# MICRA-D
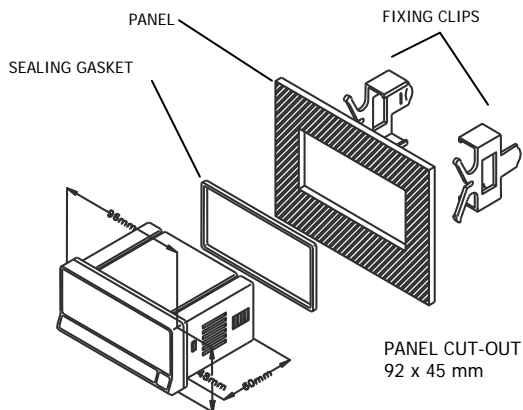
## DESCRIPTION

- The MICRA-D model from the KOSMOS SERIE is a five-digit digital instrument with 2 programmable inputs that accept signals from a variety of standard sensors and pulse generators. Can be configured to work as:
    - TACHOMETER + TOTALIZER (8 digits)
    - TACHOMETER + DIRECTION OF ROTATION INDICATION
    - FREQUENCYMETER
    - COUNTER 5 digits + TOTALIZER (8 digits)
    - SEVERAL MODES OF COUNTER (UP, DOWN, UP/DOWN, PHASE)
    - CHRONOMETER (5 digits – 4 ranges)

- Colour of display programmable, the Micra-D let you choose between green, amber or red colour assignable to measure, programming or alarm activation.
- It provides excitation of 8V @ 30mA or18 V @ 100mA.
- inputs with 13 logic functions programmable
- 2 brightness levels for display.
- Total or partial configuration lockout.
- Peak and Valley reading when TACHOMETER.
- Universal Power Supply  85-265 Vac MICRA-D or Low voltage supply 10,5-70 Vdc MICRA-D6.
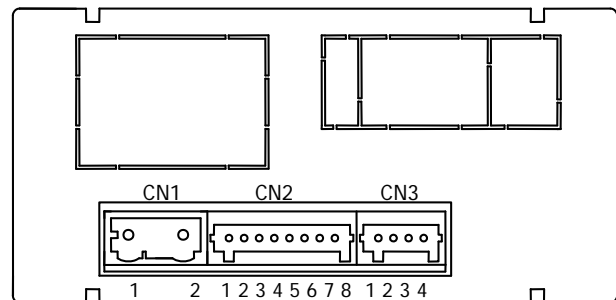- Communication protocols ASCII, ISO1745, MODBUS-RTU.

### STRUCTURE

OPTION NMA/NMV

OPTION RS2/RS4

2RE/4RE/4OP/4OPP OPTION

MAIN BOARD

KEY BOARD and DISPLAY

BOX 1/8 DIN 96x48x60 mm.

FRONT PANEL BEZEL
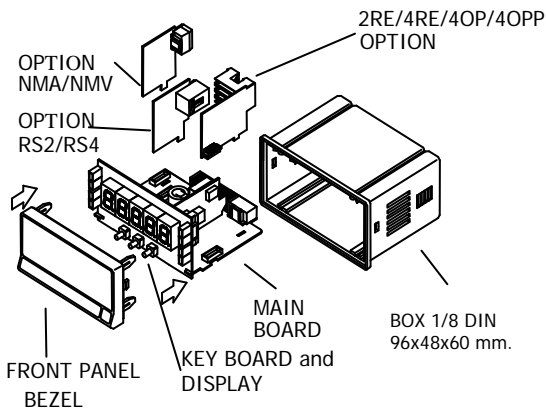
### DIMENSIONS AND MOUNTING

PANEL

FIXING CLIPS

SEALING GASKET

PANEL CUT-OUT 92 x 45 mm

## CONNECTIONS

CN1    CN2    CN3

1    2    1 2 3 4 5 6 7 8    1 2 3 4

| CN1 | POWER SUPPLY | |
|---|---|---|
| PIN | AC VERSION | DC VERSION |
| 1 | AC | VDC |
| 2 | AC | VDC |

| CN2 | INPUT SIGNAL /EXCITATION |
|---|---|
| 1 | Not Connected |
| 2 | (+) 18 V Excitation |
| 3 | (+) 8,2 V Excitation for Namur sensors |
| 4 | (-) Common excitation / signal |
| 5 | Signal B input |
| 6 | Signal A input |
| 7 | Not Connected |
| 8 | High voltage input (300 V ac max.) |

| CN3 | LOGIC FUNCTIONS |
|---|---|
| 1 | COMMON |
| 2 | INPUT 1 |
| 3 | INPUT 2 |
| 4 | INPUT 3 |

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## OPTIONS

The MICRA-D models can accept up to 3 simultaneous options; output option 2RE, 4RE, 4OPP or 4OP; communication option RS2 or RS4 and analogical option NMV or NMA:

- 2 SPDT Relays rating 8 A @ 250 V AC / 150 V DC
Ref.................................................................................**2RE**
- 4 SPST Relays rating 5 A @ 250 V AC / 50 V DC
Ref.................................................................................**4RE**
- 4 NPN Outputs rating 50 mA @ max. 50 V DC
Ref...............................................................................**4OP**
- 4 PNP Outputs rating 50 mA @ max. 50 V DC
Ref.............................................................................**4OPP**

*The setpoints are independently programmable for HI / LOW action and time delay or hysteresis operation.*

- RS232C communication output, 1200 to 19200 baud
Ref.................................................................................**RS2**
- RS485 communication output, 1200 to 19200 baud
Ref.................................................................................**RS4**
Serial communication protocols: standard, ISO1745 and MODBUS RTU.
- Isolated analogue output 4-20 mA
Ref.................................................................................**NMA**

- Isolated analogue output 0-10 V
Ref.................................................................................**NMV**

## STANDARD FUNCTIONS

### • OFFSET

The offset function operation is accomplished by a push on the OFFSET key on the front panel or by applying a low level signal to the corresponding logic input at the CN3 connector. The offset memory is cleared to zero by a constant push of 3 seconds on OFFSET key. (Also available at connector CN3).
OFFSET applies only on the PARTIAL counter.
If the OFFSET value is different from zero the TARE led will activate.

### • PEAK AND VALLEY (FREQ./TACHOMETER MODE)

The instrument detects and memorizes the max and min values reached for the variable after the last reset (peak and valley).
To display the peak value, press the MAX/MIN key. The second push makes the display calls up the valley value (Also at connector CN3).

### • RESET PEAK AND VALLEY MEMORY

The peak and valley memories can be reset back to their default values by pressing the MAX/MIN key for 3 seconds, taking into account that the reset value of these memories is the current value of the display when the reset is carried out. The same function is available at the CN3 connector.

### • TOTALIZER

Totalizer with decimal point and programmable scale factor and independent from partial counter.
Count range : from 99999999 to -99999999.
Sensor type, mode and count direction are selected by the partial counter.

## FRONT PANEL FUNCTIONS
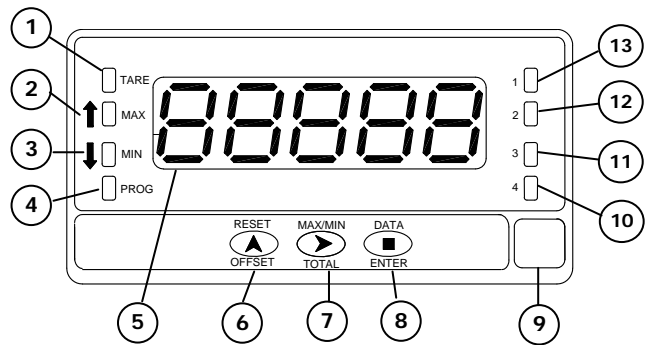


| MODE | | RUN | PROG |
|---|---|---|---|
| TARA | 1 | Programmed Offset | - |
| MAX | 2 | Indicates peak on display (FREQ. / Tac.) | - |
| MIN | 3 | Indicates valley on display (FREQ. / Tac.) | - |
| PROG | 4 | - | PROG mode activated |
| DISPLAY | 5 | Displays the input variable | Displays programming parameters |
| RESET/ OFFSET KEY | 6 | Takes on the display value as offset | Increments the value of the flashing digit |
| MAX-MIN / TOTAL KEY | 7 | MAX, MIN or TOTAL visualisation | Moves to the right the flashing digit |
| ENTER KEY | 8 | Enters in PROG mode. Displays data | Accepts data. Advances program |
| Label | 9 | Measurement unit | |
| LED Output 4 | 10 | Activation Output 4 | Programming output 4 |
| LED Output 3 | 11 | Activation Output 3 | Programming output 3 |
| LED Output 2 | 12 | Activation Output 2 | Programming output 2 |
| LED Output 1 | 13 | Activation Output 1 | Programming output 1 |

## Logic Programmable Functions  CN3

The rear connector CN3 provides 3 user programmable optocoupled inputs that can be operated from external contacts or logic levels supplied by an electronic system. Three different functions may be then added to the functions available from the front-panel keys. Each function is associated to one of the CN3 connector pins (PIN 2, PIN 3 and PIN 4) and is activated by applying a falling edge or a low level pulse to the corresponding pin with respect to common (PIN 1). Each pin can be assigned one of the 13 functions listed hereafter.

(*) Factory configuration.

| N° | Function | Description | Activation |
|---|---|---|---|
| 0 | Deactivated | None. The pin has no function | None |
| 1 (*) | OFFSET | Adds the current display value to the offset memory and sets the display to zero. | Falling edge |
| 2 (*) | RESET | Sets to zero the partial counter value (Proc) | Falling edge |
| 3 | MAX | Displays the peak value. (MÁX.) In Tachometer mode. | Low level |
| 4 | MIN | Displays the valley value. (MÍN) In Tachometer mode. | Low level |
| 5 | RESET MAX/MIN | Clears the peak or valley readings (the one shown in the display). | Falling edge |
| 6 (*) | RESET TOTALIZER | Sets the TOTALIZER to zero. | Falling edge |
| 7 | PRINT PROCESS | Sends the partial counter value (Proc) to printer | Falling edge |
| 8 | PRINT TOTAL | Sends the total value to printer | Falling edge |
| 9 | PRINT OFFSET | Sends the offset value to printer | Falling edge |
| 10 | ASCII | Sends the last four digits to a MICRA-S. By holding the input to a low level, transmission takes place every second | Falling edge |
| 11 | BRIGHTNESS | Change the display brightness from Hi to Low | Low level |
| 12 | SETPOINT VALUE | Displays the selected setpoint value | Low level |
| 13 | FALSE SETPOINTS | Simulates that the instrument has a four setpoints option installed | Low level |

# MICRA-D

## SPECIALS FUNCTIONS

- Return to the factory configuration.
- Change of display colour when the alarm is activated (programmable)
- Total or partial lockout of the configuration by code.

## ACCURACY

Frequency/Tachometer ................................. 0,005%
Chronometer..........................................0, 01%
Temperature coefficient ..........................50 ppm/°C
Warm up time ....................................5 minutes

## FUSES (DIN 41661) Recommended (not supplied)

- MICRA-D.............................................F 0.2 A/250 V
- MICRA-D6 ............................................F 2 A/250 V

## POWER SUPPLY

- UNIVERSAL...........................................85 – 265 Vac
  100 – 300Vdc
- LOW VOLTAGE.....................................10,5 – 70 Vdc
  22 – 53 Vac
- Consumption ................ 5 W without options, 8 W max.

## FILTERS

Antirebound
- Fc with duty cycle 50% ....................................20 Hz
- Fc with duty cycle 30% ....................................10 Hz

## DISPLAY

Type .............. 5 programmable tricolour 14 mm digits
LED's............................8, control and status indication
Decimal Point ......................................programmable
Sign .................................. automatic s/configuration
Positive overflow indication................................OvEr
Negative overflow indication.............................-OvEr

Counter display limits ............ Process -99999 to 99999
Totalizer .................................... -9999999 to 99999999
Chronometer ranges ..........4, from 999.99s to 9999.9h
Frequency ranges ... 0.01 Hz to 20KHz/10KHz(totalizer)
Tachometer range 0 to 99999(rpm), programmable (rate)
Scale factor
  Counter........... programmable from 0.0001 to 99999
  Freq/Tach ....... programmable from 0.0001 to 99999

Display update rate
Counter........................................................ 100ms
Chronometer ................................................ 100ms
Frequency/Tachometer .......programmable 0.1 to 9.9s

## COUNTER and CHRONO MEMORY

Non-volatile E2PROM retains all programming data and count value when power is removed or interrupted.

## INPUT SIGNAL

### Frequency meter and Tachometer input

- Frequency Limits
- MIN frequency .....................................0.01Hz
- MAX frequency without totalizer ........... 19 KHz
- MAX frequency with totalizer.............. 9.9 KHz

### Counter input

- Up or down without relays..............................20 KHz
- Up or down with relays....................................15 KHz
- Bidirectionnal Phase or Direc without relays....20 KHz
- Bidirectionnal phase or Direc with relays.........15 KHz
- Bidirectionnal Indep without relays.................20 KHz
- Bidirectionnal Indep with relays.......................15 KHz

**EXCITATION**................................... 8V/24V DC @ 30mA
18 Vdc (not stabilised) @ 100 mA

### Contact closure
### FILTER

- Fc with duty cycle 50%....................................20Hz
- Fc with duty cycle 30%....................................10Hz

### INPUTS (2 CHANNELS)
#### MAGNETIC PICKUP

- Sensitivity ..............Vin (AC) > 60mVpp @ F < 1 kHz
  ............................ > 120 mVpp @ F > 1 kHz

#### NAMUR SENSOR

- Rc .......................................... 3k3 Ω (incorporated)
- Ion ........................................................< 1mA DC
- Ioff........................................................> 3mA DC

#### TTL/24V DC (encoder)

- Logic levels ................. "0" < 2.4V DC, "1" > 2.6V DC

#### NPN or PNP sensor

- Rc .......................................... 3k3 Ω (incorporated)
- Logic levels ................. "0" < 2.4V DC, "1" > 2.6V DC

#### CONTACT CLOSURE

- Vc ................................................................ 5V
- Rc ............................................................. 3k9 Ω
- Fc (auto selection of input type prog.) .............20Hz

#### HIGH VOLTAGE INPUT (1 CHANNEL)

- Voltage limits ....................................10 to 300V AC

## ENVIRONMENTAL

- Operating temperature ...................... -10 °C to +60 °C
- Storage temperature ..........................-25 °C to 80 °C
- Relative humidity ............................... <95% at 40 °C
- Sealed front panel .........................IP65 (Indoor use)
- Max. Altitude................................................2000 m

## MECHANICAL

- Dimensions...................... 1/8 DIN 96 x 48 x 60 mm
- Weight .......................................................160 g
- Case material......................UL 94 V-0 polycarbonate

## ORDER REFERENCES

- Universal supply................................... **MICRA-D**
- Low voltage supply.............................. **MICRA-D6**