

# Programmable length-meter

## Technical data:

Code : MC400  
Model : AP-450  
Supply : 220 v , 50 Hz , +/- 10%  
Range : 0 ...999.9 cm.  
Output : Relay (5 A / 250 Vac)  
Amb. Temp.: -10...+50 C  
Programming: by front panel keys  
Dimensions : 72x72 mm front panel mounting



## Features:

- Process value is saved automatically at power failures.
- Auto reset using watch dog.
- Multifunction (auto/semi-auto/manual modes of operation).
- On line parameter editing.
- UP or DOWN measurement.
- Slow (mechanical switch) and fast(Electronic ) input measuring pulse.
- Programmable timer for output Relay "ON time" (auto mode only)

## Details:

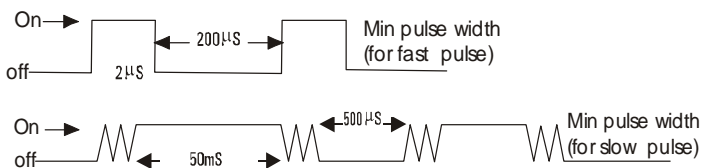
### A : Front panel

- 1- Set key : This key is used to:
  - Display and edit preset value.
  - Enter programming mode .
  - Display and edit parameter values.
- 2- UP key : This key is used to :
  - Increase parameter value .
  - Choose the next parameter.
- 3- DN. key : This key is used to :
  - Decrease parameter value .
  - Choose the previous parameter.
- 4- R key : This key is used to :
  - Clear the measured length (Reset to zero)
- 5- LED-OUT1 : Relay 1 status (ON=Relay is active)
- 6- LED-OUT2 : Relay 2 status (ON=Relay is active)

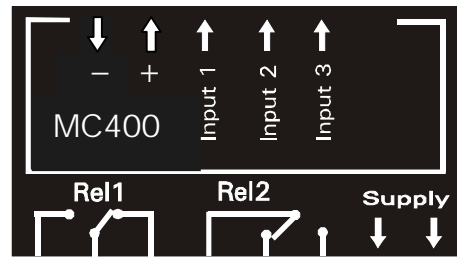
### B : Rare side (Input /Output)

#### INPUTS:

- 1- Supply : Supply terminals ( 220 v , 50 Hz , +/- 10%)
- 2- Input 1 : terminals for applying input measuring pulse.  
(applying a low pulse (-) to this terminal is counted as one measuring pulse)



- 3- Input 2 :Remote reset terminal  
(applying a low pulse (-) to this terminal will reset the unit to zero)
- 4- Input 3 : Terminal for down measuring mode  
(connecting this terminal to a low (-) will put the unit in down measuring mode.



**OUTPUTS:**

- +/\_ : 15...18 V dc, 50 mA output to be used for sensors etc.
- ??? : Output relay (5 A / 250 Vac)

**Operating Instructions :**

- This unit operates in two deferent modes, Normal mode (Displaying Process value .) Programming mode (Displaying parameters). Connect supply and pulsing wires ,apply power and the unit will start operation in normal mode.
- To view and edit the set value (S\_V) press the “Set” key S\_V will be displayed in blinking mode ,use UP or DN key to edit the value.
- To view and edit the operator programmable parameters, Press and hold the “Set ” key until the first parameters “Func” is Displayed ,release the set key ,now you can view the para. value by pressing the “Set” key” again and while pressing “Set” key “edit the value by UP/DN keys,or use UP/DN keys to choose another parameter and view or edit it’s value.Releasing the set key will save the new value in memory.  
If untouched the unit will return to normal mode after timeout.

Please do not confuse Parameter values with parameter menus  
(for example “Func”is a parameter menu but “Auto” or “Au.Hd “ are parameter values)

please note:

- To measure length. A mechanism must be used to produce measuring pulses and apply to “input 1” terminal. For instance A photo electric switch with a slotted disc can be connected to the shaft of the rotating unit to provide the measuring pulses.

Table 1 shows available parameters and corresponding possible values.

Para.	Possible value
Func.	Auto / Hand / Au.Hd
Au.dt.	0 ~ 99.9
PuLS	Slo / FASt
Slo.n	0 ~ 20
d--L	diA. / Len.
n_diA	0.01 ~ 999.9 cm
n_LEn	0.01 ~ 999.9 cm
Slot	1 ~ 360
unit	0.0 / 0.00
SAUE	YES-no

## Parameter description.

Func. : Choose Auto-semi auto or manual mode.

- In automatic mode. When  $P_V = S_V$ 
  - 1- Relay 1 and LED 1 will turn on and stay on for a time period specified by the “Au.dt.” parameter
  - 2- The  $P_V$  will reset to zero, measuring will continue none stop.  
Note: If in down measuring mode, when  $P_V=0$  measuring will stopped, to start measuring again disconnect the (-) from “input 3” terminal to put the unit in UP measuring mode.
- In manual mode. When  $P_V = S_V$ 
  - 1- measuring will be stopped.
  - 2-Relay 1 and LED 1 will turn on and stay on.
  - 3-To turn Relay 1 and LED 1 off and resume measuring again, the unit must be reset to zero by pressing “R” key.
- In Semi auto mode. When  $P_V = S_V$ 
  - 1- measuring will NOT be stopped.
  - 2-Relay 1 and LED 1 will turn on and stay on.but measuring will NOT be stopped.  
This mode is considered to be useful when a break is applied to stop the measuring pulses(it will show the length measured after applying the break.if the measured length is more than 999.9 or less than -199.9 ,the display will show “OVER”)
  - 3-To turn Relay 1 and LED 1 off, the unit must be reset to zero by pressing “R” key.

Au.dt.: Delay time (in 0.1 sec) for output relay “ON time” in auto mode

PuLS: type of counting pulse (Slow/Fast)

- Choose “SLO”: when measuring pulse is provided by mechanical micro-switch or the like. the maximum number of pulse per second which can be counted in this mode is 20. specify the number of pulse per second (1....20) in the “Slo.n” parameter for better noise rejection.

Slo.n:

- specify the number of pulse per second (1....20) for better noise rejection

d\_L:

- “diA” length measurement is based on diameter  
(i.e.  $LENGTH = (\text{number of pulse counted}/SLOt) * 3.14 * n.diA$ )
- “LEn” length measurement is based on pulse  
(i.e.  $LENGTH = \text{number of pulse counted} * n.LEn$ )

n\_diA.: This is the size of the diameter (length per rev.)

n\_LEn.: This is the the length for each pulse (length per pulse.)

Slot.: This is the number of pulse generated per revolution of the shaft.

unit: this is the unit for “n.Len” or “n.diA” in cm  
0.0= tenth of cm (mm) 0.00= hundredth of cm.

SAUE:

- “YES” the process value is saved in memory at power cuts or when the unit is turned off, and when powered on the unit will resume operation from saved value.
- “no” the process value is NOT saved in memory at power cuts or when the unit is turned off.

An example

Lets suppose the unit has to operate in automatic mode to measure and cut rope segments of length 100 meters ,lets also suppose cutting time is 1.3 seconds and measuring pulses are provided by a mechanical micro-switch and for each revolution of the shaft we get 30 measuring pulse and shaft diameter is 45 cm and we also want the process value to be saved in memory at power cuts.

According to the given conditions the parameters should be set as follows.

Parameter	Value	
Func.	Auto	
Au.dt.	1.3	
PuLS	FASt	
d--L	diA	OPTIONAL parameters
n.diA	45.0	
Slot	30	The following optional parameters are implemented on request.
Unit	0.0	(Do not hesitate to contact us for additional requests. )
SAVE	YES	