



2024 BROCHURE

M400

Multifunction industrial display
for dimensional measurement

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Touch screen display, Intuitive operation, Highly flexible, the M400 can be used in a wide variety of applications, from the simplest to the most complex.

In a nutshell:

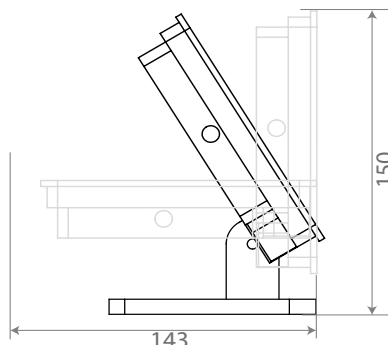
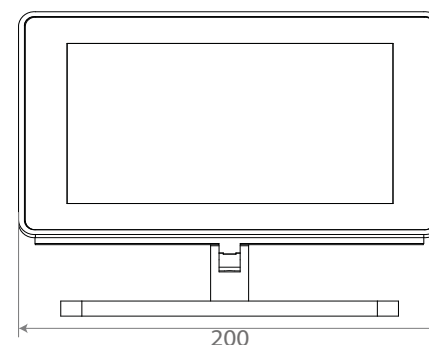
- Up to 32 characteristics can be processed simultaneously
- 99 inputs (sensors, instruments, etc.) via a network of M-Bus units
- 128 programs available
- 7" screen
- Direct acquisition of characteristics from probes or instruments, calculated characteristics, attributes characteristics or manual input characteristics
- Connectivity: USB (keyboard or VCOM type), RS232, Network, Web API, Profinet, Modbus RTU, QR code readers.
- Approved robustness, even in the harshest industrial environments, thanks to its machined aluminium casing.
- Embedded proprietary OS for flawless IT security



Simple and intuitive

The M400 is fitted with a 7" (17.8 cm) colour TFT touch screen. Its **highly intuitive user interface** makes it quick to program and easy for any operator to get familiar with. Measurements can be displayed as bar graphs, galvanometers or numerical values only.

Compact and robust



The case is made of machined aluminium and comes on a swivel base that can be fixed using 4 M5 threads. The front of the M400 is covered with an integral polyester film for maximum protection against liquid splashes.

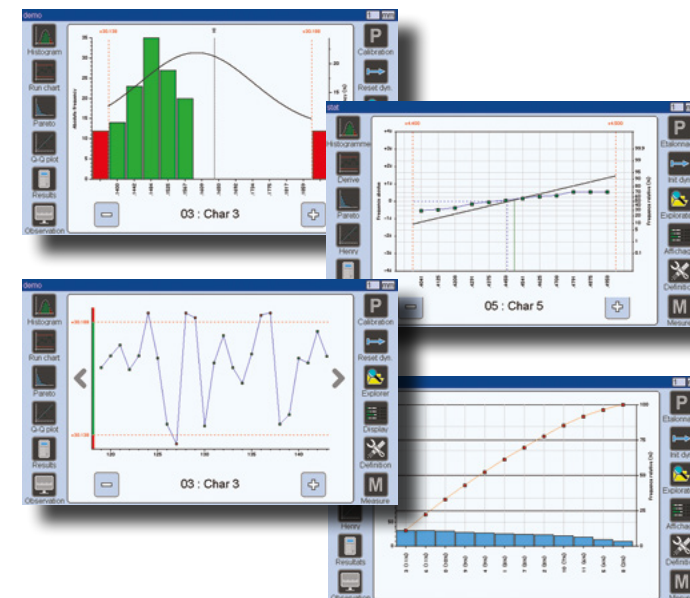
Connectors



- 1 - M-Bus for connecting MB-XX modules
- 2 - 2 pedal and/or button inputs
- 3 - RS232 COM port (ASCII and Modbus RTU protocol)
- 4 - USB port - keyboard emulation (no driver required)
- 5 - Virtual COM port on USB
- 6 - USB port > USB key and QR code reader
- 7 - 24VDC power supply

SPC Functions

The M400 can record up to 1,000 measurements per part (128 parts max). The measurements saved can be used on various SPC screens (machine or process statistics) to provide the operator with information that can be accessed quickly and easily at the machine. For more advanced processing or archiving, the MB-NET module takes over and interfaces with your IT system.



Connect

Your measuring equipment :

- Instruments
- Sensors
- Air gages
- and many more...

Display

Your measurements on a simple, intuitive interface

- Program your tolerances and calibrate your characteristics
- Enter control-related information with QR code
- Display statistics

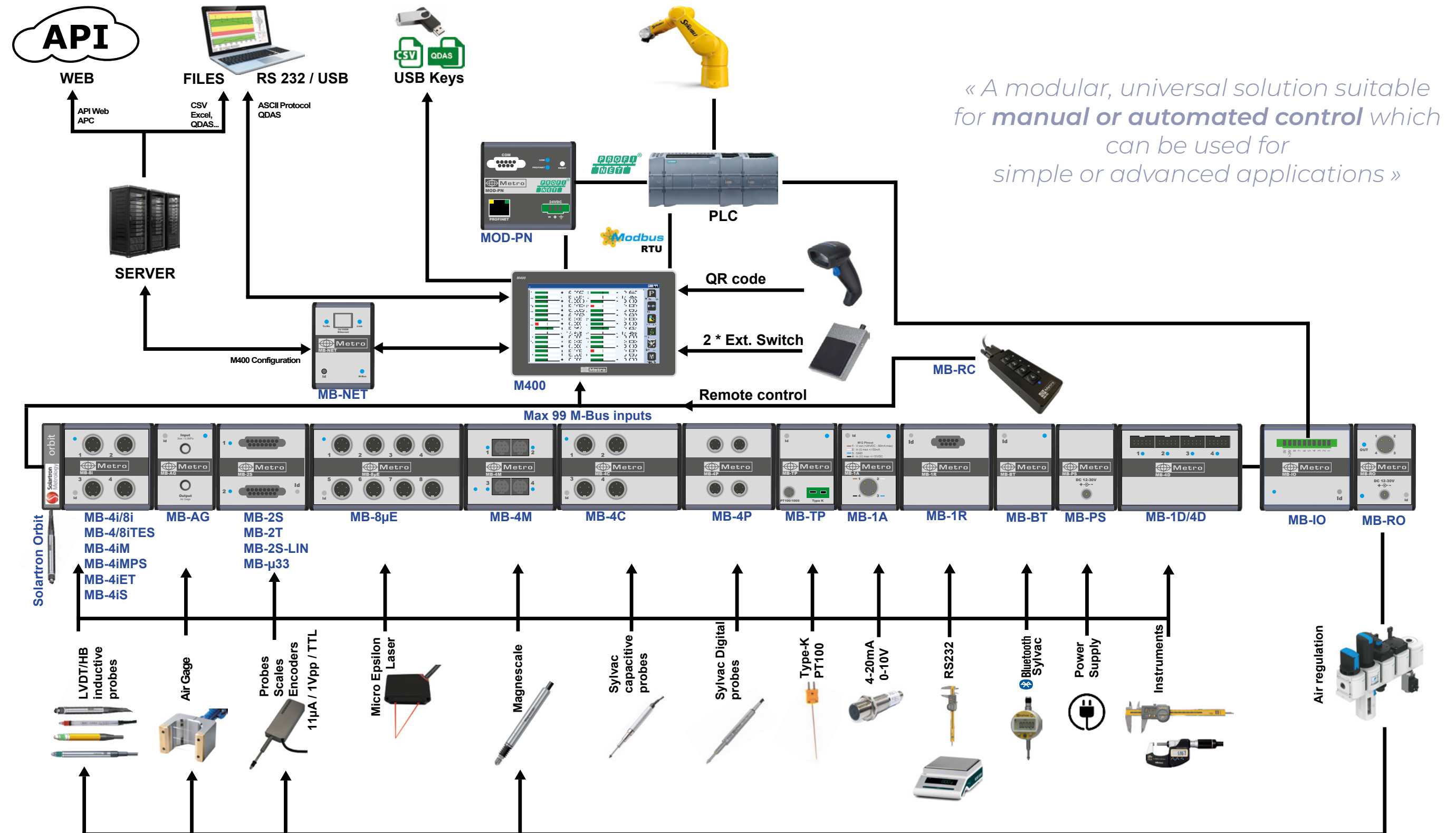
Communicate

- To a PLC with MODBUS RTU, Profinet or inputs/outputs.
- To a computer via USB, RS232, network
- To WEB applications such as SPC or APC

Improve!

The quality of your production :

- Reduce the risk of error
- Automate your measurements
- Make the most of your measuring data



Solutions for automation

The M400 offers a wide range of options for integrating or building automated systems.

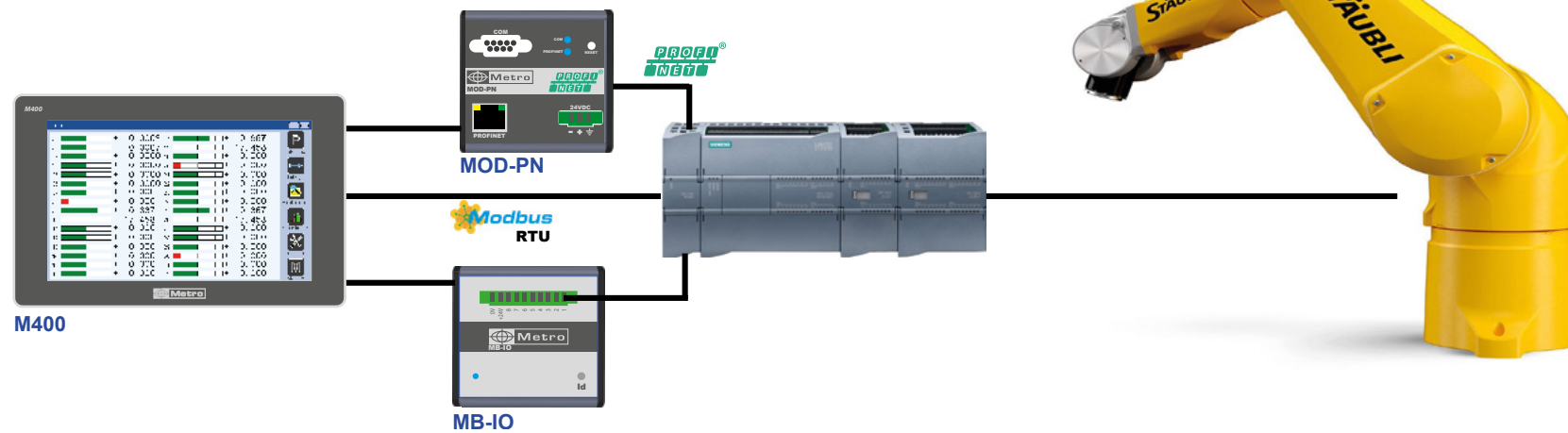
**Inputs
Outputs**

Script

**Modbus
RTU**

Profinet

« Let the M400 handle your measurement tasks and benefit from all its power for your automated machine »

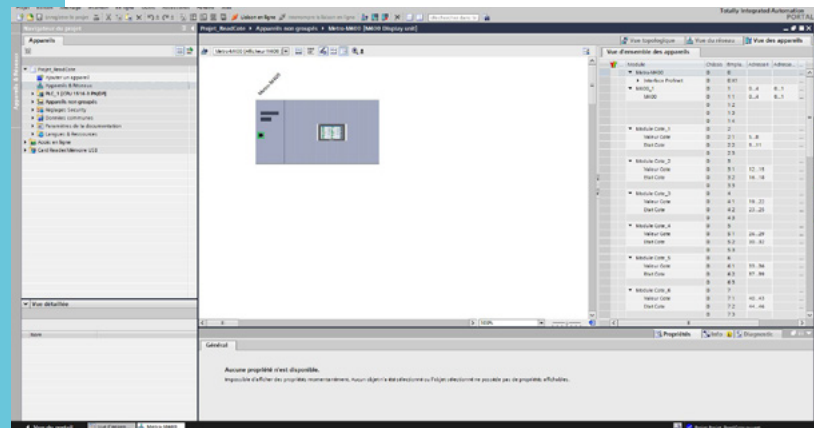


MOD-PN - A certified Profinet module

The M400 can communicate in Profinet via our MOD-PN module. This module has obtained official certification guaranteeing a high level of performance and reliability.

The MOD-PN is supplied with a GSDML (downloadable from our website) allowing the M400 to be programmed directly from official Siemens tools such as TIA portal.

The M400 is then fully controllable from a compatible PLC: editing of tolerances, calibration, live measurement values, program changes, etc.



The M400 is also directly compatible with the



Panel mounting for perfect integration

The M400 can be supplied with a swivel base or can be integrated into a panel. The M-BUS modules are mounted on a DIN rail.



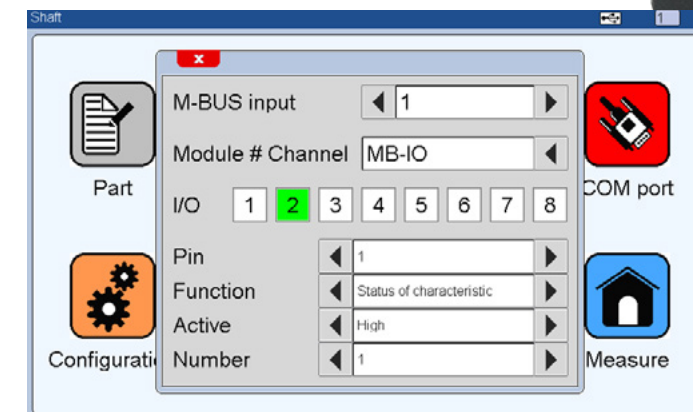
MB-IO Module

Thanks to its 8 optocoupler-isolated inputs/outputs, the MB-IO module can be used to interface automation devices to the M400. Up to 4 MB-IOs, i.e. 32 inputs/outputs can be managed.

Each terminal can be easily configured as an input or output from the touch screen interface.

Simply select a terminal and assign it one of the thirty + functions available, for example:

- Calibration
- Good / bad part
- Transfer
- etc.

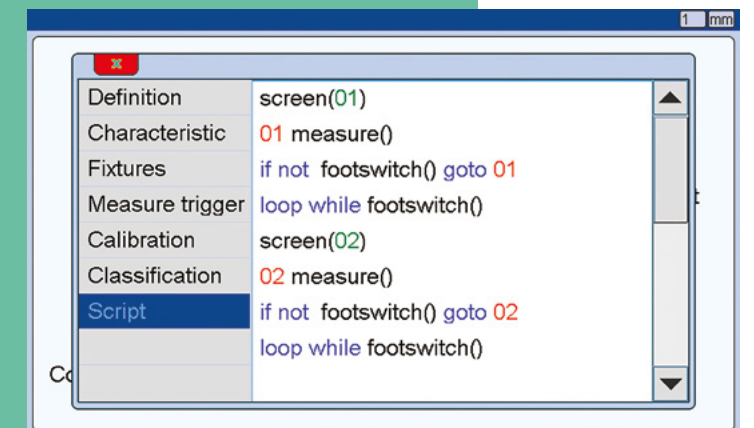


Do you have a semi-automated application? Use the built-in VB script editor

The M400 includes a VB-script like editor for automating your workstation via MB-IO modules. Display messages, control actuators and presence sensors, and transfer measurements.

The script can be written using the «Display Manager» PC software.

Simple applications no longer require a PLC!



« Metro can help you
in producing your script »

Sequential mode

For manual measurement applications, the M400 features a sequence editing mode that makes it simple and intuitive to define the operating mode of an inspection.

It's a **graphical script inspired by a simplified grafcet** that lets you define the steps that will guide the operator through the inspection.

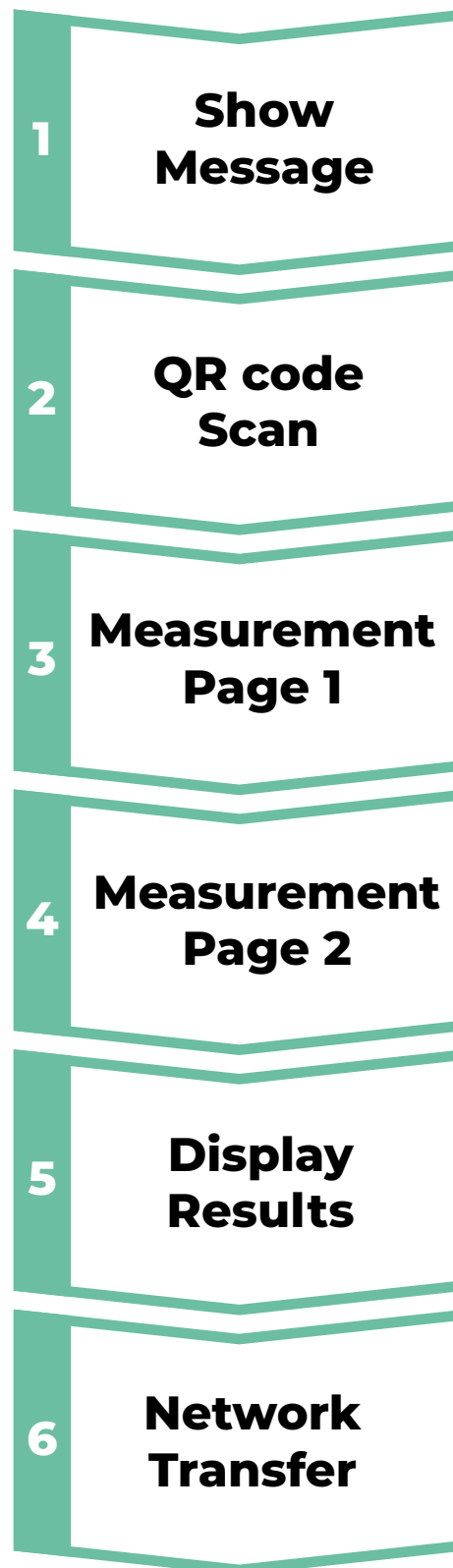
Sequence mode offers you a multitude of possibilities for very simple or more elaborate applications, with **incredible ease of use**.

Configuration part

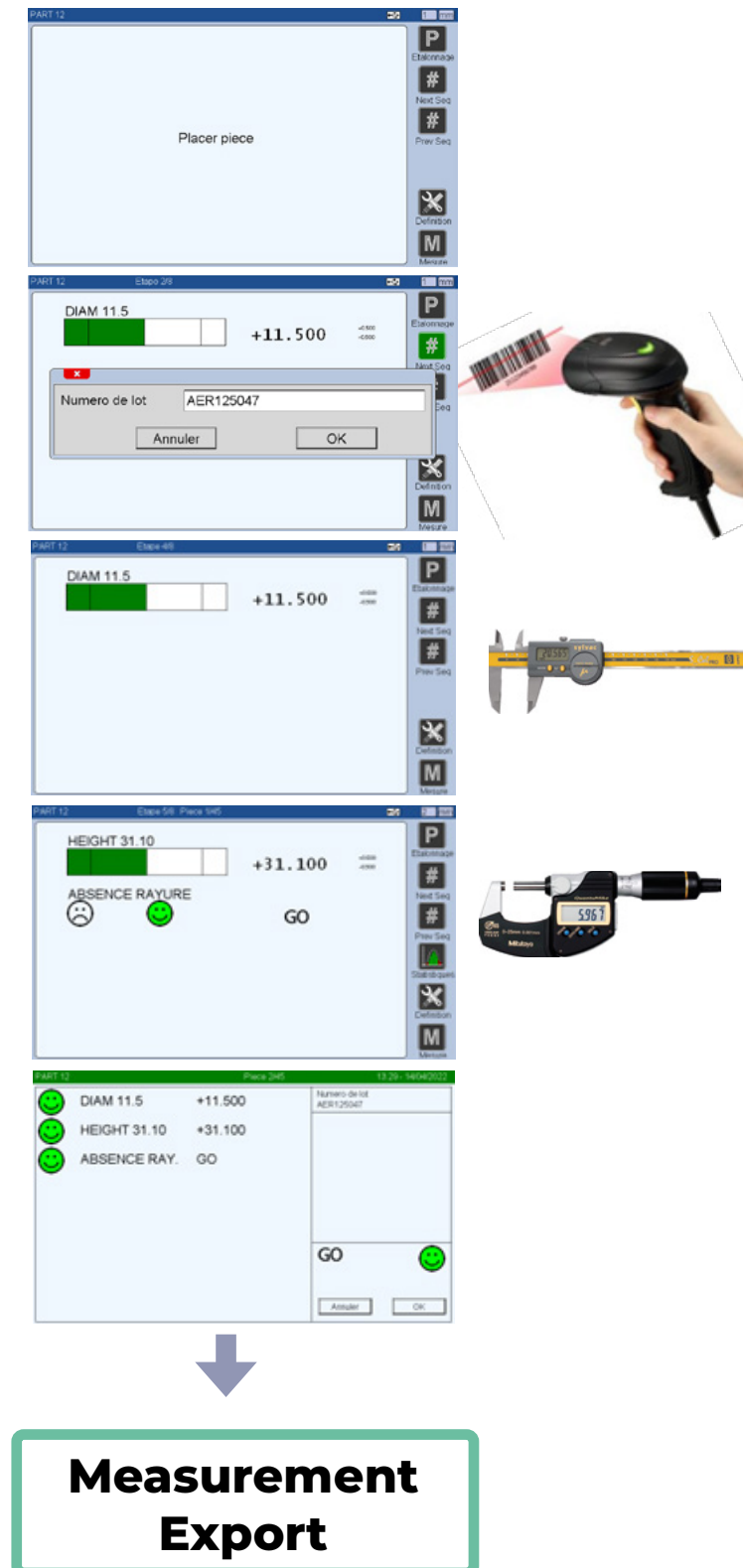
Simply select actions from a list and place them in the desired order to completely customise the measurement process.

Characteristics are previously defined in the characteristics editor, where you can select the instrument, define tolerances, the master dimension, etc. with just a few clicks.

The sequence editor offers great flexibility. It allows you to create loops and conditional steps, define the type of export, control the output of pneumatic pushed LVDTs, switch on the air for air gages and display statistics.



« For your manual shop floor dimensionnal controls, the M400 allows you to centralise your different instruments and gives rigour to your control plan. »



Display part

Once the M400 has been configured, the operator simply needs to follow the on-screen instructions.

There are many benefits:

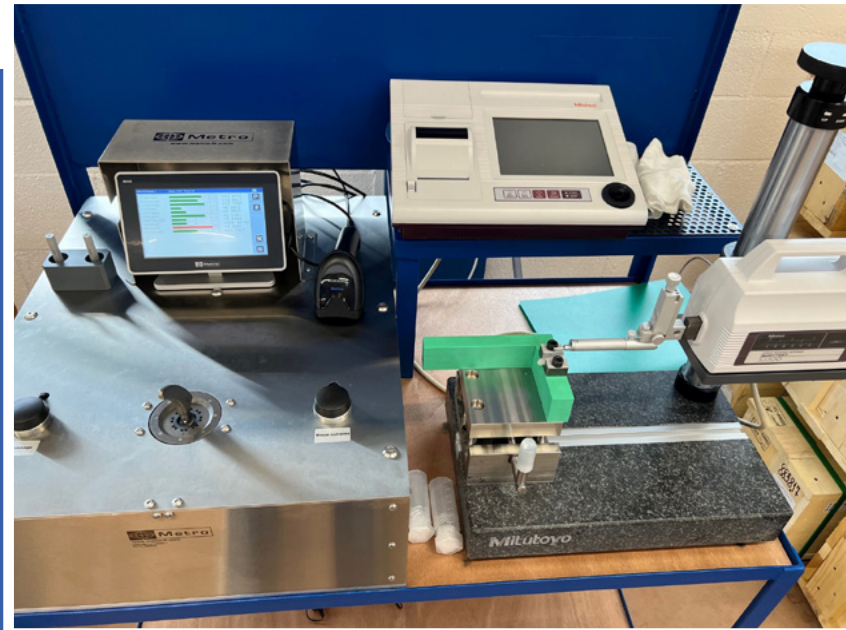
- Limited risk of error
- Rigour in following an inspection plan
- Centralisation of a multitude of measuring tools on a single screen
- A simple, consistent graphical interface that can be handled by any operator,
- Export of measurements, with local statistical processing if required.
- The PC at the workstation becomes optional.
- No risk of viruses or computer attacks linked to the connection of the M400 to your network, as it is not a PC.

Application examples

Medical

Manual cone measuring station on a hip prosthesis.

The control assembly consists of a pneumatic ring with 24 independent measuring points, spread over 3 altitudes.



The M400 measurement sequence requires the operator to enter information using a QR-code reader, such as batch number, name, drawing number, etc.

- Direct measurement of diameters at 3 altitudes using MB-AG modules for air gage,
- Calculation of the circularity at each altitude, the taper angle and the theoretical diameter at the gauge plane.
- Acquisition of a Mitutoyo roughness tester via the MB-IR M-BUS module.

The measurements and data acquired are then compiled into a final report in the customer's format and stored on the customer's server. Files are automatically archived and reports printed at the end of each batch. Calibrations are also integrated into the traceability system.

Finally, we control the air regulator by reducing the pressure by a factor of 10 when the ring is not measuring, to save air (and therefore electricity) and limit noise. We do not cut off the air completely to maintain a constant temperature for the measuring tool.

Measure

- Diameters and heights

Calculate

- Taper angle, circularity

Acquire

- Roughness tester, attribute characteristics,
- production info (Batch nr, operator, etc.)

Traceability

- Creation and printing of measurement files on the network in client format
- Calibration traceability



Automation

Automated sorting machine. Here, the M400 measures 9 precision inside diameters using 2 multi-levels air gages, and heights using LVDTs on 5 separate stations.

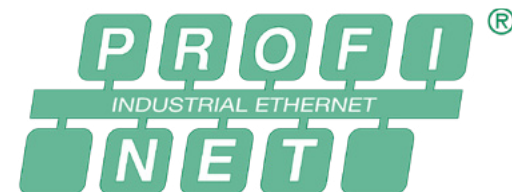
The M400 allows to :

- calculate characteristics according to their tolerances, including dynamic characteristics (form faults)
- calibrate air gages
- simple, live statistics display
- Simple, intuitive HMI for sensor settings and machine set-up
- A very simple data transfer system using keyboard emulation (no driver required), enabling measurement tests (GAGE R&R for instance) to be carried out very simply while the machine is being set up.

Profinet communication is provided to the machine's main PLC.

The main PLC thus completely outsources the measurement task to the M400.

The MOD-PN (the M400's Profinet module) is certified by Profibus International, guaranteeing maximum performance.



M400 and accessories	REF
M400 Display	45500
Flange option for panel mounting	45512
Optional rear kit for mounting M-Bus modules (eliminates the need for an M-Bus cable)	45510
MOD-PN - PROFINET communication module	MOD-PN
M-bus cable between M400 and modules, L2, 5 or 10m	81210-X
Pedal with jack	18020
Table button with jack	18022
Measurement acquisition modules	
M-Bus for 4 or 8 inductive probes (half-bridge) METRO	MB-4I / 8I
M-Bus for 4 or 8 inductive probes (half-bridge) TESA	MB-4IT / 8IT
M-Bus for 4 inductive probes (LVDT) Mahr type P2004M	MB-4IM
M-Bus for 4 inductive probes(LVDT) Marposs type F10-F25	MB-4IMPS
M-Bus for 4 inductive probes (LVDT) Etamic type ZDBxx	MB-4IE
M-Bus for 4 inductive probes (LVDT) Ametek Solartron type AX/xx/S	MB-4IS
M-Bus for 8 Micro Epsilon NCDT opto laser sensors (requires MB-PS)	MB-8μE
M-Bus for 2 Heidenhain probes, scales or encoders with 11μA or 1Vpp signal (max 2000 interpolation)	MB-2S
M-Bus for 2 Heidenhain probes, scales or encoders with 11μA or 1Vpp signal (max 2000 interpolation)with linearization feature	MB-2S-LIN
M-Bus for 4 Sylvac capacitive probes (P25 type)	MB-4C
M-Bus for 8 Sylvac Bluetooth instruments	MB-BT
M-Bus for 1 or 4 Digimatic instruments (or other via Metro adapter cable)	MB-ID / 4D
M-Bus for 4 Sylvac digital probes (Type P12D)	MB-4P
M-Bus for 1 Air Gage. Requires air preparation ref ACS-PNE-003 or ACS-PNE-004 (air saving) + MB-RO	MB-AG
M-Bus for 2 TTL sensors, scales or encoders with SUBD-15 connector	MB-2T
M-Bus for 4 Magnescale probes (type DK)	MB-4M
Accessory - automation - communication Modules	
M-Bus for PT100/1000 sensor or type K thermocouple input	MB-TP
M-Bus with 1 relay output (designed to control ACS-PNE-001 or 004 air preparation units)	MB-RO
M-Bus remote control with 4 programmable buttons (new version 2024)	MB-RC
M-Bus with 1 analogue input 4-20mA or 0-10VDC	MB-1A
M-Bus with RS232 input for instrument (list of compatible instruments on request)	MB-1R
M-Bus power supply for M-Bus	MB-PS
M-Bus with 8 optocoupled inputs/outputs	MB-IO
M-Bus network communication for displays (network file generation) or Web API communication	MB-NET



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