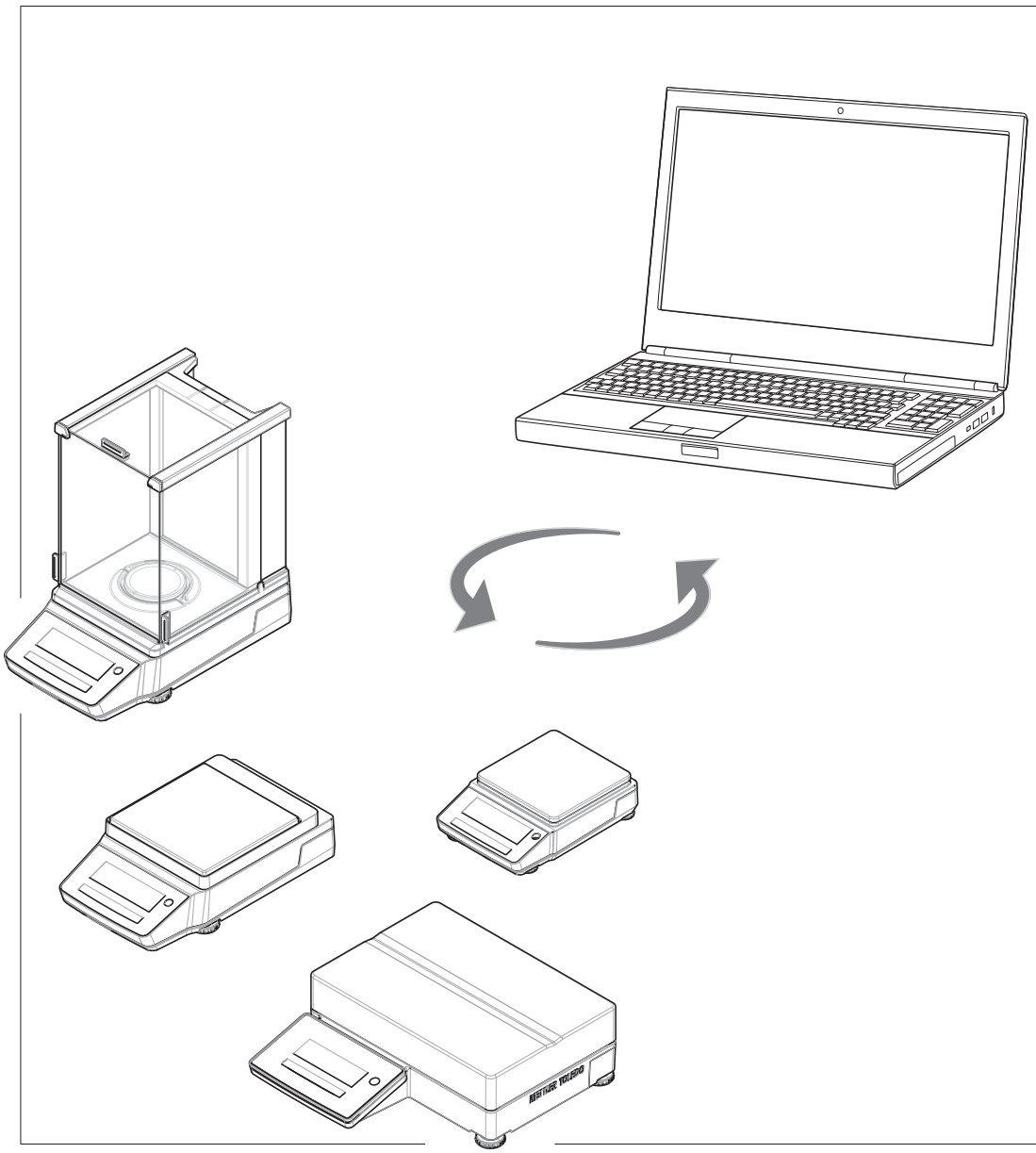
Reference Manual

MT-SICS Interface Commands

MA 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/MA-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 [I0 ▸ Page 25] command.

See also

I0 – Currently available MT-SICS commands ▸ Page 25

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.
␣	The possible parameters of the command must be separated from one another and from the command name by a space (ASCII 32 dec.).
`"text"`	The possible input for "text" is a sequence of characters (8-bit ASCII character set from 32 dec. to 255 dec.).
`..CR LF`	Each command must be closed by C_RL_F (ASCII 13 dec., 10 dec.). The characters C_RL_F, 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:

< >	Triangle brackets indicate that you must specify a value for the enclosed parameter. The brackets are not sent with the command string.
[ ]	Square brackets indicate that the enclosed expression is optional and can be omitted. The brackets are not sent with the command string.
a..b	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:

↓	`D␣"Hello"`	The quotation marks " " must be inserted in the entry.
↑	`D␣A`	Command executed successfully.

The command terminator C_RL_F 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 display unit
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.)

Examples

Set the key beeper volume:

↓	M11␣30	Set the key beeper volume to 30%.
↑	M11␣A	Command executed successfully.

Query the actual key beeper volume:

↓	M11	Query of the current key beeper volume.
↑	M11␣A␣30	Current key beeper volume is set to 30%.

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␣+	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%:

↓	m11␣30	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.

Note

We recommend using the [I0 ▸ Page 25] command to get a list of all commands that are supported by your particular balance.

Example

↓	`I0`	Send list of commands.
↑	`I0␣B␣0␣"I0"`	Level 0 command `I0` implemented.
↑	`I0␣B…`	…
↑	`I0␣B␣0␣"@"`	Level 0 command [@ ▸ Page 12] (abort) implemented.
↑	`I0␣B␣1␣"D"`	Level 1 command D implemented.
↑	`I0␣B…`	…
↑	`I0␣A␣3␣"SM4"`	Level 3 command [SM4 ▸ Page 87] implemented.

If you need a list of commands including the version of a command, use `I1` [I1 ▸ Page 26].

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.

@ – Abort

To be able to start from a determined state, when establishing the communication between balance and system, you should send an abort command to the balance, see [@ ▸ Page 12]. 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.

METTLER TOLEDO DeltaRange balances

If the fine range of DeltaRange balances has been exceeded at the time of transmission, the balance sends a weight value as balance response in which the tenth character is a space.

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_RL_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 – display unit

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 57]. This enables the displayed unit and info unit to be shown on the terminal. Display unit 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 MX105 has five decimal places, its digit is 0.01 mg. The digit is sometimes used as a generic unit.

USB interface of the balance

If the Microsoft Windows® USB driver is used

Please make sure the balance will not be switched off, is not disconnected from the power and the USB cable is not disconnected during an established USB connection. Otherwise the connection is broken and can not be reestablished easily. To reestablish the connection you need to restart the PC or deactivate and reactivate the connection using the device manager.

See also

- @ – Abort ▸ Page 12
- I0 – Currently available MT-SICS commands ▸ Page 25
- I1 – MT-SICS level and level versions ▸ Page 26
- S – Stable weight value ▸ Page 70
- SI – Weight value immediately ▸ Page 71
- SIR – Weight value immediately and repeat ▸ Page 72
- SIRU – Weight value in display unit immediately and repeat ▸ Page 73
- SIU – Weight value in display unit immediately ▸ Page 74
- SR – Send stable weight value and repeat on any weight change ▸ Page 94
- ST – Stable weight value on pressing (Transfer) key ▸ Page 98
- SU – Stable weight value in display unit ▸ Page 99
- T – Tare ▸ Page 100
- TI – Tare immediately ▸ Page 102
- Z – Zero ▸ Page 109
- ZI – Zero immediately ▸ Page 110
- C – Cancel all commands ▸ Page 13

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 terminal (if one is present), see [I4 ▸ Page 30].

Example

↓	@	Abort
↑	I4␣A␣"B021002593"	Balance is "reset", its serial number is B021002593.

See also

I4 – Serial number ▸ Page 30

C – Cancel all commands

Description

Cancel all running commands.

Syntax

Command

C	Cancel running commands.

Responses

C␣B	The cancel running command has been started.
C␣A	Command understood and executed successfully.

Comments

- This command has a similar functionality as the command [@ ▸ Page 12] but responds with a well defined answer and does not fully reset the device.
- This command is executed always immediately.
- This command cancels all active and pending interface commands correctly and in a safe way on the interface where cancel was requested. This command does not cancel any commands or procedures that are not triggered by a SICS command.
- The command C responds with C␣A after all active and pending interface commands have been terminated.
- This command is typically used for repeating commands such as [SIR ▸ Page 72] and for adjustment commands triggering a procedure.
- New procedures/command requests can be initiated right after a C␣A.

Example

↓	C	Cancel running commands.
↑	C␣B	Cancel running started.
↑	C␣A	Command understood and executed successfully.

Command-specific error responses

Response

C␣E␣<Error>	Current error code.

Parameter of command-specific error

Name	Type	Values	Meaning
<Error>	Integer	0	Error while canceling

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 16]. The unit corresponds to the factory setting of display unit, 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.
		1	Mode = Auto, status display "AutoCal" or "Cal" not activated If a balance setting invokes a trigger because Mode 1 is selected, the status display "AutoCal" or "Cal" will be activated; this means the balance will ask for adjustment.
		2	Mode = Auto, status display "AutoCal" or "Cal" flashes The sensors built into the balance have determined a considerable change in the ambient conditions. The balance requests an adjustment or at least a test, see TST x commands.
<WeightType>	Integer	0	Built-in weight (if available)
		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 16].
<"Unit">	String		The unit corresponds to the factory setting of display unit, e.g., gram (g).

Comments

- Setting <Mode> = 1 and <Weight> = 0 corresponds to the menu setting "ProFACT" / "FACT" under "Adjust/Test". <Mode> = 2 can not be set.
- [C2 ▸ Page 17] is independent of C0.
- The value of the external weight can be changed in the menu of the balance under "Adjust/Test ", see Reference Manual or [M19 ▸ Page 55].
- Use [C1 ▸ Page 16] to start an adjustment defined with C0.
- C0 must be reset manually; [@ ▸ Page 12] 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 16] 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 55
- C2 – Start adjustment with external weight ▸ Page 17

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 14].

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 55] 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 12
- C0 – Adjustment setting ▸ Page 14
- M19 – Adjustment weight ▸ Page 55

C2 – Start adjustment with external weight

Description

Syntax

First Responses

C2␣B	The adjustment procedure has been started.
C2␣I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
C2␣L	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

C2␣<"WeightValue>␣<Unit">	Prompt to unload or load the balance.
C2␣A	Command understood and executed successfully.
C2␣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">	Float		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.

Example

↓	C2	Start the external adjustment.
↑	C2␣B	Adjustment operation started.
↑	C2␣"␣␣␣␣␣␣0.00␣g"	Prompt to unload the balance.
↑	C2␣"␣␣␣␣2000.00␣g"	Prompt to load adjustment weight 2000.00 g.
↑	C2␣"␣␣␣␣␣␣0.00␣g"	Prompt to unload the balance.
↑	C2␣A	Adjustment completed successfully.

See also

- M19 – Adjustment weight ▸ Page 55
- @ – Abort ▸ Page 12
- C – Cancel all commands ▸ Page 13

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.

COM – Parameters of the serial interfaces

Description

You can use this command to define the connection parameters of the serial interfaces (e.g. RS232, RS422).

Syntax

Commands

COM	Query of the existing interface settings.
COM␣<Port>␣<Baud>␣<Bit>␣<HS>	Set parameters of the specified interface to desired values.

Responses

COM␣B␣<Port>␣<Baud>␣<Bit>␣<HS> … COM␣A␣<Port>␣<Baud>␣<Bit>␣<HS>	Current communication parameters.
COM␣A	Command executed successfully.
COM␣I	Command understood but not executable (e.g. update rate is too high for the selected baud rate, see comments).
COM␣L	Command understood but not executable (e.g. parameter incorrect).

Parameters

Name	Type	Values	Meaning
<Port>	Integer	0	Built-in RS232 interface
<Baud>	Integer	2	600 baud
		3	1200 baud
		4	2400 baud
		5	4800 baud
		6	9600 baud (factory setting)
		7	19200 baud
		8	38400 baud
		9	57600 baud
		10	115200 baud
<Bit>	Integer		Bits / Parity / Stop bits
		0	7 / Even / 1
		1	7 / Odd / 1
		2	7 / None / 1
		3	8 / None / 1 (factory setting)
		4	7 / Even / 2
		5	7 / Odd / 2
		6	7 / None / 2
		7	8 / None / 2
<HS>	Integer	0	No handshake (factory setting)
		1	Software handshake (Xoff – Xon controlled protocol)
		2	Hardware handshake (CTS – RTS controlled protocol)

Comments

Examples

↓	COM	Send current settings for interface parameters for all present interfaces.
↑	COM␣B␣0␣6␣3␣0	RS232 is set to 9600 baud, 8 bits, no parity, 1 stop bit, no handshake.

↓	COM␣0␣8␣3␣0	Setting the parameters for the serial interface to 38400 baud, 8 data bits, no parity, 1 stop bit, no handshake.
↑	COM␣A	Parameters successfully set to desired values.

D – Write text to display

Description

Use D to write text to the balance display.

Syntax

Command

D␣<"Text">	Write text into the balance display.

Responses

D␣A	Command understood and executed successfully: Text appears left-aligned in the balance display marked by a symbol, e.g., *.
D␣I	Command understood but currently not executable.
D␣L	Command understood but not executable (incorrect parameter or balance with no display).

Parameter

Name	Type	Values	Meaning
<Text>	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

↓	D␣"HELLO"	Write HELLO into the balance display.
↑	D␣A	The full text HELLO appears in the balance display.

↓	D␣" "	Clear the balance display.
↑	D␣A	Balance display cleared, marked by a symbol, e. g., *.

See also

- DW – Show weight ▸ Page 23
- 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 deivice 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 21] 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 21

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

I0 – Currently available MT-SICS commands

Description

The `I0` 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

`I0`	Send list of all implemented MT-SICS commands.

Responses

`I0␣B␣<Level>␣<"Command">`
`I0␣B␣<Level>␣<"Command">`
`I0␣B`
…
`I0␣A␣<Level>␣<"Command">`
	Number of the MT-SICS level where the command belongs to
	2nd (next) command implemented.
	…
	Last command implemented.

`I0␣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 `I0` 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

↓	`I0`	Send list of commands.
↑	`I0␣B␣0␣"I0"`	Level 0 command `I0` implemented.
↑	`I0␣B…`	…
↑	`I0␣B␣0␣"@"`	Level 0 command [@ ▸ Page 12] (abort) implemented.
↑	`I0␣B␣1␣"D"`	Level 1 command D implemented.
↑	`I0␣B…`	…
↑	`I0␣A␣3␣"SM4"`	Level 3 command [SM4 ▸ Page 87] implemented.

See also

- @ – Abort ▸ Page 12
- C – Cancel all commands ▸ Page 13
- SM4 – Dynamic weighing: Time interval ▸ Page 89

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"> … <V"3">	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"␣"2.00"␣"2.20"␣"1.00"␣"1.50"	Level 0-3 is implemented and the according version numbers are shown.

i Note

The idea behind the MT-SICS level was the standardization of the commands for all METTLER TOLEDO devices. With the MT-SICS levels a simple identification was created to identify a certain set of MT-SICS command (and the functionality behind); see below.

With years of experience and with MT-SICS commands and devices becoming more and more complexes it is no longer possible to maintain the levels and the command behind in the original way. Thus we decided no longer to support the levels in the MT-SICS manuals. Consequently the level version for level 0, 1 and 2 needs to be fixed to a version, version of level 3 has to remain 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 must be defined by the according product team
  For Rainbow examples, Level 3 is fixed to version 2.20

Usually all defined commands at the level of 0…1 were implemented in the devices. This is no longer the case. Therefore, do not expect anymore that all commands of a certain level are implemented.

MT-SICS Levels

Since the 1980s, products launched on the market support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS), which 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:

	@ – Cancel
	I0 – Implemented MT-SICS commands
	I1 – MT-SICS level and level versions
	I2 – Device data
	I3 – Software version and type
	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 – Key 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…, E…, COM, DAT, DATI, ECHO, I…, M…, P…, PWR, R…, SI…, SN…, SM…, SU…, TIM, TS…, UPD, WS, ZS

Commands of MT-SICS Level 3

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

A…, LX…, PW, SM…

See also

I14 – Device information ▸ Page 34

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␣"MS204S␣220.0090␣g"`	Balance type and capacity.

See also

I14 – Device information ▸ Page 34

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)

Comments

- Only the software version of the terminal software is issued.
- If no terminal is present, the bridge software is issued instead.
- More detailed information is available with [I14 ▸ Page 34].

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 34

I4 – Serial number

Description

Use `I4` to query the serial number of the balance terminal.

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

- The serial number agrees with that on the model plate and is different for every balance.
- The serial number can be used, for example, as a device address in a network solution.
- The balance response to `I4` appears unsolicitedly after switching on and after the abort command [@ ▸ Page 12].
- More detailed information is available with [I14 ▸ Page 34].
- Only the serial number of the terminal is issued.
- If no terminal is present, the serial number of the bridge is issued instead.

Example

↓	`I4`	Query of the serial number.
↑	`I4␣A␣"B021002593"`	The serial number is "B021002593".

See also

- @ – Abort ▸ Page 12
- I14 – Device information ▸ Page 34

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 with [I14 ▸ Page 34].
- Only the SW-ID of the terminal is issued.
- If no terminal is present, the SW-ID of the bridge is issued instead.

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 34

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 12].

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 type.

Responses

I11␣A␣<"Model">	Current balance 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 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:
  DU = Dual Range
  /M, /A = Approved balance

Example

↓	I11	Query of the current balance type.
↑	I11␣A␣"MA204"	The balance is an "MA204".

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	<Bridge>	Weighing bridge information corresponding to <No>
		<Terminal>	Balance terminal information corresponding to <No>
		<Option>	Balance option information corresponding to <No>
		<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 (compact balances, bridges with/without terminal etc.)
- 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␣"MA204"	Balance is an "MA204".

↓	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␣"MA204"	Balance is an "MA204".
↑	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 terminal is "1.2.3.4.5".

I35 – Manufacturer text array

Description

This command reads the manufacturer text array by index. The text array can be used by the manufacturer for storing arbitrary data in text form. The entries are limited to 26 characters and there are 32 entries available.

Syntax

Command

I35	Query the complete manufacturer text array.
I35␣Index	Query the manufacturer text array by index.

Responses

I35␣B␣Index␣"Text" I35␣B… I35␣A␣Index␣"Text"	Reads the parameters from the device; all entries.
I35␣Index I35␣A␣Index␣"Text"	Reads the parameters from the device; specific entry.

Parameters

Name	Type	Values	Meaning
<Index>	Unsigned 8 bits	0 … 31	
<Text>	String	Encoding UTF-8	Maximum length is restricted to 8 – 26 chars,i.e., 26 bytes. The text is set by the manufacturer

Comment

- There is a block of 1024 bytes reserved for this data. Due to the overhead of 6 bytes per entry, the total memory of 1024 bytes is exactly consumed [(26 + 6) * 32 = 1024].

Examples

↓	I35	Reads the parameters from the device; all entries.
↑	I35␣B␣0␣"Mettler Toledo" I35␣B1␣"" I35␣B… I35␣A␣31␣""Serv.␣Tel:␣0049 7431␣11␣11	This command returns always the whole array.
↓	I35␣7	Reads the parameters from the device; specific entry. Text with index number 7.
↑	I35␣A␣7␣"Next␣␣Serv.␣Date:␣22.11.99"	Text with index number 7 is "Next Serv. Date: 22.11.99".

I36 – Approval type

Description

This command reads the type of regulation for which the scale is configured. This is just a command to read out for what type of approval the scale or load cell is configured. The configuration for an approval type is done by the set of parameters.

Syntax

Command

I36	Query the type of regulation.

Response

I36␣A␣Approval␣ID	Reads the parameters from the device.

Parameter

Name	Type	Values	Meaning
<Approval>	Unsigned 32 bits; unsed as bitset		Represents the corresponding approval IDs, calculated according to the following formula:
			$Approval = \sum_{selectable\ ApprovalTypes} 2^{Approval\ ID}$
		0	OIML R60
		1	OIML R 76-1
		2	NTEP/NIST Handbook 44
		3	OIML R 51

Comment

- The settings of this command have influence on the SIX* commands. The approval flag of the SIX* commands is set to approved regarding the approval standard and the unit used. However not all the necessary type data settings are done by setting this command to a certain value. For example, the minimum load has to be set by an other command even if a certain approval type implies a specific value.

Example

↓	I36A	Reads the parameters from the device.
↑	I36␣A␣3	The device is declared to be configured for approval according to OIML R 51.

I37 – Scale range configuration

Description

Based on the settings of range change behavior, the number of ranges defined and anchor points of the fine ranges, the load cell or device can determine which range configuration is set. This command returns the range configuration defined within the load cell or device.

Syntax

Command

I37	Query the range configuration defined within the load cell or device.

Response

I37␣A␣RangeID	Reads the parameters from the device.

Parameter

Name	Type	Values	Meaning
<RangeID>	Unsigned 16 bits; reprresents the range configu-ration of the scale	0	SR = Single Range
		1	DR = Dual Range (laboratory only)
		2	MR = Multiple Range
		3	MI = Multi-Interval (including Dual-Interval Industry and DeltaRange® Laboratory)

Comment

- The command is needed for the terminal to decide whether the range number has to be displayed or not:
  - MR: range number has to be displayed.
  - MI: range number is not important to display.

Examples

↓	I37	Reads the parameters from the device.
↑	I37␣A␣2	Answer of a MR scale
↓	I37	Reads the parameters from the device.
↑	I37␣A␣0	Answer of a SR scale
↓	I37	Reads the parameters from the device.
↑	I37␣I␣0	Answer of a scale with a non-standard configuration

I38 – Type label range definitions

Description

Use `I38` to returns a set of information for each range/interval. All values are given in definition unit.

Syntax

Commands

`I38`	Query the information for each range/interval.
`I38␣Range`	Query the range/interval.

Responses

`I38␣B␣Range␣Min`$_N$`␣Max`$_N$`␣D␣E␣Class␣Unit`
`I38␣B…`
`I38␣A␣Range␣Min`$_N$`␣Max`$_N$`␣D␣E␣Class␣Unit`
	Set the information for each range/interval.

Parameters

Name	Type	Values	Meaning
`<Range>`	Integer		Range/interval numbering according to OIML R76 and NTEP/NIST Handbook 44
		`1`	1st range of device (range with smallest capacity)
		`2`	2nd range of device range/interval
`<Min`$_N$`>`	String		Minimum load for this range according to OIML R76 and NTEP/NIST Handbook 44
`<Max`$_N$`>`	String		Nominal maximum weight for this range
`<D>`	String		Display step for this range
`<E>`	String		Approved step for this range
`<Class>`	String	`0 … 5`	Accuracy class 0 = not approved 1 = Accuracy class I 2 = Accuracy class II 3 = Accuracy class III 4 = Accuracy class IIII 5 = Accuracy class III L only for NTEP/NIST Handbook 44 (20, section 2.20)
`<Unit>`	String		The unit used for this command is the definition unit

Comment

- All formatted values have the same number of decimal places as the smallest display step d.

Examples

↓	`I38`	Query the current information for multi range device class III and definition unit in g.
↑	`I38␣B␣1␣␣␣␣␣␣␣20.0␣␣␣␣␣␣300.0␣␣␣␣␣␣␣␣0.1␣␣␣␣␣␣␣␣1.0␣0␣g`	Range 1: 0 g to 300 g d = 0.1 g e = 1 g, not approved.
↑	`I38␣B␣2␣␣␣␣␣␣␣20.0␣␣␣␣␣3000.0␣␣␣␣␣␣␣␣1.0␣␣␣␣␣␣␣␣1.0␣0␣g`	Range 2: 0 g to 3000 g d = 1 g e = 1 g, not approved.
↑	`I38␣A␣3␣␣␣␣␣␣␣40.0␣␣␣␣␣6000.0␣␣␣␣␣␣␣␣2.0␣␣␣␣␣␣␣␣2.0␣0␣g`	Range 3: 0 g to 6000 g d = 2 g e = 2 g, not approved.

↓	I38	Query the current information for multi interval device class III and definition unit in kg.
↑	I38␣B␣1␣␣␣␣␣␣␣2.0␣␣␣␣␣␣␣60.0␣␣␣␣␣␣␣ 0.02␣␣␣␣␣␣␣0.10␣1␣kg	Range 1: 0 kg to 60 kg d = 0.02 kg e = 0.1 kg, accuracy class I.
↑	I38␣B␣2␣␣␣␣␣␣␣60.0␣␣␣␣␣␣␣300.0␣␣␣␣␣␣␣ 0.10␣␣␣␣␣␣␣0.10␣1␣kg	Range 2: 60 kg to 300 kg d = 0.1 kg e = 0.1 kg, accuracy class I.
↑	I38␣A␣3␣␣␣␣␣␣300.0␣␣␣␣␣␣␣600.0␣␣␣␣␣␣␣ 0.20␣␣␣␣␣␣␣0.20␣1␣kg	Range 3: 300 kg to 600 kg d = 0.2 kg e = 0.2 kg, accuracy class I.

↓	I38	Query the current information for multi interval device class II and definition unit in g.
↑	I38␣B- ␣1␣␣␣␣␣0.0200␣␣␣␣20.0000␣0.0002␣␣␣␣␣ 0.0010␣2␣g	Range 1: 0 g to 20 g d = 0.0002 g e = 0.001 g, accuracy class II.
↑	I38␣B␣2␣␣␣␣␣20.0000␣␣␣␣50.0000␣␣␣␣␣ 0.0005␣␣␣␣␣0.0010␣2␣g	Range 2: 20 g to 50 g d = 0.0005 g e = 0.001 g, accuracy class II.
↑	I38␣A␣3␣␣␣␣50.0000␣␣␣100.0000␣␣␣␣␣ 0.0010␣␣␣␣␣0.0010␣2␣g	Range 3: 50 g to 100 g d = 0.001 g e = 0.001 g, accuracy class II.

↓	I38	Query the current information for dual range device class III and definition unit in g.
↑	I38␣B␣1␣␣␣␣␣␣␣20␣␣␣␣␣␣3000␣␣␣␣␣␣␣␣␣ 1␣1␣3␣g	Range 1: 0 g to 3000 g d = 1 g e = 1 g, accuracy class III.
↑	I38␣A␣2␣␣␣␣␣␣40␣␣␣␣␣60000␣␣␣␣␣␣␣␣␣ 2␣2␣3␣g	Range 3: 0 g to 6000 g d = 2 g e = 2 g, accuracy class III.

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 model of the device.

Syntax

Command

I51	Query of the power-on time.

Responses

I51␣A␣<Days>␣<Houre>␣<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
<Houre>	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.

I59 – Get initial zero information

Description

If a weighing device is starting up it is supposed to perform an initial zero operation before any weight values can be obtained from the device. If someone wants to obtain weight values before the initial zero operation has been successfully performed the device refuses to send weight values. In order to successfully perform the initial zero operation the load on the weight receptor must be within the switch on range limits. In the case where the initial zero operation can't be performed successfully the user gets no information if the switch on range limits are exceeded or not. This command is used to determine if currently an initial zero operation is in progress and if the switch on range limits are exceeded or not.

Syntax

Command

`I59`	Query the initial zero information.

Response

`I59␣A␣<InitZero>␣<LoadState>`	Current Initial information.

Parameters

Name	Type	Values	Meaning
`<InitZero>`	Integer	`0 … 2`	Indicates whether an initial zero operation is in progress or not
		`0`	Undefined e.g. If initial zero operation not started
		`1`	Initial zero operation in progress
		`2`	Initial zero operation done
`<LoadState>`	Integer	`+`	Load above upper switch on range limit
		`-`	Load below lower switch on range limit
		`S`	Load within switch on range limits and stable
		`D`	Load within switch on range limits and unstable
		`0`	Undefined – If the parameter "InitZero" equals to 0 or 2 the parameter "LoadState" always equals to undefined

Comment

- If a zero value and an initial zero value have been saved with the M35 command the initial zero value is restored from the saved initial zero value. The answer in this case will be `I59␣A␣2␣0`.

Examples

↓	`I59`	Query the initial zero information.
↑	`I59␣A␣1␣+`	The initial zero operation is in progress and the load is above the upper switch on range limit.

↓	`I59`	Query the initial zero information.
↑	`I59␣A␣1␣-`	The initial zero operation is in progress and the load is below the lower switch on range limit.

↓	`I59`	Query the initial zero information.
↑	`I59␣A␣1␣D`	The initial zero operation is in progress, the load is within the switch on range limits and unstable.

↓	I59	Query the initial zero information.
↑	I59␣A␣0␣0	The initial zero state is undefined.

↓	I59	Query the initial zero information.
↑	I59␣A␣2␣0	The initial zero operation has been successfully performed.

I65 – Total operating time

Description

This command reads the device total operation time.

Syntax

Command

I65	Query of total operating time.

Responses

I65␣A␣<Day>␣<Hour>	Current operating time.
I65␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<Day>	Integer		Operating time days
<Hour>	Integer	0 … 23	Operating time hours

Comment

- Every full minute the microprocessor is running will be counted as operating time. This is also done during standby.

Example

↓	I65	Query of total operating time.
↑	I65␣A␣456␣3	Device has been in operation for 456 days and 3 hours.

I66 – Total load weighed

Description

This command reads the device total load weighed. Every weight in all modes is counted.

Syntax

Command

I66	Query of total load weighed.

Responses

I66␣A␣<TotalWeight>␣<Unit>	Current total load weighed.
I66␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<TotalWeight>	Float		Total of all loads weighed in the definition unit
<Unit>	String		Definition unit

Comments

- The total load is increased every time an active MT-SICS [SNR ▸ Page 90] command with no preset value would send a stable weight.
- All values are added as absolute values.

Example

↓	I66	Query of total load weighed.
↑	I66␣A␣4455.41592␣g	The total load weighed is 4455.41592 g.

See also

I67 – Total number of weighings ▸ Page 46

I67 – Total number of weighings

Description

This command reads the device total number of weighings. Every weighing in all modes is counted.

Syntax

Command

I67	Query of total number of weighings.

Responses

I67␣A␣<WeighingNo>	Current number of weighings.
I67␣I	Command understood but currently not executable.

Parameter

Name	Type	Values	Meaning
<WeighingNo>	Integer		Number of weighings

Comment

- The total number of weighings is increased every time an active MT-SICS [SNR ▸ Page 90] command with no preset value would send a stable weight.

Example

↓	I67	Query of total number of weighings.
↑	I67␣A␣1234	The total number of weighing is 1234.

See also

I66 – Total load weighed ▸ Page 45

I68 – Total backlight operating time

Description

This command reads the device total backlight operation time. Every backlight operating time in all modes is counted.

Syntax

Command

I68	Query of total backlight operating time.

Responses

I68␣A␣<Day>␣<Hour>	Current operating time.
I68␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<Day>	Integer		Backlight operating time days
<Hour>	Integer	0 … 23	Backlight operating time hours

Example

↓	I68	Query of total backlight operating time.
↑	I68␣A␣456␣3	Backlight has been in operation for 456 days and 3 hours.

I69 – Service provider address ASCII

Description

Address and phone number of service provider. Only printable ASCII characters are admissible.

Syntax

Commands

I69	Query the address and phone number of service provider.
I69␣<Line>␣<"Text">	Query the text from line.

Responses

I69␣B␣0␣<"Text">	Current text of line 0.
I69␣B␣1␣<"Text">	Current text of line 1.
I69␣B␣2␣<"Text">	Current text of line 2.
I69␣B␣3␣<"Text">	Current text of line 3.
I69␣B␣4␣<"Text">	Current text of line 4.
I69␣B␣5␣<"Text">	Current text of line 5.
I69␣B␣6␣<"Text">	Current text of line 6.
I69␣A␣7␣<"Text">	Current text of line 7.
I69␣A␣No␣<"Text">	Current text of line No.
I69␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<Line>	Integer	0 … 7	Text line number
<"Text">	String	Max 40 chars	Service provider address information

Examples

↓	I69	Query the address and phone number of service provider.
↑	I69␣B␣0␣"Mettler-Toledo␣GmbH"	The text of line 0 is "Mettler-Toledo GmbH".
↑	I69␣B␣1␣"Im␣Langacher␣44"	The text of line 1 is "Im Langacher".
↑	I69␣B␣2␣"8606␣Greifensee"	The text of line 2 is "8606 Greifensee".
↑	I69␣B␣3␣"044␣944␣45␣45"	The text of line 3 is "044 944 45 45".
↑	I69␣B␣4␣""	The text of line 4 is not defined.
↑	I69␣B␣5␣""	The text of line 5 is not defined.
↑	I69␣B␣6␣""	The text of line 6 is not defined.
↑	I69␣A␣7␣""	The text of line 7 is not defined.

↓	I69␣2	Query the text from line 2.
↑	I69␣A␣2␣"8606␣Greifensee"	The text of line 2 is "8606 Greifensee".

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

K␣<Mode>	Set configuration.

Responses

K␣A[␣<FunctionID>]	Command understood and executed successfully. Mode 4: Function with <FunctionID> was invoked by pressing the corresponding key and executed successfully.
K␣I[␣<FunctionID>]	Command understood but currently not executable (balance is actually in menu or input mode). Mode 4: Function with <FunctionID> 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).
K␣L	Command understood but not executable (incorrect or no parameter).

Additional Responses in Mode 3:

K␣<EventID>␣<KeyID>	Key <KeyID> has issued an <EventID>.

Additional Responses in Mode 4:

K␣B␣<FunctionID>	Function with <FunctionID> was invoked and started; the execution needs time to complete.

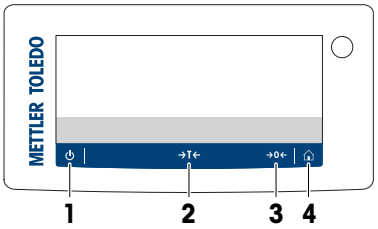
Parameters

Name	Type	Values	Meaning
<Mode>	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
<EventID>	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

<KeyID>	Integer	1	⏻	Switches the balance on or off
		2	→T←	Tares the balance
		3	→0←	Zeros the balance
		4	⌂	Returns from any menu level, or other window to the application home screen

- K␣1 is the factory setting (default value).
- K␣1 active after balance switched on and after the abort command [@ ▸ Page 12].
- Only one K 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).

M01 – Weighing mode

Description

Use M01 to set the weighing mode or query the current setting.

Syntax

Commands

M01	Query of the current weighing mode.
M01␣<WeighingMode>	Set the weighing mode.

Responses

M01␣A␣<WeighingMode>	Current weighing mode.
M01␣A	Command understood and executed successfully.
M01␣I	Command understood but currently not executable.
M01␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<WeighingMode>	Integer	0	Normal weighing mode
		1	Sensor mode

Comment

- Check possible settings with product-specific Reference Manual.

Example

↓	M01	Query of the current weighing mode.
↑	M01␣A␣1	Sensor mode is set.

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	0	Very stable
		1	Stable
		2	Standard
		3	Unstable
		4	Very 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.

M11 – Key beeper volume

Description

Use M11 to set the volume of the key beeper or query the current setting.

Syntax

Commands

M11	Query of the current beeper volume.
M11␣<BeeperVolume>	Set the beeper volume.

Responses

M11␣A␣<BeeperVolume>	Current key beeper volume.
M11␣A	Command understood and executed successfully.
M11␣I	Command understood but currently not executable.
M11␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<BeeperVolume>	Integer	0 … 100	Key beeper volume in %

Comment

- The parameter setting will be saved. The only way to reset the default value will be via MT-SICS or by means of a balance user reset.

Examples

↓	M11	Query of the current key beeper volume.
↑	M11␣A␣60	The key beeper volume is 60%.

↓	M11␣80	Set the key beeper volume to 80%.
↑	M11␣A	The key beeper volume is set to 80%.

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 to 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 17] to begin the adjustment procedure with the set weight.
- Before a custom unit can be selected with M21, it must be set with M22.

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 14
- C1 – Start adjustment according to current settings ▸ Page 16
- C2 – Start adjustment with external weight ▸ Page 17

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 104] to begin the test procedure with the set weight.

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

TST2 – Test with external weight ▸ Page 104

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	MT-SICS unit
		1	Display unit
		2	Info unit

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 ▸ Page 60]

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 display unit and info unit settings are reconfigured according to the menu settings.
- At startup the MT-SICS unit and the display unit are set according to the display unit menu setting.
- 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 MT-SICS unit is g. Current display unit is g. Current display unit is g. Current info unit 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 in display unit ▸ Page 99

M22 – Custom unit definitions

Description

You can use M22 to set your own custom unit or query the currently defined custom unit.

Syntax

Commands

M22	Query of the current custom unit definitions.
M22␣<No>␣<Formula>␣<Factor>␣<Unit>␣<Rounding>	Set the custom unit(s).

Responses

M22␣B␣<No>␣<Formula>␣<Factor>␣<Unit>␣<Rounding> M22␣B… M22␣A␣<No>␣<Formula>␣<Factor>␣<Unit>␣<Rounding>	Current first custom unit. … Current last custom unit.
M22␣A	Command understood and executed successfully.
M22␣I	Command understood but currently not executable.
M22␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<No>	Integer	1 … 2	Custom display unit .. info unit
<Formula>	Integer	0	(net weight) x factor
		1	factor/(net weight)
<Factor>	Float		Factor
<Unit>	String	""	Unit name
<Rounding>	Float		Rounding step

Comments

- The lower limit of the adjustment weight set with M19 is the lowest possible adjustment weight (I54␣Min).
- Use [C2 ▸ Page 17] to begin the adjustment procedure with the set weight.
- Before a custom unit can be selected with M21, it must be set with M22.

Example

↓	M22	Query of the current custom unit definitions.
↑	M22␣A␣1␣0␣15.5␣""␣0.05	The custom unit is (net weight) x 15.5, rounded to 0.05.

See also

M21 – Unit ▸ Page 57

M23 – Readability, 1d/xd

Description

Use M23 to set how many digits of the weighing result should be displayed or output and whether the value should be rounded, or to query the current value setting.

Syntax

Commands

M23	Query of the current readability.
M23␣<Readability>	Set the readability.

Responses

M23␣A␣<Readability>	Current readability.
M23␣A	Command understood and executed successfully.
M23␣I	Command understood but currently not executable.
M23␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Readability>	Integer	0	1d
		1	10d
		2	100d
		3	1000d
		4	2d
		5	5d

Comments

- It is the balance model that determines which parameters can be changed.
- The custom unit [M22 ▸ Page 60] will not be changed with the M23 command.
- M23 has no influence of the stability criteria for the [taring ▸ Page 100] and [zeroing ▸ Page 109] commands.
- The readability is specified in digits [d] – this is the smallest increment a balance may display.
- The parameter setting will be saved and the only way to set the default behavior is sent MT-SICS command M23␣0 not [@ ▸ Page 12].
- If the resulting display step has an unusual value it is changed to the nearest normal display step (1, 2, 5 etc.).
  Example: d = 0.02 g, readability = 2d, the resulting display step would be 0.04 g which is changed to 0.05 g.
- The readability reduction is applied to the display step of the finest range. The steps of the coarser ranges are only adapted if they would be smaller than the step of the finest range. Example:

	1d	5d	10d
Fine range resolution	0.1 g	0.5 g	1 g
Coarse range resolution	0.5 g	0.5 g	1 g

Example

↓	M23	Query the readability.
↑	M23␣A␣4	The readability is 2d.

↓	M23␣1	Set the readability to 10d.

↑	M23_A	The readability is set to 10d.

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.

Examples

↓	M26	Query of the current application.
↑	M26␣A␣2	The application is Percent.

↓	M26␣3	Set the application number 3.
↑	M26␣A	Application 3 is set.

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">	1st 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␣""	1st adjustment, performed at 1.1.2011, 08:26 h, internal adjustment.
↑	M27␣B␣2␣14␣12␣2010␣14␣30␣1␣"200.1234␣g"	2nd 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"	3rd adjustment, performed at 14.12.2010, 08:26 h, external adjustment, weight 200.1234 g.

M29 – Weighing value release

Description

Use M29 to define the weight value release or query the current setting.

Syntax

Commands

M29	Query of the current value release setting.
M29␣<ValueRelease>	Set the value release.

Responses

M29␣A␣<ValueRelease>	Current value release.
M29␣A	Command understood and executed successfully.
M29␣I	Command understood but currently not executable.
M29␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<ValueRelease>	Integer	0	Very fast
		1	Fast
		2	Reliable and fast
		3	Reliable
		4	Very reliable

Comment

- Not all balances offer the complete range of settings. If a setting is made that is not supported by the balance, an error massage is issued (M29␣L).

Example

↓	M29␣3	Set the value release to reliable.
↑	M29␣A	The value release is set to reliable.

M30 – Check weighing definition

Description

Use M30 to set the check weighing definition with nominal and tolerance.

Syntax

Commands

M30	Query of check weighing parameters.
M30␣<Nom>␣<Unit>␣<Tol>	Set check weighing parameters.

Responses

M30␣A␣<Nom>␣<Unit>␣<Tol>	Check weighing parameters.
M30␣A	Command understood and executed successfully.
M30␣I	Command understood but currently not executable.
M30␣L	Command understood but not executable (incorrect parameter, value range, ...).

Parameters

Name	Type	Values	Meaning
<Nom>	Integer	1 digit – max. load	Nominal weight
<Unit>	String		Unit of nominal weight
<Tol>	Integer		+/- tolerance in % (of nominal weight)

Examples

↓	M30	Query of check weighing parameters.
↑	M30␣12.5␣g␣2.5	Check weighing with nominal weight 12.5 g and a tolerance of 2.5% set.

↓	M30␣175.2␣g␣4.0	Set the check weighing definition to 175.2 g and a tolerance of 4.0%.
↑	M30␣A	Check weighing definition to 175.2 g and tolerance of 4.0% is set.

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

PW	Query of the piece weight for the piece counting application.
PW␣<SinglePiece>␣<Unit>	Set the piece weight for the according value. The unit should correspond to the unit actually set under display unit.

Responses

PW␣A␣<SinglePiece>␣<Unit>	Current piece weight value in unit actually set under display unit.
PW␣A	Command understood and executed successfully.
PW␣I	Command understood but currently not executable (e.g., piece counting application is not active or balance is currently executing another command).
PW␣L	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 70] commands in display unit such as [SU ▸ Page 99], [SIU ▸ Page 74], after the piece weight reference has been set by PW.
- To change the unit of the interface to pieces, use the command [M21 ▸ Page 57].

Example

↓	PW␣20.00␣g	Set the piece weight of the piece counting application to 20.00 g.
↑	PW␣A	Piece weight value is set.

See also

- M21 – Unit ▸ Page 57
- SU – Stable weight value in display unit ▸ Page 99
- SIU – Weight value in display unit immediately ▸ Page 74

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

PWR␣<OnOff>	Switch the balance on or off.

Responses

PWR␣A	Balance has been switched off successfully.
PWR␣A␣ I4␣A␣<"SNR">	Balance with the serial number "SNR" has been switched on successfully see [I4 ▸ Page 30].
PWR␣I	Command understood but currently not executable (balance is currently executing another command, e.g., taring, or application is not in Home screen).
PWR␣L	Command understood but not executable.

Parameter

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

Comments

- The balance response to [I4 ▸ Page 30] 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

↓	PWR␣1	Switch the balance on.
↑	PWR␣A	The balance has been switched on successfully.
↑	I4␣A␣"0123456789"	The serial number is shown.

See also

I4 – Serial number ▸ Page 30

R01 – Restart device

Description

Restarts the device. This is a warm start.

Syntax

Command

R01	Restart the device.

Response

I4␣A␣<"SerialNumber"> (or equivalent startup response)	Startup response of the device.

Parameter

Name	Type	Values	Meaning
I4␣A␣<"SerialNumber">			Startup response after the device has restarted

Comments

- If the mapping of the serial interface is 'MT-SICS Printer 24': Command R01 response ---- METTLER TOLEDO ---- the software has been restarted.
- This command must not be confused with M38. M38 modifies parameters whereas R01 does not.

Example

↓	R01	Restart the device.
↑	I4␣A␣"B001000001"	The software has been restarted. The serial number of the device is B001000001.

S – Stable weight value

Description

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

Syntax

Command

S	Send the current stable net weight value.

Responses

S␣S␣<WeightValue>␣<Unit>	Current stable weight value in unit actually set under display unit.
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␣+	Balance in overload range.
S␣-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<WeightValue>	Float		Weight value
<Unit>	String		Currently set display 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 99].

Example

↓	S	Send a stable weight value.
↑	S␣S␣␣␣␣100.00␣g	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 the display unit, from the balance to the connected communication partner via the interface.

Syntax

Command

SI	Send the current net weight value, irrespective of balance stability.

Responses

S␣S␣<WeightValue>␣<Unit>	Stable weight value in unit actually set under display unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under display 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 set display unit

- The balance response to the command SI with the last built-in weight value (stable or dynamic) before receipt of the command SI.
- To send weight value immediately in actually displayed unit, see [SIU ▸ Page 74].
- 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

↓	SI	Send current weight value.
↑	S␣D␣␣␣␣129.07␣g	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 the display unit, from the balance to the connected communication partner via the interface, but this time on a continuous basis.

Syntax

Command

SIR	Send the net weight values repeatedly, irrespective of balance stability.

Responses

S␣S␣<WeightValue>␣<Unit>	Stable weight value in unit actually set under display unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under display 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 set display unit

- The number of weight values per second can be configured using [UPD ▸ Page 108].
- SIR is overwritten by the commands [S ▸ Page 70], [SI ▸ Page 71], [SR ▸ Page 94], [@ ▸ Page 12] and hardware break and hence cancelled.
- To send weight value in actually displayed unit, see [SIRU ▸ Page 73].
- This command is cancelled by the [@ ▸ Page 12], [S ▸ Page 70], [SI ▸ Page 71], [SIRU ▸ Page 73], [SIU ▸ Page 74], [SNR ▸ Page 90], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] commands.

Example

↓	SIR	Send current weight values at intervals.
↑	S␣D␣␣␣␣129.07␣g	The balance sends stable ("S") or unstable ("D") weight values at intervals.
↑	S␣D␣␣␣␣129.08␣g	
↑	S␣S␣␣␣␣129.09␣g	
↑	S␣S␣␣␣␣129.09␣g	
↑	S␣D␣␣␣␣114.87␣g	
↑	S␣…	

See also

UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 108

SIRU – Weight value in display unit immediately and repeat

Description

Request current weight value in display unit independent of the stability and repeat sending responses until the command is stopped.

Syntax

Command

SIRU	Requests the current weight value and repeat.

Responses

S␣S␣<WeightValue>␣<Unit>	Stable weight value in unit actually set under display unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under display 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 set display unit

Comments

- As the [SIR ▸ Page 72] command, but with currently displayed unit.
- The number of weight values per second can be configured using [UPD ▸ Page 108].
- This command is cancelled by the [@ ▸ Page 12], [S ▸ Page 70], [SI ▸ Page 71], [SIRU ▸ Page 73], [SIU ▸ Page 74], [SNR ▸ Page 90], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] 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 72
- UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 108

SIU – Weight value in display unit immediately

Description

Request current weight value in display unit independent of the stability.

Syntax

Command

SIU	Request the current weight value in display unit.

Responses

S␣S␣<WeightValue>␣<Unit>	Stable weight value in unit actually set under display unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under display 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 set display unit

Comments

- As the [SI ▸ Page 71] command, but with currently displayed unit.

Example

↓	SIU	Requests the current weight value in display unit independent of the stability.
↑	S␣D␣␣␣␣␣12.34␣lb	Non-stable (dynamic) weight value is 12.34 lb.

SIX1 – Current gross, net, tare values

Description

This command is intended to provide complete weighing information for a variety of applications. To provide complete weight information to the terminal or host software, several status flags are provided beside gross, net and tare value.

Syntax

Command

SIX1	Query the weighing information.

Responses

SIX1␣A␣<Sts>␣<MinW>␣<CoZ>␣<Rep>␣<Calc>␣<PosE>␣<StepE>␣<MarkE>␣<Range>␣<TM>␣<G>␣<N>␣<T>␣<Unit>	Current weighing information.
SIX1␣I	The request could not be served because the state of the device did not allow it.

Parameters

Name	Type	Values	Meaning
<Sts>	Char		Status of the weighing, linked to the net value
		S	Stable weight
		D	Dynamic weight (unstable, not accurate)
		+	Overload
		-	Underload
		I	Invalid value
<CoZ>	Char		Center of zero status
		Z	+/- ¼ e around gross zero
		N	Outside the limits of +/- ¼ e around gross zero
<Rep>	Char		Repeating indicator
		R	Repeated value (was already sent once or more times)
		N	New weight update (new computed weight value)
<Calc>	Char		Calculation method indicator
		R	Net, tare and gross values are rounded separately
		C	Gross is calculated based on rounded net and rounded tare
<PosE>	Integer		Position of the approved digit e relative to base resolution (smallest digit d). Blanked digits (at the end) are counted. This parameter can be used on terminals to set the approval brackets at the correct position
		0	Not approved
		1	Approved, last digit is approved (no brackets)
		2	Approved, second last digit is approved
		3	Approved, third last digit is approved
		4	approved, fourth last digit is approved
		5	Approved, fifth last digit is approved

Name	Type	Values	Meaning
<StepE>	Integer		Step of the approved digit
		0	Not approved
		1	Step of e is 1
<Range>	Integer	1 … n	Range/interval number of the net value. Numbering according OIML/NIST range numbering scheme (n is product dependent, maximum 9)
		1	Single range
		1, 2, …, n	Multi range: range is linked to gross value
		1, 2, …, n	Multi interval: range is linked to net value
<TM>	Char		Tare mode (no tare, manual tare, measured tare)
		N	No tare
		M	Measured tare
<G>	String		Gross value
<N>	String		Net value rounded for actual range step
<T>	String		Tare value rounded for actual range step
<Unit>	String		The unit used for this command is the definition host unit The unit can be selected by using the [M21 ▸ Page 57] command.

Examples

↓	SIX1	Query the current information for multi interval (see OIML R76-1 2006), device class II and gross is calculated (G = N + T). 1. Range 0 g to 3510 g, e = 10d = 0.1 g, (e = approved, d = display). 2. Range 3510 g to 7020 g, e = d = 0.1 g. 3. Range 7020 g to 35100 g, e = d = 1 g.
↑	SIX1␣S␣0␣N␣N␣C␣2␣1␣0␣1␣M␣␣␣␣ 1496.33␣␣␣␣621.67␣␣␣␣␣874.66␣g	Reads the parameters from the device (G = 1496.324 g, N = 621.665 g, T = 874.659 g). This example shows an stable weight with a calculated gross value. The tare is measured. The displayed gross value, which is the exact sum of the rounded net and rounded tare, does not always fulfill the rounding rules. This behavior is indicated by the "C" in the flags.
↑	SIX1␣D␣0␣N␣R␣C␣2␣1␣0␣2␣P␣␣␣␣8496.36 ␣␣␣␣␣6621.7␣␣␣␣1874.66␣g	Reads the parameters from the device (G = 8496.324 g, N = 6621.665 g, T = 1874.659 g). This example shows an unstable weight with a calculated gross value. Differently to the previous example, this update was sent already over the interface. This time the tare is preset and the net weight is in range 2. This explains the missing second decimal place in net value. All the same, the gross value has 2 decimal places to be able to display the exact addition of the net and tare values. It can be shown again that the calculated gross value does not need to fulfill any rounding rules regarding the exact gross value.

↑	SIX1␣D␣0␣N␣N␣C␣3␣1␣0␣3␣M␣␣␣12496.66 ␣␣␣␣␣10622␣␣␣␣1874.66␣g	Reads the parameters from the device (G = 12496.324 g, N = 10621.665 g, T = 1874.659 g). Now the net weight is in range 3. Now no decimal place is present at the net value. As above, the calculated gross value does not need to fulfill any rounding rules.
↑	SIX1␣D␣0␣Z␣N␣C␣2␣1␣0␣1␣N␣␣␣␣␣␣␣0.00 ␣␣␣␣␣␣␣0.00␣␣␣␣␣␣␣0.00␣g	Reads the parameters from the device (G = 0.0024 g, N = 0.0024 g, T = 0.0000 g). This example shows the "center of zero" feature indicated by the "Z" in the command. It shows as well that the "center of zero" does not rely on stable values.
↑	SIX1␣S␣0␣N␣N␣C␣2␣1␣0␣1␣M␣␣␣␣1234.27 ␣␣␣␣-888.97␣␣␣␣2123.24␣g	Reads the parameters from the device (G = 1234.264 g, N = -888.971 g, T = 2123.235 g). This example shows how negative values are handled and displayed.

↓	SIX1	Query the current information for multi range (see OIML R76-1 2006), device class III and gross is calculated (G = N + T). 1. Range 0 g to 3000 g, e = d = 1 g, (e = approved, d = display). 2. Range 0 g to 6000 g, e = d = 2 g. 3. Range 0 g to 15100 g, e = d = 5 g.
↑	SIX1␣S␣0␣N␣N␣C␣1␣1␣0␣1␣M␣␣␣␣␣␣␣736 ␣␣␣␣␣␣␣533␣␣␣␣␣␣␣203␣g	Reads the parameters from the device (G = 735.38 g, N = 532.63 g, T = 202.75 g). This example shows an stable weight with a calculated gross value. The tare is measured. The displayed gross value, which is the exact sum of the rounded net and rounded tare, does not always fulfill the rounding rules. This behavior is indicated by the "C" in the flags. Different to the examples above, these have no decimal places and the configuration is multi range.
↑	SIX1␣D␣0␣N␣R␣C␣1␣5␣0␣3␣P␣␣␣␣␣␣7500 ␣␣␣␣␣␣5225␣␣␣␣␣␣2275␣g	Reads the parameters from the device (G = 7496.33 g, N = 5223.62 g, T = 2272.71 g). This weight update was sent before (indicated by "R") and the device is in range 3. This implies that all values have now step 5. Even so, this example demonstrates that the calculated gross value does not always conform the rounding rule. This time the tare was preset.
↑	SIX1␣D␣0␣Z␣N␣C␣1␣1␣0␣1␣N␣␣␣␣␣␣␣␣␣0 ␣␣␣␣␣␣␣␣␣0␣␣␣␣␣␣␣␣␣0␣g	Reads the parameters from the device (G = 0.24 g, N = 0.24 g, T = 0.00 g). This example shows the "center of zero" feature indicated by the "Z" in the command. It shows as well that the "center of zero" does not rely on stable values.
↑	SIX1␣S␣0␣N␣N␣C␣1␣5␣0␣3␣M␣␣␣␣␣␣4040 ␣␣␣␣␣-2405␣␣␣␣␣␣6445␣g	Reads the parameters from the device (G = 4042.53 g, N = -2402.71 g, T = 6445.24 g). This example shows how negative values are handled and displayed.
↑	SIX1␣I	The request could not be served because the state of the device did not allow it.
↑	SIX1␣+	The request could not be served because of overload.

See also

- M21 – Unit ▸ Page 57
- I38 – Type label range definitions ▸ Page 39
- T – Tare ▸ Page 100
- M21 – Unit ▸ Page 57

SIX3 – Current gross, net, tare, HighResNet, MaxResNet values

Description

This command is intended to provide complete weighing information for a variety of applications. To provide complete weight information to the terminal or host software, several status flags are provided beside gross, net, tare, high resolution net and maximum resolution net value. The unit of this command is the host unit.

Syntax

Command

SIX3	Query the weighing information.

Responses

SIX3␣<Sts>␣<MinW>␣<CoZ>␣<Rep>␣<Calc>␣ <PosE>␣<StepE>␣<MarkE>␣<Range>␣<TM>␣<G>␣ <N>␣<T>␣<HrSts>␣<HR>␣<MR>␣<Unit>	Current weighing information.
SIX3␣I	The request could not be served because the state of the device did not allow it.

Parameters

Name	Type	Values	Meaning
<Sts>	Char		Status of the weighing, linked to the net value
		S	Stable weight
		D	Dynamic weight (unstable, not accurate)
		+	Overload
		-	Underload
		I	Invalid value
<MinW>	Integer		MinWeigh status
		0	MinWeigh function is inactive
		1	Below MinWeigh limit. Relative accuracy is bad
		2	Above MinWeigh limit. Minimum relative accuracy is guaranteed
<CoZ>	Char		Center of zero status
		Z	+/- ¼ e around gross zero
		N	Outside the limits of +/- ¼ e around gross zero
<Rep>	Char		Repeating indicator
		R	Repeated value (was already sent once or more times)
		N	New weight update (new computed weight value)
<Calc>	Char		Calculation method indicator
		R	Net, tare and gross values are rounded separately
		C	Gross is calculated based on rounded net and rounded tare

Name	Type	Values	Meaning
<PosE>	Integer		Position of the approved digit e relative to base resolution (smallest digit d). Blanked digits (at the end) are counted. This parameter can be used on terminals to set the approval brackets at the correct position
		0	Not approved
		1	Approved, last digit is approved (no brackets)
		2	Approved, second last digit is approved
		3	Approved, third last digit is approved
		4	approved, fourth last digit is approved
		5	Approved, fifth last digit is approved
<StepE>	Integer		Step of the approved digit
		0	Not approved
		1	Step of e is 1
		2	Step of e is 2
		5	Step of e is 5
<MarkE>	Integer		This flag indicates whether the weight value has to be marked as "not approved". A possible indication could be an asterisk
		0	No special indication needed
		1	Special indication (e.g. asterisk) has to be displayed
<Range>	Integer	1 … n	Range/interval number of the net value. Numbering according OIML/NIST range numbering scheme (n is product dependent, maximum 9)
		1	Single range
		1, 2, …, n	Multi range: range is linked to gross value
		1, 2, …, n	Multi interval: range is linked to net value
<TM>	Char		Tare mode (no tare, manual tare, measured tare)
		N	No tare
		M	Measured tare
		P	Preset tare
<G>	String		Gross value
<N>	String		Net value rounded for actual range step
<T>	String		Tare value rounded for actual range step
<HrSts>	Char		Status of the high resolution net weight
		S	Stable weight (linked to net value)
		D	Dynamic weight (unstable, not accurate)
<HR>	String		High resolution net value
<MR>	String		Maximum resolution net value
<Unit>	String		The unit used for this command is the definition host unit The unit can be selected by using the [M21 ▸ Page 57] command.

Examples

↓	SIX3	Query the current information for multi interval (see OIML R76-1 2006), device class II and gross is calculated (G = N + T). 1. Range 0 g to 3510 g, e = 10d = 0.1 g, (e = approved, d = display). 2. Range 3510 g to 7020 g, e = d = 0.1 g. 3. Range 7020 g to 35100 g, e = d = 1 g.
↑	SIX3␣S␣0␣N␣N␣C␣2␣1␣0␣1␣M␣␣␣␣ 1496.33␣␣␣␣621.67␣␣␣␣␣874.66␣g	Reads the parameters from the device (G = 1496.324 g, N = 621.665 g, T = 874.659 g). This example shows an stable weight with a calculated gross value. The tare is measured. The displayed gross value, which is the exact sum of the rounded net and rounded tare, does not always fulfill the rounding rules. This behavior is indicated by the "C" in the flags.
↑	SIX3␣D␣0␣N␣R␣C␣2␣1␣0␣2␣P␣␣␣␣8496.36 ␣␣␣␣␣6621.7␣␣␣␣1874.66␣g	Reads the parameters from the device (G = 8496.324 g, N = 6621.665 g, T = 1874.659 g). This example shows an unstable weight with a calculated gross value. Differently to the previous example, this update was sent already over the interface. This time the tare is preset and the net weight is in range 2. This explains the missing second decimal place in net value. All the same, the gross value has 2 decimal places to be able to display the exact addition of the net and tare values. It can be shown again that the calculated gross value does not need to fulfill any rounding rules regarding the exact gross value.
↑	SIX3␣D␣0␣N␣N␣C␣3␣1␣0␣3␣M␣␣␣12496.66 ␣␣␣␣␣10622␣␣␣␣1874.66␣g	Reads the parameters from the device (G = 12496.324 g, N = 10621.665 g, T = 1874.659 g). Now the net weight is in range 3. Now no decimal place is present at the net value. As above, the calculated gross value does not need to fulfill any rounding rules.
↑	SIX3␣D␣0␣Z␣N␣C␣2␣1␣0␣1␣N␣␣␣␣␣␣␣0.00 ␣␣␣␣␣␣␣0.00␣␣␣␣␣␣␣0.00␣g	Reads the parameters from the device (G = 0.0024 g, N = 0.0024 g, T = 0.0000 g). This example shows the "center of zero" feature indicated by the "Z" in the command. It shows as well that the "center of zero" does not rely on stable values.
↑	SIX3␣S␣0␣N␣N␣C␣2␣1␣0␣1␣M␣␣␣␣1234.27 ␣␣␣␣-888.97␣␣␣␣2123.24␣g	Reads the parameters from the device (G = 1234.264 g, N = -888.971 g, T = 2123.235 g). This example shows how negative values are handled and displayed.

↓	SIX3	Query the current information for multi range (see OIML R76-1 2006), device class III and gross is calculated (G = N + T). 1. Range 0 g to 3000 g, e = d = 1 g, (e = approved, d = display). 2. Range 0 g to 6000 g, e = d = 2 g. 3. Range 0 g to 15100 g, e = d = 5 g.
↑	SIX3␣S␣0␣N␣N␣C␣1␣1␣0␣1␣M␣␣␣␣␣␣␣736 ␣␣␣␣␣␣␣533␣␣␣␣␣␣␣203␣g	Reads the parameters from the device (G = 735.38 g, N = 532.63 g, T = 202.75 g). This example shows an stable weight with a calculated gross value. The tare is measured. The displayed gross value, which is the exact sum of the rounded net and rounded tare, does not always fulfill the rounding rules. This behavior is indicated by the "C" in the flags. Different to the examples above, these have no decimal places and the configuration is multi range.
↑	SIX3␣D␣0␣N␣R␣C␣1␣5␣0␣3␣P␣␣␣␣␣␣7500 ␣␣␣␣␣␣5225␣␣␣␣␣␣2275␣g	Reads the parameters from the device (G = 7496.33 g, N = 5223.62 g, T = 2272.71 g). This weight update was sent before (indicated by "R") and the device is in range 3. This implies that all values have now step 5. Even so, this example demonstrates that the calculated gross value does not always conform the rounding rule. This time the tare was preset.
↑	SIX3␣D␣0␣Z␣N␣C␣1␣1␣0␣1␣N␣␣␣␣␣␣␣␣␣0 ␣␣␣␣␣␣␣␣␣0␣␣␣␣␣␣␣␣␣0␣g	Reads the parameters from the device (G = 0.24 g, N = 0.24 g, T = 0.00 g). This example shows the "center of zero" feature indicated by the "Z" in the command. It shows as well that the "center of zero" does not rely on stable values.
↑	SIX3␣S␣0␣N␣N␣C␣1␣5␣0␣3␣M␣␣␣␣␣␣4040 ␣␣␣␣␣-2405␣␣␣␣␣␣6445␣g	Reads the parameters from the device (G = 4042.53 g, N = -2402.71 g, T = 6445.24 g). This example shows how negative values are handled and displayed.
↑	SIX3␣I	The request could not be served because the state of the device did not allow it.
↑	SIX3␣+	The request could not be served because of overload.

See also

- M21 – Unit ▸ Page 57
- I38 – Type label range definitions ▸ Page 39
- T – Tare ▸ Page 100

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 89].

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 [M26 ▸ Page 63].
- 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 89].
↑	SM0␣A␣3	Any SMx commands are canceled.

See also

- SM1 – Dynamic weighing: Start immediately and send the result ▸ Page 84
- SM2 – Dynamic weighing: Start after a minimum load is exceeded send result ▸ Page 85
- SM3 – Dynamic weighing: Start after a minimum load is exceeded, send result and repeat ▸ Page 87
- SM4 – Dynamic weighing: Time interval ▸ Page 89

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 display unit
<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 [M26 ▸ Page 63].
- 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 display unit
<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 [M26 ▸ Page 63].
- 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 83] and [@ ▸ Page 12] 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 display unit
<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 [M26 ▸ Page 63].
- 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 [SM0 ▸ Page 83], [SM1 ▸ Page 84], [SM2 ▸ Page 85] and [@ ▸ Page 12] commands.
- 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.
↑	SM␣A	Command understood, results follow.
↑	SM␣*␣␣␣␣␣25.83␣g	Result of the 1st dynamic weighing is 25.83 g.
↑	SM␣*␣␣␣␣␣22.91␣g	Result of the 2nd dynamic weighing is 22.91 g.
↑	SM␣*␣␣␣␣␣24.05␣g	Result of the 3rd 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 [M26 ▸ Page 63].
- 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 display unit 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 (1st value). Next stable weight value after preset deflection (2nd 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 display 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 94] sends also dynamic weight values.
- This command is cancelled by the [@ ▸ Page 12],[S ▸ Page 70], [SI ▸ Page 71], [SIR ▸ Page 72], [SIU ▸ Page 74], [SIRU ▸ Page 73], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] 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	1st weight value is 12.34 g.
↑	S␣S␣␣␣␣␣␣67.89␣g	2nd 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 display 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 (1st value). Next stable weight value after preset deflection (2nd 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 display 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 94] sends also dynamic weight values.
- This command is cancelled by the [@ ▸ Page 12],[S ▸ Page 70], [SI ▸ Page 71], [SIR ▸ Page 72], [SIU ▸ Page 74], [SIRU ▸ Page 73], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] 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	1st weight value is 12.34 g.
↑	S␣S␣␣␣␣␣␣67.89␣g	2nd weight value is 67.89 g.

See also

SNR – Send stable weight value and repeat on stable weight change ▸ Page 90

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

Description

Request the current stable weight value in display unit 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 display unit, 1st weight change.
S␣D␣<WeightValue>␣<Unit>	Dynamic weight value in unit actually set as display unit.
S␣S␣<WeightValue>␣<Unit>	Next stable weight value in unit actually set as display unit.
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 12],[S ▸ Page 70], [SI ▸ Page 71], [SIR ▸ Page 72], [SIU ▸ Page 74], [SIRU ▸ Page 73], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] commands.
- In contrast to SR, [SNR ▸ Page 90] 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 90

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

Description

Request the current weight values in display 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 1st 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		Unit, only available units permitted

Comments

- As the [SR ▸ Page 94] command, but with currently displayed unit.
- This command is cancelled by the [@ ▸ Page 12],[S ▸ Page 70], [SI ▸ Page 71], [SIR ▸ Page 72], [SIU ▸ Page 74], [SIRU ▸ Page 73], [SNRU ▸ Page 92], [SR ▸ Page 94] and [SRU ▸ Page 96] commands.
- In contrast to [SR ▸ Page 94], [SNRU ▸ Page 92] 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 current display unit.
↑	S␣S␣␣␣␣␣␣12.34␣lb	1st weight value is stable and12.34 lb.
↑	S␣D␣␣␣␣␣␣13.88␣lb	2nd weight value is non-stable and13.88 lb.
↑	S␣S␣␣␣␣␣␣15.01␣lb	3rd weight value is stable and15.01 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

ST	Query the current status transfer function.
ST␣1	Sent the current stable net weight value with display unit each time when the transfer key is pressed.
ST␣0	Stop sending weight value when print key is pressed.

Responses

ST␣A␣0	Function inactive, no weight value is sent when the transfer key is pressed.
ST␣A␣1	Function active, weight value is sent each time when the transfer key is pressed.
ST␣A	Command understood and executed successfully.
ST␣I	Command understood but currently not executable (balance is currently executing another command).
ST␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Status>	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

↓	ST␣1	Activate ST function.
↑	ST␣A	Command executed.
↑	S␣S␣␣␣␣123.456␣g	When transfer key pressed: current net weight is 123.456 g.

SU – Stable weight value in display unit

Description

Use SU to query the stable weight value in display unit.

Syntax

Command

SU	Query the stable weight value with the currently displayed unit.

Responses

S␣S␣<WeightValue>␣<Unit>	Current stable weight value with the currently displayed unit.
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␣+	Balance in overload range.
S␣-	Balance in underload range.

Comments

- As the [S ▸ Page 70] command, but with currently displayed unit.

Example

↓	SU	Query the stable weight value with the currently displayed unit.
↑	S␣S␣␣␣␣␣12.34␣lb	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 display unit 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.
- Clearing 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

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, o is in the tare memory.

See also

- T – Tare ▸ Page 100
- TI – Tare immediately ▸ Page 102

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 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 22

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 is set in the menu under "Adjustments".

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 12
- C – Cancel all commands ▸ Page 13
- C2 – Start adjustment with external weight ▸ Page 17
- M20 – Test weight ▸ Page 56
- M20 – Test weight ▸ Page 56

TST3 – Test with built-in weight

Description

Use `TST3` to start the sensitivity test function using built-in test weight.

Syntax

Command

`TST3`	Start sensitivity test function with built-in test weight.

Responses

`TST3␣B`	The test procedure has been started. Wait for next response, see Comments.
`TST3␣A␣<"DeviationValue">`	Test procedure completed successfully. Weight value corresponds to the deviation from the specified value displayed after the test.
`TST3␣I`	Command understood but currently not executable (balance is currently executing another command). No second response follows. The test procedure has been aborted as, e.g., stability was not attained or wrong weights were loaded.
`TST3␣L`	Command understood but not executable (incorrect parameter). No second response follows.

Parameter

Name	Type	Values	Meaning
`<"DeviationValue">`	String		Current difference (deviation value is output without unit)

Comments

- For additional information on testing the adjustment, see the Reference Manual of the balance.
- The unit is fixed to definition unit, no unit is output since the built-in weight is used.

Example

↓	`TST3`	Start sensitivity test with built-in weight.
↑	`TST3␣B`	The test procedure has been started.
↑	`TST3␣A␣"␣␣␣␣␣0.0002"`	Test with internal weight completed successfully. The difference to the specified value is 0.0002 (= 2 digits from a weigh module/balance with an increment of 0.1 mg).

See also

- @ – Abort ▸ Page 12
- C – Cancel all commands ▸ Page 13
- C3 – Start adjustment with built-in weight ▸ Page 18

TST4 – Repeatability test

Note
This command is only available on balances with built-in weight (e.g., MA-L).

Description

This command initializes the repeatability test with the built-in weight and gets the results of the repeatability test.

Syntax

Command

TST4␣No	Start repeatability test with no cycles.

Response

TST4␣A␣<"SDev"␣"Unit">␣<MaxTemp>␣ <MinTemp>␣<MeanTemp>␣<Hour>␣ <Minute>␣<Second>	Repeatability test completed successfully. Command understood but currently not executable (balance is currently executing another command).
TST4␣I	The test procedure has been aborted as, e.g., stability was not attained or wrong weights were loaded.

Parameters

Name	Type	Values	Meaning
<No>	Integer	5 … 100	Number of repeatability test times
<"SDev">	String	10 char	Standard deviation of tested weighing load and definition unit
<"Unit">	String		Unit of tested weighing load
<MaxTemp>	Float		Maximum temperature during test, in °C
<MinTemp>	Float		Minimum temperature during test, in °C
<MeanTemp>	Float		Average temperature during test, in °C
<Hour>	Integer	0 … 23	Hours of the total time of repeatability test
<Minute>	Integer	0 … 59	Minutes of the total time of repeatability test
<Second>	Integer	0 … 59	Seconds of the total time of repeatability test

Comments

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

Example

↓	TST4␣5	Executes repeatability test with testing number 5.
↑	TST4␣B␣0	Start repeatability test.
↑	TST4␣B␣1 … TST4␣B␣5	Start of repeatability test cycles.
↑	TST4␣A␣"0.01␣g" 25.3␣23.4␣24.5␣00␣01␣23	Test successfully. The standard deviation is 0.001 g, maximum temperature is 25.3 °C; minimum temperature is 23.4 °C; average temperature is 24.5 °C. Whole test time is 1 minute and 23 seconds.

See also

- @ – Abort ▸ Page 12
- C – Cancel all commands ▸ Page 13

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

UPD	Query of the update rate of the host interface.
UPD␣<CurrentUPD>	Set the update rate of the host interface.

Responses

UPD␣A␣<CurrentUPD>	Current setting of the update rate of the host interface.
UPD␣A	Command understood and executed successfully.
UPD␣I	Command understood but currently not executable (balance is currently executing another command).
UPD␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<UpdateRate>	Float	0.1 … 1000	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.
- 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

↓	UPD	Query of the update rate of the host interface.
↑	UPD␣A␣20.2	The update rate of the interface is 20.2 values per second.

↓	UPD␣20	Set the update rate of the host interface to 20 values per second.
↑	UPD␣A	Command executed successfully.
↑	UPD	Query of the exact update rate of the host interface.
↑	UPD␣A␣18.311	The exact update rate is 18.311 values per second.

See also

- SIR – Weight value immediately and repeat ▸ Page 72
- SIRU – Weight value in display unit immediately and repeat ▸ Page 73

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

Z	Zero the balance.

Responses

Z␣A	Zero setting successfully performed. Gross, net and tare = 0.
Z␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
Z␣+	Upper limit of zero setting range exceeded.
Z␣–	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

↓	Z	Zero.
↑	Z␣A	Zero setting performed.

See also

ZI – Zero immediately ▸ Page 110

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 109

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 30], 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 30

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