

**MICROPROCESSOR-BASED TWO-CHANNEL
CONTROLLER**

MS8111PWM3F

TECHNICAL DESCRIPTION AND INSTRUCTIONS FOR USAGE

PLOVDIV 2005

I. DESIGNATION

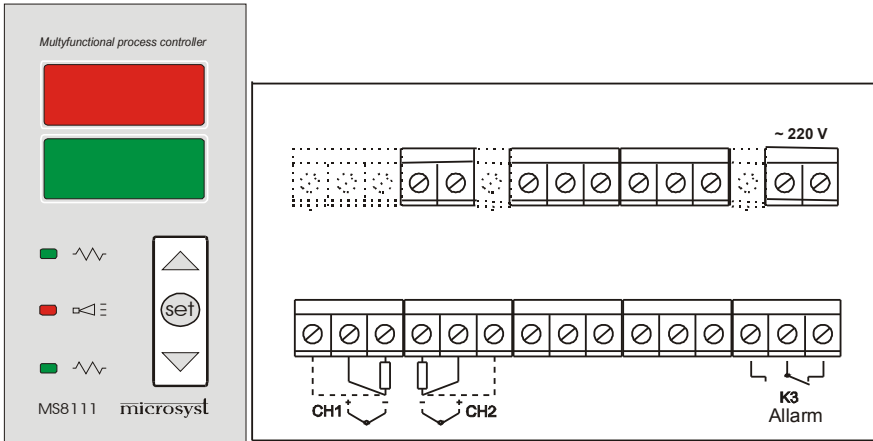
The microprocessor-based two-channel controller MS8111PWM3F is designed for simultaneous control of two processes, using proportional regulation. Each channel has 3 outputs for control of loads (heaters), switched to separate phase of the power supplying net, and a parameter “coefficient of the power” is entered for each output. It allows creation of zones with different temperature in the volume of the object (for example along the technological line).

The controller has a built-in timer, which, after starting and running out of the set-pointed time activates relay output, activating suitable signalization about end of the process.

II. TECHNICAL DATA



Digital inputs	1
Start/Stop Timer	active level 0 V
Analog outputs	2
RTD Sensor	Pt 100
Thermocouples	J, K, S ...
Linear – voltage, current	0...5 (10) V; 0 (4) ... 20 mA
Outputs	6
	OK for TTL; optoisolator
Indication and keyboard	
Display	2 x 4 digits LED 10 mm
Range of the display	0 ... 9999
Accuracy	± 1 LSB
Format of the display	(0).XXXX X.XXX XX.XX XXX.X XXXX
Keyboard	Folio
Power supply	
Power supplying voltage	220V / max 20mA
Frequency of the power supplying voltage	50 Hz (± 1 Hz)
Operating conditions	
Operating temperature	0 ... 50 °C
Operating relative humidity	0 ... 80 % RH
Dimensions	
Overall dimensions (WxHxL)	96 x 48 x 128 mm
Installation	Panel in a hole 90 x 44 mm
Weight	max 300 g
Degree of protection	IP40
Storage	
Storage temperature	-10 ... 70 °C
Storage relative humidity	0 ... 95 % RH

III. FACE AND BACK PANEL



IV. PROGRAMMING OF SET-POINTS

You can enter the mode of programming of set-points by pressing and holding for more than 5 sec of the button [SET], till the button is pressed, the values of the two set-points appear on the display. If you release the button before running out of the time for holding, you will not enter the mode).



When entering mode of programming the name of the parameter appears on the lower display and its value appears on the upper display. The editing of the values can be realized by the buttons   , and the passing to the next parameter – by the button [SET].





Parameters:

Name	Description	Values
SP 1	Set-point of Channel 1	In the limits of changing of the input parameter
SP 2	Set-point of Channel 2	In the limits of changing of the input parameter
- t -	Set-point of timer	0 ÷ 999 minutes

By brief pressing of the button [SET] the status of the timer appears on the display – in static mode – the set-point, and at started timer – the remaining time.

V. SYSTEM PARAMETERS

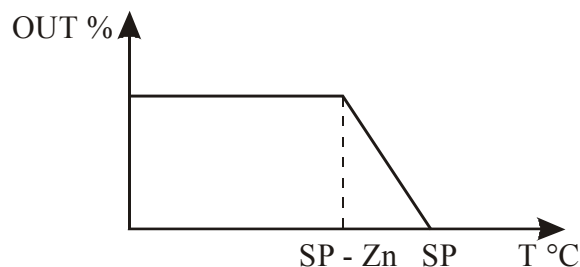
You can enter the mode of programming of system parameters by simultaneous pressing and holding for more than 5 sec. of the buttons   together.

In the mode the name of the parameter appears on the lower display. By   you can select the desired parameter, and by the button [SET] its value appears on the upper display. The editing of the values can be done by the buttons   , and the passing to the next parameter – by the button [SET].

Name	Description	Values
t 1	Period of Channel 1	$(1 \div 255) \times 0,5$ seconds
Zn1	Proportional zone of Channel 1	In the limits of changing of the input parameter
1F1	Channel 1 Coefficient of the power of phase 1	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
1F2	Channel 1 Coefficient of the power of phase 2	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
1F3	Channel 1 Coefficient of the power of phase 3	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
t 2	Period of Channel 2	$(1 \div 255) \times 0,5$ seconds
Zn2	Proportional zone of Channel 2	In the limits of changing of the input parameter
2F1	Channel 2 Coefficient of the power of phase 1	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
2F2	Channel 2 Coefficient of the power of phase 2	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
2F3	Channel 2 Coefficient of the power of phase 3	$(0 \div 128) \times 1/128$ 0 – the phase is constantly switched off 128 – the phase is switched on 100 %
AL1	Lower limit of alarm for Channel 1	In the limits of changing of the input parameter
AH1	Higher limit of alarm for Channel 1	In the limits of changing of the input parameter
AL2	Lower limit of alarm for Channel 2	In the limits of changing of the input parameter
AH2	Higher limit of alarm for Channel 2	In the limits of changing of the input parameter
End	Exit from the mode of system parameters	When you select it by the button [SET] you will exit the mode of system parameters.

Algorithm of control of an unspecified output

When the input parameter is out of the zone (for example of channel 1)




$$OUTI = 100 \cdot \frac{1FI}{128}, \% \quad (I=1, 2, 3)$$

When the input parameter is in the zone

$$OUTI = 100 \cdot \frac{1FI}{128} \cdot \frac{SP - PV1}{Zn1}, \% \quad (I=1, 2, 3)$$


VI. HIDDEN SYSTEM PARAMETERS

To see the hidden system parameters is necessary when power supplying the device to press and hold the button . In this case, in the list of the system parameters, after **End** the following parameters appear:

The hidden system parameters are "visible" till next switching off of the power supply.

Name	Description	Values
Fr 1	Coefficient of the filter of Channel 1	0 - 128 units The set-pointing of smaller value means deeper filter of the input parameter
tJ 1	Time of waiting before filter jump of Channel1 when changing the input parameter with value bigger than JP 1 .	0 - 128 секунди
JP 1	Filter jump of Channel 2	0 .. 255 units input parameter When changing the input parameter with value bigger than the set-pointed one and keeping of the new status for time bigger than tJ 1 the filter jumps and takes the new value.
Fr 2	Coefficient of the filter of Channel 2	0 - 128 единици The set-pointing of smaller value means deeper filter of the input parameter
tJ 2	Time of waiting before filter jump of Channel2 when changing the input parameter with value bigger than JP 2 .	0 - 128 секунди
JP 2	Filter jump of Channel 2	0 .. 255 units input parameter When changing the input parameter with value bigger than the set-pointed one and keeping of the new status for time bigger than tJ 2 the filter jumps and takes the new value..
SYS	Mode of the timer	0 – minutes 1 – seconds
rs__	Initiation of connection by serial channel	Do not press [SET]

VII. USER OFFSET

For permission for entering of user offset in the indications of the two channels it is necessary to power supply the device when the button  is pressed and held. In this case in the mode of programming of set-points are set-pointed values, which are added (subtracted at sign minus) to the indications of the channels.

Attention – the device does not indicate the previously entered corrections

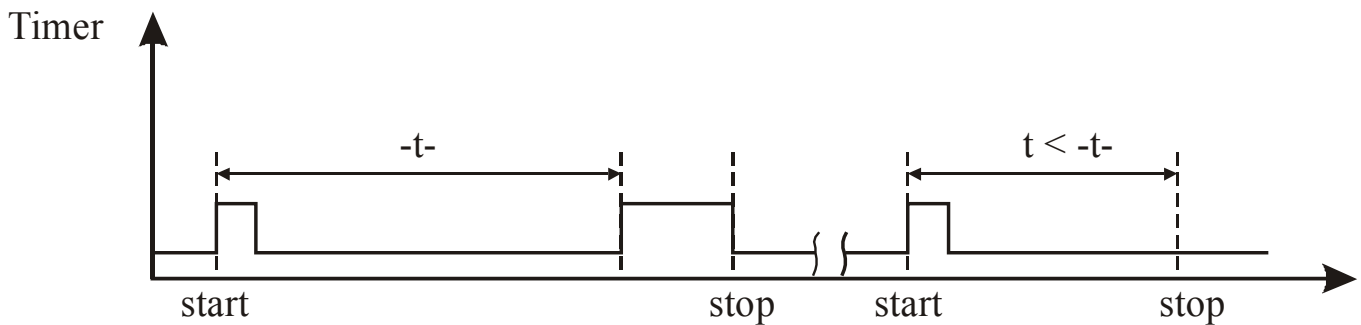
The mode of offset is valid till next switching off of the power supply.

VIII. TIMER

The timer can be started by outer start/stop input. After starting the output of the timer is switched on for 1 second, after that it is switched off. The time of the set-point starts running out and the LED **ALL** starts flashing on the front panel. After running out of the time of the set-point, the output of the timer switches on constantly, the LED **ALL** also emits light constantly. This status continues till outer stopping by the input start/stop. The output switches off; the timer waits for a new start.

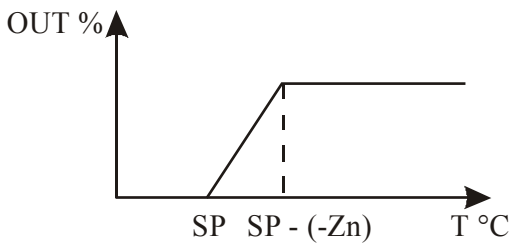
* The timer can be stopped before running out of the set-point.

** The mode in seconds is indicated by decimal point.



IX. OTHER POSSIBILITIES OF THE CONTROLLER

MS8111PWM3F can also work in mode “cooling”, i.e. it can control cooling system. For that it is necessary the parameters $Zn1$ and/or $Zn2$ to be set-pointed with negative values.



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