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Software manual

ITKP-31-02-12-20-EN

CBCP-05

Character-Based Communication Protocol
MW-01 Mass Converter
MW-04 Mass Converter

DECEMBER 2020

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1. GENERAL INFORMATION

A. A character based communication protocol is designed for establishing communication between a RADWAG mass converter and a peripheral device via RS232, RS485, Ethernet.
B. The protocol consists of commands sent from a peripheral device to the mass converter and responses from the peripheral device.
C. Responses are sent from the mass converter each time a command is received.
D. Commands, forming the communication protocol, enable obtaining data on the device status and facilitate influencing its operation, e.g.: acquiring measurement results from the mass converter, etc.

2. LIST OF COMMANDS

Command	Command overview
Z	Zero
T	Tare
OT	Give tare value
UT	Set tare
S	Send stable measurement result in basic measuring unit
SI	Immediately send measurement result in basic measuring unit
SP	Immediately send the result in basic weighing unit of a *n* weighing platform
SIA	Immediately send the result from all weighing platforms in basic weighing units
SU	Send stable measurement result in current measuring unit
SUI	Immediately send measurement result in current measuring unit
C1	Switch on continuous transmission in basic measuring unit
C0	Switch off continuous transmission in basic measuring unit
CU1	Switch on continuous transmission in current measuring unit
CU0	Switch off continuous transmission in current measuring unit
DH	Set min checkweighing threshold
UH	Set max checkweighing threshold
ODH	Give value of min checkweighing threshold
OUH	Give value of max checkweighing threshold
P	Set platform n
PC	Send all implemented commands

***)** – *For MW-04 mass converter exclusively.*



Each command must end with CR LF characters.

3. RESPONSE FORMAT

On receipt of a command, the mass converter responds as follows:

XX_A CR LF	Command understood and in progress.
XX_D CR LF	Command carried out (appears only after the XX_A command).
XX_I CR LF	Command understood but not accessible at this moment.
XX _ ^ CR LF	Command understood but max threshold is exceeded.
XX _ v CR LF	Command understood but min threshold is exceeded.
XX _ OK CR LF	Command carried out.
ES_CR LF	Command not recognised.
XX _ E CR LF	Time limit exceeded while waiting for stable measurement result (time limit is a characteristic scale parameter).

XX *- in each case it is the name of a sent command.*
_ - space.

4. COMMANDS OVERVIEW

4.1. Zeroing

Format: **Z CR LF**

Response options:

Z_A CR LF **Z_D CR LF**	- command understood and in progress. - command carried out.
Z_A CR LF **Z_^ CR LF**	- command understood and in progress. - command understood but zeroing range is exceeded.
Z_A CR LF **Z_E CR LF**	- command understood and in progress. - time limit exceeded while waiting for stable measurement result.
Z_I CR LF	- command understood but not accessible at this moment.

4.2. Taring

Format: **T CR LF**

Response options:

T_A CR LF **T_D CR LF**	- command understood and in progress. - command carried out.
T_A CR LF **T_v CR LF**	- command understood and in progress. - command understood but taring range is exceeded.

T_A CR LF **T_E CR LF**	- command understood and in progress. - time limit exceeded while waiting for stable measurement result.
T_I CR LF	- command understood but not accessible at this moment.

4.3. Give Tare Value

Format: **OT CR LF**

Response: **OT_TARE CR LF** - command carried out.

Response format:

1	2	3	4-12	13	14	15	16	17	18	19
O	T	space	tare	space	unit			space	CR	LF

Tare - 9 characters, right justification.
Unit - 3 characters, left justification.



Tare value is always given in an adjustment (calibration) unit.

4.4. Set Tare

Format: **UT_TARE CR LF**, where **TARE** - tare value

Response options:

UT_OK CR LF	- command carried out.
UT_I CR LF	- command understood but not accessible at this moment.
ES CR LF	- command not recognised (tare format incorrect).



Use dot in tare format as decimal point.

4.5. Send Stable Measurement Result in Basic Measuring Unit

Format: **S CR LF**

Response options:

S_A CR LF **S_E CR LF**	- command understood and in progress. - time limit exceeded while waiting for stable measurement result.
S_I CR LF	- command understood but not accessible at this moment.
S_A CR LF **MASS FRAME**	- command understood and in progress. - response: mass value in basic measuring unit.

Response format:

1	2-3	4	5	6	7-15	16	17	18	19	20	21
S	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S CR LF – command sent from a computer.
S _ A CR LF – command understood and in progress.
S _ _ _ _ - _ _ _ _ _ _ 8 . 5 _ g _ _ CR LF - command carried out, response: mass value in basic measuring unit.

4.6. Immediately Send Measurement Result in Basic Measuring Unit

Format: **SI CR LF**

Response options:

SI_I CR LF	- command understood but not accessible at this moment.
MASS FRAME	- immediate response: mass value in basic measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	I	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S I CR LF – command sent from a computer.
S I _ ? _ _ _ _ _ _ _ 1 8 . 5 _ k g _ CR LF - command carried out, immediate response: mass value in basic measuring unit.

4.7. Immediately send the result in basic weighing unit of a *n* weighing platform

For MW-04 mass converter exclusively.

Format: **SPn CR LF**, where **n** – weighing platform no. (from 1 to 4).

Response options:

SPn_I CR LF	- command understood but not accessible at this moment.
MASS FRAME „Pn" CR LF	- immediate response: mass value in basic measuring unit for n weighing platform.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
P	n	space	stability marker	space	character	mass	space	unit			CR	LF

n - weighing platform number.
Mass - 9 characters with right justification.
Unit - 3 characters with left justification.

4.8. Immediately send the result from all weighing platforms in basic weighing units

For MW-04 mass converter exclusively.

Format: **SIA CR LF**

Response options:

SIA_I CR LF	- command understood but not accessible at this moment.
MASS FRAME „P1" ; MASS FRAME „P2" ; MASS FRAME „P3" ; MASS FRAME „P4" CR LF	- immediate response: mass value from each of all weighing platforms in basic measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19
P	n	space	stability marker	space	character	mass	space	unit		

n - weighing platform number.
Mass - 9 characters with right justification.
Unit - 3 characters with left justification.

Example:

Weighing module connected with two weighing platforms (platform 1, platform 2).

S I A CR LF – command sent from a computer
P 1 _ ? _ _ _ _ _ _ 1 1 8 . 5 _ g _ _ ; P 2 _ _ _ _ _ _ _ _ _ 3 6 . 2 _ k g _ ; P 3 _ I ; P 4 _ I CR LF - command understood, immediate responses are mass values from all weighing platforms in basic weighing unit of each of the weighing platform. Where: **P 3 _ I** – platform 3 not accessible, **P 4 _ I** - platform 4 not accessible

4.9. Send Stable Measurement Result in Current Measuring Unit

Format: **SU CR LF**

Response options:

SU_A CR LF **SU_E CR LF**	- command understood and in progress. - time limit exceeded while waiting for stable measurement result.
SU_I CR LF	- command understood but not accessible at this moment.
SU_A CR LF **MASS FRAME**	- command understood and in progress. - response: mass value in basic measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S U CR LF – command sent from a computer.
S U _ A CR LF - command understood and in progress.
S U _ _ _ - _ _ 1 7 2 . 1 3 5 _ N _ _ CR LF - command carried out, response: mass value in current measuring unit.

4.10. Immediately Send Measurement Result in Current Measuring Unit

Format: **SUI CR LF**

Response options:

SUI_I CR LF	- command understood but not accessible at this moment.
MASS FRAME	- immediate response: mass value in basic measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	I	stability marker	space	character	mass	space	unit			CR	LF

Example:

S U I CR LF – command sent from a computer.
S U I ? _ - _ _ _ 5 8 . 2 3 7 _ g _ _ CR LF - command carried out, immediate response: mass value in current measuring unit.
Where: _ - space.

4.11. Switch On Continuous Transmission in Basic Measuring Unit

Format: **C1 CR LF**

Response options:

C1_I CR LF	- command understood but not accessible at this moment.
C1_A CR LF **MASS FRAME**	- command understood and in progress. - response: mass value in basic measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	I	space	stability marker	space	character	mass	space	unit			CR	LF

4.12. Switch Off Continuous Transmission in Basic Measuring Unit

Format: **C0 CR LF**

Response options:

C0_I CR LF	- command understood but not accessible at this moment.
C0_A CR LF	- command understood and carried out.

4.13. Switch On Continuous Transmission in Current Measuring Unit

Format: **CU1 CR LF**

Response options:

CU1_I CR LF	- command understood but not accessible at this moment.
CU1_A CR LF **MASS FRAME**	- command understood and in progress. - response: mass value in current measuring unit.

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	I	stability marker	space	character	mass	space	unit			CR	LF

4.14. Switch Off Continuous Transmission in Current Measuring Unit

Format: **CU0 CR LF**

Response options:

CU0_I CR LF	- command understood but not accessible at this moment.
CU0_A CR LF	- command understood and carried out.

4.15. Set Min Checkweighing Threshold

Format: **DH_XXXXX CR LF**, where **XXXXX** - mass format.

Response options:

DH_OK CR LF	- command carried out.
ES CR LF	- command not recognised (mass format incorrect).

4.16. Set Max Checkweighing Threshold

Format: **UH_XXXXX CR LF**, where **XXXXX** - mass format.

Response options:

UH_OK CR LF	- command carried out.
ES CR LF	- command not recognised (mass format incorrect).

4.17. Give Value of Min Checkweighing Threshold

Format: **ODH CR LF**

Response: **DH_MASS CR LF** - command carried out.

Response format:

1	2	3	4-12	13	14	15	16	17	18	19
D	H	space	mass	space	unit			space	CR	LF

Mass - 9 characters, right justification.
Unit - 3 characters, left justification.

4.18. Give Value of Max Checkweighing Threshold

Format: **OUH CR LF**

Response: **UH_MASS CR LF** - command carried out.

Response format:

1	2	3	4-12	13	14	15	16	17	18	19
U	H	space	mass	space	unit			space	CR	LF

Mass - 9 characters, right justification.
Unit - 3 characters, left justification.

4.19. Change platform n

For MW-04 mass converter exclusively.

Format: **Pn CR LF**, where **n** – weighing platform no. (from 1 to 4).

Response options:

Pn_OK CR LF	- command carried out.
Pn_I CR LF	- command understood but not accessible at this moment.
ES CR LF	- command not recognized (incorrect platform number).

4.20. Send All Implemented Commands

Format: **PC CR LF**

Response:

PC_A_"Z,T,S,SI,SP*,SIA*,SU,SUI,C1,C0,CU1,CU0,DH,ODH,UH,OUH,OT,UTP*,PC" - command carried out, the mass converter has sent all implemented commands.

***)** - *For MW-04 mass converter exclusively.*