

PROFIBUS

Communication Protocol:
MW-04 Mass Converter

SOFTWARE MANUAL

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RADWAG®
RADWAG BALANCES AND SCALES
ADVANCED WEIGHING TECHNOLOGIES

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1. GENERAL INFORMATION

PROFIBUS communication module ensures data exchange between the main control device (master) and the MW-04 mass converter (slave) in accordance with Profibus DP protocol. The master reads cyclic signals from the slave and saves cyclic states of the slave. Communication with the MW-04 mass converter via PROFIBUS enables:

- Mass readout,
- Taring,
- Zeroing,
- Status readout,
- Current unit readout,
- Setting and readout of tare value,
- Setting and readout of **LO** threshold value,
- Dosing process START / STOP,
- Setting and readout of the fast dosing threshold value,
- Setting and readout of the slow dosing threshold value,
- Dosing status readout,
- Setting and readout of **Min** threshold value,
- Setting and readout of **Max** threshold value.

2. MASS CONVERTER SETTINGS AND CONFIGURATION

To configure mass converter settings for communication via Profibus protocol, run **MWManager** PC software, and go to **<Communication>** submenu. For detailed description of settings configuration read **MWManager** user manual.

3. DATA STRUCTURE

3.1. Memory Map

3.1.1. Output Address

Address Offset	0	1	2	3	4	5	6	7	8	9
0	M1	M1	M1	M1	T1	T1	T1	T1	J1	J1
1	S1	S1	LO1	LO1	LO1	LO1	M2	M2	M2	M2
2	T2	T2	T2	T2	J2	J2	S2	S2	LO2	LO2
3	LO2	LO2	M3	M3	M3	M3	T3	T3	T3	T3
4	J3	J3	S3	S3	LO3	LO3	LO3	LO3	M4	M4
5	M4	M4	T4	T4	T4	T4	J4	J4	S4	S4
6	LO4	LO4	LO4	LO4	-	-	-	-	MIN	MIN
7	MIN	MIN	MAX	MAX	MAX	MAX	DS	DS	DS	DS
8	DW	DW	DW	DW	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	ST1	ST1	ST2	ST2	ST3	ST3	ST4	ST4

M1	Mass for platform 1, 4 bytes, float.
M2	Mass for platform 2, 4 bytes, float.
M3	Mass for platform 3, 4 bytes, float.
M4	Mass for platform 4, 4 bytes, float.
T1	Tare for platform 1, 4 bytes, float.
T2	Tare for platform 2, 4 bytes, float.
T3	Tare for platform 3, 4 bytes, float.
T4	Tare for platform 4, 4 bytes, float.
J1	Current unit for platform 1, 2 bytes, word.
J2	Current unit for platform 2, 2 bytes, word.
J3	Current unit for platform 3, 2 bytes, word.
J4	Current unit for platform 4, 2 bytes, word.
S1	Status for platform 1, 2 bytes, word.
S2	Status for platform 2, 2 bytes, word.
S3	Status for platform 3, 2 bytes, word.
S4	Status for platform 4, 2 bytes, word.
LO1	LO threshold for platform 1, 4 bytes, float.

LO2	LO threshold for platform 2, 4 bytes, float.
LO3	LO threshold for platform 3, 4 bytes, float.
LO4	LO threshold for platform 4, 4 bytes, float.
MIN	MIN threshold for an active platform, 4 bytes, float.
MAX	MAX threshold for an active platform, 4 bytes, float.
DS	Fast dosing threshold for an active platform, 4 bytes, float.
DW	Slow dosing threshold for an active platform, 4 bytes, float.
ST1	Status for platform 1, 2 bytes, word.
ST2	Status for platform 2, 2 bytes, word.
ST3	Status for platform 3, 2 bytes, word.
ST4	Status for platform 4, 2 bytes, word.

3.1.2. Input Address

Address Offset	0	1	2	3	4	5	6	7	8	9
0	C	C	CP	CP	P	P	T	T	T	T
1	LO	LO	LO	LO	-	-	MIN	MIN	MIN	MIN
2	MAX	MAX	MAX	MAX	DS	DS	DS	DS	DW	DW
3	DW	DW	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-

C	Command, 2 bytes, word.
CP	Command with parameter, 2 bytes, word.
P	Selected (active) platform.
T	Tare for a platform, 4 bytes, float.
LO	LO threshold for a platform, 4 bytes, float.
MIN	MIN threshold for a platform, 4 bytes, float.
MAX	MAX threshold for a platform, 4 bytes, float.
DS	Fast dosing threshold for a platform, 4 bytes, float.
DW	Slow dosing threshold for a platform, 4 bytes, float.

3.2. Variable Description

3.2.1. Output Variables

Readout of the output variables enables obtaining information on instrument status.



All output values, excluding mass value, are given in an adjustment units.

Output variable name	Address	Length [word]	Data type
Platform 1 mass	0	2	float
Platform 1 tare	4	2	float
Platform 1 unit	8	1	word
Platform 1 status	10	1	word
Platform 1 LO	12	2	float
Platform 2 mass	16	2	float
Platform 2 tare	20	2	float
Platform 2 unit	24	1	word
Platform 2 status	26	1	word
Platform 2 LO	28	2	float
Platform 3 mass	32	2	float
Platform 3 tare	36	2	float
Platform 3 unit	40	1	word
Platform 3 status	42	1	word
Platform 3 LO	44	2	float
Platform 4 mass	48	2	float
Platform 4 tare	52	2	float
Platform 4 unit	56	1	word
Platform 4 status	58	1	word
Platform 4 LO	60	2	float
Active platform MIN	68	2	float
Active platform MAX	72	2	float
Fast dosing threshold for an active platform	76	2	float
Slow dosing threshold for an active platform	80	2	float
Status of platform 1 process	102	1	word
Status of platform 2 process	104	1	word
Status of platform 3 process	106	1	word
Status of platform 4 process	108	1	word

- **Mass** – returns mass value in a current unit.
- **Tare** – returns tare value in an adjustment unit.
- **Unit** – determines currently displayed mass unit.

Unit		Bit No.						Dec
		B5	B4	B3	B2	B1	B0	
g	Gram	0	0	0	0	0	1	1
kg	Kilogram	0	0	0	0	1	0	2
ct	Carat	0	0	0	1	0	0	4
lb	Pound	0	0	1	0	0	0	8
oz	Ounce	0	1	0	0	0	0	16
N	Newton	1	0	0	0	0	0	32

- **Status** – determines weighing instrument status (platform).

Status bit	Task	Dec
0	Measurement correct (weighing instrument does not report an error).	1
1	Measurement stable.	2
2	Weighing instrument indicates zero.	4
3	Weighing instrument tared.	8
4	Weighing instrument in weighing range II.	16
5	Weighing instrument in weighing range III.	32
6	Weighing instrument reports NULL error.	64
7	Weighing instrument reports LH error.	128
8	Weighing instrument reports FULL error.	256

Example:

Bit No.	B8	B7	B6	B5	B4	B3	B2	B1	B0
Value	0	0	0	0	1	0	0	1	1

The weighing instrument does not report any error, measurement stable in weighing range II.


- **LO threshold** – returns **LO threshold** value in an adjustment unit.
- **MIN** – returns **MIN threshold** value (in an adjustment unit).
- **MAX** - returns **MAX threshold** value (in an adjustment unit).
- **Fast dosing threshold** - returns fast dosing threshold value in an adjustment unit.
- **Slow dosing threshold** - returns slow dosing threshold value in an adjustment unit.

- **Process status** – determines status of the dosing process.

Decimal value of the variable (Dec)	Process status	Bit No.	
		B1	B0
0	Process disabled.	0	0
1	Dosing start.	0	1
2	Dosing stop.	1	0
3	Dosing end.	1	1

3.2.2. Input Variables

Saving output variables to the MW-04 mass converter allows to influence converter operation.

	<i>All input values are set with regard to the adjustment unit.</i>
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Input variable name	Address	Length [word]	Data type
Command	0	1	word
Complex command	2	1	word
Complex command parameters			
Platform	4	1	word
Tare	6	2	float
LO	10	2	float
MIN	16	2	float
MAX	20	2	float
Fast dosing threshold	24	2	float
Slow dosing threshold	28	2	float

- **Command** – basic command. Setting respective command bit performs the task in accordance with the table:

Command bit	Task	Dec
0	Platform zeroing	1
1	Platform taring	2
5	Dosing process start	32
6	Dosing process stop	64

Example:


0000 0000 0010 0000 – dosing process start on the active platform.

- **Complex command** - setting respective command bit performs the task in accordance with the table:

Command bit	Task	Dec
0	Set tare value for the active platform.	1
1	Set LO threshold for the active platform.	2
3	Set MIN threshold for the active platform.	8
4	Set MAX threshold for the active platform.	16
5	Set fast dosing threshold for the active platform.	32
6	Set slow dosing threshold for the active platform.	64
8	Set active platform.	256

Example:

0000 0000 0000 0010– command sets **LO** threshold value, the value given in **LO** parameter is set (address 10).

	<i>Complex command requires the user to set a correct parameter, addresses from 4 to 28.</i>
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- **Platform** – complex command parameter - active platform number:

Decimal value of the parameter	Platform number
0	1
1	2
2	3
3	4

- **Tare** – complex command parameter - tare value (in an adjustment unit).
- **LO** – complex command parameter - **LO** threshold value (in an adjustment unit)
- **MIN** - complex command parameter - **MIN threshold** value (in an adjustment unit).
- **MAX** - complex command parameter - **MAX threshold** value (in an adjustment unit).

- **Fast dosing threshold** - complex command parameter – fast dosing threshold value (in an adjustment unit).
- **Slow dosing threshold** - complex command parameter – slow dosing threshold value (in an adjustment unit).



A command or a command with parameter is executed once when its bit setting is detected. If the command with the same bit is to be executed again, zero the bit.

Example:

Command	Address 1	Address 0
Taring	0000 0000	0000 0010
Command bit zeroing	0000 0000	0000 0000
Taring	0000 0000	0000 0010



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