Reference Manual
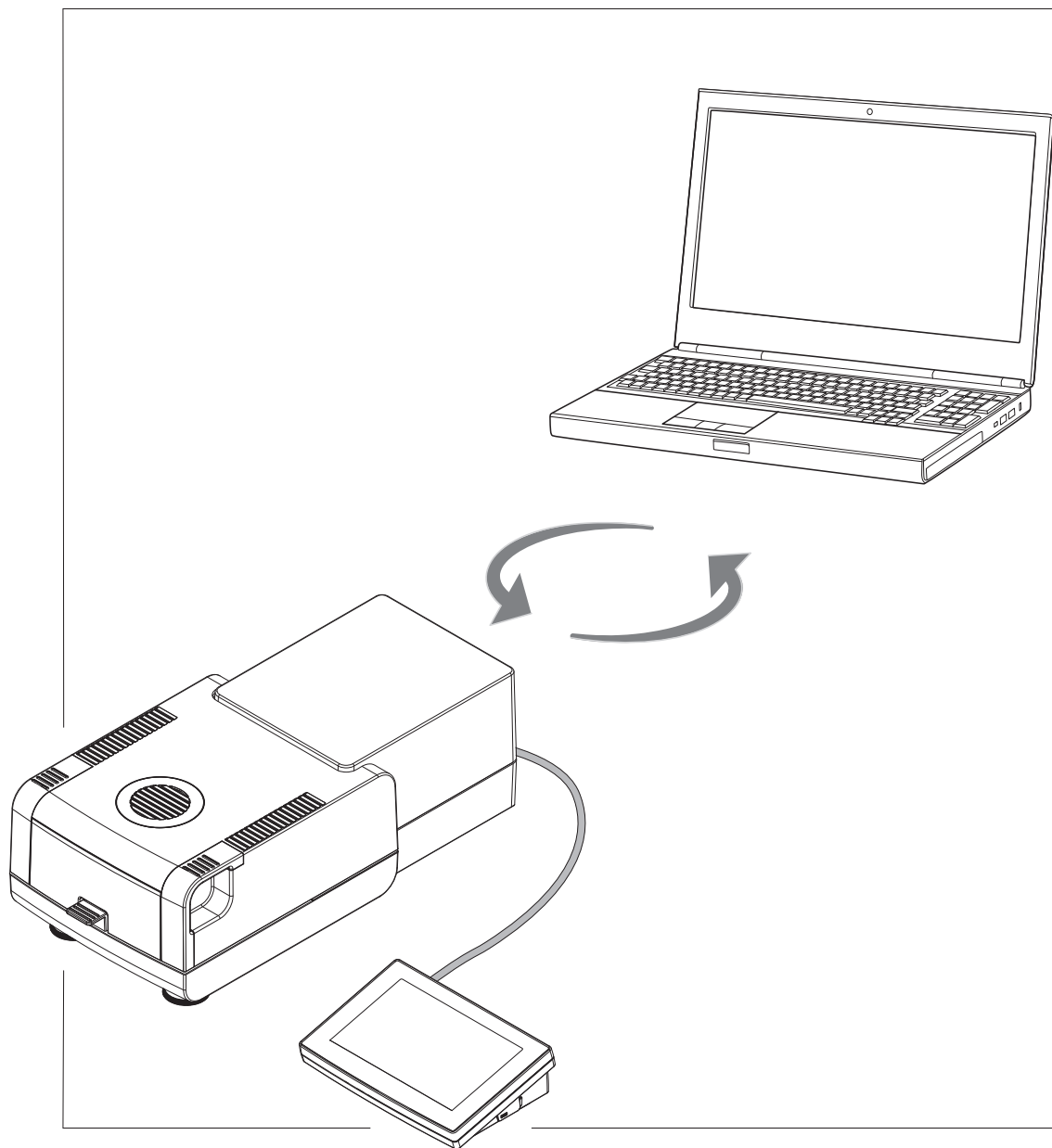
MT-SICS Interface Commands
for Moisture Analyzers HX204, HS153, HC103

METTLER TOLEDO

Table of Contents

1 Introduction

To enable you to integrate Moisture Analyzers in your system in a simple way, Moisture Analyzer functions can be accessed through an appropriate set of commands described in this document.

Additional documentation on data interface

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

▶ www.mt.com/HX204-RM

▶ www.mt.com/HS153-RM

▶ www.mt.com/HC103-RM

Data exchange with the Moisture Analyzer

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

The commands that are available for your Moisture Analyzer can be called up as a list using the I0 command [IO ▶ Page 52].

How the Moisture Analyzer operates

Your Moisture Analyzer is used to determine the moisture content of virtually any substance. The instrument operates according to the thermogravimetric principle: At the start of the measurement the Moisture Analyzer determines the weight of the sample, the sample is then rapidly heated with the built-in halogen dryer unit and the moisture vaporizes. During the drying, the instrument continuously records the weight of the sample and shows the decrease in the moisture. On completion of the drying, the final result of the moisture or dry substance content of your sample is displayed.

During drying the Moisture Analyzer passes through the following instrument statuses:
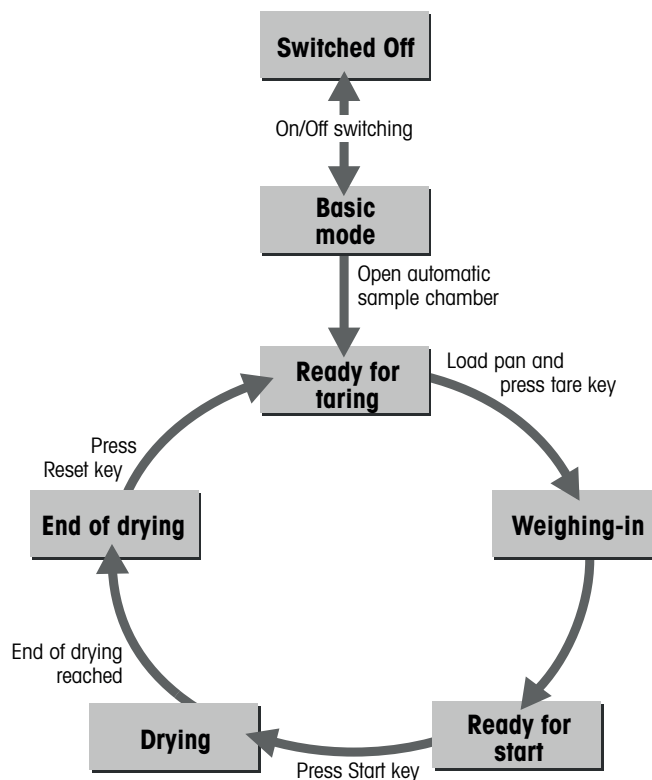
The following instrument statuses also exist:

- Entry status
- Taring

- Weight adjustment
- Temperature adjustment

Automated drying process

The flowchart below shows a possible process to automate drying procedures:
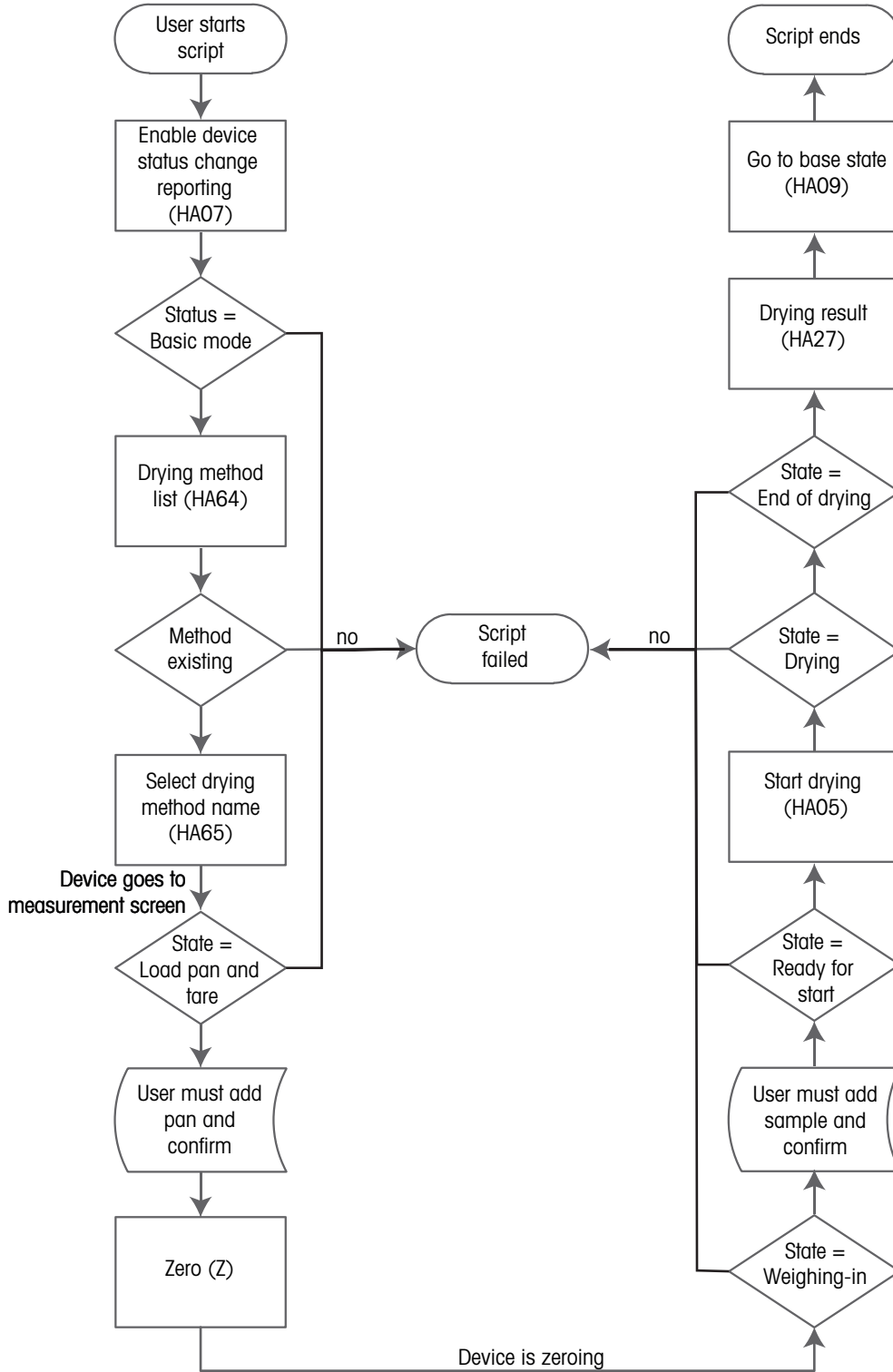
For full information on the functions of the Moisture Analyzer, always consult the Reference Manual (RM).

See also

2 Command Formats

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

Basic rules

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

2.1 Conventions

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

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

Example

Command to Moisture Analyzer which writes **Hello** into the instrument display:

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

The command terminator C_RL_F is not shown.

2.2 Response formats

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

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

2.2.1 Format of responses with weight value

Syntax

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

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

Parameters

Name	Type	Values	Meaning
<ID>	String		Response identification, refers to the invoking command
␣	Blank		Space (ASCII 32 dec.)
<Status>	Character	S	**S**table weight value
<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.
<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 0.256 g:

↓	S	Request a stable weight value.
↑	S␣S␣␣␣␣␣0.256␣g	

2.2.2 Format of responses without weight value

Syntax

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

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

Parameters

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

Example

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

2.3 Error messages

2.3.1 Command-specific error messages

Syntax

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

<ID>	␣	<Status>	C_R	L_F
1-5 characters		1 character		

Parameters

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

Example

Response while instrument is in overload range:

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

2.3.2 General error messages

Syntax

There are three different error messages:

<ID>	C$_R$	L$_F$
2 characters		

Parameters

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

Example

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

↓	dat␣30␣10␣2012	DAT accidentally written in lowercase.
↑	ES	Syntax error; dat not recognized as a command.

2.4 Tips for programmers

Overview of command of specific models

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

📝 **Note**

We recommend using the I0 command [I0 ▸ Page 52] to get a list of all commands that are supported by your particular Moisture Analyzers.

Example

↓	I0	Send list of commands.
↑	I0␣B␣0␣"I0"	Level 0 command I0 implemented.
↑	I0␣B…	…
↑	I0␣B␣0␣"@"	Level 0 command @ [@ ▸ Page 13] (cancel) implemented.
↑	I0␣B␣1␣"D"	Level 1 command D implemented.
↑	I0␣B…	…
↑	I0␣A␣3␣"SM4"	Level 3 command SM4 implemented.

If you need a list of commands including the version of a command, use I1 [I1 ▸ Page 53].

Command and response

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

Cancel

To be able to start from a determined state, when establishing the communication between Moisture Analyzers and system, you should send a cancel command see the @ [@ ▸ Page 13] or C [C ▸ Page 14] command to the Moisture Analyzers. Otherwise, when the instrument is switched on or off, faulty characters can be received or sent.

Sending several commands in succession

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

📝 **Note**

Always wait for the response before you send a new command.

Carriage Return, Line Feed

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

Platform	'New Line'
DOS/Windows	$C_R L_F$
Macintosh	C_R
Unix	L_F

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

Quotation marks " "

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

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

Weight unit of weight value – 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 instrument offer the possibility of selecting a particular unit, see command M21 [M21 ▶ Page 68]. 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.

USB interface of the instrument

If the Microsoft Windows® USB driver is used

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

See also

- 📄 @ – Abort ▶ Page 13
- 📄 I0 – Currently available MT-SICS commands ▶ Page 52
- 📄 I1 – MT-SICS level and level versions ▶ Page 53
- 📄 S – Stable weight value ▶ Page 73
- 📄 SI – Weight value immediately ▶ Page 74
- 📄 SIR – Weight value immediately and repeat ▶ Page 75
- 📄 Z – Zero ▶ Page 80
- 📄 ZI – Zero immediately ▶ Page 81

2.5 Read only

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

3 Commands and Responses

@ – Abort

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

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

Response

I4␣A␣"<SNR>"	Serial number is emitted; the instrument is ready for operation.

Comments

- All commands awaiting responses are cancelled.
- The cancel command is always executed.
- The emitted serial number corresponds to the serial number of the terminal (if one is present), see command [I4 ▶ Page 57].

Example

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

See also

📄 I4 – Serial number ▶ Page 57

C – Cancel all commands

Description
Cancel all running commands.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

C	Cancel running commands.

Responses

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

Comments

- This command has a similar functionality as the command [@ ▸ Page 13] but responds with a well defined answer and does not fully reset the device.
- This command is executed always immediately.
- This command cancels all active and pending interface commands correctly and in a safe way on the interface where cancel was requested. This command does not cancel any commands or procedures that are not triggered by a SICS command.
- The command C responds with C␣A after all active and pending interface commands have been terminated.
- This command is typically used for repeating commands such as [SIR ▸ Page 75] 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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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 command [C1 ▶ Page 18]. The unit corresponds to the factory setting of the host unit 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 TST 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 command C1 [C1 ▶ Page 18].

Name	Type	Values	Meaning
<"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` [C2 ▸ Page 19] is independent of `C0`.
- Use [C1 ▸ Page 18] to start an adjustment defined with `C0`.
- `C0` must be reset manually; [@ ▸ Page 13] has no effect.

Examples

↓	`C0`	Query of the current status and setting of the adjustment.
↑	`C0␣A␣2␣1␣"␣␣␣100.000␣g"`	Current setting of mode is "Auto". The ambient conditions of the balance have changed so much that the balance requests an adjustment (`<Mode>` = 2) with the external weight (`<Weight>` = 1). The adjustment is initiated with the command `C1` [C1 ▸ Page 18] and requires a weight of 100.000 g.
↑	`C2`	Start external adjustment, **see** responses of `C2` [C2 ▸ Page 19].
↑	`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

C1 – Start adjustment according to current settings

Description

C1 is used to trigger an adjustment as defined using the C0 command.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

C1	Start the adjustment according to the current setting, see [C0 ▸ Page 15].

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.

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.

Example

↓	C1	Start the adjustment according to the current setting.
↑	C1␣B	Adjustment operation started.
↑	C1␣"␣␣␣␣␣␣␣0.00␣g"	Prompt to unload the balance.
↑	C1␣"␣␣␣␣2000.00␣g"	Prompt to load the adjustment weight of 2000.00 g.
↑	C1␣"␣␣␣␣␣␣␣0.00␣g"	Prompt to unload the balance.
↑	C1␣A	Adjustment completed successfully.

See also

- 📄 @ – Abort ▸ Page 13
- 📄 C0 – Adjustment setting ▸ Page 15

C2 – Start adjustment with external weight

Description

Regardless of the `C0` setting [CO ▸ Page 15], `C2` carries out external adjustment with the reference weight.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

`C2`	Start the external adjustment.

First Responses

`C2␣B`	The adjustment procedure has been started.
`C2␣I`	Command understood but currently not executable (balance is currently executing another command). No second response follows.
`C2␣L`	Command understood but not executable (e.g. adjustment with an external weight is not admissible, certified version of the balance). No second response follows.

Further Responses

`C2␣<"WeightValue">␣<Unit">`	Prompt to unload or load the balance.
`C2␣A`	Command understood and executed successfully.
`C2␣I`	The adjustment was aborted as, e.g. stability not attained or the procedure was aborted with the C key.

Parameters

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

Comments

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

Example

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

See also

C3 – Start adjustment with built-in weight

Description

You can use `C3` to start an internal adjustment procedure.

Supported Products

HX204	HS153	HC103
✓	—	—

Syntax

Command

C3	Start the internal adjustment.

First Responses

C3␣B	The adjustment procedure has been started. Wait for second response.
C3␣I	Adjustment cannot be performed at present as another operation is taking place, or the adjustment strategy is not configured correctly. No second response follows.
C3␣L	Adjustment operation not possible (e.g., no internal weight). No second response follows.

Further Responses

C3␣A	Adjustment has been completed successfully.
C3␣I	The adjustment was aborted as, e.g., stability not attained or the procedure was aborted with the Cancel button on the terminal.

Comments

- Commands sent to the balance during the adjustment operation are not processed and responded to in the appropriate manner until the adjustment is at an end.
- Adjustment cannot be performed if 'External adjustment' or 'No adjustment' is configured on the instrument. Set the adjustment strategy to 'Internal adjustment'.

Example

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

DAT – Date

Description

Set or query the balance system date.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

`DAT`	Query of the current date of the balance.
`DAT␣<Day>␣<Month>␣<Year>`	Set the date of the balance.

Responses

`DAT␣A␣<Day>␣<Month>␣<Year>`	Current date of the balance.
`DAT␣A`	Command understood and executed successfully.
`DAT␣I`	Command understood but currently not executable (balance is currently executing another command).
`DAT␣L`	Command understood but not executable (incorrect parameter).

Parameters

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

Example

↓	`DAT`	Query of the current date of the balance.
↑	`DAT␣A␣01␣10␣2017`	The date of the balance is 1st October 2017.

See also

DATI – Date and time

Description

Set or query the device system date and time in a singular action.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

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

Responses

`DATI␣A␣<Year>␣<Month>␣<Day>␣<Hour>␣<Minute>␣<Second>`	Current date and time of the device system.
`DATI␣A`	Command understood and executed successfully.
`DATI␣I`	Command understood but currently not executable (balance is currently executing another command).
`DATI␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Year>`	Integer	`2000 … 2099`	Year
`<Month>`	Integer	`1 … 12`	Month
`<Day>`	Integer	`1 … 31`	Day
`<Hour>`	Integer	`0 … 23`	Hour
`<Minute>`	Integer	`0 … 59`	Minute
`<Second>`	Integer	`0 … 59`	Second

Example

↓	`DATI`	Query of the current date and time of the device system.
↑	`DATI␣A␣2010␣03␣15␣10␣30␣18`	Current date and time of the device system is 2010-03-15 and the time is 10:30:18.

↓	`DATI␣2010␣5␣30␣12␣0␣0`	Set date to 2010-05-30 and time to 12:00:00.
↑	`DATI␣A`	Date is set to 2010-05-30 and time to 12:00:00.

See also

HA05 – Start/Stop drying

Description

Start or stop a selected drying method.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

HA05␣<DryingControl>	Start or stop drying.

Responses

HA05␣A	Command executed, measurement started.
HA05␣I	Command not executable due to a general error.
HA05␣L	Command understood but not executable (incorrect parameter).

Comment

• If a drying process is stopped using stop drying command the drying data will still be stored on the device.

Examples

↓	HA05␣1	Start drying process.
↑	HA05␣A	Command executed, measurement started.

↓	HA05␣0	Stop drying process.
↑	HA05␣A	Command executed, measurement stopped.

Command-specific error responses

Response

HA05␣E␣<Error>	Current error code.

Parameter of command-specific error

Parameter

Name	Type	Values	Meaning
<Error>	Integer	1	Device is not in state ready for start (e.g. no drying method selected)
		2	Temperature too high to start
		3	Door is open (device with manual door)

See also

📄 HA07 – Device status change reporting ▸ Page 24

HA07 – Device status change reporting

Description

Activate or deactivate device status change reporting.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA07␣<1>	Activate device status change reporting.
HA07␣<0>	Deactivate device status change reporting.

Responses

HA07␣A	Command executed.
HA07␣A␣<Status> ... HA07␣A␣<Status> ...	Status change reporting activated
HA07␣I	Command not executable due to a general error.
HA07␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<OnOff>	Integer	0	Code to deactivate device status change reporting.
		1	Code to activate device status change reporting.
<Status>	Integer	1	Base
		2	Load pan and tare
		3	Weighing-in (adding sample)
		4	Ready for start
		5	Drying
		6	End of drying
		7	Entry
		11	Taring
		12	Weight adjustment or test
		13	Temperature adjustment or test
		20	Pre-heating
		21	Weighing-in out-of-tolerance
		22	Setup wizard

Comments

- After activation of reporting the current status is returned immediately.
- If active, status change messages are also sent in the standby mode.
- Command just possible if the device is in user mode.

Examples

↓	HA07␣1	Activate device status change reporting.
↑	HA07␣A	Status change reporting activated.
↑	HA07␣A␣1	Current status is base
	…	

↓	HA07␣0	Deactivate device status change reporting.
↑	HA07␣A	Command executed.

Command-specific error responses

Response

HA07␣E␣<Error>	Current error code.

Parameter of command-specific error

Parameter

Name	Type	Values	Meaning
<Error>	Integer	101	Error 1
		102	Error 2
		10n	Error n

HA09 – Go to base state

Description

Exit current state and return to base state (home screen). This is only possible from the following states:.

Values	Meaning
2	Load pan and tare
3	Weighing-in (adding sample)
6	End of drying
7	Entry
22	Setup wizard

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

HA09	Go to base state.

Responses

HA09_A	Command executed.
HA09_I	Command not executable due to a general error.
HA09_L	Command understood but not executable (incorrect parameter).

Comment

• For a list of all states see HA07.

Example

↓	HA09	Go to base state.
↑	HA09_A	Command executed.

Command-specific error responses

Response

HA09_E_<Error>	Current error code.

Parameter of command-specific error

Parameter

Name	Type	Values	Meaning
<Error>	Integer	1	Device cannot go to base state due to the current state

See also

HA24 – Drying temperature

Description

Query of current drying temperature.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

HA24	Query drying temperature.

Response

HA24␣A␣<Temperature>	Current drying temperature in °C.

Parameter

Name	Type	Values	Meaning
<Temperature>	Integer		Drying temperature °C

Example

↓	HA24	Query of current drying temperature.
↑	HA24␣A␣105	The drying temperature is 105 °C.

HA26 – Drying data

Description

Output the drying data in selectable unit. In case of activated QuickPredict it is recommend to use the command [HA30 ▸ Page 31].

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

`HA26␣<UnitID>`	Gets the drying data in a certain unit.

Responses

`HA26␣A␣<Status>␣<UnitID>␣`
`<WetWeight>␣<CurrentWeight>␣`
`<Result>␣<Duration>`
	Current drying data.

`HA26␣A`	Command understood and executed successfully.
`HA26␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Status>`	Integer	0	No drying exists
		1	Drying running
		2	Drying ended
		3	Drying terminated
`<UnitID>`	Integer	0	Currently set moisture unit
		1	Grams
		2	DC (dry content)
		3	MC (moisture content), (factory setting)
		4	AM (ATRO moisture content)
		5	AD (ATRO dry content)
		6	g/kg MC (moisture content)
		7	g/kg DC (dry content)
		8	-MC (negative moisture content)
`<WetWeight>`	Float		Wet weight in grams
`<CurrentWeight>`	Float		Current weight in grams
`<Result>`	Float		Actual result in requested unit
`<Duration>`	Integer		Drying duration in seconds

Comments

- If a drying is inexistent (e.g., after a RAM LOST), the parameters x3..x6 are set to 0.
- If the measuring results exceed the tolerances for ATRO result display (L-999.99 % AM or >999.99 % AD) the selected results in x2 = 4 AM or x2 = 5 AD will automatically be transferred in x2 = 3 MC or x2 = 2 DC respectively.

Examples

↓	`HA26␣3`	Query of drying data.
↑	`HA26␣A␣2␣3␣4.762␣3.066␣35.61␣497`	Drying has been ended regularly, result requested in % moisture content, wet weight 4.762 g, dry weight 3.066 g, 35.61 % moisture content, drying ended at 497 seconds.

↓	`HA26␣2`	Query of drying data.
↑	`HA26␣A␣1␣2␣2.672␣2.467␣92.33␣143`	Drying is running, result requested in % dry content, wet weight 2.672 g, dry weight 2.467 g, 92.33 % dry content, drying for 143 seconds in progress.

HA27 – Drying result

Description

Query the measured drying result from the result windows of the current measurement. It is recommend to use HA31 [HA31 – Stored results ▸ Page 33]. HA27 does not support prediction and returns the last measured value if the measurement has been finished with a prediction. HA27 can supplement the HA31 if the measured result should be recalculated in a different unit than displayed.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA27␣<UnitID>	Query of drying result.

Responses

HA27␣A␣<Result>␣<UnitText>	Last measured drying result.
HA27␣A	Command understood and executed successfully.
HA27␣I	Command understood but currently not executable (drying in progress).
HA27␣L	Command understood but not executable (incorrect parameter e.g. number, value range).

Parameters

Name	Type	Values	Meaning
<UnitID>	Integer	0	Currently set moisture unit
		1	Grams
		2	DC (dry content)
		3	MC (moisture content), (factory setting)
		4	AM (ATRO moisture content)
		5	AD (ATRO dry content)
		6	g/kg MC (moisture content)
		7	g/kg DC (dry content)
		8	-MC (negative moisture content)
<Result>	Float		Drying result (always 7 digit number)

Example

↓	HA27␣3	Query of drying result.
↑	HA27␣A␣3.940000␣%MC	Drying result 3.940000 %MC.

HA30 – Current Prediction Data

Description

Returns the displayed measured value, the predict status and if available the actual prediction. The command `HA30` replaces [HA26 ▸ Page 28]. `HA26` can supplement `HA30` in case the actual measured value is needed in a different unit the one that is set for the displayed value.

Supported Products

HX204	HS153	HC103
✓	✓	—

Syntax

Commands

`HA30`	Query the drying data and the prediction data in the display unit.

Responses

`HA30␣A␣<ActResult>␣<Unit>␣`
`<Duration>␣<Status>␣<Prediction>␣`
`<Uncertainty>␣<Time>␣<ResultCount>`
	Current drying data and prediction data.

`HA30␣A`	Command understood and executed successfully.
`HA30␣I`	Command understood but currently not executable (no drying measurement is running/active).

Parameters

Name	Type	Values	Meaning
`<ActResult>`	Float		Current measured result in display unit.
`<Unit>`	String	Max 8 chars	Display unit as text.
`<Duration>`	Integer		Drying duration in seconds.
`<Status>`	Integer	0	No prediction available (e.g. no QuickPredict method).
		1	Prediction pending: initialization time.
		2	Prediction pending: additional initialization time is needed.
		3	Prediction pending at the moment.
		4	No prediction and no prediction pending anymore.
		5	Prediction available.
`<Prediction>`	Float		Predicted result in the given displayed unit or 0.00 if prediction is not (yet) available (Status not 5).
`<Uncertainty>`	Float		Current prediction uncertainty (+/-) in the given displayed unit or 0.00 if prediction is not (yet) available (Status not 5).
`<Time>`	Integer		Time in seconds since measurement start at which the forecast was calculated.
`<ResultCount>`	Integer	0	No stored prediction available.
		1	1 stored prediction available.
		2	2 stored predictions available.

Comment

- If the parameter `<ResultCount>` indicates that a prediction has been stored already, the stored prediction can be read with command `HA31` [HA31 ▸ Page 33]. If the measurement is still running and the prediction index indicates that not all prediction memory spaces are used yet, a valid prediction can be stored with `HA33` [HA33 ▸ Page 37].

Example

↓	`HA30`	Query current prediction data.
↑	`HA30␣A␣10.53␣%MC␣434␣5␣11.17␣0.23␣430␣1`	The current measured value is 10.53 %MC and the measurement has been running for 434 seconds. The predicted final result is 11.17 %MC +/-0.23 %MC. The prediction data was calculated with the available measured data at 430 second. One prediction has been stored already.

HA31 – Stored results

Description

Query the stored results of the current running drying measurement. Unlike command [HA27 ▶ Page 30], this command also supports QuickPredict. It can therefore be used during the running measurement to read out stored predicted results or at the end of the measurement to query the stored final measured or predicted results of the drying measurement.

Supported Products

HX204	HS153	HC103
✓	✓	—

Syntax

Commands

HA31	Query stored results

Responses

HA31␣B␣<Type>␣<Value>␣<Uncertainty>␣<Unit>␣<DurationOrTime> HA31␣A␣<Type>␣<Value>␣<Uncertainty>␣<Unit>␣<DurationOrTime>	Stored results for the (running or finished) measurement.
HA31␣I	Command understood but currently not executable (no stored result available in the current measurement or no measurement is running at the moment).

Parameters

Name	Type	Values	Meaning
<Type>	Integer	1	Intermediately stored predicted final result (only available if QuickPredict in use).
		2	Finally stored predicted final result (only available if QuickPredict in use).
		3	Stored measured final result.
		4	Aborted result.
<Value>	Float		Measured or predicted result value or 0.00 for an aborted result.
<Uncertainty>	Float		Prediction Uncertainty or 0.00 if <Value> is not a predicted value.
<Unit>	String	Max 8 chars	Unit of the <Value> and <Uncertainty>.
<DurationOrTime>	Integer		Drying duration in seconds as the result was calculated or measured.

Comments

- The command returns an I-answer if no stored result for the current measurement is available or no measurement is running. Therefore this command can only be used between the measurement start until the final result windows has been closed.
- A measurement is only complete if the last line of the answer has a type of 2-4. If only an intermediate prediction (Type = 1) is in the response, the measurement is still ongoing.

Example

↓	`HA31`	Query the stored results for the current measurement.
↑	`HA31␣A␣1␣11.17␣0.23␣%MC␣430`	In the running measurement one intermediate prediction has been stored. The measurement is still ongoing.
↑	`HA31␣B␣1␣11.17␣0.23␣%MC␣430` `HA31␣A␣3␣11.18␣0.00␣%MC␣527`	In the current measurement an intermediate prediction (11.17 %MC +/-0.23 %MC) has been stored and 97 seconds later the measurement has reached the switch-off criteria. The measured final value is 11.18 %MC.

HA32 – Prediction action

Description

Query the prediction actions available for a running measurement.

Supported Products

HX204	HS153	HC103
✓	✓	—

Syntax

Commands

HA32	Read prediction action

Responses

HA32␣B␣<Action>␣<State>␣<Duration> HA32␣A␣<Action>␣<State>␣<Duration>	Prediction action for the running measurement.
HA32␣I	Command understood but currently not executable (no measurement is running, therefore command is not available).

Parameters

Name	Type	Values	Meaning
<Action>	Integer	1	Save prediction and continue the measurement.
		2	Save prediction and stop the measurement.
<State>	Integer	0	Action deactivated.
		1	Action activated but no prediction available at the moment.
		2	Action activated but the defined precondition is not fulfilled.
		3	The number of available action calls has already been reached.
		4	Action activated and executable.
<DurationOrTime>	Integer		Drying duration in seconds as the response was created.

Comments

- The availability of an action depends on several factors:
  - The action must be enabled for the corresponding method.
  - A prediction must be available.
  - The current prediction must meet the defined conditions of the action.
  - The availability of an action may change during the measurement.
- Usually the conditions to execute the prediction actions are defined in the method. In case the host implements the preconditions, the command [HA30 ▶ Page 31] can be used to get the current data for decision base.

Example

↓	`HA32`	Query for current prediction actions.
↑	`HA32␣B␣1␣1␣90` `HA32␣A␣2␣1␣90`	Both prediction actions are activated in the method settings but no prediction available at the moment.
↑	`HA32␣B␣1␣2␣131` `HA32␣A␣4␣0␣131`	The action "Save & Continue" is activated but the precondition for the execution is not fulfilled. The action "Save & Stop" is deactivated in the method settings.
↑	`HA32␣B␣1␣3␣256` `HA32␣A␣2␣4␣256`	Both prediction action are activated in the method settings. The action "Save & Continue" was already executed and is not available anymore. The action "Save & Stop" is still available.

HA33 – Execute prediction action

Description

This command is only supported for QuickPredict methods. During a measurement with an active prediction, it is possible to store the current prediction as an intermediate final result or accept a prediction as a final result of the running measurement.

Supported Products

HX204	HS153	HC103
✓	✓	—

Syntax

Commands

HA33␣<Action>	Execute prediction action

Responses

HA33␣A␣<Type>␣<Value>␣<Uncertainty>␣<Unit>␣<Time>	Stored final result.

Parameters

Name	Type	Values	Meaning
<Action>	Integer	1	Save prediction and continue the measurement.
		2	Save prediction and stop the measurement.
<Type>	Integer	0	Action not executed, no action result (Query further information about the cause with HA32).
		1	Intermediately stored predicted final result.
		2	Finally stored predicted final result (the measurement has been stopped by the action).
<Value>	Float		Stored predicted final value or 0.00 if action was not executed.
<Uncertainty>	Float		Stored predicted final result uncertainty or 0.00 if action was not executed.
<Unit>	String	Max 8 chars	Display Unit as text. Unit of <Value> and <Uncertainty> (see list in HA26/HA27).
<Time>	Integer		Drying duration in seconds as the predicted result has been calculated or 0 if the action was not executed.

Comments

- The availability of an action depends on several factors:
  - Action must be enabled for the corresponding method.
  - A prediction must be available
  - The current prediction must meet the defined preconditions of the action
- Usually the preconditions to execute the prediction actions are defined in the method and the availability of prediction actions can be queried using command HA32 [HA32 ▸ Page 35]. In case the host implements the preconditions, the command [HA30 ▸ Page 31] can be used to get the current data for decision base.

Example

↓	`HA33␣1`	Query the stored results for the current measurement.
↑	`HA33␣A␣1␣11.17␣0.23␣%MC␣430`	The action "Save & Continue" was sent and was executed successfully. The saved intermediate prediction was calculated at 430 sec after measurement start.
↑	`HA33␣A␣0␣0.00␣0.00␣%MC␣0`	The action "Save & Continue" was sent but was not executed.

HA61 – Method parameters: Unit, switch-off criteria, temperature profile

Description

Method parameters of current measurement regarding unit, switch-off criteria and drying program.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

`HA61␣1`	Query of method parameter.

Responses

`HA61␣A␣<Method>␣<UnitID>␣`
`<SwitchOff>␣<Timer>␣<Program>␣`
`<Temperature>␣<RampTime>␣<Level1Temp>␣`
`<Level1Time>␣<Level2Temp>`
	Current setting of the method parameters.

`HA61␣A`	Command understood and executed successfully.
`HA61␣I`	Command understood but currently not executable (no method defined).
`HA61␣L`	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
`<Method>`	Integer	1	Current method is shown
`<UnitID>`	Integer	1	Grams
		2	DC (dry content)
		3	MC (moisture content), (factory setting)
		4	AM (ATRO moisture content)
		5	AD (ATRO dry content)
		6	g/kg MC (moisture content)
		7	g/kg DC (dry content)
		8	-MC (negative moisture content)
`<SwitchOff>`	Integer	1	Switch off manually (n/a)
		2	Switch off via timer
		3	Test measurement
		4	Switch-off criterion 1 (1 mg / 10 s); for samples which dry very quickly
		5	Switch-off criterion 2 (1 mg / 20 s); for samples which dry quickly
		6	Switch-off criterion 3 (1 mg / 50 s); suitable for most types of samples (factory setting)
		7	Switch-off criterion 4 (1 mg / 90 s); for samples which dry moderately quickly
		8	Switch-off criterion 5 (1 mg / 140 s); for samples which dry very slowly
		9	Free switch-off criterion
`<Timer>`	Integer	30 … 28800	Set the timer in seconds (factory setting: 900 s)

Name	Type	Values	Meaning
`<Program>`	Integer	1	Standard drying (factory setting)
		2	Rapid drying
		3	Gentle drying
		4	Step drying
`<Temperature>`	Integer	40 … 230	Set temperature in °C (factory setting: 105 °C)
`<RampTime>`	Integer	0 … 28800	Ramp time in seconds (factory setting: 180 s)
`<Level1Temp>`	Integer	50 … 230	Temperature of level 1 of step drying, in °C (factory setting: 50 °C)
`<Level1Time>`	Integer	0 … 28800	Time of level 1 of step drying, in seconds (factory setting: 300 s)
`<Level2Temp>`	Integer	50 … 230	Temperature of level 2 of step drying, in °C (factory setting: 105 °C)
`<Level2Time>`	Integer	0 … 28800	Time of level 2 of step drying, in seconds (factory setting: 0 s)

Example

↓	`HA61␣1`	Query method parameters for method 1.
↑	`HA61␣A␣1␣1␣6␣300␣1␣160␣180␣105␣0␣105␣0`	Method parameters set: display mode grams, switch-off criterion 3, timer 300 seconds, standard drying, set temperature 160 °C, ramp time 180 seconds, level 1 temperature 105 °C, level 1 time 0 seconds, level 2 temperature 105 °C, level 2 time 0 seconds.

HA62 – Method parameters: Target weight, print interval, method name, method code

Description

Method parameters of current measurement regarding target weight, print interval and method name.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA62␣<Method>	Query of method parameter.

Responses

HA62␣A␣<Method>␣<TargetWeight>␣ <PrintInterval>␣<MethodName>␣<TextID1>	Current setting of the method parameters.
HA62␣A	Command understood and executed successfully.
HA62␣I	Command understood but currently not executable (no method defined).
HA62␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	1	Current method is shown
<TargetWeight>	Float	0.100 … 200.000	Target weight in grams HX204: 0.100 … 200.000 HS153: 0.100 … 150.000 HC103: 0.500 … 100.000
<PrintInterval>	Integer	0	No print interval set
		10	Printout every 10 seconds
		30	Printout every 30 seconds
		60	Printout every 60 seconds
		120	Printout every 120 seconds
		600	Printout every 600 seconds
<MethodName>	String	Max 30 chars	Name for the method
<TextID1>	String	Max 30 chars	Comments (ID) for the measurement

Example

↓	HA62␣1	Query method parameters for method 1.
↑	HA62␣A␣1␣5.000␣30␣"Butter"␣""	Method parameters: target weight 5.000 g, print interval 30 seconds, method name "Butter", no ID.

HA64 – Drying method list

Description

Outputs a list of drying methods.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

HA64	Query of the available drying methods.

Responses

HA64␣B␣<"MethodName"> HA64␣B… HA64␣A␣<"">	Current drying method name.
HA64␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<"MethodName">	String	Max 30 chars	Name of drying method

Comment

- The drying method list is independent of activated/deactivated state of drying method.

Example

↓	HA64	Query of the available drying methods.
↑	HA64␣B␣"Milkpowder"	The drying method "Milkpowder" is available.
↑	HA64␣B␣"Cocoa"	The drying method "Cocoa" is available.
↑	HA64␣A␣""	There are two available drying methods "Milkpowder" and "Cocoa" on the device.

HA65 – Drying method name

Description

Gets or sets a drying method.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

`HA65`	Query of the current drying method name.
`HA65␣<"MethodName">`	Set the drying method name.

Responses

`HA65␣A␣<"MethodName">`	Current drying method name.
`HA65␣A`	Command understood and executed successfully.
`HA65␣I`	Command not executable due to a general error.
`HA65␣L`	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
`<"MethodName">`	String	`Max 30 chars`	Name of drying method

Comment

• The drying method selection is independent of activated/deactivated state of drying method.

Examples

↓	`HA65`	Query of the current drying method name.
↑	`HA65␣A␣"Milkpowder"`	The drying method "Milkpowder" is set.

↓	`HA65`	Query of the current drying method name.
↑	`HA65␣A␣""`	No drying method was set, e.g., device in base state.

↓	`HA65␣"Milkpowder"`	Set the drying method to "Milkpowder".
↑	`HA65␣A`	The drying method "Milkpowder" is set.

Command-specific error responses

Response

`HA65␣E␣<Error>`	Current error code.

Parameter of command-specific error

Parameter

Name	Type	Values	Meaning
`<Error>`	Integer	1	Drying method not existing
		2	Device is not in base state, e.g., drying ongoing
		3	Measurement cannot be selected because the results limit has been reached

See also

📄 HA07 – Device status change reporting ▸ Page 24

📄 HA64 – Drying method list ▸ Page 42

HA66 – Drying method parameterset

Description

Read all active parameters of a drying method. Inactive method parameters are not included in the command answer.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

`HA66␣<"MethodName">`	Query of the current drying method name.

Responses

`HA66␣B␣Level␣Type␣<"Key">␣ValueList`
`HA66␣B…`
`HA66␣A␣Level␣Type␣<"Key">␣ValueList`
	Current drying method parameters.

`HA66␣I`	Command not executable due to a general error.
`HA66␣L`	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
`<"MethodName">`	String	`Max 30 chars`	Name of drying method
`<Level>`	Integer	`0 … 255`	Level number of the data element (factory setting: 0)
`<Type>`	Integer	`0`	Start method parameter set
		`1`	End method parameter set
		`2`	Method name
		`3`	Node, can contain other nodes and properties
		`4`	Property, type of property is specified in the `"Key"`
`<"Key">`	String	`Max 100 chars`	Name of the data element
`<ValueList>`	String	`Max 100 chars`	Variable list of values. Each value is a quoted string. Values are separated by a space. There can be `0` to `N` values. The total length of the value list including quotes and separating spaces must not exceed the specified amount.

Comments

- If the command terminates with an `A`-answer, the `Key` is "END" and values "OK".
- Properties use the type name as `Key`.

Examples

In this example the parameter set of drying method "Almonds, ground" is read out.

↓	`HA66␣"Almonds,␣ground"`	Query the parameter set of drying method "Almonds, ground".
↑	`HA66␣B␣0␣0␣"SWVersion"␣"2.30"`	Method parameters set: level 0, type start method parameter set, key "SWVersion", value list "2.30".
↑	`HA66␣B␣1␣2␣"Name"␣"Almonds,␣ground"`	Method parameters set: level 1, method name, key "Name", value list "Almond, ground".
↑	`HA66␣B␣2␣3␣"Root"␣"0"`	Method parameters set: level 2, type node, can contain other nodes and properties, key "Root", value list "0".
↑	`HA66␣B␣3␣3␣"Main measurement parameter"␣"Main measuring parameters"␣"0"`	Method parameters set: level 3, type node, can contain other nodes and properties, key "Main measurement parameter" "Main measurement parameter", value list "0".
↑	`HA66␣B␣4␣3␣"Drying␣program"␣"Drying␣program"␣"0"`	Method parameters set: level 4, type node, can contain other nodes and properties, key "Drying program" "Drying program", value list "0".
↑	`HA66␣B␣5␣4␣"Enumeration"␣"Standard"`	Method parameters set: level 5, type property, type of property is specified in the "Key", key "Enumeration" "Standard".
↑	`HA66␣B␣6␣4␣"String"␣"Standard"`	Method parameters set: level 6, type property, type of property is specified in the "Key", key "String" "Standard".
↑	`HA66␣B␣6␣4␣"String"␣"Rapid"`	Method parameters set: level 6, type property, type of property is specified in the "Key", key "String" "Rapid".
↑	`HA66␣B␣5␣3␣"Drying␣temper-ature␣(S)"␣"Drying␣tem-perature"␣"0"␣"Standard"`	Method parameters set: level 5, type node, can contain other nodes and properties, key "Drying temperature (S)" "Drying temperature", value list "0" "Standard".
↑	`HA66␣B␣6␣4␣"Temperature"␣"130"␣"40"␣"230"␣"0"␣"1"`	Method parameters set: level 6, type property, type of property is specified in the "Key", key "Temperature", value list "130" "40" "230" "0" "1".
↑	…	
↑	`HA66␣A␣0␣1␣"END"␣"OK"`	All method parameters for the drying method "Almonds, ground" have been read out.

In this example the parameter set of drying method "Almonds, ground" could not be read out due to a method error.

↓	`HA66␣"Almonds,␣ground"`	Query the parameter set of drying method "Almonds, ground".
↑	`HA66␣B␣0␣0␣"SWVersion"␣"2.30"`	Method parameters set: level 0, type start method parameter set, key "SWVersion", value list "2.30".
↑	`HA66␣B␣1␣2␣"Name"␣"Almonds,␣ground"`	Method parameters set: level 1, method name, key "Name", value list "Almond, ground".
↑	`HA66␣B␣2␣3␣"Root"␣"0"`	Method parameters set: level 2, type node, can contain other nodes and properties, key "Root", value list "0".
↑	`HA66␣B␣3␣3␣"Main measurement parameter"␣"Main measuring parameters"`	Method parameters set: level 3, type node, can contain other nodes and properties, key "Main measurement parameter" "Main measurement parameter", value list "0".
↑	…	
↑	`HA66␣E␣1␣"Unknown␣Datatype-␣QProperty"`	All method parameters for the drying method "Almonds, ground" cannot be read out due to a method error.

Command-specific error responses

Response

`HA66␣E␣<Error>`	Current error code.

Parameter of command-specific error

Parameter

Name	Type	Values	Meaning
`<Error>`	Integer	0	Command error
		1	Method error

See also

📄 HA64 – Drying method list ▶

HA621 – ID1

Description

Query comments for ID1.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA621␣<Method>	Query Text ID1.

Responses

HA621␣A␣<"TextID1">	Command understood and executed successfully.
HA621␣I	Command understood but currently not executable (no method or ID defined).
HA621␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0	Current method is shown
<"TextID1">	String	Max 30 chars	Text ID1 (factory setting: " "). Text with reduced character set

Example

↓	HA621␣0	Text ID1.
↑	HA621␣A␣"Coffee␣Powder"	Query of Text ID1 "Coffee Powder".

HA622 – ID2

Description

Query comments for ID2.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA622␣<Method>	Query Text ID2.

Responses

HA622␣A␣<"TextID2">	Command understood and executed successfully.
HA622␣I	Command understood but currently not executable (no method or ID defined).
HA622␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0	Current method is shown
<"TextID2">	String	Max 30 chars	Text ID2 (factory setting: " "). Text with reduced character set

Example

↓	HA622␣0	Text ID2.
↑	HA622␣A␣"Milk␣Powder"	Query of Text ID2 "Milk Powder".

HA623 – ID3

Description

Query comments for ID3.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA623_<Method>	Query Text ID3.

Responses

HA623_A_<"TextID3">	Command understood and executed successfully.
HA623_I	Command understood but currently not executable (no method or ID defined).
HA623_L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0	Current method is shown
<"TextID3">	String	Max 30 chars	Text ID3 (factory setting: " "). Text with reduced character set

Example

↓	HA623_0	Text ID3.
↑	HA623_A_"Chocolate"	Query of Text ID3 "Chocolate".

HA624 – ID4

Description

Query comments for ID4.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

HA624␣<Method>	Query Text ID4.

Responses

HA624␣A␣<"TextID4">	Command understood and executed successfully.
HA624␣I	Command understood but currently not executable (no method or ID defined).
HA624␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<Method>	Integer	0	Current method is shown
<"TextID4">	String	Max 30 chars	Text ID4 (factory setting: " "). Text with reduced character set

Example

↓	HA624␣0	Text ID4.
↑	HA624␣A␣"Orange␣juice"	Query of Text ID4 "Orange juice".

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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).

Comment

- If I0 lists commands that cannot be found in the manual, these are reserved commands "for internal use" or "for future use", and should not be used or altered in any way.

Example

↓	I0	Send list of commands.
↑	I0␣B␣0␣"I0"	Level 0 command I0 implemented.
↑	I0␣B…	…
↑	I0␣B␣0␣"@"	Level 0 command @ [@ ▸ Page 13] (cancel) implemented.
↑	I0␣B␣1␣"D"	Level 1 command D implemented.
↑	I0␣B…	…
↑	I0␣A␣3␣"SM4"	Level 3 command SM4 implemented.

See also

📄 @ – Abort ▸ Page 13

📄 C – Cancel all commands ▸ Page 14

I1 – MT-SICS level and level versions

Description

Query MT-SICS level and versions.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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)

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.

📝 Note

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

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

- Level 0 fixed to version 2.30
- Level 1 fixed to version 2.22
- Level 2 fixed to version 2.33
- Level 3 is product specific and must be defined by the according product team
  For Rainbow examples, Level 3 is fixed to version 2.20

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

MT-SICS Levels

Since the 1980s, products launched on the market support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS), which is divided into 4 levels, depending on the functionality of the device:

MT-SICS level 0:	Basic command set, e.g., weighing cell.
MT-SICS level 1:	Elementary command set, i.e. balances without integrated applications.
MT-SICS level 2:	Extended command, maybe set specific for a device family, e.g., for the Excellence balance line.
MT-SICS level 3:	Application-specific command set, e.g., MT-SICS for piece counting or percent weighing, dynamic weighing, Moisture Analyzer.

Commands of MT-SICS Level 0

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

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

Commands of MT-SICS Level 1

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

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

Commands of MT-SICS Level 2

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

C…, E…, COM, DAT, DATI, ECHO, I…, M…, P…, PWR, R…, SI…, SN…, SM…, SU…, TIM, TS…, UPD, WS, ZS

Commands of MT-SICS Level 3

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

A…, LX…, PW, SM…

See also

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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

Comment

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

Example

↓	I2	Query of the balance data.
↑	I2␣A␣"HX204␣Excellence␣Plus␣ 200.900␣g"	Balance type and capacity.

See also

📄 I14 – Device information ▸ Page 61

I3 – Software version number and type definition number

Description

Provides the software version number and the type definition number.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

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

Responses

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

Parameters

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

Comment

- More detailed information is available with [I14 ▸ Page 61].

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

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

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 `@` [@ ▶ Page 13].
- More detailed information is available with command `I14` [I14 ▶ Page 61].

Example

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

See also

📄 @ – Abort ▶ Page 13
📄 I14 – Device information ▶ Page 61

I5 – Software material number

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

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 ▶ Page 61].

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 61

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

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

Responses

I10␣A␣<"ID">	Current balance ID.
I10␣A	Command understood and executed successfully.
I10␣I	Command understood but currently not executable (balance is currently executing another command).
I10␣L	Command not executed as the balance ID is too long (max. 20 characters).

Parameter

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

Comments

- A sequence of maximum 20 alphanumeric characters are possible as <ID>.
- The set balance ID is retained even after the cancel command [@ ▸ Page 13].

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

I11	Query of the current balance or weigh module type.

Responses

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

Parameter

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

Comments

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

• The following abbreviations used in model designations are relevant to MT-SICS:
DR = Delta Range.
DU = Dual Range.
/M, /A = Approved balance or weigh module.

Example

↓	I11	Query of the current balance type.
↑	I11␣A␣"HX204"	The balance is an "HX204".

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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).

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".

I16 – Date of next service

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

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.

I28 – Inclination sensor state

Description

Indicates whether or not the vertical deviation of the device is within the permissible limits.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

I28	Query the current state of inclination sensor.

Responses

I28␣A␣<Status>	Current state of inclination sensor.
I28␣I	The inclination sensor cannot be transferred at present as another operation is taking place or there is a failure at the inclination sensor.

Parameter

Name	Type	Values	Meaning
<Status>	Integer	0	Within the limits
		1	Outside the limits

Comments

- Also supported by stand-alone platforms. During stand-alone operation, the backlighting for the inclination sensor is not activated.
- If no inclination sensor is present, an "ES" response is generated.

Example

↓	I28	Query of the current state of the inclination sensor.
↑	I28␣A␣1	The vertical deviation of the device is outside the limit.

M07 – AutoDoor function

Description

You can use M07 to set the AutoDoor function or query the current setting. The AutoDoor function automatically opens and closes the door, the doors or the cover depending on the instrument.

Supported Products

HX204	HS153	HC103
✓	—	—

Syntax

Commands

M07	Query of the current AutoDoor setting.
M07␣<AutoDoor>	Set the AutoDoor function.

Responses

M07␣A␣<AutoDoor>	Current AutoDoor setting.
M07␣A	Command understood and executed successfully.
M07␣I	Command understood but currently not executable.
M07␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<AutoDoor>	Integer	0	AutoDoor function switched off
		1	AutoDoor function switched on

Comments

- For further details, **see** the section titled "Door function" in the "User settings" chapter of the Reference Manual of the balance.

Example

↓	M07␣1	AutoDoor function switched on.
↑	M07␣A	AutoDoor function is set.

M14 – Available languages

Description

This command is used to output all available languages on the device with language identification and language name.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

M14	Query of the available languages.

Responses

M14␣B␣<ID>␣<"Language"> M14␣B… M14␣A␣<ID>␣<"Language">	First language. … Last language.
M14␣I	Command understood but currently not executable.
M14␣L	Command understood but not executable (incorrect parameter).

Parameters

Name	Type	Values	Meaning
<ID>	Integer	0 … max	Language number
<"Language">	Integer	0	English
		1	German
		2	French
		3	Spanish
		4	Italian
		5	Russian
		6	Japanese simplified (Katakana only)
		7	English (United States)
		8	Polish
		9	Reserved
		10	Czech
		11	Hungarian
		12	Slovak
		13	Slovene
		14	Dutch
		15	Portuguese
		16	Chinese
		17	Japanese (Nihongo)
		18	Korean
		19	Portuguese (Brazil)
		20	Danish
		21	Turkish

Example

↓	`M14`	Query of the available languages.
↑	`M14␣B␣0␣"English"`	No 0 language is English.
↑	`M14␣B␣1␣"Deutsch"`	No 1 language is Deutsch.
↑	`M14␣B␣2␣"Français"`	No 2 language is Français.
↑	`M14␣B␣3␣"Español"`	No 3 language is Español.
↑	`M14␣B␣4␣"Italiano"`	No 4 language is Italiano.
↑	`M14␣B␣5␣"Russian"`	No 5 language is Russian.
↑	`M14␣B␣6␣"Katakana"`	No 6 language is Katakana.
↑	`M14␣B␣8␣"Polski"`	No 8 language is Polski.
↑	`M14␣B␣10␣"Cestina"`	No 10 language is Cestina.
↑	`M14␣B␣11␣"Magyar"`	No 11 language is Magyar.
↑	`M14␣B␣16␣"Chinese"`	No 16 language is Chinese.
↑	`M14␣A␣17␣"Japanese"`	No 17 language is Japanese.

M21 – Unit

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

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		

Name	Type	Values	Meaning		
<Unit>	Integer	0			**Applicable for definition unit**
			Gram	g	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.

Examples

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

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

M31 – Operating mode after restart

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

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.

PWR – Switch on / Switch off

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

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

Responses

PWR␣A	Balance has been switched off successfully.
PWR␣A␣ I4␣A␣<"SNR">	Balance with the serial number "SNR" has been switched on successfully see [I4 ▶ Page 57].
PWR␣I	Command understood but currently not executable (balance is currently executing another command, e.g., taring, or application is not in Home screen).
PWR␣L	Command understood but not executable.

Parameter

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

Comments

- The balance response to [I4 ▶ Page 57] appears unsolicited after switching the balance on.
- In case of cable power driven devices, the switch off command set the device in the standby state.
- In case of cable power and battery driven devices:
  - If the device is cable powered, the switch off command PWR␣0 set the device in the standby state.
  - If the device is battery powered, the switch off command PWR␣0 set the device in the off state.

Example

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

See also

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

S	Send the current stable net weight value.

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 Format of responses with weight value.

Example

↓	S	Send a stable weight value.
↑	S␣S␣␣␣␣␣100.00␣g	The current, stable ("S") weight value is 100.00 g.

SI – Weight value immediately

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

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

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

Example

↓	`SI`	Send current weight value.
↑	`S␣D␣␣␣␣␣129.07␣g`	The weight value is unstable (dynamic, "D") and is currently 129.07 g.

SIR – Weight value immediately and repeat

Description

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Command

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

Parameters

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

Comments

- SIR is overwritten by the commands [S ▸ Page 73], [SI ▸ Page 74], [@ ▸ Page 13] and hardware break and hence cancelled.
- This command is cancelled by the [@ ▸ Page 13], [S ▸ Page 73], [SI ▸ Page 74], SIRU, SIU, SNR, SNRU, SR and SRU commands.

Example

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

See also

▤ UPD – Update rate of SIR and SIRU output on the host interface ▸ Page 77

TIM – Time

Description

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

Supported Products

HX204	HS153	HC103
✓	✓	✓

Syntax

Commands

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

Responses

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

Parameters

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

Example

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

See also

📄 DAT – Date ▸ Page 21

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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 … 11.4	Update rate in values per second 1 … 11.4

Comments

Examples

↓	UPD	Query of the update rate of the host interface.
↑	UPD␣A␣11.2	The update rate of the interface is 11.2 values per second.

↓	UPD␣12	Set the update rate of the host interface to 12 values per second.
↑	UPD␣A	Command executed successfully.
↑	UPD	Query of the exact update rate of the host interface.
↑	UPD␣A␣10.311	The exact update rate is 10.311 values per second.

See also

SIR – Weight value immediately and repeat ▸ Page 75

WS – Draft shield doors

Description

Use `WS` to query the position of the draft shield doors, or open/close the draft shield doors.

Supported Products

HX204	HS153	HC103
✓	—	—

Syntax

Commands

WS	Query the position of the draft shield doors.
WS␣<Door>	Open or close draft shield door(s).

Responses

WS␣<Status>	
WS␣A	Command understood open/close starts.
WS␣I	Command understood but currently not executable (balance is currently executing another command).
WS␣L	Command understood but not executable (incorrect parameter).

Parameter

Name	Type	Values	Meaning
<Status>	Integer		Identification of the status of the draft shield doors' positions. (Supported values are product dependent)
		0	All draft shield doors closed
		1	All or right draft shield door(s) opened (see notes "single drive mechanism")
		2	Left draft shield door(s) opened
		3	Top draft shield door opened
		4	Right and left draft shield doors opened
		5	Right, left and top draft shield doors opened
		6	Right and top draft shield doors opened
		7	Left and top draft shield doors opened
		8	Error
		9	Intermediate
<Door>	Integer		Identification of the draft shield door(s). (Supported values are product dependent)
		0	Close all draft shield doors
		1	Open all or the right draft shield door(s) (see notes "single drive mechanism")
		2	Open all or the left draft shield door(s) (see notes "single drive mechanism")
		3	Open the top draft shield door(s)
		4	Open the right and left draft shield doors
		5	Open the right, left and top draft shield doors
		6	Open the right and top draft shield doors
		7	Open the left and top draft shield doors

Comments

- The user must ensure that the doors are in the correct position. If the doors are blocked when closing, then they return to their original position. The position can be monitored by a query command.

Command-specific error responses

Commands

WS␣3	Open the top draft shield door.

Responses

WS␣L	Command understood but not executable (the balance have not a top draft shield door).

Examples

↓	WS␣1	Open the draft shield door(s).
↑	WS␣A	Draft shield door(s) opened.

↓	WS	Query the position of the draft shield doors.
↑	WS␣9	Draft shield has not opened yet, because too little time has passed.

↓	WS	Query the position of the draft shield doors.
↑	WS␣1	Draft shield door(s) successfully opened.

↓	WS␣0	Close all draft shield doors.
↑	WS␣A	All draft shield door(s) are closed.

↓	WS	Query the position of the draft shield doors.
↑	WS␣0	Draft shield doors successfully closed.

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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.

Example

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

See also

📄 ZI – Zero immediately ▸ Page 81

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.

Supported Products

HX204	HS153	HC103
✓	✓	✓

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.

Example

␣	ZI	Zero immediately.
␣	ZI␣D	Re-zero performed under non-stable (dynamic) conditions.

See also

4 What if…?

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

Establishing the communication

Test whether the unidirectional operation is working.

Switch the Moisture Analyzer off with the "Off" key and then on again with the "On" key.

The Moisture Analyzer must now send identification string [I4 ▶ Page 57], e.g., `I4_A_"0123456789"`.

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

Connection

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

* Data line from the balance (TxD signal).
* Data line to the balance (RxD signal).
* Signal ground line (GNDINT).

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

Interface parameters

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

* 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 Moisture Analyzer 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 Moisture Analyzer and the peripheral device to "No Handshake" or "none". The handshake lines now have no influence on the communication.

Characters are not displayed correctly

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

See also

📄 I4 – Serial number ▶ Page 57

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