Reference Manual

MT-SICS Interface Command Set

for Automated Precision Weigh Modules

METTLER TOLEDO

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1 Configuration tool

METTLER TOLEDO recommends APW-Link™ as a configuration tool

APW-Link™ is a Windows based software.

Features

- Configuration Tree for easy commissioning and parameterization
- Multiple, selectable languages
- Terminal with free configurable buttons
- Automatic baud rate search
- Connection over RS232, USB to RS232 converter and Ethernet TCP/IP possible
- Weight Display with Zeroing and Taring button
- Graph Display with zoom function and x-y Data
- Backup / Restore feature
- Supports all APW weigh modules
- Supported operating systems: Windows XP - Professional - SP3; Windows 7 - Professional / Enterprise / Ultimate; Windows 8 / 8.1 – Professional / Enterprise; Windows Server 2003 / 2010

Download

▶ http://www.mt.com/apw-link APW-Link™ is free of charge but requires a registration before download.

2 Introduction

Real weighing applications have very wide-ranging requirements which can at some cases necessitate weighing up to several hundred tons and at some applications the demanded readability could be very fine, sometimes as low as one micro-gram. METTLER TOLEDO offers an extensive range of weighing devices in order to fulfill these versatile requirements. These weighing devices provide a simple interface for a quick integration with control systems. This integration is further facilitated by standardized commands which enable certain functions and operations. Throughout this document, the term "weigh module" is used to cover also the term "(weighing) bridge" which is operated without any terminal. The term "balance" denotes a weighing device in combination with a terminal.

Version number of the MT-SICS

Each level of the MT-SICS has its own version number which can be requested with the command "`I1`" from level 0. You can use the command "`I1`" via the interface to request the MT-SICS level and MT-SICS versions implemented on your weigh module.

Data interface at weigh module

Settings of the interface such as baud rate, number of data bits, parity, handshake protocols and connector pin assignment are described in the Reference Manual of the optional interface and the peripheral instrument or cable in question.

Data exchange with the weigh module

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

The existing commands that are available can be called up using the I0 command.

i Note

Some of the commands work only via the built-in RS232 interface.

2.1 Command formats

Commands sent to the weigh module/balance comprise one or more characters of the ASCII character set. Here, the following must be noted:

	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 weigh module/balance.

2.1.1 Language 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 weigh module/balance.
↑	Response of the weigh module/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.

2.1.2 Response formats

All responses sent by the weigh module/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

2.1.2.1 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 – Weight value in display unit and MinWeigh information immediately ▸ Page 238] and [SUM – Stable weight value in display unit and MinWeigh information ▸ Page 251] only)
		D	Unstable ("D" for **D**ynamic) weight value
		N	Unstable weight value, below minimal weight ([SIUM – Weight value in display unit and MinWeigh information immediately ▸ Page 238] and [SUM – Stable weight value in display unit and MinWeigh information ▸ Page 251] 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 host unit
C_R	Byte		Carriage return (ASCII 13 dec.)
L_F	Byte		Line feed (ASCII 10 dec.)

Example

Response with stable weight value of 14.256 g:

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

2.1.2.2 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 update rate to 20 weight values per second:

↓	UPD␣20	
↑	UPD␣A	Command executed successfully.

Query the actual update rate:

↓	UPD	
↑	UPD␣A␣18.3	Update rate is set to 18.3 values per second.

2.1.3 Error messages

2.1.3.1 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	+	Weigh module or balance is in overload range (weighing range exceeded)
		–	Weigh module or 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.)

Examples

Trial to set the update rate to 20 weight values per second:

↓	UPD␣290	Update rate accidentally set to 290.
↑	UPD␣L	Command not executed successfully; parameters is outside valid range.

Response while weigh module or balance is in overload range:

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

2.1.3.2 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 weigh module/balance has not recognized the received command or the command is not allowed
		ET	Transmission error: The weigh module/balance has received a "faulty" command, e.g. owing to a parity error or interface break
		EL	Logical error: The weigh module/balance can not execute the received command
C_R	Byte		Carriage return (ASCII 13 dec.)
L_F	Byte		Line feed (ASCII 10 dec.)

Examples

Trial to set the update rate to 20 weight values per second:

↓	UPD␣290	Update accidentally set to 290.
↑	UPD␣L	Command not executed succesfully, parameters are outside valid range.

Response while weigh module is in overload:

↓	SI	Send current weight value.
↑	S␣+	Overload; no weigh value available

2.1.3.3 Specific error messages on weight response

Description

If any error is detected in the system, it is no longer possible to get a weight value. In this case the weight value is overwritten with an error number and trigger code.

We recommend contacting your METTLER TOLEDO representative if any error occurs.

Syntax

The error message has the same format as the weight value (10 characters) and starts always with S␣S␣.

S␣S	␣	␣..␣	Error	␣	<ErrorNumber>	<ErrorTrigger>	C_R	L_F
		1-2 spaces			1-2 characters	1 character		
		Total 10 characters (same as weight value) - Filled with spaces on the beginning						

Parameters

Name	Type	Values	Meaning
<ErrorNumber>	Integer	1	Boot error
		2	Brand error
		3	Checksum error
		9	Option fail
		10	EEPROM error
		11	Device mismatch
		12	Hot plug out
		14	Weigh module / electronic mismatch
		15	Adjustment needed
<ErrorTrigger>	String	b	Error from electronics (weigh module, balance)
		t	Error from terminal
C_R	Byte		Carriage return (ASCII 13 dec.)
L_F	Byte		Line feed (ASCII 10 dec.)

Examples

↓	SI	Send current weight value.
↑	S␣S␣␣Error␣10b	EERPOM error on the electronic unit occurred! Check if every thing is connected correctly. If any error occurs after power restart, contact your METTLER TOLEDO representative.

↓	SIR	Send current weight value at intervals.
↑	S␣S␣␣␣Error␣1t	Boot error on the terminal occurred! If any error occurs after power restart, contact your METTLER TOLEDO representative.

2.1.4 Specific error messages on weight response

Description

If any error is detected in the system, it is no longer possible to get a weight value. In this case the weight value is overwritten with an error number and trigger code.

We recommend contacting your METTLER TOLEDO representative if any error occurs.

Syntax

The error message has the same format as the weight value (10 characters) and starts always with S␣S␣.

S␣S	␣	␣..␣	Error	␣	<ErrorNumber>	<ErrorTrigger>	C_R	L_F
		1-2 spaces			1-2 characters	1 character		
		Total 10 characters (same as weight value) - Filled with spaces on the beginning						

Parameters

Name	Type	Values	Meaning
<ErrorNumber>	Integer	1	Boot error
		2	Brand error
		3	Checksum error
		9	Option fail
		10	EEPROM error
		11	Device mismatch
		12	Hot plug out
		14	Weight module / electronic mismatch
		15	Adjustment needed
<ErrorTrigger>	String	b	Error from electronics (weigh module)
		t	Error from terminal
C_R	Byte		Carriage return (ASCII 13 dec.)
L_F	Byte		Line feed (ASCII 10 dec.)

Examples

↓	SI	Send current weight value.
↑	S␣S␣␣Error␣10b	EERPOM error on the electronic unit occurred! Check if every thing is connected correctly. If any error occurs after power restart, contact your METTLER TOLEDO representative.

↓	SIR	Send current weight value at intervals.
↑	S␣S␣␣␣Error␣1t	Boot error on the terminal occurred! If any error occurs after power restart, contact your METTLER TOLEDO representative.

2.2 Tips for programmers

Overview of command of specific models

This reference manual covers the MT-SICS commands for weigh modules/balances. As the weigh modules/ balances can differ based on model and software version, not all the MT-SICS level 2 and 3 commands are usable on every model. We therefore recommend using the I0 command to get an overview of all commands that are supported by a particular balance.

Planning the use of MT-SICS commands

Investigations of various applications have shown that the vast majority of all system solutions can be handled with the commands of MT-SICS level 0 and 1. This means for you: if you restrict yourself to the commands of MT-SICS level 0 and 1, you can expand your system with additional weigh modules, balances from METTLER TOLEDO without having to change your application programs.

Setup with / without terminal

Use the same setup during configuration and later use: If you intend to use the weigh module without the terminal, the configuration has to be done without terminal as well. Due to the system's architecture, the storage behavioral of configurations is different whether the terminal is attached to the bridge or not: With a terminal attached, configuration is stored in the terminal's memory; without a terminal attached, the bridge's memory is used. Removing a terminal after configuration means to remove the configuration and activation the bridge's (default) configuration. Adding a terminal after configuration means overriding the configuration with the one stored within the terminal.

Command and response

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

Cancel

To be able to start from a determined state, when establishing the communication between weigh module/ balance and system, you should send a cancel command to the weigh module/balance, **see** [@ – Cancel ▸ Page 16] or [C – Cancel all commands ▸ Page 23]. When the balance or system is switched on or off, faulty characters can be received or sent.

Parameter values after switching the weigh module/balance on/off

The commands of the standard command are saved on the permanent memory of the weigh module/balance. This means that all values changed via the interface are saved when the weigh module/balance is switched off.

Several commands in succession

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

METTLER TOLEDO DeltaRange balances and weigh modules

If the fine range of DeltaRange balances has been exceeded at the time of transmission, the weigh module/ 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 weigh module/balance type; **see** technical data of the weigh module/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

Nevertheless, all commands have to be closed by a C_RL_F (dec: 13, 10; hex: 0D, 0A) which corresponds to "ENTER" in most human machine interfaces.

Quotation marks " "

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

↓	`D␣"place 4\"filter!"`	
↑	`D␣A`	Balance display: place 4" filter!

Weight unit of weight value – host 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 weigh modules/balances offer the possibility of selecting a particular unit **see** [M21 – Unit ▸ Page 165]. This enables the displayed unit and info unit to be shown on the terminal. Host 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 weigh module, balance can display – this is also referred to as the weigh modules/balance's readability. E.g. a WX205 has five decimal places; its digit is 0.01 mg. The digit is sometimes used as a generic unit.

Binary coded multiple selections

Some parameters that allow multiple selections are binary coded: Each possible selection is represented by one bit, the corresponding parameter equals to the decimal interpretation.

Selection 8	Selection 7	Selection 6	Selection 5	Selection 4	Selection 3	Selection 2	Selection 1	Parameter
0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0..255
$2^7 = 128$	$2^6 = 64$	$2^5 = 32$	$2^4 = 16$	$2^3 = 8$	$2^2 = 4$	$2^1 = 2$	$2^0 = 1$	$\sum_{i=1}^{8} Selection_i \cdot 2^{i-1}$

Responses may easily be interpreted by converting the decimal number to binary again.

3 Commands and Responses

@ – Cancel

Description

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

@ can be used to achieve the same effect as disconnecting and reconnecting the power supply, which empties the volatile memories. The purpose of this command is to initiate a command sequence.

Syntax

Command

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

Response

I4␣A␣"<SNR>"	Serial number is emitted; the weigh module/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 100].

Example

↓	@	Cancel
↑	I4␣A␣"B021002593"	Weigh module or balance is "reset", its serial number is B021002593.

See also

I4 – Serial number ▸ Page 100

A01 – Percent weighing: Reference in %

Description

Use this command to set or query the reference value for percent weighing.

For querying to take place, a reference value must have been saved beforehand (A01 or function key or).

Syntax

Commands

A01	Query of the reference for the percent weighing application.
A01␣<Reference>	Set the reference for the percent weighing application.

Responses

A01␣A␣<Reference>	Reference for the percent weighing application is set.
A01␣B A01␣A	Start to set the reference (waiting for stable weight) Command understood and executed successfully.
A01␣I	Command understood but currently not executable.
A01␣L	Command understood but not executable (e.g. percent weighing application is not active or parameter is incorrect) or no reference value present.
A01␣E	Setting reference aborted (not stable, over- or underload, abort key,…).

Parameter

Name	Type	Values	Meaning
<Reference>	Float	(0) … 100	Reference for the percent weighing application in %; must be greater than zero.

Comments

- This command can only be used when the application "Percent weighing" is started. For details on available applications and how the activate them, **see** M25 and M26.
- Use the SU commands for percent weighing. Otherwise, the results will be displayed in the set unit unless the host unit is changed to % using [M21 ▸ Page 165].

Example

↓	A01␣100.00	Set the reference for percent weighing to 100.00%.
↑	A01␣B	Reference is set, waiting for stable weight.
↑	A01␣A	The reference for percent weighing is set to 100.00%.

A02 – Sample identification for samples in weighing application

Description

Use A02 to set or query an identification of a sample in weighing application.

Syntax

Commands

A02	Query the identifications of a sample of the weighing application.
A02␣<Index>	Query the sample number of the weighing application.
A02␣<Index>␣<"Identification">	Set the sample number and identification of the weighing application.

Responses

A02␣B␣<Index>␣<"Identification"> A02␣B… A02␣A␣<Index>␣<"Identification">	Query the identifications of a sample of the weighing application.
A02␣A	Command understood and executed successfully.
A02␣I	Command understood but currently not executable.
A02␣L	Command understood but not executable (e.g. weighing application is not active or parameter is incorrect).

Parameters

Name	Type	Values	Meaning
<Index>	Integer	1 … n	Sample number (n is product dependent)
<"Identification">	String	Max 60 chars	Identification of the sample

Comment

This command only applies to the "Weighing" application. For details on available applications and how the activate them, **see** M25 and M26.

Examples

↓	A02	Query the identifications of a sample of the weighing application.
↑	A02␣B␣1␣"12345"	The identification of sample 1 is "12345".
↑	A02␣B␣2␣"AAA-67890"	The identification of sample 2 is "AAA-67890".
↑	A02␣A␣3␣""	No identification for sample 3 (empty string).

↓	A02␣1␣"98765"	Set the identification 1 to "98765".
↑	A02␣A	The identification 1 is set to "98765".

A03 – Sample name for samples in weighing application

Description

Use A03 to assign an individual name to sample IDs, or query the current name.

Syntax

Commands

A03	Query the IDs name of the weighing application.
A03␣<No>	Query of specific ID.
A03␣<No>␣<"ID">	Set the ID name of the weighing application.

Responses

A03␣B␣<No>␣<"ID"> A03␣B␣<No>␣<"ID"> A03␣A␣<No>␣<"ID">	All existing ID names of the weighing application.
A03␣A	Command understood and executed successfully.
A03␣I	Command understood but currently not executable.
A03␣L	Command understood but not executable (e.g. weighing application is not active or parameter is incorrect).

Parameters

Name	Type	Values	Meaning
<No>	Integer	1 … n	Number of weighing ID name
<"ID">	String	Max 24 chars	String of weighing ID name

Comment

This command applies to the "Weighing" application. For details on available applications and how the activate them, **see** M25 and M26.

Examples

↓	A03	Query the IDs name of the weighing application.
↑	A03␣B␣1␣"Batch"	Name of ID1 is "Batch".
↑	A03␣B␣2␣"Lot"	Name of ID2 is "Lot".
↑	A03␣A␣3␣""	Name of ID3 name is empty.

↓	A03␣2	Query the second ID name of the weighing application.
↑	A03␣A␣2␣"Lot"	Name of second ID is "Lot".

↓	A03␣1␣"Batch"	Set the ID1 name to "Batch".
↑	A03␣A	Name of ID1 is set.

A06 - Dynamic Weighing: Dynamic Behavior

Description

Reads or writes weighing filter for the dynamic weighing application.

Syntax

Commands

A06	Query the parameters from the device.
A06␣<Behavior>	Set the parameters to the device.

Responses

A06␣A␣<Behavior>	Current behavior of the device.
A06␣A	Command understood and executed successfully.
A06␣L	Command understood but not executable, e.g. dynamic weighing application is not active or parameter is incorrect.

Parameters

Name	Type	Values	Meaning
<Behavior>	Integer	1 2 3	Stable, suitable for relatively stable weighing objects Standard, suitable for normal weighing objects Unstable, suitable for unstable weighing objects

Initial values

↓	A06	Query the parameters from the device.
↑	A06␣A␣1	The initial behavior of the dynamic weighing application is "Stable".

Comment

This command can only be used when the application Dynamic Weighing is started.

Examples

↓	A06	Query the parameters from the device.
↑	A06␣A␣2	The behavior is "Standard".

↓	A06␣1	Set the weighing filter for the Dynamic Weighing application to "Stable".
↑	A06␣A	Command understood and executed successfully.

A10 – Nominal, +Tolerance, -Tolerance

Description

Use A10 to enter the nominal values, inc. +/- tolerances, or query the current values. As soon as you have specified the values, the SmartTrac changes and displays the graphic weighing-in aid.

Syntax

Commands

A10	Query of the nominal value, + tolerance, - tolerance.
A10␣<No>␣<Value>␣<Unit>	Set the nominal value, + tolerance, - tolerance.

Responses

A10␣B␣0␣<Value>␣<Unit> A10␣B␣1␣<Value>␣<Unit> A10␣A␣2␣<Value>␣<Unit>	Query of the nominal value, + tolerance, - tolerance.
A10␣A	Command understood and executed successfully.
A10␣I	Command understood but currently not executable.
A10␣L	Command understood but not executable.

Parameters

Name	Type	Values	Meaning
<No>	Integer	0	Nominal value
		1	+ tolerance
		2	- tolerance
<Value>	Float		Nominal value
<Unit>	String	Max 5 chars	Weight unit, % with +/- tolerances possible

Comments

- The values will be output differently depending on the application. For details on available applications and how the activate them, **see** M25 and M26.
- Specified nominal and tolerance values must be reset manually:

  A10␣0␣0␣g

  A10␣1␣2.5␣%

  A10␣2␣2.5␣%
- As soon as you have specified the values, the SmartTrac switches to the graphic weighing-in aid.
- Weight and percentage values are rounded, as is the case with values entered manually.

Examples

↓	A10	Query of the nominal value, + tolerance, - tolerance.
↑	A10␣B␣0␣100.12␣g	Current setting is nominal value 100.12 g, + tolerance is 5.25 g and - tolerance is 7.6%.
↑	A10␣B␣1␣5.25␣g	
↑	A10␣A␣2␣7.6␣%	

↓	A10␣0␣100.12␣g	Set the nominal value to 100.12 g.
↑	A10␣A	The nominal value is set 100.12 g.

A30 – Internal loads

Description

Use A30 to request status of internal loads. This command is used to inquire how many internal weights are available in the balance and its status.

Syntax

Commands

A30	Query of quantity and status of the internal loads.
A30␣<Qty>	Place internal load.

Responses

A30␣A␣Qty␣Stat	Quantity and status of the internal loads.
A30␣I	Command understood but currently not executable.
A30␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Qty>	Integer		Number of internal loads
		0	No load placed
		1	Total load placed
		2	First partial load placed
		3	Second partial load placed
<Stat>	Integer		Status of built-in weights
		0	No load placed
		1	Total load placed
		2	First partial load placed
		3	Second partial load placed
		8	Error
		9	Not determined (not in defined end position)

Comment

The number of internal loads depends on the balance model.

Examples

↓	A30	Query of quantity and status of the internal loads.
↑	A30␣A␣1␣0	There is only one internal load which is currently not placed.

Control of internal loads

↓	A30␣1	Place total internal load.
↑	A30␣A	The load is placed.

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 [@ – Cancel ▸ Page 16] 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 responses with C␣A after all active and pending interface commands have been terminated.
- This command is typically used for repeating commands such as [SIR – Weight value immediately and repeat ▸ Page 232] 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 – Start adjustment according to current settings ▸ Page 26]. The unit corresponds to the factory setting of host unit, e.g. gram (g) with standard balances or carat (ct) with carat balances respectively. 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 When a considerable change in the ambient conditions is determined, 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 ▸ Page 259] x commands
<WeightType>	Integer	0	Built-in weight (factory setting)
		1	External weight
<2WeightValue">	String		Weight values specify the value of the weight for an external calibration requested from the user via the display or interface, **see** [C1 – Start adjustment according to current settings ▸ Page 26].
<"Unit">	String		The unit corresponds to the factory setting of host unit, e.g. gram (g)

Comments

- Setting <Mode> = 1 and <Weight> = 0 corresponds to the menu setting "ProFACT" / "FACT" under "Adjust/Test".
- [C2 – Start adjustment with external weight ▸ Page 28] 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 with [M19 ▸ Page 163].
- Use [C1 ▸ Page 26] to start an adjustment defined with C0.
- C0 must be reset manually; [@ – Cancel ▸ Page 16] has no effect.
- Check remaining ranges with [I50 – Remaining weighing ranges ▸ Page 120] command.
- The parameters are not stored permanently.

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 – Start adjustment according to current settings ▸ Page 26] and requires a weight of 100.000 g.
↑	C2	Start external adjustment, **see** responses of [C2 – Start adjustment with external weight ▸ Page 28].
↑	C0	Query of the current status and setting of the adjustment.
↑	C0␣A␣3␣1␣"␣␣␣100.000␣g"	Adjustment started.
↑	C0	Query of the current status and setting of the adjustment.
↑	C0␣A␣4␣1␣"␣␣␣100.000␣g"	Adjustment successfully executed.

↓	C0␣0␣1	Set adjustment setting to manual and external.
↑	C0␣A	Adjustment setting set.

See also

- C2 – Start adjustment with external weight ▸ Page 28
- M19 – Adjustment weight ▸ Page 163
- TST0 – Query/set test function settings ▸ Page 259
- TST1 – Test according to current settings ▸ Page 260

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 24].

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.
- Use @ or C to abort a running adjustment.
- The value of the external adjustment weight needed for adjustment must be set accordingly by an [M19 ▸ Page 163] command.
- Check remaining ranges with [I50 – Remaining weighing ranges ▸ Page 120] 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

- C0 – Adjustment setting ▸ Page 24
- M19 – Adjustment weight ▸ Page 163
- TST1 – Test according to current settings ▸ Page 260
- C – Cancel all commands ▸ Page 23
- @ – Cancel ▸ Page 16

C2 – Start adjustment with external weight

Description

Regardless of the [C0 – Adjustment setting ▸ Page 24] setting, C2 carries out external adjustment with the reference weight defined in [M19 – Adjustment weight ▸ Page 163].

Syntax

Command

C2	Start the external adjustment. Query of the current weight used by means of the [M19 – Adjustment weight ▸ Page 163] command.

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.
- Use [@ – Cancel ▸ Page 16] or [C – Cancel all commands ▸ Page 23] to abort a running adjustment.
- The value of the external adjustment weight needed for adjustment must be set accordingly by an [M19 ▸ Page 163] command.
- Check remaining ranges with [I50 – Remaining weighing ranges ▸ Page 120] command.

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

- C – Cancel all commands ▸ Page 23
- M19 – Adjustment weight ▸ Page 163
- TST1 – Test according to current settings ▸ Page 260
- TST2 – Test with external weight ▸ Page 262

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 can not be performed at present as another operation is taking place. 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 C key.

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.
- Use [@ – Cancel ▸ Page 16] or [C – Cancel all commands ▸ Page 23] to abort a running adjustment.
- Check remaining ranges with [I50 – Remaining weighing ranges ▸ Page 120] command.

Example

↓	C3	Start the internal adjustment.
↑	C3␣B	Adjustment operation started.
↑	C3␣A	Adjustment completed successfully.

See also

- C – Cancel all commands ▸ Page 23
- TST3 – Test with built-in weight ▸ Page 264

C4 – Standard / initial adjustment

Description

An initial adjustment is a procedure that determines a new adjustment factor between the built-in weight used for internal adjustment and the external weight defined by the [M19 – Adjustment weight ▸ Page 163] command. All internal adjustments following this procedure will show the same weighing results as if the adjustment were done with the external weight. The initial adjustment thus allows tuning of the internal adjustment of several weigh modules to one external weight standard.

Syntax

Command

C4	Start initial adjustment.

First Responses

C4␣B	Initial adjustment procedure has been started. Wait for second response.
C4␣I	Initial adjustment cannot be performed at present because another operation is taking place (e.g., zero setting or taring), or the current weight value is outside the permissible range.
C4␣L	Command understood but not executable (parameter not allowed). No second response follows.

Further Responses

C4␣<"WeightValue">␣<"Unit">	Prompt to unload or load the weighing module.
C4␣A	The adjustment has been completed successfully.
C4␣I	The adjustment procedure was aborted because, e.g., the stability needed for this operation was not achieved within the timeout limit, or a wrong weight was loaded.

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

- In order to perform an initial adjustment, the actual load seen by the weight module must be within plus/minus (2 g + 1% of weighing capacity) relative to the load when the weight module was switched on.
- The criterion that must be fulfilled to reach stability for initial adjustment depends on the type of the weigh module and cannot be changed.
- The timeout may be set using the M67 command.
- The value of the external adjustment weight needed for initial adjustment must be set accordingly by an M19 command if preload exists.
- The new factor determined by the initial adjustment procedure will be reset to the adjustment factor evaluated in the factory when the FSET␣0 or FSET␣1 command is performed. With FSET␣2, the initial calibration by the user is retained.
- Check remaining ranges with [I50 – Remaining weighing ranges ▸ Page 120] command.

Example

↓	C4	Start the internal adjustment.
↑	C4␣B	Adjustment operation started.
↑	C4␣"␣␣␣100.0000␣g"	Prompt to load weight of 100.0000 g used for initial adjustment.
↑	C4␣"␣␣␣␣0.0000␣g"	Prompt to unload the module.
↑	C4␣A	Adjustment completed successfully.

C5 – Enabling/disabling step control

Description

Use C5 to enable and disable step control (user interaction) during the adjustment procedures triggered by the adjustment commands C6 – C8.

Syntax

Commands

C5	Query the status of the step control.
C5␣<Status>	Enable / disable the step control.

Responses

C5␣A␣<Status>	Current status of the step control.
C5␣A	Command understood and executed successfully.
C5␣I	Command understood but currently not executable.
C5␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Status>	Integer	0	Step control is turned off (all adjustment procedures run without user interaction)
		1	Step control is turned on (all adjustment procedures which support step control need a user confirmation when the weight is placed on the pan)

Comments

- Adjustment methods using built-in weights and adjustment commands without parameter 'Method' will ignore the state of C5 and only work without step control.
- Use the command I62 to read out the timeout for user interaction.

Example

↓	C5	Query the status of the step control.
↑	C5␣A␣1	Step control is enabled.

See also

- C6 – Customer linearization and sensitivity adjustment ▸ Page 34
- C7 – Customer standard calibration ▸ Page 37
- C8 – Sensitivity adjustment ▸ Page 40
- I62 – Timeout ▸ Page 131

C6 – Customer linearization and sensitivity adjustment

Description

Use C6 to start the adjustment of the customer linearization. With these measurement values also an adjustment of the customer sensitivity scaling is done.

Syntax

Commands

C6	Request the whole list of available methods.
C6␣<Method>	Execute the command with or without the step control C5.
C6␣<Method>␣<Load>	Execute the command with or without the step control C5 and with the parameter <Load>.

Responses

C6␣B␣<Method> … C6␣A␣<Method>	Current list of available methods.
C6␣B C6␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> C6␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> … C6␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"DevPerMille"> C6␣A	Content of a specific method without step control C5␣0.
C6␣B C6␣C␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> C6␣C C6␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> C6␣C␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> … C6␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"DevPerMille"> C6␣A	Content of a specific method with step control C5␣1.
C6␣E␣<Error>	Error occurred during the adjustment.
C6␣A	Command understood and executed successfully.
C6␣I	Command understood but currently not executable.
C6␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0, 2	0: use default method of the adjustment (=2) 2: Adjustment with external weights
<Load>	Float		Calibration load in the host unit (default using the M19 value). Load used in step control ('Execute C6␣C Load') modifies the required weight value of the actual adjustment state
<Index>	Integer		Step number of the procedure
<State>	Char	R, D or C	Actual state of the adjustment process R = requesting external weight D = waiting for stability C = calibration deviation (procedure is finished, corrected calibration deviation is given in parameter "DevPerMille")
<WgtState>	Char	+, -, o	Actual weight state + load is above tolerances - load is below tolerances o (small omega) load is within tolerances
<"LoadInstruction">	String		Instruction, which load to place on the pan String with the load combination to place on the pan separated by "+". The string contains as many numbers as different loads are used in the procedure "0" = do not place the load "1" = place load 1 "1+2" = place load 1 and load 2 "0+2" = only place load 2
<"ValueHostUnit">	String		Load information of the actual adjustment state (weight and host unit)
<"DevPerMille">	String		Deviation of the measured calibration load (before adjustment) relative to the exact calibration load in per mille (‰). Value is rounded to the resolution of the finest range
<Error>	Integer	1, 2, 3, 4, 5	Parameter showing the source of the error 0: Timeout 1: Cancel 2: Built-in weight not supported 3: Adjustment not available (e.g. adjustment is unknow or disabled) 4: Calibration or adjustment load error (e.g. adjustment load is too light or too heavy) 5: Busy (e.g. another adjustment is already running)

Comments

- The parameter <Load> and also the load value corrected with step control are tested against range definitions. A logic error (L) is returned for values violating the range definitions.
- The procedure can be canceled by command C.

Examples

↓	C6	Request the whole list of available methods
↑	C6 B 0 C6 A 2	Methods 0 and 2 are available. Other methods are not implemented

↓	C6 2	Start the linearization adjustment method 2 (without step control C5 0.
↑	C6 B C6 B 0 R - "0+0" " 0.00 g" C6 B 0 D o "0+0" " C6 B 1 R - "1+0" " 200.00 g" C6 B 1 D o "1+0" " C6 B 2 R - "1+2" " 400.00 g" C6 B 2 D o "1+2" " C6 B 2 C o "1+2" "0.23" C6 A	Linearization adjustment is started Request weight for first step. Capture weight of first step. Request weight of second step (ext. load L1). Capture weight of third step. Request weight of third step (ext. load L1+L2). Capture weight of third step. Corrected calibration deviation in per mille (‰). Linearization adjustment finished.

↓	C6 2 400	Start linearization adjustment method 2 with step control C5 1.
↑	C6 B C6 C 0 R - "0+0" " 0.00 g"	Linearization adjustment is started. Request weight for first step (ext. & int. unload).
↑	C6 C	User confirms placed weight.
↑	C6 B 0 D o "0+0" " C6 C 1 R - "1+0" " 200.00 g"	Capture weight of first step. Request weight for second step (ext. load L1).
↑	C6 C 220.00	User changes requested weight value.
↑	C6 C 1 R - "1+0" " 220.00 g"	Request weight for second step (ext. load L1).
↑	C6 C	User confirms placed weight.
↑	C6 B 1 D o "1+0" " C6 C 2 R - "1+2" " 400.00 g"	Capture weight of second step. Request weight for third step (ext. load L1+L2).
↑	C6 C	User confirms placed weight.
↑	C6 B 2 D o "1+2" " C6 B 2 C o "1+2" "0.23" C6 A	Capture weight of third step. Corrected calibration deviation in per mille (‰) . Linearization adjustment finished.

↓	C6 2 400	Start linearization adjustment (method 2).
↑	C6 B C6 C 0 R - "0+0" " 0.00 g"	Linearization adjustment is started. Request weight for first step (ext. & int. unload).
↑	C6 E 0	Timeout error response.

See also

- C – Cancel all commands ▸ Page 23
- C5 – Enabling/disabling step control ▸ Page 33

C7 – Customer standard calibration

Start the adjustment of the customer standard calibration which defines the exact weight value of the built-in weights.

Syntax

Commands

C7	Request the whole list of available methods.
C7␣<Method>	Execute the command with or without the step control C5.
C7␣<Method>␣<Load>	Execute the command with or without the step control C5 and with the optional parameter <Load>.

Responses

C7␣B␣<Method> ... C7␣A␣<Method>	Current list of available methods.
C7␣B C7␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C7␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> … C7␣A	Execute the command without step control C5␣0 and with optional parameter <Load>.
C7␣B C7␣C␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C7␣C C7␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C7␣C␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C7␣C␣<Load> C7␣C␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C7␣C … C7␣A	Execute the command with step control C5␣1 and with modifying a required weight value of one state during the adjustment. The state which is corrected is displayed again and must be confirmed by the operator.
C7␣A	Command understood and executed successfully.
C7␣I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
C7␣L	Command understood but not executable (incorrect parameter)

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0 … 2	List of available methods (model dependent)
		0	Use default method of the adjustment
		1 or 2	Method 1: For direct force translation (without lever arms) Method 2: For hybrid force translation (with lever arms)
<Load>	Float		Calibration load in the definition unit (default using the M19 value) Load used in step control (Execute C5␣C␣Load) modifies the required weight value of the actual adjustment state
<Index>	Integer		Step number of the procedure
<State>	Char	R or D	Actual state of the adjustment process R = requesting external weight D = waiting for stability
<WgtState>	Char	+, -, o	Actual weight state: + load is above tolerances - load is below tolerances o (small omega) load is within tolerances
<"LoadInstruction">	String	0	Instruction, which load to place on the pan String with the load combination to place on the pan separated by "+". The string contains as many numbers as different loads are used in the procedure. If the actual step uses built-in weights, the string will be empty. • "0" = do not place the load • "1" = place load 1 • "1+2" = place load 1 and load 2 • "0+2" = only place load 2
<"ValueHostUnit">	String		Load information of the actual adjustment state (weight and host unit)
<Error>	Integer	1, 2, 3, 4, 5	Parameter showing the source of the error 0: Timeout 1: Cancel 2: Built-in weight not supported 3: Adjustment not available (e.g. adjustment is unknow or disabled) 4: Calibration or adjustment load error (e.g. adjustment load is too light or too heavy) 5: Busy (e.g. another adjustment is already running)

Comments

- The standard adjustment determines the exact weight of the internal load. Therefore the external adjustment load must be known exactly.
- If step control is enabled, the states which require external loads must be confirmed, the others are running automatically.
- The parameter <Load> and also the load value corrected with step control are tested against range definitions. A logic error (L) is returned for values violating the range definitions.
- The procedure can be canceled by command C.
- This command is equivalent to C4.

Examples

↓	C7	Request the whole list of available methods.
↑	C7 B 0 C7 A 1	Methods 0 and 1 are available. Other methods are not implemented or disabled.

↓	C7 1 400	Start the standard calibration procedure (method 1), without step control (automatic recognition of placed weights).
↑	C7 B C7 B 0 R - "0" " 0.00 g" C7 B 0 D o "0" " " C7 B 1 D o " " " " C7 B 2 D o " " " " C7 B 3 R - "1" " 400.00 g" C7 B 3 D o "1" " " C7 B 4 R + "0" " 0.00 g" C7 B 4 D o "0" " " C7 B 5 D o " " " " C7 B 6 D o " " " " C7 A	Standard calibration is started. Request weight for first step (ext. & int. unload). Capture weight of first step. Capture weight of second step (int. push). Capture weight of third step (int. unload). Request weight for fourth step (ext. load L1). Capture weight of fourth step. Request weight for fifth step (ext. unload). Capture weight of fifth step. Capture weight of sixth step (int. load). Capture weight of seventh step (int. unload). Standard calibration finished.

↓	C7 1 400	Start the standard calibration procedure (method 1), with step control (user interaction).
↑	C7 B C7 C 0 R - "0" " 0.00 g"	Standard calibration is started. Request weight for first step (ext. & int. unload).
↑	C7 C	User confirms placed weight.
↑	C7 B 0 D o "0" " " C7 B 1 D o " " " " C7 B 2 D o " " " " C7 C 3 R - "1" " 400.00 g"	Capture weight of first step. Capture weight of second step (int. push). Capture weight of third step (int. unload). Request weight for fourth step (ext. load L1).
↑	C7 C	User confirms placed weight.
↑	C7 B 3 D o "1" " " C7 C 4 R + "0" " 0.00 g"	Capture weight of fourth step. Request weight for fifth step (ext. unload).
↑	C7 C	User confirms placed weight.
↑	C7 B 4 D o "0" " " C7 B 5 D o " " " " C7 B 6 D o " " " " C7 A	Capture weight of fifth step. Capture weight of sixth step (int. load). Capture weight of seventh step (int. unload). Standard calibration finished.

See also

- C – Cancel all commands ▸ Page 23
- C5 – Enabling/disabling step control ▸ Page 33

C8 – Sensitivity adjustment

Description

Use C8 to start the customer adjustment of the sensitivity scaling (internal and external).

Syntax

Commands

C8	Request the whole list of available methods.
C8␣<Method>	Execute the command with or without the step control C5.
C8␣<Method>␣<Load>	Execute the command with optional parameter <Load>.

Responses

C8␣B␣<Method> ... C8␣A␣<Method>	Current list of available methods.
C8␣B C8␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> C8␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"ValueHostUnit"> … C8␣B␣<Index>␣<State>␣<WgtState>␣ <"LoadInstruction">␣<"DevPerMille"> C8␣A	Content of a specific method.
C8␣A	Command understood and executed successfully.
C8␣I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
C8␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0, 1 or 2	0: use default method of the adjustment 1: internal adjustment 2: external adjustment
<Load>	Float		Calibration load in the host unit. The parameter 'Load' is optional; by default the parameter <Load> is preset by the device using the M19 definition Load used in step control (Execute C8␣C␣Load) modifies the required weight value of the actual adjustment state
<Index>	Integer		Step number of the procedure
<State>	Char	R, D or C	Actual state of the adjustment process R = requesting external weight D = waiting for stability C = calibration deviation (procedure is finished, corrected calibration deviation is given in parameter "DevPerMille")

Name	Type	Values	Meaning
<WgtState>	Char	+, -, o	Actual weight state: + load is above tolerances - load is below tolerances o (small omega) load is within tolerances
<"LoadInstruction">	String	0	Instruction, which load to place on the pan String with the load combination to place on the pan separated by "+". The string contains as many numbers as different loads are used in the procedure. If the actual step uses internal weights, the string will be empty • "0" = do not place the load • "1" = place load 1 • "1+2" = place load 1 and load 2 • "0+2" = only place load 2
<"ValueHostUnit">	String		Load information of the actual adjustment state (weight and host unit)
<"DevPerMille">	String		Deviation of the measured calibration load (before adjustment) relative to the exact calibration load in per mille (‰). Value is rounded to the resolution of the finest range
<Error>	Integer	1, 2, 3, 4, 5	Parameter showing the source of the error 0: Timeout 1: Cancel 2: Built-in weight not supported 3: Adjustment not available (e.g. adjustment is unknow or disabled) 4: Calibration or adjustment load error (e.g. adjustment load is too light or too heavy) 5: Busy (e.g. another adjustment is already running)

Comments

- The parameter 'Load' and also the load value corrected with step control are tested against range definitions. A logic error (L) is returned for values violating the range definitions.
- This command accepts always two parameters also if the third parameter has no functionality in the triggered method. In this case, the third parameter is ignored by the command and does not respond a logic error (L).
- The procedure can be canceled by command C.
- External weight values must be exactly known.
- This command is equivalent to C2 and C3 (depending on the parameter **method**)

Examples

↓	C8	Request the whole list of available methods.
↑	C8 B 0 C8 A 1 C8 A 2	Methods 0, 1 and 2 are available. Other methods are not implemented.

↓	C8 1	Start the internal sensitivity adjustment procedure (method 1)
↑	C8 B C8 B 0 R - " " " 0.00 g" C8 B 0 D o " 0 " " C8 B 1 D o " " " " C8 B 2 D o " " " " C8 B 3 D o " 1 " " C8 B 4 D o " 0 " " C8 B 4 C o " 0 " " 0.23" C8 A	Sensitivity adjustment is started. Request weight for first step (ext. & int. unload). Capture weight of first step. Capture weight of second step (int. push). Capture weight of third step (int. unload). Capture weight of fourth step (int. load L1). Capture weight of fifth step (int. unload). Corrected calibration deviation in per mille (‰). Sensitivity adjustment finished.

↓	C8 2 400	Start the external sensitivity adjustment procedure (method 2), without step control (automatic recognition of placed weights).
↑	C8 B C8 B 0 R - " 0 " " 0.00 g" C8 B 0 D o " 0 " " C8 B 1 R - " 1 " " 400.00 g" C8 B 1 D o " 1 " " C8 B 1 C o " 1 " " 0.23" C8 A	Sensitivity adjustment is started. Request weight for first step (ext. & int. unload). Capture weight of first step. Request weight for second step (ext. load L1). Capture weight of second step. Corrected calibration deviation in per mille (‰). Sensitivity adjustment finished.

↓	C8 2 400	Start the external sensitivity adjustment procedure (method 2), with step control (user interaction).
↑	C8 B C8 C 0 R - " 0 " " 0.00 g"	Sensitivity adjustment is started. Request weight for first step (ext. & int. unload).
↑	C8 C	User confirms placed weight.
↑	C8 B 0 D o " 0 " " C8 C 1 R - " 1 " " 400.00 g"	Capture weight of first step. Request weight for second step (ext. load L1).
↑	C8 C	User confirms placed weight.
↑	C8 B 1 D o " 1 " " C8 B 1 C o " 1 " " 0.23" C8 A	Capture weight of second step. Corrected calibration deviation in per mille (‰). Sensitivity adjustment finished.

↓	C8 2 400	Start the external sensitivity adjustment procedure (method 2).
↑	C8 B C8 C 0 R - " 0 " " 0.00 g"	Sensitivity adjustment is started. Request weight for first step (ext. & int. unload).
↑	C8 E 0	Timeout error response.

See also

- C – Cancel all commands ▸ Page 23
- C5 – Enabling/disabling step control ▸ Page 33
- M19 – Adjustment weight ▸ Page 163

C9 – Scale placement sensitivity adjustment

Description

Start the adjustment of the scale placement sensitivity scaling. If this adjustment is used, make sure to trigger it before any subsequent adjustment in the signal processing chain since it does not reset subsequent signal processing parameters!

This command is only available for weigh modules with external lever system that is not part of the factory adjustment of the load cell. For this kind of weigh modules, this command replaces the factory standard adjustment by service technician.

Syntax

Commands

C9	Request the whole list of available methods.
C9␣<Method>	Execute the command according to a predefined method.

Responses

C9␣B␣<Method> … C9␣A␣<Method>	Current list of available methods.
C9␣B C9␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> C9␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"ValueHostUnit"> … C9␣B␣<Index>␣<State>␣<WgtState>␣<"LoadInstruction">␣<"DevPerMille"> C9␣A	Content of a specific method.
C9␣A	Command understood and executed successfully.
C9␣I	Command understood but currently not executable.
C9␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0, 1 or 2	Method = 0: use default method of the adjustment. If default method is not defined, method 1 or method 2 is used, depending on the availability of built-in weights
<Index>	Integer		Step number of the procedure
<State>	Char	R, D or C	Actual state of the adjustment process R = requesting external weight D = waiting for stability C = sensitivity deviation (procedure is finished, corrected sensitivity deviation is given in parameter "DevPerMille")
<WgtState>	Char	+, -, o	Actual weight state: + load is above tolerances - load is below tolerances o (small omega) load is within tolerances

Name	Type	Values	Meaning
<"LoadInstruction">	String		Instruction, which load to place on the pan String with the load combination to place on the pan separated by "+". The string contains as many numbers as different loads are used in the procedure. If the actual step uses built-in weights, the string will be empty Examples for two loads "0+0" = do not place the load "1+0" = place load 1 "1+2" = place load 1 and load 2 "0+2" = only place load 2 Examples for four loads: "0+0+0+0" = do not place the load "1+0+0+0" = place load 1 "1+2+0+0" = place load 1 and load 2 "0+2+0+0" = only place load 2 "1+2+3+4" = place load 1, load 2, load 3 and load 4
<"ValueHostUnit">	String		Load information of the actual adjustment state (weight and unit) in host units (M21) with the maximum displayed decimal places
<"DevPerMille">	String		Deviation of the measured calibration load (before adjustment) relative to the exact calibration load in per mille (‰). Value is rounded to the resolution of the finest range
<Error>	Integer	1, 2, 3, 4, 5	Parameter showing the source of the error 0: Timeout 1: Cancel 2: Built-in weight not supported 3: Adjustment not available (e.g. adjustment is unknow or disabled) 4: Calibration or adjustment load error (e.g. adjustment load is too light or too heavy) 5: Busy (e.g. another adjustment is already running)

Comments

This command is used to perform a sensitivity adjustment. This operation performs a sensitivity adjustment without modifying the adjustment parameters of subsequent signal processing blocks. This is needed; when the linearity and the sensitivity of an external lever system are corrected with scaling blocks later in the signal processing chain (e.g., scale production adjustment).

- Method 1 of this command is an internal sensitivity adjustment. This adjustment does not reset block parameters of following SP blocks! Therefore be sure to trigger this adjustment before any adjustment of subsequent SP blocks. Otherwise do not use this adjustment!
- This adjustment can be canceled by the command C.

Examples

↓	C9	Request the whole list of available methods.
↑	C9 B 0 C9 A 1	Methods 0 and 1 are available. Other methods are not implemented or have been disabled.

↓	C9 1	Start the internal sensitivity adjustment procedure (method 1).
↑	C9 B C9 B 0 R - "" " 0.00 g" C9 B 0 D o "0" " " C9 B 1 D o " " " " C9 B 2 D o " " " " C9 B 3 D o "1" " " C9 B 4 D o "0" " " C9 B 4 C o "0" " 0.23" C9 A	Sensitivity adjustment is started. Request weight for first step (ext. & int. unload). Capture weight of first step. Capture weight of second step (int. push). Capture weight of third step (int. unload). Capture weight of fourth step (int. load L1). Capture weight of fifth step (int. unload). Corrected calibration deviation in per mille (‰). Sensitivity adjustment finished.

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
		1	Built-in RS422 interface
<Baud>	Integer	0	150 baud
		1	300 baud
		2	600 baud
		3	1200 baud
		4	2400 baud
		5	4800 baud
		6	9600 baud (factory setting)
		7	19200 baud
		8	38400 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

- Command only available without a connected terminal.
- If an option is present in the system, the host is automatically assigned to that interface and the COM command is not available anymore.
- The answer is returned with the current settings, the settings are changed afterwards.
- No values other than those specified must be used; otherwise, uncontrollable settings may result.
- When adjusting the values, the connection parameters of the connected communication partner must also be adjusted. Otherwise, it will not be possible to establish any further communication.
- It is recommended to check the parity bit in the communication of the weighing device with the control system (PLC) in order to see whether there is any error in the transmission.
- Transmission errors might become more likely as the baud rate of the communication is increased.

Examples

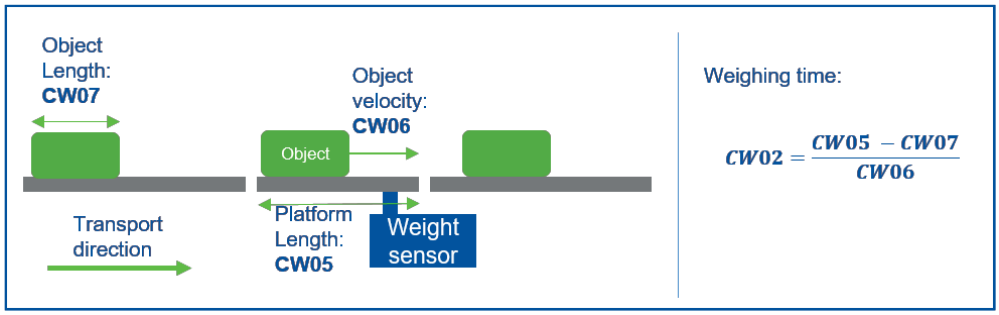
↓	COM	Send current settings for interface parameters for all present interfaces.
↑	COM␣B␣0␣6␣3␣0	RS232 is set to 9600 baud, 8 bits, no parity, 1 stop bit, no handshake.

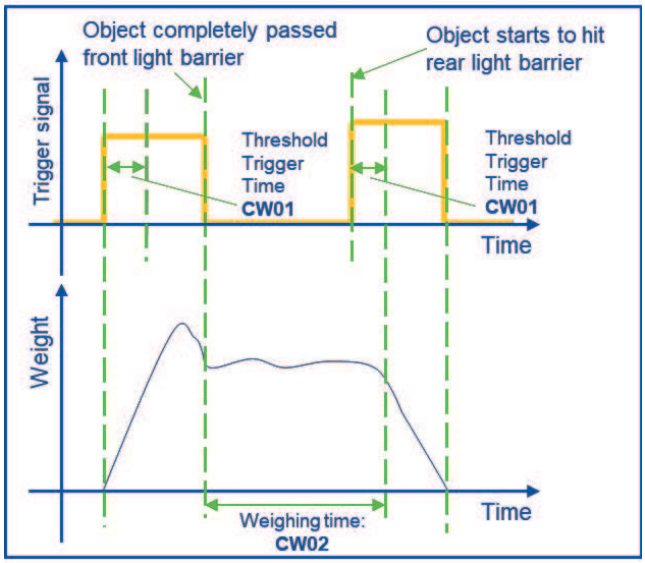
↓	COM␣0␣8␣3␣0	Setting the parameters for the serial interface to 38400 baud, 8 data bits, no parity, 1 stop bit, no handshake.
↑	COM␣A	Parameters successfully set to desired values.

CW02 - Time for weighing

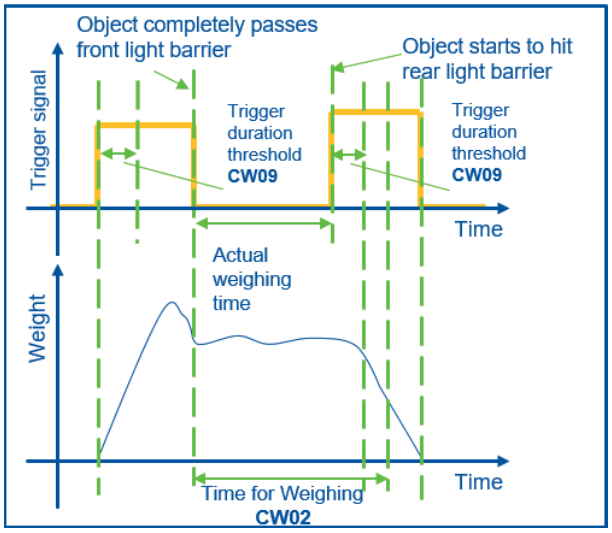
Use CW02 to set the weighing time for check weighing.

- If the value is zero (CW02 0), the weighing time will be calculated as follows:

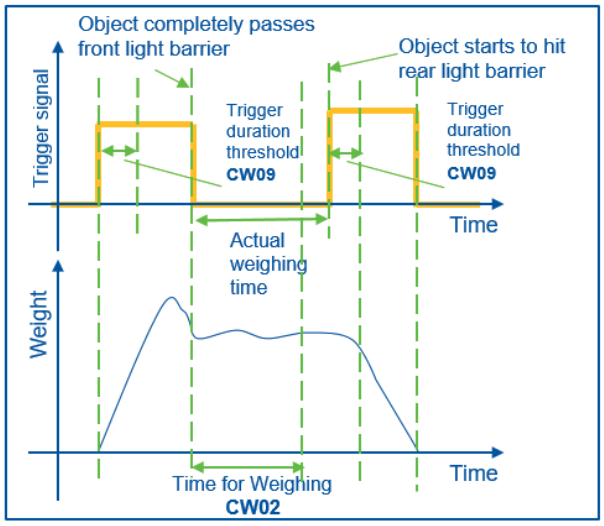




- If the value is not zero and longer than the actual weighing time, then the actual weighing time will be used.



- If the value is not zero and shorter than the actual weighing time, then



Syntax

Commands

CW02	Query the parameters from the device.
CW02␣<Time>	Set the parameters to the device.

Responses

CW02␣A␣<Time>	Current behavior of the device.
CW02␣A	Command understood and executed successfully.
CW02␣L	Command understood but not executable. E.g. ProGage: minimum weighing time less than 100 ms.

Parameters

Name	Type	Values	Meaning
<Time>	unsigned 16 bits	0	Weighing time is calculated
		>0	Weighing time in ms

Initial values

↓	CW02	Query the parameters from the device.
↑	CW02␣A␣0	Weighing time is calculated.

Comment

Due to the check weighing algorithm of ProGage, the minimum weighing time must be greater than 100 ms.

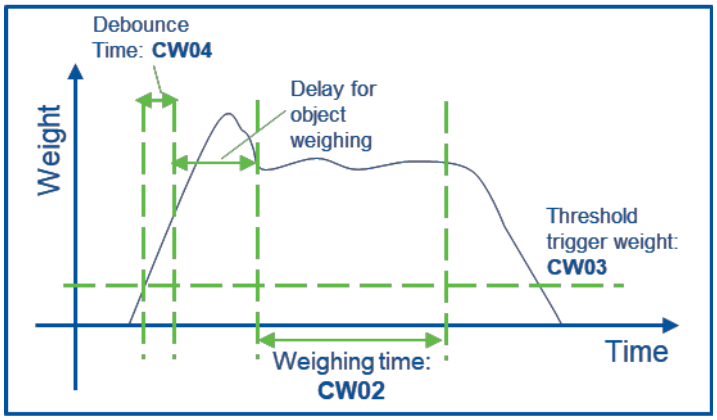
Examples

↓	CW02	Query the parameters from the device.
↑	CW02␣A␣200	The current weighing time is set to 200 ms.

↓	CW02␣300	Set the weighing time to 300 ms.
↑	CW02␣A	Command understood and executed successfully.

CW03 - Triggered weight value

Use the CW03 command to set the weight threshold to trigger the weighing process in trigger mode "No external trigger".



Syntax

Commands

CW03	Query the parameters from the device.
CW03␣<Weight>	Set the parameters to the device.

Responses

CW03␣A␣<Weight>	Current threshold.
CW03␣A	Command understood and executed successfully.

Parameters

Name	Type	Values	Meaning
<Weight>	float 32 bits	1 display step … capacity of the device	Weight value treshold

Initial values

Product dependent, typically 10 % of capacity.

Examples

↓	CW03	Query the parameters from the device.
↑	CW03␣A␣300.0	The current threshold triggered weight is set to 300 g.
↓	CW03␣200	Set the threshold weight to 200 g.
↑	CW03␣A	Command understood and executed successfully.

CW11 - Check weighing: Weight calculation mode

Use CW11 to get/set the weight calculation mode in the weighing process in case of trigger mode "Weight trigger, no external trigger".

Syntax

Commands

CW11	Query the parameters from the device.
CW11␣<Mode>	Set the parameters to the device.

Responses

CW11␣A␣<Mode>	Current weight calculation mode.
CW11␣A	Command understood and executed successfully.

Parameters

Name	Type	Values	Meaning
<Mode>	integer	0 1 2	Raising Falling Other trigger

Initial values

Commands

CW11	Query the parameters from the device.
CW11␣A␣0	Calculation mode = Raising edge

Comments

- This parameter makes sense only when CW01 is "Weight trigger, no external trigger (i.e. light-barriers to detect the weighing object)".
- For weight calculation mode 2, the command in he software used is product dependent. E.g., command SIMS is used for product SPG23C.

Examples

↓	CW11	Query the parameters from the device.
↑	CW11␣A␣0	Calculation mode = Raising edge

↓	CW11␣1	Set calculation mode to raising edge.
↑	CW11␣A	Command understood and executed successfully.

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.

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. *.

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	2020 … 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␣2021	The date of the balance is 1st October 2021.

See also

- DATI – Date and Time ▸ Page 54
- TIM – Time ▸ Page 258

DATI – Date and Time

Description

Set or query the balance system date and time in a single action.

Syntax

Commands

DATI	Query of the current date and time of the balance.
DATI␣<Year>␣<Month>␣<Day> ␣<Hour>␣<Minute>␣<Second>	Set the date and time of the balance.

Responses

DATI␣A␣<Year>␣<Month>␣<Day> ␣<Hour>␣<Minute>␣<Second>	Current date and time of the balance.
DATI␣A	Command understood and executed successfully.
DATI␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Year>	Integer		Year The accepted range of years is depending on platform/ product
<Month>	Integer	01 … 12	Month
<Day>	Integer	01 … 31	Day, valid date only
<Hour>	Integer	00 … 23	Hour
<Minute>	Integer	00 … 59	Minute
<Second>	Integer	00 … 59	Second

Examples

↓	DATI	Query of the current date and time of the balance.
↑	DATI␣A␣2021␣11␣30␣22␣45␣56	The date and time of the balance is 30th November 2021, 22:45:56.

↓	DATI␣2021␣11␣30␣22␣45␣56	Sets the date and time of the balance to 30th November 2021, 22:45:56
↑	DATI␣A	Command understood and executed successfully.

See also

- DAT – Date ▸ Page 53
- TIM – Time ▸ Page 258

DIN – Configuration for digital inputs

Description

Set or query the configuration for the digital inputs.

Syntax

Commands

DIN	Query of the configuration for the digital inputs.
DIN␣<Input>␣<"Command">␣<Transition>␣<Interface>	Set the configuration for the digital input.

Responses

DIN␣B␣<Input>␣<"Command">␣<Transition>␣<Interface> DIN␣B… DIN␣A␣<Input>␣<"Command">␣<Transition>␣<Interface>	Current configuration for the digital input.
DIN␣A	Command understood and executed successfully.
DIN␣I	Command understood but currently not executable.
DIN␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Input>	Integer	1 … n	Number of digital input
<"Command">	String	max. 64 chars	MT-SICS command
<Transition>	Integer	0: rising edge	Transition of the input signal
		1: falling edge	
<Interface>	integer	0 … n	Number of Interface, Interface number, **see** [COM ▸ Page 46]

Comments

- Only one event can be programmed on each digital input.
- Nonsense "Command" leads to an ES on the specified interface.

Example

↓	DIN	Query the current configuration for the digital input.
↑	DIN␣A␣2␣"SI"␣1␣1	The command "SI" will be executed on the interface 1 by falling edge on digital input number 2.

DIS – Digital input status

Description

Use `DIS` to ask the actual status of the digital input ports. The number of input ports is dependent on the product model type.

Syntax

Commands

`DIS`	Query the status of all available input ports.
`DIS␣<Input>`	Query the status of a specific input port.

Responses

`DIS␣B␣<Input>␣<Status>`
 	
`DIS␣B…`
`DIS␣A␣<Input>␣<Status>`
	Current status for all available input ports.

`DIS␣A␣<Input>␣<Status>`	Current status of a specific input port.
`DIS␣I`	Command understood but currently not executable.
`DIS␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Input>`	Integer	`1 … n`	Number of the input port
`<Status>`	Boolean	`0: off` `1: on`	Status of the input port

Comments

- This command returns the Boolean status of the queried input port(s).
- If the product has no physical input ports, this command returns the status of the logical input ports.

Examples

↓	`DIS`	Query the status of all available input ports.

↑	`DIS␣B␣1␣1`
	
	`DIS␣B␣2␣1`
	
	`DIS␣A␣3␣1`
		Current status for all available input ports.

↓	`DIS␣1`	Query the status of the input port-1.
↑	`DIS␣A␣1␣1`	Current status of the input port-1 is "1".

See also

🔗 DIN – Configuration for digital inputs ▸ Page 55

DOS – Digital output status

Description

Use DOS to ask the actual status of the digital output ports. The number of output ports is dependent on the product model type.

Syntax

Commands

DOS	Query the status of all available output ports.
DOS␣<Output>	Query the status of a specific output port.

Responses

DOS␣B␣<Output>␣<Status> DOS␣B… DOS␣A␣<Output>␣<Status>	Current status for all available output ports.
DOS␣A␣<Output>␣<Status>	Current status of a specific output port.
DOS␣I	Command understood but currently not executable.
DOS␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Output>	Integer	1 … n	Number of the output port
<Status>	Boolean	0: off 1: on	Status of the output port

Comments

- This command returns the boolean status of the queried output port(s).
- If the product has no physical output ports, this command returns the status of the logical output ports.

Examples

↓	DOS	Query the status of all available output ports.
↑	DOS␣B␣1␣0 DOS␣B␣2␣0 DOS␣B␣3␣0 DOS␣B␣4␣0 DOS␣A␣5␣0	Current status for all available output ports.

↓	DOS␣1	Query the status of the output port-1.
↑	DOS␣A␣1␣0	Current status of the output port-1 is "0".

See also

- F01 – Automatic prefilling configuration ▸ Page 69
- F13 – Filling phase configuration ▸ Page 86
- F15 – Digital output function configuration ▸ Page 89

DOT – Configuration for digital outputs

Description

Set or query the configuration for the digital outputs.

Syntax

Commands

DOT	Query of the current configuration for the digital outputs.
DOT␣<Output>␣<Duration>␣<Delay>	Set the configuration for the digital outputs.

Responses

DOT␣B␣<Output>␣<Duration>␣<Delay> DOT␣B… DOT␣A␣<Output>␣<Duration>␣<Delay>	Current configuration for the digital output.
DOT␣A	Command understood and executed successfully.
DOT␣I	Command understood but currently not executable.
DOT␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Output>	Integer	1 … n	Number of digital output
<Duration>	String	10 … 65535 ms	Duration time in ms
<Delay>	Integer	0 … 65535 ms	Delay time in ms

Comments

- Only one event can be programmed on each digital output.
- The timing resolution: duration and delay are rounded up to the system resolution (usually 8 or 10 ms).

Example

↓	DOT	Query the current configuration for the digital output.
↑	DOT␣A␣2␣500␣100	The digital output number 2 will increase the voltage for a duration of 500 ms with a delay of 100 ms. Digital outputs can be set with the commands: [DOTC ▸ Page 59], DOTP and [WMCF ▸ Page 270].

See also

- DOTC – Configurable digital outputs – Weight monitor ▸ Page 59
- WMCF – Configuration of the weight monitoring functions ▸ Page 270

DOTC – Configurable digital outputs – Weight monitor

Description

Use DOTC for weight monitoring functionality for dosing or check weighing application. Benefit is that this function works without a PC or PLC.

Syntax

Commands

DOTC	Query of the current configuration for the weight monitor.
DOTC␣<Output>␣<Active>	Set the configuration for the weight monitor.
DOTC␣<Output>␣<Active>␣<Interface>␣<TargetValue>␣<TargetUnit>␣<Tol->␣<TolUnit>␣<Tol+>␣<TolUnit>␣<State>	Set the configuration for the weight monitor.

Responses

DOTC␣B␣<Output>␣<Active> DOTC␣B… DOTC␣A␣<Output>␣<Active>	Current configuration for the weight monitor.
DOTC␣B␣<Output>␣<Active>␣<Interface>␣<-TargetValue>␣<TargetUnit>␣<Tol->␣<TolUnit>␣<Tol+>␣<TolUnit>␣<State> DOTC␣B… DOTC␣A␣<Output>␣<Active>␣<Interface>␣<-TargetValue>␣<TargetUnit>␣<Tol->␣<TolUnit>␣<Tol+>␣<TolUnit>␣<State>	Current configuration for the weight monitor.
DOTC␣A	Command understood and executed successfully.
DOTC␣I	Command understood but currently not executable.
DOTC␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Output>	Integer	1 … n	Number of digital output
<Active>	Boolean	1 = on	Command on DOT (n) active
		0 = off	
<Interface>	Integer	0 … n	Observed interface, Interface number, **see** [COM ▸ Page 46]
<TargetValue>	Float		Target value
<TargetUnit>	String		Target unit, only available units permitted
<Tol-> <Tol+>	Float		Tolerance
<TolUnit>	String		Tolerance unit, available units and % permitted
<State>	String	S = only stable values	Trigger for the value state
		D = only dynamic values	
		A = all values, S and D	

Comments

- Digital output must be available.
- Only one command DOTC(n), DOTP(n) or [WMCF ▸ Page 270] can be configured for the same digital output.
- Duration and delay from the digital output must be defined with the command [DOT ▸ Page 58].
- Target value will be rounded to the defined resolution from the load cell.
- Target unit only allowed units are permitted.
- The weight value monitoring function works only with a weight value command (e.g. SI, SIR).
- The update rate depends on the defined UPD rate.
- Tol- and Tol+ defined as % reference to the target value.
- Only allowed units are permitted, **see** [M21 ▸ Page 165].

Examples

↓	DOTC␣2	Query the current configuration for the weight monitor on the second digital output (DOT␣2).
↑	DOTC␣A␣2␣1␣0␣100␣g␣5␣%␣10␣g␣S	DOT␣2 will be set on every stable weight value on Interface 0 between 100 g – 5 % +10 g.

↓	DOTC␣3␣1␣1␣300␣g␣5␣mg␣1␣g␣A	Set the following configuration for the third digital output (DOT␣3): DOT␣3 will be set on every value (stable and unstable) on Interface 1 between 300 g -5 mg +1 g.
↑	DOTC␣A	Command understood and executed successfully.

↓	DOTC␣1␣0	Deactivate DOTC on digital output 1 (DOT␣1). Other settings like interface, TargetValue,… will be unchanged.
↑	DOTC␣A	Command understood and executed successfully.

↓	DOTC␣1␣1	Activate DOTC on digital output 1 (DOT␣1). Old settings will be used or default if newer defined.
↑	DOTC␣A	Command understood and executed successfully.

See also

- DOT – Configuration for digital outputs ▸ Page 58
- WMCF – Configuration of the weight monitoring functions ▸ Page 270

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 52] 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 52

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

- UTF-8 is ASCII compatible if only the code of the first 127 characters is used.
- The ErrorMessage is language dependent and can be switched by M15.
- The error code and message will change as soon as the device detects an other state i.e. after a restart or reset.
- If the device is able to detect multiple error s in parallel then only the most critical error (lowest error number) is stated.

Example

↓	E01	Query of the current system error state.
↑	E01␣101␣"БАТАРЕЯ␣СЕЛА␣- ␣ПРОВЕРЬ␣ДАТУ␣И␣ВРЕМЯ"	The last device error is "BATTERY BACKUP LOST - CHECK DATE TIME SETTINGS". The selected language is Russian.

E02 – Weighing device errors and warnings

Description

Use E02 to ask the active errors and warnings of the weighing device. The list of the errors and warnings is always product-specific.

Syntax

Command

E02	Query active errors and warnings of the weighing device.

Responses

E02␣<ErrorCode>	Weighing device returns the error code.
E02␣I	Command understood but currently not executable.

Parameter

Name	Type	Values	Meaning
<ErrorCode>	Bit set (32 bits)	$ErrorCode = \sum 2^{Bit}$	Error code including all device errors and warnings

Comments

- This command returns the error code of the weighing device which is a combination of bits for active errors and warnings. Error code of the device is calculated according to the following formula, where bits represent the respective warnings and error conditions:

$$ErrorCode = \sum 2^{Bit}$$

- The list of errors and warnings is always product-specific. Refer to the corresponding user manual of the product for a complete list of device errors and warnings.

The bits for the warning and error conditions are explained in the table below. SLP85xD load cells are taken as example:

Bit	Error Code	Meaning	Error / Warning Condition	Weighing Response
0	10	Non-volatile data memory error (EEPROM)	Error during read/write process	Send the error code instead of the weight value Example: S␣S␣102
1	102	Zero drift error	Zero drift (actual zero compared to user calibrated zero) > 10% of maximum capacity	
2	103	Supply voltage error	Supply voltage > 33V	
3	104	PCBA temperature error	PCBA (main board) temperature > 80 °C	

Bit	Error Code	Meaning	Error / Warning Condition	Weighing Response
4	200	Measuring sensor temperature warning	Temperature of the measuring sensor is out of the compensated range [-10 °C … 40 °C]	Send weight value Example: `S␣S␣10␣g`
5	201	Measuring sensor temperature gradient warning	Temperature change of the measuring sensor is out of tolerance ($\Delta T / \Delta t > 0.5\ ^{0}C$ / 60 s)	
6	202	PCBA temperature warning	70 °C < PCBA (main board) temperature < 80 °C	
7	203	Supply voltage warning	Supply voltage is out of tolerances [10V … … 30V]	
8	204	Zero drift warning	1% of max. cap. < zero drift (actual zero compared to user calibrated zero) < 10% of max. cap.	
9	205	Load cell overload	Weight value > Maximum capacity	
11 … 31	0	Reserved for future use	None	

Examples

↓	`E02`	Query active errors and warnings of the weighing device.
↑	`E02␣A␣8`	PCBA (main board) temperature is higher than 80 °C. Device returns the error code 104 to weight request commands.

↓	`E02`	Query active errors and warnings of the weighing device.
↑	`E02␣A␣102` ($2^6 + 2^7$)	PCBA (main board) temperature is higher than 70 °C and supply voltage is out of tolerances.

See also

E03 – Current system errors and warnings ▸ Page 65

E03 – Current system errors and warnings

Description

Use `E03` to ask the current errors and warnings of the weighing device together with the error code and the error message.

Syntax

Command

`E03`	Query current errors and warnings of the weighing device.

Responses

`E03␣A␣<Index>␣<Code>␣<Message>`	Weighing device returns the error code and the error message.
`E03␣I`	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
`<Index>`	Integer	`0 … 31`	Index for the error code and message
`<Code>`	Integer	`0`	No error
		`10`	Non-volatile data memory error (EEPROM)
		`102`	Zero drift error
		`103`	Supply voltage error
		`104`	PCBA temperature error
		`200`	Measuring sensor temperature warning
		`201`	Measuring sensor temperature gradient warning
		`202`	PCBA temperature warning
		`203`	Supply voltage warning
		`204`	Zero drift warning
		`205`	Load cell overload
`<Message>`	String	`128 chars`	Error text message in UTF-8

Comment

UTF-8 is ASCII compatible if only the code of the first 127 characters is used.

Examples

↓	`E03`	Query current errors and warnings of the weighing device.
↑	`E03␣A␣0␣0␣"No error"`	Weighing device returns the error code and the error message.

↓	`E03`	Query current errors and warnings of the weighing device.
↑	`E03␣B␣0␣104␣"PCBA temperature error"` `E03␣A␣1␣203␣"Supply voltage warning"`	Weighing device returns active error codes and corresponding messages.

See also

E02 – Weighing device errors and warnings ▸ Page 63

ECHO – Echo Mode

Description

This command puts the MT-SICS device into one of several echo modes. There are modes to echo everything that is received, to send back a received line repeatedly, or to drop everything that is received. Each mode can be used to test a different aspect of the communication channel. E.g. to test the performance of the send and receive directions or the reliability of the communication channel, MT-SICS client and MT-SICS server. The echo mode does not execute any function on the device itself. To exit the echo mode an escape command needs to be sent to the device. After exiting the echo mode the number of received and sent octets are replied so the client can calculate the throughput or verify that no data was dropped.

Note

APW-Link does not offer the option to enter ASCII control characters (e.g. escape command). In order to use the ECHO command, use a terminal program with the ability to send ASCII control characters (e.g. escape command) to send the escape command.

Syntax

Commands

ECHO␣<Mode>	Start echo mode.
<ANY>	Any sequence of printable characters (modes 0-2) or bytes (mode 3) to be echoed.
<ESC>	Exit echo mode.

Responses

ECHO␣C	Echo mode started.
<ANY>	Any sequence of printable characters (modes 0-2) or bytes (mode 3) echoed.
<EOL>ECHO␣A␣<ReceivedCount>␣<SentCount>	Number of received counts and sent counts between the ECHO␣C response and the ESC command.

Parameter

Name	Type	Range	Meaning
<Mode>	Integer		Echo mode
		0	Start text based drop mode (server drops all the data)
		1	Start text based echo mode (server echoes all the data immediately)
		2	Start text based echo mode repeatedly (server echoes the received line repeatedly)
		3	Start binary echo mode (server echoes all the data immediately
<Any>	Bytes		Any sequence of printable characters (modes 0-2) or bytes (mode 3) to be echoed
<ESC>	Escape character	27_{DEC} / $1B_{HEX}$	Exit echo mode Note that an extra <EOL> is added when acknowledging with ECHO␣A to ensure that the response starts with a new line.
<ReceivedCount>	Integer		Number of received counts between the ECHO␣C response and the <ESC> command.
<SentCount>	Integer		Number of sent counts between the ECHO␣C response and the <ESC> command.

Example 1

Start the text based drop mode. In this mode all the sent data is discarded by the MT-SICS server. Then exit the echo mode and resume normal MT-SICS operation.

↓	ECHO␣0	Start echo mode.
↑	ECHO␣C	Command understood and executed successfully.
↓	This data is dropped.	Send text.
↓	... ...	
↓	<ESC>	Exit echo mode.
↑	<EOL>ECHO␣A␣23␣0	23 received counts, 0 sent counts

Example 2

Start the text based echo mode and request the echo of a Base64 encoded sequence of bytes. Then exit the echo mode and resume normal MT-SICS operation.

↓	ECHO␣1	Start echo mode.
↑	ECHO␣C	Command understood and executed successfully.
↓	Let's echo something!	Send text.
↑	Let's echo something!	The device immediately echoes the sequence of bytes.
↓	<ESC>	Exit echo mode.
↑	<EOL>ECHO␣A␣23␣23	23 received counts, 23 sent counts

Example 3

Start the text based echo mode and request the echo of a Base64 encoded sequence of bytes repeatingly. Then exit the echo mode and resume normal MT-SICS operation. Before exiting the echo mode, the last line shall be completely responded.

↓	ECHO␣2	Start echo mode.
↑	ECHO␣C	Command understood and executed successfully.
↓	Let's echo something!<EOL>	Send text.
↑	Let's echo something!<EOL> Let's echo something!<EOL> Let's echo something!<EOL> ...	The device immediately starts echoing the sequence of bytes until an <EOL> is received. Then it continues to send the same line repeatedly, including <EOL>.
↓	<ESC>	Exit echo mode.
↑	<EOL>ECHO␣A␣23␣59248	23 received counts, 59248 sent counts (2576 lines are responded)

Comments

- The text based echo modes echo all printable characters. Printable characters are 0x20…0x7E, 0x80… 0xFF and the <EOL> sequence. Thus, UCS and UTF encoded Unicode characters are also echoed. All other characters are not echoed, i.e. suppressed. All suppressed characters are not counted and must not be used.
- The binary echo mode echoes all characters except the escape character 0x1B which is used to terminate the echo mode. It is not guaranteed that all characters can be sent or echoed. Depending on the used interface or flow control settings some characters may be consumed by the driver stack (e.g. XON, XOFF). All characters which make it through the driver stack are counted and echoed.
- The device will stay in the echo mode until an escape character is sent or until the device is restarted.
- The repeating echo mode is useful to test the reliability of MT-SICS clients while continuously receiving. Experience has shown that continuously receiving may be challenging for PC applications in at least two cases:
  - Performing time consuming operations, e.g. accessing a file on a network drive, while continuously receiving. The application or the underlying communication infrastructure may struggle to properly continue receiving data while the time consuming operation is ongoing. This e.g. is the case if the time consuming operation is performed on the main thread, i.e. that thread which is responsible to update the user inferface.
  - Exiting the application while contiuously receiving. The application or the underlying communication infrastructure may struggle to properly shut down all communication related parts during exiting. This e.g. is the case if the underlying communication infrastructure is running on a separate thread, which might be stopped too late, and will then still try to forward data to the main thread.
- In the repeating echo mode, the length of the buffered sequence is limited to the device capabilites, e.g. 64 or 120 bytes. If the written sequence is too long, the device shall truncate the excessive bytes. It is device dependent whether the beginning or the end of the sequence is truncated.
- The drop mode is useful to test the performance and reliability of the MT-SICS servers when continuously receiving data. With the drop mode the received data is just discarded and the maximum throughput can be achieved. Otherwise it is hard to achieve the maximum throughput because the command handler is the bottleneck and blocks incoming data (e.g. using flow control).
- The binary echo mode is useful to check if a communication interface is capable of handling binary data.

F01 – Automatic prefilling configuration

Description

Use F01 to activate or deactivate the prefilling process, to assign digital outputs to the prefilling process and to set the prefilling duration.

Syntax

Commands

F01	Query the current configuration for automatic prefilling function.
F01␣<Active>␣<OutputOn>␣<Duration>	Set the configuration for the automatic prefilling function.

Responses

F01␣A␣<Active>␣<OutputOn>␣<Duration>	Current configuration for automatic prefilling function.
F01␣A	Command understood and executed successfully.
F01␣I	Command understood but currently not executable.
F01␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Active>	Boolean	0: off 1: on	Activate / deactivate the prefilling function
<OutputOn>	Bit set (8 bits)	$OutputOn = \sum_{output\ ports\ on} 2^{Bit}$	Set of digital outputs which will remain high during prefilling
<Duration>	Float	0 … 65535 ms	Prefilling duration

Comments

- Target of the prefilling is to start the filling process with a low speed in order to avoid the foaming of the liquid in-side the container.
- <OutputOn> defines which output ports are assigned to the prefilling process. This parameter is calculated as a bit set. See the table below for the definition of the bit set:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output-8	Output-7	Output-6	Output-5	Output-4	Output-3	Output-2	Output-1

Examples

↓	F01	Query the current configuration for automatic prefilling function.
↑	F01␣A␣1␣12␣500	Prefilling is activated and the digital outputs 3 and 4 are assigned to this process ($2^2 + 2^3 = 12$). This process will last for 500 ms.

↓	F01␣1␣5␣100	Activate prefilling with the digital outputs 3 and 1 ($5 = 2^2 + 2^0$) and a duration of 100 ms.
↑	F01␣A	Command understood and executed successfully.

F02 – Material filling duration configuration

Description

Use F02 to configure the material filling duration for filling applications. This is the waiting time in order to capture the filling material in the air after all filling valves are shut.

Syntax

Commands

F02	Query the current configuration for material filling duration.
F02␣<Duration>	Set the configuration for the material filling duration.

Responses

F02␣A␣<Duration>	Current configuration for material filling duration.
F02␣A	Command understood and executed successfully.
F02␣I	Command understood but currently not executable.
F02␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Duration>	Float	0 … 65535 ms	Material filling duration

Comment

Target of the material filling duration is to wait for the filling material that is still in the air after all filling valves are closed and to capture this material inside the container.

Examples

↓	F02	Query the current configuration for material filling duration.
↑	F02␣A␣400	Material filling duration is configured as 400 ms.

↓	F02␣200	Set material filling duration to 200 ms.
↑	F02␣A	Command understood and executed successfully.

F03 – Automatic refilling configuration

Description

Use `F03` to activate or deactivate the refilling function. It automatically sets the selected output port for a time calculated by the optimization function.

Syntax

Commands

`F03`	Query the current configuration for the automatic refilling function.
`F03␣<Active>`	Activate or deactivate the automatic refilling function.

Responses

`F03␣A␣<Active>`	Current status of automatic refilling function.
`F03␣A`	Command understood and executed successfully.
`F03␣I`	Command understood but currently not executable.
`F03␣L`	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
`<Active>`	Boolean	`0: off` `1: on`	Activate / deactivate the automatic refilling function

Comments

- Target of the automatic refilling function is to fill the container up to the target weight automatically, in case the actual final weight is less than the target reference weight.
- For the refilling function, the output port(s) is/are selected automatically which is/are connected to the valve(s) that control(s) the final part of the filling process (fine filling).

The selected output port(s) will be activated and it/they will remain high for certain duration.

Examples

↓	`F03`	Query the current configuration for automatic refilling function.
↑	`F03␣A␣0`	Automatic refilling function is not active.

↓	`F03␣1`	Activate the automatic refilling function.
↑	`F03␣A`	Command understood and executed successfully.

See also

- F13 – Filling phase configuration ▸ Page 86
- F15 – Digital output function configuration ▸ Page 89

F04 – Target weight configuration

Description

Use F04 to set a target reference weight for the filling application.

Syntax

Commands

F04	Query the reference target weight.
F04␣<TargetWeight>␣<Unit>␣<NegTolP>␣<PosTolP>	Configure the reference target weight.

Responses

F04␣A␣<TargetWeight>␣<Unit>␣<NegTolP>␣<PosTolP>	Current configuration of the target weight.
F04␣A	Command understood and executed successfully.
F04␣I	Command understood but currently not executable.
F04␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<TargetWeight>	Float		Reference target weight
<Unit>	String	g, mg or ug	Unit of the reference target weight
<NegTolP>	Float	%	Negative tolerance limit given as percentage of <TargetWeight>
<PosTolP>	Float	%	Positive tolerance limit given as percentage of <TargetWeight>

Comments

- Actual final weight is compared to reference target weight to determine the success of the filling application.
- Optimization- and refilling functions do their calculations based on the target weight.
- Filling function is deactivated if the target weight is configured as F04␣0.

Examples

↓	F04	Query the reference target weight.
↑	F04␣A␣1000␣g␣1␣2	Reference target weight is configured as 1000 g with negative tolerance limit of 1% (- 10 g) and positive tolerance limit of 2% (+ 20 g) .

↓	F04␣2000␣g␣5␣5	Define the reference target weight as 2000 g with negative and positive tolerance limits of 5% (± 100 g).
↑	F04␣A	Command understood and executed successfully.

See also

- F03 – Automatic refilling configuration ▸ Page 71
- F05 – Optimization function configuration ▸ Page 73

F05 – Optimization function configuration

Description

Use F05 to activate or deactivate the optimization function and configure the optimization method and its degree. Optimization function is used to reconfigure the cut-off points for the valves automatically in case of a mismatch between the reference target weight and the actual final weight.

Syntax

Commands

F05	Query the configuration of the optimization function.
F05␣<Active>␣<Method>␣<Degree>	Configure the optimization function.

Responses

F05␣A␣<Active>␣<Method>␣<Degree>	Current configuration of the optimization function.
F05␣A	Command understood and executed successfully.
F05␣I	Command understood but currently not executable.
F05␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Active>	Boolean	0: off 1: on	Activate / deactivate the optimization function
<Method>	Integer	1	Feedback optimization-1
		2	Feedback optimization-2
		3	Feed forward optimization
		4	Both method 1 and 3
		5	Both method 2 and 3
<Degree>	Integer	1	High optimization degree
		2	Medium optimization degree
		3	Low optimization degree

Comments

- Optimization function has the purpose of reconfiguring the cut-off points within the actual or subsequent filling cycle such that the actual final weight stays within tolerances in shortest filling time.
- Different methods for the optimization are explained below:

Method-1

In this method, the biggest cut-off point is optimized according to the deviation from the target weight. All other cut-off points are reconfigured according to the optimization step of the biggest cut-off point.

With this method, actual filling weight is optimized based on the deviation from the reference target weight.

Method-2

In this method, all cut-off points are optimized according to the biggest cut-off point such that the filling time is reduced as much as possible.

With this method, all cut-off points are brought closer to the biggest cut-off point, thus total filling time is reduced.

Method-3

This method can be used, if there is a variable (not constant) flow rate from one or all of the filling valves. In this case, the average value of the variable flow rate over the last 10 filling cycles is calculated and the biggest cut-off point is optimized based on this value.

Method-4

Set both method 1 and method 3.

Method-5

Set both method 2 and method 3.

- You can refer to the operating instructions of the SLP85xD load cells for more details regarding optimization calculations.

Examples

↓	F05	Query the status of the optimization function.
↑	F05␣A␣1␣1␣1	Optimization function is activated with feedback optimization-1 and high optimization degree.

↓	F05␣1␣2␣3	Activate the optimization function with feedback optimization-2 and low optimization degree.
↑	F05␣A	Command understood and executed successfully.

See also

- F04 – Target weight configuration ▸ Page 72
- F13 – Filling phase configuration ▸ Page 86

F06 – Weight monitor function configuration

Description

Use F06 to configure the weight monitor function. This function can be configured to monitor the filling process based on weight increase.

Syntax

Commands

F06	Query the current configuration for weight monitor function.
F06␣<N>	Query the current configuration for a certain normal filling process.
F06␣<N>␣<Active>␣<Delta>␣<Unit>	Set the configuration for weight monitor function.

Responses

F06␣B␣<N>␣<Active>␣<Delta>␣<Unit> F06␣B␣… F06␣A␣<N>␣Active>␣<Delta>␣<Unit>	Current configuration for weight monitor function.
F06␣A␣<N>␣Active>␣<Delta>␣<Unit>	Current configuration for a certain normal filling process,
F06␣A	Command understood and executed successfully.
F06␣I	Command understood but currently not executable.
F06␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<N>	Integer	1 … 5	Number of the normal filling process which will be monitored with this function
<Active>	Boolean	0: off 1: on	Activate / deactivate the weight monitor function
<Delta>	Float		The difference between the filling characteristic curve and monitor characteristic curve
<Unit>	String	g, mg	Unit of the parameter <Delta>

Comments

- When activated, this function builds a monitor curve which sets the lower limit for the actual filling curve. If the actual filling curve goes below the monitor curve, this implies that there is an error in the filling application. This error is interpreted as bag/bottle breakage.
- If this error occurs, following steps are taken:
  - Remaining filling process is stopped
  - Error bit for the bag/bottle breakage is set, **see** command [F09 – Filling application status ▸ Page 80]
  - Set the output I/O port if configured as "Alarm" message
- After the error condition is removed, filling process can be continued with the F10␣2 command.
- You can refer to the operating instructions of the SLP85xD load cells for more details regarding the definition of the weight monitor function.

Examples

↓	F06	Query the current configuration for weight monitor function.
↑	F06␣B␣1␣1␣1␣g F06␣B␣2␣1␣1␣g F06␣B␣3␣1␣1␣g F06␣B␣4␣1␣1␣g F06␣A␣5␣1␣1␣g	Weight monitor function is activated for all filling phases and follows the characteristic filling curve with a delta parameter of 1 g.

↓	F06␣2	Query the current configuration for 2nd filling phase.
↑	F06␣A␣2␣1␣1␣g	Filling monitor function is activated for the 2nd filling phase and follows the actual filling curve with a distance of 1 g.
or		
↑	F06␣A␣2␣0␣1␣g	Weight monitor function is deactivated for 2nd filling phase.

See also

- F09 – Filling application status ▸ Page 80
- F13 – Filling phase configuration ▸ Page 86

F07 – Time monitor function configuration

Description

Use F07 to configure the weight monitor function. This function can be configured to monitor the filling process based on time.

Syntax

Commands

F07	Query the current configuration for time monitor function.
F07␣<N>	Query the current configuration for a certain cut-off point.
F07␣<N>␣<Active>␣<TOUT>	Set the configuration for time monitor function.

Responses

F07␣B␣<N>␣<Active>␣<TOUT> F07␣B␣… F07␣A␣<N>␣Active>␣<TOUT>	Current configuration for time monitor function.
F07␣A␣<N>␣Active>␣<TOUT>	Current configuration for a certain cut-off point.
F07␣A	Command understood and executed successfully.
F07␣I	Command understood but currently not executable.
F07␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<N>	Integer	1 … 5	Number of the cut-off point
<Active>	Boolean	0: off 1: on	Activate / deactivate the time monitor function
<TOUT>	Float		Time-out duration for the selected cut-off point given in seconds

Comments

- This type of monitor function can be used to monitor whether filling material is filled continuously. If filling is interrupted, it can be understood based on the timeout parameters at which filling phase the problem has occurred.
- If one of the timeout parameters is exceeded, remaining filling process is stopped and the corresponding error bit is set <TOUTN>, **see** command [F09 – Filling application status ▸ Page 80]. This error is interpreted as the interruption of the filling material.
- After the error condition is removed, filling process can be continued with the F10␣2 command.
- You can refer to the operating instructions of the SLP85xD load cells for more details regarding the definition of the time monitor function.

Examples

↓	F07	Query the current configuration for time monitor function.
↑	F07␣B␣1␣1␣1.5 F07␣B␣2␣1␣2.5 F07␣B␣3␣0␣0 F07␣B␣4␣0␣0 F07␣A␣5␣0␣0	Time monitor function is activated with the timeout durations of 1.5 s for cut-off point-1 and 2.5 s for the cut-off point-2. Time monitor function is not activated for the cut-off points 3, 4 and 5.

↓	F07␣1␣1␣2	Activate the time monitor function for the 1st cut-off point with a timeout duration of 2 s.
↑	F07␣A	Command understood and executed successfully.
or		
↓	F07␣2	Query the current configuration for 2nd cut-off point.
↑	F07␣A␣2␣0␣0.0	Time monitor function is deactivated for 2nd cut-off point.

See also

- F09 – Filling application status ▸ Page 80
- F13 – Filling phase configuration ▸ Page 86

F08 – Filling statistics

Description

Use F08 to query or reset the statistics of the filling application.

Syntax

Commands

F08	Query the statistics for the filling application.
F08␣0	Reset the statistics for the filling application.

Responses

F08␣A␣<Mean>␣<Std>␣<Sum>␣<Count>␣ <ActualWeight>␣<Unit>␣<TotalTime>	Current statistics for the filling application.
F08␣A	Command understood and executed successfully.
F08␣I	Command understood but currently not executable.
F08␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mean>	Float		Mean value of all actual filling results
<Std>	Float		Standard deviation of all actual filling results
<Sum>	Float		Accumulated weight value of all previous filling cycles
<Count>	Float		Number of total filling cycles
<ActualWeight>	Float		Last filling result recorded by the load cell
<Unit>	String	g, mg, µg	Unit of the weight parameters
<TotalTime>	Float		Last total filling time recorded by the load cell. Unit given in seconds (s)

Comments

- Filling statistics are calculated by the load cell on a continuous basis, until it is reset by the user with the F08␣0 command.
- Only successful filling cycles are reflected in the statistics which are not interrupted by manual intervention or aborted due to an error.

Examples

↓	F08	Query the statistics for the filling application.
↑	F08␣A␣1000.050␣1.5␣1000000.050␣ 1000␣1000.100␣g␣4.050	Mean weight value of the filled containers is 1000.050 g with a standard deviation of 1.5 g, and the accumulated weight value of all previous filling cycles is 1000.050 kg. In total, 1000 filling cycles have elapsed. Last filling cycle resulted with 1000.100 g as the final weight and 4.050 seconds as the filling time.

↓	F08␣0	Reset the filling statistics.
↑	F08␣A	Command understood and executed successfully.

F09 – Filling application status

Description

Use `F09` to query the status of the filling application.

Syntax

Command

`F09`	Query the status of the filling application.

Responses

`F09␣A␣<Status>`	Current status of the filling application.
`F09␣A`	Command understood and executed successfully.
`F09␣I`	Command understood but currently not executable.

Parameter

Name	Type	Values	Meaning
`<Status>`	Bit Set	$Status = \sum_{statusbit\ on} 2^{Bit}$	Status of the filling application calculated as bit set Refer to the table under the comments for the definition of the individual bits

Comments

- Filling application status is calculated as a bit set according to the following table:

Bit	Designation	Status / Error Condition
0	General Status Bit	Set if any other bit is 1
1	TareWeight+	Set if container weight > upper limit for tare weight
2	TareWeight-	Set if container weight < lower limit for tare weight
3	TOUT1	Set if filling time until 1st cut-off point > timeout parameter-1
4	TOUT2	Set if filling time until 2nd cut-off point > timeout parameter-2
5	TOUT3	Set if filling time until 3rd cut-off point > timeout parameter-3
6	TOUT4	Set if filling time until 4th cut-off point > timeout parameter-4
7	TOUT5	Set if filling time until 4th cut-off point > timeout parameter-5
8	Bag/Bottle Breakage	Set if the weight value of the actual filling curve < weight value of the monitor characteristic curve
9	TOL-	Set if the final filling weight < lower tolerance limit of target weight
10	TOL+	Set if the final filling weight > upper tolerance limit of target weight
11	EMPTY	Remains high during the emptying process, **see** command [F16 – Emptying function configuration ▸ Page 91]
12	READY	Set once final filling weight is determined and reset once a new container is placed
13	RESERVED	
14	RESERVED	
15	RESERVED	

- The general status bit is set automatically if one of the error bits (Bit-1 to Bit-10) is set.
- Filling application is stopped automatically, if one of the error bits (Bit-1 to Bit-8) is set.
- The values in this register are reset automatically once run or abort command, **see** command [F10 – Control filling ▸ Page 82] is received by the weighing device.
- The status bits (READY & EMPTY) can be monitored by the control system to check when it is the right time to place a new empty container on the weighing platform after a filling cycle is finished.

Example

↓	F09	Query the statistics for the filling application.
↑	F09␣A␣97	Following conditions are met; (97 = 1100001B): • Timeout for 3th cut-off point is reached. • Timeout for 4th cut-off point is reached.

See also

F10 – Control filling ▸ Page 82

F10 – Control filling

Description

Use F10 to control the state of the filling application.

Syntax

Command

F10␣<Action>	Change the status of the filling control.

Responses

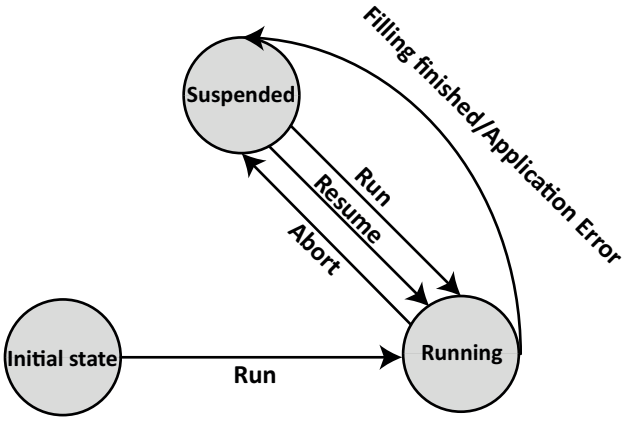
F10␣A␣<Action>	Status of the filling control is changed.
F10␣A	Command understood and executed successfully.
F10␣I	Command understood but currently not executable.
F10␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Action>	Integer	0	Run the filling application
		1	Abort the filling application
		2	Resume the filling application

Comments

- After power-on, the device enters into initial state. Based on the state of the device, different filling control commands are possible:
  - **Run** F10␣0: Start the filling cycle from the initial or suspended state, and clear all the filling application status F09. That means that a new filling cycle will start.
  - **Abort** F10␣1: Cancel or interrupt the filling cycle when in the running state.
  - **Resume** F10␣2: Continue the filling cycle from the suspended state.



- Once the filling cycle is finished or there are application errors, device enters into the suspended state.
- Under suspended status, user can send **Resume** F10␣2 command to continue the unfinished filling cycle, or send the **Run** F10␣0 command to start a new filling cycle. Main difference between the "Resume" and "Run" commands is that "Run" command will clear all the filling application status F09, whereas the "Resume" command doesn`t change the content of the filling application status.
- If the device is in the suspended status and user wants to start a new filling process, it only needs to send the "Run" command. It is not necessary to return from the "Suspended" status to the "Initial" State.

Example

↓	F10␣0	Run the filling application.
↑	F10␣A	Command understood and executed successfully.

See also

F11 – Report filling state ▸ Page 84

F11 – Report filling state

Description

Use F11 to query the current state of the filling application.

Syntax

Command

F11	Query the current state of the filling application.

Responses

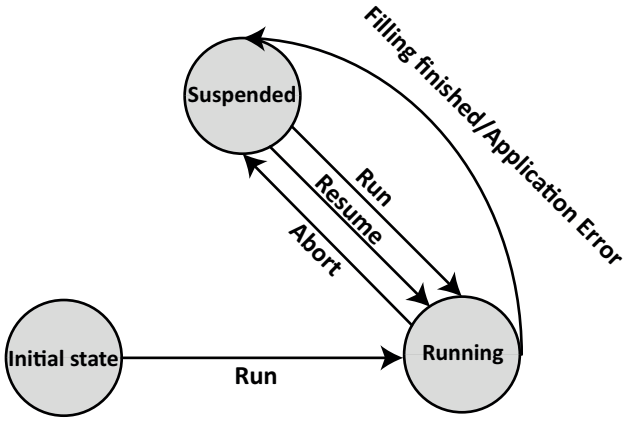
F11 A <State>	Current state of the filling application.
F11 I	Command understood but currently not executable.
F11 L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<State>	Integer	0	Initial state
		1	Running
		2	Suspended / Finished

Comments

- Use F11 to query the state of the filling machine before sending the filling control command F10.
- Following states are possible:
  - **Initial state**: After power-on, the device enters into initial state.
  - **Running state**: Filling application is running.
  - **Suspended / Finished state**: Once the filling cycle is finished or there are application errors, device enters into the suspended state. Under suspended status, user can send **Resume** F10 2 command to continue the unfinished filling cycle, or send the **Run** F10 0 command to start a new filling cycle.



Example

↓	F11	Query the current state of the filling application.
↑	F11 1	Filling application is running.

See also

F10 – Control filling ▸ Page 82

F12 – Filling stability criteria configuration

Description

Use F12 to define the stability criteria for the final control weighing of the filled material.

Syntax

Commands

F12	Query the stability criteria for the final control weighing.
F12␣<Tol>␣<ObserTimeOut>␣<StabTimeOut>	Define the stability criteria for the final control weighing.

Responses

F12␣A␣<Tol>␣<ObserTimeOut>␣<StabTimeOut>	Current configuration of the stability criteria for the final control weighing.
F12␣A	Command understood and executed successfully.
F12␣I	Command understood but currently not executable.
F12␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Tol>	Float	0.1 … 1000	Tolerance in digits (smallest weight increment) within which the value must stay to be regarded as stable
<ObserTimeOut>	Float	0 … 32535	Observation time in milliseconds during which the value must stay within tolerance in order to be regarded as stable
<StabTimeOut>	Float	0 … 32535	Stabilization timeout in milliseconds. If this duration is reached during control weighing, last measured value will be taken as the final weight result, regardless from the fulfillment of the stabilization criteria

Comment

During stabilization timeout <StabTimeOut>, actual weight is tested for stability. If the stability condition is met, that means if the actual weight value stays within <Tol> for the duration of <ObserTimeOut>, this is determined as the filling result, even if the stabilization timeout <StabTimeOut> has not yet expired. In any case, the last weight value will be taken as the filling result when the stabilization timeout <StabTimeOut> has expired.

Examples

↓	F12	Query the stability criteria for the final control weighing.
↑	F12␣A␣1.0␣200␣1000	Final weight has to stay within 1 digit for the duration of 200 ms in order to be regarded as stable. Last measured value will be taken as the filling result after 1000 ms has expired since the start of control weighing.

↓	F12␣5.0␣300␣500	Set stability criteria as follows: Final weight has to stay within 5 digits for 300 ms in order to be regarded as stable. However, last measured value will be taken as the filling result if 500 ms expires without a stable weight value being detected.
↑	F12␣A	Command understood and executed successfully.

F13 – Filling phase configuration

Description

Use F13 to set the configuration for different filling phases. Up to 5 different filling phases can be configured.

Syntax

Commands

F13	Query the configuration for the filling phases.
F13␣<N>	Query the current configuration for a specific filling phase.
F13␣<N>␣<Active>␣<OutputOn>␣<Weight-N>␣<Unit>␣<LockDurationN>	Set the configuration for a specific filling phase.

Responses

F13␣B␣<N>␣<Active>␣<OutputOn>␣<WeightN>␣<Unit>␣<LockDurationN> … F13␣A␣<N>␣<Active>␣<OutputOn>␣<WeightN>␣<Unit>␣<LockDurationN>	Current configuration for the filling phases.
F13␣A␣<N>␣<Active>␣<OutputOn>␣<WeightN>␣<Unit>␣<LockDurationN>	Current configuration for a specific filling phase.
F13␣A	Command understood and executed successfully.
F13␣I	Command understood but currently not executable.
F13␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<N>	Integer	1 … 5	Number of the filling phase
<Active>	Boolean	0: off 1: on	Activate / deactivate selected filling phase
<OutputOn>	Bit set	$OutputOn = \sum_{output\ ports\ on} 2^{Bit}$	Set of the digital outputs which will remain high during the selected filling phase
<WeightN>	Float		Upper limit value (cut-off point) for the selected filling phase
<Unit>	String	g, mg, ug	Available units for the cut-off point
<LockDurationN>	Float	0 … 65535	Lock-out duration given in milliseconds

Comments

- Filling phases can be configured with an upper limit value (cut-off point) and lock-out duration. User can assign to each filling phase a set of output ports. Assigned output port(s) will remain high (logic 1) until the upper limit value (cut-off point) and they will be reset (logic 0) if the upper limit value (cut-off point) has been exceeded.
- Filling phases must be defined in correct sequence (1 → 2 → 3 → 4 → 5).
- Lock-out duration is defined as the time duration which prevents current filling phase from being cut off prematurely as a result of peak loads (overshoot).

Example

↓	F13	Query the configuration for the filling phases.
↑	F13␣B␣1␣1␣3␣500.0␣g␣250 F13␣B␣2␣1␣6␣850.0␣g␣100 F13␣B␣3␣0␣0␣0.0␣g␣0 F13␣B␣4␣0␣0␣0.0␣g␣0 F13␣B␣5␣0␣0␣0.0␣g␣0	Filling phase-1 is activated and is controlled by output ports 1 and 2 (3=00011B) which will remain high until 500 g is measured by the load cell. After filling phase-1 is activated, a lock-out time of 250 ms will be introduced where monitored weight values are not allowed to change the filling phase. Filling phase-2 is activated and is controlled by output ports 2 and 3 (6=00110B) which will remain high between 500 g and 850 g. After filling phase-2 is activated (at 500 g), a lock-out time of 100 ms will be introduced where monitored weight values are not allowed to change the filling phase. All other normal filling processes are not activated.

F14 – Automatic tare configuration

Description

Use `F14` to configure the automatic tare function.

Syntax

Commands

`F14`	Query the configuration for the automatic tare function.
`F14␣<Active>␣<Weight>␣<Unit>␣ <LowTolP>␣<UppTolP>␣<Delay>`	Set the configuration for the automatic tare function.

Responses

`F14␣A␣<Active>␣<Weight>␣<Unit>␣ <LowTolP>␣<UppTolP>␣<Delay>`	Current configuration for the automatic tare function.
`F14␣A`	Command understood and executed successfully.
`F14␣I`	Command understood but currently not executable.
`F14␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Active>`	Boolean	`0: off` `1: on`	Activate / deactivate automatic tare function
`<Weight>`	Float		Expected weight of the container
`<Unit>`	String	`g, mg, ug`	Available units for the expected container weight
`<LowTolP>`	Float	`%`	Lower tolerance limit for the tare weight given as % of the expected container weight
`<UppTolP>`	Float	`%`	Upper tolerance limit for the tare weight given as % of the expected container weight
`<Delay>`	Float	`0 … 65535`	Introduced delay for the automatic tare function given in milliseconds

Comments

- Automatic tare function can be activated if the expected container weight is known.
- If the actual container weight is less than the lower tolerance limit of the expected container weight, "TareWeight-" bit is set in the filling application status register, **see** command [F09 – Filling application status ▸ Page 80] and the filling application is stopped.
- If the actual container weight is more than the upper tolerance limit of the expected container weight, "TareWeight+" bit is set in the filling application status register, **see** command [F09 – Filling application status ▸ Page 80] and the filling application is stopped.

Example

↓	`F14`	Query the configuration for the automatic tare function.
↑	`F14␣A␣1␣50.0␣g␣2.0␣1.0␣500`	Automatic tare function is activated. Container weight has to be between 49 g (50 g – 2%) and 50.5 g (50 g + 1%) in order to be accepted. 500 ms delay is introduced after the entry of the start trigger to perform tare.

See also

F09 – Filling application status ▸ Page 80

F15 – Digital output function configuration

Description

Use F15 to assign roles to digital output ports.

Syntax

Commands

F15	Query the roles of all digital output ports.
F15␣<Output>␣<Function>	Query the role of a specific digital output port.

Responses

F15␣B␣<Output>␣<Function> … F15␣A␣<Output>␣<Function>	Current assigned roles for all output ports.
F15␣A␣<Output>␣<Function>	Current assigned role for a specific output port.
F15␣A	Command understood and executed successfully.
F15␣I	Command understood but currently not executable.
F15␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Output>	Integer	1 … 5	Number of the digital output port
<Function>	Integer	0	No function
		1	Ready Signal
		2	Empty Signal
		3	Alarm Signal
		4	Valve Control

Comments

- Only a single function can be assigned to each output port.
- Same function can be assigned to multiple output ports except the alarm function. If one output is set to "Alarm" function, another output which is already set to "Alarm" will be set to "No function" automatically, because only one output can be set as alarm.
- If the role of one output port is set or changed for the "Valve" function, then all the settings for the commands F01, F03 and F13 must be checked for consistency.
- The values that these functions can take are given in the table below:

Function	Condition for "0"	Condition for "1"
NoFunction	Always	Never
Ready Signal	By default	"READY" bit is set, **see** command [F09 – Filling application status ▸ Page 80]
Empty Signal	By default	"EMPTY" bit is set, **see** command [F09 – Filling application status ▸ Page 80]
Alarm Signal	By default	"General Status Bit" bit is set, **see** command [F09 – Filling application status ▸ Page 80]
Valve Control	By default	Based on the status of the filling application, **see** command [F01 – Automatic prefilling configuration ▸ Page 69], [F03 – Automatic refilling configuration ▸ Page 71], [F13 – Filling phase configuration ▸ Page 86]

Example

↓	`F15`	Query the roles of all digital output ports.

↑	`F15␣B␣1␣1`
	`F15␣B␣2␣2`
	`F15␣B␣3␣3`
	`F15␣B␣4␣4`
	`F15␣A␣5␣4`
		Following functions are assigned to the digital output ports:
		• Output-1: "Ready Signal".
		• Output-2: "Empty Signal".
		• Output-3: "Alarm Signal".
		• Output-4 and Output-5: "Valve Control".

See also

- F01 – Automatic prefilling configuration ▸ Page 69
- F03 – Automatic refilling configuration ▸ Page 71
- F13 – Filling phase configuration ▸ Page 86

F16 – Emptying function configuration

Description

Use F16 to set the durations for the emptying and zeroing functions.

Syntax

Commands

F16	Query the status for the emptying and zeroing functions.
F16␣<Active>␣<EmptyDuration>␣<ZeroDuration>	Set the durations for the emptying and zeroing functions.

Responses

F16␣A␣<Active>␣<EmptyDuration>␣<ZeroDuration>	Current status for the emptying and zeroing functions.
F16␣A	Command understood and executed successfully.
F16␣I	Command understood but currently not executable.
F16␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Active>	Boolean	0: off 1: on	Activate/deactivate emptying and zeroing functions
<EmptyDuration>	Float	0 to 65535	Bottle/container unloading time in milliseconds during which the "Empty" signal is active
<ZeroDuration>	Float	0 to 65535	Waiting time after the bottle/container is removed, before sending the zero command to the load cell

Comments

- During the <EmptyDuration>, the "Empty" signal is active, and indicates that the bottle/container is being removed from the platform of the weighing device.
- After the <EmptyDuration>, if the filling process is controlled by gross weight, then the application must wait for the <ZeroDuration> to send the zero command in order to keep the filling accuracy; if the filling process is controlled by the net weight, this process is skipped.

Example

↓	F16	Query the status for the emptying and zeroing functions.
↑	F16␣A␣1␣500␣1000	Emptying and zeroing functions are activated. Current configured <EmptyDuration> is 500 ms, and the <ZeroDuration> is 1000 ms.

See also

F09 – Filling application status ▸ Page 80

FCUT – Filter characteristics (cut-off frequency)

Description

Use FCUT to set the cut-off frequency of the fixed filter.

Syntax

Commands

FCUT	Query cut-off frequency.
FCUT␣<Frequency>	Set cut-off frequency.

Responses

FCUT␣A␣<Frequency>	Current cut-off frequency.
FCUT␣A	Command understood and executed successfully.
FCUT␣I	Command understood but currently not executable.
FCUT␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Frequency>	Float	0 or < 0.001 Hz	not active (M02 active)
		0.001 Hz – 20.0 Hz	Cut-off frequency

Comments

- To use the command FCUT you have to set M01 to 2 and <Frequency> ≥ 0.001 Hz.
- If FCUT is activated (<Frequency> ≥ 0.001 Hz), it will override any settings for ambient conditions (M02) in sensor mode.

Examples

↓	FCUT	Query actual cut-off frequency.
↑	FCUT␣A␣0.1	Actual cut-off frequency is 0.1 Hz.

↓	M01␣2	Change weighing mode to sensor mode to enable FCUT.
↑	M01␣A	Command understood and executed successfully.
↑	FCUT␣3.0	Set cut-off frequency to 3.0 Hz.
↑	FCUT␣A	Command understood and executed successfully.

See also

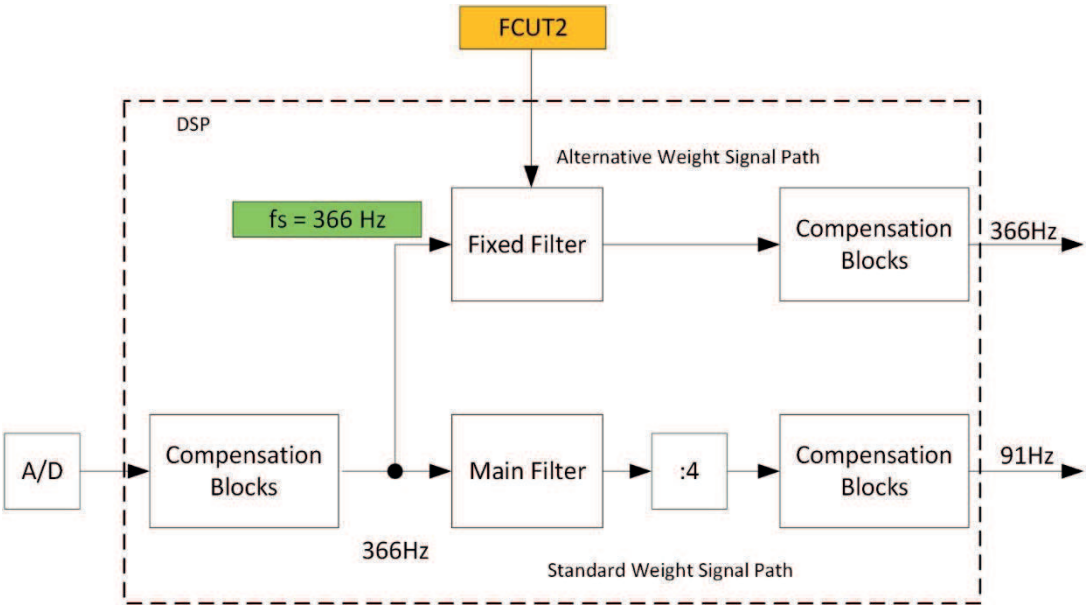
- M01 – Weighing mode ▸ Page 157
- M02 – Environment condition ▸ Page 158

FCUT2 - Filter cut-off frequency of alternative weight path

Description

Set the cut-off frequency of the fixed filter in the alterntive signal path.

The following picture is a simplified block diagram of signal processing containing a standard an an alternative signal path (taken from product WMF). "fs" is defined as the sampling frequency of the input samples of the fixed filter.



Syntax

Commands

FCUT2	Query the parameters from the device.
FCUT2␣<Frequency>	Set the parameters to the device.
FCUT2␣0	Reset frequency to factory default.

Responses

FCUT2␣A␣<Frequency>	Current filter cut-off frequency of the device.
FCUT2␣A	Command understood and executed successfully.
FCUT2␣L	Command understood but not executable, e.g. value out of the allowed range.

Parameters

Name	Type	Values	Meaning
<Frequency>	Float 32 bits	0 to f_{max}	Cut-off frequency in Hz. 0 = code to reset the frequency to factory default. f_{max} is product dependent.

Initial values

↓	FCUT2	Query the parameters from the device.
↑	FCUT2␣A␣<Factory default>	The initial value is equal to the factory default and defined by the product.

Comments

- FCUT2 is only available when the SAI block format is set to "APW 8 block format" (see [M111 ▸ Page 207]).
- Alternative weight path also known as "fast weight path" or "dosing path".

Examples

↓	FCUT2	Query the parameters from the device.
↑	FCUT2␣A␣0.1	The cut-off frequency on the alternative weight path is 0.1 Hz.

↓	FCUT2␣11.0	Set the cut-off frequency to 11 Hz.
↑	FCUT2␣A	Command understood and executed successfully.

↓	FCUT2␣0	Reset the cut-off frequency to factory default.
↑	FCUT2␣A	Command understood and executed successfully.

FSET – Reset all settings to factory defaults

Description

Use FSET to reset all settings to factory defaults.

Syntax

Command

FSET␣<Exclusion>	Resets all user and interface settings as well as the customer calibration to factory settings.

Responses

FSET␣A	Command understood and executed successfully.
FSET␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Exclusion>	Integer	0	Communication parameters are not reset
		1	Resets all settings
		2	Communication parameters and adjustment (C0, C1, C2, C3 and C4) are not reset

Comments

- The FSET command cannot be canceled by @.
- All user settings except date (DAT) and time ([TIM ▸ Page 258]) are reset to factory values.
- In case resetting of the interface parameters is included (FSET␣1), the answer is returned with the current interface settings and the interface parameters are reset afterwards.
- After the response FSET␣A, the weigh module restarts and issues [I4 ▸ Page 100] when it's ready again.
- **See** COPT command to reset all settings on the optional interface.

Example

↓	FSET␣1	Reset all settings to factory values.
↑	FSET␣A	Command understood and executed successfully.
↑	I4␣A␣"B123456789"	Restart, I4 shows the serial number: B123456789.

See also

I4 – Serial number ▸ Page 100

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

Comments

- If a terminal and a weigh module, weighing platform are being used, the command list of the terminal is output. If only a weigh module, platform is being used, the command list of the weigh module, platform is shown.
- 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 @ (cancel) implemented.
↑	I0␣B␣1␣"D"	Level 1 command D implemented.
↑	I0␣B…	…
↑	I0␣A␣3␣"SM4"	Level 3 command SM4 implemented.

See also

@ – Cancel ▸ Page 16

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.

See also

I14 – Device information ▸ Page 104

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␣<"Type>␣<Capacity>␣<Unit">`	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 or weigh module
`<"Capacity">`	String		Capacity of balance or weigh module
`<"Unit">`	String		Weight unit

Comments

- With DeltaRange balances, the last decimal place is available only in the fine range.
- The number of characters of "text" depends on the balance type and capacity.

Example

↓	`I2`	Query of the balance data.
↑	`I2␣A␣"WMS404C-L␣WMS-Bridge␣ 410.0090␣g"`	Balance type and capacity.

See also

I14 – Device information ▸ Page 104

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.

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

I4 – Serial number ▸ Page 100

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

Comments

- 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 cancel command @.
- More detailed information is available with I14.
- 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

- @ – Cancel ▸ Page 16
- I14 – Device information ▸ Page 104

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 a 8 digit number and an alphabetic character as an index
- More detailed information is available with I14.
- 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 104

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	5 … 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 cancel command @.

Example

↓	I10	Query of the current balance ID.
↑	I10␣A␣"My␣Balance"	The balance ID is "My Balance".

I11 – Model designation

Description

This command is used to output the model designation.

Syntax

Command

I11	Query of the current balance or weigh module type.

Responses

I11␣A␣<"Model">	Current balance or weigh module type.
I11␣I	Type can not be transferred at present as another operation is taking place.

Parameter

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

Comments

- A sequence of maximum 20 alphanumeric characters is possible as <Model>.
- The following abbreviations used in model designations are relevant to MT-SICS:
  DR = Delta Range.
  DU = Dual Range.
  /M, /A = Approved balance or weigh module.

Example

↓	I11	Query of the current weigh module type.
↑	I11␣A␣"WMS404C-L/10"	The weigh module is an "WMS404C-L/10".

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␣B␣0␣1␣"Bridge"	Bridge.
↑	I14␣B␣0␣2␣"Terminal"	Terminal.
↑	I14␣A␣0␣3␣"Option"	Option.

↓	I14␣1	Query of the current instrument descriptions.
↑	I14␣B␣1␣1␣"X205T"	Bridge is a "X205T".
↑	I14␣B␣1␣2␣"PAT"	Excellence Plus Terminal.
↑	I14␣A␣1␣3␣"RS232␣Option"	RS232 Option.

↓	I14␣2	Query of the current Software identification numbers.
↑	I14␣B␣2␣1␣"11670123A"	Software identification number of the bridge is "11680123A".
↑	I14␣B␣2␣2␣"11670456B"	Software identification number of the terminal is "11680456B".
↑	I14␣A␣2␣3␣"11670789B"	Software identification number of the option is "11680789B".

↓	I14␣3	Query of the current software versions.
↑	I14␣B␣3␣1␣"4.23"	Version of the bridge software is "4.23".
↑	I14␣B␣3␣2␣"4.10"	Version of the terminal software is "4.10".
↑	I14␣A␣3␣3␣"1.01"	Version of the RS232 option software is "1.01".

↓	I14␣4	Query of the serial numbers.
↑	I14␣B␣4␣1␣"0123456789"	Serial number of the bridge is "0123456789".
↑	I14␣B␣4␣2␣"1234567890"	Serial number of the terminal is "1234567890".
↑	I14␣A␣4␣3␣"2345678901"	Serial number of the RS232 option is "2345678901".

↓	I14␣5	Query of the type definition numbers.
↑	I14␣B␣5␣1␣"1.2.3.4.5"	Type definition number of the bridge is "1.2.3.4.5".
↑	I14␣B␣5␣2␣"1.2.3.4.5"	Type definition number of the terminal is "1.2.3.4.5".
↑	I14␣A␣5␣3␣"1.2.3.4.5"	Type definition number of the RS232 option is "1.2.3.4.5".

I15 – Uptime

Description

Delivers the uptime; the period during which the device program is executing since start or restart or reset.

Syntax

Command

I15	Query the uptime.

Responses

I15␣A␣<Minutes>	Time in minutes since uptime, accuracy +/-5%.
I15␣I	Uptime can not be transferred at present as another operation is taking place.

Parameter

Name	Type	Values	Meaning
<Minutes>	String		Uptime (in minutes) since start or restart or reset

Example

↓	I15	Query the uptime.
↑	I15␣A␣123014	The balance program is executed approx. 123014 minutes (since start or restart or reset).

I16 – Date of next service

Description

You can use I16 to query the date when the balance is next due to be serviced.

Syntax

Command

I16	Query the date of next service.

Responses

I16␣A␣<Day>␣<Month>␣<Year>	Current date of next service.
I16␣I	Date of next service can not be transferred at present as another operation is taking place.

Parameters

Name	Type	Values	Meaning
<Day>	Integer	01 … 31	Day
<Month>	Integer	01 … 12	Month
<Year>	Integer	2000 … 2099	Year

Example

↓	I16	Query the date of next service.
↑	I16␣A␣19␣07␣2011	Date of next service is July 19, 2011.

I21 – Revision of assortment type tolerances

Description

Use `I21` to query the revision of assortment type tolerances.

Syntax

Command

`I21`	Query the revision of assortment type tolerances.

Responses

`I21␣A␣<"Revision">`	Revision of assortment type tolerances.
`I21␣I`	Balance type can not be transferred at present as another operation is taking place.

Parameter

Name	Type	Values	Meaning
`<"Revision">`	String	`7 … 30 chars`	Revision

Example

↓	`I21`	Query the revision of assortment type tolerances.
↑	`I21␣A␣"5678"`	The revision is "5678".

I26 – Operating mode after restart

Description

Use `I26` to query the operating mode.

Syntax

Command

`I26`	Query of the operating mode.

Responses

`I26␣A␣<Mode>`	Operating mode.
`I26␣I`	Operating mode can not be transferred at present as another operation is taking place.

Parameter

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

Example

↓	`I26`	Query of the operating mode.
↑	`I26␣A␣0`	Operation mode is: user mode.

I27 – Change history from parameter settings

Description

Use I27 to query the change history from the parameter settings.

Syntax

Command

I27	Query the change history.

Responses

I27␣B␣<No>␣<Day>␣<Mon- th>␣<Year>␣<Hour>␣<Min- ute>␣<"Name">␣<"ID">␣<"What">␣ <"Old">␣<"New"> I27␣B… I27␣A␣<No>␣<Day>␣<Month>␣<Year>␣<Hour>␣ <Minute>␣<"Name">␣<"ID">␣<"What">␣<"Old" >␣ <"New">	Get change history.
I27␣A	No data, empty change history.
I27␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<No>	Integer	1 … n	Change number (n is product dependent)
<Day>	Integer	1 … 31	Day on which the parameter has been changed
<Month>	Integer	1 … 12	Month on which the parameter has been changed
<Year>	Integer	2000 … 2099	Year on which the parameter has been changed
<Hour>	Integer	0 … 23	Hour on which the parameter has been changed
<Minute>	String	0 … 59	Minute on which the parameter has been changed
<"Name">	String		User name
<"ID">	String		Identification
<"What">	String		Title of changed parameter
<"Old">	String		Old value
<"New">	String		New value

Example

↓	I27	Query change history.
↑	I27␣B␣1␣12␣12␣2009␣12␣00␣"User␣1"␣ "1"␣"Number␣of␣users"␣"User␣6␣Off"␣ "User␣6␣On"	Last change: Number of users -> User 6 from off to on.
↑	I27␣A␣2␣01␣12␣2009␣10␣22␣"User␣1"␣ "1"␣"Passw.␣Change␣Date"␣"Off"␣ "On"	Password change date from off to on.

I29 – Filter configuration

Description

Query actual filter configuration.

Syntax

Command

I29	Query filter configuration.

Responses

I29␣A␣<WeighingMode>␣<Environment>	Current filter configuration.
I29␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<WeighingMode>	Integer	0	Normal weighing / Universal
		1	Dosing
		2	Sensor mode
		3	Check weighing
		4	Dynamic weighing
<Environment>	Integer	0	Very stable
		1	Stable
		2	Standard
		3	Unstable
		4	Very unstable

Comment

See [M01 ▸ Page 157] and [M02 ▸ Page 158] to change filter settings.

Example

↓	I29	Query of the current state of the level sensor.
↑	I29␣A␣0␣2	The actual filter setting is: Normal weighing / Standard.

See also

- M01 – Weighing mode ▸ Page 157
- M02 – Environment condition ▸ Page 158

I32 – Voltage monitoring

Description

`I32` returns the scaled reading from the voltage monitoring channels in volt. The number of channels is product specific.

Syntax

Commands

`I32`	Request the voltage of all channels.
`I32␣<Channel>`	Request the voltage of a specific channel.

Responses

`I32␣B␣<Channel>␣<Voltage>`
`I32␣B…`
`I32␣A␣<Channel>␣<Voltage>`
	Current voltage values for all channels.

`I32␣A␣<Channel>␣<Voltage>`	Current voltage value for a specific channel.
`I32␣I`	Command understood but currently not executable.
`I32␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0 to N`	ID of available voltage monitor channel Range of values: 0 … highest available voltage monitor channel
`<Voltage>`	Float		Voltage of the voltage monitoring channel, in Volt

Comments

- By this command, the ADC information is made accessible for diagnostic and service purpose.
- If no voltage monitor channel is configured, the command `I32` is not available and will not be shown in the command list like `I0`.

Example

↓	`I32`	Request the voltage of all configured voltage monitor channels.

↑	`I32␣B␣0␣1.1988465E1`
	`I32␣B␣1␣1.1679084E1`
	`I32␣B␣2␣-1.2217906E1`
	`I32␣B␣3␣3.9961543E0`
	`I32␣A␣4␣1.5718208E0`
		There are five voltage monitor channels available
		Channel-0: 11.988 V.
		Channel-1: 11.679 V.
		Channel-2: -1.222 V.
		Channel-3: 4 V.
		Channel-4: 1.572 V.

I43 – Selectable units for host unit

Description

Returns the selectable units for host unit. This command is used for the terminal menu to display the selectable items only.

Syntax

Command

I43	Query the selectable units for host unit.

Responses

I43␣A␣<Units>␣<ActUnit>␣<Factory>	Selectable units for host unit.
I43␣I	Command understood but currently not executable.
I43␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Units>	Bit set		Sum value of selectable units, calculated in accordance with the following formula $Environments = \sum_{SelectableEnvironmentIndexes} 2^{EnvironmentIndex}$ Units is set to 0. In this case the menu item 'select unit' is not shown. The definition unit will be used as the only available unit
<ActUnit>	Integer	-1 … max. unit index	Actual unit for host unit. This parameter is read from M21␣0
<Factory>	Integer	-1 … max. unit index	Factory setting for host unit

Examples

↓	I43	Given the balance supports only "g" as unit 1 then the answer for this command is:
↑	I43␣A␣1␣0␣0	This is because the index for "g" is 0 and $2^0 = 1$.

↓	I43	Given the balance supports "g", "kg", "mg" and "ct" as display unit then the answer for this command is:
↑	I43␣A␣43␣3␣0	The actual unit is "mg", the factory setting is "g" and the possible units are "g", "kg", "mg" and "ct". The indexes for the units mentioned before are 0, 1, 3 and 5 and so the sum is $2^0 + 2^1 + 2^3 + 2^5 = 43$.

See also

M02 – Environment condition ▸ Page 158

I44 – Selectable units for display unit

Description

Returns the selectable units for display unit. This command is used for the terminal menu to display the selectable items only.

Syntax

Command

I44	Query the selectable units for display unit.

Responses

I44␣A␣<Units>␣<ActUnit>␣<Factory>	Selectable units for display unit.
I44␣I	Command understood but currently not executable.
I44␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Units>	Bit set		Sum value of selectable units, calculated in accordance with the following formula $Environments = \sum_{SelectableEnvironmentIndexes} 2^{EnvironmentIndex}$ Units is set to 0. In this case the menu item 'select unit' is not shown. The definition unit will be used as the only available unit
<ActUnit>	Integer	-1 … max. unit index	Actual unit for display unit. This parameter is read from M21␣0
<Factory>	Integer	-1 … max. unit index	Factory setting for host unit

Examples

↓	I44	Given the balance supports only "g" as info unit then the answer for this command is:
↑	I44␣A␣1␣0␣0	This is because the index for "g" is 0 and $2^0 = 1$.

↓	I44	Given the balance supports "g", "kg", "mg" and "ct" as info unit then the answer for this command is:
↑	I44␣A␣43␣3␣0	The actual unit is "mg", the factory setting is "g" and the possible units are "g", "kg", "mg" and "ct". The indexes for the units mentioned before are 0, 1, 3 and 5 and so the sum is $2^0 + 2^1 + 2^3 + 2^5 = 43$.

See also

M02 – Environment condition ▸ Page 158

I45 – Selectable environment filter settings

Description

This command returns the selectable environment filter settings for use in the device menu. The device application must know which items are selectable in order to display them correctly.

Syntax

Command

I45	Query the environment filter settings.

Responses

I45␣A␣<Environments>␣<ActEnvt>␣<Factory>	Selectable environment filter settings.
I45␣I	Command understood but currently not executable.
I45␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Environments>	Bit set		List of supported environmental conditions. Sum value of selectable units, calculated in accordance with the following formula $Environments = \sum_{SelectableEnvironmentIndexes} 2^{EnvironmentIndex}$ Environment Index: in accordance with the table defined under comments
<ActEnvt>	Integer	1 … 5	Actual environment setting. This parameter is read from M02
<Factory>	Integer	1 … 5	Environment factory setting

Comment

Available environment parameters are given in the table below:

ID	Environmental condition
0	Very stable
1	Stable
2	Standard
3	Unstable
4	Very unstable
5	Automatic

Examples

↓	I45	Query the environment filter settings.
↑	I45␣A␣14␣1␣2	Available environment modes: Stable, Standard and Unstable ($14 = 2^1 + 2^2 + 2^3$) Actual value: Stable (1) Factory preset: Standard (2).

↓	I45	Query the selectable units for host unit.
↑	I45␣A␣4␣2␣2	Available environment modes: Standard ($4 = 2^2$) Actual value: Standard (2) Factory preset: Standard (2).

See also

M02 – Environment condition ▸ Page 158

I46 – Selectable weighing modes

Description

This command returns the selectable weighing modes for use in the device menu. The device application must know which items are selectable in order to display them correctly.

Syntax

Command

I46	Query the weighing mode settings.

Responses

I46␣A␣<Modes>␣<ActMode>␣<Factory>	Current selectable weighing mode settings.
I46␣I	Command understood but currently not executable.
I46␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Modes>	Bit set		Sum value of weighing modes. The sum calculated in accordance with the following formula: $Modes = \sum_{SelectableWeighingModes} 2^{Weighing\ mode}$ Mode index: in accordance with the table defined under comments
<ActMode>	Integer	1 … 20	Actual weighing mode setting. This parameter is read from M01
<Factory>	Integer	1 … 20	Weighing mode factory setting

Comment

Available weighing mode parameters are given in the table below:

ID	Environmental condition
0	Normal weighing
1	Dosing
2	Fixed filter
3	Absolute weighing
4	Dynamic weighing
6	Raw weight values / No filter

Example

↓	I46	Query the weighing mode settings.
↑	I46␣A␣3␣1␣0	Only normal weighing and dosing ($3 = 2^0 + 2^1$) can be selected in the menu. The current setting is dosing (1) and factory setting is normal weighing (0).

See also

M01 – Weighing mode ▸ Page 157

I47 – Switch-on range

Description

This command reads the upper and lower bound of the switch-on range. The switch-on range is defined relatively to the production zero point.

Syntax

Command

I47	Query switch-on range.

Responses

I47␣A␣<Min>␣<Max>␣<Unit>	Switch-on range.

Parameters

Name	Type	Values	Meaning
<Min>	Float		Lower bound of the switch-on range in the host unit
<Max>	Float		Upper bound of the switch-on range in the host unit
<Unit>	String		The unit used for this command is the host unit The unit can be selected by using the M21 command

Comment

Min and max value are formatted with the finest resolution.

Example

↓	I47	Query the switch-on range
↑	I47␣A␣-2␣18␣g	The device can make the switch-on operation within -2 g and +18 g around the production zero value

I48 – Initial zero range

Description

This command reads the upper and lower bound of the initial zero range. The initial zero range is defined relatively to the production zero point.

Syntax

Command

I48	Query initial zero range.

Responses

I48␣A␣<Min>␣<Max>␣<Unit>	Initial zero range.
I48␣I	Command understood but currently not executable.
I48␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Min>	Float		Lower bound of the initial zero range in the host unit
<Max>	Float		Upper bound of the initial zero range in the host unit
<Unit>	String (ASCII)		The unit used for this command is the host unit The unit can be selected by using the M21 command

Comment

Min and max value are formatted with the finest resolution.

Example

↓	I48	Query the initial zero range
↑	I48␣A␣-2␣18␣g	The device can make the initial zero operation within -2 g and +18 g around the production zero value

See also

M21 – Unit ▸ Page 165

I50 – Remaining weighing ranges

Description

You can use `I50` to query the remaining weighing ranges.

Syntax

Command

`I50`	Query of the remaining weighing ranges.

Responses

`I50␣B␣<RangeNo>␣<Range>␣<Unit>`
`I50␣B…`
`I50␣A␣<RangeNo>␣<Range>␣<Unit>`
	List of remaining weighing ranges.

`I50␣L`	Command understood but not executable (incorrect or no parameter).
`I50␣I`	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
`<RangeNo>`	Integer	`0`	Remaining maximum weighing range
		`1`	Remaining range in which internal or initial adjustment are still possible
		`2`	Remaining range in which external adjustment is still possible
`<Range>`	Float		This number indicates the remaining range. A value with a preceding negative sign indicates the amount by which the range is exceeded
`<Unit>`	String		Returns the range in the currently set weight unit

Comments

- The range values relate to the sum of all loads on the weighing platform (pre, tare, net load) and are to be understood as reference values. If a range is shown as being exceeded, the preload, or possibly only the tare or net load, can be reduced.
- If there is no built-in weight available, the remaining range (value 1) is zero.
- The remaining range in which an external adjustment is still possible depends on the setting of M19.

Example

↓	`I50`	Query of the current state of the level sensor

↑	`I50␣B␣0␣␣␣␣535.141␣kg`
	`I50␣B␣1␣␣␣␣-18.973␣kg`
	`I50␣A␣2␣␣␣␣335.465␣kg`
		With the given preload, a remaining weighing range of about 535 kg is available.
		An internal adjustment by the user is not possible because the total load of approximately 19 kg is too heavy. An external adjustment is still possible up to a further additional load of 335 kg.

See also

M19 – Adjustment weight ▸ Page 163

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 up as long as the microprocessor has power. The power-on time is zero after a power loss. The power-on time is not touched by a restart or reset of the microprocessor. To handle the restart or reset effects, the time information is stored immediately before the restart or reset function is executed.

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.

I52 – Auto zero activation settings

Description

This command reads the activation settings for the auto zero feature.

Syntax

Command

I52	Query the auto zero activation settings.

Responses

I52␣A␣<Activation>	Initial auto zero activation.
I52␣I	Command understood but currently not executable.
I52␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning	
<Activation>	Integer	0 … 3	Identification for the auto zero activation settings. The setting defines: a) the factory setting for auto zero switched on/off b) to allow/avoid changing of the auto zero on/off state by command M03	
			Auto zero function	Changing by M03
		0	Switched off	Prohibited
		1	Switched on	Prohibited
		2	Switched off	Permitted
		3	Switched on	Permitted

Comment

In OIML R 76-1 [19], this feature is called "zero-tracking".

Examples

↓	I52	Query the auto zero activation settings.
↑	I52␣A␣1	The auto zero function is enabled, and cannot be altered by the M03 command.

↓	I52	Query the auto zero activation settings.
↑	I52␣A␣3	The auto zero function is enabled, and can be altered by the M03 command.

See also

M03 – Auto zero function ▸ Page 159

I53 – Ipv4 runtime network configuration information

Description

This command will return information entries for each Ipv4 based network interface that is currently configured in the network stack of the weigh module. The command is similar to the "ipconfig" command on Windows. The information is based on the settings that are currently operational in the network stack. The information might change after a factory reset. The IP configuration of an application is defined as follows:

- Host IP Address, **see** M70
- Netmask, **see** M70
- optional item: Default Gateway Address, **see** M71
- optional item: Domain Name Service (DNS-) Server Address, **see** M72

IP configuration can either be set manually, **see** M70) or obtained from a DHCP server, **see** M69). For the case that DHCP server becomes unavailable (due to network problems, crash,..) a fallback IP adress must be configured. Such a fallback configuration can either be given manually, **see** M70) or by "AutoIP" (this feature will assign an IP without contacting a server, as on Windows PCs). However, AutoIP is not a real use case.

The IP settings made by above mentioned M-commands are stored in non-volatile memory. The settings only take effect after a reboot.

Syntax

Commands

`I53`	Query the runtime network configuration information.
`I53␣<Index>`	Query the network interface index.

Responses

`I53␣B␣<Index>␣<"Name">␣<State>␣<"MAC">␣<DHCP>␣<AutoIP>␣<"Host">␣<"Netmask">␣<"DefaultGateway">␣<"DNSServer">`
…
`I53␣B␣<Index>␣<"Name">␣<State>␣<"MAC">␣<DHCP>␣<AutoIP>␣<"Host">␣<"Netmask">␣<"DefaultGateway">␣<"DNSServer">`
`I53␣A␣<Index>␣<"Name">␣<State>␣<"MAC">␣<DHCP>␣<AutoIP>␣<"Host">␣<"Netmask">␣<"DefaultGateway">␣<"DNSServer">`
	Current runtime network configuration information.

`I53␣A`	Command understood and executed successfully.
`I53␣I`	Command understood but currently not executable (no network interfaces present in the system).
`I53␣L`	Command understood but not executable (no network interfaces with index "1" present in the system).

Parameters

Name	Type	Values	Meaning
`<Index>`	Integer	`0 or n`	Network interface index
		`0`	1st network interface
		`n`	n +1th network interface
`<"Name">`	String		Name of the network interface
`<State>`	Integer	`0 … 2`	State of the network interface
		`0`	Disabled (down)
		`1`	Enabled but media disconnected
		`2`	Enabled and connected
`<"MAC">`	String	`Max 17 chars`	MAC address of the network interface. Must be in format "00:00:00:00:00:00"

Name	Type	Values	Meaning
<DHCP>	Boolean	0 … 1	DHCP enabled or disabled
		0	DHCP disabled
		1	DHCP enabled
<AutoIP>	Boolean	0 … 1	AutoIP enabled or disabled
		0	AutoIP disabled
		1	AutoIP enabled
<"Host">	String	Max 15 chars	Ipv4 address (dot-decimal notation) of the device on the given network interface
<"Netmask">	String	Max 15 chars	Ipv4 netmask (dot-decimal notation) on the given network interface
<"DefaultGateway">	String	Max 15 chars	Ipv4 default gateway (default router) address (dot-decimal notation) on the given network interface
<"DNSServer">	String	Max 15 chars	Ipv4 address (dot-decimal notation) of the DNS (Domain Name Service) server on the given network interface

Comment

Before setting an IP configuration on a device (manually or by setting a fallback IP configuration in the DHCP case), the responsible person (e.g. from the IT department) for the network where the device will be connected to has to be contacted to work out a valid IP configuration for the device.

Examples

↓	I53	Query the runtime network configuration information.
↑	I53␣B␣0␣"eth0"␣2␣ "11:22:33:44:55:66"␣1␣1␣"10.0.0.2"␣ "255.255.255.0"␣"10.0.0.1"␣ "10.0.0.1" I53␣B␣1␣"eth1"␣1␣ "aa:bb:cc:dd:ee:ff"␣1␣1␣ "192.168.0.2"␣"255.255.255.0"␣ "0.0.0.0"␣"192.168.0.1" I53␣A␣2␣"wifi0"␣0␣ "aa:00:cc:11:ee:22"␣1␣1␣ "172.24.225.100"␣"255.255.254.0"␣ "172.24.225.1"␣"172.24.225.2"	The network interface "eth0" is fully configured and operational. The network interface "eth1" is disconnected from the cable and no default gateway is configured. The network interface "wifi0" is currently disabled. All network interfaces do have DHCP and AutoIP enabled.

↓	I53␣1␣0	Query the settings from network interfaces 1.
↑	I53␣B␣1␣"eth1"␣1␣ "aa:bb:cc:dd:ee:ff"␣1␣1␣ "192.168.0.2"␣"255.255.255.0"␣ "0.0.0.0"␣"192.168.0.1"	The network interface 1 "eth1" is disconnected from the cable and no default gateway is configured.

I54 – Adjustment loads

Description

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

Syntax

Command

I54	Query the weight increment for external adjustments.

Responses

I54␣A␣<Min>␣<Max>␣<Increment>	Adjustment loads.
I54␣I	Command understood but currently not executable.
I54␣L	Command understood but not executable (incorrect parameter).

Parameters

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

Example

↓	I54	Query the weight increment for external adjustments.
↑	I54␣A␣1000.0␣3000.0␣750.0	In the case of external adjustment, the loads for selection are 1000 g, 1750 g, 2500 g and 3000 g.

I55 – Menu version

Description

This command queries the menu version of the device SW.

Syntax

Commands

I55	Query the menu version.
I55␣A	Set the menu version.

Responses

I55␣A␣<Version>	Current menu version.
I55␣I	Command understood but currently not executable.
I55␣L	Command understood but not executable (incorrect parameter).

Parameter

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

Comments

- The menu structure consists of menu item, menu item value range and menu item level.
- The menu version is model dependent.

Example

↓	I55	Query the menu version.
↑	I55␣A␣3	The menu version is 3.

I56 – Scaled weight ramp value

Description

This command is used to read the scaled weight ramp value. It is used for error diagnosis in the field, where it is very useful for locating an error in a weighing system. The scaled weight ramp value is defined as follows:

The value indicates the deflection of a digital load cell. It represents the deflection without any additional structures like for example weighing pans.

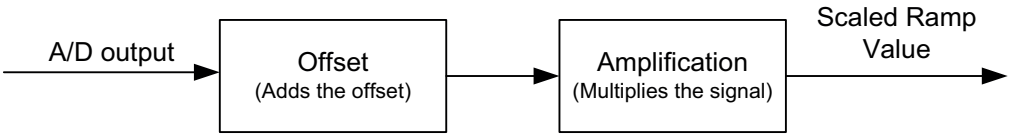
The value neither has a relation to the final weighing value nor is it processed by the Signal Processing or the Post Processing.

For both, strain gage and MFR weighing systems, a scaled weight ramp value of 0% represents no load on the digital load cell and a scaled weight ramp value of 100% means that nominal load is applied on the digital load cell.

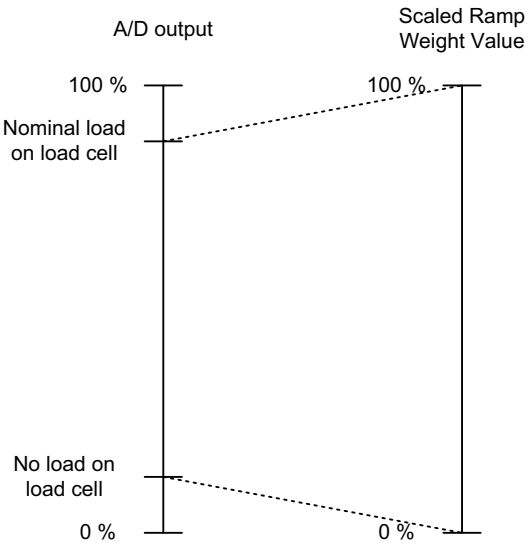
In order to accomplish this, a scaled weight ramp value generator is introduced, consisting of an offset block and an amplification block. These blocks are needed to scale the A/D converter output signal.

The scaled weight ramp value is not restricted to the range of 0% to 100%. For example if one accidentally connects a load cell with a higher sensitivity than the formerly connected, then the scaled weight ramp value may be greater than 100% unless the configuration of the scaled weight ramp value generator is changed.

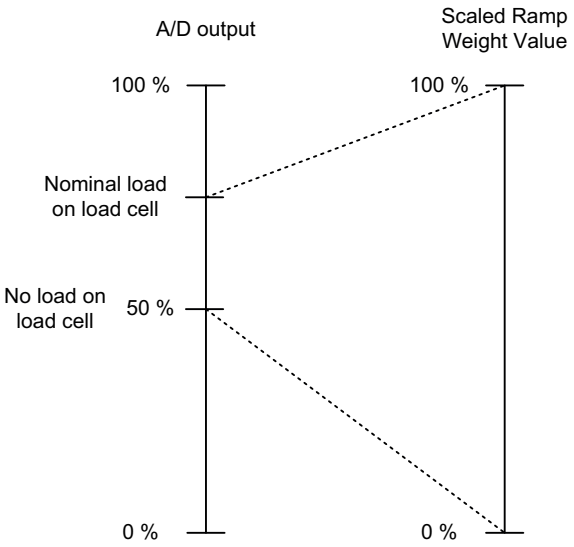
The configuration of the scaled weight ramp value generator shall be written at the end of the production and is the same per assortment type.



typical MFR case



typical SG case



Syntax

Command

`I56`	Query the scaled weight ramp value.

Response

`I56␣A␣RampValue`	Current scaled weight ramp value.

Parameter

Name	Type	Values	Meaning
RampValue	Float		Scaled weight ramp value in percent, with one digit after the decimal point

Comment

This command is used to display the menu item named "Ramp value" in the service menu of the pegaFOOD terminals.

Example

↓	I56	Query the scaled weight ramp value.
↑	I56␣A␣56.3	The scaled weight ramp value is 56.3%.

See also

M35 – Zeroing mode at startup ▸ Page 178

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 has been saved with the [M35 ▸ Page 178] 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.

I62 – Timeout

Description

This command is used to read the timeout settings for the weight recording and for the service command step control C5.

Syntax

Command

I62	Query the whole list of entries.
I62␣<Index>	Query a single entry of the list.

Responses

I62␣B␣<Index>␣<Time> I62␣B… I62␣A␣<Index>␣<Time>	List of all timeout entries.
I62␣A␣<Index>␣<Time>	Entry for a single timeout parameter.
I62␣I	Command understood but currently not executable.
I62␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Index>	Integer	0	Weight recording
		1	Step control C5
<Time>	Integer	0 … 120 (Index: 0)	Maximum waiting time for the stability flag and for the signal being within range
		0 … 65535 (Index: 1)	Maximum waiting time for the user input in service command step control C5

Comment

The parameter weight recording time also be can set with M67.

Example

↓	I62	Query the whole list of entries.
↑	I62␣B␣0␣20 I62␣A␣1␣1000	The timeout for weight recording is 20 seconds. The timeout for step control is 1000 seconds.

See also

- C5 – Enabling/disabling step control ▸ Page 33
- M67 – Timeout ▸ Page 191

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 241] command with no preset value would send a stable weight.
- All values are added as absolute values.
- The number of significant digits is the same as for MT-SICS [SNR ▸ Page 241] command in the definition unit.

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 134

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 241] 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 133

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".

I71 – One time adjustment status

Description

Read out the one-time adjustment configuration and the one-time adjustment counter.

Syntax

Command

I71	Query one time adjustment status.

Responses

I71 A <Mode> <MaxCount> <CurrentCounter>	Query the status of the one-time adjustment.
I71 I	Command understood but currently not executable.
I71 L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0 … 2	Mode of the scale placement GEO calibration adjustment
		0	Disabled
		1	Enabled
		2	Counting (permitted, but with restriction of the possible number of calibration)
<MaxCount>	Integer		Maximal allowed number of execution times in counting mode. If MaxCount = 0 the scale placement GEO calibration adjustment is disabled. If MaxCount is equal or greater than CurrentCounter, the scale placement GEO calibration adjustment is disabled
<CurrentCounter>	Integer		Current number of successful executions of the scale placement GEO calibration adjustment. Only the number of executions by command C10 1 is counted

Command

- Use case: the terminal must decide, whether the user should be forced to trigger the GEO adjustment or not.

Example

↓	I71	Query the status of the one-time adjustment.
↑	I71 A 2 1 1	The scale placement GEO calibration adjustment is in counting mode, allowing one execution of the command C10 1 and it has been executed once. The command C10 1 will return an I response if it is triggered again.

I73 – Sign Off

Description

If activated, this command is sent automatically when the device is switched off. To switch off the device, either use the command `PWR` or press the button OFF.

Syntax

Command

`I73`	Query sign off.

Responses

`I73␣A␣<"SerialNumber">`	Serial number.
`I73␣I`	Command understood but currently not executable.
`I73␣L`	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
`<"SerialNumber">`	String		Device serial number

Command

- Command is needed to notify calibry about a device switch-off by the user.

Examples

↓	`I73`	Query sign off.
↑	`I73␣A␣"B314201995"`	Serial number.

↓	`PWR␣0`	Power off with `I73` deactivated (pre-condition device is on).
↑	`PWR␣A`	The device is in standby mode.

↓	`PWR␣0`	Power off with `I73` activated (pre-condition device is on).
↑	`PWR␣A` `I73␣A␣"B314201995"`	The device is in standby mode.

I74 – GEO code at point of calibration - HighRes

Description

This command returns the high resolution GEO code at point of calibration(GCcalHR).

Syntax

Command

I74	Query the GEO code value at point of calibration.

Responses

I74␣A␣<GeoCode>	Get the GEO code.
I74␣I	Command understood but currently not executable.
I74␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<GeoCode>	Float	-1.0 … 31.0	High resolution GEO code at point of calibration

Example

↓	I74	Query the GEO code value at point of calibration.
↑	I74␣A␣15.1	The GEO code at point of calibration is 15.1.

I75 – GEO code at point of use - HighRes

Description

This command returns the high resolution GEO code at point of use (GCuseHR).

Syntax

Command

I75	Query the GEO code value at point of use.

Responses

I75␣A␣<GeoCode>	Get the GEO code.
I75␣I	Command understood but currently not executable.
I75␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<GeoCode>	Float	-1.0 … 31.0	High resolution GEO code at point of use

Example

↓	I75	Query the GEO code value at point of use.
↑	I75␣A␣12.1	The GEO code at point of use is 12.1.

I76 – Total number of voltage exceeds

Description

Use `I76` to query the total number of the device voltage enters the configurable voltage monitor range.

Syntax

Commands

`I76`	Query the status of all voltage monitoring channels.
`I76␣<Channel>`	Query the status of a certain voltage monitoring channel.

Responses

`I76␣B␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
`I76␣B…`
`I76␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
	Current values of all voltage monitoring channels.

`I76␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`	Current values of a certain voltage monitoring channel.
`I76␣I`	Command understood but currently not executable.
`I76␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0 … n`	Identification for voltage monitor channel (n is product dependent)
`<LowerThreshold>`	Float		Lower threshold value for the voltage monitor channel
`<UpperThreshold>`	Float		Upper threshold value for the voltage monitor channel
`<Counts>`	Integer		Number of voltage values falling into defined monitor channel

Comments

- Use `I76` to view the results from the voltage monitor function.
- Supply voltage of the weighing device is monitored by the voltage monitor function.
- Number of the voltage monitor channels is dependent on the model type of the product.
- The target of this function is to count the number of the voltage values which fall outside the permissible supply voltage range.

Example

↓	`I76`	Query the status of all voltage monitoring channels.
↑	`I76␣B␣0␣7.0␣10.0␣0` `I76␣A␣1␣30.0␣33.0␣2`	Channel-0 monitors the range between 7 and 10 V and there is no voltage value detected in this range. Channel-1 monitors the range between 30 and 33 V and there are 2 voltage values detected in this range.

I77 – Total number of load cycles

Description

Use `I77` to query total number of load cycles that are counted between predefined thresholds.

Syntax

Command

`I77`	Query total number of load cycles for all defined channels.
`I77␣<Channel>`	Query total number of load cycles for a specific channel.

Responses

`I77␣B␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
`I77␣B…`
`I77␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
	Current values for all monitor channels.

`I77␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`	Current values for a certain monitor channel.
`I77␣I`	Command understood but currently not executable.
`I77␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0 to N`	Identification for load cycle monitor channel
`<LowerThreshold>`	Float		Lower threshold value for the load cycle monitor channel defined as the percentage of the maximum capacity
`<UpperThreshold>`	Float		Upper threshold value for the load cycle monitor channel defined as the percentage of the maximum capacity
`<Counts>`	Integer		Number of load cycles detected by the defined monitor channel

Comments

- The number of channels is product specific.
- A load cycle of one monitor channel is defined as placing a weight (belonging to that channel) on the weighing device until the weight is stable, and then removing the weight from the device (leaving that channel) until the weight is stable again.

Example

↓	I77	Query total number of load cycles for all defined channels.
↑	I77␣B␣0␣1.0␣20.0␣0 I77␣B␣1␣20.0␣60.0␣2 I77␣B␣2␣60.0␣100.0␣4 I77␣A␣3␣100.0␣400.0␣1	Channel-0 monitors the range between 1% and 20% of maximum capacity and there is no load cycle detected in this range. Channel-1 monitors the range between 20% and 60% of maximum capacity and there are 2 load cycles detected in this range. Channel-2 monitors the range between 60% and 100% of maximum capacity and there are 4 load cycles detected in this range. Channel-3 monitors the range between 100% and 400% of maximum capacity and there is 1 load cycle detected in this range.

I78 – Zero deviation

Description

Use `I78` to query the zero deviation of the weighing device.

Syntax

Command

`I78`	Query the zero deviation of the weighing device.

Responses

`I78␣A␣<ZeroDeviation>`	Current value for the zero deviation.
`I78␣I`	Command understood but currently not executable.
`I78␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<ZeroDeviation>`	Float		Current zero deviation from the user calibrated zero value defined as the percentage of the maximum capacity

Comments

- When the weighing device accepts the zero command or the initial zero point is established, it can calculate the deviation between the actual zero value and the user calibrated zero value.
- Only the last calculated zero deviation value can be read with this command.

Example

↓	`I78`	Query the zero deviation of the weighing device.
↑	`I78␣A␣0.2`	Current zero deviation is 0.2% of the maximum capacity.

I79 – Total number of zero deviation exceeds

Description

Use `I79` to query the total number of zero deviations detected by predefined monitor channels.

Syntax

Command

`I79`	Query total number of zero deviations for all predefined channels.
`I79␣<Channel>`	Query total number of zero deviations for a specific channel.

Responses

`I79␣B␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
`I79␣B…`
`I79␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
	Current values for all monitor channels.

`I79␣A␣<Channel>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`	Current values for a certain monitor channel.
`I79␣I`	Command understood but currently not executable.
`I79␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0 … n`	Identification for zero deviation monitor channel (n is product dependent)
`<LowerThreshold>`	Float		Lower threshold value for the zero deviation monitor channel defined as the percentage of the maximum capacity
`<UpperThreshold>`	Float		Upper threshold value for the zero deviation monitor channel defined as the percentage of the maximum capacity
`<Counts>`	Integer		Number of zero deviations detected by the defined monitor channel

Comments

- The number of channels is product specific.
- When the weighing device accepts the zero command or the initial zero point is established, it can calculate the deviation between the actual zero value and the user calibrated zero value. This value is checked by the monitor channels to increase the counter value.

Example

↓	`I79`	Query total number of zero deviations for all predefined channels.
↑	`I79␣B␣0␣1.0␣10.0␣2` `I79␣A␣1␣10.0␣400.0␣0`	Channel-0 monitors the range between 1% and 10% of maximum capacity and there are 2 zero deviations detected in this range. Channel-1 monitors the range between 10% and 400% of maximum capacity and there are no zero deviations detected in this range.

I80 – Total number of temperature exceeds

Description

Use `I80` to query the total number of temperature deviations detected by predefined monitor channels.

Syntax

Command

`I80`	Query total number of temperature deviations for all predefined channels.
`I80␣<Channel>`	Query total number of temperature deviations for a specific channel.

Responses

`I80␣B␣<Channel>␣<Sensor>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
`I80␣B…`
`I80␣A␣<Channel>␣<Sensor>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`
	Current values for all monitor channels.

`I80␣A␣<Channel>␣<Sensor>␣<LowerThreshold>␣<UpperThreshold>␣<Counts>`	Current values for a certain monitor channel.
`I80␣I`	Command understood but currently not executable.
`I80␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0 … n`	Index for the channel of the temperature sensor (n is product dependent)
`<Sensor>`	Integer	`0: Measuring sensor (SG)` `1: PCBA (Mainboard)`	Identification for the temperature sensor
`<LowerThreshold>`	Float		Lower threshold value for the temperature deviation monitor channel
`<UpperThreshold>`	Float		Upper threshold value for the temperature deviation monitor channel
`<Counts>`	Integer		Number of temperature deviations detected by the defined monitor channel

Comments

- The number of channels is product specific.
- Sensor-0 is the temperature sensor placed close to the measuring bridge (Strain Gage) and Sensor-1 is the temperature sensor placed on the PCBA (Mainboard).
- The target of this function is to count the number of the temperature values which fall outside permissible operating temperature range. The value of the counter is increased only once when a temperature value enters into a monitor range and stays inside this range.

Example

↓	I80	Query total number of temperature deviations for all predefined channels.
↑	I80␣B␣0␣0␣-50.0␣-10.0␣0 I80␣B␣1␣0␣40.0␣80.0␣1 I80␣B␣2␣1␣70.0␣80.0␣0 I80␣A␣3␣1␣80.0␣100.0␣0	Channel-0 belonging to the Sensor-0 monitors the temperature range between -50°C and -10°C and there are no temperature values detected in this range. Channel-1 belonging to the Sensor-0 monitors the temperature range between 40°C and 80°C and there is 1 temperature value detected in this range. . Channel-2 belonging to the Sensor-1 monitors the temperature range between 70°C and 80°C and there is no temperature value detected in this range. Channel-3 belonging to the Sensor-1 monitors the temperature range between 80°C and 100°C and there is no temperature value detected in this range.

I81 – Temperature gradient

Description

Use `I81` to query the last calculated temperature gradient for available temperature sensors.

Syntax

Command

`I81`	Query the last calculated temperature gradient of all available temperature sensors.
`I81␣<Channel>`	Query the last calculated temperature gradient for a specific sensor.

Responses

`I81␣B␣<Channel>␣<Gradient>␣<Duration>`
`I81␣B…`
`I81␣A␣<Channel>␣<Gradient>␣<Duration>`
	Current values for all available temperature sensors.

`I81␣A␣<Channel>␣<Gradient>␣<Duration>`	Current values for a certain temperature sensor.
`I81␣I`	Command understood but currently not executable.
`I81␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0: Measuring sensor (SG)` `1: PCBA (Mainboard)`	Identification for the temperature sensor
`<Gradient>`	Float		Temperature gradient given in °C
`<Duration>`	Float		Duration of the temperature gradient given in second

Comments

- Sensor-0 is the temperature sensor placed close to the measuring bridge (Strain Gage) and Sensor-1 is the temperature sensor placed on the PCBA (Mainboard).
- `I81` command returns the temperature change (<Gradient>) over a certain time period (<Duration >) for a selected temperature sensor (<Sensor>)
- If the duration parameter is 0, either the sensor is switched off, or the gradient value has not yet been calculated.
- Only the last calculated temperature difference is used in the gradient calculation.

Example

↓	`I81`	Current values for all available temperature sensors.
↑	`I81␣A␣0␣0.2␣60`	Temperature gradient is calculated only for the temperature sensor-0 (Measuring bridge) and the result is 0.2°C temperature change measured over 60 seconds.

I82 – Total number of temperature gradient exceeds

Description

Use `I82` to query the total number of temperature gradient deviations detected by predefined monitor channels.

Syntax

Command

`I82`	Query total number of temperature gradient deviations for all predefined channels.
`I82␣<Channel>`	Query total number of temperature gradient deviations for a specific sensor.

Responses

`I82␣B␣<Channel>␣<MaxGradient>␣<Duration>␣<Counts>`
`I82␣B…`
`I82␣A␣<Channel>␣<MaxGradient>␣<Duration>␣<Counts>`
	Current values for all monitor channels.

`I82␣A␣<Channel>␣<MaxGradient>␣<Duration>␣<Counts>`	Current values for a certain monitor channel.
`I82␣I`	Command understood but currently not executable.
`I82␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Channel>`	Integer	`0: Measuring sensor (SG)` `1: PCBA (Mainboard)`	Identification for the temperature sensor
`<MaxGradient>`	Float		Upper threshold value for the temperature gradient monitor channel
`<Duration>`	Float		Duration of the temperature gradient given in second
`<Counts>`	Integer		Number of temperature gradients exceeding the upper threshold value

Comments

- Sensor-0 is the temperature sensor placed close to the measuring bridge (Strain Gage) and Sensor-1 is the temperature sensor placed on the PCBA (Mainboard).
- If the duration parameter is 0, either the sensor is switched off, or the gradient value has not yet been calculated.
- Only the last calculated temperature difference is used in the gradient calculation.
- Counter value is not incremented during the warm-up phase of the weighing device after the power is switched-on.

Example

↓	`I82`	Query total number of temperature gradient deviations for all predefined channels.
↑	`I82␣A␣0␣0.5␣60␣0`	Temperature gradient is monitored only for the temperature sensor- 0 (Measuring bridge). Upper threshold value is defined as 0.5°C temperature change in 60 seconds. The gradient values measured by the sensor have not exceeded this maximum limit so far.

I83 – Software identification

Description

This command returns the identification of the approval relevant software modules of a weighing device.

Syntax

Command

I83	Query the identification.
I83␣<Index>	Query the index.

Responses

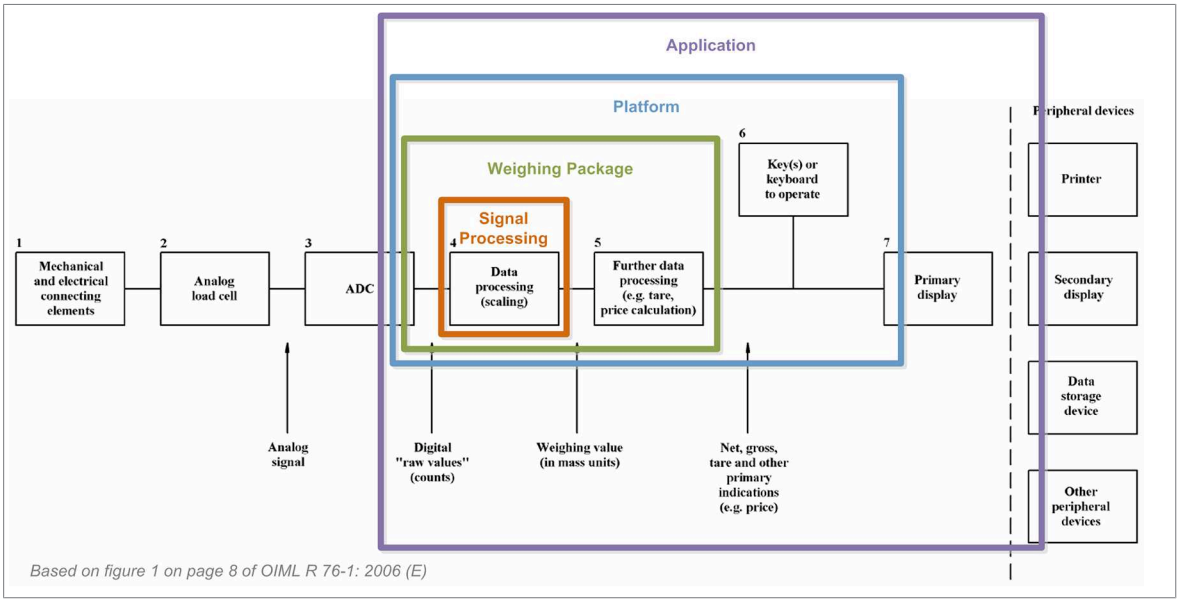
I83␣B␣<Index>␣<"SW-Module">␣<"Version"> I83␣B␣<Index>␣<"SW-Module">␣<"Version"> I83␣B… I83␣A␣<Index>␣<"SW-Module">␣<"Version">	Current list of entries.
I83␣A␣<Index>␣<"SW-Module">␣<"Version">	Current text from index only.

Parameters

Name	Type	Values	Meaning
<Index>	Integer	0 … 255	Array index of version list entry
<"SW-Module">	String	AP, PF, WP, SP (max 30 chars)	Software module name, <new module name abbreviation> must be unique and added by the MT-SICS team.
		AP	Scale terminal application software
		PF	Core system functions and configuration (e.g.: Rainbow)
		WP	Weighing package (e.g.: Rainbow)
		SP	Signal processing (e.g.: Rainbow)
<"Version">	String	Max 20 chars	Version identification

Comments

- The first line must be the application/product software version, i.e. the overall SW version.
- The number and the sequence of software modules is product dependent.
- The terminal can use the return values to show the version information required by approval documents. Solution with ICS Terminals (as an example) Test Certificate TC8039 "Software: Rainbow" requires as an essential characteristic: Software identification shown on terminal or display of complete weighing instrument in the form: Loadcell-Firmware-Version: AP:2.3.0 RB:2.2.0 WP:2.2.1 SP:1.70.33.
- The following picture emphasizes the relation between the software modules and the OIML signal path:



Examples

↓	`I83`	Query the identification.

↑	`I83␣B␣0␣"Application"␣"2.3.0"`
	`I83␣B␣1␣"Platform"␣"2.2.0"`
	`I83␣B␣2␣"Weighing Package"␣"2.2.1"`
	`I83␣A␣3␣"Signal Processing"␣"1.70.33"`
		Actual entry for index 0 is: Module name "Application" with version "2.3.0".
		Actual entry for index 1 is: Module name "Platform" with version "2.2.0".
		Actual entry for index 2 is: Module name "Weighing Package" with version "2.2.1".
		Actual entry for index 3 is: Module name "Signal Processing" with version "1.70.33".

↓	`I83␣2␣0`	Requests the entry for index 2 only.
↑	`I83␣B␣2␣"Weighing Package"␣"2.2.1"`	Actual entry for index 2 is: Module name "Weighing Package" with version "2.2.1".

I100 – Active stability criteria

Description

This command returns the active stability criteria.

Syntax

Commands

I100	Reads the parameters from the device; all entries.
I100␣<Fu>	Reads the parameters from the device; specific entry.

Responses

I100␣B␣<Fu>␣<Limit>␣<Time> I100␣B␣<Fu>␣<Limit>␣<Time> ... I100␣A␣<Fu>␣<Limit>␣<Time>	Current configuration of the stability criteria, all entries
I100␣A␣<Fu>␣<Limit>␣<Time>	Current configuration of the stability criteria, specific entry
I100␣I	Command understood but currently not executable.
I100␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Values	Meaning	Examples of related commands
<Fu>	0	Normal weighing	S, SI, SIR, …
	1	Taring	T, TI, …
	2	Zero setting	Z, ZI, …
	3	Adjustments and tests	C1, C2, C3, C6, C7, C8, TSTx, …
<Limit>		Stability limit in digits (smallest weight increment) within which the value must stay to be regarded as stable	
<Time>		Stabilization timeout in milliseconds. If this duration is reached during control weighing, last measured value willObservation time in seconds during which the value must stay within tolerance in order to be regarded as stable	

Examples

↓	I100	Reads the parameters from the device; all entries.
↑	I100␣B␣0␣1.0␣0.5 I100␣B␣1␣1.0␣0.5 I100␣B␣2␣0.5␣1.0 I100␣B␣3␣0.5␣1.0	For weighing and taring the active value of the Limit / Time parameter is 1 digit / 0.5 seconds. For the other weighing functions, the active value of the Limit / Time parameter is 0.5 digits / 1 seconds.

↓	I100␣1	Reads the parameters from the device; specific entry. Current values for taring.
↑	I100␣A␣1␣1.0␣0.5	For taring the active value of the Limit / Time parameter is 1 digit / 0.5 seconds.

I101 - Humidity value

Description

Requests the current humidity value.

Syntax

Commands

I101	Query the parameters from the device, all entries.
I101␣<No>	Query the parameters from the device for a specific entry.
I101␣<No>	Set the parameters to the device.

Responses

I101␣B␣<No>␣<HumVal> I101␣B␣<No>␣<HumVal> ... I101␣A␣<No>␣<HumVal>	Command understood and executed successfully, all entries.
I101␣A␣<No>␣<HumVal>	Command understood and executed successfully for a specific entry.

Parameters

Name	Type	Values	Meaning
<No>	Integer	1...n	Humidity sensor number n is product dependent
<HumVal>	float 32 bits	1... 100%RH	Humidity sensor value in %RH

Initial values

Initial values are product dependent.

Comment

The number of humidity sensors is product dependent.

Examples

↓	I101	Query the parameters from the device.
↑	I101␣A␣1␣46.8	The device has one humidity sensor The humidity value is 46.8 %RH.

↓	I101␣2	Query the humidity value from sensor 2
↑	I101␣A␣2␣56.3	The humidity value of sensor 2 is 46.8 %RH.

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
		C	Key was released (after being pressed shortly or for 2 second)
<FunctionID>	Integer	0	Adjustment
		1	Tare
		2	Zero
		3	Data transfer to printing device
		4 … 6	Reserved for future use
		7	Test
<KeyID>	Integer		Indicator for pressed key

<KeyID>	Integer	1	⌂/⌂	Home
		2	🗐/👤	User profile (XP/XPE balances or PWT terminal only)
		3	🗐/👤⚙	Settings (XP/XPE balances or PWT terminal only)
		4	reserved	
		5	→0←	Zero
		6	reserved	
		7	🖶/🖶	Transfer
		8	☰/☰/⚙	Configure actual applications
		9	▦/▬/▦	Applications
		10	→T←/On/Off/⏻	Tare On/Off

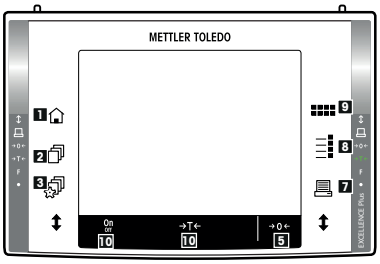
Comments

- There is no key number assigned to the door keys; therefore, no response is invoked upon pressing one of these keys.
- K␣1 is the factory setting (default value).
- K␣1 active after balance switched on and after the cancel command @.
- K␣2 door function is not disabled.
- Only one K mode is active at one time.
- The mapping of the key numbers on the different terminals are displayed below:

The terminal XS (SWT) is delivered with a new design and housing color since Q3/2014. You can find both the old and new designs below:

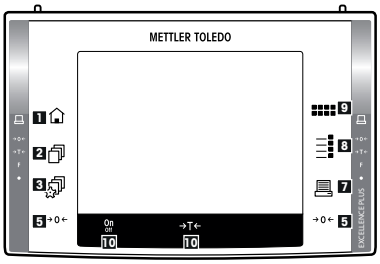
PWT terminal

(e.g. XP Analytical Balances)



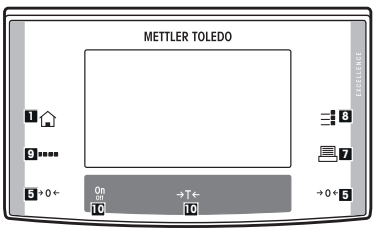
PWT terminal

(e.g. WXTP Weigh Module)



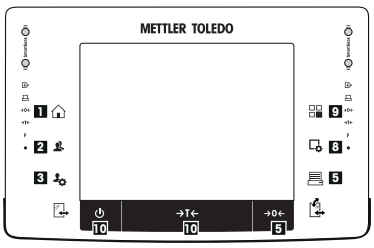
SWT terminal

(e.g. WXTS Weigh Module)



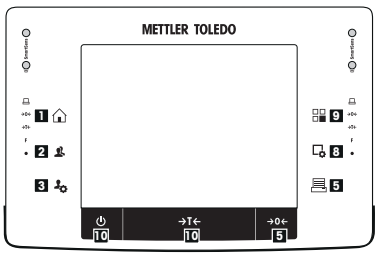
PWT terminal

(e.g. XPE Analytical Balances)



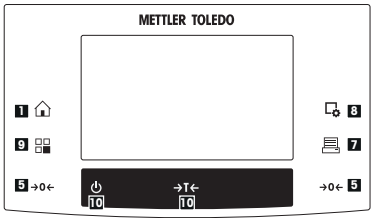
PWT terminal

(e.g. WXTP Weigh Module)



SWT terminal with new terminal design

(e.g. WXTS Weigh Module)



Example

When a code with a long press 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␣1	The taring function has been started → taring active.
↑	K␣A␣1	Taring completed successfully.
↑	K␣B␣1	The taring function has been started → taring active.
↑	K␣I␣1	Taring not completed successfully, taring aborted (e.g. tried to tare a negative value).

LST – Current user settings

Description

Use the LST command to listing of general module data and current settings which can be changed by the user.

Syntax

Command

LST	Listing of general module data and current settings which can be changed by the user.

Responses

LST␣B␣I2␣"WMS204-L␣Standard␣ 410.0090␣g"	Returns the module data (header).
LST␣B␣I3␣"1.0␣1.23.4.567.890"	Returns the firmware version and the type definition number (header).
LST␣B␣I4␣"1234567890"	Returns the serial number (header).
LST␣B␣C4␣"0"	Returns whether an initial adjustment by the user was performed ("1") or not ("0") (header).
LST␣B␣Cx␣"0"	Returns whether internal or external adjustment by the user was performed ("1") or not ("0") (header).
LST␣B␣C0␣0␣0	Sets the adjustment settings (calibration settings) (first command of the user settings).
…	
LST␣A␣WMCF␣0	Inquires the configuration of the weight monitoring function (last command of the user settings).

Comments

- The general module data are output in a five-line header ("I2" to "Cx"). This is followed by the current user settings in alphabetical sequence.
- The foregoing responses are examples. The actual responses depend on the current settings.

Example

↓	LST	Query of the list of all current user settings.
↑	LST␣B␣I2␣"WMS204-L␣410.0090␣g"	Returns the module data (header).
↑	LST␣B␣I3␣"1.0␣1.23.4.567.890"	Returns the firmware version and the type definition number (header).
↑	LST␣B␣I4␣"1234567890"	Returns the serial number (header).
↑	LST␣B␣C4␣"0"	Initial adjustment information (header).
↑	LST␣B␣Cx␣"0"	Internal or external adjustment information (header).
↑	LST␣B␣C0␣0␣0	First command of the user settings.
↑	…	…
↑	LST␣A␣WMCF␣0	Last command of the user settings.

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/Universal
		1	Dosing
		2	Sensor mode
		3	Check weighing
		6	Raw weight values / No filter

Comments

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.
- Please check possible settings with product specific Reference Manual.

Examples

↓	M01	Query of the current weighing mode.
↑	M01␣A␣4	Dynamic weighing mode is set.

↓	M01␣1	Set the weighing mode to dosing.
↑	M01␣A	Dosing is set.

See also

- FCUT – Filter characteristics (cut-off frequency) ▸ Page 92
- I46 – Selectable weighing modes ▸ Page 117
- M02 – Environment condition ▸ Page 158

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).

Parameter

Name	Type	Values	Meaning
<Environment>	Integer	0	Very stable
		1	Stable
		2	Standard
		3	Unstable
		4	Very unstable
		5	Automatic

Comments

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.
- If FCUT is activated (<Frequency> ≥ 0.001 Hz) and weighing mode, see M01 is 2 (sensor mode), it will override any settings for ambient conditions (M02) in sensor mode.
- 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 (M02␣L).

Example

↓	M02␣3	Set the environment to unstable.
↑	M02␣A	Environment is set.

See also

- FCUT – Filter characteristics (cut-off frequency) ▸ Page 92
- M01 – Weighing mode ▸ Page 157

M03 – Auto zero function

Description

Use M03 to switch the auto zero function on or off and query its current status.

Syntax

Commands

M03	Query of the current auto zero function.
M03␣<AutoZero>	Set the auto zero function.

Responses

M03␣A␣<AutoZero>	Current auto zero 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	Auto zero is switched off (is not supported by approved balances)
		1	Auto zero is switched on

Comment

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M03␣1	Switch on the auto zero function.
↑	M03␣A	Auto zero function is activated.

M17 – ProFACT: Single time criteria

Description

Use M17 to set the time and days when a ProFACT adjustment should be executed automatically, or to query the current setting.

i **Note** The settings ProFACT/FACT and days are model dependent.

Syntax

Commands

M17	Query of the current ProFACT time criteria.
M17␣<Hour>␣<Minute>␣<Second>␣<Days>	Set the ProFACT time criteria.

Responses

M17␣A␣<Hour>␣<Minute>␣<Second>␣<Days>	Current ProFACT time criteria.
M17␣A	Command understood and executed successfully.
M17␣I	Command understood but currently not executable.
M17␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Hour>	Integer	00 … 23	Hours
<Minute>	Integer	00 … 59	Minutes
<Second>	Integer	00 … 59	Seconds
<Days>	Integer	0	Time criteria is switched off
		2^0 = 1	Monday
		2^1 = 2	Tuesday
		2^2 = 4	Wednesday
		2^3 = 8	Thursday
		2^4 = 16	Friday
		2^5 = 32	Saturday
		2^6 = 64	Sunday

Comments

- The days of the week are written in binary code. Combinations of different days are expressed as the sum of the individual days.
- Only one time criterion can be set using M17; all other times are deactivated. [M32 ▸ Page 175] must be used if you wish to set several different times.
- If two or more times are set [M32 ▸ Page 175] command, resulting in an M17 query, an M17␣I response is generated.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Examples

↓	M17␣12␣00␣00␣5	Set the ProFACT time criteria to Monday and Wednesday (5 = 1 + 4) at 12:00 h.
↑	M17␣A	ProFACT time criteria is set.

↓	M17	Query of the current ProFACT time criteria.

↑	M17␣A␣12␣00␣00␣127	The balance will currently be adjusted every day (127 = 1 + 2 + 4+ 8 + 16 + 32 + 64) at 12:00 h.

M18 – ProFACT/FACT: Temperature criterion

Description

Use M18 to set the temperature criterion for triggering a ProFACT internal adjustment, or to query the current value.

Syntax

Commands

M18	Query of the current ProFACT/FACT temperature criterion.
M18␣<Criterion>	Set the ProFACT/FACT temperature criterion.

Responses

M18␣A␣<Criterion>	Current ProFACT/FACT temperature criterion.
M18␣A	Command understood and executed successfully.
M18␣I	Command understood but currently not executable.
M18␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Criterion>	Integer	0 … 4	The settings of temperature criterion values depend on the balance model and system setup (bridge module with/without terminal)
		0	Temperature criterion is switched off
		1	0.5 Kelvin
		2	1.0 Kelvin
		3	2.0 Kelvin
		4	3.0 Kelvin

Comments

- Temperature difference (Δ temp.) is defined as the criterion. The balance automatically performs an internal adjustment if the temperature of the balance changes by the defined temperature difference.
- 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 parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M18␣1	Set the ProFACT/FACT temperature criterion to the 1st setting.
↑	M18␣A	1st setting is activated.

M19 – Adjustment weight

Description

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

Syntax

Commands

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

Responses

M19␣A␣<Value>␣<Unit>	Current adjustment weight.
M19␣A	Command understood and executed successfully.
M19␣I	Command understood but currently not executable.
M19␣L	Command understood but not executable (incorrect parameter) or adjustment weight is 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 parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Examples

↓	M19	Query of the current adjustment weight.
↑	M19␣A␣100.123␣g	The adjustment weight is 100.123 g.

↓	M19␣500.015␣g	Set the adjustment weight to 500.015 g.
↑	M19␣A	The adjustment weight is set to 500.015 g,

See also

- C0 – Adjustment setting ▸ Page 24
- C1 – Start adjustment according to current settings ▸ Page 26
- C2 – Start adjustment with external weight ▸ Page 28
- C7 – Customer standard calibration ▸ Page 37

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	>10 digits	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 262] 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

- TST1 – Test according to current settings ▸ Page 260
- TST2 – Test with external weight ▸ Page 262

M21 – Unit

Description

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

Syntax

Commands

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

Responses

M21␣B␣<Channel>␣<Unit> M21␣B… M21␣A␣<Channel>␣<Unit>	Current first unit. … Current last unit.
M21␣<Channel>␣<Unit>	Unit of output channel.
M21␣A	Command understood and executed successfully.
M21␣I	Command understood but currently not executable.
M21␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning		
<Channel>	Integer	0	Host unit, used on the MT-SICS Host		
		1	Display unit, used on the terminal screen		
		2	Info unit, used in the info field on the terminal screen		
<Unit>	Integer	0	Gram	g	**Applicable for definition unit** yes
		1	Kilogram	kg	yes
		2	Ton	t	yes
		3	Milligram	mg	yes
		4	Microgram	µg	yes
		5	Carat	ct	yes
		6	Newton	N	yes
		7	Pound avdp	lb	yes
		8	Ounce avdp	oz	yes
		9	Ounce troy	ozt	yes
		10	Grain	GN	yes
		11	Pennyweight	dwt	yes
		12	Momme	mom	yes
		13	Mesghal	msg	yes
		14	Tael Hongkong	tlh	yes
		15	Tael Singapore	tls	yes
		16	Tael Taiwan	tlt	yes
		17	Tical	tcl	yes
		18	Tola	tola	yes
		19	Baht	baht	yes
		20	lb	oz	yes
		21	Ton (short ton = 2000 lb)	ton	yes
		25	no unit	--	
		26	Piece	PCS	available with application "Counting"
		27	Percent	%	available with application "Percent"
		28	Custom unit 1	cu1	available if custom unit 1 is switched on M22
		29	Custom unit 2	cu2	available if custom unit 2 is switched on M22
		30	Currency unit 1		available if currency unit 1 is switched on M22
		31	Currency unit 2		available if currency unit 2 is switched on M22

Comments

- All S commands (except SU) are given in Host unit according to the definition of the MT-SICS. Only weight units are accepted as Host unit, see table above, in column applicable for definition unit marked with 'yes'.
- In the event of a power failure, the host unit is lost and, following a restart, the weighing unit is displayed as "g".
- It is not possible to use "no unit" for the displayed unit.
- The units and/or their notation may be different in older software versions.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Examples

↓	M21	Query of the current unit.
↑	M21 B 0 0 M21 B 1 3 M21 A 2 5	Current host unit is g. Current display unit is mg. Current info unit is carat.

↓	M21 0 1	Set the unit to 1 kg.
↑	M21 A	The unit is set to 1 kg.

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 … max. units	Number of custom unit
<Formula>	Integer	0	(net weight) x factor
		1	factor/(net weight)
<Factor>	Float		Factor
<Unit>	String		Unit name (max. 4 characters)
<Rounding>	Float		Rounding step

Comments

- To query or define a custom unit, it must be switched on M21.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M22	Query of the current custom unit definitions.
↑	M22␣B␣1␣0␣15.5␣"sfr"␣0.05	The first custom unit is (net weight) x 15.5 sfr, rounded to 0.05.
↑	M22␣A␣2␣1␣25.4␣"h1"␣0.1	The second custom unit is 25.4/(net weight) h1, rounded to 0.1.

See also

M21 – Unit ▸ Page 165

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 will not be changed with the M23 command.
- M23 has no influence of the stability criteria for the [Taring ▸ Page 252] and [Zeroing ▸ Page 272] commands.
- The readability is specified in digits [d] – this is the smallest increment a balance may display.
- 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

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.
- The stability criteria for the weight result (weighing commands) will be adapt to the selected readability based on the USTB setting.

Examples

↓	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.

See also

- M22 – Custom unit definitions ▸ Page 168
- T – Tare ▸ Page 252
- Z – Zero ▸ Page 272

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 (including linearity)
<"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.

M28 – Temperature value

Description

Use M28 to query the temperature value.

Syntax

Command

M28	Query of the current temperature value.

Responses

M28␣B␣<No>␣<TempVal> M28␣… M28␣A␣<No>␣<TempVal>	1st temperature sensor. … last temperature sensor.
M28␣A	Command understood and executed successfully.
M28␣I	Command understood but currently not executable.

Parameters

Name	Type	Values	Meaning
<No>	Integer	1 … n	Number of temperature sensors (n is product dependent)
<TempVal>	Float		Temperature sensor value in °C

Comments

- The number of temperature sensors depends on the product.
- There is no more Information available about the temperature offset and resolution.

Example

↓	M28	Query of the current temperature value.
↑	M28␣A␣1␣22.5	There is only one temperature sensor available. The temperature value is 22.5 °C.

M29 – Weighing value release

Description

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

This is an indirect and compact setting of the stability criterion. This factor merges both parameters of the USTB command into one value for all functions.

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

Comments

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- This command is only active when USTB is set to factory default (which is 0 for all entries).
- 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.

See also

USTB – User defined stability criteria ▸ Page 268

M31 – Operating mode after restart

Description

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

Syntax

Commands

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

Responses

M31␣A␣<Mode>	Current settings of operating mode following restart.
M31␣A	Command understood and executed successfully.
M31␣L	Command understood but not executable (not permitted).

Parameter

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

Comment

Customer can only use the user- and diagnostic mode. All other settings will give a M31␣L response.

Examples

↓	M31	Query of the current operating mode following restart.
↑	M31␣A␣0	The operating mode following restart is: user mode.

↓	M31␣1	Set the production mode as operating mode after restart.
↑	M31␣A	Operating mode is set.

M32 – ProFACT: Time criteria

Description

You can use M32 to set several times at which an automatic ProFACT adjustment procedure should be carried out, or query the current settings. The days of the week are defined with [M33 ▸ Page 175].

M32 is only available for modules with internal adjustment weight.

Syntax

Commands

M32	Query of the current ProFACT time criteria.
M32␣<Number>␣<Hour>␣<Minute>␣<Status>	Set the ProFACT time criteria.

Responses

M32␣B␣<Number>␣<Hour>␣<Minute>␣<Status> M32␣B… M32␣A␣<Number>␣<Hour>␣<Minute>␣<Status>	Current ProFACT time criteria.
M32␣A	Command understood and executed successfully.
M32␣I	Command understood but currently not executable.
M32␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Number>	Integer	0 … 3	FACT time index
<Hour>	Integer	00 … 23	Hours
<Minute>	Integer	00 … 59	Minutes
<Status>	Integer	0	Time deactivated (off)
		1	Time activated (on)

Comments

- Only 1 time criterion can be set using M17; all other times are permanently deactivated. M32 and [M33 ▸ Page 176] must be used if you wish to set several different times.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Examples

↓	M32␣2␣12␣00␣1	ProFACT time 2 set to 12:00 and activated (on).
↑	M32␣A	ProFACT time criteria is set.

↓	M32	Query of the current ProFACT time criteria.
↑	M32␣B␣1␣09␣00␣1	The balance will currently be adjusted at 9:00 h, 12:00 and 15:00 h.
↑	M32␣B␣2␣12␣00␣1	
↑	M32␣A␣3␣15␣00␣1	

M33 – ProFACT: Day of the week

Description

You can use M33 to set the days of the week on which a ProFACT adjustment procedure should be carried out, or to query the current settings. The times for each are defined using [M32 ▸ Page 175].

M33 is only available for modules with internal adjustment weight.

Syntax

Commands

M33	Query of the current ProFACT weekday.
M33␣<Weekday>	Set the ProFACT weekday.

Responses

M33␣A␣<Weekday>	Current ProFACT weekday.
M33␣A	Command understood and executed successfully.
M33␣I	Command understood but currently not executable.
M33␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<WeekDay>	Integer	0	Time criteria is switched off
		2^0 = 1	Monday
		2^1 = 2	Tuesday
		2^2 = 4	Wednesday
		2^3 = 8	Thursday
		2^4 = 16	Friday
		2^5 = 32	Saturday
		2^6 = 64	Sunday

Comments

- The days of the week are written in binary code. Combinations of different days are expressed as the sum of the individual days.
- Only 1 time criterion can be set using M17; all other times are deactivated. [M32 ▸ Page 175] and M33 must be used if you wish to set several different times.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M33␣5	Time adjustments are made on Mondays and Wednesdays (5 = 1 + 4).
↑	M33␣A	ProFACT weekday is set.

M34 – MinWeigh: Method

Description

Use M34 to select the MinWeigh method you wish to work with, or query the currently set MinWeigh method.

Syntax

Commands

M34	Query of the current MinWeigh method.
M34␣<Method>	Set the MinWeigh method.

Responses

M34␣A␣<Method>	Current MinWeigh method.
M34␣A	Command understood and executed successfully.
M34␣I	Command understood but currently not executable.
M34␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0	MinWeigh deactivated
		1	Method 1 activated
		2	Method 2 activated
		3	Method 3 activated
		4	Method 4 activated
		5	Method 5 activated

Comments

- MinWeigh can only be activated by a service technician.
- For additional information on mnimum weight (MinWeigh), **see** the Reference Manual of the balance.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Examples

↓	M34	Query of the current MinWeigh method.
↑	M34␣A␣3	The MinWeigh method is 3.

↓	M34␣1	Set the MinWeigh method to 1.
↑	M34␣A	MinWeigh method 1 is set.

M35 – Zeroing mode at startup

Description

You can use M35 to save the last zero. Following a power failure, the balance will resume operation with the saved zero. In normal mode M35␣0, the balance specifies a new zero reference point at start-up as soon as a stable condition has been achieved.

Syntax

Commands

M35	Query of the current zeroing mode at startup.
M35␣<Mode>	Set the zeroing mode at startup.

Responses

M35␣A␣<Mode>	Current zeroing mode at startup.
M35␣A	Command understood and executed successfully.
M35␣I	Command understood but currently not executable.
M35␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0	Normal mode
		1	Start with saved zero or save last zero

Comments

- If the mode is set to 1 when the balance is started up, the fail-safe, saved zero is used.
- For certification reasons, this command may only be executed on normal balances. Certifiable balances do not have this function.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M35␣1	Save the last zero and use it at following startup.
↑	M35␣A	Start-up zeroing mode is set.

M38 – Selective parameter reset

Description

Use M38 to execute a reset of selected parameters.

Syntax

Command

M38␣<ResetMode>	Execute reset

Responses

M38␣A	Command understood and executed successfully.
M38␣I	Command understood but currently not executable.
M38␣L	Command understood but not executable (incorrect parameter).

Parameters

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

Comments

- After user- and master reset the module performs a complete restart similar to startup after power up.
- <ResetMode> 1 to 3 not yet implemented.

Example

↓	M38␣0	Execute a actions reset.
↑	M38␣A	Command understood and executed successfully.

See also

FSET – Reset all settings to factory defaults ▸ Page 95

M39 – SmartTrac: Graphic

Description

You can use M39 to set the type of SmartTrac graphic (used weighing range graphic) or query the current setting.

Syntax

Commands

M39	Query of the current SmartTrac Graphic.
M39␣<SmartTrac>	Set the SmartTrac Graphic.

Responses

M39␣A␣<SmartTrac>	Current setting of the SmartTrac Graphic.
M39␣A	Command understood and executed successfully.
M39␣I	Command understood but currently not executable.
M39␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning (Nominal =0)	Meaning (Nominal > 0)
<SmartTrac>	Integer	0	No SmartTrac	Weighing-in graphic
		1	Round SmartTrac	Round weighing in SmartTrac
		2	SmartTrac bar	Weighing-in SmartTrac bar
		3	SmartTrac measuring beaker	SmartTrac crosshairs

Comments

- If the application contains a nominal value that is > 0, the used weighing range graphics mentioned above are automatically displayed as weighing-in graphics listed in the left-most column.
- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

Example

↓	M39␣2	Set the SmartTrac bar.
↑	M39␣A	SmartTrac bar has been set.

M43 – Custom unit

Description

Use M43 to activate or deactivate custom units (custom display unit, custom info unit).

Syntax

Commands

M43	Query of the current custom unit setting.
M43␣<CustomUnitNumber>␣<Mode>	Write new custom unit.

Responses

M43␣B␣<CustomUnitNumber>␣<Mode> M43␣B… M43␣A␣<CustomUnitNumber>␣<Mode>	Current custom units.
M43␣A	Command understood and executed successfully.
M43␣I	Command understood but currently not executable.
M43␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<CustomUnitNumber>	Integer	1	Custom display unit
		2	Custom info unit
<Mode>	Integer	0	Deactivate custom unit
		1	Activate custom unit

Comments

- Dependency: [M21 ▸ Page 165] - Unit (Host-, Display- and Info-Unit)
  [M22 ▸ Page 168] - Custom unit definitions (Formula, Factor, Unit, Rounding)
- Custom units cannot be fully defined or managed via Host.

Examples

↓	M43	Query of current custom unit settings.
↑	M43␣B␣1␣1 M43␣A␣2␣0	Custom display unit is on. Custom info unit is off.

↓	M43␣1␣0	Deactivated custom display unit.
↑	M43␣A	Command understood and executed successfully.

M44 – Command executed after startup response

Description

Use M44 to set or query the command executed after startup.

Syntax

Commands

M44	Query of the current startup command setting.
M44␣<Interface>␣<"Command">	Set the startup command.

Responses

M44␣B␣<Interface>␣<"Command"> M44␣B… M44␣A␣<Interface>␣<"Command">	Interface number 0. … Interface number n.
M44␣A	Command understood and executed successfully.
M44␣I	Command understood but currently not executable.
M44␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0 … n	Interface number
<"Command">	String	max 64 chars	MT-SICS Command after startup

Comments

- Command executed after I4 and after initial zero.
- An invalid command leads to ES after start up.

Examples

↓	M44	Query of the current startup command setting.
↑	M44␣B␣0␣""	There is no command specified on interface 0.
	M44␣A␣1␣"SIR"	Starts SIR after startup on interface 1.

↓	M44␣0␣"SR␣1␣g"	Start SR command after startup on interface 0.
↑	M44␣A	Command understood and executed successfully.

M45 – Electrical termination of RS422/ RS485 data lines

Description

Use M45 to set the electrical termination of RS422/RS485 data lines switch state.

Syntax

Commands

M45	Query of the current RS electrical termination setting.
M45␣<Interface>␣<OnOff>	Set RS electrical termination on or off.

Responses

M45␣B␣<Interface>␣<State> M45␣B… M45␣A␣<Interface>␣<State>	Interface number 0. … Interface number n.
M45␣A	Command understood and executed successfully.
M45␣I	Command understood but currently not executable.
M45␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0 … n	Interface number, **see** COM
<State>	Boolean	ON = 1	RS422 bus termination setting
		Off = 0	

Comments

- Only bus systems like RS422 will be shown in the list.
- Default setting is M45␣0 = off.

Examples

↓	M45	Query of the RS electrical termination setting.
↑	M45␣A␣1␣1	RS bus termination on interface 1 is on. There is only one bus interface available.

↓	M45␣1␣0	Set RS electrical termination to Off.
↑	M45␣A	Command understood and executed successfully.

M47 – Frequently changed test weight settings

Description

Use M47 to read and write the frequently changed test weight settings, such as actual weight and next calibration date.

Syntax

Commands

M47	Query of the current test weight settings.
M47␣<Number>	Query of the specific test weight setting.
M47␣<Number>␣<"Actual-Weight">␣<"Unit">␣<Day>␣<Month>␣<Year>	Write new test weight settings for the specific test weight.

Responses

M47␣B␣<Number>␣<"Actual-Weight">␣<"Unit">␣<Day>␣<Month>␣<Year> M47␣B… M47␣A␣<Number>␣<"Actual-Weight">␣<"Unit">␣<Day>␣<Month>␣<Year>	Current test weight settings.
M47␣A	Command understood and executed successfully.
M47␣I	Command understood but currently not executable.
M47␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Number>	Integer	1 … 12	Number of the test weight.
<"ActualWeight">	String	Max 10 chars	Actual weight of the test weight.
<"Unit">	String	Max 2 chars	Actual unit of the test weight.
<Day>	Integer	1 … 31	Day of the next calibration date.
<Month>	Integer	1 … 12	Month of the next calibration date.
<Year>	Integer	2000 … 2099	Year of the next calibration date.

Comments

- These initial values are set by the GWP software on the weigh module, balance.
- The parameter "Number" corresponds with the "Number" of [M48 ▸ Page 186] command.
- To write the infrequently changed parameters, the command "[M48 ▸ Page 186]" is used.
- The following conditions must be met before a test weight is considered valid: if name is defined (max 20 characters), if weight value is defined (more than 0), and if unit is valid.
- This command is available only in XP and XS balances and is not supported in XA balances.

Examples

↓	M47	Query of the list for all test weight settings.
↑	M47␣B␣1␣"100.0"␣"g"␣12␣10␣2010 M47␣B␣2␣"9.9999"␣"g"␣19␣08␣2010 M47␣B␣3␣"20.0001"␣"g"␣10␣12␣2009 M47␣B␣4␣"0"␣"mg"␣12␣09␣2011 M47␣B␣5␣"0"␣"g"␣31␣12␣2099 M47␣B␣6␣"0"␣"g"␣31␣12␣2099 M47␣B␣7␣"0"␣"g"␣31␣12␣2099 M47␣B␣8␣"0"␣"g"␣31␣12␣2099 M47␣B␣9␣"0"␣"g"␣31␣12␣2099 M47␣B␣10␣"0"␣"g"␣31␣12␣2099 M47␣B␣11␣"0"␣"g"␣31␣12␣2099 M47␣A␣12␣"0"␣"g"␣31␣12␣2099	The first three test weight settings are defined correctly, the fourth weight is not completely defined (weight value is still 0) and the rest is not defined at all.

↓	M47␣1	The parameters of the first test weight are requested.
↑	M47␣A␣1␣"100.0"␣"g"␣10␣11␣2010	The requested test weight has an actual value of 100 grams and the next recalibration is on November 10th 2010.

↓	M47␣1␣"20.0"␣"g"␣10␣12␣2012	Parameters of the first test weight are changed.
↑	M47␣A	The test weight's actual weight is set to 20 grams and the next recalibration date to December 10th 2012.

M48 – Infrequently changed test weight settings

Description

Use M48 to read and write the infrequently changed test weight settings, such as actual weight and next calibration date.

Syntax

Commands

M48	Query of the infrequently used test weight settings.
M48␣<Number>	Query of the specific infrequently used test weight setting.
M48␣<Number>␣<"Name">␣<"ID">␣<"Class">␣<"Certificate">␣<"Set">	Write new infrequently used test weight settings for the specific test weight.

Responses

M48␣B␣<Number>␣<"Name">␣<"ID">␣<"Class">␣<"Certificate">␣<"Set"> M48␣B… M48␣A␣<Number>␣<"Name">␣<"ID">␣<"Class">␣<"Certificate">␣<"Set">	Current test weight settings.
M48␣A	Command understood and executed successfully.
M48␣I	Command understood but currently not executable.
M48␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Number>	Integer	1 … 12	Number of the test weight.
<"Name">	String	Max 20 chars	Name of the test weight.
<"ID">	String	Max 20 chars	ID of the test weight.
<"Class">	String	See Comments	Class of the test weight.
<"Certificate">	String	Max 20 chars	Certificate of test weight.
<"Set">	String	Max 20 chars	Set number of test weight.

Comments

- The parameter "Number" corresponds with the "Number" of [M47 ▸ Page 184] command.
- Examples for Weight classes: E1, E2, F1, F2, M1, M2, M3, ASTM1, ASTM2, ASTM3, ASTM4, ASTM5, ASTM6, ASTM7.
- The following conditions must be met before a test weight is considered valid: if name is defined (max 20 characters), if weight value is defined (more than 0), and if unit is valid.
- This command is available only in XP and XS balances and is not supported in XA balances.

Examples

↓	M48	Query of the list for all infrequently used test weight settings.
↑	M48␣B␣1␣"50gQK"␣"798012"␣"E1"␣"1231"␣"4551" M48␣B␣2␣"55gQK"␣"798013"␣"E1"␣"1232"␣"4552" M48␣B␣3␣"60gQK"␣"798014"␣"E1"␣"1233"␣"4553" M48␣B␣4␣"Test/Adj. Weight 4"␣""␣"E1"␣""␣"" M48␣B␣5␣"Test/Adj. Weight 5"␣""␣"E1"␣""␣"" M48␣B␣6␣"Test/Adj. Weight 6"␣""␣"E1"␣""␣"" M48␣B␣7␣"Test/Adj. Weight 7"␣""␣"E1"␣""␣"" M48␣B␣8␣"Test/Adj. Weight 8"␣""␣"E1"␣""␣"" M48␣B␣9␣"Test/Adj. Weight 9"␣""␣"E1"␣""␣"" M48␣B␣10␣"Test/Adj. Weight 10"␣""␣"E1"␣""␣"" M48␣B␣11␣"Test/Adj. Weight 11"␣""␣"E1"␣""␣"" M48␣A␣12␣"Test/Adj. Weight 12"␣""␣"E1"␣""␣""	The first three test weight settings that are infrequently used are defined correctly, and the rest is not defined at all.

↓	M48␣1	The infrequently used parameters of the first test weight are requested.
↑	M48␣A␣1␣"50gQK"␣"798012"␣"E1"␣"5467"␣"4556"	The actual test weight name of the requested test weight is 50gQK, the weight ID is 798012, the weight class is E1, the weight certificate is 5467 and the weight set number is 4556.

↓	M48␣3␣"100gQK"␣"10988"␣"F1"␣"5991"␣"4111"	Parameters of the third test weight are changed.
↑	M48␣A	Command understood and executed successfully.

See also

M47 – Frequently changed test weight settings ▸ Page 184

M49 – Permanent tare mode

Description

Define tare value used for start-up. Normal behavior stores tare value to volatile memory and tare value is set back to zero for start-up (compare [M35 ▸ Page 178] for zero value). Permanent behavior stores tare value to nonvolatile memory (pre-tare value, see [TA ▸ Page 253]) and provides tare value for start-up. Two modes for permanent behavior are distinguished:

- one-time storage of current tare value by sending M49 command with tare mode 1
- continuous storage of last tare value by activation of mode 2

Syntax

Command

`M49`	Request the tare behavior.
`M49␣<TareMode>`	Set the tare behavior.

Responses

`M49␣A␣<TareMode>`	Display the tare mode.
`M49␣A`	Command understood and executed successfully.
`M49␣I`	Command understood but currently not executable.
`M49␣L`	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
`<TareMode>`	Integer	`0`	Normal, tare set to zero upon startup
		`1`	Permanent tare used on startup, one-time storage of current tare
		`2`	Permanent tare used on startup, continuous storage of last tare value

Comment

Command is similar to `M35` command (permanent zero mode).

Examples

↓	`M49`	Request the tare behavior.
↑	`M49␣A␣1`	Permanent tare is used after startup.

↓	`M49␣0`	Set normal tare behavior after next startup.
↑	`M49␣A`	Command understood and executed successfully.

↓	`M49␣1`	Set permanent tare behavior after next startup.
↑	`M49␣A`	Command understood and executed successfully.

M66 – GWP: Certified test weight settings

Description

Use M66 command to read and write the certified test weight settings. It is used primarily for the Matrix-Code of the weight certificate of METTLER TOLEDO. It allows directly import the settings of a certified weight from the certificate into the weigh module and thus eliminates any typing errors.

Syntax

Commands

M66	Query of the data from one weight only.
M66␣<"ID">␣<"Class">␣<"Certificate">␣<"ActualWeight">␣<"Unit">␣<Day>␣<Month>␣<Year>	Set data of one weight only.

Responses

M66␣A␣<"ID">␣<"Class">␣<"Certificate">␣<"ActualWeight">␣<"Unit">␣<Day>␣<Month>␣<Year>	Current data from one weight only.
M66␣A	Command understood and executed successfully.
M66␣I	Command understood but currently not executable.
M66␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<"ID">	String	5 … 20 chars	Identifcation of the test weight
<"Class">	String	5 … 20 chars	Class of the test weight
<"Certificate">	String	5 … 20 chars	Certificate of test weight
<"ActualWeight">	String	Max 20 chars	Actual weight of the test weight
<"Unit">	String	Max 2 chars	Unit of the actual weight
<Day>	Integer	1 … 31	Day of the next calibration date, e.g. 05 (Format: dd)
<Month>	String	1 … 12	Month of the next calibration date, e.g. 11 (Format: mm)
<Year>	Integer	2000 … 2099	Year of the next calibration date, e.g. 2009 (Format: yyyy)

Comments

- Query of whole list of entries is not possible. Use [M47 ▸ Page 184] and [M48 ▸ Page 186] to get information about all specific tests.
- The initial values are set by the software on the weigh module, balance.
- Examples for Weight classes: E1, E2, F1, F2, M1, M2, M3, ASTM1, ASTM2, ASTM3, ASTM4, ASTM5, ASTM6, ASTM7
- Please note that this command has a product specific implementation.
- This command is available only in XP and XS balances and is not supported in XA balances.

Examples

↓	M66	
↑	M66␣A␣"A-0926748"␣"E1"␣"MT-089987"␣"99.99807"␣"g"␣21␣07␣210	The query was uniquely defined for the balance, the balance responds with the inquired data.

↓	M66	
↑	M66␣I	The device is not ready to read the test/adj. weight settings. (e.g. there are more than one Test / Adj. weight available, therefore the query could not be answered.

↓	M66␣"A-0926748"␣"E1"␣"MT-089987"␣"99.99807"␣"g"␣21␣07␣210	Write data on the balance.
↑	M66␣A	The received data are valid and has been stored on the balance.

↓	M66␣"A-0926748"␣"E1"␣"MT-089987"␣"99.99807"␣"g"␣21␣07␣210	Write data on the balance.
↑	M66␣I	The device is not ready to read the test/adj. weight settings. (e.g. there are more than one Test / Adj. Weight available, therefore the query could not be answered. **See** product specific implementation).

M67 – Timeout

Description

Command M67 provides the possibility to configure the timeout used in commands like "S", "Z" etc to better meet the actual need.

Syntax

Command

M67	Query the actual timeout.
M67␣<Timeout>	Set the timeout in seconds.

Responses

M67␣A␣<Timeout>	Current timeout in seconds.
M67␣A	Command understood and executed successfully.
M67␣I	Command understood but currently not executable.
M67␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Timeout>	Integer	0 … 65535	Timeout in seconds

Comments

- This command affects the behavior of the commands [S ▸ Page 223], [Z ▸ Page 272], [T ▸ Page 252] … C1 … [TST1 ▸ Page 260] … as well as the zeroing procedure at module startup.
- To specify the timeout, only integer numbers ranging from 0 to 65535 are allowed, any decimal places would be truncated.
- Choosing a too short timeout may cause other commands to response with "␣I" (e.g. "C3␣I" if the timeout is shorter than the time that is needed to place the internal load). Different commands under different conditions may ask different timeouts; therefore, the actual setting has to be approved under real conditions.
- After a FSET command, the timeout will be reset to the factory default.
- METTLER TOLEDO recommends a minimal timeout of 40 seconds (factory default setting).

Example

↓	M67␣60	Set the timeout to 60 seconds.
↑	M67␣A	Command understood and executed successfully. The timeout is now 60 seconds.

M68 – Behavior of serial interfaces

Description

This command is used to set the behavior when querying or setting the parameters of the serial interfaces. The behavior can either be configured to store the parameters of the serial interfaces permanently or temporary. If the permanent mode is used the parameters remain in case of a system restart. If the temporary mode is selected the parameters do not remain in case of a system restart. Temporary parameters remain valid until the system is restarted.

Syntax

Command

M68	Query the behavior of the serial interface.
M68␣<Mode>	Set the behavior of the serial interface.

Responses

M68␣A␣<Mode>	Current behavior of the serial interface.
M68␣A	Command understood and executed successfully.
M68␣I	Command understood but currently not executable.
M68␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Mode>	Integer	0	Permanent parameter storage
		1	Temporary parameter storage

Examples

↓	M68	Get current storage mode.
↑	M68␣A␣0	The parameters of the serial interfaces are stored permanently.

↓	M68␣1	Set storage mode to temporary.
↑	M68␣A	The parameters of the serial interfaces are stored temporary.

M69 – Ipv4 network configuration mode

Description

General introduction: **see** [I53 – Ipv4 runtime network configuration information ▸ Page 123]. This specific command will set the mode of how the device will obtain an IP configuration. In case of the mode "Use DHCP, set fallback IP configuration manually", the IP settings made via the `M70` command will be used in case of problems with the DHCP server.

Use `M69` to set or query the configuration but does not apply the setting immediately and does not check whether the network stack can support the selected setting. The behavior if the supplied configuration cannot be supported by the network stack is product specific. Example: If DHCP is activated by M69 although DHCP is not supported by the network stack: use a well-known hard-coded IP address.

Syntax

Commands

`M69`	Query the network configuration mode.
`M69␣<Index>`	Query the network interface index.
`M69␣<Index>␣<Mode>`	Set the IP configuration mode for a given network interface.

Responses

`M69␣B␣<Index>␣<Mode>`
`M69␣B…`
`M69␣A␣<Index>␣<Mode>`
	Current network configuration mode.

`M69␣A`	Command understood and executed successfully.
`M69␣I`	Command understood but currently not executable (no network interfaces present in the system).
`M69␣L`	Command understood but not executable (no network interfaces with index 0 present in the system).

Parameters

Name	Type	Values	Meaning
`<Index>`	Integer	`0 or n`	Network interface index
		`0`	1st network interface
		`n`	n +1th network interface
`<Mode>`	Integer	`0 … 3`	Mode of the IP configuration
		`0`	Static IP configuration
		`1`	Use DHCP, obtain fallback IP configuration with AutoIP
		`2`	Use DHCP, set fallback IP configuration manually
		`3`	IP networking disabled, no communication possible

Examples

↓	M69	Query the network configuration mode.
↑	M69␣B␣0␣0 M69␣B␣1␣1 M69␣A␣2␣2	The network interface at index 0 is manually configured. The network interface at index 1 is configured for DHCP/AutoIP. The network interface at index 2 is configured for DHCP/Manual.

↓	M69␣1	Query the mode of network interface index 1.
↑	M69␣A␣1␣1	The network interface at index 1 is configured for DHCP/AutoIP.

↓	M69␣0␣0	Set IP configuration mode of network interface index 0 to manual.
↑	M69␣A	The IP configuration mode at index 0 is configured for manual.

↓	M69␣0␣1	Set IP configuration of network interface index 0 to DHCP/AutoIP.
↑	M69␣A	The IP configuration mode at index 0 is configured for DHCP/AutoIP.

↓	M69␣0␣2	Set IP configuration of network interface index 0 to DHCP/Manual.
↑	M69␣A	The IP configuration at index 0 is configured for DHCP/Manual.

↓	M69␣0␣3	Set IP configuration of network interface index 0 to not configured.
↑	M69␣A	The IP configuration at index 0 is not configured.

See also

- M70 – Ipv4 host address and netmask for static configuration ▸ Page 195
- M117 – TCP Port number configuration ▸ Page 209

M70 – Ipv4 host address and netmask for static configuration

Description

General Introduction: **see** [I53 – Ipv4 runtime network configuration information ▸ Page 123]. This specific command will set a basic IP configuration composed of IPv4 host address and IPv4 netmask address. This configuration will be used by a network device if either the configuration mode `M69` is set to manual or the configuration mode is set to DHCP with manual fallback IP configuration.

Syntax

Commands

`M70`	Query the host address and netmask.
`M70␣<Index>`	Query the host address and netmask of network interface index.
`M70␣<Index>␣<"Host">␣<"Netmask">`	Set the host address and netmask for a given network interface.

Responses

`M70␣B␣<Index>␣<"Host">␣"Netmask"`
`M70␣B␣…`
`M70␣A␣<Index>␣<"Host">␣"Netmask"`
	Current host address and netmask.

`M70␣A`	Command understood and executed successfully.
`M70␣I`	Command understood but currently not executable (no network interfaces present in the system).
`M70␣L`	Command understood but not executable (no network interfaces with index 0 present in the system).

Parameters

Name	Type	Values	Meaning
`<Index>`	Integer	`0 or n`	Network interface index
		`0`	1st network interface
		`n`	n +1th network interface
`<"Host">`	String	`Max 15 chars`	Ipv4 address (dot-decimal notation) of the device on the given network interface
`<"Netmask">`	String	`Max 15 chars`	Ipv4 netmask (dot-decimal notation) on the given network interface

Comments

- If the mode of the IP configuration is set to "DHCP/Manual" `M69`, the setting of this command only takes effect in the network stack if DHCP fails.
- If the mode of the IP configuration is set to "DHCP/AutoIP" or "not configured" `M69`, this setting does not take effect in the network stack.
- Use I53 to read the settings that are effectively operational in the network stack. `I53` will either return the configured static settings or the dynamic settings given by DHCP.

Examples

↓	M70	Query the host address and netmask.
↑	M70␣B␣0␣"10.0.0.3"␣"255.255.255.0" M70␣B␣1␣"192.168.0.11"␣"255.254.0" M70␣A␣2␣"10.0.1.100"␣"255.255.255.0"	The host address at index 0 is "10.0.0.3" and the netmask is "255.255.255.0". The host address at index 1 is "192.168.0.11" and the netmask is "255.254.0". The host address at index 2 is set to "10.0.1.100" and the netmask is set to "255.255.255.0".

↓	M70␣1	Query the host address and netmask of network interface index 1.
↑	M70␣A␣1␣"192.168.0.11"␣"255.255.255.0"	The host address at index 1 is "192.168.0.11" and the netmask is "255.255.255.0".

See also

- M69 – Ipv4 network configuration mode ▸ Page 193
- M117 – TCP Port number configuration ▸ Page 209

M71 – Ipv4 default gateway address

Description

This specific command will set a default gateway address for a specific network device. This configuration will be used by a network device if either the configuration mode M69 is set to manual or the configuration mode is set to to DHCP with manual fallback IP configuration.

Syntax

Commands

M71	Query the default gateway address.
M71␣<Index>	Query the default gateway address of network interface index.
M71␣<Index>␣<"DefaultGateway">	Set the default gateway address for a given network interface.

Responses

M71␣B␣<Index>␣<"DefaultGateway"> M71␣B␣… M71␣A␣<Index>␣<"DefaultGateway">	Current default gateway address.
M71␣A	Command understood and executed successfully.
M71␣I	Command understood but currently not executable (no network interfaces present in the system).
M71␣L	Command understood but not executable (no network interfaces with index 0 present in the system).

Parameters

Name	Type	Values	Meaning
<Index>	Integer	0 or n	Network interface index
		0	1st network interface
		n	n +1th network interface
<"DefaultGateway">	String	Max 15 chars	Ipv4 default gateway address (dot-decimal notation) on the given network interface

Comments

- If the mode of the IP configuration is set to "DHCP/Manual" M69, the setting of this command only takes effect in the network stack if DHCP fails.
- If the mode of the IP configuration is set to "DHCP/AutoIP" or "not configured" M69, this setting does not take effect in the network stack.
- Use I53 to read the settings that are effectively operational in the network stack. I53 will either return the configured static settings or the dynamic settings given by DHCP.

Examples

↓	M71	Query the default gateway address.
↑	M71␣B␣0␣"10.0.0.1" M71␣B␣1␣"192.168.0.1" M71␣A␣2␣"10.0.1.1"	The default gateway address at index 0 is "10.0.0.1". The default gateway address at index 1 is "192.168.0.1". The default gateway address at index 2 is "10.0.1.1".

↓	M71␣1	Query the default gateway address of network interface index 1.
↑	M71␣A␣1␣"192.168.0.1"	The default gateway address at index 1 is "192.168.0.1".

↓	M71␣0␣"10.0.0.1"	Set the default gateway address of network interface index 0 to "10.0.0.1".
↑	M71␣A	The default gateway address at index 0 is set to "10.0.0.1".

See also

- I53 – Ipv4 runtime network configuration information ▸ Page 123
- M69 – Ipv4 network configuration mode ▸ Page 193
- M70 – Ipv4 host address and netmask for static configuration ▸ Page 195
- M117 – TCP Port number configuration ▸ Page 209

M72 – Ipv4 DNS server address

Description

This specific command will set a DNS Server address for a specific network device. This configuration will be used by a network device if either the configuration mode M69 is set to manual or the configuration mode is set to DHCP with manual fallback IP configuration.

Syntax

Commands

M72	Query the DNS server address.
M72␣<Index>	Query the DNS server address for a network interface index.
M72␣<Index>␣<"DNSServer">	Set the DNS server address for a given network interface.

Responses

M72␣B␣<Index>␣<"DNSServer"> M72␣B␣… M72␣A␣<Index>␣<"DNSServer">	Current DNS server address.
M72␣A	Command understood and executed successfully.
M72␣I	Command understood but currently not executable (no network interfaces present in the system).
M72␣L	Command understood but not executable (no network interfaces with index 0 present in the system).

Parameters

Name	Type	Values	Meaning
<Index>	Integer	0 or n	Network interface index
		0	1st network interface
		n	n +1th network interface
<"DNSServer">	String	Max 15 chars	Ipv4 DNS server address (dot-decimal notation) on the given network interface

Comments

- If the mode of the IP configuration is set to "DHCP/Manual" M69, the setting of this command only takes effect in the network stack if DHCP fails.
- If the mode of the IP configuration is set to "DHCP/AutoIP" or "not configured" M69, this setting does not take effect in the network stack.

Examples

↓	M72	Query the DNS server address.
↑	M72␣B␣0␣"10.0.0.1" M72␣B␣1␣"192.168.0.1" M72␣A␣2␣"10.0.1.1"	The DNS server address at index 0 is "10.0.0.1". The DNS server address at index 1 is "192.168.0.1". The DNS server address at index 2 is "10.0.1.1".

↓	M72␣2	Query the DNS server address of network interface index 2.
↑	M72␣A␣2␣"10.0.1.1"	The DNS server address at index 2 is "10.0.1.1".

↓	M72␣0␣"10.0.0.1"	Set the DNS server address of network interface index 0 to "10.0.0.1".
↑	M72␣A	The DNS server address at index 0 is set to "10.0.0.1".

See also

- I53 – Ipv4 runtime network configuration information ▸ Page 123
- M69 – Ipv4 network configuration mode ▸ Page 193
- M117 – TCP Port number configuration ▸ Page 209

M89 – Interface command set

Description

This command queries and sets the interface command set.

Syntax

Commands

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

Responses

M89␣B␣<Interface>␣<CmdSet> M89␣B… M89␣A␣<Interface>␣<CmdSet>	Current command set of the first available interface. Current command set of the last available interface.
M89␣A	Command understood and executed successfully.
M89␣I	Command understood but currently not executable.
M89␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0	Serial interface 1
		1	Serial interface 2 (model dependent)
		2	USB device (model dependent)
<CmdSet>	Integer	0	MT-SICS
		1	MT-PM
		2	Sartorius 22 character output format
		3	Sartorius 16 character output format

Comments

- New command set type settings are active after a maximum of 100 ms. No commands must be sent during this period.
- The MT-PM and Sartorius commands shall only be used for compatibility/exchangeability with respective devices, but MT-SICS shall be the major command set.

Examples

↓	M89	Query the command set of all available interfaces.
↑	M89␣B␣0␣0	The serial interface 1 uses the MT-SICS command set.
↑	M89␣A␣2␣1	The serial interface use the MT-PM command set. The balance does not have a serial interface 2.

↓	M89␣1␣2	Set the serial interface 2 to use the Sartorius command set.
↑	M89␣A	The serial Interface 2 uses the Sartorius command set.

M103 – RS422/485 driver mode

Description

Configure RS422/485 driver mode which defines the handling of the two control pins DE (Driver Enable) and RE (Receiver Enable).

Syntax

Command

M103	Query the driver mode.
M103␣<Interface>	Query the driver mode of a specific interface.
M103␣<Interface>␣<DriverMode>	Set the driver mode.

Responses

M103␣B␣<Interface>␣<DriverMode> M103␣B… M103␣A␣<Interface>␣<DriverMode>	Driver modes of all interfaces. Driver mode of a specific interface.
M103␣A	Command understood and executed successfully.
M103␣I	Command understood but currently not executable.
M103␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	0 … n	Identification for physical serial interface (n is product dependent) The kind of physical serial interface is product specific (RS232, RS422, RS485, USB etc.)
<DriverMode>	Integer	0	RS232 mode
		1	RS422 mode (full-duplex)
		2	RS485 mode (half-duplex) / RS422 mode (half-duplex)

Comments

- The activation of the RS422/485 driver mode is only possible for RS422/485 interfaces.
- The RS422 driver mode allows performing full-duplex communication using 4 unidirectional wires.
- The RS485 driver mode allows performing half-duplex communication using 2 bidirectional wires.
- The setting of data flow control COM may be dependent on the setting of the RS422/485 driver mode and vice versa.

Examples

↓	M103␣0␣2	Activate RS485 driver mode on the serial interface 0.
↑	M103␣A	Command understood and executed successfully.

↓	M103	Query the driver mode.
↑	M103␣B␣0␣0 M103␣B␣1␣2 M103␣A␣2␣0	Serial interfaces 0 and 2 are configured to use the classical RS232 mode, e.g. because the underlying physical interface is RS232 or CL which does not allow RS422/485 modes. The serial interface 1 is configured to use RS485 driver mode.

See also

COM – Parameters of the serial interfaces ▸ Page 46

M109 – IPv4 device managed network configuration setting

Description

This command defines the setting for the IPv4 device managed network configuration. If IPv4 device managed network configuration is enabled, the device itself manages its network configuration. The network configuration can take place for example through a display on a terminal or MT-SICS commands for network configuration, **see** dependencies. If IPv4 device managed network configuration is disabled, the network settings of the device are configured by an external device, e.g. an Industrial Ethernet configuration tool.

Syntax

Commands

`M109`	Query the current settings.
`M109␣<DevNetEnabled>`	Change settings.

Responses

`M109␣A␣<DevNetEnabled>`	Current list of setting.
`M109␣A`	Command understood and executed successfully.
`M109␣I`	Command understood but currently not executable.
`M109␣L`	Command understood but not executable (selected setting is not available).

Parameter

Name	Type	Values	Meaning
`<DevNetEnabled>`	Integer	`0 or 1`	IPv4 device managed network configuration factory setting
		`0`	IPv4 configuration not managed by this device
		`1`	IPv4 configuration managed by this device

Comment

Changing the settings of `M109` may influence the available IPv4 network configuration capabilities of the device (e.g. disable certain SICS commands).

Examples

↓	`M109`	Request the setting of IPv4 device managed network configuration.
↑	`M109␣A␣0`	The setting for device managed network configuration is set to disabled.

↓	`M109␣0`	Set the setting to enabled.
↑	`M109␣A`	Command understood and executed successfully.

See also

- M69 – Ipv4 network configuration mode ▸ Page 193
- M70 – Ipv4 host address and netmask for static configuration ▸ Page 195
- M71 – Ipv4 default gateway address ▸ Page 197
- M72 – Ipv4 DNS server address ▸ Page 199

M110 – Change display resolution

Description

For automated processes like dosing, higher weight value resolutions are needed to control the process. This command increases/decreases the weight value resolution up to factor 100. The guaranteed readability is the standard readability based on datasheet.

Syntax

Command

M110	Query the current display resolution.
M110␣<FactorID>	Set the factor.

Responses

M110␣A␣<FactorID>	Current display resolution.
M110␣A	Command understood and executed successfully.

Parameter

Name	Type	Values	Meaning
<FactorID>	Integer	-6	Factor 100 lower
		-5	Factor 50 lower
		-4	Factor 20 lower
		-3	Factor 10 lower
		-2	Factor 5 lower
		-1	Factor 2 lower
		0	Standard display resolution
		1	Factor 2 higher
		2	Factor 5 higher
		3	Factor 10 higher
		4	Factor 20 higher
		5	Factor 50 higher
		6	Factor 100 higher

Comments

- Typical use case of an increased display resolution: Improved process control of filling and dosing applications. Process control can round the value at the required decimal.
- The resolution is specified in digits [d] – this is the smallest increment a device may display.
- The customer unit M22 will not be changed with the M110 command.
- It is recommended to implement only one of the commands M23 or M110 in a product.
- If both commands are implemented, only one of the settings can be active at the same time, i.e. only one of the commands can be configured to a value other than 0 at the same time.
- The stability criteria for the weight result (weighing commands) will be adapted for lower display resolution to the selected readability based on the USTB setting (same as M23). M110 only has an influence on weighing; it has no influence on the stability criteria for the taring, zeroing and adjustments.
- The stability criteria will not change for higher display resolution.
- M110 settings have no effect in production and service mode.
- This command may only be used on not certified devices. On certified devices it is not allowed to use this function.

Examples

↓	M110	Request the current display resolution.
↑	M110␣A␣6	The current display resolution is factor 100 higher. Example: standard readability 1 g -> factor 100 shows 0.01 g.

↓	M110␣-2	Set display resolution to factor 5 lower.
↑	M110␣A	The display resolution is 5 lower.

See also

- M22 – Custom unit definitions ▸ Page 168
- M23 – Readability, 1d/xd ▸ Page 169

M111 – SAI Cyclic data format activation

Description

This command activates a specific supported SAI cyclic data format on the device.

Syntax

Command

M111	Read the parameters from the device.
M111␣<ActivatedFormat>	Write the parameters to the device.

Responses

M111␣A␣<ActivatedFormat>	Current activated formats.
M111␣A	Command understood and executed successfully.
M111␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Range	Meaning
<ActivatedFormat>	Integer	0 ... 31	SAI cyclic data format to be activated by the device. 0 = 1 block format 1 = 2 block format 2 = 4 block format 3 = 8 block format 31 = custom format (= APW 8 block format)

Comment

Only the SAI formats being supported by a device may be activated.

Examples

↓	M111	Request the current activated formats.
↑	M111␣A␣1	The SAI 2 block format is activated.

↓	M111␣0	Activate the SAI cyclic data 1 block format on the device.
↑	M111␣A	Command understood and executed successfully.

M116 – Ignore Industrial Ethernet initial module parametrization

Description

Certain Industrial Ethernet systems (e.g. Profinet) allow initial module parametrization. If supported, module parameters are sent from the PLC to the device (weighing module) during connection setup. Examples of module parameters: weighing environment, cut-off frequency, and timeout settings.

In Siemens TIA portal (Profinet system), initial module parametrization cannot be disabled if the module device manufacturer supports this feature (defined by the device description file).

With this command, the module can be configured to ignore the parameters sent by the PLC and thereby disabling this functionality.

Syntax

Command

M116	Read the parameters from the device.
M116␣<Behavior>	Write the parameters to the device.

Responses

M116␣A␣<Behavior>	Current activated parameters.
M116␣A	Command understood and executed successfully.
M116␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Range	Meaning
<Behavior>	Boolean	0	Initial module parametrization enabled (parameters sent by the PLC taking effect). Default setting.
		1	Ignore initial module parametrization (ignore parameters sent by the PLC).

Examples

↓	M116	Request the current activated parameters.
↑	M116␣A␣0	Initial module parametrization enabled.

↓	M116␣1	Disable initial module parametrization.
↑	M116␣A	Command understood and executed successfully.

M117 – TCP Port number configuration

Description

This command will set the TCP port number of network devices providing a TCP connection.

Syntax

Command

M117	Reads the parameters from the device; all entries.
M117␣<DeviceIndex>	Reads the parameters from the device; specific entry.
M117␣<DeviceIndex>␣<PortIndex>	
M117␣<DeviceIndex>␣<PortIndex> ␣<PortNumber>	Write the parameters to the device.

Responses

M117␣B␣<DeviceIndex>␣<PortIndex> ␣<PortNumber M117␣B␣<DeviceIndex>␣<PortIndex> ␣<PortNumber ... M117␣A␣<DeviceIndex>␣<PortIndex> ␣<PortNumber	Current parameters of all network devices or devices with a specific DeviceIndex.
M117␣A	Command understood and executed successfully.
M117␣I	There are no network interfaces present in the system.
M117␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Range	Meaning
<DeviceIndex>	integer	0	1st network interface
		n	n+1st network interface
<PortIndex>	integer	0	1st port
		n	n+1st port
<PortNumber>	integer	0	Set to default port number. 0 is no valid TCP port number.
		1 ... 65535	Port number to set.

Examples

↓	M117	Request the current device parameters.
↑	M117␣B␣0␣0␣80 M117␣B␣0␣1␣81 M117␣B␣1␣0␣8080 M117␣A␣1␣1␣8081	The system has 2 network interfaces. Both network interfaces have 2 configurable TCP ports. Network interface with index 0 has TCP port numbers 80 (PortIndex 0) and 81 (PortIndex 1). Network interface with index 1 has TCP port numbers 8080 (PortIndex 0) and 8081 (PortIndex 1).

↓	M117␣1␣0␣23	Set PortIndex 0 of DeviceIndex 1 to PortNumber 23.
↑	M117␣A	Command understood and executed successfully.

Comments

- The settings only take effect after a reboot.
- The number of existing TCP ports is product specific and can differ among the product's network devices.

See also

- M69 – Ipv4 network configuration mode ▸ Page 193
- M70 – Ipv4 host address and netmask for static configuration ▸ Page 195
- M71 – Ipv4 default gateway address ▸ Page 197
- M72 – Ipv4 DNS server address ▸ Page 199

M118 – Fieldbus network stack type configuration

Description

Define the type of fieldbus network stack to be active. A restart may be required to apply this setting.

Syntax

Command

M118	Read the parameters from the device.
M118␣<Stack>	Write the parameters to the device.

Responses

M118␣A␣<Stack>␣<AvailableStacks>	Current activated parameters.
M118␣A	Command understood and executed successfully.
M118␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Range (ID)	Meaning
<Stack>	Integer	0	Disable stack (if possible)
		1	PROFINET IO RT
		2	EtherNet / IP
		3	EtherCat
		4	PROFIBUS
<AvailableStacks>	Integer	see formula	$AvailableStacks = \sum_{\substack{selectable \\ FieldbusStacks}} 2^{FieldbusStackID}$
		0	No Fieldbus stack available

Examples

↓	M118	Request the parameters.
↑	M118␣A␣2␣6	EtherNet / IP stack is selected (2). Available stacks are PROFINET IO RT and EtherNet / IP ($6 = 2^1 + 2^2$)

↓	M118␣1	Select PROFINET IO RT stack.
↑	M118␣A	Command understood and executed successfully.

↓	M118␣0	Disable the Fieldbus stack.
↑	M118␣A	Command understood and executed successfully.

Comment

Available stacks are defined by the device firmware and are visible in the bitset.

M119 - Byte order mode for automation

Defines the 16-bit or 32-bit byte order for automation.

In kinds of fieldbus network communication e.g. Modbus RTU, Profibus DP and so on, due to the different mode of data storage endian, PLC or controllers may demand the swap of data in specific byte order to facilitate data parsing and storage. The storage types of most-used PLC systems includes Byte (8 bits), Word (16 bits) and Double Word (32 bits).

16-bit or 32-bit data byte order can be in 4 ways:

- No swap
- Byte swap
- Word swap
- Byte and word swap

The devices need to convert 16-bit and/or 32-bit data into the host's required byte sequence before data transmission.

Note

64-bit values can be stored into 2 Double Words, following the principles above. While actually 64-bit values are rarely used.

Data type	Data
float 32 bits	1234.56
Little Endian	ec 51 9a 44
Big Endian	44 9a 51 ec [a b c d]
Byte Order Mode for Automation = 0 (no swap)	44 9a 51 ec [a b c d]
Byte Order Mode for Automation = 1 (byte swap)	9a 44 ec 51 [b a d c]
Byte Order Mode for Automation = 2 (word swap)	51 ec 9a 44 [c d a b]
Byte Order Mode for Automation = 3 (byte and word swap)	ec 51 9a 44 [d c b a]

Data type	Data
unsigned short 16 bits	20
Little Endian	14 00
Big Endian	00 14 [a b]
Byte Order Mode for Automation = 0 (no swap)	00 14 [a b]
Byte Order Mode for Automation = 1 (byte swap)	14 00 [b a]
Byte Order Mode for Automation = 2 (word swap)	00 14 [a b]
Byte Order Mode for Automation = 3 (byte and word swap)	14 00 [b a]

Syntax

Commands

M119	Query the parameters from the device, all entries.
M119␣<Interface>	Query the parameters from the device for a specific entry.
M119␣<Interface>␣<Mode>	Set the parameters to the device.

Responses

M119␣B␣<Interface>␣<Mode> M119␣B␣<Interface>␣<Mode> ... M119␣A␣<Interface>␣<Mode>	Command understood and executed successfully, all entries.
M119␣A␣<Interface>␣<Mode>	Command understood and executed successfully for a specific entry.
M119␣A	Command understood and executed successfully for a specific entry.

Parameters

Name	Type	Values	Meaning
<Interface>	Integer	01...n	Interface number n as well as the kind of the physical serial interface are product dependent
<Mode>	unsigned 8 bits	0 1 2 3	no swap byte swap word swap byte and word swap

Initial values

↓	M119	Query the parameters from the device.
↑	M119␣B␣0␣0 M119␣B␣1␣0 M119␣A␣2␣0	Example with 3 serial interfaces: Initially the swap mode is no swap

Comments

- This command is needed for fieldbus communication, e.g. Modbus, Profibus, etc.
- The byte order has to be correctly set over the MT-SICS interface before starting communication on Modbus RTU or Profibus DP.
- This command is recommended to be used together with the interface command set. First set to the targeted byte order mode through this command over the MT-SICS interface, then set the interface command set to Modbus RTU over the same physical interface, after which Modbus RTU communication can be started.

Examples

↓	M119	Query the parameters from the device.
↑	M119␣B␣0␣0 M119␣B␣1␣0 M119␣A␣2␣0	All three serial interfaces are set to no swap mode

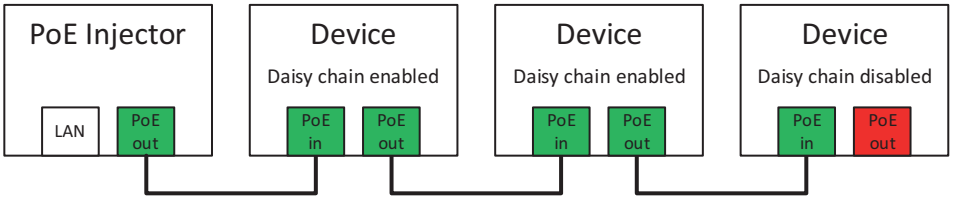
↓	M119␣2	Query the parameters from the device for interface 2.
↑	M119␣A␣21	Interface 2 is set to byte swap mode

↓	M119␣0␣3	Query the parameters from the device for interface 2.
↑	M119␣A	Parameter successfully set to the desired value,.

M124 – Power supply for daisy chain

Description

Configures power supply for daisy chain to power the next device. A typical use case is PoE (Power over Ethernet):



Syntax

Commands

M124	Reads the parameters from the device
M124␣<Enable>	Executes a function on the device

Responses

M124␣A␣<Enable>	Current configuration of the daisy chain.
M124␣A	Command understood and executed successfully.
M124␣I	Command understood but currently not executable.
M124␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Values	Meaning
<Enable>	0	Daisy chain disabled
	1	Daisy chain enabled

Comment

SPE has implemented passive PoE to daisy chain SPEs. Passive PoE means that the power supply is always on. If a device is connected to the SPE that has PoE enabled, the device may be damaged if it can't handle PoE. Therefore, the default value is 0 and power must be manually enabled for daisy chaining.

Examples

↓	M124	Reads the parameters from the device.
↑	M124␣A␣0	Daisy chain disabled
↓	M124␣1	Enable daisy chain
↑	M124␣A	Daisy chain enabled
↓	M124␣0	Disable daisy chain
↑	M124␣A	Daisy chain disabled

MOD – Various user modes

Description

The MOD command can be used to activate a higher display resolution. The additionally displayed digit(s) or display increment is referred to as an auxiliary digit step. All specifications regarding weighing performance still relate to the nominal readability stated in the specifications.

The auxiliary digit step is a 'tendency display' that provides additional information which is especially valuable when dispensing small quantities. A maximum of 2 additional digits can be displayed.

Syntax

Commands

MOD	Query the user modes.
MOD␣<Mode>	Set user mode by mode.
MOD␣<Mode>␣<Increment>␣<Unit>	Set user mode by increment.

Responses

MOD␣A␣<Mode>	Query the current user mode.
MOD␣A␣<Mode>␣<Increment>␣<Unit>	Query the current user mode with increments.
MOD␣A	Command understood and executed successfully.
MOD␣I	Command understood but currently not executable.
MOD␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Boolean	0	Switch off all user modes
		1	Increased display resolution
<Increment>	Float		Define higher display resolution
<Unit>	String		Unit from value increment

Comments

- The MOD command is only available on request by your METTLER TOLEDO contact person.
- Mode 1 affects all S commands: [S ▸ Page 223], [SI ▸ Page 225], [SIR ▸ Page 232]… However, the syntax response of the S command remains unchanged: "S␣S␣<Weight>␣<Unit>". In addition: The rounding can be affected as follows: In control mode, 100.4 g can be displayed as 100.38 g.
- Activation of the increased display resolution has no effect on the stability criteria set under USTB. Note: The auxiliary digit step can be unstable (e.g. due to environmental effects) although the stability criterion (according to USTB) is fulfilled.
- When taring and zeroing, although the auxiliary digit step is set to zero when the [T ▸ Page 252] or [Z ▸ Page 272] command is transmitted, depending on environmental conditions the additional decimal place may soon be different from zero.

Examples

↓	MOD	Query the current user mode.
↑	MOD␣A␣0	The user mode is off.

↓	MOD	Query the current user mode.
↑	MOD␣A␣1␣0.0001␣g	The user mode is 1 (Increased display resolution) and increment is 0.0001 g

↓	MOD␣1	Set the user mode to Mode 1 (increased display resolution factor 10).
↑	MOD␣A	User mode is set to the desired value.

↓	MOD␣1␣0.0001␣g	Set the user mode to Mode 1 and the increments to 0.0001 g.
↑	MOD␣A	User mode is set to the desired value.

MONH – Monitor on interface

Description

The MONH command sent all telegrams (requests and responses) from the selected interface are sent in parallel to the interface from which the command is executed.

Syntax

Commands

MONH	Query the monitor on interface setting.
MONH␣<State>␣<Interface>	Set monitor on interface.
MONH␣<State>	Set monitor interface off.

Responses

MONH␣A␣<State>	Current monitor on interface setting. Assumption: monitor function is off (State = 0).
MONH␣A␣<State>␣<Interface>	Current monitor on interface setting. Assumption: monitor function is on (State = 1).
MONH␣A	Activate/deactivate the monitor on an interface.
MONH␣A	Set the monitor interface off; State = 0.
MONH␣I	Command understood but currently not executable.
MONH␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<State>	Boolean	0	Off
		1	On
<Interface>	Integer	0 … n	Interface number (n is product dependent)

Comments

- The monitored interface can be faster than the current one. In this case some telegrams might be discarded.
- [SIR ▸ Page 232] or other repetitive commands are not locked and can lead to nonsense. MONH is locked against an [SIR ▸ Page 232] on the monitoring interface, not on the monitored.
- On some systems the Baud rate of the monitoring interface is set to the same Baud rate as the monitored interface.
- The command @ does not stop the MONH.

Examples

↓	MONH	Query the current monitor on interface setting.
↑	MONH␣A␣0	The monitor on interface is off.

↓	MONH	Query the current monitor on interface setting.
↑	MONH␣A␣1␣0	The monitor on interface 0 is on.

↓	MONH␣1␣1	Set the monitor on interface 1 to on (set from interface 0).
↑	MONH␣A	The monitor on interface 1 is on.

NID – Node Identification (for network protocols)

Description

Node identification. This is required to identify each device in a communication network.

Syntax

Commands

NID	Query the weigh module address.
NID␣<NodeID>	Set the weigh module address.

Responses

NID␣A␣<NodeID>	Current weigh module address.
NID␣A	Command understood and executed successfully.
NID␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<NodeID>	Integer	1 … 31	Node identification

Comments

- This command is only available if an interface for addressed mode (e.g. RS422) is present.
- In the addressed communication protocol, **see** [PROT ▸ Page 220], the address (1 .. 31) is represented by a one-byte ASCII coded character starting at "1" (31 hex). The highest address (31) thus corresponds to 4F hex (ASCII character "O"). All commands must be sent to the module with preceding address byte. Consequently, the first byte of all responses is also the address:

dec.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
hex.	30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
ASCII	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?

dec.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
hex.	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
ASCII	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O

- All commands sent to the module must have a leading address byte. Because of this, the first byte of all responses is also the address.
- The address 0 (30 hex) is a broadcast. All modules on the network will reply.

Examples

↓	NID	Query the current weigh module address.
↑	NID␣A␣15	The address (Node ID) is 15 decimal = "?" ASCII.

↓	NID␣12	Set the Node ID: 12 decimal = "<" ASCII to the weigh module.
↑	NID␣A	Address (Node ID) set as desired.

See also

PROT – Protocol mode ▸ Page 220

NID2 – Device node ID

Description

Node IDs can be changed via MT-SICS command. This command is only available for Profibus DP.

Syntax

Commands

NID2	Query the node identification.
NID2␣<NodeID>	Set the node identification.

Responses

NID2␣A␣<NodeID>	Current node identification.
NID2␣A	Command understood and executed successfully.
NID2␣I	Command understood but currently not executable.
NID2␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<NodeID>	Integer	0 … 127	Node identification

Example

↓	NID2␣12	Set the node identifications to 12.
↑	NID2␣A	Node identification is set to 12.

PROT – Protocol mode

Description

This command is only available if an interface for addressed mode (e.g. RS422) is present.

Syntax

Command

PROT	Query the protocol mode.
PROT␣<Mode>	Set the protocol mode.

Responses

PROT␣A␣<Mode>	Current protocol mode.
PROT␣A	Command understood and executed successfully.
PROT␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Mode>	Integer	0	Standard protocol without addressing (terminal mode)
		1	Addressed protocol, suitable for network applications
		2	Framed Protocol, **see** [Appendix ▸ Page 276]

Comments

- The PROT command only changes the protocol of the interface that is suitable for addressed mode communication. Protocol via any other interface, such as RS232, is not affected.
- In the addressed communication protocol, the address (1 … 31) is represented by a one-byte ASCII coded character starting at "1" (31 hex). The highest address (31) thus corresponds to 4F hex (ASCII character "O"). All commands must be sent to the module with a preceding address byte. Consequently, the first byte of all responses is also the address.
- To avoid bus conflicts, do not use repetitive commands ([SIR ▸ Page 232], [SNR ▸ Page 241], [SR ▸ Page 245]) in addressed mode if more than one weigh module is connected to the network.
- It's better to set the node ID with [NID ▸ Page 218] before selecting an addressed protocol. Otherwise, the current node ID has to precede the [NID ▸ Page 218] command if it should be changed.

Examples

↓	PROT	Query the current protocol mode.
↑	PROT␣A␣0	The standard protocol without addressing (terminal mode) is active.

↓	NID␣18	Set module address to 18 (ASCII "B").
↑	NID␣A	Module address set as desired.
↓	PROT␣1	Set the protocol mode to addressed protocol.
↑	PROT␣A	Protocol set as desired.
↓	BS	Query of stable weight value from the Module with address 18 (ASCII "B").
↑	BS␣S␣␣␣␣100.000␣g	Module with address 18 responds and sends the current value (100.000 g).

See also

🔗 NID – Node Identification (for network protocols) ▸ Page 218

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.

See also

- FSET – Reset all settings to factory defaults ▸ Page 95
- M38 – Selective parameter reset ▸ Page 179

RDB – Readability

Description

Readability, e.g. 0.0001 g with a WMS404C-L weigh module, determines the smallest weight increment that can be measured and sent via interface to the system called 1 digit (1 d). It strongly affects weighing behavior, especially weighing speed, stability, and reproducibility. The RDB command makes the weigh module faster at the cost of the smallest weight increment that can be distinguished. Proper setting of this parameter is therefore important to the entire weighing application.

Syntax

Commands

RDB	Query the current readability.
RDB␣<DecPlaces>	Readability expressed as number of decimal places referring to weight unit g.

Responses

RDB␣A␣<DecPlaces>	Current readability.
RDB␣A	Command understood and executed successfully.
RDB␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<DecPlaces>	Integer	0 … max. decimal places	Readability in weight unit g (Decimal places)

Comments

- Default factory setting for RDB is the maximum possible number of decimal places (highest accuracy) specific to the respective module, e.g. 4 decimal places with a WMS404C-L weigh module.
- The definition of the readability is always referring to the weight unit gram, regardless of the current used weighing unit.
- RDB enables reduction of the number of decimal places below the maximum; it cannot be increased above the maximum nor accept negative values. For more decimal places, **see** [MOD ▸ Page 215].
- After acknowledgement "RDB␣A", the weigh module performs a complete restart similar to startup after power up. Weighing and communication can be resumed when the restart procedure is complete. Due to the restart procedure, new initial zero setting is performed and the tare memory is reset to 0. Nevertheless, all other settings (except readability) are not affected.
- The RDB command can be used for a complete firmware restart by leaving the parameter of RDB unchanged.
- Since the stability criterion for weighing, taring, and zero setting, as well as for adjustment and test is related to digits "d", **see** USTB, changing the readability will also change the absolute stability criteria for all functions including the adjustment (calibration) and test procedures.

Examples

↓	RDB	Query the current readability
↑	RDB␣A␣1	The readability is 1 = 0.1 g

↓	RDB␣2	Set the readability to 2 = 0.01 g.
↑	RDB␣A	Readability set as desired.
↑	I4␣A␣"B123456789"	Restart, I4 shows the serial number B123456789.

See also

USTB – User defined stability criteria ▸ Page 268

S – Stable weight value

Description

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

If the automatic door function is enabled and a stable weight is requested the balance will open and close the balance's doors to achieve a stable weight.

Syntax

Command

S	Send the current stable net weight value.

Responses

S␣S␣<WeightValue>␣<Unit>	Current stable weight value in unit actually set under host 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␣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		Currently displayed unit

Comments

- The duration of the timeout depends on the balance type.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.
- To send the stable weight value in actually displayed unit, **see** SU.

Example

↓	S	Send a stable weight value.
↑	S␣S␣␣␣␣100.00␣g	The current, stable ("S") weight value is 100.00 g.

SC – Send stable weight value or dynamic value after timeout

Description

Command SC with configurable timeout is used for processes with defined time cycles.

Syntax

Command

SC␣<Time>	Send the current stable net weight value – or dynamic weight value immediately after timeout. Timeout defined in ms.

Responses

S␣S␣<WeightValue>␣<Unit>	Current stable weight value in unit actually set under host unit.
S␣D␣<WeightValue>␣<Unit>	Dynamic weight value in unit actually set under host unit after timeout.
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 under load range.

Parameters

Name	Type	Values	Meaning
<Time>	Integer	0 … 65535 ms	Timeout in Milliseconds [ms]
<WeightValue>	Float		Weight value
<Unit>	String		Currently displayed unit

Comments

- <Time> will be rounded to the next possible interval (interval steps 8 ms)
- The M67 command does not apply for the SC command.
- The criterion for the stability of the weight value is set by the USTB command.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

Example

↓	SC␣500	Send a stable weight value or within 500 ms a dynamic weight value.
↑	S␣S␣␣␣␣100.00␣g	If the weigh module is able to determine a stable weight value within 500 ms, this value will be transmitted immediately; the weight is 100.00 g.
or		
↑	S␣D␣␣␣␣103.04␣g	In case this is not possible (e.g. due to vibrations), a dynamic weight value will be transmitted immediately after timeout; in this example, a dynamic weight value (note the 'D' in the answer string) of 103.04 g was transmitted after 500 ms. The stability criterion for weighing was not met within 500 ms.

SI – Weight value immediately

Description

Use SI to immediately send the current weight value, along with the host 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 host unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under host unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
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		Currently displayed unit

Comments

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

SIC1 – Weight value with CRC16 immediately

Description

This command is an extension of the SI command with an additional <CRC16> hash value.

Syntax

Command

SIC1	Query current weight value.

Responses

SIC1␣A␣<Status>␣<Weight>␣<Unit>␣<CRC16>	Current weight value together with the <CRC16> value.
SIC1␣I	The request could not be served because the state of the balance did not allow it (e.g. a taring or zeroing in progress).

Parameters

Name	Type	Values	Meaning
<Status>	Char		Weight status
		S	Stable weight
		D	Dynamic weight (unstable, not accurate)
		+	Overload
		–	Underload
		I	Invalid value
<Weight>	String		Net weight value in host unit
<Unit>	String		The unit used for this command is the host unit
<CRC16>	Integer		CRC16 hash value over the whole message CRC-16-CCITT algorithm value (polynomial: 0x1021, initial value: 0xFFFF)

Comments

- The CRC is calculated over the whole message, starting with the first S up to and including the space before the CRC itself. For example: SIC1␣S␣12325.00␣g␣**E603** → Message and **CRC**.
- Similar to other S commands this weight command reflects the error code in the command response if there is an internal error (with influence on the weight).

Examples

↓	SIC1	Query current weight value.
↑	SIC1␣S␣12325.00␣g␣E603	The current weight value is 12325.00 g and the value is detected as stable.

↓	SIC1	Query current weight value.
↑	SIC1␣+	The request could not be served because of overload. A similar response is sent in case of underload.

SIC2 – HighRes weight value with CRC16 immediately

Description

This command is similar to SIC1 with the only difference that a high resolution weight is returned.

Syntax

Command

SIC2	Query current weight value.

Responses

SIC2␣A␣<Status>␣<HRWeight>␣<Unit>␣<CRC16>	High resolution weight value together with the CRC16 value.
SIC2␣I	The request could not be served because the state of the balance did not allow it (e.g. a taring or zeroing in progress).

Parameters

Name	Type	Values	Meaning
<Status>	Char		Weight status
		S	Stable weight
		D	Dynamic weight (unstable, not accurate)
		+	Overload
		–	Underload
		I	Invalid value
<HRWeight>	String		High resolution net weight value in host unit
<Unit>	String		The unit used for this command is the host unit
<CRC16>	Integer		CRC16 hash value over the whole message The CRC16 is calculated using the CRC-16-CCITT algorithm

Comments

- The CRC is calculated over the whole message, starting with the first S up to and including the space before the CRC itself. For example: SIC1␣␣␣12325.00␣g␣**E603** → Message and **CRC**.
- Similar to other S commands this weight command reflects the error code in the command response if there is an internal error (with influence on the weight).

Examples

↓	SIC2	Query current weight value.
↑	SIC2␣S␣12325.0012␣g␣C7C9	The current HighRes weight value is 12325.0012 g and the value is detected to be stable.

↓	SIC2	Query current weight value.
↑	SIC2␣+	The request could not be served because of overload. A similar response is sent in case of underload.

SIMC - Clear stored weight value

Clear the stored weight value from the device. The value can be stored using the SIMS command.

Syntax

Command

SIMC	Clear the stored weight value from the device

Response

SIMC␣A	Command understood and executed successfully.

See also

SIMS - Store weight immediately ▸ Page 231

SIMR - Recall stored weight value

Recall the sored weight value from the device. The value can be stored using the SIMS command.

Syntax

Command

SIMR	Query the parameters from the device

Responses

S␣<Status>␣<WeightValue>␣<Unit>	Command understood and executed successfully.
SIMR␣I	No weight has previously been stored by the SIMS command

Parameters

Name	Type	Values	Meaning
<Status>	Character		Status of the weighing, linked to the net value
		S	Stable weight
		D	Dynamic weight
		+	Overload
		−	Underload
		/	Inclination
		|	Invalid value
<WeightValue>	Float		Weight value in host unit
<Unit>	String (ASCII)		The unit used for this command is the host unit

Initial values

↓	SIMR	Query the parameters from the device.
↑	SIMR␣I	No weight has previously been stored by the SIMS command.

Example

↓	SIMR	Query the parameters from the device.
↑	S␣S␣␣␣␣15.003␣g	The current stored weight value is 15.003 g

See also

SIMS - Store weight immediately ▸ Page 231

SIMRC - Recall and clear stored weight value

Recalls the weight previously stored by the SIMS command from the device.

Syntax

Command

SIMRC	Query the parameters from the device

Responses

S␣<Status>␣<WeightValue>␣<Unit>	Command understood and executed successfully.
SIMRC␣I	No weight has previously been stored by the SIMS command

Parameters

Name	Type	Values	Meaning
<Status>	Character		Status of the weighing, linked to the net value
		S	Stable weight
		D	Dynamic weight
		+	Overload
		−	Underload
		/	Inclination
		|	Invalid value
<WeightValue>	Float		Weight value in host unit
<Unit>	String (ASCII)		The unit used for this command is the host unit

Initial values

↓	SIMRC	Query the parameters from the device.
↑	SIMRC␣I	No weight has previously been stored by the SIMS command.

Comments

- The command name starts with SI to emphasize the similarities to the SI command.
- The command name SIMRC means "SI Memory Recall and Clear".
- The terminology "store"/"recall"/"clear" follows common terminology of e.g. calculators.

Example

↓	SIMRC	Query the parameters from the device.
↑	S␣S␣␣␣␣15.003␣g	The current stored weight value is 15.003 g

See also

- SIMS - Store weight immediately ▸ Page 231
- SI – Weight value immediately ▸ Page 225

SIMS - Store weight immediately

Store weight into memory for later recalling by SIMR or SIMRC.

Syntax

Command

SIMS	Store current weight data into cache.

Response

SIMS␣A	Command understood and executed successfully.

Comments

- The weight value will be stored in non-permanent memory and will only be available as long the device is powered.
- The command name starts with SI to emphasize the similarities to the SI command.
- The command name SIMS means "SI Memory Store".
- The terminology "store"/"recall"/"clear" follows common terminology of e.g. calculators.

See also

- SIMR - Recall stored weight value ▸ Page 229
- SIMRC - Recall and clear stored weight value ▸ Page 230
- SI – Weight value immediately ▸ Page 225

SIR – Weight value immediately and repeat

Description

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

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 host unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under host unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S␣L	Command understood but not executable (incorrect parameter).
S␣+	Balance in overload range.
S␣-	Balance in underload range.

Comments

- The number of weight values per second can be configured using UPD.
- SIR is overwritten by the commands S, SI, SR, @ and hardware break and hence cancelled.
- To send weight value in actually displayed unit, **see** SIRU.
- This command is cancelled by the @, S, SI, SIRU, SIU, SNR, SNRU, SR and SRU commands.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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

- S – Stable weight value ▸ Page 223
- SI – Weight value immediately ▸ Page 225
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233
- SIU – Weight value in display unit immediately ▸ Page 237
- SNR – Send stable weight value and repeat on stable weight change ▸ Page 241
- SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change ▸ Page 243
- SRU – Send stable weight value with currently displayed unit and repeat on any weight change ▸ Page 247
- SR – Send stable weight value and repeat on any weight change ▸ Page 245
- UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 267

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 host unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under host unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S␣L	Command understood but not executable (incorrect parameter).
S␣+	Balance in overload range.
S␣-	Balance in underload range.

Comments

- As the SIR command, but with currently displayed unit.
- The number of weight values per second can be configured using UPD.
- This command is cancelled by the @, S, SI, SIRU, SIU, SNR, SNRU, SR and SRU commands.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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

- @ – Cancel ▸ Page 16
- S – Stable weight value ▸ Page 223
- SI – Weight value immediately ▸ Page 225
- SIR – Weight value immediately and repeat ▸ Page 232
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233
- SIU – Weight value in display unit immediately ▸ Page 237
- SNR – Send stable weight value and repeat on stable weight change ▸ Page 241
- SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change ▸ Page 243
- SR – Send stable weight value and repeat on any weight change ▸ Page 245
- SRU – Send stable weight value with currently displayed unit and repeat on any weight change ▸ Page 247
- UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 267

- SIR – Weight value immediately and repeat ▸ Page 232
- UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 267

SIS – Send netweight value with actual unit and weighing status

Description

Use SIS to immediately send the current net weight value to the connected communication partner via the interface, along with the host unit and other information regarding the weighing status.

Syntax

Command

SIS	Send the current net weight value.

Responses

SIS␣A␣<State>␣<"NetWeight">␣<Unit1>␣ <Readability>␣<Step>␣<Approv>␣<Info>	At status 0 to 3.
SIS␣A␣<State>␣"<Error>"	At status 4 to 6.
SIS␣I	Command understood but currently not executable.
S␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning	
<State>	Integer	0	Stable weight value	
		1	Dynamic weight value	
		2	Stable inaccurate weight (MinWeigh)	
		3	Dynamic inaccurate weight (MinWeigh)	
		4	Overload	
		5	Underload	
		6	Error, not valid	
<"NetWeight">	Float		Net weight value	

Name	Type	Values	Meaning	
<Unit1>	Integer	0	Gram	g
		1	Kilogram	kg
		2	reserved	
		3	Milligram	mg
		4	Microgram	µg
		5	Carat	ct
		6	reserved	
		7	Pound avdp	lb
		8	Ounce avdp	oz
		9	Ounce troy	ozt
		10	Grain	GN
		11	Pennyweight	dwt
		12	Momme	mom
		13	Mesghal	msg
		14	Tael Hongkong	tlh
		15	Tael Singapore	tls
		16	Tael Taiwan	tlt
		17	reserved	
		18	Tola	tola
		20	Baht	baht
<Readability>	Integer	0 … 6	Amount of decimal places	
<Step>	Integer	1	"1" step	
		2	"2" step	
		5	"5" step	
		10	"10" step	
		20	"20" step	
		50	"50" step	
		100	"100" step	
<Approv>	Integer	0	Standard balance, Not approved	
		1	e = d	
		10	e = 10 d	
		100	e = 100 d	
		-1	Unapproved with * in display	
<Info>	Integer	0	Without tare	
		1	Net with weighed tare	
		2	Net with stored tare	

Comments

- Can not be used with custom unit, piece counting (PCS) or percent weighing (%).
- This command has **no** effect on the other S* commands.
- The units and/or their notation may be different in older software versions.
- Relates to the host output interfaces. The weight unit is the host unit, not the displayed unit.
- Also supplies a weigh value for zeroing, adjusting and taring, and in the menu.

Examples

↓	SIS	Query of the current weight value with actual host unit and weighing status.
↑	SIS<"NetWeight">A<"NetWeight">0<"NetWeight">"100.00"<"NetWeight">0<"NetWeight">2<"NetWeight">1<"NetWeight">10<"NetWeight">0	100.0(0) g.

↓	SIS	Query of the current weight value.
↑	SIS<"NetWeight">A<"NetWeight">1<"NetWeight">"10.0"<"NetWeight">5<"NetWeight">2<"NetWeight">50<"NetWeight">0<"NetWeight">2	10.0 ct, carat value, with step 50, in coarse range, with stored tare and unstable.

↓	SIS	Query of the current weight value.
↑	SIS<"NetWeight">A<"NetWeight">6<"NetWeight">"Error7"	Error, not valid.

↓	SIS	Query of the current weight value.
↑	SIS<"NetWeight">A<"NetWeight">4<"NetWeight">""	Overload.

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 host unit.
S␣D␣<WeightValue>␣<Unit>	Non-stable (dynamic) weight value in unit actually set under host unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S␣L	Command understood but not executable (incorrect parameter).
S␣+	Balance in overload range.
S␣-	Balance in underload range.

Comments

- As the [SI ▸ Page 225] command, but with currently displayed unit.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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.

SIUM – Weight value in display unit and MinWeigh information immediately

Description

Use SIUM to immediately send the current weight value, along with the displayed unit and MinWeigh information, from the balance to the connected communication partner via the interface.

Syntax

Command

SIUM	Send the current net weight value with currently displayed unit and MinWeigh Information, irrespective of balance stability.

Responses

S␣<Status>␣<WeightValue>␣<Unit>	Weight value in currently displayed unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S␣L	Command understood but not executable (incorrect parameter).
S␣+	Balance in overload range.
S␣-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<Status>	Char	S	Stable, net >= MinWeigh limit
		D	Dynamic, net >= MW limit
		M	Stable, net < MinWeigh limit
		N	Dynamic, net < MW limit
<WeightValue>	Float		Weight value
<Unit>	String		Currently displayed unit

Comments

- As the [SI ▸ Page 225] command, but with currently displayed unit and MinWeigh information.
- If the MinWeigh function is switched off, or is not available on the balance, it corresponds to the command [SIU ▸ Page 237].
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

Examples

↓	SIUM	Query of the current weight value with currently displayed unit.
↑	S␣D␣␣␣␣123.34␣mg	Dynamic net weight displayed, greater than MinWeigh limit.

↓	SIUM	Query of the current weight value with currently displayed unit.
↑	S␣M␣␣␣␣123.34␣mg	Stable net weight displayed, less than MinWeigh limit.

↓	SIUM	Query of the current weight value with currently displayed unit.
↑	S␣N␣␣␣␣123.34␣mg	Dynamic net weight displayed, less than MinWeigh limit.

SIX1 – Current gross, net and tare values

Description

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

Syntax

Command

SIX1	Read the parameters from the device.

Responses

SIX1␣<Sts>␣<MinW>␣<CoZ>␣<Rep>␣<Calc>␣<PosE>␣<StepE>␣<MarkE>␣<Range>␣<TM>␣<G>␣<N>␣<T>␣<Unit>	Current parameters.
SIX1␣I	Command understood but currently not executable.
SIX1␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Sts>	Character		Status of the weighing, linked to the net value
		S	Stable weight
		D	Dynamic weight
		+	Overload
		–	Underload
		/	Inclination
		|	Invalid value
<MinW>	Integer		MinWeigh status
		0	MinWeigh function is inactive.
		1	Below MinWeigh limit. Relative accuracy is bad.
		2	Above MinWeigh limit. The minimum relative accuracy is guaranteed.
<CoZ>	Character		Center of zero status
		Z	+/– ¼ e around gross zero
		N	Outside the limits of +/– ¼ e around gross zero
<Rep>	Character		Repeating indicator
		R	Repeated value (was already sent once or several times)
		N	New weight update (new computed weight value)
<Calc>	Character		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 relative to the base resolution (smallest digit d). Bland 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. by an asterisk *) has to be displayed.
<Range>	Integer		Range/interval number of the net value. Numbering according to OIML/NIST range numbering scheme.
		1	Single range
		1, 2, ..., n	Multi range: range is linked to gross value. Multi interval: range is linked to net value.
<TM>	Character		Tare mode
		N	No tare
		M	Measured tare
		P	Preset tare
<G>	Float		Gross value, calculated or rounded
<N>	Float		Net value, rounded for actual range step
<T>	Float		Tare value, rounded for actual range step
<Unit>	String (ASCII)		The unit used for this command is the host unit The unit can be selected by using the M21 command

See also

- M21 – Unit ▸ Page 165
- T – Tare ▸ Page 252
- TA – Tare weight value ▸ Page 253

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

Description

Request the current stable weight value in host 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 displayed unit

Comments

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

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

- In contrast to SNR, SR sends also dynamic weight values.
- This command is cancelled by the @, S, SI, SIR, SIU, SIRU, SNRU, SR and SRU commands.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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.

See also

- @ – Cancel ▸ Page 16
- S – Stable weight value ▸ Page 223
- SI – Weight value immediately ▸ Page 225
- SIR – Weight value immediately and repeat ▸ Page 232
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233
- SIU – Weight value in display unit immediately ▸ Page 237
- SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change ▸ Page 243
- SR – Send stable weight value and repeat on any weight change ▸ Page 245
- SRU – Send stable weight value with currently displayed unit and repeat on any weight change ▸ Page 247

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 displayed unit

Comments

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

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

- In contrast to SNR, SR sends also dynamic weight values.
- This command is cancelled by the @, S, SI, SIR, SIU, SIRU, SNRU, SR and SRU commands.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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

- @ – Cancel ▸ Page 16
- S – Stable weight value ▸ Page 223
- SI – Weight value immediately ▸ Page 225
- SIR – Weight value immediately and repeat ▸ Page 232
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233
- SIU – Weight value in display unit immediately ▸ Page 237
- SNR – Send stable weight value and repeat on stable weight change ▸ Page 241
- SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change ▸ Page 243
- SR – Send stable weight value and repeat on any weight change ▸ Page 245
- SRU – Send stable weight value with currently displayed unit and repeat on any weight change ▸ Page 247

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

Description

Request the current stable weight value in host 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 host unit, 1st weight change.
S␣D␣<WeightValue>␣<Unit>	Dynamic weight value in unit actually set as host unit.
S␣S␣<WeightValue>␣<Unit>	Next stable weight value in unit actually set as host 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 @, S, SI, SIR, SIU, SIRU, SNRU, SR and SRU commands.
- In contrast to SR, [SNR ▸ Page 241] 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.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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

- S – Stable weight value ▸ Page 223
- SI – Weight value immediately ▸ Page 225
- SIR – Weight value immediately and repeat ▸ Page 232
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233
- SIU – Weight value in display unit immediately ▸ Page 237
- SNR – Send stable weight value and repeat on stable weight change ▸ Page 241
- SNRU – Send stable weight value with currently displayed unit and repeat on stable weight change ▸ Page 243
- SR – Send stable weight value and repeat on any weight change ▸ Page 245
- SRU – Send stable weight value with currently displayed unit and repeat on any weight change ▸ Page 247

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␣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

- As the SR command, but with currently displayed unit.
- This command is cancelled by the @,[S ▸ Page 223], [SI ▸ Page 225], [SIR ▸ Page 232], [SIU ▸ Page 237], [SIRU ▸ Page 233], [SNRU ▸ Page 243], [SR ▸ Page 245] and [SRU ▸ Page 247] commands.
- In contrast to SR, SNRU 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.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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

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.

If the automatic door function is enabled and a stable weight is requested the balance will open and close the balance's doors to achieve a stable weight.

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␣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		Currently displayed unit

Comments

- As the [S ▸ Page 223] command, but with currently displayed unit.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

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.

SUM – Stable weight value in display unit and MinWeigh information

Description

Use SUM to send the current stable weight value, along with the currently displayed unit and the MinWeigh information, from the balance to the connected communication partner via the interface.

Syntax

Command

SUM	Send the current stable net weight value with currently displayed unit and MinWeigh Information.

Responses

SUM␣<Status>␣<WeightValue>␣<Unit>	Weight value in currently displayed unit.
S␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring).
S␣L	Command understood but not executable (incorrect parameter).
S␣+	Balance in overload range.
S␣-	Balance in underload range.

Parameters

Name	Type	Values	Meaning
<Status>	Char	S	Stable, >= MinWeigh limit
		M	Stable, < MinWeigh limit
<WeightValue>	Float		Weight value
<Unit>	String		Weight unit

Comments

- As the [S ▸ Page 223] command, but with currently displayed unit and MinWeigh information.
- If a weight other than the net weight is displayed, only the "S" index and the stable weight value displayed are output on the interface.
- If the MinWeigh function is switched off or not available on the balance, the corresponding command is [SU ▸ Page 250].
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

Examples

↓	SUM	Query of the current weight value with currently displayed unit.
↑	S␣M␣␣␣␣123.34␣mg	Stable weight displayed, less than MinWeigh limit.

↓	SUM	Query of the current weight value with currently displayed unit.
↑	S␣S␣␣␣␣123.34␣mg	Stable weight displayed, greater than MinWeigh limit.

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 host 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.
- The draft shield closes with this command, when the "Door function" is set on "Automatic". It opens after sending a stable weight.
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

Example

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

See also

TA – Tare weight value ▸ Page 253

TA – Tare weight value

Description

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

Syntax

Commands

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

Responses

TA␣A␣<TareWeightValue>␣<Unit>	Query current tare weight value in tare memory, in unit actually set under host unit.
TA␣I	Command understood but currently not executable (balance is currently executing another command, e.g. zero setting, or timeout as stability was not reached).
TA␣L	Command understood but not executable (incorrect parameter).

Parameters

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

Comments

- The tare memory will be overwritten by the preset tare weight value.
- The inputted tare value will be automatically rounded by the balance to the current readability. This value is shown in the response.
- The taring range is specified to the balance type.

Example

↓	TA␣100.00␣g	Preset a tare weight of 100 g.
↑	TA␣A␣␣␣␣100.00␣g	The balance has a value of 100.00 g in the tare memory.

See also

- T – Tare ▸ Page 252
- TAC – Clear tare weight value ▸ Page 254

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 252
- TA – Tare weight value ▸ Page 253
- TC – Tare or tare immediately after timeout ▸ Page 255
- TI – Tare immediately ▸ Page 257

TC – Tare or tare immediately after timeout

Description

Command TC with configurable timeout is used for processes with defined time cycles.

Syntax

Command

TC␣<Time>	Tare, i.e. store the next stable weight value as a new tare weight value, and send this value back - or store and send dynamic value immediately after timeout. Timeout defined in ms.

Responses

TC␣S␣<TareWeightValue>␣<Unit>	Taring successfully performed. The tare weight value returned corresponds to the weight change on the balance in the unit actually set under host unit since the last zero setting.
TC␣D␣<TareWeightValue>␣<Unit>	Taring performed using an unstable (status "D" for dynamic) tare value immediately after timeout. The tare weight value returned corresponds to the weight change on the balance in the unit actually set under host unit since the last zero setting.
TC␣I	Command understood but currently not executable (balance is currently executing another command, e.g. zero setting, or timeout as stability was not reached).
TC␣L	Command understood but not executable (incorrect parameter).
TC␣+	Upper limit of taring range exceeded.
TC␣-	Lower limit of taring range exceeded.

Parameters

Name	Type	Values	Meaning
<Time>	Integer	1 … 65535 ms	Timeout in milliseconds [ms]
<TareWeightValue>	Float		Tare weight value
<Unit>	String		Currently displayed unit

Comments

- The tare memory is overwritten by the new tare weight value.
- <Time> will be rounded to the next possible interval (interval steps 8 ms).
- The M67 command does not apply for the TC command.
- The criterion for the stability of the weight value is set by the USTB command.
- The tare value can be inquired by using the [TA ▸ Page 253] command.
- Clearing tare memory: **see** [TAC ▸ Page 254].
- The weight value is formatted as a right aligned string with 10 characters including the decimal point. For details, please refer to chapter Format of responses with weight value.

Example

↓	TC␣500	Tare within a maximum time period of 500 ms.
↑	TC␣S␣␣␣␣␣100.00␣g	The balance is tarred and has a value of 100.00 g in the tare memory.
or		
↑	TC␣D␣␣␣␣␣105.46␣g	Taring performed upon timeout of 500 ms, an unstable (status "D" for dynamic) tare value of 105.46 g is stored in the tare memory. The stability criterion for taring was not met.

See also

TAC – Clear tare weight value ▸ Page 254

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 252
- TA – Tare weight value ▸ Page 253
- TAC – Clear tare weight value ▸ Page 254

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

Comments

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.

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 53
- DATI – Date and Time ▸ Page 54

TST0 – Query/set test function settings

Description

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

Syntax

Commands

TST0	Query of the setting for the test function.
TST0␣<Test>	Set the test configuration of the balance.

Responses

TST0␣A␣<Test>␣<"WeightValue">␣<"Unit">	Current setting for the test function.
TST0␣A	Command understood and executed successfully.
TST0␣I	Command understood but currently not executable (balance is currently executing another command).
TST0␣L	Command understood but not executable (incorrect parameter).

Parameters

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

Comments

- The current value of the external weight can be seen in the menu under "Test", **see** Reference Manual.
- With an internal test, no weight value appears.
- For additional information on testing the adjustment, **see** the Reference Manual of the balance.
- The value of the external weight is set in the menu under "Test" or with M20.

Example

↓	TST0	Query of the current setting for the test and the value of the external test weight
↑	TST0␣A␣1␣"␣␣␣2000.0␣g"	The current setting corresponds to the test with an external weight. For a test initiated with the [TST2 ▸ Page 262] command, an external weight of 2000.0 g is needed.

See also

TST1 – Test according to current settings ▸ Page 260

TST1 – Test according to current settings

Description

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

Syntax

Command

TST1	Start test function in the current setting [TST0 ▸ Page 259], M20.

First Responses

TST1␣B	The test procedure has been started. Wait for next response, **see** Comment.
TST1␣A␣<"Deviation">	Test completed, current difference is mention.
TST1␣I	Command understood but currently not executable (balance is currently executing another command). No second response follows.
TST1␣L	Command understood but not executable (incorrect parameter). No second response follows.

Further Responses

TST1␣<"TestWeight">␣<"Unit">	Prompt to unload and load the balance (only with external weight).
TST1␣A␣<"TestWeight">␣<"Unit">	Test procedure completed successfully. Weight value with unit corresponds to the deviation from the specified value displayed after the test. No unit is specified if the test has been performed with the built-in weight.
TST1␣I	The test procedure has been aborted as, e.g., stability was not attained or wrong weights were loaded.

Parameters

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

Comments

- Commands sent to the balance during the test procedure are not processed and responded to in the appropriate manner until the test procedure is at an end.
- Use @ or C to abort a running adjustment.
- For additional information on testing the adjustment, **see** the Reference Manual of the balance.

Example

↓	TST1	Start test function in the current setting.
↑	TST1␣B	The test procedure has been started.
↑	TST1␣"␣␣␣0.00000␣g"	Clear weighing pan.
↑	TST1␣"␣100.00000␣g"	Load 100 g external weight.
↑	TST1␣"␣␣␣0.00000␣g"	Unload weight.
↑	TST1␣A␣"␣␣␣0.00020␣g"	Test completed, current difference is 0.00020 g.

See also

- C0 – Adjustment setting ▸ Page 24
- M20 – Test weight ▸ Page 164
- TST0 – Query/set test function settings ▸ Page 259

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.
- Use @ or C to abort a running adjustment.
- 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 "Test" or with M20.

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

- C0 – Adjustment setting ▸ Page 24
- M20 – Test weight ▸ Page 164
- TST0 – Query/set test function settings ▸ Page 259

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

- Use @ or C to abort a running adjustment.
- 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.
- The commands received immediately after the first response are not processed and responded to in the appropriate manner until after the second response.

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

C3 – Start adjustment with built-in weight ▸ Page 30

TST5 – Module test with built-in weights (scale placement sensitivity test)

Description

Start the module test function using built-in weights to verify the scale placement sensitivity adjustment. This test does not return the overall sensitivity error of the weigh module, but it shows the sensitivity error after the factory and scale placement adjustment stage in the signal path. The corrections of the signal, which are done with the scale production and customer/user adjustment stage, are not taken into account in this test function.

This test function is used to verify the sensitivity adjustment done by command C9 (scale placement sensitivity adjustment). Do not use this test function, to verify the sensitivity adjustment done by commands C1, C2, C3, C6 and C8 (customer sensitivity adjustment).

Syntax

Commands

TST5	Starts the test procedure with built-in weights.

Responses

TST5␣B	Test procedure has been started.
TST5␣A␣<"DevPerMille">	Test completed, current difference is mentioned.

Parameters

Name	Type	Values	Meaning
<"DevPerMille">	String		Deviation of the measured signal when the built-in weights are applied to the scale, relative to the exact value of the built-in weights in per mille (‰). The value is rounded to the resolution of the finest range

Comments

- This test shows the sensitivity error after the factory/production adjustment and the scale placement adjustment stage in the signal path using built-in weights. In certain scales (especially in hybrid scales) the overall sensitivity error cannot be tested using built-in weights as these built-in weights cannot be applied on the external lever system. The only thing what can be tested in this case is the sensitivity error of the load cell itself, i.e. the signal before the corrections of the external lever system (which is typically done in the scale production adjustment stage and the customer/user adjustment stage). However be careful that if the adjustment of the external lever system or even the customer sensitivity or linearity adjustment is not done correctly, the scale sensitivity error can be bad even if this test function shows a good result.
- For example in hybrid scales, a sensitivity adjustment using built-in weights can only correct the span of the load cell without external lever system. This is typically done using command C9 (scale placement sensitivity adjustment). With this test function it can be determined if such a sensitivity adjustment using built-in weights is necessary.
- This test function is similar to TST3, but at a different place in the signal path. The output parameter deviation is defined in per mille (different to TST3).
- This adjustment can be canceled by the command @ or C.

Example

↓	TST5	Starts the test procedure.
↑	TST5␣B	Test procedure has been started.
↑	TST5␣A␣"0.23"	Test completed; current difference is 0.23 per mille.

Command-specific error responses

Response

TST5_E_<Error>	Current error code.

Parameter of command-specific error

Parameters

Name	Type	Values	Meaning
<Error>	Integer	0	Timeout
		1	Cancel
		2	Built-in weight not supported
		3	Test not available (e.g. unknown or disabled)
		4	Calibration load error (e.g. load value of built-in weights is too light or too heavy)
		5	Busy (e.g. another adjustment or test is already running)

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	1 … 1000	Update rate in values per second Terminal: 1 … ..23, stand-alone bridge: 1 … ..1000

Comments

- The parameter setting will be saved and the only way to reset the default value will be via MT-SICS or by means of a factory reset, FSET or via terminal not @.
- Use C2 to begin the adjustment procedure with the set weight.
- An update rate less than 23 must be specified for weigh modules, balances with a terminal. Otherwise, unpredictable behavior may occur.

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 232
- SIRU – Weight value in display unit immediately and repeat ▸ Page 233

USTB – User defined stability criteria

Description

Use USTB to define the stability criteria individually for weighing, taring, zero setting and adjustment functions.

Syntax

Commands

USTB	Query the current stability criteria for all functions: weighing, taring, and zero setting.
USTB␣<Function>␣<Crit>␣<Time>	Set the stability criteria.

Responses

USTB␣B␣<Function>␣<Crit>␣<Time> USTB␣B… USTB␣A␣<Function>␣<Crit>␣<Time>	Current settings of the stability criteria.
USTB␣A	Command understood and executed successfully.
USTB␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Function>	Integer	0	Stability criterion for weighing, **see** "S", "SI", "SIR" … commands
		1	Stability criterion for taring, **see** "T", "TI", commands
		2	Stability criterion for zero setting, **see** "[Z ▸ Page 272]", "[ZI ▸ Page 274]", commands
		3	Stability criterion for adjustments, **see** "C1" to "C9" commands
<Crit>	Float	0.1 … 1000 digit	Specify tolerance in digits (smallest weight increment) within which the value must stay to be regarded as stable
<Time>	Float	0.1 … 4.0 seconds	Specify the observation time in seconds during which the value must stay within tolerance in order to be regarded as stable

Comments

- The observation period is rolling.
  It restarts every time the current weight value exceeds the tolerance. Therefore, the actual time for stability determination depends on the current weight trend as well as on the history before sending an S, SR…, T, or [Z ▸ Page 272] command. Ideally, taring or zero setting can take just a few milliseconds, provided the weight value was stable for the observation period before sending the appropriate command.
- As long as no user values for USTB are set (USTB = 0), factory default settings are used.
- During power up or restart, **see** RDB command the zero point will only be determined if stability for zero setting is achieved. Otherwise, an undefined weight value will appear after the startup procedure has been completed.
- The adjustment function parameter is not available on all product lines.

Examples

↓	USTB	Query the current stability criteria for all functions: weighing, taring, and zero setting.
↑	USTB␣B␣0␣1␣1	Stability criteria for weighing: 1 digit for at least 1 seconds.
↑	USTB␣B␣1␣0.5␣2	Stability criteria for taring: 0.5 digit for at least 2 seconds.
↑	USTB␣A␣2␣0.5␣2	Stability criteria for zeroing: 0.5 digit for at least 2 seconds.

↓	USTB␣0␣1␣1.5	Set the stability criteria for weighing to 1 digit for at least 1.5 seconds.
↑	USTB␣A	Command understood and executed successfully.

WMCF – Configuration of the weight monitoring functions

Description

The WMCF command is used to configure a "Check weighing" or "Dispensing" function without a PC or PLC. The digital outputs DOT␣1…3 are used.

Syntax

Commands

WMCF	Query the current configuration of the weight monitoring functions.
WMCF␣<Function>	Set WMCF function.
WMCF␣1␣<TargetValue>␣<Unit>␣<Tol->␣<Unit>␣<Tol+>␣<Unit>	Set configuration for "Control Weighing" function. The digital output will be set if a stable weight value is: DOT␣1: below <TargetValue> - <Tol->. DOT␣2: between <TargetValue> - <Tol-> and <TargetValue> + <Tol+>. DOT␣3: over <TargetValue> + <Tol+>.
WMCF␣2␣<Limit1>␣<Unit>␣<Limit2>␣<Unit>␣<Limit3>␣<Unit>	Set configuration for "Dispensing" function. The digital output will be set if a any (stable and unstable) weight value reach: DOT␣1: <Limit1>. DOT␣2: <Limit2>. DOT␣3: <Limit3>.

Responses

WMCF␣A␣0 or WMCF␣A␣1␣<TargetValue>␣<Unit>␣<Tol->␣<Unit>␣<Tol+>␣<Unit> or WMCF␣A␣2␣<Limit1>␣<Unit>␣<Limit2>␣<Unit>␣<Limit3>␣<Unit>	Current configurations for the weight monitor function.
WMCF␣A	Command understood and executed successfully.
WMCF␣I	Command understood but currently not executable.
WMCF␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Function>	Integer	0	Off
		1	Control weighing
		2	Dispensing
<TargetValue>	Float		Target value
<Tol->	Float		Minus tolerance
<Tol+>	Float		Plus tolerance
<Limit1> … <Limit3>	Float		Weight limit value
<Unit>	String		Target, tolerance and limit unit, only available units permitted

Comments

- Digital output must be available.
- Only one command DOTC (n), DOTP (n) or `WMCF` can be configured for the same digital output.
- `TargetValue` and `Limit1 … Limit3` will be rounded to the defined resolution from the load cell.
- Only allowed units are permitted, **see** M21.
- The weight value monitoring function works only with a weight value command (e.g. SI, SIR).
- The weight value monitoring function works only on the interface 1 (RS422), **see** COM.
- The update rate depends on the defined UPD rate.
- `Tol-` and `Tol+` defined as % reference to the `Target Value`.
- Duration and Delay from the digital output must be defined with the command DOT.

Examples

↓	`WMCF`	Query the current configuration for the weight monitoring function.
↑	`WMCF␣A␣0`	No weight monitoring function is activated.
or		
↑	`WMCF␣A␣1␣100␣g␣3␣g␣5␣%`	The target weight for check weighing is 100 g. Weights which are equal to or greater than 97 g and less than or equal to 105 g (=100 g+5 %) are within the tolerance. The digital Output are TRUE, if weight value is stable and: `DOT␣1`: < 97 g. `DOT␣2`: ≥ 97 g and ≤ 105 g. `DOT␣3`: > 105 g.
or		
↑	`WMCF␣A␣2␣70␣g␣75␣g␣76␣g`	The limits of the dispensing function are 70 g, 75 g, and 76 g. The digital output are TRUE, if any (stable and unstable) weight values are: `DOT␣1`: ≥ 70 g. `DOT␣2`: ≥ 75 g. `DOT␣3`: ≥ 76 g.

↓	`WMCF␣A␣1`	Activate "Control Weighing" function with last used parameters.
↑	`WMCF␣A␣1␣100␣g␣3␣g␣5␣%`	The last used parameters are activated, **see** example above.

↓	`WMCF␣1␣300.00␣30␣mg␣0.1␣%`	When check weighing, the target weight of 300 g may be exceeded by a minimum of 299.70 g and by a maximum of 300.30 g (= 300.00 g+ 0.1%).
↑	`WMCF␣A`	Command understood and executed successfully.

↓	`WMCF␣2␣150␣g␣165␣g␣167␣g`	When dosing, the first limit is 150 g, the second 165 g and the third 167 g.
↑	`WMCF␣A`	Command understood and executed successfully.

See also

- DOT – Configuration for digital outputs ▸ Page 58
- DOTC – Configurable digital outputs – Weight monitor ▸ Page 59

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.

Comments

- 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.
- The draft shield closes with this command, when the "Door function" is set on "Automatic". It opens after sending a stable weight.

Example

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

See also

ZI – Zero immediately ▸ Page 274

ZC – Zero or zero immediately after timeout

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. The command ZC with configurable timeout is used for processes with defined time cycles.

Syntax

Command

ZC␣<Time>	Set next stable weight value as new zero weight (reference) point or set dynamic weight value immediately after timeout as new zero weight point. Timeout is specified in ms.

Responses

ZC␣S	Zero setting successfully performed. Gross, net and tare = 0.
ZC␣D	Zero setting successfully performed with dynamic weight value after timeout i.e. the stability criterion for zero setting was not met. Gross, net and tare = 0.
ZC␣I	Command understood but currently not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
ZC␣L	Command understood but not executable (incorrect parameter).
ZC␣+	Upper limit of zero setting range exceeded.
ZC␣-	Lower limit of zero setting range exceeded.

Parameter

Name	Type	Values	Meaning
<Time>	Integer	1 … 65535	Timeout in milliseconds [ms]

Comments

- The tare memory is cleared after zero setting.
- <Time> will be rounded to the next possible interval (interval steps 8 ms).
- Zero point set under unstable conditions may not be considered as a true reference for further measurements.
- The tare memory is cleared after zero setting.
- The criterion that must be fulfilled to reach stability for zeroing can be set using the USTB command.

Example

↓	ZC␣500	Set new zero point within maximum 500 ms.
↑	ZC␣S	Zero setting performed, stability criterion for zero setting met.
or		
↑	ZC␣D	Zero setting performed upon timeout of 500 ms under unstable conditions (stability criterion for zero setting not fulfilled).

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.

Comments

- 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 272

4 What if...?

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

Establishing the communication

Switch the weigh module/balance off / on.

The balance must now send identification string I4, 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 weigh module/balance (TxD signal).
- Data line to the weigh module/balance (RxD signal).
- Signal ground line (GNDINT).

For RS422 communication, at least four connecting lines are needed:

- Data line from the weigh module/balance (TX+ signal).
- Data line from the weigh module/balance (TX- signal).
- Data line to the weigh module/balance (RX+ signal).
- Data line to the weigh module/balance (RX- signal).

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.

5 Appendix

5.1 Framed protocol

Introduction

With the command PROT a framed bus protocol (PROT␣2) that is derived from the DIN Measurement Bus (DIN 66348) can be selected. This protocol may be used to make data transmission more reliable.

Nevertheless, full safety cannot be guaranteed since not all transmission errors may be detected or some errors may compensate each other.

In this protocol, the data is enclosed by a set of control characters and a checksum is calculated. This checksum enables the receiver to check whether the data was transmitted correctly or not.

In the following description, control characters are enclosed by angle brackets.

Used Control Characters

Character	Hex	Function
<STX>	02	FrameStart This control character marks the begin of a frame
<ETX>	03	FrameEnd This control character marks the end of a frame
<ACK>	06	Acknowledge This control character will be sent by the receiver after a frame is transmitted correctly
<NAK>	15	NegativeAcknowledgement This control character will be sent by the receiver after a frame is transmitted incorrectly
<EOT>	04	EndOfTransmission This control character terminates the transmission immediately

Frame Structure

A frame encloses the data that has to be transmitted. The control characters <STX> and <ETX> mark the begin and the end of the frame. The Block Control Code (BCC) follows this frame.

<STX>	Control character FrameStart
ADDR	Weighing Module address
... ...	Data
<ETX>	Control character FrameEnd
BCC	Block Control Code

BCC

Transmission errors may be detected by means of the Block Control Code. The BCC equals XOR (exclusive or) over the data bytes and <ETX> (including ADDR, but excluding <STX>). Single 1-bit errors may be detected whereas multiple errors may compensate each other and remain undetected.

Flow of Communication

After the transmission of a frame, the receiver has to reply with <ACK> or <NAK> within 200 ms. If the BCC and the data don't mach, a transmission error is detected and <NAK> has to be returned. This requests the sender to transmit the frame again. The number of transmission trials is limited to three. After three erroneous trials, the transmission is aborted with <EOT>. <EOT> may also be used to abort the transmission at any time unless the BCC is expected (the BCC can take an arbitrary value including 03 hex which represents <EOT>).

Example

The command SI is sent to the weigh module:

Character	Hex	Comment
<STX>	02	FrameStart
7	37	Weighing Module address
,S'	53	Data
,I'	49	
<ETX>	03	FrameEnd
BCC	0E	Block Control Code

The weigh module checks the frame by means of the BCC. If the Data was transmitted correctly, the weigh module returns a <ACK>. Subsequently, the weigh module sends the following reply:

Character	Hex	Comment
<STX>	02	FrameStart
7	37	Weighing Module address
,S'	53	Data
,␣'	20	
,D'	44	
,␣'	20	
,␣'	20	
,␣'	20	
,␣'	20	
,␣'	20	
,␣'	20	
,␣'	20	
,3'	33	
,␣'	2E	
,4'	34	
,8'	38	
,␣'	20	
,g'	67	
<ETX>	03	FrameEnd
BCC	75	Block Control Code

The PLC then checks the data with the BCC and acknowledges the successful transmission by sending <ACK>.

Exception: SIR

A problem occurs if a SIR command is issued. It won't be practicable to await an acknowledgement for 200 ms after each weighing result. Therefore, the weigh module doesn't expect a <ACK> or <NAK> while replying on a SIR command.

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