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Software manual

ITKP-36-01-02-21-EN

PROFIBUS

Communication Protocol:
MW-04 Mass Converter

FEBRUARY 2021

CONTENTS

1. GENERAL INFORMATION 4
2. MASS CONVERTER SETTINGS AND CONFIGURATION 4
3. DATA STRUCTURE 5
3.1. Memory Map 5
3.1.1. Output Address 5
3.1.2. Input Address 6
3.2. Variable Description 6
3.2.1. Output Variables 6
3.2.2. Input Variables 9

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.		B5	B4	B3	B2	B1	B0	Dec
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.



All input values are set with regard to the adjustment unit.

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).



Complex command requires the user to set a correct parameter, addresses from 4 to 28.

- **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