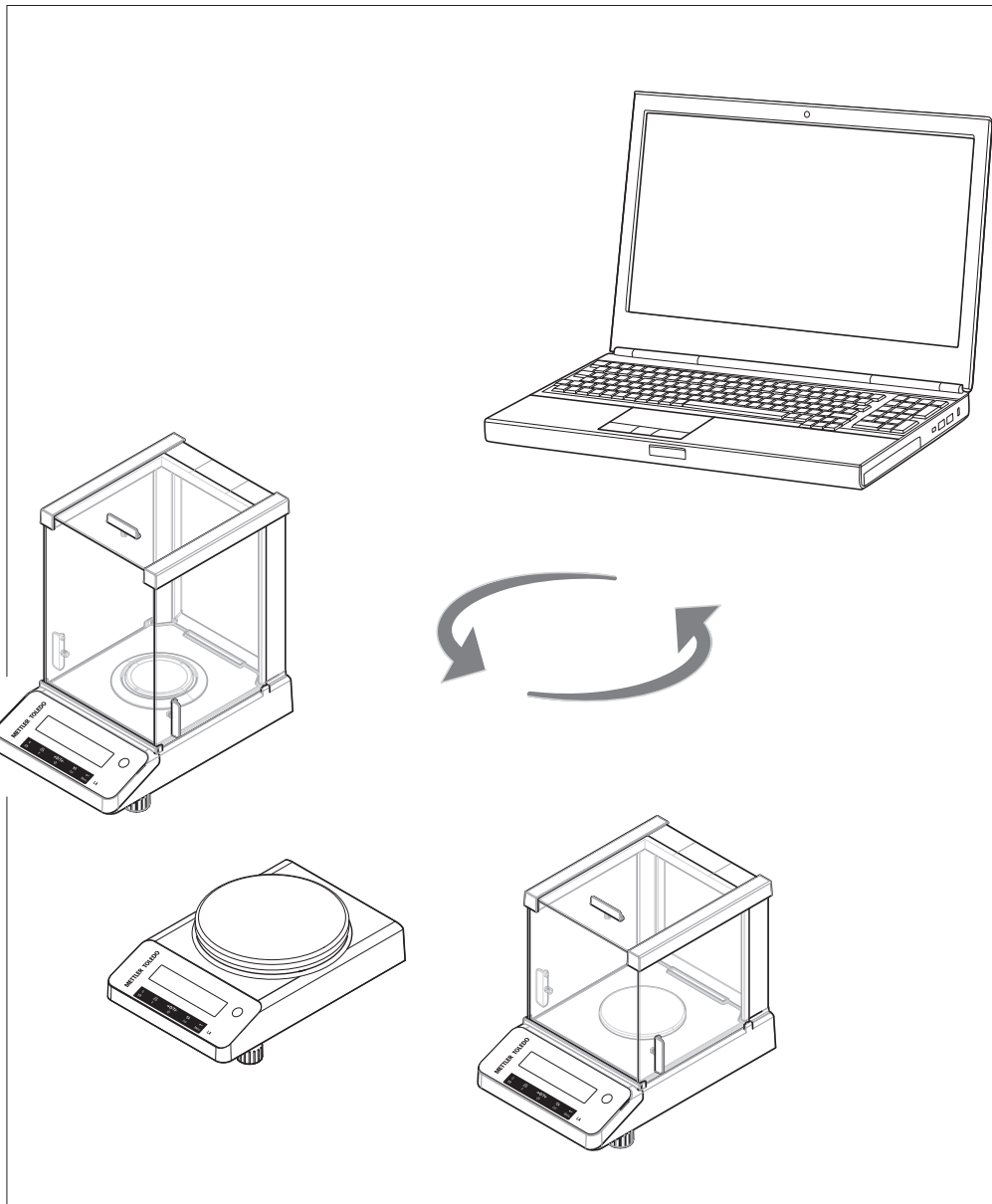


MT-SICS Interface Commands

LA balances



METTLER TOLEDO

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1 Introduction

To enable you to integrate balances into your systems in a simple way, balance functions can be accessed through an appropriate set of commands described in this document.

Additional documentation on data interface

Settings of the interface are described in the Reference Manual of the balance in question.

▶ www.mt.com/LA-RM

Data exchange with the balance

Each command received by the balance via the data interface is acknowledged by a response of the balance to the initial device. Commands and balance responses are data strings with a fixed format, and will be described in detail in the command description.

The commands that are available for your balance can be called up as a list using the [IO ▶ Page 23] command.

See also

🔗 IO – Currently available MT-SICS commands ▶ Page 23

🔗 Tips for programmers ▶ Page 9

2 Command Formats

Commands sent to the balance comprise one or more characters of the ASCII character set.

Basic rules

	Enter commands only in uppercase. Nevertheless, units have to be capitalized properly.
<code>_</code>	The possible parameters of the command must be separated from one another and from the command name by a space (ASCII 32 dec.).
<code>"text"</code>	The possible input for "text" is a sequence of characters (8-bit ASCII character set from 32 dec. to 255 dec.).
<code>..CR LF</code>	Each command must be closed by <code>C_RL_F</code> (ASCII 13 dec., 10 dec.). The characters <code>C_RL_F</code> , which can be inputted using the Enter or Return key of most entry keypads, are not listed in this description every time, but it is essential they be included for communication with the balance.

2.1 Conventions

Throughout this manual, the following conventions are used for command and response syntax:

<code>< ></code>	Triangle brackets indicate that you must specify a value for the enclosed parameter. The brackets are not sent with the command string.
<code>[]</code>	Square brackets indicate that the enclosed expression is optional and can be omitted. The brackets are not sent with the command string.
<code>a..b</code>	Intervals or ranges are represented using the "dot-dot" notation indicating the set of numbers from a to b including a and b.
↓	Commands sent to the balance.
↑	Response of the balance.

Example

Command to balance which writes **Hello** into the balance display:

↓	<code>D_"Hello"</code>	The quotation marks " " must be inserted in the entry.
↑	<code>D_A</code>	Command executed successfully.

The command terminator `CRLF` is not shown.

2.2 Response formats

All responses sent by the balance to the transmitter to acknowledge the received command have one of the following formats:

- Response with weight value
- Response without weight value
- Error message

2.2.1 Format of responses with weight value

Syntax

A general description of the response with weight value is the following.

<ID>	␣	<Status>	␣	<WeightValue>	␣	<Unit>	C _R	L _F
1-2 characters		1 character		10 characters		1-5 characters		

Parameters

Name	Type	Values	Meaning
<ID>	String		Response identification, refers to the invoking command
␣	Blank		Space (ASCII 32 dec.)
<Status>	Character	S	S table weight value
		M	Stable weight value, but below minimal weight (SIUM and SUM only)
		D	Unstable ("D" for D ynamic) weight value
		N	Unstable weight value, below minimal weight (SIUM and SUM only)
<WeightValue>	Float		Weighing result; shown as a number with 10 characters (after a blank/space!), including decimal point, and minus sign (–) directly in front of the first digit if the value is negative. The weight value appears right aligned. Preceding zeros are not shown except for the zero to the left of the decimal point. With METTLER TOLEDO DeltaRange balances, outside the fine range the last decimal place is shown as a space.
<Unit>	String		Weight unit as actually set under unit 1
C _R	Byte		Carriage return (ASCII 13 dec.)
L _F	Byte		Line feed (ASCII 10 dec.)

Examples

Response with stable weight value of 14.256 g:

↓	S	Request a stable weight value
↑	S␣S␣␣␣␣␣␣14.256␣g	

Response with stable weight value of 152.38 g outside the fine range:

↓	S	Request a stable weight value
↑	S␣S␣␣␣␣152.38␣g	

2.2.2 Format of responses without weight value

Syntax

A general description of the response without weight value is the following:

<ID>	␣	<Status>	␣	Parameters...	C _R	L _F
1-5 characters		1 character				

Parameters

Name	Type	Values	Meaning
<ID>	String		Response identification, refers to the invoking command
␣	Blank		Space (ASCII 32 dec.)
<Status>	Character	A	Command executed successfully
		B	Command not yet terminated, additional responses following
Parameters...			Command-dependent response code
C _R	Byte		Carriage return (ASCII 13 dec.)
L _F	Byte		Line feed (ASCII 10 dec.)

Example

Switch the zero-tracking function on:

↓	M03_1	Switch on the zero-tracking function.
↑	M03_A	The zero-tracking function is activated.

2.3 Error messages

2.3.1 Command-specific error messages

Syntax

A general description of the response without weight value is the following:

<ID>	␣	<Status>	C _R	L _F
1-5 characters		1 character		

Parameters

Name	Type	Values	Meaning
<ID>	String		Response identification, refers to the invoking command
␣	Blank		Space (ASCII 32 dec.)
<Status>	Character	+	Balance is in overload range (weighing range exceeded)
		-	Balance is in underload range (e.g., weighing pan is not in place)
		L	Logical error (e.g., parameter not allowed)
		I	Internal error (e.g., balance not ready yet)
C _R	Byte		Carriage return (ASCII 13 dec.)
L _F	Byte		Line feed (ASCII 10 dec.)

Example

Response while balance is in overload range:

↓	SI	Request a weight value immediately.
↑	S _L +	Overload; no weight value available.

2.3.2 General error messages

Syntax

There are three different error messages:

<ID>	C _R	L _F
2 characters		

Parameters

Name	Type	Values	Meaning
<ID>	String	ES	Syntax error: The balance has not recognized the received command or the command is not allowed
		ET	Transmission error: The balance has received a "faulty" command, e.g., owing to a parity error or interface break
		EL	Logical error: The balance can not execute the received command
C _R	Byte		Carriage return (ASCII 13 dec.)
L _F	Byte		Line feed (ASCII 10 dec.)

Example

Trial to set the key beeper volume to 30%:

↓	m02_2	m accidentally written in lowercase.
↑	ES	Syntax error; m not recognized as a command.

2.4 Tips for programmers

Overview of command of specific models

This Reference Manual covers the MT-SICS commands for balances. As the balances can differ based on model and software version, not all the MT-SICS commands are usable on every model.

i Note

We recommend using the [IO ▶ Page 23] command to get a list of all commands that are supported by your particular balance.

Example

↓	IO	Send list of commands.
↑	IO_B_0_"IO"	Level 0 command IO implemented.
↑	IO_B...	...
↑	IO_B_0_"@"	Level 0 command [@ ▶ Page 11] (abort) implemented.
↑	IO_B_1_"D"	Level 1 command D implemented.
↑	IO_B...	...
↑	IO_A_3_"SM4"	Level 3 command [SM4 ▶ Page 86] implemented.

If you need a list of commands including the version of a command, use I1 [I1 ▶ Page 24].

Command and response

You can improve the dependability of your application software by having your program evaluate the response of the balance to a command. The response is the acknowledgment that the balance has received the command.

Cancel

To be able to start from a determined state, when establishing the communication between balance and system, you should send a cancel command see [@ ▶ Page 11] or C to the balance. Otherwise, when the balance or system is switched on or off, faulty characters can be received or sent.

Sending commands without waiting for responses

Do not send multiple commands to the instrument without waiting for the corresponding responses.

If several commands are sent in succession without waiting for the corresponding responses, it is possible that the instrument confuses the sequence of command processing, or ignores entire commands, or responses are omitted.

Update rate and timeout

The update rate for repeated commands and the duration of the timeout (time-limit function) depend on the balance type, see technical data of the balance in question.

Carriage Return, Line Feed

Depending on the platform, C_RL_F is not just a "new line" (Java: "newLine()" or C/C++ "\n"):

Platform	'New Line'
DOS/Windows	C _R L _F
Macintosh	C _R
Unix	L _F

All commands must be closed by a C_RL_F (dec: 13, 10; hex: 0D, 0A).

Quotation marks ""

Quotation marks included in the command must always be entered. If a quotation mark is located within the string, it may be escaped by a backslash (\):

↓	D_"place 4\"filter!"	
↑	D_A	Balance display: place 4" filter!

Weight unit of weight value – unit 1

It is always essential to consider the weight unit that is to be used to display weighing results. Depending on where the results are output, the balances offer the possibility of selecting a particular unit, see [M21 ▶

Page 46]. This enables the displayed unit and unit 2 to be shown on the terminal. Unit 1 is used to output the weighing results via an interface (host) on the basis of MT-SICS commands. The weight values and the displayed unit can only be output by means of the `SU` commands.

Digit [d]

A digit refers to the smallest numerical increment a balance can display – this is also referred to as the balance's readability. Example: The balance LA204 has four decimal places, its digit is 0.1 mg. The digit is sometimes used as a generic unit.

See also

- [@ – Abort ▶ Page 11](#)
- [IO – Currently available MT-SICS commands ▶ Page 23](#)
- [I1 – MT-SICS level and level versions ▶ Page 24](#)
- [S – Stable weight value ▶ Page 77](#)
- [SI – Weight value immediately ▶ Page 78](#)
- [SIR – Weight value immediately and repeat ▶ Page 79](#)
- [SIRU – Weight value with currently displayed unit immediately and repeat ▶ Page 80](#)
- [SIU – Weight value with currently displayed unit immediately ▶ Page 81](#)
- [SR – Send stable weight value and repeat on any weight change ▶ Page 93](#)
- [ST – Stable weight value on pressing \(Transfer\) key ▶ Page 97](#)
- [SU – Stable weight value with currently displayed unit ▶ Page 98](#)
- [T – Tare ▶ Page 99](#)
- [TA – Tare weight value ▶ Page 100](#)
- [TI – Tare immediately ▶ Page 102](#)
- [Z – Zero ▶ Page 110](#)
- [ZI – Zero immediately ▶ Page 111](#)

2.5 Read only

Several commands support the query but no longer the setting of a value. However, they return success for the special case of trying to set the value that is set already. The affected commands have documented this behavior in their individual descriptions.

3 Commands and Responses

@ – Abort

Description

Terminates processes such as zero, tare, calibration, or testing. If the device is in standby mode, it is turned on.

Syntax

Command

@	Resets the balance to the condition found after switching on, but without a zero setting being performed.
---	---

Response

I4_A_ "<SNR>"	Serial number is emitted; the balance is ready for operation.
---------------	---

Comments

All commands awaiting responses are cancelled.

Key control is set to the default setting K_1 .

The tare memory is not reset to zero.

If the balance is on standby, it is switched on.

The cancel command is always executed.

The emitted serial number corresponds to the serial number of the balance, see [14 ▶ Page 28].

Example

↓	@	Abort
↑	I4_A_ "B021002593"	Balance is "reset", its serial number is B021002593.

See also

[I4 – Serial number ▶ Page 28](#)

C0 – Adjustment setting

Description

This command queries and sets the type of adjustment. Additional commands are required to actually trigger and to define the weight for external adjustment.

Syntax

Commands

C0	Query of the current adjustment setting.
C0_<Mode>_<WeightType>	Set the adjustment setting.

Responses

C0_A_<Mode>_<WeightType>_<"WeightValue_ Unit">	Weight value and unit specify the value of the weight for an external adjustment requested from the user via the display, see [C1 ▶ Page 14]. The unit corresponds to the factory setting of unit 1, e.g., gram (g). With internal adjustment, neither weight value nor unit appears.
C0_I	Command understood but currently not executable (balance is currently executing another command, e.g., taring).
C0_A	Adjustment setting set successfully.
C0_L	Command understood but not executable (incorrect parameter; certified version of the balance).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0	Mode = Manual The adjustment can only be triggered manually. A change in the ambient conditions has no influence on the initiation of the calibration procedure.
<WeightType>	Integer	0	Built-in weight
		1	External weight
<"WeightValue">	String		Weight values specify the value of the weight for an external calibration requested from the user via the display or interface, see [C1 ▶ Page 14].
<"Unit">	String		The unit corresponds to the factory setting of unit 1, e.g., gram (g).

Comments

[C2 ▶ Page 16] is independent of c0.

The value of the external weight can be changed in the menu of the balance under [CAL/ADJ.EXT](#) (see Reference Manual) or with command [M19 ▶ Page 44].

Use [C1 ▶ Page 14] to start an adjustment defined with c0.

c0 must be reset manually; [@ ▶ Page 11] has no effect.

Examples

↓	c0	Query of the current status and setting of the adjustment.
↑	c0_A_2_1_"___100.000_g"	Current setting of mode is "Auto". The ambient conditions of the balance have changed so much that the balance requests an adjustment (<Mode> = 2) with the external weight (<Weight> = 1). The adjustment is initiated with the command [C1 ▶ Page 14] and requires a weight of 100.000 g.
↓	c0_0_1	Set adjustment setting to manual and external.
↑	c0_A	Adjustment setting set.

See also

- [M19 – Adjustment weight ▶ Page 44](#)
- [C2 – Start adjustment with external weight ▶ Page 16](#)
- [TST0 – Query/set test function settings ▶ Page 104](#)
- [TST1 – Test according to current settings ▶ Page 105](#)
- [C3 – Start adjustment with built-in weight ▶ Page 18](#)
- [TST0 – Query/set test function settings ▶ Page 104](#)

C1 – Start adjustment according to current settings

Description

c1 is used to trigger an adjustment as defined using the c0 command.

Syntax

Command

c1	Start the adjustment according to the current setting, see [C0 ▶ Page 12].
----	--

First Responses

C1_B	The adjustment procedure has been started. Wait for second response, see Comments.
C1_I	Command understood but currently not executable (balance is currently executing another command). No further response follows.
C1_L	Command understood but not executable (e.g., approved version of the balance). No further response follows.

Further Responses

C1_<"WeightValue_Unit">	Weight request with external adjustment.
C1_A	Command understood and executed successfully.
C1_I	The adjustment was aborted as, e.g., stability not attained or the procedure was aborted with the C key.

Parameters

Name	Type	Values	Meaning
<"WeightValue">	String		Weight values specify the value of the weight for a sensitivity adjustment requested from the user via the display or interface.
<"Unit">	String		The unit corresponds to the definition unit, e.g., gram (g).

Comments

Commands sent to the balance during the adjustment operation are not processed and responded to in the appropriate manner until the adjustment is at an end.

The value of the external adjustment weight needed for adjustment must be set accordingly by an [M19 ▶ Page 44] command.

Example

↓	C1	Start the adjustment according to the current setting.
↑	C1_B	Adjustment operation started.
↑	C1_"0.00_g"	Prompt to unload the balance.
↑	C1_"2000.00_g"	Prompt to load the adjustment weight of 2000.00 g.
↑	C1_"0.00_g"	Prompt to unload the balance.
↑	C1_A	Adjustment completed successfully.

See also

- [@ – Abort ▶ Page 11](#)
- [C0 – Adjustment setting ▶ Page 12](#)
- [M19 – Adjustment weight ▶ Page 44](#)
- [TST1 – Test according to current settings ▶ Page 105](#)

C2 – Start adjustment with external weight

Description

Regardless of the `c0` setting [C0 ▶ Page 12], `c2` carries out an external adjustment with the reference weight defined in `m19` [M19 ▶ Page 44].

Syntax

Command

<code>C2</code>	Start the external adjustment. Query of the current weight used by means of the <code>m19</code> command.
-----------------	---

First Responses

<code>C2_B</code>	The adjustment procedure has been started.
<code>C2_I</code>	Command understood but currently not executable (balance is currently executing another command). No second response follows.
<code>C2_L</code>	Command understood but not executable (e.g., adjustment with an external weight is not admissible, certified version of the balance). No second response follows.

Further Responses

<code>C2_<"WeightValue">_<Unit"></code>	Prompt to unload or load the balance.
<code>C2_A</code>	Command understood and executed successfully.
<code>C2_I</code>	The adjustment was aborted as, e.g., stability was not attained or the procedure was aborted with the C key.

Parameters

Name	Type	Values	Meaning
<code><"WeightValue"></code>	Float		Weight values specify the value of the weight for a sensitivity adjustment requested from the user via the display or interface.
<code><"Unit"></code>	String		The unit corresponds to the definition unit, e.g., gram (g).

Comments

- Commands sent to the balance during the adjustment operation are not processed and responded to in the appropriate manner until the adjustment is at an end.
- The value of the external adjustment weight needed for adjustment must be set accordingly by an [M19 ▶ Page 44] command.

Example

↓	<code>C2</code>	Start the external adjustment.
↑	<code>C2_B</code>	Adjustment operation started.
↑	<code>C2_ "_____0.00_g"</code>	Prompt to unload the balance.
↑	<code>C2_ "_____2000.00_g"</code>	Prompt to load adjustment weight 2000.00 g.
↑	<code>C2_ "_____0.00_g"</code>	Prompt to unload the balance.
↑	<code>C2_A</code>	Adjustment completed successfully.

See also

- [🔗 TST1 – Test according to current settings ▶ Page 105](#)
- [🔗 M19 – Adjustment weight ▶ Page 44](#)
- [🔗 @ – Abort ▶ Page 11](#)

C3 – Start adjustment with built-in weight

Description

You can use C3 to start an internal adjustment procedure.

Syntax

Command

C3	Start the internal adjustment.
----	--------------------------------

First Responses

C3_B	The adjustment procedure has been started. Wait for second response.
C3_I	Adjustment cannot be performed at present as another operation is taking place, or the adjustment strategy is not configured correctly. No second response follows.
C3_L	Adjustment operation not possible (e.g., no internal weight). No second response follows.

Further Responses

C3_A	Adjustment has been completed successfully.
C3_I	The adjustment was aborted as, e.g., stability not attained or the procedure was aborted with the Cancel button on the terminal.

Comments

Commands sent to the balance during the adjustment operation are not processed and responded to in the appropriate manner until the adjustment is at an end.

Adjustment cannot be performed if 'External adjustment' or 'No adjustment' is configured on the instrument. Set the adjustment strategy to 'Internal adjustment'.

Example

↓	C3	Start the internal adjustment.
↑	C3_B	Adjustment operation started.
↑	C3_A	Adjustment completed successfully.

D – Write text to display

Description

Use `D` to write text to the balance display.

Syntax

Command

<code>D_<"Text"></code>	Write text into the balance display.
-------------------------------	--------------------------------------

Responses

<code>D_A</code>	Command understood and executed successfully: Text appears left-aligned in the balance display marked by a symbol, e.g., *.
<code>D_I</code>	Command understood but currently not executable.
<code>D_L</code>	Command understood but not executable (incorrect parameter or balance with no display).

Parameter

Name	Type	Values	Meaning
<code><Text></code>	String		Text on the balance display

Comments

A symbol in the display, e.g., * indicates that the balance is not displaying a weight value.

The maximum number of characters of "text" visible in the display depends on the balance type. If the maximum number of characters is exceeded, the text disappears on the right side.

Quotation marks can be displayed as indicated in chapter [1.1.3 ▶ Page 10].

Use the `DW` command to switch the main display to 'show weight' mode.

Examples

↓	<code>D_"HELLO"</code>	Write HELLO into the balance display.
↑	<code>D_A</code>	The full text HELLO appears in the balance display.
↓	<code>D_ " "</code>	Clear the balance display.
↑	<code>D_A</code>	Balance display cleared, marked by a symbol, e. g., *.

See also

[DW – Show weight ▶ Page 21](#)

[Tips for programmers ▶ Page 10](#)

DAT – Date

Description

Set or query the balance system date.

Syntax

Commands

DAT	Query of the current date of the balance.
DAT_<Day>_<Month>_<Year>	Set the date of the balance.

Responses

DAT_A_<Day>_<Month>_<Year>	Current date of the balance.
DAT_A	Command understood and executed successfully.
DAT_I	Command understood but currently not executable (balance is currently executing another command).
DAT_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Day>	Integer	01 ... 31	Day
<Month>	Integer	01 ... 12	Month
<Year>	Integer	1970 ... 2099	Year The accepted range of years is depending on platform/ product

Example

↓	DAT	Query of the current date of the balance.
↑	DAT_A_01_10_2017	The date of the balance is 1st October 2017.

See also

[TIM – Time](#) ▶ Page 103

DW – Show weight

Description

Resets the display after using the `D` command. Then the device display shows the current weight value and unit.

Syntax

Command

DW	Switch the main display to weight mode.
----	---

Responses

DW_A	Command understood and executed successfully: Main display shows the current weight value.
DW_I	Command understood but currently not executable.

Comment

`DW` resets the balance display following a [`D` ▶ Page 19] command.

Example

↓	DW	Switch the main display to weight mode.
↑	DW_A	Main display shows the current weight value.

See also

[D – Write text to display ▶ Page 19](#)

E01 – Current system error state

Description

This command queries severe and fatal system errors.

Syntax

Command

E01	Query of the current system error state.
-----	--

Responses

E01_<ErrorCode>_<"ErrorMessage">	Current error code and message.
E01_I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<ErrorCode>	Integer	0	No error
		4	EEPROM error
		5	Wrong cell data
		6	No standard calibration
		7	Program memory defect
		9	Temperature sensor defect
		16	Wrong load cell brand
		17	Wrong type data set
		100	Memory full
		101	Battery backup lost
<"ErrorMessage">	String	128 chars	Error text message in UTF-8

Comments

The error code and message will change as soon as the device detects an other state i.e. after a restart or reset.

If the device is able to detect multiple error s in parallel then only the most critical error (lowest error number) is stated.

Example

↓	E01	Query of the current system error state.
↑	E01_101_"BATTERY_BACKUP_LOST_- _CHECK_DATE_TIME_SETTINGS"	The last device error is "BATTERY BACKUP LOST - CHECK DATE TIME SETTINGS".

IO – Currently available MT-SICS commands

Description

The IO command lists all commands implemented in the present software.

All commands are listed first in level then in alphabetical order - even though levels are not supported anymore the Syntax of this command hasn't changed.

Syntax

Command

IO	Send list of all implemented MT-SICS commands.
----	--

Responses

IO_B_<Level>_<"Command"> IO_B_<Level>_<"Command"> IO_B ... IO_A_<Level>_<"Command">	Number of the MT-SICS level where the command belongs to 2nd (next) command implemented. ... Last command implemented.
IO_I	Command understood but currently not executable (balance is currently executing another command).

Parameters

Name	Type	Values	Meaning
<Level>	Integer	0	MT-SICS level 0 (Basic set)
		1	MT-SICS level 1 (Elementary commands)
		2	MT-SICS level 2 (Extended command list)
		3	MT-SICS level 3 (Application specific command set)
<"Command">	String		MT-SICS command

Comment

If IO lists commands that cannot be found in the manual, these are reserved commands "for internal use" or "for future use", and should not be used or altered in any way.

Example

↓	IO	Send list of commands.
↑	IO_B_0_"IO"	Level 0 command IO implemented.
↑	IO_B...	...
↑	IO_B_0_"@"	Level 0 command [@ ▶ Page 11] (abort) implemented.
↑	IO_B_1_"D"	Level 1 command D implemented.
↑	IO_B...	...
↑	IO_A_3_"SM4"	Level 3 command [SM4 ▶ Page 86] implemented.

See also

[@ – Abort ▶ Page 11](#)

[SM4 – Dynamic weighing: Time interval ▶ Page 88](#)

I1 – MT-SICS level and level versions

Description

Query MT-SICS level and versions.

Syntax

Command

I1	Query of MT-SICS level and MT-SICS versions.
----	--

Responses

I1_A_<"Level">_<"V0">_<"V1">_<"V2">_<"V3">	Current MT-SICS level and MT-SICS versions.
I1_I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<Level>	String	0	MT-SICS level 0
		01	MT-SICS level 0 and 1
		012	MT-SICS level 0, 1 and 2
		03	MT-SICS level 0 and 3
		013	MT-SICS level 0, 1 and 3
		0123	MT-SICS level 0, 1, 2, and 3
		3	Device-specific with MT-SICS level 3
<"V0"> ... <"V3">	String		MT-SICS versions of the related level (0 to 3)

Comment

The command I14 provides more comprehensive and detailed information.

Example

↓	I1	Query the current MT-SICS level and version.
↑	I1_A_"0123"_<"2.30">_<"2.22">_<"2.33">_<"2.20">	Level 0-3 is implemented and the according version numbers are shown.

Note

The idea behind the MT-SICS levels was to standardize the commands for all METTLER TOLEDO devices so commands (and the functionality behind them) could easily be identified; see below.

With years of experience and as MT-SICS commands and devices became more and more complex, it was no longer possible to maintain the levels in the original way. The levels are therefore no longer specified in the MT-SICS manuals. Consequently, the versions of levels 0, 1 and 2 needed to be fixed whereas the version of level 3 continues to be product specific.

Level 0 fixed to version 2.30

Level 1 fixed to version 2.22

Level 2 fixed to version 2.33

Level 3 is product-specific and is defined by the respective product team.

MT-SICS Levels

The METTLER TOLEDO Standard Interface Command Set (MT-SICS) is divided into 4 levels, depending on the functionality of the device:

MT-SICS level 0:	Basic command set, e.g., weighing cell.
MT-SICS level 1:	Elementary command set, i.e. balances without integrated applications.
MT-SICS level 2:	Extended command, maybe set specific for a device family, e.g., for the Excellence balance line.

MT-SICS level 3:	Application-specific command set, e.g., MT-SICS for piece counting or percent weighing, dynamic weighing, etc.
------------------	--

Commands of MT-SICS Level 0

The following commands are assigned to MT-SICS Level 0:

@	– Abort
I0	– Currently available MT-SICS commands
I1	– MT-SICS level and level versions
I2	– Device data
I3	– Software version number and type definition number
I4	– Serial number
I5	– Software material number
S	– Stable weight value
SI	– Weight value immediately
SIR	– Weight value immediately and repeat
Z	– Zero
ZI	– Zero Immediately

Commands of MT-SICS Level 1

The following commands are assigned to MT-SICS Level 1:

D	– Write text to display
DW	– Show weight
K	– Keys control
SR	– Send stable weight value and repeat on any weight change
T	– Tare
TA	– Tare weight value
TAC	– Clear tare weight value
TI	– Tare immediately

Commands of MT-SICS Level 2

Commands extend the basic and elementary function, but not application specific, e.g.,:

C..., E01, DAT, M..., PWR, SN..., SU, TIM, TS..., UPD

Commands of MT-SICS Level 3

Application-specific command set, e.g., MT-SICS for piece counting or percent weighing
PW, SM...

See also

 I14 – Device information ▶ Page 32

I2 – Device data (Type and capacity)

Description

Use I2 to query the device data (type), including the weighing capacity. The response is output as a single string.

Syntax

Command

I2	Query of the balance data.
----	----------------------------

Responses

I2_A_<"text">	Balance type and capacity.
I2_I	Command understood but currently not executable (balance is currently executing another command, e.g., taring).

Parameters

Name	Type	Values	Meaning
<"Type">	String		Type of balance
<"Capacity">	String		Capacity of balance
<"Unit">	String		Weight unit

Comments

The number of characters of "text" depends on the balance type and capacity.

Example

↓	I2	Query of the balance data.
↑	I2_A_"LA104E_120.0090_g"	Balance type and capacity.

See also

[I14 – Device information](#) ▶ Page 32

I3 – Software version number and type definition number

Description

Provides the software version number and the type definition number.

Syntax

Command

I3	Query of the balance software version and type definition number.
----	---

Responses

I3_A_<"Software_TDNR">	Balance software version and type definition number.
I3_I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).

Parameters

Name	Type	Values	Meaning
<"Software TDNR">	String		Software version number and type definition number (TDNR)

Comment

More detailed information is available by executing command I14 [I14 ▶ Page 32].

Example

↓	I3	Query of the software version number(s) and type definition number.
↑	I3_A_"2.10_10.28.0.493.142"	2.10: Software version number. 10.28.0.493.142: Type definition. number

See also

[I14 – Device information ▶ Page 32](#)

I4 – Serial number

Description

Use I4 to query the serial number of the balance.

Syntax

Command

I4	Query of the serial number.
----	-----------------------------

Responses

I4_A_<"SerialNumber">	Serial number.
I4_I	Command not understood, not executable at present Command understood but currently not executable (balance is currently executing another command, e.g. initial zero setting).

Parameter

Name	Type	Values	Meaning
<"SerialNumber">	String		Serial number

Comments

The serial number agrees with that on the model label and is different for every balance.

The serial number can be used, e.g., as device address in a network.

The response of the balance to I4 appears unsolicitedly after switching it on and after executing the abort command @ [@ ▶ Page 11].

More detailed information is available by executing command I14 [I14 ▶ Page 32].

Example

↓	I4	Query of the serial number.
↑	I4_A_"B021002593"	The serial number is "B021002593".

See also

[@ – Abort ▶ Page 11](#)

[I14 – Device information ▶ Page 32](#)

I5 – Software material number

Description

Use I5 to query the software material number (SW-ID).

Syntax

Command

I5	Query of the software material number and index.
----	--

Responses

I5_A_<"Software">	Software material number and index.
I5_I	Command understood but currently not executable (balance is currently executing another command).

Parameter

Name	Type	Values	Meaning
<"Software">	String		Software material number and index

Comments

The SW-ID is unique for every software. It consists of an 8-digit number and an alphabetic character as an index.

More detailed information is available by executing command I14 [I14 ▶ Page 32].

Example

↓	I5	Query of the software material number and index.
↑	I5_A_"12121306C"	12121306C: Software material number and index.

See also

[I14 – Device information ▶ Page 32](#)

I10 – Device identification

Description

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

Syntax

Commands

I10	Query of the current balance ID.
I10_<"ID">	Set the balance ID.

Responses

I10_A_<"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).

Parameter

Name	Type	Values	Meaning
<"ID">	String	0 ... 20 chars	Balance or weigh module identification

Comments

A sequence of maximum 20 alphanumeric characters are possible as <ID>.

The set balance ID is retained even after the abort command [@ ▶ Page 11].

Example

↓	I10	Query of the current balance ID.
↑	I10_A_ "My_Balance"	The balance ID is "My Balance".

I11 – Model designation

Description

This command is used to output the model designation.

Syntax

Command

I11	Query of the current balance or weigh module type.
-----	--

Responses

I11_A_<Model">	Current balance or weigh module type.
I11_I	Type can not be transferred at present as another operation is taking place.

Parameter

Name	Type	Values	Meaning
<Model">	String	Max 20 chars	Balance or weigh module type

Comments

A sequence of maximum 20 alphanumeric characters is possible as <Model>.

The following abbreviations used in model designations are relevant to MT-SICS:

DR = Delta Range.

DU = Dual Range.

/M, /A = Approved balance or weigh module.

Example

↓	I11	Query of the current balance type.
↑	I11_A_"LA403E"	The balance is an "LA403E".

I14 – Device information

Description

This command is used to output detailed information about the device. All components – including optional accessories – are taken into account and the associated data is output.

Syntax

Command

I14	Query of the current balance information.
-----	---

Responses

I14_A_<No>_<Index>_<"Info">	Current balance information.
I14_I	Command understood but currently not executable.
I14_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<No>	Integer	0	Instrument configuration
		1	Instrument description
		2	SW-identification number
		3	SW version
		4	Serial number
		5	TDNR number
<Index>	Integer		Index of instrument module
<"Info">	String	<Balance>	Balance information corresponding to <No>
		<Printer>	Printer information corresponding to <No>
		<Second Display>	Second Display information corresponding to <No>

Comments

The response to the query of instrument configuration can comprise one or more lines.

The description of an option is the language-independent product name, e.g. "RS232-Option".

If there are several modules of the same kind, the descriptions have an appendix, comprising of a hyphen and a number. Examples: <Option-1>, <Option-2>.

Examples

↓	I14_0	Query of the current balance information.
↑	I14_A_0_1_"Balance"	"Balance".
↓	I14_1	Query of the current instrument descriptions.
↑	I14_A_1_1_"LA2002E"	Balance is an "LA2002E".
↓	I14_2	Query of the current software identification numbers.
↑	I14_A_2_1_"12121304A"	Software identification number of the balance is "12121304AA".
↓	I14_3	Query of the current software versions.
↑	I14_A_3_1_"1.55"	Version of the balance software is "1.55".
↓	I14_4	Query of the serial numbers.
↑	I14_A_4_1_"1123121443"	Serial number of the balance is "1123121443".
↓	I14_5	Query of the type definition numbers.
↑	I14_A_5_1_"23.28.3.1534.776"	Type definition number of the balance is "23.28.3.1534.776".
↓	I14	Query of the current instrument descriptions.
↑	I14_B_0_1_"Balance"	"Balance".
↑	I14_B_1_1_"LA2002E"	Balance is an "LA2002E".
↑	I14_B_2_1_"11670123"	Software identification number of the balance is "11670123".
↑	I14_B_3_1_"1.23"	Version of the balance software is "1.23".
↑	I14_B_4_1_"1234567890"	Serial number of the balance is "1234567890".
↑	I14_A_5_1_"1.2.3.4.5"	TDNR of the balance is "1.2.3.4.5".

I26 – Operating mode after restart

Description

Use I26 to query the operating mode.

Syntax

Command

I26	Query of the operating mode.
-----	------------------------------

Responses

I26_A_<Mode>	Operating mode.
I26_I	Operating mode can not be transferred at present as another operation is taking place.

Parameter

Name	Type	Values	Meaning
<Mode>	Integer	0	User mode
		1	Production mode
		2	Service mode
		3	Diagnostic mode

Example

↓	I26	Query of the operating mode.
↑	I26_A_0	Operation mode is: user mode.

I33 – Approval seal break counter

Description

I33 returns the service counter without breaking the approval seal. The service counter is increased after a successful service calibration or service linearization.

Syntax

Command

I33	Query of the service counter.
-----	-------------------------------

Responses

I33_A_Counter	Current service counter.
I33_I	Command understood but currently not executable.

Parameter

Name	Type	Values	Meaning
<Counter>	Integer		Status of service counter

Example

↓	I33	Query of the service counter.
↑	I33_A_37	The actual service counter is 37.

I51 – Power-on time

Description

Delivers the power-on time; the period during which the device is powered including short interruptions (e.g., power, restart etc.) with negligible impact on thermal state of the device.

Syntax

Command

I51	Query of the power-on time.
-----	-----------------------------

Responses

I51_A_<Days>_<Hours>_<Minutes>_<Seconds>	Power-on time data.
I51_I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<Days>	Integer	0 ... 65535	Power-on time days
<Hours>	Integer	0 ... 23	Power-on time hours
<Minutes>	Integer	0 ... 59	Power-on time minutes
<Seconds>	Integer	0 ... 59	Power-on time seconds

Comment

The power-on time is counted as long as the device is powered and during interruptions (e.g., power, restart etc.) up to a product specific duration (typically a value in the range of 30 ... 60 seconds, product dependent). The duration is defined according various effects, e.g., the thermal model of the device. Interruptions longer than this time results in a reset of the power-on time to the initial values. Please note that there is a certain inherent variability, because the switch-off time will be recorded only every n seconds (typically 5 seconds, product dependent).

The power-on time is not touched by a restart or reset of the device (in contrast to the run time, see I15).

Example

↓	I51	Query the power-on time data.
↑	I51_A_1456_17_3_37	The power-on time is 1456 days 17 hours 3 minutes and 37 seconds.

I54 – Adjustment loads

Description

This command queries the weight increment for external adjustments. If the increment is bigger than 0, the weighing device can be adjusted by a defined range of external adjustment weights. This is called VariCal.

Syntax

Command

I54	Query the weight increment for external adjustments.
-----	--

Responses

I54_A_<Min>_<Max>_<Increment>	Adjustment loads.
I54_I	Command understood but currently not executable.
I54_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Min>	Float		Smallest load in the definition unit
<Max>	Float		Biggest load in the definition unit
<Increment>	Float		Load increment in the definition unit. Starting with the smallest load, the intermediate loads are defined in increments of the Increment parameter

Example

↓	I54	Query the weight increment for external adjustments.
↑	I54_A_1000.0_3000.0_750.0	In the case of external adjustment, the loads for selection are 1000 g, 1750 g, 2500 g and 3000 g.

See also

[M19 – Adjustment weight](#) ▶ Page 44

I55 – Menu version

Description

This command queries the menu version of the device SW.

Syntax

Commands

I55	Query the menu version.
I55_A	Set the menu version.

Responses

I55_A_<Version>	Current menu version.
I55_I	Command understood but currently not executable.
I55_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Version>	Integer	0 ... n	Menu version (n is product dependent)

Comments

The menu structure consists of menu item, menu item value range and menu item level.

The menu version is model dependent.

Example

↓	I55	Query the menu version.
↑	I55_A_3	The menu version is 3.

K – Keys control

Description

With the `K` command, the behavior of the terminal keys may be configured: first, the `K` command controls whether a key invokes its corresponding function or not and second, it configures whether an indication of which key has been pressed or released is sent to the host interface or not.

Using this functionality, an application running on a connected system (e.g., a PC or PLC) may make use of the balance terminal to interact with the balance operator.

Syntax

Command

<code>K_<Mode></code>	Set configuration.
-----------------------------	--------------------

Responses

<code>K_A[_<FunctionID>]</code>	Command understood and executed successfully. Mode 4: Function with <code><FunctionID></code> was invoked by pressing the corresponding key and executed successfully.
<code>K_I[_<FunctionID>]</code>	Command understood but currently not executable (balance is actually in menu or input mode). Mode 4: Function with <code><FunctionID></code> by pressing the corresponding key, but it could not be successfully executed (e.g., calibration was aborted by user or a negative value was tared).
<code>K_L</code>	Command understood but not executable (incorrect or no parameter).

Additional Responses in Mode 3:

<code>K_<EventID>_<KeyID></code>	Key <code><KeyID></code> has issued an <code><EventID></code> .
--	---

Additional Responses in Mode 4:

<code>K_B_<FunctionID></code>	Function with <code><FunctionID></code> was invoked and started; the execution needs time to complete.
-------------------------------------	--

Parameters

Name	Type	Values	Meaning
<code><Mode></code>	Integer	1	Functions are executed, no indications are sent (factory setting)
		2	Functions are not executed, no indications are sent
		3	Functions are not executed, indications are sent
		4	Functions are executed, indications are sent
<code><EventID></code>	Char	R	Key was pressed and held around 2 seconds or double clicked
		C	Key was released (after being pressed shortly or for 2 seconds)

Name	Type	Values	Meaning
<FunctionID>	Integer	0	Adjustment
		2	Tare/re-zero
		3	Data transfer to printing device
		4	Enter menu
		5	Quit menu and save parameters
		6	Quit menu without saving
		9	Standby (instrument can be switched on with reset command)
		10	Switch weight unit
		12	Set factory setting
<KeyID>	Integer		Indicator for pressed key

LA Balances

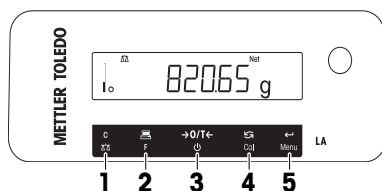
<KeyID>	Integer	1	C ΔΔ	<p>Cancels or leaves any menu without saving or moves one step back in the menu.</p> <p>Selects or exits the simple weighing application</p>
		2	⏏ F	<p>Prints display value or transmits data</p> <p>Navigates backward in the menu or menu selection</p> <p>Decreases parameters in the menu or in an application</p> <p>Opens the application list for selecting an application</p>
		3	→0/T← ⏻	<p>Zeros or tares the balance</p> <p>Switches the balance on or off</p>
		4	↻ Cal	<p>Scrolls through a list of values or activates an adjustment</p> <p>Navigates forward in the menu or menu selection</p> <p>Increases parameters in the menu or in an application</p>
		5	← Menu	<p>Enables to enter a value or activates the menu</p> <p>Accepts numeric inputs in applications</p>

κ₁ is the factory setting (default value).

κ₁ active after balance switched on and after the abort command @ [@ ▶ Page 11].

Only one κ mode is active at one time.

The mapping of the key numbers on the terminal is displayed below:



Example

When a code with a press and hold is sent, new key commands will not be accepted.

↓	K_4	Set mode 4: when a key is pressed, execute the corresponding function and send the function number as a response.
↑	K_A	Command executed successfully.
↑	K_B_2	The taring function has been started → taring active.
↑	K_A_2	Taring completed successfully.
↑	K_B_2	The taring function has been started → taring active.
↑	K_I_2	Taring not completed successfully, taring aborted (e.g. tried to tare a negative value).

M02 – Environment condition

Description

Use M02 to adjust the balance so that it is optimized for the local ambient conditions, or to query the current value.

Syntax

Commands

M02	Query of the current environment.
M02_<Environment>	Set the environment.

Responses

M02_A_<Environment>	Current environment.
M02_A	Command understood and executed successfully.
M02_I	Command understood but currently not executable.
M02_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Environment>	Integer	1	Stable
		2	Standard
		3	Unstable

Example

↓	M02_3	Set the environment to unstable.
↑	M02_A	Environment is set.

M03 – Zero-tracking

Description

Use M03 to switch the zero-tracking function on or off. M03 also serves to query the status of the zero-tracking function.

Syntax

Commands

M03	Query current status of the zero-tracking function.
M03_<AutoZero>	Set the zero-tracking function.

Responses

M03_A_<AutoZero>	Current zero-tracking function
M03_A	Command understood and executed successfully.
M03_I	Command understood but currently not executable.
M03_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<AutoZero>	Integer	0	Zero-tracking is switched off (is not supported by approved balances).
		1	Zero-tracking is switched on.

Example

↓	M03_1	Switch on the zero-tracking function.
↑	M03_A	The zero-tracking function is activated.

M19 – Adjustment weight

Description

Use **M19** to set your external adjustment weight, or to query the current weight value and unit.

Syntax

Commands

M19	Query of the current adjustment weight.
M19_<Value>_<Unit>	Set the adjustment weight.

Responses

M19_A_<Value>_<Unit>	Current adjustment weight.
M19_A	Command understood and executed successfully.
M19_I	Command understood but currently not executable.
M19_L	Command understood but not executable (incorrect parameter) or adjustment weight is too low.

Parameters

Name	Type	Values	Meaning
<Value>	Float		Value of the adjustment weight, balance specific limitation
<Unit>	String		Weight unit of the adjustment weight = defined unit of the balance

Comments

The adjustment weight must be entered in the defined unit of the balance. This unit can be found by entering a query command **M19** without arguments.

The taring range is specified to the balance type.

The lower limit of the adjustment weight set with **M19** is the lowest possible adjustment weight (**I54_Min**).

Use [**C2** ▶ Page 16] to begin the adjustment procedure with the set weight.

Examples

↓	M19	Query of the current adjustment weight.
↑	M19_A_100.123_g	The adjustment weight is 100.123 g.
↓	M19_500.015_g	Set the adjustment weight to 500.015 g.
↑	M19_A	The adjustment weight is set to 500.015 g.

See also

- 🔗 **C0** – Adjustment setting ▶ Page 12
- 🔗 **C1** – Start adjustment according to current settings ▶ Page 14
- 🔗 **C2** – Start adjustment with external weight ▶ Page 16

M20 – Test weight

Description

You can use M20 to define your external test weight or query the currently weight setting.

Syntax

Commands

M20	Query of the current external test weight.
M20_<TestWeight>_<Unit>	Set the external test weight.

Responses

M20_A_<TestWeight>_<Unit>	Current external test weight.
M20_A	Command understood and executed successfully.
M20_I	Command understood but currently not executable.
M20_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<TestWeight>	Float		Value of the external test weight
<Unit>	String		Weight unit of the external test weight = defined unit of the balance

Comments

The test weight must be entered in the defined unit of the balance. This unit can be found by entering a query command M20 without arguments.

Use [TST2 ▶ Page 107] to begin the test procedure with the set weight.

The lower limit of the test weight set with M20 is the lowest possible adjustment weight (I54_Min).

Examples

↓	M20	Query of the current external test weight.
↑	M20_A_100.123_g	The external test weight is 100.123 g.
↓	M20_500.015_g	Set the external test weight to 500.015 g.
↑	M20_A	The external test weight is set to 500.015 g.

See also

[TST1 – Test according to current settings ▶ Page 105](#)

[TST2 – Test with external weight ▶ Page 107](#)

M21 – Unit

Description

Use M21 to set the required weighing unit for the output channels of the weight or request current setting.

Syntax

Commands

M21	Query the unit of all output channels.
M21_<Channel>	Query the unit of output channel only.
M21_<Channel>_<Unit>	Set the unit of an output channel.

Responses

M21_B_<Channel>_<Unit> M21_B... M21_A_<Channel>_<Unit>	Current first unit. ... Current last unit.
M21_<Channel>_<Unit>	Unit of output channel.
M21_A	Command understood and executed successfully.
M21_I	Command understood but currently not executable.
M21_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Channel>	Integer	0	Host unit
		1	Unit 1
		2	Unit 2

Name	Type	Values	Meaning		
<Unit>	Integer	0	Gram	g	Applicable for definition unit
		1	Kilogram	kg	Applicable for definition unit
		3	Milligram	mg	Applicable for definition unit
		5	Carat	ct	Applicable for definition unit
		7	Pound avdp	lb	Applicable for definition unit
		8	Ounce avdp	oz	Applicable for definition unit
		9	Ounce troy	ozt	Applicable for definition unit
		10	Grain	GN	Applicable for definition unit
		11	Pennyweight	dwt	Applicable for definition unit
		12	Momme	mom	Applicable for definition unit
		13	Mesghal	msg	Applicable for definition unit
		14	Tael Hongkong	tlh	Applicable for definition unit
		15	Tael Singapore	tlS	Applicable for definition unit
		16	Tael Taiwan	tlT	Applicable for definition unit
		18	Tola	tola	Applicable for definition unit
		19	Baht	baht	Applicable for definition unit
		20	lb	oz	Applicable for definition unit
		25	no unit	--	
		26	Piece	PCS	available with application "Counting"
		27	Percent	%	available with application "Percent"
		28	Custom unit 1	U	available if custom unit 1 is switched on M22

Comments

All `s` commands (except `su`) are given in Host unit according to the definition of the MT-SICS. Only weight units are accepted as host unit, see table above, in column applicable for definition unit marked with 'yes'. In the event of a power failure or restart, the settings of unit 1 and unit 2 are reconfigured according to the menu settings.

At startup, host unit and unit 1 are set according to the menu setting of unit 1.

It is not possible to use "no unit" for the displayed unit.

Examples

↓	M21	Query of the current unit.
↑	M21_B_0_0 M21_B_1_0 M21_B_2_0 M21_A_3_0	Current host unit is g. Current unit 1 is g. Current unit 1 is g. Current unit 2 is g.
↓	M21_0_1	Set the unit to 1 kg.
↑	M21_A	The unit is set to 1 kg.

See also

[🔗](#) SU – Stable weight value with currently displayed unit ▶ Page 98

M25 – List applications

Description

Use M25 to list all the applications available on the balance.

Syntax

Command

M25	Query of the available applications.
-----	--------------------------------------

Responses

M25_B_<ApplicationID>_<"Name">	First application.
M25_B...	...
M25_A_<ApplicationID>_<"Name">	Last application.
M25_I	Command understood but currently not executable.
M25_L	Command understood but not executable.

Parameters

Name	Type	Values	Meaning
<ApplicationID>	Integer	0 ... 5	Application number
		0	Normal weighing
		1	Piece counting
		4	Dynamic weighing automatic
		5	Dynamic weighing manual
<"Name">	String		Application name

Comment

It is the balance model that determines which parameters can be used.

Example

↓	M25	Query of the available applications.
↑	M25_B_0_"Weighing"	Default application is Weighing.
↑	M25_B_1_"Piececounting"	Application 1 is piece counting.
↑	M25_B_4_"Dynamicweighingautomatic"	Application 4 is automatic dynamic weighing.
↑	M25_B_5_"Dynamicweighingmanual"	Application 5 is manual dynamic weighing.

See also

[🔗 M26 – Current application ▶ Page 51](#)

M26 – Current application

Description

Use M26 to select the required application or query the current selection.

Syntax

Commands

M26	Query of the current application selection.
M26_<ApplicationID>	Set the application number.

Responses

M26_A_<ApplicationID>	Current application selection.
M26_A	Command understood and executed successfully.
M26_I	Command understood but currently not executable.
M26_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<ApplicationID>	Integer	0 ... max. appl.	Application number

Comment

Application number: Number of the application according to the application list, see [M25 ▶ Page 49].

Examples

↓	M26	Query of the current application.
↑	M26_A_4	The current application is automatic dynamic weighing.
↓	M26_4	Set the application number 5.
↑	M26_A	Application 5 is set.

See also

[M25 – List applications ▶ Page 49](#)

[M25 – List applications ▶ Page 49](#)

M27 – Adjustment history

Description

Use M27 to call up the adjustment history.

Syntax

Command

M27	Query of the adjustment history.
-----	----------------------------------

Responses

M27_B_<No>_<Day>_<Month>_<Year>_<Hour>_<Minute>_<Mode>_<"Wgt"> M27_B... M27_A_<No>_<Day>_<Month>_<Year>_<Hour>_<Minute>_<Mode>_<"Wgt">	1 st adjustment entry. ... last adjustment entry.
M27_I	Command understood but currently not executable.
M27_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<No>	Integer	1 ... n	Number of the adjustment entry (n is product dependent)
<Day>	Integer	1 ... 31	Date, day
<Month>	Integer	1 ... 12	Date, month
<Year>	Integer	1970 ... 2099	Date, year The accepted range of years is depending on platform/product
<Hour>	Integer	0 ... 23	Time, hour
<Minute>	Integer	0 ... 59	Time, minute
<Mode>	Integer	0	Built-in adjustment
		1	External adjustment
<"Wgt">	String		Weight of the adjustment weight used

Example

↓	M27	Query of the adjustment history.
↑	M27_B_1_1_1_2011_08_26_0_""	1 st adjustment, performed at 1.1.2011, 08:26 h, internal adjustment.
↑	M27_B_2_14_12_2010_14_30_1_ "200.1234_g"	2 nd adjustment, performed at 14.12.2010, 14.30 h, external adjustment, weight 200.1234 g.
↑	M27_A_3_14_12_2010_8_26_1_ "200.1234_g"	3 rd adjustment, performed at 14.12.2010, 08:26 h, external adjustment, weight 200.1234 g.

M31 – Operating mode after restart

Description

Use M31 to set the operating mode of the device following restart.

Syntax

Commands

M31	Query of the current operating mode following restart.
M31_<Mode>	Set the operating mode following restart.

Responses

M31_A_<Mode>	Current settings of operating mode following restart.
M31_A	Command understood and executed successfully.
M31_L	Command understood but not executable (not permitted).

Parameter

Name	Type	Values	Meaning
<Mode>	Integer	0	User mode
		1	Production mode
		2	Service mode

Comment

Customer can only use the user mode. All other settings will give a M31_L response.

Examples

↓	M31	Query of the current operating mode following restart.
↑	M31_A_0	The operating mode following restart is: user mode.
↓	M31_1	Set the production mode as operating mode after restart.
↑	M31_A	Operating mode is set.

M38 – Selective parameter reset

Description

Use M38 to execute a reset of selected parameters.

Syntax

Command

M38_<ResetMode>	Execute reset
-----------------	---------------

Responses

M38_I	Command understood but currently not executable.
M38_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<ResetMode>	Integer	0	Actions, reset, clear window
		1	Applications reset
		2	User reset
		3	Master reset

Comments

After user- and master reset the module performs a complete restart similar to startup after power up.

<ResetMode> 0, 1 and 3 not yet implemented.

Example

↓	M38_2	Execute a user reset.
↑	I4_A_..."	Command understood and executed successfully.

M46 – Interval print

Description

Simulation of a print key press on a regular time base. The simulation is active as long as the interval time is not set to zero and the balance is switched on. The simulation is stopped when the interval time is set to zero. The simulation starts to count down the time interval set by this command immediately after the command has been acknowledged. The first print key press simulation is executed after the first time the interval time has elapsed. After the interval time has elapsed, the print key press is executed, the interval time is reset and the countdown restarted. Once the print interval time has been set, the countdown is also started when the balance is switched on and the balance is ready to weigh. The target is to have periodical print outs of the current weight on the pan. Therefore the simulation is stopped during the setup of the balance or application etc.

Syntax

Commands

M46	Query of the current print interval time in seconds.
M46_<Value>	Set the current print interval time in seconds.

Responses

M46_A_<Value>	Current print interval time in seconds.
M46_A	Command understood and executed successfully.
M46_I	Command understood but currently not executable.
M46_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Value>	Integer	0 ... 65535	Interval time in seconds

Examples

↓	M46	Read the currently set interval time.
↑	M46_A_96	The current set interval time is 96 seconds.
↓	M46_2564	Set the interval time to 2564 seconds.
↑	M46_A	The interval time is set to 2564 seconds.

M73 – Calibration key behavior

Description

This command queries and sets the calibration key behavior.

Syntax

Commands

M73	Query the calibration key behavior.
M73_<Mode>_<WeightType>	Set the calibration key behavior.

Responses

M73_A_<Mode>_<WeightType>_<"WeightValue_Unit">	Current calibration key behavior.
M73_A	Command understood and executed successfully.
M73_I	Command understood but currently not executable.
M73_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0	Manual (the adjustment can be triggered manually)
		1	Off (the adjustment can not be triggered manually)
<WeightType>	Integer	0	Built-in weight (factory setting)
		1	External weight
<"WeightValue">	String	Max 12 chars	The value of the weight for an external adjustment requested from the user via the display
<"Unit">	String	Max 4 chars	The unit corresponds to the factory setting of the host unit

Comments

Setting <Mode> = 1 corresponds to the menu setting "Off" in the "Cal" Key Settings resp. "On" in the "ADJ.LOCK" setting. <WeightType> don't work when <Mode> = 1.

The value of the external weight can be changed in the menu of the balance under "Calibration", see Reference Manual or with [M19 ▶ Page 44].

Use [C1 ▶ Page 14] to start the calibration defined with M73.

M73 influences the function of the corresponded key which is used to activate calibration.

Examples

↓	M73	Query the calibration key behavior.
↑	M73_A_0_1_"100.000_g"	The calibration key function is set to "Manual" with an "External weight" of "100.000 g".
↓	M73_1_0	Set the calibration key function to off.
↑	M73_A	The calibration key function is set to off.

See also

[CO – Adjustment setting ▶ Page 12](#)

[M19 – Adjustment weight ▶ Page 44](#)

M76 – User date format

Description

This command queries and sets the user date format for display and printing.

Syntax

Commands

M76	Query the date format setting.
M76_<Format>	Set the date format setting.

Responses

M76_A_<Format>	Current date format setting.
M76_A	Command understood and executed successfully.
M76_I	Command understood but currently not executable.
M76_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Format>	Integer	0	D.MMM YYYY
		1	MMM D YYYY
		2	DD.MM.YYYY
		3	MM/DD/YYYY
		4	YYYY-MM-DD
		5	YYYY/MM/DD

Examples

↓	M76	Query the date format setting.
↑	M76_A_0	The date format setting is D.MMM YYYY.
↓	M76_1	Set the date format setting as MMM D YYYY.
↑	M76_A	The date format setting is set to MMM D YYYY.

M77 – User time format

Description

This command queries and sets the user time format for display and printing.

Syntax

Commands

M77	Query the time format setting.
M77_<Format>	Set the time format.

Responses

M77_A_<Format>	Current time format setting.
M77_A	Command understood and executed successfully.
M77_I	Command understood but currently not executable.
M77_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Format>	Integer	0	24:MM 24 h format
		1	12:MM 12 h format
		2	24.MM 24 h format
		3	12.MM 12 h format

Examples

↓	M77	Query the time format setting.
↑	M77_A_0	The time format setting is 24:MM.
↓	M77_1	Set the time format setting as 12:MM.
↑	M77_A	The time format setting is set to 12:MM.

M80 – Automatically switch off behavior

Description

This command queries and sets the device automatically switches off after a certain time of inactivity or not switch off.

Syntax

Commands

M80	Query the device automatically switches off.
M80_Mode_<Time>	Set the device automatically switches off.

Responses

M80_A_<Mode>_<Time>	Current device automatically switches off.
M80_A	Command understood and executed successfully.
M80_I	Command understood but currently not executable.
M80_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0	Disabled (no automatic switching off)
		1	Enabled, delayed with time of inactivity
<Time>	Integer	0 ... 43200 sec.	Since 0 is the default value for all parameters after an nonvolatile memory erase, Time = 0 will be read when reading the first time. For symmetry, it is permissible to also write Time = 0 . In case of Disabled , this parameter has no effect anyway. In case of Enabled , writing Time = 0 results in the Disabled behavior.

Comments

In case of cable power driven devices, the switch off command `PWR_0` set the device in the standby state.

In case of cable power and battery driven devices:

- If the device is cable powered, the switch off command `PWR_0` set the device in the standby state.
- If the device is battery powered, the switch off command `PWR_0` set the device in the off state.

Examples

↓	M80	Query the device automatically switches off.
↑	M80_A_0_900	The device automatically switches off is disabled. The 900 seconds parameter has no effect.
↓	M80_1_50	Set the device automatically switches off as enabled and the time of inactivity to 50 seconds.
↑	M80_A	The inactivity time is set to 50 seconds.

M82 – Actual zero/tare key zero range setting

Description

This command queries and sets the actual upper limit of the combined zero/tare key zero range. Up and including the upper limit, the combined zero/tare key performs a zero. Above the upper limit the zero/tare key performs a tare.

Syntax

Commands

M82	Query the upper limit of the zero/tare key zero range.
M82_<Max>	Set the upper limit of the zero/tare key zero range.

Responses

M82_A_<Max>	Current upper limit of the zero/tare key zero range.
M82_A	Command understood and executed successfully.
M82_I	Command understood but currently not executable.
M82_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Max>	Float		Upper limit in the definition unit

Comment

The zero range is relatively to the effective switching on zero point defined.

Examples

↓	M82	Query the upper limit of the zero/tare key zero range.
↑	M82_A_1000.00	The upper limit of the zero/tare key zero range is 1000 times the definition unit.
↓	M82_100	Set the upper limit of the zero/tare key zero range to 100 times the definition unit.
↑	M82_A	The upper limit of the zero/tare key zero range is set to 100 times.

M84 – Service reminder mode

Description

This command queries and sets the service reminder mode.

Syntax

Commands

M84	Query the service reminder mode.
M84_<Mode>	Set the service reminder mode.

Responses

M84_A_<Mode>	Current service reminder mode.
M84_A	Command understood and executed successfully.
M84_I	Command understood but currently not executable.
M84_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Mode>	Boolean	0	Off
		1	On

Comments

If the service reminder mode is activated (switched on), the service reminder icon will be displayed after the next service date according or other conditions (i.e. 8000 operating hours) are reached.

If the service reminder mode is deactivated (switched off), the service reminder icon will not be displayed after the next service date according or other conditions are reached.

Examples

↓	M84	Query the service reminder mode.
↑	M84_A_0	Service reminder mode is set to "Off".
↓	M84_1	Set service reminder mode to "On".
↑	M84_A	Command understood and executed successfully.

M85 – Printing format

Description

This command queries and sets the printing format including header, weight value information, signature line and line feed.

Syntax

Commands

M85	Query the printing format.
M85_<Header>_<WeightInfo>_<SignLine>_<LineFeed>	Set the printing format.

Responses

M85_A_<Header>_<WeightInfo>_<SignLine>_<LineFeed>	Current printing format.
M85_A	Command understood and executed successfully.
M85_I	Command understood but currently not executable.
M85_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Header>	Integer	0	No print header
		1	Header with date and time
		2	Header with date, time and balance ID
<WeightInfo>	Integer	0	Net
		1	Gross/Tare/Net (model dependent)
<SignLine>	Boolean	0	Off
		1	On
<LineFeed>	Integer		Setting the numbers of empty lines need to be printed in the end of printing result (model dependent)

Examples

↓	M85	Query the printing format.
↑	M85_A_1_1_1_2	The printing result has a header with date/time, weight value would be in the format of Gross/Tare/Net each line respectively, the signature line will be printed, and there are 2 empty lines added at the end.
↓	M85_0_0_0_5	Set the printing result without header, net weight value only, no signature line and with 5 empty lines in the end.
↑	M85_A	Command understood and executed successfully.

M86 – Menu protection mode

Description

This command queries and sets the menu protection mode.

Syntax

Commands

M86	Query the menu protection mode.
M86_<Mode>	Set the menu protection mode.

Responses

M86_A_<Mode>	Current menu protection mode.
M86_A	Command understood and executed successfully.
M86_I	Command understood but currently not executable.
M86_L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Mode>	Boolean	0	Menu protection mode is switched off (model dependent)
		1	Menu protection mode is switched on All menu items except submenu "PROTECT" are hidden. There is no way for the user to change menu settings unless the protection mode is set to off again (model dependent)

Examples

↓	M86	Query the menu protection mode.
↑	M86_A_0	Menu protection mode is "off".
↓	M86_1	Set menu protection mode to "on".
↑	M86_A	Command understood and executed successfully.

M87 – Mode and logical device type for serial interfaces

Description

This command queries and sets the logical device type and mode of the physical serial interfaces.

Syntax

Commands

M87	Query the send modes of all logical channels.
M87_<Interface>	Query of the specific logical channel.
M87_<Interface>_<LogicalDevice>_<Mode>	Set the send mode of specific logical channel.

Responses

M87_B_<Interface>_<LogicalDevice>_<Mode>	Current send mode of the first logical channel.
M87_B...	
M87_A_<Interface>_<LogicalDevice>_<Mode>	Current send mode of the last logical channel.
M87_A	Command understood and executed successfully.
M87_I	Command understood but currently not executable.
M87_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1 (model dependent)
		1	Serial interface 2 (model dependent)
		2	USB device (model dependent)
<LogicalDevice>	Integer	0	Host (model dependent)
		1	Printer 24 (model dependent)
		2	Secondary display (model dependent)
		3	PC-Direct (model dependent)
		4	Reader (e.g., barcode reader COM)
<Mode>	Integer	0	Send off
		1	Send stable weigh value [S ▶ Page 77] / Print stable weight value
		2	Send continuous [SIR ▶ Page 79]
		3	Send and repeat [SR ▶ Page 93] / Print auto
		4	Send immediate [SI ▶ Page 78] / Print all

Comments

This command is product dependent.

Send/Print: The send modes are valid for the host only. The print modes are valid for the printer and PC-Direct. The behavior of the modes is basically the same but the format is different. The host uses MT-SICS; the printer uses the print format and PC-Direct just sends the weight value without the unit in a format fitted to Excel.

The `Mode` of the printer and PC-Direct is limited to "Print stable weight value", "Print auto" and "Print all".

The `LogicalDevice` of the USB device is fixed to "MT-SICS Host".

The `Mode` of the secondary display is fixed to "Send off".

The below table is the detail map information between mode and logical devices.

	Send off	Send stable	Print stable	Send continuous	Send auto	Print auto	Send all	Print all
Host	✓	✓	–	✓	✓	–	✓	–
Printer 24	–	–	✓	–	–	✓	–	✓
2 nd display	✓	–	–	–	–	–	–	–
PC-Direct	–	–	✓	–	–	✓	–	✓
Reader	✓	–	–	–	–	–	–	–

Examples

↓	M87	Query the send modes of all logical channels.
↑	M87_B_0_1_1	Serial interface "Serial interface 1" is set to "Printer 24" with the mode set to "Print stable weight value".
↑	M87_B_1_2_0	Serial interface "Serial interface 2" is set to "Secondary display" with the mode set to "Send off".
↑	M87_A_2_0_3	Serial interface "USB device" is set to "Host" with the mode set to "Send and repeat".
↓	M87_1	Query the logical channel and mode of the serial interface "Serial interface 2".
↑	M87_A_1_2_0	Serial interface "Serial interface 2" is set to "Secondary display" with the mode set to "Send off".
↓	M87_1_1_4	Set serial interface "Serial interface 2" to printer with the mode "Print all".
↑	M87_A	Command understood and executed successfully.

M88 – Printing zero values in the auto print mode

Description

This command queries and sets the setting of printing zero values in the auto print mode.

Syntax

Commands

M88	Query all serial interfaces settings of printing zero values in the auto print mode.
M88_<Interface>	Query specific interface setting of printing zero values in the auto print mode.
M88_<Interface>_<Mode>	Set the specific interface setting of printing zero values in the auto print mode.

Responses

M88_B_<Interface>_<Mode> M88_B... M88_A_<Interface>_<Mode>	Current of the first interface setting of printing zero values in the auto print mode. Current of the last interface setting of printing zero values in the auto print mode.
M88_A	Command understood and executed successfully.
M88_I	Command understood but currently not executable.
M88_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
		1	Serial interface 2 (model dependent)
		2	USB device (model dependent)
<Mode>	Boolean	0	Off
		1	On

Examples

↓	M88	Query all serial interfaces settings of printing zero values in the auto print mode.
↑	M88_B_0_0	Do not print zero values in the auto print mode on the serial interface 1.
↑	M88_A_1_1	Print zero values in the auto print mode on the serial interface 2.
↓	M88_1	Query the serial interface 2 setting of printing zero values in the auto print mode.
↑	M88_A_1_0	Do not print zero values in the auto print mode on the serial interface 2.
↓	M88_1_1	Set the serial interface 2 to print zero values in the auto print on.
↑	M88_A	Command understood and executed successfully.

See also

[M87 – Mode and logical device type for serial interfaces](#) ▶ Page 64

M89 – Interface command set

Description

This command queries and sets the interface command set.

Syntax

Commands

M89	Query the command set of all available interfaces.
M89_<Interface>	Query specific interface command set.
M89_<Interface>_<CmdSet>	Set the specific command set of interface.

Responses

M89_B_<Interface>_<CmdSet>	Current command set of the first available interface.
M89_B...	Current command set of the last available interface.
M89_A_<Interface>_<CmdSet>	
M89_A	Command understood and executed successfully.
M89_I	Command understood but currently not executable.
M89_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
<CmdSet>	Integer	0	MT-SICS
		2	Sartorius 22 character output format

Comment

New command set type settings are active after a maximum of 100 ms. No commands must be sent during this period.

Examples

↓	M89	Query the command set of all available interfaces.
↑	M89_B_0_0	The serial interface 1 uses the MT-SICS command set.
↑	M89_A_2_1	The serial interface use the MT-PM command set. The balance does not have a serial interface 2.
↓	M89_1_2	Set the serial interface 2 to use the Sartorius command set.
↑	M89_A	The serial Interface 2 uses the Sartorius command set.

See also

[M87 – Mode and logical device type for serial interfaces](#) ▶ Page 64

M90 – Connection parameters of serial interfaces for logical devices

Description

This command queries and sets the connection parameters for logical devices.

Syntax

Commands

M90	Query the connection parameters of all available logical devices.
M90_<Interface>	Query settings of a single logical devices.
M90_<Interface>_<LogicalDevice>_<Baud>_<DataBit>_<Parity>_<Stopbit>_<DataFlow>	Set the settings for a specified serial interface with device index.

Responses

M90_B_<Interface>_<LogicalDevice>_<Baud>_<DataBit>_<Parity>_<Stopbit>_<DataFlow>	Current connection parameters of the first available logical devices.
M90_B...	Current connection parameters of the last available logical devices.
M90_A_<Interface>_<LogicalDevice>_<Baud>_<DataBit>_<Parity>_<Stopbit>_<DataFlow>	
M90_A	Command understood and executed successfully.
M90_I	Command understood but currently not executable.
M90_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
<LogicalDevice>	Integer	0	Host
		1	Printer 24
		2	Secondary display
		3	PC-Direct
<Baud>	Integer	2	600 baud
		3	1200 baud
		4	2400 baud
		5	4800 baud
		6	9600 baud
		7	19200 baud
		8	38400 baud
<DataBit>	Integer	0	7 data bits
		1	8 data bits
<Parity>	Integer	0	No parity
		1	Even parity
		2	Odd parity
		3	Mark
		4	Space
<Stopbit>	Integer	0	1 stop bit
		1	2 stop bits

Name	Type	Values	Meaning
<DataFlow>	Integer	0	No data flow control
		1	Software (Xon / Xoff)
		2	Hardware (RTS / CTS)

Comment

New interface settings are active after a maximum of 100 ms. No commands must be sent during this period.

Examples

↓	M90	Query the connection parameters of all available logical devices.
↑	M90_B_0_0_6_1_0_0_1	Serial Interface 1; Host: 9600 bd, 8 bits, no parity, 1 stop bits, software handshake.
↑	M90_B_0_1_4_0_1_1_1	Serial Interface 1; Printer 24: 2400 bd, 7 bit, even parity, 2 stop bits, software handshake.
↑	M90_B_0_2_6_1_0_0_1	Serial Interface 1; 2 nd display: 9600 bd, 8 bits, no parity, 1 stop bits, software handshake.
↑	M90_B_0_3_1_1_0_0_0	Serial Interface 1; PC-Direct: 300 bd, 8 bits, no parity, 1 stop bits, no handshake.
↓	M90_0_1_3_1_0_0_1	Set the printer device on serial interface 1 to 1200 baud, 8 data bits, No parity, 1 stop bit, Software (Xon / Xoff).
↑	M90_A	Printer device on serial interface 1 is set to 1200 bd, 8 bits, no parity, 1 stop bit, software handshake.

See also

 M87 – Mode and logical device type for serial interfaces ▶ Page 64

M91 – End of line settings for logical devices

Description

This command queries and sets end of line settings of logical devices.

Syntax

Commands

M91	Query the end of line settings of all logical devices.
M91_<Interface>	Query of the specific logical devices.
M91_<Interface>_<LogicalDevice>_<EOL>	Set the settings for a specified serial interface with given device index.

Responses

M91_B_<Interface>_<LogicalDevice>_<EOL>	Current the end of line setting of the first logical device.
M91_B...	Current the end of line setting of the last logical device.
M91_A_<Interface>_<LogicalDevice>_<EOL>	
M91_A	Command understood and executed successfully.
M91_I	Command understood but currently not executable.
M91_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
<LogicalDevice>	Integer	0	Host
		1	Printer 24
		2	Secondary display
		3	PC-Direct
		4	Reader (e.g., barcode reader COM)
<EOL>	Integer	0	<CR LF> carriage return, line feed
		1	<CR> carriage return
		2	<LF> line feed
		3	<TAB> tabulator

Examples

↓	M91	Query the end of line settings of all logical devices.
↑	M91_B_0_0_0	Serial interface 1; Host: <CR LF>.
↑	M91_B_0_1_0	Serial interface 1; Printer 24: <CR LF>.
↑	M91_B_0_2_0	Serial interface 1; 2 nd display: <CR LF>.
↑	M91_B_0_3_0	Serial interface 1; PC-Direct: <CR LF>.
↓	M91_0_1_0	Set the printer device on serial interface 1 to <CR LF>.
↑	M91_A	Printer device on serial interface 1 is set to <CR LF>.

See also

[🔗](#) M87 – Mode and logical device type for serial interfaces ▶ Page 64

M92 – Character encodings for logical devices

Description

This command queries and sets the character encodings of logical devices.

Syntax

Commands

M92	Query the character encodings of all logical devices.
M92_<Interface>	Query of the specific logical devices.
M92_<Interface>_<LogicalDevice>_<Encoding>	Set the settings of a specified serial interface with given device index.

Responses

M92_B_<Interface>_<LogicalDevice>_<Encoding>	Current the character encoding of the first logical device.
M92_B...	Current the character encoding of the last logical device.
M92_A_<Interface>_<LogicalDevice>_<Encoding>	Current the character encoding of the last logical device.
M92_A	Command understood and executed successfully.
M92_I	Command understood but currently not executable.
M92_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
<LogicalDevice>	Integer	0	Host
		1	Printer 24
		2	Secondary display
		3	PC-Direct
<Encoding>	Integer	0	IBM/DOS (Code page 437 + MT specific special characters)
		1	ANSI/WIN (Windows-1252 + MT specific special characters)
		2	UTF-8

Comments

IBM/DOS is based on CP437. ANSI/WIN is based on CP1252. But there are some special characters in device. The following tables list the special characters.

MT specific special characters in IBM/DOS:

0	↑	↓	→	←	↔	▶	┌	┐	└	┘	■	└	↵	└	⌘	
16	└	↵	┐	0	1	2	3	4	5	6	7	8	9	°	μ	△

127	158	166	167	237	254
␣	␣	␣	␣	␣	␣

MT specific special characters in ANSI/WIN:

127	129	141	143	144	149	157	160	170	173	186
□	□	□	ÿ	δ	▪	Φ		␣	-	␣

Examples

↓	M92	Query the character encodings of all logical devices.
↑	M92_B_0_0_0	Serial Interface 1; Host: IBM/DOS.
↑	M92_B_0_1_0	Serial Interface 1; Printer 24: IBM/DOS.
↑	M92_B_0_2_0	Serial Interface 1; 2 nd display: IBM/DOS.
↑	M92_B_0_3_0	Serial Interface 1; PC-Direct: IBM/DOS.
↑	M92_B_1_1_0	Printer 24: IBM/DOS.
↑	M92_B_1_2_0	2 nd display: IBM/DOS.
↑	M92_A_1_3_0	PC-Direct: IBM/DOS.
↓	M92_0_1_1	Set the printer device on serial interface 1 to ANSI/WIN.
↑	M92_A	Printer device on serial interface 1 is set to ANSI/WIN.

See also

[🔗](#) M87 – Mode and logical device type for serial interfaces ▶ Page 64

PW – Piece counting: Piece weight

Description

Use `PW` to set the reference weight of 1 piece, which you can then use for the piece counting application.

Syntax

Commands

<code>PW</code>	Query of the piece weight for the piece counting application.
<code>PW_<SinglePiece>_<Unit></code>	Set the piece weight for the according value. The unit should correspond to the unit actually set under unit 1.

Responses

<code>PW_A_<SinglePiece>_<Unit></code>	Current piece weight value in unit actually set under unit 1.
<code>PW_A</code>	Command understood and executed successfully.
<code>PW_I</code>	Command understood but currently not executable (e.g., piece counting application is not active or balance is currently executing another command).
<code>PW_L</code>	Command understood but not executable (parameter is incorrect).

Comments

By setting a reference weight, the display unit is automatically switched to unit "PCS".

On the interface the unit is not changed. However, the piece counting value can be requested by using the [S ▶ Page 77] commands in unit 1 such as [SU ▶ Page 98], [SIU ▶ Page 81], after the piece weight reference has been set by `PW`.

To change the unit of the interface to pieces, use the command [M21 ▶ Page 46].

Example

↓	<code>PW_20.00_g</code>	Set the piece weight of the piece counting application to 20.00 g.
↑	<code>PW_A</code>	Piece weight value is set.

See also

- [M21 – Unit ▶ Page 46](#)
- [SU – Stable weight value with currently displayed unit ▶ Page 98](#)
- [SIU – Weight value with currently displayed unit immediately ▶ Page 81](#)

PWR – Switch on / Switch off

Description

Use `PWR` to switch the balance on or off. When it is switched off, standby mode is activated.

Syntax

Command

<code>PWR_<OnOff></code>	Switch the balance on or off.
--------------------------------	-------------------------------

Responses

<code>PWR_A</code>	Balance has been switched off successfully.
<code>PWR_A_</code> <code>I4_A_<"SNR"></code>	Balance with the serial number "SNR" has been switched on successfully see [I4 ▶ Page 28].
<code>PWR_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g., taring, or application is not in Home screen).
<code>PWR_L</code>	Command understood but not executable.

Parameter

Name	Type	Values	Meaning
<code><OnOff></code>	Integer	0	Set the balance to standby mode
		1	Switch the balance on

Comments

The balance response to [I4 ▶ Page 28] appears unsolicited after switching the balance on.

In case of cable power driven devices, the switch off command set the device in the standby state.

In case of cable power and battery driven devices:

- If the device is cable powered, the switch off command `PWR_0` set the device in the standby state.
- If the device is battery powered, the switch off command `PWR_0` set the device in the off state.

Example

↓	<code>PWR_1</code>	Switch the balance on.
↑	<code>PWR_A</code>	The balance has been switched on successfully.
↑	<code>I4_A_"0123456789"</code>	The serial number is shown.

See also

[I4 – Serial number ▶ Page 28](#)

S – Stable weight value

Description

Use `s` to send a stable weight value, along with unit `1`, from the balance to the connected communication partner via the interface.

Syntax

Command

<code>s</code>	Send the current stable net weight value.
----------------	---

Responses

<code>S_S_<WeightValue>_<Unit></code>	Current stable weight value in unit actually set under unit <code>1</code> .
<code>S_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g., taring, or timeout as stability was not reached).
<code>S_+</code>	Balance in overload range.
<code>S_-</code>	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<code><WeightValue></code>	Float		Weight value
<code><Unit></code>	String		Currently displayed unit

Comments

The duration of the timeout depends on the balance type.

The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to Format of responses with weight value.

To send the stable weight value in actually displayed unit, see [SU ▶ Page 98].

Example

↓	<code>s</code>	Send a stable weight value.
↑	<code>S_S_100.00_g</code>	The current, stable ("S") weight value is 100.00 g.

SI – Weight value immediately

Description

Use `SI` to immediately send the current weight value, along with unit 1, from the balance to the connected communication partner via the interface.

Syntax

Command

<code>SI</code>	Send the current net weight value, irrespective of balance stability.
-----------------	---

Responses

<code>S_S_<WeightValue>_<Unit></code>	Stable weight value with currently displayed unit.
<code>S_D_<WeightValue>_<Unit></code>	Non-stable (dynamic) weight value with currently displayed unit.
<code>S_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g., taring).
<code>S_+</code>	Balance in overload range.
<code>S_-</code>	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<code><WeightValue></code>	Float		Weight value
<code><Unit></code>	String		Currently displayed unit

Comments

The balance responds to command `SI` with the last built-in weight value (stable or dynamic) before receiving command `SI`.

To send weight value immediately in actually displayed unit, see [SIU ▶ Page 81].

The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to Format of responses with weight value.

Example

↓	<code>SI</code>	Send current weight value.
↑	<code>S_D_129.07_g</code>	The weight value is unstable (dynamic, "D") and is currently 129.07 g.

SIR – Weight value immediately and repeat

Description

Use `SIR` to immediately send the current weight value, along with unit 1, from the balance to the connected communication partner via the interface, but this time on a continuous basis.

Syntax

Command

<code>SIR</code>	Send the net weight values repeatedly, irrespective of balance stability.
------------------	---

Responses

<code>S_S_<WeightValue>_<Unit></code>	Stable weight value with currently displayed unit.
<code>S_D_<WeightValue>_<Unit></code>	Non-stable (dynamic) weight value with currently displayed unit.
<code>S_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g., taring).
<code>S_+</code>	Balance in overload range.
<code>S_-</code>	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<code><WeightValue></code>	Float		Weight value
<code><Unit></code>	String		Currently displayed unit

The number of weight values per second can be configured using [UPD ▶ Page 109].

Comments

`SIR` is overwritten by the commands [S ▶ Page 77], [SI ▶ Page 78], [SR ▶ Page 93], [@ ▶ Page 11] and hardware break and hence cancelled.

To send weight value in actually displayed unit, see [SIRU ▶ Page 80].

This command is cancelled by the [@ ▶ Page 11], [S ▶ Page 77], [SI ▶ Page 78], [SIRU ▶ Page 80], [SIU ▶ Page 81], [SNR ▶ Page 89], [SNRU ▶ Page 91], [SR ▶ Page 93] and [SRU ▶ Page 95] commands.

Example

↓	<code>SIR</code>	Send current weight values at intervals.
↑	<code>S_D_129.07_g</code>	The balance sends stable ("S") or unstable ("D") weight values at intervals.
↑	<code>S_D_129.08_g</code>	
↑	<code>S_S_129.09_g</code>	
↑	<code>S_S_129.09_g</code>	
↑	<code>S_D_114.87_g</code>	
↑	<code>S_...</code>	

See also

🔗 UPD – Update rate of SIR and SIRU output on the host interface ▶ Page 109

SIRU – Weight value with currently displayed unit immediately and repeat

Description

Request current weight value with currently displayed unit independent of stability and repeat sending responses until command is stopped.

Syntax

Command

SIRU	Request current weight value and repeat.
------	--

Responses

S_S_<WeightValue>_<Unit>	Stable weight value with currently displayed unit.
S_D_<WeightValue>_<Unit>	Non-stable (dynamic) weight value with currently displayed unit.
S_I	Command understood but currently not executable (balance is currently executing another command, e.g., taring).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Weight value
<Unit>	String		Currently displayed unit

Comments

As the [SIR ▶ Page 79] command, but with currently displayed unit.

The number of weight values per second can be configured using [UPD ▶ Page 109].

This command is cancelled by the [@ ▶ Page 11], [S ▶ Page 77], [SI ▶ Page 78], [SIRU ▶ Page 80], [SIU ▶ Page 81], [SNR ▶ Page 89], [SNRU ▶ Page 91], [SR ▶ Page 93] and [SRU ▶ Page 95] commands.

Example

↓	SIRU	Query of the current weight value with currently displayed unit.
↑	S_D_12.34_lb	Non-stable (dynamic) weight value of 12.34 lb.
↑	S_D_12.44_lb	Non-stable (dynamic) weight value of 12.44 lb.
↑	S_D_12.43_lb	Non-stable (dynamic) weight value of 12.43 lb.

See also

[SIR – Weight value immediately and repeat ▶ Page 79](#)

[UPD – Update rate of SIR and SIRU output on the host interface ▶ Page 109](#)

SIU – Weight value with currently displayed unit immediately

Description

Request current weight value with currently displayed unit independent of stability.

Syntax

Command

SIU	Request current weight value with currently displayed unit.
-----	---

Responses

S_S_<WeightValue>_<Unit>	Stable weight value with currently displayed unit.
S_D_<WeightValue>_<Unit>	Non-stable (dynamic) weight value with currently displayed unit.
S_I	Command understood but currently not executable (balance is currently executing another command, e.g., taring).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Weight value
<Unit>	String		Currently displayed unit

Comments

Identical with [SI ▶ Page 78] command but with currently displayed unit.

Example

↓	SIU	Requests the current weight value with the currently displayed unit independent of the stability.
↑	S_D_12.34_lb	Non-stable (dynamic) weight value is 12.34 lb.

SM0 – Dynamic weighing: Cancel all SMx commands

Description

Use `SM0` to cancel any SMx commands that are in progress.

Syntax

Command

SM0	Cancel all SMx commands except [SM4 ▶ Page 88].
-----	---

Responses

SM0_A	Command understood and executed successfully.
SM0_I	Command understood but currently not executable (balance is currently executing another command or dynamic weighing application is not active or parameter is incorrect).

Comments

This command can only be used with the application "Dynamic weighing". For details on available applications and how to activate them, see [M25 ▶ Page 49] and [M26 ▶ Page 51].

Can only be executed if no weight is being applied respectively the "Dynamic weighing" window has disappeared.

Example

↓	SM0	Cancel all SMx commands except [SM4 ▶ Page 88].
↑	SM0_A_3	Any SMx commands are canceled.

See also

- [SM1 – Dynamic weighing: Start immediately and send the result ▶ Page 83](#)
- [SM2 – Dynamic weighing: Start after a minimum load is exceeded send result ▶ Page 84](#)
- [SM3 – Dynamic weighing: Start after a minimum load is exceeded, send result and repeat ▶ Page 86](#)
- [SM4 – Dynamic weighing: Time interval ▶ Page 88](#)

SM1 – Dynamic weighing: Start immediately and send the result

Description

Use `SM1` to start dynamic weighing immediately. The result is transferred via the interface once the weighing time has elapsed.

Syntax

Command

SM1	Start dynamic weighing immediately and transfer the result.
-----	---

First Responses

SM1_A	Dynamic weighing has been started, wait for second response. During the weighing operation, e.g. until the second response, no further commands can be executed.
SM1_I	Command understood but currently not executable (balance is currently executing another command or dynamic weighing application is not active or parameter is incorrect). No second response follows.

Further Responses

SM_*_<WeightValue>_<Unit>	Transfer of the result completed successfully. Weight value corresponds to the result of the measurement cycle. The unit corresponds to the current weight unit in the display.
SM_+	Abort, overload during the measurement cycle.
SM_-	Abort, underload during the measurement cycle.
SM_I	The dynamic weighing has been aborted.

Parameters

Name	Type	Values	Meaning
SM_*	String	S	Identification for dynamic weighing value
<WeightValue>	Float		Weight value in unit 1
<Unit>	String		Weight unit

Comments

This command can only be used with the application "Dynamic weighing". For details on available applications and how to activate them, see [M25 ▶ Page 49] and [M26 ▶ Page 51].

Can only be executed if no weight is being applied respectively the "Dynamic weighing" window has disappeared.

The balance does not perform stability or plausibility checks for the start.

Prerequisite: A weight is already placed on the balance because weighing starts immediately after `SM1`.

Example

↓	SM1	Start a dynamic weighing immediately and transfer the result.
↑	SM1_A	Command understood, result follows.
↑	SM_*_#####23.76_g	Result of the dynamic weighing is 23.76 g.

SM2 – Dynamic weighing: Start after a minimum load is exceeded send result

Description

Use `SM2` to start dynamic weighing if the applied weight exceeds the specified minimum load. The result is transferred via the interface once the weighing time has elapsed.

Syntax

Command

SM2	Start a dynamic weighing automatically after the defined minimum load is exceeded and transfer the result (once).
-----	---

First Responses

SM2_A	Dynamic weighing has been started, wait for second response. During the weighing operation, e.g. until the second response, no further commands can be executed.
SM2_I	Command understood but currently not executable (balance is currently executing another command or dynamic weighing application is not active or parameter is incorrect). No second response follows.

Further Responses

SM_*_<WeightValue>_<Unit>	Transfer of the result completed successfully. Weight value corresponds to the result of the measurement cycle. The unit corresponds to the current weight unit in the display.
SM_+	Abort, overload during the measurement cycle.
SM_-	Abort, underload during the measurement cycle.
SM_I	The dynamic weighing has been aborted.

Parameters

Name	Type	Values	Meaning
SM_*	String	S	Identification for dynamic weighing value
<WeightValue>	Float		Weight value in unit 1
<Unit>	String		Weight unit

Comments

This command can only be used with the application "Dynamic weighing". For details on available applications and how to activate them, see [M25 ▶ Page 49] and [M26 ▶ Page 51].

Can only be executed if no weight is being applied respectively the "Dynamic weighing" window has disappeared.

The single start standby can be cancelled by the [SM0 ▶ Page 82] and [@ ▶ Page 11] commands before start of the weighing.

The minimum load is defined as 5 g.

Example

↓	SM2	Start a dynamic weighing after the defined minimum load is exceeded and transfer the result.
↑	SM2_A	Command understood, result follows.
↑	SM_*_24.30_g	Result of the dynamic weighing is 24.30 g.

SM3 – Dynamic weighing: Start after a minimum load is exceeded, send result and repeat

Description

Use SM3 to start several dynamic weighing procedures in succession if the applied weights exceed the specified minimum load. The results are transferred via the interface once the weighing time has elapsed.

Syntax

Command

SM3	Start dynamic weighing automatically.
-----	---------------------------------------

First Responses

SM3_A	Dynamic weighing has been started, wait for second response. During the weighing operation, e.g. until the second response, no further commands can be executed.
SM3_I	Command understood but currently not executable (balance is currently executing another command or dynamic weighing application is not active or parameter is incorrect). No second response follows.

Further Responses

SM_*_<WeightValue>_<Unit>	Transfer of the result completed successfully. Weight value corresponds to the result of the measurement cycle. The unit corresponds to the current weight unit in the display. Further results follow when the start condition is fulfilled again.
SM_+	Abort, overload during the measurement cycle.
SM_-	Abort, underload during the measurement cycle.
SM_I	The dynamic weighing has been aborted.

Parameters

Name	Type	Values	Meaning
SM_*	String	S	Identification for dynamic weighing value
<WeightValue>	Float		Weight value in unit 1
<Unit>	String		Weight unit

Comments

This command can only be used with the application "Dynamic weighing". For details on available applications and how to activate them, see [M25 ▶ Page 49] and [M26 ▶ Page 51].

Can only be executed if no weight is being applied respectively the "Dynamic weighing" window has disappeared.

The recurring establishment of the start standby is cancelled by the commands [SM0 ▶ Page 82], [SM1 ▶ Page 83], [SM2 ▶ Page 84] and [@ ▶ Page 11].

The minimum load is defined as 5 g.

Example

↓	SM3	Start dynamic weighing when weight drops below and afterwards above the defined minimum load, transfer the result and repeat the process.
↑	SM3_A	Command understood, results follow.
↑	SM_*_25.83_g	Result of the 1 st dynamic weighing is 25.83 g.
↑	SM_*_22.91_g	Result of the 2 nd dynamic weighing is 22.91 g.
↑	SM_*_24.05_g	Result of the 3 rd dynamic weighing is 24.05 g.

SM4 – Dynamic weighing: Time interval

Description

Use SM4 to set the time interval for a dynamic weighing procedure, or query the current time setting.

Syntax

Commands

SM4	Query of the time interval for the dynamic weighing application.
SM4_<DynWeighTimeInterval>	Set the time interval for the dynamic weighing application.

Responses

SM4_A_<DynWeighTimeInterval>	Current time interval for the data acquisition of the dynamic weighing.
SM4_A	Command understood and executed successfully; time interval set.
SM4_I	Command understood but currently not executable (balance is currently executing another command).
SM4_L	Command understood but not executable (e.g. dynamic weighing application is not active or parameter is incorrect).

Parameter

Name	Type	Values	Meaning
<DynWeighTimeInterval>	Integer	0 ... 120	Time interval in seconds

Comments

This command can only be used with the application "Dynamic weighing". For details on available applications and how to activate them, see [M25 ▶ Page 49] and [M26 ▶ Page 51].

Can only be executed if no weight is being applied respectively the "Dynamic weighing" window has disappeared.

Example

↓	SM4_14	Set the time interval for the data acquisition of the dynamic weighing to 14 seconds.
↑	SM4_A	Current time interval is set to 14 seconds.

SNR – Send stable weight value and repeat on stable weight change

Description

Request the current stable weight value in unit 1 followed by stable weight values after predefined minimum weight changes until the command is stopped.

Syntax

Commands

SNR	Send the current stable weight value and repeat after each deflection (see comment).
SNR_<PresetValue>_<Unit>	Send the current stable weight value and repeat after each deflection greater or equal to the preset value (see comment).

Responses

S_S_<WeightValue>_<Unit> S_S_<WeightValue>_<Unit> ...	Current stable weight value (1 st value). Next stable weight value after preset deflection (2 nd value). ...
S_I	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
S_L	Command understood but not executable (incorrect parameter).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<PresetValue>	Float	1 digit ... capacity	Preset minimum deflection load
<Unit>	String		Currently set unit 1

Comments

The preset value is optional. If no value is defined, the deflection depends on balance readability as follows:

Readability	Min. deflection
0.001 mg	0.001 g
0.01 mg	0.01 g
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

In contrast to `SNR`, [SR ▶ Page 93] sends also dynamic weight values.

This command is cancelled by the [@ ▶ Page 11], [S ▶ Page 77], [SI ▶ Page 78], [SIR ▶ Page 79], [SIU ▶ Page 81], [SIRU ▶ Page 80], [SNRU ▶ Page 91], [SR ▶ Page 93] and [SRU ▶ Page 95] commands.

Example

↓	SNR_50_g	Send the current stable weight value and repeat after each deflection greater or equal to the preset value of 50 g.
↑	S_S_12.34_g	1 st weight value is 12.34 g.
↑	S_S_67.89_g	2 nd weight value is 67.89 g.

SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change

Description

Request the current stable weight value in the currently displayed unit followed by stable weight values after predefined minimum weight changes until the command is stopped.

Syntax

Commands

SNRU	Send the current stable weight value with the currently displayed unit and repeat after each deflection (see comment).
SNRU_<PresetValue>_<Unit>	Send the current stable weight value with the currently displayed unit and repeat after each deflection greater or equal to the preset value (see comment).

Responses

S_S_<WeightValue>_<Unit> S_S_<WeightValue>_<Unit> ...	Current stable weight value (1 st value). Next stable weight value after preset deflection (2 nd value). ...
S_I	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
S_L	Command understood but not executable (incorrect parameter).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<PresetValue>	Float	1 digit ... capacity	Preset minimum deflection load
<Unit>	String		Currently displayed unit

Comments

The preset value is optional. If no value is defined, the deflection depends on balance readability as follows:

Readability	Min. deflection
0.001 mg	0.001 g
0.01 mg	0.01 g
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

In contrast to `SNR`, [SR ▶ Page 93] sends also dynamic weight values.

This command is cancelled by the [@ ▶ Page 11], [S ▶ Page 77], [SI ▶ Page 78], [SIR ▶ Page 79], [SIU ▶ Page 81], [SIRU ▶ Page 80], [SNRU ▶ Page 91], [SR ▶ Page 93] and [SRU ▶ Page 95] commands.

Example

↓	SNRU_50_g	Send the current stable weight value with the currently displayed unit and repeat after each deflection greater or equal to the preset value of 50 g.
↑	S_S_12.34_g	1 st weight value is 12.34 g.
↑	S_S_67.89_g	2 nd weight value is 67.89 g.

See also

[🔗](#) SNR – Send stable weight value and repeat on stable weight change ▶ Page 89

SR – Send stable weight value and repeat on any weight change

Description

Request the current stable weight value in unit 1 followed by weight values after predefined minimum weight changes until the command is stopped.

Syntax

Commands

SR	Send the current stable weight value and then continuously after every weight change If no preset value is entered, the weight change must be at least 12.5% of the last stable weight value, minimum = 30 digit.
SR_<PresetValue>_<Unit>	Send the current stable weight value and then continuously after every weight change greater or equal to the preset value a non-stable (dynamic) value followed by the next stable value, range = 1 digit to maximal capacity.

Responses

S_S_<WeightValue>_<Unit>	Current, stable weight value in unit actually set as unit 1, 1 st weight change.
S_D_<WeightValue>_<Unit>	Dynamic weight value in unit actually set as unit 1.
S_S_<WeightValue>_<Unit>	Next stable weight value in unit actually set as unit 1.
S_I	Command understood but currently not executable (balance is currently executing another command, e.g. zero setting, or timeout as stability was not reached).
S_L	Command understood but not executable (incorrect parameter).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Weight value
<Unit>	String		Unit, only available units permitted

Comments

This command is cancelled by the [[@](#) ▶ Page 11], [[S](#) ▶ Page 77], [[SI](#) ▶ Page 78], [[SIR](#) ▶ Page 79], [[SIU](#) ▶ Page 81], [[SIRU](#) ▶ Page 80], [[SNRU](#) ▶ Page 91], [[SR](#) ▶ Page 93] and [[SRU](#) ▶ Page 95] commands.

In contrast to [SR](#), [[SNR](#) ▶ Page 89] only sends stable weight values.

If, following a non-stable (dynamic) weight value, stability has not been reached within the timeout interval, the response [S_I](#) is sent and then a non-stable weight value. Timeout then starts again from the beginning.

The preset value can be entered in any by the balance accepted unit.

Example

↓	SR_10.00_g	Send the current stable weight value followed by every load change of 10 g.
↑	S_S_____100.00_g	Balance stable.
↑	S_D_____115.23_g	100.00 g loaded.
↑	S_S_____200.00_g	Balance again stable.

See also

[🔗](#) SNR – Send stable weight value and repeat on stable weight change ▶ Page 89

SRU – Send stable weight value with currently displayed unit and repeat on any weight change

Description

Request the current weight values in the currently displayed unit and repeat sending responses after a predefined minimum weight change until the command is stopped.

Syntax

Commands

SRU	Send the current stable weight value with the currently displayed unit and then continuously after every weight change. If no preset value is entered, the weight change must be at least 12.5% of the last stable weight value, minimum = 30 digit.
SRU_<WeightValue>_<Unit>	Send the current stable weight value with the currently displayed unit and then continuously after every weight change greater or equal to the preset value a non-stable (dynamic) value followed by the next stable value, range = 1 digit to maximal capacity.

Responses

S_S_<WeightValue>_<Unit>	Current, stable weight value with the currently displayed unit until 1 st weight change.
S_D_<WeightValue>_<Unit>	Non-stable (dynamic) weight value with the currently displayed unit.
S_I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S_+	Balance in overload range.
S_-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Weight value
<Unit>	String		Currently displayed unit

Comments

As the [SR ▶ Page 93] command, but with currently displayed unit.

This command is cancelled by the [@ ▶ Page 11], [S ▶ Page 77], [SI ▶ Page 78], [SIR ▶ Page 79], [SIU ▶ Page 81], [SIRU ▶ Page 80], [SNRU ▶ Page 91], [SR ▶ Page 93] and [SRU ▶ Page 95] commands.

In contrast to [SR ▶ Page 93], [SNRU ▶ Page 91] only sends stable weight values.

If, following a non-stable (dynamic) weight value, stability has not been reached within the timeout interval, the response S_I is sent and then a non-stable weight value. Timeout then starts again from the beginning.


The preset value can be entered in any by the balance accepted unit.

Example

↓	SRU	Send the current stable weight value followed by every default load change with the currently displayed unit.
↑	S_S_12.34_lb	1 st weight value is stable and 12.34 lb.
↑	S_D_13.88_lb	2 nd weight value is non-stable and 13.88 lb.
↑	S_S_15.01_lb	3 rd weight value is stable and 15.01 lb.


ST – Stable weight value on pressing (Transfer) key

Description



Use `ST` to send the current stable weight value when the transfer key  is pressed. The value is sent, along with the currently displayed unit, from the balance to the connected communication partner via the interface.

Syntax

Commands

<code>ST</code>	Query the current status transfer function.
<code>ST_1</code>	Sent the current stable net weight value with unit 1 each time when the transfer key  is pressed.
<code>ST_0</code>	Stop sending weight value when print key is pressed.

Responses

<code>ST_A_0</code>	Function inactive, no weight value is sent when the transfer key  is pressed.
<code>ST_A_1</code>	Function active, weight value is sent each time when the transfer key  is pressed.
<code>ST_A</code>	Command understood and executed successfully.
<code>ST_I</code>	Command understood but currently not executable (balance is currently executing another command).
<code>ST_L</code>	Command understood but not executable (incorrect parameter).

Parameter


Name	Type	Values	Meaning
<code><Status></code>	Boolean		Behavior of the transfer function
		0	Inactive
		1	Active

Comments

`ST_0` is the factory setting (default value).

`ST` function is not active after switching on and after reset command.

Example

↓	<code>ST_1</code>	Activate <code>ST</code> function.
↑	<code>ST_A</code>	Command executed.
↑	<code>S_S_____123.456_g</code>	When transfer key  pressed: current net weight is 123.456 g.

SU – Stable weight value with currently displayed unit

Description

Use `SU` to query the stable weight value with the currently displayed unit.

Syntax

Command

<code>SU</code>	Query the stable weight value with the currently displayed unit.
-----------------	--

Responses

<code>S_S_<WeightValue>_<Unit></code>	Current stable weight value with the currently displayed unit.
<code>S_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
<code>S_+</code>	Balance in overload range.
<code>S_-</code>	Balance in underload range.

Comments

As the [S ▶ Page 77] command, but with currently displayed unit.

Example

↓	<code>SU</code>	Query the stable weight value with the currently displayed unit.
↑	<code>S_S_12.34_lb</code>	The current, stable weight value is 12.34 lb.

T – Tare

Description

Use **T** to tare the balance. The next stable weight value will be saved in the tare memory.

Syntax

Command

T	Tare, i.e. store the next stable weight value as a new tare weight value.
---	---

Responses

T_S_<TareValue>_<Unit>	Taring successfully performed. The tare weight value returned corresponds to the weight change on the balance in the unit actually set under unit 1 since the last zero setting.
T_I	Command understood but currently not executable (balance is currently executing another command, e.g., zero setting, or timeout as stability was not reached).
T_L	Command understood but not executable (incorrect parameter).
T_+	Upper limit of taring range exceeded.
T_-	Lower limit of taring range exceeded.

Parameters

Name	Type	Values	Meaning
<TareValue>	Float		Weight value in host unit
<Unit>	String		Weight unit

Comments

The tare memory is overwritten by the new tare weight value.

The duration of the timeout depends on the balance type.

For clearing the tare memory, see [TAC ▶ Page 101].

Example

↓	T	Tare.
↑	T_S_100.00_g	The balance is tared and has a value of 100.00 g in the tare memory.

See also

[TA – Tare weight value ▶ Page 100](#)

[TAC – Clear tare weight value ▶ Page 101](#)

TA – Tare weight value

Description

Use TA to query the current tare value or preset a known tare value.

Syntax

Commands

TA	Query of the current tare weight value.
TA_<TarePresetValue>_<Unit>	Preset of a tare value.

Responses

TA_A_<TareWeightValue>_<Unit>	Query current tare weight value in tare memory, in unit actually set under unit 1.
TA_I	Command understood but currently not executable (balance is currently executing another command, e.g., zero setting, or timeout as stability was not reached).
TA_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<TareWeightValue>	Float		Tare weight value in host unit
<Unit>	String		Weight unit

Comments

The tare memory will be overwritten by the preset tare weight value.

The inputted tare value will be automatically rounded by the balance to the current readability. This value is shown in the response.

The taring range is specified to the balance type.

Example

↓	TA_100.00_g	Preset a tare weight of 100 g.
↑	TA_A_100.00_g	The balance has a value of 100.00 g in the tare memory.

See also

[T – Tare](#) ▶ Page 99

[TAC – Clear tare weight value](#) ▶ Page 101

TAC – Clear tare weight value

Description

Use TAC to clear the tare memory.

Syntax

Command

TAC	Clear tare value.
-----	-------------------

Responses

TAC_A	Tare value cleared, 0 is in the tare memory.
TAC_I	Command understood but currently not executable (balance is currently executing another command, e.g. zero setting).
T_L	Command understood but not executable (incorrect parameter).

Example

↓	TAC	Clear tare value.
↑	TAC_A	Tare value cleared, 0 is in the tare memory.

See also

- [T – Tare ▶ Page 99](#)
- [TI – Tare immediately ▶ Page 102](#)
- [TA – Tare weight value ▶ Page 100](#)

TI – Tare immediately

Description

Use **TI** to tare the balance immediately and independently of balance stability.

Syntax

Command

TI	Tare immediately, i.e. store the current weight value, which can be stable or non stable (dynamic), as tare weight value.
----	---

Responses

TI_S_<WeightValue>_<Unit>	Taring performed, stable tare value. The new tare value corresponds to the weight change on the balance since the last zero setting.
TI_D_<WeightValue>_<Unit>	Taring performed, non-stable (dynamic) tare value.
TI_I	Command understood but currently not executable (balance is currently executing another command, e.g. zero setting).
TI_L	Command understood but not executable (e.g. approved version of the balance).
TI_+	Upper limit of taring range exceeded.
TI_-	Lower limit of taring range exceeded.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Tare weight value in host unit
<Unit>	String		Weight unit

Comments

This command is not supported by approved balances.

The tare memory will be overwritten by the new tare weight value.

After a non-stable (dynamic) stored tare weight value, a stable weight value can be determined. However, the absolute value of the stable weight value determined in this manner is not accurate.

The taring range is specific to the balance type.

Example

↓	TI	Tare immediately.
↑	TI_D_117.57_g	The tare memory holds a non-stable (dynamic) weight value.

See also

[T – Tare](#) ▶ Page 99

[TA – Tare weight value](#) ▶ Page 100

[TAC – Clear tare weight value](#) ▶ Page 101

TIM – Time

Description

Set the system time of the balance or query the current time.

Syntax

Commands

TIM	Query of the current time of the balance.
TIM_<Hour>_<Minute>_<Second>	Set the time of the balance.

Responses

TIM_A_<Hour>_<Minute>_<Second>	Current time of the balance.
TIM_A	Command understood and executed successfully.
TIM_I	Command understood but currently not executable (balance is currently executing another command).
TIM_L	Command understood but not executable (incorrect parameter, e.g. 22_67_25) or no clock is built in.

Parameters

Name	Type	Values	Meaning
<Hour>	Integer	00 ... 23	Hours
<Minute>	Integer	00 ... 59	Minutes
<Second>	Integer	00 ... 59	Seconds

Example

↓	TIM	Query of the current time of the balance.
↑	TIM_A_09_56_11	The current time of the balance is 9 hours, 56 minutes and 11 seconds.

See also

[🔗](#) DAT – Date ▶ Page 20

TST0 – Query/set test function settings

Description

Use `TST0` to query the current setting for testing the balance, or to specify the type of testing (internal or external).

Syntax

Commands

<code>TST0</code>	Query of the setting for the test function.
<code>TST0_<Test></code>	Set the test configuration of the balance.

Responses

<code>TST0_A_<Test>_<"WeightValue">_<"Unit"></code>	Current setting for the test function.
<code>TST0_A</code>	Command understood and executed successfully.
<code>TST0_I</code>	Command understood but currently not executable (balance is currently executing another command).
<code>TST0_L</code>	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<code><Test></code>	Integer	0	Test with built-in weight
		1	Test with external weight
<code><"WeightValue"></code>	String	10 chars	Weight value in definition unit
<code><"Unit"></code>	String	Max 9 chars	Weight unit. The unit corresponds to the definition unit

Comments

With an internal test, no weight value appears.

For additional information on testing the adjustment, see the Reference Manual of the balance.

The value of the external weight can be set with [M20 ▶ Page 45].

Example

↓	<code>TST0</code>	Query of the current setting for the test and the value of the external test weight
↑	<code>TST0_A_1_"_2000.0_g"</code>	The current setting corresponds to the test with an external weight. For a test initiated with the [TST2 ▶ Page 107] command, an external weight of 2000.0 g is needed.

See also

- 🔗 M20 – Test weight ▶ Page 45
- 🔗 TST1 – Test according to current settings ▶ Page 105
- 🔗 CO – Adjustment setting ▶ Page 12
- 🔗 M20 – Test weight ▶ Page 45

TST1 – Test according to current settings

Description

Use TST1 to start the balance test function using the preset parameter settings.

Syntax

Command

TST1	Start test function in the current setting [TST0 ▶ Page 104], [M20 ▶ Page 45].
------	--

First Responses

TST1_B	The test procedure has been started. Wait for next response, see Comment.
TST1_A_<"Deviation">	Test completed, current difference is mention.
TST1_I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
TST1_L	Command understood but not executable (incorrect parameter). No second response follows.

Further Responses

TST1_<"TestWeight">_<"Unit">	Prompt to unload and load the balance (only with external weight).
TST1_A_<"TestWeight">_<"Unit">	Test procedure completed successfully. Weight value with unit corresponds to the deviation from the specified value displayed after the test. No unit is specified if the test has been performed with the built-in weight.
TST1_I	The test procedure has been aborted as, e.g., stability was not attained or wrong weights were loaded.

Parameters

Name	Type	Values	Meaning
<"Deviation">	String		Current difference in definition unit
<"TestWeight">	String		Value of the test weight in definition unit
<"Unit">	String		Weight unit. Fixed to definition unit

Comments

Commands sent to the balance during the test procedure are not processed and responded to in the appropriate manner until the test procedure is at an end.

For additional information on testing the adjustment, see the Reference Manual of the balance.

Example

↓	TST1	Start test function in the current setting.
↑	TST1_B	The test procedure has been started.
↑	TST1_"_0.00000_g"	Clear weighing pan.
↑	TST1_"_100.00000_g"	Load 100 g external weight.
↑	TST1_"_0.00000_g"	Unload weight.
↑	TST1_A_"_0.00020_g"	Test completed, current difference is 0.00020 g.

See also

- [TST0 – Query/set test function settings ▶ Page 104](#)
- [M20 – Test weight ▶ Page 45](#)
- [C1 – Start adjustment according to current settings ▶ Page 14](#)

TST2 – Test with external weight

Description

Use TST2 to start the balance test function using external test weights.

Syntax

Command

TST2	Start test function with external weight.
------	---

First Responses

TST2_B	The test procedure has been started. Wait for next response, see Comment.
TST2_A_<"Deviation">	Test completed, current difference is mention.
TST2_I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
TST2_L	Command understood but not executable (incorrect parameter). No second response follows.

Further Responses

TST2_<"TestWeight">_<"Unit">	Prompt to unload and load the balance.
TST2_A_<"TestWeight">_<"Unit">	Test procedure completed successfully. Weight value with unit corresponds to the deviation from the specified value displayed in the top line after the test.
TST2_I	The test procedure has been aborted as, e.g. stability was not attained or wrong weights were loaded.

Parameters

Name	Type	Values	Meaning
<"Deviation">	String		Current difference in definition unit
<"TestWeight">	String		Value of the test weight in definition unit
<"Unit">	String		Weight unit. Fixed to definition unit

Comments

Commands sent to the balance during the test procedure are not processed and responded to in the appropriate manner until the test procedure is at an end.

For additional information on testing the adjustment, see the Reference Manual of the balance.

The value of the external weight can be set with [M20 ▶ Page 45].

Example

↓	TST2	Start test with external weight.
↑	TST2_B	The test procedure has been started.
↑	TST2_"_0.00_g"	Prompt to unload the balance.
↑	TST2_"_200.00_g"	Prompt to load the test weight.
↑	TST2_"_0.00_g"	Prompt to unload the balance.
↑	TST2_A_"_0.01_g"	External test completed successfully.

See also

- [@ – Abort](#) ▶ Page 11
- [C2 – Start adjustment with external weight](#) ▶ Page 16
- [M20 – Test weight](#) ▶ Page 45
- [TST0 – Query/set test function settings](#) ▶ Page 104
- [M20 – Test weight](#) ▶ Page 45

UPD – Update rate of SIR and SIRU output on the host interface

Description

Use `UPD` to set the update rate of the host interface or query the current setting.

Syntax

Commands

<code>UPD</code>	Query of the update rate of the host interface.
<code>UPD_<CurrentUPD></code>	Set the update rate of the host interface.

Responses

<code>UPD_A_<CurrentUPD></code>	Current setting of the update rate of the host interface.
<code>UPD_A</code>	Command understood and executed successfully.
<code>UPD_I</code>	Command understood but currently not executable (balance is currently executing another command).
<code>UPD_L</code>	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<code><UpdateRate></code>	Float	0.1 ... 100 0	Update rate in values per second 0.1 ... 22.9

Comments

The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a balance user reset, see [M38 ▶ Page 54].

The balance can not realize every arbitrary update rate. The specified update rate is therefore rounded to the next realizable update rate. Use `UPD` without parameter to query the actually configured update rate. The achievable update rate depends on the signal processing and baud rate used. Check the current update rate with the command query `UPD`. The required minimum baud rate is 220 times the actual update rate

Examples

↓	<code>UPD</code>	Query of the update rate of the host interface.
↑	<code>UPD_A_20.2</code>	The update rate of the interface is 20.2 values per second.
↓	<code>UPD_20</code>	Set the update rate of the host interface to 20 values per second.
↑	<code>UPD_A</code>	Command executed successfully.
↑	<code>UPD</code>	Query of the exact update rate of the host interface.
↑	<code>UPD_A_18.311</code>	The exact update rate is 18.311 values per second.

See also

- [SIR – Weight value immediately and repeat ▶ Page 79](#)
- [SIRU – Weight value with currently displayed unit immediately and repeat ▶ Page 80](#)
- [M38 – Selective parameter reset ▶ Page 54](#)

Z – Zero

Description

Use `z` to set a new zero; all weight values (including the tare weight) will be measured relative to this zero. After zeroing has taken place, the following values apply: tare weight = 0; net weight (= gross weight) = 0.

Syntax

Command

<code>z</code>	Zero the balance.
----------------	-------------------

Responses

<code>z_A</code>	Zero setting successfully performed. Gross, net and tare = 0.
<code>z_I</code>	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
<code>z_+</code>	Upper limit of zero setting range exceeded.
<code>z_-</code>	Lower limit of zero setting range exceeded.

The zero point determined during switching on is not influenced by this command, the measurement ranges remain unchanged.

The duration of the timeout depends on the balance type.

The tare memory is cleared after zero setting.

Example

↓	<code>z</code>	Zero.
↑	<code>z_A</code>	Zero setting performed.

See also

[Zl – Zero immediately](#) ▶ Page 111

ZI – Zero immediately

Description

Use ZI to set a new zero immediately, regardless of balance stability. All weight values (including the tare weight) will be measured relative to this zero. After zeroing has taken place, the following values apply: tare weight = 0; net weight (= gross weight) = 0.

Syntax

Command

ZI	Zero the balance immediately regardless the stability of balance.
----	---

Responses

ZI_D	Re-zero performed under non-stable (dynamic) conditions.
ZI_S	Re-zero performed under stable conditions.
ZI_I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
ZI_+	Upper limit of zero setting range exceeded.
ZI_-	Lower limit of zero setting range exceeded.

This command is not supported by approved balances.

The zero point determined during switching on is not influenced by this command, the measurement ranges remain unchanged.

The tare memory is cleared after zero setting.

Example

└	ZI	Zero immediately.
└	ZI_D	Re-zero performed under non-stable (dynamic) conditions.

See also

[Z – Zero](#) ▶ Page 110

4 What if...?

Tips from actual practice if the communication between the system (computer) and the balance is not working.

Establishing the communication

Switch the balance off / on.

The balance must now send identification string [I4 ▶ Page 28], e.g., I4_A_ "0123456789".

If this is not the case, check the following points.

Connection

For RS232 communication, at least three connecting lines are needed:

- Data line from the balance (TxD signal).

- Data line to the balance (RxD signal).

- Signal ground line (GNDINT).

Make sure that all these connections are in order. Check the connector pin assignment of the connection cables.

Interface parameters

For the transmission to function properly, the settings of the following parameters must match at both the computer and the balance:

- Baud rate (send/receive rate)

- Number of data bits

- Parity bit

Check the settings at both devices.

Handshake

For control of the transmission, in part separate connection lines are used (CTS/DTR). If these lines are missing or wrongly connected, the computer or balance can not send or receive data.

Check whether the weigh module/balance is prevented from transmitting by handshake lines (CTS or DTR). Set the parameter "protocol" for the weigh module/balance and the peripheral device to "No Handshake" or "none". The handshake lines now have no influence on the communication.

Characters are not displayed correctly

In order to display ASCII characters >127 dec., ensure that 8-bit communication is taking place.

See also

 I4 – Serial number ▶ Page 28

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