KOSMOS SERIES

MULTIFUNCTION DIGITAL PANEL METER
FAST ADQUISITION

MODEL GAMMA-M

MODBUS-RTU PROTOCOL COMPATIBLE

DITEL

CODE: 30727083 EDICIÓN: 23-04-2008

ECF

INTRODUCTION TO THE KOSMOS SERIES

This manual does not constitute a formal agreement. All information given in this manual is subject to change without notice.

The KOSMOS SERIES brings a new phylosophy in digital panel instrumentation which is expressed by multipurpose, modular-concept devices providing a rich array of basic functions and advanced capabilities.

With a fully MODULAR DESIGN, it is possible to implement a wide variety of applications by only adding the adequate options.

Intelligence within allows the meter to recognize the options installed and ask for the necessary parameters to properly function within desired margins. The paramenters related to non-installed options are removed from the program routines.

The instruments CALIBRATION is made at the factory eliminating the need for adjustment potentiometers.
Any circuit or option liable to be adjusted incorporates a memory where calibration parameters are stored, making it possible the optional cards be totally interchangeable without need of any subsequent adjust.

Custom CONFIGURATION for specific applications can be made quickly and easily through five front panel keys, following structured choice menus aided by display prompts at each programming step.

Other features of the KOSMOS family include :

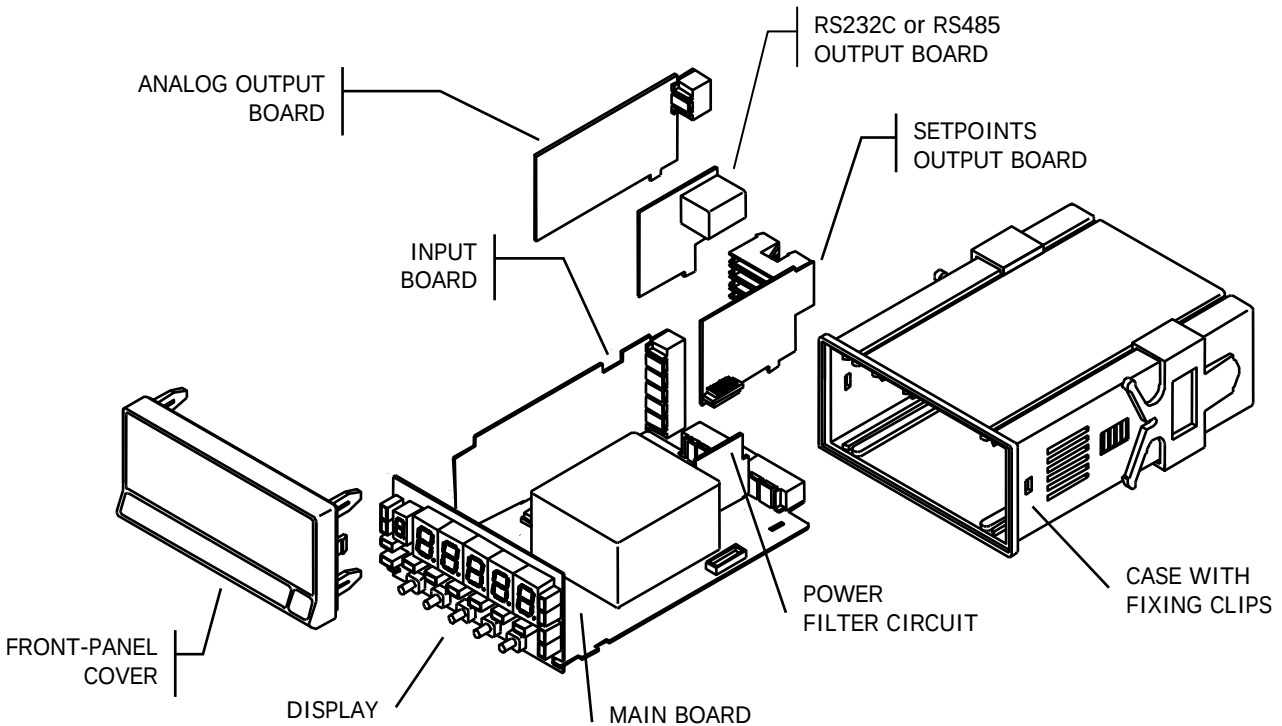
- CONNECTIONS via plug-in terminal blocks without screws and CLEMP-WAGO clips cable retention system.
- DIMENSIONS
  Models ALPHA & BETA 96x48x120 mm DIN 43700
  Models MICRA & JR/JR20 96x48x60 mm DIN 43700
- CASE MATERIAL UL-94 V0-rated polycarbonate.
- PANEL INSTALLATION without screws by means of single part fastening clips.

To guarantee the meter's technical specifications, it is recommended to recalibrate the meter at periodical intervals according to the ISO9001 standards for the particular application operating criteria. Calibration should be perfomed at the factory or in a qualified laboratory.

DIGITAL PANEL INSTRUMENT **KOSMOS SERIES**

MODEL GAMMA-M

INDEX


RS232C or RS485
OUTPUT BOARD
ANALOG OUTPUT
BOARD
SETPOINTS
OUTPUT BOARD
INPUT
BOARD
POWER
FILTER CIRCUIT
CASE WITH
FIXING CLIPS
FRONT-PANEL
COVER
DISPLAY
MAIN BOARD

1. MODEL GAMMA-M

The GAMMA-M model of KOSMOS series done with new technologies and giving high performances like: display range of ±9999 points, up to 30 points of linearization, direct access to the setpoint programming, 31 programmable logical functions and high conversion rate @ 555 / second.

The GAMMA-M is an instrument to measure and control with direct indication in engineering units. The multifunction input board allows to connect Load-Cells (mV) or Shunts to measure DC currents, Process signals ±10V or ±20mA or lineal potentiometer for measure distance, length etc.. The instrument supply different excitation voltages for sensors, 24V @ 30mA, 2.2V @ 30mA, 5 or 10V @ 120mA allowing supply up to 4 Load-Cells; This differents voltages are selected by internal jumpers.
Thanks to its high conversion rate (555/s) can read peaks or valley values from signal with a minimum width of 2,1 ms. An analog output (ANA option) transmitting 200 readings per second, an optocouplers output option (4OP o 4OPP) with a reaction time of 2,1 ms or 2 relay or 4 relay as well as the easy link to a PC through RS2 or RS4 serial output option using protocolos DITEL, ISO1745 or MODBUS RTU with the possibility of using a logical function that sends through RS 200 informations of variable per second. All is conferring to the instrument very high performances.

In adition the instrument has three kind of filters that allow to stabilize the reading with signals comming from differents process.
A special function nr27 **SAMPLE & HOLD** allows to stop during hold time the reached value during the measure as well as the PEAK, VALLEY, PEAK-PEAK values and also the comparison with SETPOINTS (selectable).
The basic instrument is made with main board, supply filter, input board and display (see figure on page. 4).
The basic functions of the instrument are display of input variables value, reading and store of peak,valley and peak-peak of this variables as well as funtions Hold, Tare and reset of them. The model GAMMA-M also accept the following output options:

COMUNICATION

RS2	Serie RS232C
RS4	Serie RS485

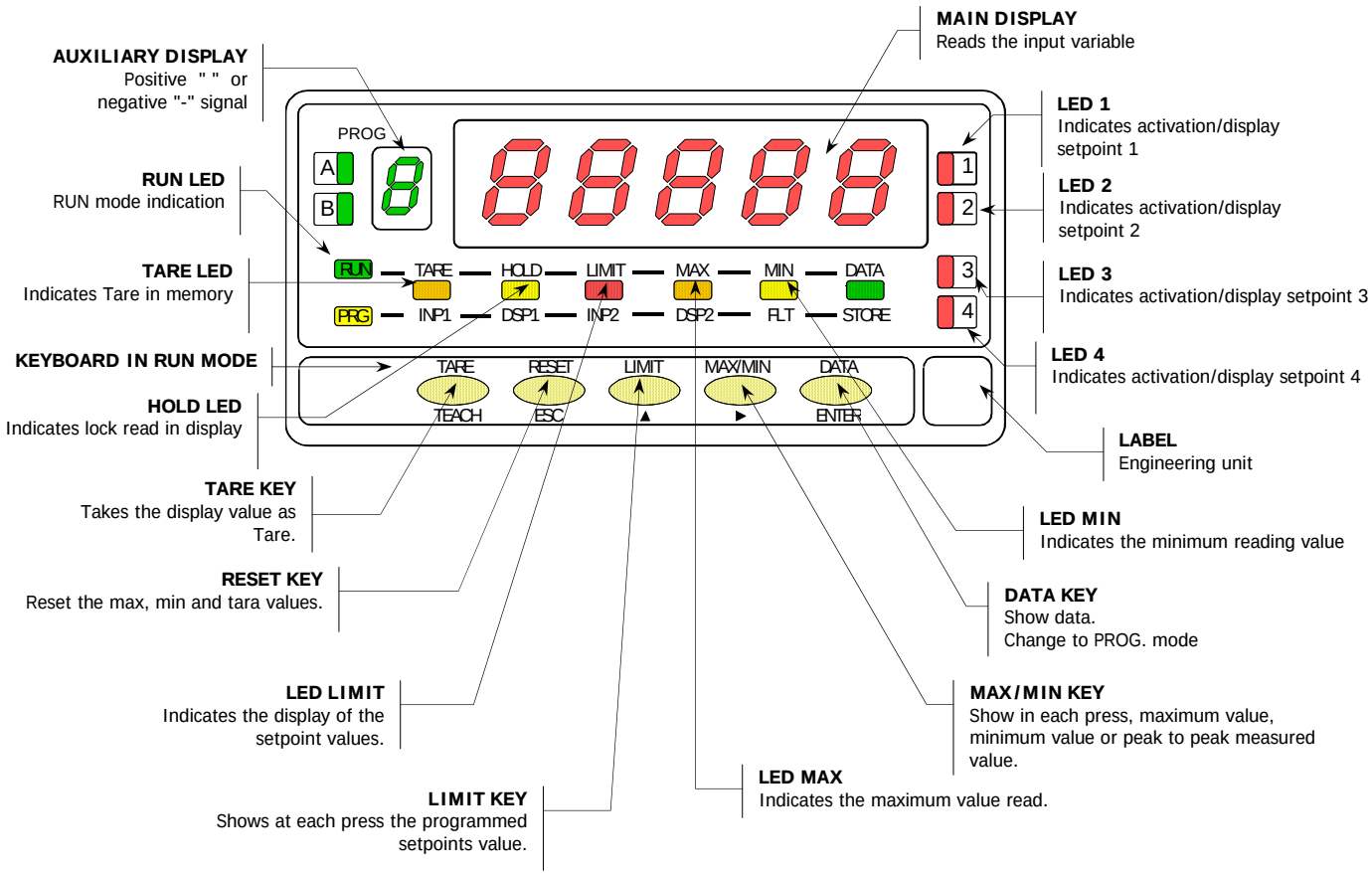
CONTROL

ANA	analog output 4-20mA, 0-10V
2RE	2 Relais SPDT 8A
4RE	4 Relais SPST 5A
4OP	4 output OPTOS NPN
4OPP	4 output OPTOS PNP

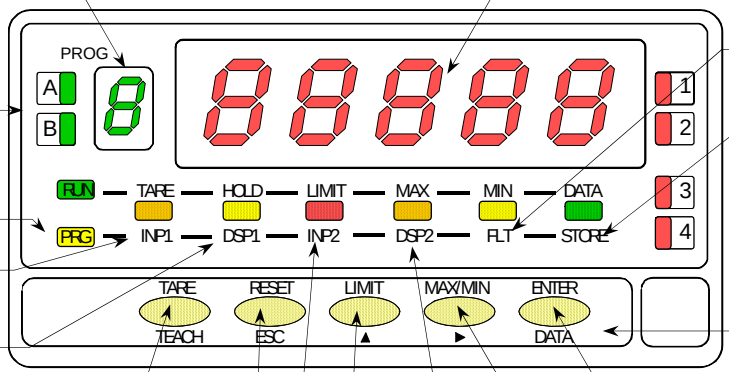
All outputs are optoisolated from input signal and general power supply.

This instrument conforms to the following directives: 89/336/CEE and 73/23/CEE
Caution: Read complete instructions to ensure safety protections.

FRONT-PANEL FUNCTIONS IN RUN MODE



FRONT-PANEL FUNCTIONS IN PROG MODE



AUXILIARY DISPLAY
Indicates program module

MAIN DISPLAY
Reads programming parameters

A and B LED's
Indicates program module letter.

FLT LED
Indicates input filter programming.

STORE LED
Indicates exit from de program mode with data memory storage.

PROG LED
Indicates programmation mode

INP1 LED
Indicates Input1 programming

DSP1 LED
Indicates Display1 programming

KEYBOARD IN PROG MODE

TEACH KEY
Reads the INP1, INP2, INP# value

ESC KEY
Returns to run mode at any program step

ENTER KEY
Accepts data.
Advances program setps

KEY ▶
Moves de flashing digit to the right

INP2 LED
Indicates Input2 programming
Indicates Input# programming

KEY ▲
Increments the flashing digit value

DSP2 LED
Indicates Display2 programming
Indicates Display# programming

2. GETTING STARTED

PACKAGE CONTENTS

- ❑ Instructions manual in English including Declaration of Conformity.
- ❑ D.P.M. model Gamma-M.
- ❑ Accessories for panel mounting (sealing gasket and fastening clips).
- ❑ Accessories for wiring connections (removable plug-in connectors and fingertip).
- ❑ Wiring label sticked to the Gamma-M.
- ❑ Set of engineering units labels

- **Check the package contents.**

CONFIGURATION

Power supply (pages 9 and 10)

- ❑ Instruments supplied for 115/ 230 V AC power are factory set for 230 V AC (USA market 115 V AC).
- ❑ Instruments supplied for 24/ 48 V AC power are factory set for 24 V AC.
- ❑ Instruments supplied for 10-30 V DC can be powered from any voltage between 10 and 30 V DC without need of making changes.

- **Check the wiring label before power connection.**

Programming instructions (Pages 11 and 12)

- ❑ The software is divided into several independently accessible modules for configuration the input, the display, the setpoints, the analog output, the output communication and logic inputs.

✓ **Read carefully this section.**

Input type and connections (Pages 13, 14, 15 and 16)

- ❑ The instrument provides four excitation voltages to supply the transducer 2,2V, 5V , 10V or 24V, are set up at factory for 10V.

✓ **Check the transducer sensitivity, if you have any doubt please consult the transducer specifications**.

Programming Lock-out (page 35)

- The instrument is set at the factory with thelock-out code to **"0000".**

Warning!

✓ **Note and keep in safe place de lock-out code.**

2.1 - Power supply

Should any hardware modification be performed, remove the electronics from the case as shown in figure 9.1.

115/230 V AC: The instruments with 115/230 V AC power, are shipped from the factory for 230 V AC (USA market 115 V AC), see figure 9.2. To change supply voltage to 115 V AC, set jumpers as indicated in figure 9.3 (see table 1). The wiring label should be modified to match new setups.

24/48 V AC: The instruments with 24/48 V AC power supply, are shipped from the factory for 24 V AC, see figure 9.3 To change supply voltage to 48 V AC, set jumpers as indicated in figure 9.2 (see table 1). The wiring label should be modified to match new setups.

10-30V DC: The instruments for 10-30V DC power supply are prepared to withstand any voltage between 10 and 30V without need of wiring changes.

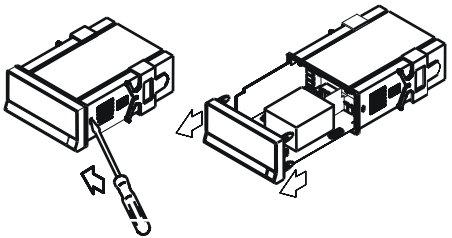


Fig. 9.1 Removing the case

Table 1. Jumper settings

Pin	1	2	3	4	5
230V AC	-	▬		▬	
115V AC	▬		▬		-
48V AC	-	▬		▬	
24V AC	▬		▬		-

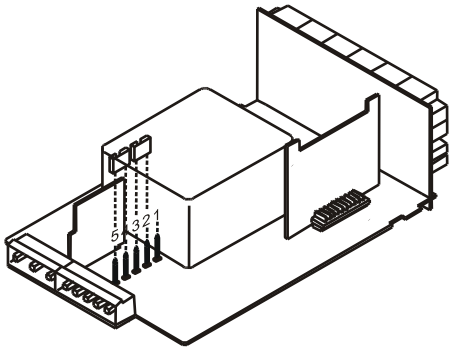


Fig. 9.2. Supply voltage 230 V or 48 V AC

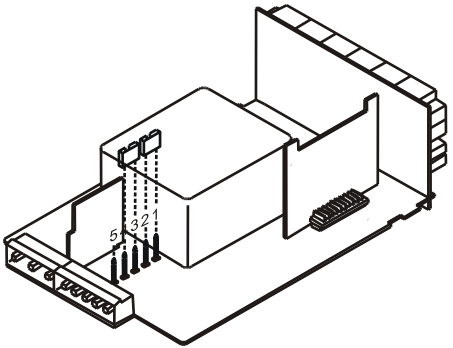
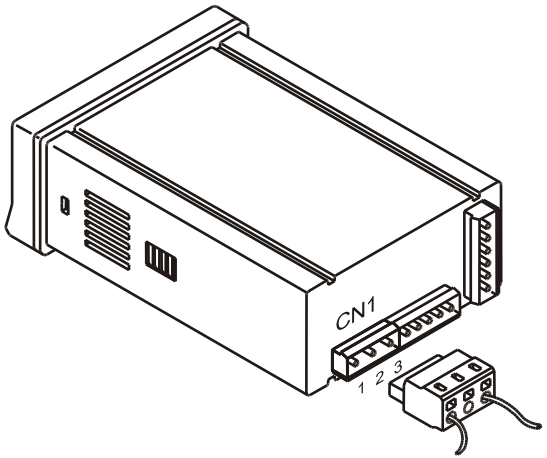


Fig. 9.3. Supply voltage 115 V or 24 V AC

POWER CONNECTION-CN1



AC VERSIONS
PIN 1 - AC HI
PIN 2 - GND (GROUND)
PIN 3 - AC LO (NEUTRAL)

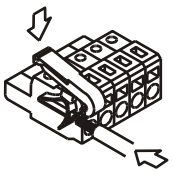
DC VERSIONS
PIN 1 - DC POSITIVE
PIN 2 - N/C (no connection)
PIN 3 - DC NEGATIVE

INSTALLATION
To meet the requirements of the directive EN61010-1, where the unit is permanently connected to the mains supply it is obligatory to install a circuit breaking device easy reachable to the operator and clearly marked as the disconnect device.

WARNING
In order to guarantee electromagnetic compatibility, the following guidelines for cable wiring must be followed:
- Power supply wires must be routed separated from signal wires. *Never* run power and signal wires in the same conduit.
- Use shielded cable for signal wiring and connect the shield to ground of the indicator (pin2 CN1).
- The cable section must be ∃0.25 mm□

If not installed and used according to these instructions, protection against hazards may be impaired.

CONNECTORS



To perform wiring connections, remove the terminal block from the meter's connector, strip the wire leaving from 7 to 10 mm exposed and insert it into the proper terminal while pushing the fingertip down to open the clip inside the connector as indicated in the figure.
Proceed in the same manner with all pins and plug the terminal block into the corresponding meter's connector.
Each terminal can admit cables of section comprised between 0.08 mm² and 2.5 mm² (AWG 26 ÷ 14).
The blocks provide removable adaptors into each terminal to allow proper fastening for cable sections of <0.5 mm².

2.2 – Programming instructions

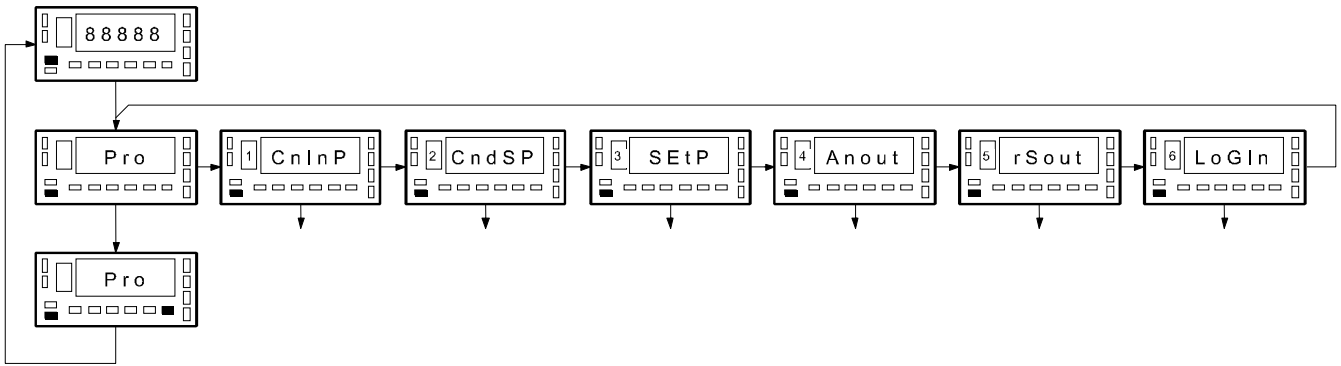
Connect the instrument to the main supply. During a few seconds al segments will turn on as a checking of the good function of the device.
Press ENTER key to enter to the programming mode and the display will show the indication -Pro-.
The programming rutine is divided in independant access modules, accessible by pressing the ▶ key from the level –pro- in this order:

1. CnInP =Input configuration.
2. CndSP =Display configuration.
3. SetP =Setpoints.
4. Anout =Analog output.
5. rSout = Serial output.
6. LoGIn =Logical input.

The 3, 4 and 5 modules will be omitted if the 2RE option, analog option or serial option are not installed. The information about the programming of each one is explained in its manuals.
The picture shows how to enter in the programming mode, the module selection level and the exit saving changes or not saving changes. Once the display shows the indication of the module, the access to the configuration menus is done by pressing ENTER key.

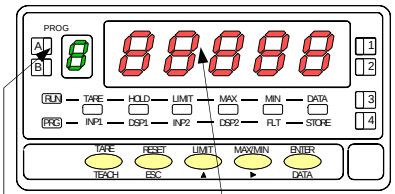
The ESC key exits the programming mode from any programming step.

The global diagrams, that can be seen in the picture, shown the way to advance in the programming of the instrument



The programming instructions are composed by a general description and a series of step-by-step instructions to be followed sequentially. Each menu step is represented by an illustration of the display and keyboard module with indicators (display and LED's), reference [page number . figure number] and a text describing the action of each key at that step.

[page n° / figure n°] Mnemo



Program module and menu step indicators

In the step-by-step instructions, you are given the action of the three buttons mainly used to program data. The normal procedure at each step is to push on ▶ a number of times to make changes and push on ENTER to validate changes and advance to the next programming step. At the end of a complete menu sequence the meter returns to the run mode saving changes in memory.

In general the following actions can be made during the program mode.

ENTER validate changes and advance to next step

ESC discard changes and go to the run mode

▶ select among a list of available options / shift to next digit to the right

▲ increment digit value

With respect to the figures in the step-by-step instructions, the display indications may have the following meanings :

1./ The display shows one of the available options with filled-out segments. That means that the display shows the choice made previously. The use of ▶ allows to select from available options.

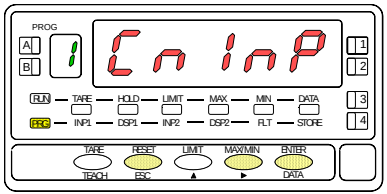
2./ A series of black "8" also represents the display indication of a previous choice, with the difference that it cannot be changed in the current step. If it is already the desired parameter, you may exit from the menu by a push of ESC without making changes or, if wanted to modify it, a push of ENTER advances the meter to the next step where changes are allowed.

3./ A series of white "8" represents any numerical value that is programmed by using keys ▲ (increment digit value) and ▶ (advance to the next digit).

2.3 – Input configuration

If the Gamma-M should work with **mV** (Load-Cell, shunt or similar) we choose **LoAd.** This input accepts up to 500mV.
If the Gamma-M should work with process signal in V or mA we select **ProC** and then U or mA according needed. If 1V input is used should be connected to mV input according drawing on pag.15.
If used like **Pot** this should be connected as in drawing on pag. 16 and with excitation supply **2,2V** to have a greater input impedance and better linearity. If have to be used with 10V excitation should be considered as a standard transducer of 10V and connect as indicated on pag.15.
If Gamma-M works with mA select **ProC** and **mA** and by pressing ENTER key save the configuration and go to run mode.

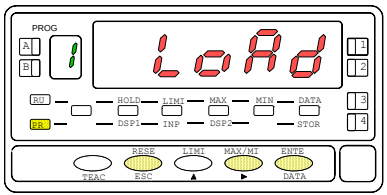
[13.1] Input configuration



From the run mode, press ENTER key to enter in programming mode (the display shows the indication -Pro-). Press ▶ key and the display shows the indication in figure 13.1 corresponding to the access level of the input programming module.

▶ Go to next programming step
ENTER Access the input type selection.
ESC Cancel programming and return to run mode.

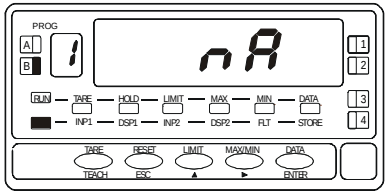
[13.2] Input type



The display shows the input type to program. If you want to modify this parameter, press ▶ key until the desidered selection appears in the display [**LoAd**= mV input, load cel, **ProC**= mV, V, mA input or **Pot**= Potentiometer input], if you chosse **Pot** by pressing ENTER key the instrument will save the changes and go to run mode.

ENTER Access the input range selection.
ESC Cancel programming and return to run mode

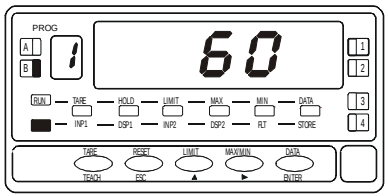
[14.1] Input range



If **ProC** has been choosed, pushing ENTER will appear the kind of signal [**V**=Volt, **mA**=Current. If **LoAd** has been choosed, will appear the different ranges (see diagram). If **Pot** has been choosed , when push ENTER directly store into memory and pass to next step. Push ▶, until the desired option be displayed.

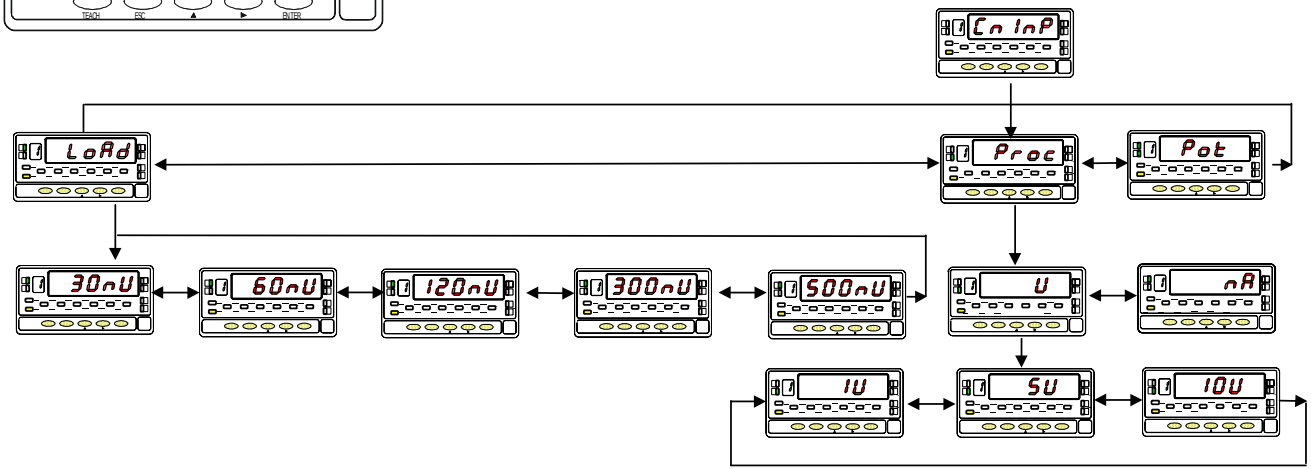
ENTER Store the value in memory and goes to next step.
ESC Cancel programming and goes to run mode

[14.2] Range selection



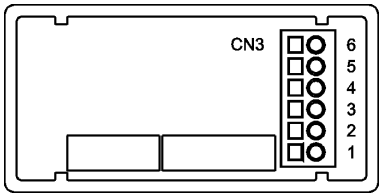
If the option was **LoAd,** pushing ▶ can choose among [±30mV, ±60mV, ±120mV, ±300mV y ±500mV] as a maximum input range. If the option was **V**, can choose among [**1**=±1V, **5**=±5V, **10**=±10V]. The rest of inputs are fixed range. On figur3 14.2 is shown the 60mV range selection.

ENTER Save the value in memory and goes to run mode
ESC Cancel programming and goes to run mode.

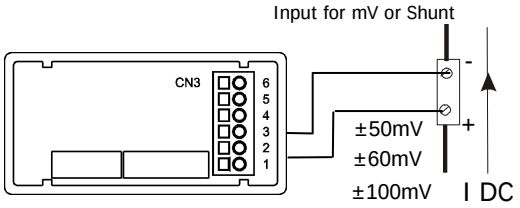


Input type connection

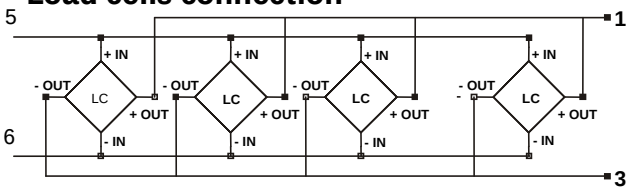
See conection advises in page 10.



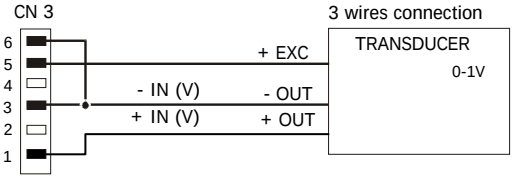
PIN 6 = -EXC[Output excitation (-)]
PIN 5 = +EXC[Output excitation (+)]
PIN 4 = +IN[Input mA (+)]
PIN 3 = -IN[Input V ,mV ,mA]
PIN 2 = +IN[Input V (+) (0-10/0-5)]
PIN 1 = +IN[Input mV y 0-1V) (+)]



Load cells connection

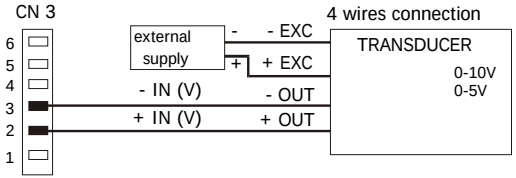


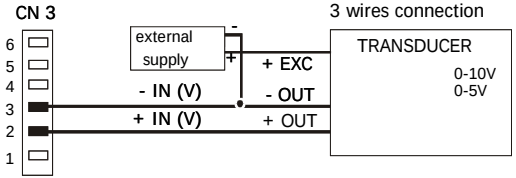
Transmitter connection 0-1V



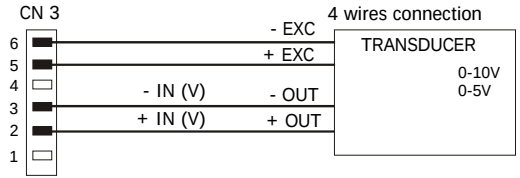
Transmitter connection 0-10V or 0-5V

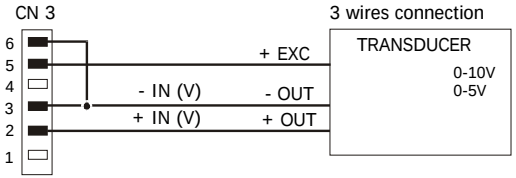
External power supply connection





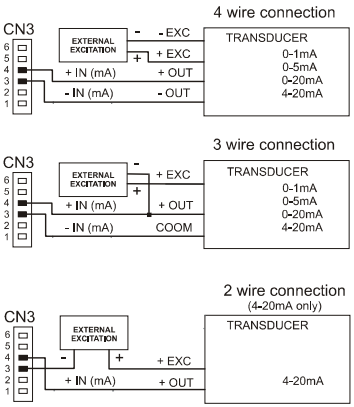
Excitation from Gamma-M



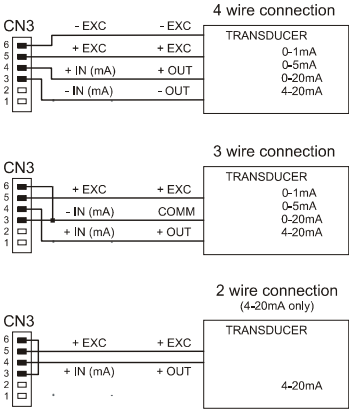


For input process signal mA

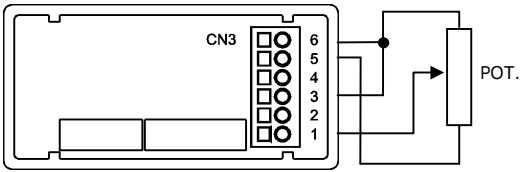
CONNECTION WITH EXTERNAL EXCITATION



EXCITATION SUPPLIED BY GAMMA-M



Connection type potentiometer with
Input impedance > 10MΩ



Excitation = 2.2V Jumper J4
Input type = Potentiometer

Transducer excitation selection

Excitation selection jumpers

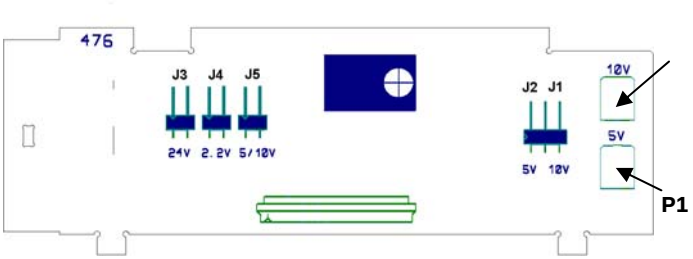


fig. 16.1

Exc = 24V DC not stabilized **J3**
Exc = 2,2V DC not adjustable **J4**
Exc = 5V DC **J5** + **J2** **P1** = fine adjust 5V
Exc = 10V DC **J5** + **J1** **P2** = fine adjust 10V

Default setting Exc=10V
P2 adjust 10V.
P1 adjust 5V.

WARNING! J3, J4, J5 connect only one

2.4 – Display configuration

After selection of the input range, it may be necessary to scale the instrument for the particular application. For many common applications, single slope scaling (2 points) should be suficient to have good readings over the entire process range. Other aplications, in which non-linear devices are used may require linearizing the signal. This is accomplished by scaling the meter with more than two points (see fig. 17.1)

Aplication type	**N° of scaling points**
Lineal function	2 points
Non lineal	Up to 30 points

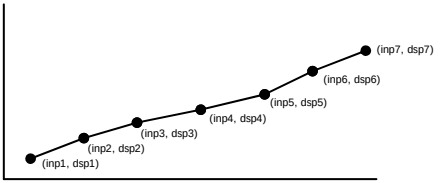
1./ Display range configuration.

The procedure of scaling the display consists of programming a minimum of two points composed each by an input (INP#) and a display (DSP#) coordinates.

When scaling the meter with two points (linear function), they should be located near the process limits for the best possible accuracy.

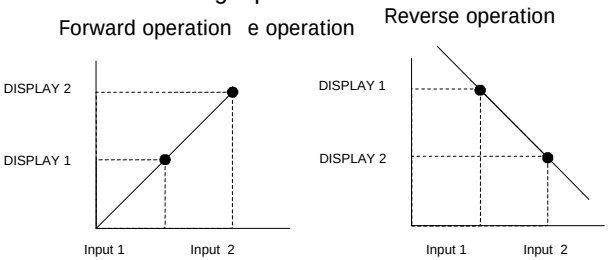
For multi-point scaling, it is recommended to use the most possible number of points and to reduce the segment length. **The input signal values of the scaling points must be all increasing or all decreasing. Avoid programming two different displays for two equal inputs.** The display values can be entered in any order and even be repeated for two or more input values.

Fig. 17.1: Linearizing function with 6 segments (7 points). Up to 29 segments are available.



2./ Action modes

The figure below represents two modes of operation obtained by programming increasing or decreasing display values for increasing input values.



Forward operation :

- When input signal *increases*, the display *increases*.
- When input signal *decreases*, the display *decreases*.

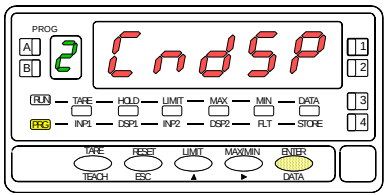
Reverse operation :

- When input signal *increases*, the display *decreases*.
- When input signal *decreases*, the display *increases*.

3./ Display range programming.

After deciding the values for INPUT and DISPLAY and the decimal point position, we are ready to enter in the display configuration module (2 CndSP) to efectively scale the meter. The scaling procedure is completed with digital filters and display rounding.

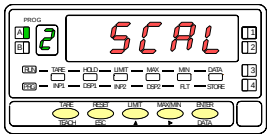
[18.1] Display configuration



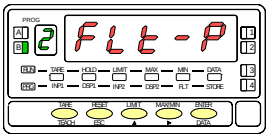
ENTER

From the run mode, press ENTER to get access to the programming mode (the display shows -Pro-). Press two times the ▶ key to go to the entry stage of the display configuration module, represented in fig. 18.1. This module provides five menus : scaling, balanced filter, damping filter, round and tare (lockout). Press ENTER to access to the first menu (SCAL) and press repeatedly the ▶ key if you want to shift around the different menus (See next pages for instructions on each menu).

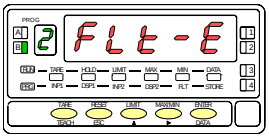
▶ Go to next programming module.
ENTER Enter the selected menu.
ESC Go to run mode.



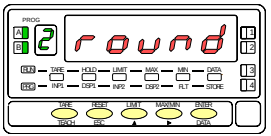
MENU 2A
SCALE



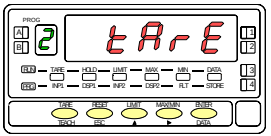
MENU 2B
BALANCED FILTER



MENU 2B
DAMPING FILTER



MENU 2AB
ROUND FILTER

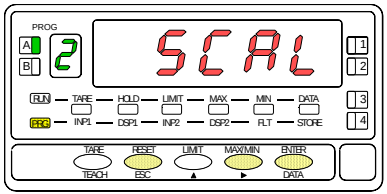


MENU 2
TARE

MENU 2A - SCALE

In this menu will be intoduced the necessary parametres that configs the scal (INP1-DSP1 – decimal point – INP2-DSP2 and if needed up to 29 aditional points). By default, the instrument waits the introduction of this values by keyboard. The input values can be programmed by keyboard or measuring directly the input signal by method Teack, push in this case the key TEACH.

[19.1] Scale configuration



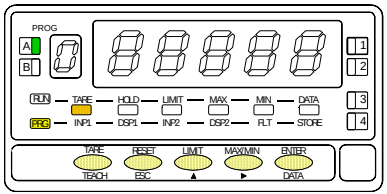
The figure 19.1 shows the indication (**SCAL**) corresponding to the scal menu. Press ENTER key to access this menu.

ENTER Access to scale configuration

▶ Go to next programming step.

ESC Cancel programming and returns to run mode.

[19.2] Input 1 value



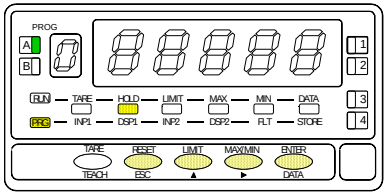
The previously programmed INP1 value appears on the display, LED INP1 activated, with the digit (sign) in flash. There are two methods to program input values:

Key-in method: Use ▲ to switch between "0" (positive) and "-" (negative). Press ▶ to advance to the next digit to the right which goes in flash. Press repeatedly ▲ to increment the active digit until it takes desired value. Proceed in the same manner with all the digits until desired value is completed on the display with sign. Press ENTER to accept this value as INP1 and go next step.

Teach method: Apply signal to the meter input. Press TEACH to view the actual signal value present at the input connector (LED INP1 flashes). Press ENTER to accept this value as INP1 and go next step.

ESC To exit from the programming mode without saving changes.

[19.3] Display 1 value

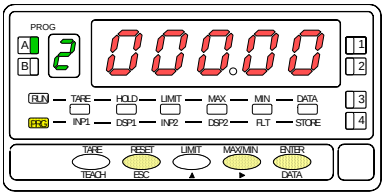


The previously programmed DSP1 value appears on the display, LED DSP1 activated, with the digit (sign) in flash. By means of the ▲ and ▶ procedure, program desired DSP1 value and press ENTER. The limits of the span are -9999 and 9999 points.

ENTER Validate data and access to next programming step.

ESC Cancel programming and returns to run mode.

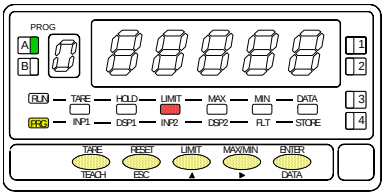
[20.1] Decimal point



Programming the blinking decimal point. Press ▶ key to situate it in the desired position. If no decimal point is desired then you have to situate it to the righter place in the display. The selected position will be fixed for all the programming and run mode.

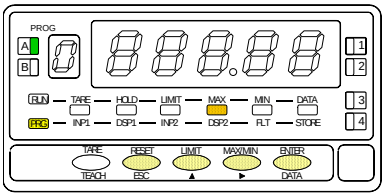
ENTER Validate data and access to next programming step..
ESC Cancel programming and returns to run mode.

[20.2] Input 2 value



Programming input value in point 2, led INP2 on.
Key-in method Use ▲ to switch between "0" (positive) and "-" (negative). Press ▶ to advance to the next digit to the right which goes in flash. Press repeatedly ▲ to increment the active digit until it takes desired value. Proceed in the same manner with all the digits until desired value is completed on the display with sign. Press ENTER to accept this value as INP2 and go next step.
Teach method: Press TEACH key to display the real input value.
ENTER Validate data and access to next programming step.
ESC Cancel programming and returns to run mode.

[20.3] Display 2 value



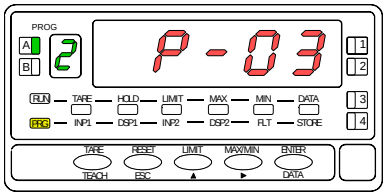
Programming of the display value for the first point, activated LED DSP2. By means of the ▲ and ▶ procedure, program desired DSP2 value and press ENTER. The limits of the span are -9999 and 9999 points..

To save changes and return to run mode press ENTER key or,
To access the programming of the scale linearisation points, press ENTER key during 3 seconds.

ESC Cancel programming and returns to run mode.

Warning: VERY IMPORTANT: Scaling the meter with a tare value different from zero may cause false readings when exiting to the run mode. Before trying to program the scale, check the TARE LED and, if activated proceed to clear the tare memory (Fig. 26.2).

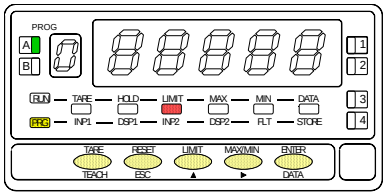
[21.1] Point 3



1 second flag indication for scaling point 3.

Multi-slope scaling sequence begins at this step..

[21.2] Input 3 value

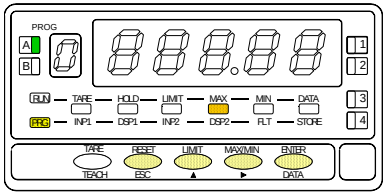


The previously programmed INP3 value appears on the display, LED INP2 activated. There are two methods to program input values :

Key-in method: Use ▲ to switch between "0" (positive) and "-" (negative). Press ► to advance to the next digit to the right which goes in flash. Press repeatedly ▲ to increment the active digit until it takes desired value. Proceed in the same manner with all the digits until desired value is completed on the display with sign. Press ENTER to accept this value as INP3 and go next step.

Teach method: Apply signal to the meter input. Press TEACH to view the actual signal value present at the input connector, LED INP2 flashes. Press ENTER to accept this value as INP3 and go next step. ESC To exit from the programming mode

[21.3] Display 3 value



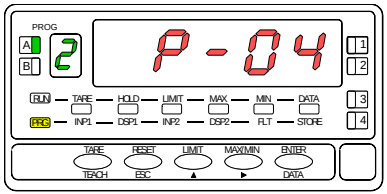
Programming of the display value for the third point, activated LED DSP2. By means of the ▲ and ► procedure, program desired DSP3 value and press ENTER. The limits of the span are -9999 and 9999 points.

c) To validate data and advance to the next point ; press ENTER; or

d) To save the programmed data in the memory and return to the run mode (the meter is scaled by three points), press and hold down ENTER for 3 seconds.

ESC To exit from the programming mode without saving changes.

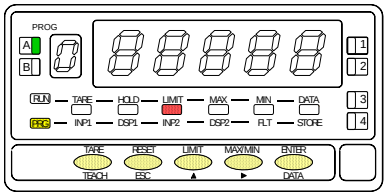
[22.2] Point 4



1 second flag indication for scaling point 4.

NOTE: The instructions given for programming point 4 are applicable to the programming of points up to 30

[22.2] Input 4 value



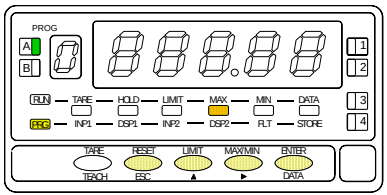
The previously programmed INP4 value appears on the display, LED INP2 activated. There are two methods to program input values :

Key-in method: Use ▲ to switch between "0" (positive) and "-" (negative). Press ▶ to advance to the next digit to the right which goes in flash. Press repeatedly ▲ to increment the active digit until it takes desired value. Proceed in the same manner with all the digits until desired value is completed on the display with sign. Press ENTER to accept this value as INP4 and go next step.

Teach method: Apply signal to the meter input. Press TEACH to view the actual signal value present at the input connector, LED INP2 flashes. Press ENTER to accept this value as INP4 and go next step.

ESC To exit from the programming mode without saving changes.

[22.3] Display 4 value



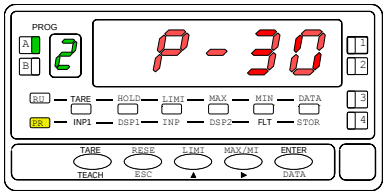
Display value programming in point 4, led DSP2 turned on.

By means of the ▲ and ▶ procedure, program desired DSP3 value and press ENTER. The limits of the span are -9999 and 9999 points.

c. To validate data and advance to the next point ; press ENTER; or
d. To save the programmed data in the memory and return to the run mode (the meter is scaled by three segments), press and hold down ENTER for 3 seconds.

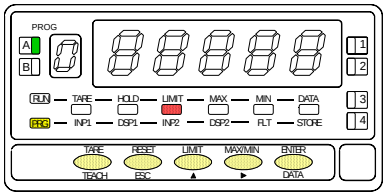
ESC To exit from the programming mode without saving changes.

[23.1] Point 30



One second the indication P-30 appears in the display.

[23.2] Input 30 value



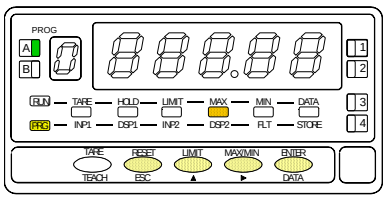
The previously programmed INP30 value appears on the display, LED INP2 activated. There are two methods to program input values :

Key-in method: Use ▲ to switch between "0" (positive) and "-" (negative). Press ▶ to advance to the next digit to the right which goes in flash. Press repeatedly ▲ to increment the active digit until it takes desired value. Proceed in the same manner with all the digits until desired value is completed on the display with sign. Press ENTER to accept this value as INP30 and go next step.

Teach method: Apply signal to the meter input. Press TEACH to view the actual signal value present at the input connector, LED INP2 flashes. Press ENTER to accept this value as INP30 and go next step.

ESC To exit from the programming mode without saving changes.

[23.3] Display 30 value



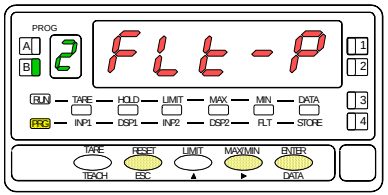
Programming the display value in point 30, led DSP2 on.
By means of the ▲ and ▶ procedure, program desired DSP30 value. The limits of the span are -9999 and 9999 points.

ENTER Save programmed data and return to run mode.
ESC Return to previous point.

MENU 2B - BALANCED FILTER

The balanced filter acts as a delay on the display response to signal variations produced at the input. The effect of incrementing this filter level results in a softer response of the display to the input variations.
The filtering level is programmable from 0 to 9. Level 0 disables the filter.

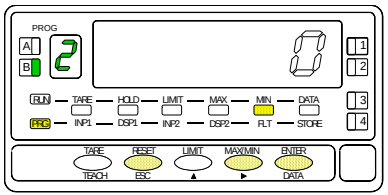
[24.1] Balanced filter



The figure 24.1 shows the indication (**FLt-P**) corresponding to entry stage of the balanced filter menu. Press the ENTER key to acceed this menu.

ENTER To access to the programming filter.
▶ To skip over this menu and go to next one.
ESC To exit from the programming mode without saving changes.

[24.2] Filter value



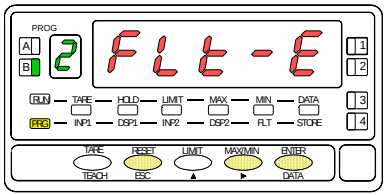
The figure 24.2 shows the initially selected level for the filter-P (any number between 0 and 9) with the FLT LED activated.
Press repeatedly the ▶ key to change the digit until desired value appears on the display.

ENTER To save the entry into the memory and go to the next programming menu.
ESC To exit from the programming mode without saving changes.

MENU 2B - DAMPING FILTER

The damping filter cuts off input values exceeding from the limits of a simmetrical band. This band becomes more selective as the filter level is increased.
The filtering level is programmable from 0 to 9. Level 0 disables the filter.

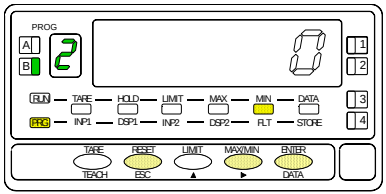
[25.1] Damping filter



The figure 25.1 shows the indication (**FLt-E**) corresponding to entry stage of the damping filter menu. Press the ENTER key to acceed this menu.

ENTER To access to program the filter level.
▶ To skip over this menu and go to next one.
ESC To exit from the programming mode without saving changes.

[25.2] Filter value



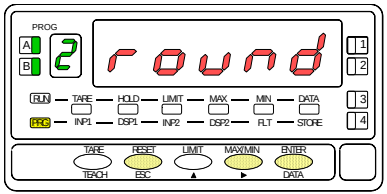
The figure 25.2 shows the initially selected level for the filter-E (any number between 0 and 9) with the FLT LED activated.
Press repeatedly the ▶ key to change the digit until desired value appears on the display.

ENTER To save the entry into the memory and go to the next programming menu.
ESC To exit from the programming mode without saving changes.

MENU 2AB - ROUND FILTER

This menu allows selection among 4 levels of display rounding. When resolution is not critical, a rounding increment higher than 1, may help to stabilize the display.

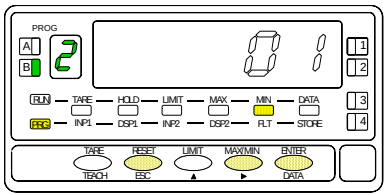
[26.1] Round filter



The figure 26.1 shows the indication (**round**) corresponding to the round menu. Press ENTER to acceed the configurations.

ENTER To get access to the round level selection.
▶ To Skip over this menu and pass to the next one.
ESC To exit from the programming mode without saving changes.

[26.2] Rounding increment



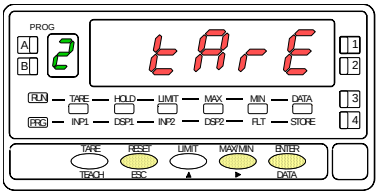
Program the rounding increment, LED FLT activated.
The display shows the previously selected round level. To change this parameter, press repeatedly the ▶ key to rotate around the different options : [**01** = no rounding, **02** = round to 2 counts, **05** = round to 5 counts, **10** = round to 10 counts].

ENTER To save the option present on display and return to the run mode.
ESC To exit from the programming mode without saving changes.

MENU 2 - TARE

This menu allows enabling and disabling the tare function and its reset.

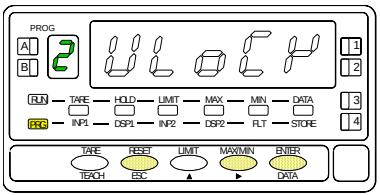
[27.1] Tare menu



The figure 27.1 shows the indication (**tArE**) corresponding to the tare menu. Press ENTER to acceed the configurations.

ENTER To get access to the tare menu.
▶ To Skip over this menu and pass to the next one.
ESC To exit from the programming mode without saving changes.

[27.2] Tare UloCk/LoCK



The initially programmed option appears on the display : [**UloCK** = tare function enabled, **LoCK** = tare function disabled].

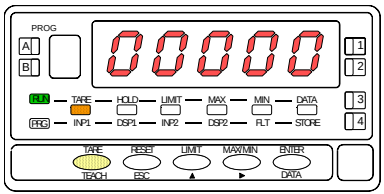
▶ To switch between lock and unlock indications until desired option is displayed.
ENTER To save the option present on display and return to the run mode.
ESC To exit from the programming mode without saving changes.

3. KEYBOARD AND REMOTE CONTROLS

3.1 – KEYBOARD FUNCTIONS

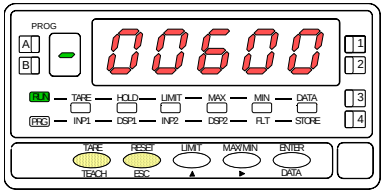
The front-panel keyboard includes the following function keys: TARE, RESET, LIMIT and MAX/MIN. The functionality of each one, which is avaliable in the "RUN" mode is described next.

TARE. A push of this key adds the current display value to the tare memory and brings the display to zero. The "TARE" LED indicates that a tare value different from zero is contained in the tare memory.



[28.1] Tare operation

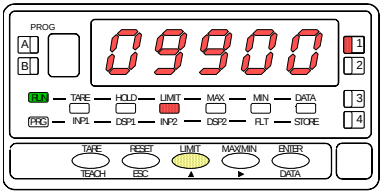
To reset the tare memory press and hold down the "RESET" key, then press the "TARE" key. Release first "TARE" then "RESET". To take a tare or reset it back to zero, be sure these functions are enabled by software (see Fig. 27.2, TARE menu, UnLoCK option).



[28.2] Tare reset

LIMIT. During the RUN mode, this key is only operative in case that the instrument incorporates one of the following output options : 2 relays (ref. 2RE), 4 relays (ref. 4RE), 4 NPN transistors (ref. 4OP) or 4 PNP transistors (ref. 4OPP).

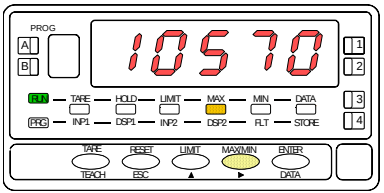
At one push of "LIMIT" key the display illuminates the "limit" LED and reads the first programmed setpoint value with the LED 1 activated. New strokes on the LIMIT key recalls successively the rest of the setpoints with the corresponding LED (on the right) activated.



[28.3] Setpoint 1 value

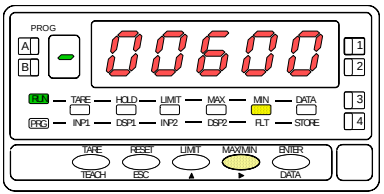
The setpoint values are shown at each push of the "LIMIT" key independently of whether they are enabled or inhibited. 15 seconds after the last key operation or by a push of "LIMIT" from the visualitation of the last setpoint, the meter returns to the normal reading.

MAX/MIN. This key calls up the peak and valley values contained in memory. The first push recalls the maximum value reached for the variable since the last reset operation (peak) and activates the "MAX" LED.



[29.1] Peak

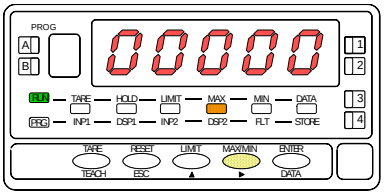
The second push recalls the minimum value registered after the last reset (valley) and activates the "MIN" LED.



[29.2] Valley

A third push shows the Peak-Peak detected value since the last reset or tare and activates the “MAX and MIN” LED.
A fourth push brings the meter to the normal reading.
The peak, valley and peak-peak values are updated even when they are registered on the display.

To erase the peak, valley or peak-peak memories, press "MAX/MIN" one, two or three times to display the value to be reset. Press and hold down the "RESET" key and simultaneously press "MAX/MIN". Release "MAX/MIN" then "RESET".
When reseting the peak to peak value, automatically the peak and valley value are reset, getting the actual variable value.



[29.3] Peak value reset

RESET. The "RESET" key is used in conjunction with "TARE" and "MAX/MIN" to erase the memories of tare and peak/valley or peak-peak value respectively.
When a tare or a tare reset operation is performed, the peak , valley and peak-peak are updated with the actual value.

PEAK = Maximum detected value since the last reset or tare.
VALEY = Minimum detected value since the last reset or tare.
PEAK-PEAK = Absolut value of **PEAK and VALEY** distance value detected since the last reset or tare.

3.2 – REMOTE FUNCTIONS

The rear connector CN2 provides 4 user programmable optocoupled inputs NPN or PNP that can be operated from external contacts or logic levels supplied by an electronic system. Four different functions may be then added to the functions available from the front-panel keys. Each function is associated to one of the CN2 connector pins (PIN 1, PIN 2, PIN 4 and PIN 5) referred to PIN 3 .

Each pin can be assigned one of the 31 functions listed on the following pages.

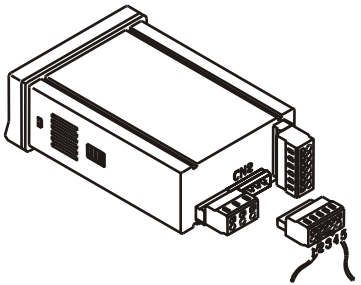


Fig. 30.1

- Default configuration

As shipped from the factory, the CN2 connector allows the TARE, MAX/MIN and RESET operations be made in the same way as from the front-panel keyboard and incorporates one more function: the display HOLD.

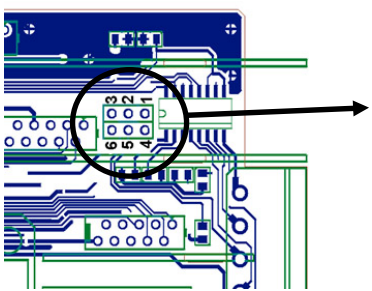
The HOLD state, which is acknowledged by the LED "HOLD", freezes the display.

From factory the logical inputs are **NPN** configured.

CN2 : DEFAULT CONFIGURATION

PIN (INPUT)	**Function**	**Number**
PIN 1 (INP-1)	RESET	Function nº 7
PIN 2 (INP-2)	HOLD	Function nº 9
PIN 3	COMMON	
PIN 4 (INP-4)	TARE	Function nº 1
PIN 5 (INP-5)	MAX/MIN	Function nº 6

The external electronics (see fig. 30.1) applied to the CN2 connector must be capable of withstanding 40V and 20mA present at all terminals with respect to COMMON. In order to guarrantee the electromagnetic compatibility, please refer to the instructions given on page 10.



Changing the logical CN2

3 2 1 J1

6 5 4 J2

CN2 input type

PNP J1 (2-3) and J2 (5-6)

NPN J1 (1-2) and J2 (4-5)

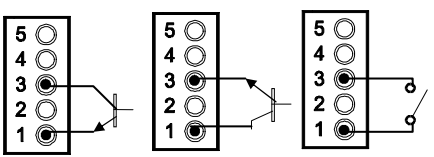


Fig.. 30.2 Conection examples. PNP, NPN or switch.

3.3 - Table of programmable functions

- Nº : Function number.
- Function : Function name.
- Description : Description and characteristics of the function.
- Activation :
  - Falling edge : The operation is performed on a falling edge applied to the pin with respect to COMMON.
  - Low level : The function remains activated while the corresponding pin is held at a low level with respect to COMMON.
- (*) Default factory configuration. It can be restored by programming all pins to '0'.
- (1) Activating the functions 3 and 4 simultaneously the peak-peak value is shown.

0 to 9 : DISPLAY / MEMORY FUNCTIONS

Nr	Function	Description	Activation
0	Deactivated	None	None
1	TARE (*)	Adds the current display value to the tare memory. The display goes to zero	Pulse
2	RESET TARE	Adds the tare memory contents to the display value and clears the tare memory	Pulse
3	PEAK (1)	Display PEAK value.	Fixed level
4	VALLEY (1)	Display VALLEY value.	Fixed level
5	RESET PEAK/VALLEY	Clears the peak or valley memory (if the values are on display)	Pulse
6	PEAK/VALLEY (*)	1st push recalls peak, 2nd push recalls valley, 3rd push recalls peak-peak, 4th push brings the meter to the indication of the variable being measured	Pulse
7	RESET (*)	Combined with (1) delete the tare. Combined with (6) delete peak or valley.	Pulse combined with (1) or (6)
8	HOLD1	Holds the display while the outputs remain active	Fixed level
9	HOLD2 (*)	Holds the display, the RS and the analog outputs	Fixed level

10 to 12 : FUNCTIONS ASSOCIATED WITH THE DISPLAY OF THE INPUT VARIABLE

Nº	Function	Description	Activation
10	INPUT	Displays the actual input signal value in mV (flashing)	Fixed level
11	GROSS	Displays the measured value + the tare value = gross	Fixed level
12	TARE	Displays the amount of tare contained in the memory	Fixed level

13 to 16 : FUNCTIONS ASSOCIATED WITH THE ANALOG OUTPUT

Nº	Function	Description	Activation
13	ANA GROSS	Makes the analog output follow the gross value (measured value + tare)	Fixed level
14	ZERO ANA	Puts the analog output to the zero state (0 V for 0-10 V, 4 mA for 4-20 mA)	Fixed level
15	ANA PEAK	Makes the analog output follow the peak value	Fixed level
16	ANA VALLEY	Makes the analog output follow the valley value	Fixed level

17 to 23 : FUNCTIONS FOR USE WITH A PRINTER VIA THE RS OUTPUTS

Nº	Function	Description	Activation
17	PRINT NET	Prints the net value.	Pulse
18	PRINT GROSS	Prints the gross value.	Pulse
19	PRINT TARE	Prints the tare value.	Pulse
20	PRINT SET1	Prints the setpoint1 value and its output status.	Pulse
21	PRINT SET2	Prints the setpoint2 value and its output status.	Pulse
22	PRINT SET3	Prints the setpoint3 value and its output status.	Pulse
23	PRINT SET4	Prints the setpoint4 value and its output status.	Pulse

24 to 25 : FUNCTIONS ASSOCIATED WITH THE SETPOINTS

Nº	Function	Description	Activation
24	FALSE SETPOINTS	Exclusively for instruments WITHOUT relays/transistors control outputs card. Allows programming and operation of 4 setpoints.	Fixed level
25	RESET SETPOINTS	Exclusively for instruments with 1 or more setpoints programmed as "latched setpoints" (That is, the setpoints that once energized remain on the ON status althoug the alarm condition disappears). Desactivates the setpoints output.	Pulse

26 to 31 : SPECIAL FUNCTIONS

Nº	Function	Description	Activation
26	S&H SETPOINTS	Grants the setpoints run during the S&H function activation	Fixed level
27	SAMPLE & HOLD	On activating this function, the measuring values peak,valley, peak-peak and actual value are hold on display as well as analog output, rs output and setpoints execpt if function 26 is active. View details on page.34.	Fixed level
28	ASCII SEND	Transmits the four last digits of the display to a remote ASCII indicator. By holding the input to a low level, transmission takes place every second.	Pulse or fixed level
29	PEAK-PEAK	Display the peak-peak value	Pulse
30	ANALOG PEAK-PEAK	The analog output follows the peak-peak value.	Fixed level
31	FAST RS	Sends by serial output RS2 or RS4 the display value at 200 per second. View Page. 54.	Fixed level

FUNCTION Nº1 TARE

The instrument has an internal buffer, where stores a dinamic average of 18 last readings (@555/seg), renewed every 5 ms.

The scan of logical inputs is done every 5ms. For that reason when is detected the function nr1, the value of TARE corresponds to the average done max. 5ms before.

3.3.1 FUNCTION Nº 27 SAMPLE & HOLD

This function is useful to show and to process very quick phenomenons, holding on display and on the outputs the values registered just at the moment of activating this function until this be deactivated.

On activating this function, the measuring values peak,valley, peak-peak and actual value are hold on display as well as analog output, rs output and setpoints execpt if function 26 is active. View details on page.34.

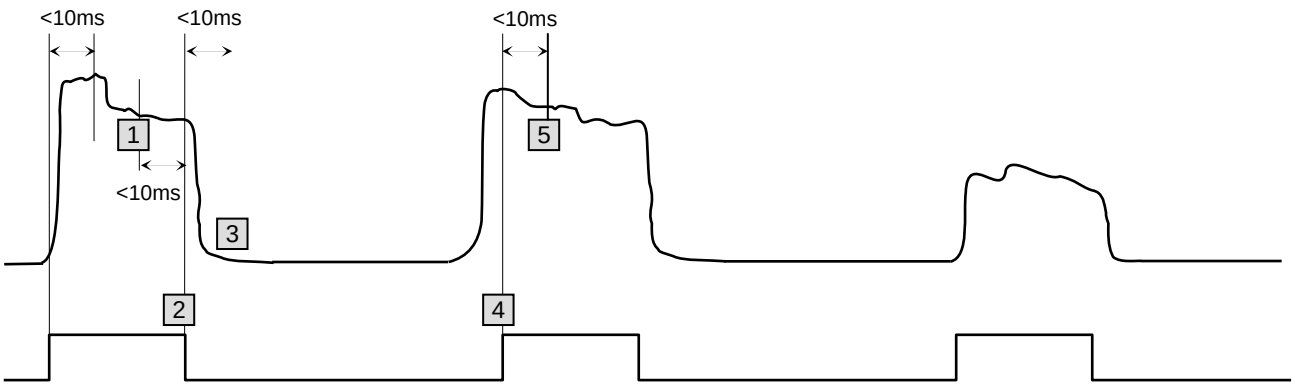
In the deactivation ,peak-peak, valley and peak values are reset (see details in diagram page 34)

To get all the advantages of this function the instrument should be used without filters, delay on setpoints and to have selected the relay function Quick. See append pag.47 and 48.

To use in "Quick" mode the way of working setpoints have to be programmed with the **MENU 3B** the first digit to **1 or 2** and **fourth** digit to **0**.

During the HOLD's time on display is possible to show the stored values net, gross, valley, peak or peak-peak, via keyboard or the specific logical function (nr 3, 4 or 29).

The diagram shows the function 27 use.



SIGNAL S&H

3 Update display with (net, gross, peak, valley and peak-peak) and (hold) 1

Stop doing peak and valley readings.

5 Reset peak and valley values.
Restart the measuring and output operation.

SETPOINTS OUTPUT

Keep the status of setpoints with values on 1

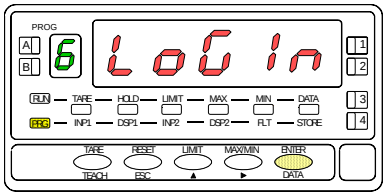
If (26)=OFF or follows if (26)=ON.

Restart the setpoints operation if (26) was OFF.

3.4 - Programming the logic inputs

After deciding the functions for each connector pin, we are ready to enter in the logic inputs configuration module (6 LoGIn) to efectively programming the logic inputs.

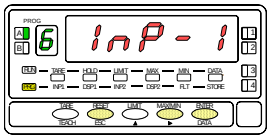
[33.1] Logic inputs



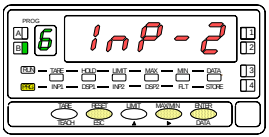
From the run mode, push ENTER to access programming mode (-Pro-). Push ▶ until fig. 35 is showed giving access to the logical functions programming. Pushing ENTER we access to the four menus of logical input selection.

▶ Go to next programming module.
ENTER Enter the selected menu.
ESC Go to run mode.

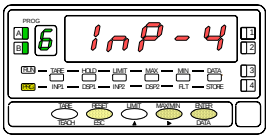
ENTER



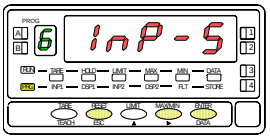
MENU 6A
PIN 1 PROGRAMMING



MENU 6B
PIN 2 PROGRAMMING



MENU 6AB
PIN 4 PROGRAMMING

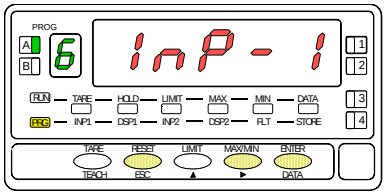


MENU 6
PIN 5 PROGRAMMING

MENU 6A - PIN 1 programming

This menu allows selecting the logic function for PIN 1. Available functions are represented by a number from 0 to 31. Consult tables to find the number corresponding to the desired function. The instructions given below apply to pin function 1. Follow the same procedure to configure the rest of the pins.

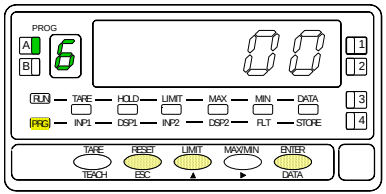
[34.1] Menu PIN 1



The figure 36.1 shows the indication (**InP-1**) corresponding to the configuration menu for the PIN 1 function. Press the ENTER key to acceed this configuration.

ENTER To acceed to the programming of the PIN 1 function.
▶ To skip over this menu and go to PIN 2.
ESC To exit from the programming mode without saving changes.

[34.2] Function number



Choose the function number [0-31], according to the table.

▲ To change number (hold down to increment automatically).
ENTER To save the entry into the memory and return to the run mode.
ESC To exit from the programming mode without saving changes.

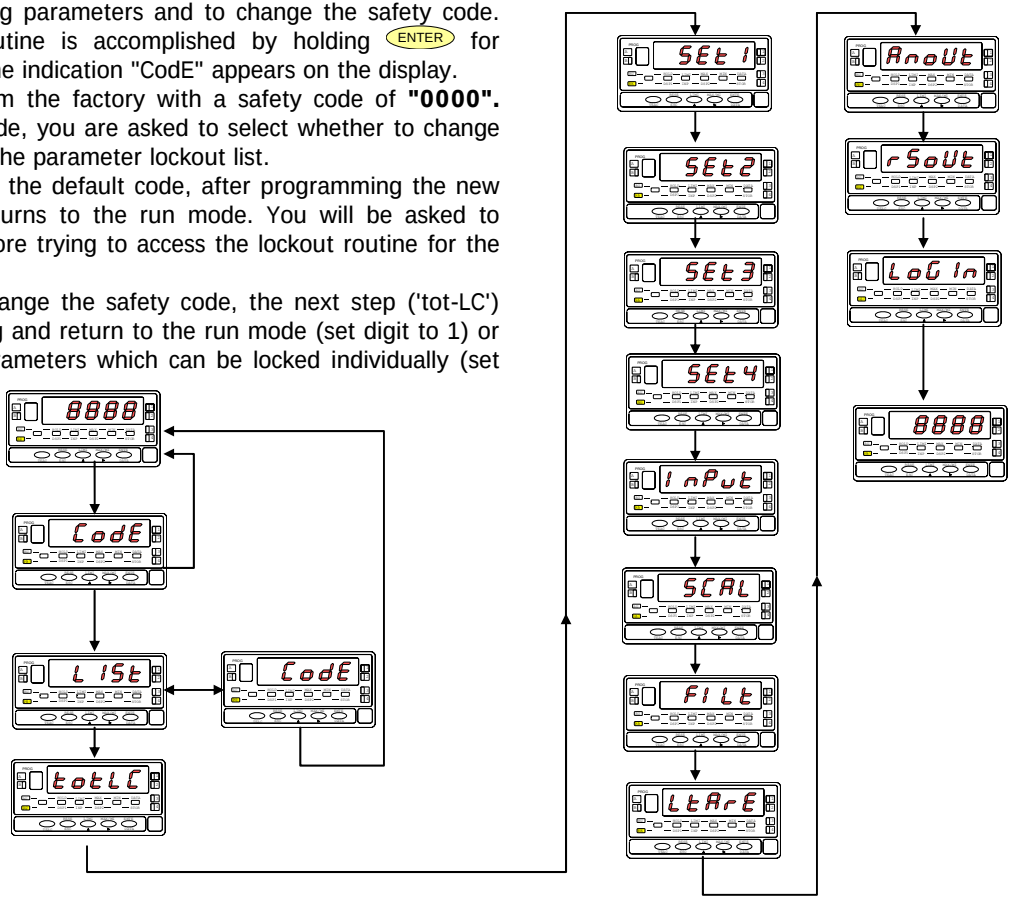
3.5 Lock-out diagram

The diagram shows all phases of the lockout routine which allows to lockout the programming parameters and to change the safety code. The access to this routine is accomplished by holding ENTER for approximately 3s until the indication "CodE" appears on the display.

The unit is shipped from the factory with a safety code of **"0000".** Once introduced this code, you are asked to select whether to change it or to enter directly in the parameter lockout list.

If you decide to change the default code, after programming the new one, the instrument returns to the run mode. You will be asked to enter the new code before trying to access the lockout routine for the next time.

If you decide not to change the safety code, the next step ('tot-LC') allows to lock everything and return to the run mode (set digit to 1) or to access the list of parameters which can be locked individually (set tot-LC to 0).



4. OUTPUT OPTIONS

Optionally, the model GAMMA-M can incorporate one or several output options for communications **(this output should never be connected to the telephone lines)** or control including :

COMMUNICATION

RS2	Serial RS232C
RS4	Serial RS485

CONTROL

ANA	Analogue 4-20 mA, 0-10 V
2RE	2 SPDT relays 8 A
4RE	4 SPST relays 5 A
4OP	4 open-collector NPN outputs
4OP	4 open-collector PNP outputs

All options are optoisolated with respect to the input signal and supplied with their instructions manual where you can find the characteristics, installation and programming.

The output cards are easily installed on the meter's main board by means of plug-in connectors and each one activates its own programming module that provides complete software-configuration.

.

Additional capabilities of the unit with output options :

- Control and processing of limit values via ON/OFF logic outputs (2 relays, 4 relays, 4 NPN outputs or 4 PNP outputs) or proportional output (4-20 mA or 0-10 V).
- Communication, data transmission and remote programming via serial interface.

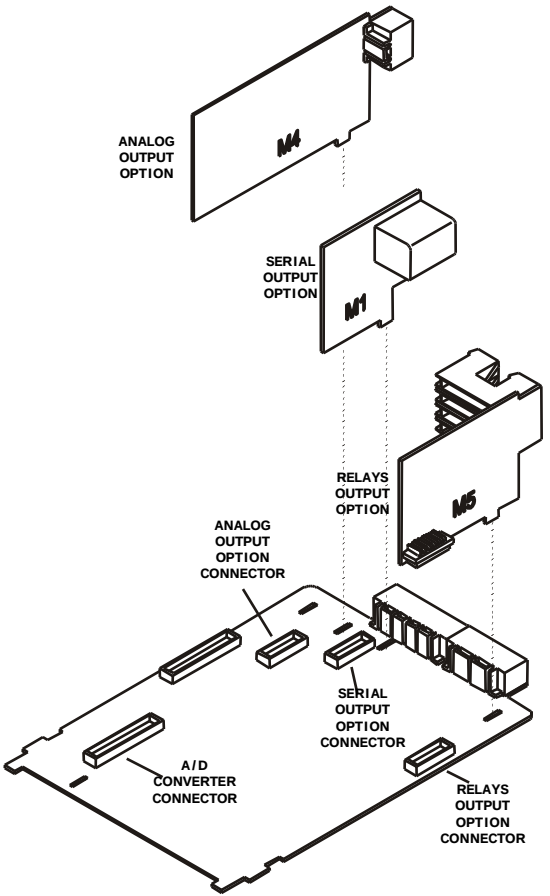
For more detailed information on characteristics, applications, mounting and programming, please refer to the specific manual supplied with each option.

The figure page 39 shows the different locations of the plug-in output cards. Each location corresponds to a specific function: setpoints, analogue and serial outputs.

The options 2RE, 4RE, 4OP and 4OPP are installed in the M5 connector.
The ANA option is installed in the M4 connector.
The options RS2 and RS4 are installed in the M1 connector.

Up to three output options can be present at a time and operate simultaneously, but only one from each category:

- ANALOGUE
- RS232C or RS485
- 2 RELAYS, 4 RELAYS, 4 PNP or 4 NPN



4.1 ADITIONAL FUNTIONS

The new GAMMA-M of ±9999 points increases and enhances the functions and programming of the following output options:

SETPOINTS

Setpoint value programming from +9999 to -9999.

2. New functions :

   2.1. Setpoint biestables "**latch**". This setpoints once activated, remains in this status until a external reset of this function (see RESET setpoints nº25, on the logical functions table, page 32). It 's use allows to know the previous activation of relais in installations where the instrument is not constantly controled.
   2.2. Setpoint activation by: net value, gross value, peak value or valley value.
   2.3. Indication of Relay activation with LED in front or additionaly flashing the reading when reached the setpoint value.

❑ Quick access to the setpoints value programming.

RS232
ModBus-RTU protocol compatible (see ModBus manual).

RS485
Send data to a Ditel printer. New programming menu ("timE") that prints data and time, page 32.
ModBus-RTU protocol compatible (see ModBus manual).

ANALOG OUTPUT
See connector functions, page 32.

SAMPLE & HOLD
New useful function to show and to process very quick phenomenons, holding on display and on the outputs the values registered just at the moment of activating this function until this be deactivated. See pag.33

5. TECHNICAL SPECIFICATONS

Process input

- Input voltage (pin2 versus pin 3).....±(0-5/ 0-10)V
- Input impedance 1MΩ
- Input voltage input (pin1 versus pin 3) ..... ± 0-1V
- Input impedance 100MΩ
- Input current.....±0-20mA
- Input impedance 11,8Ω

Load Cell input or mV

- Voltage input..... ±30,±60,±120,±300,±500mV
  4-wires, unipolar or bipolar
  Input impedance 100MΩ

Potentiometer input

- Min. resistance 120Ω
- Excitation voltage 2.2V
- Input impedance (pin 1versus pin 3) ..... >10MΩ

Excitation

2,2V @ 30mA not regulable.
24V @ 30mA not stabilized
5±100mV@120mA with fine tuning (50ppm/ºC)
10V±100mV@120mA with fine tuning (50ppm/ºC)

Display

- Main display..... -9999/9999
  ..... 5 red digits 7 Segments
- Display auxiliar..... 1 green digit 8mm
- Decimal point..... Programmable
- LED's .....14 (Funciones y salidas)
- Display rate.....10/s (100ms)
- Positive overflow ..... OVFLO
- Negative overflow..... - OVFLO

Conversion

- Technical .....ΣΔ
- Resolution..... ± 15 bits
- Rate 555/s
- Peak measure resolution..... ±15 bits

Accuracy at 23ºC ±5ºC

- Max error..... ±(0.1% reading +2 digits)
- Temperature coefficient..... 50ppm/ºC
- Warm-up time..... 10 minutes

Power supply

- GAMMA-M..... 230/115V 50/60Hz
- GAMMA-M2 ..... 24/48V 50/60Hz
- GAMMA-M1 .....10-30V DC

- Consumption.....5W (without options), 10W (MAX)
- Fusses (DIN41661) Recomended (non supplied)

230/115V AC ..... F 0.2A/250V
24/48V AC..... F 0.5A/250V
10 a 30V DC F2A/250V

5. TECHNICAL SPECIFICATIONS

Enviromental

- Working temperature .....-10º to +60ºC
- Storage temperature .....-25º to +85ºC
- Relative humidity ..... < 95% to 40ºC
- Max. Altitude .....2000 meters

Mechanical

- Measures..... 96x48x120 mm
- Front panel orificel ..... 92x45 mm
- Weight .....600 g
- Case material.....Polycarbonate s/UL 94 V-0

Reaction time

- Peak value capture
  Input signal minimal time 2,1ms

- Reaction time
  Hold-Display Max.10ms
  Hold-Analoge..... Max.10ms
  Hold-RS..... Max.10ms

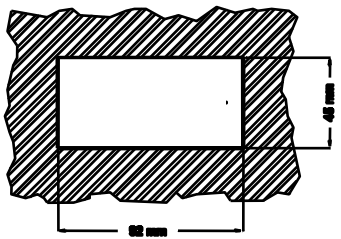
- Logical Input
  All Max.10ms

Maximum and minimum input signal values

Proc. V	**Pins**	**MIN**	**MAX**
0-10V	2-3	-13,5	+13,5
0-5V	2-3	-6,6	+6,5
0-1V	1-3	-1,2	+1,2
Proc. mA	**Pins**	**MIN**	**MAX**
0-20mA	4-3	-25	+25
Load	**Pins**	**MIN**	**MAX**
30mV	1-3	-38	+38
60mV	1-3	-75	+75
120mV	1-3	-150	+150
300mV	1-3	-305	+305
500mV	1-3	-600	+600
Pot.	**Pins**	**MIN**	**MAX**
2,2V	1-3	-2,4	+2,4

5.1 - Dimensions and mounting

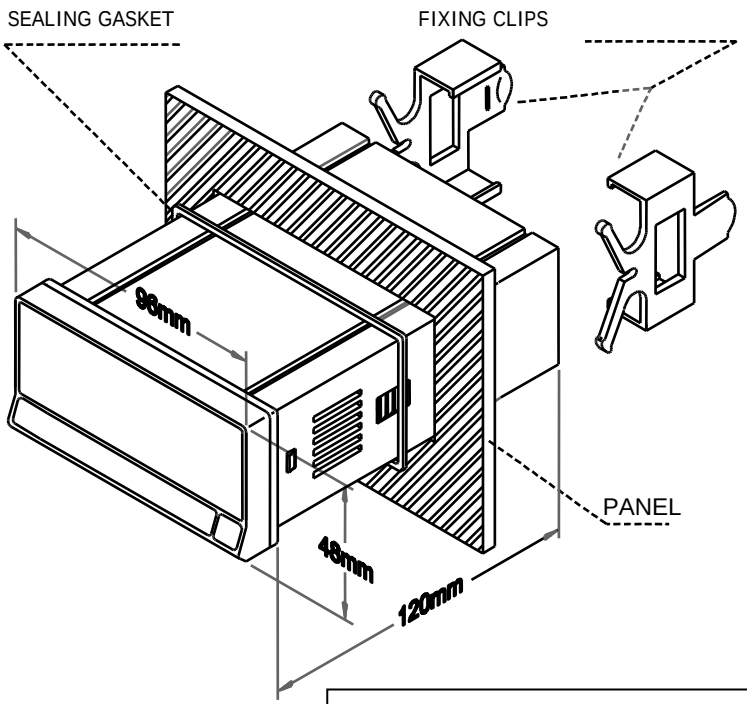
To install the instrument into the panel, make a 92x45 mm cutout and insert the instrument into the panel from the front, placing the sealing gasket between this and the front bezel.



Place the fixing clips on both sides of the case and slide them over the guide tracks until they touch the panel at the rear side.

Press slightly to fasten the bezel to the panel and secure the clips.

To take the instrument out of the panel, pull outwards the rear tabs of the fixing clips to disengange and slide them back over the case



CLEANING: The frontal cover should be cleaned only with a soft cloth soaked in neutral soap product.
DO NOT USE SOLVENTS

The instruments are warranted against defective materials and workmanship for a period of three years from date of delivery.

If a product appears to have a defect or fails during the normal use within the warranty period, please contact the distributor from which you purchased the product.

This warranty does not apply to defects resulting from action of the buyer such as mishandling or improper interfacing.

The liability under this warranty shall extend only to the repair of the instrument. No responsibility is assumed by the manufacturer for any damage which may result from its use.

All the DITEL products benefit from an unlimited and unconditional warranty of THREE (3) years from the date of their purchase. Now you can extend this period of warranty up to FIVE (5) years from the product commissioning, only by fulfilling a form.

Fill out the form in our website:
http://www.ditel.es/warranty

7. DECLARATION OF CONFORMITY

Manufacturer : DITEL - Diseños y Tecnología S.A.

Address : Travessera de les Corts, 180
08028 Barcelona
ESPAÑA

Declares, that the product :

Name : Digital panel meter

Model : **GAMMA-M**

Conforms to : EMC 89/336/CEE
LVD 73/23/CEE

Applicable Standars :	**EN50081-1** Generic emission
EN55022/CISPR22	Class B
Applicable Standars :	**EN50082-1** Generic immunity
IEC1000-4-2	Level 3 Criteria B
	Air Discharge 8kV
	Contact Discharge 6kV
IEC1000-4-3	Level 2 Criteria A
	3V/m 80..1000MHz
IEC1000-4-4	Level 2 Criteria B
	1kV Power Lines
	0.5kV Signal Lines
Applicable Standars :	**EN61010-1** Generic Safety
IEC1010-1	Installation Category II
	Transient Voltages <2.5kV
	Pollution Degree 2
	Conductive pollution excluded
	Insulation Type
	Enclosure : Double
	Inputs/Outputs : Basic

Date: May 2001
Signed: José M. Edo
Charge: Technical Manager

OUTPUT OPTIONS
RELAIS/OPTOS

ANNEX

Valid only for GAMMA-M

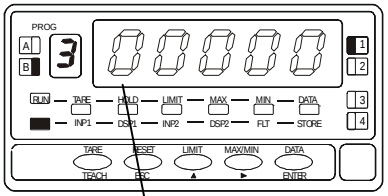
See manual 2RE-4RE-4OP-4OPP Abril 1998 code 30727012 page. 1 to 10 and 19 to 25

INDEX

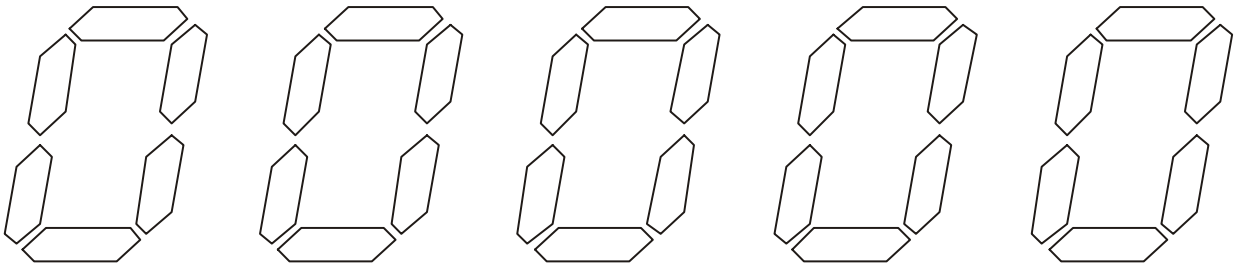
SPECIFIC SETPOINT DETAILS FOR GAMMA-M

- In GAMMA-M the auto track is not available.
- When a short reaction time is necessary, should be used the **4OP** ó **4OPP options**.
- To use the “fast” output activation mode they must be programmed in the **MENU 3B** the first digit to **1 or 2** and the **fourth** digit to **0**.
- When there is positive overflow (OVFLO) or negative overflow (-OVFLO), The output goes to repose mode (depending on the programming of the fiftth digit in the menu MODE 3B) except if they are programmed in LATCH mode , in this case they will be kept activated.

MENU 3B



1st digit: Inhibit the setpoint "**0**", enable the setpoint "**1**" or enables the lacht setpoint (latch) "**2**".
2nd digit: Activation mode HIGH "**0**" or LOW "**1**".
3rd digit: Delay the relay activation by timer"**0**", asymetrical hysteresis(HYS-1) "**1**" or asymetrical hysteresis (HYS-2) "**2**".
4th digit: Activation by fast value "**0**", by net value "**1**", by gross value "**2**", by peak value "**3**", by valley value "**4**", by peak to peak value "**5**" .
5th digit: Output normaly open "**0**", output normaly closed "**1**".



Digit 1

0=OFF
1=ON
2=ON (latch)

Digit 2

0=HI
1=LO

Digit 3

0=Delay
1=Hyst_1
2=Hyst_2

Digit 4

0=Fast
1=Net value
2=Gross value
3=Peak value
4=Valley value
5=Peak to peak value

Digit 5

0=Normaly open

1=Normaly closed

DIRECT ACCESS TO SETPOINT VALUE

The setpoint value can easily be modified by the direct access. From the run mode (RUN) press ENTER key, to enter the programming mode (PROG), and by pressing LIMIT key access to the setpoint 1 value.

The setpoints value appears at each press of ENTER key. The led indicating the setpoint number turns on, and the value in the main display appears with the left digit blinking (See fig. 51). With ▶ and ▲ keys configure the desired value between "-9999" and "+9999".

If the programming access is blocked it is not possible modify the blocked setpoint values, proced as shown in the manual to unlock them.

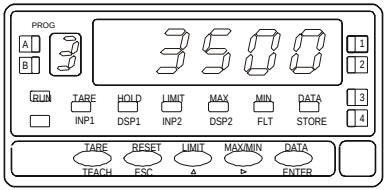
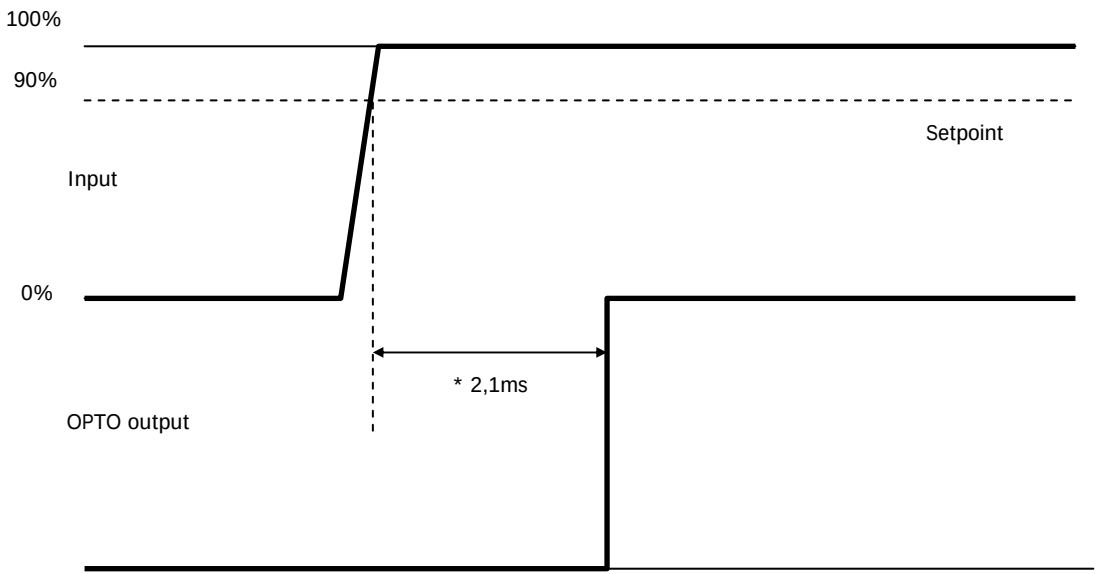


Fig. 51 Setpoint configuration

Output reaction time 4OP, 4OPP



* This time is with the 4OP or 4OPP option , without filter and with the fast option in the setpoint programming (see page 50).

ANALOG OUTPUT

ANNEX

Valid only for GAMMA-M

See manual ANA May 1999 code 30727013 page. 1 to 8 and 15 to 20

TECHNICAL SPECIFICATIONS

- Reaction time.....5ms with Filter off
- Cut Frequence .....10Hz with Filter off
- Conversions .....200/s.

- With "**Filter on**" follows the display

RS2-RS4
SERIAL INTERFACE

ANNEX
Valid only for GAMMA-M

See RS2 manual October 1997 page. 1 to 6, 8 to 10 and 17 to 21
See RS4 manual October 1997 page. 1 to 6, 8 to 10 and 19 to 23

NEW FUNCTIONS

DITEL	ISO	FUNCTION	Answer type
I	0I	Transmits logical input status	Returns value
Y	0Y	Transmits Peak to peak value	
n	0n	LATCH relays reset	Only command, no answer
y	0y	Peak to peak	

In Page 21 (RS2) or page 22 (RS4) there is a new protocol **3** = **MODBUS** (See MODBUS MANUAL Edition JUNE 2000 COD. 30727077).

PROGRAMMABLE FUNCTION nº 31

Fast transmmision via RS232C or RS485

During the activation of logical function nº31 the instrument will send through serial output RS2 or RS4 at 200/s the value measured, with the choosed tansmission format.

message format:

polarity	X	X	X	.	X	CR

The decimal point position is an example. It could be in any position.
This function allows data capture in a file for after analisis by software (example EXCEL).

Ditel Protocol : 1 start bit, 8 bit data, no parity, 1 stop bit.

ISO1745 Protocol: 1 start bit, 7 bit data, 1 bit parity even parity, 1 stop bit.

INSTRUCTIONS FOR THE RECYCLING

This electronic instrument is covered by the **2002/96/CE** European Directive so, it is properly marked with the crossed-out wheeled bin symbol that makes reference to the selective collection for electrical and electronic equipment which indicates that at the end of its lifetime, the final user cannot dispose of it as unsorted municipal waste.

In order to protect the environment and in agreement with the European legislation regarding waste of electrical and electronic equipments from products put on the market after 13 August 2005, the user can give it back, without any cost, to the place where it was acquired to proceed to its controlled treatment and recycling.

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