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MP6Plus

LABORATORY
PROFESSIONAL INDICATOR
with 1, 2, 3 or 4 channels

Measurement of WEIGHT, FORCE, PRESSURE, TORQUE, DISPLACEMENT and TEMPERATURE



















"THE EVOLUTION OF THE SPECIES": after more than 20 years of service in the various versions the new MP6₽ω is born.

MP6 is a Professional Digital Laboratory Indicator with **1**, **2**, **3**, **or 4 inputs**, suitable for receiving signals from strain gauge sensors, transmitters with voltage or current output and PT100. Particularly suitable for both static and dynamic applications, for calibration and verification in metrology laboratories or industrial environments where it is necessary to make measurements of weight, force, pressure, torque, displacement and temperature in a <u>synchronized</u> manner.

To **FIT EVERY APPLICATION** the instrument can be configured and customized: the function keys F1, F2, F3 and F4 can be programmed for the function of interest such as: PEAK, HOLD, RELEASE, TX DATA DATALOG, DISCHARGE, ZOOM. **MP6** Plus allows you to enable and disable each channel and using the **ZOOM** function it s possible to display only the channel of interest in full screen.

The instrument works with a resolution of ± 100.000 divisions and an accuracy better than 0.005% due to an internal 24-bit Sigma-Delta AD converter and a measurement control that is carried out for switching at a frequency equal to that of sampling: this system provides a better suppression of interference due to offset drift and to the connecting cables

The sampling frequency (common to all channels) can be set from 2.5 samples per second up to 4800 samples per second therefore the instrument meets the needs of applications that require a considerable speed of response.

Each input channels can be supplied in 4 different configurations:

- Version with **input for strain gauge transducers** with standard resolution of ± 100.000 div. suitable for working with load cells or force transducers with output ± 2 mV/V or ± 3 mV/V and 4 wires or 6 wires connection.
- Version with **voltage input** with standard resolution of ± 100.000 div. suitable for working with pressure, torque transmitters, etc ... with output ± 10 V or ± 5 V.
- Version with **current input** with a standard resolution of ± 160.000 div. suitable for working with pressure, torque transmitters, etc ... with output 4-20mA or 0-20mA and 2- and 3-wires.
- Version with **temperature input** for PT100 eligible to work in the range from -50 °C to + 250 °C with 0.1 °C resolution and accuracy \pm 1 °C.

The instrument is equipped with a rear **USB** port to connect directly to a PC or Tablet.

As **OPTIONS** the instrument can be equipped with:

• Additional input channels CH2, CH3 and CH4 with a synchronization system that allows to acquire at the same instant the measurement of all channels.

One, two, three or four Analog Outputs programmable as voltage (± 10V, 0/5V, 0/10V, ±5V) or current (4-20mA, 0-20mA, 0-24mA) that can be associated to different channels or to the TOTAL (sum of two or more channels).
 The refresh rate of the analog signals is equal to the frequency of acquisition of the respective channels in input.

- A serial RS232 line to directly connect the device to a PC, PLC or a serial PRINTER.
- 4 programmable **DIGITAL INPUTS** 24Vdc.
- A serial RS485 line with protocol MODBUS RTU normally used to connect multiple instruments in a same network to a PLC.
- WIRELESS transmission designed to transmit measurements to other devices by radio at a distance up to 100m.
- A powerful DATALOGGER with non-volatile memory, which allows to store data at the maximum acquisition speed, synchronize recordings with an internal clock-calendar and eventually export data to a file using an USB stick in .csv file format that can be transferred directly to Microsoft Excel.

Other features and functions of importance are:

- Graphical, large and high resolution LCD display with backlit.
- Automatic **UNIT CONVERSIONS** in many specific units for each type of transducers.
- Function MULTIMETER which displays the signal of the sensor directly in mV/V, V or mA.
- User selectable language: ITALIAN or ENGLISH.
- Function ZERO and AUTOZERO to reset automatically the measure if the measurement is below a set threshold.
- Function of **HOLD**, **PEAK**, programmable **FILTER**.
- Function of **DISCHARGE** in order to measure the amount of product discharged for example from a tank.
- Function **TOTAL** to perform the sum of the channels.
- Function **KEY LOCK** to protect the instrument settings by unauthorized persons.
- Function CLOCK-CALENDAR (Option) with date and time.
- 24 columns **PRINTER** (option) connected to the serial port through which it is possible to print the measuring points with the date and time and the data of the company that carried out the survey.

For each input channel, you can calibrate the signal coming from the sensor both in the **POSITIVE RANGE** and in the **NEGATIVE RANGE** (Example in tension and compression) through 3 different modes:

- Calibration with **Full Scale**: characterization through the programming of the transducer full scale and sensitivity in both the positive and negative range.
- Calibration for **POINTS**: linearity correction by programming 5 known points in both the positive and negative range.
- **Known Weight**: practice characterization (in the field) by imposing a known weight, pressure, torque to the sensor and calibrating the transducer output to this reference value.

To increase security the instrument has the ability to perform a **BACKUP** of all calibrations data so that you can recall them in case of accidental tampering.

MP6Plus may be accompanied by various applications and analysis software to perform calibrations for : PRESSURE FORCE and TORQUE measurements.

Typical applications:

Calibration of reference machines: force, pressure and torque.

Calibration of materials testing machines.

Calibration of test benches and testing machine.

Calibration of transducers, pressure transmitters and pressure switches.

Calibration of load cells, force transducers and dynamometers.

Calibration of wrenches: snap or direct reading, screwdrivers.

Audits between laboratories for the verification of measurement uncertainties.

Audit to perform metrological confirmations.

Audit for interlaboratory comparisons.

Quality control in production lines.

Quality Control in Calibration and Testing Laboratories.

Tests on materials such as springs, friction detection, breakout forces.

Tests on protective devices and safety.

Monitoring over time of mechanical quantities.

STANDARD CONFIGURATION

CH₁

±2mV/V, ±3mV/V ±5V, ±10V 0-20mA, 4-20mA

POWER SUPPLY 220 Vac



USB 2.0 •

PEAK TOTAL **DISCHARGE DIGITAL FILTER** ZERO and AUTOZERO **DIGITAL CALIBRATIONS UNIT CONVERSION**

ADDITIONAL OPTIONS

CH2 - CH3 - CH4 OPTIONS

±2mV/V, ±3mV/V ±5V, ±10V 0-20mA, 4-20mA

PT100 (temperature) ONLY CHANNELS CH2 and CH4

RS232C RS485 MODBUS





PRINTER



From 1 to 4 **ANALOG OUPUTS**

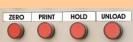
Associated with channels CH1, CH2, CH3, CH4 or **TOTAL**

The refresh rate of the analog signals is equal to the frequency of acquisition of the respective channels in input.





4 Programmabile **Digital Inputs**





• Remote Function key PLC Commands





Internal **CLOCK CALENDAR**



Front panel USB port to download data logger using a USB sticks and to bring data directly to a PC. File type: csv or txt

Power Supply

115 Vac

24Vdc



TECHNICAL DATA

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CASE MATERIAL ALUMINIUM painted container PROTECTION CLASS (EN 60529) IP40		· ·				
PROTECTION CLASS (EN 60529)						
THOTEORION CEASS (EN 00325)		·				
DEGREE OF ENVIRONMENTAL CONT.	PROTECTION CLASS (EN 60529)	1				
	DEGREE OF ENVIRONMENTAL CONT.	0.01				
WEIGHT ~ 0,8 kg	WEIGHT	~ 0,8 kg				

OPTIONS

INPUT CH2-CH3-CH4: STRAIN GAUGE TRANSDUCERS	$\pm 2mV/V$, $\pm 3mV/V$ (max $\pm 3.5mV/V$)			
RESOLUTION	± 100.000div			
TRANSDUCERS POWER SUPPLY	5Vdc switching (±3%)			
TYPE OF CONNECTION	4 or 6 wires			
TRANSDUCER RESISTANCE	from 100Ω to 2000Ω			
INPUT CH2 – CH3 - CH4: VOLTAGE AMPLIFIED TRANSDUCERS	±10V e ±5V			
RESOLUTION	\pm 100.000 div			
TRANSDUCERS POWER SUPPLY	20Vdc			
INPUT CH2 – CH3 - CH4: CURRENT AMPLIFIED TRANSDUCERS	0-20mA 4-20mA			
RESOLUTION	+200.000 div +160.000 div			
TRANSDUCERS POWER SUPPLY	20Vdc			
INPUT CH2 – CH4 TEMPERATURE	PT100 2 wires (range -50 +250°C)			
ACCURACY	±1°C			
RESOLUTION	±0.1°C°			
UNITS	C°, °F			
RS232 SERIAL OUTPUT	MAX cable Lenght 13m			
RS485 MODBUS RTU (max 32 in multipoint)	MAX cable Lenght 1000m			
PRINTER	24 columns (RS232)			

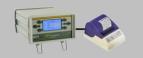


USB Port for PC communication.

RS232C serial port for PC or PLC communication.

RS485 serial port for PC or PLC communication

The USB, RS232 and RS485 are indipendent so it is possible to connect at the same time a PC, a PLC and a 24 columns serial printer.



Serial communication with a 24 columns PRINTER.

On the report is it possible to print up to 3 header lines with the company data. A mesurement point will be printed by pressing the key PRINT or using a remote digital command.

You can print on both paper and adhesive labels.

Analog Outputs	1, 2, 3 or 4 independent outputs				
Current Output	0-20mA, 4-20mA, 0-24mA				
Voltage Output (max 20mA – RL min: 1kΩ)	0-5V, 0-10V, ±10V, ±5V				
DIGITAL INPUTS with programmable function	4				
WIRELESS transmission – only version with up to 2 channels	433MHz				
Max distance in free space	100m				
DATA LOCCED allows you to store the massurements and to keep them in internal memory over if you turn off the					

DATA LOGGER allows you to store the measurements and to keep them in internal memory even if you turn off the instrument.

The logging can be done in **AUTO** mode or **MANUAL** mode.

The **AUTO** mode records the measurements at regular intervals for a programmable time. The time interval between two measurements points can be varied from the maximum speed conversone (4,8kHz) up to recording every 24 hours.

The **MANUAL** mode allows the operator to decide when to record the measurements on memory. The command can be given either via a button on the front panel or via a digital input.

All data can be subsequently displayed on the display, downloaded through the powerful software **MPSupervisor** or exported to external Flash Memory (USB stick) for charting, data processing on Microsoft Excel, press reports etc ...

D	ATA LOGGER			
М	ax Storing Points			1 channel enabled : max. 130.000
				2 channels enabled: max. 65.000
				3 channels enabled: max. 32.000
				4 channels enabled: max. 43.000
				4 channels enabled +TOTAL: max. 26.000
М	AX PROGRAMMABLE TIME			100 days
CL	OCK - CALENDAR			Year, Month, Day, Hour, Minute, Seconds



Front Panel USB connector (type A) that allows you to save or export the recorded measurements directly on a USB stick, for faster portability of the measures on PC. It is possible to export the file in TXT or CSV for a direct import of the measures on programs such as Microsoft Excel.

COMPONENTS SUPPLIED





Power Cord



TOTAL STATE OF THE PROPERTY OF

DB9 Male Connector for transducer

CD with Manual and USB Driver

COMPONENTS IN OPTION (purchased separately)



USB cable



RS232 Serial Cable



Pair of mounting brackets for panel



Desktop Printer 24 columns



DB9 Male Connector For each transducers



Calibration Report ACCREDIA Certificate (MP6Plus +Transducer)



Calibrator for mV/V signals



Case for transport

ELECTRICAL CONNECTION



- Power Supply
- 2 Fuse
- **3** Main Switch
- 4 USB Port
- **S** RS232 RS485 Digital Input Analog Outputs.
- **6** CH1 standard input
- CH2 Input (Option)
- 8 CH3 Input (Option)
- CH4 Input (Option)

APPLICAZIONI SOFTWARE (purchased separately)



To complete the system of measurement **AEP transducers** has developed several software applications that interface directly to the instrument **MP6**? and support the user in the various functions of calibration, testing, analysis, data storage, transfer of measures on Microsoft Excel etc. ...

MPSupervisor is a software dedicated to **MP6**? . Through this software you can download the data logger and operate directly on **MP6**? to change parameters and create graphics test.

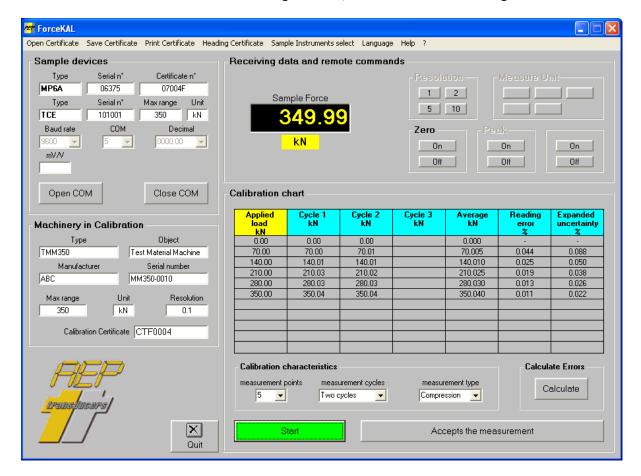
Quick Analzyer is a general purpose acquisition software where **MP6**₂₀₀ can be associated to other **AEP instruments**. For dedicated calibration applications 3 different software are available: **ForceKal, PressKal, TorqueKal.**

For more information download the manuals of the software on the site:

www.aeptransducers.com www.aep.it

ForceKAL

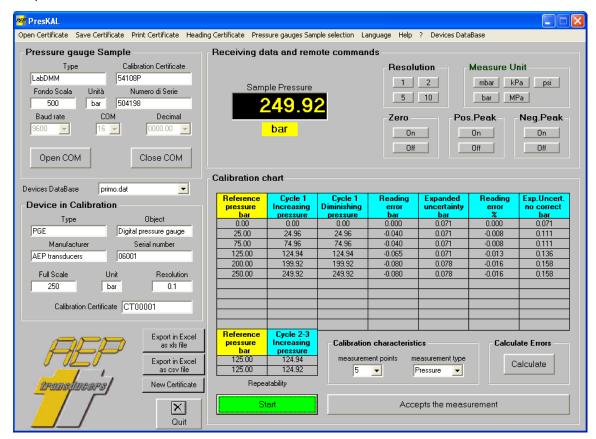
Dedicated to the calibration of testing machines, test benches where force is generated.



PressKAL

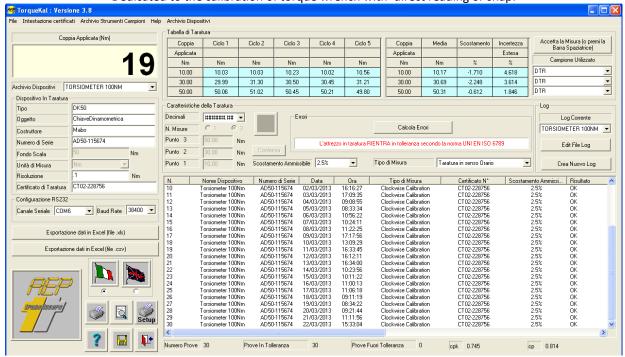
Dedicated to the calibration of pressure gauges such as

- manometers
- pressure transducers
- pressure transmitters
- pressure switches



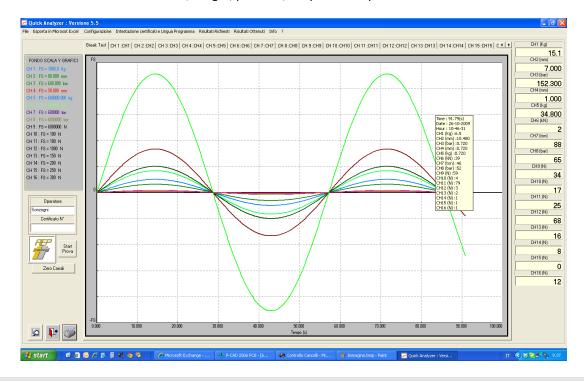
TORQUEKAL

Dedicated to the calibration of torque wrench with direct reading or snap.



QUICK ANALYZER

Dedicated to recording and graphical analysis of up to 16 different AEP transducers instruments to measure: force, weight, pressure, torque and displacement.

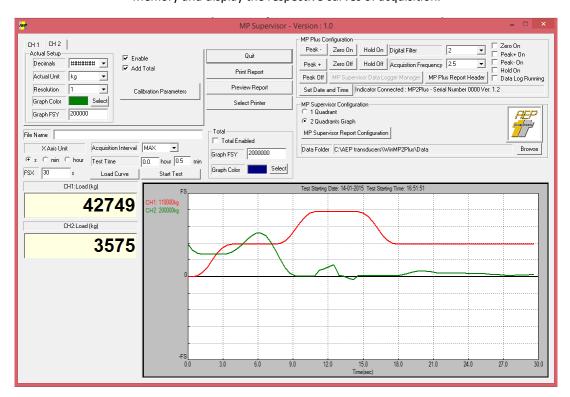


MP Supervisor

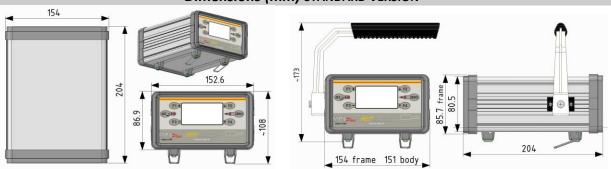
A dedicated program that allows an immediate interfacing through the USB port with the MP6Plus and allows you to view graphs, export data to Microsoft Excel directly from the PC and set all configuration parameters.

The program also allows you to download a Data Logger carried out using the internal memory or the USB Flash

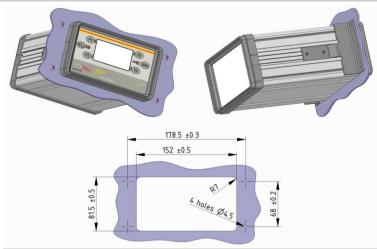
Memory and display the respective curves of acquisition.



Dimensions (mm) STANDARD VERSION



MOUNTING PANEL APPLICATION



Note: For mounting panel requires 2 special brackets.

PURCHASE CODES

	Inputs	Power	Analog Output	Serial Output	Functions	Accessories	Digital Inputs
MP6P	X	XXX	XX	Х	Х	X	Х
	2	230	A1	S	D	М	N
	2 inputs	230 Vac	1 output	RS232, RS458 Modbus, Printer	Data logger Clock-Calendar	Handle	4 Digital Inputs
	3	115	A2	W	F		
	3 inputs	115Vac	2 outputs	Wireless	Datalogger		
	4	24	А3	Transmission	Clock-Calendar USB Flash		
	4 inputs	24Vdc	3 outputs		Memory		
-		•	A4				
			4 outputs				

Example: MP6P230 (MP6Plus power supply230Vac base version)

Example: MP6P224A2SM (MP6Plus 2 channels- power supply 24Vdc + 2 Analog output + Serial output + handle) **Examples:** MP6P3115SF (MP6Plus 3 channels power supply 115Vac + Serial output + USB Flash Memory)

ALWAYS SPECIFY in the puchase order how to configure the input channels:

Example: CH1 = 4-20mA CH2 = 2mV/V CH3 = 10V CH4 = PT100



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