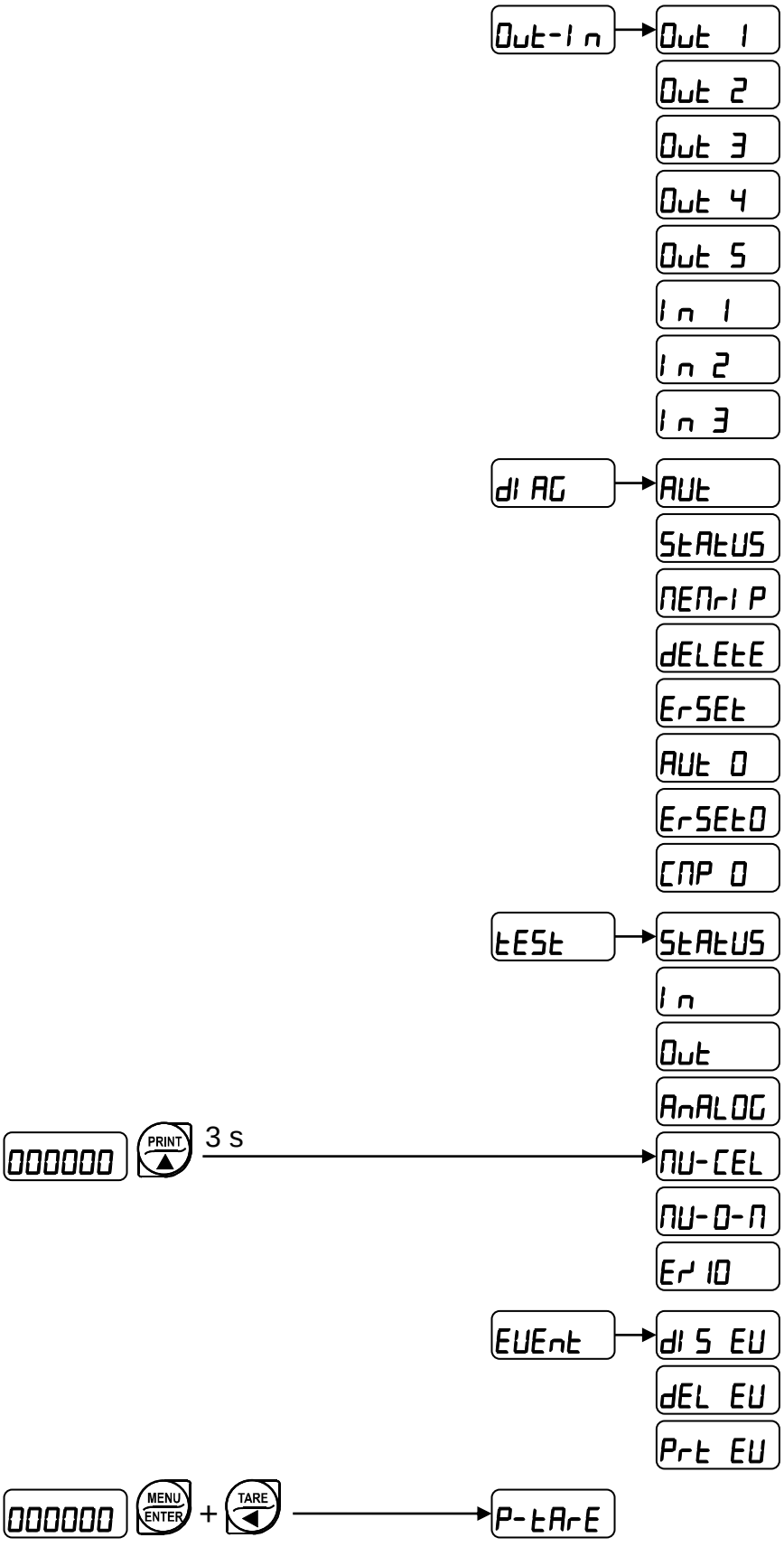
Into menus changes are applied right after pressing the ENTER key (no further confirmation is required).

SETPOINT



SYSTEM PARAMETERS




Out-In
Out 1
Out 2
Out 3
Out 4
Out 5
In 1
In 2
In 3
diAG
AUt
StAtUS
MEMrIP
dELEtE
ErSEt
AUt 0
ErSEt0
CAP 0
tESt
StAtUS
In
Out
AnALOG
000000
PRINT
3 s
nU-CEL
nU-0-n
Er 10
EUEnt
dIS EU
dEL EU
Prt EU
000000
MENU ENTER
+
TARE
P-tArE

DISPLAY VISUALIZATIONS UPON INSTRUMENT SWITCH-ON

Upon switch-on, the display shows in sequence:
- 111111 → 999999 (ONLY in case of approved program);
- instrument model (e.g.: tLMB);
- SU followed by the software code (e.g.: SU 100);
- program type: bASE (base);
- r followed by the software version (e.g.: r 1.04.01);
- HU followed by the hardware code (e.g.: HU 600);
- serial number (e.g.: 1005 15);

PROGRAMMING OF SYSTEM PARAMETERS

From the weight display, press simultaneously keys MENU and ESC to access the parameter setting.

MENU/ENTER: 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.
ESC: to cancel and return to the previous menu.

FILTER ON THE WEIGHT

000000 (MENU/ENTER) + (→0←/ESC) PASSUN (→0←/ESC) InFO ◀▲ FILtEr

Setting this parameter allows a stable weight display to be obtained.
To increase the effect (weight more stable) increase the value (from 0 to 9, default 4).
As seen in the diagram:
- By confirming the FILtEr message, the currently programmed filter value is displayed.
- By changing and confirming the value, the weight is displayed and it will be possible to experimentally verify its stability.
- If stability is not satisfactory, confirming brings back the message FILtEr and the filter may be modified again until an optimum result is achieved.

The filter enables to stabilise a weight as long as its variations are smaller than the corresponding "response time". It is necessary to set this filter according to the type of application and to the full scale value set.

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
A	6	600

The "A" filter can only be set if the instrument is connected to one load cell only.

ANTI PEAK

When the weight is stable, the anti peak filter removes any sudden disturbances with a maximum duration of 1 second. Confirm the filter on the weight with ENTER and select one of the following options:

- AntPOn: anti peak filter enabled (default);
- AntPOF: anti peak filter disabled.

ALIBI MEMORY (ONLY FOR INSTRUMENTS WHERE THIS OPTION IS AVAILABLE)

000000 (MENU ENTER) + (→0← ESC) PASSUN (→0← ESC) InFO ◀▲ ALIbI

To save a weight to the alibi memory press the key ▲ for less than 3 seconds or close the dedicated input or send the command via serial protocol (see the Protocols manual).
If the net function is active, the net weight is stored; otherwise, the gross weight is stored.
Saving to the alibi memory is only possible if:

- the alibi memory is enabled;
- the weight is stable;
- the weight is above the minimum weight (20 e);
- the weight is below the max capacity;
- the weight has changed since the latest storage to alibi.

An identifying number is automatically assigned to each record stored in the memory, it increases for stored records from 1 to 999999, and is automatically reset to 1 after reaching 999999.

WARNING: the alibi memory cannot store all the 999999 records; the number of records that can be stored depends on the instrument type and on the program used.
The alibi memory is used in a "circular" manner: when the memory end is reached, the system will restart from the memory beginning by overwriting the first record; an alarm message is displayed (ALI FUL).

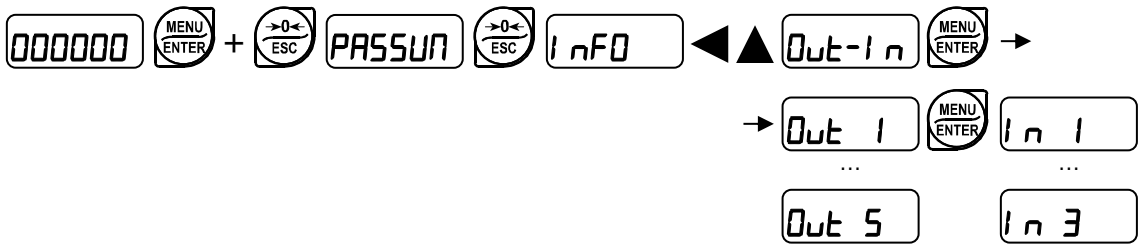
ALIBI MEMORY READING

Id (identification): enter the ID number of your required record and confirm, the display will show:

- Gross weight (GrOSS) or net weight (nEt); confirm with ENTER;
- Tara weight (tArE) or preset tare (PtArE), only if the recalled weight is a net weight; confirm with ENTER;

The parameter provides the ID of the last record stored in Alibi Memory by default.
If the entered identifier does not match any record, the message ErrOr is displayed.

OUTPUTS AND INPUTS CONFIGURATION



OUTPUTS

The outputs are set by default as follows: OPEn / SEt / GrOSS / POSnEG / OFF.

Possible operation modes:

- OPEn **(normally open)**: the relay is de-energised and the contact is open when the weight is lower than the programmed setpoint value; it closes when the weight is higher than or equal to the programmed setpoint value.
- CLOSE **(normally closed)**: the relay is energised and the contact is closed when the weight is lower than the programmed setpoint value; it opens when the weight is higher than or equal to the programmed setpoint value.

- SEt: the contact will switch on the basis of weight, according to setpoint (see section **SETPOINT PROGRAMMING**).
- PLC: the contact will not switch on the basis of weight, but is controlled by remote protocol commands.
- StAbLE: relay switching occurs when the weight is stable.
- ALArM: relay switching occurs when one of the following alarms is triggered: ErCEL, ErCELr, ErCEL I, Er OL, Er Ad, ------, Er OF; the operation mode is forced to CLOSE (normally closed).

If the operation mode SEt is selected, the following options are also active:

- GrOSS: the contact will switch on the basis of gross weight.
- nEt: the contact will switch on the basis of net weight (If the net function is not active, the contact will switch on the basis of gross weight).

- POSnEG: relay switching occurs for both positive and negative weight values.
- POS: relay switching occurs for positive weight values only.
- nEG: relay switching occurs for negative weight values only.

By confirming with ENTER the setpoint operation can be set to the value 0:

- OFF: relay switching will not occur if the setpoint value is 0.
- On:
  - setpoint = 0 and switching = POSnEG: relay switching occurs when the weight is 0; the relay will switch again when the weight is different from zero, taking hysteresis into account (both for positive and for negative weights).
  - setpoint = 0 and switching = POS: relay switching occurs for a weight higher than or equal to 0, the relay will switch again for values below 0, taking hysteresis into account.
  - setpoint = 0 and switching = nEG: relay switching occurs for a weight lower than or equal to 0, the relay will switch again for values above 0, taking hysteresis into account.

INPUTS

Default: input 1 = 2Er0 input 2 = nE-L0 input 3 = PEAH

Possible operation modes:

- nE-L0 (NET/GROSS): by closing this input for no more than one second, it's making an operation of SEMI-AUTOMATIC TARE and the display will show the net weight. To display the gross weight again, hold the NET/GROSS input closed for 3 seconds.
- 2Er0: by closing the input for no more than one second, the weight is set to zero (see section **WEIGHT ZERO-SETTING FOR SMALL VARIATIONS (SEMI-AUTOMATIC ZERO)**).
- PEAH: keeping the input closed the maximum weight value reached remains on display. Opening the input the current weight is displayed.
- PLC: closing the input no operation is performed, the input status may however be read remotely by way of the communication protocol.
- C0nt1 n: closing the input for max one second the weight is transmitted over the serial connection according to the fast continuous transmission protocol only once (**only if C0nt1 n is set in the item SEr1 AL**).
- C0EFF: when the input is closed the weight is displayed based on the set coefficient (see setting of the units of measure and coefficient), otherwise the weight is displayed.
- Pr1 ntr: when the input is closed the data are sent for printing if in the communication protocol of either serial port the parameter Pr1 ntr is set. If the alibi memory is active, data storage is carried out too.

SEMI-AUTOMATIC TARE (NET/GROSS)

THE SEMI-AUTOMATIC TARE OPERATION IS LOST UPON INSTRUMENT POWER-OFF.

To perform a net operation (SEMI-AUTOMATIC TARE), close the NET/GROSS input or press the TARE key for less than 3 seconds. The instrument displays the net weight (just set to zero) and the NET symbol lights up. To display the gross weight again, keep the NET/GROSS input closed or press TARE for 3 seconds.
This operation can be repeated many times by the operator to allow the loading of several products.

Example:
Put the box on the scale, the display shows the box weight; press TARE, the display shows the net weight to zero; introduce the product in the box, the display shows the product weight. This operation can be repeated several times.

While the net weight is displayed, keep ▲ pressed to display gross weight. When the key is released the net weight will be displayed again.

The semi-automatic tare operation is not allowed if the gross weight is zero or negative or unstable or above the maximum capacity.

PRESET TARE (SUBTRACTIVE TARE DEVICE)

000000 (MENU ENTER) + (TARE) P-tArE

It is possible to manually set a preset tare value to be subtracted from the display value provided that the P-tArE ≤ max capacity condition is verified. In multi-interval instruments, the max permitted value is Max1 (max capacity of range 1).

By default the instrument shows the last programmed preset tare value: to apply it press ▲ and then ENTER.
After setting the tare value, going back to the weight display, the display shows the net weight (subtracting the preset tare value) and the NET symbol lights up to show that a tare has been entered. To delete a preset tare and return to gross weight display, hold down TARE for about 3 seconds or keep the NET/GROSS input (if any) closed for the same length of time (3 seconds). The preset tare value is set to zero. The NET symbol is turned off when the gross weight is displayed once again.

While the net weight is displayed, keep ▲ pressed to display the preset tare. When the key is released the net weight will be displayed again.

- **IF A SEMI-AUTOMATIC TARE (NET) IS ENTERED, IT IS NOT POSSIBLE TO ACCESS THE ENTER PRESET TARE FUNCTION.**
- **IF A PRESET TARE IS ENTERED, IT'S STILL POSSIBLE TO ACCESS THE SEMI-AUTOMATIC TARE (NET) FUNCTION. THE TWO DIFFERENT TYPES OF TARE ARE ADDED.**

ALL THE SEMI-AUTOMATIC TARE (NET) AND PRESET TARE FUNCTIONS WILL BE LOST WHEN THE INSTRUMENT IS TURNED OFF.

SEMI-AUTOMATIC ZERO (WEIGHT ZERO-SETTING FOR SMALL VARIATIONS)

By closing the SEMI-AUTOMATIC ZERO input, the weight is set to zero; alternatively, by pressing the →0← key for less than 3 seconds, the StOrEP message is displayed for 3 seconds, by pressing ENTER the weight is set to zero. The zero-setting will be lost upon instrument power-off.
This function is only allowed when:

- the weight is stable; otherwise the unStbL alarm appears;
- the combined effect of the semi-automatic zero and zero tracking does not exceed 2% of the maximum capacity, otherwise the alarm E ----- appears.

PEAK

By keeping the PEAK input closed the maximum weight value reached remains displayed. By opening the input the current weight is displayed.

Peak values have no legal validity.

ANALOG OUTPUT

000000 (MENU ENTER) + (→0← ESC) PASSUN (→0← ESC) InFO ◀▲ AnALOG

- tYPE: it selects the analog output type (4÷20 mA, 0÷20 mA, 0÷10 V, 0÷5 V; default: 4÷20 mA).
- MOdE: choice of a weight followed by the analog output: gross (GrOSS) or net (nEt). If the net function is not active, the analog output varies according to gross weight.
- AnA 0: set the weight value for which you wish to obtain the minimum analog output value.

Only set a value different from zero if you wish to limit the analog output range; for instance: for a full scale value of 10000 kg you require an 4 mA signal at 5000 kg and 20 mA at 10000 kg, in this case, instead of zero, set 5000 kg.

- AnA FS: set the weight value for which you wish to obtain the maximum analog output value; it must correspond to the value set in the PLC program (default: calibration full scale). E.g.: if I am using a 4÷20 mA output and in the PLC program I wish to have 20 mA = 8000 kg, I will set the parameter to 8000.
- COr 0: analog output correction to zero: if necessary adjust the analog output, allowing the PLC to indicate 0. The sign "-" can be set for the last digit on the left. E.g.: if I use a 4÷20 mA output and, with the minimum analog setting, the PLC or tester read 4.1 mA, I must set the parameter to 3.9 to obtain 4.0 on the PLC or tester.
- COr FS: correction of analog output to full scale: if necessary permit modification of the analog output by allowing PLC to indicate the value set in the parameter AnA FS. E.g. if I am using a 4÷20 mA output with the analog set to full scale and the PLC or tester reads 19.9 mA, I must set the parameter to 20.1 to get 20.0 on the PLC or tester.

Minimum and maximum values which can be set for zero and full scale corrections:

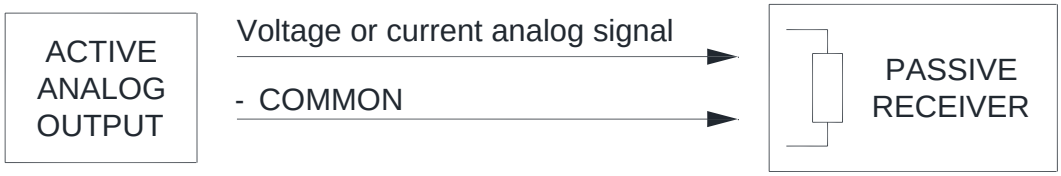
ANALOG OUTPUT TYPE	Minimum	Maximum
0÷10 V	-0.150	10.200
0÷5 V	-0.150	5.500
0÷20 mA	-0.200	22.000
4÷20 mA	-0.200	22.000

NOTE: the analog output may also be used in the opposite manner, i.e. the weight setting that corresponds to the analog zero (*AnA 0*) may be greater than the weight set for the analog full scale (*AnA FS*). The analog output will increase towards full scale as the weight decreases; the analog output will decrease as the weight increases.

For example:
***AnA 0* = 10000** ***AnA FS* = 0** **analog output 0÷10 V**

Weight = 0 kg analog output = 10 V
Weight =5000 kg analog output = 5 V
Weight =10000 kg analog output = 0 V

All analog outputs of the instrument are ACTIVE and SINGLE ENDED type, therefore they can be connected only to PASSIVE receiver devices. The minimum load allowed for voltage outputs is 2 kohm, the maximum load allowed for current outputs is 400 ohm.



SERIAL COMMUNICATION SETTING

000000 (MENU ENTER) + (→0← ESC) PASSUN (→0← ESC) InFO ◀▲ SErIAL (MENU ENTER) rS485

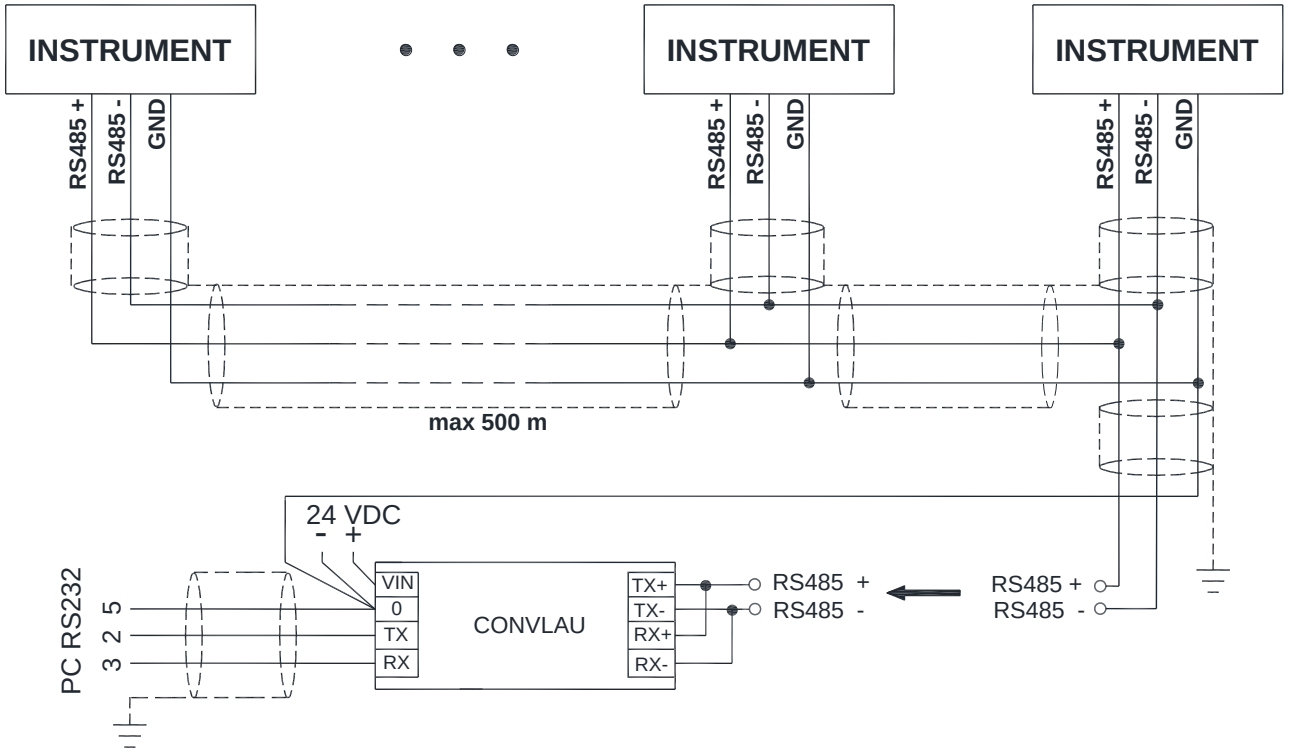
- *nOnE*: it disables any type of communication (default).
- *ModbUS*: MODBUS-RTU protocol; possible addresses: from 1 to 99 (see Communication protocols manual).
- *ASCII* : ASCII bidirectional protocol; possible addresses: from 1 to 99 (see Communication protocols manual).
  - *MOdU60*
  - *MOd td*
- *CONtIn*: continuous weight transmission protocol (see Communication protocols manual), at the frequency set in *HErt2* item (from 10 to 300).
  - *MOd t* (set: *PArIty* = *nOnE*, *StOP* = *1*).
  - *MOd td* (set: *PArIty* = *nOnE*, *StOP* = *1*).
- *rIP*: continuous weight transmission protocol to RIP5/20/60, RIP50SHA, RIPLED series remote displays; the remote display shows the net weight or gross weight according to its settings (set: *bAUd* = *9600*, *PArIty* = *nOnE*, *StOP* = *1*).
- *HdrIP*: continuous weight transmission protocol to RIP6100, RIP675, RIP6125C series remote displays; the remote display shows the net weight or gross weight according to its settings (set: *bAUd* = *9600*, *PArIty* = *nOnE*, *StOP* = *1*).

- HdrI Pn: continuous weight transmission protocol to RIP6100, RIP675, RIP6125C series remote displays (set: bAUd = 9600, PArI tY = nOnE, StOP = 1).
  When the remote display is set to gross weight:
  - if the instrument displays the gross weight, the remote display shows the gross weight.
  - if the instrument shows the net weight, the remote display shows the net weight alternated with the message nEt.
- PrI ntr: printer.

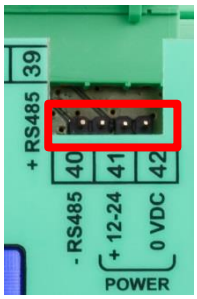
  - bAUd: transmission speed (2400, 4800, 9600, 19200, 38400, 115200; default: 9600).
  - Addr: instrument address (from 1 to 99; default: 1).
  - HErt2: maximum transmission frequency (10 – 20 – 30 – 40 – 50 – 60 – 70 – 80 – 100 – 200 – 300; default: 10); to be set when the COntI n transmission protocol is selected.
    Maximum setting frequency **(**HErt2**)**:
    - 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: delay in milliseconds which elapses before the instrument replies (from 0 to 200 ms; default: 0).
  - PArI tY:
    - nOnE: no parity (default).
    - EUEn: even parity.
    - Odd: odd parity.
  - StOP: stop bit (1 – 2; default: 1).
  - St bI t: stability character (YES – nO; default: nO); to be set when the COntI n transmission protocol is selected in nOd t mode (see section **CONTINUOUS FAST WEIGHT TRANSMISSION PROTOCOL** in Protocols manual).
  - nCOPY: number of copies(1 – 9; default: 1).
  - EMPtY: number of blank lines between one printout and the next.
  - HEAdEr: printing of custom heading from PC (YES – nO; default: nO).
  - PrtMOd: connected printer type:
    - P 190
    - StAUP
    - StAUt

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

RS485 SERIAL COMMUNICATION



If the RS485 network exceeds 100 metres in length or baud-rate over 9600 are used, two terminating resistors are needed at the ends of the network: close the two jumpers indicated in the picture on the furthest instruments. Should there be different instruments or converters, refer to the specific manuals to determine whether it is necessary to connect the above-mentioned resistors.



DIRECT CONNECTION BETWEEN RS485 AND RS232 WITHOUT CONVERTER

Since a two-wire RS485 output may be used directly on the RS-232 input of a PC or remote display or printer, it is possible to implement instrument connection to an RS-232 port in the following manner:

INSTRUMENT		RS232
RS485 –	→	RXD
RS485 +	→	GND

This type of connection allows A SINGLE instrument to be used in a ONE WAY mode.

AUTOMATIC DIAGNOSTICS OF LOAD DISTRIBUTION

000000 (MENU ENTER) + (→0← ESC) PASSUN (→0← ESC) INFO ◀▲ dI AC

Only use this function in systems where load distribution can be repeated with each change of weight (for example: liquid weighing).

- AUt (YES/nO; default: nO): it enables load diagnostics.
- StAtUS: it displays the active channels status (weight, load percentage on each channel, enabled channels and/or channels in error).
- MEMrI P: it displays stored load distributions (weight, load percentage on each channel).
- dELEtE: it deletes stored load distributions; confirmation is requested (SUrE?),press ENTER to proceed or press ESC to cancel.
- ErSEt (default: 5.0): difference between the current and stored percentage beyond which the ErdI AC alarm is triggered.
- AUt 0 (YES/nO; default: nO): it enables diagnostics on zero.
- ErSEt0 (default: 5.0): difference between the current and stored percentage beyond which the ErdI AC alarm is triggered.
- CONP 0: it displays current load distribution on zero and the one previously stored (weigh, load percentage on each channel).

Load diagnostics: the instrument, with stable weight, calculates and stores the load percentage on each channel. If under normal operation the load percentage error is higher than the value set in parameter ErSEt, the display shows the ErdI AC alarm alternated with the weight; the alarm remains active also upon instrument power-off, press ENTER to cancel.

Diagnostics on zero: if with unloaded system the load percentage error is higher than the value set in parameter ErSEt0, the display shows the ErdI AC alarm alternated with the weight; the alarm remains active also upon instrument power-off, press ENTER to cancel.

Diagnostics on zero is only available if it has been enabled during the installation.

Example of current load distribution display: the top of the display shows the weight on the scale; the bottom shows the load percentage on each active channel.
This screen can also be accessed directly from the weight display by pressing the TEST key.

000000 (MENU ENTER) + (→0← ESC) PASSUN (→0← ESC) InFO ◀▲ tESt

- **Load distribution:**

  StAtUS: it displays the active channels status (weight, load percentage on each channel, enabled channels and/or channels in error). This menu can also be accessed directly from the weight display by pressing the TEST key.

- **Input Test:**

  In: ensure that for each open input 0 is displayed, 1 is displayed when the input is closed.

- **Output Test:**

  Out: setting 0 ensure that the corresponding output opens. Setting 1 ensure that the corresponding output closes.

- **Analog Output Option Test:**

  AnALOG: It allows the analog signal to range between the minimum and the maximum values starting from the minimum.

  nA: current output test.

  UOLt: voltage output test.

- **Millivolt Test:**

  nU-CEL: it displays the response signal of each load cell expressed in mV with three decimals.

- **Millivolt stored at zero setting (only if AUt 0 = YES):**

  nU-0-n: it displays the response signal of each load cell expressed in mV with three decimals.

- **Weight in E/10 test:**

  Er 10: it displays the current weight in tenths of E, for testing purposes.

EVENTS LOG

000000 (MENU/ENTER) + (→0←/ESC) PASSUN (→0←/ESC) InFO ◀▲ EUEnt

The instrument can store up to 50 events; the oldest records are overwritten.

- dIS EU: it displays the last 50 events stored, starting from the most recent one:
  - 2Er0: zero-setting from the calibration menu, press ENTER to display the value set to zero.
  - FtE0: theoretical calibration, press ENTER to display the full scale set.
  - FrEA: real calibration, press ENTER to display the sample weight used.
  - InP0: tare setting via the keypad, press ENTER to display the set value.
  - dIAG: load distribution error, press ENTER to display the weight value that triggered the alarm, press ENTER again to display the difference between the load percentage and the stored value.
  - ALL: weight alarm, press ENTER to display the alarm type.
  - dELr: load distribution deletion.
  - E9U: equalization.
  - CHn: modification or deletion of the manual selection of active channels.
- dEL EU: it deletes stored events; confirmation is requested (SUrE?),press ENTER to proceed or press ESC to cancel.
- Prt EU: it prints all events.

INFO MENU

000000 (MENU/ENTER) + (→0←/ESC) PASSUN (→0←/ESC) InFO

GEnrI C: the identification data of the instrument are displayed.

- InStrN: instrument model
- SU Cod : software code
- PrOGrN: program type
- FU UEr: software version
- SEr nu: serial number

LEGAL: the main legally relevant parameters are displayed.

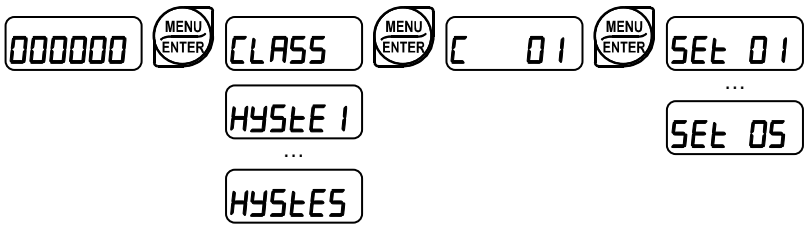
- PrOG: approval status of the instrument
- rEFnUN: number of qualified accesses
- FS-tE0: system full scale
- SEnSI b: rated sensitivity of the load cells
- E: scale verification division for single interval instruments
- E 1: scale verification division for the first range of multi-interval or multiple range instruments
- E2: scale verification division for the second range of multi-interval or multiple range instruments
- E3: scale verification division for the third range of multi-interval or multiple range instruments

- MAH: maximum capacity for single interval instruments
- MAH 1: maximum capacity of range 1 for multi-interval or multiple range instruments
- MAH2: maximum capacity of range 2 for multi-interval or multiple range instruments
- MAH3: maximum capacity of range 3 for multi-interval or multiple range instruments
- G CAL: gravity acceleration value in the calibration area
- G USE: gravity acceleration value in the place of use
- tErCOr: weight correction depending on temperature
- rELOAd: restoring the printing/storage function
- unit C: valid unit of measure when the coefficient function is active
- COEFF: weight display change coefficient
- EnAbLE: alibi memory status

SETPOINT PROGRAMMING

From the weight display, press MENU to access the setpoint setting.

MENU/ENTER: 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.
ESC: to cancel and return to the previous menu.



- SEt (from 0 to max full scale; default: 0): Setpoint; relay switching occurs when the weight exceed the value set in this parameter. The type of switching is settable (see section **OUTPUTS AND INPUTS CONFIGURATION**).

- HYStE (from 0 to max full scale; default: 0): Hysteresis, value to be subtracted from the setpoint to obtain contact switching for decreasing weight. For example with a setpoint at 100 and hysteresis at 10, the switching occurs at 90 for decreasing weight.

USE WITH W SERIES INSTRUMENTS

When the TLM8 is used in combination with a W serie instrument, the load cells are connected to the multi-channel weight transmitter, which transmits the weight to the indicator.

CONNECTION TO THE WEIGHT INDICATOR

Connection via **RS485** port.

SIGNAL	TLM8	Weight indicator
RS485 +	39	RS485 +
RS485 -	40	RS485 -
SHIELD	42	SHIELD

Weight indicator configuration

Configure, on the serial port used, the MASTER protocol with the following parameters:

bAUd = 9600 PAr I tY = nOnE StOP = 1

TLM8 multi-channel weight transmitter configuration

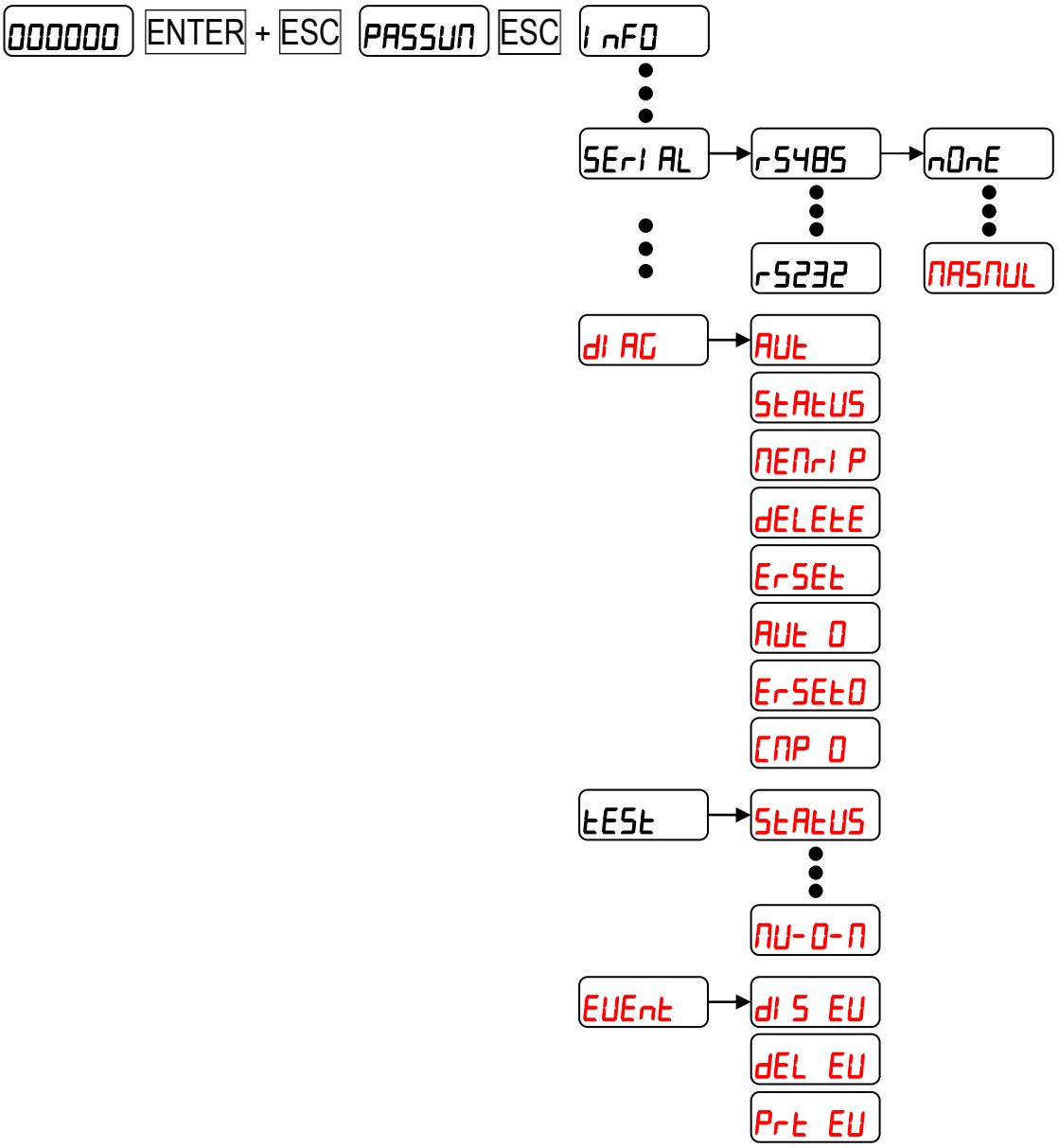
Configure, on the serial port used, the MODBUS protocol with the following parameters:

bAUd = 9600 PAr I tY = nOnE StOP = 1

ADDITIONAL MENU MAP

WARNING: the map shows only the additional menu items that are enabled on the W series instruments connected to the TLM8.

Into menus changes are applied right after pressing the ENTER key (no further confirmation is required).



TLM8 REMOTE CONTROL

The following functions of TLM8 can be performed remotely through the weight indicator:

- FILTER ON THE WEIGHT
- ANTI PEAK
- AUTOMATIC DIAGNOSTICS OF LOAD DISTRIBUTION
- LOAD DIAGNOSTICS
- DIAGNOSTICS ON ZERO
- TEST
- EVENTS LOG

WARNING: when using the weight indicator to manage the multi-channel instrument, the weight indicator display replicates exactly what would be displayed on the TLM8 display.

If the configuration is performed on the TLM8, the W series instrument connected must be restarted to allow synchronization.

REMOTE KEYPAD LOCKING

000000 ENTER + ESC PASSUN ESC InFO ◀ ▲ nOHEYb

YES: keypad locked.
nO: keypad unlocked.

ADDITIONAL ALARMS

WARNING: the list shows only the additional alarms that are enabled on the W series instruments connected to the TLM8.

Er CON: TLM8 is not responding, check connections and serial ports settings.
Er rES: TLM8 responds incorrectly, check connections and serial ports settings.
ErUArt: issues with the serial communication device.
SYnC: the instrument is synchronizing with TLM8, wait for the end of the operation.

ALARMS

nOCEL: no load cell detected, check the connections.

ErCEL: the load cell signal exceeds 39 mV; the conversion electronics (AD converter) is malfunctioning.

ErCELr: the load cell excitation is not connected or is incorrectly connected; the references are not connected or are incorrectly connected; the load cell is a 4-wire and there are no jumpers between EX- and REF- and between EX+ and REF+.

ErCEL 1: the load cell is not connected or is incorrectly connected (the number indicates the channel on which the error is detected).

Er OL: the weight display exceeds 110% of the full scale.

Er Ad: internal instrument converter failure; check load cell connections, if necessary contact technical assistance.

------: the weight exceeds the maximum capacity by 9 divisions.

Er OF: maximum displayable value exceeded (value higher than 999999 or lower than -999999).

t-----: weight too high: zero setting not possible.

MAX-PU: this message appears in the sample weight setting, in real calibration, after the fifth sample weight value has been entered.

Error: the value set for the parameter is beyond the permitted values; press ESC to quit the setting mode leaving the previous value unchanged. Examples: a number of decimals is selected for full scale which exceeds the instrument's display potential; value above the maximum setting value; the weight value set in sample weight verification does not match the detected mV increase; the analog output correction goes beyond the permitted limits.

bLOC: lock active on menu item, keypad or display.

nOdI SP: It's not possible to display properly the number because is greater than 999999 or less than -999999.

tUI CE: the current load cell has already been equalized; press ENTER to go back to the previous step and move the sample weight on the next load cell.

LOAd: the sample weight was not loaded or is too light.

ErdI AG: the load percentage error is higher than the value set in parameters ErSEt or ErSEtO; press ENTER to cancel the alarm.

------: the weight is below -20e, or the power supply is insufficient.

ALI FUL: the alibi memory is full and will be overwritten.

unStbL: unstable weight: zero-setting or net weight not possible.

nEG-0: below zero or zero weight: net weight not possible.

M inLEG: weight below minimum weight (20e): not possible to print or save.

nCHAnG: weight has not changed: not possible to print or save.

bUS Er: issues with the fieldbus device.

Serial protocol alarms:

	ErCEL	Er OL	Er Ad	------	Er OF	t-----	------
MODE							
Bit LSB	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)	76543210 **x1xxxxxx**
Status Register MODBUS RTU							
ASCII	**__O-F_**	**__O-L_**	**__O-F_**	**__O-L_**	**__O-F_**	**&aa#CR**	**__O-L_**
RIP *	**__O-F_**	**__O-L_**	**__O-F_**	**__O-L_**	**__O-F_**	**__O-F_**	**__O-L_**
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 5 digits the display reads ------.**

With an alarm the relays open and the analog outputs go to the lowest possible value according to the following table:

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

PRINTING EXAMPLES

If the printer has been set (see section **SERIAL COMMUNICATION SETTINGS**), from the weight display press the PRINT key:

BASIC PRINTOUT (ALIBI DISABLED):

```
----------------------
TLM8   BASE     Addr:01

G                878 kg
N                589 kg
T                289 kg
```

BASIC PRINTOUT (ALIBI ENABLED):

```
----------------------
TLM8   BASE     Addr:01

ID:                  6
G                878 kg
N                589 kg
T                289 kg
```

BASIC PRINTOUT (PEAK ENABLED):

```
----------------------
TLM8   BASE     Addr:01

G               1204 kg
N                831 kg
T                373 kg
P               2103 kg
```

PRINTOUT WITH *COEFF* ENABLED:

```
----------------------
TLM8   BASE     Addr:01

UNIT      kg |        bar
G       1195 |       1792
N       1195 |       1792
T          0 |          0
```

ALIBI MEMORY DATA RECALL:

```
----------------------
TLM8   BASE     Addr:01
ALIBI DATA RECALL

ID:                125
N               1063 kg
T                500 kg
```

LOAD DISTRIBUTION PRINT

Current distribution: press the PRINT key from the STATUS menu.

Current and stored distribution: from the CAP 0 and MEMRIP menus, keep pressed the PRINT key for more than 3 seconds while the weight is displayed.

CURRENT DISTRIBUTION

```
----------------------
TLM8   BASE     Addr:01
CURRENT        (STATUS)
GROSS           2014 kg
CH1:             23.5 %
CH2:             24.1 %
CH3:             15.5 %
CH4:             16.7 %
CH5:              9.0 %
CH6:             10.2 %
CH7:                ERR    (load cell connected but in error)
CH8:                OFF    (load cell not connected)
```

CURRENT AND STORED DISTRIBUTION

```
----------------------
TLM8   BASE     Addr:01
STORED         (MEMRIP)
GROSS           2014 kg
CH1:             23.5 %
CH2:             24.1 %
CH3:             15.5 %
CH4:             16.7 %
CH5:              9.0 %
CH6:             10.2 %
CH7:                ERR    (load cell connected but in error)
CH8:                OFF    (load cell not connected)
GROSS  OLD      2050 kg
CH1:             25.5 %
CH2:             22.1 %
CH3:             16.5 %
CH4:             16.7 %
CH5:              9.0 %
CH6:             10.2 %
CH7:                ERR    (load cell connected but in error)
CH8:                OFF    (load cell not connected)
```

INFORMATION ON TYPE-APPROVED INSTRUMENTS IN THE EUROPEAN UNION

Instruments first assessed by the manufacturer: they must bear an "M" sticker and can be immediately commissioned in accordance with the Directive 2014/31/EU, art.1

Instruments assessed in two stages: they do not bear an "M" sticker. The first assessment phase has been completed by the manufacturer and includes all the tests listed by EN45501:2015, 8.2.2. The second assessment phase must be completed by the authorities in charge in the Country in which the weighing scale is installed; contact your dealer in case of any doubt as to the procedure to follow.

Metrical users will be responsible for observing the time schedule relating to the required periodical assessments after the first assessment (if provided for by law in the Country of installation of the scale).

DECLARATION OF CONFORMITY - EU

LAUMAS®
ELETTRONICA

SISTEMI DI PESATURA INDUSTRIALE - CELLE DI CARICO

Sistema di gestione
Qualità certificato
UNI EN ISO 9001:2008

CERTIFICAZIONE DEL SISTEMA DI GARANZIA DELLA QUALITÀ DELLA PRODUZIONE

LAUMAS Elettronica S.r.l.
Tel. (+39) 0521 683124 - Fax (+39) 0521 681091
Via 1° Maggio 6 – 43022 Montechiarugolo (PR) Italy
C.F. - P.IVA IT01661140341

email: **laumas@laumas.it** web: **http://www.laumas.com**

Fabbricante metrico Prot. N. 7340 Parma - R.E.A. PR N. 169833 - Reg. Imprese PR N.19393 - Registro Nazionale Pile N° IT09060P00000982 - Registro A.E.E. N° IT08020000002494 - N. Mecc. PR 008385 - Cap. Soc. Euro 10.400 int. vers.

I	Dichiarazione di conformità	Dichiariamo che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.
GB	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards.
E	Declaración de conformidad	Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las siguientes normas
D	Konformitäts-erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
F	Déclaration de conformité	Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
CZ	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami.
NL	Conformiteit-verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt.
P	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes.
PL	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami.
RUS	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам.

Models: TLM8

Mark Applied	EU Directive	Standards
CE	**2014/35/EU** Low Voltage Directive	*Not Applicable (N/A)* for VDC type EN 61010-1:2010 for 230/115 VAC type
CE	**2014/30/EU** EMC Directive	EN 55022:2010 EN 61000-6-2:2005 EN 61000-6-4:2007 EN 61000-4-2:2009 EN 61000-4-3:2006+A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2014 EN 61000-4-6:2014
CE M (only if "M" mark is applied)	**2014/31/EU** NAWI Directive	EN 45501:2015 OIML R76-1:2006

Montechiarugolo (PR), 26/10/2018

LAUMAS Elettronica s.r.l.
M. Consonni
(*Legal Representative*)