



1

CASSA DI CONTENIMENTO

Tecnopolimero a base poliammidica (PA) rinforzato fibra vetro, colore nero, finitura mat.



2

Aletta di ritegno in tecnopolimero a base acetilica (POM), colore nero, finitura mat.



3

MASCHERINA CON TASTIERA

Policarbonato resistente a grassi, oli, alcoli ed acidi minerali.



4

GRADO DI PROTEZIONE

- IP54, vedi Tabella EN 60529 (a pag. A-19).
- IP67, vedi Tabella EN 60529 (a pag. A-19).



5

SENSORE MAGNETICO CON CAVO

FC-MPI (vedi pag. -) da ordinare separatamente.



6

ACCESSORI A RICHIESTA

Banda magnetica M-BAND-10 (vedi pag. -).



7

ESECUZIONI SPECIALI A RICHIESTA

Mascherina del visualizzatore con simboli grafici, marchi o diciture personalizzate.



8

ISTRUZIONI DI MONTAGGIO

- Praticare nella lamiera (spessore 0.7÷2 mm) la foratura secondo la dima indicata.
- Eliminare le bave di foratura prima di inserire la cassa di contenimento.
- Inserire in battuta la parte inferiore della cassa di contenimento nel foro e premere fino al completo inserimento a scatto (Fig.1).



9

ISTRUZIONI PER SOSTITUZIONE BATTERIA

- Rimuovere l'indicatore dalla sua sede, esercitando una pressione sull'aletta di ritegno portandola a battuta con l'ausilio di un cacciavite a taglio (Fig.2).
- Svitare la vite autofilettante in acciaio INOX AISI 304 con cava esalobata per utensile TORX® T06 e rimuovere la piastrina di chiusura (Fig.3).
- Sostituire la batteria ponendo attenzione a non invertire la polarità (vedi la posizione indicata sul coperchio).
- La sostituzione della batteria se effettuata entro 10 secondi (durata dell'alimentazione tampone) evita la perdita dei parametri di configurazione.



10

* Marchio registrato della TEXTRON INC.



11



12



13



14



15



16



17



18

Dima di foratura

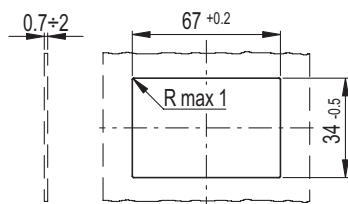


Fig.1

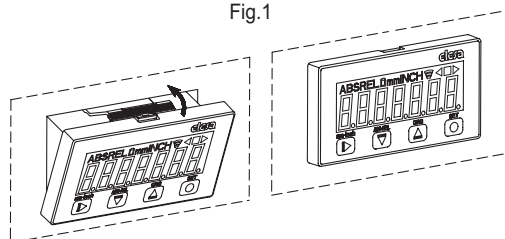


Fig.2

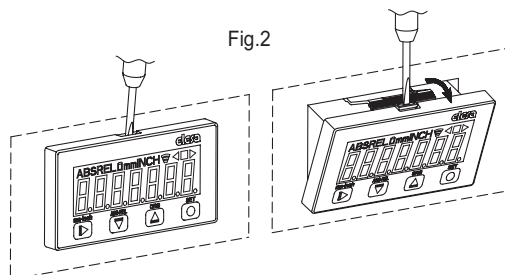
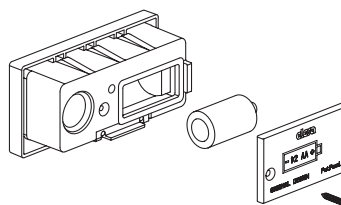


Fig.3



CARATTERISTICHE E APPLICAZIONI

Il sistema di misura MPI-R10-RF connesso al sensore dedicato FC-MPI (vedi pag. -), abbinato alla banda magnetica M-BAND-10 (vedi pag. -), è un sistema completo per la misura di spostamenti lineari e angolari (con raggio minimo di 65mm).

Caratterizzato da una estrema facilità di montaggio, permette allineamenti e posizionamenti precisi e consente di ridurre al minimo i tempi e le procedure di lavorazione.

- Massima facilità delle operazioni di montaggio e smontaggio dell'apparecchio dal pannello grazie ad un sistema con aletta di ritegno (BREVETTO ELESA).
- LCD con 7 cifre di altezza 12 mm e caratteri speciali.
- Programmabile con 4 tasti multifunzione.
- Visualizzazione dei valori in millimetri, pollici e gradi angolari.
- Visualizzazione della misura assoluta o incrementale.
- Fino a 10 valori di offset programmabili.
- Memorizzazione e visualizzazione di 32 target di misura.
- Batteria al litio interna di lunga durata.
- Alimentazione tampone durante la sostituzione della batteria.
- Attacco per connettore FC-MPI con sistema di connessione a scatto che ne facilita l'inserimento e l'estrazione.

Ulteriori informazioni tecniche disponibili nel "Manuale d'uso".

SISTEMA DI POSIZIONAMENTO RAPIDO

Il sistema di misura MPI-R10-RF può comunicare via radiofrequenza (RF) con l'unità di controllo UC-RF, costituendo un sistema senza fili (wireless) per il posizionamento rapido degli organi di macchina o di misurazioni a più assi (fig.4).

Questo sistema è particolarmente adatto ad applicazioni che richiedono frequenti cambi di formato, facilitando la corretta regolazione della posizione target/reale degli organi di macchina, rappresentando anche un sistema di sicurezza. Infatti, se anche un solo sistema di misura MPI-R10-RF non dovesse essere nella posizione target, il PLC non consentirebbe l'avvio del ciclo produttivo della macchina, evitando così di iniziare produzioni errate.

L'installazione del sistema è semplice e rapida poichè non richiede l'utilizzo di cavi di connessione fra l'unità di controllo e gli indicatori. Ulteriori informazioni tecniche disponibili nel Manuale d'uso.

Caratteristiche Meccaniche - Elettriche	
Alimentazione	Batteria al litio 1/2 AA 3.6 V (compresa nella fornitura)
Autonomia	2 anni
Display	LCD con 7 cifre di altezza 12 mm e caratteri speciali
Scala di lettura	-199999; 999999
Numero cifre decimali	programmabile
Unità di misura	millimetri, pollici, gradi angolari programmabile
Velocità di lettura max.	1 + 5 m/s programmabile (1)
Risoluzione (2)	0.01 mm - 0.001 in - 0.01°
Precisione (3)	±0.1 mm
Ripetibilità (4)	0.01 mm
Autodiagnostica	Controllo batteria, controllo sensore, controllo presenza banda magnetica
Grado di protezione	IP54 o IP67
Temperatura di esercizio	0 + 50 °C
Temperatura di immagazzinamento	-20 + +60 °C
Umidità relativa	max. 95% a 25 °C senza condensazione
Ambiente di utilizzo	Uso interno
Altitudine	Fino a 2000 m

- (1) La velocità di lettura influenza la durata della batteria.
- (2) Risoluzione: la più piccola variazione di lunghezza che il sistema è in grado di visualizzare.
- (3) Precisione: la massima deviazione del valore misurato dal sistema rispetto al valore reale.
- (4) Ripetibilità: il grado di vicinanza tra una serie di misura di uno stesso campione, quando le singole misurazioni sono effettuate lasciando immutate le condizioni di misura.

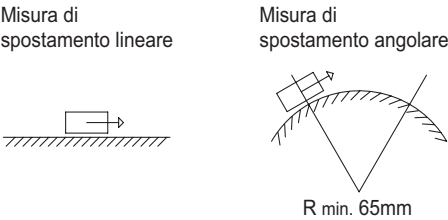
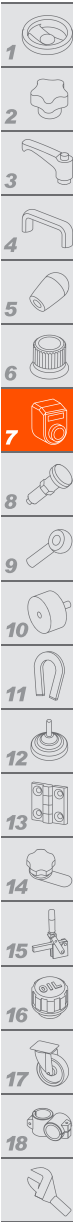
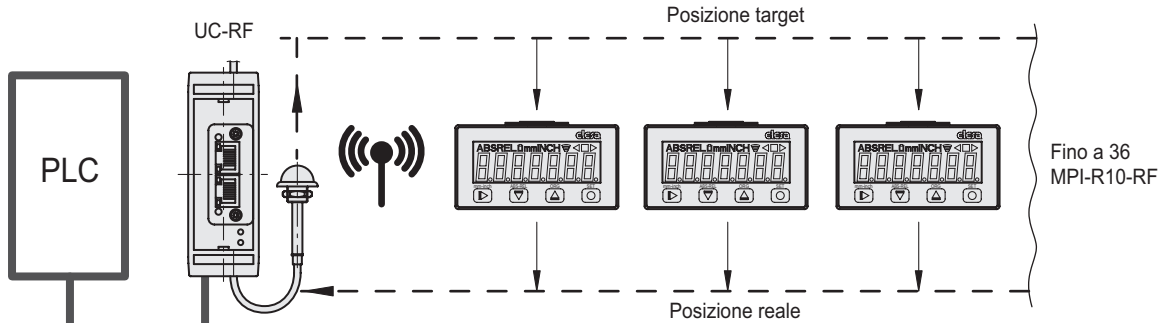
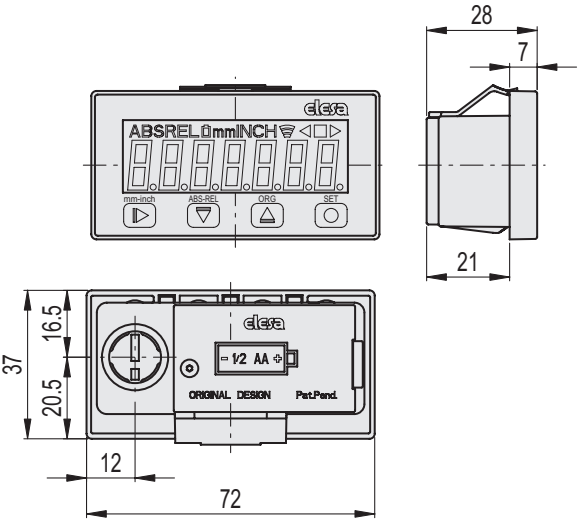
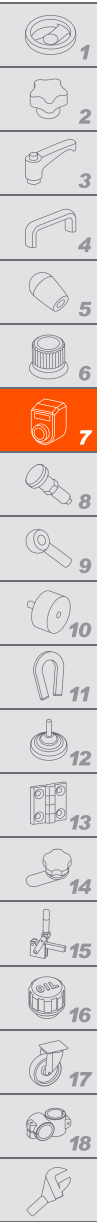


Fig.4



Indicatori di posizione



Indicatori di posizione

Codice	Descrizione	Grado di protezione	⚖
CE.99971	MPI-R10-RF-IP54	IP54	50
CE.99976	MPI-R10-RF-IP67	IP67	50



MPI-R10-RF

Electronic Magnetic Meter

OPERATING INSTRUCTION

elesa®

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1. Safety Instructions

General remarks

The equipment is designed and assembled according to the latest existing regulations. The equipment is delivered to the customer in perfect working order and in line with all safety-relevant conditions. To maintain this status of the equipment, it is imperative to consider the following when installing and using the device:

- use only according to the intended purpose;
- apply all measures regarding safety and hazards;
- observe the present manual and especially the relevant safety precautions! Make sure that the operating manual and especially the chapter describing the safety precautions is read and well understood by the staff in charge. Supplementary to the operating instructions, other generally or legally relevant regulations regarding accident prevention and environmental care are to be considered and observed. This manual is a supplement to already existing documentation (product information, mounting instructions, catalogues).

Intended purpose of the equipment

Intended purpose of the equipment is industrial process monitoring and control in packaging, wood, plastic, paper, glass and textile, etc. industry. It is imperative that the equipment is applied only:

- in properly installed condition;
- in line with the relevant technical data!



Any use beyond the instructions/parameters described in this manual may lead to:

- fatal health injuries;
- material damages or damage to equipment and property.

The device must not be used:

- in explosion hazard areas;
- in medical/life support areas and equipment.

Do not open the equipment and do not apply any modifications! Modifying the equipment might have a negative impact on reliability of the device and might result in danger! Do not attempt any repairs, but return any defective equipment to the manufacturer! Any violation of the integrity of the device as delivered will null the warranty.

Setup/Commissioning

In case of any abnormal behaviour (including change in operating conditions), the device must be switched off immediately. It is imperative to switch off power supply during any installation work at the equipment. Installation and commissioning by correspondingly trained and authorised staff only. After correct mounting and commissioning the device is ready for operation.

Maintenance/repair

Switch off the power supply of the equipment before any action. Maintenance should be performed by trained and authorised persons only.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2. System description

The MPI-R10 connected to the dedicated sensor FC-MPI, combined with the Elesa magnetic band M-BAND-10, is a complete system for the measurement of linear and angular displacement. Characterised by extremely easy assembly, it allows precise alignment and positioning, reducing times and machining procedures to a minimum.

MPI-R10 mai features are:

- Multifunction LCD with 4 function keys.
- Absolute/ incremental mode.
- Programmable offset and targets function.
- Lithium battery powered.
- Accidental polarity inversion protection.

Mechanical and electrical characteristics

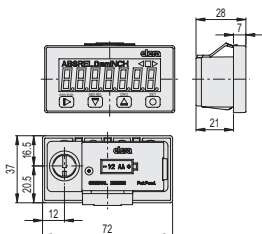
Power supply	Lithium battery 1/2AA 3.6 V
Battery life	3 years
Display	7-digit LCD of 12 mm height and special characters
Reading scale	-199999; 999999
Number of decimal digits	programmable
Programmable measuring unit	mm, inches, degrees (angle)
Max operating speed ⁽¹⁾	1 ÷ 5 m/s programmable
Resolution ⁽²⁾	0.01 mm - 0.001 in - 0.01°
Precision ⁽³⁾	±0.03mm
Repeat accuracy ⁽⁴⁾	0.0002xL mm (L is the measure in mm)
Self-diagnostic	battery check, sensor check, magnetic tape check
Protection level	IP65
Operating temperature	0°C ÷ +50°C
Storage temperature	-20°C ÷ +60°C
Relative humidity	max. 95% a 25°C without condensation
Environment	indoor use
Altitude	up to 2000 m

⁽¹⁾ The reading speed influences the battery life.

⁽²⁾ Resolution: the smallest change in length that the system is capable of displaying.

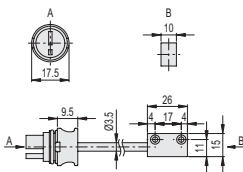
⁽³⁾ Precision: the maximum deviation of the value measured by the system from the actual one.

⁽⁴⁾ Repeat accuracy: the degree of closeness between a series of measures of the same sample, when the single measurements are carried out with the conditions unchanged.



The sensor cable, FC-MPI, is made from a metallic enclosure containing the sensor electronic, a multipolar flexible cable and a connector to plug it in the MPI-R10.

The sensor cable is available in different lengths.



The magnetic band M-BAND-10 is made of two separate parts: the magnetic band and the cover strip. The magnetic band is made of a magnetic tape, a carrier strip and an adhesive tape (Fig. 2).

The cover strip is made of a protection strip and an adhesive tape (Fig. 1).

M-BAND-10 Technical data

Accuracy class	$\pm 40 \mu\text{m}$
Material	magnetic tape: nitrilic rubber
	carrier strip: stainless steel
	cover strip: stainless steel
	acrylic adhesive tape
Width	magnetic band: 10 mm \pm 0.20 mm
	cover strip: 10 mm \pm 0.20 mm
Thickness	magnetic band: 1.43 \pm 0.15 mm
	cover strip: 0.23 mm
Magnetic pole pitch	5 mm
Operating and storage temperature	min -40°C max +100°C
Linear thermic expansion factor	$17 \times 10^{-6} \text{ K}^{-1}$

Fig.1

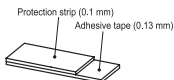
Cover strip

Fig.2

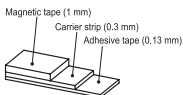
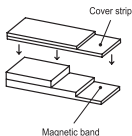
Magnetic band

Fig.3

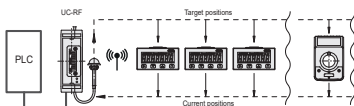
Proper assembly

2.1. RF version – MPI-R10-RF

MPI-R10-RF is compatible with the Elessa's wireless network that allow electronic meters and indicators to communicate via radio with a PLC.

The Elessa's wireless network is made by the following components:

- One control unit UC-RF
- Max 36 electronic position indicators or meter as DD51-E-RF, DD52R-E-RF or MPI-R10-RF.

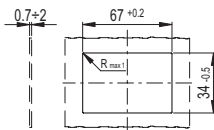


The control unit UC-RF is provided with a standard interface for the most common industrial busses to be connected to the PLC and allows the transmission of the information between the PLC and the MPI-R10-RF position indicators. The UC-RF exchanges information with the MPI-R10-RF via radio frequency and allows the setting of the target position and the control of the current position of each indicators, directly from the PLC.

3. Installation

3.1. Display installation

1. Drill the panel according to the template dimensions reported.
2. Remove all drilling burrs before fitting the MPI-R10.
3. Fit the lower part of the case into the housing.
4. Press onto the upper part until the case is completely snapped in.



3.2. Sensor installation

Fix the magnetic sensor by using M3 screws (not included in the supply).

During the installation, use a planar spacer (max 1 mm is suggested) to grant the parallelism between the sensor and the magnetic band.

The maximum distance between the sensor and the magnetic band to ensure a correct reading of the displacement is 1mm.

3.3. Magnetic band installation

To mount the magnetic band follow the instructions below:

- Clean the mounting surface carefully.
- Remove the protective foil from the adhesive tape of the magnetic band.

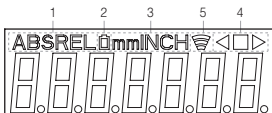
- Stick the magnetic band on the mounting surface.
- Clean the surface of the magnetic band carefully.
- Remove the protective foil from the adhesive tape of the cover strip.
- Stick the cover strip on the magnetic band. The cover strip must be installed over the magnetic band to protect it from possible mechanical damages.
- In the absence of a seat for the housing of M-BAND-10, secure the ends of the cover strip to prevent unintentional peeling.

The mounting surface must be flat. Buckles or bumps will lead to measuring inaccuracies. To guarantee an optimal adhesion of the adhesive tapes, the mounting surfaces must be perfectly cleaned, dry and smooth. The following surface roughness is recommended: $R_a \leq 3,2 \text{ N8}$ ($R_z \leq 25$). To maximize the adhesion install the strip applying pressure. Gluing should preferably be carried out at temperatures between 20 °C to 30 °C and in dry atmosphere.

WARNING

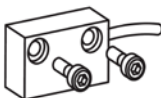
Once the installation is completed, the calibration procedure must be carried out as shown in cap. 8.5.2.

4. Display






1. Absolute or relative mode indicator
2. Low battery level indicator
3. mm, INCH or degree unit of measure
4. Target position indication
5. RF connection indicator




5. Key's functions








The function of the keys changes depending on the mode of the device.

Key Or Key Combination	Operating Mode	Programming Mode
	Keep pressed for 3 sec to enter the programming mode.	Parameter selection/ Confirm of parameter change
	<p>Keep the button pressed for 3 s to set the origin of the measurement.</p> <p>Programmable with one of the following options (see the <code>_____0__</code> voice of the menu – cap. 8.3):</p> <p>d_tArG: when a target is loaded the display shows the actual absolute position. Pressing the key, on the display appears the target absolute position to reach</p> <p>d_toGD [DEFAULT]: when a target is loaded the display shows the distance to reach the target position. Pressing the key, on the display will appear the actual absolute position.</p> <p>OFF: the key is not assigned to any function in the operating mode.</p>	Digit increase / Scroll for parameters bottom-top on the menu tree

Key Or Key Combination	Operating Mode	Programming Mode
	<p>Select the:</p> <p>ABS: absolute measuring mode</p> <p>REL: incremental measuring mode</p> <p>It is possible to choose one of the following options (see the <u>__D__</u> voice of the menu – cap. 8.3):</p> <p>ArCLr [DEFAULT]: switching from ABS to REL the counter is set to zero.</p> <p>Ar: switching from ABS to REL the counter is not set to zero.</p> <p>OFF: the key is not assigned to any function in the operating mode.</p>	<p>Digit decrease /</p> <p>Scroll for parameters top-bottom on the menu tree</p>

Key Or Key Combination	Operating Mode	Programming Mode
	<p>Press the key to select the unit of measure needed. The options available are: millimeters, inches and degrees.</p> <p>It is possible to choose one of the following options (see the D_____ voice of the menu – cap. 8.3):</p> <p>ALL [DEFAULT]: selectable units of measure: mm, inch, D</p> <p>noDEG: selectable units of measure: mm, inch</p> <p>OFF: the key does not allow the unit of measure conversion</p>	<p>Program- ming mode exit / Digit selection</p>
 + 	<p>Programmable with one of the following options (see the D_____D voice of the menu – cap. 8.3):</p> <p>PrOGOrG [DEFAULT]: show and set the OriGin parameter</p> <p>PrOGOfS: show and set the OFFS parameters</p> <p>OFF: the key combination is not assigned to any function in the operating mode.</p>	<p>NA</p>



Key Or Key Combination	Operating Mode	Programming Mode
	<p>Programmable with one of the following options (see the <u> </u>0<u> </u>0 voice of the menu – cap. 8.3):</p> <p>LOADorG [DEFAULT]: Load one of the 10 programmed offsets.</p> <p>OFF: the key combination is not assigned to any function in the operating mode.</p>	NA
	<p>Programmable with one of the following options (see the <u> </u><u> </u>0<u> </u>0 voice of the menu – cap. 8.3):</p> <p>tArGEtS: the keys combination allows to load/program one of the 32 target positions. See 8.4</p> <p>OFF [DEFAULT]: the key is not assigned to any function in the operating mode</p>	NA
	<p>To turn the indicator on hold  then press the key . After the start-up sequence the indicator will be ready to be used (see cap. 4).</p>	NA

Key Or Key Combination	Operating Mode	Programming Mode
		<p>When the rESEt parameter is select. press the key . At this point, press the button and then press the key ; the display will turn off and the indicator will go into low power mode of the battery (see cap. 4).</p>

6. Switching on the system

After you have read and understood the section "Safety Instructions", proceed by switching on the indicator.




To switch the indicator on:

- hold the key 
- press the key .

The display will light up and the indicator is ready to be used.

6.1. Switching off the system (only for storage)


To switch the system off :

- enter the programming mode,
- select **rESEt** (see cap. 8.3)
- press 
- press 
- press 

The display will turn off and the indicator will go into low power mode.


7. Operating mode

7.3. Absolute/incremental measuring mode selection

Press the key  to select the absolute or incremental measuring mode.



The measuring mode selected is shown on the display by the symbols:


- **ABS**: absolute measuring mode.
- **REL**: incremental measuring mode.

It is possible to change the key  function by the menu voice **__0__** (see cap.8.3).

The available options are:


- **ArCLr** (default): when relative measurement is selected the value is always reset to zero.
- **Ar**: passing from **ABS** to **REL** the relative measurement is not reset to zero.

In this case, the counter is set to zero by pressing  + 

- **OFF**: the key  is disabled and does not allow changing the selected measuring mode.


To program the parameters listed above, see cap. 8.3.

7.2. Unit of measure selection

Press the key  to select the unit of measure.

The options available are millimeters, inches and degrees.

The measuring mode selected is shown on the display by the symbols: mm for millimeters, INCH for inches and with the ° suffix for degrees.


It is possible to change the key  function by the menu voice **0**_____.


The available options are:

- **ALL** (default): units of measure that can be selected: mm, inch, degree.
- **nodEG**: units of measure that can be selected: mm, inch.
- **OFF**: the key is disabled and does not allow changing the selected measuring mode.

To program the parameters listed above, see cap. 8.3



7.3. Setting the origin

Press the key  for three seconds to set the origin of the measurement.






Keeping pressed the **ORG** key for three seconds, the display will show the question Set Org. At this point press the key  to confirm or another to cancel.

Confirming the setting of the origin, the display will be reset to zero and the present point of the sensor will be considered as the origin of the measurements.

7.4. Setting the absolute reference



After having selected the absolute measuring mode and stopped the sensor in the starting or in the reference position, press the key combination  +  to set the absolute value to the sum of the values of the parameters **Origin** (absolute value of reference) and the selected **OFFS** (compensation value).

The value of compensation (**OFFSET**) allows you to adjust the value shown on the display in such a way that takes into account, for example, wear or tool change. The system allows you to store up to 10 values of compensation.

Pressing the key combination  + , the screen will display the last compensation value used (eg **0FS 0**). It's possible to choose the desired compensation value by pressing the key  or , and then pressing the key  to confirm.



The screen will display the absolute value equal to the sum of the values of the parameters **Origin** and **Offset**.

To program the offset values, see parameter **Offset** of cap. 8.28.3.

It is possible to change the function of the keys combination  +  choosing one of the available options in the menu voice **__0__0**



The available options are:

Load_OrG: the key combination allow to choose an offset compensation and set the origin value

OFF: the keys combination  +  is not associated to any function in the operating mode.

For programming the parameters listed above see paragraph 8.

7.5. Direct programming of the absolute reference value and compensation values

The keys combination  +  can be programmed to allow direct access to the programming of the **OrIGIn** or **OFFSEt** parameters.

It is possible to change the function of the keys combination choosing one of the available options in

the menu voice **0_____0**.


The available options are:

- **PrOGOrG**: direct programming of the absolute reference value (**OrIGIn** parameter).
- **PrOGOfS**: direct programming of the compensation value (**OFFSEt** parameter).
- **OFF**: the keys combination is not associated to any function in the operating mode.






7.6 Targets

MPI-R10 allow to set up to 32 target positions to store relevant machine configuration setting.

To program the targets:


- select **tArGEtS** in the main menu (see cap 8.3).
- select **PrOG_TG** (see cap. 8.4).
- select the wanted memory location (**PtrG 01** to **PtrG 32**).
- press the key  to select.
- Follow the instruction in cap. 8.1 to set the wanted value.

To load a target:

- select **tArGEtS** in the main menu (see cap 8.3).
- select **LOAD_TG** (see cap. 8.4).
- select the wanted target value (**LtrG 01** to **LtrG 32**) using the keys  and .
- press the key  to select.
- The value of the selected target is shown.
- Press  again to confirm or press  to go back to the target selection list.



The keys combination  +  allows direct access to the programming or loading of targets depending on the value assigned to parameter `___0_0`.

If enabled, the key combination allow to chose between the two following operations:



- **LOAD_tG**: choose one of the 32 available target positions, then press to confirm.
- **PrOG_tG**: choose to program one of the 32 available target positions, then press  to start programming.

It is possible to change the function of the keys combination chosing one of the available otions in the menu voice `___0_0`.

The available options are:

- **tArGet**: enable the direct load or program targets functions.
- **OFF**: the keys combination  +  is not linked to any function in the operating mode.

7.6.1. Reaching the target position

When a target is selected ot is is sent by the PLC (RF version only) the device will suggest the direction of movement of the sensor to reach the target by means of the symbols  .

It is possible to set the **FLIP_tG** parameter (see cap. 8.2) to adapt the target position indication to the actual sensor configuration.

It is possible to set the tolerance of the target as absolute difference from the set value by means of the **P_tOLL** parameter (see cap. 8.2).





The target position indicators will work, depending from the **FLIP_tG** and **P_tOLL** parameters, as in the following table.

	FLIP ◀	FLIP ▶
$M < T - \text{Toll}$	◀	▶
$T - \text{Toll} \leq M < T$	◀■	■▶
$M = T$	■	■
$T < M \leq T + \text{Toll}$	■▶	◀■
$M > T + \text{Toll}$	▶	◀


T = set target

M = measured value

Toll = tolerance (see P_toll)



If a target is selected is possible to cancel it by pressing the keys combination  +  and confirm the **StOP_tG** command pressing the key . To keep the target selection press the key .

7.6.2. Target display mode

Press the key  to show the present or the target position depending on the settings of the device.

It is possible to change the function of the key and the target mode choosing one of the available options in the menu voice `_____0_____`.

The available options are:

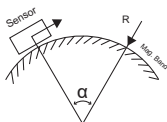
- **d_tArG** (default): when a target is loaded, the display shows the actual absolute position and the indication to reach the target as explained before in cap.7.6.1. Pressing the key  the set target position is shown.
- **d_to_Go**: when a target is loaded, the display shows the distance to the set target and the indication to reach the target as explained before in cap.7.6.1. If the target is not reached, the display blinks. Pressing the key  the display shows the actual absolute position.

7.6.3. Target tolerance

Set the value of **P_toll** parameter to define the tolerance allowed for target (see cap. 8.2 for details).

7.7. Angular measurement

MPI-R10 allow to measure angular displacements. To obtain the correct measurement, is needed to set the parameter Radius with the measure of the radius of the arc where the magnetic band is placed.



7.8. RF version (MPI-R10-RF)

7.8.1. Programming the network parameter (nEt id) and the channel parameter (nEt ch)

The system radio network is defined by the following two parameters:

- nEt id: id 00/99
- nEt ch: ch 01/36

These parameters can be configured in the Radio menu of the indicator (see cap. **Errore. L'origine riferimento non è stata trovata.**) and must be set according to the PLC recipe to guarantee a perfect communication between UC-RF and MPI-R10-RF.


Warning

For MPI-R10-RF with firmware release equal to 5.1 or higher, channel 1 is equivalent to channel 4 of the previous version. Consider it when used in old system with UC-RF with fw release lower than 5.1.


7.8.2 Targets

Using MPI-R10-RF, target positions can be sent from the PLC to the indicators through the control unit. When a target is set, the behaviour is the same as described in cap 7.6.




8. Programming mode


Press the key  for 3 seconds to enter the programming mode. Depending on the setting of **PASS** parameter (see cap. 8.2), the system may require you to enter a password.

Press the key  and  to scroll through the list of parameters and select the wanted one pressing .

Press the key  to exit the programming mode. The programming mode is automatically dropped after 30 seconds of inactivity.

8.1. Programming parameters with numeric values

Press the key  to select the digit to change. Then use  and  to respectively decrease or increase the flashing digit.

Press the key  to confirm the value and go back to the list of parameters.



The numeric values of the parameters must be inserted taking into account the selected unit of measure.

When a parameter is changed from its stored value, confirming it, the display will show the message **CHAnGEd**.

When exiting from the programming mode, the parameter are stored in the internal memory. If a parameter was changed, the display will show the message **StorEd**.

8.2. Device parameters (in alphabetic order)

Parameter	Description	Available options	Default
Deg corr	Angular scale correction	Programmable value: 0.000001 +/- 9.999999 . 0.000000 cannot be accepted (the coefficient is automatically set to 1.000000).	1.000000
Deg res	Resolution of the angular measurement	The parameter allows to define the resolution of angular measurement. The available options are: 1 ; 0.1 ; 0.01	0.01
Dir	Measurement direction Set direction of the positive axis	dir-- (▶) --dir (◀)	dir-- (▶)

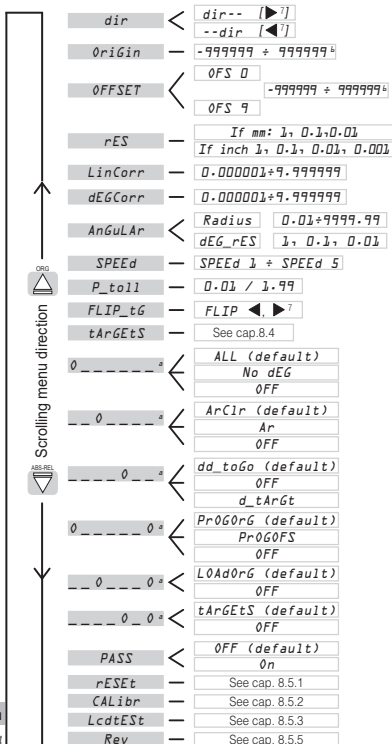
Parameter	Description	Available options	Default
<i>FLIP_p_tG</i>	Arrow to target indicators direction	◀ or ▶ The parameter set the direction of the arrow indicators when the target is not reached	▶
<i>Lin corr</i>	Linear scale correction	Programmable value: <i>0.000001</i> +/- <i>9.999999</i> . <i>0.000000</i> cannot be accepted (the coefficient is automatically set to 1.000000).	<i>1.000000</i>
<i>Offset</i>	Offset Value	Programmable value <i>Res = 1:-</i> <i>9999999 ÷</i> <i>999999</i> <i>Res = 0.1:-</i> <i>99999.9 ÷</i> <i>99999.9</i> <i>Res = 0.01:-</i> <i>9999.99 ÷</i> <i>9999.99</i> <i>Res = 0.001:-</i> <i>999.999 ÷</i> <i>999.999</i> The system allows you to store up to 10 compensation values: <i>OFS 0 ... OFS 9</i>	<i>0000.00</i>

Parameter	Description	Available options	Default
<i>Origin</i>	Reference value	Programmable value $Res = 1:-$ $999999 \div$ 999999 $Res = 0.1:-$ $99999.9 \div$ 99999.9 $Res = 0.01:-$ $9999.99 \div$ 9999.99 $Res = 0.001:-$ $999.999 \div$ 999.999	0000.00
<i>Pass</i>	Password	ON the system requires the password 22011 to enter the programming mode. OFF [DEFAULT]: the system does not require a password to enter the programming mode.	OFF
<i>P toll</i>	Tolerance of target position	$0.01 \div 9.99$ The parameter value depends on the unit of measure selected.	0.10

Parameter	Description	Available options	Default
Radius	Radius of the circumference where the reading sensor moves	<p>Programmable value: 0.01-9999.99</p> <p>The parameter allows to define the radius of the arc where the magnetic band is placed for angular measurement.</p>	100.00
Res	Resolution	<p>The parameter allows defining the resolution of the measure.</p> <p>The available options are:</p> <p>mm: 1; 0.1; 0.01</p> <p>inches: 1; 0.1; 0.01; 0.001</p>	<p>mm: 0.01</p> <p>inches: 0.01</p>
Speed	Reading max speed	<p>Programmable values 1;2;3;4;5</p> <p>The parameter set the maximum speed of the movement in m/s that can be correctly read.</p>	3

Parameter	Description	Available options	Default
Targets	Target value	<p>Programmable value</p> <p>$Res = 1:-$ $999999 \div$ 999999</p> <p>$Res = 0.1:-$ $99999.9 \div$ 99999.9</p> <p>$Res = 0.01:-$ $9999.99 \div$ 9999.99</p> <p>$Res = 0.001:-$ $999.999 \div$ 999.999</p> <p>The system allows you to store up to 32 compensation values: L t601 ... L t632.</p> <p>The parameter value depends on the unit of measure and resolution set.</p>	0

8.3. Main menu tree





8.4. Target menù tree



8.5. Additional features

8.5.1. Reset

To reset the device to its factory setup:

- select the voice **RESEt** from the main menu (see cap. 8.3).
- select **YES** pressing the key  (pressing the key the visualized value toggle between **YES** and **NO**).
- press the key  to confirm.

8.5.2. Calibration

The Calibration voice in the main menu activates the CALIBRATION MODE and the display shows **G0**.

At this point, the user must slowly move the sensor in one direction along the magnetic band.

After the **G0** it will be displayed a progress bar that will grow as long the sensor is moved. The procedure end when the position measurement is shown again by the display.

This operation allow the sensor to be accurately bound to the magnetic tape and have to be done every time after the installation of the sensor.

8.5.3. Test LCD

The LcdtEst voice in the main menu allow to switch on all the display segments.

8.5.4. Correction coefficients


To improve the corectness of the measurement, MPI-R10 allow to set two correction factors that take into account about differencies between ideal and actual installation of the magnetic band:

- **LinCorr**: is the ratio between the actual mesurement and the value measured by the device in linear measurements.
- **AngCorr**: is the ratio between the actual mesurement and the value measured by the device in angular measurements.

To calculate the correction factor, set it to 1 then read the value measured (call it M) in a reference point (call it K). The Correction fator will be equal to K/M.

Verify if the measurements done in the reference and/or other known points are correct.


8.5. 5. Revision

As last voice in the main menu, starting with the r letter, are shown the release data of the device that can be scrolled pressing the key .

Please note these values and communicate them to Elessa in case support needed.

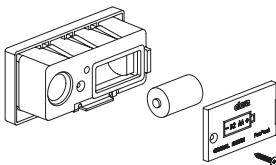
9. Battery replacement

The internal lithium 1/2 AA - 3.6 V battery ensures over 3 years battery life. (No RF version).

The symbol  is shown on the display when the battery replacement is required.



The replacement is made by simply removing the cover on the back.

By replacing the battery in less than 5 seconds, all the measurement and settings will not be lost. If more time is required and the display turns off, the settings of the device have to be set or verified again.



By replacing the battery in less than 5 seconds, all the measurement and settings will not be lost. If more time is required and the display turns off, the settings of the device have to be set or verified again.

10. Display messages and troubleshooting

Message on the display	Description	Action
SEnSor	The sensor is not connected	Connect the sensor or verify the cable and the connector
no tAPE	The magnetic tape is not detected	Verify if the sensor is correctly mounted near to the magnetic tape
SPeed X	The sensor is moving too fast according the value of the set in the Speed parameter. X is the present setting of the Speed parameter.	Press  to go back to the value reading and re-set the absolute reference.
 Flashing battery symbol	Low Battery	Replace the battery (see cap. 9).

EU DECLARATION OF CONFORMITY (DOC)**WE**

COMPANY NAME: Elesa S.p.a.
POSTAL ADDRESS: Via Pompei 29
POSTCODE AND CITY: 20900 Monza
TELEPHONE NUMBER: +39 039 28111
E-MAIL ADDRESS: info@elesa.com

Declare that the DoC is issued under our sole responsibility and belongs to the following product:

PRODUCT: Magnetic measuring system
APPARATUS MODEL: MPI-R10
TRADE MARK: Elesa

The object of the Declaration described above is in conformity with the relevant Union harmonization legislation:

2014/30/EU(EMC): Radio Equipment Directive
2011/65/UE (RoHS): Restriction of the use of certain Hazardous Substances in electrical and electronic equipment

The following harmonized standards and technical specifications have been applied:

EN 61326-1:2013

Notified Body:

Not Involved (Annex II - Conformity Assessment Module A)

Additional information:

Software Version: 5.1 or higher

PLACE, DATE OF ISSUE: CARLO BERTANI
Monza – Italy MANAGING DIRECTOR
18/05/2020 GENERAL MANAGER



ELESA S.p.A.

Via Pompei, 29
20900 Monza (MB) Italy
phone +39 039 28111
fax +39 039 836351

info@elesa.com
www.elesa.com

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