KOSMOS SERIES

FREQUENCY METER
RATE TACHOMETER- rpm TACHOMETER

MODEL MICRA-F

INSTRUCTION MANUAL

EDITION: January 2001
CODE: 30727016

100% RECYCLED PAPER

MICRA-F English

INTRODUCTION TO THE DITEL MICRA SERIES

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

DITEL brings a new philosophy in digital panel instrumentation by using 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 simply by adding the desired option(s).

Built-in intelligence allows the meter to recognize the options installed and implement the necessary parameters to properly function within desired parameters. The basic instrument without output options omits these data in the program routines.

CALIBRATION is performed 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 adjustments.

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

Other features of the MICRA family include :

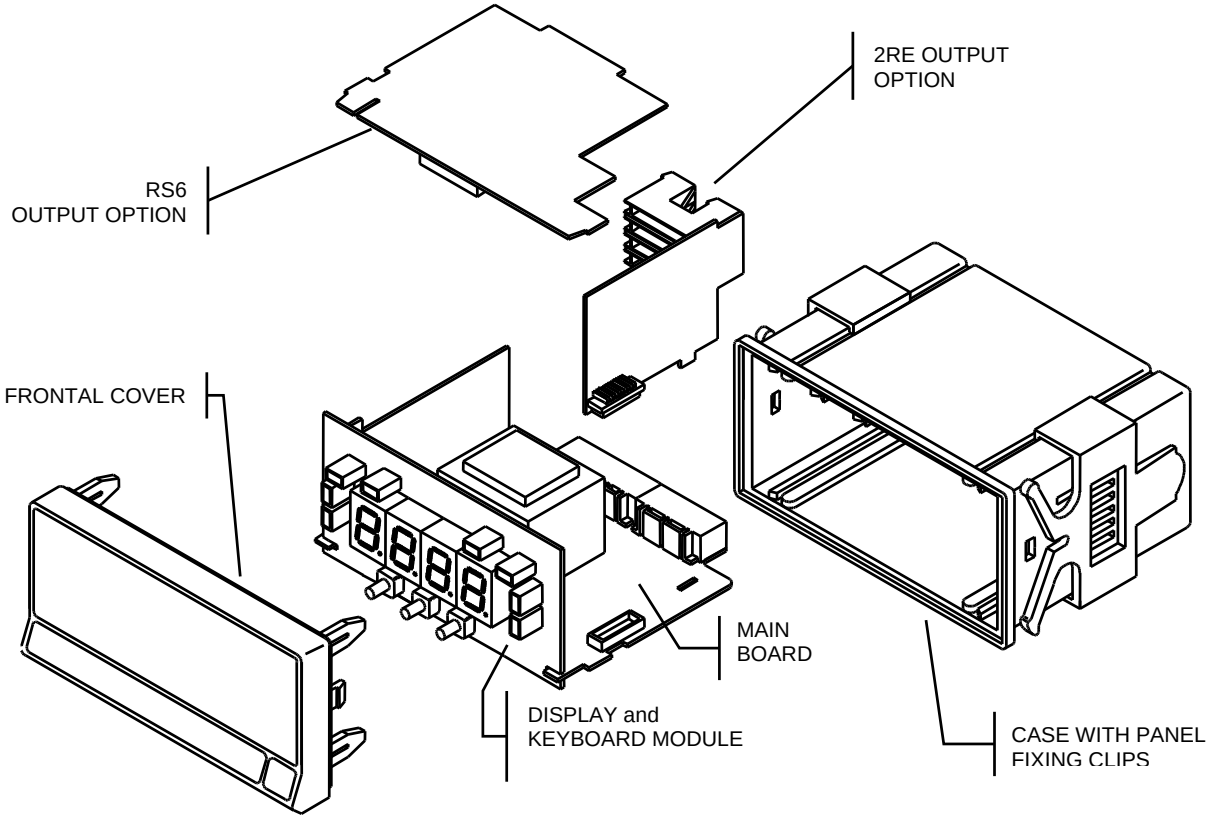
- CONNECTIONS via plug-in terminal blocks without screws and CLEMP-WAGO clips cable retention system.
- DIMENSIONS
  Models ALPHA & BETA 96x48x120 mm DIN 43700
  Models JUNIOR, JUNIOR20, & MICRA 96x48x60 mm DIN 43700
- CASE MATERIAL UL-94 V0-rated poly-carbonate.
- PANEL INSTALLATION by means of single part fingertip without screws.

To guarantee the meter's technical specifications, its is advised to check calibration parameters at periodical intervals according to the ISO9001 standards for the particular application operating criteria.
Re-calibration of the meter should be made at the factory or in a qualified laboratory.

DIGITAL PANEL METER **KOSMOS SERIES**

MODEL MICRA-F

INDEX


2RE OUTPUT
OPTION
RS6
OUTPUT OPTION
FRONTAL COVER
MAIN
BOARD
DISPLAY and
KEYBOARD MODULE
CASE WITH PANEL
FIXING CLIPS

1. MODEL MICRA-F

The MICRA-F model is a four-digit, small format instrument that makes the functions of a frequency meter, tachometer for rpm and rate meter with programmable display to measure velocity in the desired engineering units.

Designed as simple, low-cost indicators but keeping the high performance qualities of the ALPHA series, the MICRA models are well suited for applications of indication only with the possibility of incorporating communication outputs and setpoint control.

The input type of the MICRA-F is selected via internal switches. The remaining parameters are software-configurable (selection of frequency, velocity, revolutions per minute and display scaling).

Other standard features of the indicator are memory storage and display of the maximum (peak) and minimum (valley) readings as well as tare operation and reset of these memories.

The basic instrument is a soldered assembly composed of the main board, the display and keyboard module and the input card.

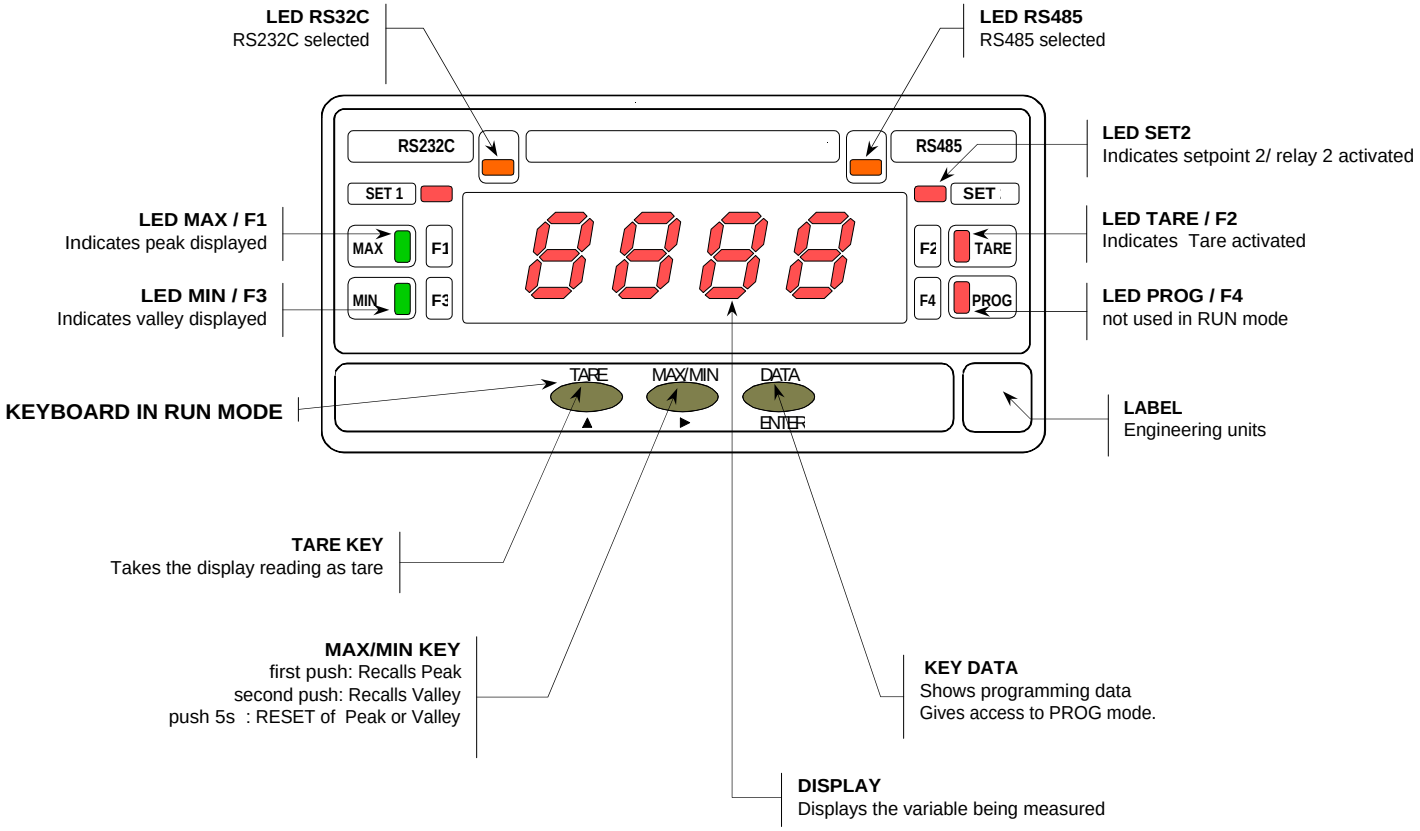
Extended capabilities are furnished by an optional output card that incorporates the RS232C and RS485 (RS6) communication protocols and a control card with 2 SPDT 8A relays (2RE).

Each option provides independent connectors protruding out of the rear of the meter, status LED's visible from the front and a specific programming module which is automatically activated once the card is installed.

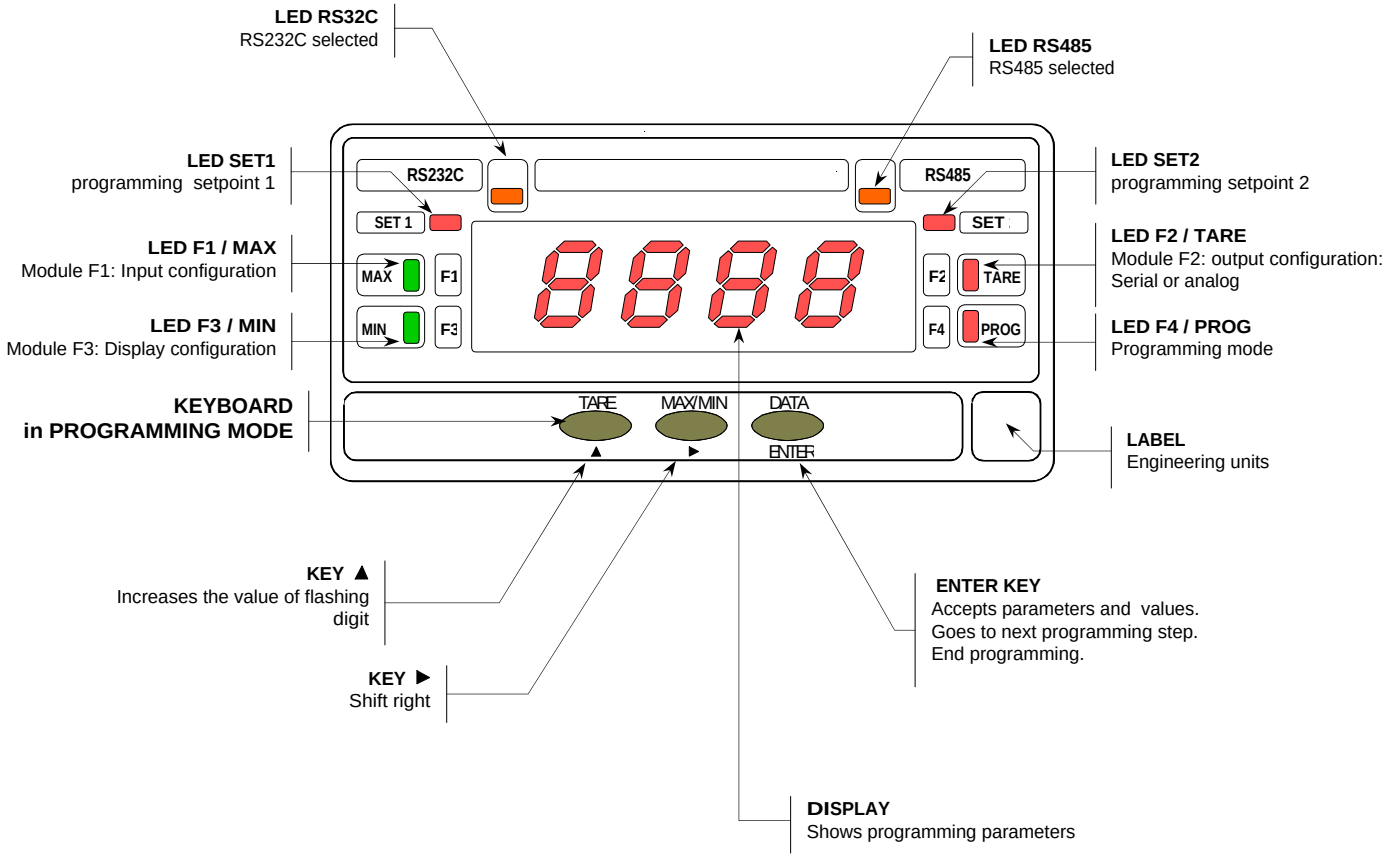
The outputs are opto-isolated with respect to the input signal, to the relay outputs and the power supply.

This instrument conforms the following community standards: 89/336/CEE and 73/23/CEE
WARNING: Refer to the instructions manual to preserve safety protections.

FRONT-PANEL FUNCTIONS DESCRIPTION (RUN MODE)



FRONT-PANEL FUNCTIONS DESCRIPTION (PROG MODE)



2. OPERATING INSTRUCTIONS

PACKING CONTENTS

- ❑ Instructions manual in English.
- ❑ The digital panel instrument MICRA-F.
- ❑ Accessories for panel mounting (sealing gasket and fixing clips).
- ❑ Accessories for wiring connection (removable terminal block connectors and fingertip).
- ❑ Wiring label affixed to the instrument's case. Set of labels with different engineering units.

✓ **Check packing contents.**

CONFIGURATION

Power supply (pages 9 & 10)

- ❑ The instruments for 115/230V AC power supply, are set up at the factory for 230V AC. **(USA market 115 V AC)**.
- ❑ The instruments for 24/48V AC power supply, are set up at the factory for 24V AC.
- ❑ If the instrument is supplied for 12V DC, 24V DC or 48V DC power supply, it is not necessary to make any change.

✓ **Check wiring label before connecting the instrument to the mains supply.**

Programming instructions (page. 11)

- ❑ The software inside the instrument allows configuring the input parameters. If a 2RE or a RS6 10 option is installed, the software detects it on power up enabling a specific routine for its configuration.

✓ **Read carefully this paragraph.**

Input type (page 13-16)

- ❑ The instrument provides an input for signals from transducers like magnetic pick-up, encoders, inductive sensors type NAMUR, PNP,NPN, TTL signals, switches or AC voltages up to 600V.

✓ **Check transducer type and signal level.**

Programming lockout (page 21)

- ❑ As shipped from the factory, the instrument allows full access to change programming parameters.
  To disable the possibility of making changes on the configuration, it is necessary to remove a plug-in jumper located on the solder side of the display board.

✓ **Check jumper position.**

2.1 – Power supply and connectors

To change the meter's physical configuration remove the case as shown in figure 9.1.

115/230 V AC: The instruments with 115/230 V AC power are set up at fabrication for 230 V AC (**USA market 115 V AC**), see figure 9.2. To change power supply configuration to 115 V AC, make the jumpers indicated in figure 9.3 and table 1. The wiring label should be modified to match the new configuration.

24/48 V AC: The instruments with 24/48 V AC power are set up at fabrication for 24 V AC, see figure 9.2. To change power supply configuration to 48 V AC, make the jumpers indicated in figure 9.3 and table 1. The wiring label should be modified to match the new configuration.

12, 24 or 48V DC: Instruments for DC power are set up for the supply voltage specified in the wiring label (12V, 24V or 48V according to the order reference).

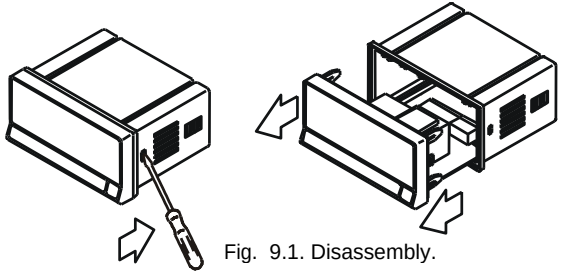


Fig. 9.1. Disassembly.

Table 1. Jumper settings.

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

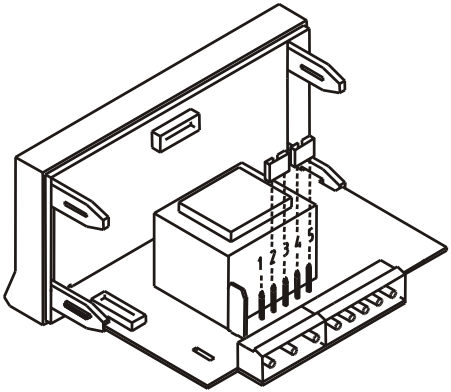


Fig. 9.2. Jumper settings for 230 V or 48 V AC

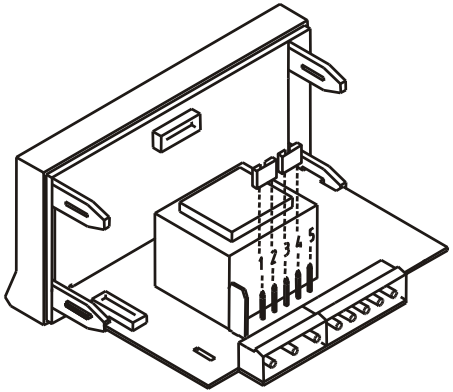
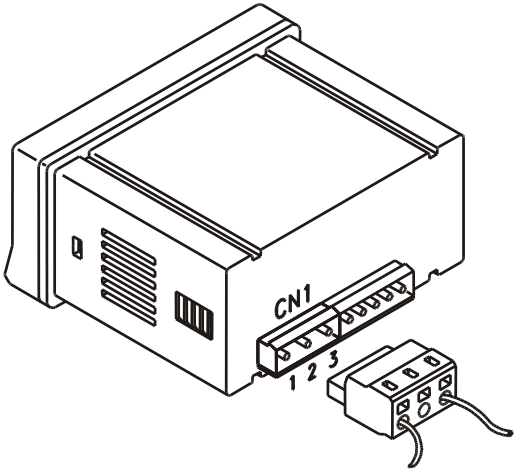


Fig. 9.3. Jumper settings for 115 V or 24 V AC

POWER CONNECTION



AC VERSIONS
PIN 1 – AC PHASE
PIN 2 – GND (GROUND)
PIN 3 – AC NEUTRAL

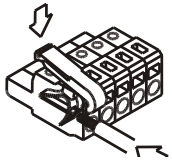
DC VERSIONS
PIN 1 – DC POSITIVE
PIN 2 – Not connected
PIN 3 – DC NEGATIVE

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 the electromagnetic compatibility, the following guidelines should be kept in mind :
- Power supply wires may 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 the ground of the indicator (pin2 CN1).
- The cables section should be ≥ 0.25 mm^2

If not installed and used in accordance with these instructions, protection against hazards may be impaired.

CONNECTORS



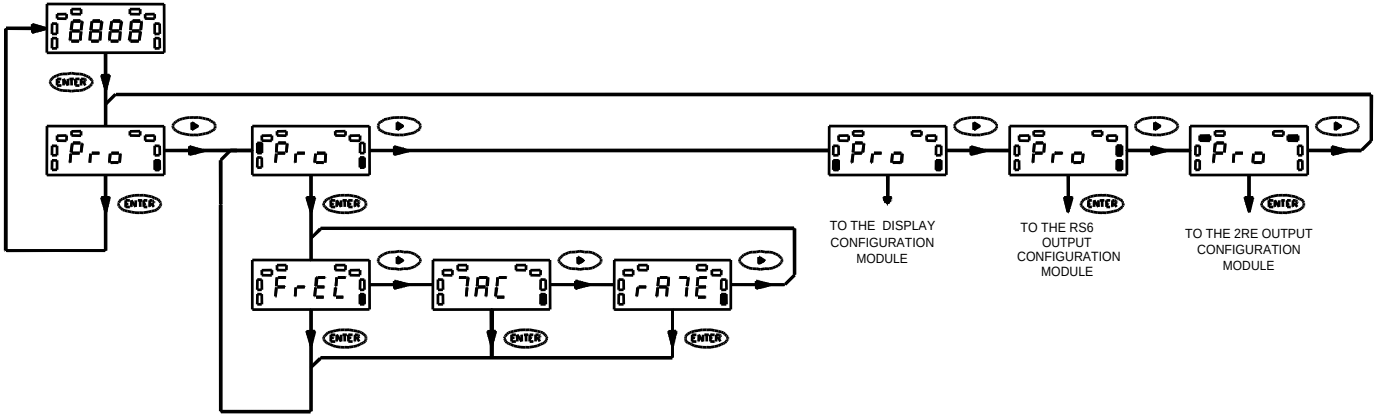
To perform wiring connections, remove the terminal block from the meter's connector, strip the wire leaving from 7 to 10mm exposed and insert it into the proper terminal while pushing the fingertip down to open the clip inside the connector as shown in the figure.
Proceed in the same manner with all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

2.2 – Programming instructions

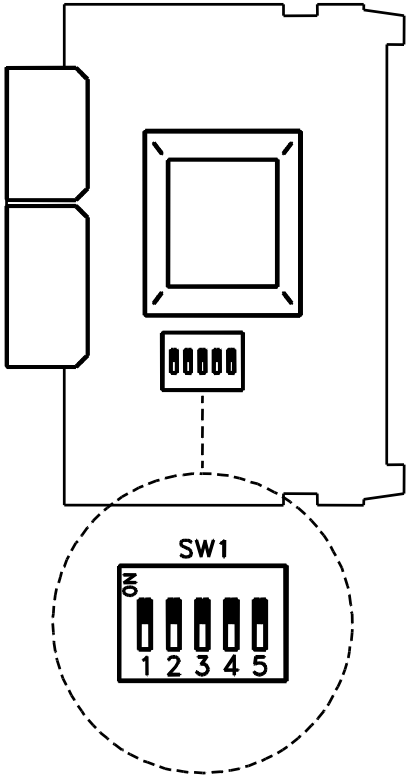
Apply power to the instrument, checking previously that it fits the operating conditions as specified on the label. Once on power up and after the display test, the instrument is in (RUN) mode. Press ENTER to go to **Pro** and **F4** LED on. This LED will remain on during all programming process.
To return to the run mode, it is necessary to pass through the different menus with ▶, until the led F4/ PROG is the only activated led . Then push ENTER. After, it automatically goes to the normal operating mode .

How to interpret the programming instructions
The programming software routine is composed by a series of hierarchically organized menus, each allowing the setting of a specific parameter. In general, the normal sequence at each step is to push the ▶ key a number of times to make changes and the ENTER key to store them into the memory and advance to the next step.
The elements used along the programming instructions are described following.

The programming instructions for each menu step are accompanied by a figure representing the display indication for the corresponding parameter. Pay special attention to the LED indications and active keys and follow the procedure described on the text to introduce correctly the desired data.
When the display indication is represented with blank segments, it means that this is one of the possible options of this menu (normally the default one) depending on the previous selection.
A series of blanked '8' represents any numerical value that can be changed by use of keys ▶ and ▲ (change digit) and (change value).



2.3 – Input configuration

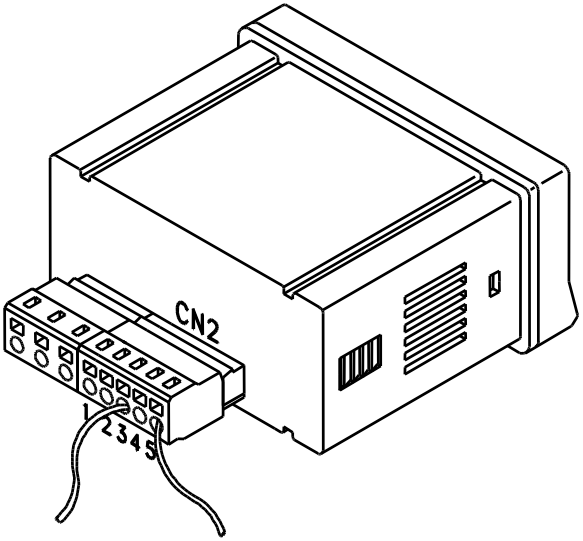


Before undertaking signal connection, set the input for the sensor type to be used in the application by means of the SW1 5-position DIP switch located on the main board.
Follow the indications given in the table:

SW1	1	2	3	4	5
Magnetic Pick-up	off	off	on	off	off
NAMUR sensor	on	off	on	on	off
NPN type sensor	on	on	off	off	off
PNP type sensor	on	off	off	on	off
TTL/ 24V (encoder)	on	off	off	off	on
Contact closure (switch)	on	on	on	off	on
Voltage up 600V*	off	off	off	off	off

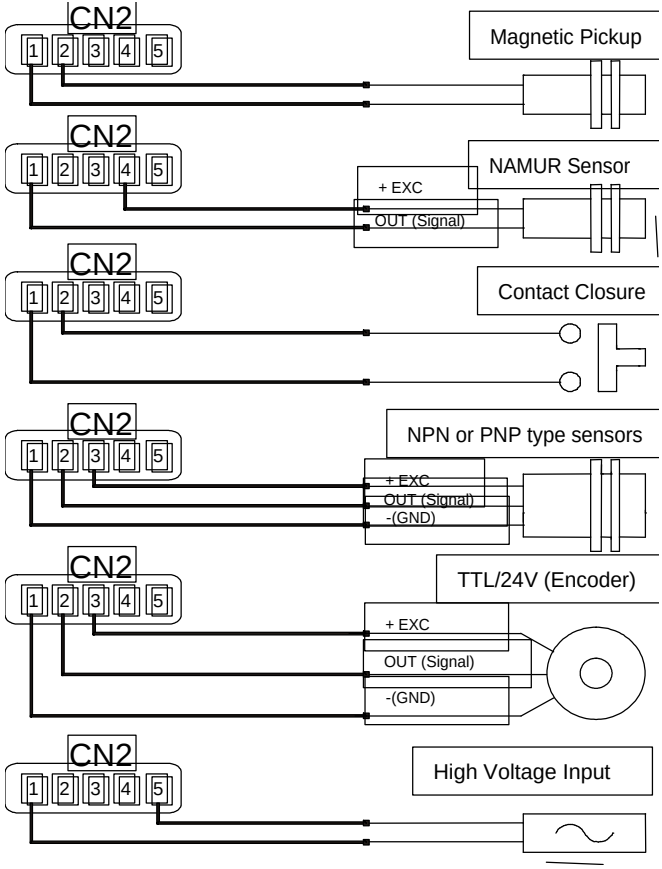
* Factory configuration

Input signal connection
Refer to the transducer's specifications and to the wiring advisements given in page 10.



INPUT SIGNAL CONNECTOR (CN2)
PIN 1 = -IN
PIN 2 = +IN
PIN 3 = +EXC [24V DC (+)]
PIN 4 = +EXC [8V DC (+)]
PIN 5 = IN [HIGH, 10-600V AC]

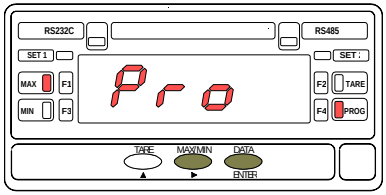
Connection according to the sensor type.
Refer to the transducer's specifications and to the wiring advisements given in page 10.



Mode selection.
This menu allows to choose among three ways of working the instrument , like frequency meter (indication **FrEC**) to measure frequency, tachometer rpm (indication **TAC**) to measure revolutions per minute and tachometer rate (indication **rATE**) to measure velocity. All acceptable sensor can be used for any of this described functions.

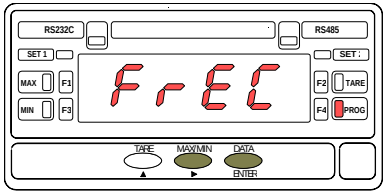
MENU F1 – MODE SELECTION

[15.1] Input to Mode selection



The figure 15.1 represents the entry level of the input configuration module (**Pro** indication, **F1** and **PROG** LED's activated).
Press ENTER to enter this module. Once completed the entire program sequence, the instrument returns to this stage. To return to the run mode, press the ▶ key and, when only the PROG LED is activated, press ENTER to save changes in the memory and exit from the programming mode.

[15.2] Mode selection



The display presents the initially selected input type : **FrEC** = FREQUENCY METER, **TAC** = TACHOMETER, **rATE** = RATE METER. Press repeatedly the ▶ key to scroll around the available options until the desired one appears on the display and press ENTER to validate the choice and automatically return to the **Pro** stage indicated in the figure 15.1.

2.4 – Display range configuration

The display range configuration depends on the measurement type selected in the input programming module.

As FREQUENCY METER, the instrument hasn't any configurable scaling parameter. The access to the display programming module (**F3** LED illuminated) is not allowed.

As RATE METER, the display configuration module allows programming the input frequency and the desired display at this frequency. The DISPLAY/FREQUENCY ratio can be selected to be in a direct or inverse proportion.

As TACHOMETER (RPM), the only parameter needed to configure the display is the number of pulses per revolution that delivers the sensor.

To adjust the display to the specific application, the instrument configured as rate meter or tachometer permits the user to access to the programming of the limit and sampling time. The access is made by a holding down the ENTER key for 5s before exiting from the display configuration module.

2.4.1 - Programming TACHOMETER (RATE)

INPUT FREQUENCY (INP1)

The "INP1" parameter refers to the signal frequency generated by the transducer. This frequency must be within the specified limits (0.1Hz to 2kHz) and can be programmed with two, one or no decimal place.

DESIRED DISPLAY (DSP1)

The "DSP1" parameter is the desired display readout corresponding to the frequency programmed in the "INP1" phase.

The decimal point can be located anywhere.

The display variation can be directly proportional to the input variation (increasing frequency increasing display) or inversely proportional (increasing frequency decreasing display) as selected in the first programmable parameter of the display module (see page 16) where **dIr** = direct, **Inv** = inverse.

EXAMPLE

It is desired to measure the rate in m/s of a conveyor belt which is driven by a turning shaft of 20 cms diameter and 300 rpm that gives 4 pulses per revolution.

In 1 second, the shaft gives 20 pulses (300 rpm are 5 revolutions per second and each revolution gives 4 pulses). The input frequency is then 20Hz.

At this frequency, the rate of the conveyor belt is :

rpm* Pi * d = 300* Pi * 20 = 18849.6 cm/min = 3.142 m/s

The INP1 and DSP1 parameters must be :

INP1 = 20

DSP1 = 3.142

The display variation mode with respect to the input frequency must be directly proportional (**dIr** option).

With the setting of the "INP1" and "DSP1" parameters, the instrument should be able to operate correctly, notwithstanding , depending on the sensor characteristics, it may be necessary to modify the internal measurement time.
After, programming the "DSP1" item, a push of ENTER of 5s provides access to the programming of the sampling time "TIME" and the "LIM".

SAMPLING TIME (TIME)

With irregular signals, the display may present fluttering or unwanted variations due to the signal cycles detected at each reading are not equal.
The "TIME" parameter allows stretching the measurement interval, making an average of a larger number of cycles. This reduces considerably the display fluttering.
The sampling time can be programmed from 0,1 to 9,9 seconds It is factory set at 1 second.

To help stabilizing the display in case of fast variation input signals, it is recommended to increase this parameter, taking into account that the display update time will be the same as the programmed sampling time.
The sampling time can be reduced to increment the display update rate.

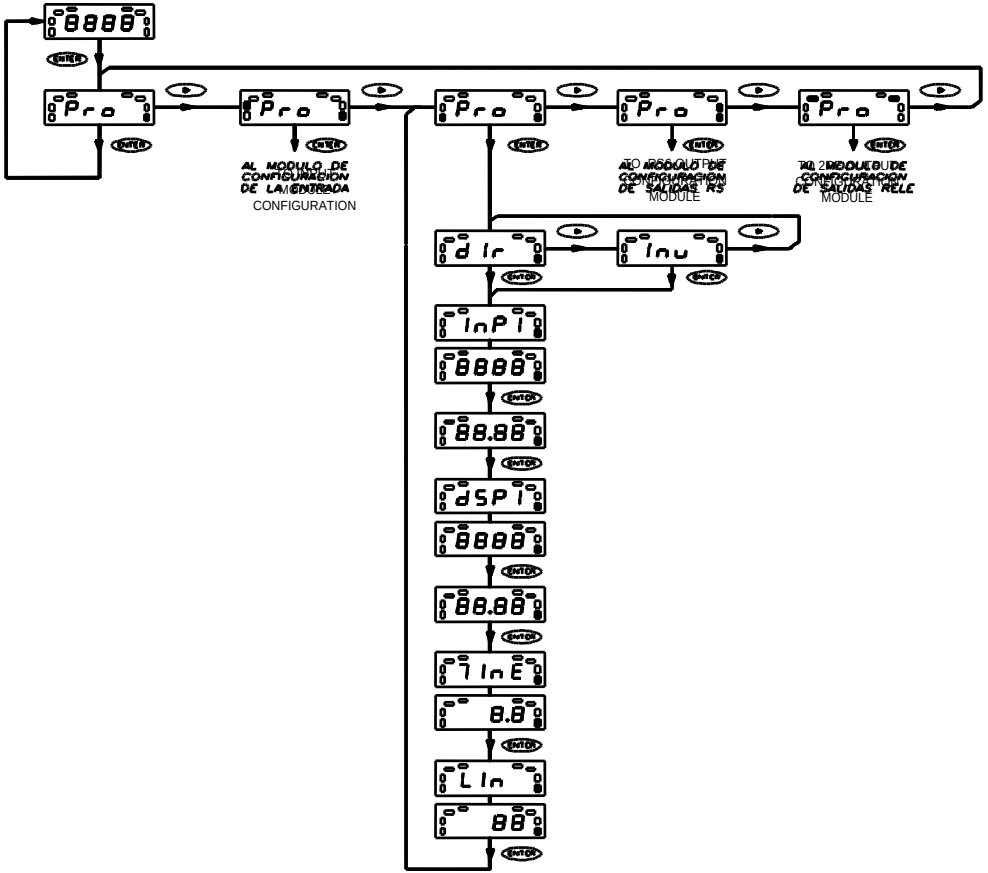
LIMIT TIME (LIM)

The limit time, programmable from 1 to 10 seconds, is applied in order to limit the waiting time for at least 1 pulse is produced at the input before to be considered to be zero.
If any pulse has been detected at the input before the end of the limit time, the input is considered to be zero and the display reads zero.
The instrument is factory set for a limit time of 10 seconds.

Decreasing the limit time the instrument detects the zero condition more quickly after the system stops, but this reduction leads to an increment of the minimum visible indication that the display can read before going to zero.

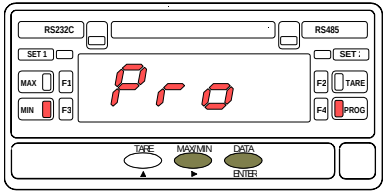
Example. Assume you want to indicate 1000 lit/s with an input frequency of 1kHz.
With a limit time of 10s, the minimum frequency is 0,1Hz (as specified on technical characteristics) and the display readout at this frequency 0,1lit/s. Since this value would no be readable in a display of 1000 counts, it is possible to reduce the limit time till 1s, so that the minimum frequency becomes 1 Hz and the minimum readout before the display shows zero is 1lit/s.

PROGRAMMING DIAGRAM FOR TACHOMETER (RATE)



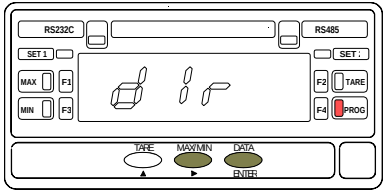
MENU F3 – PROGRAMMING INSTRUCTIONS TACHOMETER (RATE)

[19.1] Display configuration



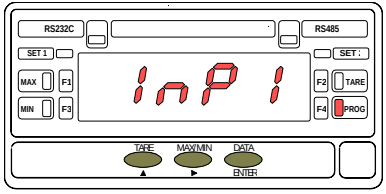
The figure 19.1 represents the entry stage of the display configuration module (**F3** and **PROG** LED activated). Press ENTER to access this module.
After the programming has been completed, the instrument will return to this stage.
From here, to go to the normal operation, press ▶ as many times as to deactivate all the functions LED's except the PROG one and press ENTER to save changes in the memory and exit from the program routines.

[19.2] Way of working



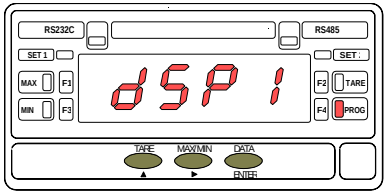
The first menu option allows selection between two display modes.
The direct mode must be selected where the display and input frequency are to be in a direct proportion, that is, the greater the frequency the greater the display. The inverse mode should be used to make the display vary in opposition with the input frequency, that is as greater the frequency, as smaller the display and vice versa.
Press ▶ key to make the display show the desired mode (**dir** = direct, **inv** = inverse) and press ENTER to validate the choice and advance to the next step.

[19.3] Frequency value



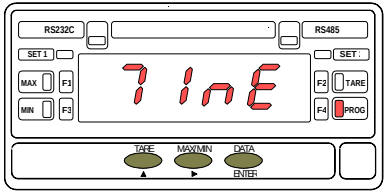
The indication shown in figure 17.3 is viewed for 2s before passing to the phase of programming the input frequency (**InP1**). After 2s or by pressing the ENTER key, the display will show any numerical value (depending on previous settings) with the first digit in flash. If desired to modify this value, press the ▲ key to vary the flashing digit from 0 to 9, and the ▶ key to advance to the next digit to be modified. Repeat these operations until the display reads the required value and press ENTER to save the entry in the memory; The decimal point becomes flashing to indicate that it is possible to change its position at this program step. Press repeatedly the ▶ key to move the decimal point until it takes the desired location. If no decimal point is required, it must be placed to the rightmost digit. Press ENTER to save changes in the memory and advance to the next programming step.

[20.1] Display value



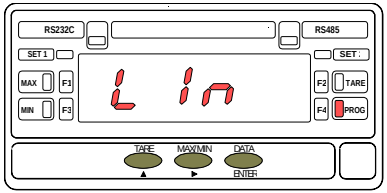
After programming the input frequency, a press of ENTER provides access to the programming of the display desired for this frequency (**dSP1**,) preceded by the symbol shown in figure 20.1. Proceed as in the section 19.3.(▲ increments value, ▶ advances to the next digit) to compose the desired value and press to set the decimal point position (by means of the ▶ key). Press again ENTER to exit from the program module and return to the **Pro** stage shown in fig. 19.1.
If it is wanted to have access to the programming of the sampling time or the limit time, after programming the decimal point location, hold the ENTER key for 5 seconds, at the end of which the display will show the indication given in figure 20.2.

[20.2] Sampling time



The sampling time (see page 17), two digits with decimal point, appears on the display after the symbol shown in the left figure. Make use of the ▲ and ▶ procedure if wanted to modify the initially programmed value (from 1.0 to 9.9 seconds) and press ENTER to save the entry in the memory and to access to the programming of the limit time.

[20.3] Limit time



A press of ENTER made at previous step makes the display show the symbol corresponding to the limit time programming phase (**LIn**) followed, after 2s by the initially set value with the first of its two digits in flash. If it is desired to change this value (see page 15) use the ▲ and ▶ key combination until desired value (from 1 to 10 seconds) is registered on the display and press ENTER to validate the introduced data and automatically return to the **Pro** stage shown in fig. 19.1.

2.4.2 – PROGRAMMING THE TACHOMETER (RPM)

PULSES PER REVOLUTION (PPR)

The "PPr" parameter refers to the number of pulses that delivers a complete revolution of the sensor connected at the input. This number must be programmed between 0 and 5000.

RESOLUTION (DCP)

The "dCP" parameter allows selection of the decimal point position (one or no decimal places).

EXAMPLE
It is desired to indicate the rate of a turning shaft that delivers 50 pulses per each revolution.

As the only necessary parameter, in the "PPr" programming step, introduce a value of 50.
In the "dCP" step, you can select whether the display must have one decimal place or not.
With the setting of the "PPr" and "dCP" parameters, the instrument should be able to operate correctly, notwithstanding, depending on the sensor characteristics, it may be necessary to modify the internal limit time.
After programming the "dCP" item, a push of ENTER of 5s provides access to the programming of this parameter.

SAMPLING TIME (TIME)

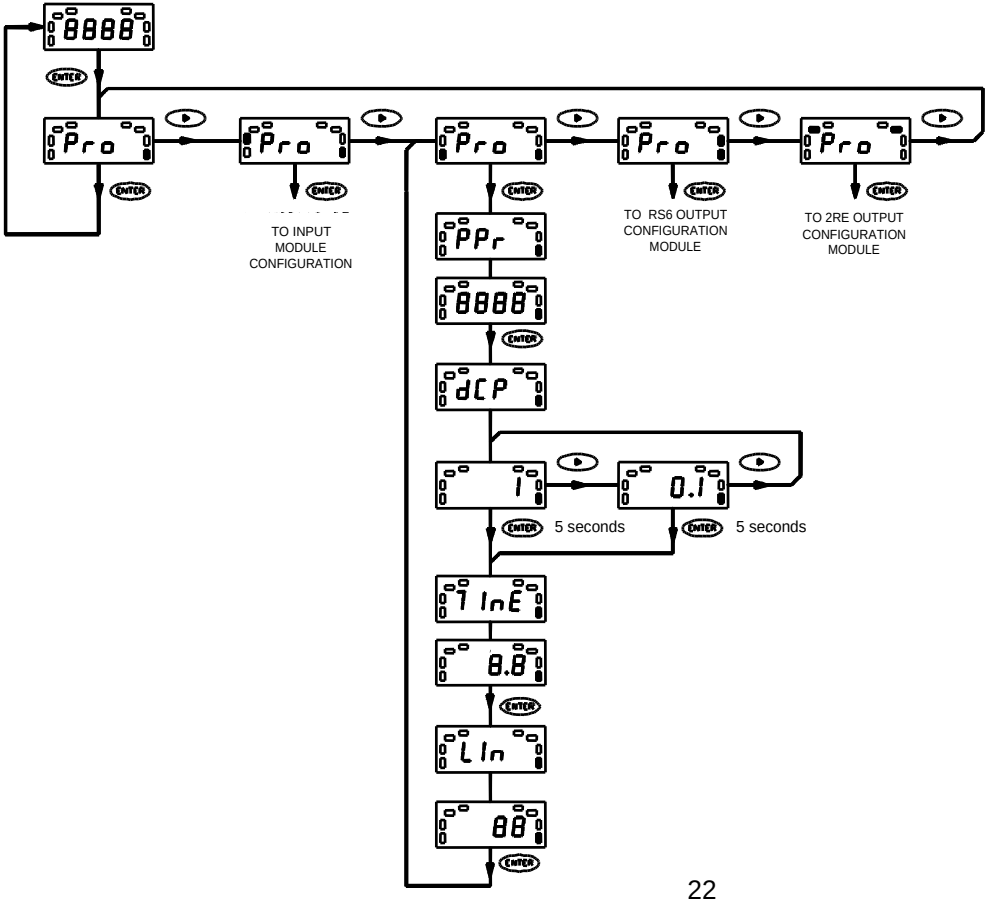
With irregular signals, the display may present fluttering or unwanted variations due to that the signal cycles detected at each reading are not equal.
The "TIME" parameter allows stretching the measurement interval, making an average of a larger number of cycles. This reduces considerably the display fluttering.
The sampling time can be programmed from 0.1 to 9.9 seconds. It is factory-set at 1 second.
To help stabilizing the display in case of fast variations input signals, it is recommended to increase this parameter, taking into account that the display update time will be the same as the programmed sampling time.
The sampling time can be also reduced to increase the display update rate.

LIMIT TIME (LIM)

The limit time, programmable from 1 to 10 seconds, is applied in order to limit the waiting time for at least 1 revolution is produced at the input before it is considered to be zero.
If any complete revolution has been detected before the end of the limit time, the input is considered to be zero and the display reads zero.

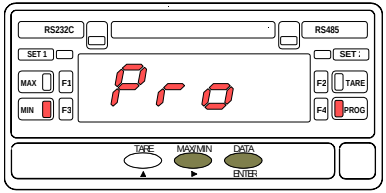
SAMPLING TIME (TIME) **LESS THAN** . LIMIT TIME (LIM)

PROGRAMMING DIAGRAM TACHOMETER (RPM)



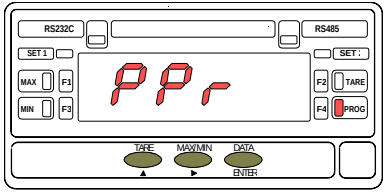
MENU F3 – TACHOMETER CONFIGURATION (RPM)

[23.1] Display configuration



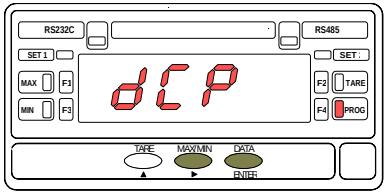
The figure 21.1 represents the entry level of the display configuration module (**F3** and **PROG** LEDs activated). Press ENTER to access this module. After the programming has been completed, the instrument will return to this stage. From here, to go to the normal operation, press ▶ as many times as to deactivate all the functions LED's except the PROG one and press ENTER to store changes in the memory and exit from the program routines.

[23.2] Pulses per revolution



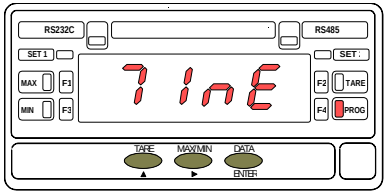
The indication shown in figure 21.2 is viewed for 2s before passing to the phase of programming the number of pulses per revolution (ppr). This value can be set from 0 to 5000 ppr. After 2s or by pressing the ENTER key, the displays shows the initially programmed value with the first digit in flash. If it is desired to modify this value, press repeatedly the ▲ key to vary the flashing digit from 0 to 9, and press ▶ to advance to the next digit to be modified. Repeat these operations until the display reads the desired value (from 1 to 5000) and press ENTER to save the entry in the memory and go to the next programming phase. If a value of **ppr** equal to 0 or greater than 5000 is introduced, the display indicates **Err** for a few seconds and holds on this programming step to allow modifying the mistaken value.

[24.1] Display resolution



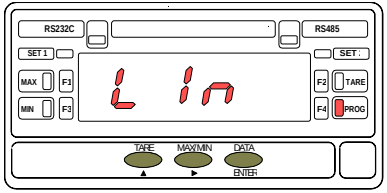
A press of ENTER made at previous step gives access to the programming of the display resolution, preceded, for 2s, by the indication shown in fig. 22.1. This step offers two options ; The indication "**1**" means that the readout will be made without any decimal place and the indication "**0.1**" means the reading of the display will have one decimal place. Press the ▶ key to pass from one to other option and, when the display reads the indication corresponding to the desired resolution, press to validate the choice and go to the **Pro** level shown in figure 23.1. If it is desired to have access to the programming of the limit time, instead of pressing the ENTER key at the end of this step, hold it down for 5 seconds, at the end of which the display will show the indication given on figure 24.2.

[24.2] Sampling time



The sampling time (see page 19), two digits with decimal point, appears on the display after the symbol shown in the left figure.
Make use of the ▲ and ▶ procedure if wanted to modify the initially programmed value (from 1.0 to 9.9 seconds) and press ENTER to save the entry in the memory and access to the programming of the limit time.

[24.3] Limit time



A press of ENTER made at previous step makes the display show the symbol corresponding to the limit time programming phase (**LIn**) followed, after 2s by the initially set value with the first of its two digits in flash. If it is desired to change this value (see page 17) use the ▲ and ▶ key combination until desired value (from 1 to 10 seconds) is registered on the display and press ENTER to validate the introduced data and automatically return to the **Pro** stage shown in fig. 23.1.

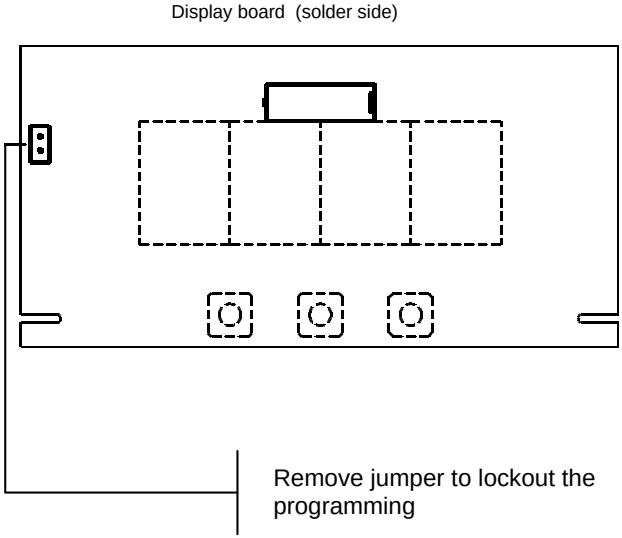
2.5 – Programming lockout

After completing the instrument's programming, it is recommended to lockout the access to the programming to prevent from accidental or unauthorized modifications.

This operation is made by taking off a plug-in jumper located on the solder side of display board circuit (see figure at right).

NOTE : Disconnect power before changing the jumper position.

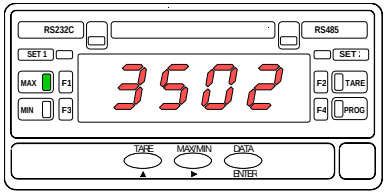
While the instrument is locked out it is however possible to access to the programming routines to check the current configuration, but it won't be possible to entry or modify data. In this case, a push of ENTER to access the programming routines will show the indication **dALA** instead of **Pro**.



3. MEMORY FUNCTIONS

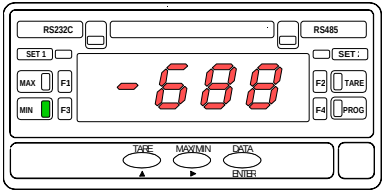
MICRA-F provides three keys, all of them are operative in the programming mode while only TARE and MAX/MIN can be used in the run mode. It also provides four LED's for control functions , two for output status indication and two more for serial option.

MAX/MIN. The instrument detects and memorizes the maximum and minimum values (peak and valley) reached by the variable after the last reset.
The peak and valley values can be displayed at any moment during normal operation by pressing MAX/MIN.



[26.1] Max. value detected

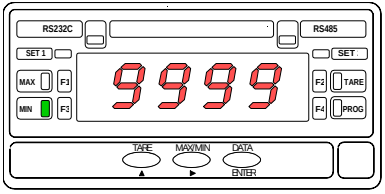
The first stroke recalls the peak value and illuminates the "MAX" led. The second stroke recalls the valley value and activates the "MIN" led.



[26.2] Min. value detected.

The third stroke deactivates the led and returns the meter to the normal reading.

To erase the peak and valley memories, press MAX/MIN to display the value wanted to be eliminated ("MAX and MIN" leds indicate which one is present on display). Press again MAX/MIN and hold it for 5s after which the display shows –999 or 9999 indicating that the peak or valley memory respectively has been reset back to these values.



[26.3] Reset of Min. value.

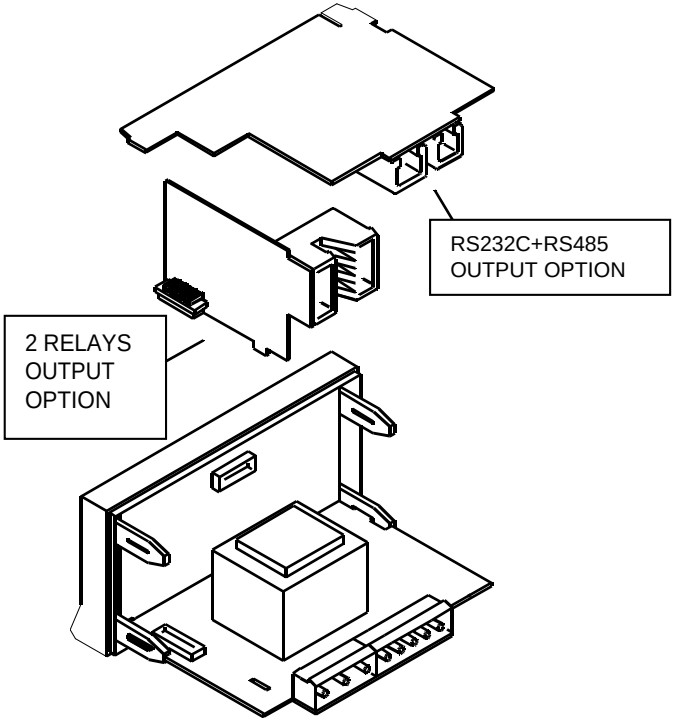
4. OUTPUT OPTIONS

4.1. OUTPUT OPTIONS

As an option, the MICRA-F models can incorporate the following output cards: A serial outputs card with RS232C and RS485 communications protocol, 1200 to 9600 baud half-duplex. Both types are included in the option but only one of them can be operative as selected via software. Ref. **RS6**

A control card with 2 SPST relay outputs rating 8A @ 250V AC / 150V DC. The option provides four selectable control modes and selection of pulsecl (with programmable pulse width) or latched output for each relay. Ref. **2RE**

The output options consist of additional cards that are supplied with their specific instructions manual describing characteristics, installation, programming and operation. Once installed in the meter's assembly by means of plug-in connectors, a program module is automatically included in the software routines.
For more detailed information on characteristics, applications, mounting and programming, please refer to the specific manual furnished with the option



5. TECHNICAL SPECIFICATIONS

INPUT SIGNAL

- Frequency Max. ..... 2 KHz
- Frequency Min. .....0.1 Hz
- Excitation ..... 8V @ 30 mA ó 24V @ 30 mA

High voltage input

- Input range.....10 to 600 V AC

Magnetic Pick-up

- Sensitivity ..... Vin (AC) > 120 mV eff.

NAMUR sensor

- Rc .....1 KΩ
- Ion ..... < 1 mA DC
- Ioff..... > 3 mA DC

NPN y PNP type sensor

- Rc .....1 KΩ (included)
- Logical level ....."0" < 2.4 V DC, "1" > 2.6 V DC

TTL/24V DC (encoder)

- Logical level ....."0" < 2.4 V DC, "1" > 2.6 V DC

Contact closure

- Vc ..... 5 V
- Rc .....3.9 KΩ
- Fc.....100 Hz

Accuracy

- Error max .....± (0.01% of reading +1 digit)
- Temperature coefficient..... 100 ppm/ ºC
- Warm-up time..... 5 minutes

POWER SUPPLY

- AC Voltages .....230/115 V, 24/48 V ±10%50/60 Hz AC
- DC Voltages ..... 12 V (10.5 to 16 V) DC, 24 V (21 to 32 V) ..... 48V (42 to 64 V) DC
- Consumption..... 3 W

FUSES (DIN 41661) Recommended

- MICRA-F (230/115V AC) ..... F 0.1A / 250 V
- MICRA-F2 (24/48V AC) ..... F 0.2A / 250 V
- MICRA-F3 (12 V DC)..... F 1A / 250 V
- MICRA-F4 (24 V DC)..... F 0.5A / 250 V
- MICRA-F5 (48 V DC)..... F 0.5A / 250 V

DISPLAY

- Type.....9999, 4 red digit 14 mm high
- Frequency meter range.....0 to 999.9 Hz
- Decimal point..... programmable
- LEDs.....4 for control and 4 for output status
- Reading rate .....< 1/ s
- Display over-range .....OvE
- Input over-range..... 000 ó OvE (flashing)

ENVIRONMENTAL

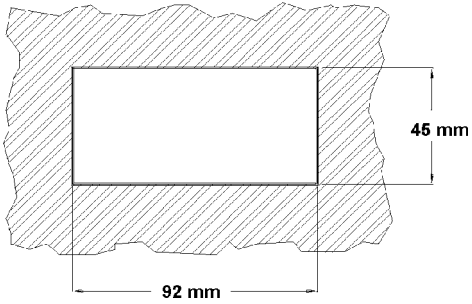
- Operating temp. ... -10 ºC to +60 ºC (0 ºC to 50 ºC acc. to UL)
- Storage temperature ..... -25 ºC to +85 ºC
- Relative humidity(non condensing).....<95 % to 40 ºC
- Max altitude .....2000 meters
- Indoor use

DIMENSIONS

- Dimensions ..... 96x48x60 mm
- Panel cutout.....92x45 mm
- Weight.....250 g
- Case material ..... polycarbonate s/UL 94 V-0

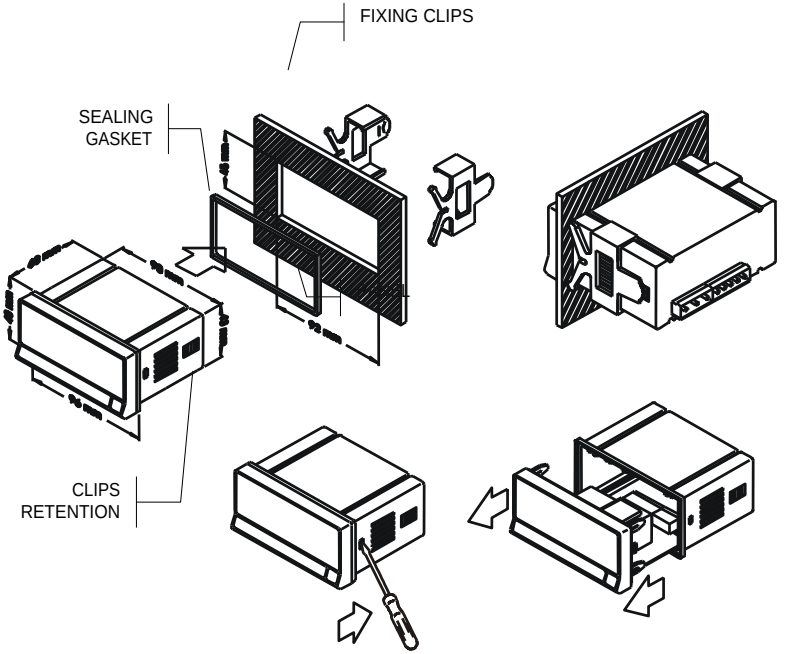
5.1 - Dimensions and mounting

To install the instrument into the panel, make a 92x45mm cutout and insert the instrument 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 remove the instrument from the panel, pull outwards the fixing clips rear tabs to disengage and slide them back over the case.



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

6. WARRANTY

All products are warranted against defective material 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 whom 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.

DECLARATION OF CONFORMITY

Manufacturer : DITEL - Diseños y Tecnología S.A.

Address : Travessera de les Corts, 180
08028 Barcelona
ESPAÑA

Declares, that the product:

Name : Indicador Digital

Model : **MICRA-F**

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

Date*:* 25 March 1999
Sign: José M. Edo
Position: Technical Manager

Applicable Standards: **EN50081-1** Generic emission
EN55022/CISPR22 Clase B

Applicable Standards: **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 Standards: **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