MIKSTER MCC 2100 Microprocessor Controller - User's Manual

MIKSTER

Sp. z o.o. (Ltd.)
41-250 Czeladź ul. Wojkowicka 21, POLAND
Tel. +48 (0-32) 265 70 97, 265 76 41, 763-77-77
Fax: 763–75-94
www.mikster.com mikster@mikster.com

CONTENTS

page

1. TECHNICAL DATA

OVERALL DIMENSIONS:	Width 190 mm Height 290 mm Depth 50 mm
POWER SUPPLY:	24 V AC (transformer in the set)
CASING:	"FRONT PANEL" type, single element
PROTECTION DEGREE:	from front IP 65
HUMIDITY:	0.75 % (relative humidity)
TEMPERATURE:	ambient -20..+70 °C working 0..+60 °C
DISPLAY UNIT:	seven-segment LED displays
KEYBOARD:	foil, 50 keys
SIGNALLING OF STATES:	18 LED diodes
TRANSMITTER OUTPUTS:	24 x short-circuiting switch (220V,2A)
ANALOG OUTPUTS:	Optional
ANALOG INPUTS:	8 x (PT-100 or 0..20 mA or 4..20mA)
DIGITAL INPUTS:	8 x separated input Umax=220V
SERIAL COMMUNICATION:	1 x RS-232 (Printer) 1 x RS-485 (PC)

2. CONTROL DESK "MIKSTER MCC 2100"

All operations connected with programmer start-up, programming, manual alterations etc. are carried out through control desk.

Keys on the desk are arranged into the following function keypads:

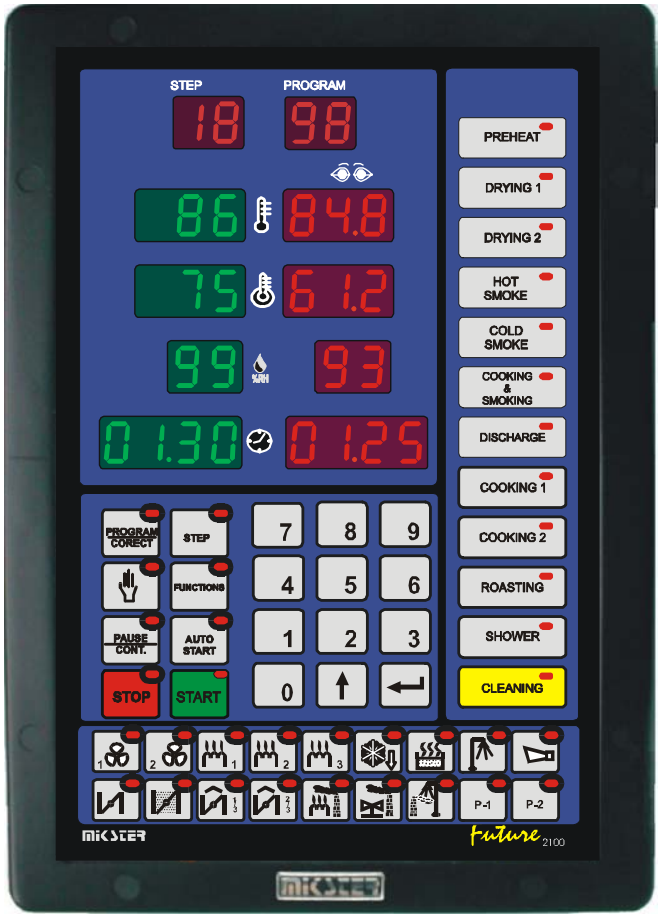
• numeric display keypad *1*

• NUMERIC keys along with FUNCTION keys *2*

• OUTPUT DEVICES MODE signaling keys and diodes *3*

• keys and diodes for TECHNOLOGICAL PROCESS SIGNALING *4*

Whole information concerning the state of working programmer (operation mode, values of set and read parameters etc.) are displayed on alphanumeric display units and signaled by LED diodes.



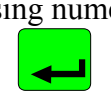
3. "MIKSTER MCC 2100" – STARTING WORK

After switching on power all displays and diodes light, after 5 seconds they should fade, that confirms correct work of the system; the controller turns to 'ready to work' mode.

3.1. Real time clock setting

In order to set correct time we should:

- press and hold for a moment the 

button, word "CODE" will be displayed and green digits "000" will blink,
- using numeric keys enter first part of the code: (as a standard – "888"), and press the  button, red digits "000" will blink,
- using numeric keys enter second part of the code: (as a standard – "888"), and press the  button, two red digits showing hour will blink,
- using numeric keys enter current hour and press the  button, two red digits showing minutes will blink,
- using numeric keys enter current minutes and press the  button (in the field "WILGOTNOSC ZADANA" *("PRESET HUMIDITY")* two digits showing year will blink),
- using numeric keys enter current year (last two digits only) and press the  button (in the field "CZAS CYKLU - godziny" *("CYCLE TIME – hours")* two digits showing month will blink),
- using numeric keys enter current month and press the  button (in the field "CZAS CYKLU - minutes" *("CYCLE TIME – minutes")* two digits showing day will blink),
- using numeric keys enter current day and press the 

button.

After having finished the above steps, the controller stores newly entered time in memory and turns to 'ready to work' mode.

4. PROGRAMMING OF TECHNOLOGICAL PROCESSES

In order to create a new program or edit an existing one, we should:

• press the 

button, word "CODE" will be displayed and green (or yellow) digits "000" will blink,

- using numeric keys enter first part of the code: "222" and

press the  button, red digits "000" will blink,

- using numeric keys enter second part of the code: "222"

  and press the  button, green digit showing program number will blink,

- using numeric keys enter program number (1-50), which we wish to create, or else correct it in case when program with such number already exists, and press the  button,

Now we may begin editing of the program, consisting of maximum 20 cycles. Number of currently edited cycle is displayed in the 

("STEP") field. We shift from cycle to cycle (1-20) by pressing the 

button.

In each cycle we may preset the following parameters:

- temperature in the chamber,
- temperature of the bar *(baton in Polish - translator's note),*
- humidity,
- cycle duration,
- cycle name,

After having set the controller in programming mode, green (yellow) digits will blink in the field "TEMPERATURA KOMORY" ("CHAMBER TEMPERATURE"). In order to preset the required parameters we should:

- select name responding to particular cycle using keypad (keys showing names of cycles (-4-)), by pressing on appropriate name; selection will be confirmed by control diode indication at the selected name,
- using numeric keys set the required chamber temperature value and press the

 button, green (yellow) digits showing bar temperature will blink,

- using numeric keys set the required bar temperature value and press the  button, green (yellow) digits showing humidity will blink,
- using numeric keys set the required humidity value and press the  button, green (yellow) digit (or digits) showing cycle duration in hours will blink,
- using numeric keys set the number of hours of cycle duration, and press the  button, green (yellow) digits showing cycle duration in minutes will blink,
- using numeric keys set the cycle duration in minutes,
- press the  button, therefore shifting to editing of next cycle,
- we repeat all steps performed during editing of the first cycle, and so on.
- after having set appropriate values for all required cycles (maximum 20), we press the  button in order to close the programming process, or the  ("PROG. / CORRECT") button in order to edit next program. We proceed with selection of program number and the programming process in the same manner as described at the beginning of this chapter.

4.1. Execution of a program stored in memory

In order to execute program, which has been previously stored in memory of the controller, we should:

- press the  button, green (yellow) digit showing program number will blink,
- using numeric keyboard we set program number, which we wish to execute and we press the  button,
- using the  button, we select the step number, from which program is to be executed,
- by pressing the  button, we start the program.

Step, which time of execution has been set at 00:00 will not be executed.

4.2. Stopping of execution of a currently executed program

At any time we are able to abort program execution **without possibility to restart it,** in order to do that we should:

- press the 

button two times; the controller turns to 'ready to work' mode.

It is also possible to abort the executed program, and then return to its execution, in order to do that we should:

- press the 

("PAUSE / CONTINUE") button; the word "PAUSE" will be displayed and the controller will abort program execution,
- in order to restart program execution we should press the 

button again.

4.3. Automatic start of the process

The MIKSTER MCC 2100 controller allows starting program at any previously set hour. In order to allow for auto-start of the controller we should:

- press the 

button; green (yellow) digit (digits) showing program number will blink,
- using numeric keyboard we set program number, which we wish to start automatically,
- press the 
button; all previously set program parameters will be displayed (by pressing the 

button we may preview parameters of the following steps),
- press the 
button; green (yellow) digits showing the hour of automatic start of technological program will blink; current time will be displayed in red,
- using numeric keyboard we set the hour of automatic start of the process,
- press the 
button; green (yellow) digits showing the minutes of automatic start of technological program will blink,
- using numeric keyboard we set the minutes of automatic start of the process,
- press the 

button and the controller turns to 'waiting for automatic program start' mode; the word "AUTO" and diodes on the 

and 

buttons will blink.

At the hour preset by us the controller will automatically start execution of appropriate program from the first step. Aborting of the process has been described in point 4.2.

4.4. Editing of preset parameters during operation of the controller

There is an option of correcting previously set parameters while the controller executes the program. In order to do that we should (during execution of a program):

- press the 

button,
- using numeric keys set the required chamber temperature and press the  button; green digits showing bar temperature will blink,
- using numeric keys set the required bar temperature value and press the  button; green (yellow) digits showing humidity will blink,
- using numeric keys set the required humidity value and press the  button; green (yellow) digit (or digits) showing cycle duration in hours will blink,
- using numeric keys set the cycle duration in hours, and press the  button; green (yellow) digits showing cycle duration in minutes will blink,
- using numeric keys set the cycle duration in minutes,
- press the 

button, the controller will continue program execution with new working parameters.

NOTE !!!

Alterations made during operation of the controller will be valid only until closing of the technological process. After program closing the controller "remembers" program with data set during the programming process.

5. SERVICE FUNCTIONS OF THE CONTROLLER

The controller has at its disposal highly extended service functions allowing for adjusting its parameters and manner of work to individual needs of its user. Suitable settings performed by service functions are stored in the controller memory, and used during execution of a selected program.

NOTE !!!

These service functions may be used only by an authorized service person or a trained person !!!
These functions should not be used unless it is absolutely necessary !!!

In order to launch service functions we should:

- press and hold for a moment the 

and 

buttons; word "CODE" will be displayed and green digits "000" will blink,

- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,

- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,

Now it is possible to select appropriate service function number. Particular numbers mean:

0. Program version
1. Setup
2. AC converter
3. Tests
4. Definition of cycle relays
5. Relay type
6. Alarms
7. Initializations
8. Relays condition for "PAUSE"
9. Relays definition "STOP"

5.1. *Controller configuring*

In order to carry out basic configuration of the controller we should:

- press and hold for a moment the 

and 

buttons; word "CODE" will appear and green digits "000" will blink,

- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,

- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,

- press the  button; number of the SETUP "F00" cell will be displayed in green (yellow), value attributed to particular parameter will be displayed in red.

- using numeric keys enter the value in a particular cell;

- press the  button; therefore moving to the next SETUP cell;

- using numeric keys enter the value in a particular cell;

We repeat the above steps until required values are set in each SETUP cell. Meaning of particular cells is shown in the table below:

FUNCTION NO.	VALUE SET BY FACTORY	RANGE	CHARACTERISTICS
F 00	0	0..31	Number in the network: RS - 485 - if we have at our disposal only one controller, then we leave the preset value as a default value, that is "0", when we have two or more controllers connected in the network, we attribute to them successive numbers.
F 01	0		Free
F 02	0		Free
F 03	380	0..450	Smoke generator board temperature
F 04	220	0..255	Smoke temperature
F 05	0	0..2	Delta status
F 06	1	0..255	Registration recording frequency
F 07	111	0..999	Code for SET-UP (3 digits)
F 08	111	0..999	Code for SET-UP (3 digits)
F 09	222	0..999	Code for programming (3 digits)
F 10	222	0..999	Code for programming (3 digits)
F 11	888	0..999	Code for clock (3 digits)
F 12	888	0..999	Code for clock (3 digits)
F 13	150	0..255	Maximum preset temperature
F 14	150	0..255	Maximum preset temperature of the bar
F 15	60	0..512	Time after turning off power
F 16	12.0	0..25.5	Preset Tk value (Tk zad) exceeded
F 17	1	0..254	Frequency of printing on printer
F 18	0	0..1	Speed of transmission 0 – 9600, 1 – 19200
F 19	0	0..24	Number of relay, in relation to which ventilation process is turned on

F 20	0	0..20	Ventilation time
F 21	0	0..24	Number of the relay, in relation to which time allowed between washing process is being calculated
F 22	0	0..200	Allowed number of hours between washing processes
F 23	0	0..24	Number of signaling relay. End of process
F 24	0	0..255	Operation time the process end relay
F 25	95		Not used
F 26	2		Not used
F 27	2		Not used
F 28	5		Not used
F 29	15		Not used
F 30	150		Not used
F 31	20		Not used
F 32	20		Not used
F 33	0	0..1	Process activation using computer 0 – off 1 – on (in case if value "1" is set, it is impossible to activate the process using the controller keyboard)
F 34	0	0..1	Process ID 0 – off 1 – on
F 35 – F 47			Not used
F 48	0	0..1	Temperature measurement unit 0 – ^{0}C 1 – ^{0}F
F 49	0	0..1	Accuracy of displayed temperature value 0 – 1 ^{0}C 1 – 0.1 ^{0}C
F 50	0	0..1	Recording accuracy 0 – 1 ^{0}C 1 – 0.2 ^{0}C

F 51	0	0	Chamber temperature measurement 0 - channel 1 1 - channel 6
F 52	0	0..1	Free
F 53	0	0..1	Transmission protocol 0 - Mikster-bus 1 - MODBUS-RTU
F 54	0	0..1	Power output ON / OFF for the PID controller 0 – OFF 1 – ON
F 55	0	0..1	Loop on / off Controller work looping 0 – off 1 – on

After having set particular parameters we press the 

button and all settings in SETUP will be stored in memory.

5.2. Zero correction for measurement channels

In order to make a correction we should:

- press and hold for a moment the 

and 

buttons; word "CODE" will appear and green (yellow) digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,
- press the 

button;
- using keys  or  select number of channel for correction; channel number will be displayed in green (yellow) in the KROK *("STEP")* field;
- connect model resistor of R = 100 Ω resistance to a selected channel;

- press the  button,

- connect model resistor on sensor characteristic (e.g. 138.5Ω for 100°C) .

- Make the temperature readout on selected channel correct by turning potentiometers on backboard of the controller. Temperature will be displayed in the "ZEGAR" ("CLOCK") field.

Similarly to the above operations we should carry out correction on all active measurement channels !

In order to leave the option of measurement channels correction press the 

button.

5.3. Test of correct work of keys and relays

In order to perform keyboard and displays test we should:

- press and hold for a moment the 

and  buttons; word "CODE" will appear and green digits "000" will blink,

- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,

- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,

- press the 

button; all displays and signaling diodes will fade;

- using numeric keys enter number of test to be performed.

Results of particular tests are shown in the table below:

Test number	Test result
0	Switches off all lights and displays
1	Switches on all lights and displays
2	Displays successive digits on numeric display
3	Tests all signaling diodes one by one
4	Tests all relays one by one
5	Tests relays by pressing buttons
6	Two-mode input state
7	Free
8	Free
9	Free

In order to select another test we should press attributed to it number on numeric keyboard.

Press the STOP button to leave "TEST" mode.

5.4. Defining of state of relays and conditions of cycle closing for particular cycles

The MCC 2100 controller allows for free configuring and defining of relays for each of cycles. In order to do that we should:

- press and hold for a moment the 9 and 1 buttons; the word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ button; blinking word "SERVICE" will appear,
- press the 4 button; red fields by the cycles names will blink;
- select name of cycle, for which we wish to define relays modes;
- by pressing the ↵ or ↑ button, select number of a relay (1-24), which we wish to turn on / off in particular cycle;
- using the FUNKC key, set whether selected relay is to be switched on (ON), or off (OFF) in particular cycle; relay mode may also be changed with the keys: 0 - off, and 1 - on;
- pressing the ↵ or ↑ button, select next number of relay and define whether it is to be on or off;

Relay number will be displayed in the "program" field, and its preset state is signaled by lighting of proper diode on buttons and displayed words "On" or "Off" in the "chamber temperature" field.
Having preset all relays modes for particular cycle we must:

- using the KROK key, set manner of cycle closing; conditions of closing cycle are shown in the table below:

Number	Condition of closing cycle

0	End of cycle after reaching preset time
1	End of cycle after exceeding preset value of temperature in the chamber
2	End of cycle after exceeding preset value of bar temperature
3	End of cycle after exceeding preset value of humidity
4	End of cycle after reaching preset time or after exceeding preset value of temperature in the chamber
5	End of cycle after reaching preset time or after exceeding preset value of bar temperature
6	End of cycle after reaching preset time or after exceeding preset value of humidity
7	End of cycle after reaching preset time and after exceeding preset value of temperature in the chamber
8	End of cycle after reaching preset time and after exceeding preset value of bar temperature
9	End of cycle after reaching preset time and after exceeding preset value of humidity
10	End of cycle after temperature drop in the chamber below preset value
11	End of cycle after temperature drop in bar below preset value
12	End of cycle after humidity drop below preset value
13	End of cycle after reaching preset time or after temperature drop in the chamber below preset value
14	End of cycle after reaching preset time or after temperature drop in bar below preset value
15	End of cycle after reaching preset time or after humidity drop below preset value
16	End of cycle after reaching preset time and after temperature drop in the chamber below preset value
17	End of cycle after reaching preset time and after temperature drop in bar below preset value
18	End of cycle after reaching preset time and after humidity drop below preset value

In order to configure next cycle we should:

- press name of appropriate cycle and further proceed exactly as in the case of defining previous cycle.

Configuring will be ended after pressing the 

key.

5.5. Defining of working conditions for relays

The MIKSTER MCC 2100 controller allows for defining of working conditions for each of the 24 relays separately.

Meaning of relays working parameters:

P0 – Time type
- 0 – Relay off
- 1 – Relay on / off in accordance with program
- 2 – turning on with time lag
- 3 – turning off with time lag
- 4 – pulse generator

P1 – time Ta
P2 – time Tb
P3 – type of regulator
- 0 – regulator on
- 1 – regulator "warming"
- 2 – regulator "cooling"
- 3 – " warming" straight hysteresis
- 4 – " cooling" straight hysteresis

P4 - number of measurement channel
- 0 – chamber temperature
- 1 – free
- 2 – bar temperature
- 3 – board temperature
- 4 – humidity
- 5 – smoke temperature

P5 – shift of preset value of the regulator in relation to preset value in program
P6 – shift of algorithm level of work with dynamic preset value
P7 – "lower" hysteresis
P8 – "upper" hysteresis

In order to perform operation of defining parameters for particular relays we should:

- press and hold for a moment the 

and 

buttons; word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,
- press the 

button;

- using the 

button select number of a relay, parameters of which we wish to set; number of selected relay will be displayed in the PROGRAM field; cell number ("P0"..."P8") will be displayed in red;
- pressing the  or  buttons select cell marked "P0";
- using numeric keyboard set ***time type*** of relay (0-4).

Descriptions below show meaning of particular options.

TIME TYPE: 0

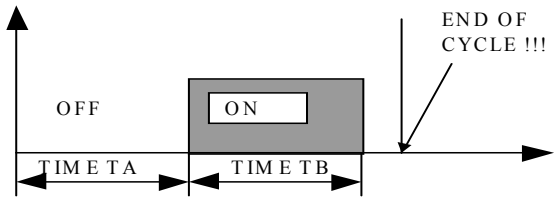
Relay unconditionally switched off.

TIME TYPE: 1

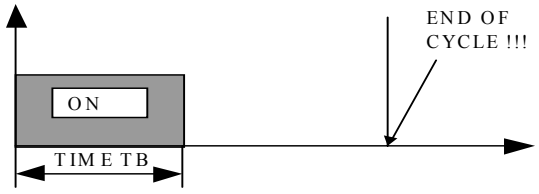
Relay is turned on according to definition in program; that means if in a particular cycle it is defined as on / off, then until the end of cycle it remains in the same mode as at the beginning of the cycle.

TIME TYPE: 2 (*turning on with time lag****)***

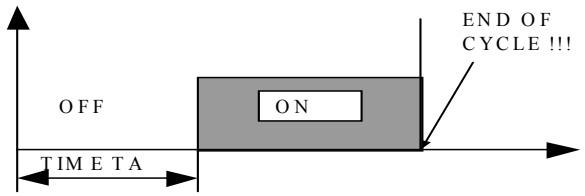
when TA and TB ≠ 0: ⇐ *parameters are described below*



when TA=0 , TB≠0:

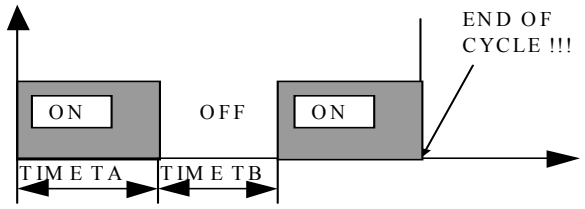


when TA>0 , TB=0:

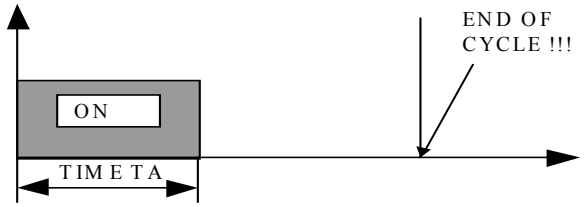


TIME TYPE: 3 (*turning off with time lag****)***

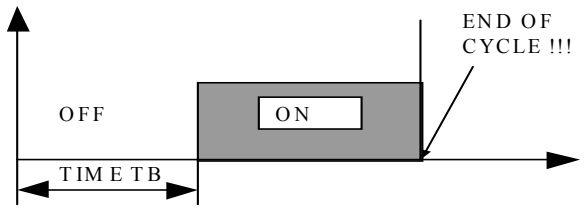
when TA>0 , TB>0:



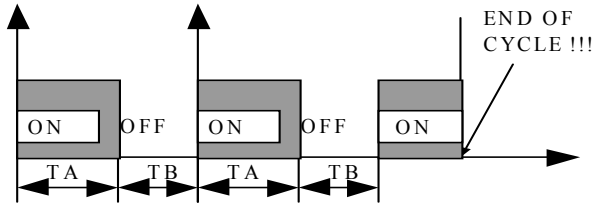
when TA>0 , TB=0:



when TA=0 , TB>0:



TIME TYPE: 4 (pulse generator)

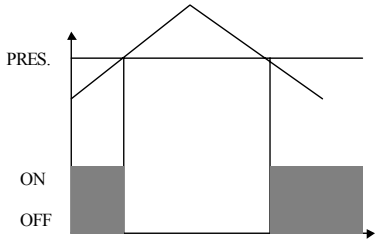


- pressing the  or  buttons, select "P1" cell;
- using numeric keyboard set "TA" parameter value (meaning of the parameter is shown on drawings above);
- pressing the  or  buttons, select "P2" cell;
- using numeric keyboard set "TB" parameter value (meaning of the parameter is shown on drawings above);
- pressing the  or  buttons, select "P3" cell;
- using numeric keyboard set ***regulator type*** (0...2); meaning of particular options is described below.

0 – regulator condition off, it means that only the time condition is being carried into effect

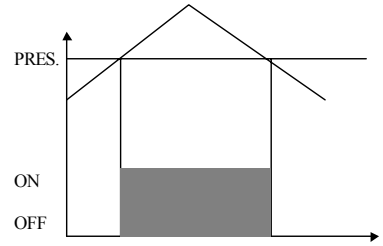
1 – "warming" regulation, that is:

- below preset value – relay on
- above preset value – relay off

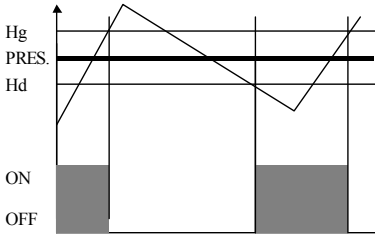


2 - "cooling" regulation, that is:

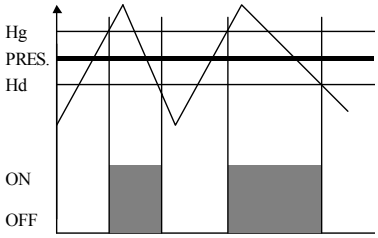
- below preset value – relay on
- above preset value – relay off



3 - regulator with hysteresis - "warming"



4 - regulator with hysteresis - "cooling"



- pressing the  or  buttons, select "P4" cell;
- using numeric keyboard set the parameter – **measurement channel** (0-5), which defines, in relation to which measurement channel regulation on a particular relay should take place;

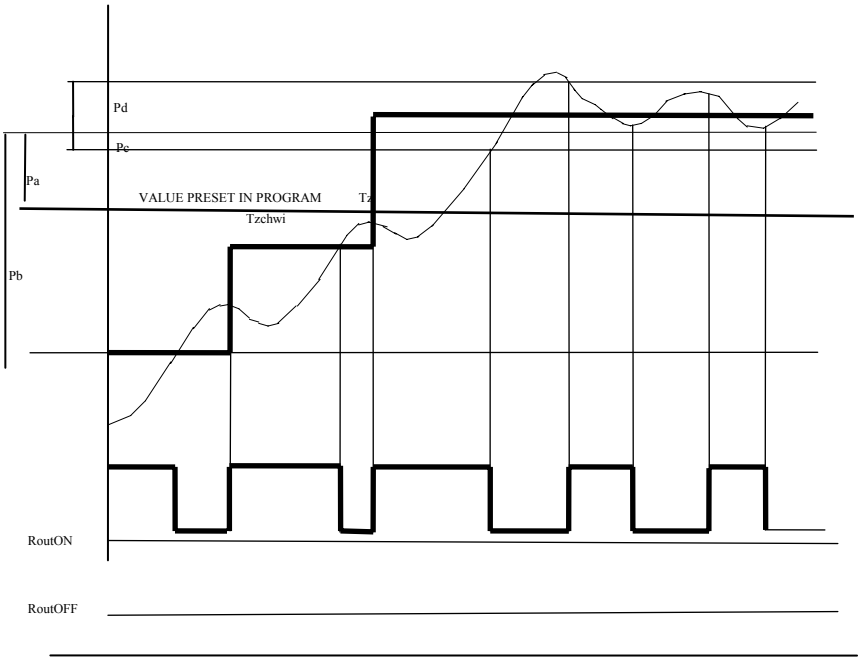
We may set the following parameters:

0 – chamber temperature "dry"
1 - free
2 – bar temperature
3 – board temperature
4 - humidity
5 – smoke temperature

- pressing the  or  buttons, select "P5" cell;
- using numeric keyboard we set value of "PA" parameter; meaning of the "PA" parameter is shown on the drawing below;

- pressing the  or  buttons, select "P6" cell;
- using numeric keyboard we set value of "PB" parameter; meaning of the "PB" parameter is shown on the drawing below;
- pressing the  or  buttons, select "P7" cell;
- using numeric keyboard we set value of "PC" parameter; meaning of the "PC" parameter is shown on the drawing below;
- pressing the  or  buttons, select "P8" cell;
- using numeric keyboard, we set value of "PD" parameter.

Meaning of "PA", "PB", "PC" and "PD" parameters is shown on the drawing below.



- in order to set parameters of next relay we should press the 

button, and then proceed similarly as in the case of setting previous relay.

After having made settings for all relays press the 

button.

Description of regulator parameters:

Pa – shift of preset value for regulator in relation to the value preset in program.
e.g..: If preset value for chamber temperature is 80 °C, and for particular relay PA=-10.0 °C, then preset value for regulator of that relay is 70 °C.

Description of regulator algorithm:

In order to improve parameters of traditional two-mode regulator, algorithm employed in the controller is expected to define momentary dynamic zero value, allowing for limiting deviation while reaching steady state of the regulator.

Description for "warming" type:

Case no. 1

if To < (Tz+Pa)-Pb then Rout = on

if (Tz+Pa)-Pb ≤ To < (Tz+Pa)-Pc

then in case if value:

(Tz+Pa)-Pb is exceeded,

parameter:

Tzchwi = [(Tz-Pa)+To]/2 is set

and, at this moment, if: To < Tz chw *(Tz momentary)* then Rout = on,
if: To > Tz chw *(Tz momentary)* then Rout = off

each successive excedance of Tz chw value results in setting new value of Tz chw

if: (Tz+Pa-Pc) ≤ To < (Tz+Pa+Pd)

then, when temperature drops:

Rout = on

when temperature rises:

Rout = off

Note !!!

In case of defining relay output as "cooling" Rout mode is opposite in relation to the above described algorithm.

5.6. Defining of alarms

The MIKSTER MCC 2100 controller allows for defining controller's response to occurrence of all sorts of events. In order to begin defining alarms we should:

- press and hold for a moment the 9 and 1 buttons; word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ button; blinking word "SERVICE" will appear,
- press the 6 button;
- press the PROG POPRAW or KROK buttons, by this selecting alarm number corresponding with occurrence of one of events described below; (alarm number will be displayed in red in the "WILGOTNOŚĆ" *("HUMIDITY")* field);

It is possible to define controller's response to occurrence of following events:

Alarm No.	Event corresponding with particular alarm
1	fading R phase of power supply
2	fading S phase of power supply
3	fading T phase of power supply
4	burner breakdown
5	thermal system breakdown
6	doors breakdown
7	Fading 220V/24V signal on control input no. 7- [CONTROL INPUT 7]
8	Fading 220V/24V signal on control input no. 8- [CONTROL INPUT 8]
9	Breakdown on channel no. 1 of AC converter [MEASUREMENT CHANNEL 1]
10	Breakdown on channel no. 2 of AC converter [MEASUREMENT CHANNEL 2]
11	Breakdown on channel no. 3 of AC converter [MEASUREMENT CHANNEL 3]
12	Breakdown on channel no. 4 of AC converter [MEASUREMENT CHANNEL 4]

13	Breakdown on channel no. 5 of AC converter [MEASUREMENT CHANNEL 5]
14	Breakdown on channel no. 6 of AC converter [MEASUREMENT CHANNEL 6]
15	Breakdown on channel no. 7 of AC converter [MEASUREMENT CHANNEL 7]
16	Breakdown on channel no. 8 of AC converter [MEASUREMENT CHANNEL 8]
17	Excedance of allowed difference between preset and read out chamber temperature (difference will be shown in function no. 16 of SETUP)
18	Excedance of preset smoke temperature (preset smoke temperature will be given in function no. 04)

- using numeric keyboard, set so called **response to alarm**. Number of selected option (0..2) will be displayed in red in the "ZEGAR" ("CLOCK") field.

We have choice of the following options:

Option No.	Meaning of option
0	occurrence of an emergency (alarm) event does not generate controller response (ALARM OFF)
1	occurrence of an alarm during technological process will not result in interruption of process realization, but in overlaying an alarm-relay mask, that is: in addition to active relays, relays included in alarm definitions menu (description below) are activated during process realization
2	occurrence of an alarm during technological process will result in interruption of technological process realization [CRITICAL ERROR], and in setting mode of relays defined in alarm menu (description below)

- by pressing the  or  keys, select number of a relay, which you wish to turn on / off in particular alarm; number of a selected relay will be displayed in green in the "PROGRAM" field;

- by pressing the 

key we set, whether selected relay is to be on ("ON"), or off ("OFF"); selected relays are activated after occurrence of an alarm and, depending on defined response to alarm occurrence (see above), they are added to active relays (REAKCJA=1) *(RESPONSE=1)* or they are certainly set in accordance with preset mode (REAKCJA=2) *(RESPONSE=2)*;

In order to define next alarm number we should press the 

or 

keys, and then proceed similarly as in the case of defining previous alarm. To close alarm definition procedure, press the 

key.

5.7. Deleting all controller settings

In order to delete from the controller memory all programs and cancel all previously entered settings we should:

- press and hold for a moment the 9 and 1 buttons; word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ button; blinking word "SERVICE" will appear,
- press the 7 button; word "SYSINI" and blinking, green "NO" and red "YES" will appear;

When we wish to carry out initialization, it is necessary to:

- press the ↵ button; (otherwise press) ↑;
- press the START button, the controller will begin initialization procedure;

NOTE !!!

During the INITIALIZATION process it is not allowed to press any keys, or switch off power supply.

Initialization may be used in emergency situations only, since after having carried out this process the controller must be re-configured !!!

5.8. Definition of relays modes for "PAUSE"

In order to preset relays, which are to turn on / off automatically after having pressed the PAUZA KONT ("PAUSE / CONT.") button, we should:

- press and hold for a moment the 9 and 1 buttons; word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ button; red digits "000" will blink,

- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,

- press the  button;

- using the  or  button, we select the number of relay, which we intend to turn on / off;

- pressing the  button, we preset the relay mode: "ON" or "OFF".

In order to close the procedure of defining relays, we should press the  button.

5.9. Definition of relays mode for "STOP"

In order to preset relays, which are to turn on / off automatically after having pressed the  button, we should:

- press and hold for a moment the  and  buttons; word "CODE" will appear and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the  button; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the  button; blinking word "SERVICE" will appear,

- press the  button;

- using the  or  button, we select the number of relay, which we intend to turn on / off;

- pressing the  button, we preset the relay mode: "ON" or "OFF".

In order to close the procedure of defining relays, we should press the  button.

NOTE: switching relays on in the  mode is not signaled by diodes lighting.

5.10. Settings and method of activating the "WASHING" process

5.10.1. The "WASHING" process programming

In order to set the "WASHING" process parameters it is necessary to:

- press and hold for a moment the 9 and 1 keys; word "CODE" will be displayed and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ key; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ key; word "SERVICE" will be displayed,
- press the FUNKC key;
- press the 1 key,
- using numeric keyboard enter proper process parameters. Parameters will change after pressing the ↵ key,
- values of successive process steps change after pressing the KROK key.

In order to end the procedure of defining the "WASHING" process parameters press the STOP key.

510.2. The "WASHING" process activation

In order to activate the "WASHING" process press the START key, and then the "WASHING" key.

A message requesting to confirm start of the process will appear on the display. Using the ↵ key, bring "YES" value displayed in the cycle time / clock field to blinking. Then press the START key, which activates the "WASHING" process.

The process will be terminated after pressing the STOP key.

5.11. Defining relays for the "WASHING" process

In order to define state of relays for the "WASHING" process do the following:

press and hold for a moment the 9 and 1 keys; word "CODE" will be displayed and green digits "000" will blink,

- using numeric keys enter first part of the code: "111", and press the ↵ key; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ key; word "SERVICE" will be displayed,
- press the FUNKC key;
- press the 4 key; red field pulsates beside cycle names (for "WASHING" process)
- select name of "WASHING" cycle, for which we want to define state of relays
- using the ↵ or ↑ key select number of a relay, which is to be turned on / off;
- using the FUNKC key pre-set the state of relay: "ON" or "OFF".

Relay number is displayed in "program" field, its preset state is signalled by lighting of proper diode on keys, and "On" or "Off" is displayed on the "chamber temperature" field.
After entering the state of all relays for a given cycle we must:

- preset mode of completing a cycle using the KROK key; conditions for completing a cycle are shown in table on page 16.

In order to configure next cycle do the following:

- press name of selected cycle and then proceed in the same way as when defining previous cycle.

In order to close the relay defining procedure press the STOP key.

5.12. Defining relays for the "automatic ventilation" mode

In order to pre-set relays, which are to turn on / off after the pre-set humidity level has been exceeded during the process, do the following steps:

- press and hold for a moment the 9 and 1 keys; word "CODE" will be displayed and green digits "000" will blink,
- using numeric keys enter first part of the code: "111", and press the ↵ key; red digits "000" will blink,
- using numeric keys enter second part of the code: "111", and press the ↵ key; word "SERVICE" will be displayed,
- press the FUNKC key;
- press the 9 key;
- using the ↵ or ↑ key select number of a relay, which is to be turned on / off;
- using the FUNKC key pre-set the state of relay: "ON" or "OFF".

In order to close the relay defining procedure press the STOP key.

5.13. Checking of the smoking chamber operation time

In order to check the smoking chamber operation time press the FUNKC key, and then the 8 key.

6.DIRECTIONS FOR CONNECTING THE CONTROLLER TO PERSONAL COMPUTER

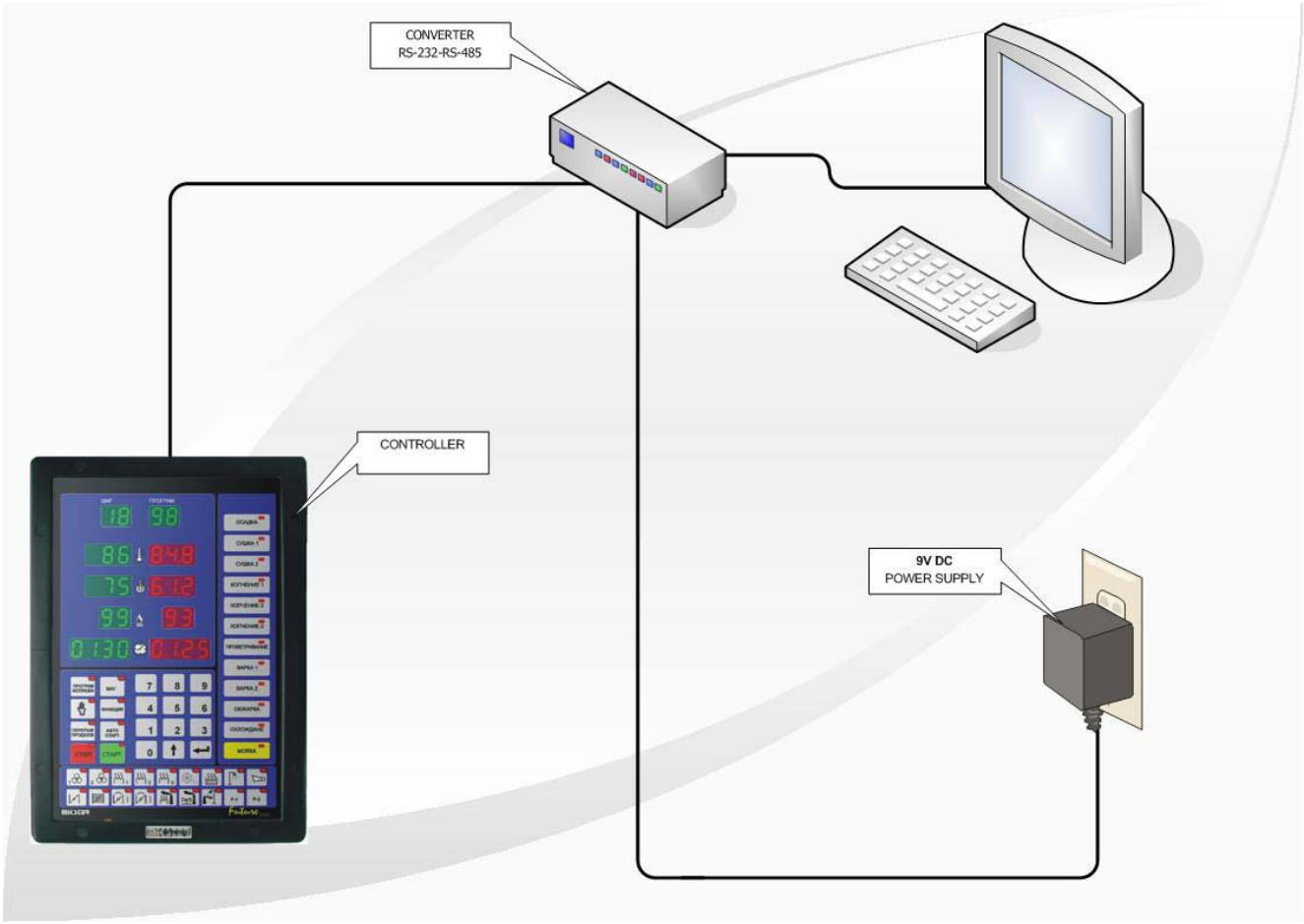


ILLUSTRATION No. 1

CONNECTING A MCC2100 CONTROLLER RECORDER TO PERSONAL COMPUTER

7. PROCEDURE FOR CONNECTING A PRINTER TO THE CONTROLLER

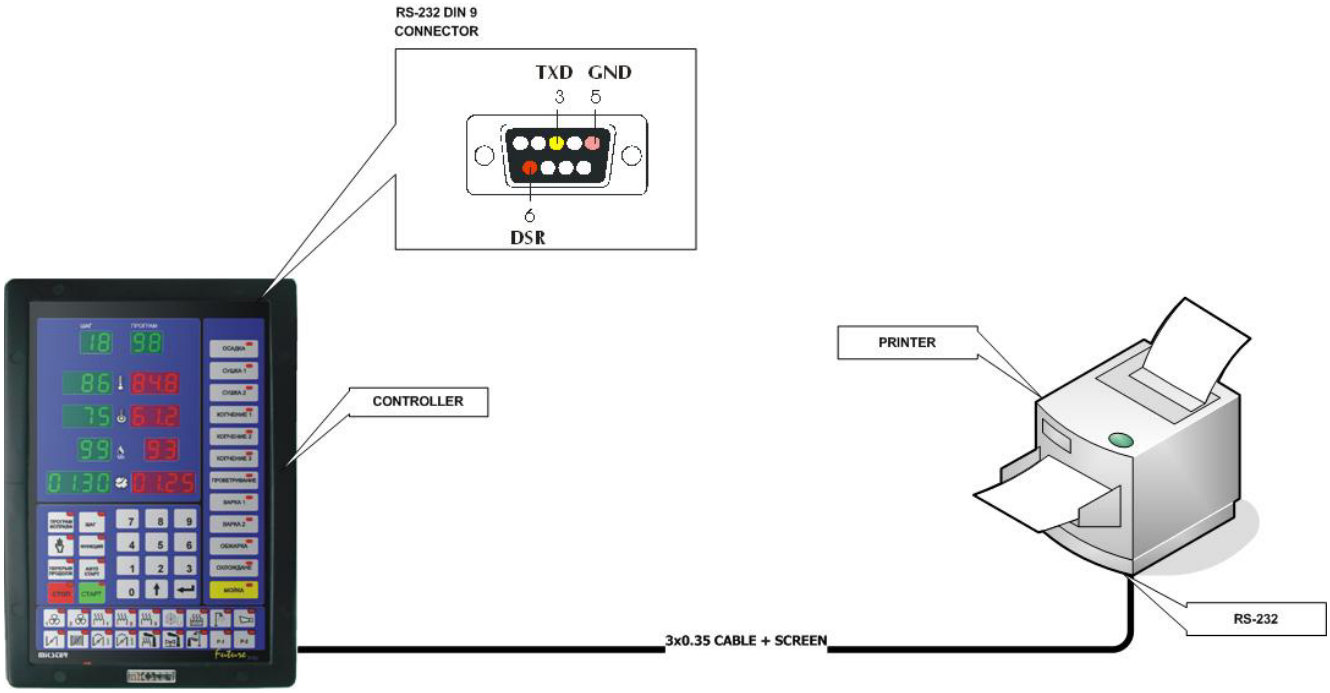


ILLUSTRATION No. 2 . CONNECTING A PRINTER TO THE MCC 2100 CONTROLLER

8. MCC-2100 CONTROLLER ERRORS TABLE.

ERROR 1	Disappearance of power supply phase R [CONTROL INPUT 1]
ERROR 2	Disappearance of power supply phase S [CONTROL INPUT 2]
ERROR 3	Disappearance of power supply phase T [CONTROL INPUT 3]
ERROR 4	Burner failure [CONTROL INPUT 4]
ERROR 5	Thermic failure [CONTROL INPUT 5]
ERROR 6	Door failure [CONTROL INPUT 6]
ERROR 7	Disappearance of 220V/24V signal on control input no. 7- [CONTROL INPUT 7]
ERROR 8	Disappearance of 220V/24V signal on control input no.8- [CONTROL INPUT 8]
ERROR 9	AC converter failure on channel no.1 [MEASUREMENT CHANNEL 1]
ERROR 10	AC converter failure on channel no.2 [MEASUREMENT CHANNEL 2]
ERROR 11	AC converter failure on channel no.3 [MEASUREMENT CHANNEL 3]
ERROR 12	AC converter failure on channel no.4[[MEASUREMENT CHANNEL 4]
ERROR 13	AC converter failure on channel no.5 [MEASUREMENT CHANNEL 5]
ERROR 14	AC converter failure on channel no.6 [MEASUREMENT CHANNEL 6]
ERROR 15	AC converter failure on channel no.7 [MEASUREMENT CHANNEL 7]
ERROR 16	AC converter failure on channel no.8 [MEASUREMENT CHANNEL 8]
ERROR 17	Exceeding of acceptable difference between set and measured chamber temperature (difference is given in function no.16)
ERROR 18	Exceeding of set smoke temperature (set smoke temperature is given In function no.4)
...	
ERROR 31	Damage of EEPROM UNIT0 memory
ERROR 33	Damage of EPROM menory

ERROR-40	Breaking of program execution as a result of power supply disappearance.
ERROR-60 ERROR-61 ERROR-62 ERROR-63 ERROR-70 ERROR-71 ERROR-72 ERROR-73	Damage of EEPROM memory
ERROR-74	Failure of recording into DA converter Cause 1: damage of DA converter . Cause 2: putting In F54 setup cell value of 1 when the controller doesn't hale analog outputs.
ERROR-77	Internal „watch-dog" counter failure
ERROR-90 ERROR-AC	Damage of AC converter