

MICROPROCESSOR-BASED WEIGHT METER OF MATERIALS

MS8308W4P

version 1.1



TECHNICAL DESCRIPTION AND INSTRUCTION FOR USAGE

PLOVDIV 2005

I. DESIGNATION

The microprocessor-based four-channel weight meter of materials MS8308W4P is designed for dosing of loose materials by control of oscillating conveyors and joint operation with packing controller. The weight meter has a possibility for memorization of six sets of parameters for different materials for dosing, and the current set is program selectable. MS8308W4P supports automatic adaptation to the falling column and two modes of automatic taring.

II. TECHNICAL DATA

1. Inputs

digital Start (galvanically isolated)	0 ÷ 24 V
digital Tare	0 ÷ 5 V
digital Pause	0 ÷ 5 V
digital Start pouring (galvanically isolated)	0 ÷ 24 V
digital Is1 (PNP galvanically isolated)	0 ÷ 24 V
digital Is2 (PNP galvanically isolated)	0 ÷ 24 V
digital Is3 (PNP galvanically isolated)	0 ÷ 24 V
digital Is4 (PNP galvanically isolated)	0 ÷ 24 V
analog Strain 1	strain-gauge measuring bridge
analog Strain 2	strain-gauge measuring bridge
analog Strain 3	strain-gauge measuring bridge
analog Strain 4	strain-gauge measuring bridge

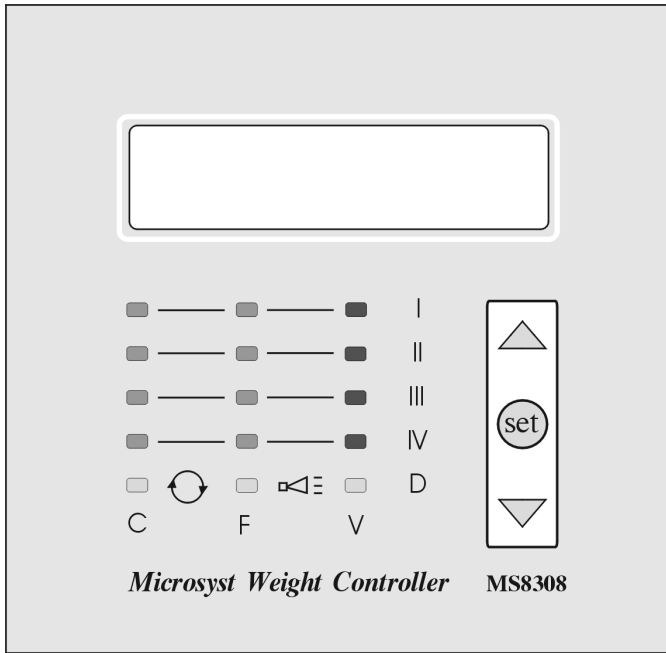
2. Outputs

digital Ready dose – OK NPN galvanically isolated	24 V / 20mA
digital End of pouring – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 1 fine – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 1 rough – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 2 fine – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 2 rough – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 3 fine – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 3 rough – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 4 fine – OK NPN galvanically isolated	24 V / 20mA
Vibrorail 4 rough – OK NPN galvanically isolated	24 V / 20mA
Valve / uppende 1 – OK NPN galvanically isolated	24 V / 200mA
Valve / uppende 2 – OK NPN galvanically isolated	24 V / 200mA
Valve / uppende 3 – OK NPN galvanically isolated	24 V / 200mA
Valve / uppende 4 – OK NPN galvanically isolated	24 V / 200mA

3. Indicator	2x16 LCD
4. Keyboard	folio
5. Overall dimensions (WxHxL)	96x96x128 mm
6. Weight	max. 300 g
7. Power supplying voltage	220 V $\pm 10\%$
8. Frequency of the power supplying voltage	50 Hz (± 1 Hz)
9. Operating temperature	0 ÷ 50 °C
10. Operating relative humidity	0 ÷ 80% RH


III. GENERAL APPEARANCE AND SCHEME OF CONNECTION


1. Front panel



LEDs

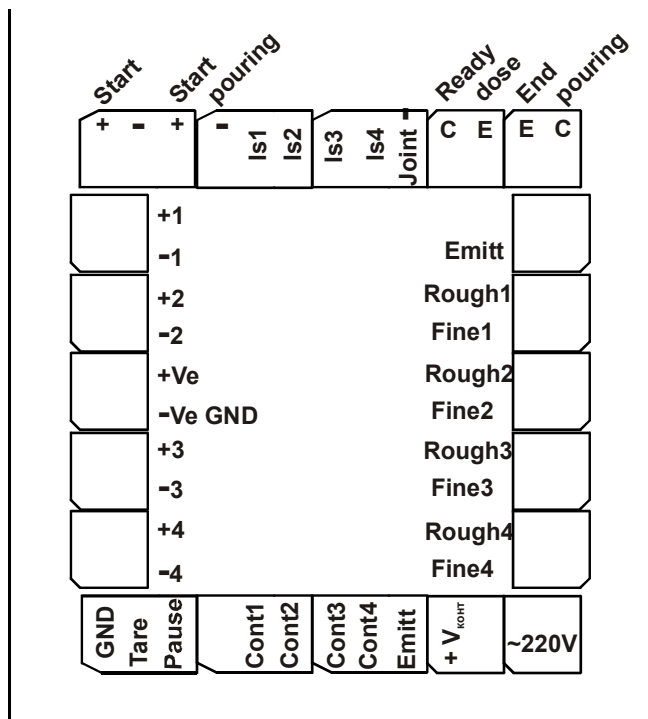
Lines I, II, III, IV – from left to right respectively: rough, fine dosing and container of the respective channel

 - mode

 - start pouring




D - ready dose

2. Back panel

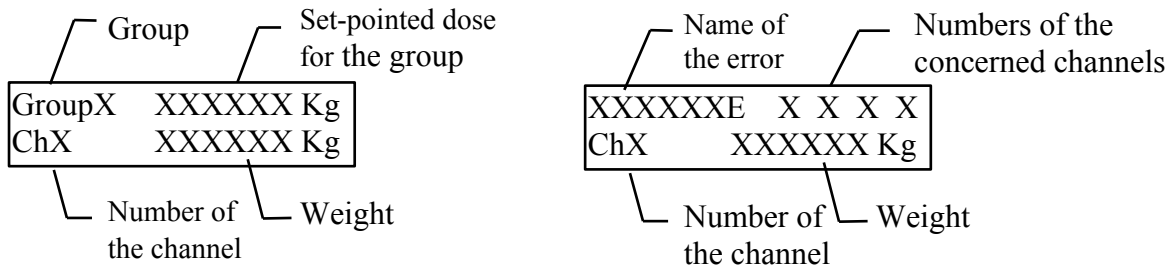


IV. DIRECTIONS FOR USE

1. BASIC MODES AND DISPLAYS

The weight meter has two basic operating modes – “*dosing*” and “*stopped dosing*”. It is in “*dosing*”, when it is not in a pause and the switch **Start** is switched on. This mode is indicated by LED , which is emitting light. It is in “*stopped dosing*”, when it is in a pause (it is indicated by a flashing LED ) or the switch **Start** is switched off and all permitted channels had poured their doses (it is indicated by LED  OFF).

The display looks as it follows:



The selected operating group and its set-point usually appears on the upper line of the display, excluding the cases, when there is an error, then the group and all errors appear consecutively (at intervals of 1 sec.) on the first line of the display. According to the selected mode, the weight of the selected channel or the weight of the channel, which will pour or is pouring at the moment (in mode “*dosing*” and **FreeView =0**) appear on the lower line of the display, and if there is no ready channel – nothing appears on the display. The selection of a channel can be done by the buttons **Up** or **Down**.

2. OPERATION PRINCIPLE OF THE WEIGHT METER

At power supplying if the switch **Start** is on and the controller is not in a pause (i.e. it is in mode “*dosing*”), it starts fine dosing immediately, if the set-point is not reached, and at reached set-point you will expect permitting signal for emptying of container. At deactivated switch **Start** or in a pause the weight meter enters mode “*stopped dosing*”.

From mode “*stopped dosing*” and not in pause, at switching on of the switch **Start** the controller starts the following algorithm:

- 1) Closes the container, if it has been opened after pouring. If sensors for closed containers are permitted (**ID Sens**), waits for signal about closed containers and passes to 3). If you have selected operation with turning containers – directly passes to 3). At forbidden sensors it passes to the next stage.
- 2) Waits for time for closing of the container (**Time C**) and passes to the next stage.
- 3) Waits for time for calming (**T OnStrt**)
- 4) Checks the condition for start: the module of the measured weight must be in the limits of the maximum possible for a new start (**OnStartW**). If the condition is fulfilled – passes to 5), otherwise there is an error “*OnStartE*” and passes to 1).
- 5) Realizes taring, if first mode of automatic taring (**AutoTare=1**) is selected. The new tare is not saved in the non-volatile memory.
- 6) The controller switches on the output for rough dosing of the channel and if the option rough and fine together is selected (**Both R&F**), it switches on also the output for fine dosing of the channel.
- 7) Waits for time for elimination of the effect of the falling column (**Time D**)
- 8) At reaching of the programmed level (**Fine**) for passing to fine dosing the output for rough dosing switches off and the respective one for fine dosing switches on.
- 9) If the redosing are forbidden (**Dose R=0**) at reaching of the weight (**Dose + Correct**), the output for fine dosing switches off and it passes to 11). At permitted redosings and previous stage 8) at reaching of weight (**Dose + Correct - ReDose**) the output for fine dosing switches off and passes to the next stage, and at permitted redosings and previous stage 10) waits for reaching of weight (**Dose + Correct**), switches off the output for fine dosing and passes to the next stage.
- 10) Waits for time (**Time R**) before check of the weight for redosing. If the weight is (**Dose + Correct**), passes to 11), otherwise, if the number of the redosings is not fulfilled, the output for fine dosing switches on and it passes to 9). At finished number of redosings – to the next stage.

- 11) Activates the output for ready dose and waits for a permitting signal for the emptying of the container
- 12) Activates the output for opening of the container. At selected operation with turning containers – directly passes to 14). At permitted sensors about closed containers wait for deactivated sensor (open container).
- 13) Waits for time for pouring (**DumpTime**) and passes to 1)
- 14) Waits for signal about realized revolution by the container and passes to 1)

At selected second mode of automatic taring (**AutoTare=2**), at the reaching of the set-pointed number of doses (**ATare Sp**) the weight meter waits for the pouring of the containers of all operating channels, “**Waiting AutoTare**” appears on the display and time (**Tfade**) starts, after its running out, “**Calculate Tare**” appears on the display and taring of all operating channels and channels, unconcerned by errors, is realized. The new values of the tares are saved in the non-volatile memory and are valid after the power fault. After the restoring of the power supply, the counting of the doses starts from zero.

In case of power fault the tuning and the selected group are memorized.

At switching off of the switch Start the controller passes from mode “dosing” to mode “stopped dosing” after the all permitted channels had poured their containers.

The change of the position of the switch Start at pause is not read.

By pressing of the button Pause the passing to pause is realized after the repouring of the container, if there is such at the moment of pressing of the button.

3. TARING

! You can tare the device only, if the device is not in mode “dosing”.

By pressing and releasing of the button **Tare**, outer for the device, you can realize the taring of the selected (displayed) channel of the device. The read weight is accepted as weight of the tare and the display is reset. The device starts measuring every change of the weight according to the tare in positive (addition) or in negative (subtraction) direction.

4. КАЛИБРОВКА

Conditions and algorithm for realization of calibration:

1. The device must not be in mode “dosing”.
2. The device must be tared in advance.
3. You have to put a standard weight of the selected (displayed) channel for calibration and wait for settling of the indication on the device.
4. You must enter mode for calibration by the following combination of buttons: press the button **Tare**, press the button **Down**, release the button **Tare** and then release the button **Down**. The following appears:

ChX XXXXXX Kg

└─ Number of
└─ Weight

the channel

5. By **Up** and **Down** you can correct the value for calibration according to the standard weight and confirm by the button **Set**.

5. SELECTION OF GROUP OF PARAMETERS

The selection of group of parameters can be done in mode “stopped dosing”, by pressing and holding for 3 sec. of the button **Set**. A marker appears on the symbol of the group of parameters. By the buttons **Up** and **Down** you can change the group of parameter (from A to F), and by the button **Set** you can confirm the selection.

6. TUNING OF PARAMETERS

! The tuning of parameters is possible only, if the device is not in mode “dosing”.

To enter the menu for tuning of parameters, press and hold the button **Set**, press the button **Up** and release the both of them. The following display appears:

➤ Group Param User Param
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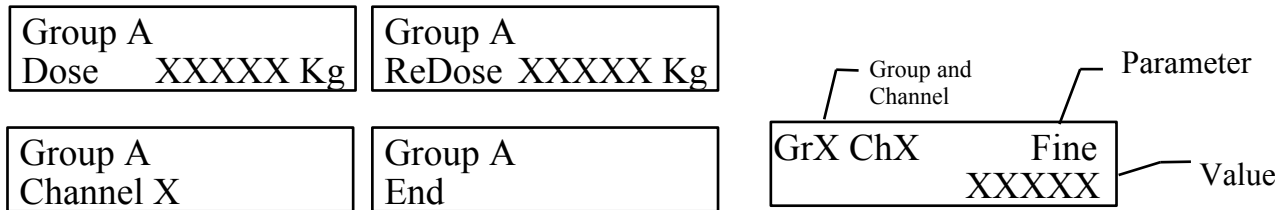
The marker “>” indicates the menu, which you have to enter.

By the buttons “Up” and “Down” you can change the position of the marker “>”, respectively the selection of the parameters, which must be tuned and by Set you can confirm the selection.

6.1. Change of the group parameters.

At marker in front of Group Param and confirmation by SET there is a possibility for selection, by the buttons Up and Down, the group of parameters, which must be tuned (A to F). The selection of group of parameters can be confirmed by the button Set. The dose of the group appears on the display. By the buttons Up and Down you can change the dose, and by the button Set you can confirm and pass to tuning of the parameter ReDose. By the buttons Up and Down you can change its value, and by the button Set you can confirm and pass to selection and tuning of the parameters of the separate channels. At forbidden redosing (DoseR=0) the parameter ReDose is missed.

By the buttons Up and Down you can select the number of the channel or End. By Set you can pass to tuning of the parameters of the channel, if such is selected, or you will exit the menu at selected End.



Group parameters

Name	Description
Fine	Weight of switching from rough to fine dosing. It is set-pointed in percents of the weight for dosing.
OnStartW	Maximum possible weight for a new start (remaining weight in the container after its emptying). <i>At value 0 - check is not realized.</i>
Correct	Correction , realized by the weight meter because of remaining weight, entering the container after switching off of the fine dosing and because of hesitation of the system. You have to consider that the so entered value for the correction is added to the set-point for dosing, i.e. if the controller doses less than the set-point, this value must be increased and if it doses more – it must be decreased.
DumpTime	Time for emptying of the container after finishing of the dosing of the channel. Dimension -> 0 .. 25.5 Sec.

6.2. Change of the user parameters.

At marker in front of User Param and confirmation by Set the first user parameter appears on the display. By the buttons Up and Down you can change the value of the parameter, and by the button Set you can pass to the next one.

User parameters

Name	Description	Tuning
AutoTare	Modes of automatic taring 0 – forbidden 1 – it is realized before each dose 2 – it is realized at intervals of determined number of doses (ATare Sp)	
Dose R	Parameter, determining the number of the redosings. At value 0 redosing is not realized. Redosing is realized, when after waiting of time Time R the measured weight is less than the set-pointed one. Dimension -> 0... 250	
Time R	Time for waiting before check about redosing. Dimension -> 0... 2.50 Sec.	
Time D	Time, in which indications are not read at starting of dosing, they are read after activation of the outputs for dosing. Размер -> 0 .. 2.50 Sec.	
Time C	Time for closing of the container, it is being read after deactivation of the outputs for control of the container. Размер -> 0 .. 25.5 Sec.	
Channel 1	Option for switching off of channel 1. On – on; Off – off	
Channel 2	Option for switching off of channel 2. On – on; Off – off	
Channel 3	Option for switching off of channel 3. On – on; Off – off	
Channel 4	Option for switching off of channel 4. On – on; Off – off	

6.3. Change of hidden user parameters.

Parameters of the controller, accessible at entering of the user parameters, if before that at power supplying you have pressed the button **Down**.

Hidden user parameters

Name	Description	Tuning
T OnStrt	Time for waiting for calming of the measuring system of the channel before check about maximum possible weight at start and automatic taring. Dimension -> 0... 25.5 Sec	
DecPoint	Position of the decimal point: 0.0000, 0.000, 0.00, 0.0, 0. and 0000. Dimension -> 0... 5	
AverFilt*	Average filter. Dimension -> 1... 5	
ExpFilt**	Exponential filter. Dimension -> 1... 5	
FiltJump	Filter jump of clearing in percents of the range. Dimension -> 0.1... 100.0	
FiltJTime	Time for filter jump. Dimension -> 0... 2.00 Sec	
ShowKg/g	Option for displaying of Kg or g of the weight 0 – g 1 – Kg	
ID Sens	Option for switching on of inductive sensors. 0 – Inductive sensors off. 1 – Permitted inductive sensors for closed container 2 – Operation with turning containers	
Both R&F	Option 0 – During rough dosing only the output for rough dosing is activated 1 – During rough dosing the outputs for rough and fine dosing are activated	
Cnt.Out	Option 0 – The active level of the output for control of the container is “0” 1 – The active level of the output for control of the container is “1”	
Cnt.Stop	Option, determining the status of the containers at stopped weight meter and emptied containers 0 – Closed containers 1 – Open containers	
FreeView	0 – In mode “ <i>dosing</i> ” the weight of the channel, which will pour or is pouring at the moment, appears on the display, if there is no ready channel, nothing is displayed. 1 – In mode “ <i>dosing</i> ” the weight of the selected channel appears on the display	
Tfade	Time for calming of the vibrations before realization of autotaring at selected second mode (AutoTare = 2) Dimension -> 0... 25.5 Sec	
ATare Sp	Number of doses, after which autotaring is realized in second mode (AutoTare = 2) Dimension -> 1... 32500	
Measure	Limit for determining of error MeasureE At 0 there is no check about error Dimension -> 0... 4095	

The change of these values must be done with great attention!

* The values of the parameter correspond to the following average sums:

- 1 – single measurement
- 2 – 2 consecutive measurements
- 3 – 4 consecutive measurements
- 4 – 8 consecutive measurements
- 5 – 16 consecutive measurements

** The bigger is the value of the parameter, the deeper is the filter.

7. MESSAGES ABOUT ERRORS

The controller indicates the following messages about errors:

- 1) “**Error! Eeprom**” - error at record or reading from EEPROM.
- 2) “**MeasureE**” – error at measuring. It is necessary to check the connection of the measuring beam with the device.
- 3) “**OnStartE**” – try for starting of a new dosing at remaining weight in the container bigger than the maximum possible one at start
- 4) “**WeightE**” – the weight of the tare together with the set-pointed value of the weight for dosing exceed the maximum weight, measured by the sensor. The reasons for appearing of this inscription could be:
 - Big weight of the tare
 - Incorrectly entered value of the set-point for dosing
 - Decalibration of the device (it is necessary to pass through a procedure of calibration)
 - ReDose > Dose

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