

Protocol SICS for Cubis MCA balances

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1 Introduction

1.1 Purpose and scope

This document describes how the MCA balance can be operated via the serial interface protocol SICS.

2 Protocol SICS

The SICS protocol is compatible with the original MT-SICS protocol from Mettler-Toledo (XPR balances) and enables interface commands for basic functions to be sent to the balance. Please note that there are differences due to the different hardware and software platforms.

The command set of SICS includes commands for reading weight values and for triggering balance functions. The SICS commands implemented in the MCA balance are described in this manual.

2.1 Overview of the supported SICS commands

Level	Comm and	Description
0	@	Reset all active SICS commands
0	I0	List all available commands
0	I1	Information about the levels and their versions
0	I2	Query balance model
0	I3	Query software version of the balance (firmware package)
0	I4	Query balance serial number
0	I5	Query software version of the application (QAPP Center)
0	S	Send weight value at stability. The balance sends a display value with stability.
0	SI	Send weight value even without stability
0	SIR	Automatically send weight values with and without stability
0	Z	Zero balance at stability. The balance performs the zeroing function when stable.
0	ZI	Zero the balance even without stability
1	T	Tare balance at stability. The balance performs the tare function when stable.
1	TI	Tare the balance without stability
1	TA	Tare Memory write / read
1	D	Display text
1	DI	Write information text in display
1	DW	Delete text from display
1	TAC	Delete tare memory
2	I10	Query or define the balance Identification (balance ID)

Level	Comm and	Description
2	I11	Query model designation
2	K	Key control
2	M13	Block touch display
2	M21	Unit
2	PWR	Standby /Wakeup device
2	ST	Send weight value at stability, if the "Save" button was pressed for transfer to the protocol
2	WS	Execute draft shield function (optional). Query door position of motorized draft shield / Open or close doors
2	C3	Performing internal calibration
Addition	SA	Send weight value at stability and store in data memory (optionally with identification)

2.2 Syntax and Grammar

The command and response of the SICS protocol are data strings with a fixed format. This section contains some general aspects, while the details are described in the section on commands.

2.2.1 Command notation

The commands are only valid in ASCII capital letters, i.e. an "s" instead of "S" is not valid.

2.2.2 Separator

Commands and parameters are separated by a single space " " (ASCII 0x20). If more than a single space is detected as a separator, a general syntax error message is returned.

2.2.3 Valid command characters

The transmission of the commands and the answers is done with ASCII characters. Valid characters are the elements from 32 to 255 (decimal) of the 8-bit ASCII character set, which can be used, for example, in a character string for the command "Write text to display". Note: To send a quotation mark in a character string, it must be masked with (\").

2.2.4 End of message

Each message (command or response) must be terminated by a sequence of the characters "carriage return" <CR> (ASCII 0x0D) and "line feed" <LF> (ASCII 0x0A).

2.2.5 Maximum length of a command

A command may contain a maximum of 64 characters. If a command sequence (excluding spaces and message terminator CR, LF) contains more than 64 characters, a general syntax error message is sent.

2.3 Command execution

Each command received by the balance is confirmed by a response from the balance to the original triggering device. In SICS communication, the connected device is thus the master and the balance responds as a slave. By default, communication is therefore initiated by the connected device and not by the user interface of the balance.

2.3.1 No command buffering

The SICS command interpreter does not buffer multiple commands that are sent or received simultaneously while another command is still active.

If a previous command is still active when a new command arrives, the command-specific error is returned for a currently unavailable functionality. For functions that are generally not available (due to locks or other permanent circumstances), the generic code for a logical error is sent. See: General Error Response.

The only exception to this rule is the "Reset all active SICS commands" command, which is executed immediately and cancels any running command.

2.3.2 Command execution when starting the balance

No SICS command is executed during startup and shutdown of the balance. The command interpreter does not execute commands until the login screen is displayed.

When the balance goes into standby mode, the currently executed command is stopped and the error "EL" is answered. Example: The tare command is waiting for stability.

2.3.3 Command execution in standby

In standby mode, only the command "@ - Reset all SICS commands" is accepted to switch on the balance.

2.3.4 Instruction execution independent of the task

All SICS commands are executed regardless of the running task and the rights of the user currently logged in. To avoid interactions the SICS interface can be disabled.

2.4 The commands in detail

In the following description of the syntax and examples, the space " ", as well as the closing characters <CR> and <LF> are not shown separately.

2.4.1 Command @ - Reset all active SICS commands

The command aborts all active SICS commands and deletes the command queue (i.e. all blocking commands). The execution of the current command is stopped without a result code. The tare memory is cleared and the balance serial number is returned. When the balance is in standby mode, it is switched on. This does not affect other standby modes or shutdown balances. All key control settings are reset to the default values. The interface unit is reset to display unit.

Syntax:

Command: @

Response: I4 A "P1"

P1: Balance serial number

Note: This is not the response to the abort of the commands, but a side effect of the reset and thus the restart of the balance. It thus only indicates the completion of the reset command.

Example:

Command: @@

Response: I4 A "0038403855"

2.4.2 Command C3 - Perform Internal Calibration

The command C3 triggers an internal calibration/adjustment of the balance. The function must be completed within 2 minutes, otherwise it is automatically aborted.

Syntax:

Command: C3

Response: C3 B

B: Calibration/adjustment started

C3 A

A: Calibration/adjustment successfully completed

Or

C3 I

I: Calibration/adjustment cancelled, manually or automatically after timeout

C3 L

L: Calibration/adjustment not possible

Example:

Command: C3

Trigger internal calibration/adjustment

Response: C3 B

Calibration/adjustment started

C3 A

Calibration/adjustment successfully completed

2.4.3 Command D - Write text in weighing display

The D command writes a text string (Unicode UTF-8) into the weighing screen of standard weighing applications. An already existing text will be overwritten. The maximum length of the text in the command is 200 characters. The maximum number of characters of "text" visible in the display depends on the display type. Longer texts may disappear on the right side.

The balance only knows the Unicode characters used by the supported languages. Characters from other languages may not be displayed.

Syntax:

Command: D "Text"

Response: D A

D: The text was written into the weighing display

Or

D I

I: Command cannot be executed

D L

L: Syntax error

Check if the text is in quotation marks and if there is a space between D and "Text".

Example:

Command: D "Put sample on balance."

Response: D A

The text was written in the weighing display.

2.4.4 Command DI – Display Information

The DI command displays an information text string (Unicode UTF-8) on the balance screen in full-screen mode, overwriting any existing text. The text can be up to 200 characters long. When the information overlay screen is active, all display interactions are disabled until the text is cleared using the DW command. The balance supports Unicode characters from the supported languages only; characters from unsupported languages may not be displayed.

Syntax:

Command: DI "Text"

Response: DI A

DI: The text was written into the weighing display

Or

DI I

I: Command cannot be executed

DI L

L: Syntax error

Check if the text is in quotation marks and if there is a space between D and "Text".

Example:

Command: DI "Put sample on balance."

Response: DI A

The text was written in the display.

2.4.5 Command DW - Delete text from display

The DW command removes the text previously displayed on the balance screen using the D or DI command. After an information message, this action clears the information overlay, restoring normal display interactions.

Syntax:

Command: DW

Response: DW A I: Command cannot be triggered at the moment
or
DW I I: Command cannot be triggered at the moment

Example:

Command: DW

Response: DW A The text in the display was deleted

2.4.6 Command I0 - List all available commands

The list is in alphabetical order of the commands and ascending through the levels.

Syntax:

Command: I0

Response: I0 B "P1" "P2" B: More commands follow in the next lines
I0 B "P1" "P2" P1: The level of the command
I0 B "P1" "P2" P2: The command code, identifier (e.g. "@")
...
I0 A "P1" "P2" A: The last command is listed
Or
I0 I I: Command cannot be executed at present

Example:

Command: I0

Response: I0 B "0" "I0" The command I0 from level 0 is available
I0 B "0" "I1" Command I1 from level 0 is available
...
I0 B "2" "ST" The ST command from level 2 is available
I0 A "2" "WS" The last command from the list

Example:

Command:

Response: I3 A "09-03-04.01.47"

2.4.10 Command I4 - Query balance serial number

Command I4 returns the serial number of the balance.

Syntax:

Command: I4

Response: I4 A "P1"

P1: Balance serial number

Or

I4 I

I: Command cannot be executed at the moment

Example:

Command: I4

Response: I4 A "0038403855"

2.4.11 Command I5 - Query the software version of the application (QAPP Center).

This command returns the version number for the QAPP Center.

Note: The original SICS command responds with the software identification.

Syntax:

Command: I5

Response: I5 A "P1"

P1: Version QAPP Center

or

I4 I

I: Command cannot be executed at the moment

Example:

Command:

Response: I5 A "09-06-05.01.09"

2.4.12 Command I10 - Query or define the balance Identification (balance ID)

Use I10 command to query or define the balance identification (balance ID). This allows an individual name to be assigned to a balance.

Syntax:

Command:	I10	Query the current balance ID.
	or	
	I10 "balance ID"	Set the balance ID.
Response:	I10 A "balance ID"	Current balance ID
	I10 A	Command understood and executed successfully.
	I10 I	Command understood but currently not executable (balance is currently executing another command).
	I10 L	Command not executed as the balance ID is too long (max. 20 characters).

Example 1: Query the current balance ID

Command: I10
Response: I10 A "My_Balance"

Example 2: Set the balance ID

Command: I10 "My_Balance"
Response: I10 A

2.4.13 Command I11 - Query model designation

This command is used to output the model designation.

Syntax:

Command:	I11	Query of the current balance or weigh module type.
Response:	I11 A "Model"	Current balance or weight module type
	I11 I	Command understood but currently not executable (balance is currently executing another command).

Example 1: Query the current balance or weigh module type

Command: I11
Response: I11 A "XPR603SDR"

2.4.14 Command K – Key control

This command is used to configure the behavior of the weighing screen buttons, allowing control over whether a key invokes its corresponding function and whether an indication of which key has been pressed is sent to the host interface. This functionality enables an application running on a connected system (e.g., a PC or PLC) to interact with the balance operator through the balance terminal.

Syntax:

Command:	K <Mode>	Set configuration. Parameter: 1 – Functions are executed; no indications are sent (default setting). 2 – Functions are not executed; no indications are sent. Weighing screen header and footer buttons disabled 3 – Functions are not executed; indications are sent; Weighing screen header and footer buttons enabled
Response:	K A	Command understood and executed successfully
	K L	Incorrect parameter; not executable.
Additional response for Mode 3	K C <Button>	Button was pressed. Parameter: 1 – Home or logout button 5 – Zero button 7 – Takeover button 8 – Print preview button 10 – Tare button

Example 1: Use key control mode 3 to get informed about pressed buttons without execution the button function

Command:	K 3
Response:	K A
Press button Zero (Zero function not executed)	K C 5

2.4.15 Command M13 – Block touch display

This command is used to block / unblock or to query the current blocking status of the balance touch function. This command works only in the weighing screen and not in menu screens.

Syntax:

Command:	M13	Query of the current block touch function state.
	M13 <Touch Function>	Set the block touch function on / off.
		Parameter:
		0 – touch display is turned off, in weighing screen no touch possible.
		1 – touch display is turned on, all touches are possible
Response:	M13 A <Touch Function>	Current state of the block touch function
	M13 A	Command understood and executed successfully
	M13 I	Command understood but currently not executable.
	M13 L	Command understood but currently not executable due to incorrect parameter.

Example 1: Block the touch function

Command: M13 1

Response: M13 A

2.4.16 Command M21 – Unit

The M21 command is used to set or query the weighing unit for the output channels of a balance. It allows users to either request the current unit setting or set a new unit for specific output channels.

Mettler Toledo defines three different output channels:

- 0: Interface channel, used for SICS protocol
- 1: Display, used in screen
- 2: Info unit, not used in Sartoris MCA balances

Syntax 1:

Command	M21	Query the unit of interface, display and info channel.
Response	M21 B <channel> <unit> M21 A <channel> <unit>	Channel and unit in multiple lines, M21 A .. indicates last line

Syntax 2:

Command	M21 <channel>	Query the unit of a specific channel
Response	M21 A <channel> <unit>	Channel and unit

Syntax 3:

Command	M21 <channel> <unit>	set the unit of a specific channel
Response	M21 A	Command understood and executed successfully
	M21 I	Command understood but currently not executable.
	M21 L	Command understood but currently not executable due to incorrect parameter.

The table below outlines the units available as per the SICS protocol specification. Please be aware that the units displayed are contingent upon the selected weighing profile and the balance model's supported units. If a display unit cannot be set, the protocol will respond with "M21 I".

Units:

Unit	Meaning	Value
g	Gram	0
kg	Kilogram	1
t	Ton	2
mg	Milligram	3
µg	Mircogram	4
ct	Carat	5
lb	Pound avdp	7
oz	Ounce avdp	8
Ozt	Ounce troy	9
GN	Grain	10
dwt	Pennyweight	11
mom	Momme	12
msg	Mesghal	13
tlh	Tael Hongkong	14
tls	Tael Singapore	15
tlt	Tael Taiwan	16
tola	Tola	18
baht	Baht	19

Remark: The reset/abort command (@) will also revert the units to the initial setting that was configured in the display channel when the balance or a task was first initiated.

2.4.17 Command PWR – Standby / Wakeup balance

Set the balance into standby mode or wake the balance up again.

Syntax 1:

Command	PWR 0	Set balance to standby
Response	PWR A	A: Command executed
	or	
	PWR I	I: Command cannot be executed at the moment

Syntax 2:

Command	PWR 1	Wakeup balance
Response	PWR A	A: Command executed
	or	
	PWR I	I: Command cannot be executed at the moment

2.4.18 Command S - Send weight value at stability

The balance sends a weight value with stability. If the balance has no stability, it waits for stability and then sends the stable weight value.

The output format is described in the chapter "Response format for weight values".

Remark: The draft shield automatic has no effect with this command.

Syntax:

Command:	S	
Response:	S S w1 u1	S: Stable weight value w1: Weight value u1: Unit
	or	
	S +	The balance has overload
	S -	The balance has underload
	S I	The command cannot be executed or the timeout has been reached due to instability.

Example:

Command:	S<CR><LF>	
Response:	S S 99.528 g	The current weight value at stability is 99.528 g

2.4.19 Command SA - Send weight value, store in data memory (optional ID)

The SA command transfers a stable weight value to the data memory. As with the S command, the system waits for stability when the balance has no stability and only then accepts it. Only valid values are accepted, no acceptance, if the warning symbol is displayed as unit. Optionally, a text can be transferred as identification for this value, which is stored in the data memory with the command. The complete entries from this memory location are then output on the SICS interface.

Syntax:

Command: SA

or

SA "Text"

text: Optional label ID for the entry in the data memory

Response: SA A "w1" "w2" "w3" "w4"
"w5" "n1" "n2" "Text"

w1: Weight value,
depending on the allocation of the tare memory

w2: Tare

w3: Tare 1

w4: Tare 2

w5: Gross calculated

n1: Balance serial number

n2: Memory Number in data memory

Text: Optionally passed marking

or

SA I

I: The passed text is longer than 80 characters or the command cannot be executed, e.g. because of timeout or weight value invalid.

SA L

L: Text comment does not contain beginning and closing quotation marks or text has not at least 2 characters.

The weighing values ("w1" to "w5") are output in this format:

Header	Space	Weight value	Space	Unit
1 - n character	1 character	10 character, including decimal point and sign	1 character	1 - n character

"w2" to "w5" are only output, if a tare memory is occupied, see examples.

Header for the weight values "w1":

G Gross value, no tare memory is occupied

N Net value, the tare memory is occupied

N1 Net value 1, the application tare memory 1 is occupied

N2 Net value 2, the application tare memory 2 is occupied

Header for the tare values "w2" to "w4":

T Tare memory occupied
 T1 Application tare memory 1 occupied
 PT1 Application tare memory 1 occupied by manual entry
 T2 Application tare memory 2 occupied
 PT2 Application tare memory 2 occupied by manual entry

Header for the calculated gross value "w5":

GC Gross value calculated, adding the values "w1" to "w4"

Example 1: No tare memory is occupied

Command: SA

Response: SA A "G 173.511 g" "" "" "" "" "SerNo. 23201202" "MemNo. 504" ""

Example 2: Tare memory is occupied

Command: SA

Response: SA A "N 134.012 g" "T 3.511 g" "" "" "GC 137.523 g" "SerNo. 23201202" "MemNo. 505" ""

Example 3: Tare and tare 1 memory are occupied

Command: SA

Response: SA A "N1 25.023 g" "T 3.511 g" "T1 134.012 g" "" "GC 162.546 g" "SerNo. 23201202" "MemNo. 506" ""

Example 4: Tare and the hand tare 1 are occupied

Command: SA

Response: SA A "N1 173.511 g" "T 3.511 g" "PT1 125.000 g" "" "GC 302.022 g" "SerNo. 23201202" "MemNo. 507" ""

Example 5: Tare 1 and tare 2 are occupied, a marking ID was transferred

Command: SA "Art.23"

Response: SA A "N2 228.866 g" "" "T1 0.200 g" "T2 99.505 g" "GC 328.371 g" "SerNo. 23201202" "MemNo. 508" "MemID Art.23"

2.4.20 Command SI - Send weight value even without stability

The balance sends the current weight value, regardless of whether it is stable or not. The output format is described in chapter "Response format for weight values".

Syntax:

Command: SI

Response: S S w1 u1

S: The weight value has stability

S D w1 u1

D: The weight value has no stability

w1: Weight value

u1: Unit

or

S +

The balance has overload

S -

The balance has underload

S I

The command cannot be executed.

Example:

Command: SI

Response: S S 99.528 g

The current weight value has stability and is 99.528 g

S D 362.359 g

The current weight value has no stability and is 362,359 g

2.4.21 Command SIR - Automatically send weight values with and without stability

The balance sends the current weight value in the grid of the weighing sequence, regardless of whether it is stable or not. Other commands can be executed while SIR is active.

If a command is executed during automatic output, e.g. tare, zeroing or calibration / adjustment, S I is output instead of the weight value until the command is completed.

The automatic output is stopped by the commands @, S, SI, SA, ST or by switching off the balance.

Syntax:

Command: SIR

Response: S S w1 u1

S: The weight value has stability

S D w1 u1

D: The weight value has no stability

w1: Weight value

u1: Unit

or

S +

The balance has overload

S -

The balance has underload

S I

The command cannot be executed at the moment.

Example:

Command: SIR
 Response: S D 594.821 g
 S D 228.896 g
 S D 228.895 g
 S S 228.890 g
 ...

2.4.22 Command ST - Send weight value at stability when Save is pressed

The ST command is used to send the current stable weight value to the SICS interface whenever the "Save" button has been pressed to save it to the print report. This function can be activated or deactivated.

The output format is described in the chapter "Response format for weight values".

Syntax 1:

Command:	ST	Query the current status of the ST function
Response:	ST A 0	The function is deactivated, there is no output to the SICS interface when the "Save" button is pressed
	ST A 1	The function is activated, the current stable weight value is output when the "Save" button is pressed
	or	
	ST I	I: Command cannot be executed at the moment

Syntax 2:

Command:	ST 1	Activates the output of the current stable weight value to the SICS interface each time the "Save" button is pressed
	or	
	ST 0	Deactivates the output of the weight value to the SICS interface each time the "Save" button is pressed
Response:	ST A	Function executed, activated or deactivated
	or	
	ST I	I: Command cannot be executed at the moment
	ST L	L: Command not executed, wrong parameter

Example:

Command:	ST 1	Activates the output function
Response:	ST A	The function was executed and activated
	S S 99.528 g	When pressing the "Save" button: The current weight value with stability is 99.528 g

2.4.23 Command T - Tare balance at stability

The command waits for a stable weight value and then tares the balance. This command resets T1 value to 0 (accessible with command TA) if a new value Tare value is set.

Syntax:

Command:	T	
Response:	T S w1 u1	S: The balance was tared with stability w1: New tare value u1: Unit
	or	
	T I	I: Command cannot be executed at the moment
	T +	Upper limit of tare range exceeded
	T -	Lower limit of tare range exceeded

Example:

Command:	T	
Response:	T S 29,817 g	The balance was tared, the tare memory now contains the value 29.817 g

2.4.24 Command TA - Read write Tare memory

The TA command can be used to read out the contents of the tare memory.

Return value is T1 if T1 is occupied, otherwise T. This command resets Tare value to 0 (accessible with command T) if a new value T1 value is set.

If a weight value is appended to the TA command as w1 and the "Second tare memory" application is active, the T1 tare memory is overwritten with this value.

The T1 tare memory of the balance can only be read out (if the "Second tare memory" application is not active), but not overwritten.

The optional parameter u1 specifies the weight unit. If this is not appended, the weight unit g is used.

The possible units are g, mg and kg.

Syntax:

Command:	TA w1 u1	w1: Weight value (optional) u1: Weight unit (optional)
Response:	TA A w1 u1	w1: weight value u1: Weight unit
	or.	
	TA I	I: Command cannot be executed at present.

Example 1:

Command:	TA
Response:	TA A 129.336 g The weight value 129.336 g is stored in the tare memory.

Example 2:

Command:	TA 130.56 g Application "Second tare memory" is active, tare memory T1 is to be filled with the value 130.56 g
Response:	TA A 130.560 g The weight value 130.56 g is stored in the tare memory.

2.4.25 Command TAC - Clear Tare Memory

The TAC command sets the tare memory to zero and thus clears it.

Syntax:

Command:	TAC
Response:	TAC A A: The tare memory was deleted
	or
	TAC I I: Command cannot be triggered at the moment

Example:

Command:	TAC
Response:	TAC A The tare memory was deleted

2.4.26 Command TI - Tare balance even without stability

The TI command tares the balance immediately, regardless of whether the balance is stable or not. This function is blocked on verified models.

Syntax:

Command: TI

Response: TI D w1 u1

D: The balance was tared without stability

w1: New tare value

u1: Unit

or

TI S w1 u1

S: The balance was tared with stability

TI I

I: Command cannot be executed at the moment

TI L

L: Function is blocked for calibrated models

TI +

Upper limit of tare range exceeded

TI -

Lower limit of tare range exceeded

Example:

Command: TI

Response: TI D 29,817 g

The balance was tared without stability, the tare memory now contains the value 29.817 g

2.4.27 Command WS - Execute Draft Shield Function (optional)

The WS command can be used to query the position of the draft shield doors and to open or close the doors. The WS command is optional and is only executed if a motorized draft shield is also present.

For Cubis Fusion a valid draft shield license (QAPP1002) must be available.

Syntax 1:

Command:	WS	Query current status of doors
Response:	WS 0	All doors closed
	WS 1	LiDS: Right door open RoDS: Open to the right side
	WS 2	LiDS: Left door open RoDS: Open to the left side
	WS 3	LiDS: Upper door open
	WS 4	LiDS: Left and right door open
	WS 5	LiDS: Left and upper door open
	WS 6	LiDS: Right and upper door open
	WS 7	LiDS: All doors open
	WS 8	Error
	WS 9	Undefined door position
	or	
	WS I	I: Command cannot be executed

Syntax 2:

Command:	WS 0	Close all doors
	WS 1	LiDS: Open right door RoDS: Open to the right side
	WS 2	LiDS: Open left door RoDS: Open to the left side
	WS 3	LiDS: Upper door open
	WS 4	LiDS: Open left and right door
	WS 5	LiDS: Open left and upper door
	WS 6	LiDS: Open right and upper door
	WS 7	LiDS: Open all doors
	WS 10	Release the left draft shield key
	WS 11	Release the right draft shield key
Response:	WS A	A: The command was executed, the doors were opened or closed
	or	
	WS I	I: Command cannot be executed

WS L

L: command not executed, wrong parameter

Example 1:

Command: WS

Response: WS 2

LiDS: Left door open

RoDS: Open to the left side

Example 2:

Command: WS 2

LiDS: Open left door

RoDS: Open to the left side

Response: WS A

A: The command was executed

2.4.28 Command Z - Zero the balance at stability

The command waits for a stable weight value and then sets the balance to zero.

Syntax:

Command: Z

Response: Z A

A: The balance was set to zero

or

Z I

I: Command cannot be executed at the moment

Z +

The upper limit of the zeroing range is exceeded

Z -

The lower limit of the zeroing range is exceeded

Example:

Command: Z

Response: Z A

The balance was set to zero

2.4.29 Command ZI - Zero the balance even without stability

The balance is immediately set to zero, regardless of whether the balance is stable or not. This function is blocked on verified models.

Syntax:

Command: ZI

Response: ZI D

D: The balance was set to zero without stability

or

ZI S

S: The balance was set to zero with stability

ZI I

I: Command cannot be executed at the moment

ZI L

L: Function is blocked for calibrated models

ZI +	The upper limit of the zeroing range is exceeded
ZI -	The lower limit of the zeroing range is exceeded

Example:

Command: ZI

Response: ZI D The balance was set to zero without stability.

3 Answers to the commands

This section contains general answers, while command-specific answers are described in the section for each command.

3.1 General answer to errors

There are three different general answers in case of error.

Type	Code	Cause
Transmission error	ET	Incomplete or wrong transmission (e.g. parity error or incomplete command)
Syntax Error	ES	Command not recognized or not allowed or wrong number of parameters passed with the command
Logical error	EL	The command cannot be executed because • Function currently disabled • command specific behavior

If a parameter is sent with the command, although no parameters are required for the command, the command is not executed and the command followed by an 'L' is returned instead.

3.2 Response format for weight values

Some commands have responses that contain a weight value. These values are always formatted in the same way.

ID	▬	Status	▬	Weight value	▬	Unit	CR	LF
1-2 character	1 space char.	1 character	1 space char.	10 character	1 space char.	1-5 charcater		

The identification ID refers to the invoking command. The status S stands for stability and D for no stability of the weighing value.

The character string for the value, with decimal point and minus sign (directly in front of the value), is filled up to a total of 10 characters with spaces on the left. (On multi-balance balances, the last decimal place outside the fine range is output as a space).

If the value contains more than 10 characters in total, an error is sent that the command is currently not executable. The string for the unit is 1-5 characters.

Note:

The weight value on verified balances is output in the same way as on standard balances. This means that the non-verified digit(s) do not get a special character or brackets. Calculated values with the unit "!" are not specially marked in SICS.

3.3 Interfaces for the SICS protocol

The SICS protocol can be used via the COM-RS232, USB-B interfaces on the rear panel of the balance and via the Ethernet interface on the display head.

The SICS protocol can be set for the respective interface, which can then be operated independently of the task and its application.

3.3.1 Interface COM-RS232

The COM-RS232 interface is intended for serial connection to a PC or PLC control unit. Baud rate, data bits, parity, stop bits and handshake must be set for this interface according to the connected device.

3.3.2 Interface USB-B

The USB-B interface is used to connect a PC via a standard USB cable, with USB-A to USB-B plug. On the PC, this connection is set up and displayed as a virtual COM port (VCP). The driver for this interface is automatically installed on the PC by the operating system, provided the user has the appropriate rights.

3.3.3 Network connection

It is also possible to use the serial communication protocol SICS via the Ethernet network connection. This client/server connection requires the setting of a common TCP port. The default is port 55555.

4 Abbreviations

Abbreviation	Description
ASCII	American Standard Code for Information Interchange The American Standard Code for Information Exchange is a 7-bit character encoding.
CR	Carriage return character Control character ^M, Hexadecimal 0x0D, Decimal 13
LF	Line feed character, line feed character Control character ^J, Hexadecimal 0x0A, Decimal 10
LiDS	Optional: Linear draft shield with three doors (right, top, left)
RoDS	Optional: Rotary draft shield
RS232	Recommended Standard 232, standard for serial interfaces
SICS	Standard Interface Common Set Interface protocol with which the balance can be operated.
SP	Space character, space, " " Hexadecimal 0x20, Decimal 32
PLC	Programmable logic controller
TCP	Transmission Control Protocol, network protocol for transmission control
VCP	Virtual COM Port