M400

Industrial display unit for dimensional measurement

Metro

Manufacturer of precision measuring devices since 1986

The M400 is an industrial display allowing to make various dimensionnal control from several types of measurement devices, especially:
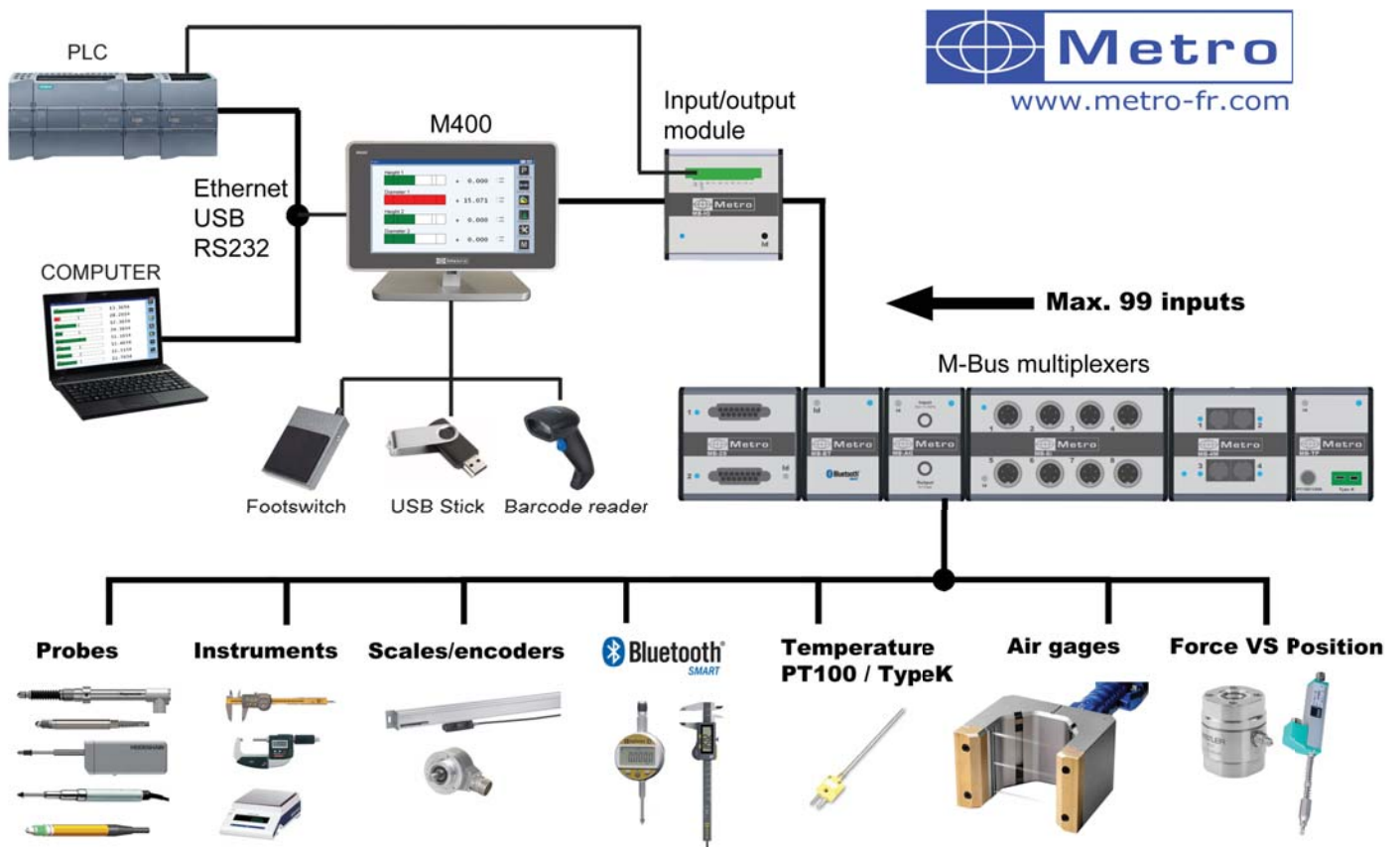
- Gauging probes: inductives, incremental, capacitive, digital
- Air gages (air plugs, air rings, air forks....)
- Hand easuring instruments: Micrometers, calipers, indicators... (connection by wire or Bluetooth)
- TTL Scales and rotary encoders
- Temperature sensors, mainly to compensate the measurements with the evolution of the temperature.

The M400 is a highly flexible display unit: the probes are connected through external M-BUS modules up to 99 inputs and up to 32 characteristics can be managed.
The M400 can be used on simple manual applications supervised by an operator, or on fully automated machines with connection to PLC.

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

The M400 is fitted with a 7'' (~17.5cm) touch screen display.

The measurements can be displayed with different types of bargraphs, needle indicators or numerical values only.

Icon desktop

Simple gauging display mode with the needle indicator

Example of configuration window

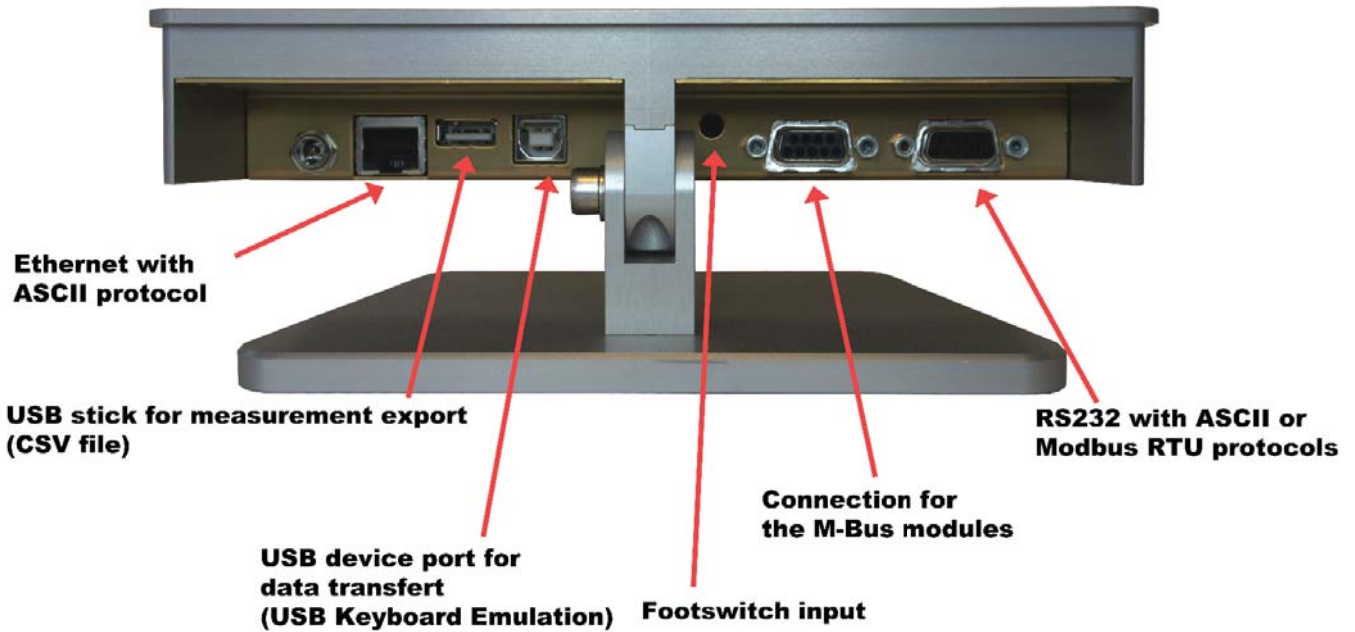Display mode multi-gauging manual

Virtual keyboard

Display mode multi gauging with tolerances

The M400 runs on our own operating system (not on Windows CE or similar). This feature allows to have high performances in terms of display, continuity of the hardware, absence of software license and absence of virus risk.

CONNECTION FACILITIES AND COMMUNICATION

Ethernet with ASCII protocol

USB stick for measurement export (CSV file)

USB device port for data transfert (USB Keyboard Emulation)

Footswitch input

Connection for the M-Bus modules

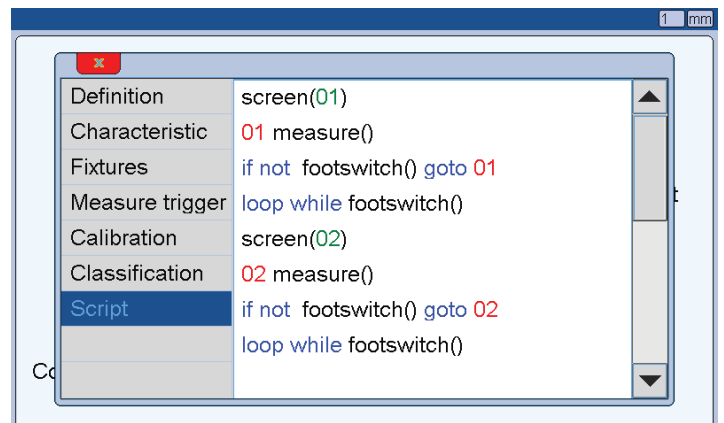**RS232 with ASCII or Modbus RTU protocols**

PLC SCRIPTS AND INPUTS/OUTPUTS

Up to 4 modules with 8 I/O each can be connected on the M400 = max 32 I/O available

2 modes are then available

- Simplified mode: It consists of a simple correspondence between each pin of the module and a function chosen on a drop down menu. (Transfer, Preset, Save the measurement, Part OK etc...). A visual system with virtual boutons/lamps allows to quickly test and setup an installation.

- Advanced mode: It is possible to write a script in Basic language allowing to monitor a simple control fixture through the I/O : lamps, pneumatic actuators, part sorting, temporization etc...

Definition	screen(01)	
Characteristic	01 measure()	
Fixtures	if not footswitch() goto 01	
Measure trigger	loop while footswitch()	
Calibration	screen(02)	
Classification	02 measure()	
Script	if not footswitch() goto 02	
	loop while footswitch()	

DATA EXPORT ON USB STICKS

It is possible to save measurements on a USB stick directly, or to transfer the M400 memory (measurement data) on the USB stick.
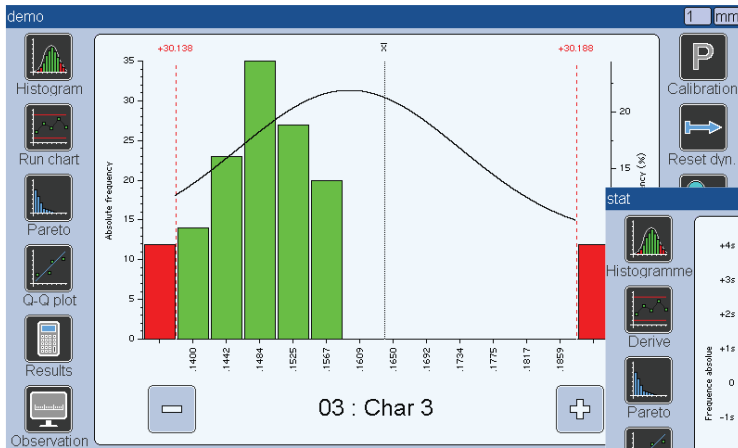A .CSV file is then available and can be used with Excel or other.
The CSV file can also be opened with the M400 display manager software that allows to draw and print some SPC curves.
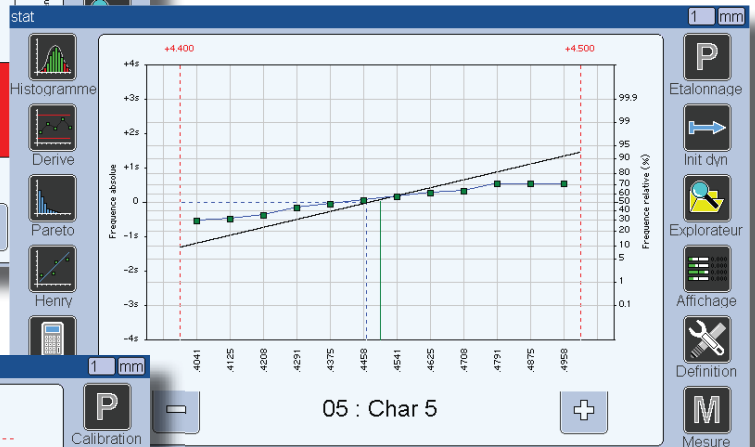
Up to 1'000 measurement by part reference can be saved on the M400 memory (the M400 can save up to 64 part references).

The saved measurement can then be exploited locally on the M400 with several SPC screens, or can be exported to the M400 display manager.
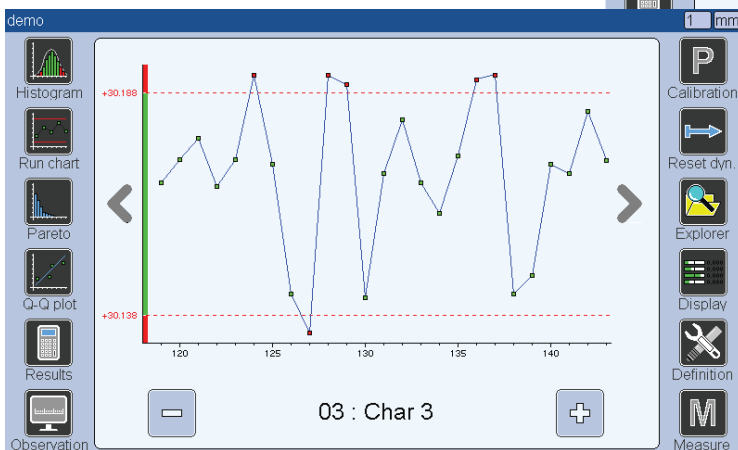
These features does not replace a full SPC software, but aims to give a local and quick trend overview to the operator close to the machine.
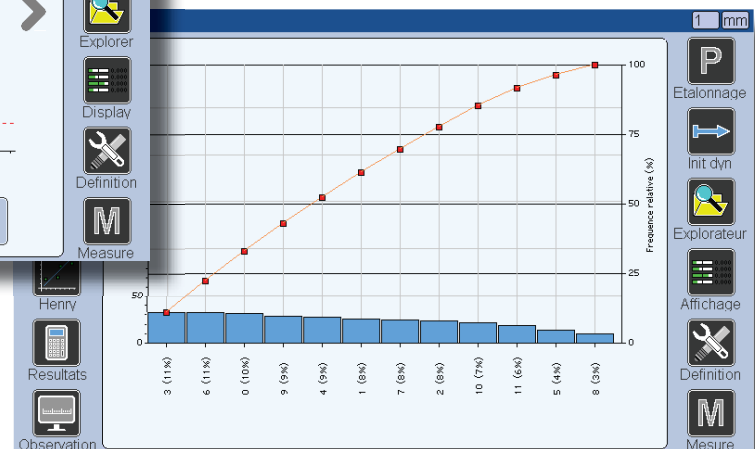

Histogram with Gauss curve

Q-Q plot

Run chart

Pareto analysis

It is possible to connect a USB barcode reader to fill the M400 fields.

It is also possible to transfer the measurement directly to a computer with a simple USB cable, without driver or specific software.

USB KEYBOARD EMULATION FOR DATA TRANSMISSION

The M400 hardware is configured as a USB keyboard. When the display is connected to a computer with USB, 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. Works everywhere (Excel, SPC softwares, ERP, etc.) on any operating system (Windows, Linux...). **No need to install a special software or any specific driver.**

MOUNTING KIT FOR M-BUS MODULES

As an 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 and 2 Heidenhain inputs).
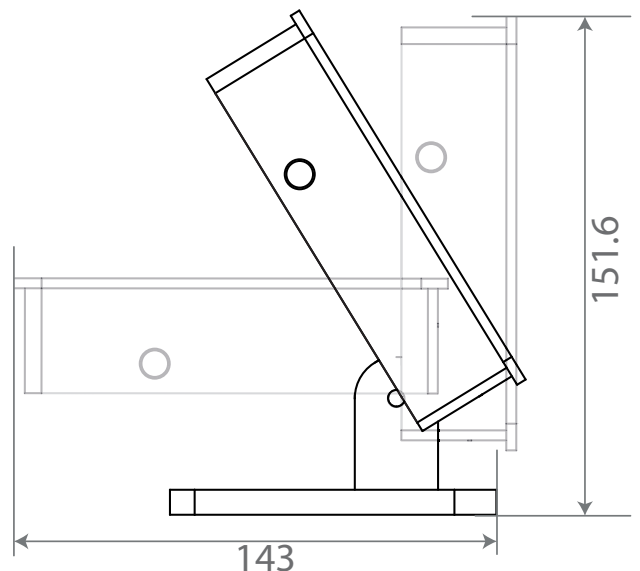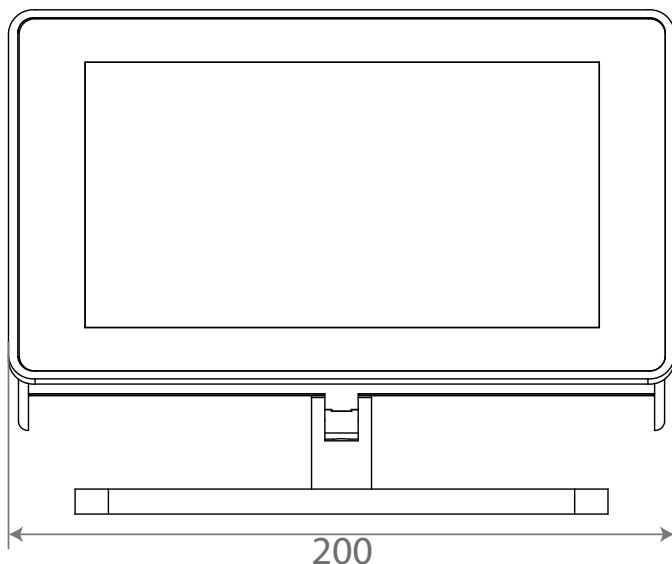

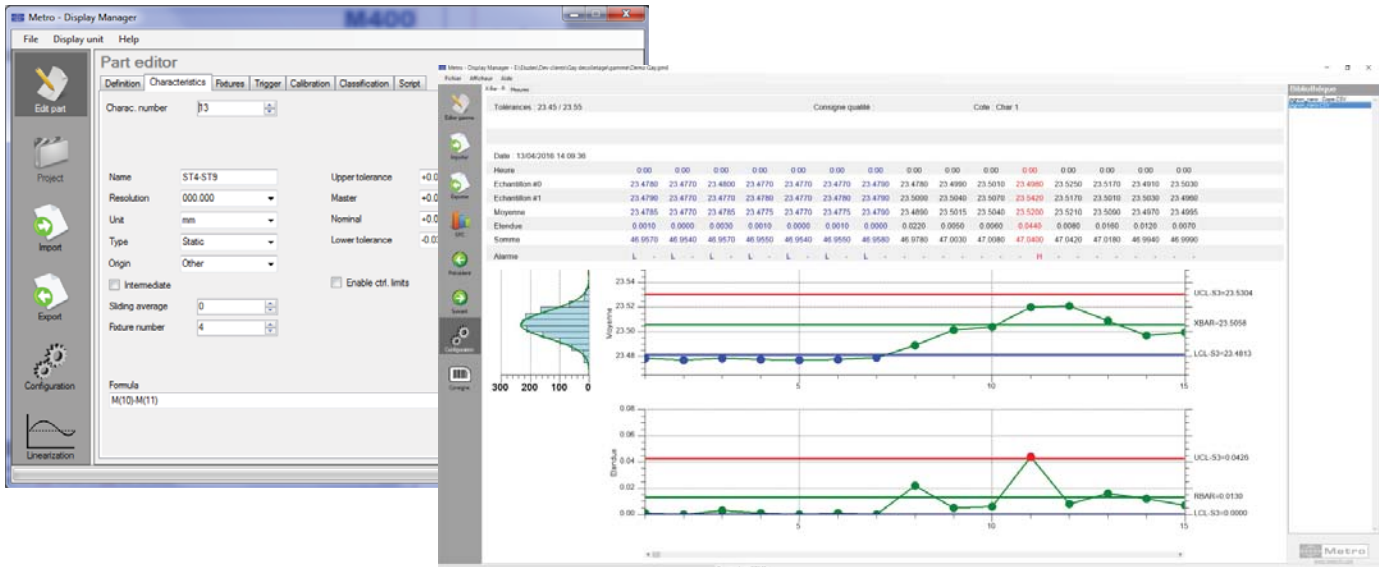*Installation of the first module*   *Installation of the next module*   *Connection*

DIMENSIONS

200

143

151.6

The M400 is delivered with a software that allows to:

- Edit and save the part configurations (tolerance, formula, ...)
- Import from a M400 and export to a M400 a part reference with all its configuration
- Edit the PLC scripts that can be used on a M400.
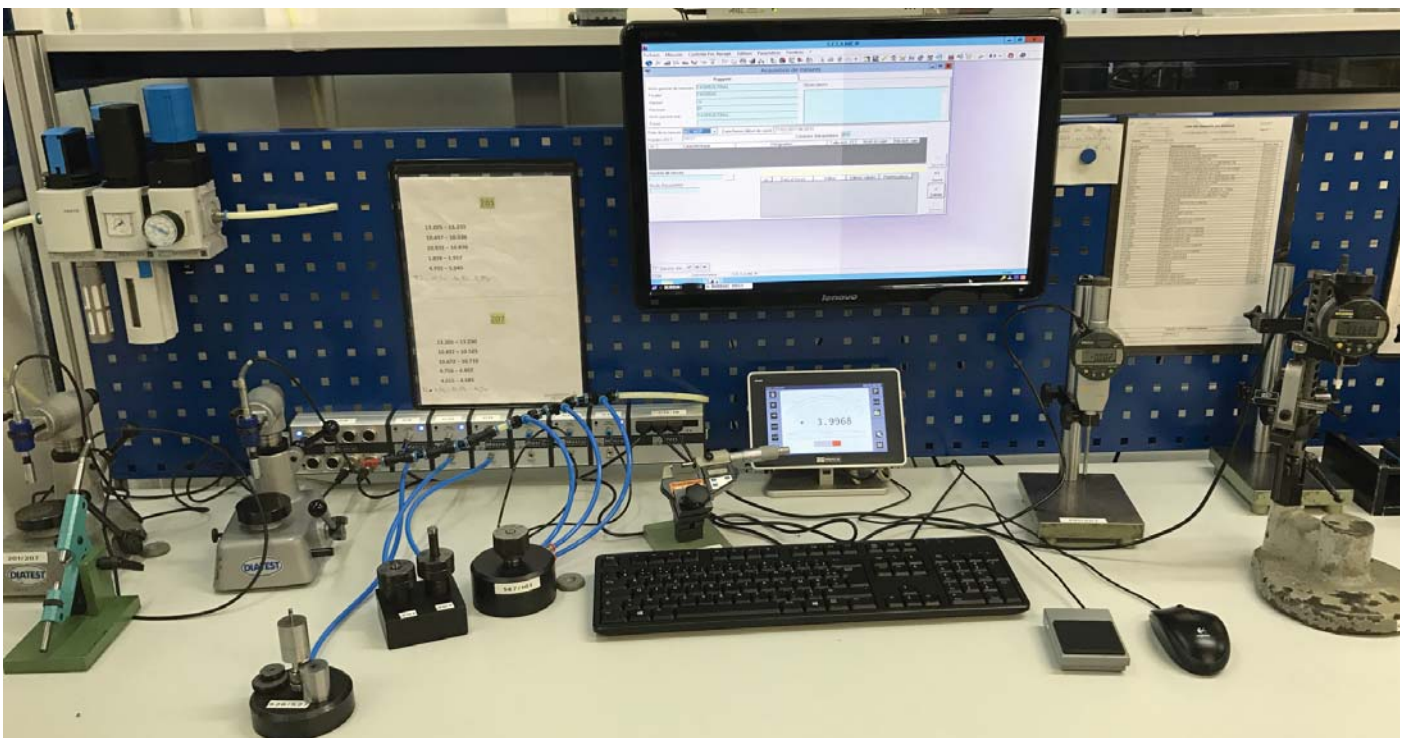- Import the measurement values saved on the M400, and draw and print SPC curves
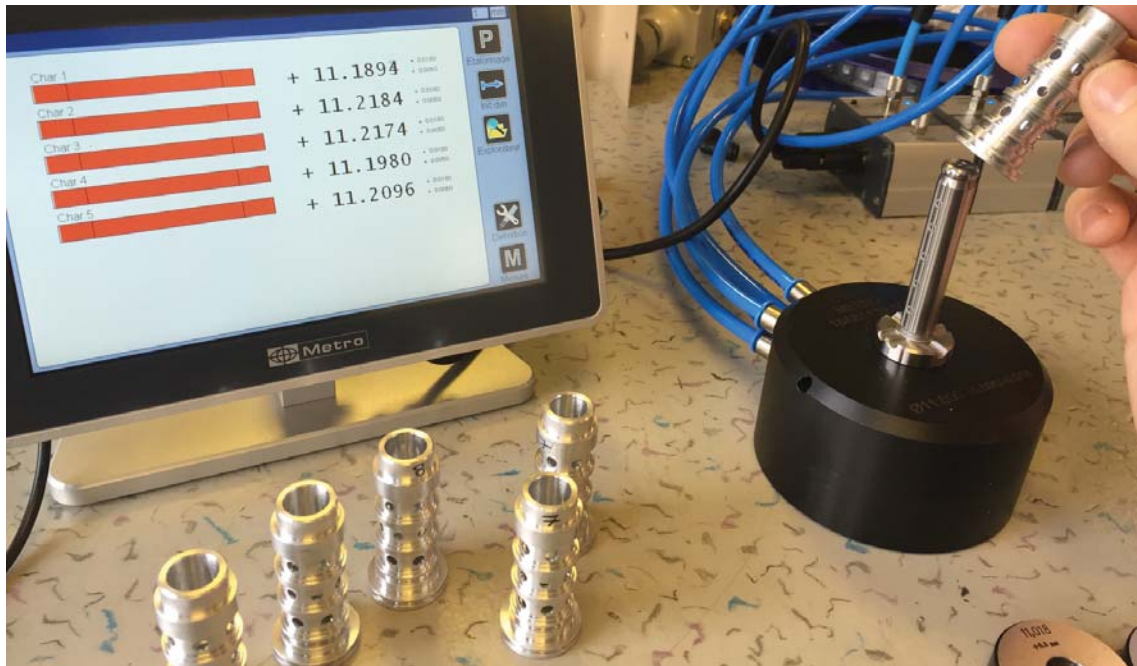

APPLICATION EXAMPLE

Metrology room:
The M400 collects the measurement and transfers to the SPC software of this company.
- Inductive probes on Diatests and snap gages, through MB-8I module
- Single and multi-level Air gages, through MB-AG modules
- Mitutoyo digital indicators and micrometers, through MB-4D module.
The M400 switchs the screen automatically depending on the fixture used by an automatic detection. Then the operator press on the footswitch to transfer the data.

5 levels air gage connected on the M400 through 5*MB-AG modules

REFERENCES

Description	Reference
Display M400	45500
Optional accessory for panel mount	45512
Option display without stand	45511
Option kit for rear mouting of the M-bus modules	45510
M-bus cable between a M400 and modules L2, 5 or 10m	81210-x
Footswitch	18020
M-Bus module for 4 or 8 Metro inductive probes (accept Metro linearized probes)	MB-4i / MB-8i
M-Bus module for 4 or 8 Tesa compatible probes	MB-4iT / MB-8iT
M-Bus module for 4 Mahr inductive probes type P2004M or Feinprüf 1300	MB-4IM
M-Bus module for 2 Heidenhain probes with 11µA or 1Vpp output (interpolation max 200)	MB-2S
M-Bus module for 4 Sylvac capacitive probes	MB-4C
M-Bus module for 8 Sylvac or Bowers Bluetooth instruments	MB-BT
M-Bus module for 4 Digimatic instruments (or other through Metro cables)	MB-4D / 8D
M-Bus module for 4 Magnescale probes	MB-4M
M-Bus module for 1 Air gage (compatible any manufacturer) Requires an air preparation set ref ACS-PNE-003	MB-AG
M-Bus module with 8 inputs/outputs	MB-IO
M-Bus module for 2 TTL encoder or scale	MB-2T
M-Bus module for 8 Sylvac or Bowers Bluetooth instruments	MB-BT
M-Bus module for Force (Kistler Piezo) VS Position (resistive sensor type Novotechnik)	MB-FP

Your distributor

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