

2013 Catalogue



27 years of high precision, quality and performances

Dear Customer,

Since 1986 Metro has developed and produced a large range of electronic measuring displays and associated systems. Our reputation stands as a reliable, reactive and innovative company.

For 27 years our products have been used by thousands of customers in various industries like Automotive, Aerospace, Watch making, Pharmaceutical, Bearings, just to name a few.

Our devices improve the quality of your products and reduce the control time in your workshops.

The design of our products promises a very long life cycle even when used in severe industrial environments. This allows to reduce ownership cost which is a key factor for many customers.

Today, Metro offers technical and commercial services in more than 20 countries worldwide thanks to our highly qualified agents and distributors.

A majority of our products are always in stock, therefore our delivery time is short.

In this 2013 edition, several new products are introduced:

- M400 display unit dedicated for multi-gauging applications
- A new M2 display with touch screen function and possibility to connect different brands and technologies of probes
- The M-Bus range has been completely renovated with new aluminium enclosures and electronics. The M-Bus offers the possibility to connect many types and brands of probes onto our displays.

These new products are a solid reflection of the standards Metro uses when creating precision devices:

- Advanced and innovative functions, communication possibilities and always a user friendly principle.
- Highest quality materials are used. For example, display enclosures are machined in solid aluminium parts.
- Only industrial components with an extended life cycle are used therefore guaranteeing that your display can always be repaired.
- Modern and compact design.
- Our displays run on our own Operating System especially designed for dimensional measurement. This feature allows exceptional performances compared to other systems running on a standard OS.

Metro appreciates your trust and confidence. We will continue to work for our customers by constantly delivering high quality products and offering excellent customer service.

Metro SA

A stylized blue ink signature of David Jacquemard.

David Jacquemard
Sales and Marketing

A stylized blue ink signature of Sébastien Jacquemard.

Sébastien Jacquemard
Research and Development

Quick product selection

Displays

	Types of inputs											
	Characteristic number	Probe inputs	Inductive HBT ¹	Incremental ²	Digital ³	Capacitive ⁴	Measuring instruments ⁵	Colour display	Touch screen function	SPC functions	Ethernet	USB
M2	1	2	X	X		X		X	X			X
Monocote	1	4	X	X	X	X					X	
Microvision	1	31 ⁶	X	X	X	X	X	X				
Multicote	8	8	X	X	X	X					X	
Multivision	8	31 ⁶	X	X	X	X	X	X				
M400	32	99 ⁷	X	X	X	X	X	X	X	X	X	X

¹ : Metro, Tesa, Mahr, Peter Hirt....

² : Heidenhain, Mitutoyo, Magnescale

³ : Solartron Orbit

⁴ : Sylvac

⁵ : Caliper, digital indicator, micrometer, weight scale ... from any brand

⁶ : 2 or 4 inputs on the device and extendable to 31 with M-Bus modules

⁷ : Inputs only with M-Bus modules. No direct input on the display

Multiplexers

	Types of inputs					
	Probe inputs	Inductive HBT ¹	Inductive LVDT	Measuring instruments ²	Ethernet	USB
Minimux 4	4	X				X
Minimux 8	8	X				X
Maximux	255 ³	X			X	X
CA4	4	X	X			
Mux 4	4			X		X
Mux 8	8			X		X
						Analogue output

¹ : Metro, Tesa, Mahr, Peter Hirt....

² : Caliper, digital indicator, micrometer, weight scale ... from any brand

³ : 16 inputs on the device and extendable to 255 with M-Bus modules

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Display units

Metro proposes a complete range of high performances display units that can deal with many different types of probes and measuring instruments :

- Inductive gauging probes (Metro, Tesa, Mahr, Peter Hirt etc.)
- Incremental (Heidenhain, Magnescale, Mitutoyo)
- Capacitive (Sylvac)
- Digital (Solartron Orbit),
- Calipers, digital indicators, micrometers etc...

Our products are able to display from 1 to 32 characteristics simultaneously and to read from 1 to 99 gauging probes depending on the model.

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Display units

M2

The M2 is designed to make dimensional control from 1 or 2 probes.

3 versions are available allowing to connect the following types of probes :

- Inductive HBT probes : Metro, Tesa, Mahr, Peter Hirt etc.
- Incremental probes : Heidenhain (1Vpp ,11 μ A or TTL signal)
- Capacitive probes : Sylvac

Measurements and results are displayed very clearly on its 4.3" touch screen display.

Thanks to its intuitive configuration and its general simplicity the M2 is a device that will be immediately adopted by every operator.

M2's housing is machined in a solid aluminium block.

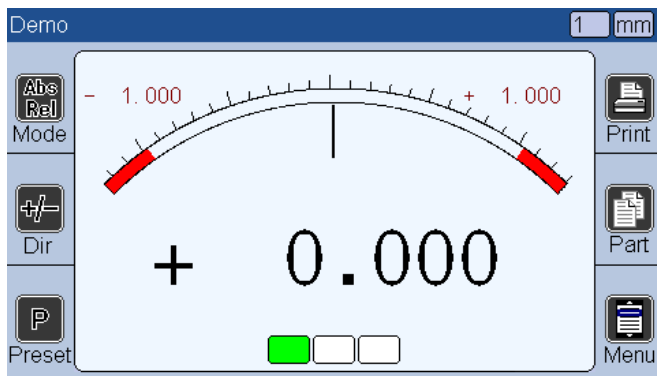


Display units

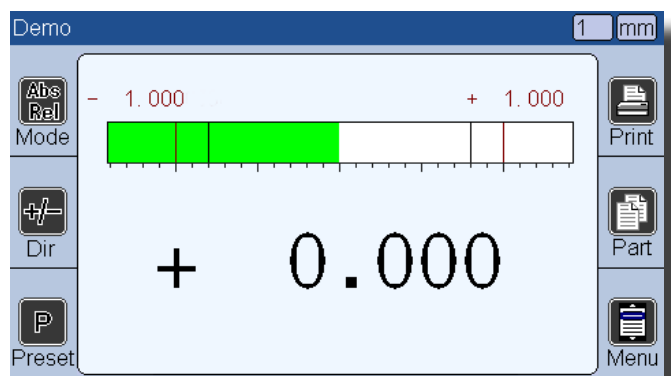
M2

Touch screen display

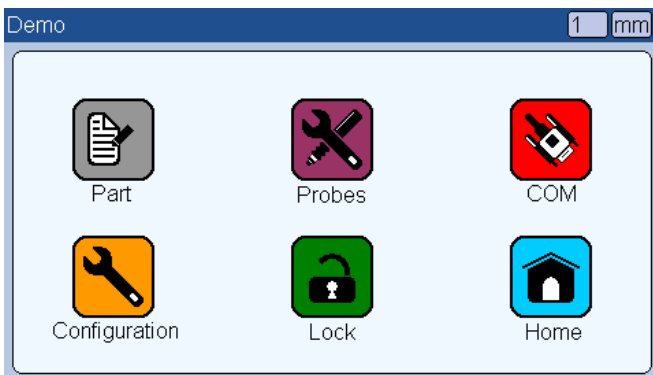
The M2 is equipped with a 4.3" touch screen display which allows an easy configuration with its user friendly interface. Measurements are displayed with a numerical value and with 2 types of indicators (needle or horizontal bargraph). 3 coloured indicators or an analogue display indicates the measurement against the tolerances limits.



Needle indicator



Horizontal bargraph



Icon desktop



Virtual keyboard

Virtual keyboard configuration



The M2 hardware can be configured as a USB device. When the M2 is connected to a computer, it is automatically detected as an additional keyboard.

It means that when the operator transfers the measurement, the values appears on the PC like if they would have been typed with a keyboard.

No need to have a special software or any specific driver.

Display units

M2

Functions

Many functions can be selected with the keyboard:

- Nominal dimension , Tolerance limits , Control limits, Dimension of the master piece.
- Calculation formula
- Calibration
- Keyboard locking
- Display resolution (from 2 to 5 decimals)
- Metric or imperial measurements (mm or inches)
- Temporary measurement stop
- Selection between 2 measurement characteristics (2 dimensions)
- Automatic switch of measurement characteristic by moving a probe
- Different languages installed. New languages can be installed upon request
- RS232 output for measurement reading
- USB device class for using the M2 as a virtual keyboard on a computer
- Absolute or relative measurement
- Measurement direction inversion



Brand	Metro-Tesa-Mahr
Stroke	up to 20 mm
Precision	1% of the stroke
Resolution	up to 0.1µm
Technology	Inductive



Brand	Sylvac
Stroke	up to 50 mm
Precision	up to 0.8µm
Resolution	up to 0.1µm
Technology	Capacitive



Brand	Heidenhain ST or MT
Stroke	up to 100 mm
Signal	11µA, 1Vpp or TTL
Resolution	up to 0.01µm
Precision	up to ± 0.2µm
Technology	Incremental / Glass scale

Display units

M2

Example of application

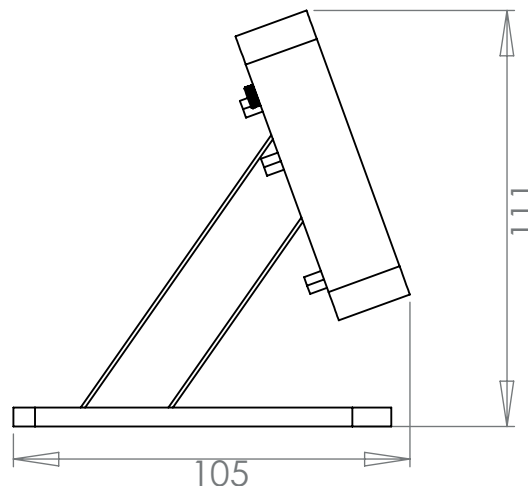
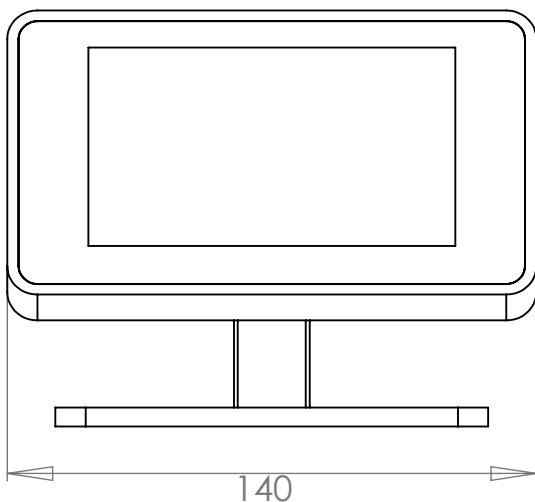


The Metro M2 display unit can be used with snap gauges or any measuring bench. The image here shows an example of application with 2 Heidenhain probes mounted on snap gauges. The measurement, as well as the results, are clearly shown on the M2 screen.

The M2 facilitates the operator's job by switching automatically the part reference on the screen by moving the probe tip. When the M2 is configured, the operator has just to place the parts on the snap gauge to get the result. At the same time, data can be sent to a PC.

This configuration increases consequently efficiency on workshops and reduces costs as well as error risks.

Mechanical dimensions



Product references

Item	Reference
Display M2 with 2 inputs for Metro inductive probes	15010
Display M2 with 2 inputs for Tesa compatible inductive probes	1501T
Display M2 with 2 inputs for Heidenhain probes (sinewave 11µA or 1Vpp signal)	15020
Display M2 with 2 inputs for Sylvac probes	15030
Display M2 with 2 inputs for Heidenhain probes (TTL signal). Works also with Mitutoyo LG and Magnescale probes with an adapter.	15000
Display M2 with 2 inputs for Mahr inductive probes	1501M

Display units

Monocote

The electronic gauging unit Monocote allows to measure a characteristic calculated from the position using 1 to 4 gauging probes.

Up to 8 measurement characteristics can be stored in its memory.

Three indicator lights and an analogue 7 segments display indicate the real part characteristic.

This display is highly adapted to be installed on an automated machine with static or dynamic measurements, connected for example by Ethernet with the Modbus-TCP protocol, or with the optional relay board.



Display units

Monocote

Functions

77 functions can be selected with the keyboard or by remote control through the RS 232 port or Ethernet:

- Tolerance limits , dimension of the master piece
- Calculation of the dimension from probes
- Calibration mode and calibration checking
- Duration of validity of the calibration
- Storage of over/under tolerance limits
- Keyboard locking
- Measuring mode (maxi-mini, maxi, mini, average, median).
- Display resolution (2 to 4 decimals)
- Metric or imperial measurements (mm or inches)
- Temporary measurement stop
- Choice between 8 measurement configurations (8 characteristics)
- Sorting of the dimension up to 8 classes
- Automatic change of measurement characteristic by moving a probe
- Measurement on a «V type» fixture (calibration with a min and max master part)

Measurement modes

6 measurement modes :

- Direct measurement : The displayed value is the measured value
- Minimum : The displayed value is the minimum value recorded from the beginning of the measurement.
- Maximum : The displayed value is the maximum value recorded from the beginning of the measurement.
- Average : The displayed value is the median or the average value from the beginning of the measurement.
- Difference : The displayed value is the difference between the maximum and the minimum values from the beginning of the measurement.
- On the fly measurement : Fast measurement by searching the maximum value of the parts moving below the probe

Compatible probes

One of the advantage of the Monocote is its compatibility with different technologies of probe :

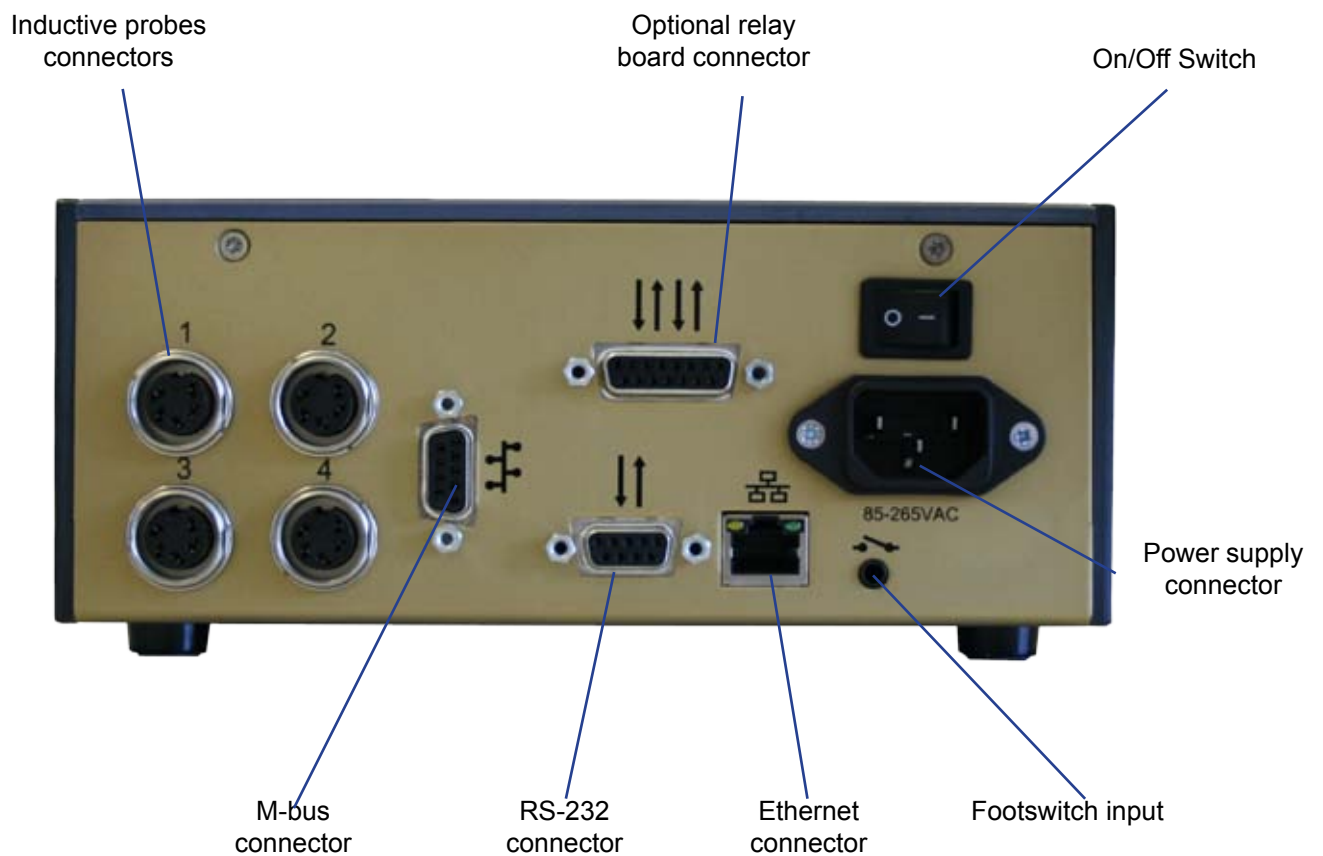
- Inductive (Metro, Mahr, Tesa compatible etc...)
- Incremental linear encoders (Metro, Heidenhain)
- Digital (Solartron Orbit)

Display units

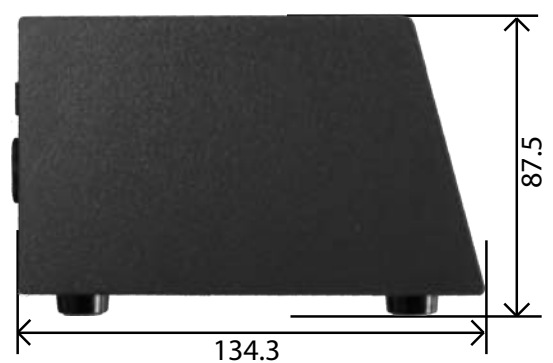
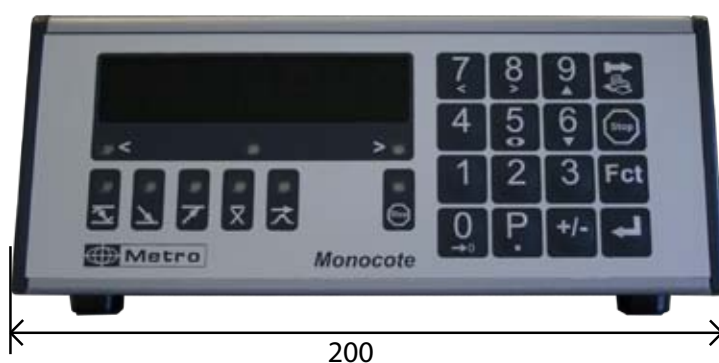
Monocote

Rear view example

Several versions for different technologies of probes are available. The picture below shows of rear view with connection facilities for 4 inductive probes and 1 M-bus extension.



Mechanical dimensions



Display units

Monocote

Communication Interfaces

- RS 232

A serial RS232 interface enables the measurement reading and to download all the parameters of the Monocote with an ASCII or Modbus RTU protocols.

- Ethernet

An Ethernet port enables the measurement reading and to download all the parameters of the Monocote with an ASCII or Modbus TCP protocols.

Optional boards

- Relay board

Two relays give the state of the tolerance indicator lights. The functions can be selected by remote control during dynamic measurements thanks to 4 optocoupled inputs.

- Multifunction board

Two relays give the state of the tolerance indicator lights. Two analog outputs give a 0-10 Volts and 4-20 mA signal which indicates the characteristic position compared with two programmable thresholds. The functions can be selected by remote control during dynamic measurements thanks to 4 optocoupled inputs. 1 to 8 programmable sorting classes can be defined with 8 optocoupled outputs.

Product references

<i>Item</i>	<i>Reference</i>
Monocote for 4 inductive probes and M-bus network extension	24100
Monocote for 4 digital probes	24110
Monocote for 2 Heidenhain linear encoders (TTL / SubD15) and M-Bus extension	24104
Monocote for 2 Heidenhain linear encoders (11µA & 1VPP / SubD15) and M-Bus extension	24106
Optional relay board	24136
Optional multifunction board	24146

Display units

MicroVision

The display unit MicroVision is designed to make dimensional control from 1 to 31 probes.

The MicroVision is universal (different probe's technologies supported) and powerful (up the 50 measurement characteristics, etc). Thanks to its intuitive menus and its general simplicity the MicroVision is a device that will be immediately adopted by every operator.



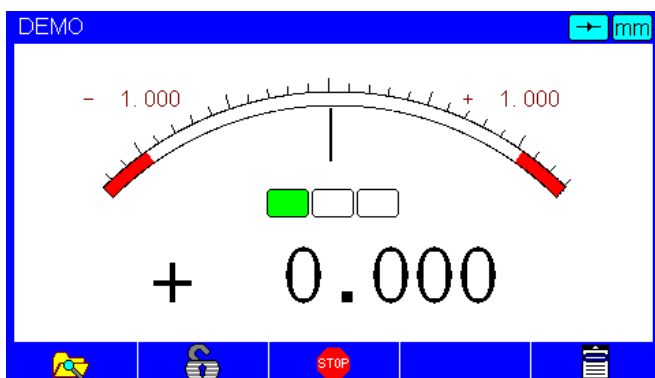
Display units

MicroVision

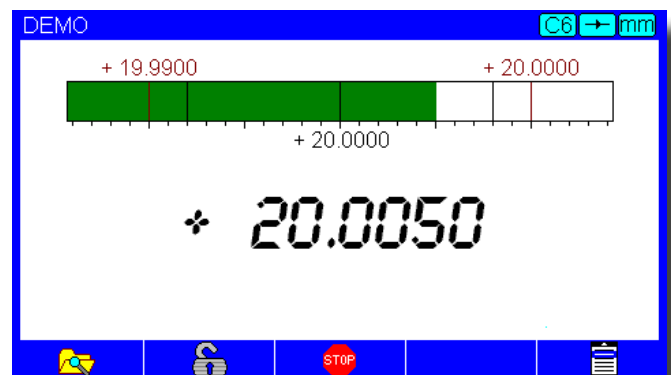
Display

The MicroVision is equipped with a 4.3" display which allows an easy configuration with its user friendly interface.

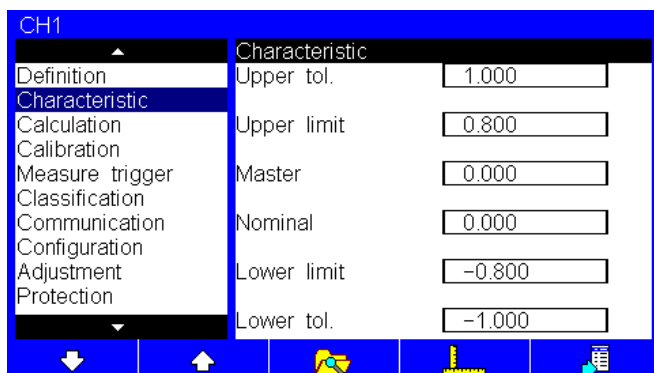
Measurements are displayed with a numerical value and with 2 types of indicators (needle or horizontal bargraph). 3 coloured indicators and an analogue display indicates the measurement against the tolerances limits.



Needle indicator



Bargraph indicator



The screen displays the configuration menu for CH1. The menu items are: Definition, Characteristic, Calculation, Calibration, Measure trigger, Classification, Communication, Configuration, Adjustment, and Protection. The Characteristic menu is expanded, showing the following settings:

Characteristic	Value
Upper tol.	1.000
Upper limit	0.800
Master	0.000
Nominal	0.000
Lower limit	-0.800
Lower tol.	-1.000

Configuration screen



The screen displays the measurement catalogue. It shows a list of functions (1:Copy, 2:Paste, 3:Delete) and a list of explorers (01:CH1, 02:CH2, 03:, 04:, 05:, 06:, 07:, 08:, 09:, 10:). The screen also shows a green indicator light and a red STOP button.

Measurement catalogue

Compatible probes

One of the advantage of the Microvision is its compatibility with different technologies of probe :

- Inductive (Metro, Tesa compatible, Mahr)
- Incremental linear encoders (Metro, Heidenhain)
- Digital (Solartron Orbit)
- Capacitive (Sylvac) with M-Bus

A M-Bus connector allows to increase the number of inputs and to mix different technologies of probes.

Display units

MicroVision

Functions

Many functions can be selected with the keyboard :

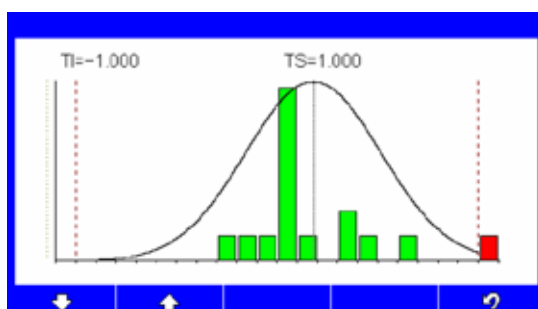
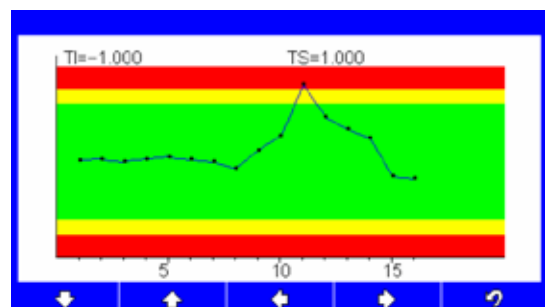
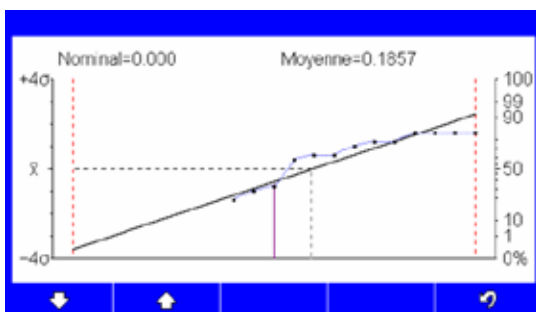
- Nominal dimension, tolerance limits , dimension of the master piece
- Calculation formula
- Calibration mode and calibration checking in 1 or 2 points
- Duration of the calibration validity
- Keyboard locking
- Measuring mode (maxi-mini, maxi, mini, average, median).
- Display resolution (2 to 5 decimals)
- Metric or imperial measurements (mm or inches)
- Temporary measurement stop
- Choice between 50 measurement configurations (50 characteristics)
- Sorting of the dimension up to 8 classes
- Automatic switch of measurement characteristic by moving a probe
- Measurement on a «V type» setup (calibration with a min and max master part)
- Different languages installed. New languages can be installed upon request

Statistical functions

An optional function allows to store up to 10'000 measures by a keyboard or a footswitch action.

Data saved can then be processed locally and several statistical screen are available:

- Histogram with Gauss curve
- Evolution of the characteristic compared with the tolerance limits.
- Q-Q plot
- Results (min, max,, standard deviation, Cm, Cmk ...)

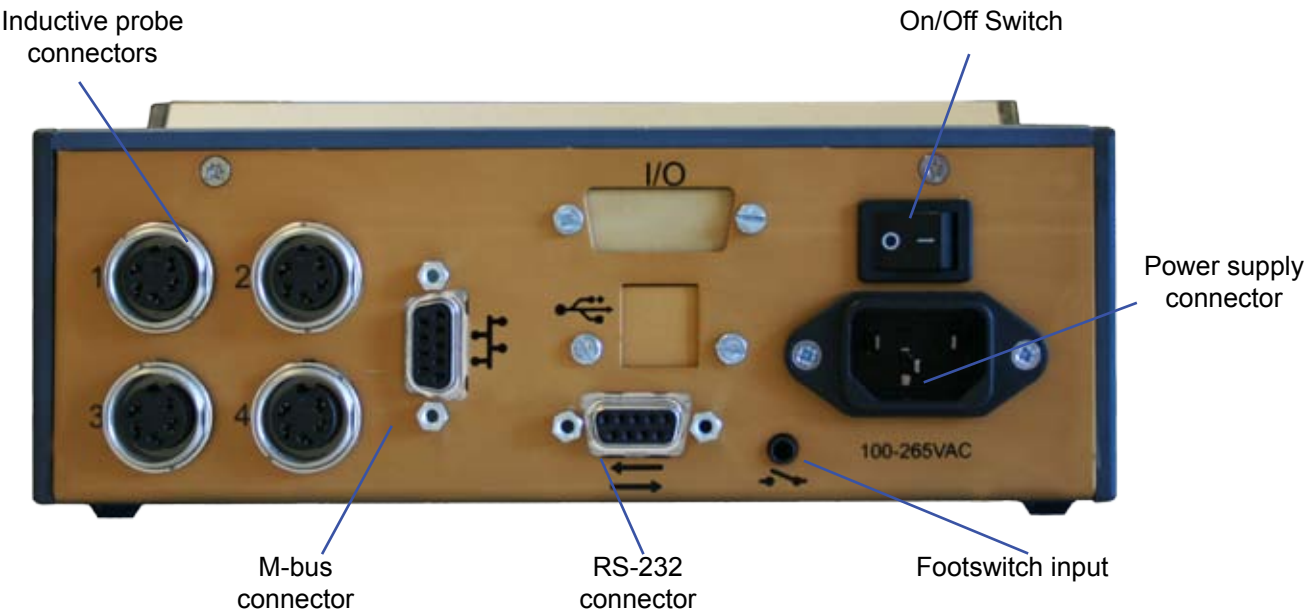


Display units

MicroVision

Rear view example

Several versions for different technologies of probes are available. The picture below is an example of rear view with the connection facility for 4 inductive probes and 1 M-bus extension.



Mechanical dimensions



Product references

Item	Reference
MicroVision for 2 Solartron Orbit probes (extensible to 31)	25000
MicroVision for 4 inductive probes and M-bus extension	25010
MicroVision for 2 Heidenhain linear encoders (TTL / SubD15) and M-Bus extension	25020
MicroVision for 2 Heidenhain linear encoders (11µA & 1VPP / SubD15) and M-Bus extension	25060
Optionnal I/O board	25100

Display units

Multicote

A multi-gauging display unit :

The electronic gauging unit Multicote allows to make multidimensional control from 1 to 8 inductive or digital probes. Dimensions can be measured and displayed simultaneously or shared out on several stations. Up to 8 measurement characteristics can be stored in its memory.

The Multicote is fitted with an analogue 7 segment display that shows the active characteristic.

2 LEDs indicate the part status and 3 LEDs by characteristic indicate the position of the dimension against the tolerance limits



Display units

Multicote

Functions

Many functions can be selected with the keyboard or by remote control through the RS232 port or Ethernet:

- Tolerance limits , dimension of the master piece
- Calculation of the dimension from probes
- Calibration mode and calibration checking
- Duration of validity of the calibration
- Gears measuring mode (fi", Fi", SR...)
- Keyboard locking
- Measuring mode (maxi-mini, maxi, mini, average, median).
- Display resolution (2 to 4 decimals)
- Metric or imperial measurements (mm or inches)
- Temporary measurement stop
- Choice between 8 measurement configurations (8 characteristics)

Measurement modes

It is possible to select one of the following 6 measurement modes :

- Direct measurement : The displayed value is the measured value
- Minimum : The displayed value is the minimum value recorded from the beginning of the measurement.
- Maximum : The displayed value is the maximum value recorded from the beginning of the measurement.
- Average : The displayed value is the median or the average value from the beginning of the measurement.
- Difference : The displayed value is the difference between the maximum and the minimum values from the beginning of the measurement.
- Gear control

Compatible probes

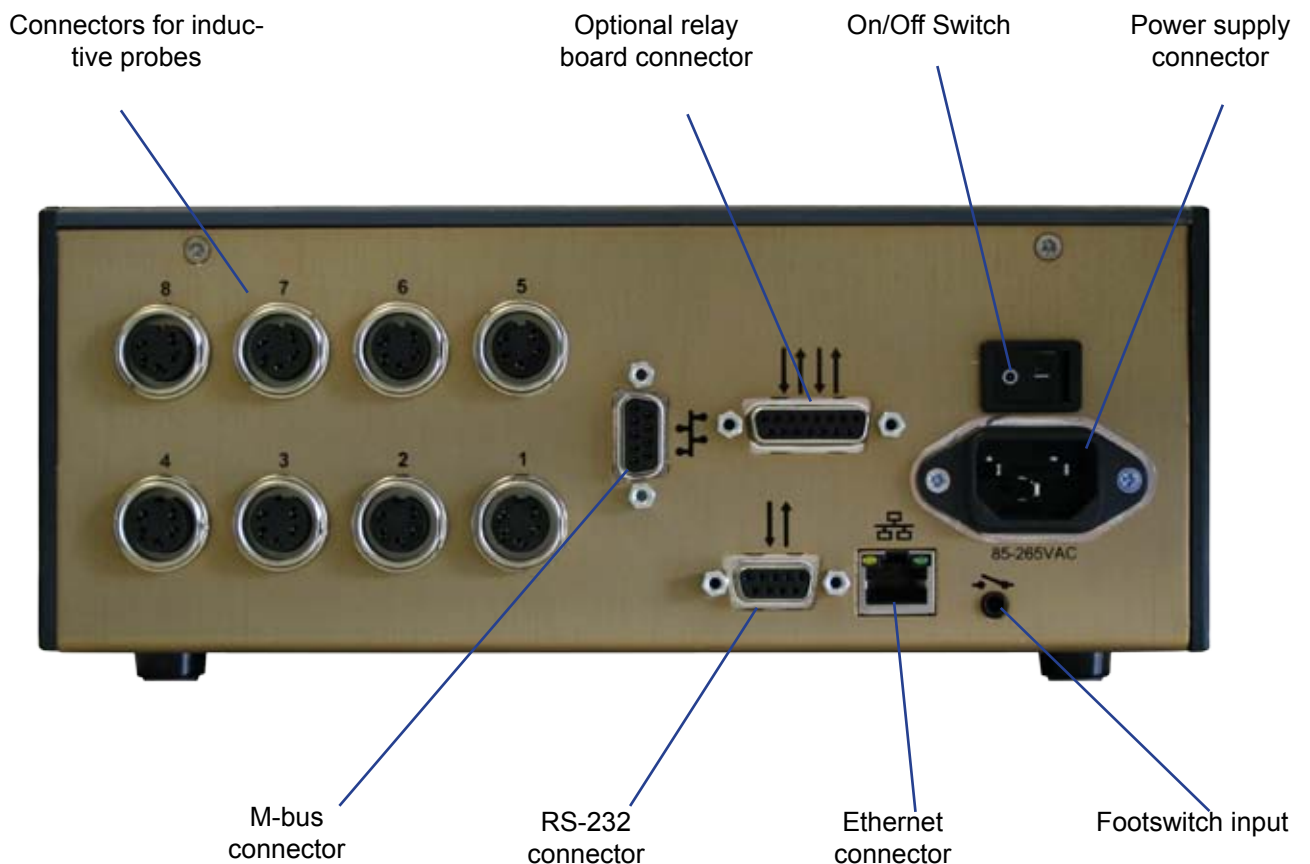
The Multicote is designed for the following probes technologies:

- Inductives (Metro, Tesa compatible)
- Solartron Orbit

Display units

Multicote

Rear view



Mechanical dimensions



Display units

Multicote

Communication Interfaces

- RS 232

A serial RS232 interface enables the measurement reading and to download all the parameters of the Monocote with an ASCII or Modbus RTU protocols.

- Ethernet

An Ethernet port enables the measurement reading and to download all the parameters of the Monocote with an ASCII or Modbus TCP protocols.

Optional boards

- Relay board

Two relays give the state of the tolerance indicator lights. The functions can be selected by remote control during dynamic measurements thanks to 4 optocoupled inputs.

- Multifunction board

Two relays give the state of the tolerance indicator lights. Two analog outputs give a 0-10 Volts and 4-20 mA signal which indicates the characteristic position compared with two programmable thresholds. The functions can be selected by remote control during dynamic measurements thanks to 4 optocoupled inputs. 1 to 8 programmable sorting classes can be defined with 8 optocoupled outputs.

References

Item	Reference
Multicote for 8 inductive probes and M-bus extension	40500
Optional relay board	24135
Optional multifunction board	24145

Display units

MultiVision

The multi-gauging unit MultiVision is designed to make dimensional control from 1 to 31 probes.

The MultiVision is universal (different probe's technologies supported) and powerful (up to 10 measurement characteristics, trigonometric calculation, up to 8 characteristics simultaneously...)

Thanks to a user friendly principle the MultiVision is a device that will be immediately adopted by every operator.



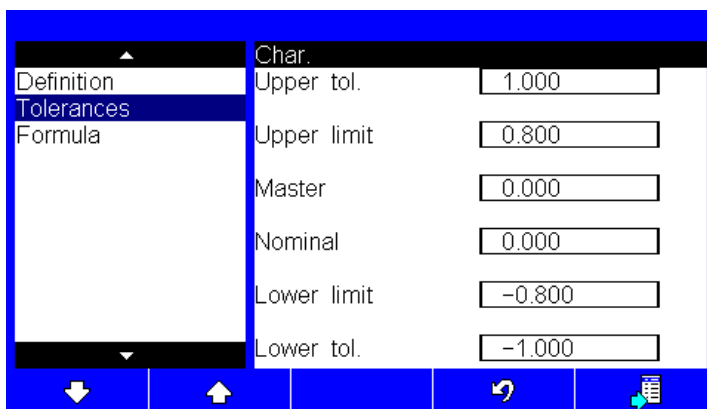
Display units

MultiVision

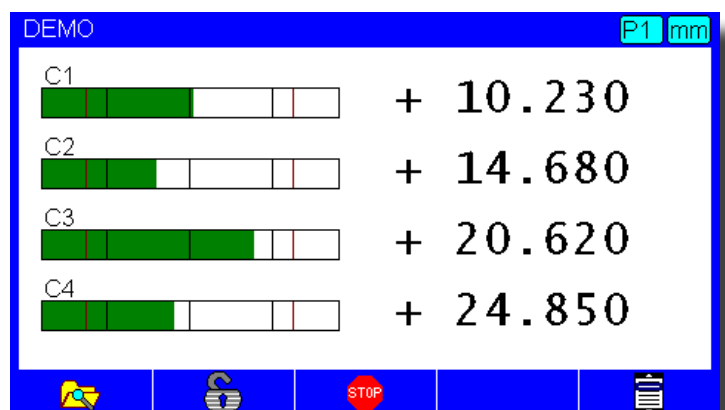
Display

The MicroVision is equipped with a 4.3" display which allows an easy configuration with its user friendly interface.

Measurements are displayed with a numerical value and with up to 8 coloured horizontal bargraphs that indicates the measurement against the tolerances limits.



Configuration screen



Measurement screen

Compatible probes

One of the advantage of the Microvision is its compatibility with different technologies of probe :

- Inductive (Metro, Tesa compatible, Mahr)
- Incremental linear encoders (Metro, Heindenhain)
- Digital (Solartron Orbit)
- Capacitive (Sylvac) with M-Bus

It is possible to connect M-Bus modules that allows to increase the inputs numbers and to mix different technologies of probes.

Display units

MultiVision

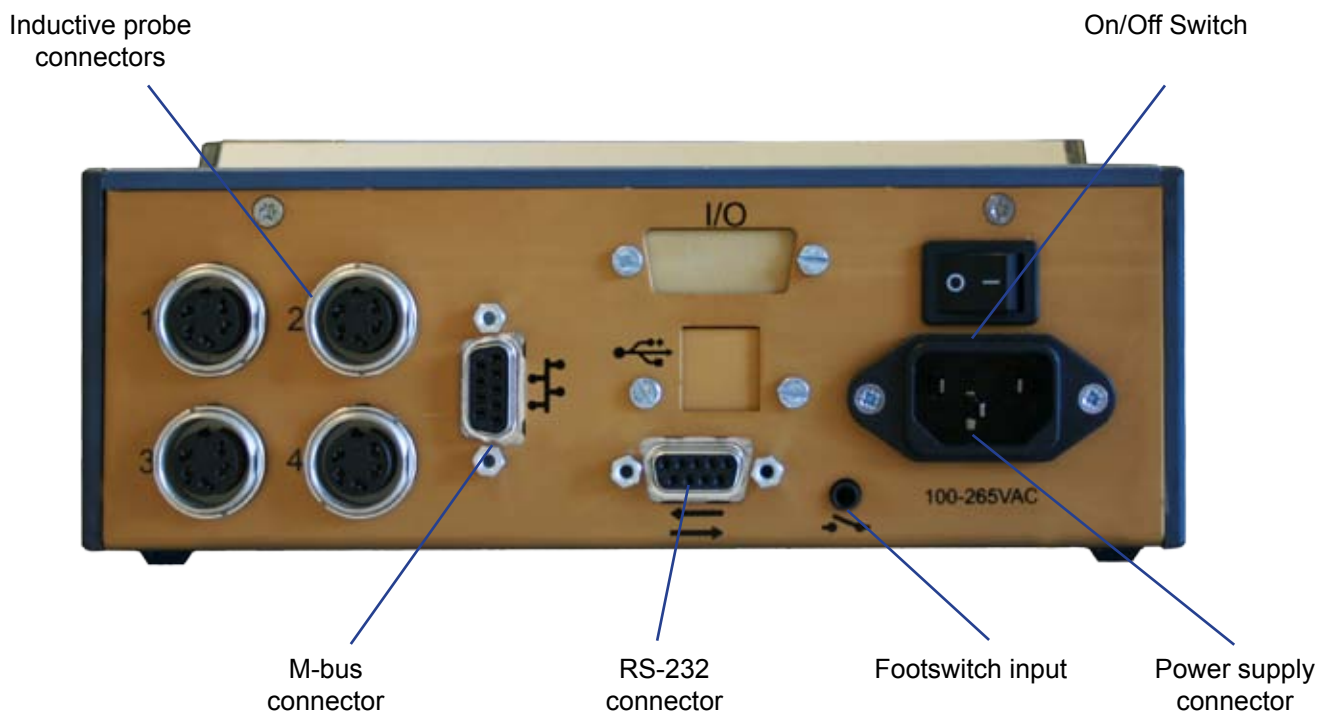
Functions

Many functions can be selected with the keyboard or by remote control through the RS 232 port:

- Nominal dimension, tolerance limits , dimension of the master part (reference piece)
- Measurement and display of 8 measurement characteristics simultaneously
- Calculation formula
- Calibration mode and calibration checking
- Duration of validity of the calibration
- Keyboard locking
- Measuring mode (maxi-mini, maxi, mini, average, median).
- Display resolution (2 to 5 decimals)
- Metric or imperial measurements (mm or inches)
- Measurement hold
- Choice between 10 measurement configurations (10 characteristics) - 40 in option
- Sorting of the dimension up to 8 classes
- Automatic change of measurement characteristic by moving a probe
- Measurement on a «V type» setup (calibration with a min and max master part)
- Different languages installed. New languages can be installed upon request

Rear view example

Several versions for different technologies of probes are available. The picture below shows of rear view with connection facilities for 4 inductive probes and 1 M-bus extension.



Display units

MultiVision

Mechanical dimensions



Product references

Item	Reference
MultiVision for 2 M-Bus probes(extensible to 31)	25200
MultiVision for 4 inductive probes and M-bus extension	25210
MultiVision for 2 Heidenhain linear encoders (TTL / SubD15) and M-Bus extension	25220
MultiVision for 2 Heidenhain linear encoders (11µA & 1VPP / SubD15) and M-Bus extension	25260
Optional I/O board	25100

Display units

M400

The M400 is designed to make dimensional control from 1 to 99 probes or measuring instruments. The M400 is universal (different probe technologies accepted) and powerful (up to 32 characteristics displayed simultaneously, trigonometric functions, SPC functions, PLC functions...)

The touch screen display makes for a very friendly interface. Even if the M400 is a very powerful device, it is very easy to use.

Its enclosure is machined in a solid aluminium block and offers an incomparable robustness, even when used in the most severe industrial environments.

The M400 front face is covered by an integral polyester sheet that ensures protection against liquid projections like oil. Connectors are oriented to the bottom limiting liquids infiltrations.

The M400 can be attached on a table with 4 M5 screws or can be mounted on a panel.

7" touch screen colour display



Solid aluminium enclosure

Adjustable stand (removable for panel mounting)

Display units

M400

Touch screen display



Icon desktop for configuration of the device



Configuration window



Measuring screen with manual multi-gauging mode



Virtual keyboard



Measuring screen with classical multi-gauging mode

The M400 display unit is fitted with a 7" colour display and touch screen functions. The user friendly interface allows an easy configuration thanks to its icon desktop, its windows and its drop down menus. There are 3 display modes available, up to 32 measurement characteristics can be displayed simultaneously.

Virtual keyboards (alphanumeric, numerical and with trigonometric functions) allows entering part's names, IP addresses, calculation formulas. An automatic system checks to see if data is entered correctly to prevent any typos.

The M400 runs on our own Operating System especially designed for dimensional measurement. This feature allows exceptional performances compared to other systems running on a standard OS.

Display units

M400

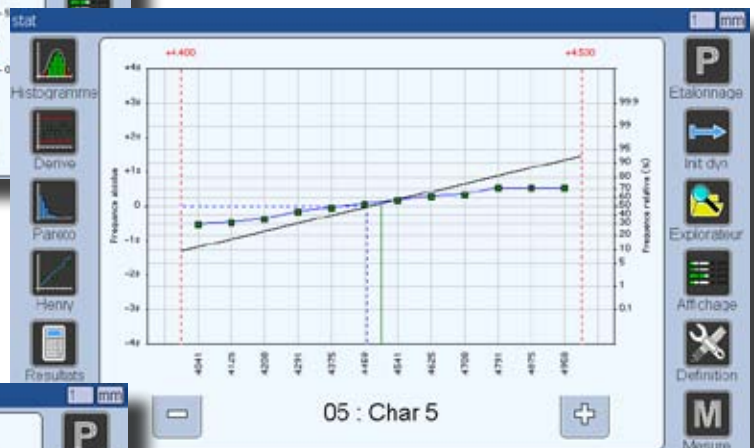
SPC

The M400 is able to store up to 30'000 measurements by part reference and up to 128 part references can be memorized.

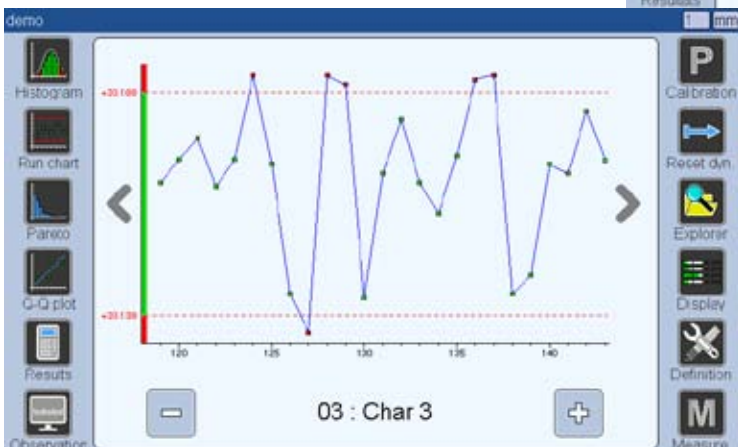
The data collected can then be used locally on the M400 for SPC analysis. The following screens are for example available :



Histograms with Gauss curve



Q-Q Plot



Run Chart



Pareto Analysis

Display units

M400

Modularity and compatibility

One advantage of the M400 is its compatibility with different technologies of probes

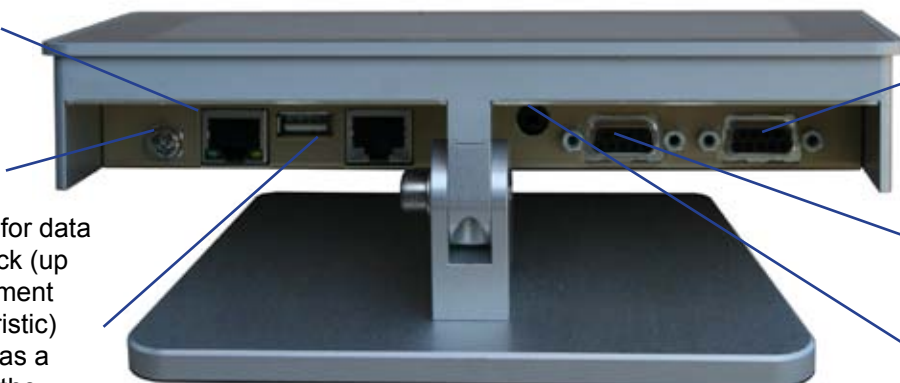
Probes are connected on separate modules through the M-bus network. This modular configuration offers the following advantages :

- Flexibility of the probes number (up to 99)
- Possibility to use simultaneously different technologies of probes :
 - Inductive (Metro, Tesa compatible, Mahr etc)
 - Incremental linear encoders (Metro, Heidenhain, Magnescale, Mitutoyo)
 - Digital (Solartron Orbit)
 - Capacitive (Sylvac)
- Any type of measuring instruments : Caliper, digital indicator, micrometer, weight scale etc...
- The M400 display unit can be installed far from the probes. Extension modules are connected by only one cable to the M400 without any risk of signal deterioration.



Connection possibilities and communication

- Ethernet with ASCII or Modbus TCP protocols
- 12-30 VDC power supply with 100/235VAC adapter
- 1 USB host port for data export to a USB stick (up to 30'000 measurement stored by characteristic) Can be configured as a USB device to use the M400 as a virtual keyboard on a computer.



- RS232 with ASCII or Modbus RTU protocols
- 1 M-bus port for connexion of the extension modules and I/O.
- 1 multifunction footswitch input

Display units

M400

Automatism

The 8 I/O M-bus module enables to interface automatism devices to the M400 thanks to its 8 optocoupled I/O.



Virtual keyboard configuration



The M400 hardware can be configured as a USB device. When the M400 is connected to a computer, it is automatically detected as an additional keyboard.

It means that when the operator transfers the measurement, the values appears on the PC like if they would have been typed with a keyboard.

No need to have a special software or any specific driver.

Single characteristic display

The M400 is also able to display only one characteristic on the screen with a needle indicator allowing an easy reading of the measurement. A useful colour indicator shows if the part is good or not. On this mode it is still possible to use all the function of the M400 like the automatic characteristic switch by a probe movement.



Display units

M400

Mounting kit for M-Bus modules

In option, the M400 can be delivered with a mounting kit for M-Bus modules.

This mounting system is composed by a fixed module and a DIN rail fixed on the M400 frame.

The fixed M-Bus module is directly connected to the mother board of the M400. With this configuration, it is therefore not necessary to use the M-Bus cable to link the first module to the display.

M-Bus modules can then be inserted on the DIN rail to be connected to the fixed module.

The picture below shows the installation of 2 M-Bus modules : (2 Sylvac inputs et 2 Heidenhain inputs).

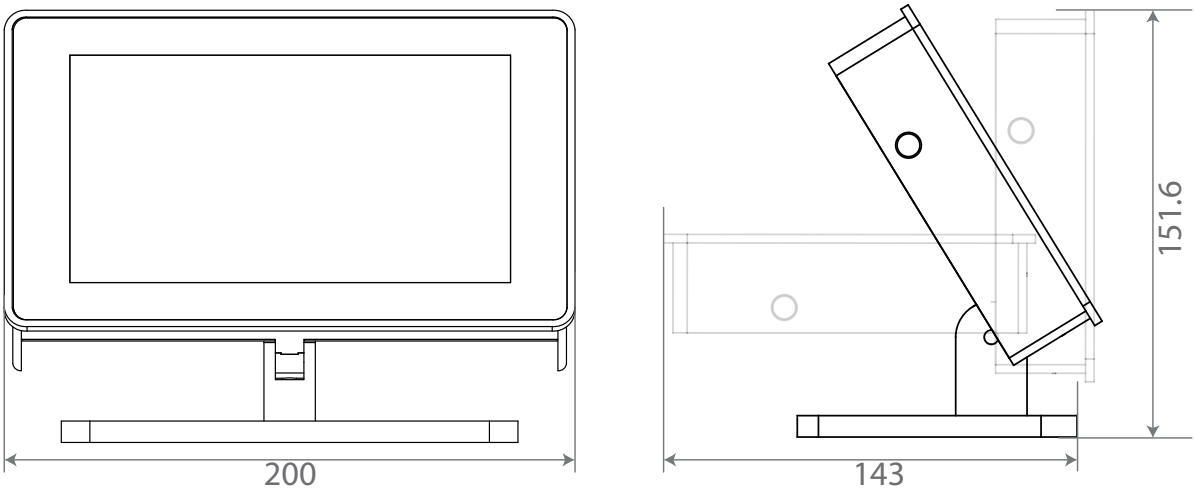


Installation of the first module

Installation of the second module

Connection

Mechanical dimensions



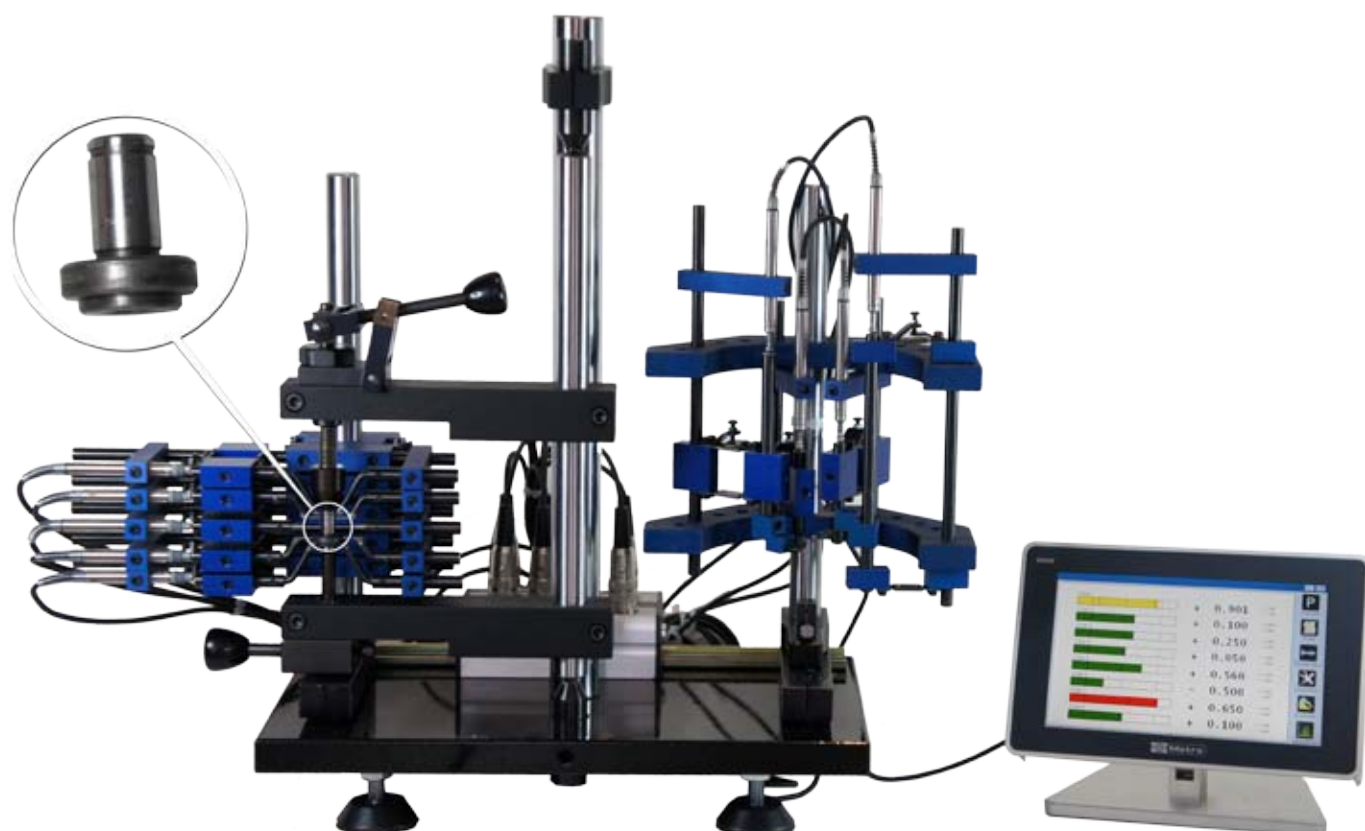
It is possible to attach the M400 with 4 M5 screws.

In option, the M400 can be delivered without its stand for being installed on a panel.

Display units

M400

Example of applications



Many companies are using multi-gauging fixtures like on the above picture. Most companies use digital or dial indicator that causes risks miscalculation and loss of time.

The M400 is highly adapted for being used with this kind of fixture because it displays clearly and quickly the results without the possibility of miscalculation. In the case of measurement in several steps, the M400 detects automatically which step is active and displays only the characteristics that are currently measured. The bargraph size adapts automatically depending on the characteristics number and up to 32 characteristics can be read and processed simultaneously. Metro proposes Taylor made solutions including fixture, display and probes.

For quotation, please send us your part drawing.

Item references

Description	Reference
M400 with USB host port for USB stick connection	45500
M400 with USB device configuration for the virtual keyboard mode	45501
Mounting kit for M-Bus modules on the rear face of the M400	45510
Option M400 only (without the support)	45511
Optional accessory for panel mounting	45512
Modules M-Bus : see next chapter	

M-Bus network

Whatever the probe you own, you can connect it to the Metro's display units and enjoy high quality performances.

Continuously improved and developed since 1996, Metro' M-bus allows to connect numerous gauging probes and instruments from various brands and technologies to the Metro display units.



M-Bus network

Presentation

Continuously improved and developed since 1996, Metro' M-bus allows to connect numerous gauging probes and instruments from various brands and technologies to the Metro display units.

It allows the user to keep the probes he already owns and improves function and performances by using a display from Metro.

The M-Bus is mechanically and electrically compatible with the Solartron Orbit bus.

The M-bus is based on a RS485 link that gives the possibility to have important distances between the displays and the transducers without loss of signal.



A wide range of connection possibilities

The module's enclosures and electronic boards have been redesigned in 2012 to offer better performance to users.

Today the M-Bus modules are made from an anodised extruded aluminium profile that can be clipped on a standard DIN rail. It is highly adapted for a severe industrial environment.

Most of the Metro display units are fitted with a M-Bus connector that allows to connect many types of probes or instruments.

With the M-Bus it is possible to mix different probe technologies on the same display.

M-Bus network

Conditioners



MB-8i : connection of inductive probes

Module to connect 8 inductive probes. Several models are available allowing the user to connect different brands of inductive gauging probes to the Metro display units:

- Metro, Tesa, Peter Hirt...



- 8 inputs
- 16 bits resolution
- 450 reads/sec
- Possibility to linearize the probes (Metro only)

MB-4D & 8D: connection of 4 or 8 measuring instruments

This module allows to plug measuring instruments (comparator, caliper, micrometer, weight scale etc...) from any brand (Mitutoyo, Mahr, Sylvac, Tesa...) to a display unit from Metro.



- 4 or 8 Digimatic inputs
- Compatible with Mitutoyo (direct), Mahr (with 16EXD cable), all the Tesa and Sylvac range, and with the instruments having a RS232 output through specific cables from Metro

MB-2S : connection of Heidenhain probes or encoders with a sinewave output

Module to connect 2 linear or rotary encoders from Heidenhain. The probes can either have a 11µA, or 1Vpp output signal.



- 2 inputs with Heidenhain pinout
- Max input signal 320kHz (Sinus)
- Compatible with 11µA or 1Vpp probes
- Manages the reference mark
- 32 bits counters

MB-2T : connection of Heidenhain probes or encoders with TTL signal

Module to connect linear or rotary encoders from Heidenhain with TTL output signal.



- 2 inputs with Heidenhain pinout
- Max input signal 12.5MHz (TTL)
- Compatible with TTL
- Manages the reference mark
- 32 bits counters

MB-2M & 4M : connection of Magnescale (ex Sony) probes

Module to connect 2 or 4 probes from Magnescale. The module is fitted with the lockable mini DIN connector that allow to plug directly the Magnescale probes without any adaptor.



- 2 or 4 inputs
- Compatible with the DK series
- Max input signal 12.5MHz
- 32 bits counter
- Manages the reference mark and error signal

M-Bus network

Conditioners

MB-2C & 4C : connection of 2 or 4 Sylvac probes

Module to connect 2 or 4 capacitive probes from Sylvac.



- 2 inputs with Sylvac connector
- Compatible with all the Sylvac range.

MB-2Y : connection of 2 Mitutoyo incremental probes

Module to connect 2 probes from Mitutoyo (LG series). The module is fitted with 2 Mitutoyo LG series connector (6 pins) that allow to plug directly your Mitutoyo probe without any adapter.



- 2 inputs with Mitutoyo LG series connector (6 pins)
- Max input signal 12.5MHz
- 32 bits counter

MB-IO : module with 8 optocoupled I/O

Allows to connect PLC peripherals to your M-Bus system.



- 8 optocoupled I/O
- 12-30VDC power supply for the outputs

MB-PS : Power supply module for M-Bus network

This module give additional power supply when the number of modules used together is excessive.

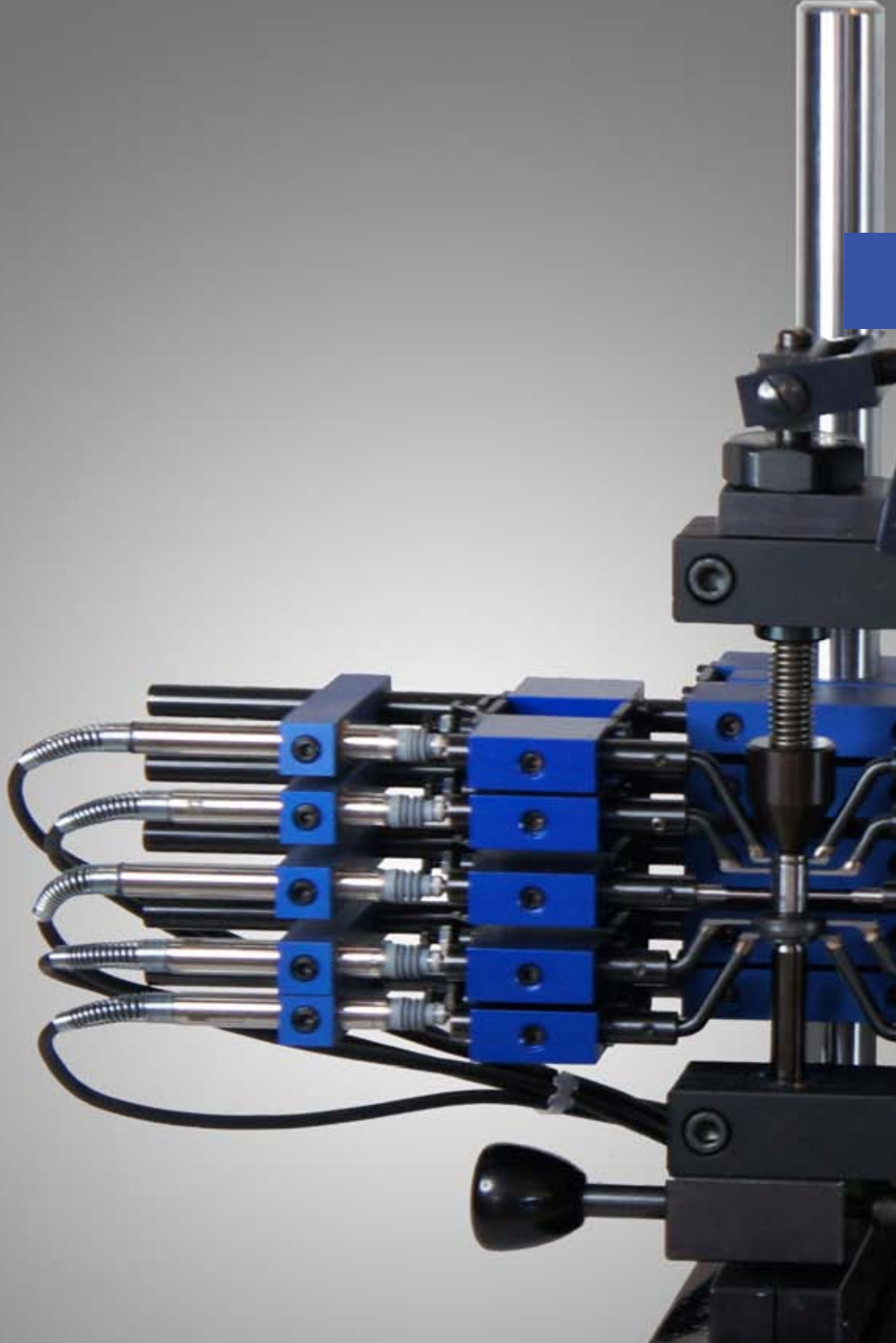


- 12-30VDC input
- 5VDC/3A output for M-Bus power supply
- The output is switched off when the M-Bus is disconnected

Item references

Item	Ref
MB-8i : connection of inductive gauging probes	MB-8i
MB-4D : connection of 4 measuring instruments	MB-4D
MB-8D: connection of 8 measuring instruments	MB-8D
MB-2S : connection of Heidenhain probes with a sinewave output	MB-2S
MB-2M : connection of 2 Magnescale (ex Sony) probes	MB-2M
MB-4M : connection of 4 Magnescale (ex Sony) probes	MB-4M
MB-2C : connection of 2 Sylvac capacitive probes	MB-2C
MB-4C : connection of 4 Sylvac capacitive probes	MB-4C
MB-PS : Power supply module for M-Bus network	MB-PS
MB-2T : connection of probes or encoders with a TTL output (Heidenhain pinout)	MB-2T
MB-2Y : connection of 2 Mitutoyo incremental probes	MB-2Y
MB-IO : module with 8 optocoupled IO	MB-IO

Gauging Fixtures

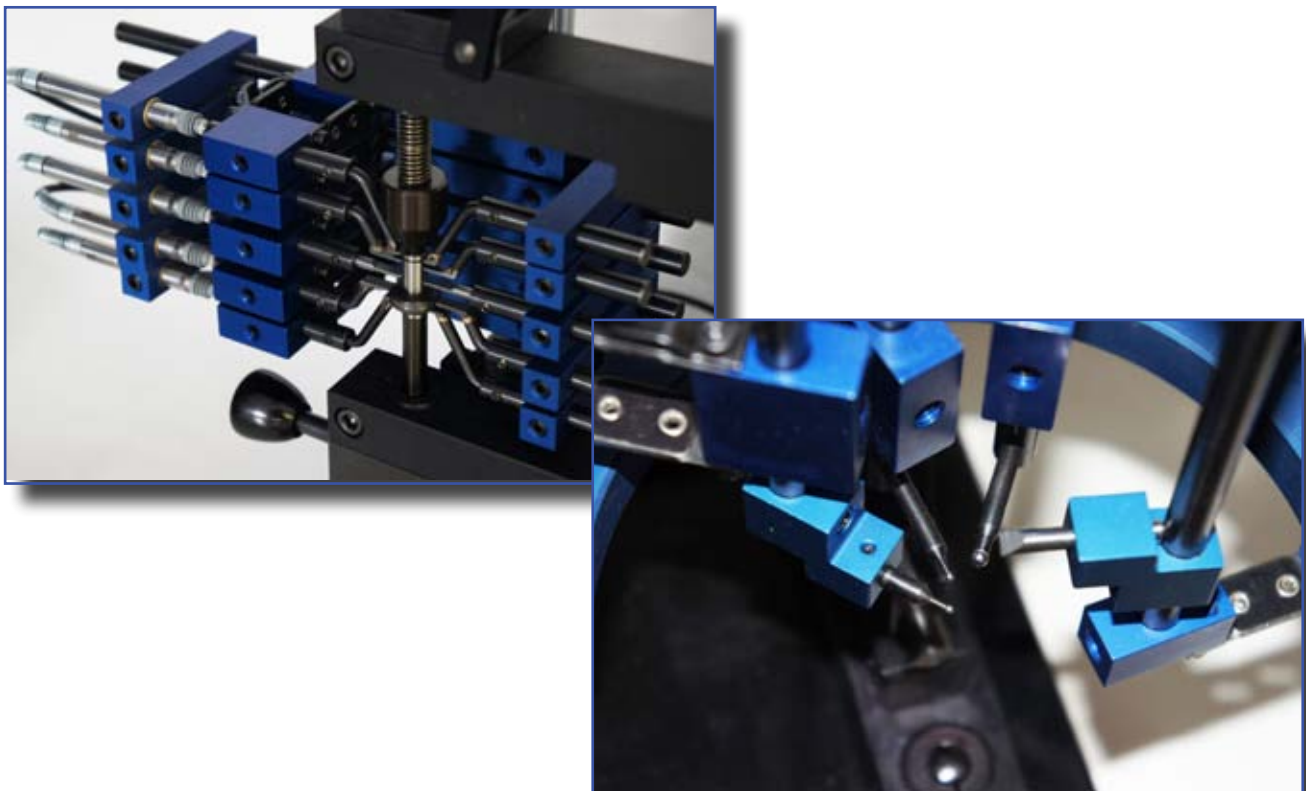


Fixtures

Multi-gauging stations

Metro proposes custom solutions for controlling complex cylindrical work parts.

The mechanical fixture is based on standard elements that allow reducing the cost of such a system. Measurement is done with inductive gauging probes (or other technologies) and the results are displayed on a M400 display unit. This allows not only to see instantaneously if the part is OK, but also allows you to send the result and information to a computer.



Customer's benefits

Why do the multi gauging stations from Metro reduces the risk of error?

Because the measurements are not dependant on the operator. Many companies perform their controls with hand tools like calipers that increase risk of miscalculation and loss of time.

Why do the multi gauging stations from Metro increase your productivity?

Because in few seconds, our system is able to:

- measure up to 32 characteristics simultaneously
- display the result GO/NO GO for each characteristics and for the complete part
- save the measurements with advanced statistics functions
- communicate all this information to an external system like a computer.

Everything with a great reliability.

Fixtures

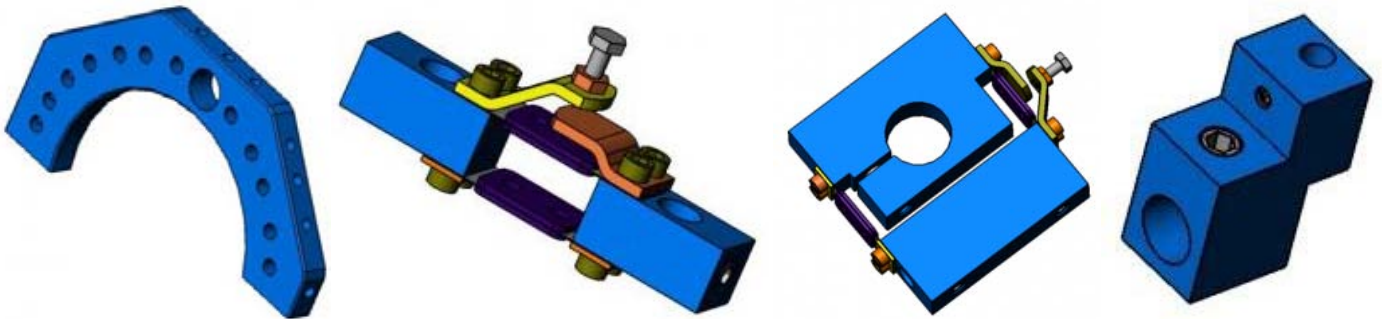
Multi-gauging stations

A customised gauging station based on standard elements

The multi-gauging fixture is made with standard elements that allows to:

- reduce the price of the system
- reduce the engineering and delivery time
- re-use elements on others fixtures when a part is finished to produce
- replace easily elements in case of damage

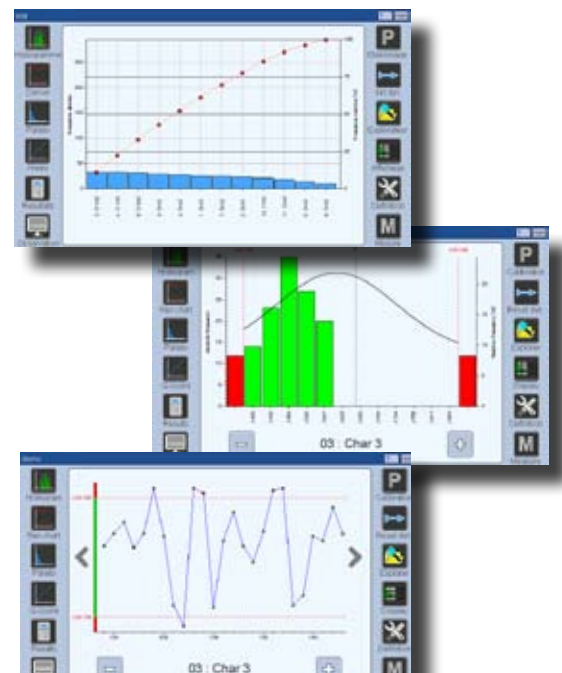
Below are few examples of standard elements. For complete list or quotation for a specific part, please contact us.



Display

The multi-gauging station can be delivered with a M400 display unit that allow to read the probes, displays and send the results to an external system like a PC.

The M400 is highly adapted for being used with this kind of fixture because it displays clearly and quickly the results without the possibility of miscalculation. In the case of measurement in several steps, the M400 detects automatically which step is active and displays only the characteristics that are currently measured. The bargraph size adapts automatically depending on the characteristics number and up to 32 characteristics can be read and processed simultaneously.



Gauging Probes

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Probes

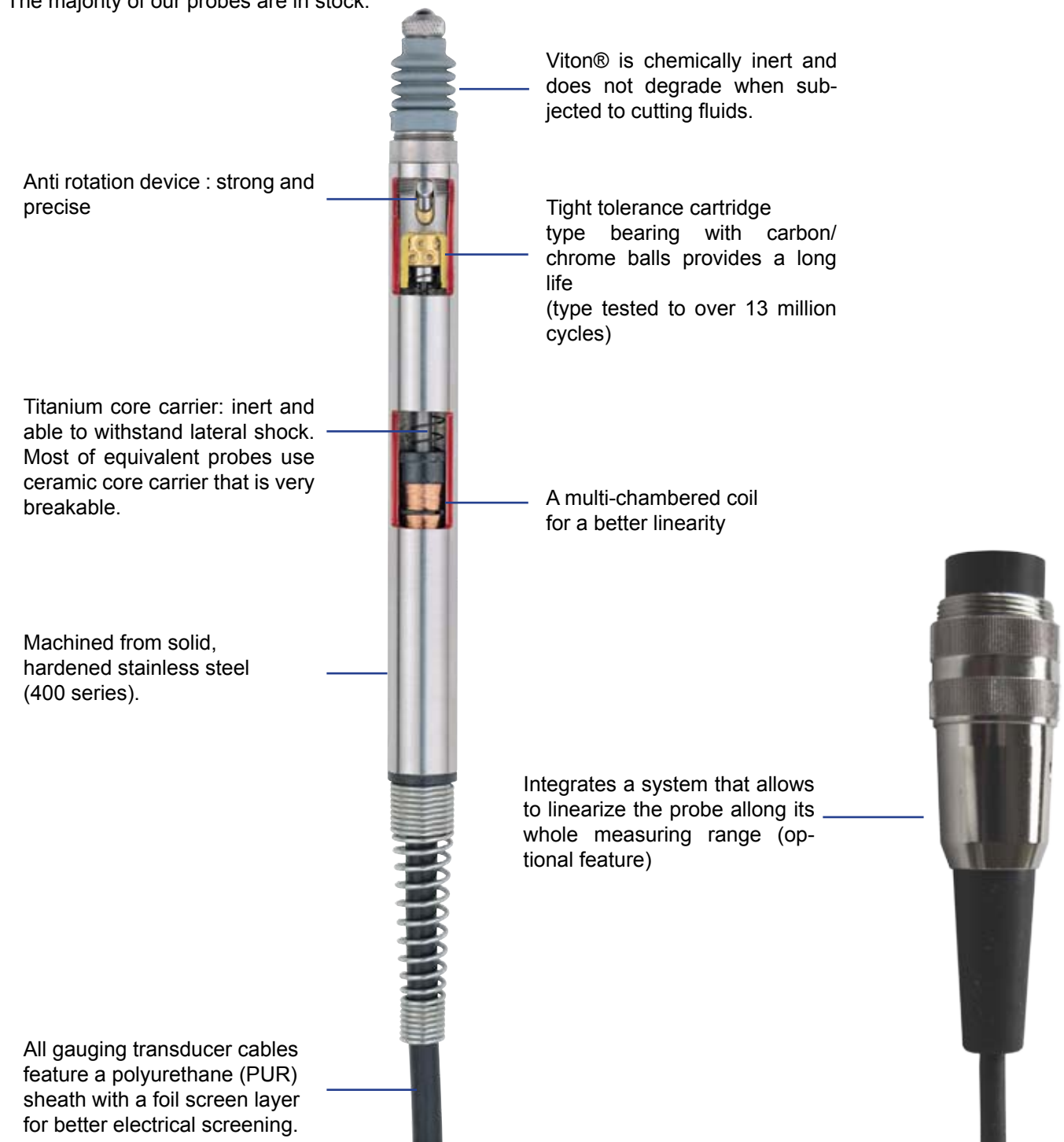
Analogue Gauging

The Half Bridge inductive probes technology has been known for over 100 years and offers a wide range of products covering most of the needs in dimensional control.

Materials used to manufacture our probes leads to unbeatable robustness and longevity.

Probes are either spring pushed or pneumatically actuated with Feather Touch (low tip force) and protected cable (stainless steel sheath) variants available.

The majority of our probes are in stock.



Probes

Analogue Gauging

Spring Push or Pneumatic actuation

In a conventional 'pencil' probe the tip pushes outwards under the influence of an internal spring. When installed in a fixture the pneumatic operation allows the number of moving parts in a fixture to be reduced, resulting in improved reliability and reduced fixture costs.

Feather Touch Probes

Feather Touch probes have been designed especially to gauge delicate surfaces such as car windscreens, LCD, pharmaceutical bottles, electro-mechanical components and plastic parts. Whereas a traditional probe exerts a tip force of approximately 0.7N, the Feather Touch exerts a mere 0.18N when used in the horizontal position. This reduction is achieved by replacing the naturally elastic traditional gaiter with a close tolerance gland. On pneumatic versions the air leakage through the gland is restricted to less than 2.5 millilitres per second at 1 bar to minimise the possibility of contamination to the surface being gauged. Despite the low volume of air flow the bearing within the probe is constantly purged, avoiding the build up of dust (use of filtered air is recommended).



Optional Protected cable

As an option we can deliver our probes ref M802 and M804 with a cable protected by a stainless steel sheath.

Environmental protection

Our probes are all fitted with Viton® gaiters to exclude moisture and dust.

Viton® is chemically inert and does not degrade when subjected to cutting fluids.

Probes with the Feather Touch option have glands instead of gaiters, and therefore should only be used in a dry environment.

All gauging transducer cables feature a 2m polyurethane (PUR) sheath with a foil screen layer for better electrical screening.

Linearization

Inductive probes have a linearity that is proportional with the tip displacement (about 1% of the displacement). Shorter is the displacement, higher is the precision.

Metro has developed a system allowing to correct the non-linearity of an inductive probe in order to get a linearity in the range of 0.3% of the displacement.

Probes

Analogue Gauging

Characteristics

Spring Push



Product type	M801	M802(A)	M804(A)	ME810	ME820
Measurement range (mm)	± 0.5	± 1	± 2	± 5	± 10
Pre-travel (mm)	0.15	0.15	0.15	0.15	0.15
Post- travel (mm)	0.35	0.35	0.85	0.85	0.85
Repeatability (µm)	<0.15	<0.15	<0.15	<0.15	<0.15
Accuracy (% of reading)	0.3%	0.3%	0.3%	0.3%	0.3%
Tip force (N): Standard	0.7	0.7	0.7	0.7	0.7
Tip force (N) : Feather touch (T suffix)	-	0.3	0.3	0.3	-
Operating Temp. °C	+5 +80	+5 +80	+5 +80	+5 +80	+5 +80
Gaiter	Viton ®	Viton ®	Viton ®	Viton ®	Viton ®
Cable	2m PUR	2m PUR	2m PUR	2m PUR	2m PUR
Body diameter	8h6	8h6	8h6	8h6	8h6
IP rating	IP65	IP65	IP65	IP65	IP65
Standard product ref	80001	80002	80003	80004	80005
Feather touch product ref (T suffix)	-	-	80023	-	-
Armoured product ref (A suffix)	-	80202	80203	-	-

Pneumatic



Product type	M802/P	M804/P	M810/P	ME810-2/P	ME820/P
Measurement range (mm)	± 1	± 2	± 5	± 1	± 10
Pre-travel (mm)	0.15	0.15	0.15	0.15	0.15
Post- travel (mm)	0.35	0.35	0.85	0.85	0.85
Repeatability (µm)	<0.15	<0.15	<0.15	<0.15	<0.15
Accuracy (% of reading)	0.3%	0.3%	0.3%	0.3%	0.3%
Tip force (N@0,4 / 1bar)	0.8 / 2.8	0.85 / 2.5	0.85 / 2.5	0.85 / 2.5	0.85 / 2.5
Operating Temp. °C	+5 +80	+5 +80	+5 +80	+5 +80	+5 +80
Gaiter	Viton ®	Viton ®	Viton ®	Viton ®	Viton ®
Cable	2m PUR	2m PUR	2m PUR	2m PUR	2m PUR
Body diameter	8h6	8h6	8h6	8h6	8h6
IP rating	IP65	IP65	IP65	IP65	IP65
Standard product ref	80102	80103	80104	80114	80105
Feather touch product ref (T suffix)	80122	80122	80124	-	80125

Probes

Analogue Gauging

Accessories and spare parts

Extension cables :

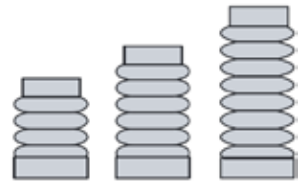
Cable extension can be used to increase the distance from the probe to the measuring device.

Ref 24032-2 (-5 or -10) for length of 2, 5 or 10m



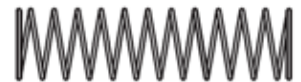
Gaiters :

Replacement gaiters for analogue and digital gauging probes and linear encoders. Gaiters are in Viton® that is chemically inert and does not degrade when subjected to cutting fluids.

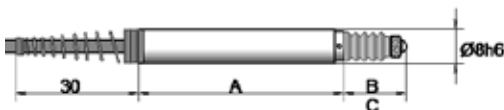
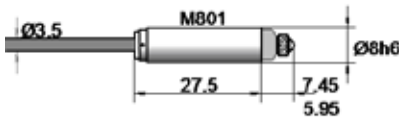


Springs :

Replacement springs for analogue gauging probes



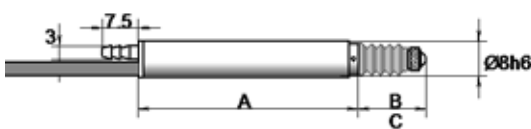
Mechanical dimensions



Standard Spring push

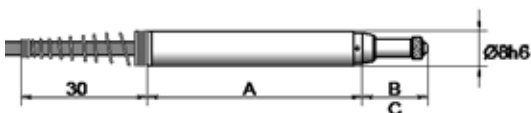
	M802 (A)	M804 (A)	M810	ME820
A	46	57	91	133
B	11.4	11.4	14.4	21.4
C	13.4	17.4	25.4	42.4

Standard Pneumatic



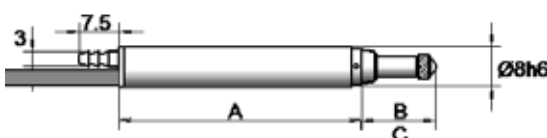
	M802P	M804P	M810P	ME810-2P	ME820P
A	55.5	77.5	102.5	102.5	136.5
B	10.9	11.4	14.4	14.4	21.5
C	13.9	17.4	25.4	25.4	42.5

Feather touch / spring push



	M802T	M804T	M810T	ME820T
A	46	68	91	134
B	11.4	11.4	14.4	12.9
C	13.9	17.4	25.4	33.9

Feather touch / pneumatic



	M802TP	M804TP	M810TP	ME820TP
A	55.5	77.5	102.5	136.5
B	10.9	11.4	14.4	21.5
C	13.9	17.4	25.4	42.5

Probes

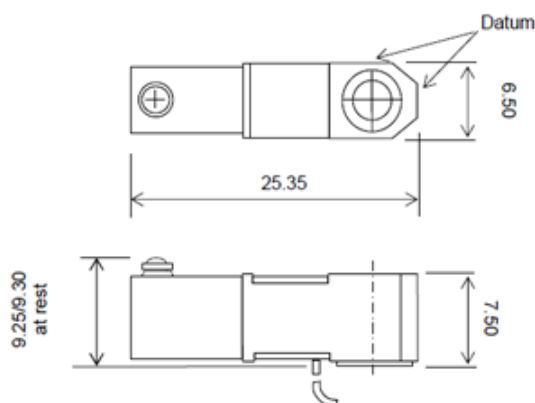
Analogue Gauging

Miniature inductive probes

The mini probe is a compact low profile transducer that is ideal for measurements in confined places such as bores. The transducer is based on a parallel spring structure that ensures that it provides excellent repeatability over a long working life, even when rotated in bores that have key slots or lubrication ports.

Technical characteristics

Mechanical travel (mm)	0.63 maximum
Measurement range (mm)	± 0.25
Start of measurement range	20 to 30 μm from limit stop
Repeatability (μm)	
- at 100 μm from limit stop	0,1 μm on axis and 0,1 μm cross axis
- at 250 μm from limit stop	0,25 μm on axis and 0,15 μm cross axis
- at 500 μm from limit stop	0,5 μm on axis and 0,25 μm cross axis
Resolution	0,01 μm with Metro conditioner
Tip force (N) @ center travel	0,7 N $\pm 25\%$
Temperature coefficient	0,08 $\mu\text{m}/^\circ\text{C}$
Mass	15g
Materials	Body : Chromium steel, Gaiter : Viton
Fixation	M3 screw(supplied)
IP rating	IP65



Dimensions

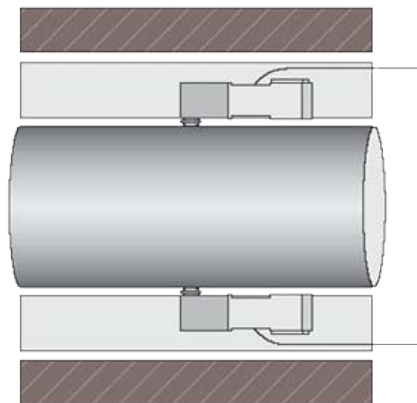


Fig. 1 – External diameter measurement in confined place

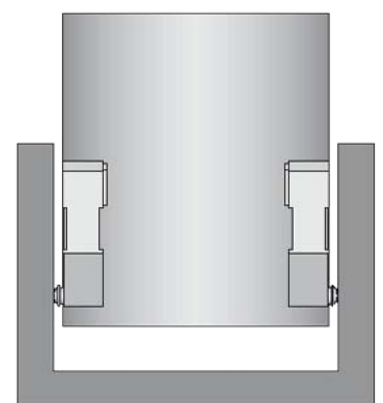


Fig. 2 – Internal diameter measurement

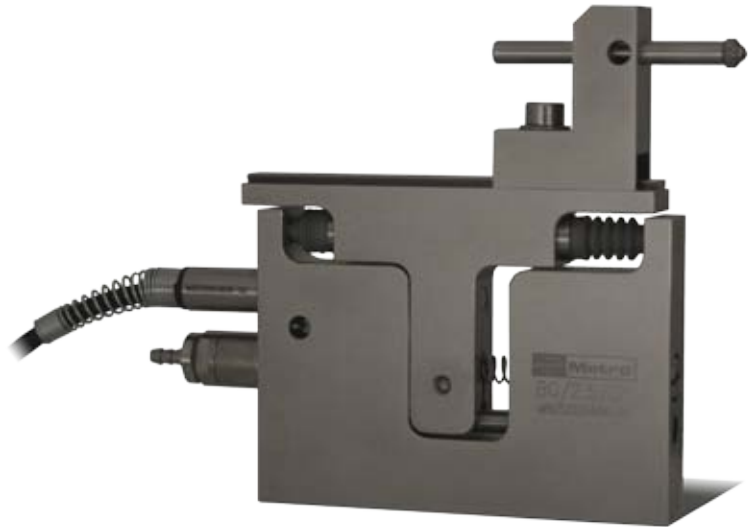
Probes

Gauging modules

Module with linear guidance

Block gauges are primarily motion changers or mechanical interfaces that sit between the component and the measuring sensor. It is adapted to application where a standard pencil probe won't fit.

The block gauge BG enables to make simple and reliable measurements. It is particularly adapted to control bores or more generally where it is difficult to use a standard pencil probe. The motion is ensured by precision linear bearings that ensure an excellent repeatability.



Technical characteristics		
	With inductive probe	With digital probe
Measurement stroke	3, 6, 11 mm	3, 6, 11 mm
Measurement range	± 1 , ± 2.5 , ± 5 mm	2, 5, 10 mm
Precision		
- 2 mm	$\pm 1 \mu\text{m}$ or $\pm 0,5 \% \times D$	$\pm 1 \mu\text{m} \pm 0,1 \% \times D$
- 5 mm	$\pm 2,5 \mu\text{m}$ or $\pm 0,5 \% \times D$	$\pm 1 \mu\text{m} \pm 0,15 \% \times D$
- 10 mm	$\pm 5 \mu\text{m}$ or $\pm 0,5 \% \times D$	$\pm 1 \mu\text{m} \pm 0,15 \% \times D$
Repeatability	$< 0.25 \mu\text{m}$	$< 0.25 \mu\text{m}$
Electric Zero	Ajustable on the measurement range	Not applicable
Tip force	Ajustable from 0,5N to 1N	Ajustable from 0,5N to 1N
Deviation with temperature	$< 0,01 \%$ from the full scale by $^{\circ}\text{C}$	$< 0,01 \%$ from the full scale by $^{\circ}\text{C}$
Materials	Stainless steel case and viton gaiters	Stainless steel case and viton gaiters
Operating temperature	10°C à $+85^{\circ}\text{C}$	10°C à $+60^{\circ}\text{C}$

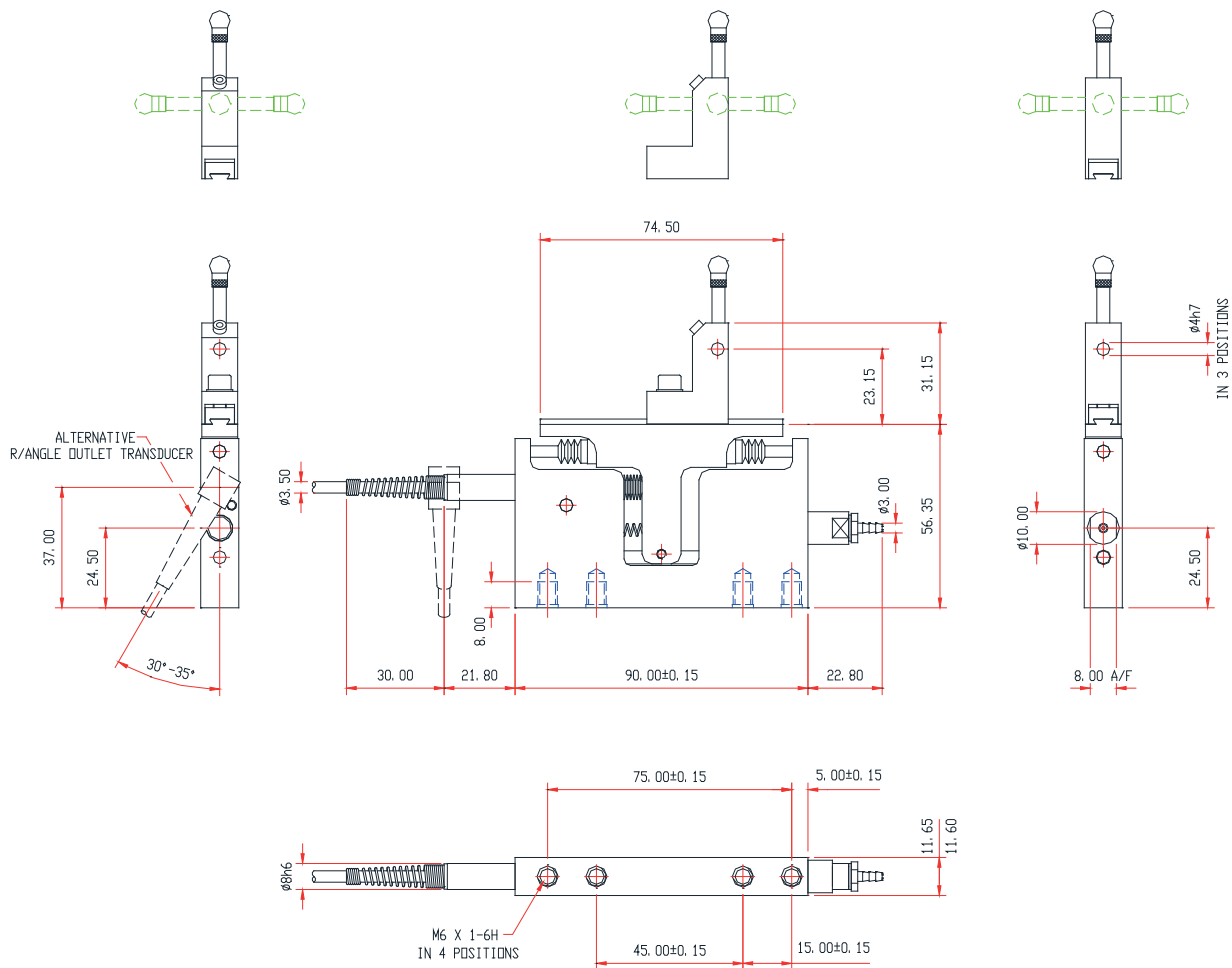
Dimensions of the 2 mm module



Probes

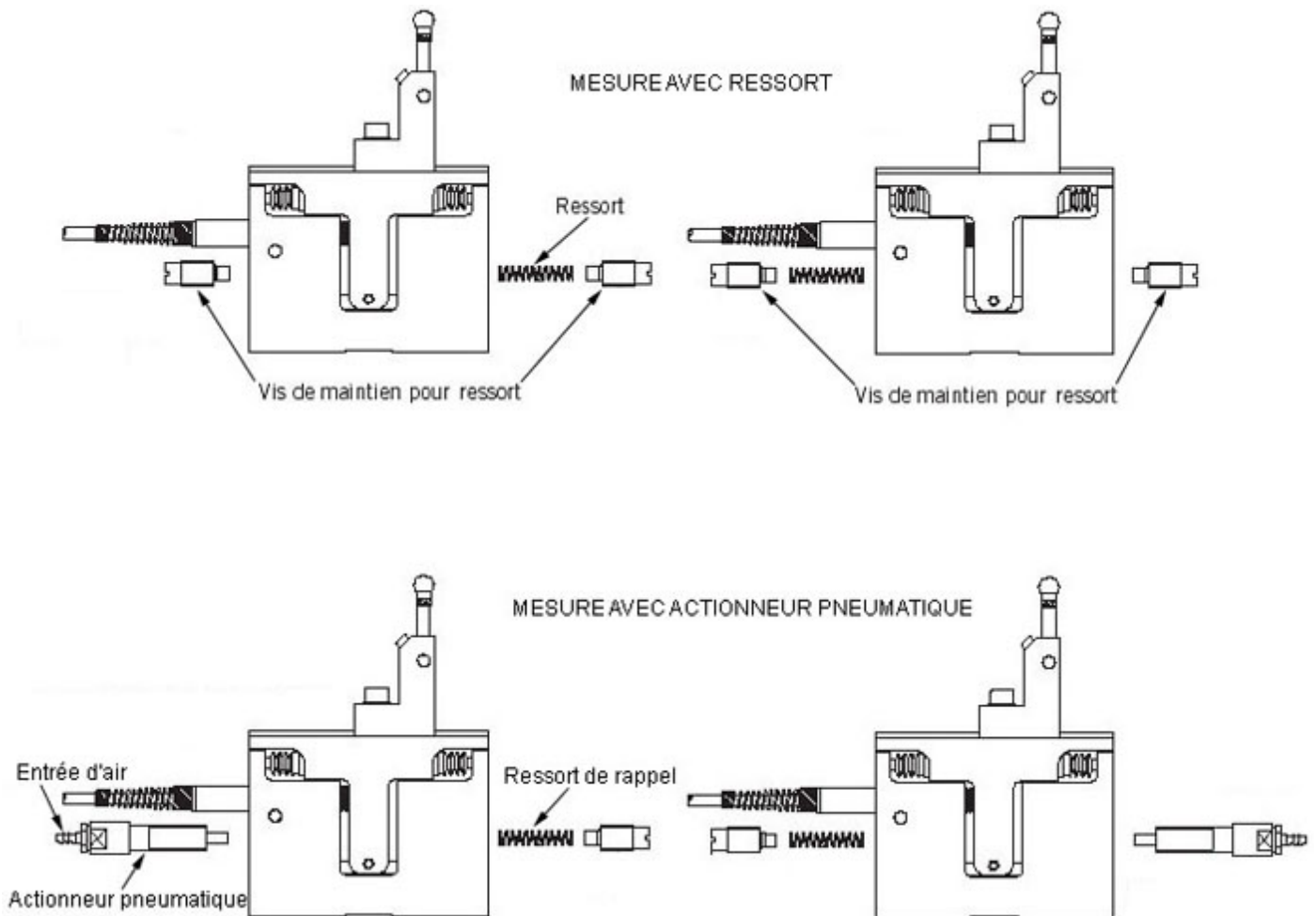
Gauging modules

Dimensions of the 10 mm module



Probes

Gauging modules



The pneumatic kit allows automated controls. Used with a spring it offers the possibility to adjust the tip force keeping a excellent repeatability.

The mechanical interface that hold the probe tip is perfectly rigid but allows an easy adjustment. The tip carrier accepts all the probe tips having a M2.5 screw thread.

Probes

Gauging modules

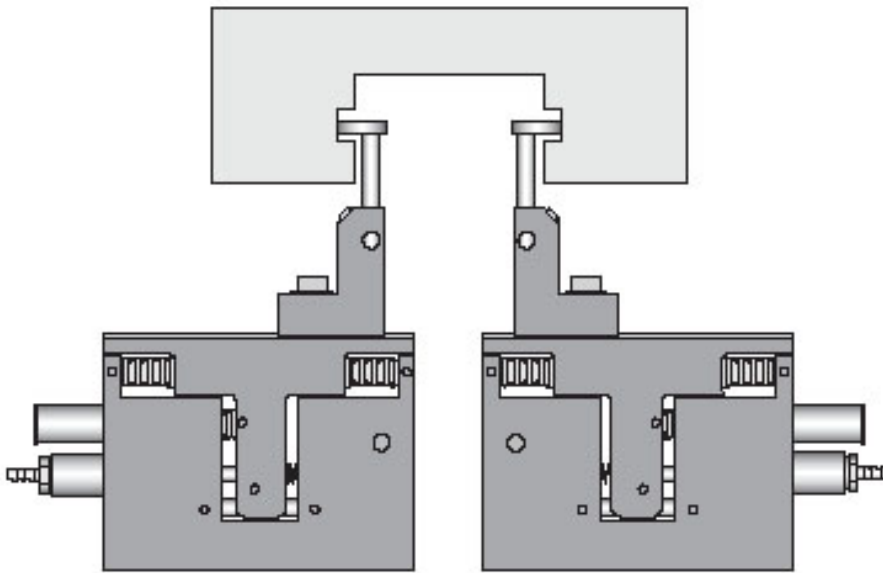


fig.1

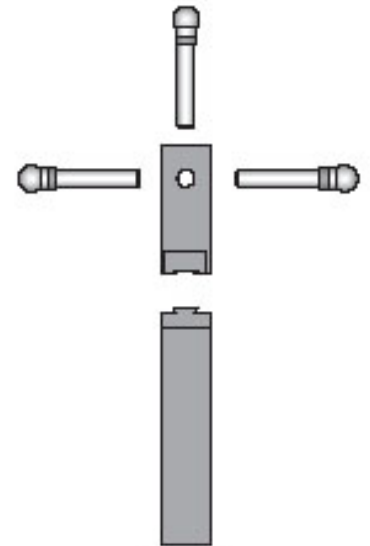


fig.2

Several block gauges can be mounted together. This very compact configuration enables controls where space is limited. It enables also to off-center the blocks (fig3).

The block gauge thanks to its adjustable tool carrier enables to make measurements at a distance >40mm (fig4).

A wide range of spring enables to use the block gauge in every directions.

With an IP65 rating, the block gauge can be used in the most severe industrial environments.



fig.3

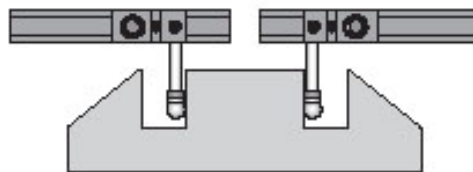


fig.4

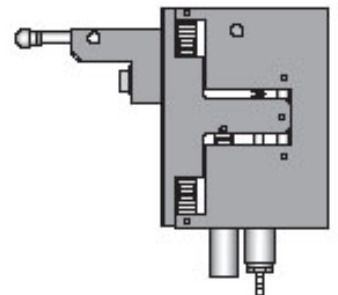


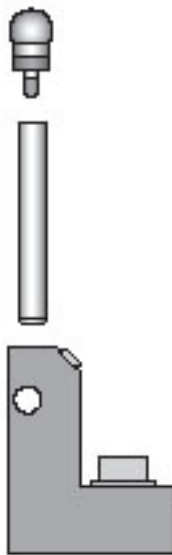
fig.5

Probes

Gauging modules

References

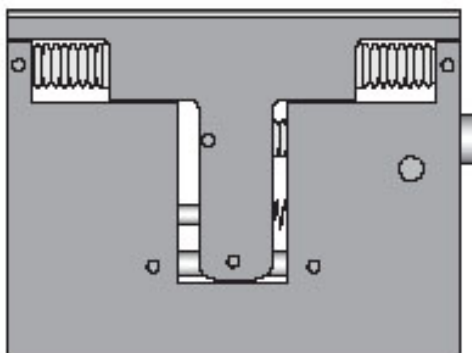
On the standard version, the block gauge is actuated by spring. The pneumatic actuation option requires to use an actuator (article reference 804570-SX). The block gauge does not include the holder, the tip holder and the probe tip that must be ordered separately. A kit including several springs (in order to adjust the tip force) is delivered together with the block gauge. It is also possible to be delivered separately. (article reference 208212-SX).



Tips	Industrial standard probes tip (M 2,5)		
-------------	---	--	--

Tip carrier	Length	Tip carrier Ø 4 mm	Tip carrier Ø 6 mm
	20 mm	83420	-----
	30 mm	83430	83630
	40 mm	83440	83640
	50 mm	-----	83650

Tool Holder	Block gauge	4mm Tool holder Article ref	6mm Tool holder Article ref
	2 mm	83420	-----
	5 and 10 mm	83430	83630



	Analogue or Digital block gauge					
	Stroke 2 mm		Stroke 5 mm		Stroke 10 mm	
	Ref.	Code	Ref.	Code	Ref.	Code
Inductive						
Axial output	BG/1	80201-2	BG/2.5	80201-5	BG/5	80201-10
Radial output	-----	-----	BGR/2.5	80201-5R	BG/5R	80201-10R
Digital						
Axial output	DK/2/S	81201-2	DK/5/S	81201-5	DK/10/S	81201-10
Radial output	-----	-----	DKR/5/S	81201-5R	DKR/10/S	81201-10R



Pneumatic actuator	Block size	Article ref
	2 mm	83403
	5 & 10 mm	83404



Replacement spring	2 mm module	5mm module	10mm module
70g	832070	-----	-----
75g	-----	835075	831075
100g	832100	835100	831100
150g	832150	835150	831150
250g	-----	835250	831250
350g	-----	835350	831350

Probes

Gauging modules

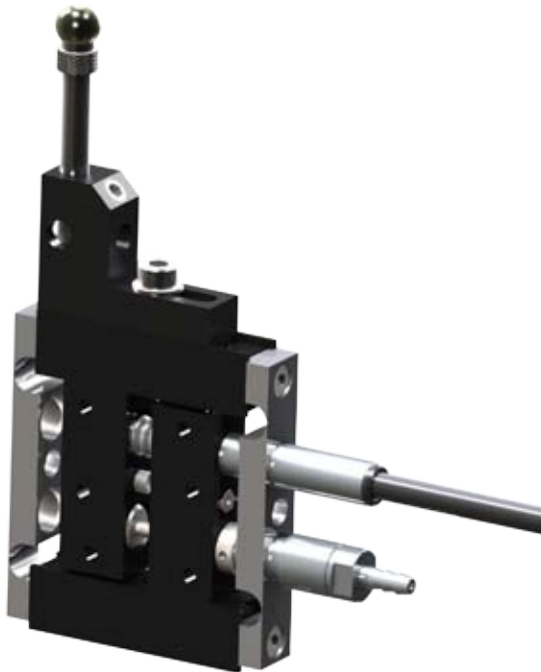
Flexure Block Gauges

Flexure block gauge is ideal for very high volume and high precision applications such as bearing components gauging. It is often the best solution for measuring moving materials, such as roughness testing.

There are no sliding parts to wear out or to cause friction within the frame or sensor which makes Metro flexures virtually free from hysteresis.

Flexures can be mounted such that there is little or no stress through the gauge centre line and enabling precision profiling of moving material, such as sheet material or rotating shafts, brake discs etc.

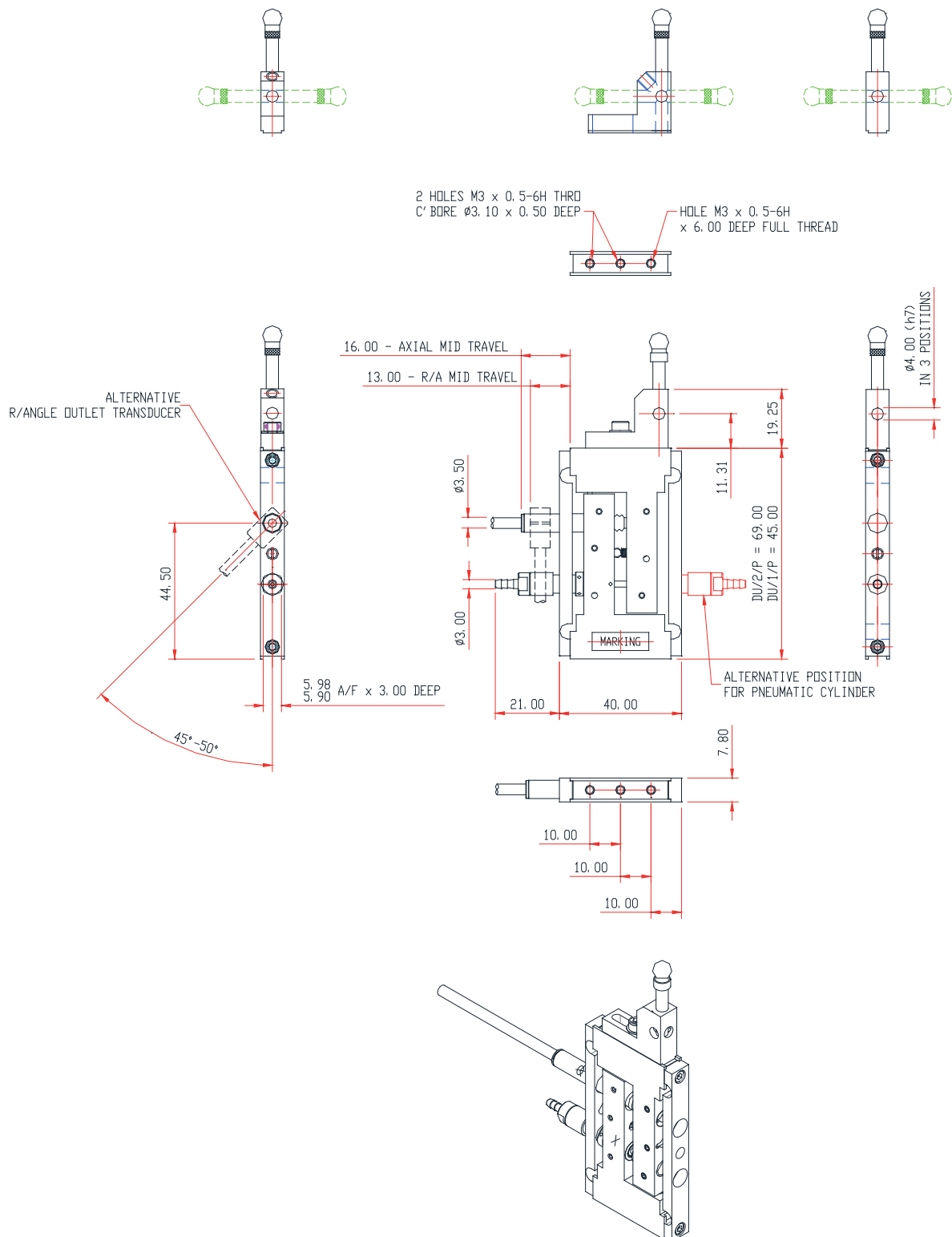
The flexure gauge has forward and reverse spring action with a pneumatically actuated version available for automatic measurements



Technical characteristics		
	0.5 mm Module	1 mm Module
Mechanical travel (mm)	1.7	2.5
Measuring range (mm)	1.0	2.0
Precision	0.1	0.1
Repeatability	< 0.1 µm	< 0.1 µm
Tip force, spring push	1.5N at center travel	1.5N at center travel
Tip force, pneumatic	1N at center travel @ 2 bar	1N at center travel @ 2 bar
Temperature coefficient	< 0,01 % from full scale by °C	< 0,01 % from full scale by °C
Mass (including tool holder, 20mm tip holder and ball tip excluding PIE/ cable)	< 60g	< 70g
Mass tool holder	12g	12g
Materials	Aluminium and stainless steel	Aluminium and stainless steel
Pneumatic operation pressure	1.5 Bar to 2.5 Bar	1.5 Bar to 2.5 Bar
Operating temperature	5°C to +85°C	5°C to +85°C

Probes

Gauging modules



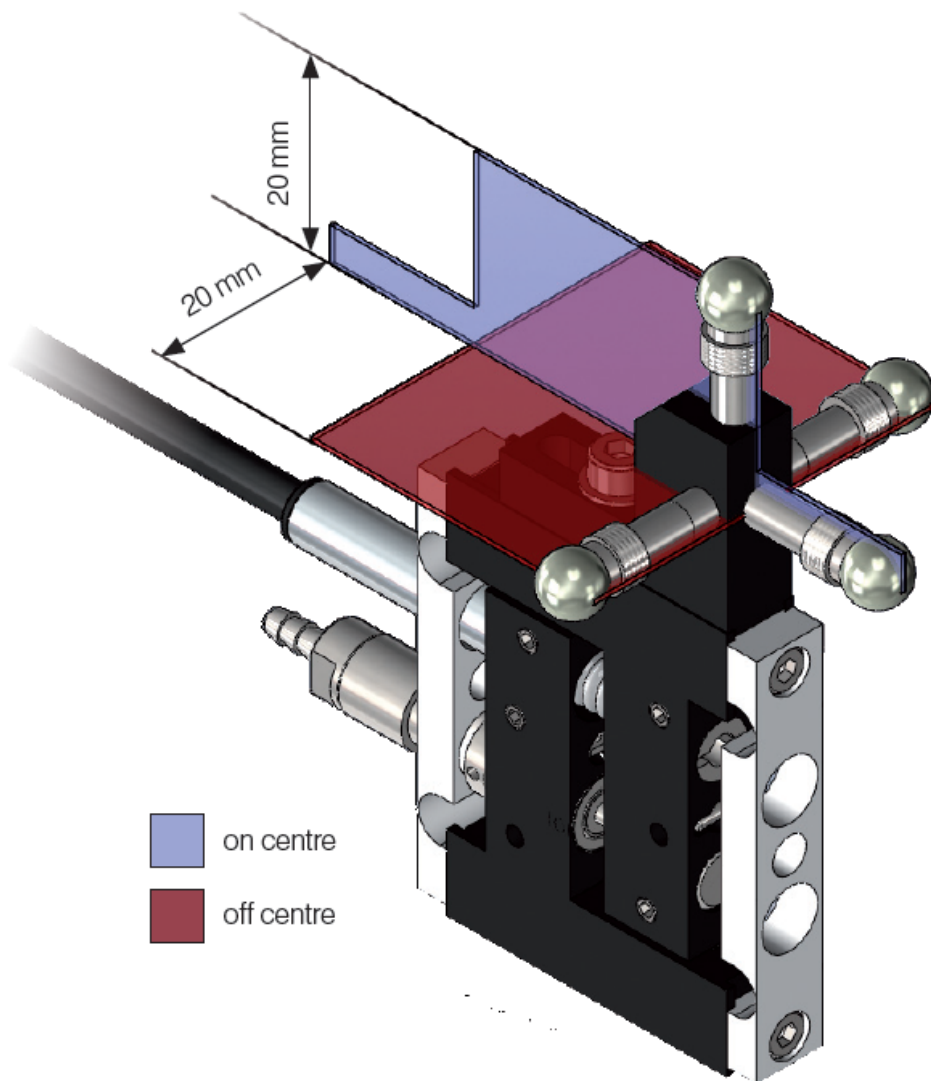
Probes

Gauging modules

Zonal repeatability

For optimal gauging performance the recommended operation is on centre. The specification is valid when using Metro standard tool holder, tip holder and tip. (Tip used is 6.35 mm TC Ball Tip)

- Repeatability on centre : $< 0.1\mu\text{m}$
- Repeatability off centre : $< 0.5\mu\text{m}$

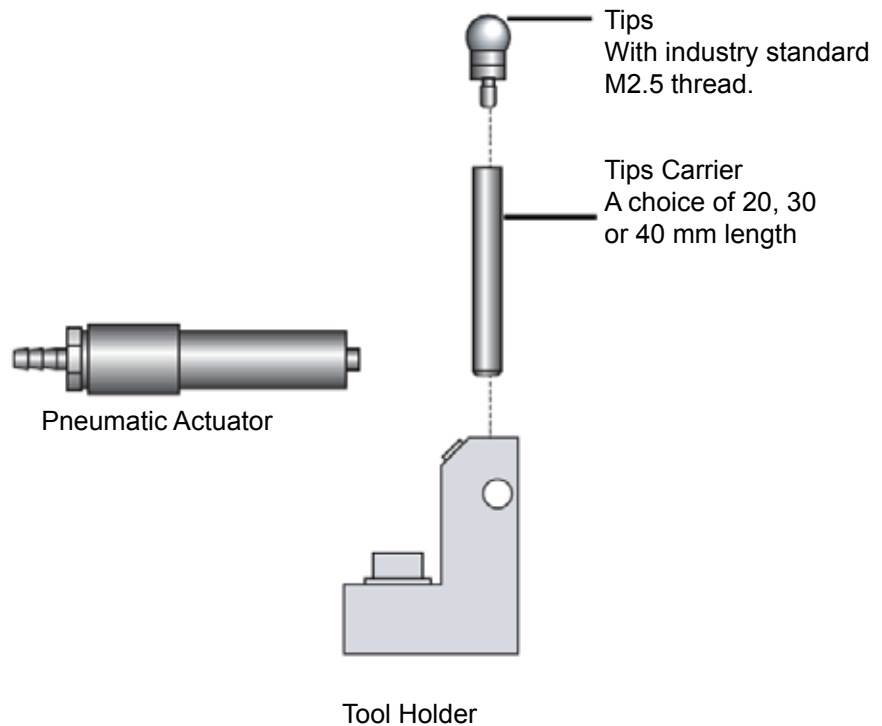


Probes

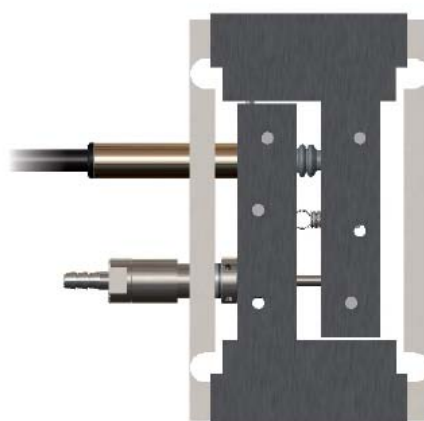
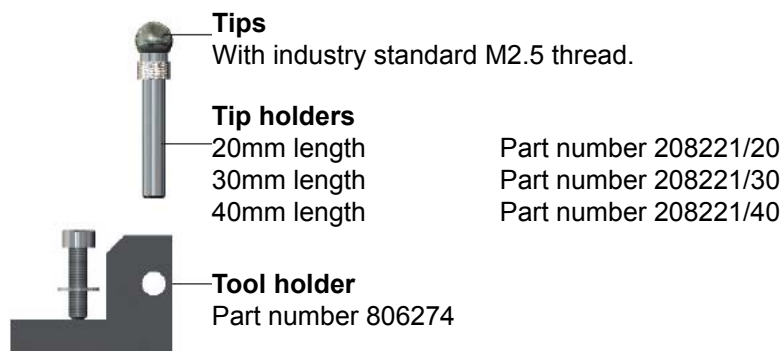
Gauging modules

Accessories

The Flexure Gauge is supplied without the pneumatic actuator as standard. If pneumatic operation is required, the actuator must be ordered separately.



References



Product type	Analogue	Digital	Analogue	Digital
Axial cable outlet	+/- 5mm	1mm	+/- 1mm	2mm
Forward spring	AU/0.5/SH	DU/1/S	AU/1.0/SH	DU/2/S
Reverse spring	AU/0.5/RH	DU/1/R	AU/1.0/RH	DU/2/R
Reverse spring pneumatic	AU/0.5/PH	DU/1/P	AU/1.0/PH	DU/2/P
Radial cable outlet				
Forward spring	AUR/0.5/SH	DUR/1/S	AUR/1.0/SH	DUR/2/S
Reverse spring	AUR/0.5/RH	DUR/1/R	AUR/1.0/RH	DUR/2/R
Reverse spring pneumatic	AUR/0.5/PH	DUR/1/P	AUR/1.0/PH	DUR/2/P

Multiplexers

for probes

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Maximux	60
CA4	64

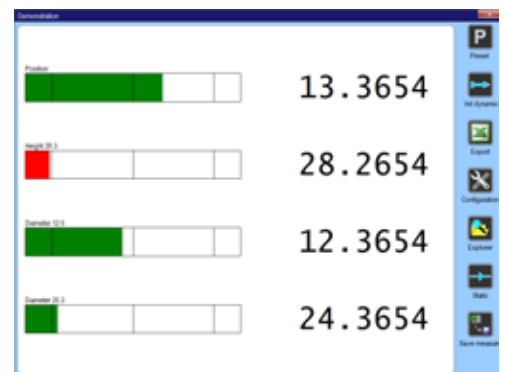


Multiplexers for probes

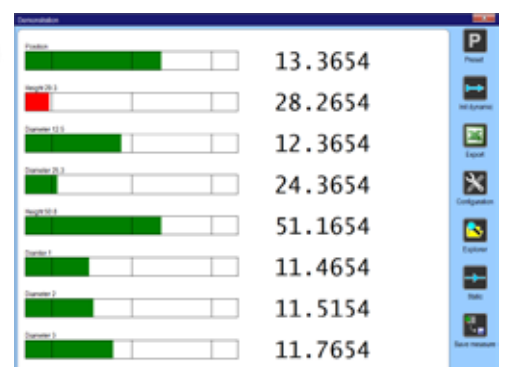
Minimux

The Minimux 4 and 8 are inductive gauging probe conditioners that have been especially designed to connect inductive probes to a PC or any other similar equipment. The Minimux 4 and 8 are easy to use and adapt to several applications.

The enclosure is made from aluminium without external settings. This device is highly adapted to be used in a severe industrial environment.



USB 



Multiplexers for probes

Minimux

Main characteristics

- 4 or 8 inputs for Metro inductive gauging probes
- USB 2.0 interface
- Power supply with the USB
- Measuring resolution :16 bits
- Optional RS232 connection on the USB port with a special cable on the Minimux 8
- Integrated management of the resolution and measuring ranges.
- Easy to use and reliable
- Robust

Functions

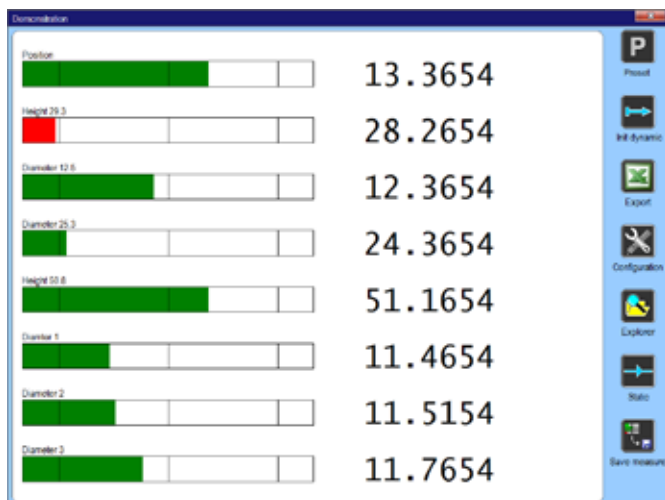
The multiplexer Minimux 4 and 8 ensure the following functions:

- Probes power supply
- Signal process
- Analogue/digital conversion
- Management of the USB Link to the PC

The Minimux are equipped with 4 or 8 inputs for Metro inductive HBT gauging probes.

- 0.1µm resolution for probes with a measuring range inferior or equal to ± 2 mm
- 1µm resolution for probes with a measuring range superior to ± 2 mm

MPC Light Software



MPC Light is a PC software (Windows) that displays measurements coming from a Minimux 4 or 8, Maximux or Wigauge. It allows to make complex calculation between probes and to display the result with bargraph indicators and numerical values. Bargraphs colour change depending on the part tolerances. Measurement can be stored on a CSV file.

Product references

Item	Reference
Minimux4 with USB2.0 port	51020
Minimux8 with USB2.0 port	51030
DIN rail mounting accessory	51021
RS232 cable with power supply for Minimux 8	51031
MPC Light Software for Windows	20100

Multiplexers for probes

Maximux

The Maximux is an inductive gauging probes conditioner that has been especially designed to connect inductive probes to a PC or any other similar equipment. The Maximux is easy to use and adapted to several applications.

The enclosure is made from aluminium without external setting. This device is very adapted to be used in an industrial environment.

The Maximux is equipped with 16 inductive probes inputs. A M-bus network port allows to increase the inputs number up to 255 with optional extension modules. It is compatible with all the M-bus modules. It is therefore very easy to mix different probe's technologies depending on the measurements to do. A range of extension boxes is available (8 and 16 inputs inductive probes, Heidenhain etc...)



Multiplexers for probes

Maximux

Measurement modes

Choice between 2 measurement modes:

- Probe mode : The Maximux returns the individual position of the probes.
- Measurement characteristics mode : The Maximux returns directly the measurement characteristics results coming from the probes combination. This mode allows trigonometric functions, calculation between measurement's characteristics as well as calibration functions.

For each probe, the Maximux ensures the linearization of the selected probe and chooses between 2 measurement scales in function of the measurement range of each probe:

- 0.1 μ m resolution for probes having a measuring range $\leq \pm 2$ mm
- 1 μ m resolution for probes having a measuring range $> \pm 2$ mm

Reading rate = 450 probes by second with a 16 bits resolution

Maximux and extension modules

Up to 255 inputs



Up to 255 probes

Multiplexers for probes

Maximux

Connection with a PLC and/or HMI

Human Machine Interfaces based on touch screen displays are widely used in industry and replace more and more the traditional mechanical buttons and indicating lights.

Thanks to its Ethernet port and its compatibility with Modbus TCP protocol, it is very easy to connect the Maximux to a PLC and/or HMI.



Free examples of Pro-face interfaces can be downloaded on our website. This offers the possibility to have a system ready to operate. www.metro-fr.com

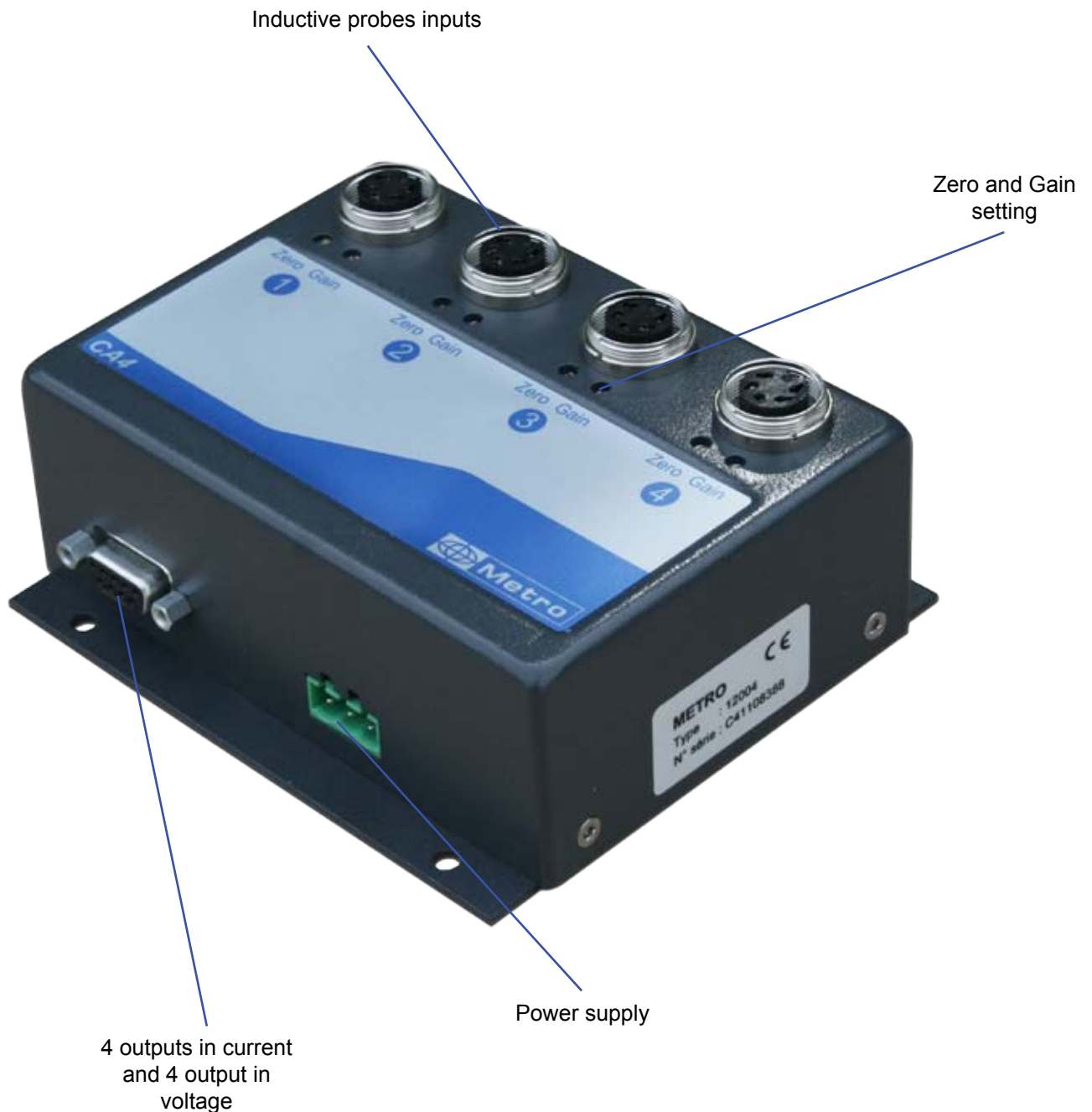
References

Item	Reference
Maximux with 16 inductive's probes inputs	51300
Extension box for 16 additionnal probes	51310
M-Bus cable to connect the Maximux and an extension box	81210
2m RS232 cable between Maximux and PC (9 PINs)	45160
DIN RAIL Mounting accessory	51021

Multiplexers for probes

CA4

The CA4 is a compact conditioner module for half bridge (HBT) or LVDT probes. It is powered from 230V or 110V. The zero and gain setting makes it compatible with most of the available probes. It is fitted with 4 analogue outputs from 0 to ± 10 VDC and 0 to ± 20 mA. By mixing the zero and the gain (from 0 to 100%) and the full scale, it is possible to get a current output of 4-20mA or a voltage output from 0 to + 5VDC or 0 to + 10VDC



Multiplexers for probes

CA4

Main characteristics

- 4 independent channels for Inductive HBT or LVDT probe
- Robust and reliable
- 4 DIN connectors
- Current or voltage output
- 230V power supply

Technical characteristics

Dimensions (mm)	126 x 110 x 53
Mass	300 g
Power supply	230 or 110 VAC
Consumption	2 VA
Operating temperature	0 to 40 °C (storage : -20 to + 85°C)
Connection	DIN connectors (5 PINs) and screw terminal
Energising frequency	11.7 kHz
Energising voltage	4 Vpp
Output voltage	± 5 VDC FS (500 Ohms minimum load) ± 10 VDC FS (1 kOhms minimum load)
Output current	± 20 mA FS (150 Ohms maximum load only with ± 5 Vcc)
Oscillator protection	Protected against openings and short circuits.
Output filter	500 Hz bypass (-3dB)
Type of probe	Half bridge (HBT) (2 kOhms load) and LVDT
Probe's sensitivity	Adjusted for Half bridge, adjustable between 45 to 450 mV/V

References

Item	Reference
CA4 Conditioner	12004

Multiplexers

for measuring instruments

This range offers the possibility to connect all the control instruments of the market (digital indicators, micrometers, calipers, weight scale etc...).

Our instrument's multiplexers "MUX" are delivered with a PC software that allows you to get the data to your computer.

2 versions are available for connection of 4 or 8 instruments.

Connection possible with the following instruments (but not limited to):

- Digimatic : Mitutoyo, Mahr
- Opto RS232 Sylvac, Tesa, Bowers etc...
- RS232
- Analogue output, single or bipolar, in current or in voltage...



Multiplexers for measuring instruments

Mux

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Multiplexers for measuring instruments

Mux

Main characteristics

- 1 USB port for a connection to a PC
- 4 or 8 inputs for measuring instruments
- 1 input for external command (footswitch)
- Indicating LED (blue) for each channel
- Reset button
- Storage temperature -40 °C to +70 °C.
- Operating temperature : +5°C to +40°C.
- Power supply by USB
- USB cable and software for PC included

Connection

Intelligent cables make possible the connection of a large range of measuring instruments :

- Mitutoyo and Mahr instruments are connected to the MUX4 through their original cable.(Digimatic)
- Opto RS232 duplex instruments (Ex: Sylvac, Tesa, ...) are connected through a cable ref 18010
- Instruments having a RS232 output are connected with the cable ref 18100. This cable can be delivered ready to use or easily configured by the user in order to fulfil each particular need thanks to the MuxConfig software.
- Instruments equipped with an analogue output in voltage or current are connected with the cable ref 189xx : $\pm 5V$, $\pm 10V$, 0-5V, 0-10V, 4-20mA, $\pm 20mA$, 0-20mA.

Operating modes

Two operating modes are available:

- **Multiplexed mode:** All the channels are active simultaneously. The transfer is made upon a request from the PC or through the instrument transfer button.
- **Addressed mode:** Only one channel is active (the addressed one). The transfer is made upon a request from the PC or through the instrument transfer button or with a footswitch connected to the Mux.

Instrument reading

There are 3 ways to read your measuring instrument :

- With a software request received on the communication port (USB or RS 232).
- With a footswitch connected to the MUX
- With the transfer button of the instrument

This configuration enables the PC to get the measurements coming from different instruments. The Winmux software allows to bring directly the data into a spreadsheet software (Excel, Open-office etc...).

Multiplexers for measuring instruments

Mux

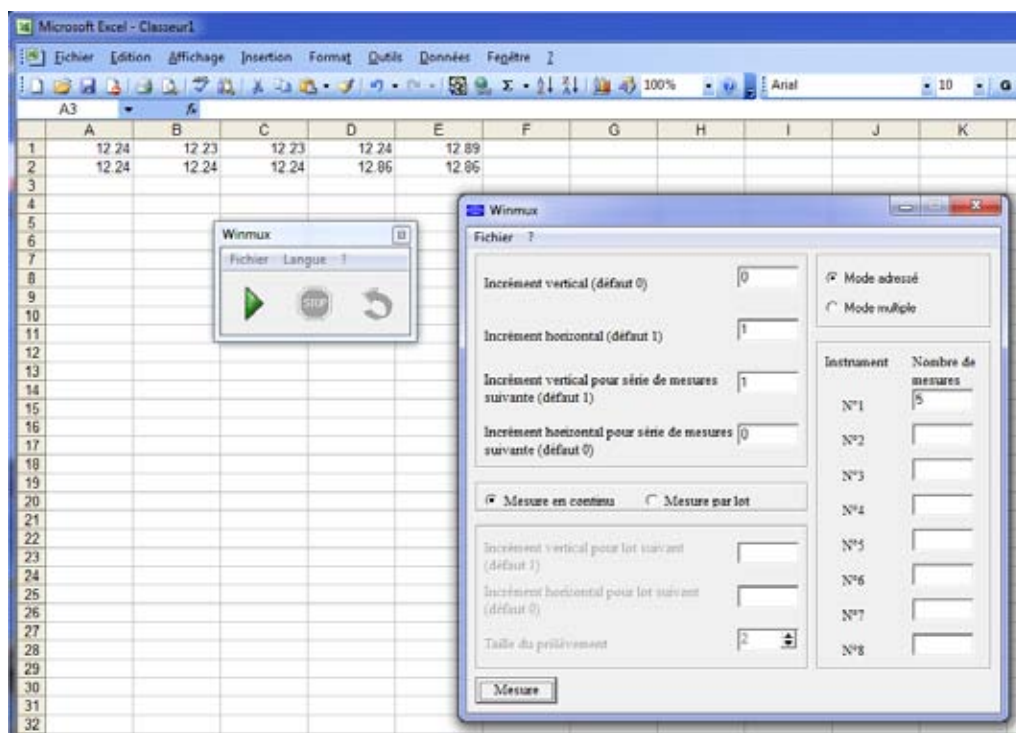
Winmux

Winmux is a free software included in the package or that can be downloaded in from our website www.metro-fr.com.

Winmux allows to bring the measurements made with the MUX directly in the selected cells of Excel or any other spreadsheet software.

- Number of channel of the multiplexer
- Number of instrument connected
- Number of measurement characteristics to read on each instrument
- Target cell for the first measurement.
- Horizontal and vertical increment between measurement
- Horizontal and vertical increment between sampling

Winmux is compatible with the spreadsheet softwares (Excel, Open-office etc...).



Multiplexers for measuring instruments

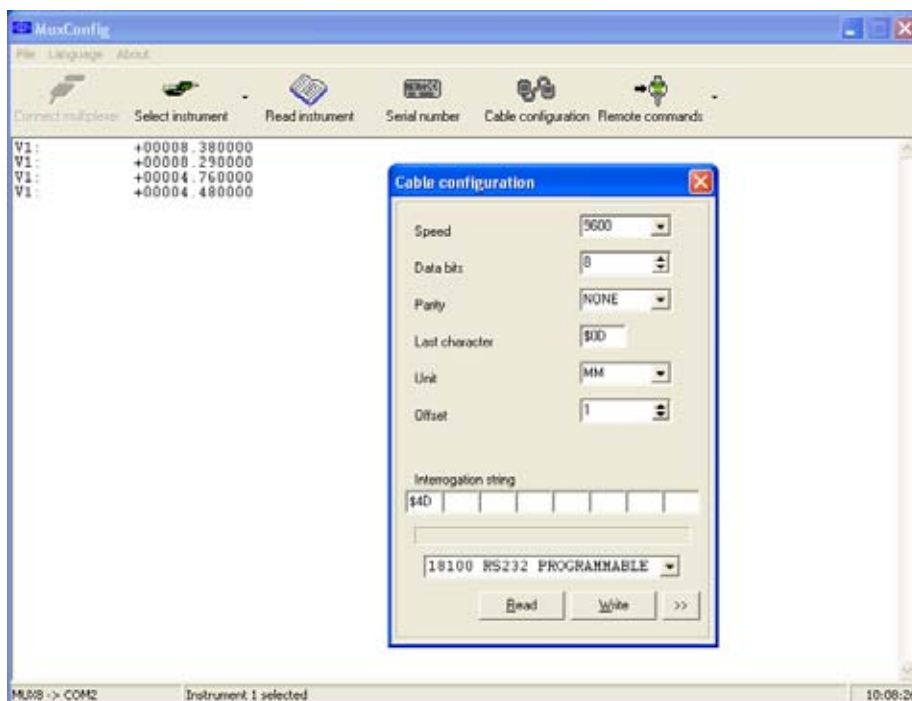
Mux

Muxconfig

Muxconfig is a utility software that allows to

- Test the MUX multiplexers
- Configure the instruments cables ref. 181xx or 189xx

Muxconfig is free and included into the package or can be download from our website www.metro-fr.com

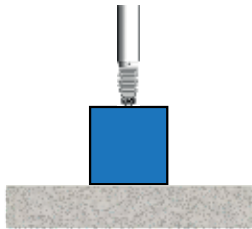


References

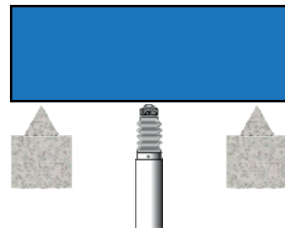
Item	Reference
Mux4 USB	18004
Mux8 USB	18008
Cable between Mux and Opto RS232 instruments	18010
Configurable cable between Mux and instruments (RS232)	18100
Footswitch	18020
RS 232/485 cable for communication with PC	18060
Winmux software	18030
Power supply adaptor 230VAC for Mux2	18040
Ready to use cables between MUX2 and RS232 instruments	On demand
Analogue instrument cable	On demand

Measurement examples

Simple measurement with 1 probe

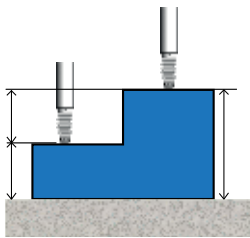


Depth

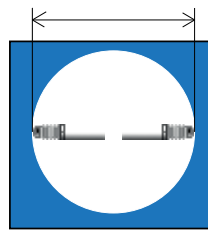


Straightness

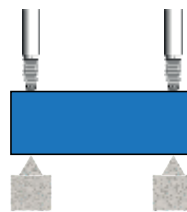
Combined measurement with 2 probes



Upset

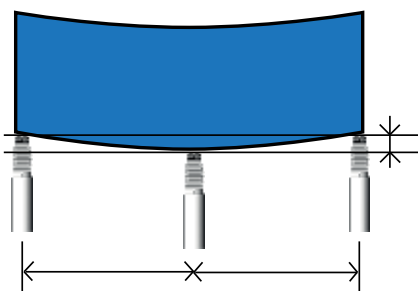


Width or bore



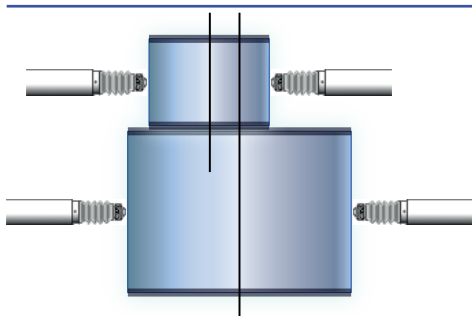
Parallelism

Combined measurement with 3 probes

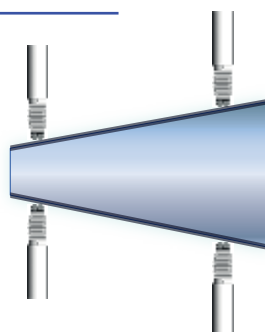


Straightness

Combined measurement with 4 probes



Concentricity



Taper ratio



Center distance



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A large, curved blue graphic element on the right side of the page, featuring a grid of rounded squares and a faint, large-scale version of the Metro globe logo.

www.metro-fr.com