



MODEL: MPC500

- 1 TO 3 LOOPS PROCESS CONTROLLER
- 6 CONFIGURABLE ANALOGUE INPUTS
- 5 LOGIC INPUTS
- PID CONTROL, RATIO, CASCADE, HEAT-COOLING
- 2 CONTROL ALGORITHMS
- 3 SETPOINT PROGRAMS OF 16 SEGMENTS
- FRONT PANEL OR SOFTWARE CONFIGURATION
- ANALOGUE & LOGIC CALCULATION FUNCTIONS
- MODULAR CONCEPTION WITH 4 OPTION SLOTS
- TRANSMITTER AUXILIARY POWER SUPPLY
- SAFETY RELAYS FOR SERVOMOTOR DRIVE
- SLAVE MODBUS COMMUNICATION RS-422/485
- UP TO 12 ALARMS
- **MEMOCARD** TO STORE CONFIGURATION & PROFILES
- LEVELS OF SECURITY LOCKING TO SAFEGUARD PROGRAMMING
- CONTINUOUS OR DISCONTINUOUS OUTPUT
- MOTORVALVE DRIVE WITH OR WITHOUT FEEDBACK POTENTIOMETER
- 9 CONFIGURABLE DISPLAY VIEWS
- BARGRAPH AND 7-SEGMENT DIGITAL INDICATIONS OF PROCESS VARIABLES, SETPOINTS AND OUTPUTS
- AUTO-TUNE FOR STABLE AND UNSTABLE PROCESSES
- 21...80 VAC/VDC OR 80...265 VAC/VDC POWER SUPPLY
- FRONT PANEL DIMENSION: 72 x 144 mm



BENEFITS OF MPC500

✂ Improves production efficiency and maximizes the flexibility of control strategy as each of the three loop can function independently or in conjunction with each other.

✂ The circuitry of the *MPC500* allows addition of option cards inside the original enclosure very easily. This results in greater operational flexibility and lower stock holdings.

✂ Configuration can be performed through the front panel of the controller, eliminating the cost of external devices. By adding the software option, configuration parameters can be loaded to the controller via a personal computer.

✂ All configurations can be saved on a memory card for later use, without bearing the costs of the programming software and the connection module.

INTRODUCTION

The *MPC500 Multi-loop Process Controller* is designed to accept six universal and five logic inputs. It can provide up to 10 relay outputs or 3 analogue control outputs. The mode of control can be selected to be PID, ratio, cascade or heat-cool controls. The controller can be configured for up to 3 independent control loops or one cascade and one single loop control. Three set point programs of 16 segments and two control algorithms are available. The controller can be set for its minimum and maximum allowable control outputs and for the minimum and maximum calculated set points. Values of the ramp on the set point when increasing or decreasing and the burn-out value of the output can be entered into the controller. Programming of the controller is performed either via its front panel or through its programming software and a PC.

The controller is housed in a metal enclosure, suitable for panel mounting with its front panel sealed to IP-64.

Universal Analogue and Logic Inputs

Six universal analogue and five logic inputs are available. They are all referenced to the same potential and isolated at 500 Veff from all the other signals. Optionally, the first and the second analogue inputs can be galvanically isolated from the rest of the inputs and from the rest of controller at 500 VAC.

Control Loops

One, two or three independent loops, or one cascade and one independent loop can be set up with normal or heat-cool outputs.

Output

Four output boards can be installed on the controller to offer direct or reverse acting control that can be based on many different process parameters. As standard features, the unit has one standard current output on board #4, two 1 A @ 250 VAC relays and one "watchdog" relay. For more details about the available output boards, please see the Order Code section of this catalogue.

Program Functions

A program is a succession of instructions performed sequentially. The instruction can be binary for automatism functions and analogue for calculation functions. It allows analogue calculations, Boolean operations, memorization and processing of ten relays, four analogue outputs and nine display views. Each program includes an analogue accumulator, a logic

accumulator and one variable which allows an indexed access. The parameters are saved and protected against a power supply failure.

Four timers are available to be used through the programs, as a standard feature. If the clock option was included in the controller, it would allow adjustments of the hour, the day, the month and the year.

Auxiliary Power Supply

The controller is supplied with a 100 mA auxiliary power supply sufficient for operation of four sensors. For more power, optional power supply boards with each supplying 28 mA \pm 20% at 24 VDC \pm 10% should be ordered. The output is isolated up to 500 VAC from the rest of the device.

Linearization

There are two types of linearization: (1) standard type which is internal and, as an example, is used for thermocouple inputs; (2) user programmable 10-point linearizer for custom linearization.

Display

The front panel shows up to nine parameters. All the process variables, calculated set points and adjustable constants can be viewed on the cyclic 4-digit display. Process variables may be indicated directly or inversely, with or without offset. A separate 6-digit display shows the set points and the tag numbers. The control signals are indicated both numerically, on a 3-digit display, and graphically on the horizontal yellow bargraph of the controller. The other two bargraphs of the controller are allocated to process variables and set points. On the face of the controller the Auto/Manual state, remote or local set point state and alarm lights can be viewed.

Watchdog

The device has a system that controls the functioning of the microprocessor board. When there is a fault, it de-energizes a 1 A @ 250 VAC relay to open the output contact and turn on the "watchdog" light on the front panel.

Communication

The RS-485 serial communication is standard and additional RS-232 communication boards can be ordered to fill output slots. The RS-232 communication can be used for sending the data to a PC or to a printer. When an RS-232 board is installed on one of the output boards, the standard basic RS-485 communication must be declared unused, as only one digital communication can be operational.

MEMOCARD

All the set point profiles and configuration parameters can be saved on a data storage card "MEMOCARD". The data storage card is specially useful for recording complicated programs from the existing controllers and downloading them into other MPC500 controllers for the speed of programming. The MEMOCARD is also valuable at the time that the configuration of the controller has been tampered with and the operator needs to reload the configuration parameter to the controller and resume the process at once.



Software Programming

Programming of the MPC500 can be performed via the front panel of the controller, or with the aid of its optional panel programming software based on WINDOWS which allows the configuration, programming and visualization of the controller's parameters.

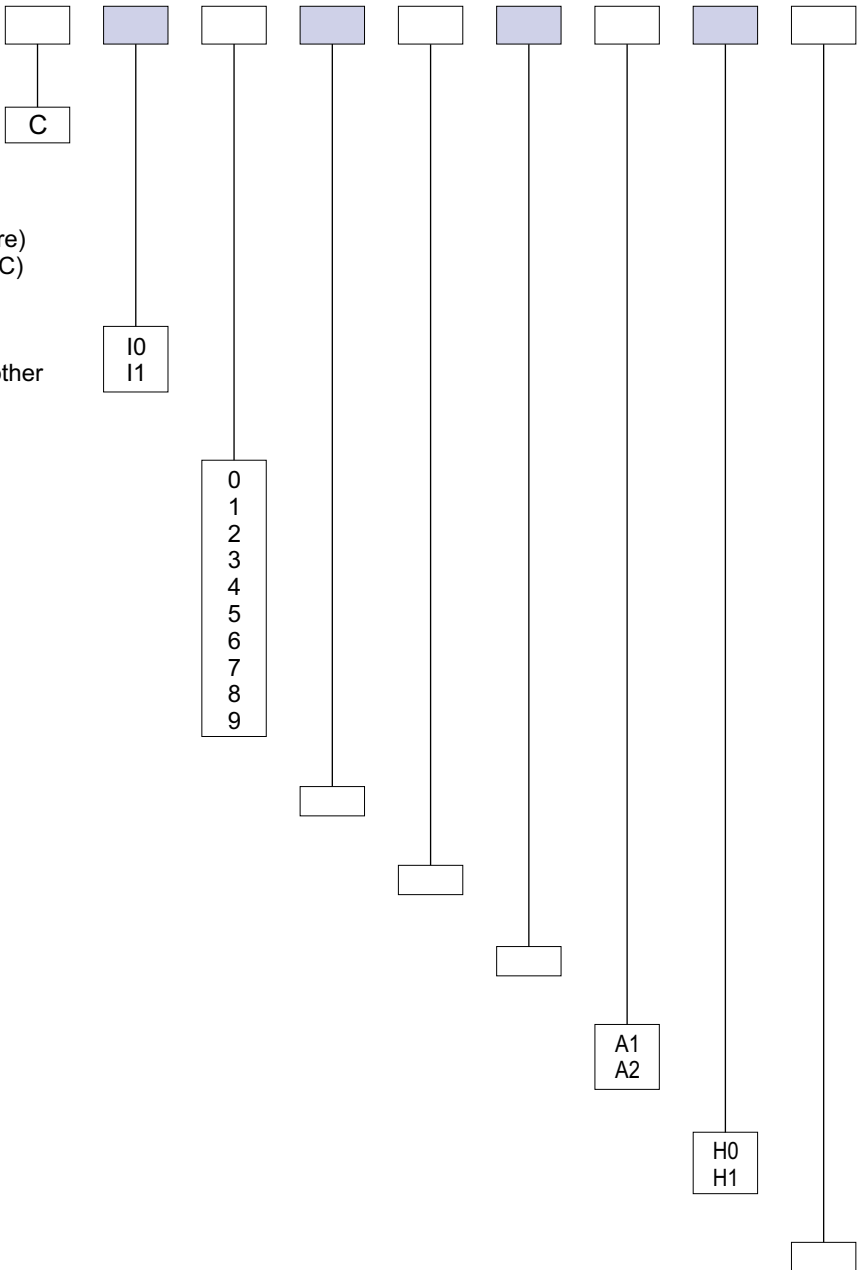
The program files can be saved in the computer for future applications.

SPECIFICATIONS

Inputs	6 analogue inputs 5 logic inputs	Logic Input	5, dry contact collector open polarization: 24 V & 5 mA
Analogue Input	Thermocouple K, J, T, S, R, N, B, E, W5; RTD 100 Ω with maximum line resistance of 20 Ω ; Voltage with or without square root extraction, 0-5 V, 1-5 V, 0-1 V, 0.2-1 V, 0-125 mV, 0-65 mV, 0-20 mV, ± 25 mV, ± 1 V; Current with or without square root extraction, 4-20 mA, 0-20 mA on shunt; Potentiometer: <220 Ω or <2.2 k Ω or <50 k Ω	Accuracy	0.1% of scale on linear input 0.12% of the scale on RTD and resistance inputs 0.1% + Cold junction error ($\pm 0.06^\circ\text{C}/^\circ\text{C}$) thermocouples
		Sampling Time	100 ms for a single loop; 230 ms for three loops
		Rejection	Common Mode 120 dB to 250 VAC; serial mode 50 dB
		Output	Current: 4-20 or 0-20 mA; 750 Ω max. insulated load; Voltage: 0-5 V, 1-5 V, 0-10 V; 35 mA maximum insulated; Logic: 0-10 V, ± 20 mA max. insulated & protected against the short circuit
		Relay Outputs	1 A @ 250 VAC or 30 VDC
		Aux. Power Supply	100 mA @ 24 VDC (standard) 24 VDC $\pm 10\%$; max. current of 28 mA $\pm 20\%$ (optional) 500 VAC output isolation
		Digital Comm.	300 to 19200 bauds, RS-485 MODBUS. RTU insulated RS-232 MODBUS. RTU insulated
		Power Supply	21...80 VDC/VAC or 80...265 VAC/100...380 VDC
		Power Consumption	25 VA maximum
		Isolation	Input/output: 500 V; Input/output/supply: 1500 V; Ch. 1 & 2 from the rest (op.)
		Electrical Safety	EN 61010-1
		EMC Emission Susceptibility	EN 50081-1 EN 50082-1
		Ambient Conditions	0...50 $^\circ\text{C}$; 5 to 95% RH
		Case	Painted metallic case IP-64 Protection on front
		Dimensions	72 x 144 x 233 mm (W x H x D) Panel cutout: 68 x 138 mm
		Weight	1.8 kg (4 lb)

ORDER CODES

Model MPC500 /



STANDARD TYPE "C"

6 Analogue Inputs
 5 Logic Inputs
 1 Current Output (Output Board #4)
 3 Relay Outputs (1 relay for watchdog)
 MODBUS Communication (RS-485 2/4 wire)
 Auxiliary Power Supply (100 mA @ 24 VDC)

INSULATION

Without
 With (Inputs 1 & 2 are insulated from the other input signals)

OUTPUT BOARD #1

Without
 1 Relay
 2 Relays
 Current
 Logic
 Voltage
 Transmitter Power Supply
 Digital com. RS-232
 Digital com. RS-485
 2 Safety Relays for Servo-drive

OUTPUT BOARD #2

Same as Board #1

OUTPUT BOARD #3

Same as Board #1

OUTPUT BOARD #4

Same as Board #1

POWER SUPPLY

80...265 VAC; 100...380 VDC
 21...80 VDC/VAC

CLOCK OPTION

Without
 With

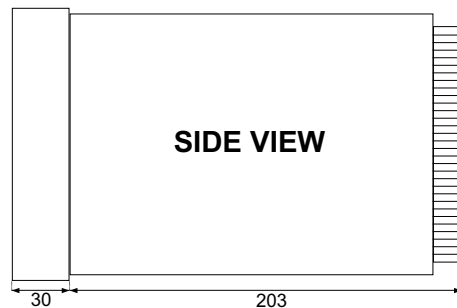
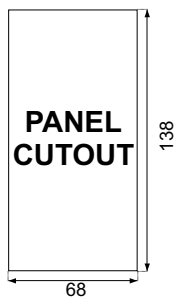
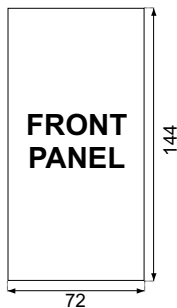
PROGRAM

PX.X standard

Input 1 & 2 insulated from inputs 3 to 6
 1 RS-232 MODBUS on Board #1
 1 current output on Board #2
 1 servodrive output on Board #3
 1 current output on Board #4
 80...265 VAC; 100...380 VDC
 With clock
 Standard Program

Sample Order: MPC500/CI1 7393 A1 H1 PX.X

DIMENSIONS AND PANEL CUTOUT (mm)



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