



Anton Paar

Measure
what is measurable
and make measurable
that which is not.

Galileo Galilei (1564-1642)

Reference Guide

General Software Functions M Series Instruments

master instrument software version: from 2.98
(Original Instructions)

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Further information

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Contents

1 About the Manual	5
2 Safety Instructions	5
3 M Series Instrument Software – An Overview	6
4 Operating the Instrument Software	7
4.1 Input Options	7
4.1.1 Using the External Keyboard	7
4.2 Using the Touch Screen	7
4.3 Calibrating the Touch Screen	9
4.4 Setting the Display Brightness	9
4.5 Setting the Screen Saver	9
4.6 Sound Settings	9
4.7 Logging On/Off	9
4.8 Using Favorites	10
5 Installing Optional Input/Output Devices	11
5.1 External Keyboard, Barcode Reader, Touchpad for Gesture Control, Mouse	11
5.2 USB Storage Device	11
5.3 Printer	11
5.3.1 Connecting a Printer	11
5.3.2 Registering, Editing, Deleting a Printer	12
5.4 External Monitor or Data Projector	12
5.5 External Touch Screen	12
6 Defining General Settings	13
6.1 Instrument Settings	13
6.1.1 Date and Time	13
6.1.2 Regional Settings	13
6.1.3 Time Server Settings	13
6.1.4 Input Units	13
6.1.5 Air Pump Settings	14
6.1.6 Network	14
6.1.7 Virtual Network Computing	14
6.1.8 FTP Settings	15
6.1.9 Instrument Name and Location	15
6.2 Defining the Printout Settings	15
6.2.1 Creating, Editing and Deleting Printer Report Layouts	15
6.2.2 Defining Header and Background of the Printer Report	16
6.2.3 Activating/Deactivating an Automatic Printout	16
6.3 Setting Sample List Options	16
6.4 Temperature Extrapolation Settings	17
6.5 Installing User Groups, User Accounts and Passwords	18
6.5.1 Creating, Editing, and Deleting User Groups	18
6.5.2 Creating, Editing, and Deleting User Accounts	18
6.5.3 Setting Notifications via Email	20
7 Defining and Using Methods	21
7.1 Measuring Methods	21
7.2 Changing Methods	21
7.2.1 Defining the Active Modules	21
7.2.2 Defining the Displayed Output Fields	21
7.2.3 Defining the Result Output	21
7.2.4 Defining Limits	22
7.2.5 Defining Quick Settings Parameters	22
7.3 Creating, Deleting, Hiding, and Arranging Methods	22
7.4 Selecting the Method	23

7.5 Using the “No Sample List” Mode	23
7.6 Using the “Sample List” Mode	24
8 Handling the Measurement Data	25
8.1 Defining the Data Memory Settings	25
8.2 Defining Data Columns for the Data Browser	25
8.3 Viewing Results	25
8.4 Filtering Results	26
8.5 Viewing Statistics	26
8.6 Printing and Exporting Results and Other Data	27
8.7 Deleting Results	27
8.8 Archiving Results	28
9 Using Special Functions	29
9.1 System Security	29
9.1.1 Security Level	29
9.1.2 Non Storage Mode	29
9.1.3 Value Visibility	30
9.1.4 Auto Logoff, Password Expiry, and Password Length	30
9.1.5 Increased Security	31
9.1.6 Advanced Security	31
9.1.7 Audit Trail	32
9.1.8 Electronic Signature	33
9.2 Functions – Constants, Formulas, Polynomials, Tables	34
9.3 Calculator	38
9.4 Group Calculator	39
10 Service Utilities	40
10.1 Making a Backup of the Instrument Settings	40
10.2 Restoring the Instrument Settings	40
10.3 Full System Backup and Restore	40
10.3.1 Performing a Full System Backup	41
10.3.2 Performing a Full System Restore	41
10.4 Updating the Software	42
10.5 Viewing the System Information	42
10.6 Exporting Instrument Data	43
10.7 Creating an IQ/OQ Report	43
10.8 Reset to Factory Settings	43
10.9 Viewing, Printing, or Exporting Live Raw Data	43
10.10 Unlocking the Service Functions	44
11 Communication / Data Transfer	45
11.1 Connecting the Instrument to an External PC via Ethernet	45
11.2 Connecting the Instrument to an External PC via RS-232	45
11.3 Operating the Instrument via Remote Control	45
11.4 Connecting the Instrument to a LIMS	49
11.5 Connecting the Instrument to AP Connect	49
11.6 Operating the Instrument via M Series Desktop Software	49
Appendix A: Software Versions	50
Appendix B: Troubleshooting	52
Appendix C: Barcodes for Assigning Methods	54

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1 About the Manual

This manual gives information about general functions of the M series instrument software. All M series instruments and modules of the Anton Paar GmbH run on this instrument software. This manual explains software features (e.g. setting date and time of the instrument, installing additional I/O equipment) that are not instrument specific and not related to the measuring procedure.

Instrument specific functions (e.g. required adjustments or setting measuring parameters) are described in the documentation of the corresponding instrument.

Conventions for safety messages

The following conventions for safety messages are used throughout this manual:

NOTICE

Description of risk

Notice indicates a situation which, if not avoided, could result in damage to property.

TIP: *Tip gives extra information about the situation at hand.*

Typographical conventions

The following typographical conventions are used throughout this manual:

Convention	Description
<key>	The names of keys and buttons are written between angle brackets.
<i>menu level 1</i> > <i>menu level 2</i>	Menu paths are written in italics. Menu levels are connected by a closing angle bracket.

2 Safety Instructions

- Read the documentation before using an M series instrument.
- Follow all hints and instructions in the documentation to ensure the correct use and safe functioning of the M series instruments.
- The documentation is a part of the product. Keep it for the complete working life of the product and make it easily accessible for all persons involved with the product. If you receive any additions or revisions to the documentation from Anton Paar GmbH, these must be treated as part of the documentation.

Liability

- This document does not claim to address all safety issues associated with the use of the instruments and samples. It is your responsibility to establish health and safety practices and to determine the applicability of regulatory limitations.
- Anton Paar GmbH only warrants the proper functioning of its instruments if no modifications are made to mechanics, electronics, or software.

3 M Series Instrument Software – An Overview

The M series instrument software runs on an embedded PC, which sits on the DCB (Device Computer Board) of the measuring instrument.

All M series instruments use this software.

Data management and safety

The instrument software offers up-to-date data management and safety features to make your work easier and help you comply with your quality management regulations:

- Print out reports.
- Export data in the format of your choice (MS Excel, text or PDF).

- Use the powerful audit trail function with tamper-proof data export (checksum).
- Rely on full compliance with GLP/GMP and 21 CFR part 11 (not applicable for DMA 4200 M, DMA 4500 M Chemicals).

Measuring methods

The instrument software provides various measuring methods depending on the instrument or measuring system, see the manual of each instrument.

How to set certain method parameters, is the same for all instruments, see section 7.1.

4 Operating the Instrument Software

4.1 Input Options

You can:

- Tap the elements on the touch screen.
- Use a computer mouse and click on the elements on the touch screen.
- Use an external keyboard to enter characters.
- Use a barcode reader.
- Use a touchpad for gesture control (not available for SDA M and Alcolyzer M).
- Use the softkeys below the touch screen (except instruments with 10.4" display).

4.1.1 Using the External Keyboard

To use buttons

When an external keyboard is connected, you can use the function keys <F1> to <F5> to operate the five buttons within the buttons area. <F1> corresponds to the leftmost button, <F5> corresponds to the rightmost button.

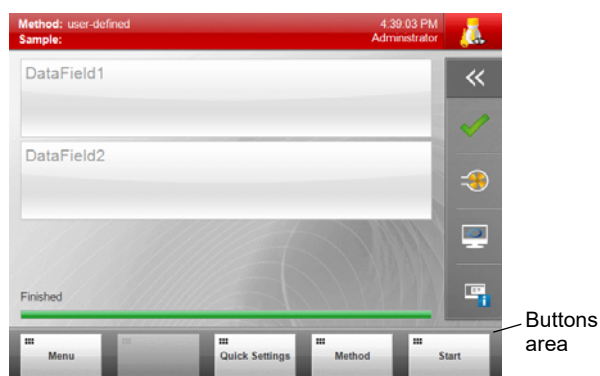


Fig. 1: Buttons area

To navigate within lists

- To move the cursor one line up or down within the list, press the <▲> or <▼> key on your external keyboard.
- To move the cursor one page up or down, press the <PgUp> or <PgDn> key on your external keyboard.

To navigate within wizards

- To navigate to the next wizard step, press <↵> on your external keyboard.

To exit dialog windows and wizards with/without saving

- To exit and save changes, press the <↵> key on your external keyboard.
- To exit without saving changes, press the <Esc> key on your external keyboard.

4.2 Using the Touch Screen

In the following parts of this manual, the operation of the instrument is described only for the input option touch screen.

NOTICE

- Operate the touch screen with clean and dry fingers only.
- Never use any sharp objects.
- Operate the touch screen with gentle fingertip pressure only.

To use buttons

Use the buttons by directly tapping on them.

The buttons at the bottom of the screen can also be activated with the softkeys below them (except instruments with 10.4" display).

To highlight items

To highlight a row in a table or list, directly tap on the row. The highlighted row will change its color from white to dark gray.

To use drop-down boxes

1. Tap on the drop-down box and then highlight an item in the drop-down list.
2. Tap <OK> to select the entry and close the list.

To use checkboxes

Tap on the checkbox to activate or deactivate it, see fig. 2.

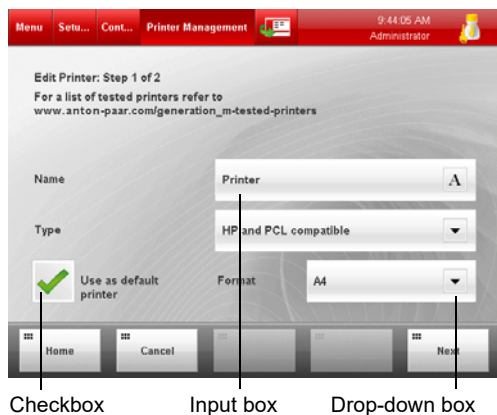


Fig. 2: Example of checkboxes, input boxes and drop-down boxes

To enter characters into an input box or a list field

1. Open the on-screen keyboard by one of the following operations:
 - Tap on the input box or list field twice.
 - Tap the "A" symbol within the input box or list field, see fig. 2.
2. Enter characters/numbers/special characters by tapping the buttons on the screen and then tap <OK>.



Fig. 3: On-screen keyboard

The functions of the special buttons are:

Button	Function
	Deletes the character on the left side of the cursor position.
	Moves the cursor position to the left.
	Moves the cursor position to the right.
	Changes to upper case in alphabetic character mode and to special characters in number mode.
	Changes to the number mode.
	Changes to alphabetic character mode.
	Changes to further special characters.
	For notation of exponential numbers, e.g. you may enter 0.025 as 2.5×10^{-2} (only number mode).

To use radio buttons

Choose one of the radio buttons to activate one of the available functions.

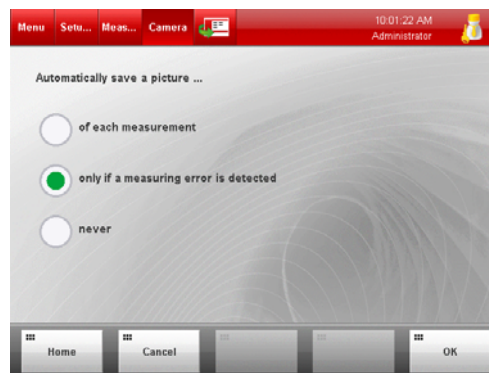


Fig. 4: Example for radio buttons

To exit dialog windows with/without saving

TIP: While a measurement is in progress, you cannot save any changes to the instrument settings. The <OK> button is deactivated, tapping <Home> quits the dialog without saving the changes.

Exit a dialog window by one of the following operations:

- To get directly to the main screen, tap <Home> and decide whether you want to save or discard changes in the following pop-up window.
- To exit and save changes tap <OK>.
- To exit without saving changes tap <Cancel>.

To exit wizards with/without saving

A wizard is a combination of two or more dialog windows. Exit a wizard by one of the following operations:

- To exit and save the settings, complete all steps of the wizard and then tap <OK>. To navigate in the wizard steps, use the buttons <Next> and <Previous>.
- To exit without saving changes, tap <Cancel>.
- To get directly to the main screen without saving, tap <Home>.

4.3 Calibrating the Touch Screen

Only available for instruments with 6.4" display.

NOTICE

If you use protection foils on instruments with 6.4" display, exchange them at least once a year (for details on exchanging the protection foil, see the manual of the instrument).

If you have difficulties in operating the touch screen user elements (buttons, drop-down boxes, etc.), calibrate the touch screen. The touch screen sensors will be adapted to the way you tap on the screen.

1. Tap <Menu> and select *Setup > Control Panel > Calibrate Touch Screen*.
2. Follow the instructions on the screen. Use your finger, not a stylus!
3. Tap anywhere on the screen to accept the new calibration.

4.4 Setting the Display Brightness

To optimize the visibility of results on the touch screen within your measuring environment, select the brightness of the display backlight.

1. Tap <Menu> and select *Setup > Control Panel > Display Brightness*.
2. Enter the preferred setting (20 % to 100 %) and tap <OK>.

TIP: Due to manufacturing tolerances of the hardware the screen may flicker for the selected value. In that case choose a value that is slightly different (e.g. 52 % instead of 50 %).

4.5 Setting the Screen Saver

You can set the time period after which the screen saver will be automatically activated.

To set the time period

1. Tap <Menu> and select *Setup > Control Panel > Screen Saver*.
2. Activate/deactivate the checkbox "Automatically switch off display...".
3. Enter a value between 1 and 300 minutes.
4. Tap <OK>.

To deactivate the screen saver

Deactivate the screen saver by one of the following operations:

- Tap the screen or use any other input device (external touch screen, mouse or keyboard).
- Start a measurement via any interface (Ethernet or RS-232).

4.6 Sound Settings

You can selectively activate a feedback sound upon every successful touch screen or softkey action (for instruments with 10.4" display only touch screen action), mouse click, and barcode reader input and/or after the completion of a measurement.

1. Tap <Menu> and select *Setup > Control Panel > Sound Settings*.
2. Activate/deactivate a feedback sound when a screen item is touched.
3. Activate/deactivate a sound when a measurement has been completed.
4. Tap <OK>.

4.7 Logging On/Off

When delivered, the instrument is freely accessible without password.

After user accounts have been installed and passwords set, you may have to pass a logon procedure after switching on the instrument.

Table 1: Factory default passwords

User type	Preset password
Operator	operator
Manager	manager
Administrator	administrator

TIP: It is recommended to replace these default passwords when first setting the instrument into operation.


To log on

1. Tap on the user indicator on the right side of the header of the main screen to open the “Logon” dialog.
2. Select your “User name”, enter your “Password”, and tap <OK>.

NOTICE

If the instrument is operated in the increased security mode, your user account will be deactivated after three failed logon attempts.

To log off

1. Tap on the user indicator on the right side of the header of the main screen to open the “Logon” dialog.
2. Tap <Log off>.
 - If no user with auto logon right exists, the user indicator changes its appearance to: 
 - The instrument finishes the current measurement or measurement series, but does not accept any input until someone successfully logs on.
 - If a user with auto logon right exists, this user is automatically logged on.

To unlock the instrument after you have forgotten the password

1. Tap the button <Forgot Password> in the “Logon” dialog.
2. Follow the instructions on the screen.


4.8 Using Favorites

The favorites function enables you to quickly access your favorite menu dialogs directly from the main screen.


All menu dialogs with  in the header can be added to the favorites list.

The favorites list is the same for all users.


To add a menu dialog to the favorites list

1. Tap  in the header.
2. Confirm the proposed name or enter a user-defined name and tap <OK>.


To use the favorites list

1. In the main screen, tap the icon  in the quick access area to open the quick access window.
2. Tap on a favorite in the list to open the respective menu dialog.
3. If necessary, use the page navigation in the header of the quick access window to navigate through the list.

To change the sequence of the favorites list


1. Tap the icon  in the quick access area.
2. Tap the <Settings> button in the left upper corner of the quick access area.
3. Highlight a list item and use the up/down arrows on the right to change the position of the list item in the favorites list.
4. Proceed so with all other list items whose position you want to change.
5. Tap <OK>.

To rename a favorites list item

1. Tap the icon  in the quick access area.
2. Tap the <Settings> button in the left upper corner of the quick access area.
3. Highlight the list item and tap <Rename>.
4. Enter the new favorite name and tap <OK>.

TIP: The favorites “Message List”, “Camera Settings” (for DMA 4100/4500/5000 M, DSA M, SDA M only), “Air Pump”, “Cleaning” (for SVM only), and “Monitor Mode” cannot be renamed. Using Xsample 530, the favorite “Liquid Level Monitoring” cannot be renamed, either.

To delete a favorites list item

1. Tap the icon  in the quick access area.
2. Tap the <Settings> button in the left upper corner of the quick access area.
3. Highlight a list item and tap <Delete>.

TIP: The favorites “Message List”, “Camera Settings” (for DMA 4100/4500/5000 M, DSA M, SDA M only), “Air Pump”, “Cleaning” (for SVM only), and “Monitor Mode” cannot be deleted. Using Xsample 530, the favorite “Liquid Level Monitoring” cannot be deleted, either.

5 Installing Optional Input/Output Devices

In this chapter you find information about the installation of optional input/output devices. For detailed information on the devices, see the respective manual.

If you use accessories that have not been supplied by Anton Paar, Anton Paar GmbH does not guarantee their functionality and safety.

5.1 External Keyboard, Barcode Reader, Touchpad for Gesture Control, Mouse

Connect an external keyboard, barcode reader, touchpad for gesture control, or mouse (not supplied by Anton Paar) to one of the USB sockets located on the left and rear of the instrument.

IMPORTANT: *All devices are immediately operational, only the barcode reader has to be activated in the menu when used to edit sample lists. In order to read QR codes of reference liquids (Lovis M/ME and SVM only), you need not specifically activate the barcode reader.*

Barcode reader

A barcode reader can be used to fill in input boxes, e.g. sample names or user-defined data fields.

TIP: *If a barcode reader is activated, the sample name is set as a mandatory data field, see section 6.3. If you don't enter a sample name, it will be set automatically to "UNNAMED".*

Tested barcode readers are Symbol DS6707 or Datalogic Firescan D131.

To activate the barcode reader

1. Tap <Menu> and select *Setup > Control Panel > Keyboard and Bar Code Settings*.
2. Activate the checkbox "Use an external keyboard or a barcode scanner to edit the sample list".
3. Tap <OK>.

Gesture control

Not available for SDA M and AlcoLyzer M

You can use the touchpad for gesture control (mat. no. 176741) to start/stop a measurement, to start / stop the air pump, and to change the current method.

5.2 USB Storage Device

Connect a USB storage device to one of the USB sockets located on the left and rear of the instrument.

TIP: *Some older USB flash drives are formatted as a super floppy. These are not compatible with your instrument. Only USB storage devices formatted as a standard hard disk (FAT32 or exFAT) are compatible.*

5.3 Printer

Your instrument supports printing on RS-232 printers connected to the RS-232 interface or on PCL compatible office printers either connected to a USB interface or over a local network (Ethernet). After connecting the printer to the instrument, register the printer in the menu *Setup > Control Panel > Printer Management*.

5.3.1 Connecting a Printer

To connect an RS-232 printer

1. Connect the printer (mat. no. 44737 or 93362) to the RS-232 interface (COM) of the instrument using the cable supplied with the printer.
2. If you use an RS-232 printer not supplied by Anton Paar, set the communication settings on the printer properly, see Technical Data in the manual of your instrument.

To connect an office printer (not supplied by Anton Paar) via USB interface

- Connect the printer to a USB socket of the instrument.

To connect an office printer (not supplied by Anton Paar) via local network

1. Set up a network connection as described in section 6.1.6.
2. Connect the PCL compatible printer to your local network. For details see the instruction manual of the printer.

5.3.2 Registering, Editing, Deleting a Printer

You can register up to 5 printers.

To register a new printer or edit a printer

1. Tap <Menu> and select *Setup > Control Panel > Printer Management* to open the printer list.
2. Tap <New> to register a new printer or highlight a list item and tap <Edit> to edit a printer.

The “Edit Printer” wizard opens.

3. **For RS-232 printers**, define the following settings:
 - Activate/deactivate the checkbox “Use as default printer”.
 - Enter a “Name” for the printer.
 - Select the adequate printer “Type”.
4. **For USB and network printers**, define the following settings:
 - Tap <OK>.
 - Enter a “Name” for the printer.
 - Select the adequate printer “Type”.
 - Activate/deactivate the checkbox “Use as default printer”.
 - Select the paper “Format”.
 - Tap <Next>.
 - Activate/deactivate the checkbox “Color Print”.
 - Select the “Port”.
 - For network printers only: Enter the IP address and IP port.
 - Tap <OK>.

To delete a printer

1. Tap <Menu> and select *Setup > Control Panel > Printer Management* to open the printer list.
2. Highlight a printer list item and tap <Delete>.

TIP: *The default printer cannot be deleted.*

5.4 External Monitor or Data Projector

The external terminal or data projector (not supplied by Anton Paar) must be able to display 640 x 480 px resolution in True Color (VGA) with at least 60 Hz.

- Connect the external monitor or data projector to the VGA interface at the rear of the instrument.

5.5 External Touch Screen

The external touch screen (not supplied by Anton Paar) must be able to display 640 x 480 px resolution in True Color (VGA) with at least 60 Hz.

Only touch screens from Elo Touch Systems and compatibles are supported. We recommend the model Elo 1715L 17" LCD Desktop Touchmonitor (1000 Series, firmware V1.9 and higher). Order only the external touch screen with IntelliTouch Surface Wave Touch Technology.

- Connect the external touch screen to the VGA interface at the rear and to one of the USB sockets of the instrument.

TIP: *Insert a USB hub in the USB connection to the Anton Paar instrument, otherwise the touch screen may not function properly.*

- If necessary, run an auto adjustment routine on the external touch screen. For details see the instruction manual of the touch screen.

To calibrate the external touch screen

If you have difficulties in hitting the touch screen user elements (buttons, drop-down boxes, etc.), calibrate the touch screen.

1. Tap <Menu> and select *Setup > Control Panel > Calibrate External Touch Screen*.
2. Follow the instructions on the screen.
Use your finger, not a stylus.

6 Defining General Settings

6.1 Instrument Settings

These settings are not method-dependent and thus will not change after a change of the current method.

6.1.1 Date and Time

1. Tap <Menu> and select *Setup > Control Panel > Date and Time*.
2. Enter the current date and time.
3. Tap <OK>.


6.1.2 Regional Settings

To set the regional settings

1. Tap <Menu> and select *Setup > Control Panel > Regional Settings*.
2. Enter the “Language”, “Data Format” (for numbers, date and time, etc.), and the “Keyboard Layout”.
The instrument displays “Are you sure you want change the regional settings? The instrument will reboot to complete this action.”
3. Tap <Yes> to confirm the new settings.
The instrument reboots.

To set the instrument to a language that you know

If the instrument is set up for a language that you do not understand, proceed as follows:

- To set the language to English, press <Ctrl>, <Alt>, and <E> simultaneously on the external keyboard.
Then switch the instrument off and on again.
- To set up the instrument for a language other than English, proceed as follows:
 - a. Tap the leftmost button in the main screen (<Menu>).
 - b. Select the menu item with the symbol  (menu *Setup*).

- c. Select the second menu item (menu *Setup > Control Panel*).
- d. Select again the second menu item (menu *Setup > Control Panel > Regional Settings*).
- e. Use the drop-down boxes to set the desired language, data format, and keyboard layout.
- f. Confirm each change with the rightmost button (<OK>) in the buttons area.
- g. In the following dialog, tap the button with the green check icon (<Yes>).
The instrument reboots.

6.1.3 Time Server Settings

Using a time server allows you to connect your instrument to a server providing the current time of your country.

To set the time zone

1. Connect the instrument to your local network via the Ethernet interface.
2. Tap <Menu> and select *Setup > Control Panel > Time Server Settings*.
3. Activate/deactivate the checkbox “Use Time Server”.
4. Enter the addresses of the time servers that shall be used for the synchronization.
Separate the addresses by a semicolon.
The servers of ntp.org are used per default.
5. Select your time zone in the drop-down list “Time Zone”.
6. Tap <OK>.
The instrument reboots.

6.1.4 Input Units

In this menu, you can define the unit for every temperature value which you enter during operation.

1. Tap <Menu> and select *Setup > Control Panel > Input Units*.
2. Select the input unit for temperatures.
3. Tap <OK>.

6.1.5 Air Pump Settings

You can define on which condition the air pump will be stopped.

1. Tap <Menu> and select *Setup > Measuring System Settings > Air Pump*.
2. Use the checkbox to activate/deactivate the option:
 - Stop air pump automatically when the density value is stable.
(only available for DMA 4100/4500/5000 M, DSA M, SDA M)
 - Stop air pump automatically after ... s.
(default value: 700 s / for SVM: 120 s)

In case both options are activated and the air density value does not become stable within the time period defined by the second option, the air pump stops nevertheless after this time period.

3. Tap <OK>.

6.1.6 Network

Connecting the instrument to your local network, enables you to use a network printer for printouts and to retrieve the instrument's system information or the instruction manual from any PC on the network.

TIP: You can find the unique MAC address of the instrument in the menu *Setup > Control Panel > Network*.

1. Connect the instrument over its Ethernet interface to your local network.
2. Tap <Menu> and select *Setup > Control Panel > Network*.
3. If your network server provides DHCP functionality, activate "Obtain an IP address automatically (DHCP)", then tap <Next> and <OK>.
4. If your network server does not provide DHCP functionality, deactivate "Obtain an IP address automatically (DHCP)" and enter the correct "IP Address", "Subnet Mask", "Default Gateway", and tap <Next>.
5. Enter addresses for the primary and secondary DNS server, and tap <OK>.

6.1.7 Virtual Network Computing

The instrument can be operated via LAN by an external PC running the virtual network client software named AP Instrument Viewer. Contact your local Anton Paar representative for further information about installation and setup of the AP Instrument Viewer.

IMPORTANT: *The live camera image is not displayed on the AP Instrument Viewer.*

TIP: *For security reasons a connection with VNC is possible only if no user is logged on at the instrument. Before a VNC connection is allowed, the user indicator has to show the symbol "locked". Therefore the auto logon feature has to be disabled (see section 6.5). Activating the checkbox "Enable VNC" will disable the auto logon function for one time only. If you activate auto logon later, you would have to disable it again in order to establish a VNC connection.*

To start the AP Instrument Viewer

1. Set up a network connection for your PC and the instrument (see section 6.1.6).
2. Log on at your instrument as administrator, see section 6.5.
3. Tap < Menu > and select *Setup > Control Panel > VNC Settings*.
4. Activate the checkbox "Enable VNC".
5. Set a password for the VNC connection.
6. If you want to deactivate the display of the instrument during a VNC connection, activate the checkbox "Enable Dark Mode".
7. Tap <OK> and <Home>.
8. Tap the logon button in the upper right corner of the instrument and press the button <Log off>. The user indicator should show the locked symbol now:



9. Tap the user indicator to display the logon screen.
10. Start the AP Instrument Viewer on your PC.

TIP: *In version 1.20 or higher you will find a short instruction by selecting the question mark in the top right corner.*

11. Enter the IP address of your instrument and the password defined in the instrument before.

12. Click the button <Open>.
13. Within the VNC client: Select your “User name”, enter your “Password”, and click <OK>.
14. Now you can operate the instrument via your PC exactly as you would do via touch screen. When VNC is not in use, it should be disabled in the VNC menu of the instrument.

TIP: *In case an action requires a restart of the instrument, do not close the AP Instrument Viewer during this restart.*

When the VNC feature is active

- The characters “VNC” are displayed in the user logo to indicate an active VNC connection.
- In case of a disconnect, a reconnection to the AP Instrument Viewer is possible within 60 seconds. Afterwards the instrument will attempt an automatic logoff.
- The touch screen of the instrument is deactivated if dark mode is enabled.
- The display is dimmed if dark mode is enabled.

6.1.8 FTP Settings

If the data transfer to and from USB storage devices is deactivated in the advanced security settings, see section 9.1.6, you can export data to an FTP server.

To create, edit and delete an FTP server connection

If necessary, contact your local IT administrator for information on FTP server path (IP address), user name and password.

1. Connect the instrument over its Ethernet interface to your local network.
2. Tap <Menu> and select *Setup > Control Panel > FTP Settings*.
3. Tap <New> and specify the following settings:
 - Name of the connection: choose freely
 - FTP server path: enter the IP address
 - user name: enter the user name used in the FTP client
 - password: enter the password used in the FTP client

TIP: *User name and password are case sensitive.*

4. Tap <OK>.

The name specified for the connection is now listed as an optional storage location.

6.1.9 Instrument Name and Location

If you have more than one Anton Paar instrument, and want to easily differentiate between them in printouts, data exports or within your local network (LIMS), you can define instrument names and locations.

1. Tap <Menu> and select *Setup > Control Panel > Instrument Name and Location*.
2. Enter the “Instrument name” and “Instrument location”.
3. Tap <OK>.

6.2 Defining the Printout Settings

You can define the layout of the printer report and set up an automatic printout. To set the output data for each method, see section 7.2.3.

6.2.1 Creating, Editing and Deleting Printer Report Layouts

You can set up to 10 different report layouts for various use.

To create or edit a report

1. Tap <Menu> and select *Setup > Printout Settings > Report Management*.
2. Tap <New> to create a new report or highlight a list item and tap <Edit>.

The “Edit Report” wizard opens.
3. Define the following settings:
 - Activate/deactivate the checkbox “Use as default report”.
 - Enter a report “Name”.
 - Select the report “Type”: “List Report” or “Detail Report”.

List reports contain several measurement results in a table.

Detail reports contain one detailed measurement result per page.
4. Tap <Next>.
 - Activate/deactivate the “GxP compliant” function (not available for DMA 4200 M).
 - Activate/deactivate signature caption 1 and signature caption 2, and use the input field to enter a name.
 - Activate/deactivate the “Print signature time” function.

5. Tap <Next>.
 - Define the paper format (portrait or landscape).
 - For detail reports only: Activate/deactivate the checkbox “Print Camera Image” (only available for DMA 4100/4500/ 5000 M, DSA M, SDA M).
 - Activate/deactivate the “Include Printed by” information.
6. Tap <OK>.

To delete a report

1. Tap <Menu> and select *Setup > Printout Settings > Report Management*.
2. Highlight a list item.
3. Tap <Delete>.

TIP: *The default report cannot be deleted.*

6.2.2 Defining Header and Background of the Printer Report

You can import logos from a USB storage device or an FTP server and use them as header or background logo in the printer report. You can also define an address which will be printed in the header of the printer report.

Logo graphics files must meet the following conditions:

- JPEG or bitmap file (file extension .jpg/.bmp)
- located in the root directory
- maximum size of 1.5 megapixel

To import a logo

1. Tap <Menu> and select *Setup > Printout Settings > Import Logos*.
2. Use the drop-down list “Storage Location” to select the connected USB storage device or FTP server.
3. Use the drop-down list “File Name” to select the correct file.
4. Use the drop-down list “Place” to define the position of the file in the internal logo list.
5. Tap <OK>.

To select logos

You can select a logo for the report header and a second logo for the report background.

1. Tap <Menu> and select *Setup > Printout Settings > Select Logos*.
2. Use the two drop-down boxes to select the logos for the header the background.
3. Tap <OK>.

To enter name and address for the header

1. Tap <Menu> and select *Setup > Printout Settings > Name and Address*.
2. Enter the name and address.
3. Tap <OK>.

6.2.3 Activating/Deactivating an Automatic Printout

1. Tap <Menu> and select *Setup > Printout Settings > Automatic Printout*.
2. Use the checkbox “After each measurement” to activate or deactivate an automatic printout.
3. Use the checkbox “Enable printing of sub samples” to print also results of sub samples.
4. Use the drop-down box “Printer” to specify the printer for the print reports.
5. Use the drop-down box “Report” to select the report layout.

You can only select a report of the “Detail Report” type for the automatic printout.
6. Select the “Export File Name” for the data to be exported.
7. Tap <OK>.

6.3 Setting Sample List Options

In the “Sample List” menu you can:

- Select the sample list mode.
- Define automatic sample name additions before and after the sample name. These additions will be added to each sample name after the measurement of the sample was finished. You can compose the additions out of a fixed part and an additional data field (date and time, user name, sample number, etc.).
- Activate up to three user-defined data fields and give these fields names to assign additional information to your samples. Typical examples are a filling line number, tank number or batch identification. For each data field that you define, an extra column will be added to the sample list.

- Define mandatory data fields. The measurement can only be started after filling in the mandatory data fields. If mandatory data fields are not completed in the sample list, you will be prompted to complete these fields after tapping <Start>.

To set sample list mode and automatic sample name

1. Tap <Menu> and select *Setup > Measuring System Settings > Sample List > Sample List / Sample Settings*.
2. Select the “Sample List Mode”.
 - If no sample changer or a sample changer without magazine is connected, you can select “No Sample List” or “Sample List”. The “No Sample List” mode is set by default. On the main screen, the button <Quick Settings> is displayed. If the “Sample List” mode is selected, the button <Sample List> is displayed instead of the <Quick Settings> button on the main screen.
 - If a sample changer with magazine is connected, you can select “Simple” mode or “User-defined” mode. For details see the corresponding manual of the Xsample.
3. Define the “Automatic Sample Name” (“Sample Name Prefix” and “Sample Name Postfix”).
4. Tap <OK>.

To set user-defined data fields

1. Tap <Menu> and select *Setup > Measuring System Settings > Sample List > User-defined Data Fields*.
2. Activate/deactivate the three “User-defined Data Fields”, enter their names.
3. Tap <OK>.

To set sample list warnings

The sample list warnings are only generated if you prepare a sample list prior to any measurement.

1. Tap <Menu> and select *Setup > Measuring System Settings > Sample List > Sample List Warnings*.
2. Use the checkboxes to activate/deactivate the “Sample List Warnings”:
 - Only with sample changer: Stop processing the sample list if a check failed.

- Warn if sample list contains a sample without a name.
- Warn if sample list contains methods with different measuring temperatures (not available for SVM 3001).

3. Tap <OK>.

To set mandatory data fields

You can set the sample name and user-defined data fields as mandatory.

1. Tap <Menu> and select *Setup > Measuring System Settings > Sample List > Mandatory Data Fields*.
2. Use the checkbox(es) to define whether it is mandatory to enter a sample name or content for user-defined data fields for each measurement.
3. Tap <OK>.

6.4 Temperature Extrapolation Settings

Only available for DMA 4100/4500/5000 M, DMA 4200 M, SVM 3001/4001, and Lovis M/ME.

The temperature extrapolation settings offer the possibility to enter temperature values to which measured quantities shall be extrapolated.

To enter, change and delete temperature values for extrapolation

TIP: *You cannot change or delete temperature values that are in use, e.g. in the result output of a method.*

1. Tap <Menu> and select *Setup > Measuring System Settings > Temperature Extrapolation Settings*.
2. Tap on the list item that you want to change or on the empty field at the bottom of the list if you want to add a temperature value.
 - 15 °C, 20 °C, 29.5 °C, and 60 °F are set by default.
 - Enter the temperature value.
 - Select the unit.
3. To delete a temperature value, highlight it and tap <Delete>.
4. Tap <OK>.




6.5 Installing User Groups, User Accounts and Passwords

When delivered, the instrument is freely accessible without password. Three user accounts are factory preset, see section 4.7. For the “administrator” user, the auto logon function is activated.

6.5.1 Creating, Editing, and Deleting User Groups

User groups

There are three standard user groups which have different levels of user rights:

	<p>Operator This user group may perform measurements, select a method, edit the sample list and perform checks.</p>
	<p>Manager This user group has the rights of the operator user group and may additionally perform adjustments.</p>
	<p>Administrator This user group has the right to access the whole menu.</p>

Custom user groups

If the user rights of the standard user groups do not fit your needs, you can create new user groups by copying existing ones that are based on the standard user groups “manager” or “operator”. For custom user groups, you can grant access rights to the instrument’s functions as needed.

Functions for which access is customizable include menu entries, the operating elements on the main screen, and additional entries, e.g. remote access via LIMS Bridge.

IMPORTANT: *Access to the submenus “Method Settings” and “Live Raw Data” can only be granted together, and not individually.*

You can export a summary of a user group’s rights for documentation purposes as an .xls or .txt file.

The standard user groups cannot be edited or deleted.

To create or edit a custom user group

1. Tap <Menu> and select *Setup > User Management > User Group Administration*.
2. To create a custom user group, highlight one of the existing user groups and tap <Copy>.
3. To change the icon, highlight the user group and tap on the drop-down box in the column “Icon”.
4. Select one of the given icons by tapping on it.
5. To change the name, highlight the user group and tap on the text box in the column “Name”.
6. Enter the name and tap <OK>.
7. To change the access rights, highlight the user group and tap in the column “Access”.
8. Change the access rights as needed and tap <OK>.

To grant access to a function, tick the checkbox.

Checkboxes with green squares indicate, that only some of the functions in this entry are accessible.

9. Tap <OK> to save the settings.

To delete a custom user group

1. Tap <Menu> and select *Setup > User Management > User Group Administration*.
2. Highlight the user group and tap <Delete>.
3. Tap <OK> to save the settings.

To export the user group’s rights

1. Tap <Menu> and select *Setup > User Management > User Group Administration*.
2. Highlight the user group and tap in the column “Access”.
3. Tap <Export>.
4. Use the drop-down box “File format” to select “Excel” or “Text”, define the “Storage Location” and enter the “File name”, then tap <OK>.

6.5.2 Creating, Editing, and Deleting User Accounts

You need administrator rights to create, edit, or delete user accounts. Up to 1000 user accounts can be created.

TIP: *A user with a deactivated account cannot log on until the account is activated again.*

TIP: *A user who has no administrator rights can only change his own password.*

Naming rules

User names must be at least one character long and contain only characters from the ASCII table (letters, numbers and most special characters).

If you operate the instrument in the increased security mode, user names must be at least six characters long.

IMPORTANT: *When the increased security is activated, user accounts not complying with the naming or password rules are deactivated.*

User names are not case sensitive.

Password rules

With low security levels, giving a password is not mandatory. If you do not set a password, users can log on by selecting their user name from the user list.

Passwords must consist of at least one character and contain only characters from the ASCII table (letters, numbers and most special characters). Passwords are case sensitive, i.e. "Anton Paar" and "anton paar" are treated as different entries.

With high security levels (21 CFR Part 11 and "Increased Security"), giving a password is mandatory. Passwords must be at least six characters long. When you set a new password, the last five passwords must not be reused. Additional password complexity rules are optionally available, see section 9.1.4.

Auto logon function

You can assign the auto logon function to one user in the menu *Setup > User Management > User Administration*.

If this user is logged on and the instrument is switched off and on again, there is no logon procedure. All instrument functions according to the user rights of the auto logon user are freely accessible.

Example: The user "smith" belongs to the user group "Operator", and the auto logon function has been assigned to him. After he has switched the instrument off, anyone can switch the instrument on and start measuring without a need to log in. Only operator level functions are available.

IMPORTANT: *If the increased security is activated, auto logon will be automatically disabled.*

To create or edit a user account

1. Tap <Menu> and select *Setup > User Management > User Administration*.
2. Tap <New> to create a new user account or highlight a user name on the user list and tap <Edit> to edit a user account.
3. Specify the following settings:
 - Activate/deactivate the user account (checkbox)
 - Activate/deactivate the "Auto logon" (checkbox)
 - User name
 - User Group
 - Role and name for electronic signature (only if "Electronic Signature" is activated)
4. To set or change the password, tap <Set Password>, enter the password in the following dialog, and tap <OK>.
5. To activate/deactivate notification emails, tap <Email Settings>, activate/deactivate the checkbox, enter your email address, and tap <OK>. For details about notification emails, see section 6.5.3.
6. Tap <OK>.

To delete a user account

Not available in the Advanced Data Integrity mode.

You cannot delete your own account (i.e. the currently active account) or an account of a user group that has a higher level of user rights than your own account.

1. Tap <Menu> and select *Setup > User Management > User Administration*.
2. Highlight a user name on the user list and tap <Delete>.

To archive a user account

If the advanced data integrity is activated, you have to archive the user data in order to remove users from the user data base permanently. You cannot archive your own account (i.e. the currently active account) or an account of a user group that has a higher level of user rights than your own account.

1. Tap <Menu> and select *Setup > User Management > User Administration*
2. Highlight a user name on the user list and tap <Archive>.

To set or change a password

All users may change their own password.

If the instrument is operated in increased security mode, you cannot reuse the last five passwords.

1. Tap <Menu> and select *Setup > User Management > User Administration*.
2. Tap <New> to create a new user account or highlight a user name on the user list and tap <Edit> to edit a user account.
3. To set or change a password, tap <Set Password>, enter the password in the following dialog and tap <OK>.
4. Tap <OK>.

6.5.3 Setting Notifications via Email

An email will be sent upon the following events:

- when a sample list has been measured successfully (only if an Xsample is used),
- when one or more errors have occurred during measuring the sample list (only if an Xsample is used),
- *for administrator users only*: when a service interval, check interval, or audit trail interval has expired.

The email is sent to the currently logged on user if the email function has been activated for their account. All users may activate or deactivate the email function in their own user account.

To connect the instrument to the network

1. Connect the instrument to your local network via the Ethernet interface.
2. Establish the network settings as described in section 6.1.6.

To set the SMTP server settings

If necessary, contact your local IT administrator for information on the host name, port, user name, password, and instrument address.

1. Tap <Menu> and select *Setup > Control Panel > SMTP Server Settings*.
2. Perform the following settings:
 - Enter the "Host" name.
 - Enter the "Port".
 - Enter the "User Name" and "Password".
 - Enter the instrument address ("From address").
 - Activate "Enable SSL" if required.
3. Tap <OK>.
4. To test the settings, tap <Test Settings>, enter your email address in the "Recipient" input box, and tap <OK>.

If the settings are correct, a test email will be sent to the defined recipient.

To activate or deactivate the email function

1. Tap <Menu> and select *Setup > User Management > User Administration*.
2. Tap <New> to create a new user account or highlight a user name on the user list and tap <Edit> to edit a user account.
3. Tap <Email Settings>.
4. Activate the checkbox and enter your "Email address".
5. Tap <OK>.

7 Defining and Using Methods

7.1 Measuring Methods

Each method contains the following kind of information:

- Instrument settings – refer to the instrument specific manual
- Xsample settings and measuring module settings (if any module is installed) – refer to the instrument specific manual
- Layout of measuring data on the main screen – see section 7.2.2
- Measuring units
- Parameter list for printout and data export – see section 7.2.3

You can use the factory preset methods as they are or change them to suit your needs, see section 7.2. You can also create new methods, see section 7.3.

Factory preset methods

Every Anton Paar M series instrument is delivered with predefined methods. The number of predefined methods and their settings depend on the instrument type – refer to the instrument specific manual.

7.2 Changing Methods

This chapter describes how to set the displayed output fields, result output quantities, limits and quick settings parameters. For further method settings, see the manual of the respective instrument.

You need manager or administrator rights to create, edit or delete methods. The maximum number of methods is 400.

7.2.1 Defining the Active Modules

For each method, you can activate/deactivate optional measuring modules. Once connected, all measuring modules are activated by default. If you want to shorten the measuring time, you can deactivate unneeded modules.

1. Tap <Menu> and select *Methods > Method Settings > method name > Activate Modules / Constants*.
2. Use the checkbox to activate/deactivate the measuring module(s).
3. Tap <OK>.

7.2.2 Defining the Displayed Output Fields

For each method, you can select the number and content of output fields on the display.

TIP: We recommend having always the output field “...Condition” on the screen, in addition to the measurement values.

To define the number of output fields

When switching to another display layout, the contents of the output fields of the previous display layout are transferred to the new layout.

1. Tap <Menu> and select *Methods > Method Settings > method name > Display Layout*.
2. Highlight a list item and tap <OK>.

To define the content of output fields

You can directly change the content of output fields in the main screen. The changes are automatically saved in the current method.

1. Tap on the output field.
2. Select the “Group”, “Quantity”, “Unit” and the number of “Digits”, and tap <OK>.

7.2.3 Defining the Result Output

You can define the list of output quantities for printouts and data exports. You can change the settings any time and repeat the printout of saved results, if required.

If no output quantities are selected, the data browser settings are used instead, see section 8.2.

To define the list of output quantities

1. Tap <Menu> and select *Methods > Method Settings > method name > Result Output*.
2. Tap on the list item that you want to change or on the empty field at the bottom of the list if you want to add an item.
The row is highlighted.
3. Tap on the highlighted list item.
4. Use the drop-down boxes to define the “Group”, “Quantity”, “Unit”, and the number of “Digits”.
5. Tap <OK>.

To change the sequence of the result output items

1. Tap <Menu> and select *Methods* > *Method Settings* > method name > *Result Output*.
2. Highlight a list item and use the up and down arrows in the right column to change the position of the list item.
3. Proceed so with all other list items whose position you want to change and tap <OK>.

7.2.4 Defining Limits

Limits can be set for any parameter separately, e.g. density, dynamic viscosity etc.

If, after a measurement, any of the selected quantities is out of the limited range, you will be warned with the yellow warning sign in the quick access area and a message in the “Message List” window.

IMPORTANT: *Limits are only applied in the measuring mode, but not in the monitor mode. (This does not apply to Lovis 2000 M.)*

To define limits

1. Tap <Menu> and select *Methods* > *Method Settings* > method name > *Limits*.
2. Select the quantity to be monitored in the column “Quantity”.
3. Define the “Lower” and “Upper” limit for the selected quantity.
4. Tap <OK>.

IMPORTANT: *Mind that the limits are set as fixed boundaries for the selected quantity. Do not mistake them as deviations.*

7.2.5 Defining Quick Settings Parameters

Quick settings function

The quick settings function enables you to easily access different parameters concerning your measurement without changing the current method.

The quick settings comprise several measuring settings or functions and are available in all sample list modes. If you have connected one or more Anton Paar measuring modules to your master instrument, the range of parameters that can be added to your quick settings will be extended. For a list of the available quick settings parameters (default and optional parameters), see the instruction manual of the respective instrument or measuring system.

User-defined data fields, see section 6.3, and user functions of the “Constant” type, see section 9.2, will be automatically added to your quick settings.

To set a quick settings parameter

1. Tap <Menu> and select *Methods* > *Method Settings* > method name > *Quick Settings Management*.
2. Tap the insert field in the free line.
3. Use the “Quantity” drop-down box to select the desired parameter and tap <OK>.
4. Tap <OK>.

To change the sequence of the quick settings parameters

1. Tap <Menu> and select *Methods* > *Method Settings* > method name > *Quick Settings Management*.
2. Highlight a parameter and use the up and down arrows in the “Order” column to change the position of the parameter in the list.
3. Tap <OK>.

To delete a quick settings parameter

TIP: *Parameters marked with a lock icon cannot be deleted.*

1. Tap <Menu> and select *Methods* > *Method Settings* > method name > *Quick Settings Management*.
2. Highlight the parameter that you want to delete and tap <Delete>.

7.3 Creating, Deleting, Hiding, and Arranging Methods

You can copy, rename, hide, delete or archive methods. The maximum number of methods is 400.

To create a new method, make a copy of an existing method of which the settings most resemble your needs. Then rename the new method and change its method settings to suit your needs. To change the settings, also refer to the instruction manual of the respective instrument or measuring system.

IMPORTANT: *Creating, deleting, archiving, hiding, and rearranging methods, affects the position numbers in the method list. If you use barcodes for assigning methods, check the position numbers of your methods after these actions.*

To copy a method

1. Tap <Menu> and select *Methods > Method Management* to open the method list.
2. Highlight a method name and tap <Copy>.

A new method is created with the same settings as the original method and the same method name plus an additional number in brackets.
3. If desired, enter a new name in the input field.

The new method is saved in the last position of the method list.

To rename a method

1. Tap <Menu> and select *Methods > Method Management* to open the method list.
2. Highlight a method name and tap <Rename>.
3. Enter the new method name (up to 50 characters long).
4. Tap <OK>.

To delete a method

Not available in the Advanced Data Integrity mode.

1. Tap <Menu> and select *Methods > Method Management* to open the method list.
2. Highlight a method name and tap <Delete>.

TIP : *You cannot delete or rename the currently used method. Change the method, see section 7.2, and then delete or rename the desired method.*

To archive a method

If the advanced data integrity is activated, you have to archive the method data in order to remove methods from the method data base permanently.

1. Tap <Menu> and select *Method > Method Management* to open the method list.
2. Highlight a method name and tap <Archive>.

TIP : *You cannot archive the currently used method or methods which were used for measurements stored in the data memory "Measured Data". Before archiving a method, the measured data has to be archived beforehand.*

To set methods visible or invisible

If a method is set invisible, you cannot select this method any longer in the method list and the method settings.

1. Tap <Menu> and select *Methods > Method Visibility*.
2. Highlight a method.
3. Enable the checkbox to set the method visible or disable the checkbox to set the method invisible.
4. Tap <OK>.

TIP : *You can tap <Select all> or <Unselect all> to change the visibility setting of all methods except the currently used method.*



To change the sequence of the method list

1. Tap <Menu> and select *Methods > Method Visibility*.
2. Highlight a method and use the up and down arrows in the "Order" column to change the position of the method in the list.
3. Proceed so with all other methods whose position you want to change, and tap <OK>.

7.4 Selecting the Method

You can select the method using the <Method> button at the main screen or using the respective column in the sample list.

To select a method with the <Method> button

1. Tap <Method> to open the methods list.
2. Highlight a method either by tapping on its name or by using  and , and tap <OK>.

7.5 Using the "No Sample List" Mode

If no sample changer or a sample changer without magazine is connected, the "No Sample List" mode is set by default, see section 6.3. You only need to tap <Start> to start a measurement.

You can use the quick settings function to change the following:

- Sample name and measurement mode
- Measurement settings of the following measurement(s) without affecting the settings of the underlying method, see section 7.2.5

To change the sample settings

TIP: *The new settings are maintained for following measurements until changes are made anew.*

1. Tap <Quick Settings>.
2. Enter a sample name using the corresponding input field if needed.
3. Define your parameters if needed.
4. Tap <OK>.

7.6 Using the “Sample List” Mode

The sample list is a tool that helps you managing samples that you want to measure.

No results are stored in the sample list but using the <Details> button in the sample list links you to the data memory and you can view the results of already measured samples in the sample list.

Number of entries

The sample list can contain up to 200 entries. The 201st entry overwrites the oldest entry. Entries older than 24 hours are automatically removed.


The sample list will be automatically cleared if you switch off the instrument.

IMPORTANT: *In the “Sample List” mode and “Simple” mode, each measurement is entered into the data memory and the sample list. The maximum data storage volume of 1000 data is calculated from the already measured samples (data memory) plus the samples in the sample list. Therefore, regularly clear the sample list and the data memory.*

To create or edit a sample list

TIP: *If you have activated user-defined data fields, see section 6.3, the data fields are shown in columns.*

1. Tap <Sample List> to open the “Sample List” window.
2. To enter a sample name, tap on a cell in the column “Sample Name”.
3. Tap on a cell in the column “Method” and select a method from the drop-down list.

4. Tap  in the column “Quick Settings”, select measurement mode and measurement settings as desired, and tap <OK>.
5. To exit the sample list and save the changes, tap <Home>.

To edit or delete a sample in the sample list

TIP: *You cannot edit or delete samples in the sample list that have already been measured.*

- To edit a sample, highlight the row and change the settings as desired.
- To delete a sample from the list, highlight the sample and tap <Delete Sample>.
- To exit the sample list and save the changes, tap <Home>.

To save a sample list

1. Tap <Sample List> and then <List Management>.
2. Select “Save Sample List” and then <OK>.
3. Choose one of the 10 available entries in the drop-down list “Sample list templates”.
4. Tap <Rename> and enter a name for your sample list.
5. Tap <OK>.

To load a sample list

1. Tap <Sample List> and then <List Management>.
2. Select “Load Sample List” and then <OK>.
3. Choose one of the ten sample lists in the drop-down list “Template”.
4. Tap <OK>.

To clear the current sample list

1. Tap <Sample List> and then <List Management>.
2. Select “Clear Sample List”.

After the sample list has been cleared, the symbol on the message list quick access button may change: If the symbol has been the yellow warning sign or the red error sign, the symbol will change to the green OK sign.

8 Handling the Measurement Data

8.1 Defining the Data Memory Settings

Not available in the non storage mode.

Not available with advanced data integrity.

Your instrument can store 1000 result data files and 110 check results. After 900 measurements or 99 checks, the instrument issues a reminder for clearing the memory. If the memory is full, no measurements or checks are possible. In that case no more measurement results or check data will be saved, so make sure to free memory space in time.

To avoid reminders and the necessity of deleting data manually, you can set the data memory to behave as a circular buffer, if you use the instrument in low security mode.

- Tap <Menu> and select *Setup > Expert Settings > Data Memory Settings*, and activate the checkboxes “Automatically delete old measurement data” and “Automatically delete old check data”. The oldest 100 measurement results or 10 check data will then be automatically deleted as soon as the number of 1000 measurement results or 110 check data has been exceeded in the data memory.

8.2 Defining Data Columns for the Data Browser

Not available in the non storage mode.

You can define the kind of data which shall be displayed in the data browser. You can change these settings any time and add further sample parameters to the result data files.

TIP: *This setting is independent of the selected method and identical for all data.*

To set data for data browser display

1. Tap <Menu> and select *Setup > Data Browser Settings*.
2. Tap on the list item that you want to change or on the empty field at the bottom of the list if you want to add an item.
The row is highlighted.
3. Tap on the highlighted list item.
4. Use the drop-down boxes to define the “Group”, “Quantity”, “Unit”, and the number of “Digits”.
5. Tap <OK>.

To change the sequence of the data

1. Tap <Menu> and select *Setup > Data Browser Settings*.
2. Highlight a list item and use the up and down arrows in the “Order” column to change the position of the list item in the list.
This results in changing the sequence of the columns in the data browser.
3. Proceed so with all other list items whose position you want to change and tap <OK>.

8.3 Viewing Results

Not available in the non storage mode.

Your instrument supports two ways of result visualization:

- In the multiple sample view, you can see all results listed in a table.
- In the single sample view, you can see a more detailed view of one result at a time.

In the multiple sample view, the output quantities according to the data browser settings are displayed. In the single sample view, the output quantities according to the result output settings are displayed.



If no output quantities have been selected in the result output settings or if the measuring method of a sample has been deleted, the data browser settings are also used for the single sample view, printouts and data exports.

Multiple sample view

1. Tap <Menu> and select *Data Memory > Measured Data* to open the multiple sample view.
2. Use the two scroll bars to scroll vertically and horizontally.

The last result is displayed at the bottom of the list.

Single sample view

1. In the multiple sample view, highlight the sample that you want to see in more detail.
2. Tap <Details> to open the single sample view.
3. Use  to see the previous result or use  to see the next result.

8.4 Filtering Results

Not available in the non storage mode.

With the filter tool, you can reduce the number of measurement results in the multiple and in the single sample view.

Filter settings can be defined separately:

- for printing, exporting, and viewing of measured data
- for deleting measured data

Subsequent actions as printing, exporting, deleting, only apply to the data corresponding with the filter criteria.

Filter criteria

- Time
- Date
- Date range
- Sample Name
- Method (only available if previously used)
- User-defined data fields
- Print/Export Status
- Sample Error State
- User (only those are available who have performed measurements)
- Magazine pos.
- Measuring value
- Master Condition
- Measurement Mode
- AVG/SUB
- Camera image available

TIP: Depending on the instruments/modules used, further specific criteria may be available.

TIP: The filter criterion "AVG/SUB" does not apply to measured data with measurement mode "(S) Standard".

Comparators

- equals
- not equal
- larger than
- smaller than
- containing
- not containing
- printed/exported
- not printed/exported

Different filter criteria are linked to each other using the logical AND relation.

To define a filter

1. In the multiple sample view, see section 8.3, tap <Filter>.
2. Define one or more filter criteria in the first column "Filter criterion".
3. Select an available "Comparator" and assign a "Value" to each filter criterion.
4. Tap <OK> to get back to the multiple sample view.

The multiple sample view and the single sample view now show only those results that meet your filter criteria.

The main screen header reads "Measured Data (filt.)" instead of "Measured Data".

Examples:

- If you only want to see the samples that have not been exported yet, choose the following settings:
 - Filter criterion: "Print/Export Status"
 - Comparator: "Not Printed/Exported"
- If you only want to see the samples that have been measured during the last week, choose the following settings:
 - Filter criterion: "Date range"
 - Comparator: "equals"
 - Value: "Last Week"

To delete filters

1. Tap <Filter> in the multiple sample view.
2. To delete a single filter, highlight the filter and tap <Delete>.
3. To delete all filters, tap <Delete All> and <OK>.

8.5 Viewing Statistics

Not available in the non storage mode.

Statistical numbers are always calculated according to the filter settings of the measured data in the data browser.

Statistical details will only be calculated for those quantities which are activated for the result output of the respective measuring method, see section 7.2.3.

Results from checks and/or scans are not included in any statistical analysis.

1. Tap <Menu> and select *Data Memory > Statistic* to open the statistics overview.
A table of methods and their respective number of result output quantities is displayed.
2. Highlight a row and tap <Details>.

For each output quantity the following statistics are displayed:

No. of Values	number of measurements
Minimum	lowest value
Maximum	highest value
Average	arithmetic mean
StdDev	standard deviation

8.6 Printing and Exporting Results and Other Data

IMPORTANT: *In the non storage mode you can print or export your measured results only immediately after the measurement.*

Your instrument supports three kinds of printouts:

- Simple continuous printouts using an RS-232 printer with paper roll
- Report printouts using an office printer (USB or local network)
- Report printouts to PDF files (USB storage device, FTP server)

Your instrument supports the export of data in the data formats:

- MS Excel (.xls) and
- ASCII text (.txt).

You can print and export:

- measured data
- check data
- adjustment data
- statistics
- audit trails
- etc.

To print data

1. Tap <Print or Export> and select *Print Report (Paper/PDF File)*.
2. Tap <OK>.
3. To print data on paper using a printer:
 - a. Select the respective printer in the drop-down box "Target".
 - b. Select the "Report" type.
 - c. Tap <OK>.
4. To print data to a PDF file:
 - a. Select "PDF Export" as target.
 - b. Select the "Report" type.
 - c. Select the "Storage Location" (USB storage device, FTP Server, or LIMS Bridge General Purpose Folder)

- d. Define a "File name".
- e. Tap <OK>.

PDF files are password protected.

TIP: *To create an empty line in your printed report, add the output quantity "Line break" from the group "System" to your result output list, and position it as desired, see section 7.2.3.*

To export data

1. Tap <Print or Export> and select *Export Data (Excel File/Text File)*.
2. Tap <OK>.
3. Use the drop-down box "File format" to select "Excel" or "Text", define the "Storage Location", and enter the "File name", then tap <OK>.

The measuring results are exported according to your current filter settings, see section 8.4. For each method the data defined in the "Result Output" menu will be exported.

8.7 Deleting Results

Not available in the non storage mode or in the Advanced Data Integrity mode.

We recommend deleting your result data regularly after a successful data export or printout.

Measured samples that are still in the sample list cannot be deleted. Clear the sample list first.

To delete a single result

1. Tap <Menu> and select *Data Memory > Delete Measured Data*.
2. Highlight a row in the multiple sample view and tap <Details>.
3. Tap <Delete>.

To delete several results

1. Tap <Menu> and select *Data Memory > Delete Measured Data*.
2. Tap <Filter> to limit the number of results to be deleted, see section 8.4, and then tap <OK>.
3. Tap <Delete All> to delete the filtered data.

To delete all results

1. Tap <Menu> and select *Data Memory > Delete Measured Data*.
2. Tap <Delete All>.

8.8 Archiving Results

Only available in the Advanced Data Integrity mode.

We recommend archiving your result data regularly. Measured data that are still in the sample list cannot be archived. Clear the sample list first.

Your instrument supports archiving of data in the data format:

- password protected PDF files

To archive a single result

1. Tap <Menu> and select *Data Memory > Archive Measured Data*.
2. Highlight a row in the multiple sample view and tap <Details>.
3. Tap <Archive>.
4. Select the "Report" type.
5. Select the "Storage Location" (USB storage device, FTP Server, or LIMS Bridge General Purpose Folder)
6. Define a "File name".
7. Tap <OK>

To archive several results

1. Tap <Menu> and select *Data Memory > Archive Measured Data*.
2. Tap <Filter> to limit the number of results to be archived, see section 8.4; and then tap <OK>.
3. Tap <Archive All> to archive the filtered data.
4. Select the "Report" type.
5. Select the "Storage Location" (USB storage device, FTP Server, or LIMS Bridge General Purpose Folder)
6. Define a "File name".
7. Tap <OK>

To archive all results

1. Tap <Menu> and select *Data Memory > Archive Measured Data*.
2. Tap <Archive All>.
3. Select the "Report" type.
4. Select the "Storage Location" (USB storage device, FTP Server, or LIMS Bridge General Purpose Folder)
5. Define a "File name".
6. Tap <OK>

9 Using Special Functions

9.1 System Security

Not available for DMA 4200 M and DMA 4500 M Chemicals.

You can enable different system security settings to ensure data security and to protect your measuring system from unauthorized access.

9.1.1 Security Level

Depending on your needs, you can set different security levels: low or 21 CFR Part 11 compliant. The “Low” security level is set by default.

TIP: Please note that you need to set a customer password for service activities to fulfill the security standards of 21 CFR Part 11, see section 9.1.6.

TIP: When you select “21 CFR Part 11” security level, user-defined values that correspond to a tighter security standard will not be changed.

If any changes are applied to one of the standard security level settings, see table 2, the security level is switched to user-defined security level.

Table 2: Comparison of security level settings

Security Level	Low	21 CFR Part 11
Audit trail	Off	On
Audit trail backup reminder	–	Default: 1 days
Electronic Signature	Off	On
E-Sign requires password	–	On if activated
Auto logoff	Off	On
Auto logoff time	–	Default: 60 min
Min. password length active	Off	On
Min. password length	–	6 characters
Password expires	Off	On
Password expiry time	–	Default: 60 days
Increased security	Off	On
GxP compliant reports	Off	On

To view the security settings

1. Tap <Menu> and select *Setup > System Security > Security Level*.
2. To check your current settings, tap <Details>.

To set the security level

IMPORTANT:

- Your current sample list will be reset by changing the security level.
- By activating “21 CFR Part 11”, increased security is activated automatically, see section 9.1.5.

1. Tap <Menu> and select *Setup > System Security > Security Level*.
2. Use the drop-down box to select a security level.
The user-defined security level is only available if the user has changed any default security settings.
3. If you want to compare your current settings and the settings that will be affected by changing the security level, tap <Details>.
The settings affected by changing the security level will be highlighted with red letters.
4. Tap <OK>.

9.1.2 Non Storage Mode

Only available for DMA 4100/4500/5000 M, DSA M, Lovis 2000 M/ME, and SVM (provided that the instrument is not part of a PBA system or an Xsample heated system).

To reduce the efforts for instrument qualification in lab environments, your DMA 4100/4500/5000 M, DSA 5000 M, Lovis 2000 M/ME, or SVM offers a non storage mode which is compliant to the United States Pharmacopeia 1058 CAT-B.

In this mode, all measuring results and check results are not stored, and the adjustment data are not viewable. The results have to be either written down manually, exported, or printed directly after every single measurement, check, or adjustment.

The export of results can be automatized, see section 6.2.3.

Non storage mode features

- operation without data memory
 - simplified system security
 - reduced menu tree
- For detailed information see the instruction manual of the respective instrument.

To activate/deactivate the non storage mode

1. Tap <Menu> and select *Setup > System Security > Non Storage Mode*.
2. Use the checkbox to activate/deactivate the non storage mode.

NOTICE

- Perform a full system backup before you activate the non storage mode. Otherwise all measured data, check data, and adjustment data will be lost.
- By activating the non storage mode, the security level will be set to low. Desired security settings (e.g. Audit Trail or logon settings) have to be set again.

3. Tap <OK> and follow the instructions on the screen.
The instrument reboots.

9.1.3 Value Visibility

By default, the instrument displays current values during monitor mode, and measurements as well as the final values after measurements. If required, the display of the current values can be restricted.

To restrict the display of values

1. Tap <Menu> and select *Setup > System Security > Value Visibility*.
2. Use the drop-down box “Value Visibility” to define when values shall be displayed (always, during measurement, only when measurement is finished).
3. Activate the checkbox “Show Temperature Value(s)” to display the temperature of the measuring system separately in restricted visibility modes.
4. Tap <OK>.

9.1.4 Auto Logoff, Password Expiry, and Password Length

To set an auto logoff time

You can set the instrument to automatically log off the current user after a defined time of inactivity.

1. Tap <Menu> and select *Setup > System Security > Logon Settings*.
2. Use the checkbox to activate or deactivate the auto logoff function.
3. Set the auto logoff time to a time between 1 and 60 min.

To set password expiry

You can define how long passwords are valid. The setting applies to all passwords. When a password expires, the corresponding user account will be deactivated.

For activating a user account and setting a password, see section 6.5.2.

1. Tap <Menu> and select *Setup > System Security > Logon Settings*.
2. Use the checkbox to activate the password expiry function.
3. Set the password expiry time to a time between 1 and 365 days.

To set the password length

1. Tap <Menu> and select *Setup > System Security > Logon Settings*.
2. Use the checkbox to activate the password length function.
3. Set the password length to a length between 6 and 30 characters.

IMPORTANT: *The default users are not required to observe the minimal password length. For full system security, deactivate or delete the default users.*

To set the number of failed logon attempts

You can define how many failed logon attempts are allowed before a user is automatically deactivated if an incorrect password is entered.

1. Tap <Menu> and select *Setup > System Security > Logon Settings*.
2. Use the checkbox to activate the function that automatically deactivates a user after failed login attempts.

3. Set the number of allowed failed attempts between 1 and 10.

To enforce a password complexity

By default, passwords can be defined without any rules. If required, a password complexity can be enforced and then future passwords must contain an uppercase character, a lowercase character, one number and one of the following special characters: . , - _ < > ? ! / & % # +

1. Tap <Menu> and select *Setup > System Security > Logon Settings*.
2. Use the checkbox “Complex password” to enforce a password complexity.

IMPORTANT: *After activating the password complexity, the currently used passwords are still valid and the password complexity rule counts as soon as the password is changed.*

9.1.5 Increased Security

In addition to different security levels, see section 9.1.1, you can tighten your security settings by activating increased security settings, see table 3.

Table 3: Increased security settings

On	Off
no endless data storage allowed	endless data storage allowed
only user-defined sample list mode allowed	all sample list types allowed
lock user account after 3 failed logon attempts	user account not locked after failed logon attempts
auto logon not allowed	auto logon allowed
user name must have at least 6 characters	user name may be shorter than 6 characters
user name must be entered instead of selected from list	user name can be selected from list
password must have at least 6 characters	passwords can have any length
last 5 passwords must not be used	same password can be re-used
only exported or printed data can be deleted	data need not be exported or printed to be able to delete them

NOTICE

If the increased security is activated, all user accounts that do not comply with the naming rules or password rules will be deactivated. The auto logon function will be deactivated if set.

To activate or deactivate increased security

1. Tap <Menu> and select *Setup > System Security > Increased Security*.
2. If you want to view your current settings, tap <Details>.
3. Use the “Increased Security” checkbox to activate or deactivate increased security.
4. If you want to view the settings that will be affected by activating increased security, tap <Details>.
5. Tap <OK>.

9.1.6 Advanced Security

In addition to different security levels, see section 9.1.1 and section 9.1.5, you can further tighten your security settings by activating the Advanced Data Integrity mode, disabling data transfer from or to USB memory devices (e.g. measurement data export or backup of the instrument settings) and assigning a customer password for service procedures.

With the Advanced Data Integrity mode measured data, check/adjustment data, audit trail data, method settings and users cannot be deleted anymore. Instead the archive functionality is available, which exports the information before removing it from the instrument.

IMPORTANT: *The “delete” term is still available for deleting custom user groups or when deleting user functions. Use the User Group Administration to disable the Delete User Functions functionality.*

To activate/deactivate advanced security

1. Tap <Menu> and select *Setup > System Security > Advanced Security*.
2. Use the checkbox to activate or deactivate the “Advanced Data Integrity”.
3. Use the “Disable USB memory devices” checkbox to activate or deactivate the data transfer to or from USB memory devices.
4. Use the checkbox “Service logon requires customer password” to activate or deactivate a password for service technicians.

- If activated, the instrument prompts you to enter and confirm a password.
- To log on, service persons have to enter the general service password first followed by the customer password.

TIP: To fulfill 21 CFR Part 11 security standards, activate this setting as well as the security level “21 CFR Part 11”, see section 9.1.1.

5. Tap <OK>.

9.1.7 Audit Trail

Using the audit trail function, generates a log file that lists all operating steps which directly or indirectly lead to changes in measuring results. Additionally all changes which are relevant for data integrity, manipulation or access control are documented in a log file as well.

The following operations including the respective warnings, which appear in the diagnosis window, are documented in the audit trail:

- successful or rejected adjustments and passed or failed checks
- resetting of adjustments to factory adjustment
- exceeding of adjustment intervals and check intervals
- changes of method settings or quick settings
- changes in customer functions
- changes of user groups (creating, editing, deleting)
- changes of user accounts (creating, editing, activating, deactivating, deleting, changing a password)
- incorrect password use
- saving and restoring of parameter settings and configurations
- deletion of measured data (number of deleted measuring data and corresponding unique sample ID)
- changes in the instrument software, module firmware, and operating system
- changes in the setup of the measuring system (mounting/dismounting modules)
- activation/deactivation of the audit trail; export/deletion of audit trail entries
- changes to the instrument date and time
- user and LIMS Bridge logon/logoff
- measurements with results and settings
- changes in sample list entries
- change of method
- export/printout of measured data, check data, and adjustment data
- changes in VNC connection

If working under QM regulations like GLP/GMP or 21 CFR part 11, we recommend that you set your security level to 21 CFR part 11 or a user-defined security level where audit trail is active. Export the audit trail data in regular intervals and store the data in a safe place.

To activate/deactivate audit trail

There are two ways to activate the audit trail function:

- You can set the security level to “21 CFR Part 11”, see section 9.1.1, and audit trail will be activated automatically.
 - You can activate the audit trail within your user-defined security mode.
1. Tap <Menu> and select *Setup > System Security > Audit Trail* to open the “Audit Trail Settings” dialog.
 2. Activate/deactivate the audit trail using the checkbox “Audit trail active”.
 3. Activate/deactivate the “Backup Reminder”, set the time span and tap <OK>.

To view and export the audit trail

The audit trail list can store up to 1999 entries. Make sure to regularly export, archive or delete the audit trail data.

1. Tap <Menu> and select *Data Memory > Audit Trail* to open the audit trail list.
2. Highlight a list item and tap <Details> to see more detailed information, and to enter a comment.
3. To export the data as an MS Excel or text file, tap <Print or Export>, and follow the instructions on the screen.

TIP: Additionally, you can print the audit trail data, see section 8.6.

To delete the audit trail entries

Not available in the Advanced Data Integrity mode.

1. Tap <Menu> and select *Data Memory > Delete Audit Trail*.
2. Tap <OK>.

All audit trail entries that have already been exported are deleted.

For data safety reasons, it is not possible to delete audit trail entries that have not been exported before.

To archive audit trail entries

If the advanced data integrity is activated, you have to archive the audit trail data in order to remove audit trail data from the audit trail data base permanently.

1. Tap <Menu> and select *Data Memory > Audit Trail*.
2. Tap <Archive> and follow the instructions on the screen.

Verifying the integrity of audit trail exports

Audit trail data exports are protected by an MD5 checksum file, which is exported together with the data file to guarantee full traceability.

After successful export of the data file and the corresponding MD5 file, a new audit trail entry including the MD5 checksum (hash) is generated. This checksum can be compared with the checksum of the exported file at any time to confirm that the exported file has not been manipulated.

TIP: *The Audit Trail entry for an export is written after a successful export. Therefore, the current MD5 checksum can be found only in the data memory of the instrument. The checksums in the exported data file are checksums from previous Audit Trail exports.*

To generate an MD5 checksum

Any MD5 checksum program can be used.

Example: Use the program “md5summer.exe”, which can be downloaded freely from www.md5summer.org/download.html.

1. On your PC, start “md5summer.exe”.
2. When asked “please select the root folder”, select the directory where the log files (the .md5 file and .xls or .txt file) are saved, and click <Verify sums>.
3. In the following dialog, select the .md5 file that you want to check, and click <Open>.

The check status and result are displayed.

If the checksum (hash) is the same as in the corresponding master instrument’s audit trail entry, the export file has not been manipulated.
4. Quit the program by clicking <Close>.

9.1.8 Electronic Signature

Not available in the non storage mode.

Electronic signatures can be classified as ordinary manual signatures helping to verify the authenticity of electronic data in regulated process environments.

Roles for the electronic signature

Depending on importance or impact, different signing roles can be assigned to a user. According to common regulations, you can choose between three different roles: submitter, reviewer, or approver.

Once the electronic signature function has been activated, a sample or a check can be signed as positive or negative by the submitter, followed by the reviewer and finally by the approver. If required, this three role signing can be reduced to a two role signing mode including only a submitter and an approver.

Signing states

With the electronic signature activated, three boxes appear in the first column of the data table in the multiple sample or check view next to the error state icon. The boxes illustrate the signing states of submitter (bottom box), reviewer (middle box), and approver (top box):

- grey box: not signed yet
- green box: signed as positive
- red box: signed as negative

Substitute signing

If a user of a higher level signs first, the signing states of the lower levels are set according to the evaluation of this higher level user.

Example: If a sample is signed as positive by the approver prior to a submitter or reviewer, the signing states of submitter and reviewer are also set as positive, consequently.

To enforce a two-man rule (or “three-man rule”), this substitute signing by a higher level user in place of the lower level user can be disabled.

TIP: *If the substitute signing is disabled, a submitter has to perform the measurements and checks. If a reviewer or approver performs a measurement or a check, it can be finished, but it can not be signed.*

To set the electronic signature

1. Tap <Menu> and select *Menu > Setup > System Security > Electronic Signature*.
2. Use the “Electronic signature” checkbox to activate or deactivate the electronic signature.
3. If a password is required during the signing process, also activate the checkbox “Electronic Signature requires Password” (for setting a password, see section 6.5.2).
4. Use the drop-down box “Electronic Signature Levels” to select the number of required signing roles.

The instrument will reboot if this setting is activated.

5. To allow the substitute signing by a higher level user for measurements of lower level users, also activate the checkbox “Allow substitute signing”.
6. Tap <OK>.

To assign the role and name for the electronic signature

1. Tap <Menu> and select *Setup > User Management > User Administration*.
2. Highlight the user to whom an electronic signature role shall be assigned.
3. Tap <Edit>.
4. Use the “Role for electronic signature” drop-down box to specify the role for electronic signature.
5. Enter a name to specify the user who executes the electronic signature if needed.
6. Tap <OK>.

To execute the electronic signature for a sample or a check

Only the user who carried out the measurement is allowed to sign the corresponding sample or check as the submitter.

IMPORTANT: *Once you have executed an electronic signature, you can no longer change the signing state of the corresponding sample or check.*

1. Tap <Menu> and select *Data Memory > Measured Data* or *Data Memory > Check Data* respectively.
2. Highlight the sample/check that shall be signed.

3. Change to the single sample/check view by tapping <Details>.
4. Tap the corresponding signing role button.
5. If needed, add a comment using the input field.
6. Enter your password if required.
7. Assess the sample/check by tapping <Sign negative> or <Sign positive>.
8. If you want to print or export your results including signing state and respective comments, tap <Print or Export>.

9.2 Functions – Constants, Formulas, Polynomials, Tables

Measurement mode functions are only available for DMA M and DSA M

With user functions and measurement mode functions, you can automatically calculate quantities of your interest from the output values of your instrument. For the calculated quantities, you have the same options for display, printout and export as for standard measurement results.

Example:

- Convert your results into a unit that is not supported in the standard instrument configuration.

There are seven types of functions: constants, formulas, linear functions, polynomials with one input value (1D), polynomials with two input values (2D), user tables, and measurement mode functions.


You can program up to 150 functions.

Cascading user functions

You can freely use the output value of one user function as the input variable for another user function, independent of the types of user functions involved. The instrument software automatically checks for circularity of the formula system.

Displaying user functions in output fields

To select an output quantity from the group “User Functions” for the display, see section 7.2.2.

Output fields displaying custom functions show the user symbol  in the upper right corner of the output field. A maximum of 20 characters of the user function's name can be displayed.

To program or edit a constant

The “Constant” user function is used to integrate a user-defined value into the result output.

The constant can describe every quantity needed and does not need to be directly measured with your measuring system. The constant can also be used in other user functions or changed if needed.

The constant has to be activated in the method settings of the desired methods. Then a value for the constant can be set in the method settings of the respective methods or in the sample settings via the quick settings function.

1. Tap <Menu> and select *Setup > Expert Settings > User Function Management* to open the user functions list.
2. Tap <New> to program a new constant, or highlight a list item and tap <Edit> to edit a constant. The “Edit Function” wizard opens.
3. Perform the following settings:
 - Enter a name for the constant (up to 50 characters long).
 - Use the drop-down box “Function Type” to select “Constant”.
 - Use the drop-down box “Physical Quantity” to select the type of quantity you want to use.
 - Use the drop-down box “Unit” to select the output unit.
4. Tap <Next>.
 - Enter a comment to describe this user function.
 - Activate/deactivate the checkbox “Protect function against changes by other users”.

The comment will not be printed, exported, or displayed anywhere, but is only an internal description of your user function.
5. Tap <OK>.

A message is displayed to inform you in which menu you can set the value for the constant, and in which menu you can activate the user function.
6. To activate the constant in the desired methods, tap <Menu> and select *Methods > Method Settings > method name > Activate Modules / Constants*.
7. Highlight your constant user function, enable the checkbox, and tap <OK>.

The constant is automatically added to the quick settings parameters.
8. To enter a value for the constant, use the quick settings function in the sample list or the menu “Formula Parameters” in the method settings.

To program or edit a formula

1. Tap <Menu> and select *Setup > Expert Settings > User Functions Management* to open the user functions list.
2. Tap <New> to program a new formula, or highlight a list item and tap <Edit> to edit a formula. The “Edit Function” wizard opens. Perform the following settings:
 - Enter a name for the formula (up to 50 characters long).
 - Use the drop-down box “Function Type” to select “Formula”.
 - Use the drop-down box “Physical Quantity” to select the type of quantity you want to calculate.
 - Use the drop-down box “Unit” to select the output unit.
3. Tap <Next>.
 - Enter a comment to describe this user function.
 - Activate/deactivate the checkbox “Protect function against changes by other users”.

The comment will not be printed, exported, or displayed anywhere, but is only an internal description of your user function.
4. Tap <Next>.
 - Enter a “Name” for the first variable, and define the input quantity.
 - Do the same for further input quantities if required.
5. Tap <Next>.
6. Enter your formula and tap <OK>.

The following formula elements are available:

- parentheses: ()
- operators: + - / * ^
- functions: log(), ln(), sqrt(), sin(), cos(), tan(), asin(), acos(), atan()
- constants

To program or edit a linear function

1. Tap <Menu> and select *Setup > Expert Settings > User Function Management* to open the user functions list.
2. Tap <New> to program a new linear function, or highlight an existing linear function and tap <Edit> to open the “Edit Function” wizard.
3. Perform the following settings:
 - Enter a name for the linear function (up to 50 characters long).
 - Use the drop-down box “Function Type” to select “Linear Function”.

- Use the drop-down box “Physical Quantity” to select the type of quantity you want to calculate.
 - Use the drop-down box “Unit” to select the output unit.
4. Tap <Next>.
 - Enter a comment to describe this user function.
 - Activate/deactivate the checkbox “Protect function against changes by other users”.
The comment will not be printed, exported, or displayed anywhere, but is only an internal description of your user function.
 5. Tap <Next>.
 6. Define the input quantity and tap <Next>.
 7. Enter “Offset” and “Factor” for your linear function, and tap <OK>.

To program or edit a polynomial (one- or two-dimensional)

The general formula for a one-dimensional polynomial is:

$$f(x) = \text{Coeff.0} + \text{Coeff.1} * x + \text{Coeff.2} * x^2 + \text{Coeff.3} * x^3 + \text{Coeff.4} * x^4 + \text{Coeff.5} * x^5 + \text{Coeff.6} * x^6$$

x selected input quantity
f(x) calculated output quantity

The general formula for a two-dimensional polynomial is:

$$f(x,y) = \text{Coeff.00} + \text{Coeff.01} * y + \text{Coeff.02} * y^2 + \text{Coeff.03} * y^3 + \text{Coeff.10} * x + \text{Coeff.11} * x * y + \text{Coeff.12} * x * y^2 + \text{Coeff.20} * x^2 + \text{Coeff.21} * x^2 * y + \text{Coeff.30} * x^3$$

x selected first input quantity
y selected second input quantity
f(x,y) calculated output quantity

1. Tap <Menu> and select *Setup > Expert Settings > User Function Management* to open the user functions list.
2. Tap <New> to program a new polynomial, or highlight an existing polynomial and tap <Edit> to open the “Edit Function” wizard.
3. Perform the following settings:
 - Enter a name for the polynomial (up to 50 characters long).
 - Use the drop-down box “Function Type” to select the polynomial type.
 - Use the drop-down box “Physical Quantity” to select the type of quantity you want to calculate.

- Use the drop-down box “Unit” to select the output unit.
4. Tap <Next>.
 - Enter a comment to describe this user function.
 - Activate/deactivate the checkbox “Protect function against changes by other users”.
The comment will not be printed, exported, or displayed anywhere, but is only an internal description of your user function.
 5. Tap <Next>.
 6. Define the input quantity/quantities and tap <Next>.
 7. Enter the polynomial coefficients.
If you do not enter a value for a coefficient, the coefficient will be set to zero.
 8. Tap <OK>.

To program or edit a user table

A literature table or individual experimental data of e.g. the density of a binary mixture at different concentrations can be programmed into a user table. Up to 1000 data pairs can be entered. You can also use every input quantity available to build up a user table.

TIP: *The larger the number of data pairs, and the higher the accuracy of the data pairs, the higher the accuracy of the results that you can obtain with your user table.*

TIP: *The instrument will interpolate, but not extrapolate. This means, that the data pairs that you enter into the instrument will have to cover the whole range of values that you want to measure.*

You can enter the data pairs manually, or import data from a USB storage device or an FTP server. The data files must fulfill the following requirements:

- File extension: .csv
 - Content: only data pairs;
data separator: semicolon;
decimal mark: decimal point;
no thousands separators or blanks
 - Location: root directory of the USB storage device or FTP server
1. Tap <Menu> and select *Setup > Expert Settings > User Function Management* to open the user functions list.
 2. Tap <New> to program a new user table, or highlight an existing user table and tap <Edit> to open the “Edit Function” wizard.
 3. Perform the following settings:

- Enter a name for the user table (up to 50 characters long).
 - Use the drop-down box "Function Type" to select "Table".
 - Use the drop-down box "Physical Quantity" to select the type of quantity you want to calculate.
 - Use the drop-down box "Unit" to select the output unit.
4. Tap <Next>.
 - Enter a comment to describe this user function.
 - Activate/deactivate the checkbox "Protect function against changes by other users".

This comment will not be printed, exported, or displayed anywhere, but is only an internal description of your user function.
 5. Tap <Next>.
 6. Define the input quantity and tap <Next>.
 7. Enter the values of the table and tap <OK>, or import the data.
 8. To import data, tap <Import>, select the storage location and file, and tap <OK>.

To program or edit a measurement mode function

With a measurement mode function you can include the results of sub-measurements (i.e. the single determinations) in the calculation of a formula.

After definition, the measurement mode function has to be activated in the method settings of the desired methods.

If the calculated value is out of the limited range after a measurement, you will be warned with a yellow warning sign in the quick access area and a message in the "Message List" window. Include the output quantity "Sample Error State" in the result output in order to report the status with the measurement data.

IMPORTANT: *When using Temperature Table Scan with Repeated Mode, measurement mode functions might not work with DSA M, SDA M and DMA 4100/4500/5000 M instruments.*

1. Tap <Menu> and select *Setup > Expert Settings > Measurement Mode Functions* to open the functions list.
2. Tap <New> to program a new function, or highlight an existing function and tap <Edit> to open the "Edit Function" wizard.

3. Perform the following settings:
 - Enter a name for the function (up to 50 characters long).
 - Use the drop-down box "Physical Quantity" to select the type of quantity you want to calculate.
 - Use the drop-down box "Unit" to select the output unit.
4. Tap <Next>.
 - Enter a comment to describe this function.
 - Activate/deactivate the checkbox "Protect function against changes by other users".

The comment will not be printed, exported, or displayed anywhere, but is only an internal description of your function.
5. Tap <Next>.
6. For all variables that you require, enter a "Name" and define the input quantity.
7. Tap <Next>.
8. Enter the formula of the function.

The following formula elements are available:

- parentheses: ()
- operators: + - / * ^
- functions: log(), ln(), sqrt(), sin(), cos(), tan(), asin(), acos(), atan()
- constants

Use the previously defined variable names for the input quantities, and for the reference to a sub-measurement, append its sequence number in brackets, e.g. *Input1[1]*.

9. Tap <Next>.
 - Use the drop-down box "Select a target value" to select whether the measurement mode function shall be compared to a reference value.
 - In case you select "Fixed Value", enter the target value and the limit for the range.
 - In case you select "Measured Value", select the input quantity and enter the limit and the sequence number of the sub-measurement.
10. Tap <OK>.

To verify a user function

You can directly check the output of your user function when you have finished the programming: use the calculator, see section 9.3, or the group calculator, see section 9.4.

To print or export all user functions

1. Tap <Menu> and select *Setup > Expert Settings > User Function Management* to open the user functions list.
2. To perform a printout on paper or to a PDF file, or to export the data as an MS Excel or text file, tap <Print or Export> and follow the instructions on the screen.

To delete a user function

1. Tap <Menu> and select *Setup > Expert Settings > Delete User Function* to open the user functions list.
2. Highlight a list item and tap <Delete>.

TIP: *User functions that are used to define limits in methods, cannot be deleted.*

TIP: *For Advanced Data Integrity, use the User Group Administration to revoke the access right for deleting user functions.*

9.3 Calculator

With the calculator you can simulate any factory predefined function or any of your own user functions. You can enter an input value and check which output value the function will generate. You can also generate a graph within a defined range for the selected function.

Example:

You have programmed a user function and want to verify that it works properly.

To perform a calculation

1. Tap <Menu> and select *Setup > Expert Settings > Calculator* to open the calculator.
2. Use the drop-down boxes to select the “Function” and the output “Unit”, and tap <OK>.
3. Select “Manual Value Input (Calculator)” and tap <OK>.
4. Enter the “Value” for the input parameter(s) and tap <Next>.

5. Read out the result of the function.
6. To perform a printout on paper or to a PDF file, or to export the data as an MS Excel or text file, tap <Print or Export> and follow the instructions on the screen.
7. To calculate further results with other values, tap <Previous> and repeat steps 4 and 5.
8. To exit the calculator, tap <OK>.

To generate a graph

1. Tap <Menu> and select *Setup > Expert Settings > Calculator* to open the calculator.
2. Use the drop-down boxes to select the “Function” and the output “Unit”, and tap <OK>.
3. Select “Data diagram” and tap <OK>.
4. Activate the checkbox in the column “Select” for the variable quantity (in case more than two quantities are available).
5. Enter a “Value” for the constant input parameter that has not been activated in column “Select”, and tap <Next>.

6. Define the range for the x axis (variable input quantity) by entering the first value and the last value for the variable quantity.

The graph is displayed and can be printed out or exported by tapping <Print or Export>.

Graphs cannot be printed by RS-232 printers with paper roll.

7. Tap on the graph to activate the zoom function.
 - Use the magnifiers below the graph to zoom in and out.
 - Use the arrows to move from one data point to the previous or next one.
 - Use the data point bar to scroll within the graph.
 - To close the zoom function, tap <X> in the upper right corner.
8. To calculate further results with other values, tap <Previous> twice and repeat steps 4 to 6.
9. To exit the calculator, tap <OK>.

9.4 Group Calculator

With the group calculator, you can simulate all calculations belonging to a certain group in one step. Enter the corresponding input values to get all output values belonging to the group.

To perform a calculation

1. Tap <Menu> and select *Setup > Expert Settings > Group Calculator*.
2. Use the drop-down box "Group", select the type and tap <Next>.
3. Enter the "Values" for the Input Quantities and tap <Next>.
4. Read out the calculated results.
5. To perform a printout on paper or to a PDF file, or to export the data as an MS Excel or text file, tap <Print or Export> and follow the instructions on the screen.
6. To calculate further results with other values, tap <Previous> and repeat steps 3 and 4.
7. To exit the calculator, tap <OK>.

10 Service Utilities

This chapter informs about doing a backup/restore of your instrument settings, performing a full system backup/restore, an instrument software or module firmware upgrade, getting details about the system, viewing the live raw data, and resetting your instrument to factory settings.

10.1 Making a Backup of the Instrument Settings

You can use this utility for:

- Saving the current instrument status including all method settings and your favorites list for safety reasons / for the case that someone changes the settings accidentally.
- Saving the current settings before you perform an instrument software update.
- Copying the instrument settings to other M series instruments of the same instrument type.

A backup file contains the following instrument settings and information:

- Global Settings including: measuring system settings, control panel settings (except date and time, time server settings, advanced camera settings), system security settings, printout settings, data browser settings, expert settings (check management and data memory settings), filters in data memory
- Method settings
- User functions
- Users
- Adjustments (SVM only: includes calibration corrections)

To make a backup of instrument settings

1. Tap <Menu> and select *Service > Backup Instrument Settings*.
2. Select the content of your backup file in the column "Value" and tap <Next>.
3. Select the data storage location and enter a "File name", or accept the automatic file name.
4. Tap <OK>.
5. Tap <Yes> to create your backup file.

The backup file is stored into the root directory of your USB storage device or FTP server.

10.2 Restoring the Instrument Settings

With software version 1.70 and higher you can restore any backup file made with version 1.60 or higher.

NOTICE

- For instruments with software version 1.60 installed, it is not possible to restore backups made with older software versions.
- When restoring the instrument settings, make sure that the backup file corresponds with the instrument type.

1. Tap <Menu> and select *Service > Restore Instrument Settings*.
2. Select the location of your backup file (USB storage device or FTP server) and the "File name" using the two drop-down boxes.
The backup file must be stored in the root directory.
3. Tap <Detail> for information on the selected backup file.
4. Tap <Next>.
5. Select the settings to be restored to your instrument in the column "Value", and follow the instructions on the screen.
6. Tap <OK> to restore the settings.

10.3 Full System Backup and Restore

Not available for SVM.

From software version 2.40, the software for M series instruments enables a backup of the entire measuring system. A full system backup file can be used to restore a measuring system to the state of the backup.

IMPORTANT: *A full system backup can be restored only to instruments of the same type.*

- *For example: A backup file of an instrument with a 10.4" touch screen can only be restored to instruments with the same touch screen size, but not to instruments with a smaller touch screen.*

If you restore the full system, the entire file is restored to an instrument or system. In contrast, when you restore the instrument settings, the content can be selected from the available instrument settings backup file (e.g. only one of the stored methods).

The data can be stored on a USB storage device. At least 300 MB free memory are required. Due to the large amount of data, transfer to an FTP server is not possible.

IMPORTANT: *The backup and restore from USB might take 15 to 60 minutes each.*

10.3.1 Performing a Full System Backup

A full system backup file includes the software and firmware versions of all instruments, all settings, adjustments, checks, measurement data, and audit trail entries (if activated).

Conditions for a successful full system backup

- The serial numbers of the master instrument and of each measuring module of the system have been set correctly.
- The software/firmware versions of the master instrument and of each measuring module of the system have been set correctly.
- The entire system works correctly and is fully functional.

TIP: *A full system backup should always be generated after a system has been installed.*

In case that one of the above conditions is not fulfilled, no Full System Backup will be performed. The master instrument will show the corresponding error message.

To perform a full system backup

1. Connect a USB storage device to a USB socket of your instrument.
2. Tap <Menu> and select *Service > Full System Backup*.
3. Activate or deactivate “Device-independent backup”.

TIP: *“Device-independent backup” generates a file that can be transferred to another measuring system consisting of the same measuring modules, but with different serial numbers. If not activated, the backup file can only be restored to exactly the same measuring system from which the backup file has been generated.*

4. Choose the USB storage device.
5. Tap <OK>.

The instrument will display a message and reboot if you confirm.

TIP: *The backup package is a folder with an automatically generated name (containing the instrument name, serial no., date and time). It is stored in an automatically created folder named “BackupArchives”.*

10.3.2 Performing a Full System Restore

TIP: *A full system restore will not restore the network settings. Therefore, check that the network settings are according to your requirements after a full system restore.*

Conditions for a successful full system restore

- Existing full system backup for the measuring system
- The module configuration of the measuring system has to be the same as that of the system for which the backup has been done.

IMPORTANT: *For some instruments, also the adjustment data and settings are restored to the state of the full system backup. Perform a backup of the instrument settings before a full system restore if the current instrument settings and adjustment data shall be applied afterwards, see section 10.1 and section 10.2.*

To perform a full system restore

1. Connect a USB storage device to a USB socket of your instrument.
2. Tap <Menu> and select *Service > Full System Restore*.
3. Activate or deactivate “Force module firmware restore”.

TIP: *If activated, the module firmware is restored for all modules, even if adjustment data or instrument settings cannot be restored.*

4. Select the storage location and folder on your USB storage device.

IMPORTANT: *If you use a USB storage device, the folder with the backup package must be located in a folder named “BackupArchives”. This folder is automatically created when doing a Full System Backup. If the folder “BackupArchives” contains more than one backup package folder, you can select the one to be used. Otherwise, the most recent package will be used for restoring the system.*

5. Tap <OK>.
6. The instrument will display a message and reboot if you confirm.

10.4 Updating the Software

NOTICE

- Before updating the software, contact your Anton Paar representative, as an update can possibly affect settings concerning data transfer and interfaces.
- To update the system, you need administrator rights with activated auto logon function, see section 6.5.2, or the administrator must log on and perform the update. It is not possible to downgrade the system to an older version.

Perform a system update to set up the instrument with the new features of the latest instrument software version including the module firmware.

TIP: You can download the latest instruction manual for your instrument from the respective product page on www.anton-paar.com.

TIP: Before you start the system update, export or print relevant measurement data, see section 8.6, and create a backup file of the instrument settings, see section 10.1.

To update the software

1. Load the latest software package into the root directory of your USB storage device or FTP server.
2. Connect a USB storage device to a USB socket of your instrument, or connect the instrument to the FTP server.
3. Tap <Menu> and select *Service > Update > System Update*.
4. Select the storage location (USB storage device or FTP server) and the "File name" of the new software package.
5. Tap <OK>.
6. Follow the instructions on the screen.
7. Restore the instrument settings, see section 10.2.

To update the module firmware

TIP: A message is shown if the firmware installed on one of your modules is too old. If the auto logon for a user with administrator rights is activated, the firmware update of the module can be started. Otherwise, the administrator must log on, and then start the firmware update (menu *Service > Update > Module Firmware Update*).

1. Load the latest firmware into the root directory of your USB storage device or FTP server.
2. Connect the USB storage device to a USB socket of your instrument, or connect the instrument to the FTP server.
3. Tap <Menu> and select *Service > Update > Module Firmware Update*.
4. Select the storage location and file name of the new firmware, or select "Internal" and tap <Update>.

If you select "Internal", the instrument automatically checks the system. In case any modules run an older firmware version, the instrument will update it to the version supported by the user interface software. No USB storage device or FTP server connection is required in this case.
5. Follow the instructions on the screen.

To install a language pack

To receive a language pack, contact your Anton Paar representative.

1. Load the desired language pack into the root directory of your USB storage device or FTP server.
2. Connect the USB storage device to a USB socket of your instrument, or connect the instrument to the FTP server.
3. Tap <Menu> and select *Service > Update > Install Language Pack*.
4. Select the storage location and file name of the language pack, tap <OK> and follow the instructions on the screen.

10.5 Viewing the System Information

In this menu you find information on the configuration of the hardware, software and firmware including, if connected, Xsample filling equipment and external measuring modules. The instrument type, serial number, and software/firmware versions are shown in a table.

In this menu, you can also save an instrument log file to a USB storage device or an FTP server. The log file contains the last operating steps and may help during trouble shooting.

To view the hardware and software/firmware configuration

1. Tap <Menu> and select *Service > System Information* to open the configuration overview table.
2. Use the vertical scroll bar to scroll through the table.

To save the instrument log file

1. Connect a USB storage device to a USB socket of your instrument, or connect the instrument to the FTP server.
2. Tap <Menu> and select *Service > System Information* to open the configuration overview table.
3. Tap <Save Logfile> and select the storage location.
4. Accept the automatically generated file name or enter a new one, and tap <OK>.

The instrument log file is now saved to the root directory.

To change the log file configuration

In special cases your Anton Paar representative will ask you to change the configuration of your log file in order to get more specific information about your instrument.

1. Connect a USB storage device with the special configuration file delivered by your Anton Paar representative to a USB socket of your instrument.
2. Tap <Menu> and select *Service > Update > Logging Configuration*.
3. Tap <OK>.
4. Save the instrument log file.

10.6 Exporting Instrument Data

You can export the measured data, last adjustments, and system information in the form of an Excel workbook.

1. Tap <Menu> and select *Service > Export Instrument Data*.
2. Select the storage location.
3. Accept the automatically generated file name or enter a new one, and tap <OK>.

10.7 Creating an IQ/OQ Report

Print or export an IQ/OQ report that lists:

- Software version of the system and serial numbers of the instruments
(*only in the PDF version*)
- Currently active user accounts
- Following measurement and data settings if any changes have been made compared to the factory default settings:

- Settings in the sample list menu
- Global device settings, e.g. air pump settings
- Data browser settings
- Method settings, new and deleted methods
- User functions, measurement mode functions

1. Tap <Menu> and select *Service > IQ/OQ Report*.
2. To perform a printout on paper or to a PDF file, or to export the data as an MS Excel or text file, follow the instructions on the screen.

TIP: *Fit the content of the exported Excel worksheet to one page before printing the sheet.*

10.8 Reset to Factory Settings

For SVM, this function is accessible only to service staff.


From software version 2.80, the software for M series instruments features a reset to factory settings. Thereby the instrument is restored to the original system settings, and all data and individual settings are erased.

1. Tap <Menu> and select *Service > Reset To Factory Settings*.
2. Confirm the displayed message.
The instrument reboots.

IMPORTANT: *Regional settings and network settings will not be reset to factory settings.*

10.9 Viewing, Printing, or Exporting Live Raw Data

If the monitor mode is active, you get a live view of sensor signals including raw data in this menu. You can export or print the live raw data.

After a measurement is finished, the live raw data and the quantities on the main screen are frozen. To unfreeze the values, tap .

For a list of the available instrument specific live raw data, see the manual of the instrument.

To view live raw data

1. Tap <Menu> and select *Service > Live Raw Data*.
2. Select the live raw data you are interested in.

To print or export live raw data

1. Tap <Menu>, select *Service > Live Raw Data*, and choose one of the groups of live raw data quantities.
2. To perform a printout on paper or to a PDF file, tap <Print or Export> and follow the instructions on the screen.

Calculations

You can view a list of the calculations of the currently available output quantities.

DCB – Air Pump

Air Pump State	status of the air pump (0 or 1)
----------------	---------------------------------

DCB - Air Pressure

Air Pressure	currently measured air pressure [hPa]
Air Pressure Condition	current status of the measurement
Air Pressure State	status of the air pressure measurement
Air Pressure Substate	detailed information about the status of the air pressure measurement

DCB – Environment

Heatsink temperature	temperature of the heat sink
NTC temperature	temperature measured within the instrument
Instrument internal temperature	temperature measured within the instrument

10.10 Unlocking the Service Functions

NOTICE

Please be aware that unlocking the service functions will render void the warranty of your instrument!

Service and repair activities may only be performed by Anton Paar service technicians or other authorized representatives of Anton Paar. Software functions concerning the service activities are not accessible to end users of Anton Paar instruments.

If service or repair activities are not performed by Anton Paar service technicians or other authorized representatives of Anton Paar, Anton Paar cannot warrant the functionality or correctness of its instruments.

To unlock the service functions

1. Contact your local Anton Paar representative. They will create an unlock password for you.
2. Tap <Menu> and select *Setup > System Security > Unlock Service*.
3. Enter the unlock password.
4. Define a service password.
5. Confirm the service password.
6. Tap <OK>.

To use the service functions

1. Tap on the user indicator on the right side of the header of the main screen to open the “Logon” dialog.
2. Select the user “Service”.
3. Enter the customer-defined service password.
4. Tap <OK>.

11 Communication / Data Transfer

11.1 Connecting the Instrument to an External PC via Ethernet

You can transfer the system information from your instrument to any PC on your local network via ethernet.

1. Set up a network connection for the instrument as described in section 6.1.6.
2. Open an internet browser on a PC that is connected to your local network.
3. Enter the IP address of your instrument in the address field of the browser, and press the <↵> key.

Now the system information of your instrument is displayed together with a download link for the PDF file of the instruction manual.

11.2 Connecting the Instrument to an External PC via RS-232

If you want to connect the instrument to a PC, there are two possibilities. Find the required parts in the table below:

Possibility 1	Possibility 2
<ul style="list-style-type: none"> • RS-232 connection cable, 3 m, mat. no. 70429 • Gender changer, mat. no. 302592 	<ul style="list-style-type: none"> • RS-232 cable, 1.5 m, crossed mat. no. 12455

To connect the cable

Possibility 1	Possibility 2
COM connector at the rear of the master instrument	
Gender changer	RS-232 cable, crossed
RS-232 connection cable	
RS-232 connector of PC	

If your PC does not feature an RS-232 connector, it is also possible to connect to a USB socket by using a USB/RS-232 converter.

11.3 Operating the Instrument via Remote Control

You can operate the instrument using commands for the serial interface RS-232.

IMPORTANT: *If you have defined an RS-232 printer, ensure that you do not print anything (manually or automatically) while using the RS-232 interface for data transfer to a PC. Otherwise, there will be a conflict with the RS-232 printer, and both the print-out and the data transfer will fail.*

Required RS-232 settings

- Baud rate: 9600
- Data bits: 8
- Stop bits: 1
- Parity: none
- Handshaking: none

Output format

- Language: always English
- Decimal separator: . (dot)
- Column separator: ; (semicolon)
- Line end: [CR]

RS-232 interface commands

Commands can be written with or without blanks between the words, for example both “getdata” and “get data” are valid commands.

The encoding is according to the 8-bit ANSI code page 850. This means that strings with special characters can only be converted with a loss of information. A “?” (question mark) will be used for characters which cannot be encoded.

IMPORTANT: *To ensure a correct communication, note the following:*

- *After each command, the master instrument’s response has to be waited for. Reaction times may vary, e.g. the response time for the command “getdata” depends on the number of measurement data in the data memory.*
- *Only one command may be sent per second, otherwise the output data might get shifted.*
- *After changing the position of methods, e.g. due to hiding, deleting, or creating new methods, the “method_number” changes.*
- *In case of multiple measurements, a result is provided via RS-232 for each sub measurement.*

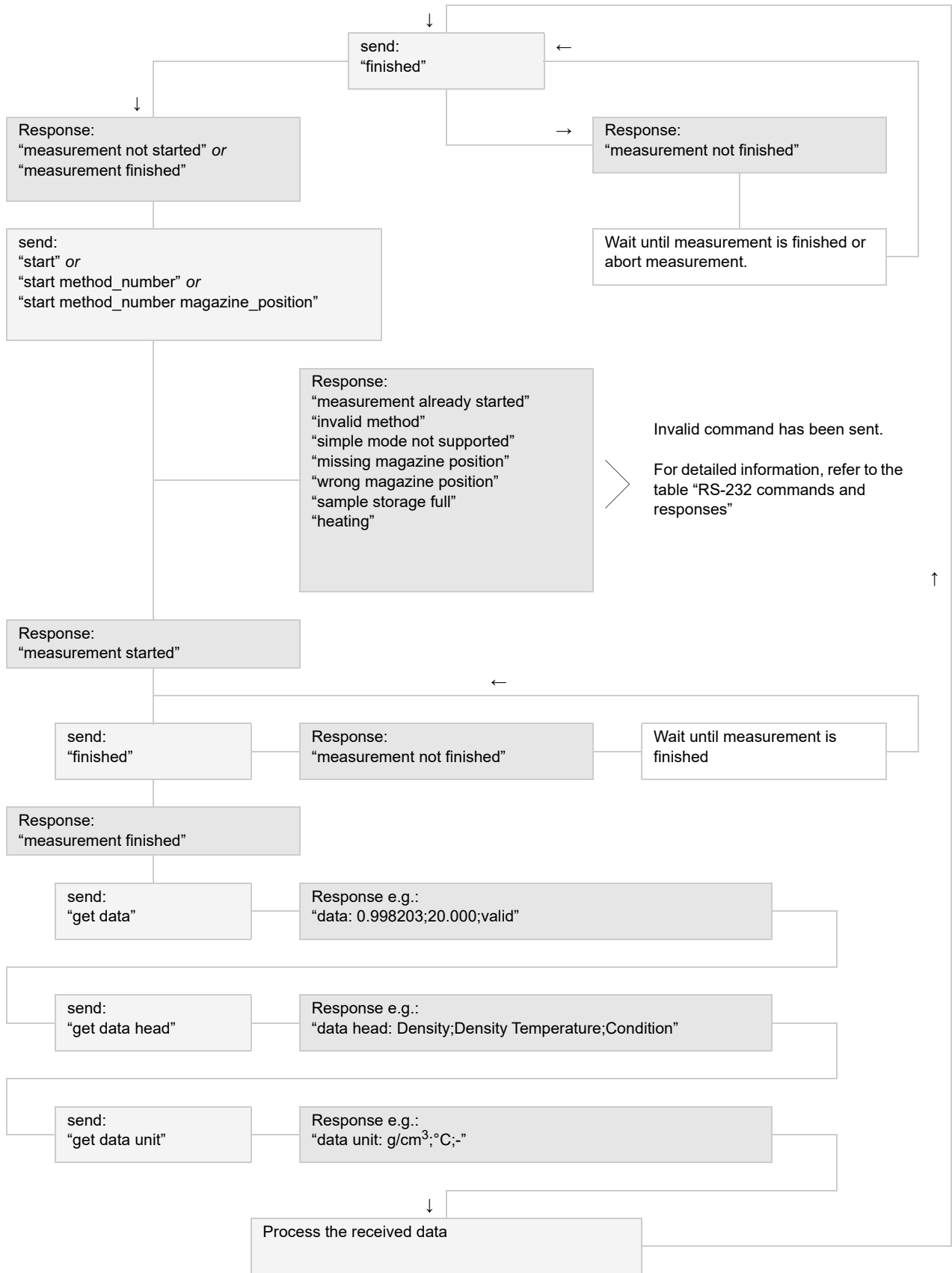
The following interface commands are available for controlling the instrument:

start <i>or</i>	Creates a new sample in the sample list and starts a measurement with the active method.
start method_number <i>or</i>	Creates a new sample in the sample list and starts a measurement with the given method number.
start method_number magazine_position	If an Xsample sample filling module is active and the sample list is in the user-defined mode, the magazine position is evaluated and set for the sample.
abort	Aborts the measurement.
getdatahead	Gets meta data of the last measured sample. The meta data include the names of the output quantities of the last measured sample. The output quantities depend on the method and are set in the "Result Output" settings.
getdataunit	Gets unit data of the output quantities of the last measured sample. For each output quantity, the unit is returned.
getdata	Returns the result values of the last measurement only once.
continuousmeasurementstart	Switches to the monitor mode.
getdatawithsubs	Returns all sub measurement values for measurement modes "TS, TTS, RM, MF or MM". The average value will not be returned.
finished	Returns the status of the measurement.
getrawdata^a	Returns the current raw data values. The unique sample ID is "NaN" if no sample has been measured yet.
getmethodname	Returns the name and number of the method.
getid	Returns the serial number, instrument type, software version, and protocol version.
set temperature xx.xxx^b	Sets the set temperature of the current method to the given value (xx.xxx [°C]). This command is only allowed if no measurement is in progress.
help	Returns a list of the available RS-232 interface commands.

^a DMA M, DSA M, SDA M only, not applicable for Lovis 2000 M/ME or other instruments

^b DMA M, DSA M only, not applicable for Lovis 2000 M/ME or other instruments

Schematic overview of the communication process:



RS-232 commands and responses

Command	Response	Description
start <i>or</i> start method_number <i>or</i> start method_number magazine_position	measurement started	The command has been accepted, and the measurement has been started.
	measurement already started	The measurement has already been started.
	invalid method	The received start command did not contain a method number, or the number could not be parsed.
	simple mode not supported	An Xsample sample filling equipment is active but the sample list is in the simple mode which is not supported. Change to the user-defined sample list mode.
	missing magazine position	An Xsample sample filling module is active and the sample list is in the user-defined mode but no magazine position parameter has been received.
	wrong magazine position	An Xsample sample filling module is active and the magazine position parameter is not valid (e.g. smaller than 1 or larger than the magazine size).
	sample storage full	The data memory and sample list are full. Clear the data memory and sample list or activate the automatic clearing option, see section 8.1.
abort	heating	The Heating Attachment is heating, so no measurement can be started.
	measurement aborted	The measurement has been aborted.
	measurement not started	No measurement has been started.
getdatahead	already aborting	The measurement is already being aborted.
	Density;Specific Gravity;Density Temperature;Density Condition	Example response with the default settings
getdataunit	no data available	No measurement has been finished yet, and so no data is available.
	g/cm ³ ;°C;-	Example response with the default settings
getdata	no data available	No measurement has been finished yet, and so no data is available.
	0.000892;0.000894;20.001;valid	Example response with the default settings
finished	no new data available	No new measurement has been finished yet, and so no new data is available.
	Measurement not started	No measurement has yet been started.
	Measurement not finished	The measurement is in progress now.
getrawdata	Measurement finished	The measurement has been finished.
	1.102689;19.999;20.000:8	Example response
getmethodname	method name: Density, 0	Example response

Command (cont.)	Response	Description
getid	serial number: 80000000 DMA 4500 M V1.70.6534.40 protocol version: 2.00	Example response
set temperature xx.xxx	accepted	The command has been accepted and the density temperature has been set to the given value.
	wrong parameter value	The given value has not been accepted (e.g. value is out of specifications).
help	commands: <ul style="list-style-type: none"> • abort • start (method number) (magazine position) • finished • getdatahead • getdataunit • getdatawithsubs • getdata • getrawdata • getmethodname • getid • settemperature xx.xxx • setcell2temperature xx.xxx • continuousmeasurementstart • checkslsettings • confirmdatavalid • datascrambled • help 	List of all available commands

11.4 Connecting the Instrument to a LIMS

The instrument can be connected to your Laboratory Information Management System (LIMS) using the Anton Paar software LIMS Bridge. LIMS Bridge can be used to send remote measurement commands from the LIMS to the instrument and to forward result files from the instrument to the LIMS.

For details see the manual of the LIMS Bridge.

11.5 Connecting the Instrument to AP Connect

AP Connect links various laboratory measuring instruments to your existing data management system. All data is collected, stored, and distributed safely and fully automatically.

For details see the manual of AP Connect.

11.6 Operating the Instrument via M Series Desktop Software

M Series Desktop is an optional PC software to completely and permanently control the supported instruments.

The software runs on a single workstation computer. Client-server operation is not provided. All data processing is performed on the PC, not on the instrument.

For details see the manual of the M Series Desktop Software.

Appendix A: Software Versions

DMA 4100/4500/5000 M

Software version	Date of release	Document number	Remarks
2.92	08.05.2017	C76IB003EN-T	First version released for DMA 4100/4500 M
2.93	24.11.2017	C76IB003EN-U	Renamed "Measurement finished by" criteria to "Precision class"
		XDLIB017EN-A	First version released for DMA 5000 M
		XDLIB017EN-B	Precision class "Fast" available for DMA 4100/4500 M
		XDLIB017EN-C	<ul style="list-style-type: none"> Advanced Data Integrity mode added Password complexity rules added VNC mode added The access right to stop a measurement can now be assigned in the user group administration Compatibility to LIMS Bridge version 3.30
2.94	14.11.2018	XDLIB017EN-D	<ul style="list-style-type: none"> Set viscosity correction mode Dark mode added for VNC Number of allowed failed logons configurable
		XDLIB017EN-E	Dynamic viscosity added in group "Density (Expert)"
2.95	07.06.2019	XDLIB017EN-F	<ul style="list-style-type: none"> Measurement mode functions added 6 new display layout types added, which can display sub-measurement results Average calculation for Repeated Mode configurable in order to comply with ASTM D4052 for opaque samples Configurable "Printed by" information for PDF reports
2.96	25.10.2019	XDLIB017EN-G	Possibility to perform temperature table scans with repeated mode
2.97	24.07.2020	XDLIB017EN-H	Support for M Series Desktop Software
2.98	18.12.2020	XDLIB017EN-I	no changes

DMA 4500 M Chemicals

Software version	Date of release	Document number	Remarks
2.90	02.05.2016	C76IB015EN-A	First version released
2.91	07.11.2016	C76IB015EN-B	<ul style="list-style-type: none"> • User group administration added • Prohibition of measurements after check expiration until a check has passed • Set temperature added to custom check result • Supports connection to a time server • Electronic signature for check results • Sample name added to export file name (automatic printout) • 400 methods
2.92	08.05.2017	C76IB015EN-C	<ul style="list-style-type: none"> • Atmospheric pressure sensor adjustment is saved in the adjustment data memory • Possibility added to enter barometer ID for atmospheric pressure sensor adjustment • KB Graph renamed to Density Adjustment Trend
		C76IB015EN-D	<ul style="list-style-type: none"> • SCU electronics supported • Output quantity "Damping" renamed to "Quality Factor" • Added output quantity "Damping" (correlates to the same output quantity of DMA Classic)
2.93	24.11.2017	C76IB015EN-E	Renamed "Measurement finished by" criteria to "Precision class"
	26.01.2018	E62IB001EN-A E62IB001EN-B	<ul style="list-style-type: none"> • Precision class "Fast" added • Unlock viscosity feature added
2.94	14.11.2018	E62IB001EN-D	• Set viscosity correction mode
		E62IB001EN-E	Dynamic viscosity added in group "Density (Expert)"
2.95	07.06.2019	E62IB001EN-F	<ul style="list-style-type: none"> • Measurement mode functions added • 6 new display layout types added, which can display sub-measurement results • Average calculation for Repeated Mode configurable in order to comply with ASTM D4052 for opaque samples • Configurable "Printed by" information for PDF reports
2.96	25.10.2019	E62IB001EN-G	Possibility to perform temperature table scans with repeated mode
2.97	24.07.2020	E62IB001EN-H	Support of optional Pressurized Measurement Unit (PMU) of Xsample 530
2.98	18.12.2020	E62IB001EN-I	no changes

Appendix B: Troubleshooting

Table 4: Measurement

Problem	Cause and Correction	see
I cannot start any measurement 15 minutes or more after booting the instrument.	Check if one or more modules have older firmware versions installed than expected from the instrument's software. The relevant information is either displayed on the start screen or in the diagnosis list of the quick access area. Tap <Menu> and select <i>Service > Update > Module Firmware Update</i> to update the respective modules using the internal firmware update package.	section 10.4

Table 5: Touchscreen

Problem	Cause and Correction	see
The screen elements do not react when tapped.	Bad touchscreen calibration: Perform a new touchscreen calibration.	section 4.3
	<i>Only for instruments with 6.4" display:</i> Exchange the protection foil (mat. no. 81233).	manual of the instrument
The screen flickers. <i>(only for instruments with 6.4" display)</i>	Due to manufacturing tolerances of the hardware, the screen may flicker for certain values of reduced display brightness. Change the display brightness.	section 4.4

Table 6: Data memory

Problem	Cause and Correction	see
I cannot see certain results in the data memory.	The filter function is activated, and the results do not match the filter criteria: Change the filter settings.	section 8.4
I have deleted all results but there are still results visible in the data memory.	The filter settings in menu "Delete Measured Data" are different from the settings in menu "Data Browser Settings": Perform corresponding settings in both menus.	section 8.7 and section 8.4

Table 7: Data export

Problem	Cause and Correction	see
The export to the USB storage device does not work.	The USB storage device has the old super floppy formatting and is therefore not accepted by the instrument: Reformat with FAT32 or try a newer USB storage device.	
Data export to FTP server does not work.	Check your FTP connection settings.	section 6.1.8
Wrong output data are exported.	The settings in the "Result Output" menu are wrong: Change the settings.	section 7.2.3

Table 8: Password protection

Problem	Cause and Correction	see
The instrument boots up without logon procedure, and no password is requested.	A user with activated auto logon function was logged in on the instrument before it was switched off: Tap on the user indicator icon and log on with another user account.	section 6.5.2

Table 9: Printout problems

Problem	Cause and Correction	see
No printout on office printer.	Office printer problems: Check that the printer has enough paper, toner, etc. See the corresponding printer manual.	
	The office printer type is not supported by your instrument.	section 5.3
	Wrong interface used: Use the interface that has been defined in menu "Printer Management", or change the interface settings.	section 5.3
	Wrong or no definition of the printer in menu "Printer Management": Change the definition.	section 5.3
No printout on RS-232 printer.	Printer problems: Check the printer. See the corresponding printer manual.	
	Wrong or no definition of the printer in menu "Printer Management": Change the definition.	section 5.3
	Chinese printer: Declare the printer as "RS-232 (Chinese)" in menu "Printer Management".	section 5.3
The RS-232 printer printout makes no sense.	Wrong communication settings on the RS-232 printer: Change the DIP switch settings, see the printer manual.	instrument's technical data in the manual
Wrong output values are printed.	The settings in menu "Result Output" are wrong: Change the settings.	section 7.2.3

Appendix C: Barcodes for Assigning Methods

To generate a barcode for a method, you can use any barcode generator, e.g. <http://barcode.tec-it.com>

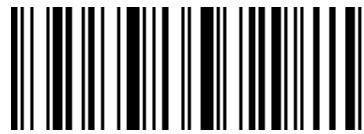
- Use the format “MethodX” with “X” standing for the position number of the method in the method list.
- To view the position number, tap <Method>.

The barcodes pictured below are type Code 128 (encodes all 128 ASCII characters).

TIP: Check the position number of your method after any changes in the method sequence, after deleting or hiding methods, and after creating new methods.



Method1



Method6



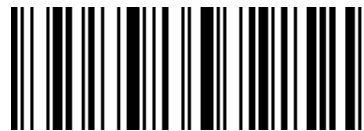
Method2



Method7



Method3



Method8



Method4



Method9



Method5



Method10