Data Sheet: MP4P.539.R1.EN

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MP4Plus

PANEL MOUNTED PROFESSIONAL INDICATOR with 4 independent channels

Measurement of: WEIGHT, FORCE, PRESSURE, DISPLACEMENT, TEMPERATURE TORQUE, ANGLE and SPEED.

"THE EVOLUTION OF THE SPECIES": after more than 30 years of service in the various versions the new **MP4*Plus*** is born.

MP4*Plus* is a Professional Digital Laboratory Indicator with **4 inputs**, suitable for receiving signals from strain gauge sensors, transmitters with voltage or current output, PT100, potentiometer and ENCODER.

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.

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.

MP4*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 exceeds 0.005% accuracy due to an internal 24-bit Sigma-Delta AD converter and a measurement control system working at a frequency equal to the sampling frequency: this system provides a better suppression of interference caused by offset drift and connecting cables.

The sampling frequency can be set from 2.5 samples per second up to 4800 samples per second therefore the instrument is suited for applications that require a considerable speed of response.

Each input channel can be supplied in 6 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 ±10V or ±5V.
- 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 with 2 or 3 wires connections.
- 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 ± 1 °C.
- Version with **incremental ENCODER input** suitable for working with linear or rotary encoders. You can also define whether to measure angle, displacement or speed.
- Version with **POTENTIOMETER input** suitable for working with linear transducers or displacement.

MP4*Plus* has as standard configuration:

- **4 DIGITAL INPUT** 24Vdc with programmable functions.
- **5** programmable **SET POINTS**.
- **5 RELAYS** type DPDT. The relays can be programmed, in combination with the setpoint, to create a simple automation or logics of intervention.
- A powerful **DATALOGGER** with non-volatile memory, which allows to store data at the maximum acquisition speed, synchronizes recordings with an internal clock-calendar and can eventually export data to a USB stick in .csv file format that can be transferred directly to Microsoft Excel.
- A rear **USB** port to connect directly to a PC or Tablet.

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

- 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 **RS232C** line to directly connect the device to a PC, PLC or a serial **PRINTER**. Moreover, **MP4*Plus*** can be programmed to work as **REPEATER.**
- A serial **RS485** line with protocol MODBUS RTU normally used to connect multiple instruments in a same network to a PLC.
- A front panel **USB port type A**, to export directly on a USB stick a datalogger in csv file format for a complete compatibility with 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 transducer.
- **MULTIMETER** function 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 two or more channels.
- Function **KEY LOCK** to protect the instrument settings by unauthorized persons.
- 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.
- **REPEATER** Function: The instrument can be configured to display (in the form passive as Slave) measures from the RS232C serial port (for example from another **MP4*Plus*** - Master) to a remote view of the measures.
  In this case all the features enabled on the **MP4*Plus*** Slave will be active (Setpoint, USB, printer, logger etc). The **REPEATER** function is active for one channel.

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.

MP4*Plus* can be accompanied by the PC program **MP Supervisor** (Option) which allows easy connection between the instrumento and the pc over USB and allows you to display graphs or export data to Microsoft Excel.
The program also allows you to download the data log either stored on the internal memory or on a USB stick and easily compare the measurements.

Typical applications:

Automatic weighing systems and small dosages.
Systems for monitoring levels of tanks, silos and hoppers.
Integrated measuring systems on test benches and testing.
Measurement systems integrated into automated processes.
Control systems of industrial processes.
Automatic systems Testing and Quality Control in production lines.
Control measures on board for materials testing machines.
Control measures on springs, friction detection, breakout forces, leakage tests.
Tests on protective and safety devices.

STANDARD CONFIGURATION

INPUT

CH1 – CH2 – CH3 – CH4
± 2 mV/V, ± 3 mV/V
± 10 V, ± 5 V
4-20 mA, 0-20 mA
POTENTIOMETER

*PT100 (temperature)
*ENCODER incremental

⚠ * only for channels CH2 and CH4

FUNCTION

Power Supply
220 Vac

NO External Power Supply

USB 2.0

5 Set Point
5 RELAYS programmable

Ca be used for:

- motors ON / OFF
- solenoid ON / OFF

4 Programmable Digital Inputs

Used for:

- Remote Function key
- PLC Commands

FUNCTION

+

Internal CLOCK CALENDAR

PEAK - TOTAL - DISCHARGE

DIGITAL FILTER - ZERO and AUTOZERO

DIGITAL CALIBRATIONS

UNIT CONVERSION

ADDITIONAL OPTIONS

OPTION

RS232C and RS485 Modbus

PRINTER **REPEATER**

From 1 to 4 analog output
Associated to 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.

OPTION

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

24 Vdc

SOFTWARE APPLICATION
MP *Supervisor*

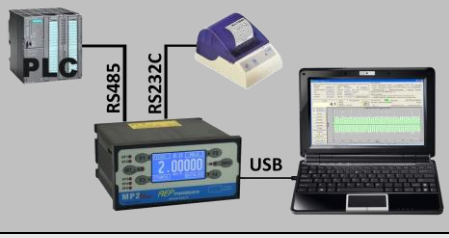
Instrument Configuration Data Analysis
Datalogger Management
Graphics.

TECHNICAL DATA

STARDARD NUMBER OF CHANNELS	**4** (CH1 - CH2 - CH3 - CH4)
ACCURACY	≤± 0,010 %
LINEARITY ERROR	≤± 0,010 %
INTERNAL DIVISIONS	24 bit
INPUT: STRAIN GAUGE TRANSDUCERS	**± 2 mV/V** and **± 3 mV/V** (max ±3.5 mV/V)
RESOLUTION	± 100.000 div
TRANSDUCERS POWER SUPPLY	5 Vdc switching (±3 %)
TYPE OF CONNECTION	4 or 6 wires
TRANSDUCER RESISTANCE	from 100Ω to 2000Ω
TRANSDUCERS CONNECTED IN PARALLEL	For each channel: **4** to 350Ω or **8** to 700Ω
INPUT: VOLTAGE AMPLIFIED TRANSDUCERS	**± 10V** e **± 5V**
RESOLUTION	± 100.000 div
TRANSDUCERS POWER SUPPLY	20 Vdc (±1Vdc)
INPUT: CURRENT AMPLIFIED TRANSDUCERS	**0-20 mA** | **4-20 mA**
RESOLUTION	+200.000 div | +160.000 div
TRANSDUCERS POWER SUPPLY	20 Vdc (±1 Vdc)
INPUT: TEMPERATURE (only CH2 and CH4)	**PT100** 2 wires (range -50 +250 °C)
ACCURACY	± 1 °C
RESOLUTION	± 0.1 °C
UNIT CONVERSIONS	°C, °F
INPUT: incremental ENCODER	linear and rotary encoders
TYPE OF INPUT	RS422 line driver power supply 5Vdc (A+, A-, B+, B-) 5Vdc Open Collector (A, B) TTL (A, B)
Unit Conversions for **DISPLACEMENT**	m, dm, cm, mm, µm, foot, inch
Unit Conversions for **ANGLE**	° (degrees)
Unit Conversions for **SPEED**	mm/min, m/min, ft/min, in/min, mm/s, m/s, ft/s, in/s rpm, Hz
INPUT: POTENTIOMETER	R min. 1 kΩ
POWER SUPPLY	5 Vdc
Unit Conversions for **TEMPERATURE**	°C, °F
Unit Conversions for **WEIGHT** and **FORCE**	Kg, t, N, daN, kN, MN, lb, klb
Unit Conversions for **PRESSURE**	bar, mbar, psi, MPa, kPa, Pa, mH_2O, inH_2O, kg/cm^2 mmHg, cmHg, inHg, atm
Unit Conversions for **TORQUE**	N·m, N·mm, kN·m, kg·m, g·cm, kg·mm, ft·lbf, in·lbf
Unit Conversions for **DISPLACEMENT**	mm, m, foot, inch, cm, dm, µm
MULTIMETER FUNCTION	Direct Display in mV/V, Volt or mA
BACKLIT GRAPHIC DISPLAY	128 x 64 dots
CHARACTER SIZE	~ 4 mm (~13 mm when ZOOM is activated)
ADJUSTING DISPLAY CONTRAST	YES
TRANSDUCER CALIBRATION	Both in the POSITIVE and NEGATIVE range
TYPE OF DIGITAL CALIBRATION	Full Scale, Point Interpolation, Known Weight
FIELD LINEARITATION	On 1 … 5 measurement point
BACKUP AND RESTORE FUNCTION	Save and restore all configuration data
FUNCTION OF ZERO	100% (on all the measurement range)
FUNCTION OF AUTOZERO	With TIME and THRESHOLD programming
FUNCTION OF PEAK	POSITIVE and NEGATIVE
FUNCTION OF DISCHARGE	YES
FUNCTION OF KEY BLOCK	Enabled through a Password
FUNCTION OF TOTAL (on all enabled channels)	YES
PROGRAMMABLE RESOLUTION	1 … 100
PROGRAMMABLE POINT POSITION	0 … 5
DIGITAL FILTER	0 ... 5
PROGRAMMABLE CONVERSION RATE	from 2.5 to 4800 samples for second
INSTRUMENT LANGUAGE	ITALIAN and ENGLISH
FUNCTION KEYS PROGRAMMABLE IN CONFIGURATION	F1 – F2 – F3 – F4

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 of reading (4,8 kHz) 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 ...	
INTERNAL DATA LOGGER (non volatile memory) Max storing points MAX TIME CLOCK CALENDAR	 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. 26.000 100 days Year, Month, Day, Hour, Minute, Seconds
PROGRAMMABLE SET POINT DIGITAL INPUT with programmable function RELAYS OUTPUT – contact DPDT form MAX VOLTAGE MAX CURRENT MAX POWER	5 4 5 220 Vdc – 250 Vac 2 A 60 W – 62,5 VA
Rear Panel USB output, Connector type B	Max Cable Length 3.5 m
NOMINAL WORKING TEMPERATURE MAX WORKING TEMPERATURE STORAGE TEMPERATURE TEMPERATURE EFFECTS on the measurements a) on zero (10 °C variation) b) on full scale (10 °C variation)	0... +50 °C 0... +50 °C -20... +70 °C ≤±0,005 % ≤±0,005 %
POWER SUPPLY FREQUENCY EXTERNAL PROTECTION FUSE MAX. POWER REQUIRED	230 Vac ±10 % 50/60 Hz 250 mA / 250 V 10 VA
PANEL MOUNTING CASE CASE MATERIAL FRONT AND REAR PANEL MATERIAL PROTECTION CLASS (EN 60529) DEGREE OF ENVIRONMENTAL CONT. DIMENSIONS (HxLxD) mm DRILLING TEMPLATE (A x L) mm WEIGHT	DIN 43700 NORYL UL94 V-O UL94 V-2 IP40 (only front panel) 1 72 x 144 x 150 mm 68 x 138 mm ~ 0,8 kg

OPTIONS

RS232C SERIAL LINE **RS485 MODBUS RTU** (max 32 in multipoint) **PRINTER** 	MAX cable Lenght 13 m MAX cable Lenght 1000 m 24 columns (RS232C) The USB, RS232C and RS485 are **INDEPENDENT** so it is possible to connect at the same time a PC, a PLC and a 24 columns serial PRINTER. On the report is it possible to print up to 3 header lines with the company data. A measurement 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 Current Output Voltage Output (max 20 mA – RL min: 1 kΩ)	1 or 2 outputs independent 0-20 mA, 4-20 mA, 0-24 mA 0-5 V, 0-10 V, ± 10 V, ± 5 V
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.	
POWER SUPPLY	115 Vac o 24 Vdc

COMPONENTS SUPPLIED

Mounting Brackets

N° 4 connector DB9 male for transducer

CD with Manual and USB Driver

COMPONENTS IN OPTION (purchased separately)

USB Cable

RS232C Serial Cable

DB9 Male Connector for transducers

Desktop 24 columns printer

ELECTRICAL CONNECTION

CH1 - CH2 – CH3 – CH4 Transducers Connectors

USB Connector

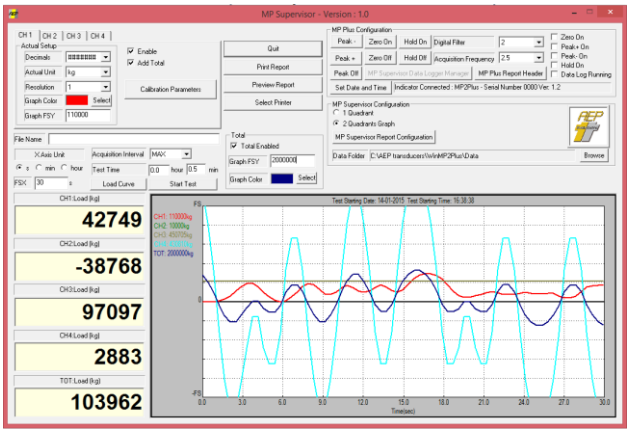
Serial Outputs
Analog Outputs
Digital Inputs

Relays Outputs

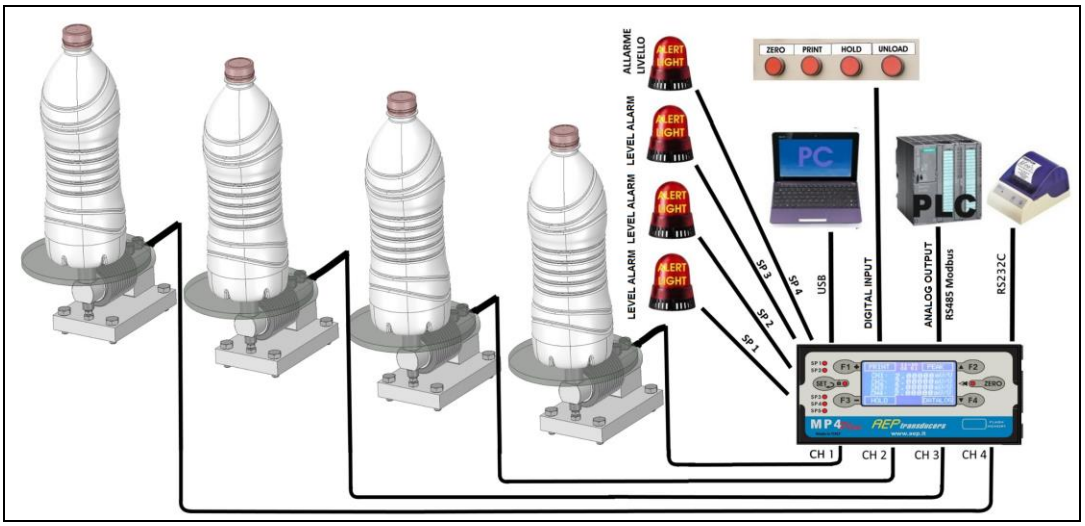
Power Supply

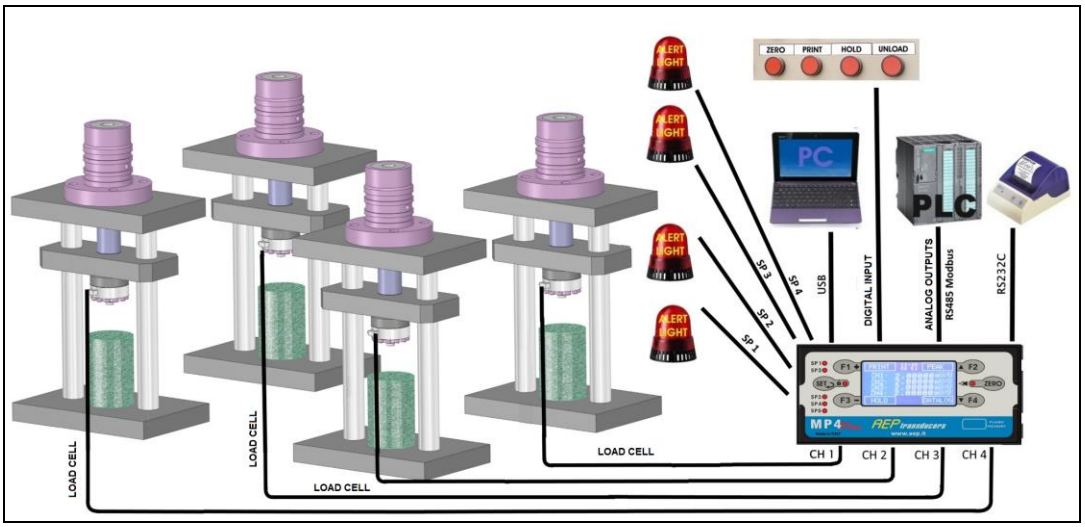
MP Supervisor (Option)

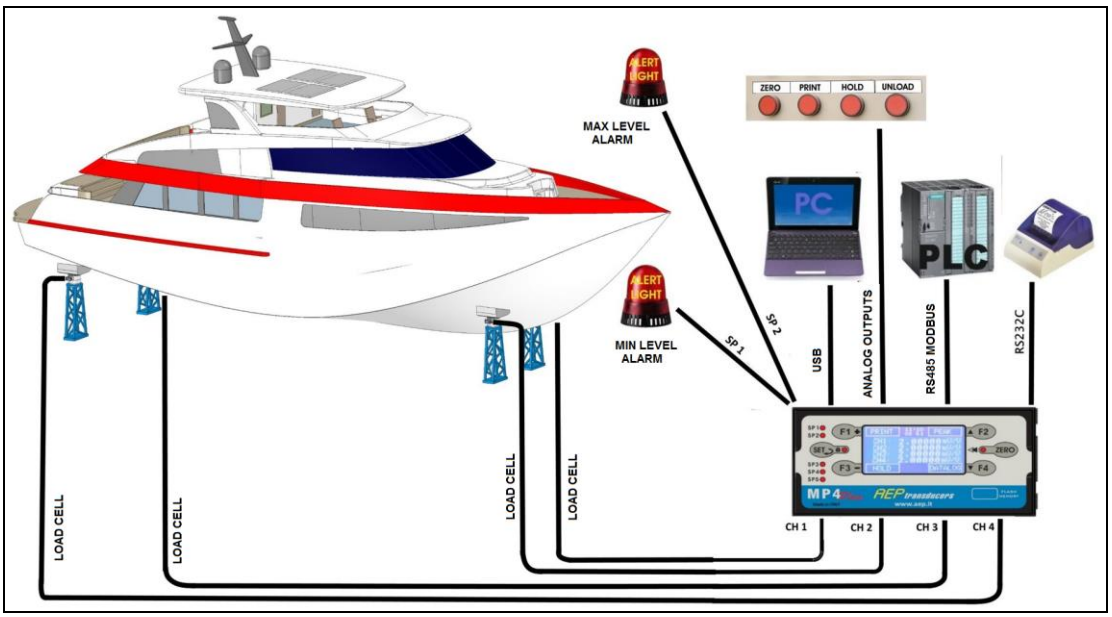
A dedicated program that allows an immediate interfacing through the USB port with the MP4Plus and allows you to view graphs, export data to Microsoft Excel directly from the PC and set all configuration parameters.
The program also allows you to download a Data Logger carried out using the internal memory or the USB Flash Memory and display the respective curves of acquisition.



Typical APPLICATION



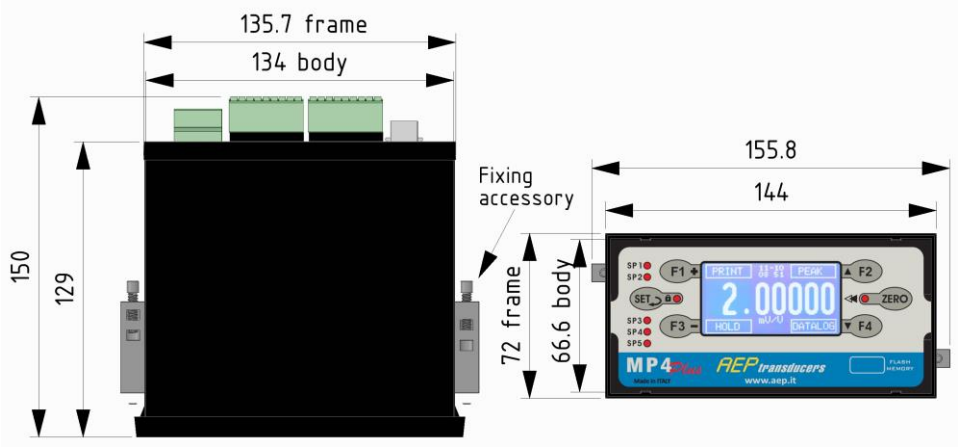




BALANCING

Ability to view both the weights of 4 distinct cells that TOTAL weight.

Dimensions (mm)



MOUNTING PANEL APPLICATION

PURCHASE CODE

	Power	Analog Output	Serial Output	Function
MP4P	**XXX**	**XX**	**X**	**X**
	230 230 Vac	**A1** 1 Output	**S** RS232C, RS458 Modbus, Printer	**F** USB Front for Flash Memory
	115 115Vac	**A2** 2 Output		
	24 24Vdc	**A3** 2 Output		
		A3 4 Output		

Example: MP4P230 (MP4Plus power supply 230Vac base version)
Example: MP4P24A2S (MP4Plus power supply 24Vdc + 2 analog output + Serial Output)
Example: MP4P115SF (MP4Plus power supply 115Vac + Serial Output + USB Flash Memory)

ALWAYS SPECIFY in the purchase order how to configure the input channels.
After the sale, the inputs **can not be changed** by the customer.

Example of channel configuration **CH1:** 2mV/V, 4-20mA, ± 10V, POTENTIOMETER
Example of channel configuration **CH2:** 2mV/V, 4-20mA, ± 10V, POTENTIOMETER, PT100, ENCODER
Example of channel configuration **CH3:** 2mV/V, 4-20mA, ± 10V, POTENTIOMETER
Example of channel configuration **CH4:** 2mV/V, 4-20mA, ± 10V, POTENTIOMETER, PT100, ENCODER