

Universal microprocessor-based programmable controller

MS8104K5



TECHNICAL DESCRIPTION AND INSTRUCTION FOR USAGE

PLOVDIV 2003

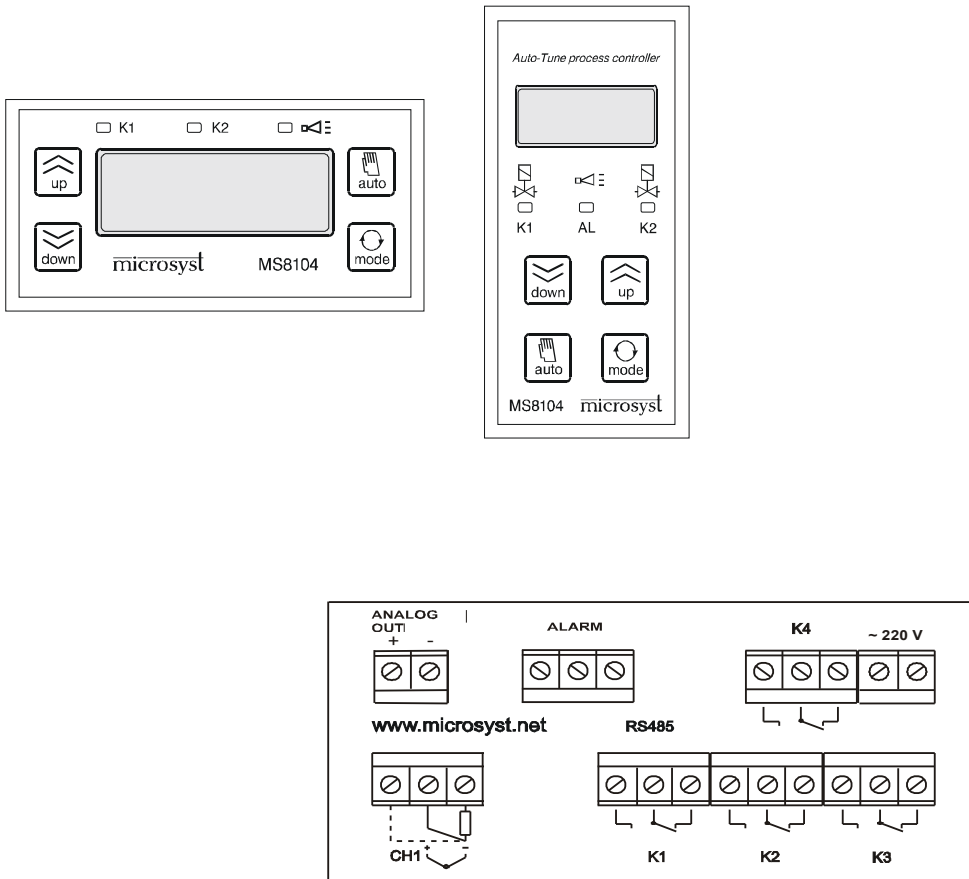
I. TECHNICAL DATA

Inputs		1
Resistive thermal sensor or thermocouple		
From sensors for other technological parameters		
- Linear voltage		0 ÷ 10 V DC
- Linear current		0(4) ÷ 20 mA DC
Outputs		digital –5; analog – 1
digital K1, K2, K3,K4,ALL Options		Relay 250 V / 5,10 A or OK for TTL Triac 250 V / 2 A; Relay 250 V / 5,10 A; OK for TTL or for SSR 250 V / 10,20,40 A
Analog transmitting		0(4) ÷ 20 mA / 0 ÷ 1 (10) V
Indication and keyboard		
Display		4 digits LED 10 mm
Range of the display		-1999 ÷ 9999
Accuracy		± 1 LSB
Format of the display		XXXX, X.XXX, XX.XX, XXX.X
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

II. DESIGNATION

The model **MS8104K5** of “Microsyst” is designed for measurement, indication and/or control of different parameters of the technological processes.

III. FACE AND BACK PANEL



IV. OPERATION PRINCIPLE

The following symbols are accepted:

PV - input parameter

SP1 - set-point of Channel 1 (**K1**)

SP2 - set-point of Channel 2 (**K2**)

SP3 - set-point of Channel 3 (**K3**)

SP4 - set-point of Channel 4 (**K4**)

ϵ_1 - hysteresis for **SP1** (HST1)

ϵ_2 - hysteresis for **SP2** (HST2)

ϵ_3 - hysteresis for **SP3** (HST3)

ϵ_4 - hysteresis for **SP4** (HST4)

On **Fig. 1** is shown the principle operation of the controller.

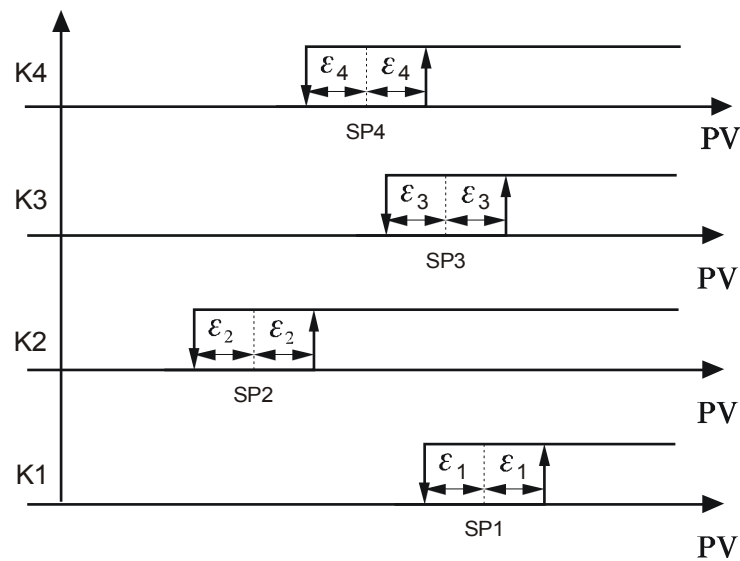



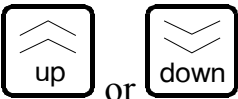

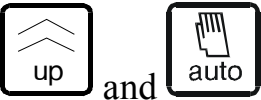
Fig. 1

V. INSTRUCTION FOR USAGE


1. Normal operating mode


You enter normal operating mode right after switching on of the power supply. The values of the input parameter are indicated on the display. The LED **K1** emits light at switched on output **K1**, the LED **K2** emits light at switched on output **K2**. The LED **AL** emits light at switched on output **Alarm**. The status of the outputs **K3 and K4** is not indicated on the face panel.

In this mode the separate buttons have the following function:

BUTTON/COMBINATION OF BUTTONS	FUNCTION
	<p>By consecutive pressing of this button you can realize browsing and editing of the separate set-points - SP1, SP2, SP3 and SP4.</p> <p>When you press the button SP1 appears on the display. When release the button the value of the set-point SP1 appears on the display. The next pressing of the button switches to SP2 and so on to SP4. After the value of set-point SP4 has appeared the pressing of the button realizes appearing of PU and after the releasing of the button, the controller returns to normal operating mode.</p> <p>You can return to normal operating mode also by non-pressing of a button for more than 5 seconds.</p>
	<p>They realize editing of the values of the set-points SP1, 2, 3 and 4.</p> <p>By the button MODE you can select the value of the set-point, desired for change, as it is described above. After its value has appeared, by the pressing of the buttons UP or DOWN you can increase or decrease the value.</p> <p>By the pressing of a button, different from the buttons UP and DOWN, and also if you don't press any button for more than 5 seconds, you will exit from he mode for editing and memorizing of the value.</p>
	<p>By pressing and holding of this button for more than 3 seconds you will enter operating mode "TUNING OF PARAMETERS"(see below)</p>
	<p>The single entering of this combination (pressing of the button UP, holding and pressing of the button AUTO) when the input variable is on the display will realize locking of the keyboard. By the second entering of this combination you will unlock the keyboard. The new status is indicated by "Loc" or "UnLc".</p> <p>The locking of the keyboard is a prohibition to the access to mode "TUNING OF PARAMETERS" and prohibition of the editing of the values of the set-points SP1, SP2, SP3 and SP4.</p> <p><u>The status of the keyboard is memorized in non-volatile memory and it is valid after temporary power fault.</u></p>

2. Tuning of parameters

When you enter operating mode for tuning of the parameters of the controller on the display appears “**tune**”, and it stays there till releasing of the button .

You can look at the parameters consecutively by pressing the button , and you can edit the value by pressing of the buttons **UP** and **DOWN**.

If you press and hold the button **UP** or **DOWN**, the edited value starts increasing or decreasing automatically.

When the last parameter appears the controller returns to normal operating mode.

Name	Description	Values
HST1	Hysteresis (ϵ_1) at control of set-point SP1 .	-1999 ÷ 9999 (3) (dec. point according to the measured parameter)
HST2	Hysteresis (ϵ_2) at control of set-point SP2 .	-1999 ÷ 9999 (3) (dec. point according to the measured parameter)
HST3	Hysteresis (ϵ_3) at control of set-point SP3 .	-1999 ÷ 9999 (3) (dec. point according to the measured parameter)
HST4	Hysteresis (ϵ_4) at control of set-point SP4 .	-1999 ÷ 9999 (3) (dec. point according to the measured parameter)
AL	Lower limit of the alarm	Min. input ÷ Max. input
AH	Higher limit of the alarm	Min. input ÷ Max. input
tAL	Time delay for activation of the output alarm	0 ÷ 80 seconds
Filt	Coefficient of filtering of the input parameter (1)	0.01 ÷ 1.00

- 1) **Smaller value of the coefficient of filtering means deeper filter.**
- 2) **In the operating mode “TUNING OF PARAMETERS” all outputs are switched off and are not controlled.**
- 3) **The logic of the ON/OFF algorithm of control of the output is determined by the sign of the hysteresis: “heating” at positive and “cooling” at negative hysteresis.**

System parameters

PARAMETERS ACCESSIBLE AT PRESSED BUTTON AT SWITCHING ON OF THE POWER SUPPLY		
P1	Multiplying coefficient of the analog output	-1999 ÷ 9999
P0	Shift of the analog output	-1999 ÷ 9999
dPnt	Position of the decimal point	128 – x.xxx 64 – xx.xx; 32 – xxx.x; 0 – xxxx
A db	Band operation of the filter of the input signal	0 ÷ 255 (Dimension and decimal point according to the measured parameter)
Adbt	Time for waiting after exit from the band of the filter for accepting of the new value.	0÷255 x 0.5 Sec
dSPL	Consecutively Higher and Lower limit of change of the parameter on the display	- 1999 ÷ 9999 The decimal point is according to the set-pointed in dPnt

TRANSMITTER ANALOG OUTPUT: $A_{out} = \frac{PV \cdot 1023}{P1} + P0$

! After exit from tuning of system parameters, till the switching off of the instrument, the combination of buttons for locking and unlocking of the keyboard gives a possibility for tuning of the offset of the analog input. In this mode you can enter freely programmable coefficient, which will be added always at the measuring of the channels. The value, which is being tuned, is more accurate than the measured parameter with one order.

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