WEIGHT INDICATORS

DGT

SERIES

Technical Manual

DGT _06.02_10.04_EN_T

INDEX

NOTE FOR THE TECHNICIAN:
Please take note that when the "StEP…. (**USER MAN.REF**.) is mentioned, this refers to the user manual.

!!WARNING!!

For the **ATEX** weight indicator version it is **COMPULSORY** to read and understand the **ATEX ATTACHMENT** in the user manual (**USER MAN.REF**.) containing important warnings.

1. REQUIREMENTS FOR AN EFFECTIVE INSTALLATION

To obtain the best results it is recommended to install the indicator and the platform (or transducer) in a place with the following conditions (for **ATEX** version refers to the corresponding attachment in user manual):

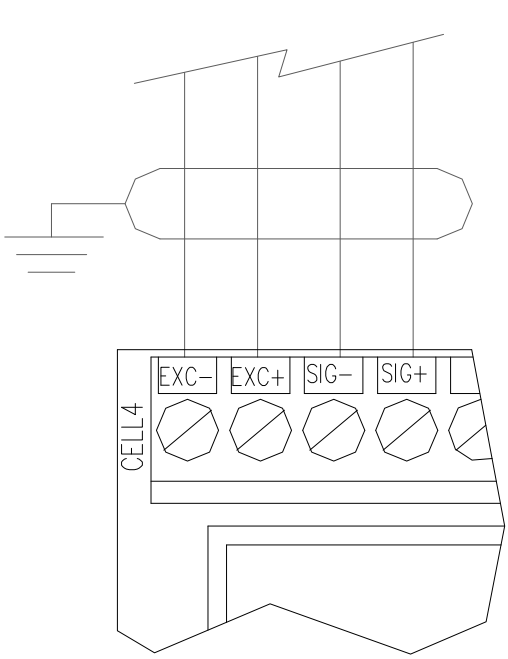
- **Stable and vibration free**
- **Moderate temperature and humidity (15-30℃ and 40-7 0%).**
- **No dust or strong vapours**
- **No draughts**
- **Mains power supply is restricted to within ± 10% of the rated voltage**
- **Make sure the platform is level or that the loading cells are resting evenly**
- **Avoid welding with load cells installed.**
- **When the load cells are used with assembling kits under storage bins or the like, connect the upper and lower supporting plate with a copper wire cable and then earth all the upper plates.**
- **Use waterproof sheaths and couplings in order to protect the load cell cables.**
- **Use a waterproof junction box to connect the cells**.
- **The extension leads of the load cells or signal amplifiers must be screened. In addition they must be laid on their own in a raceway or metal pipe as far away as possible from the power supply cables.**
- **Connection of the cell or amplifier cables on the electrical panel shall be independent and, if possible, connected directly to the indicator's terminal board without laying other cables in the raceway.**
- **Install "RC" filters on the contactor coils, on the solenoid valves and on all devices producing electric disturbances.**
- **If it is possible that condensation could form inside the weight transmitter it is advisable to leave the instrument powered at all times.**
- **Electric protections (fuses etc.) are provided by the technician installing the instrument.**
- **Do not install anywhere where there is the risk of explosion.**

2. CONNECTION TO THE LOAD RECEIVER

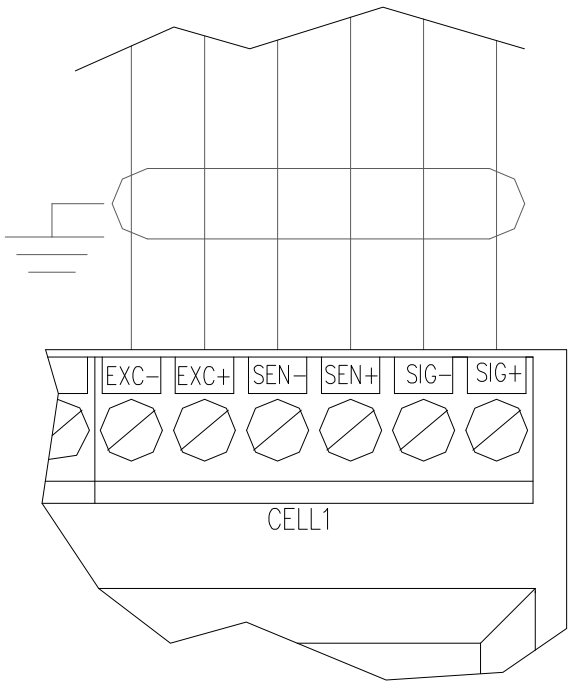
2.1 DGT4, DGT20 and DGT60 Models

After having followed the instructions regarding the platform or the load receiver, the screened cable leading from the load cell(s) must be connected to the instrument terminal board(s) (from CELL1 up to CELL4, see paragraph 11 "CONNECTION SCHEME") through the relative input(s) (see paragraph "INSTALLATION", **USER MAN. REF.)**.

The CELL1 terminal board of the indicator may be connected to the 6-wire load receiver (with use of SENSE), instead for CELL2, CELL3 and CELL4 it's allowed only the 4-wire connection.
The sense allows compensating for any drops in voltage in the part of the cable that connects the instrument to the transducer. It is useful when the distance between the indicator and the transducer is greater than 10 m.



4-WIRE CONNECTION



6-WIRE CONNECTION

!! IMPORTANT !!

- If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuit -SEN with -EXC and +SEN with +EXC.

- When there are 6-wire cells:
  1. the SENSE is managed exclusively in <u>systems with just one cell</u>, connected to the CELL1 terminal board; in these applications, open the J1 and J2 jumpers (Mod. DGTQ)

  2. <u>in sistems with various cells</u>, the SENSE is not managed, therefore for each cell:
     - Shortcircuit the +SENSE wire with the +EXC wire and the –SENSE wire with the –EXC wire; otherwise one may leave the SENSE wires unconnected.
     - Close the J1 and J2 jumpers.

2.2 DGTQ Model

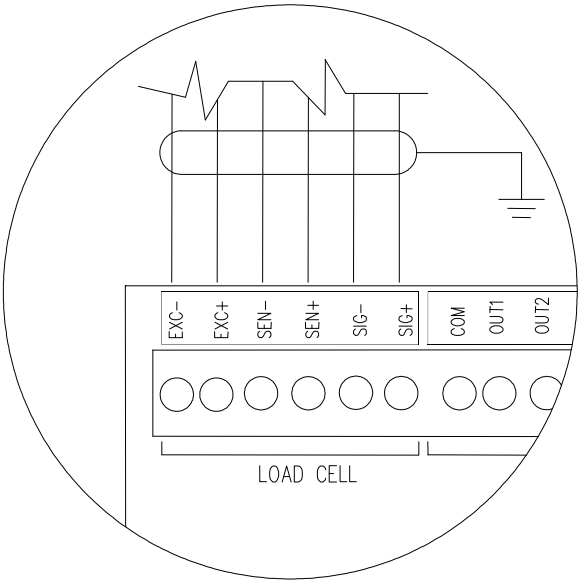
After having followed the instructions regarding the platform or the load receiver, the screened cable leading from the load cell(s) must be connected to the instrument through the CELL1 terminal board or the C1, C2, C3, C4 connector see paragraph 11 "CONNECTION SCHEME", through the relative input(s) (see paragraph "INSTALLATION", **USER MAN. REF.)**.

The CELL1 terminal board of the indicator may be connected to the 6-wire load receiver (with use of SENSE), or simply 4-wire; for this, through jumper J1 and J2 (normally closed) it is possible to choose whether to short-circuit the SENSE with the POWER SUPPLY (jumpers closed) or not (jumpers open).

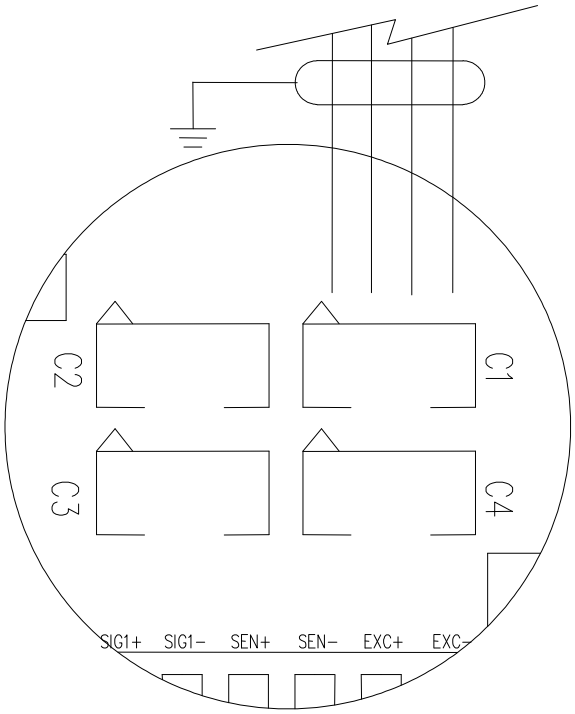
The sense allows compensating for any drops in voltage in the part of the cable that connects the instrument to the transducer. It is useful when the distance between the indicator and the transducer is greater than 10 m.

The 4-pin C1, C2, C3 e C4 connectors instead allow just the 4-wire connection.

6-WIRE CONNECTION



4-WIRE CONNECTION



!! IMPORTANT !!

- If one wants to use 4 wires in the CELL 1 terminal board or in the C1 connector (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC by closing the J1 and J2 jumpers.

- When there are 6-wire cells:
  1) the SENSE is managed exclusively in <u>systems with just one cell</u>, connected to the CELL1 terminal board; in these applications, open the J1 and J2 jumpers.

  2) <u>in sistems with various cells</u>, the SENSE is not managed, therefore for each cell:
  - Shortcircuit the +SENSE wire with the +EXC wire and the –SENSE wire with the –EXC wire; otherwise one may leave the SENSE wires unconnected.
  - Close the J1 and J2 jumpers.

2.3 DGTP/DGTPK Models

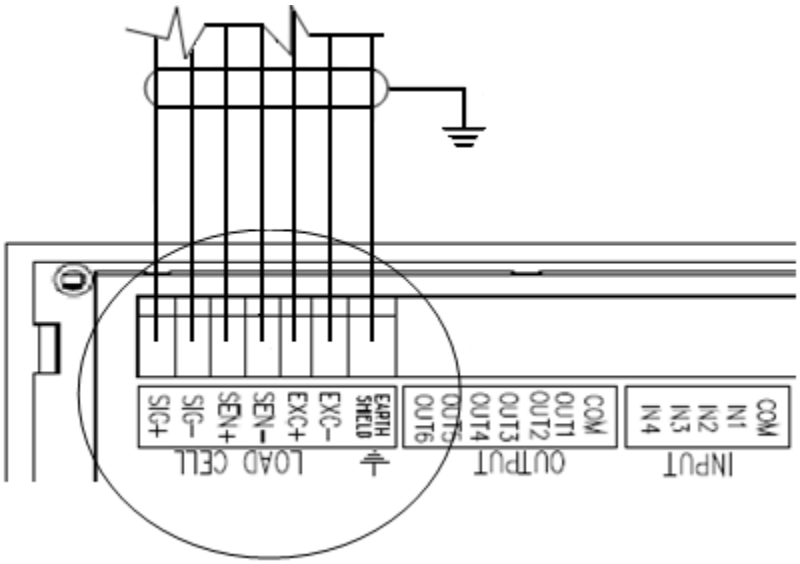
After having followed the instructions regarding the platform or the load receiver, the screened cable leading from the load cell(s) must be connected to the instrument through the CELL1 terminal board or the CELL1, CELL2, CELL3, CELL4 connector see paragraph 11 "CONNECTION SCHEME", through the relative input(s) (see paragraph "INSTALLATION", **USER MAN. REF.)**.

The CELL1 terminal board of the indicator may be connected to the 6-wire load receiver (with use of SENSE), or simply 4-wire; for this, through jumper J3 and J4 (normally closed) it is possible to choose whether to short-circuit the SENSE with the POWER SUPPLY (jumpers closed) or not (jumpers open).

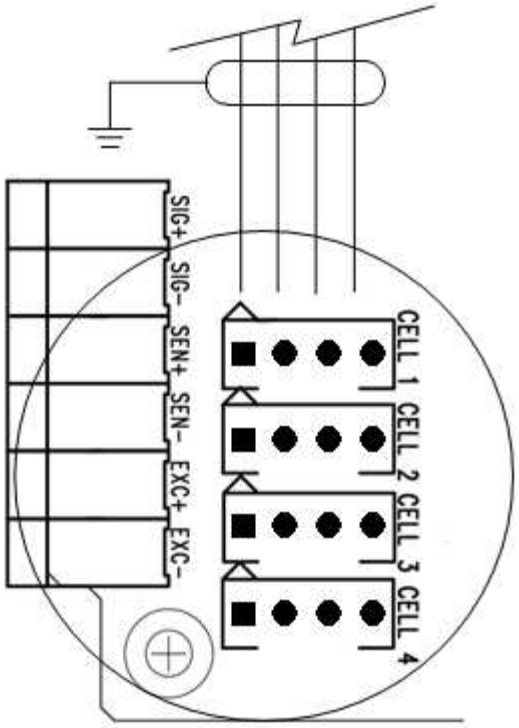
The sense allows compensating for any drops in voltage in the part of the cable that connects the instrument to the transducer. It is useful when the distance between the indicator and the transducer is greater than 10 m.

The 4-pin CELL1, CELL2, CELL3 e CELL4 connectors instead allow just the 4-wire connection.

6-WIRE CONNECTION



4-WIRE CONNECTION



!! IMPORTANT !!

- If one wants to use 4 wires in the CELL 1 terminal board or in the C1 connector (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC by closing the J3 and J4 jumpers.

- When there are 6-wire cells:
  1) the SENSE is managed exclusively in <u>systems with just one cell</u>, connected to the CELL1 terminal board; in these applications, open the J3 and J4 jumpers.

  2) <u>in sistems with various cells</u>, the SENSE is not managed, therefore for each cell:
  - Shortcircuit the +SENSE wire with the +EXC wire and the –SENSE wire with the –EXC wire; otherwise one may leave the SENSE wires unconnected.
  - Close the J3 and J4 jumpers.

2.4 EARTHING SYSTEM

For the right earthing and the optimal functioning of the system, it is necessary to ground the indicator, load cells, eventual junction box, and the weighing structure.

INDICATOR

Ground terminal 2 (GND) using a copper cable with a section not less than 16 mm^2.

LOAD CELLS AND JUNCTION BOX

- In the case the load cells are connected to the indicator through a junction box, it is necessary to connect the sheathing both of cells cables and of indicator cable to the earthing of the junction box (refer to the junction box manual) and connect this to the earth through copper cables having at least a 16 mm^2 cross-section.
- If the load cells are directly connected to the indicator (without the junction box), it is necessary to ground the sheathing of the cell cables using copper cables having at least a 16 mm2 cross-section.

Moreover in both cases it is required to:

- Connect the upper side of every cells to the lower side using a copper braid having at least 16 mm2 cross-section; the upper side must be short-circuited with the surface of the weighing structure and the lower one must be connected to the earth using a copper braid having at least 16 mm2 cross-section.
- Use Earth plate of suitable length, in order to obtain a total resistance of earthing plant lower than 1 Ω.

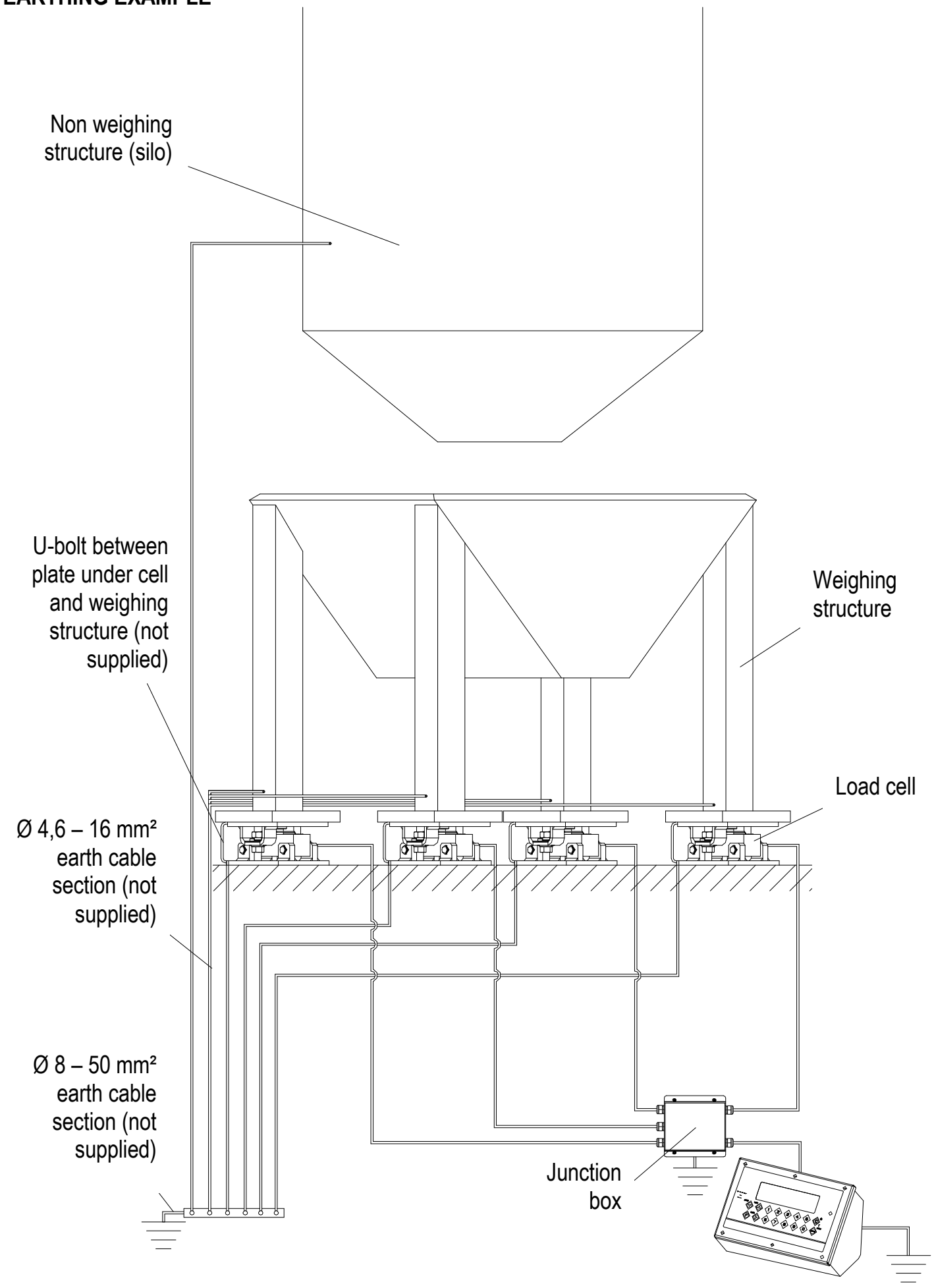
WEIGHING STRUCTURE

Connect the weighing structure and the possible connected structures (for example silos that release material on the weighing structure) to the earth through copper cables having at least a 16 mm^2 cross-section.

NOTES:

- In the case the weighing system regards great and/or outdoor structures, the cross-section must be greater (for example 50 mm2), because the voltage into play is greater (for example thunderbolts).
- In order to avoid possible undesired effects, if there are other shielded cable connected to the indicator (for instance, PC cable) the shield should be earthing only on the cable termination towards the indicator.
- Every shielded cable or not (for instance PC cable, cell cable, power supply cable) connected to the indicator should be as shorter as possible, then you have to come out of the shield the minimum length of cable, go three round around a ferrite ring and then connect to the terminal box.
- If the indicator is situated inside an electric panel, the power supply cable should be a shielded cable as shorter as possible, distant from every coil supply cable, inverter, electromotive force, etc. and in addition dedicate an uncoupler transformer in order to feed the indicator only.

EARTHING EXAMPLE



3. SETUP ENVIRONMENT

With "SETUP ENVIRONMENT" we intend a specific menu, inside which it's possible to set all the functioning parameters of the indicator.
To enter it, turn on the instrument and, while the firmware version is displayed , press the TARE key for an instant.
The indicator shows the first parameter "tYPE".

NOTE: THE METROLOGICAL PARAMETERS of the SETUP ARE normally NOT ENABLED and therefore are just displayed.
To enable them, open the instrument and activate the special micro switch (see paragraph 11 "CONNECTIONS SCHEMES") and then turn it on.

Functions assumed by the keys in the SET-UP ENVIRONMENT:

ZERO Scrolls the programming steps forward in sequence.
If one needs to enter a numeric value, this decreases the digit to be modified (blinking).

TARE Allows to scroll backwards through the programming steps.
In the case in which one enters a numeric value, the selected digit (blinking) increases.

MODE Allows to quickly position on the first step of a menu.
In the case in which one needs to enter a numeric value, select the digit to be modified (blinking) from left to right.

PRINT Allows to enter a step or confirm a parameter inside a step.

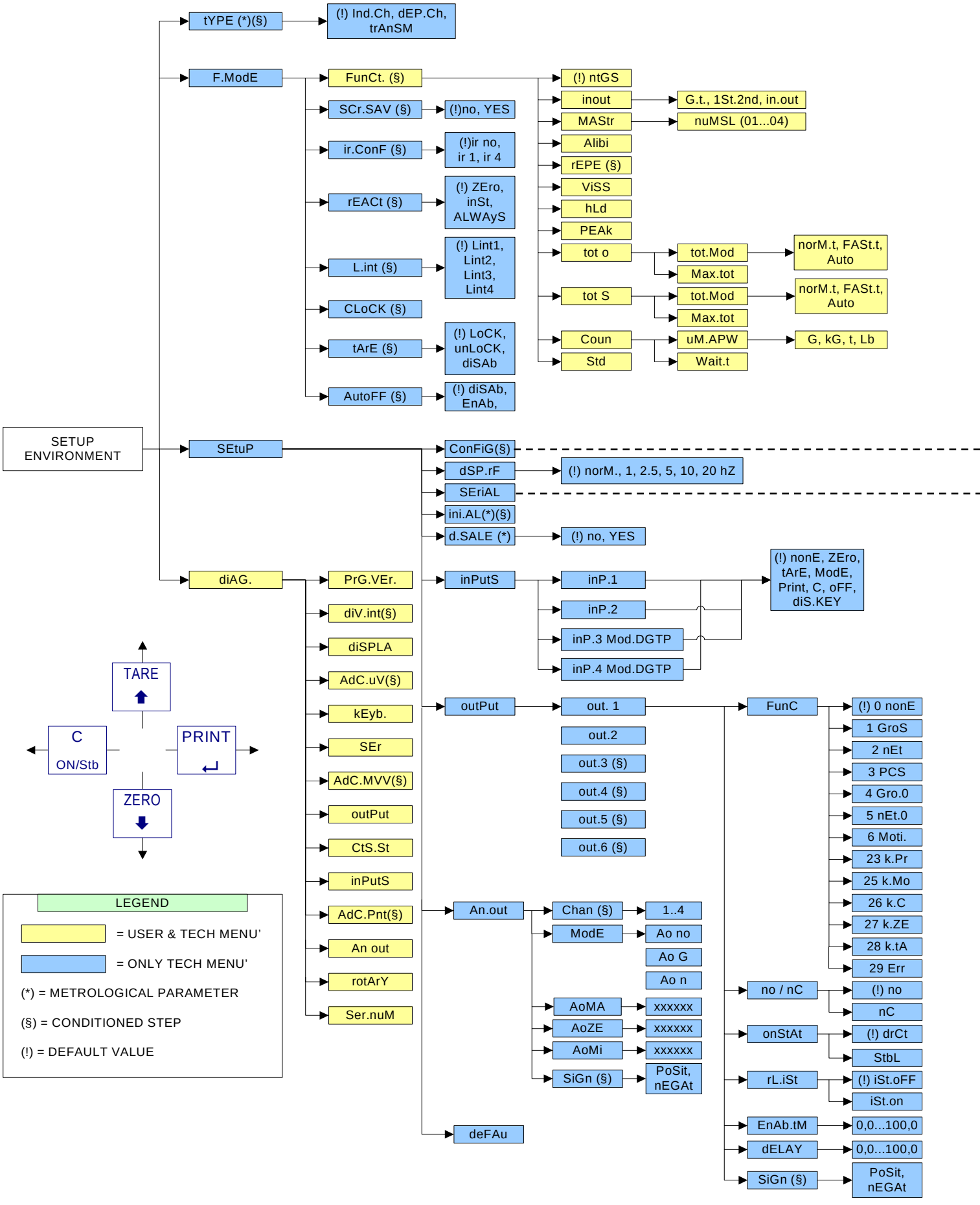
C-ON/OFF Allows to exit a step without confirming the possibly modified parameter and go to the preceding level.
When entering a numeric value it quickly zeros the displayed value.

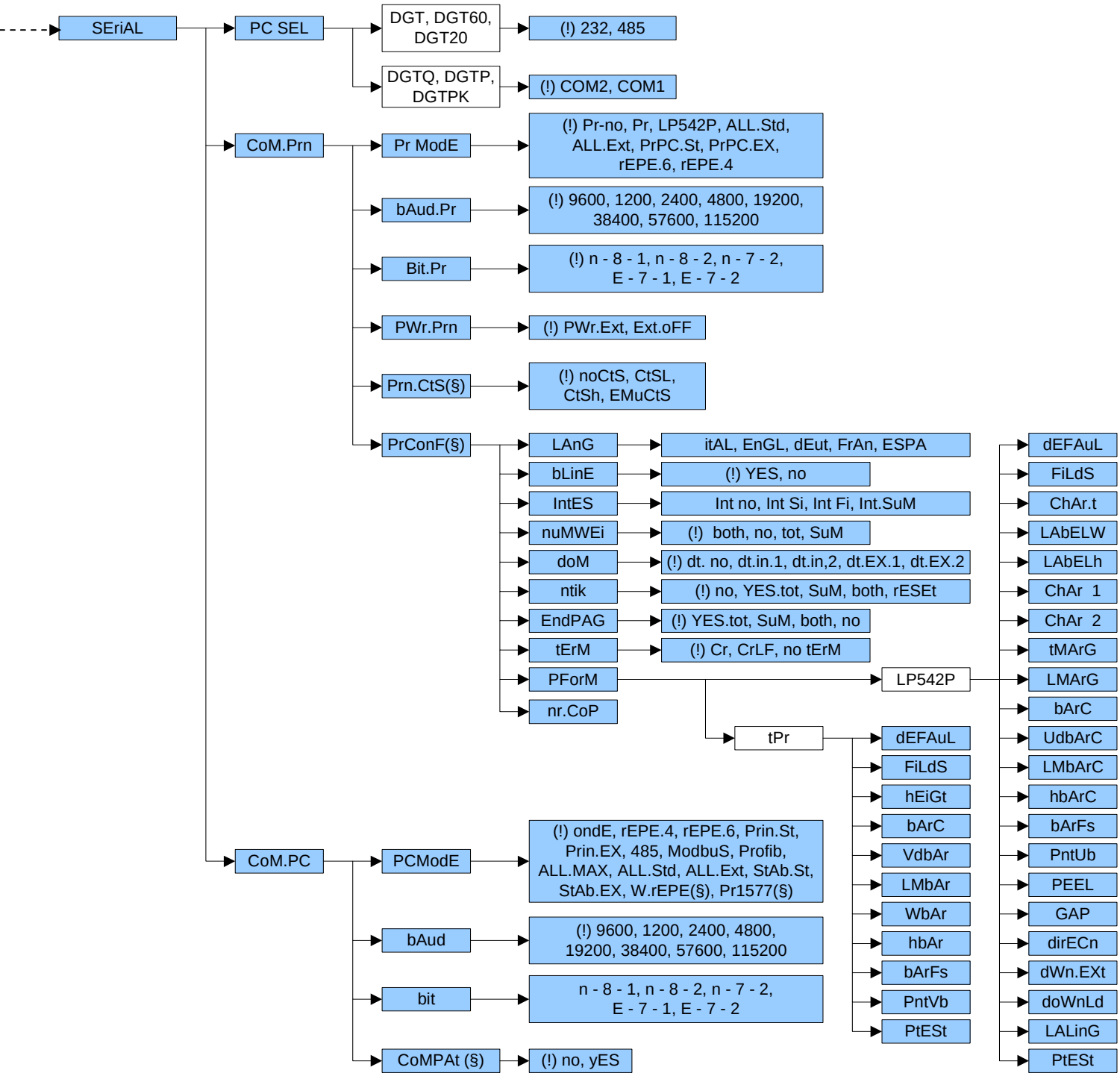
NUMERIC KEYS **In the DGTPK indicator** one can enter numeric values, from right to left.

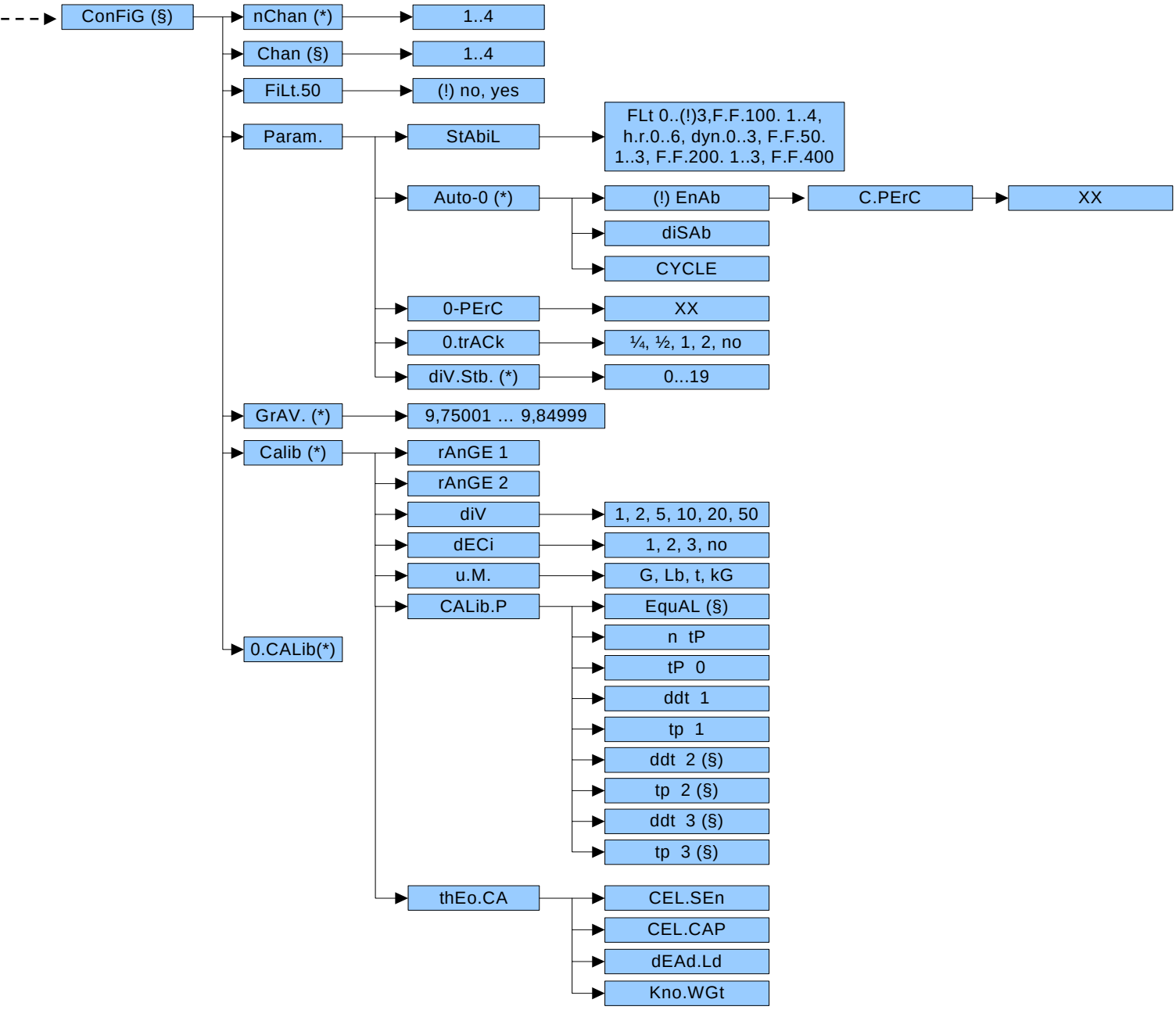
The display indicates the abbreviation of the step whose meaning is described below. The values indicated with the **(!)** symbol at the end of the step, are values set by DEFAULT.

TO EXIT THE SET-UP ENVIRONMENT, PRESS THE C - ON/OFF KEY MANY TIMES UNTIL THE INDICATOR SHOWS "SAVE? IN THE DISPLAY: CONFIRM WITH PRINT TO SAVE ANY CHANGES MADE OR PRESS ANOTHER KEY TO NOT SAVE.

3.1 SET-UP ENVIRONMENT BLOCK DIAGRAM




SEriAL
PC SEL
DGT, DGT60, DGT20
(!) 232, 485
DGTQ, DGTP, DGTPK
(!) COM2, COM1
CoM.Prn
Pr ModE
(!) Pr-no, Pr, LP542P, ALL.Std, ALL.Ext, PrPC.St, PrPC.EX, rEPE.6, rEPE.4
bAud.Pr
(!) 9600, 1200, 2400, 4800, 19200, 38400, 57600, 115200
Bit.Pr
(!) n - 8 - 1, n - 8 - 2, n - 7 - 2, E - 7 - 1, E - 7 - 2
PWr.Prn
(!) PWr.Ext, Ext.oFF
Prn.CtS(§)
(!) noCtS, CtSL, CtSh, EMuCtS
PrConF(§)
LAnG
itAL, EnGL, dEut, FrAn, ESPA
bLinE
(!) YES, no
IntES
Int no, Int Si, Int Fi, Int.SuM
nuMWEi
(!) both, no, tot, SuM
doM
(!) dt. no, dt.in.1, dt.in,2, dt.EX.1, dt.EX.2
ntik
(!) no, YES.tot, SuM, both, rESEt
EndPAG
(!) YES.tot, SuM, both, no
tErM
(!) Cr, CrLF, no tErM
PForM
LP542P
dEFAuL
FiLdS
ChAr.t
LAbELW
LAbELh
ChAr 1
ChAr 2
tMArG
LMArG
bArC
UdbArC
LMbArC
hbArC
bArFs
PntUb
PEEL
GAP
dirECn
dWn.EXt
doWnLd
LALinG
PtESt
nr.CoP
tPr
dEFAuL
FiLdS
hEiGt
bArC
VdbAr
LMbAr
WbAr
hbAr
bArFs
PntVb
PtESt
CoM.PC
PCModE
(!) ondE, rEPE.4, rEPE.6, Prin.St, Prin.EX, 485, ModbuS, Profib, ALL.MAX, ALL.Std, ALL.Ext, StAb.St, StAb.EX, W.rEPE(§), Pr1577(§)
bAud
(!) 9600, 1200, 2400, 4800, 19200, 38400, 57600, 115200
bit
n - 8 - 1, n - 8 - 2, n - 7 - 2, E - 7 - 1, E - 7 - 2
CoMPAt (§)
(!) no, yES



(§) = shows that **the parameter is visible only in certain programming conditions; see the explanation of the parameter for the details.**

(*) = shows that **with an approved instrument the parameter is not visible or not enterable; see the explanation of the parameter for further details.**

3.2 DESCRIPTION OF THE STEPS

(*) tYPE TYPE OF APPLICATION (§)

One selects the type of application which will be made: scale with independent channels, a scale with dependent channels (could be digitally equalized) or scale with independent channels simultaneously viewable on the PC.

IND.CH. Instrument connected to 1, 2, 3 or 4 independent scales.

DEP.CH Instrument connected to a scale with 2, 3, or 4 dependent load cells (could eventually be digitally equalized through a specific software procedure).

TRANSM. Independent channel mode which makes it possible to have a simultaneous transmission, through the serial line, of the values read by each single channel (for further details see section **8.13 "SIMULTANEOUS TRANSMITTER CHANNEL VALUE", USER MAN.REF.**)
NOTE: The configuration and the calibration of the instrument are done the same way as with the independent channel mode.

(!) IND.CH.

(*) With approved instrument the parameter is read-only.
(§) The parameter is not displayed if one has selected the MASTER/SLAVE functioning mode, **FmodE** >> **FunCt** >> **MAStr** parameter.

F.ModE SCALE FUNCTIONING

- **FunCt** FUNCTIONING MODE (§)
  - **Std** Unit of measure conversion.
  - **ntGS** Net weight / gross weight conversion.
  - **inout** Input / output weigh.
    Once the in / out mode is selected, "tYPE" is displayed for an instant and then one is asked to select with PRINT the print mode of the acquired data:
    - **"G.t." gross/tare:**
    - **"1st.2nd" first weigh/second weigh:**
    - **"in.out" input/output:**
  - **MAStr** Multiscale Repeater.
    By selecting with PRINT this functioning mode, one is asked to enter the number of SLAVES to be used: for an instant "nuMSL" is displayed; then enter the number (between 01 and 04).
  - **ALibi** Alibi memory.
  - **rEPE** Single scale repeater.
  - **UiSS** Sensitivity times ten.
  - **hLd** Freezing of the weight on the display.
  - **PEAK** Peak detector.
  - **tot o** Horizontal totalizer.
    Once the horizontal totaliser functioning mode is selected, one needs to select the type of totalisation: normal (t.norM), fast (t.FASt) or automatic (Auto).
  - **tot S** Vertical totalizer.
    Once the vertical totaliser functioning mode is selected, one needs to select the type of totalisation: normal (t.norM), fast (t.FASt) or automatic (Auto).
  - **Coun** Counting.
    Once the Counting functioning mode is selected, one needs to select the Unit of Measure of the average piece weight (APW): *g / kg / t / Lb,* and the sampling interval in seconds (WAit.t).

(!) ntGS
(§) The parameter is not displayed if one has set "**trAnSM**" in the **tYPE** parameter.

NOTES:
For the functioning details, refer to section 8 "SELECTABLE FUNCTIONING MODES", **USER MAN.REF.**
Once the functioning mode is selected, if there's a printer, the standard printout relative to the printer selected in the **SEtuP** >> **SErIAL** >> **Com.Prn** >> **PrMODE** parameter will automatically be enabled. One can load the default parameters by executing the default of the selected printout (see section **8**)

- **Scr.SAv:** SCREEN SAVER (§)

If the indicator has the date/time option, it is possible to enable the "Screen Saver" function: after a programmable time (from 1 to 255 minutes) that the scale is unloaded, the time is shown on the display, in the "HH-MM.SS" format. As soon as a weight variation is detected, or a key is pressed, the indicator displays the current weight once again.

- **no** Disabled.
- **yES** Enabled: one is asked to enter the time which the indicator waits to display the time, after the weight has become stable and keys are not pressed.

(!) no

(§) The parameter is not displayed if there is no date/time option or if one has selected the rEPE functioning mode, **FmodE** >> **FunCt** parameter.
NOTE: The date/time function is standard fitted in the DGTP/DGTPK version.

- **irConF** REMOTE CONTROL CONFIGURATION (§)

With the 4-key remote control (optional) it is possible to remote the ZERO, TARE, MODE and ENTER/PRINT keys, or just the TARE key.

ir no Remote control disabled.
ir 1 All the remote control keys work as the TARE key.
ir 4 The remote control keys work as ZERO, TARE, MODE and ENTER/PRINT.

(!) ir no
(§) The parameter is displayed with the DGT60 model.

- **rEACt** REENABLING OF THE PRINTOUTS AND THE INDICATOR FUNCTIONS(§)

While using the indicator, it is possible to incur in the "**no.0.unS"** error shown on the display accompanied by an acoustic signal; this means that the printout or the function which one wants to carry out must be reenabled (in order to avoid accidental executions).
It is possible to set the reenabling in the following modes: "passage of the net weight by zero", "weigh instability" or "always".

- **ZEro** passage of the net weight by zero
- **inSt** instability
- **ALWAyS** always **(§)** This parameter is not visible if by selecting the horizontal totaliser or vertical totaliser functioning mode one sets the automatic totalisation mode.

(!) ZEro

(§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

- **L.int** DISPLAY BACKLIGHT INTENSITY (§)

Through this step one selects the intensity of the backlighting or of the LED display:
Lint 1 (minimum), Lint 2, Lint 3, Lint 4 (maximum).
(!) Lint 1
(§) The parameter is displayed with the DGT60 model.

- **CLoCK** DATE/TIME ADJUSTMENT (OPTIONAL) (§)
  In this step one sets the date and time of the indicator; by pressing PRINT one is asked to enter, in this order, the day, month, year, hour and minute.
  The entry of each parameter must be confirmed with PRINT.

  (§) the parameter is not displayed if there is no date/time option or if the rEPE functioning mode has been selected, **FmodE** >> **FunCt** parameter.
  NOTE: The date/time function is standard fitted in the DGTP/DGTPK version.

- **tArE** LOCKED / UNLOCKED / DISABLED TARE SELECTION(§)
  - **LoCK** locked tare
  - **unLoCK** unlocked tare
  - **diSAb** disabled tare

  See the "TARE OPERATIONS" section for further functioning details, **USER MAN. REF.**
  (!) LoCK

  (§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

- **AutoFF** AUTO SWITCH-OFF
  It is possible to enable the automatic switch off of the indicator (from 1 to 255 minutes), or disable it; the auto switch-off starts working when, **with unloaded scale,** the weight has not been moved or a key has been pressed during the set time: the display shows the blinking "- oFF – " message and an acoustic signal is emitted; then the indicator turns off.
  - **disAb** auto switch-off disabled.
  - **EnAb** auto switch-off enabled (one will be asked to enter the number of minutes after which the indicator must turn off: enter a number from 1 to 255).

  (!) diSAb
  (§) The parameter is not displayed if one has selected the rEPE functioning mode, **FmodE** >> **FunCt** parameter.

SEtuP SCALE CONFIGURATION

- **ConFiG** METRIC CONFIGURATION(§)

  (§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

  - **(*) nChAn** SELECTION OF NR. OF INDICATOR CHANNELS
    1÷4 in SCALE WITH NON DEPENDENT CHANNELS functioning mode ("IND.CH." / "trAnSM")
    2÷4 in SCALE WITH DEPENDENT CHANNELS functioning mode ("DEP.CH")
    (!) Ch. 1

    (*) With approved instrument the parameter is read-only.

  - **ChAn** SELECTION OF THE ACTIVE CHANNEL(§)
    1÷4 in SCALE WITH NON DEPENDENT CHANNELS functioning mode ("IND.CH." / "trAnSM")

    (§) The parameter is not displayed if one has set "**dEP.CH**" in the **tYPE** parameter or in case of a single channel application, **SEtuP** >> **ConFiG** >> **nChAn** step.

  - **FiLt..50**
    By pressing the **PRINT** key, one can enable/disable the 50 Hz filter By
    - **no** disables the 50 Hz filter
    - **YES** enables the 50 Hz filter

➢ **Param.** METRIC PARAMETERS

o **StAbiL** FILTER INTEGRATION

By pressing the PRINT key one accesses the selection of the type and degree of filter intervention for the stability of the weight indication:

- **FLt 0 ÷ 3** Filter for simple weighing
- **F.F.100.1 ÷ 4** Filter for dosage at 100 Hz
- **h.r.0 ÷ 6** Filter for high resolution
- **dyn.0 ÷ 3** Filter for crane scale
- **F.F.50.1 ÷ 3** Filter for dosage at 50 Hz
- **F.F.200.1 ÷ 3** Filter for dosage at 200 Hz
- **F.F. 400** Filter for serial conversion/transmission at 400Hz
- **CuStoM** Costumized filter for use of the manufacturer

The higher the filter value, and greater is its intervention relative to the type of filter used.
(!) FLt 3

(*) With approved instrument, one can select only the **FLt 0**, **FLt 1**, **FLt 2**, **FLt 3** parameters
NOTE: The **F.F.200.1 ÷ 3 and F.F.400** filters are not usable in the "DEP.CH" 2, 3 and 4 channel functioning mode.

o **(*) Auto-0** AUTO ZERO AT THE START UP

Automatic acquisition of the gross zero at the start-up (up to +/- 10% of the capacity):

- **EnAb** Enabled on scale 1
- **diSAb** Disabled
- **CYCLE** Executed cyclically on all the present scales. **(§)** This value is not visible if there is just one scale (see **nChAn** parameter), or with more scales connected in a dependent way (see **tYPE** parameter).

If the auto zero is enabled, the “C.PErC” message is displayed and one is aked to enter the value as a % of the capacity of the autozero (included between 1 and 50)

(*) In case of approved instrument, the settable values are between 1 and 10.
(!) EnAb 50 (10 with approved instrument)

o **(*) 0-PErC** ZERO CAPACITY

This menu allows to set the % of the action capacity of the ZERO key. The settable values are in between 0 and 50. By entering the 0 value, the ZERO key is disabled.

(*) In case of approved instrument, the settable values are between 0 and 2.

(!) 50 (2 with approved instrument)

o **(*) 0trACk** ZERO TRACKING

This menu allows setting the zero tracking, in other words, the compensation parameter of the scale’s thermal drift; the set value corresponds to the number of divisions that is reset in the fixed time of 1 second.

- **tr. ½** +/- half division.
- **tr. ¼** +/- one fourth of a division
- **tr. 1** +/- one division.
- **tr. 2** +/- two divisions.
- **tr. no** tracking disabled.

(!) tr. ½

(*) In case of approved instrument, it’s possible to select only the **tr. no, tr. ½ and tr. ¼** parameters

- **diU.Stb** DIVISIONS BY STABILITY(§)
  In this step one enters the number of divisions by which the instrument detects the weight stability; the higher the number of divisions, less is the sensitivity, and consequently the stability is more easily detected. The possible values are 0 (weight always stable)..99.
  (!) 2

  (*) With approved instrument the parameter is read only.

➢ **(*) GrAV** GRAVITY ACCELERATION AND OF USE

Through this step one selects the acceleration value **of calibration and of use** of the instrument:
Manual entry of the g value: one may manually enter the gravitational acceleration value; **one must modify the 6 decimal digits of the gravitational acceleration.**
In case one enters a wrong g value: the minimum decimal value is suggested (9,75001); a wrong value is any decimal number that is not between 9,75001 and 9,84999 (inclusive).
(!) g = 9,80655

(*) With approved instrument the parameter is read-only.

➢ **(*) CALib.** SCALE CALIBRATION

See paragraph 4 "SCALE CALIBRATION".

(*) With approved instrument the parameter is read-only.

➢ **(*) 0CALib.** ZERO CALIBRATION

See paragraph 4 "SCALE CALIBRATION".

(*) The parameter is not displayed if the instrument is approved.

• DsP.rF DISPLAY REFRESH

It is possible to slow the speed of the display refresh improving the stability of the displayed data:
- **norM**. The function of improving the stability of the displayed data is disabled
- **20Hz** 20 display / sec refreshments
- **10Hz** 10 display / sec refreshments
- **5Hz** 5 display / sec refreshments
- **2,5Hz** 2,5 display / sec refreshments
- **1Hz** 1 display / sec refreshment

Note: This works only the displaying.

• SEriAL SERIALS, PRINTOUTS, ETC…

➢ **PC SEL** PC SERIAL SELECTION

Through this step one can select the PC serial port and therefore invert the serial ports.

DGT4, DGT20 and DGT60 models

485 The communication between the indicator and the PC takes place through the RS485 (or **PROFIBUS** port with the DGTQPB model) while the transmission of the data to the printer takes place through the RS232 port.

232 The communication between the indicator and the PC takes place through the RS232 port while the transmission of the data to the printer takes place through the **RS485** port or does not take place for the **DGT4PB/DGT20PB**.

(!) 232

DGTQ and DGTP/DGTPK models

COM1 The communication between the indicator and the PC takes place through the **COM1** serial port (or **PROFIBUS** port with the DGTQPB and DGTPPB models) while the transmission of the data to the printer takes place through the **COM2** serial port.

COM2 The communication between the indicator and the PC takes place through the **COM1** serial port while the transmission of the data to the printer takes place through the **COM2** serial port or does not take place for the **DGTQPB** and **DGTPPB**.

(!) COM2

➢ CoM.Prn PRINTER SERIAL

o PrModE TRANSMISSION UPON THE PRINTER SERIAL

- **Pr- no** transmission disabled.
- **tpr** enables the printing with ASCII printer (for example DP190 or TPR).
- **LP542P** enables to print with labelling machine LP542S
- **ALL.Std** continuous transmission with standard string.
- **ALL.Eht** continuous transmission with extended string (or multiscale string in the TRANSM mode).
- **PrPC.St** transmission of the standard string upon the pressing of the PRINT key.
- **PrPC.EX** transmission of the extended string upon the pressing of the PRINT key.
  NOTE: if the "TOTALIZER" mode (horizontal or vertical) is active, the transmission through the key is carried out by pressing the MODE key.
  The transmission of the standard or extended string upon the pressing of the PRINT key is confirmed by "trAnSM" on the display.
- **rEPE.6** transmission to 6-digit remote display.
- **rEPE.4** transmission to 4 digit remote display.

(!) Pr-no

Notes:

- By selecting the REPE.6 protocol the serial output is automatically set at 4800, N-8-1. In any case it's possible to set it differently.
- In the MASTER/SLAVE functioning mode (see section 8.4 MULTISCALE REPEATER (MAStr),**USER MAN. REF**) for the printer port the transmission modes are enabled to the printer and the "rEPE.6/rEPE4" transmission mode.
- If one wants to use the LP542S printer, select the LP542P item.

For the protocol and transmission mode specifications, see section 6.4 "SERIAL PORT TRANSMISSION MODES" and 6.6 "TRANSMISSION PROTOCOLS".

o bAud.Pr SET BAUD RATE

By pressing the PRINT key one accesses the selection of the data transmission speed (measured in Baud = bit/second). The possible values are:
1200, 2400, 4800, 9600, 19200, 38400, 57600,115200.
(!) 9600

o bit.Pr SET PARITY, WORD, STOP BIT

By pressing the PRINT key one accesses the selection of the available values: n-8-1, n-8-2, n-7-2, E-7-1, E-7-2.
(!) n-8-1

o PWr.Prn SETTING PRINTER MANAGEMENT

In this step one programmes the management of a possible connected printer:

PWr.EXt with instrument on, printer managed.
Ext.oFF printer managed; the start-up characters are sent to the printer, because the printer is considered to be configured in the energy saving mode.

(!) PWr.EXt

- **Prn.CtS** RTS/CTS STATUS CONFIGURATION (§)
  On the printer serial line the indicator has a CTS input (Clear To Send). A device (like a printer) that is slow in processing the data received, can interrupt the transmission temporarily using this signal.
  - **noCtS** no signal
  - **CtSL** CTS active low (for LP542, TPR, DP24 printers)
  - **CtSh** CTS active high (for DP190 printers)
  - **EmuCtS** Emulation of the CTS signal: one is asked to enter the number of characters (nChrS), in 3 digits, which will be transmitted to the printer upon each transmission; then one needs to enter the waiting time in milliseconds (tiME), in 4 digits, between a transmission and another.

  The TIME OUT of a printout is a minute, in other words, after a minute that the printout is blocked, it is cancelled.
  (!) noCtS
  (§) The parameter is not displayed unless "tPr" or "LP542P" has been selected in the "PrModE" step.

- **PrConF** CONFIGURATION OF THE PRINTOUTS (§)
  See the 8 "Print Programming" section for the description of all the menu's parameters.
  (§) The parameter is not displayed unless "tPr" or "LP542P" has been selected in the "PrModE" step.

➢ CoM.PC PC SERIAL

- **PCModE** TRANSMISSION ON THE PC SERIAL
  (§) If one has selected the rEPE functioning mode in the **FModE** >> **FunCt** step, only the "rEPE.6" and "W.rEPE" parameters are displayed.
  - **ondE** transmission on external command PC (given from PC or PLC, for example)
  - **rEPE.4** transmission to 4 digit remote display.
  - **rEPE.6** transmission to 6 digit remote display / Reception of the "rEPE.6" string.
  - **Prin.St**. transmission of standard string when the PRINT key is pressed.
  - **Prin.EX** transmission of extended string when the PRINT key is pressed.
    NOTE: if the "TOTALIZER" mode (horizontal or vertical) is active, the transmission through the key is carried out by pressing the MODE key.
    The transmission of the standard or extended string upon the pressing of the PRINT key is confirmed by "trAnSM" on the display.
  - **485** transmission with 485 protocol, by confirming with PRINT, one is required to enter the machine code (the message "Ad485" appears for an instant): enter a value between 0 and 98.
  - **ModbuS** Transmission with the MODBUS protocol
  - **ProFib** Transmission with the PROFIBUS protocol
  - **ALL.Std** continuous transmission with standard string.
  - **ALL.EXt** continuous transmission with extended string (or multiscale string in the TRANSM mode).
  - **StAb.St** transmission with each weigh with standard string.
  - **StAb.EX** transmission with each weigh with extended string (or multiscale string in the TRANSM mode).
  - **W.rEPE (§)** Reception of string from remote scale. **(§)** The parameter is displayed only if one has selected the rEPE functioning mode in the **FModE** >> **Func** step.
    By confirming with **PRINT** one is requested to set the following parameters for the management of the remote scale:

    tErM *REMOTE SCALE TERMINATOR*
    In this step one enters the decimal ASCII code (up to 2 characters) of the terminator characters of the weight string (I.E. 13 for CR or 10 for LF).
    (!) 00

WEi.PoS *REMOTE SCALE WEIGHT POSITION*
In this step one sets the position of the first character of the weight value, in the string transmitted by the remote scale, knowing that the first character on the left of the string has the 00 position.
A possible character sign is also part of the weight value.

For example, if the received string is **sppppppppuu + CR + LF:**

Received string	**s**	**p**	**p**	**p**	**p**	**p**	**p**	**p**	**u**	**u**	**CR**	**LF**
Position of the character	00	01	02	03	04	05	06	07	08	09	10	11

Therefore one should set the 00 value.
It is possible to set up to 2 characters (from 0 to 39).
(!) 00

WEi.LEn *LENGTH OF THE WEIGHT DATA STRING*
In this step one enters the number of digits (from 1 to 39) which make up the weight value, including the sign and the non significant digits (for example, if the transmitted string **sppppppppuu + CR + LF**, in which **s** is the weight sign, **ppppppp** is the weight value, **uu** is the unit of measure, one should set the 08 value).

Str.LEn *LENGTH OF THE COMPLETE STRING*
In this step one enters the number of digits (from 0 to 39) which make up the entire string transmitted from the serial line scale, less the terminator character (for example, if the transmitted string is **sppppppppuu + CR + LF**, in which **s** is the weight sign, **ppppppp** is the weight value, **uu** is the unit of measure, one should set the value 11).
(!) 01

dECi. *REMOTE SCALE DIVISIONS*
Enter the number of scale's decimals (from 0 to 5).
(!) 0

The two following parameters allow to generate the weight stability communicated by the remote scale and allow to manage the stability LEDs on the indicator:

StAb *NUMBER OF READINGS PER STABILITY*
Enter the number of consecutive readings which the indicator must consider to obtain the stability (2 characters, from 0 to 20).
(!) 03

StA.int *WEIGHT DIFFERENCE PER STABILITY*
Enter the maximum value (2 characters, from 0 to 20) of the difference between the weights of the consecutive readings, set in the previous step.
If the weight difference between the readings is equal or less than the set value, the weight is considered to be stable (stability LED off), otherwise the weight is considered to be unstable (stability LED on).
(!) 02

- **Pr1577** Reception of the "rEPE.6" string. **(§)** The parameter is displayed only if one has selected the rEPE functioning mode in the **FModE** >> **FunCt** step.

(!) ondE

NOTES:
- If the functioning mode selected in the **FModE** >> **FunCt** step is different than rEPE, by selecting the REPE6 or REPE4 protocol the serial output is automatically set at 4800, N-8-1.
  By selecting the Pr1577 protocol the serial output is automatically set at 4800, E-7-1.
  In any case it's possible to set it differently.
- For the transmission modes and protocol specifications, see the 6.4 "SERIAL PORTS TRANSMISSION MODES" and 6.6 "TRANSMISSION PROTOCOLS" sections.

- **bAud** SET BAUD RATE
  By pressing the PRINT key one accesses the selection of the data transmission speed (measured in Baud = bit/second). The possible values are:
  1200, 2400, 4800, 9600, 19200, 38400, 57600,115200
  (!) 9600

- **bit** SET PARITY, WORD, STOP BIT
  By pressing the PRINT key one accesses the selection of the available values:
  n-8-1, n-8-2, n-7-2, E-7-1, E-7-2.
  (!) n-8-1

- **(§) CoMPAt** ENABLE THE "DGQ" COMMUNICATION PROTOCOL **(visible only in the DGTQ model)**
  This step allows to enable the communication protocol compatibel with the DGQ series indicator; for the description of this protocol and the relative set of commands, refer to the technical manual of the DGQ indicator.
  yES: enabled compatibility
  no: disabled compatibility
  NOTE: by enabling the compatibility, only the commands of the "DGQ" protocol will be available; the commands shown in this manual will be automatically disabled.
  (!) no

- **Add.En** ENABLING AND SELECTING THE 485 SERIAL ADDRESS (§)
  In the rEPE functioning mode, through the **FmodE >> FunCt** parameter it is possible to enable the 485 protocol and links its own address to the instrument; the indicator will repeate the weight if the address in the received string is the same as the address set here.
  - no = 485 protocol disabled.
  - YES = 485 protocol enabled.

  If one enables the 485 protocol, one is asked to enter the 485 address, on the display appears the message *Adr-XX* in which XX is the 485 address, from 00 to 99 (by pressing the **TARE** or **ZERO** keys one increases the digit, and with **MODE** it's selected; when the chosen values is reached, one confirms with **PRINT**).
  (§) The parameter is displayed in the DGT4 and DGT60 models, if one has selected the rEPE functioning mode, **FmodE** >> **FunCt** parameter.

- **(*) ini.AL INITIALIZES ALIBI MEMORY (§)**
  The initialisation cancels all the data stored in the Alibi memory; by pressing PRINT one is asked to confirm the operation. The display shows "iALib?"; press PRINT again to confirm or another key to cancel.
  At the end the " AL.OK " message appears if the operation is made with success; otherwise the " AL.ERR" message is displayed.
  (§) The parameter is displayed only if the ALIBI functioning mode is selected, **FmodE** >> **FunCt** >> **Alibi** parameter.
  (*) The parameter is not displayed with an approved instrument.

- **(*) dSALE LIMITATION OF THE SCALE FUNCTIONS**
  - **no** limitations disabled
  - **yES** limitations enabled

  Refer to the user manual for the description of its functioning **(USER MAN.REF.).**
  (!) no
  (*) The parameter is not visible with an approved instrument or if one has selected the rEPE or MAStr functioning modes, **FmodE** >> **FunCt** parameter.

- **inPutS INPUT CONFIGURATION**

  In this step one sets the function to link to each input (n°2).

  - **inP.1** INPUT 1
    - o **nonE** Disabled
    - o **ZEro** **ZERO** Key
    - o **tArE** **TARA** Key
    - o **ModE** **MODE** Key
    - o **Print** **PRINT** Key
    - o **C** **C** Key **ON/OFF** for DGT60 model); the simple pressing of the indicator key will be repeated
    - o **oFF** TURNING OFF THE INDICATOR
    - o **diS.kEy** DISABLING OF KEYBOARD

    (!) nonE

  - **inP.2:** INPUT 2

    The programming of the 2 input is done as described for input 1.

    NOTE: In case various inputs are simultaneously enabled just the one with the lower number is taken into consideration.

- **outPut OUTPUT CONFIGURATION**

  In this step one sets the function to be linked to each output (n°2).

  - **out.1** OUTPUT 1
    - o **FunC** OUTPUT FUNCTION
      - **0 nonE** No function
      - **1 GroS** Set point on the Gross Weight
      - **2 nEt** Set point on the Net Weight
      - **3 PCS** Set point on the Pieces
      - **4 Gro.0** Gross Weight at zero
      - **5 nEt.0** Net Weight at zero
      - **6 Moti.** Instability
      - **23 k.Pr** Pressing of the PRINT key
      - **25 k.Mo** Pressing of the MODE key
      - **26 k.C** Pressing of the **C - ON/OFF** Key
      - **27 k.ZE** Pressing of the ZERO Key
      - **28 k.tA** Pressing of the TARE Key
      - **29 Err** ERROR INDICATION

    - o **no/nC** NO/NC CONTACTS

      no output 1 normally opened.

      nC output 2 normally closed.

      (!) no

    - o **onStAt** SWITCHING CONDITION

      drCt the output is activated as soon as the weight reaches the set threshold, (independently from the stability) and is disabled in the moment in which the weight goes below the set disabling threshold.

      StbL the output is activated in the moment in which the weight, after reaching the set activation thresholds, becomes stable and is disabled in the moment in which the weight goes below the set disabling threshold, it becomes stable.

      (!) drCt

    - o **rL.iSt** HYSTERESIS

      iSt.oFF disabled Hysteresis

      iSt.on enabled Hysteresis

      (!) iSt.oFF

- **EnAb.tM** ENABLING TIME
  One enters the length of the output enabling in seconds (4 digits with a decimal). The output is disabled once the set time has passed, starting from the moment of the activation (see following parameter). By setting "000.0" the output remains always active.
  Notes:
  - The delay time is considered only if one has selected the "Set point on gross weight", "Set point o Net weight" or "Set point on Pieces" as a output function.
  - Once disabled, the output is only reenabled (before verifying again the enabling condition) if the disabling condition takes place.

- **dELAy** ENABLING DELAY PERIOD
  One enters the enabling delay period in seconds (4 digits with a decimal).
  The output is enabled once the set time has passed, starting from the moment in which the condition takes place. By setting "000.0" the output is enabled when the enabling condition takes place.
  Notes:
  - The output is enabled only if the enabling condition takes place for the length of time set.
  - The delay is valid only for the enabling of the output. When the enabling condition no longer takes place the output immediately is disabled.
  - With switching condition upon stability, the output is enabled only when, after the set time has passed, the weight shows to be stable.
  - The delay time is considered only if one has selected the "Set point on gross weight", "Set point o Net weight" or "Set point on Pieces" as a output function.

- **SiGn** SET POINT SIGN (§)
  PoSit Functioning on positive weight.
  nEGAt Functioning on negative weight.
  (§) The parameter is displayed only if one has selected the "Set point on gross weight", "Set point o Net weight" or "Set point on Pieces" as a output function.

The same configurations are valid for:
- **out.2** OUTPUT 2
- **out.3 (§)** OUTPUT 3
- **out.4 (§)** OUTPUT 4
- **out.5 (§)** OUTPUT 5
- **out.6 (§)** OUTPUT 6

(§) Optional output, with the DGTQ model.

- **An.out** ANALOGUE OUTPUT (DGT4 AN, DGTQ AN and DGTPAN)
  - **ChAn** SELECTION OF THE ACTIVE CHANNEL(§)
    1÷4 in SCALE WITH NON DEPENDENT CHANNELS functioning mode ("IND.CH." / "trAnSM")
    (§) The parameter is not displayed if one has set "**dEP.CH**" in the **tYPE** parameter or in case of a single channel application, **SEtuP** >> **ConFiG** >> **nChAn** step.

  - **ModE** OPERATING MODE
    - **Ao no** = analogue output disabled.
    - **Ao G** = analogue output on the gross weight.
    - **Ao n** = analogue output on the net weight.

  - **AoMAX** MAXIMUM VALUE
    Setting of the maximum value of the analogue output.

  - **AoZEr** SCALE ZERO VALUE
    Setting of the analogue output value when the scale displays zero weight.

- o **AoMin** MINIMUM VALUE
  Setting of the minimum value of the analogue output.

- o **SiGn** SIGN (§)
  - **PoSit** Functioning with positive weight.
  - **nEGAt** Functioning with negative weight.

(§) The parameter is displayed only if one has selected the operating mode on the Net Weight.
See the 7 "ANALOGUE OUTPUT (DGT4 AN and DGTQ AN)" section for configuring it.

- **dEFAu INITIALIZATION OF THE INSTRUMENT**

Through this step one can initialize the instrument with the subsequent activation of the default parameters. By pressing PRINT, a confirmation message ("dFLt?) will appear: confirm again with PRINT or exit with any other key.

NOTE: The initialization of the instrument causes a cancellation of the present calibration and the activation of the default parameters. In any case if one exits the setup environment WITHOUT CONFIRMING the modification made, all the parameters of the last saving made will remain (including the calibration).

In case of approved instrument, the default DOES NOT HAVE EFFECT on the metrological parameters (those marked with (*)).

diAG DIAGNOSTICS MENU

It is a submenu inside which it is possible to check the software components and the scale hardware.

- **PrG.Ver** CHECKING THE SOFTWARE VERSION
  By pressing **PRINT** the instrument shows the software version in the XX.YY.ZZ. format.

- **diV.int** CALIBRATION INTERNAL DIVISIONS(§)
  By pressing **PRINT** the instrument shows the calibration internal divisions.
  (§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

- **AdC.uV** MICRO VOLTS (§)
  By pressing PRINT the instrument shows the micro volts relative to the weight on the scale.
  With the ZERO and TARE keys it is possible to switch the visualisation of the microvolts for each configured channel of the scale. In the "DEP.CH." mode it is also possible to view the sum of the microvolts of the configured channels ("SuM" appears for a few instants).
  NOTE: The maximum voltage that the instrument accepts in input is 30 mV (30000 μV); the weighing system is powered by the indicator at 5 Vdc.
  A correct operation will have a value less than 30000 with a weight of full scale capacity on the weighing system.

  (§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

- **AdC.MVV** MILLIVOLTS/VOLT (§)
  By pressing **PRINT** the instrument displays the millivolts/volt relative to the weight on the scale.
  Through the **ZERO** and **TARE** keys it's possible to switch the display of the millivolts for each configured channel of the scale. With the **MODE** key one can execute the scale zero, while with **PRINT** one cancels.
  NOTES:
  - If the load cell isn't correctly connected, or if the signal of the load cell is incorrect, "WAIT" is displayed for a few seconds, and then "ERROR".
  - In the "DEP.CH." or "TRANSM" mode, if one channel is over the capacity, "OVER C" is displayed, in which C is the number of the channel over the capacity. If more than one channel is over the capacity, "OVER C" is displayed, in which C is the number of the channel with the lowest index.

- **AdC.Pnt** CONVERTER POINTS
  By pressing **PRINT** the instrument shows the A/D converter points relative to the weight on the scale.
  With the ZERO and TARE keys it is possible to switch the display of the A/D converter points for each scale's configured channel. In the "DEP.CH." mode, it is also possible to view the sum of the microvolts of the configured channels ("SuM" appears for a few instants).
  (§) The parameter is not displayed if one has selected the rEPE or MAStr functioning mode, **FmodE** >> **FunCt** parameter.

- **diSPLA** DISPLAY TEST
  By pressing **PRINT** the instrument turns on all the display segments one at a time, after which it exits automatically from the step.

- **KEYb.** KEYBOARD TEST
  By pressing **PRINT** the instrument displays 0000; by pressing the keys one at a time, the relative codes are brought again to the display. One exits pressing the same key three times.

- **SEr** RS232 SERIAL PORT TEST
  By pressing **PRINT** the instrument displays " S xy" in which x indicates the status of the printer serial port while y indicates the status of the PC serial port. Both can take on two values:
  0 Serial port does not work
  1 Serial port works

  DGT4, DGT20 and DGT60 models
  During the test one should short-circuit TX with RX (in the RS232 terminal).
  Furthermore the ASCII "TEST"<CRLF> string is continuously transmitted on both the serial lines.
  CAREFUL: It's not possible to test the functioning of the RS485 port.

  DGTQ model
  During the test one should short-circuit A(+) with B(-) (in the COM1 terminal) and TX with RX (in the COM2 terminal).Furthermore the ASCII "TEST"<CRLF> string is continuously transmitted on both the serial lines.
  CAREFUL: It's not possible to test the functioning of the COM1 port if configured like RS485.

  DGTP model
  During the test one should short-circuit TX1 with RX1 (in the COM1 terminal) and TX2 with RX2 (in the COM2 terminal).Furthermore the ASCII "TEST"<CRLF> string is continuously transmitted on both the serial lines.
  CAREFUL: It's not possible to test the functioning of the COM1 port if configured like RS485.

- **CtS.St** TEST OF THE CTS STATUS
  By pressing **PRINT** one views the status/level of the CTS signal of the printer (on) connected to the PRN serial port.

- **outPut** TEST OF THE OUTPUTS
  By pressing **PRINT** the instrument displays "rEL.1" and enables output 1; press the ZERO or TARE key to enable the other output.

- **InPutS** TEST OF THE INPUTS
  By pressing **PRINT** the instrument displays " i.bx-y" in which x, y indicate:
  x – the input which is controlling 1 and 2; to change the input which one wants to control press the ZERO or TARE keys.
  y - the input status:
  0 Disabled input
  1 Enabled input

- **Anout** ANALOGUE OUTPUT TEST
  If the instrument is fitted with the analogue output (DGT4 AN, DGTQ AN and DGTP AN models), through this step one can test if the values of the D/A converter (to be entered at time of calibration) correspond with the relative

values of the analogue output (in voltage or in current), see paragraph 7 "ANALOGUE OUTPUT (DGT4 AN and DGTQ AN models)".
By pressing PRINT the display shows 00000; enter a value between 00000 and 65535 and confirm with PRINT; the instrument will supply the corresponding analogue value in output.
To exit the test confirm twice with PRINT the same entered value.

- **rotAry** ROTARY SWITCH (only in the DGTP/DGTPK version)
  By pressing **ENTER** the display shows the value of the ROTARY SWITCH input.

- **SEr.nuM** SERIAL NUMBER
  Diagnostics check for use of the manufacturer.

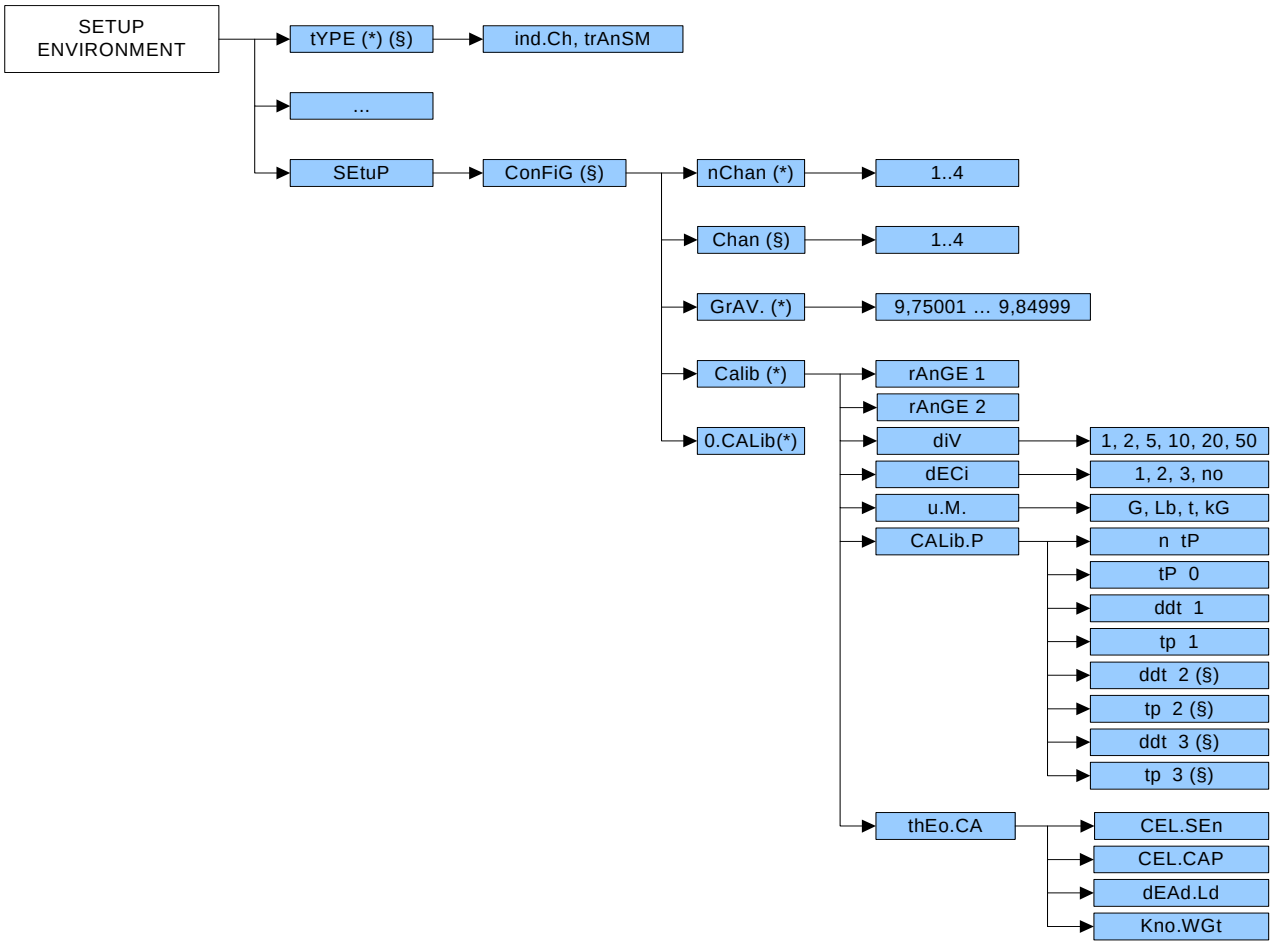
4. CALIBRATION

There are two possible types of calibration, depending on the type of application chosen for the instrument: for "IND.CH." type (independent channels) and for "DEP.CH." type (dependent channels, which could eventually be digitally equalized) (see section 3.2: tYPE – Application type).
NOTE: For the type of "TRANSM." functioning (*see section 3.2: tYPE – Application type*) the calibration procedure is the same as that of the scale with independent channels.

IMPORTANT: with Approved Instrument, the following parameters:
- are read only: "GrAV", "rAnGE 1", "rAnGE 2", "diV", "dECi", "u.M", "ntP", "ddt1", "ddt 2", ddt 3"
- are not displayed: "0Calib.", "tP0", "tP1", "tP2", "tP3".

4.1 Calibration procedure for the INDEPENDENT CHANNELS and "TRANSM" MODE

Premise: this procedure is to be followed if one has to calibrate from 1 to 4 independent scales, either in the "IND.CH." or in the "TRANSM." functioning mode (see section 3.2: tYPE – Application type). Each single cell must be connected to an instrument channel; if one wants to connect more than four cells it will be necessary to equalize these externally using the junction box.



(§) = shows that **the parameter is visible only in certain programming conditions; see the explanation of the parameter for the details.**

(*) = shows that **with an approved instrument the parameter could be not visible or not enterable; see the explanation of the parameter for further details.**

1) Enter in the SET-UP ENVIRONMENT of the scale (when turned on, press for an instant the **TARE** key while the firmware version is displayed).
2) ***Select the type of appliaction:***
   Enter in the "tyPE" step and select the "ind.Ch" parameter.
3) ***Select the number of the connected cells***
   Select number of scales (in other words, the number of channels, from 1 to 4) connected to the indicator:
   SEtuP >> ConFiG >> nChan >> 1..4 and press **PRINT**.
4) ***Select the cell to be calibrated***
   Select the scale to be calibrated (in other words the channel number, from1 to 4):
   SEtuP >> ConFiG >> Chan >> 1..4 and press **PRINT**.
5) Select the step **SEtuP >> ConFiG >> CALib** and press **PRINT**.
6) ***Setting Total Capacity or 1st Range***
   Select the "rAnGE1" step and press **PRINT**;
   Set the total capacity of the scale or the first range in case of multirange functioning.
   The keys take on the following functionalities:

ZERO	Decreases the selected digit (blinking).
TARE	Increases the selected digit (blinking).
MODE	Selects the digit to be modified (blinking), from left to right.
C	Quickly zeros the displayed value.

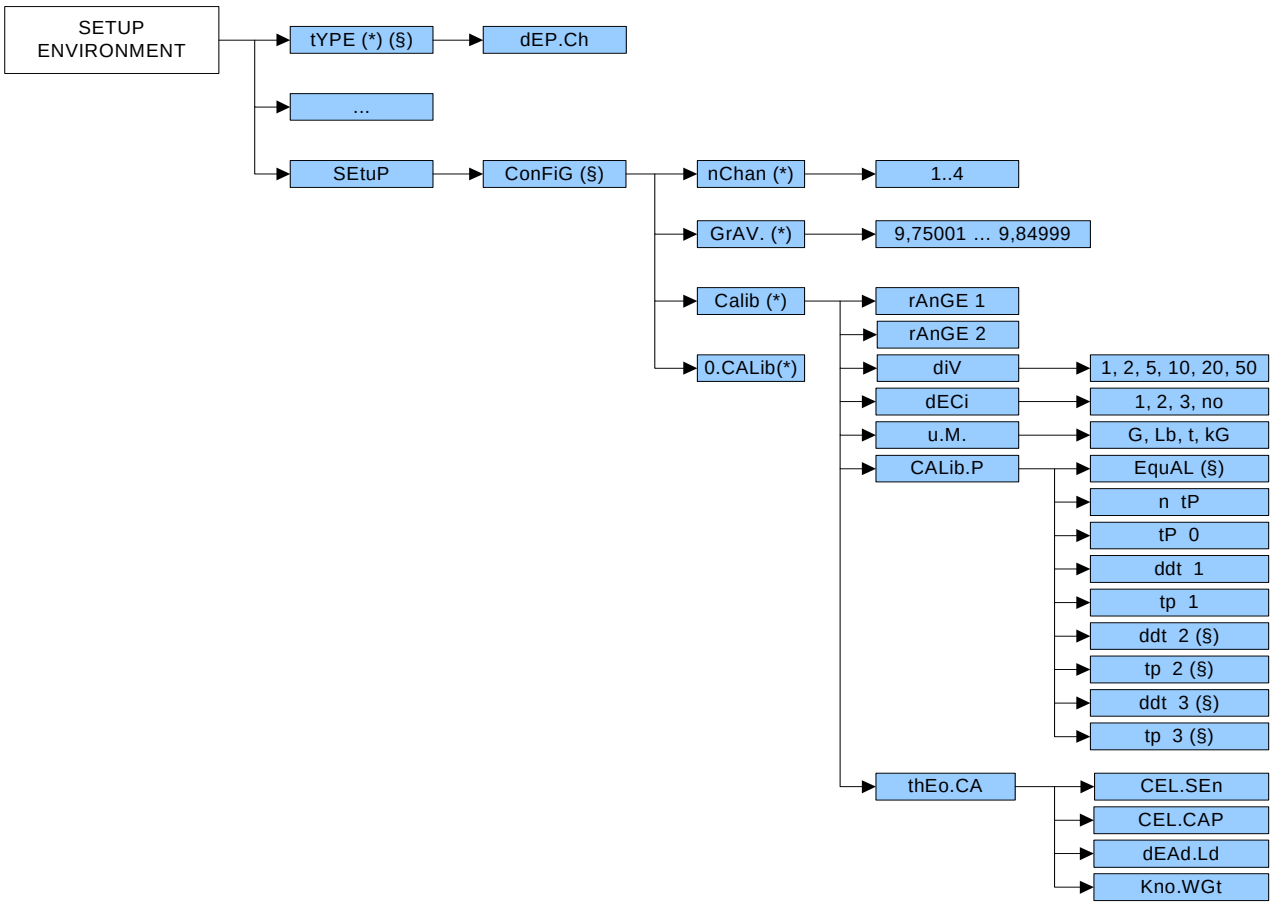
7) ***Setting of the 2nd Range capacity***
   Select the "rAnGE2" step (only in case of dual range scale) and press **PRINT**;
   Set the capacity of the second range and press **PRINT**.
8) ***Minimum Division***
   Select the "diV" step and press **PRINT**;
   Set the scale's minimum division or the first range in case of dual range and press **PRINT** (selectable values: 1, 2, 5, 10, 20, 50).
   Note: the settable division refers to the FIRST RANGE. With the second range the following division is set. For example, by setting diV=2 , the second range will have diV=5
   (!) 1
9) ***Number of Decimal digits***
   Select the **"**dECi" step and press **PRINT**;
   The selectable values are 1.0 (one decimal), 1.00 (two decimals), 1.000 (three decimals), 100000 (no decimal); confirm with **PRINT**.
   (!) 1.000
10) ***Unit of Measure***
    Select the "u.M." and press **PRINT**.
    Set the unit of measure (g, Lb, t, kg) and press **PRINT**.
    (!) kg
11) Select the "CALib.P" step and press **PRINT**.
12) Select the "ntP" step and press **PRINT**.
13) ***Nr. of Calibration points***
    Set the number of points with the **ZERO** or **TARE** keys on which one wants to make the calibration (from 1 to 3, with 1 one will make the zero point and a weight point) and press **PRINT**.
14) ***Acquisition of Scale Zero***
    Select the "tP0" step (scale zero point): unload the scale and wait a few seconds; then press **PRINT**.
15) ***Setting of 1st Sample Weight***
    Select the "ddt1" step (setting of first sample weight); press **PRINT**, enter the weight value and confirm with **PRINT**.
16) ***Acquisition of 1st Sample Weight***
    Select the "tP1" step (acquisition of first sample weight): put the weight on the scale, wait a few seconds and press **PRINT**.

17) **<u>If a calibration point had been set</u>**, once the weight acquisition has been made, the display shows for an instant the value of the internal divisions and then the "ntP" step (or "EqUAL" for the procedure of calibration 4.2).
18) **<u>If there are more calibration points</u>, repeat the operations for the points "ddt2", "tP2", "ddt3", "tP3".** Once the weight acquisition is made, the display shows for an instant the value of the internal divisions and then the "ntP" step (or "EqUAL" for the calibration procedure 4.2).
19) ***If a single scale is connected to the instrument*** **(nChan = 1) >>** Go to point 19)
If there are various scales connected to the instrument **(nChan > 1) >>** Repeat the calibration procedure for each scale, starting from point 3) in order to select the scale to be calibrated (go through again the steps from 3) >> 16).
20) ***Saving the Calibration***
Once the calibration has been made of all the necessary points, press many times the **C - ON/OFF** key until the indicator shows "SAVE? in the display: confirm with **PRINT** to store and return to weighing.

N.B.: the calibration points must be in increasing order (point 1 < point 2 < point 3).

4.2 Calibration procedure for DEPENDENT CHANNELS MODE (could eventually be digitally equalized)

Premise: this procedure is to be followed in case one has to calibrate a scale having 2, 3 or 4 load cells in the "DEP.CH" functioning mode, (*see section. 3.2: tYPE –Application type*) and wants to equalize directly from the indicator, without using the external junction boxes.
In this case one should connect each single cell to one of the available channels of the instrument.
Note: it is always better to carry out the ***equalization procedure*** (steps from 4 to 9), but it isn't compulsory (in some applications, it can not be done).



(§) = indicates that **the parameter is visible only in certain programming conditions; see the explanation of the parameter itself for the details.**

(*) = indicates that **with an approved instrument the parameter can be not visible or read only; see the explanation of the parameter itself for the details.**

1) Enter in the SET-UP ENVIRONMENT of the indicator (when turned on, press for an instant the **TARE** key while the firmware version).
2) ***Select the type of application:***
   Enter in the "tyPE" step and select the "dEP.Ch" parameter.
3) ***Select the number of connected cells***
   Select the number of cells (in other words, the number of the channels, from 2 to 4) in the **SEtuP >> ConFiG >> nChan** step and press **ENTER/PRINT**.
4) Repeat the passages from 4) to 10) described previously in section 4.1 "Calibration procedure for INDEPENDENT CHANNELS' mode"
   If one does not want to carry out the equalization proceed with point 11).

Cell Equalization procedure:

5) Select the "EquAL" step and press ENTER/PRINT: the display shows "rESEt?"; confirm with **ENTER** to clear the present equalization and proceed to the **equalization of the cells**; by pressing C one exits the equalization.
6) Select "Eq 0" step (equalization of zero): unload the weighing system and press the **PRINT** key.
7) Select "Eq 1" step (equalization of the first cell): put a calibration weight on the cell connected to input 1 of the indicator and press the **PRINT** key.
8) Select "Eq 2" step (equalization of the second cell): put the **same calibration weight** on the cell connected to input 2 of the indicator and press the **PRINT** key.
9) **If nChan > 2:**
   Select "Eq 3" step (equalization of the third cell): put the **same calibration weight** on the cell connected to input 3 of the indicator and press the **PRINT** key.
   If nChan > 3: Select "Eq 4" step (equalization of the fourth cell): put the **same calibration weight** on the cell connected to input 4 of the indicator and press the **PRINT** key.
10) When the equalization is finished the message 'EQ OK' appears and one exits the equalization submenu.

11) Select the "ntP" step and press **PRINT**.
12) ***Nr. of Calibration points***
    Set the number of points with the **ZERO** or **TARE** keys on which one wants to make the calibration (from 1 to 3, with 1 one will make the zero point and a weight point) and press **PRINT**.
13) ***Acquisition of Scale Zero***
    Select the "tP0" step (scale zero point): unload the scale and wait a few seconds; then press **PRINT**: if the equalization of the channels has not been made the 'no Eq?' message appears and the instrument emits an acoustic signal: press the ENTER/PRINT key to proceed anyways with the acquisition of the weight or the **C - ON/OFF** key to exit the step.
14) Repeat the points from 14) to 17) described previously in the "'SCALE CONNECTED TO JUST ONE CHANNEL' MODE".
15) ***Saving the Calibration***
    When the calibration has been made of all the necessary points, press various times the **C - ON/OFF** key until the indicator shows "SAVE? in the display: confirm with **PRINT** to store and return to weighing.

Note: after the cell equalization, is necessary to execute the calibration procedure

4.3 IN CASE THE ZONE OF USE IS DIFFERENT FROM THE CALIBRATION ZONE ONE SHOULD:

1) Enter the SET-UP ENVIRONMENT of the scale (when turned on, press for an instant the TARE key while the firmware version is displayed).
2) Enter the step **SEtuP >> ConFiG >> GrAV** and set the gravity acceleration value for the CALIBRATION ZONE.
3) Make the calibration as described previously.
4) Save and exit the SET-UP ENVIRONMENT (press various times the **C - ON/OFF** key until the indicator shows "SAVE?" in the display and confirm with PRINT.
5) Enter the SET-UP ENVIRONMENT of the scale and enter the step **SEtuP >> ConFiG >> GrAV** and set the gravity acceleration value for the ZONE OF USER.

6) Save and exit from the SET-UP ENVIRONMENT.
7) The weight error caused by a different gravitational value between the calibration zone and the zone of use is automatically corrected.

NOTE: with Approved Instrument, upon start-up the display shows the gravitational acceleration value of the ZONE OF USE.

4.4 QUICK CALIBRATION OF ZERO

Useful for calibrating just the ZERO point when a permanent TARE weight is added to the scale (for example a roller unit).

1) Enter in the SET-UP ENVIRONMENT of the scale (upon start-up, press for an instant the TARE key while the firmware version is displayed).
2) Enter the step **SEtuP >> ConFiG >> 0.CALib** and press PRINT (the display shows "CAL.0?"**.**
3) ***Tare Acquisition***
   Put the tare on the scale and press PRINT to confirm the operation.
4) ***Saving the Calibration***
   Once the zero calibration is made, press various times the **C - ON/OFF** key until the indicator shows "SAVE?" in the display: confirm with PRINT to store and return to weighing.

4.5 THEORETICAL CALIBRATION

Premise: it's possible to use this procedure if one does not have a sample weight available for carrying out a real calibration.

1) Follow the steps described in par. **4.1** up to point 10) (independent channels), otherwise follow the steps described in par. **4.2** up to point 4) (dependent channels)
2) Select the "thEo.CA" step and press **PRINT**
3) **Setting cell sensitivity in mV/V**
   Select the "CEL.SEn" step; press **PRINT**, enter the cell sensitivity in mV/V (up to 99.99999 mV/V) and confirm with **PRINT**.
   In case of various connected cells through the junction box, enter the average of the value; in case of dependent channels, enter the sum of the value.
4) **Setting cell capacity**
   Select the "CEL.CAP" step; press **PRINT**, enter the cell capacity (the unit of measure is the one configured for the scale, up to 999999) and confirm with **PRINT.**
5) **Setting pre-load weight**
   Select the "dEAd.Ld" step; press **PRINT**, enter the weight of the structure bearing on the load cells.
   The first character indicates the sign: '0' indicates a positive value, '-' indicates a negative value.
   The sign is changed by positioning on the first digit and press on the up arrow / down arrow keys:
   with 3 decimals: from -9.9999 to +9.9999
   with 2 decimals: from -99.999 to +99.999
   with 1 decimal: from -999.99 to +999.99
   with 0 decimals: from -9999.9 to +9999.9
   Confirm with the **PRINT** key.
   Note: enter 000000 if one does not know this value.
6) **Acquisition of a known weight**
   Select the "Kno.WGt" step and press **PRINT**; the "GET.WT?" message appears; enter the known value (value included between 0 and the scale capacity, the unit of measure is the one set for the scale) and press **PRINT**.
   Note: by setting 0 one acquires the weight of the bearing structure on the cells.

   In case of unstable weight the "ER.MOT" message will appear for a second, and one will be asked if one wants to repeat the operation ("REPET?" message).In this case press **PRINT** to repeat the operation.

Once the procedure is finished, press the **C** key to exit the calibration; one will be asked whether to apply the new calibration ("th.CAL?"). Press **PRINT** to confirm, or **C** to cancel.
Note: once the calibration is confirmed, the indicator sets the capacity of the cells ("CEL.CAP" step) equal to the scale capacity; consequently the values of the other steps are automatically recalculated.

If there are various scales, repeat the previous passages by selecting the desired channel (**SEtuP >> ConFiG >> Chan >> 1..4**).

5. GRAVITY ACCELERATION AND CORRECTION OF THE WEIGHING ERROR.

5.1 INDICATION OF THE GRAVITY ACCELERATION VALUE (Compulsory for the legal type instruments)

This instrument conforms to the laws currently in force regarding non-automatic weighing instruments. Such g-sensitive instruments are influenced by the gravitational acceleration value "**g**" of the utilisation zone hence it is compulsory to indicate, with a label or on the display, the coded name of the utilisation zone where the weighing machine can be used.
When turned on, the approved instrument display, after the name and the installed software version, the gravity acceleration value of the zone of use for a few seconds. Specifically:

Approved instrument:
Instrument start-up → … → "**LEGAL**" → "***g value*** "

5.2 CORRECTION OF THE WEIGHING ERROR introduced by a different g value between the calibration and utilisation zone (compulsory for legal type instruments).

Such g-sensitive instruments are influenced by the gravitational acceleration value "**g**" of the utilisation zone so a special programme has been created to compensate for any differences in the gravitational attraction between the place where the weighing machine is calibrated and the place of utilisation, eliminating in this way the error entered on the weight.

Approved instrument:
In the SET-UP ENVIRONMENT, in the **SEtuP >> ConFiG >> GrAV** step it is possible to only have displayed the gravitation acceleration value of the destination zone of use.

Non approved instrument:
In the SET-UP ENVIRONMENT, in the **SEtuP >> ConFiG >> GrAV**, it is possible to view and/or enter the gravitation acceleration value of the destination zone of use.

6. SERIAL OUTPUTS

The instrument has two bidirectional serial outputs, which have the output in ASCII code compatible with the majority of printers, remote displays, PCs and other devices.
The transmission of data through the serial ports can be configured in different ways, according to the setting of the "PC SEL", "PCMode**"** and "Pr.ModE" steps in the SET-UP environment.
Refer to the paragraph 6.4 section for the functioning specifics.

6.1 RS485 (DGT4 / DGT60 / DGT4 AN / DGT20 / DGT20AN) or COM1 (DGTQ / DGTQ AN/ DGTP / DGTP AN) SERIAL PORT

It is bi-directional (half duplex) and uses an R485 for transmitting data for the DGT4 and DGT60, or one may use either an RS485 or an RS232 for the DGTP and DGTQ (depending on how the jumpers of the COM1 of the board have been set; the jumpers are set by default in RS485 for further details see section 11 – "CONNECTION SCHEMES").
It is mainly used to connect computers, PLCs, additional remote displays.
The transmission speed may be selected in the SET UP among these: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 Baud (bit/sec.).

Below is the RS485 connection of the indicator:

DGT4/DGT60/DGT20	DGTQ and DGTP	Meaning
-	B(-)	Line 485 -
+	A(+)	Line 485 +

Connections in RS232 from LP542S, DP24, DP190 printer to the COM1 serial port of the DGTQ and DGTP indicator:

	DP24/LP542S 9pin (female)	DP190 Terminal Board	INDICATOR DGTQ	INDICATOR DGTP	CABLE STANDARD
GND	5	GND	GND	GND	Grey
CTS	8	BU	B(-)	RX1	Brown
RX	3	RX	A(+)	TX1	Pink

Please find below the connection in RS232 between the TPR printer and the COM1 serial port of the DGTQ and DGTP indicator:

TPR Terminal board	INDICATOR DGTQ	INDICATOR DGTP	STANDARD CABLE
GND	GND	GND	Black
RTS	B(-)	RX1	Yellow
RX	A(+)	TX1	Grey
			Blue (not connected)

Below is the connection in RS232 between the PC and the COM1 serial port of the DGTQ and DGTP indicator:

	PC 9pin (male)	PC 25pin (male)	INDICATOR DGTQ	INDICATOR DGTP	STANDARD CABLE
GND	5	7	GND	GND	Grey
TX	3	2	B(-)	RX1	Yellow
RX	2	3	A(+)	TX1	Pink

Please find below the RS232 connection for the DGT4/DGTQ/DGT60/DGT20 configured as repeater:

TRANSMITTER	DGT4/DGT20	DGTQ	DGT60
GND	GND	GND	GND
TX	RX	RX2	RX

Below is shown the connection in RS232 between the GLH60R WEIGHT REPEATER and the COM1 serial port of the DGTQ and DGTP indicator:

	GLH60R	INDICATOR DGTQ	INDICATOR DGTQ	STANDARD CABLE
RX	2	A(+)	TX1	Pink
GND	4	GND	GND	Grey

6.2 RS232 or COM2 SERIAL PORT

It is bi-directional (full duplex) and uses an RS232 for transmitting data; it is mainly used to connect to printers, computers and PLCs. The transmission speed may be selected in the SET UP among these: 1200, 2400, 4800, 9600, 19200, 38400, 57600,115200 Baud.

Connections from LP542S, DP24, DP190 printer to indicator:

	DP24/LP542S 9pin (female)	DP190 Terminal Board		INDICATOR	CABLE STANDARD
GND	5	GND	|	GND	Grey
CTS	8	BU	|	RX	Brown
RX	3	RX	|	TX	Pink

Please find below the connection between the TPR printer and the indicator:

TPR Terminal board		INDICATOR	STANDARD CABLE
GND	|	GND	Black
RTS	|	RX	Yellow
RX	|	TX	Grey
	|		Blue (not connected)

Please find below the connection in RS232 between the PC and the indicator:

	PC 9pin (male)	PC 25pin (male)	INDICATOR	STANDARD CABLE
GND	5	7	GND	Grey
TX	3	2	RX	Yellow
RX	2	3	TX	Pink

Please find below the connection in RS232 for the DGT4/DGTQ/DGT60/DGTP/DGT20 configured as a repeater:

TRANSMITTER	DGT4/DGT20	DGTQ	DGT60	DGTP
GND	GND 17	GND 8	GND 17	GND 32
TX	RX 16	RX2 7	RX 16	RX 30

Below is shown the connection in RS232 between the GLH60R WEIGHT REPEATER and the indicator:

GLH60R Serial line		INDICATOR	STANDARD CABLE
RX 2	|	TX	Pink
GND 4	|	GND	Grey

6.3 PROFIBUS PORT (DGT4PB, DGTQPB, DGT20PB and DGTPPB version)

It is bidirectional and it is mainly used for connections to the PLC.
The transmission speed (baud rate) and the format of the serial word, in case of Profibus transmission, are not modifiable in the SETUP ENVIRONMENT, but by default are set at:

- **Baud Rate** (*or transmission speed*): **9600 bit / sec**
- **Format of the Data** (*or format of the serial word*): **n - 8 - 1** (no parity – 8 data bits – 1 stop bit)

Below is the PROFIBUS connection of the indicator:

Indicator Profibus port At	Meaning to
3 B-LINE	3 B(-)
5 GND BUS	5 GND
6 +5V BUS	6 +5V
8 A-LINE	8 A(+)

NOTE: The PROFIBUS port supports only the "PROFIBUS" transmission mode available only for the PC port (see **SEtup** >> **SEriAL** >> **CoM.Pc** >> **PcModE** step).

6.4 SERIAL PORT TRANSMISSION MODES

6.4.1 PC PORT SELECTION

It's possible to select the serial port to be used as a PC port and therefore, invert the serial ports.
This setting is made in the **SEtuP** >> **SEriAL** >> **PC SEL** step.

DGT4 and DGT60 models

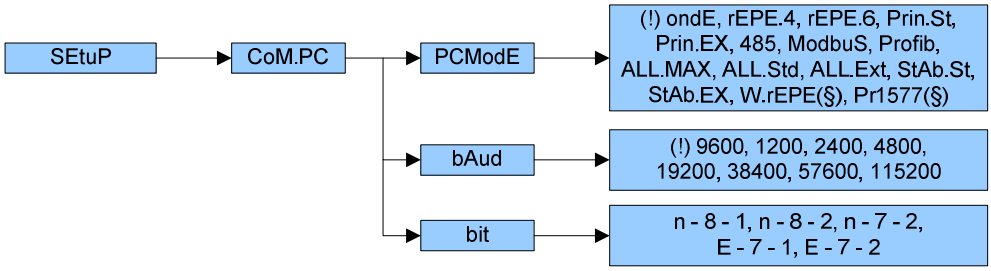
By selecting the **485/PROFIBUS** serial port as PC PORT the **232** serial line is set as PRN PORT.
By selecting the **232** serial port as PC PORT the **485** serial line is set as PRN PORT or, in the case of the **DGT4PB**, the **PROFIBUS** port is not managed.

DGTQ and DGTP/DGTPK models

By selecting the **COM 1/PROFIBUS** serial port as PC PORT the **COM 2** serial line is set as PRN PORT.
By selecting the **COM 2** serial port as PC PORT the **COM 1** serial line is set as PRN PORT or, in the case of the **DGTQPB** and **DGTPPB**, the **PROFIBUS** port is not managed.

6.4.2 PC PORT

Please find below the various selectable serial weight transmission modes of the PC serial port through the corresponding "PCModE" StEP of the SET-UP environment.



- **TRANSMISSION REQUESTED FROM AN EXTERNAL DEVICE** "ondE" parameter)
  In this case the indicator waits for a command before transmitting (see the section 6.5 "SERIAL COMMANDS FORMAT").
  With Baud rate at 9600, through the READ command, it is possible to make up to 10-11 requests per second, while with Baud rate at 115200 one can arrive at 16.
  The transmission works with weight <, =, > 0 with approved or unapproved instrument.

- **4 – 6 DIGIT REMOTE DISPLAY TRANSMISSION** ("rEPE.4" and "rEPE.6" parameter and **FModE** >> **Func** step not set on rEPE)
  If one has selected a functioning mode different than rEPE in the **FModE** >> **Func** step**,** The weight displaying takes place both in the indicator as well as in a weight repeater of 4 or 6 digits, (normally the capacity will be properly set up for a correct displaying).
  N.B. When either transmission mode is selected, the relative serial output is automatically set to 4800, N – 8 – 1 . In any case itt's possible to set it differently.
  Independently from the set transmission speed one can obtain up to 6 transmissions per second.

- **TRANSMISSION WHEN THE PRINT KEY IS PRESSED** ("Prin.Std", "PrinEX" parameter)
  The instrument communicates the weight data through the serial port when the PRINT key is pressed (except for in the TOTALIZER mode where one should press the MODE key).
  For non approved instruments:
  The transmission takes place if the weight is stable and the net weight is > 0.
  Reenabling the transmission depends on how the "rEACt" step has been set in the SET-UP environment (passing by zero of the NET weight, weight instability or always).
  For approved instruments:
  The transmission takes place if the weight is stable and the net weight is > 20 divisions.
  Reenabling the transmission depends on how the "rEACt" step has been set in the SET-UP environment (passing by zero of the NET weight, weight instability or always).

  NOTES:
  - In the TOTALISER functioning mode, the transmission on the PC port takes place upon the pressing of the **MODE** key.
  - The data is transmitted using the standard string (Prin.St) or the extended string (or multiscale string in the TRANSM mode) (PrinEX); see the paragraph 6.6 for the description of the 3 strings.
  - The transmission is confirmed by the the indication of "trAnSM" on the display.

- **TRANSMISSION IN RS 485 SERIAL MODE** ("485" parameter)
  The protocol is the same as the transmission upon request (ondE parameter), except that the instrument responds only if its machine code is the one requested (before the request the machine code must be put, I.E. 00READ<CRLF>).
  If a broadcast address command (99) is received no answer is given. If the command is correct it is executed anyways.
  Note: In case of a MASTER/SLAVE connection, connect the SLAVE indicator to the PC and configure "ALL:STD" parameter (**SEtuP** >> **SEriAL** >> **CoM.PC** >> **PCModE**)

- **TRANSMISSION IN MODBUS MODE** ("ModbuS" parameter)

  → *See the "MODBUS transmission" appendix, to be requested from the reseller.*

- **TRANSMISSION IN PROFIBUS MODE** ("ProFib" parameter)

  → *See the "PROFIBUS (DGT4 PB, DGTQ PB, DGT20PB and DGTP PB) transmission" appendix, to be requested from the reseller.*

- **CONTINUOUS TRANSMISSION** ("ALL.Std" "ALL.EXt" and "ALL.MAX" parameter)
  This mode is used for interfacing to the PC, remote displays and other devices which request a constant updating of the data independently from the weight stability.
  The instrument transmits data with each converter read operation:
  - With Baud rate at 9600 one can obtain up to 10 transmissions per second.
  - With Baud rate at 115200 one can obtain up to 16 transmissions per second for the PC port, 12 for the PRINTER port.

  The transmission works with weight <, =, > 0 with approved or unapproved instrument.
  The data is transmitted using the standard string (ALL.Std) or the extended string (or multiscale string in the TRANSM mode) (ALL.EHt); see the paragraph 6.6 for the description of the 3 strings.

The “ALL MAX” transmission protocol is advisable for applications in which a high frequency of transmissions is requested.
(up to 250TX/sec. with baud rate equal to 115200); the weight is transmitted in hexadecimal format (for example: 03E8= 1000g), without decimal point.
NOTE: The data transmission frequency increases or lessens depending on the frequency of the configured filter.
To obtain 250TX/sec one should configure the filter F.F.400 (**SEtuP** >> **ConFIG** >> **Param.** >> **StAbiL)**

- **TRANSMISSION ON STABILITY** ("StAb.St" and "StAb.EX" parameter)
  Each time a weight on the scale becomes stable, a communication string is transmitted on the PC serial port.

  For non approved instruments:
  - The transmission takes place if the weight is stable and the net weight is > 10 divisions.
  - Reenabling the transmission depends on how the "rEACt" step has been set in the SET-UP environment (passage by zero of the NET weight or instability of the NET weight of 10 divisions; by choosing "always" it works upon instability).

  For approved instruments:
  - The transmission takes place if the weight is stable and the net weight is > 20 divisions.
  - Reenabling the transmission depends on how the "rEACt" step has been set in the SET-UP environment (passage by zero of the NET weight or instability of the NET weight of 20 divisions; by choosing "always" it works upon instability).

  The data is transmitted using the standard string (StAb.St) or the extended string(or multiscale string in the TRANSM mode) (StAb.EX); see the paragraph 6.6 for the description of the 3 strings.

- **RECEPTION OF THE REPE.6 STRING** ("rEPE.6" parameter and **FModE** >> **Func** step set on rEPE)
  If an instrument is connected which transmits the data with "rEPE.6" protocol, the indicator repeats the data of the display and the indication leds of the connected instrument. If one enables the 485 address in the **SEtuP** >> **SEriAL** >> **CoM.Pc** >> **Add.En** step, the instrument repeats only if its machine code is the one requested (one must put the machine code before the string). The instrument repeats also if a command with broadcast address is received (99).
  NOTE: It is advisable to have a maximum number of receptions per second equal to 10.

- **RECEPTION OF THE STRING FROM REMOTE SCALE** ("W.rEPE" parameter and **FModE** >> **Func** step set on rEPE)
  If an instrument is connected which transmits the data in continuous mode, the indicator repeats the transmitted net weight.
  NOTE: It is advisable to have a maximum number of receptions per second equal to 10.
- **RECEPTION OF THE PR 1577 STRING** ("Pr1577" parameter and **FModE** >> **Func** step set on rEPE)
  If an instrument is connected which transmits the data with "Pr1577" protocol, the indicator repeats the data of the display and the indication leds of the connected instrument.

6.4.3 PRN PORT

Please find below the various selectable serial weight transmission modes of the PRN serial port through the corresponding "PrModE" StEP of the SET-UP environment.

- **TRANSMISSION TO PRINTER** ("tPr" and "LP542" parameter): requests the use of the print key on the indicator (prints upon request of the operator). The print command is inhibited if the weight is in motion and in all other circumstances in which the data is not valid (see "EXECUTION OF THE PRINTOUTS" section, **USER MAN.REF.**).

- **CONTINUOUS TRANSMISSION** ("ALL.Std" and "ALL.EHt" parameter): see the "ALL.Std" and "ALL.EHt" modes of the PC port.

- **TRANSMISSION OF THE PC STRING UPON PRESSURE OF THE PRINT KEY** ("PrPC.St" and "PrPC.EH" parameter): see the "Prin.St" or "Prin.EH" mode of the PC port

- **4 – 6 DIGIT REMOTE DISPLAY TRANSMISSION** ("rEPE.4" and "rEPE.6" parameter): see the "rEPE.4" and "rEPE.6" mode of the PC port.

NOTE: In the MASTER/SLAVE functioning mode (see section 8.4 MULTISCALE REPEATER (MAStr), **USER MAN.REF.**) only the transmission modes to the printer and the "rEPE.4" and "rEPE.6" transmission mode are enabled for the printer port.

THE CONNECTION AND THE SOFTWARE CONFIGURATION OF THE SERIAL OUTPUTS MUST BE CARRIED OUT BY TECHNICAL PERSONNEL WHO KNOW THE PROCEDURES ON THE BASIS OF THE NEEDS OF THE USER.

6.5 SERIAL COMMANDS FORMAT

Version reading command

[CC]VER<CR LF>

Instrument response:

- DGT4/DGT20 model [CC]VER,vvv,DGT**bbbbb**<CR LF>
- DGT60 model [CC]VER,vvv,DGT60**bbb**<CR LF>
- DGTQ model [CC]VER,vvv,DGTQ**bbbb**<CR LF>
- DGTP model [CC]VER,vvv,DGTP**bbbb**<CR LF>
- DGTPK model [CC]VER,vvv,DGTK**bbbb**<CR LF>

in which: vvv is the firmware version

b space character, ascii decimal 32 character.

Extended weight read command

[CC]REXT<CR LF>

Instrument response in the "IND.CH." mode or in the "DEP.CH" mode: EXTENDED STRING (see paragraph 6.6.2).

Instrument response in the "TRANSM." mode: MULTISCALE STRING (see paragraph 6.6.3).

NOTES:

- If the instrument is in the "IND.CH." mode (scale with independent channels) or in the "DEP.CH" mode (scale with dependent channels and digitally equalized) the weight value is read relative to the active channel; to read the values of the other channels (if configured) one has to switch each time onto the desired channel (*see also CGCH channel switching command*).
- If the instrument is in the "TRANSM." mode (scale with independent channels) it is possible to read simultaneously the values for all the configured channels

Reading command of the extended weight with Average Piece Weight (APW)

[CC]REXTA<CR LF>

Instrument response in the "IND.CH." or in the "DEP.CH" mode: EXTENDED STRING (see paragraph 6.6.2).

Instrument response in the "TRANSM." mode: MULTISCALE STRING (see paragraph 6.6.3).

NOTES:

- If the instrument is in the "IND.CH." mode (scale with independent channels) or in the "DEP.CH" mode (scale with dependent channels and digitally equalized) the weight value is read relative to the active channel; to read the values of the other channels (if configured) one has to switch each time onto the desired channel (*see also CGCH channel switching command*).
- If the instrument is in the "TRANSM." (scale with independent channels) mode it is possible to read simultaneously the values for all the configured channels

Extended weight read command

[CC]REXD<CR LF>

Instrument response in the "IND.CH." or in the "DEP.CH" mode: EXTENDED STRING (see paragraph 6.6.2).

Instrument response in the "TRANSM." mode: MULTISCALE STRING (see paragraph 6.6.3).

Weight read command

[CC]READ<CR LF>

Instrument response: STANDARD STRING (see paragraph 6.6.1).

Weight reading command with sensitivity times 10
[CC]GR10<CR LF>
Instrument response: STANDARD STRING (see paragraph 6.6.1).

Reading command of micro volts relative to the weight
[CC]MVOL<CR LF>
Instrument response in "IND.CH." mode: STANDARD STRING (see paragraph 6.6.1).
Response of the instrument in "TRANSM" and "DEP.CH" mode: MULTISCALE STRING (See section 6.6.3).

NOTES:
- If the instrument is in the "IND.CH." mode (scale with independent channels) the voltage value is read relative to the active channel; to read the values of the other channels (if configured) one has to switch each time onto the desired channel (*see also CGCH channel switching command*).
- If the instrument is in the "TRANSM." (scale with independent channels) or in the "DEP.CH" mode (scale with dependent channels and digitally equalized) mode it is possible to read simultaneously the values for all the configured channels

Reading command of converter points relative to the weight
[CC]RAZF<CR LF>
Instrument response in "IND.CH." mode: STANDARD STRING (see paragraph 6.6.1).
Response of the instrument in "TRANSM" and "DEP.CH" mode: MULTISCALE STRING (See section 6.6.3).

NOTES:
- If the instrument is in the ("IND.CH.") mode (scale with independent channels) the voltage value is read relative to the active channel; to read the values of the other channels (if configured) one has to switch each time onto the desired channel (*see also CGCH channel switching command*).
- If the instrument is in the "TRANSM." (scale with independent channels) or in the "DEP.CH" mode (scale with dependent channels and digitally equalized) mode it is possible to read simultaneously the values for all the configured channels

Tare command
[CC]TARE<CR LF> or [CC]T<CR LF> (short command).
Instrument response: [CC]OK<CR LF> if the command has been RECEIVED; the instrument's response does not mean necessarily that the instrument executes the tare.

Zero command
[CC]ZERO<CR LF> or [CC]Z<CR LF> (short command)
Instrument response: [CC]OK<CR LF> if the command has been RECEIVED; the instrument's response does not mean necessarily that the instrument executes the zero.

CLEAR command
[CC]C<CR LF>; [CC]CLEAR<CR LF>
Instrument answer: [CC]OK<CR LF> if the CLEAR command has been RECEIVED, no answer for the **C - ON/OFF** command; the instrument answer does not imply that the command is executed.
The command works also inside the SET-UP ENVIRONMENT.

Command for Switching the Converter Channel
[CC]CGCHN<CR LF>
Instrument answer: [CC]OK<CR LF> if the CGCH command has been RECEIVED.
In which N: number of channel on which one wants to position the instrument

Test Command
[CC]ECHO<CR LF>
Instrument response: [CC]ECHO<CR LF>.

Print Command
[CC]PRNT<CR LF> or [CC]P <CR LF> (short command).
Instrument answer: [CC]OK<CR LF> if the PRINT command has been received; no answer for the P command; the instrument's response does not mean necessarily that the instrument executes the printout.

Tare insertion command
[CC]TMANVVVVVV<CR LF> or [CC]WVVVVVV <CR LF> (short command)
in which: VVVVVV: manual tare value with the decimal point, from 1 to 6 characters; the non significant zeros can be omitted.
Instrument answer: [CC]OK<CR LF> if the TMAN command has been RECEIVED; no answer for the W command; the instrument's response does not mean necessarily that the instrument executes the tare.

Command for viewing temporary message on the display
[CC]DISPNNVVVVVV <CR LF>
in which: NN: is the indicator display number, standard 00 (ascii hex)
V is the message:
- if present it is shown on the NN display.
- if not present, the command interrupts the possible visualisation enabled using a previous DISP command, restoring the visualisation of the weight data.

NOTE
In the case in which the display shown in the command is of the numeric type (for example the standard display 00), if in the transmitted message there are two consecutive points the message is stopped after the first of the two points. When the display is showing a message transmitted serially through the DISP command, the indicator does not display those messages usually shown in the scale status (ZERO, TARE, HOLD, ...).
Instrument response: [CC]OK<CR LF>
The message remains for the time set through the DINT command:
The ASCII characters having the decimal code greater than 31 are accepted.
With approved instrument:
One needs to wait the end of the current visualisation before being able to view the next one.

Command for setting display visualisation interval
[CC]DINTNNNN<CR LF>
in which: NNNN is the visualisation interval (in milliseconds), expressed in ascii hex character; for example, in order to set a visualisation time of 2 seconds (2000 milliseconds, which converted into hex it becomes 07D0), the command becomes DINT07D0<CR><LF>.
By setting a time equal to zero, the message transmitted with the DISP command remains permanently shown on the display.
Instrument response: [CC]OK<CR LF>
With approved instrument:
The minimum settable time is 1 millisecond (0001HEX), and maximum settable time is 5 seconds (5000 milliseconds, 1388 HEX).
PC confirmation command
[CC]PCOK<CR LF>
The indicator shows on the display the "-PCOK-" message for about 2 seconds.
Instrument response: [CC]OK<CR LF>.

Serial command for setting the apw (only for the counting operating mode)
[CC]SPMUvvvvvvvv <CR LF> or [CC]Xvvvvvvvv<CR LF> (short command).
in which: vvvvvvvv is the apw (up to 8 characters with decimal point); maximum value: 9999.999
System response: [CC]OK<CR LF>.
For example, to set a APW of 1.55 g, the command is the SPMU1.55<CR LF> or SPMU0001.550 <CR LF> and all the various combinations adding zeros to the right or to the left but taking into consideration that the maximum length of the APW field is 8 characters.

NOTES:
- The APW are not accepted in the SPMU.12<CRLF> format; these must be in the SPMU0.12<CRLF> format.
- the APW are not accepted equal to zero.

Serial command which supplies the indicator status
[CC]STAT<CR LF>
Instrument response:
[CC]STATXX<CR LF>
in which XX is a decimal value which supplies the status of the indicator; the possible values are:

XX indicator status
00 normal scale status
01 normal scale status in input
02 instrument in technical set-up
03 instrument in boot phase
04 instrument in rx/tx set-up phase
05 instrument in test phase of the serial ports
06 instrument in print test
07 instrument in firmware update phase
08 instrument in stand-by
09 instrument in automatic zero phase
10 instrument in change channel
11 instrument in inputs test phase

Key pressure simulation command
[CC]KEYPXX<CR LF>
in which XX is the code of the pressed key:
Key pressure simulation command
[CC]KEYPXX<CR LF>
in which XX is the code of the pressed key:
00: ZERO key;
01: TARE key;
02: MODE key;
03: PRINT key;
04: C key
05: numeric 1 key;
06: numeric 2 key;
07: numeric 3 key;
08: numeric 4 key;
09: numeric 5 key;
0A: numeric 6 key;
0B: numeric 7 key;
0C: numeric 8 key;
0D: numeric 9 key;
0E: numeric 0 key;
Instrument response: OK<CR LF>: accepted command.
In case the simulated key has two linked functions (key briefly pressed or at length, like the TARE key), if the KEYP command is followed by the release command of the (KEYR) key within a maximum time of 1,5 seconds, the simple function will be executed (key briefly pressed); otherwise the second function will be made (key pressed at length).

Key pressure simulation command
[CC]KEYR<CR LF>
Response: [CC]OK<CR LF>

NOTE: The instrument does not transmit the OK answer to the following short commands: P, Q, T, W, X, Z.

Scale information reading: [CC]RALL<CR LF>
Instrument answer:

SS,B,NNNNNNNUM,LLLLLLLUM,YYTTTTTTTTUM,XXXXXXXUM,SSS,AAA,CCC,TTT,XXXXX-YYYYYY<CR LF>.

in which:

SS	UL	Underload
	OL	Overload
	ST	Stability of the display
	US	Unstability of the display
	TL	Active inclination input
B	Number of platform on which the totalisation has been made.	
NNNNNNNUM	Net weight with unit of measure.	
LLLLLLLUM	Gross weight with unit of measure.	
XXXXXXXUM	Last net weight totalized with unit of measure	
SSS	Scale status:	000 normal scale status
		001 normal scale status in input
		002 instrument in technical setup
		003 instrument in boot phase
		004 instrument in rx/tx set-up phase
		005 instrument in test phase of the serial ports
		006 instrument in print test
		007 instrument in firmware update phase
		008 instrument in stand-by
		009 instrument in automatic zero phase
		010 instrument in change channel
		011 instrument in input test phase
AAA	Counter of pressed keys.	
CCCC	Code of last key pressed.	
TTT	Counter of totalisations.	
XXXXX	Last rewriting number stored in the Alibi memory.	
YYYYYY	Last weigh number stored in the Alibi memory.	

Set point command
[CC]STPTntxxxxxxtyyyyyy<CR LF>
in which: n indicates the SET POINT number (1, 2)
t → **F** if the following weight value indicates the DISABLING of the outputs (OFF).
t → **O** if the following weight value indicates the ENABLING of the outputs (ON). xxxxxx and yyyyyy take on the set point value of disabling or enabling: the digits must be entered WITHOUT the decimal point, omitting the NON significant zeros.
Instrument responses: [CC]OK<CR LF> in case of syntax and correct values.
[CC]NO<CR LF> in case of correct syntax but wrong values.

Example of instrument with capacity 10,000 kg and division 1 g:
Command: **STPT1F5000O6500** (Disabling first output at 5 kg and enabling at 6,5 kg)
Response: **OK**

NOTES: The negative response of the instrument (ERR 02), happens in the following cases:
- one of the two entered values is greater than the capacity.
- one of the two entered values has a minimum division that is inconsistent in comparison to the one set in the instrument.
- the disabling value is greater than that of enabling.

Furthermore, the transmitted values are valid until the indicator is turned off. To permanently save these on the instrument one should use the saving command (CMDSAVE) described later on. If one wants to save various set points one should set all of them and at the end transmit the saving command.

SET POINT saving command
[CC]CMDSAVE<CR LF>
Response: [CC]OK<CR LF>

ADVANCED COMMANDS

Input reading command:

Sintax

Format	**<ESC><II>INPU<N><STX>**
Parameters	**N = input number (expressed in hexadecimals):** **- 0 to simultaneously read all the inputs.** **- from 1 to 2 to identify the single input which one wants to read (from 1 to 6 with the DGTQ model).**
Answer	**<ESC><II>INPUNVVVV <STX>** **In which N = input number (expressed in hexadecimals), described previously** **VVVV = input \ inputs status:** **- for the single input, V = 0000 means input not active, while V = 0001 active input, FFFF input reading error.** **- for all the inputs (in other words N = 0), the returned value corresponds to the hexadecimal codification of the status of the inputs**
Example	**<ESC>01INPU0 <STX>**
Result	**Reading of indicator's inputs' status (see the following explanation).**

A bit is ascribed to each input:

												Board inputs DGTP/ DGTPK model		Board inputs DGT4, DGT20, DGT60 and DGTQ models	
Bit not managed												IN 4	IN 3	IN 2	IN 1
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Therefore if the INPU00003 string is received, the hexadecimal value, converted into binary, indicates that the status of the inputs is the following:

												Board inputs DGTP/ DGTPK model		Board inputs DGT4, DGT20, DGT60 and DGTQ models	
Bit not managed												**IN 4**	**IN 3**	**IN 2**	**IN 1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**1**	**1**

The active inputs are therefore IN 1 and, IN 2.
NOTES:
- The reading command of the inputs works also in the set-up environment
- No input is ascribed to bits from 2 to 15 bits and these are fixed at zero.

Output reading command:

Sintax

Format	**<ESC><II>OUTS<N><STX>**
Parameters	**N = output number (expressed in hexadecimals):** **- 0 to simultaneously read all the outputs.** **- from 1 to 2 to identify the single input which one wants to read (from 1 to 6 with the DGTQ model).**
Answer	**<ESC><II>OUTSNVVVV <STX>** **In which N = input number (expressed in hexadecimals), described previously** **VVVV = outputs status:** **- for the single output, V = 0000 means output not active, while V = 0001 active output, FFFF output reading error.** **- for all the outputs (in other words N = 0), the returned value corresponds to the hexadecimal codification of the status of the outputs**
Example	**<ESC>01OUTS0 <STX>**
Result	**Reading of indicator's outputs' status (see the following explanation).**

DGT4 and DGT60 models

A bit is ascribed to each input:

														Board outputs	
Bit not managed														RL 2	RL 1
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Therefore if the OUTS00002 string is received, the hexadecimal value, converted into binary, indicates that the status of the outputs is the following:

														Board outputs	
Bit not managed														**RL2**	**RL 1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	**Bit 1**	**Bit 0**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**

The active outputs are therefore RL 1 and, RL 2.

NOTES:
- The reading command of the outputs does not work in the set-up environment
- No output is ascribed to bits from 2 to 15 bits and these are fixed at zero.

DGTQ model
A bit is ascribed to each input:

										Expansion outputs (optional)				Board outputs	
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Therefore if the OUTS0002D string is received, the hexadecimal value, converted into binary, indicates that the status of the outputs is the following:

										Expansion outputs (optional)				Board outputs	
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	**Bit 5**	Bit 4	**Bit 3**	**Bit 2**	Bit 1	**Bit 0**
0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**1**	0	**1**

The active outputs are therefore OUT 1, OUT 3, OUT 4 and OUT 6.

NOTES:
- The reading command of the outputs does not work in the set-up environment
- No output is ascribed to bits from 6 to 15 bits and these are fixed at zero.

DGTP/DGTPK model
A bit is ascribed to each input:

										Board outputs					
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Therefore if the OUTS0002D string is received, the hexadecimal value, converted into binary, indicates that the status of the outputs is the following:

										Board outputs					
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	**Bit 5**	Bit 4	**Bit 3**	**Bit 2**	Bit 1	**Bit 0**
0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**1**	0	**1**

The active outputs are therefore OUT 1, OUT 3, OUT 4 and OUT 6.

NOTES:
- The reading command of the outputs does not work in the set-up environment
- No output is ascribed to bits from 6 to 15 bits and these are fixed at zero.

Enabling/disabling of the output command:

Sintax

Format	**<ESC><II> OUTPNVVVV <STX>**
Parameters	**- N = output number (expressed in hexadecimals)** **- 0 to activate simultaneously all the outputs** **- from 1 to 2 to identify the single output which one wants to enable (from 1 to 6 with the DGTQ model).** **- VVVV = enabling/disabling code;** **- for the single output, V = 0000 disabled, while V = 0001 enabled.** **- for all the outputs (in other words N = 0), the value identifies the outputs to be enabled (expressed in hexadecimals).**
Answer	**<ESC><II>OK<STX>** **The answer does not imply that the command has been made on the output or all the set outputs.**
Example	**<ESC>01OUTP00003<STX>**
Result	**Configuration of the outputs (see the following explanation)**

DGT4, DGT20 and DGT60 models
A bit is ascribed to each output:

														Board outputs	
Bit not managed														RL 2	RL 1
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

The bit at 1 is interpreted as active output, while the bit at 0 as disabled output.
If, for example, one wants to enable simultaneously the **R1** and **R2** outputs, the binary combination will be

														Board outputs	
Bit not managed														**RL 2**	**RL 1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	**Bit 1**	**Bit 0**
0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**

Which, in hexadecimals, corresponds to the number 0003; therefore the command will be OUTP00003 + CR + LF.

NOTES:
- The set point enabling command does not work neither in the set-up environment nor in the weighing phase; if the setpoint mode has been selected and the output function is different than "nonE". (rif. output step, FunC parameter).
- No output is ascribed to the bits from 2 to 15 and are fixed at zero.

DGTQ model
A bit is ascribed to each output:

										Expansion outputs (optional)				Board outputs	
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

The bit at 1 is interpreted as active output, while the bit at 0 as disabled output.
If, for example, one wants to enable simultaneously the **OUT6, OUT4** and **OUT2** outputs, the binary combination will be

										Expansion outputs (optional)				Board outputs	
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	**Bit 5**	Bit 4	**Bit 3**	Bit 2	**Bit 1**	Bit 0
0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0

Which, in hexadecimals, corresponds to the number 002A; therefore the command will be OUTP0002A + CR + LF.

NOTES:
- The set point enabling command does not work neither in the set-up environment nor in the weighing phase; if the setpoint mode has been selected and the output function is different than "nonE". (rif. output step, FunC parameter).
- No output is ascribed to the bits from 6 to 15 and are fixed at zero.

DGTP/DGTPK model
A bit is ascribed to each output:

										Board outputs					
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

The bit at 1 is interpreted as active output, while the bit at 0 as disabled output.
If, for example, one wants to enable simultaneously the **OUT6, OUT4** and **OUT2** outputs, the binary combination will be

										Board outputs					
Bit not managed										**OUT6**	**OUT5**	**OUT4**	**OUT3**	**OUT2**	**OUT1**
Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	**Bit 5**	Bit 4	**Bit 3**	Bit 2	**Bit 1**	Bit 0
0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0

Which, in hexadecimals, corresponds to the number 002A; therefore the command will be OUTP0002A + CR + LF.

NOTES:
- The set point enabling command does not work neither in the set-up environment nor in the weighing phase; if the setpoint mode has been selected and the output function is different than "nonE". (rif. output step, FunC parameter).
- No output is ascribed to the bits from 6 to 15 and are fixed at zero.

LEGEND
[CC] e **<II>**= instrument code, e.g.. 00 (only with RS485 protocol).
<CR LF>= Carriage Return + Line Feed (ASCII characters 13 and 10).

SERIAL ERRORS
Upon each serial command received the instrument transmits a response which may be a response to a command (see the command description) or the indication of the command error:
ERR01<CR LF> it is shown when a correct command is transmitted from the PC to the indicator however it is followed by letters inserted involuntarily (I.E.: READF TARES…).
ERR02<CR LF> it is shown when a correct command is transmitted from the PC to the indicator, but containing wrong data.
ERR03<CR LF> it is shown when a non allowed command is transmitted. It may be a command not used in the selected functioning mode or the command reaches the indicator in the instant in which the keyboard buffer is already occupied by another command.
ERR04<CR LF> it is shown when an inexistent command is transmitted.

6.6 TRANSMISSION PROTOCOLS

The weight data transmission on the PC and PRN serial ports may take place in 3 formats: STANDARD STRING, EXTENDED STRING or MULTISCALE STRING.

6.6.1 STANDARD STRING

STRING TRANSMITTED IN THE DEPENDENT CHANNEL AND INDEPENDENT CHANNEL MODE
[CC]hh,kk,ppppppppp,uu + CR + LF

STRING TRANSMITTED IN THE TRANSM MODE:
[CC]hh,ppppppppp,uu + CR + LF

in which: **[CC]** INSTRUMENT CODE IN THE FORMAT OF TWO ASCII DECIMAL DIGITS
ONLY IN THE CASE THAT THE 485 PROTOCOL IS SELECTED (FOR EXAMPLE 00).

hh	UL	Under load (not transmitted in the "TRANSM" mode)
	OL	Over load (not transmitted in the "TRANSM" mode)
	ST	Stability of the display
	US	Instability of the display
,		Comma character
kk	NT	Net Weight
	GS	Gross Weight
	GX	Gross weight with sensitivity times 10
	VL	Value in micro volts relative to the weight
	RZ	Value in converter points relative to the weight
,		Comma character
ppppppppp		8 digits (including any sign and decimal point) which identify the weight. The insignificant digits are filled with spaces. Through the MVOL and RAZF command the indicator transmits the relative value on 10 digits instead of 8.
uu		Unit of measurement "kg" "**b**g" "**b**t" "lb" "mv" (microvolts) "vv" (converter points)
CR		Carriage Return (13 ascii decimal character).
LF		Line Feed (10 ascii decimal character).

The transmitted weight is the GROSS weight (GS) if no TARE WEIGHT has been entered; otherwise, the NET WEIGHT (NT) will be transmitted.

6.6.2 EXTENDED STRING

Without APW (only in a mode other than **counting** or in response to the REXT command**)**:
[CC]B,hh,NNNNNNNNNN,YYTTTTTTTTTT,PPPPPPPPPP,uu,(dd/mm/yybb**hh:mm:ss|"NO DATE TIME") + CR + LF**

With APW (only in **piece counting** mode or in response to the REXT command**)**:
[CC]B,hh,NNNNNNNNNN,YYTTTTTTTTTT,PPPPPPPPPP,AAAA.AAAAA,uu + CR + LF

in which:

[CC] INSTRUMENT CODE IN THE FORMAT OF TWO ASCII DECIMAL DIGITS
JUST IN CASE THE 485 PROTOCOL IS SELECTED (FOR EXAMPLE 00)

B scale number (1 in scale with equalized channel mode ("DEP.CH"),the channel number from 1÷4 in scale with independent channels mode ("IND.CH.).

, Comma character

hh
UL Under load
OL Overload
ST Stability of display
US Instability of display

, Comma character

NNNNNNNNNN net weight on 10 characters including possible sign and decimal point

, Comma character

YY "PT" if the tare is manual, otherwise YY = " " (two empty spaces) if the tare is semiautomatic.

, Comma character

TTTTTTTTTT tare weight on 10 characters including possible sign and decimal point.

, Comma character

PPPPPPPPPP number of pieces on 10 characters, equal to 0 if the indicator is in a functioning mode other than the counting mode.

, Comma character

AAAA.AAAAA Average Piece Weight on 10 characters with 5 decimals. The Average Piece Weight is always reported in grams.

, Comma character

uu Unit of measure "Kg" "**b**g" "**b**t" "lb

, Comma character (only with REXD command)

dd/mm/yy Date in the “dd/mm/yy” format (only with REXD command)

bb 2 space characters, ascii decimal 32 character (only with REXD command)

hh:mm:ss Time in the "hh:mm:ss" format (only with REXD command)

CR Carriage Return (ascii decimal 13 character)

LF Line Feed (ascii decimal 10 character)

The non significant digits of the net, tare, pieces and gross weights are filled with spaces (space characters, ascii decimal 32 character).
If the optional TIME DATE board has not been detected, in response to the REXD command, only the weight is transmitted and not the date and time; in its place there is "NO DATE TIME".

6.6.3 MULTISCALE STRING

The string varies depending upon the configured channels:

Chan. Transmitted string

1 **[CC]hh,ppppppppp,uu, (dd/mm/yy**bb**hh:mm:ss|"NO DATE TIME") + CR + LF**

2 **[CC]hh,ppppppppp,uu,hh,ppppppppp,uu, (dd/mm/yy**bb**hh:mm:ss|"NO DATE TIME") + CR + LF**

3 **[CC]hh,ppppppppp,uu,hh,ppppppppp,uu,hh,ppppppppp,uu, (dd/mm/yy**bb**hh:mm:ss|"NO DATE TIME") + CR + LF**

4 **[CC]hh,ppppppppp,uu,hh,ppppppppp,uu,hh,ppppppppp,uu,hh,ppppppppp,uu, (dd/mm/yy**bb**hh:mm:ss|"NO DATE TIME") + CR + LF**

in which:

[CC] = INSTRUMENT CODE IN THE FORMAT OF TWO ASCII DECIMAL DIGITS ONLY IF THE 485 PROTOCOL HAS BEEN SELECTED (FOR EXAMPLE 00)

For each set channel:

hh
- ST Stability of the display
- US Instability of the display
- VL Value in microvolts relative to the weight
- RZ Value in converter points relative to the weight

, Comma character

ppppppppp 8 digits (including eventual sign and decimal point) which identify the weight. The insignificant digts are filled with spaces. Through the MVOL and RAZF commands the indicator transmits the relative value on 10 digits instead of 8.

, Comma character

uu Unit of measure "kg" "**b**g" "**b**t" "lb" "mv" (microvolts) "vv" (converter points)

, Comma character (only with REXD command)

dd/mm/yy Date in the “dd/mm/yy” format (only with REXD command)

bb 2 space characters, ascii decimal 32 character (only with REXD command)

hh:mm:ss Time in the "hh:mm:ss" format (only with REXD command)

CR Carriage Return (ascii decimal 13 character)

LF Line Feed (ascii decimal 10 character)

If the optional TIME DATE board has not been detected (standard only in DGTP/DGTPK version), in response to the REXD command, only the weight is transmitted and not the date and time; in its place there is "NO DATE TIME".

LEGEND:

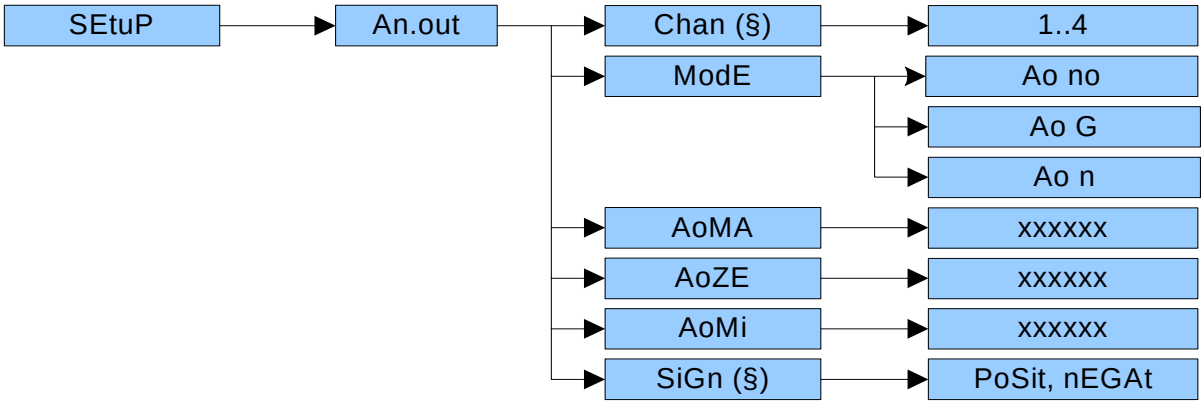
b space character, 32 decimal ascii character.

7. ANALOGUE OUTPUT (DGT4 AN, DGTQ AN, DGT20AN and DGTP AN version)

In all the functioning modes, through an optional interface, it is possible to use an analogue output configurable at 0 – 10V, 0 – 20 mA or 4 – 20 mA. The voltage and the output current from the interface are proportional to the gross weight or net weight present on the scale. In regards to the electrical connection scheme, refer to the section 11 "ELECTRICAL SCHEMES".

Note: The analogue output is updated every 50ms and takes on the value corresponding to the weight converted in that instant; therefore if the filter is slowed on the weight, the analogue output also slows down.

For configuring the parameters, one should enter the setup environment and enter in the **SEtuP** >> **ConFiG** >> **Anout** step.



ChAn

By entering this step, one selects the channel to be configured (from 1 to 4).

NOTE: The parameter is not displayed if one has set "**dEP.CH**" in the **tYPE** parameter or in case of one channel application, step **SEtuP** >> **ConFiG** >> **nChAn.**

ModE

By entering this step one selects the tyep of analogue output:

- **Ao no** = analogue output disabled.
- **Ao G** = analogue output on gross weight.
- **Ao n** = analogue output on net weight.

Once the functioning mode is confirmed, one sets the values of the analogue output; in other words, the digital/analogue converter values are entered (between 0 and 65535) to which corresponds a certain output value in voltage or in current.

In this configuration the instrument keys take on the following meanings (functions):

ZERO	It decreases the selected digit (blinking).
TARE	It increases the selected digit (blinking)
MODE	It selects the digit (blinking) from left to right.
PRINT	By pressing once after have a value has been entered, it enables the corresponding output analogue value, (allowing the check) but remains still inside the step in case of a new modification. By pressing a second time (on the same entered value), it confirms and exits the step.
C	It allows to quickly zero the present value.

NOTE: The functioning mode is just one for all the configured channels.

AoMAX

By entering this step, one sets the maximum value of the analogue output, in other words:

- with functioning on the positive weight → the value corresponding tohe full scale capacity and in the overload condition.
- with functioning on the negative weight → the value corresponding to the under load condition.

This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument emits a prolonged sound, after which it zeros the value just entered.

Ao ZEr
By entering this step, one sets the analogue output value when the scale displays zero weight (supplied when the scale is in under load). This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument emits a prolonged sound, after which it zeros the value just entered.

Ao Min
By entering this step, one sets the minimum value of the analogue output, in other words:
- with functioning on the positive weight → the value corresponding to the under load condition.
- with functioning on the negative weight → the value corresponding to the full scale value of the scale and the over load condition.

This value can be anywhere between 0 and 65535 (values of the digital/analogue converter); if a higher digit is entered, the instrument emits a prolonged sound, after which it zeros the value just entered.

SiGn
By entering this step, one sets the functioning on the negative or positive weight.

Note: It's not possible to set the functioning on the negative gross weight; for this purpose the parameter is displayable only in the functioning on the net weight.

APPROXIMATE VALUES BETWEEN THE D/A CONVERTER AND ANALOGUE OUTPUT

D/A CONVERTER VALUES	VOLTAGE VALUE (V)	CURRENT VALUE (mA)
1200	0	0
12700		4
58600		20
62650	10	

8. PROGRAMMING THE PRINTOUTS

If in the set-up environment the presence of the printer has been configured correctly, the indicator carries out the print functions; each functioning mode has specific printouts, shown in the "Print examples" section in the user manual **(USER MAN.REF.)**. In any case, it is possible to define some printing fields, the size of the characters, a heading and other options depending on the printer and the predefined functioning mode.

In the "Pr.Mode" step of the set-up environment it is possible to select whether to print on the DP190 / TPR printer or the LP542S (LP542P) labeller; see the following steps for all the printing options.

1) Enter the SET-UP environment of the scale (when turned on, press for an instant the **TARE** key while the firmware version is displayed).
2) Select the **SEtuP >> SEriAL >> Com.Prn >> PrMode** step and press **PRINT**.
3) Select the desired printer ("tPR" or "LP542P) and press **PRINT**.
4) In the section 3 "SET-UP ENVIRONMENT" see the descriptions of the "baud.Pr", "Bit.Pr", "PWr.Prn", "on.Prin" and "Prn.CtS" steps for configuring the baud rate, the number of transmission bits, the printer's power supply and the CTS signal.
5) Select the "**Pr Conf**" step and press **PRINT**: one enters the **PROGRAMMING MENU OF THE PRINTOUTS.** Below is the description of the steps.
6) Once the setting have been made, press the **C - ON/OFF** key various times until the indicator shows "SAVE? In the display: confirm with **PRINT** to memorize and return to weighing.

PrConF *CONFIGURATION OF THE PRINTOUTS*

In this step one enters the print programming submenu.
NOTE: the parameter and all its submenus are not displayed unless the "Pr- no" in the "PrModE" step.

LanG *PRINTING LANGUAGE*

One selects the language in which the printouts are carried out:

ItAL italian.
EnGL english.
dEut german.
FrAn french.
ESPA spanish.
(!) ItAL

bLinE *EMPTY LINE AT THE BEGINNING OF THE PRINTOUT*

YES at the beginning of each printout an empty line is inserted.
no no empty line.
(!) YES

IntES *PRINTING OF HEADING*

Int no no heading.
Int Si prints the heading; in the totalizer mode it is printed only upon the first totalisation (in other words if the partial total is zero).
Int Fi prints the heading; in the totalizer mode it is printed in all the totalisations.
Int.SuM prints the heading; in the totalizer mode it is printed in all the totalisations and in the partial total.
(!) Int no

nuMWEi *PRINTING OF NUMBER OF WEIGHS (ONLY FOR TOTALIZER MODE)*

no does not print the number of weighs.
tot prints the number of weighs only in the single totalisation.
Sum prints the number of weighs only in the partial total.
both prints the number of weighs in the totalisations as well as in the partial total.
NOTE: the parameter is displayed only if the "totalizer" functioning mode has been selected.
(!) both

dOM *PRINTS DATE AND TIME*

dt. no the date and time are not printed.
dt.in.1 the date and time are printed using the clock inside the printer; in the totalizer functioning mode the date and time are printed just in the total and not in the single totalizations
dt.in.2 as above, but in the totalizer functioning mode the date and time are printed also in the single totalizations.
dt.EX.1 like "dt.in.1" but the indicator's date and time board (optional) is used.
dt.EX.2 like "dt.in.2" but the indicator's date and time board (optional) is used.
NOTE: The date and time is printed, if programmed, before the possible barcode, which is always at the end of the printout
(!) dt. No

ntik *PRINTS TICKET NUMBER*

The ticket number is a sequence number which increases upon each printing made, this number, between 1 and 65535, is kept in memory also when the instrument is turned off.

no does not print the ticket number.
yes.tot prints the ticket number; in the totalizer functioning mode it is printed only in the single totalisations.
SuM prints the ticket number; in the totalizer functioning mode it is printed just in the partial total.
both prints the ticket number; in the totalizer functioning mode it is printed in the totalisations as well as in the partial total.
rESEt by pressing PRINT the sequence number in the ticket is zeroed.
NOTE: The ticket number, if programmed, is printed after the weight data.
(!) no

EndPAG *SELECTION OF PAGE END PRINTING*

This step allows to print 2 empty lines at the end of each printout (if "DP190" is selected in the "PrModE" step) or an end label (if "LP542" is selected in the "PrModE step).

no does not print the page end

yes.tot prints the end page; in the totalizer functioning mode it is printed just in the single totalisations.

SuM prints the end page; in the totalizer functioning mode it is printed just in the partial total.

both prints the end page; in the totalizer functioning mode it is printed in the totalisations as well as in the partial total.

(!) yes.tot

tErM *SETTING TERMINATOR*

When connecting a printer it is often necessary to transmit one of the following protocols in order to define the end of the print line.

Cr CR (for DP190, LP522/542P, TPR)

CrLF CR LF (for EPSON LX300 and TMU295).

(!) Cr

PForM *PRINT FORMATTING*

In this step one enters a submenu for selecting the weight data which one wants to print and the print layout.

Depending on the type of printer selected in the PrModE step (LP542P or tPr), the parameters which are suggested, change.

nr.CoP *NUMBER OF TICKET COPIES*

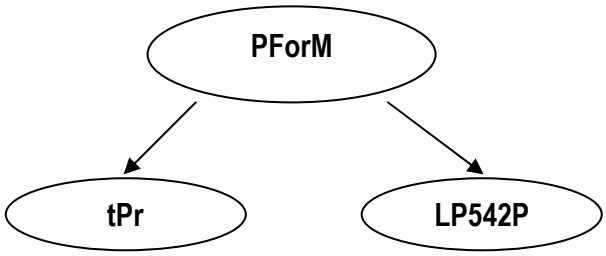
Through this step one sets the number of ticket copies which will be printed, valid for any type of printout and functioning mode.

The possible values are 1…3.

(!) 1.

8.1 FORMATTING DATA AND LAYOUT

Depending on the type of selected printer in the PrModE step (LP542P o tPr), the suggested parameters are different.



DEFAuL *PRINTOUT DEFAULT*

Through this StEP one enables the default printing relative to the selected functioning mode.
The default sets, in each of the following steps, the value marked with the **(!)** symbol.

FiLdS *PRINTING FIELDS*

Through this StEP it is possible to select which fields to be printed among those available:
G; n; t; G n; G t; n G; n t; t G, t n; G n t; G t n; n G t; n t G; t G n, t n G (in which G is the gross weight; n is the net weight and t is the tare weight).
(!) G t n

hEiGht *FONT HEIGHT SELECTION FOR PRINTING THE WEIGHT DATA, DATE AND TIME, PROGRESSIVE NUMBERS AND ID'S:*

ChAr 1 normal height
ChAr 2 double height
(!) ChAr 1

bArC *PRINTS THE BAR CODE*

In this step one programmes the printing of the 39 CODE (if "TPR" has been selected in the "PrModE" step), which will be printed before the printing of the date and time:

no does not print the bar code.
yes.tot prints the bar code; in the totalizer functioning mode it is printed just in the single totalisations.

SuM prints the bar code; in the totalizer functioning mode it is printed just in the partial total.
both prints the bar code; in the totalizer functioning mode it is printed in the totalizations as well as in the partial total.
(!) no

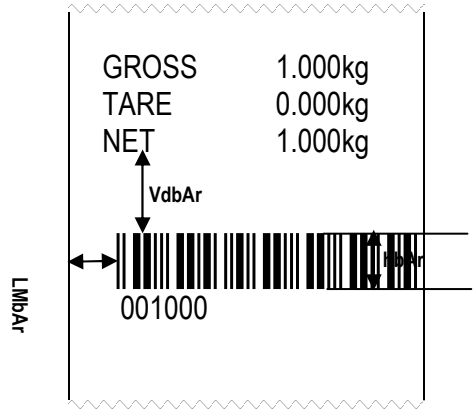
NOTES:

- the weight values are expressed in 6 digits without decimal point and with the possible non significant zeros present.
- between a weight value and the following one a space is inserted.
- the bar code is printed as the last data, after the weight values, possible numeric codes and ticket number, but before the date and time (with DP190 or TPR printer).

THE FOLLOWING PARAMETERS ARE VISIBLE ONLY IF IN THE PREVIOUS STEP A PARAMETER DIFFERENT FROM "no" HAS BEEN SET.

VdbAr *SELECTING THE BAR CODE'S VERTICAL DISTANCE OF THE PRECEDING TEXTS:*
In lines with normal height font, programmable value: 0…9. **(!) 0**

LMbAr *SELECTION OF LEFT MARGIN*
Expressed in 1/8 of a mm (from 1 to 99). **(!) 01**



WbAr *SELECTION OF BAR CODE FONT WIDTH:*
Programmable value: W1…W3
(!) W1

hbAr *SELECTION OF BAR CODE FONT HEIGHT:*
Expressed in 1/8 of mm (from 0 to 255) **(!) 000**

bArFS *SELECTION OF PRINT FIELDS IN THE BAR CODE:*
Programmable value:G; n; t.
In which G is gross weight, n is net weight and t is tare weighing.
(!) G

PntVb *PRINTING OF THE BAR CODE'S NUMERIC FIELD*
This step allows to select the printing of the bar code's numeric field:

no	the numeric field is not printed.
undEr	under the bar code
AboVE	above the bar code
Ab/un	both above as well as below the bar code.

PtESt *PRINT TEST*
By pressing PRINT, a label is printed of the fields previously selected, **but with fixed weight values.**
The print test depends on the selected functioning mode:

Std mode: the first time the fields with the unit of measure in kg are printed, the second time the fields with the unit of measure in lb are printed, and on this way

ntGS, StP G, StP n, VISS, Alibi, inout mode: simple printout.

MAStEr mode: not settable.

HoLD mode: the first time the fields without the "HOLD" indication are printed, the second time the fields with the "HOLD" indication, and on this way.

PEAk mode: the first time the fields without the "PEAK" indication are printed, the second time the fields with the "PEAK" indication, and on this way.

tot Mode and S tot mode: when the PRINT key is pressed there will be a selection menu with the following items:

" TOT.1.0": simulates the printing of the first totalisation relative to storage zero.
" TOT.2.0": simulates the printing of another totalisation relative to storage zero.
" SUM 0": simulates the printing of the partial total relative to storage zero.
" TOT.1.1": simulates the printing of the first totalisation relative to storage one.
" TOT.2.1": simulates the printing of another totalisation relative to storage one.
" SUM 1": simulates the printing of the partial total relative to storage one.
" GtotAL": simulates the printing of the general total.

Coun mode: the first time the fields are printed with the Number of Pieces and the APW, the second time the fields are printed without the Number of Pieces and the APW.

********** **LP542P** **********

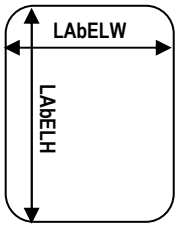
PREMISE: the purpose is to create the label directly onto the indicator, by configuring the parameters described below.
Once the programming is done, one will need to download the label onto the printer (doWnLd step) and then save it in its permanent memory; carefully read section 8.1.

DEFAuL: *PRINTOUT DEFAULT*
In this step one enables the default printout relative to the selected functioning mode.
The default sets, in each of the following steps, the value marked by the **(!)** symbol.

FiLdS: *PRINT FIELDS*
In this step it is possible to select which fields to print among the available ones:
G; n; t; G n; G t; n G; n t; t G, t n; G n t; G t n; n G t; n t G; t G n, t n G (in which G is the gross weight, n is the net weight and t is the tare weight).
(!) G t n

ChAr.t: *FONT TYPE WITH WHICH THE WEIGHT DATA, DATE AND TIME, PROGRESSIVE NUMBERS AND ID'S ARE PRINTED.*
ChAr.1: the data is printed by using the font which will be programmed in the **ChAr 1** step.
ChAr.2: the data is printed by using the font which will be programmed in the **ChAr 2** step.
SEE **EXAMPLE 1.**
(!) ChAr 1

LAbELW: *LABEL WIDTH (IN MM)*
Enter a value with 3 digits, expressed in mm.
(!) 63



LAbELH: *LABEL HEIGHT*
Enter a value with 3 digits, expressed in mm.
(!) 80

ChAr 1: *SELECTING THE FONT WITH WHICH THE DATA LINKED TO THIS CHARACTER WILL BE PRINTED*
(!) Font. 3d

ChAr 2: *SELECTING THE FONT WITH WHICH THE DATA LINKED TO THIS CHARACTER WILL BE PRINTED.*
(!) Font. 3d

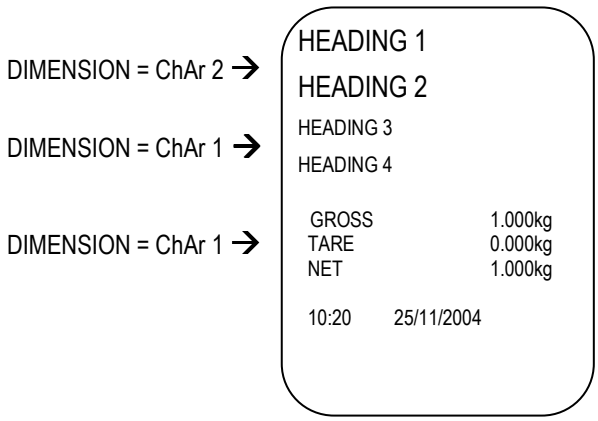
It is possible to select for each letter one of the following fonts:

PARAMETER	TYPE OF FONT (WIDTH X HEIGHT)
Font. 1	1 x 1,5 mm
Font. 1d	1 x 3 mm
Font. 2	1,5 x 2,5 mm
Font. 2d	1,5 x 5 mm
Font. 3	2 x 3 mm
Font. 3d	2 x 6 mm
Font. 4	3 x 4 mm
Font. 4d	3 x 8 mm
Font. 5	4 x 6 mm
Font. 5d	4 x 12 mm

EXAMPLE 1: one wants to print 4 heading lines, of which the first two are double the height in respect to the second two, GROSS, TARE, NET, DATE and TIME.

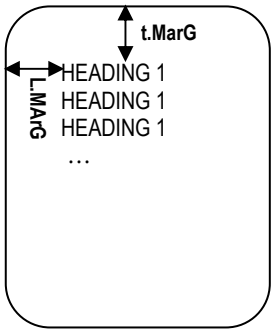
One will programme:
in the heading, LinE 1 and LinE 2 = ChAr 2
LinE 3 and LinE 4 = ChAr 1
ChAr.t = ChAr 1
ChAr 1 = Font. 3
ChAr 2 = Font. 3d

Result:



t.MarG: *DISTANCE OF THE DATA PRINTED FROM THE LABEL'S UPPER MARGIN*
Enter a value with 3 digits, expressed in mm
(!) 10

L.MArG: *DISTANCE OF THE DATA PRINTED FROM THE LABEL'S LEFT MARGIN*
Enter a value with 3 digits, expressed in mm
(!) 4



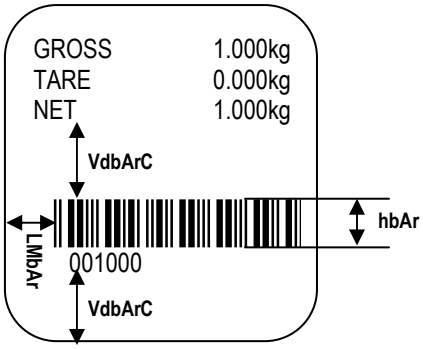
bArC: *PRINTING THE BAR CODE (ONLY CODE 39 TYPE)*

no does not print the bar code.
yes.tot prints the bar code; in the totalizer functioning mode it is printed just in the single totalisation.
SuM prints the bar code; in the totalizer functioning mode it is printed just in the partial total.
both prints the bar code; in the totalizer functioning mode it is printed both in the totalisations as well as in the partial total.
(!) no

NOTES:
- the weight values are expressed with 6 digits without decimal point and possibly with non significant zeros.
- between a weight value and the following one a space is inserted
- the bar code is printed as the last data, after the weight values, numeric codes and ticket number, but before the time and date

THE FOLLOWING PARAMETERS ARE VISIBLE ONLY IF IN THE PREVIOUS STEP A PARAMETER DIFFERENT FROM "no" HAS BEEN SET.

VdbArC: *SELECTING THE VERTICAL DISTANCE OF THE BAR CODE FROM THE PREVIOUS TEXTS:*
Enter a value with 3 digits, expressed in mm
(!) 5



LMbAr: *SELECTING THE LEFT MARGIN*
Enter a value with 2 digits, expressed in mm
(!) 15

hbAr: *SELECTING BAR CODE HEIGHT*
Enter a value with 2 digits, expressed in mm
(!) 10

bArFS: *SELECTING THE PRINT FIELDS IN THE BAR CODE*
Selectable fields: G; n; t; G n;G t; n G; n t; t G; t n; G n t; G t n; n G t; n t G; t G n; t n G.
(!) n
In which G is the gross weight, n is the net weight and t is the tare weight.

PntVb: *PRINTING THE NUMERIC FIELD OF THE BAR CODE*

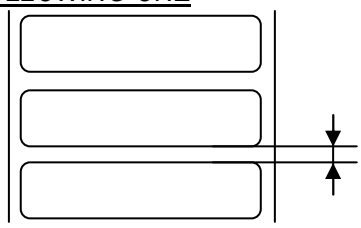
no: the numeric field is not printed.
Si: the numeric field is printed under the bar code
(!) Si

PEEL: *CONFIGURATION OF THE SENSOR WHICH PEELS OFF THE LABEL*

on: sensor active
oFF: sensor not active
(!) oFF

GAP *SETTING THE VERTICAL DISTANCE BETWEEN A LABEL AND THE FOLLOWING ONE*

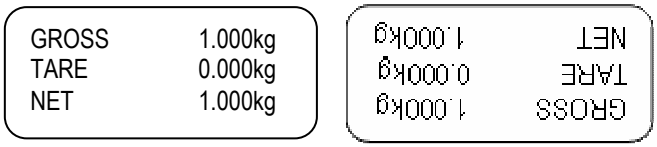
Enter the value in mm.



NOTE: if one uses a continuous form, set the value 00.

dirECn: *SETTING THE PRINT DIRECTION*

dirECt: direct printing
rEvErSE: upside down printing
(!) direct



Direct Upside down

dWn.EHT: *SETTING OF THE TYPE OF FORMAT*
FdFW: format created through the indicator
FEHtn: format created with the programme or tool on PC

doWnLd: *TRANSMISSION & TEMPORARY SAVING OF THE LABEL PROGRAMMED IN THE LABELLER*
This step temporarily saves the label in the labeller memory; by turning it off it causes the loss of the saved data.
Carefully read section 8.1.

L.ALinG: *ALIGNMENT OF THE LABEL IN THE PRINTER*

PtESt *PRINTING TEST*
By pressing PRINT, a test label is printed of previously selected fields, **but with fixed weight values.**
The print test depends on the selected functioning mode:

STD mode: the first time the fields with the kg unit of measure are printed, the second time the fields with the lb unit of measure are printed, and so on.

NTGS, VISS, Alibi, INOUT modes: simple printing.

MASTER mode: not settable.

HOLD mode: the first time the fields without the "HOLD" message are printed, the second time the ones with the "HOLD" message are printed, and so on.

PEAk mode: the first time the fields without the "PEAK" message are printed, the second time the ones with the "PEAK" message are printed, and so on.

Tot o and tot s mode: when the PRINT is pressed a selection menu appears with the following items:
" TOT.1.0": simulates the printing of the first totalisation relative to the zero registry.
" TOT.2.0": simulates the printing of a further totalisation relative to the zero registry.
" SUM 0": simulates the printing of the partial total relative to the zero registry.
" TOT.1.1": simulates the printing of the first totalisation relative to the one registry.
" TOT.2.1": simulates the printing of a further totalisation relative to the one registry.
" SUM 1": simulates the printing of the partial total relative to the one registry.
" GtotAL": simulates the printing of the general total.
COUN mode: the first time the fields with the pieces number and apw are printed, the second time the ones without the pieces number and apw are printed.

!! IMPORTANT !!

8.2 SAVING THE LABEL IN THE LABELLER'S PERMANENT MEMORY

Once the programming of the label has made, one should:

1. Download the label created in the labeller → press PRINT when the display shows the **"doWnLd"** step.
2. Press the **C - ON/OFF** key; the display shows the message **"L.SAVE?":** press the PRINT key to save the label created in the labeller's permanent memory.

When saving the data on the labeller, the green led blinks; while this happens do not do anything with the indicator or the labeller.

The saving of the label ends when the led stops blinking.

The labeller has the label saved and is ready to print it; turning off the labeller does not cause the loss of the saved data.

REPEAT THESE SAVING OPERATIONS EACH TIME THAT ONE MODIFIES THE LABEL OR THE DATA IN IT OR IF IT IS NECESSARY TO CHANGE THE FUNCTIONING MODE AFTER HAVING PROGRAMMED THE LABEL.

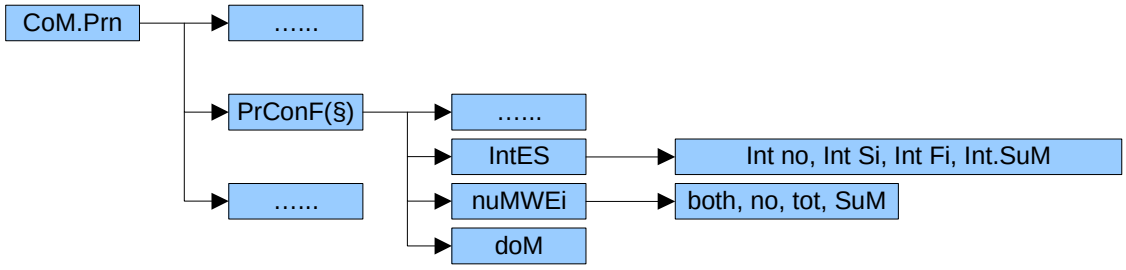
It is also possible to create or customize the label, by using the label creation programme supplied together with the labeller; refer to the labeller manual for further information.

9. PRINTING THE HEADING

It is possible to programme from the PC the 4 alphanumeric heading lines of 24 characters each, which will be printed in the manner which has been programmed until these are cancelled or substituted.

One configures the heading by using the DINI TOOLS software on the PC; by following the instructions of the relative manual, while to select the printing mode of the heading follow the procedure described below:

Enter in the TECHNICAL SET-UP >> SEtup >> SeriAL >> **CoM.Prn**



1. Enter in the step CoM.Prn
2. Enter in the step PrConF(§)
3. Enter in the step IntES
4. Select the heading printing mode:
   - **int no** = does not print the heading
   - **int Si** = prints the heading (only with the first totalisation if a totalizer mode has been selected)
   - **int F1** = if a totalizer mode is selected, it prints the heading in all the totalisations
   - **int.SuM** = if a totalizer mode is selected, it prints the heading in all the totalisations in the total.

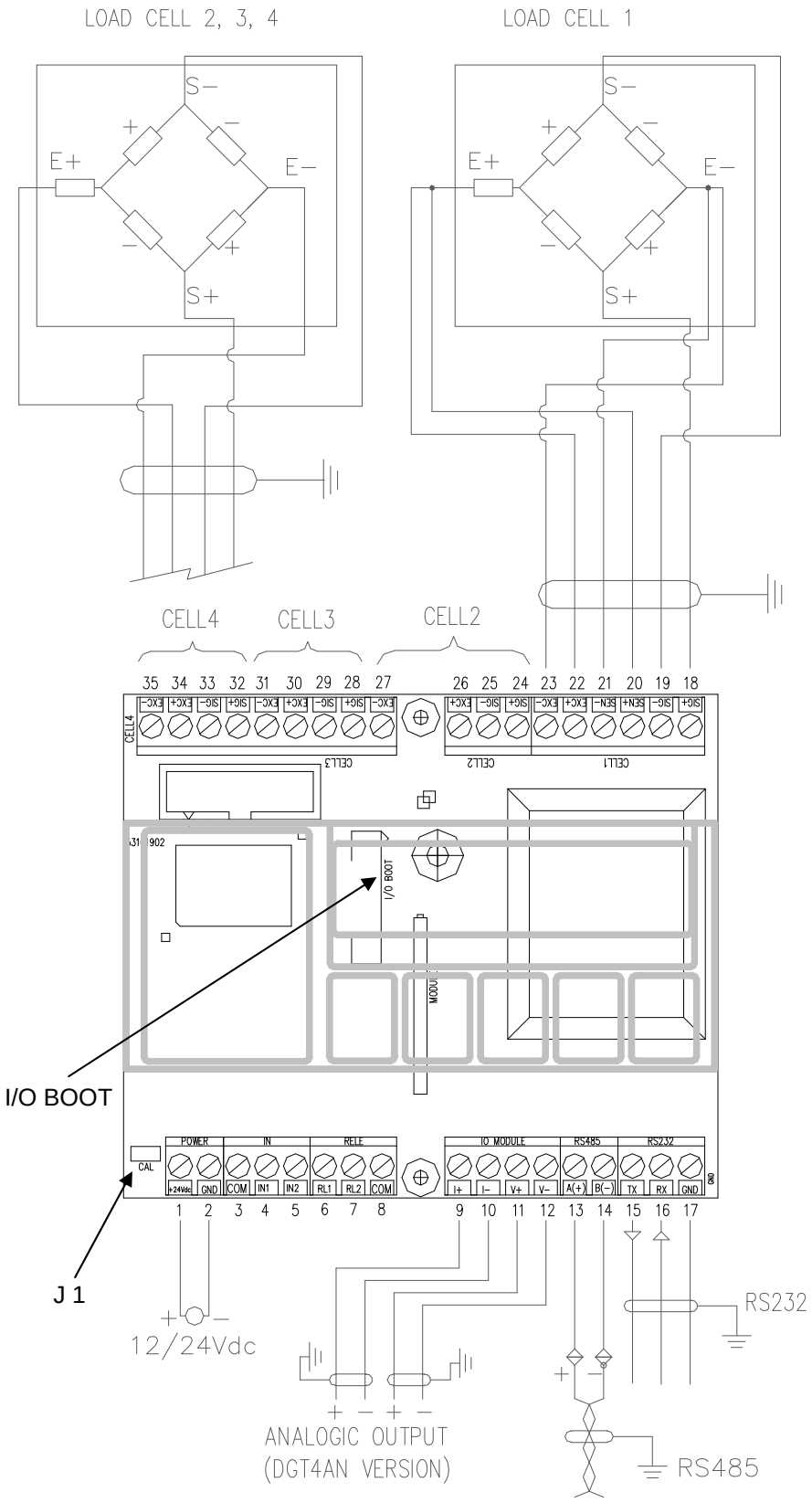
10. ERROR MESSAGES

While using the indicator, it is possible to incur in the following errors:

MESSAGE	DESCRIPTION
PREC.	It is displayed if one tries to calibrate a point without first having confirmed the number of calibration points
ERMOT	Weight unstable during the acquisition of a point during calibration.
ERPNT	During the acquisition of a calibration point a null value has been read by the converter.
Err.X.1:	Error which takes place if the capacity of channel X has not been set, or if there is an error in the calibration parameters of channel X, in which X indicates the number of channel to which the error refers to.
Er – 11	Calibration error: a too small sample weight has been used; it is advisable to use a weight equal to at least half of the scale capacity.
Er – 12	Calibration error: the acquired calibration point (tP1 o tP2 o tP3) is equal to the zero point (tP0).
Er – 37	Scale to be calibrated **TECH.MAN.REF.** (it is advisable to carry out a technical default, "dEFAu" parameter, before proceeding). NOTE: press the →**T**← key before accessing the setup.
Er – 39	Scale to be calibrated **TECH.MAN.REF.** (it is advisable to carry out a technical default, "dEFAu" parameter, before proceeding). NOTE: press the →**T**← key before accessing the setup.
C.Er. – 36	During the calibration some internal negative points have been calculated: - the calibration point is less than the zero point. - the signal is negative (check the connections)
C.Er. – 37	During the calibration some internal points less than the minimum value have been calculated: - the calibration point is equal to the zero point. - A capacity too high in relation to the division has been set.
hW-Err	HARDWARE ERROR: software not compatible with the installed hardware; the hardware expansion component is missing which allows the software to function.

11. CONNECTION SCHEMES

11.1 DGT4 / DGT60 / DGT20 / DGT4 AN / DGT20AN MOTHERBOARD



MEANING OF DGT4 / DGT60 / DGT20 / DGT4 AN / DGT20AN TERMINAL BOARDS AND MOTHER BOARD JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . *+24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:
18. *SIG+* SIGNAL +
19. *SIG-* SIGNAL -
20. *SEN+* SENSE +
21. *SEN-* SENSE -
22. *EXC+* EXCITATION +
23. *EXC-* EXCITATION -

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC.

CELL2:
24. *SIG+* SIGNAL +
25. *SIG-* SIGNAL -
26. *EXC+* EXCITATION +
27. *EXC-* EXCITATION -

CELL3:
28. *SIG+* SIGNAL +
29. *SIG-* SIGNAL -
30. *EXC+* EXCITATION +
31. *EXC-* EXCITATION -

CELL4:
32. *SIG+* SIGNAL +
33. *SIG-* SIGNAL -
34. *EXC+* EXCITATION +
35. *EXC-* EXCITATION -

- **CALIBRATION JUMPER**

J1 = if closed, it enables the access to the metrological parameters

- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board or for the CLOCK board.

- **ANALOGUE OUTPUT** (DGT4 AN version)

On current:
9. *I+* + 20 mA
10. *I-* 0 mA (GND)
On voltage:
11. V+ + 10 V
12. *V-* 0 V (GND)

Note: the maximum resistance applicable on the output current is 350 Ohm and the minimum resistance applicable on the output voltage is 10 kohm.

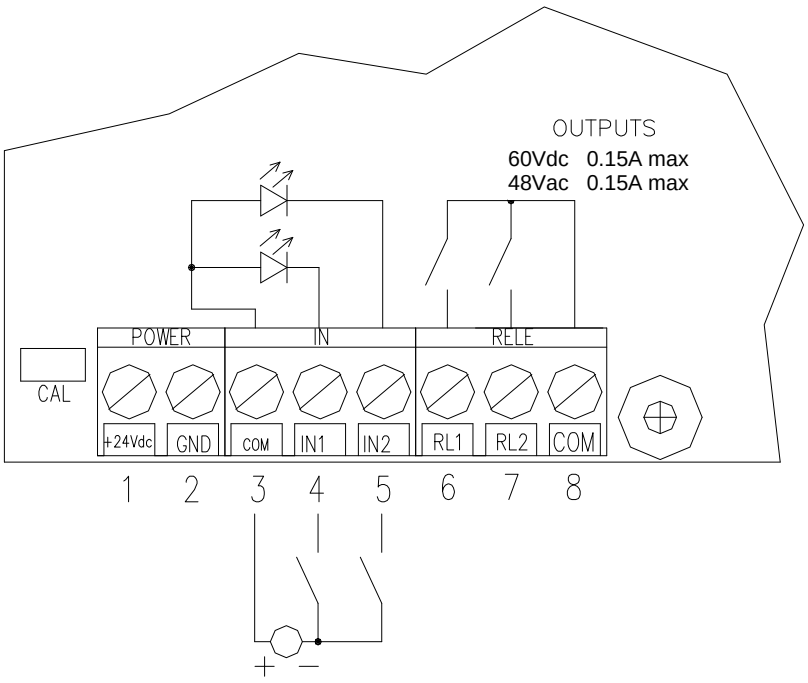
- **RS 485 SERIAL PORT** (DGT4, DGT60 and DGT4 AN models)

13. A(+) 485 + Line
14. B(-) 485 - Line

- **RS 232 SERIAL PORT**

15 . *TX* Transmission
16 . *RX* Reception
17 . *GND* GND

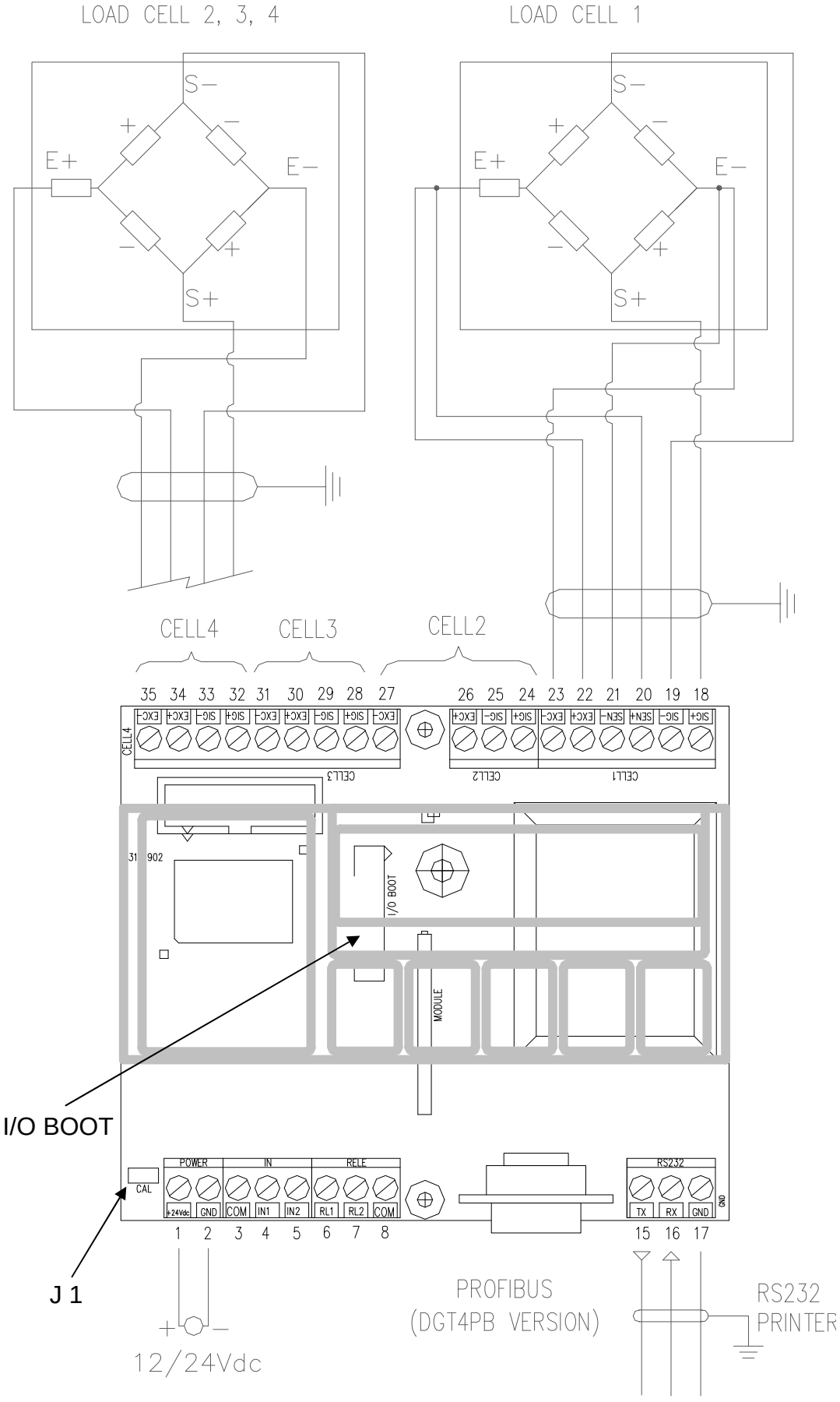
- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS) AND PHOTOMOSFET OUTPUTS** (for all the versions)



SUPPLY
12 Vdc ÷ 24 Vdc
min 5 mA - max 20 mA

The maximum power of the outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max), the maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

11.2 DGT4PB / DGT20PB MOTHERBOARD



MEANING OF DGT4PB / DGT20PB TERMINAL BOARDS AND MOTHER BOARD JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . *+24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:
18. *SIG+* SIGNAL +
19. *SIG-* SIGNAL -
20. *SEN+* SENSE +
21. *SEN-* SENSE -
22. *EXC+* EXCITATION +
23. *EXC-* EXCITATION -

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC.

CELL2:
24. *SIG+* SIGNAL +
25. *SIG-* SIGNAL -
26. *EXC+* EXCITATION +
27. *EXC-* EXCITATION -

CELL3:
28. *SIG+* SIGNAL +
29. *SIG-* SIGNAL -
30. *EXC+* EXCITATION +
31. *EXC-* EXCITATION -

CELL4:
32. *SIG+* SIGNAL +
33. *SIG-* SIGNAL -
34. *EXC+* EXCITATION +
35. *EXC-* EXCITATION -

- **CALIBRATION JUMPER**

J1 = if closed, it enables the access to the metrological parameters

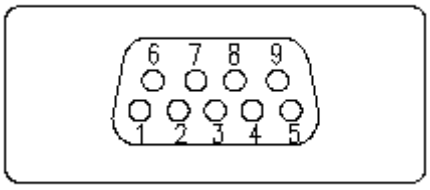
- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board or for the CLOCK board.

- **RS 232 SERIAL PORT**

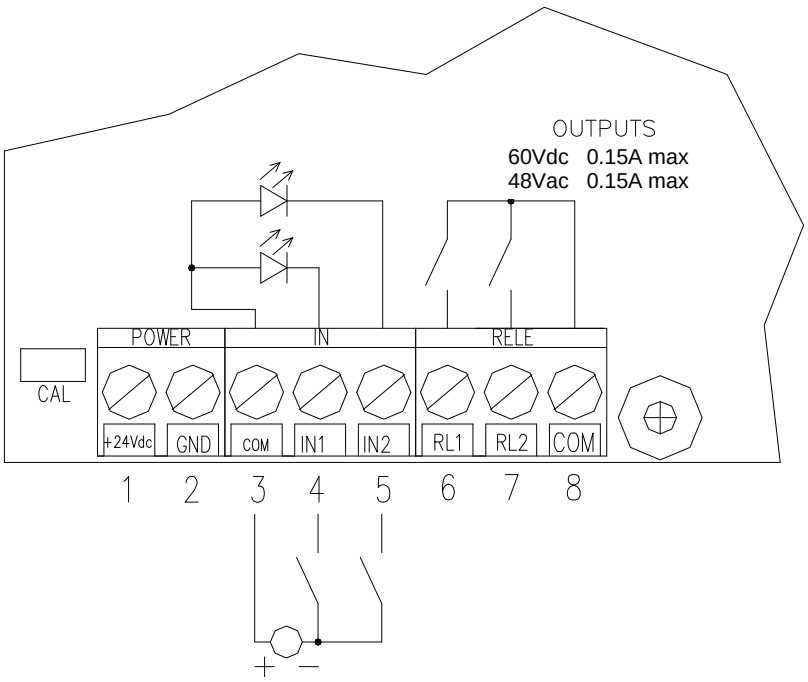
15 . *TX* Transmission
16 . *RX* Reception
17 . *GND* GND

- **PROFIBUS FEMALE CONNECTOR** (DGT4PB / DGT20PB version)



3 . B-LINE
5 . GND BUS
6 . +5VBUS
8 . A-LINE

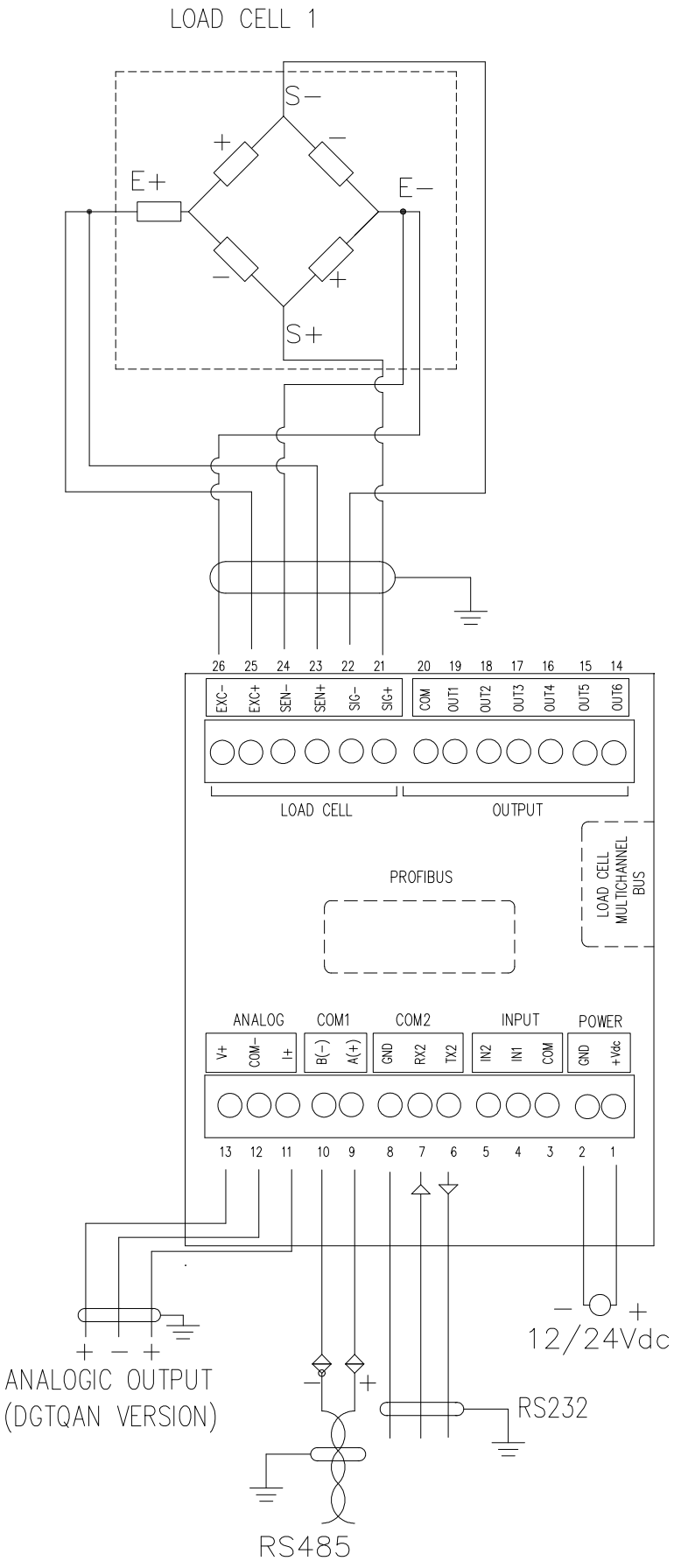
- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS) AND PHOTOMOSFET OUTPUTS** (for all the versions)

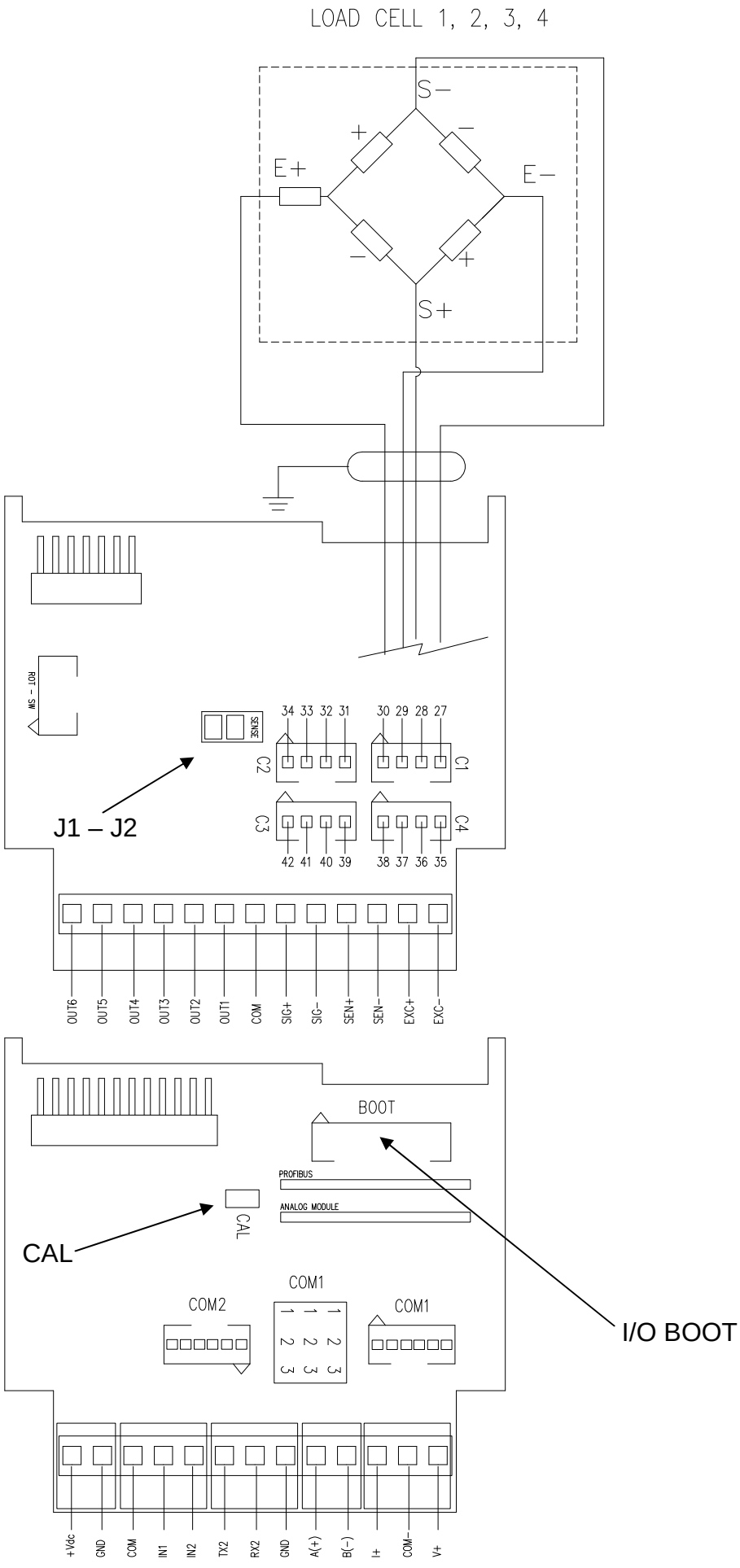


SUPPLY
12 Vdc ÷ 24 Vdc
min 5 mA - max 20 mA

The maximum power of the outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max), the maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

11.3 DGTQ / DGTQ AN BOARDS




LOAD CELL 1, 2, 3, 4
S−
+
−
E+
E−
−
+
S+
BOOT
J1 – J2
CAL
I/O BOOT
PROFIBUS
ANALOG MODULE
COM1
COM2
COM1
OUT6
OUT5
OUT4
OUT3
OUT2
OUT1
COM
SIG+
SIG−
SEN+
SEN−
EXC+
EXC−
+Vdc
GND
COM
IN1
IN2
TX2
RX2
GND
A(+)
B(−)
I+
COM−
V+

MEANING OF "DGTQ" / "DGTQ AN" TERMINAL BOARDS AND BOARDS JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . +*24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:

6-Pin terminal board

21. + *SIG* SIGNAL +
22. - *SIG* SIGNAL -
23. + *SEN* SENSE +
24. - *SEN* SENSE -
25. + *EXC* EXCITATION +
26. - *EXC* EXCITATION –

C1 – 4-Pin AMP Connector

27. - *SIG* SIGNAL -
28. + *SIG* SIGNAL +
29. - *EXC* EXCITATION –
30. + *EXC* EXCITATION +

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board or in the C1 connector (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC by closing the J1 and J2 jumpers.

CELL2:

C2 – 4-Pin AMP Connector

31. + *SIG* SIGNAL +
32. - *SIG* SIGNAL -
33. + *EXC* EXCITATION +
34. - *EXC* EXCITATION -

CELL3:

C3 – 4-Pin AMP Connector

39. + *SIG* SIGNAL +
40. - *SIG* SIGNAL -
41. + *EXC* EXCITATION +
42. - *EXC* EXCITATION -

CELL4:

C4 – 4-Pin AMP Connector

35. + *SIG* SIGNAL +
36. - *SIG* SIGNAL -
37. + *EXC* EXCITATION +
38. - *EXC* EXCITATION -

- **SENSE JUMPER**

J1 and J2 = if closed, REFERENCE + and POWER SUPPLY +, REFERENCE – and POWER SUPPLY – for the channel 1 are jumpered on the board.

- **CALIBRATION JUMPER**

CAL = if closed, it enables the access to the metrological parameters

- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board or for the CLOCK board.

- **ANALOGUE OUTPUT** (DGTQ AN version)

On voltage:
13. V + + 10 V
12. *COM -* 0 V (GND)
On current:
11. I + + 20 mA
12. *COM -* 0 mA (GND)

Note: the maximum resistance applicable on the output current is 350 Ohm and the minimum resistance applicable on the output voltage is 10 kohm.

- **COM 1 SERIAL PORT** (DGTQ and DGTQ AN versions)

	RS485	**RS232**
8. *GND*		GND
9. A (+)	Line 485 +	Transmission
10. B (-)	Line 485 -	Reception

JUMPERS COM1 (*)

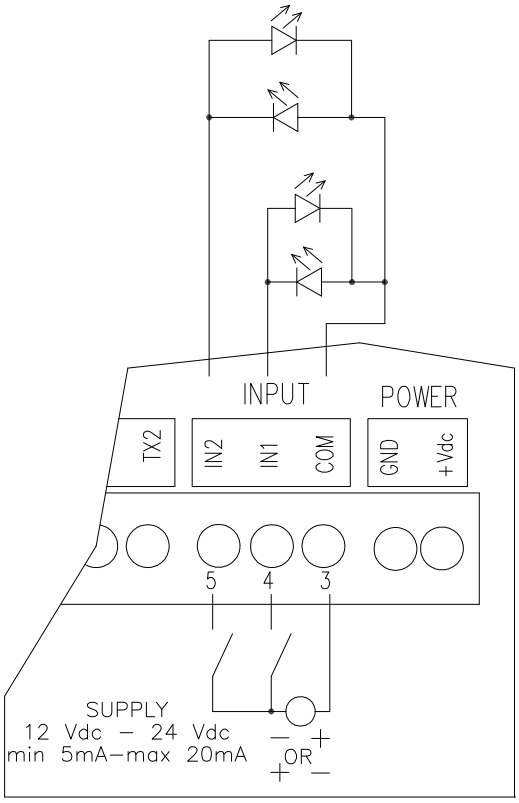
1 and 2 all closed = RS485 serial line
2 and 3 all closed = RS232 serial line

(*) The jumpers are set by default in RS485.

- **PRN SERIAL PORT COM 2**

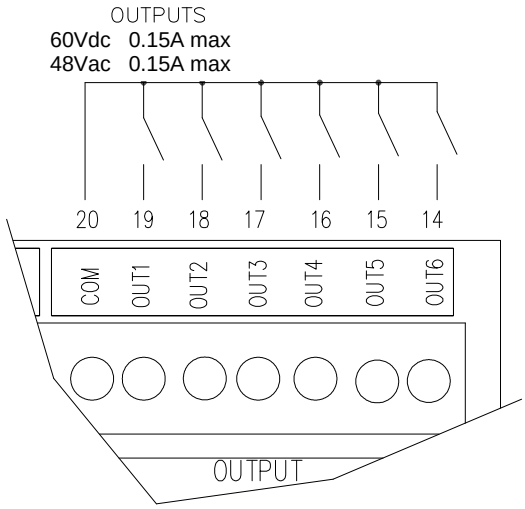
6. *TX* Transmission
7. *RX* Reception
8. *GND* GND

- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS)** (for all the versions)



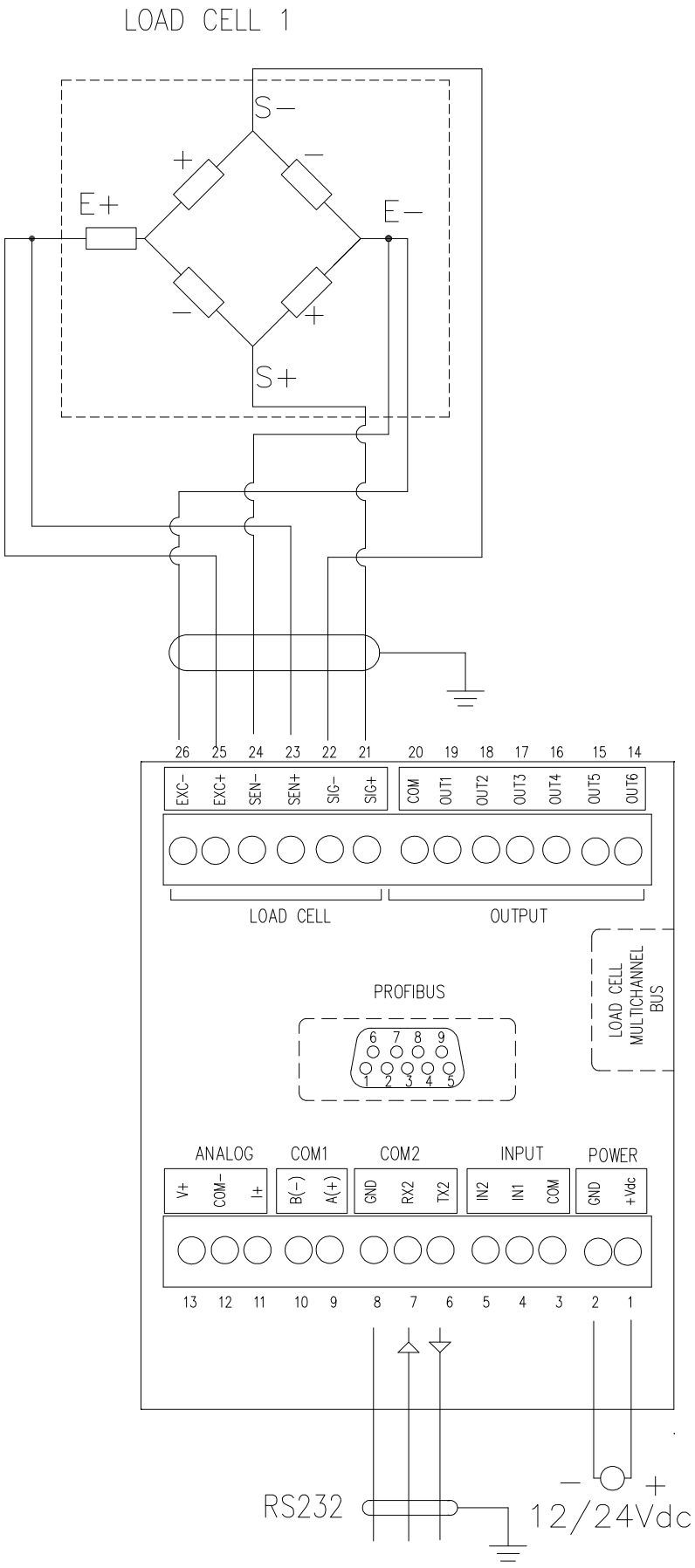
The maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

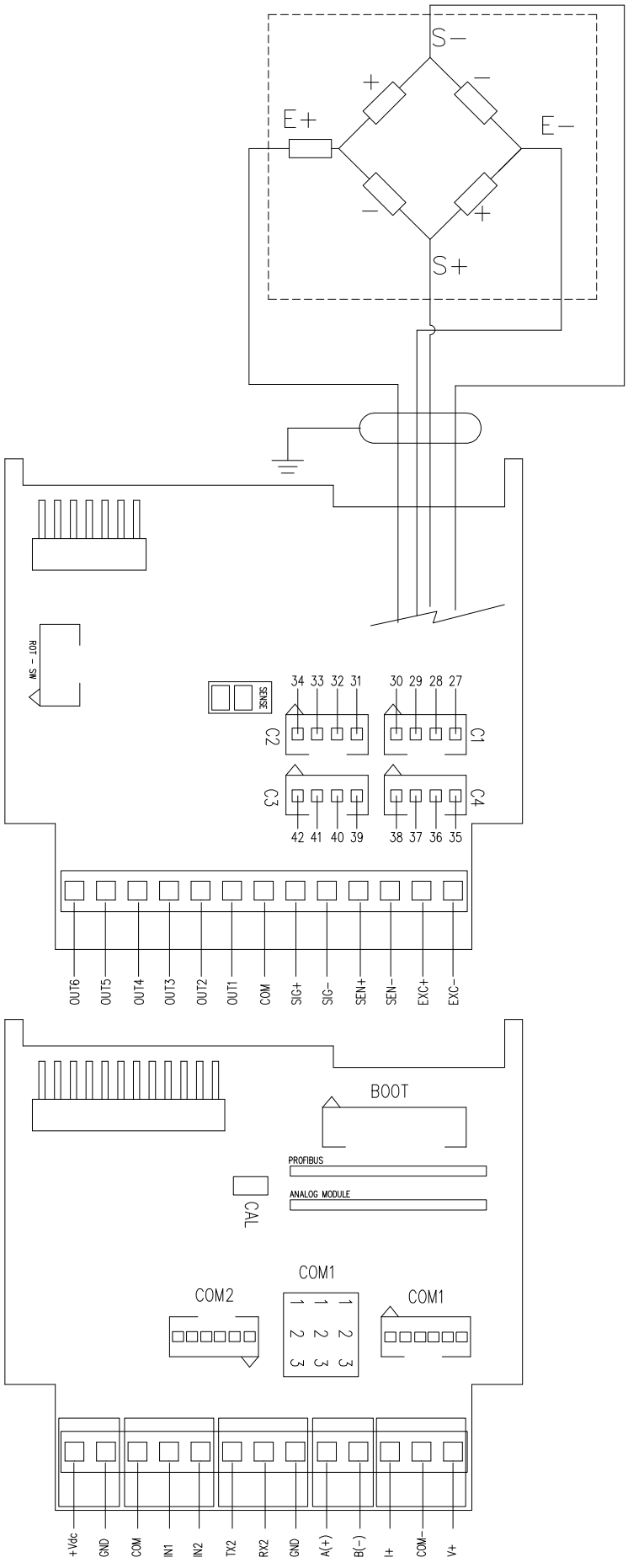
- **PHOTOMOSFET OUTPUTS** (for all the versions)



The maximum power of the photomosfet outputs 48 Vac 0,15 A max (or 60 Vdc 0,12 A max),

11.4 DGTQ PB BOARDS




LOAD CELL 1, 2, 3, 4
S−
+
−
E+
E−
−
+
S+
BOOT
SENSE
34 33 32 31
30 29 28 27
C2
C1
C3
C4
42 41 40 39
38 37 36 35
OUT6
OUT5
OUT4
OUT3
OUT2
OUT1
COM
SIG+
SIG−
SEN+
SEN−
EXC+
EXC−
PROFIBUS
ANALOG MODULE
CAL
COM1
COM2
COM1
+Vdc
GND
COM
IN1
IN2
TX2
RX2
GND
A(+)
B(−)
I+
COM−
V+

MEANING OF "DGTQ PB" TERMINAL BOARDS AND BOARDS JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . +*24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:

6-Pin terminal board

21. + *SIG* SIGNAL +
22. - *SIG* SIGNAL -
23. + *SEN* SENSE +
24. - *SEN* SENSE -
25. + *EXC* EXCITATION +
26. - *EXC* EXCITATION –

C1 – 4-Pin AMP Connector

27. - *SIG* SIGNAL -
28. + *SIG* SIGNAL +
29. - *EXC* EXCITATION –
30. + *EXC* EXCITATION +

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board or in the C1 connector (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC by closing the J1 and J2 jumpers.

CELL2:

C2 – 4-Pin AMP Connector

31. + *SIG* SIGNAL +
32. - *SIG* SIGNAL -
33. + *EXC* EXCITATION +
34. - *EXC* EXCITATION -

CELL3:

C3 – 4-Pin AMP Connector

39. + *SIG* SIGNAL +
40. - *SIG* SIGNAL -
41. + *EXC* EXCITATION +
42. - *EXC* EXCITATION -

CELL4:

C4 – 4-Pin AMP Connector

35. + *SIG* SIGNAL +
36. - *SIG* SIGNAL -
37. + *EXC* EXCITATION +
38. - *EXC* EXCITATION -

- **SENSE JUMPER**

J1 and J2 = if closed, REFERENCE + and POWER SUPPLY +, REFERENCE – and POWER SUPPLY – for the channel 1 are jumpered on the board.

- **CALIBRATION JUMPER**

CAL = if closed, it enables the access to the metrological parameters

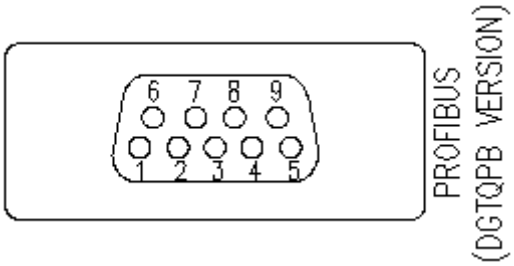
- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board or for the CLOCK board.

- **PRN SERIAL PORT COM 2**

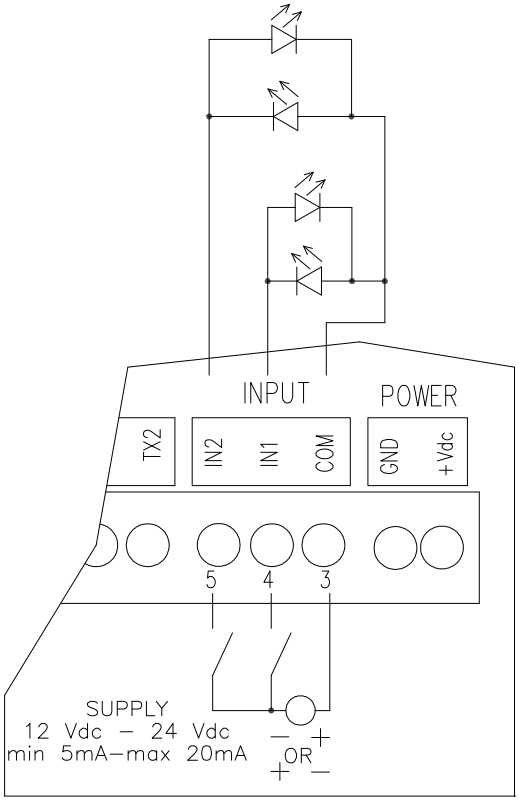
6. ***TX*** Transmission
7. ***RX*** Reception
8. ***GND*** GND

- **PROFIBUS FEMALE CONNECTOR** (DGTQ PB version)



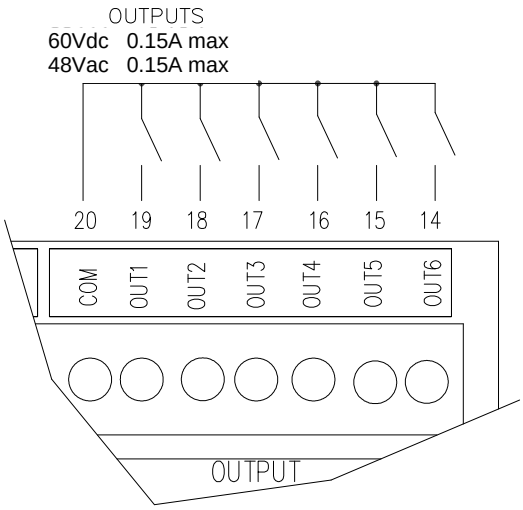
3. B-LINE
5. GND BUS
6. +5VBUS
8. A-LINE

- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS)** (for all the versions)



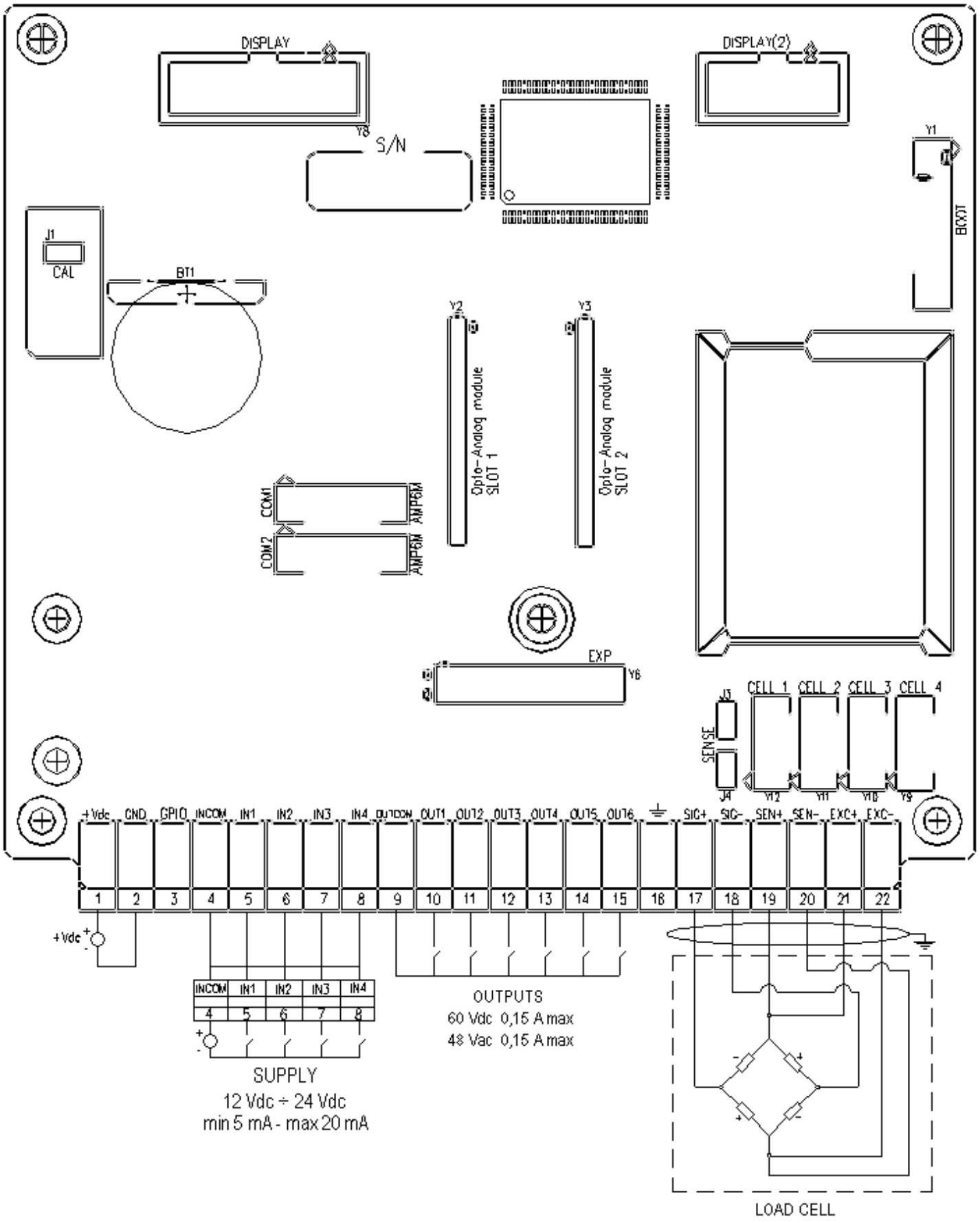
The maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

- **PHOTOMOSFET OUTPUTS** (for all the versions)



The maximum power of the photomosfet outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max).

11.5 DGTP / DGTP AN / DGTP PB MOTHERBOARD



MEANING OF DGTP / DGTP AN / DGTP PB TERMINAL BOARDS AND MOTHER BOARD JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . *+24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:

17. *SIG+* SIGNAL +
18. *SIG-* SIGNAL -
19. *SEN+* SENSE +
20. *SEN-* SENSE -
21. *EXC+* EXCITATION +
22. *EXC-* EXCITATION -

CELL1 – 4-Pin AMP Connector
1. *EXC+* EXCITATION +
2. *EXC-* EXCITATION -
3. *SIG+* SIGNAL +
4. *SIG-* SIGNAL -

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC.

CELL2:
CELL2 – 4-Pin AMP Connector
1. + *EXC* EXCITATION +
2. - *EXC* EXCITATION -
3. + *SIG* SIGNAL +
4. - *SIG* SIGNAL -

CELL3:
CELL3 – 4-Pin AMP Connector
1. + *EXC* EXCITATION +
2. - *EXC* EXCITATION -
3. + *SIG* SIGNAL +
4. - *SIG* SIGNAL -

CELL4:
CELL4 – 4-Pin AMP Connector
1. + *EXC* EXCITATION +
2. - *EXC* EXCITATION -
3. + *SIG* SIGNAL +
4. - *SIG* SIGNAL -

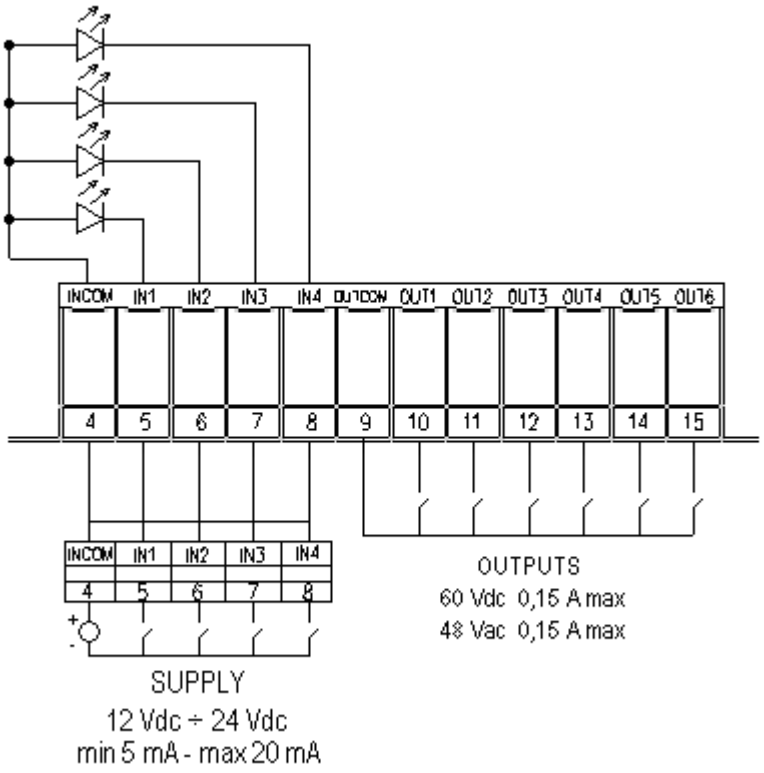
- **CALIBRATION JUMPER**

J1 = if closed, it enables the access to the metrological parameters

- **I/O BOOT**

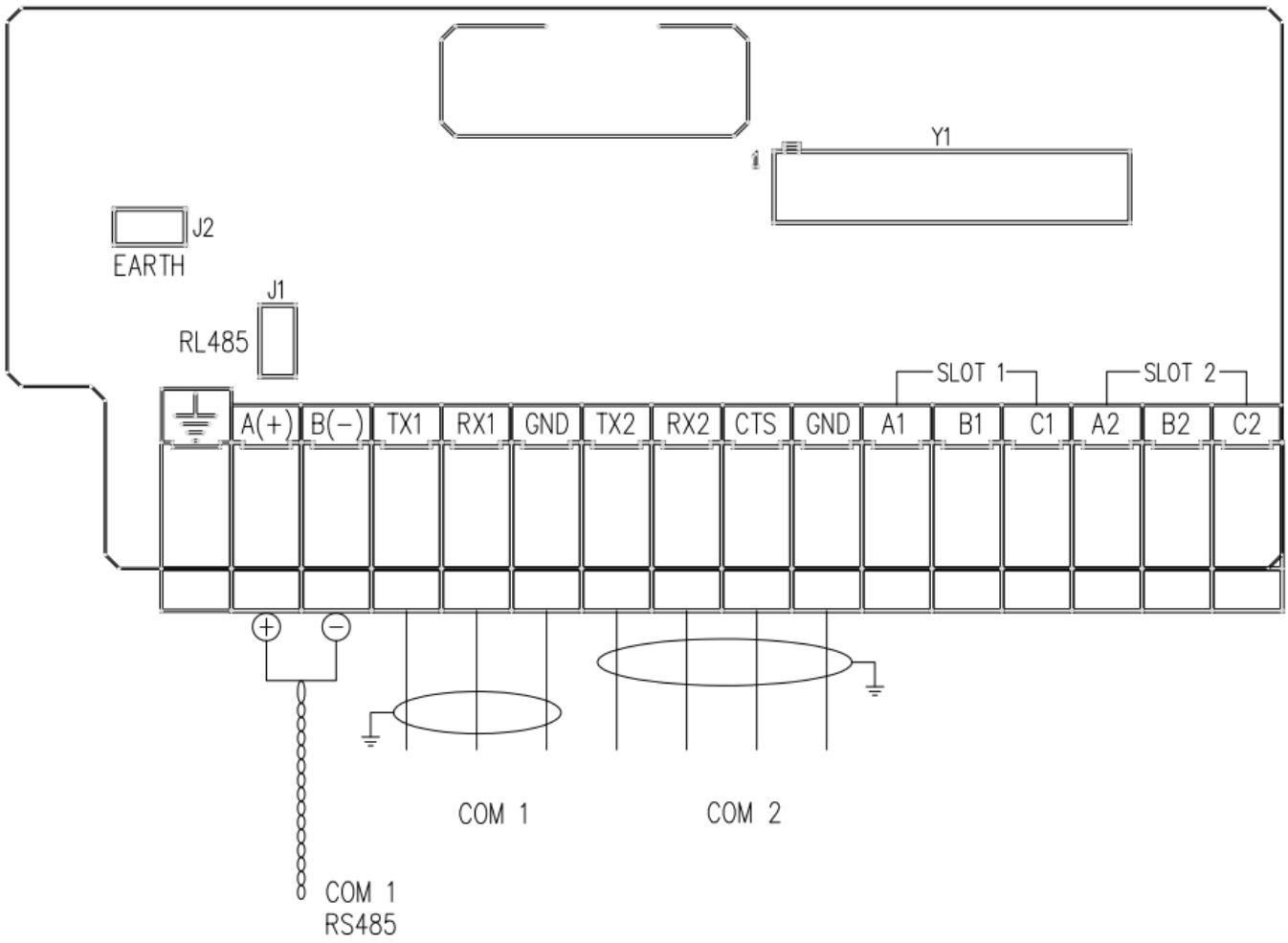
Connector for the connection of the ALIBI MEMORY board.

- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS) AND PHOTOMOSFET OUTPUTS** (for all the versions)



The maximum power of the outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max), the maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

11.6 DGTP / DGTP AN EXPANSION BOARD



MEANING OF DGTP / DGTP AN TERMINAL BOARDS AND EXPANSION BOARD JUMPERS

- **ANALOGUE OUTPUT** (DGTP AN version)

SLOT 1 (I/O 1)
33. ***I+*** + 20 mA
34. ***COM*** (GND)
35. ***V+*** + 10 V

SLOT 2 (I/O 2)
36. ***I+*** + 20 mA
37. ***COM*** (GND)
38. ***V+*** + 10 V

Note: the maximum resistance applicable on the output current is 350 Ohm and the minimum resistance applicable on the output voltage is 10 kohm.

- **RS 485 SERIAL PORT** (DGTP and DGTP AN models)

24. A(+) 485 + Line
25. B(-) 485 - Line

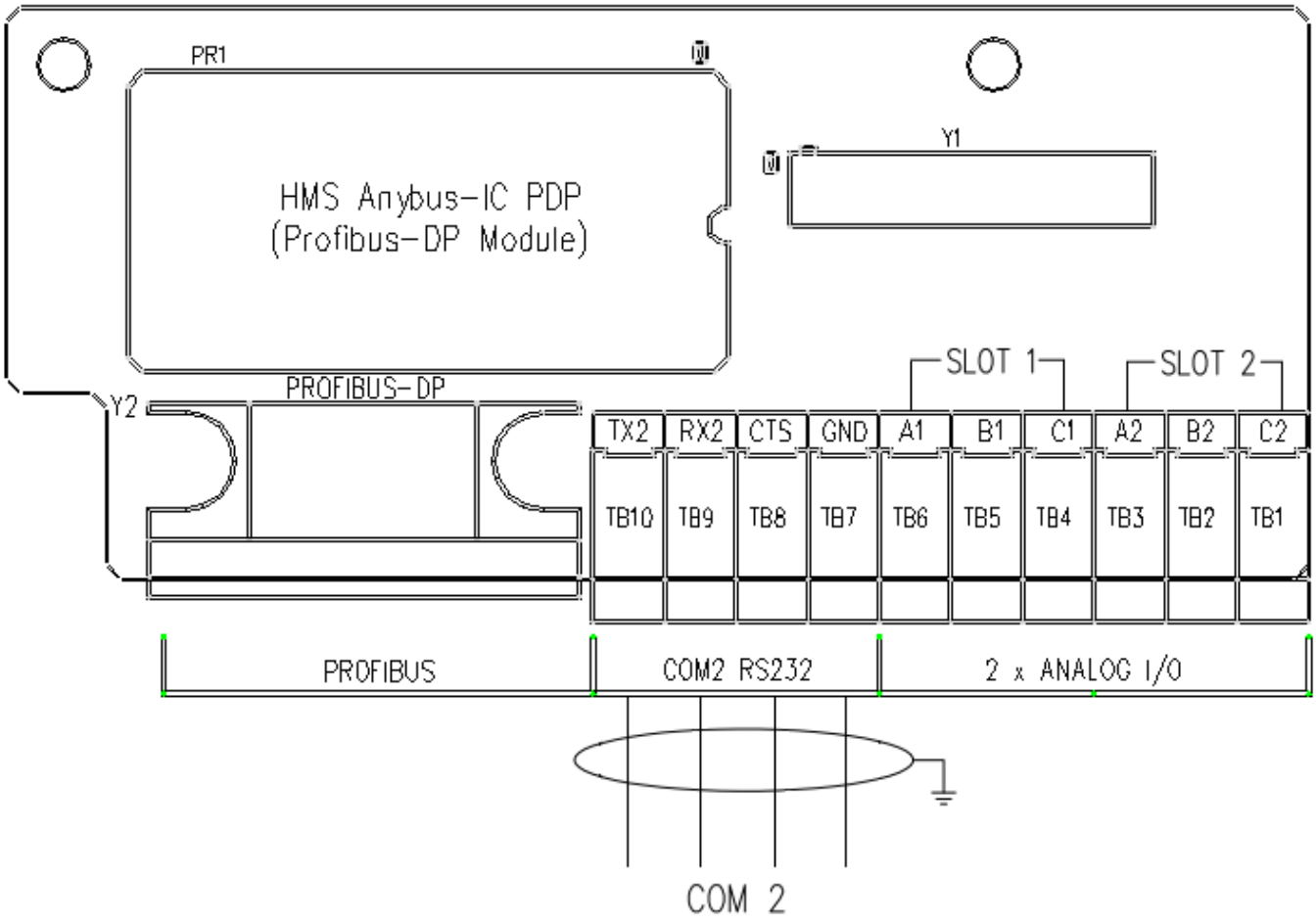
- **COM1 RS 232 SERIAL PORT**

26. *TX* Transmission
27 . *RX* Reception
28 . *GND* GND

- **COM2 RS 232 SERIAL PORT**

29. *TX* Transmission
30 . *RX* Reception
31. *CTS* Synchronism signal
32 . *GND* GND

11.7 DGTP PB EXPANSION BOARD



MEANING OF DGTP PB TERMINAL BOARDS AND EXPANSION BOARD JUMPERS

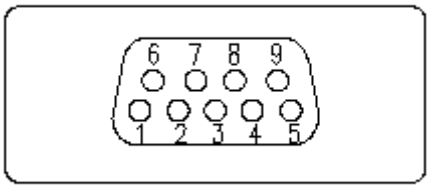
- **ANALOGUE OUTPUT** (DGTP AN version)

SLOT 1 (I/O 1)
33. ***I+*** + 20 mA
34. ***COM*** (GND)
35. ***V+*** + 10 V

SLOT 2 (I/O 2)
36. ***I+*** + 20 mA
37. ***COM*** (GND)
38. ***V+*** + 10 V

Note: the maximum resistance applicable on the output current is 350 Ohm and the minimum resistance applicable on the output voltage is 10 kohm.

- **PROFIBUS FEMALE CONNECTOR** (DGTP PB version)

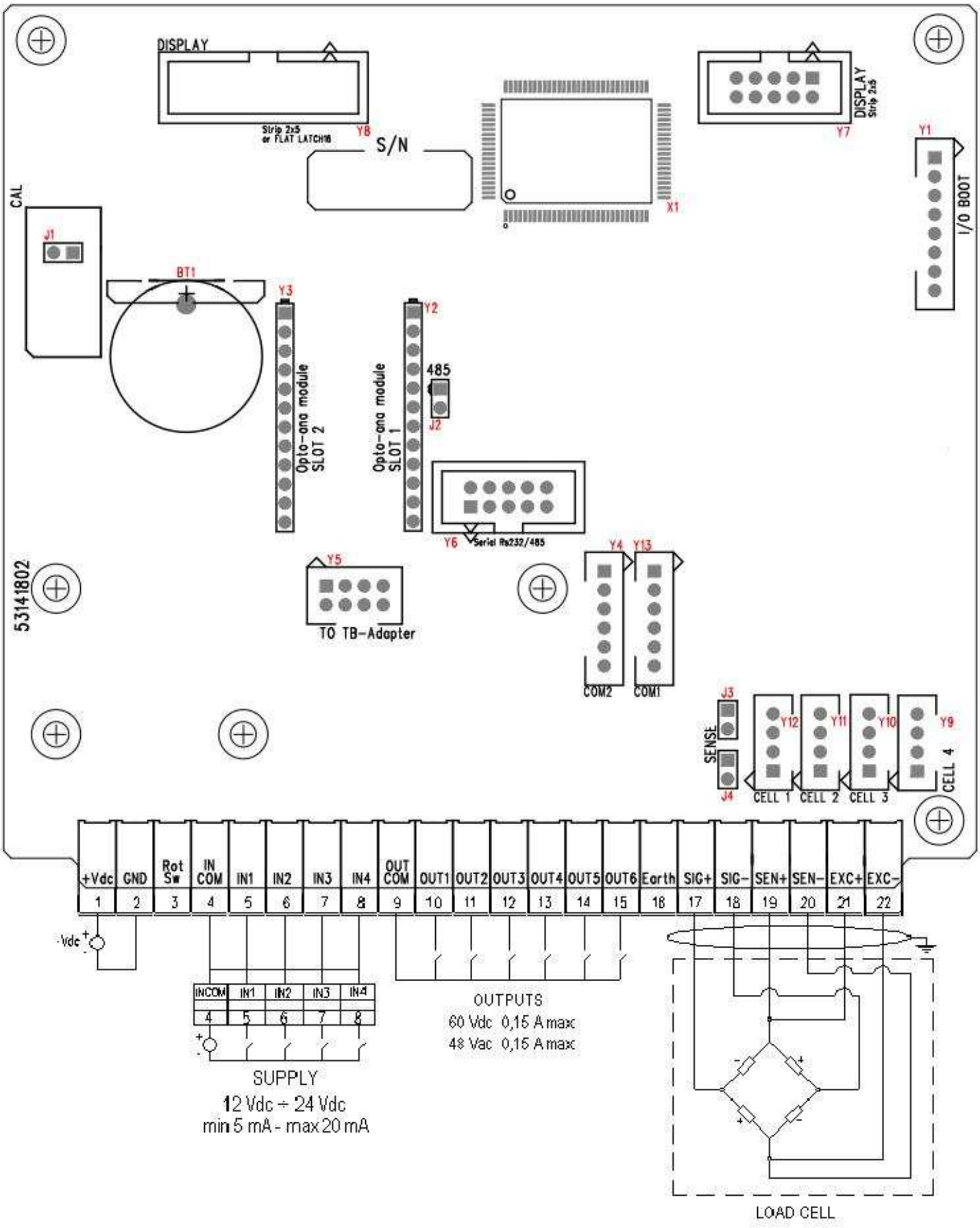


3 . B-LINE
5 . GND BUS
6 . +5VBUS
8 . A-LINE

- **COM2 RS 232 SERIAL PORT**

29. ***TX*** Transmission
30 . ***RX*** Reception
31. ***CTS*** Synchronism signal
32 . ***GND*** GND

11.8 DGTPK MOTHERBOARD



MEANING OF DGTPK TERMINAL BOARD AND MOTHER BOARD JUMPERS

- **VE 12 / 24 Vdc POWER SUPPLY**

1 . *+24Vdc* +12 / 24 Vdc
2 . *GND* 0 Vdc (GND)

- **CELL LOAD RECEPTORS**

CELL1:

17. *SIG+* SIGNAL +
18. *SIG-* SIGNAL -
19. *SEN+* SENSE +
20. *SEN-* SENSE -
21. *EXC+* EXCITATION +
22. *EXC-* EXCITATION -

CELL1, 2, 3, 4 – 4-Pin AMP Connector
1. *EXC+* EXCITATION +
2. *EXC-* EXCITATION -
3. *SIG+* SIGNAL +
4. *SIG-* SIGNAL -

!! IMPORTANT !!

If one wants to use 4 wires in the CELL 1 terminal board (without using the SENSE signal), one should short-circuiting - SEN with -EXC and +SEN with +EXC.

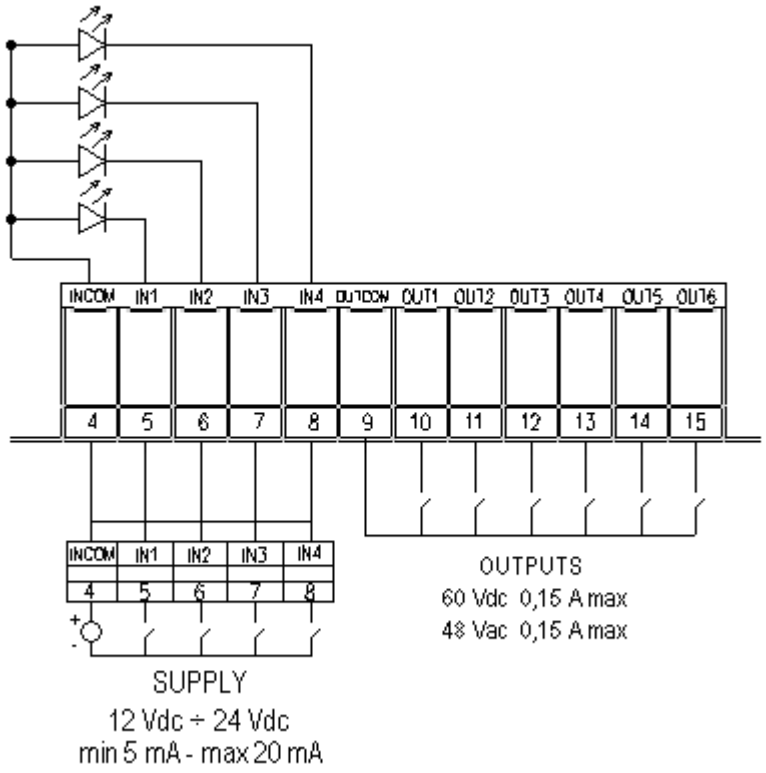
- **CALIBRATION JUMPER**

J1 = if closed, it enables the access to the metrological parameters

- **I/O BOOT**

Connector for the connection of the ALIBI MEMORY board.

- **INPUTS (OPTOISOLATOR PHOTOCOUPLERS) AND PHOTOMOSFET OUTPUTS** (for all the versions)



The maximum power of the outputs 48 Vac 0,15 A max (or 60 Vdc 0,15 A max), the maximum voltage applicable to the inputs is between 12 ÷ 24 Vdc with current from minimum 5 mA to maximum 20 mA.

11.9 RS 485 SERIAL PORT

On the same RS 485 line it's possible to connect up to 32 indicators.

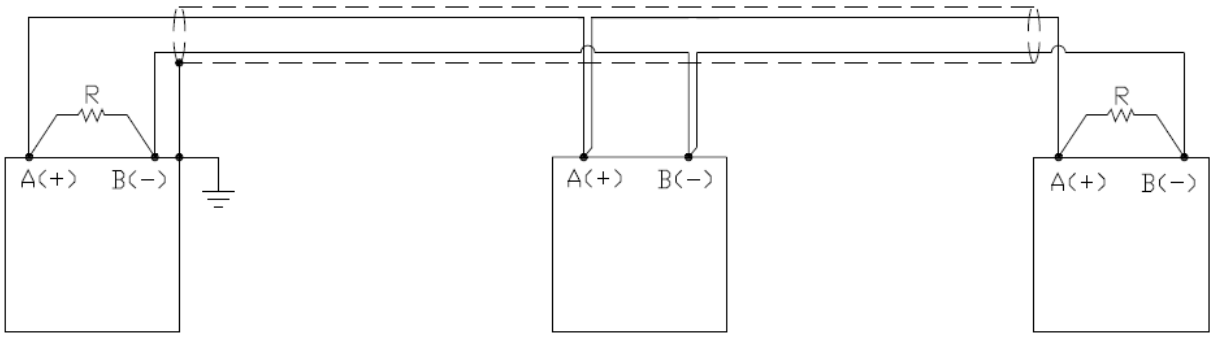


Figure 1: electrical diagram of the connections and the 2 termination resistances.

On the RS485 network normally one connects 2 termination resistances of 120 ohm (shown with "R" in figure 1), **ONLY** on the 2 devices **which are at the 2 ends of the cable.**

The maximum reachable length from the line with the use of the appropriate cable for RS 485 connections, the twisted 2x24 AWG duplex cable, shielded with external sheathing + aluminium band, is of about 1200 meters.