Operating Instructions

Sartorius LMA100P, LMA110S

Model Mark 3
Electronic Moisture Analyzers

98648-016-12

Contents

Introduction

Thank you for choosing the Sartorius moisture analyzer, the international version of the field-proven Mark 3 from Sartorius. This analyzer is a modular analytical instrument that can be configured to meet various performance requirements. Each analyzer consists of two parts, a control module and a heater module. The control module is comprised of a keypad and a display with the appropriate electronics. The heater module consists of the electronic balance and heating cavity. Up to more than one heater modules may be interfaced with a single control module. On initial power-up, the control module will automatically detect how many heater modules have been connected and are powered on. If more than one heater module is detected, the analyzer will run in the Multi-module mode.

The moisture analyzer is used as a quick and reliable means of determining the moisture content in various samples by the principle of loss on drying.

Key features include:

- Sample heating with infrared quartz tubes
- Precision electronic balance for accurate weighing and continuous weight monitoring during analysis
- Quarter VGA screen for easy viewing
- Large storage of methods for easy recall of frequently used drying procedures
- Modular system for add-on capability of multiple heater modules

Only for model LMA100P:

- Integral thermal printer for hard copy documentation of results, reports and graphic presentation in GLP format

Please take the time to read these Operating Instructions to learn the safe operation of this analyzer. The device has many features that will be described and can be of benefit to your moisture testing program.

The Operating Instructions contain guidance in the form of descriptions, charts, software flow charts, and pictorial diagrams:

- Key names are presented in bold: **Start**|**Stop**
- Safety symbols indicate notes or caution of risks as detailed below.

Descriptions and Symbols
Important safety related instructions are highlighted visually throughout the Operating Instructions with a description:

Danger
Warning of a possible danger that may lead to a serious injury.

Caution
Warning of a possible danger that may result in minor injury or damage.

Note
Important guideline on how to use the moisture analyzer correctly.

Instrument labels


Caution:
Read manual before operating


Danger:
Electrical hazard


Caution:
Hot surface

Warning and Safety Information

This moisture analyzer complies with the European Council Directives as well as international regulations and standards for electrical equipment, electromagnetic compatibility, and the stipulated safety requirements. Improper use or handling, however, can result in damage and/or injury.

Read these operating instructions thoroughly before using your moisture analyzer to prevent damage to the equipment. Keep these instructions in a safe place.

Follow the instructions below to ensure safe and trouble-free operation of your moisture analyzer:

Use the moisture analyzer only for performing moisture analysis of samples. Any improper use of the analyzer can endanger persons and may result in damage to the analyzer or other material assets.

Samples or containers (e.g., beakers or graduated flasks) that are too large or bulky to permit complete closure of the sample chamber hood must not be placed in the analyzer.

Do not use this moisture analyzer in a hazardous area/location; operate it only under the ambient conditions specified in these instructions.

– The moisture analyzer may be operated only by qualified persons who are familiar with the properties of the sample to be analyzed.

Class A Warning
Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Make sure before getting started that the voltage rating printed on the manufacturer's label is identical to your local line voltage (see the section on "Connecting the Moisture Analyzer to AC Power" in the chapter entitled "Getting Started")

- The analyzer comes with a power supply that has a grounding conductor
- The only way to switch the power off completely is to unplug the power cord.
- Position the power cable so that it cannot touch any hot areas of the moisture analyzer.
- Use only extension cords that meet the applicable standards and have a protective grounding conductor.
- Disconnecting the ground conductor is prohibited.
- Connect only Sartorius accessories and options, as these are optimally designed for use with your moisture analyzer.
- Protect the moisture analyzer from contact with liquid.
- If there is visible damage to the moisture analyzer or power cord: unplug the equipment and lock it in a secure place to ensure that it cannot be used for the time being.

Clean your moisture analyzer according to the cleaning instructions only (see "Cleaning").

Do not open the analyzer housing. If the seal is broken, this will result in forfeiture of all claims under the manufacturer's warranty.

In case you have any problems with your moisture analyzer:

○ contact your local Sartorius office, dealer or service center

Warning: Severe Burns!

- When setting up the moisture analyzer, leave enough space to prevent heat from building up and to keep your analyzer from overheating:
  - leave 20 cm (about 8 inches) around the moisture analyzer
  - 1 m (3 ft.) above the device
- Do not put any flammable substances on, under or near the moisture analyzer, because the area around the heating unit will heat up.
- Be careful when removing the sample from the chamber: the sample itself, the heater module and the sample pan used can still be extremely hot.
- Do not remove the heater module unit during operation: the heating element and its protective glass panels can get extremely hot!
- Prevent excess heat build-up around the analyzer.

Hazards for persons or equipment posed by using specific samples:

Fire

Explosion

- Flammable or explosive substances
- Substances that contain solvents
- Substances that release flammable or explosive gases or vapors during the drying process

  In some cases, it is possible to operate the moisture analyzer in an enclosed nitrogen atmosphere to prevent the vapor released during drying from coming in contact with oxygen in the surrounding atmosphere. Check on a case-to-case basis whether this method can be used, because installation of the analyzer in too small an enclosed space can affect its functions (for instance through excessive heat build-up within the analyzer). When in doubt, perform a risk analysis.

  The user shall be liable and responsible for any damage that arises in connection with this moisture analyzer.

Poisoning

Caustic burns

- Substances containing toxic or caustic or corrosive substances: These may be dried only under a fume hood. The value for the “lower toxic limit” in a work area must not be exceeded.

Corrosion:

- Substances that release aggressive vapors during the heating process (such as acids): In this case we recommend that you work with small sample quantities. Otherwise, vapors can condense on cold housing parts and cause corrosion.

  The user shall be liable and responsible for any damage that arises in connection with this moisture analyzer.

- Sample Pans (Delivered with the Analyzer):
  The reusable metal pans are not made of stainless steel. For this reason, they are not resistant to corrosion. These pans can be used only for powder and granules (e.g. plastics) with very low moisture content.
  If the moisture content is higher, the disposable aluminium pans (90 mm diameter) must be used (see chapter “Accessories”).

Caution
Do not touch the metal surfaces inside the drying chamber while removing or placing a sample in the analyzer since the surfaces are very hot.

Do not touch the heater hood ventilation area at any time because this area can be hot during and after a test.

- Do not test flammable or toxic materials.
- Use the analyzer in a fume hood if the samples emit fumes which could be harmful.
- Know where the fire extinguisher is located. Use only an extinguisher rated for use with electrical fires.
- Keep the analyzer clean. Always unplug the analyzer and cool it thoroughly before cleaning or performing service.
- Do not block the ventilation areas of the heating chamber.
- If necessary, press the **Start**|**Stop** key during a test to stop the test.
- Locate the analyzer away from flammable materials.
- If liquid is spilled into the analyzer, unplug the Heating Module from the electrical supply immediately.
- Analyzer is suitable for continuous operation

Safety Precautions

Danger
Use of this product in a manner not specified by the manufacturer may impair any safety protection provided by the equipment!

Every attempt has been made to make this analyzer safe and easy to use. However, like any laboratory instrument respect must be given to the operation of the analyzer due to environmental conditions, the nature of the samples being tested and of the chemicals which might be near the analyzer.
To avoid personal injury or damage to the analyzer, please observe the following precautions:
Read all instructions in the Operating Instructions prior to operating your analyzer.

Warning
Control module contains 3V Lithium Battery. Please dispose of in accordance with local regulations and conventions.

Getting Started

Thank you for choosing the Sartorius moisture analyzer. The modular analytical instrument is designed to be configured to meet various performance requirements. Each analyzer consists of two parts, a control module and a heater module. The control module contains the keypad and display with the appropriate electronics. The heater module consists of an electronic balance and heating cavity. Heater modules may be interfaced with a single control module.
On initial power-up, the control module will automatically detect how many heater modules have been connected and are powered on. If more than one heater module is detected, the analyzer will run in the multi-module mode.

Storage and Shipping Conditions
Allowable storage temperature:
–10 to +50°C
–14°F to +122°F

Allowable shipping temperature:
–40 to +70°C
–40°F...+158°F

Unpacking the Moisture Analyzer
The moisture analyzer is delivered in a set of two custom-made boxes specifically designed for this precision instrument to provide optimum protection during transportation.

Note
Retain the original packaging in order to ship the analyzer if it needs to be transported or stored at some future time.

Follow the instructions carefully when unpacking the analyzer:

- Unpack the analyzer carefully and gently.
- Remove all the contents of the carton. Check carefully to make sure you have removed all accessory items.
- The device consists of two modules, a control module and a heater module. Heater modules may be connected to a single control module.
- Inspect each module for physical damage and report any damage immediately to Sartorius or the distributor that you purchased the analyzer from.
- Verify that you have received the following accessories:

Instructions for Recycling the Packaging

To ensure adequate protection for safe shipment, your moisture analyzer has been packaged to the extent necessary using environmentally friendly materials. After successful installation of the moisture analyzer, you should return this packaging for recycling because it is a valuable source of secondary raw material. For information on recycling options, including recycling of old weighing equipment, contact your municipal waste disposal center or local recycling depot.

Equipment Supplied

- Inter-module cable
- Power module cable
- Pan support
- Pan shield
- Power cord
- Tweezers
- Sample pans
- Operating instructions manual

Only model LMA100P:

- Roll of paper
- Paper spool & 2 end caps

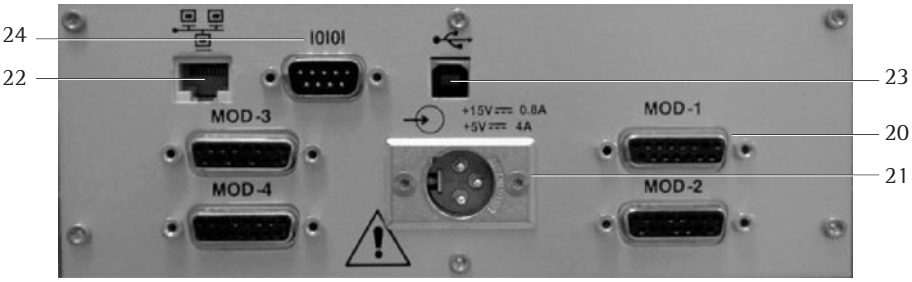
General Views of the Moisture Analyzer

No.	Designation
	Heater Module
1	Pan shield
2	Pan support
3	Cylindrical quartz heating tubes
4	RTD temperature sensor
5	Heater adjustment tool connector
6	LED status lights
7	Service panel, heaters & RTD temperature sensor
8	Level vial
9	Adjustable leveling feet
10	Inter-module cable receptacle
11	Main power switch
12	Main cord receptacle
13	Fuse 1 (250 V~5A T)
14	Fuse 2 (250 V~5A T)
15	Module power cable receptacle

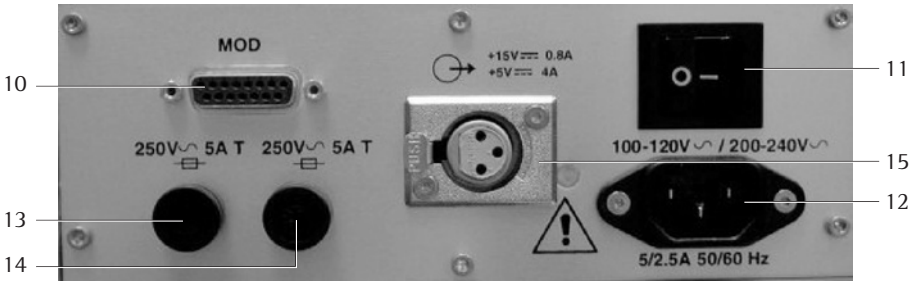
No.	Designation
	Control Module
16	Only model LMA100P: Printer cavity
17	VGA display
18	Soft keys and display overlay
19	Keypad
20	Inter-module cable receptacle
21	Module power cable receptacle
22	Ethernet socket: only for Sartorius Service
23	USB socket: only for Sartorius Service
	Cables and Power cord
24	Serial connector
25	Inter-module cable
27	Main power cord

LMA100P: General View

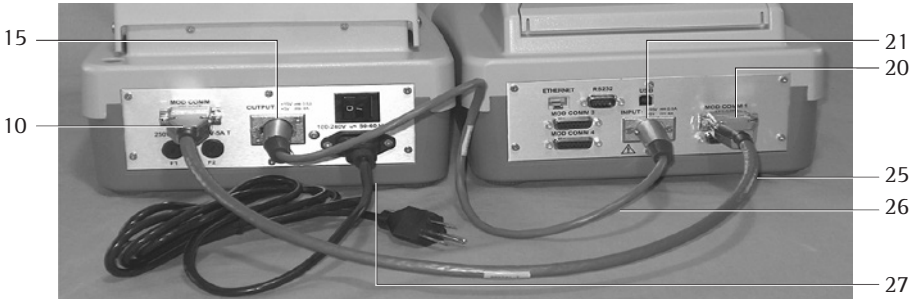
Control Module Connector Panel



Heater Module Connector Panel



Cables Connected to Control and Heater Modules



* = only for model LMA100P

Assembly
The analyzer does not come fully assembled. The control and heater modules are placed next to each other and may be placed on either side of each other. Assemble the modules and individual components in the following order:

1. Open the heater hood using the handle and install the pan shield so that the center hole fits over the center ring of the cavity base plate.

2. Next, place the stem of the pan support through the center ring of the base plate and into the hole of pan receiver.

3. Remove the foam from the heater chamber.

4. Connect the power module cable between the control module and the heater module, observing the pin orientation.

5. Connect the inter-module cable between the control module (MOD COMM 1 connector) and the heater module, observing the connector orientation.

   Only for model LMA100P:
6. Open the printer cavity cover and, if necessary, place the roll of paper with spool and two end caps into place (see page 20, Internal Printer). Once the power is turned on, you will be able to automatically feed the paper.

7. If multiple heater modules are used, install the additional inter-module cables from each heater module to the control module inter-module cable receptacles (MOD COM's). Refer to the chapter in this manual on multi-mode operation for instructions specific to operating multiple heater modules.

Choosing a Suitable Location
In order to ensure that the analyzer functions properly, select a location that meets the following requirements:

- Permissible ambient environment
  - Temperature:
    +15 to +40°C (59°F to 104°F)
  - Relative humidity:
    10 – 85%, non-condensing
  - Altitude:
    0 to 2,000 meters (0 to ~6562 ft)

- The analyzer is intended for indoor use.

- Place the analyzer on a rigid, horizontal surface, preferably free of vibration.

- Avoid drafts and excessive temperature fluctuation.

- Locate the analyzer away from flammable materials.

Connecting the Moisture Analyzer to AC Power
This Class I Equipment (grounded type) analyzer contains a universal self-adjusting power supply rated to 100-120/200-250V~5/2.5A 50/60 Hz. Check that this voltage matches your local line voltage. If your voltage is not within this rating, do not connect the power cord to the power supply.

Danger
The analyzer may only be operated using the original power cord supplied. Please do not use it with an extension cord. The wall socket must be grounded. The AC Power mains supply fluctuations are not to exceed ±10% of the nominal supply voltage. The (Over Voltage) Category II for transient over voltages is EN 61010-1. The pollution Degree 2 is supplied EN 61010-1. The analyzer is rated to Normal Protection (not protected against harmful ingress of moisture).

- Insert the power cord that with the analyzer into the power input receptacle on the back of the heater module.

- Then plug the power cord into a wall socket.

- Turn the analyzer on by moving the power switch on the back of the analyzer to the On position. The analyzer will briefly proceed through a self-diagnostic routine and then display the standby screen. It will automatically enter a warm-up period as noted on the screen. Should the analyzer display any warnings, consult the trouble-shooting section of this manual, or call Sartorius.

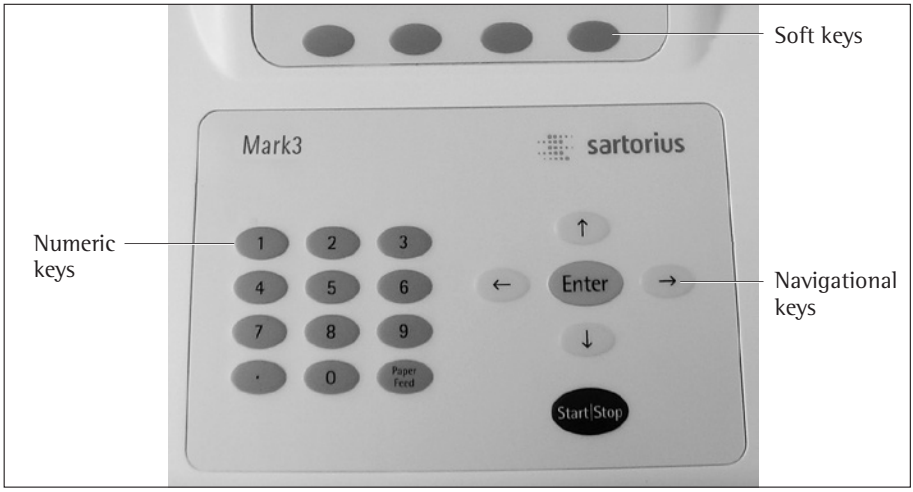
Leveling the Moisture Analyzer
In order to function properly, the heater module should be horizontal. The heater module has a level vial. You can tell when the analyzer is level by checking whether the bubble is centered in the vial.

- Check that all four feet are in the fully inserted position.
- Observing the level vial, rotate one foot at a time to level.

  Adjust control module so that it does not rock.

Note
The heater module must be re-leveled each time the analyzer is moved.

Warm-up
To enable the analyzer to function optimally, plug it in and leave it powered on for a minimum of 15 minutes. The analyzer is preprogrammed to alert the operator that the device is in the warm-up period. It is best to allow the analyzer to complete this warm-up period before testing samples; however, this may be overridden by pressing the **Enter** key.



Keypad

Operating Design

The analyzer is operated through the keypad in conjunction with the quarter VGA screen. The device is preprogrammed with operational and setup software that enables the analyzer to be custom configured to meet the particular needs of the application, environment or user ability.

Keypad

The analyzer has two membrane type keypads: the main keypad and a second that also serves to sealed the display. The keypad consists of three dedicated keys, numeric keys, navigational keys and soft keys. The following is a description of each of the key functions:

Dedicated keys:
Each key has a particular function. Pressing the key once will initiate the desired action.

Start|Stop Initiates the testing of a sample

Stops a test in progress

Enter Press to finalize the entry of a numeric value

- Selects the highlighted menu selection in a list
- From the Standby screen will print the last result

Only for model LMA100P:
Paper Feed Printer paper feed (advances 1 line per press)

Numeric and Decimal Point Keys
Numbers from 0 to 9 and the decimal point are pressed either to enter a specific numeric value or to make a selection from a list of menu choices preceded by a number.

Navigational Keys
Four keys are intended to move the highlighted cursor on the screen in a particular direction.

→ Moves the cursor to the right

← Moves the cursor to the left

↑ Moves the cursor up

↓ Moves the cursor down

Soft keys:
The functionality of these keys will change depending on what is on the display. A label on the display just above the key will describe the key function at the moment.
Some examples of the soft keys are as follows:

[Print] Prints various items corresponding to the menu selection

[On/off] Toggles a highlighted selection between on and off

[Recall] Used to select a drying program from the Program menu

[Setup] Access to all setup parameters from the Setup menu.

[Users] Used to select an operator. Name will be printed on the results printout.

[⬆] Display will return to the previous menu.

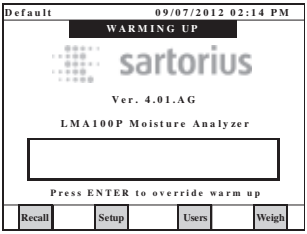
[⬅] Display will return to the Standby menu.

[Delete] Deletes the single highlighted character when entering alphanumeric program names and operators.

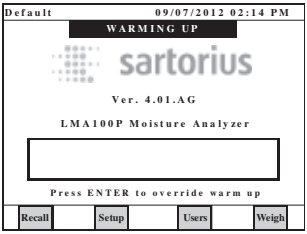
[Weigh] Sets analyzer to the weighing mode.

Display Modes

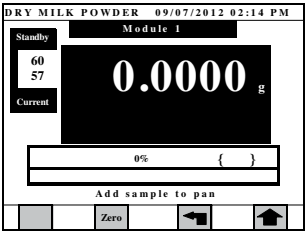
The large quarter VGA display is designed to make operation and setting up the analyzer easy through of detailed information in clear descriptions, choices or menus. The analyzer will display information in several different formats as described below:



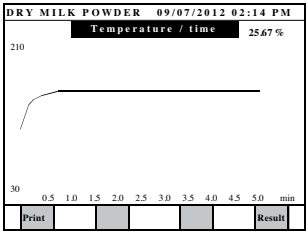
Warm-up:
This mode is entered whenever the analyzer is powered on. The warm-up period ensures that the analyzer is properly conditioned before testing is begun. During warm-up the screen will be mostly blank.



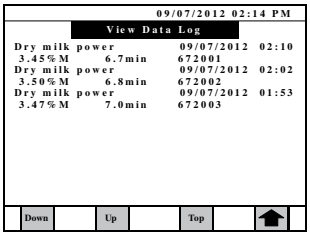
Standby (or Test Done):
In this mode the analyzer is in an ideal status.
This is the period between testing samples.
The temperature of the chamber is controlled to a particular level based on the Standby temperature set for the last test performed. The screen will display the program name, date and time, temperature and the last result, if a test has been run.



Test:
This mode is entered when the **Start**|**Stop** key is pressed to initiate a test. The screen is similar in design to the Standby mode but also includes prompts to guide the operator through the steps of adding a sample, entering an ID, if desired, and displaying the result when the test is completed.

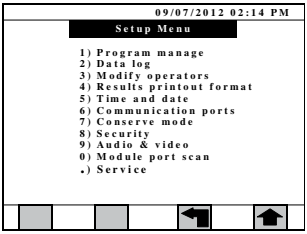


Graph:
The graph mode can be entered during or after a test to show a graph of the weight versus time, temperature versus time, or result versus time.



Data Log:
The data log mode is used for reviewing past samples that have been tested. The log of samples can be sorted, or samples can be manually selected to perform statistical calculations.

Menu Structure



The set up software is structured according to a series of menus. The Setup menu lists several topics of instrument setup. By drilling down into these topics, sub-menus will allow specific choices to be selected. See the Setup section for details.

How to navigate in the menu structure:

- To select a menu and to drill down to more specific information:
  - Press the preceding number key of this listing or
  - Use the navigational arrow keys to highlight the desired listing first, then press the **Enter** key

- To return to a preceding menu level, press the **arrow** soft key. Subsequent presses will return you to the Standby screen.

- To return to the Standby screen, press the **bent arrow** if one is available from that screen. To choose a specific selection option or to enter a value:

  A selection can be made by:
  - Pressing the preceding number key of this listing, or
  - Using the navigational arrow keys to highlight the desired listing first, then press the Enter key.

- How to make a numeric input:
  - Use the numeric keypad to enter a value fist, then press the **Enter** key.

Data Output

Only for model LMA100P:

Internal Printer

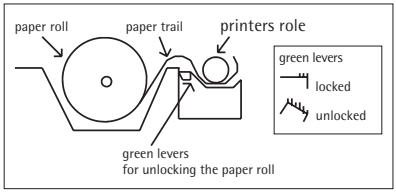
The LMA100P comes standard with an integral 40– character thermal printer for hard-copy documentation of results, programs, graphs, and screens. A single roll of paper is housed in the paper compartment behind the printer head. The Paper Feed key is used to advance the paper.

To advance the paper:

- Press the **Paper Feed** key.

To install a new roll of paper:

- Completely remove the old roll by advancing the paper with the **Paper Feed** key.
- Open the printer cover and remove the paper spool and end caps. Place the spool through the new roll of paper, push on the end caps, and then set the roll into the paper compartment with the paper feeding from the bottom front.
- Insert the free end of the paper into the printer head. The printer head will sense the paper and automatically feed the paper through the print head. Use the **Print Feed** key to advance the paper more, if desired.
- Press the green lever backwards to release the printer roller in order to straighten the paper, if necessary. Then return the lever.
- Pull the free end out of the paper compartment through the slot in the printer cover and close the cover.
- Test the printer by pressing the **Enter** key. The last test result will be printed.



Side view of printer compartment

To tear off a section of paper:

- Hold the end of the paper and turn it 45 degrees with respect to the surface of the cover. Position the leading edge of the paper on the front surface of the printer cover and pull slightly forwards to tear off the paper.

LED Status Lights

The heater module has two LED lights on the front left corner that visually indicate the status of the analyzer. The left LED shows the status of the balance. The right LED indicates the status of the heating function.

Each LED may have three colors: red, green or amber. Red is generally associated with a warning state and shows that corrective action must be taken. Green is generally associated with a positive condition, indicating you can proceed. Yellow generally indicates a transitional period or that the test is in progress.

Warmup	Balance LED	Heater LED
Warming up	Rapidly flashing RED	Rapidly flashing RED
Ready to test	Steady GREEN	Steady GREEN
Heater in conserve mode	Steady GREEN	Steady YELLOW

Standby	Balance LED	Heater LED
Sample in chamber heating cavity (chamber)	Flashing YELLOW	Flashing GREEN
Equilibrating	Flashing YELLOW	Flashing YELLOW

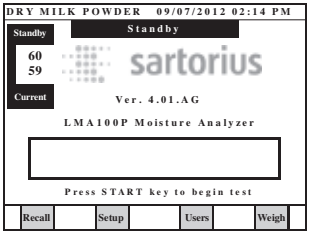
Test mode	Balance LED	Heater LED
Test in progress	Steady YELLOW	Steady YELLOW
Test done	Flashing YELLOW	Flashing GREEN
Sample loading Below target	Flashing GREEN	Steady GREEN
Within target	Flashing YELLOW	Steady GREEN
Above target	Flashing RED	Steady GREEN

Diagnostics	Balance LED	Heater LED
Failed diagnostics	Flashing RED	Flashing RED

* = only for model LMA100P

Operating the Moisture Analyzer

The Moisture Analyzer is designed to test moisture content in a large variety of materials including powders, pastes, liquids and solids. The performance of the analyzer is dependent upon selecting optimum drying analysis conditions for your specific sample type. Sartorius will support you in finding the set of testing parameters (referred to as a program) you need for your specific tests. On request, Sartorius will provide a chart of the parameters and test results we have compiled by testing samples in our laboratory and comparing the results to those obtained by reference methods.



Standby Screen
During warm-up, your analyzer will enter the Standby mode and the Standby screen will be displayed.
It is from the Standby (or Test Done) screen that all functions of operating the analyzer, including testing samples and setting parameters, take place.

The standby screen shows the following information:

- Program name
- Time and date
- Standby temperature and actual temperature
- Various soft keys for options that are available depending on the security setup options engaged
- Warnings that will need to be addressed before testing

Functions available from the Standby screen:

- Press **Start**|**Stop** key to initiate a test
- Press **Recall** soft key to change the program to be used for testing a sample
- Press **User** soft key to select an operator name (feature must be turned on in Setup)
- Press **Setup** soft key to enter the Setup menu in order to make all parameter changes
- Press **Graph** soft key to display a graph
- Press **Weigh** soft key to use as a balance

Standby-Temperature with a New Program

When creating a new program, the standby temperature setting from the previous drying program is used automatically by the analyzer.

Example:
You have created a new program for drying a temperature-sensitive sample at low temperature. The analyzer uses the standby temperature, e.g. 165°C, from the previous program.
You must call up the standby temperature parameter and change the temperature value. If you forget performing this setting, your analyzer is always too hot before starting the test.

Program name: 01Default
Temp1=105C, Standard ramp,
Time1=Off
Temp2=Off, Time2=Off
Slope=0.050%/1 minute, Actual
Start delay=0 second
Standby temp=60C,
Equilibration=Off*
Ideal weight=5g, Lock=Off
Target limits=Off
Mode=Standard

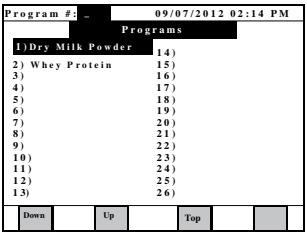
* = only for model LMA100P

Default Drying Program
Your analyzer is delivered with a default drying program. The drying program contains all the specific parameters to test a sample including temperature, endpoint, unit of measure, standby temperature, etc. You will notice if you are in the default program or a specific material program by the program name at the top left of the display.

- LMA100P: 300 drying programs
- LMA110S: 60 drying programs

Recalling a Program

Drying programs are stored for easy access at a later time. This eliminates the need to change parameters for frequently tested samples. Following drying programs can be stored:
Creating and storing a program is described under Developing a Drying Program.



To recall a stored program, perform the following steps:

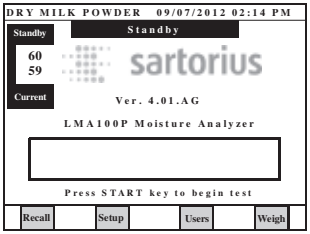
1. From the Standby screen, press the **RECALL** soft key. The screen will change to the first page of stored programs as show below.

2. To display programs on the next pages, press the **Down** soft key.

3. Press the number(s) key followed by the **Enter** key for the number that precedes the program name.
   As an alternative, use the arrow keys to highlight the desired program name, then press Enter. The display will change to the Standby screen with the new program in the top left corner. This program will be used for the next test. If a blank program is entered, the analyzer will use the last valid program that was entered.

Note

As a shortcut, it is not necessary to have the desired program listed on the display to recall it. Simply enter the desired number from your memory on the first page and press the **Enter** key.



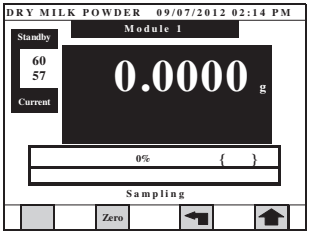
Testing a Sample
A test can only be initiated from the Standby or Test Done screen. The program that will be used is shown in the upper left corner.

To test a sample, perform the following:

1) Open the hood of the heater module using the handle on the front of the analyzer.

Caution
The heater hood will be hot during testing and the standby mode.
Only touch the heater hood by the handle.

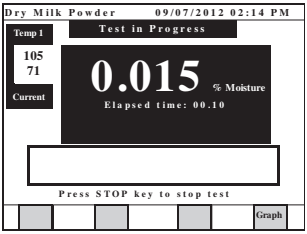
2) Place one pan onto the pan support and close the heater hood.



3) From the Standby screen, press the **Start**|**Stop** key. The display will change to the test mode as shown on the left. The balance will automatically tare and show zero weight on the screen.

Note
If you forgot to place the pan onto the balance ahead of time, you may open the heater hood now, add the pan, close the heater hood and manually tare by pressing the **Zero** soft key.

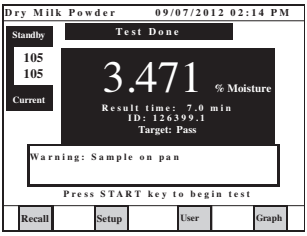
4. At the “Add sample to pan” prompt, open the heater hood and begin adding sample to the pan. A bar graph on the display will guide the operator to place the correct amount of sample as set by the ideal weight parameter of the drying program. Continue adding sample until the beeper sounds, indicating that the sample amount is within 10% of the ideal weight. The exact weight is also displayed on the screen.



5. At the “Close heater hood” prompt, close the heater hood. The balance will capture the initial weight of the sample “Sampling” and then show that the test is in progress. The display will change to show current information including the elapsed time and the current percentage weight loss in the units as specified in the drying program.

Note
To stop the test in progress, press the **Start**|**Stop** key.

The printer will begin to print as the test begins. Print-out information can be selected in Setup menu under Printer (LMA100P only).



At the end of the test the display will show “Test Done.” The result will stay on the screen as well as be printed. The analyzer will enter the Standby mode until the next test is initiated.

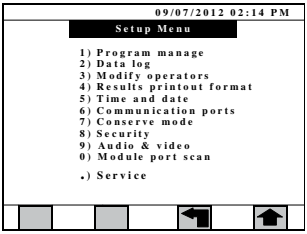
The display will prompt you, the operator to remove the sample before the next sample can be tested. Open the hood and carefully remove this sample using tweezers, and while the hood is open, add the sample pan for the next sample to be tested.

Caution
The sample is hot during and after the test. Remove the sample with care by using the tweezers provided with the analyzer. Do not touch any internal part of the heating chamber or pan shield as they will be very hot.

Press the **Start**|**Stop** key to begin the next test using the same program.

Note
The analyzer balance must be calibrated before putting the unit into routine service. See the section on Calibrate Balance in this manual.

Setup Menu



All settings including changing of instrument options and program parameters, are selected in the Setup menu. Each subject is listed on the Setup menu screen.

To enter the Setup menu:

- From the Standby screen, press the **Setup** soft key to display the Setup Menu screen.

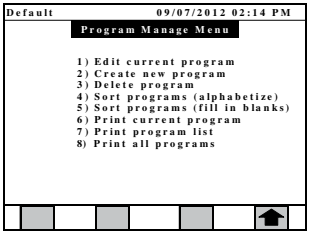
Note
Pressing the arrow soft key from the Setup menu or any submenu will always take you back one level.

Setting the Device Parameters in the Program Manage Menu

The Program Manage Menu provides access to all setup functions associated with creating, editing, or managing sample drying programs.

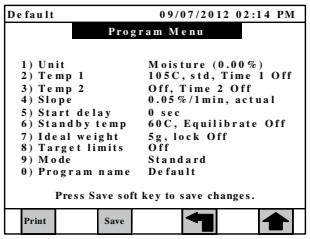
To enter the Program Manage Menu:

- From the Setup menu screen, press the **1** key or highlight “Program manage”, using the navigation keys and press **Enter**.



Edit Current Program

All parameters associated with a currently stored drying program can be edited and re-stored or changed without re-storing. The program to be edited will be in the top left corner of the display. If this is not the program you wish to edit, then it must first be recalled.



To edit a current program:

- From the Program manage menu, press the **1** key to display the Program Menu screen.

All the parameters of the drying program are displayed on this screen for the program named in the top left corner. To make a change to any of the parameters, enter the submenu for that topic.
A complete list of all variables for each parameter is shown on the next page.

To edit a current program without storing:

- Make the change, then press the **arrow** key to return one level.

- Alternatively make the change, then press the **bent arrow** key to return to the Standby screen. On the Standby screen, the warning will show that the changes have not been saved.

To save an edited program:

- Make changes, then press the **Save** soft key to return to the Standby screen.

Table: Program Settings

Screen	Parameter	Variables	Explanation
Units	Units	Moisture	Initial wt. – final wt. / Initial wt. × 100
		Solids	Final wt. / Initial wt. × 100
		Volatiles	Initial wt. – final wt. / Initial wt. × 100
		Moisture/dry	Initial wt. – final wt. / Final wt. × 100
		ppm moisture*	% Moisture × 10,000
		ppm solids*	% Solids × 10,000
		mg/l	Final wt. × 1000 / volume in mL
		Weight	Initial wt. – final wt.
		TGA moisture*	See appendix
		TGA solids*	See appendix
	Result display	Decimal place	0.01% or 0.001%
	Factors	Scale factor	Factored result = (result × scale factor) + offset
		Offset	Factored result = (result × scale factor) + offset
Temperature 1	Temperature	Maximum 210°C	Set temperature or Off
	Ramp rate*	Standard	Standard temperature ramp rate
		Rapid	More rapid ramp rate
	Time	10.0 – 99.9 minutes	Set time or Off
Temperature 2	Temperature	Maximum 210°C	Set temperature or Off
	Ramp rate*	Standard	Standard temperature ramp rate
		Rapid	More rapid ramp rate
	Time	20.0 – 99.9 minutes	Set time or Off
Slope	% Initial weight	0.010 – 9.990	Weight variable of endpoint criteria
	Window of time	0.1 – 99.9 minutes	Time variable of endpoint criteria
	Calculation	Actual slope	Slope criteria met for endpoint
		Calc 1	Calculated endpoint
		Calc 2	Calculated endpoint
		Calc 3	Calculated endpoint
Start delay	Start delay	0 - 9 seconds	Delay before starting test
	Mode	Mark 2	Simulates Mark 2 start delay
		LMA100P | LMA110S	Start delay
Standby temp.	Standby temp.	Maximum 165°C	Set temperature between tests
	Equilibration time*	1 – 60 minutes	Delay after standby temperature met
Ideal weight	Ideal weight	0.1 – 99.0 g	Set ideal sample weight for test
	Percent	1 – 10%	Set tolerance of ideal weight
	Ideal weight	Lock On or Off	Set ideal weight lock strict (On) or Off
Target limit	Target limit	Upper limit	Set upper limit of result tolerance
		Lower limit	Set lower limit of result tolerance
	Turn limits	Off	Turns target limit feature Off
Mode	Mode	Standard	Standard test mode
		Syringe*	Initial weight taken by difference
		Concentration	Corrects a result for sample volume

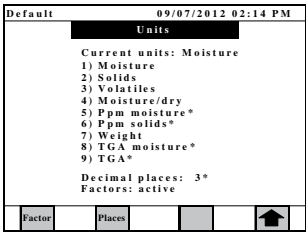
* = only for model LMA100P

Units

The analyzer will calculate the test result in a variety of units of measure, depending on your specific application. This menu also provides access to the advanced options associated with units: displayed readability and correlation factors.

To change the unit of measure:

- Press the **1** key from the Program Menu to display the Units menu. The current unit will be shown.



* = only for model LMA100P

- Press a number key for the new unit of choice.

LMA100P:

- Note that there are some advanced options indicated by **Factor** and **Places** on the soft keys. To change these features, see “Displayed Readability” and “Factors.”

LMA110S:

- Note that there is an advanced options indicated by **Factor** on the soft key. To change this feature, see “Factors.”

- When all the parameters for units have been changed, then press the arrow soft key to accept the changes. The display will return to the Program Menu.

LMA100P: Displayed Readability

To change the displayed readability:

- Press the **Places** soft key from the Units menu. Press a number key to select the desired displayed readability in percent.

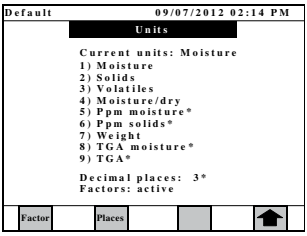
- The display will return to the Units menu.

Factors

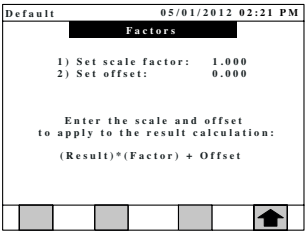
The analyzer has a feature for entering a scale or offset factor to adjust the result to a more accurate value. Only under special circumstances will either of the factors ever be used.

To set or change factors:

- Press the **1** key for Units to display the Units screen.



- Press the **Factor** soft key. The display will change to the Factors screen.



- Press the **1** or **2** key to display either the scale factor or offset screen.
- Enter the desired value and press the **Enter** key to return to the Factors screen.
- Press the **Arrow** soft key to return to the Units screen.

(result) · (scale) + offset

* = only for model LMA100P

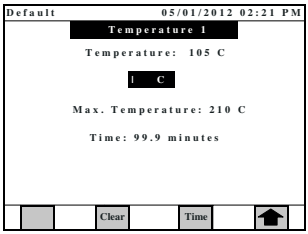
Temperature 1 and 2
The analyzer will dry the sample at one or two temperatures set in one degree of Celsius increments. A second temperature is optional and is normally set to Off. See the Applications section for a description of when to use a second temperature for two-step drying.

To set or change Temperature 1 or Temperature 2:

- Press the **2** or **3** key for Temp 1 or Temp 2, respectively. The display will change to the Temp 1 or Temp 2 screen. The current temperature will be shown.

- Using the numeric keys, type in the desired temperature and press **Enter**.

- Note that there are some advanced options indicated by Ramp and Time 1 (or 2) on the soft keys. To change these features see, “Ramp Rate”* and “Time 1 and 2.”



- When all the parameters for Temperature 1 or 2 have been changed, press the **Enter** again or the **Arrow** key to accept the changes. The display will return to the Program Menu.

LMA100P: Ramp Rate
Temperature 1 and 2 can each have one of two ramp rates: standard or rapid. The ramp rate is the time it takes to obtain the drying temperature.
Most applications will use the standard ramp rate.

To set or change ramp rate:

- Press the **Ramp** soft key to toggle between Standard and Rapid.

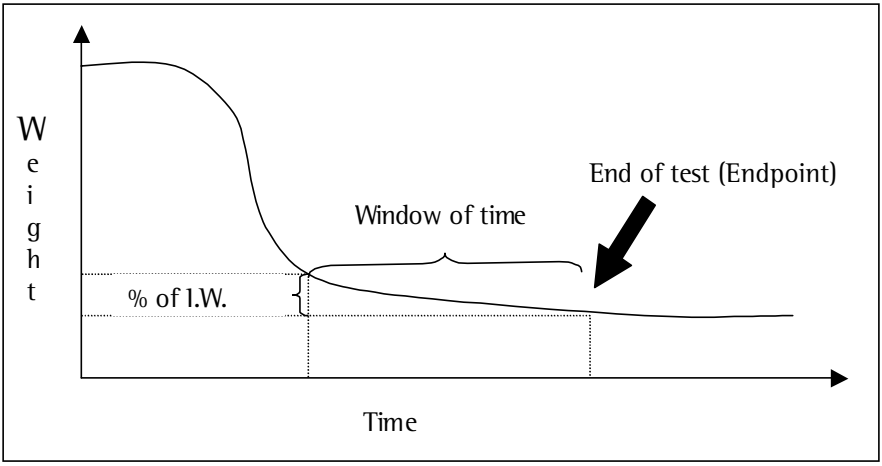
* = only for model LMA100P

Time 1 and 2
Each the Temperature 1 and 2 setting can have a set period of time. Time 1 or 2 is the time during which the sample will be dried at each temperature before advancing to the next temperature. Once the time for the last temperature has elapsed, the test will terminate unless a slope endpoint has been turned On. If Temperature 2 is set, then at the end of Time 1, the analyzer will ramp to Temperature 2.

To set or change Time 1 or 2:

- Press the **Time 1** or **Time 2** soft key to display the Time 1 or Time 2 screen.
- Use the numeric keys type in the desired temperature, then press the **Enter** key. The display will return to the Temperature 1 or 2 screen.

Slope
The slope function provides an automatic endpoint for the test. The slope function consists of two variables: window of time and percent of initial weight (%IW) change. During the test, the weight change of the sample is continuously monitored within a moving window of time. When the loss of weight within the window is less than the initial weight percentage set, the slope criteria has been met. The final weight is taken and calculation is performed to end the test. This slope is referred to as “actual slope” because the endpoint is actually achieved.

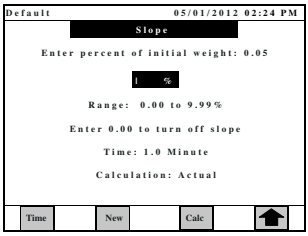


To set or change slope:

- Press the **4** key from the Program Menu to display the Slope screen. The current initial weight percentage is shown.

- Use the numeric keys type in the desired %IW, then press the **Enter** key.

- Note that there are some advanced options indicated by **Time** and **Calc** on the soft keys. To change these features, see “Window of Time” or “Calculation Endpoint.”



- When all the parameters for Slope have been changed, press the **Enter** again or the **Arrow** key to return to the Program menu.

Window of Time

To set or change window of time:

- Press the **Time** soft key to display the Window of time screen.

- Use the numeric keys to type in the desired window of time, then press the **Enter** key. The display will return to the Slope screen.

Endpoint Calculation

There are three additional advanced slope settings called Calc 1, Calc 2 and Calc 3, which are algorithms that calculate the endpoint prior to achieving the actual slope. These will provide more rapid results on some samples; however, the success of the Calc mode varies from case to case.

To set or change Calc endpoint:

- Press the **Calc** soft key to display the Calc menu.

- Press a number key to select the desired calculation setting. The display will return to the Slope screen.

- If developing a method, check the correlation of each Calc mode starting with Calc 1 to the actual endpoint result.

Start Delay
The start delay is a time in seconds that can be set to ensure that a good initial weight is taken at the beginning of the test.

To set or change start delay:

- Press the **5** key from the Program Menu to display the Start delay screen. The current start delay is shown.
- Use the numeric keys to type in the desired %IW, then press the **Enter** key.
- Note the mode: Mark 2 or LMA1.... If in the Mark 2 mode, start delay will simulate the previous Mark 2 analyzer. Press the **Mode** soft key to toggle between Mark 2 and LMA1....
- Press the **Enter** key again or the **Arrow** soft key to return to the Program Menu.

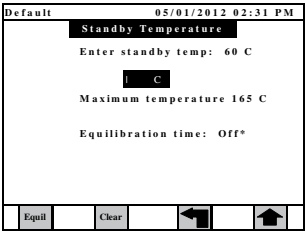
Standby Temperature
The standby temperature is the temperature that the analyzer chamber will be controlled to at the end of a test or prior to a test when a new program is recalled.

To set or change standby temperature:

- Press the **6** key from the Program Menu to display the standby temperature screen. The current standby temperature is shown.
- Use the numeric keys to type in the desired standby temperature, press the **Enter** key.

LMA100P:

- Note that there is an advanced option for equilibration indicated by **Equil** on a soft key. To change this feature, see "Equilibration Time" on the next page.
- When all the parameters for slope have been changed, press the **Enter** key again or **Arrow** key to return to the Program Menu.



* = only for model LMA100P

LMA100P: Equilibration Time
The equilibration time is a time in minutes that the standby temperature must be maintained before the next test can be started.

To set or change equilibration time:

- Press the **Equil** soft key to display the equilibration screen.

- Use the numeric keys to type in the desired time, then press the **Enter** key. The display will return to the Standby temperature screen.

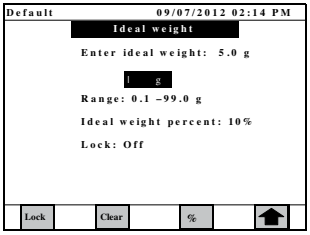
Note
If equilibration is activated, a test cannot be initiated with the **Start**|**Stop** key until the set equilibration time expires. Trying to run a test beforehand will a message to appear in the warning box. The status bar will show “Ready to Test” when the equilibration period has been met.

Ideal Weight
The ideal weight is the amount of sample in grams that should be used for the test as prompted with a bar graph and beeper in the Test mode.

To set or change the ideal weight:

- Press the **7** key from the Program Menu to display the Ideal Weight screen. The current ideal weight is shown.

- Use the numeric keys to type in the desired ideal weight then press the **Enter** key.



- Note that there are some advanced options indicated by **Lock** and % on the soft keys. To change these features, see “Ideal Weight Percent Limit” and “Ideal Weight Lock.”

- When all the parameters for slope have been changed, press the **Enter** key again or the **Arrow** key to return to the Program Menu.

Ideal Weight Percent Limit
The ideal weight limit is a tolerance range for the ideal weight in percent that the sample weight must be in. Example: If the ideal weight is 10 grams, and the target limit is 10%, then an acceptable sample weight is between 9 and 11 grams.

To set or change the Ideal weight percent limit:

- Press the % soft key to display the Ideal weight percent screen.

- Use the numeric keys to type in the desired time, press the **Enter** key. The display will return to the Ideal Weight screen.

Ideal Weight Lock
When activated, the ideal weight lock prevents the use of any other sample weight other than the one that is within the target limits. If the lock is not activated, when in the test mode, the target weight guide is still shown but any sample weight can be used for the test.

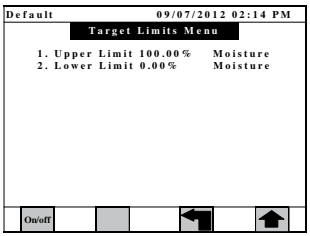
To set or change ideal weight lock:

- Press the **Lock** soft key to toggle On or Off on the Ideal Weight screen.

Target Limits
The Target limit Menu provides a statistical process control (SPC) feature that can be set to identify when a tested sample is within or outside the desirable limits selected. If this feature is activated, a Pass or Fail will be displayed after each test, indicating the sample is within or outside the set limits; this will also appear on the printout.

To turn the Target Limits feature on and to enter limits:

- Press the **8** key from the Program Menu to display the Target Limits screen. The current target limits are shown.



- Press the **On**|**Off** soft key to toggle target limits: On
- Press the **1** key to set the upper limit.
- Press the **2** key to set the lower limit.

When all the parameters for target limits have been changed, press the **Arrow** key to accept the changes. The display will return to the Program Menu.

Note only for LMA100P:
The limits are set in the current unit with the exception of ppm Moisture and ppm Solids.
These are set in percent. Example: If you wish to set a lower limit of 50 ppm M, enter 0.005.
(ppm / 10,000 = %)

Test Mode

This feature provides a few special test modes for specific applications:

- Standard: normal test mode where a sample is placed directly onto the pan or pan with sample pads to take a direct weight of the initial weight.

LMA100P:

- Syringe: used for volatile liquid samples to prevent evaporation of the sample prior to obtaining an initial weight. In this mode, special test mode prompts will guide the operator to weigh a full syringe containing a sample and then again after the syringe content is placed onto the sample pad. The analyzer automatically calculates the initial weight as the difference between the full and empty syringe. See the chapter on Syringe Mode in this manual.

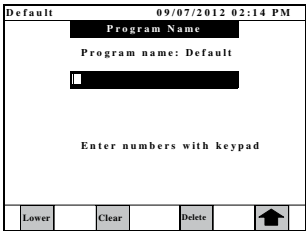
- Concentrate: used for determining total suspended solids in low solid samples. The sample solids are first concentrated onto a filter pad placed in a vacuum apparatus. During the test mode, the operator will then be prompted to enter the number of milliliters of sample that was filtered. Results are displayed in mg/l. See details in the chapter on Concentration Mode in this manual.

To change the test mode:

- Press the **9** key from the Program Menu to display the Mode screen.

- Press the number key for the mode of choice. The display will return to the Program Menu.

Program Name
Each program is stored by a unique program name. Your analyzer may be preprogrammed with a default set of programs or a set customized for your company. Program names can be alphanumeric and have some characters.



To change or set the program name:

- Press the **0** key from the Program Menu to display the Program Name screen.
- Use the navigational arrow keys, up and down, to enter letters, symbols or a space at the cursor. Pressing the **up arrow** key first shows a space, then scrolls through the alphabet starting with “A” forward, followed by symbols. Pressing the **down arrow** scrolls through the symbols followed by letters in backwards order. To change to lower case letters, press the **Lower** soft key.
- After selecting the first character, press the navigational **arrow right** key to move to the cursor to the next character space and repeat the process.
- The navigational **arrow left** key moves the cursor left.
- When finished entering the program name, press the **Enter** key to return to the Program Manage menu Menu.

Create a New Program

The analyzer will store following drying programs:

- LMA100P: 300 drying programs
- LMA110S: 60 drying programs

New programs can be created and stored for routine usage. All drying program parameters are set as described in "Edit Current Program" on page 30. When creating a new program, the parameters will be used of the last program to be recalled.

Note

When creating a new program, you will edit the last program to be recalled and shown on the Program Menu screen. However, you will need to give it a new program name for storing. Therefore, first choose a program that is most similar to your new program to minimize the amount of changes to make.

To create a new program:

- From the Program Manage menu press the **2** key for "Create new program" to display the Program Menu screen.
- The program name will be labeled "New." Change program to your desired name.
- Finish making changes to all program parameters as desired.
- Press the **Save** key to store the new program in the first available blank program slot.

Note

Programs will be saved when downloading a new software version.

Delete Program

At times you may want to delete a drying program that you will no longer need.

To delete a program:

- From the Program Manage menu, press the **3** key to go to the Delete screen showing the list of programs.
- Type in the number of the program you want to delete or move the highlight with the navigation arrow keys and press the **Enter** key. The screen will return to the Program Manage menu.

Sort Programs

Programs can be sorted in two ways to make them easier to view when recalling programs:

- Alphabetical: sorts by alphabetical order starting with characters, numbers and then letters.
- Fill in the blank: removes all the blank program positions and places programs in the storage positions starting at 1 in the same order as before the sort.

To sort programs:

- From the Program Manage menu, press the **4** or **5** key. The display will change, indicating that the analyzer is sorting. When finished, the display will return to the Program Manage menu screen.

Configuring the Printout

Print Current Program

To print the parameters of the current program as shown in the top left corner of the Program Manage menu screen:

- From the Program Manage menu, press the **6** key. The current program will be printed.

Print Program List

To print the entire list of programs:

- From the Program Manage menu, press the **7** key. The list of programs will be printed.

Print All Programs

To print all programs with parameters:

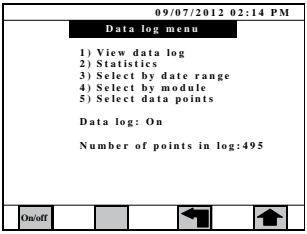
- From the Program Manage menu, press the **8** key. The list of programs with parameters will be printed.

Data Log
The analyzer will store the last 999 test results. Results can easily be sorted, viewed on the display or printed. In addition, you can perform statistical analysis on sorted or selected results for viewing or printing. Sorted data may be also downloaded.

Note
The default setting for the data log is Off.
To store data to the data log, it must be turned On first. Results in the data log are saved when dowd loading a new software version.

To enter the data log:

- From the Standby screen, press the **Setup** soft key to display the Setup menu screen.



- Press the **2** key or highlight "Data log" and press the **Enter** key to display the Data Log menu.

To enable data to enter the data log:

- From the Data Log menu, press the **On**|**Off** soft key to toggle data log to On.

To prevent data from entering the data log:

- From the Data Log menu, press the **On**|**Off** soft key to toggle data log to Off.

To view data log results:

- From the Data Log menu, press the **1** key to display the data log.

- Use the soft keys to move through the data:
  Up Moves to more recent data
  Down Moves to older data

To manually select data log results to form a group:

- From the Data Log menu, press the **5** key to display the data log selection screen. The last group selected is still retained.

- Toggle the **Select All** or **Clear All** soft key to select or deselect all data in order to define a known starting point.

- Use the navigation keys to scroll through the data: right arrow to page down, left arrow to page up.

- Highlight a test result and press the **Enter** key to show STAT. Continue for all desired results to form the group.

To print the data group:

- From the data log selection screen, press the **Print Stat** soft key to print the selected group results.

To print the entire data log:

- From the data log selection screen, press the **Print All** soft key to print all the data log results.

To print statistics for a group:

- After selecting a group from the data log selection screen, press the **Arrow** soft key to return to the Data Log menu while retaining the group.

- From the Data Log menu, press the **2** key to view statistics of the selected results. The display will show statistics including the average, standard deviation, relative standard deviation, the highest value and the lowest value.

- To print the statistics, press the **Print** soft key. Use the **Arrow** soft key to return to the Data Log menu.

To select by date range:

- From the Data Log menu screen, press the **3** key for Select by date range to go to the Select data range screen.

- Press the **1** key and set a start date

- Press the **2** key and set an end date

- Press the **Arrow** soft key to sort the data log for this date range.

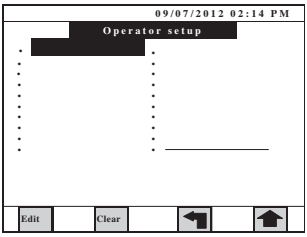
All data in the data log tested on and between these dates will be retained as a group. The display will return to the Data Log menu screen. From here you can perform statistics on the group by pressing the **2** key for Statistics, or view selected data by pressing the **5** key for Select data points. All data in this group will be displayed when you press STAT. From here you may print this group by pressing the **Print** soft key.

Modify Operators

The analyzer may be programmed with a custom list of operators specific for your company.
Operators can be alphanumeric and contain various characters.

To change or set operator names:

- Press the **3** key from the Setup menu to display the current list of operators.



- Use the arrow soft keys, then press **Enter** for any operator slot to display the alphanumeric entry screen. You may also press the **Edit** soft key for the highlighted name.
- Enter the desired name, then press the **Enter** key to return to the Set Users/Operators Menu.
- Line 20 is a blank line that cannot be edited.
- When finished, press the **Arrow** soft key to return to the Setup menu.

Note
To enable the use of Operators and to have the operator name on the result printout, Operator must first be activated in the Results Printout Format menu. When Operator is activated, then the **User** soft key will be available from the Standby menu to select an operator from the list of operators.

Note
Operator names will be deleted when downloading a new version of software.

Graphing

Your analyzer is able to display and print a graph of the current or last test. Three styles of graphs are available:

- Percent|time
- Weight|time
- Temperature|time

To view the percent|time graph during a test:

- From the Test in Progress screen, press the **Graph** soft key. The display will show the Result|Time graph. The graph automatically updates and scales until the test is completed. When the test has been completed it will automatically scale one more time.

To view the weight|time graph during a test:

- From the Percent|Time graph, press the **Weight** soft key.

To view the Temperature|Time graph during a test:

- From either the Percent|Time or Weight|Time graphs, press the **Temp** soft key.

To return to the Percent|Time graph:

- From either the Weight|Time or Temp|Time graphs, press the % (result) soft key.

To return to the Test in Progress screen during a test:

- From any graph screen, press the **Test** soft key.

To view a graph from the Test Done or Standby screen after a test is completed:

- Prior to running a new test, press the **Graph** soft key.

To print any graph:
After the test is completed, from the Test Done screen, press the **Print** soft key while displaying any of the three graphs.

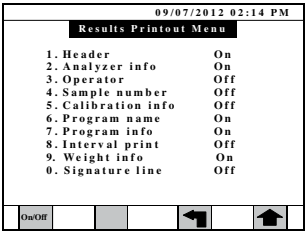
LMP100P Moisture Analyzer
Module 1: M30604026
Program 1: Default
UNITS: Moisture
MODE: Standard START DELAY: 0 sec M2
TEMP1: 105C, Std TIME1: Off
TEMP2: Off TIME2: Off
SLOPE: Window: 1.0 %IW: 0.050 Actual
STANDBY: 60C EQILIBRATE: Off*
IDEAL WT: 5.0 grams LOCK: Off
RESULT on 06/15/2003 at 10:24 AM
Elapsed time: 07:13

52.466 %M

Initial Weight = 5.1671 grams
Final Weight = 2.4561 grams
Weight Loss = 2.7110 grams

Results Printout Format

The printout format may be customized by choosing the specific content regarding the analyzer or your testing conditions that may be important to your testing program. The default printout format is shown below:



To change the printout format:

- From the Setup Menu screen press the **4** key or highlight Results Printout format using the navigation keys and press **Enter** to display the Results Printout menu.

* = only for model LMA100P

- Press the number key corresponding to the content to be added to the Result Printout format.

- The following content is either On or Off:
  Analyzer info
  Calibration info
  Program info
  Signature line
  Operator
  Program name
  Weight info

- The following content requires a selection or input:
  Header
  Sample number
  Interval print

  A complete printout format is shown to the left:

Header line 1
Header line 2
Header line 3
LMA100P Moisture Analyzer
Module 1: M30604026
Operator: John Smith
Sample ID: 1
Calibration internal: 06/12/2012 09:00 AM
Last temp cal: 05/13/2003 08:20 AM
Program 1: Titon X
UNITS: Moisture FACTOR: 1.00, 0.00
MODE: Standard START DELAY: 9 sec M2
TEMP1: 105C, Std TIME1: Off
TEMP2: Off TIME2: Off
SLOPE: Window: 1.0 %IW: 0.050 Actual
STANDBY: 60C EQUILIBRATE: Off*
IDEAL WT: 5.0 grams LOCK: Off
TARGETS: MIN: 45.00 MAX: 55.00

Time	Temp	Weight	Data	Units
0:00	61C	5.167	0.00	%M

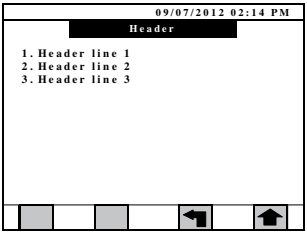
RESULT on 06/15/2012 at 10:24 AM
Elapsed time: 07:13

52.466 %M

Target: PASS
Initial Weight = 5.1671 grams
Final Weight = 2.4561 grams
Weight Loss = 2.7110 grams

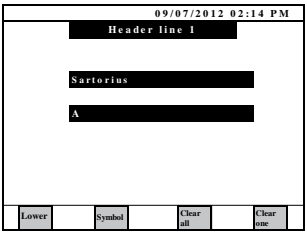
Signature:

* = only for model LMA100P

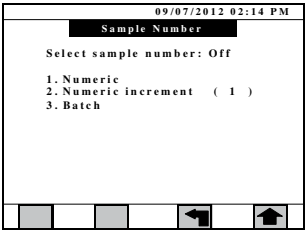


To edit or change header lines:

- From the Results Printout menu press the **1** key.



- From the Header screen press the number key **1**, **2** or **3** to edit or change any of the three header lines.
- Press the **Enter** key when finished editing each header line.
- Press the **Enter** key from the Header screen to return to the Results Printout menu.



To select a sample number format:

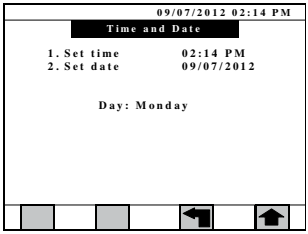
- From the Results Printout menu press the **4** key to display the Sample Number screen.
- Press the number for the format desired.
  The display will return to the Results Printout menu screen. (If Numeric Increment is selected you will be prompted to enter a starting number before returning to the Results Printout menu screen.)

To set a print interval:

- From the Results Printout menu, press the **8** key.
- Select an interval in seconds. The screen will return to the Results Printout menu.

Setting the Time and Date

The time and date along with the date format will need to be set to your local time on setup. The date will automatically roll to the next year. The analyzer will set the day of the week automatically.



To set the time and date (and format):

- From the Setup Menu screen, press the **5** key or highlight Time and Date using the navigation keys and press **Enter** to display the Time and Date screen.

To set the time:

- From the Time and Date screen, press the **1** key for Set time.
- At the Time screen, press the **Format** soft key to select the 12- or 24-hour clock.
- Use the numeric keys to type in the local time.
- If you want to use the 12-hour clock, press the **AM|PM** soft key to select AM or PM.
- Press the **Enter** key to return to the Time and Date screen.

To set the date:

- From the Time and Date screen, press the **2** key for Set date.
- At the Date screen, press the **Format** soft key to select format.
- Use the numeric keys to type in the date. The day is automatically shown.
- Press the **Enter** soft key to return to the Time and Date screen.

Communication Ports

The device offers four unique modes to communicate to other Sartorius moisture analyzers, a PC, with a network or to the internal printer.

- Serial – Transfer programs between moisture analyzers (LMA1... [Mark 3] or Mark 2) or interface with a PC
- USB – For Sartorius Service only
- Ethernet – connect to a network

LMA100P:

- Internal printer – permits result printouts at the analyzer

To set up serial communications to match peripheral device:

- From the Setup Menu screen, press the **6** key or highlight the Communication Ports menu using the navigation keys and press the **Enter** key.
- Press the **1** key for Serial Port to display the Serial Port menu screen.
- Press the **1** key or **On**|**Off** soft key to toggle the serial port On.
- Press the **2** key for Select baud rate and then the appropriate key to select either 300, 1200, 2400, 4800, 9600, 19200, 57600, or 115200. The screen will return to the Serial Port menu screen.
- Press the **3** key for Set up serial port to make final selections:
  - 8, no parity, 1 stop bit
  - 7, even parity, 1 stop bit
  - 7, odd parity, 1 stop bit
- Finally, press the **4** key to toggle CTS On or Off.

LMA100P:
To turn the internal printer Off, press the **4** key from the Communication Ports menu, or highlight Printer On and toggle the **On**|**Off** soft key to display Printer Off.

Note
To download or upload drying programs from another Sartorius product (Mark 3, Mark 2, Omni 1) refer to operating instructions “Transfer Programs” on page 61.

Serial Command Set
Through specific serial commands entered via a personal computer interfaced to the device, all setup and operational functions of the analyzer can be performed from the computer.

For a complete set of serial commands, please contact Sartorius.

Pin Assignment Chart
Pin Configuration of 9 pin DE-9S

Pin	Remark
1	Shorted with pins 4 and 6
2	TxD (out)
3	RxD (in)
4	Shorted with pins 1 and 6
5	GND (tied to shell and digital ground)
6	Shorted with pins 1 and 4
7	CTS
8	RTS
9	No connection

Serial Command List

Command Format	Limit Description	Response Format	Range
Test Setting Commands			
SET UNITS MOISTURE		UNITS MOISTURE	
SOLIDS		UNITS SOLIDS	
VOLATILES		UNITS VOLATILES	
MOISTURE/DRY		UNITS MOISTURE/DRY	
PPM MOISTURE*		UNITS PPM MOISTURE	
PPM SOLIDS*		UNITS PPM SOLIDS	
WEIGHT		UNITS WEIGHT	
SET TEMP1 x	Float (0-210) 0=OFF	TEMP1 x	25-210C
SET TEMP2 x	Float (0-210) 0=OFF	TEMP2 x	25-210C
SET RAMP1 STANDARD*	"STANDARD"/"RAPID"	RAMP1 STANDARD	
RAPID*		RAMP1 RAPID	
SET RAMP2 STANDARD*	"STANDARD"/"RAPID"	RAMP2 STANDARD	
RAPID*		RAMP2 RAPID	
SET TIME1 xx.x	Float (0-99.9) 0=OFF	TIME1 xx.x	0=99.9 minutes, 0=OFF
SET TIME2 xx.x	Float (0-99.9) 0=OFF	TIME2 xx.x	0=99.9 minutes, 0=OFF
SET FACTOR x.xxx	Float	FACTOR x.xxx	
SET OFFSET x.xxx	Float	OFFSET x.xxx	
SET PLACES x	Integer (2 or 3)	PLACES x	2,3
SET SLOPE x.xxx	Float (0.0 - 9.99)	SLOPE x.xxx	0-9.99%, 0=OFF
SET SLOPETIME x.xx	Float (0.1 - 99.99)	SLOPETIME x.xx	0-9.99 minutes, 0=OFF
SET CALC ACTUAL	"ACTUAL"/"CALC1"/ "CALC2"/"CALC3"	CALC ACTUAL	
CALC1		CALC CALC1	
CALC2		CALC CALC2	
CALC3		CALC CALC3	
SET DELAY x	Integer (0 - 9)	DELAY x	0-9 sec
SET STANDBY x	Integer (<165)	STANDBY x	25-165C
SET EQUILIBRATE x*	Integer (0 - 60)	EQUILIBRATE x	0-60 minutes
SET IDEALWEIGHT xx.x	Float (0.1 - 99.0)	IDEALWEIGHT xx.x	0-99 grams
SET IDEAL PERCENT xx.x	Float (0.1 - 10.0)	IDEAL PERCENT xx.x	1-10
SET IDEALLOCK ON OFF	"ON"/"OFF"	IDEALLOCK ON IDEALLOCK OFF	
SET TARGETUPPER xxx.x	Float (0 - 100.0)	TARGETUPPER xxx.x	0-100
SET TARGETLOWER xxx.x	Float (0 - 100.0)	TARGETLOWER xxx.x	0-100
SET TARGETLIMIT ON OFF	"ON"/"OFF"	TARGETLIMIT ON TARGETLIMIT OFF	
SET MODE STANDARD	"STANDARD"/"SYRINGE"/ "CONCENTRATION"	MODE STANDARD	
SYRINGE*		MODE SYRINGE	
CONCENTRATION		MODE CONCENTRATION	
SET PROGRAMNAME string	String	PROGRAMNAME string	Max: 15 characters
GET TEMP1	Float (0-210) 0=OFF	TEMP1 x	
GET TEMP2	Float (0-210) 0=OFF	TEMP2 x	

* = only for model LMA100P

Command Format	Limit Description	Response Format	Range
GET RAMP1*	"STANDARD"/"RAPID"	RAMP1 STANDARD	
GET RAMP2*	"STANDARD"/"RAPID"	RAMP2 STANDARD	
GET TIME1	Float (0-99.9) 0=OFF	TIME1 xx.x	
GET TIME2	Float (0-99.9) 0=OFF	TIME2 xx.x	
GET FACTOR	Float	FACTOR x.xxx	
GET OFFSET	Float	OFFSET x.xxx	
GET PLACES	Integer (2 or 3)	PLACES x	
GET SLOPE	Float (0.0 - 9.99)	SLOPE x.xxx	
GET SLOPETIME	Float (0.1 - 99.99)	SLOPETIME x.xx	
GET CALC	"ACTUAL"/"CALC1"/ "CALC2"/"CALC3"	CALC ACTUAL	
GET DELAY	Integer (0 - 9)	DELAY x	
GET STANDBY	Integer (<165)	STANDBY x	
GET EQUILIBRATE*	Integer (0 - 60)	EQUILIBRATE x	
GET IDEALWEIGHT	Float (0.1 - 99.0)	IDEALWEIGHT xx.x	
GET IDEAL PERCENT	Float (0.1 - 10.0)	IDEAL PERCENT xx.x	
GET IDEALLOCK	"ON"/"OFF"	IDEALLOCK ON	
GET TARGETUPPER	Float (0 - 100.0)	TARGETUPPER xxx.x	
GET TARGETLOWER	Float (0 - 100.0)	TARGETLOWER xxx.x	
GET TARGETLIMIT	"ON"/"OFF"	TARGETLIMIT ON	
GET MODE	"STANDARD"/"SYRINGE"/ "CONCENTRATION"	MODE STANDARD	
GET PROGRAMNAME	String	PROGRAMNAME string	
System Commands			
SET SN xxxxxxxx	Set controller SN	SN M3123005A	9 characters
SET MN xxxxxxxx	Set module SN	MN M3123005A	9 characters
SET TCD mm/dd/yyyy		TCD 12/28/2004	mm/dd/yyyy
SET BCD mm/dd/yyyy		BCD 12/28/2004	mm/dd/yyyy
SET LCT EXTERNAL		LCT EXTERNAL	
INTERNAL		LCT INTERNAL	
NONE		LCT NONE	
SET SLEEP ON		SLEEP ON	
OFF		SLEEP OFF	
SET SLEEPTIME hh:mm pm		SLEEPTIME hh:mm pm	hh:mm am or hh:mm pm
SET WAKE ON		WAKE ON	
OFF		WAKE OFF	
SET WAKETIME hh:mm pm		WAKETIME hh:mm pm	hh:mm am or hh:mm pm
SET SLEEPDAY 1-7		SLEEPDAY 1-7 ON/OFF	1=Monday...7=Sunday
SET WAKEDAY 1-7		WAKEDAY 1-7 ON/OFF	1=Monday...7=Sunday
SET CONSERVE x		CONSERVE x	0-60 minutes
SET TIME xx:xx AM/PM		TIME 01:00 PM	hh:mm am or hh:mm pm
SET DATE mm/dd/yyyy		DATE 01/18/2005	mm/dd/yyyy
SET TIMEFORMAT 0-1		TIMEFORMAT 0	0=AM/PM, 2=24 hr

* = only for model LMA100P

Command Format	Limit Description	Response Format	Range
SET DATEFORMAT 0-1		DATEFORMAT 0	
SET PASSNUM xxxxx		PASSNUM xxxxx	
SET ACCESS 1-9 ON		ACCESS 1-9 ON/OFF	Security access 1-9 correspond to menu items 1-9
1-9 OFF			
SET OP X string		OP x string	Operator Names: 1-19, 15 character max.
SET PRINTER ON		Printer ON	
SET PRINTER OFF		Printer OFF	
GET SN		SN M3123005A	
GET MN		MN M3123005A	
GET TCD		TCD: mm/dd/yyyy hh:mm AM/PM	
GET BCD		BCD: mm/dd/yyyy hh:mm AM/PM	
GET LCT		LCT: EXTERNAL	
GET SLEEP		SLEEP OFF	
GET SLEEPTIME		SLEEPTIME 00:00 AM	
GET WAKE		WAKE OFF	
GET WAKETIME		WAKETIME 00:00 AM	
GET SLEEPDAY 1-7		SLEEPDAY 1-7 ON/OFF	
GET WAKEDAY 1-7		WAKEDAY 1-7 ON/OFF	
GET CONSERVE		CONSERVE 0	
GET TIME		HH:MM:SS	
GET DATE		MM/DD/YYYY	
GET TIMEFORMAT		TIMEFORMAT 0	
GET DATEFORMAT		DATEFORMAT 0	
GET PASSNUM		PASSNUM xxxxxx	
GET ACCESS 1-8		ACCESS X ON/OFF	
GET OP X		OP 1-19 string	
GET STATS		Prints stats	
GET PRINTER		Printer ON/OFF	
GET READING		x.xxxx xxC (Weight Temp)	
GET WINDOW		WINDOW Window string	
GET RESULT		STATUS followed by result lines	
GET DATALOG		Data Log format	

Command Format	Limit Description	Response Format	Range
Results Printout Commands			
SET HEADER 1 string		HEADER 1 string	Max: 15 characters
SET HEADER 2 string		HEADER 2 string	Max: 15 characters
SET HEADER 3 string		HEADER 3 string	Max: 15 characters
SET PRINTHEADER ON		PRINTHEADER ON	
OFF		PRINTHEADER OFF	
SET INFO ON		INFO ON	
OFF		INFO OFF	
SET OPERATOR ON		OPERATOR ON	
OFF		OPERATOR OFF	
SET SAMPNO NUMERIC		SAMPNO NUMERIC	
INC		SAMPNO INC	
BATCH		SAMPNO BATCH	
OFF		SAMPNO OFF	
SET CALINFO ON		CALINFO ON	
OFF		CALINFO OFF	
SET PROGNAME ON		PROGNAME ON	
OFF		PROGNAME OFF	
SET PROGINFO ON		PROGINFO ON	
OFF		PROGINFO OFF	
SET WEIGHTS ON		WEIGHTS ON	
OFF		WEIGHTS OFF	
SET SIGNATURE ON		SIGNATURE ON	
OFF		SIGNATURE OFF	
SET INTERVAL x		INTERVAL 30	Print Interval: 0=OFF, 2, 5, 10, 30, 60 seconds
GET HEADER 1		Print header 1: SARTORIUS	
GET HEADER 2		Print header 2:	
GET HEADER 3		Print header 3:	
GET PRINTHEADER		PRINTHEADER ON	
GET INFO		INFO ON	
GET OPERATOR		OPERATOR ON	
GET SAMPNO		SAMPNO INC + SAMPNO ON	
GET CALINFO		CALINFO OFF	
GET PROGNAME		PROGRAMNAME New	
GET PROGINFO		PROGINFO ON	
GET WEIGHTS		WEIGHTS ON	
GET SIGNATURE		SIGNATURE ON	
GET INTERVAL		INTERVAL 30	

Command Format	Limit Description	Response Format	Range
System DO Commands			
DO TRANSFER MARK3			
DO TRANSFER MARK2			
DO CAL INTERNAL		Internal Calibration Complete	
DO CAL EXTERNAL		Calibration Complete	
DO WEIGHT RAISE			
DO WEIGHT LOWER			
DO PROGRAMS CLEAR		PROGRAMS CLEAR	
DO PROGRAMS SAVE		PROGRAMS SAVE	
DO PROGRAMS ALPHABETIZE		PROGRAMS ALPHABETIZE	
DO RECALL XXX		RECALL XXX	
DO ARCHIVE SAVE		ARCHIVE SAVE	
DO ARCHIVE LOAD		ARCHIVE LOAD	
DO TARE		TARING	
DO CLROPERATORS		CLROPERATORS	
DO CLRDATALOG		CLRDATALOG	
DO KEY 0		KEY 0	
DO KEY 1		KEY 1	
DO KEY 2		KEY 2	
DO KEY 3		KEY 3	
DO KEY 4		KEY 4	
DO KEY 5		KEY 5	
DO KEY 6		KEY 6	
DO KEY 7		KEY 7	
DO KEY 8		KEY 8	
DO KEY 9		KEY 9	
DO KEY .		KEY .	
DO KEY PF (Paper Feed)		KEY PF (Paper Feed)	
DO KEY START (Start/Stop)		KEY START (Start/Stop)	
DO KEY UP		KEY UP	
DO KEY DOWN		KEY DOWN	
DO KEY LEFT		KEY LEFT	
DO KEY RIGHT		KEY RIGHT	
DO KEY SOFT1		KEY SOFT1	
DO KEY SOFT2		KEY SOFT2	
DO KEY SOFT3		KEY SOFT3	
DO KEY SOFT4		KEY SOFT4	
DO KEY ENTER		KEY ENTER	

Mark 3 Program Download Format

Introduction: This document details the program output format for the Mark 3 Moisture Analyzer. The analyzer has the capability to transfer program settings to another Mark 3 or a PC. The analyzer can also be downloaded with settings from a PC.
This text format is used to transfer all the information necessary to control the test conditions of a moisture analysis test.

Field	Description
1	Program Number (#XXX)
2	Program Name (15 characters max.)
3	Units (0=Moisture, 1=Solids, 2=Volatiles, 3=Moisture dry, 4=PPM Moisture, LMA100P: 5=PPM Solids, 6=Weight, 7=mg/L LMA110S: 5=Weight, 6=mg/L
4	Slope Time (X.X minutes)
5	Slope Percentage (X.XXX)
6	Slope Calculation (0=Actual, 1=Calc 1, 2=Calc 2, 3=Calc 3)
7	Standby Temperature (165C max)
8	Equilibration Time (X minutes)
9	Ideal Weight (XX.X grams)
10	Ideal Weight % (XX.X)
11	Ideal Weight Lock (0=OFF, 1=ON)
12	Target Limit: Upper (X.XXX %)
13	Target Limit: Lower (X.XXX %)
14	Target Limit: Usage (0=OFF, 1=ON)
15	Test Resolution (2=X.XX%, 3=X.XXX%)
16	Scale Factor (X.XXX) Default=1.000
17	Scale Offset (X.XXX) Default=0.000
18	Temperature 1 (XXX)
19	Ramp 1 (0=Standard, 1=Rapid)
20	Time 1 (XX.X)
21	Temperature 2 (XXX)
22	Ramp 2 (0=Standard, 1=Rapid)
23	Time 2 (XX.X)
24	Test Mode (0=Standard, LMA100P: 1=Syringe, 2=Concentration, 3=Fat LMA110S: 1=Concentration, 2=Fat)
25	Start Delay (seconds)

Output Example:
1,Default,0,1.0,0.050,0,60,0,5.0,10.0,0,100.00,0.000,0,3,1.000,0.000,105,0,0.0,0,0,
0.00,128/r/n

Mark 2 Program Download Format

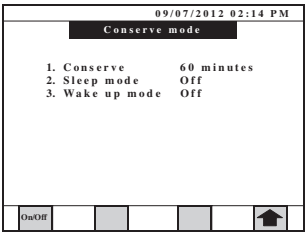
Field	Description
1	Program Number (#XXX)
2	Units (M,S,W,V,L)
3	Ideal Weight (XX.X, Negative value indicates ideal wt. loading locked 90-110%)
4	Temp 1 (XXX)
5	Temp 2 (XXX)
6	Time 1 (Seconds)
7	Time 2 (Seconds)
8	Standby Temp (XXX)
9	Slope Mode (0=Actual, 1=Calc1, 2=Calc2, 3=Calc3)
10	Slope Time (Tenths of minutes, example: 50=5.0 minutes)
11	Slope % (XX.XXX)
12	Start Delay of Initial Wt. Capture*
13	Program Name (19 characters)

Output Example (Factory Defaults):
1,M, 5.0,105, 0, 0, 0, 60,0,10, 0.050,65,FACTORY 1
2,M,30.0,110, 0, 120, 0,110,0,20, 0.010,65,FACTORY 2
3,S, 2.0,135, 0, 0, 0,130,0,10, 0.100,65,FACTORY 3
4,W, 5.0,105,130, 300, 300, 60,0, 0, 0.000,65,FACTORY 4
5,L, 2.0,135, 0, 0, 0,100,0,10, 0.050,65,FACTORY 5
/r/n

* Field 12 - Start Delay of Initial Wt. Capture Bit 0...Sample ID 0=Off 1=On

Sample ID Off			**Sample ID On**		
Time(s)	**Value**	**Hex**	**Time (s)**	**Value**	**Hex**
0	0	0000 0000	0	1	0000 0001
1	16	0001 0000	1	17	0001 0001
2	32	0010 0000	2	33	0010 0001
3	48	0011 0000	3	49	0011 0001
4	64	0100 0000	4	65	0100 0001
5	80	0101 0000	5	81	0101 0001
6	96	0110 0000	6	97	0110 0001
7	112	0111 0000	7	113	0111 0001
8	128	1000 0000	8	129	1000 0001
9	144	1001 0000	9	145	1001 0001

Conserve Mode



The Conserve Mode allows the analyzer to manage the heating elements to be turned Off when the analyzer is not in use. In addition, a time schedule can be set for each day of the week for a Sleep mode and a Wake mode.

To edit or change the Conserve Mode period:

- From the Setup Menu screen, press the **7** key or highlight the Conserve mode using the navigation keys and press **Enter** to display the Conserve Mode screen.
- Press the **1** key for Conserve to show the Conserve screen.
- Use the numeric keys to type in a period of time up to 60 minutes and press **Enter** to return to the Conserve Mode screen.

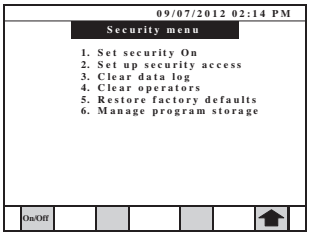
Note
To turn Conserve Off, meaning the analyzer will maintain the standby temperature while the analyzer is not being used, enter 0 minutes.

To set or change the sleep and wake mode:

- From the Conserve Mode screen press **2** or **3** key to show the Sleep mode or Wake up mode screen.
- From the Sleep mode or Wake up mode screen, type in the desired time (use **AM**|**PM** key to set correctly) and press the **Enter** key.
- Press the **Day** soft key. Then select the days of the week that the Sleep mode or Wake up mode is to be used. You will need to press the appropriate number key for each day to toggle it either On or Off.
- Press the **Enter** key to return to the Wake up or Sleep mode screen.
- Press the **Enter** again to return to the Conserve Mode screen.
  To manually wake the analyzer, press the **Enter** key.

Security

The security mode allows the analyzer to be pass code protected from making unauthorized changes or to access selectable features including the setup configuration, programs, the data log and other areas. The security mode is also where important actions can be taken, including clearing the data log or operators, as well as managing program storage or restoring the analyzer to original or factory default settings.



To edit or change any parameter under Security menu:

- From the Setup menu screen, press the **8** key or highlight, Security mode using the navigation keys and press **Enter** to display the Security menu.

Activate and Deactivate Security

To activate security:

- From the Security menu screen the press **1** for Set Security On. The display will change to the Pass Code screen.

- Type a pass code up to 6 digits using the numeric keys and press the **Enter** key. The analyzer will now be secured as set in the “Set up security access” menu. The display will return to the Setup menu.

To deactivate security:

- From the Setup menu screen press the **8** key or highlight Security and press the **Enter** key.

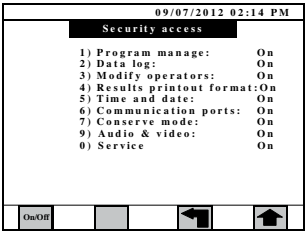
- Type the set pass code and press the **Enter** key.
  The security protection of the analyzer will now be deactivated.

Setup Security Access

Sections of the analyzer setup configuration and other features can be security protected with the pass code at the discretion of the primary operator.

To set up security access:

- If security is On, first deactivate security as described above.



- From the Security menu screen, press the **2** key or highlight "Set up security access" and press the **Enter** key to display the Security access screen.

- From the list of features, select either On or Off to activate or deactivate, respectfully, each feature.

- Press the respective number key to toggle On or Off, or highlight the selection and press the **On**|**Off** soft key.

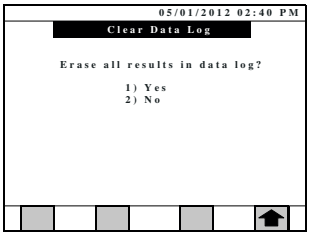
- Press the **Arrow** soft key to return the Security menu.

- Security must be set On in the Security menu to activate.

Note

If a selection from the Security access list is activated (showing On next to the listing in the Security access screen) and the security mode has been enabled under "Set pass code On|Off," then when an operator tries to enter this selection, the Pass code screen will appear. The only way to enter this selection is to enter the correct pass code which deactivates security.

Clear Data Log
The data log holds 999 results. Periodically it may become full or you may elect to clear all current results in the data log. Security must be deactivated to perform this function.



To clear the data log:

- From the Security Menu screen, press the **3** key or highlight Clear data log and press the **Enter** key to display a confirmation screen.

- Press the **1** key for Yes to clear all results in the data log.

Note
Clearing the data log causes a permanent loss of data.

Clear Operators
At times you may want to clear all operators. Operator 20 will always remain a blank line. Security must be deactivated to perform this function.

To clear all operators:

- From the Security Menu screen, press the **4** key or highlight Clear operators and press the **Enter** key to display a confirmation screen.

- Press the **1** key for Yes to clear all operators in the Operator list.

Note
Clearing the operators causes a permanent loss of operator names.

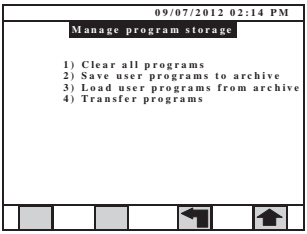
Restore Factory Defaults
At some time it may be necessary to return the analyzer to factory default settings. Security must be deactivated to perform this function.

To restore factory defaults:

- From the Security Menu screen, press the **5** key or highlight Restore factory defaults and press the **Enter** key to display a confirmation screen.

- Press the **1** key for yes to restore all factory settings

Note
Restoring factory default settings will cause a permanent loss of results in the data log as well as clear all programs and any user setup parameters.



Manage Program Storage
The analyzer has the capacity to store a custom set of programs in memory. In the event that the user selectable programs become altered, the stored custom set of programs may be re-loaded. This section also all programs to be cleared or reload saved programs to be reloaded from an archive or another analyzer. Security must be deactivated to perform this function.

Clear All Programs
To clear all programs:

- From the Security Menu screen, press the **6** key or highlight Manage program storage and press the **Enter** key to display the Manage program storage screen.

- Press the **1** key to Clear all programs and display the confirmation screen. Press the **1** key to permanently clear all programs.

Note
Clearing all programs will cause a permanent loss of all programs.

Save User Programs to Archive
The analyzer has the storage capacity to store a backup set of the current programs in memory.

To save user programs to archive:

- From the Security Menu screen, press the **6** key or highlight Manage program storage and press the **Enter** key to display the Manage program storage screen.

- Press the **2** key for Save user programs to archive and display the confirmation screen.

Note
Saving user programs to archive will overwrite any existing programs that may have previously been stored to this archive.

Load User Programs
If the user selectable programs become altered, the last stored backup set of programs may be re-loaded from the archive.

To re-load user programs from the archive:

- From the Security Menu screen, press the **6** key or highlight Manage program storage and press the **Enter** key to display the Manage program storage screen.

- Press the **3** key for Load user programs to archive and display the confirmation screen.

- Press the **1** key to save user programs to archive.

Note
Loading user programs from archive will overwrite any existing programs that may have previously been stored to the user selectable list of programs.

Transfer Programs
The analyzer has been designed for easy uploading or downloading of all programs from other Sartorius moisture analyzers to the device. The following combination of analyzers with the appropriate cable is capable of transferring programs:
Mark 3 to LMA1... (serial to serial, null modem cable)
Mark 2 to LMA1... (serial to serial, see Accessories on page 81)

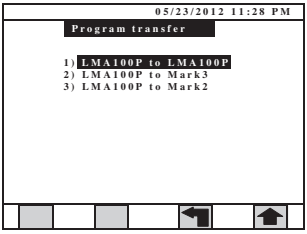
Set the same communication parameters on both analyzers:

- Suggested settings: 9600 baud, 8 bits, No parity, and 1 stop bit, CTS Off

To download programs from device to another analyzer:

- Install the appropriate cable between the analyzers.

- Turn the serial port On in serial port menu (page 53).



- From the Security Menu screen, press the **6** key or highlight Manage program storage and press the **Enter** key to display the Manage program storage screen.

- (Mark 2 only—press Setup, Setup 2 menu, Prg Xmit and External input)

- Press the **4** key for transfer programs.

- Press the **1** key for LMA1... to Mark 3 or **2** key for Mark 2 to LMA1... (Mark 3). After a confirmation screen, the display will show the program transfer in progress.

- Check the transfer in the receiving analyzer under Recall.

To upload programs to your LMA1... from another analyzer, follow instructions on the downloading analyzer:

- Install the appropriate cable between the analyzers.

- Turn the serial port On in serial port menu (page 53).

- (Mark 2 only—press Setup, Setup 2 menu, Prg Xmit and Output Programs)

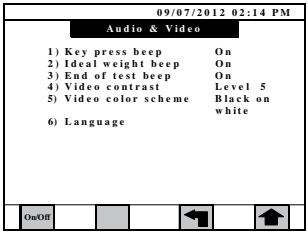
- The LMA1... will automatically recognize receipt of the programs.

- Check the transfer in the receiving analyzer under Recall.

Audio, Video and Language

The analyzer audio and video appearance may to adjusted to your desired taste or lighting conditions.

Audio Adjustments
An audio beep may be activated or turned off for a keystroke, when adding sample during the test mode or at the end of a test. If the key press beep is activated, a beep will occur every time a key is pressed. If the ideal weight beep is activated, a pulsating beep will occur when the weight of the sample being added is within the ideal weight limits.



To change the audio format:

- From the Setup Menu screen, press the **9** key or highlight Audio & Video using the navigation keys and press **Enter** to display the Audio & Video screen.

To change the key press audio beep:

- From the Audio & Video screen, press the **1** key to toggle On or Off, or highlight Key press beep and press the **On**|**Off** soft key.

To change the ideal weight audio beep:

- From the Audio & Video screen, press the **2** key to toggle On or Off, or highlight Ideal weight beep and press the **On**|**Off** soft key.

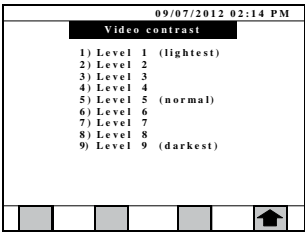
To change end of test beep:

- From the Audio & Video screen, press the **3** key to toggle On or Off, or highlight End of test beep and press the **On**|**Off** soft key.

Video Contrast Adjustment

To change the video contrast:

- From the Audio & Video screen, press the **4** key for Video contrast to display the Video contrast screen.



- Press a number key between 1 and 9 to change. A smaller number will make the screen appear lighter, while a larger number will make the screen appear darker.

- Press the **Arrow** soft key to save the contrast selection and return the Audio & Video screen.

Video Color Scheme

The screen may be set in either of two color schemes: black lettering on a white background or white lettering on a black background.

To change the video color scheme:

- From the Audio & Video screen, press the **5** key for Video color scheme to select either black on white or white on black.

Setting the Language

- 6 languages are available for display of the information:
- English
- Spanish
- German
- French
- Italian
- Portuguese

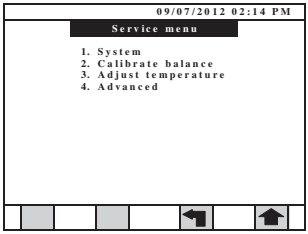
- To change the language, press the 6 key in the “Audio & Video” menu. Then select the required language.

Service

For best performance and reliable usage, the analyzer requires periodic cleaning (see the chapter on “Cleaning”).
The analyzer contains a wide variety of features related to calibrating and troubleshooting.
The Service menu is where you have access to:

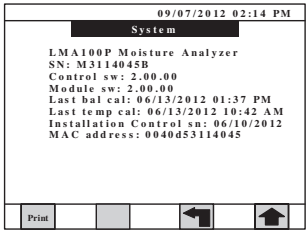
- Calibrating the balance
- Adjusting the temperature
- Establishing a calibration schedule
- Troubleshooting and diagnostics
  (Factory secured area, under the guidance of Sartorius Service personnel only)

System
This screen will display important information about your analyzer including model, serial number, software version, dates of last calibration and adjustment, installation date and MAC address.



To view the system screen:

- From the Setup menu screen, press the “**.**” key or highlight Service using the navigation keys and press **Enter** to display the Service menu screen.



To view and print system information:

- From the System menu press the **1** key to display System screen.
- Press the **Print** soft key to print this screen.

Calibration | Adjustment Functions

Calibrate Balance

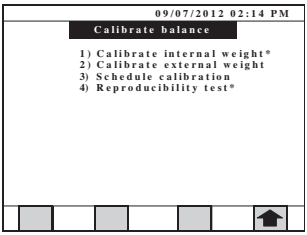
The balance of the analyzer should be calibrated and adjusted on installation and then periodically at some interval consistent with your quality program (one year is typical).

LMA100P: The balance may be calibrated and adjusted using the internal 100g calibration weight or a known external calibration weight.

LMA110S: The balance may be calibrated manually with a Known external calibration weight.

The analyzer also allows you to set a calibration interval that will remind you when calibration is due.

To access the balance calibration and other balance test features:

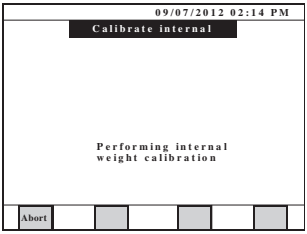


- From the Service menu screen, press the **2** key for "Calibrate Balance."

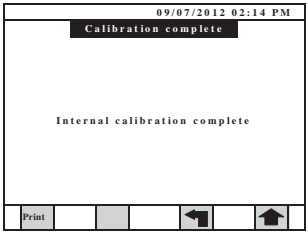
* = only for model LMA100P

To calibrate using the internal weight only to the LMA100P:

- Remove any object from the pan support



- From the Calibrate balance screen, press the **1** key for Calibrate internal weight to display the Calibrate internal screen.
- The balance will automatically re-zero.
- The analyzer will automatically activate the internal calibration and adjustment mechanism.



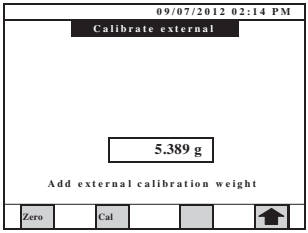
- When the procedure has been completed, “Calibration successful” will be displayed.

- Press Print to obtain a calibration report or **Arrow** key to exit to the Service menu. The date of last balance calibration on the System screen is also updated.

To calibrate and adjust using an external calibration weight:

- From the Calibrate balance screen, press the **2** key for Calibrate external weight to display the Calibrate external screen.

- The balance will automatically re-zero.



- At the prompt, “Add cal weight”, add the calibration weight to the pan support and close the hood. The analyzer will automatically recognize hood closure, wait for stability and begin the calibration and adjustment procedure.

Note
Permissible external calibration weights include:
LMA100P: 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 g.
LMA110S: 10, 20 and 30 g.
Weights must be within 2% of tolerance.

- When this procedure has been completed, the display will show “Calibration complete” when finished.

- Press Print to obtain a calibration report or **Arrow** key to exit to the Service menu. The date of last balance calibration on the System screen is also updated.

To schedule calibration/adjustment:

- From the Calibrate balance screen, press the **3** key for Schedule calibration to display the Schedule calibration screen.
- Press the number key for the interval of choice.
- When done, press the **Arrow** key to accept the changes. The display will return to the Calibrate balance menu and will reset the calibrations schedule. When this interval expires, the operator will be prompted on the screen to calibrate the analyzer. However, this message will not prevent testing a sample or any other operation of the analyzer.

Note
When the new calibration has been completed, the analyzer will automatically reschedule the same interval from the time the calibration is completed.

Heater Adjustment

Adjust Temperature or Verify Temperature
The temperature of the analyzer should be verified and adjusted as needed periodically at some interval consistent with your quality program (one year is typical). To perform an adjustment the optional temperature calibration and adjustment kit is needed.

Installation of the temperature bowl:

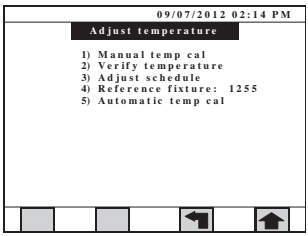
- Open the heater hood and wear gloves to carefully remove the pan support and the pan shield since it may be hot.

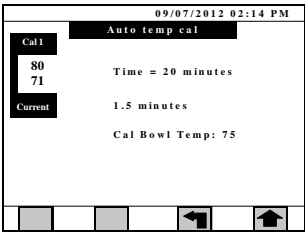
Caution
The pan support and pan shield will be hot. Only remove these items if you are wearing protective gloves. Otherwise, leave the heater hood open and let these items cool down before attempting to remove them.

- Place the temperature bowl ("fixture") in the same place as the pan shield.
- Press the leads coming off the temperature bowl into the connectors in the rear of the temperature chamber for the automatic temperature calibration.
- Lower the heater hood.

Perform temperature adjustment:

- From the Service menu, press the **3** key to display the Adjust Temperature screen.





- To initiate an automatic temperature calibration and adjustment, press the **5** for Automatic Temp Cal. The screen will change to the Temperature screen.

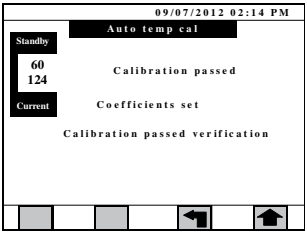
- The analyzer will automatically begin at two temperatures (80°C and 150°C). Each of Cal 1 and Cal 2 temperature steps will take 20 minutes.
  The time elapsed is shown on the screen. As soon as the Cal 1 temperature phase has expired, Cal 2 will begin automatically.

- When the Cal 2 phase has elapsed, the screen will change to show that adjustment has been completed.

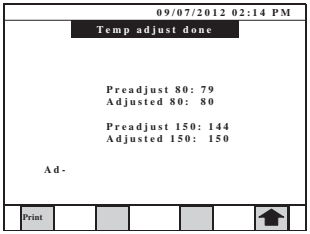
- The analyzer will then verify the adjustment by checking at 130°C for 20 minutes. The entire temp calibration and adjustment process takes
  60 minutes.

- The “Temp adjust done” screen will show both the pre-adjusted temperature, along with the postadjusted temperature for both calibration
  temperatures.

- The time and date of last temperature calibration and adjustment is automatically updated on System menu.



- Pressing the **Arrow** soft key anytime during the temperature adjustment will abort the “auto temp cal” process. The screen will return to the “Auto temp cal” screen without adjusting the analyzer temperature calibration.



- The automatic temperature adjustment report is printed after the adjustment process.

Automatic Temperature Adjustment Report

Fixture number 1234
Temperature 80C: 82C
Temperature 150: 150C
Mark 3 Moisture Analyzer
Module SN: M3085010B
Calibration passed 04/10/11 02:05 PM

Signature:

_____

To verify an adjustment temperature:

- From the Service menu, press the **3** key to display the Adjust Temperature screen.
- Press the **2** for Verify temperature. The screen will change to the Verify temperature screen.
- The default verifies temperature is 130°C. Press the "Temp" soft key to begin. The screen will change to the Temp verify in process screen and show the selected temperature. After 20 minutes, the screen will change to the Temp verify done screen and will display the expected selected temperature and the actual temperature that was measured by the temperature bowl ("fixture").
- Press the **Print** soft key to print a temperature verification report (LMA100P only).
- If the agreement of the selected temperature and the actual temperature are not within 2 degrees for any of the selected temperatures, it is recommended that you perform the temperature calibration and adjustment procedure.

To change the temperature adjustment schedule:

- From the Service menu, press the **3** key to display the Adjust Temperature screen.

- Press the 3 for Adjust schedule. The screen will change to the Schedule temp adjust screen.

- Select the desired period of time. When this period expires, a warning will appear in the warning box indicating that a new verification or temperature adjustment should be performed.

To enter a reference fixture number:

- From the Adjust Temperature screen, press the **4** for Reference fixture. The screen will change to have you enter the reference fixture number that is marked on your temperature bowl. The number will then appear on both the temperature adjustment or verification reports.

Concentration Mode

The device is able to determine Total Suspended Solids in low solids samples, such as for wastewater samples. The sample solids are first concentrated onto a filter pad placed into a vacuum apparatus. During the test mode the operator will be prompted to enter the number of milliliters of sample that was filtered. Results are displayed in mg/l.

$$\frac{\text{Wet wt of filter pad (mg)} - \text{dry wt of filter pad (mg)}}{\text{Entered milliliters of sample} / 1000}$$

To select the concentration mode:

- Press the **9** key from the Program menu to display the Mode screen.
- Press the **3** key for Concentration. The display will return to the Program menu.

To test samples in the Concentration mode:

- Open the heater hood, place the filter pad onto a pan and close the hood.
- Press the **Start**|**Stop** key to begin a test.
- The analyzer will automatically tare the pan and filter pad.
- Open the hood, remove the filter pad and place it into the vacuum apparatus. Pour a known volume of sample into the vacuum apparatus. When finished, remove the sample pad and return it to the pan in the heater module and close the hood.
- At the prompt, enter the number of milliliters of sample that were put through the vacuum apparatus and then press the **Enter** key.
- The analyzer will enter the test mode. When the test is done, the results will be reported in mg/l.

Syringe Mode (LMA100P only)

When testing samples with a highly volatile component such as paint, to achieve the most accurate results it is desirable to use the LMA100P syringe mode. This mode consists of obtaining the initial sample weight by recording the difference between a syringe full of sample and after sample has been dispensed. Results are displayed in the selected unit.

To select syringe mode:

- Press the **9** key from the Program menu to display the Mode screen.
- Press the **2** key for Syringe. The display will return to the Program menu.

To test samples in the Syringe mode:

- Open the heater hood, place a sample pad on a pan and close the hood.
- Press the **Start**|**Stop** key to begin a test.
- The analyzer will automatically tare the pan and sample pad.
- At the prompt, open the hood and remove both the pan and pad. Then place the full syringe on the pan support and close hood. The analyzer will take the full weight of the syringe with sample.
- At the prompt, remove the syringe from the pan support.
- At the prompt, replace the pan and pad. Then add sample to the pad.
- At the prompt, remove the pan and pad.
- At the prompt, place the empty syringe back on the pan support, close hood. The analyzer will now read the empty syringe weight.
- At the prompt, remove the empty syringe.
- At the prompt, replace the pan with sample on the pad back onto the pan support and close the hood to start the test.
- The analyzer will enter the test mode. When the test is done, the results will be reported in the selected unit.

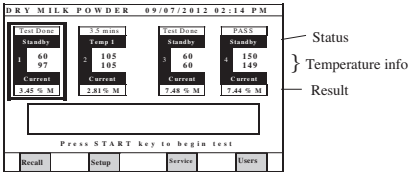
Note
If for some reason the automatic transition in the steps of the syringe mode does not advance to the next step, the **Enter** key may be used to advance the step.

Multi-module Mode

The multi-module mode allows one operator to simultaneously control up to 4 (LMA100P: 4 units connectable; LMA110S: 2 units connectable) heater modules connected to a single Control Module. This is possible by connecting each heater module to a Mod Comm port on the back of the Control Module.

To initiate an additional heater module:

- Connect the inter-module cable.
- Power off and back on again the heater module that powers the control module (press **Enter** to override Warm-up).
- On power up, a scan is initiated to determine which Mod Comm ports have a heater module attached. If more than one is connected, the screen will display in the Multi-module mode. Note that a double set of bars shows the active heater module.



Multi-module screen description:

- Heater module icon: Separate display of heater module information including:
- Status: warm-up, test done, pass/fail, minutes in test
- Test result
- Current temperature and temperature status
- Program name: current program for active heater module
- Time and date
- **Recall** soft key: Select program for active heater module
- **Setup** soft key: Access to global setup
- **Service** soft key: Access to specific functions for active heater module
- **Users** soft key: Access to list of users for active heater module
- Warning box: Messages specific to active heater module

Multi-module key functions:

- Navigational keys (**right** and **left Arrows**): Moves double bars to activate heater module (or press keys 1–4).
- **Start**|**Stop**: Initiates test for active heater module

Each heater module can run a test independent from the other heater modules by recalling a program from the program list and initiating a test. The program list is common for all heater modules. When a test is initiated, the display will show test screens from the single module mode, such as entering an ID number and bar graph prompt to add the ideal sample size.

To test a sample in multi-mode:

- Press the navigational **right** or **left arrow** key to move the double bars to the desired heater module.
- Check current program. To change program, press **Recall** and select a new program if desired.
- Press the **Start**|**Stop** key to initiate a test. (the screens and functionality are the same as in the single module mode).
- After the initial weight is captured, the display will return to the multi-mode screen. The status line will show the elapsed time of the test to indicate a test is in progress.
- At the end of the test, the status line will display "Test Done" (or Pass or Fail if target limits have been entered in this program). The printer will also print the result at the end of the test (LMA100P only).

Note
Certain functions are not available in the multi-module mode including: Interval print and graphing. However, in the multi-module mode, one can test one or more samples and still have access to service for another heater module which is not testing a sample.

To perform service options on any heater module such as:
– Balance calibration

– Temperature adjustment

LMA100P:
– Balance repeatability test

- From the multi-module screen, press the navigational **right** or **left arrow** key to move the double bars to activate the desired heater module.
- Press the **Service** soft key to display the Service menu.
- Press the number key of the desired option and press the **Enter** key. The display will show these screens as in the single module mode.

LMA100P: Operation using 3 or 4 heating modules
The inter-module cables between control module and heater module are so short that only one heater module on the left and right of the control module can be connected. For this case, please, order the optional 69TC0131 cable kit.

Cleaning

Recommended care
For best performance and reliable usage, the analyzer requires periodic cleaning.

Danger
Before beginning the cleaning process:

- The analyzer must be disconnected from the power source.
- Allow the analyzer to cool down for 30 minutes.
- Take care during cleaning not to spill any liquid into the analyzer.
- The I/O connections on the back of the analyzer may not come into contact with liquids.
- Do not immerse the analyzer in water or any other cleaning solution.

Regular cleaning of the analyzer with a mild detergent and a soft cloth should include the following:

- Clean the outer surface of the analyzer.
- Carefully remove and clean the pan support and pan shield.
- Keep all warning labels clean.
- Wipe dust from the interior of the stainless steel heater housing.
- Remove and clean the recessed area under the pan shield:
  - Remove the pan support and pan shield.
  - Remove the two screws holding the perforated plate.
  - Be careful not to spill liquid or solid debris down the center hole where the balance pan receiver protrudes.

TGA Formulas (LMA100P)

TGA (Thermal Gravimetric Analysis) mode provides the capability of distinguishing two components of a sample material by heating at two different temperatures and calculating their individual percent of total composition.

Drying conditions are programmed where component one is evolved at Temperature 1 (Cycle 1) and the second component at Temperature 2 (Cycle 2). When the slope conditions of Cycle 1 are met, the analyzer prints the first percent calculation and then ramps to Temperature 2. When the same slope conditions are met for the second cycle, the analyzer prints the second percent calculation. Finally, a total percent is calculated and printed. To achieve this drying procedure, parameters for Temp 1, Time 1, Temp 2, Time 2 and Slope must be set.

To set the TGA parameters:

- From the main standby screen, press the **Setup** soft key.
- From the Setup Menu, press the **1** key for Program Manage.
- From the Program Manage menu, press the **2** key for Create new program if creating a new program or the **1** key for Edit current program to edit an existing program.
- From the Program menu, enter values for Temp 1, Time 1, Temp 2, Time 2 and the Slope.
- To turn the TGA mode On, press the **1** key for Units followed by either **8** key for TGA moisture or the key for TGA volatiles. See formulas below to select correct TGA formula. Press the **Arrow** soft key to return to the Program menu.
- If desired, press the **0** key for Program Name to change the program name.
- Press the **Save** soft key to save the changes.

Note
The settings Temp 1, Time 1, Temp 2, Time 2, Slope and Units: TGA moisture or volatiles must be set for the TGA mode to operate.

Selection for units of either moisture or volatiles will change component two (Cycle 2) calculation. When “TGA Volatiles” is selected, each component’s loss will be calculated as a percent of the initial sample weight. When “TGA moisture” is selected, each component loss will be calculated as a percent of that cycle’s initial weight. The following equations are used for calculations: (IW=Initial Weight, FW=Final Weight)

TGA Formulas

	Cycle 1	Cycle 2	Total
Volatiles:	$\%V = \frac{IW1-FW1}{IW1}$	$\%V = \frac{IW2-FW2}{IW1}$	$\%V = \frac{IW1-FW2}{IW1}$
Moisture:	$\%M = \frac{IW1-FW1}{IW1}$	$\%M = \frac{IW2-FW2}{IW2}$	$\%M = \frac{IW1-FW2}{IW1}$

Note
Only the total percent result is stored in the Data Log.

LMA100P Moisture Analyzer
Module 1: M30604026
Program 1: TGA
UNITS: TGA Moisture
MODE: Standard START DELAY: 0 sec M2
TEMP1: 60C, Std TIME1: 2.0
TEMP2: 130C, Std TIME2: 2.0
SLOPE: Window: 1.0 %IW: 0.100 Actual
STANDBY: 60C EQUILIBRATE: Off
IDEAL WT: 5.0 grams LOCK: Off
RESULT on 06/15/2012 at 10:24 AM

CYCLE 1 on 04/13/12 at 02:29 PM
Elapsed time: 05:40
0.848 %M
Initial Weight = 5.0666 grams
Final Weight = 5.0236 grams
Weight Loss = 0.0430 grams

CYCLE 2 on 04/13/12 at 02:35 PM
Elapsed time: 06:00
3.391 %M
Initial Weight = 5.0236 grams
Final Weight = 4.8532 grams
Weight Loss = 0.1704 grams
RESULT on 04/13/2012 at 02:35 PM
Elapsed time: 11:40
4.212 %M
Initial Weight = 5.0666 grams
Final Weight = 4.8532 grams
Weight Loss = 0.2134 grams

Recycling

The packaging is made from environmentally-friendly materials that can be used as secondary raw materials. If you no longer need this packaging, bring it to your local recycling and waste disposal facility according to the regulations applicable in your country.
In Germany, you can dispose of this material using the VfW dual system (contract number D-59101-2009-1129).
The equipment, including accessories and batteries, must not be disposed of in general household waste, and must be recycled similar to electrical and electronic devices. For further information about disposal and recycling options, please contact your local service staff. The partners listed on the following website can be used for disposals within the EU:

1) Go to http://www.sartorius.com.

2) Select the summary under “Service.”

3) Then select “Information on Disposal.”

4) Addresses for local Sartorius disposal contacts can be found in the PDF files given on this webpage.

Sartorius will not take back equipment contaminated with hazardous materials (ABC contamination) either for repair or disposal.

Insert heading:
“Service Address for Disposal”
Please refer to our website (www.sartorius.com) or contact the Sartorius Service Department for more detailed information regarding repair service addresses or the disposal of your device.

Specifications

Models	LMA100P	LMA110S
Display of Results	0.001%	0.001%
Balance Resolution	0.0001 grams	0.0001 grams
Balance Capacity	100 grams	40 grams
Reproducibility of the measurement	Sample weight = 1g : 0.1% Sample weight = 5g : 0.02%	
Balance Repeatability	±0.1 mg	±1.0 mg
Method of Measurement	Loss on Drying	
Modular Configuration: Control and heater modules	(Optional: up to 4 heater modules)	(Optional: up to 2 heater modules)
Heat Source	Four parallel infrared quartz cylinders	
Temperature Setting/Control	30–210°C in one-degree increments/RTD sensor, ±1°C	
Temperature Steps	Programmable, one or two with selectable ramp rate	Programmable, one or two
Temperature Adjustment	Optional fixture for internal electronic two-point adjustment	
Standby Temperature	30–160°C in one degree increments with selectable equilibration time	30–160°C in one degree increments
Temperature Display	Display of both target and current temp at each stage of drying and standby	
Conserve Mode Clock	Programmable time by day of week to shut down and wake up analyzer	
Balance Calibration	Internal calibration weight or external manual	External manual
Ideal Weight	Audio and visual display for programmable target sample weight addition	
Target Limit Alert	Minimum and maximum programmable limits and screen alert when test done	
Program Storage with unique settings, alphanumeric naming	300 programs	60 programs
Result	Storage 999 results with statistics: average, SD, RSD, high and low	
Units of Measure of Results	Weight, %moisture, %solids, %volatiles, PPM, ppm moisture, ppm solids, mg	
Endpoint Determination	Actual slope, Calculation and Windows of Time modes	
Sample ID	Numeric, Numeric incrementing, alphanumeric or turned off	
Modes of Operation	Standard Test, Syringe or Concentration modes	–
Operator Names	Twenty alphanumeric operator names	
Security Mode	Selectable setup and operation protection with pass code	
Graph Mode	Graph of Temperature/Time and Percent/Time	
Display	Quarter VGA with contrast adjustment (black on white or white on black)	
Keypad	Sealed membrane with audible tactile feedback	
Internal Printer	Thermal, 40-character graphic with selectable format without internal printer	–
External Input|Output	Serial	
Internal Clock	Date and Time: U.S. or International, Military or AM|PM	
Audio Beep	Key stoke, ideal weight met and end of test, selectable on or off	
System Status Indicator Lights	Two tri-color LEDs (balance & heater) on front of heater module	
Power Requirements	100–120/200–240 V~ ~5A T	
Dimensions (L × W × H)	41.3 × 49.5 × 23.5 cm (16 1/4" × 19 1/2" × 9 1/4") modules combined	
Weight	10 kg (22 lbs.)	

CE Marking

The moisture analyzer complies with the following EC Directives and European Standards:

Council Directive 2004/108/EEC: "Electromagnetic compatibility (EMC)"

Applicable European Standards:
Limitation of emissions:
In accordance with product standard EN 61326-1 Class B (residential area)

Defined immunity to interference:
in accordance with product standard EN 61326-1
(minimum test requirements, un-monitored operation)

Class A Warning
Warning: This is a class A product. In a domestic environment this product may cause radio interference in wich case the user may be required to take adequate measures.

Note:
The operator shall be responsible for any modifications to Sartorius equipment and for connections of cables not supplied by Sartorius and must check and, if necessary, correct these modifications. On request, Sartorius will provide information on the minimum operating specifications in accordance with the standards listed above for defined immunity to interference.

Council Directive 2006/95/EC: "Electrical equipment designed for use within certain voltage limits"

Applicable European Standards:

EN61010-1: 2001
Safety requirements for electrical equipment for measurement, control and laboratory use
Part 1: General requirements

If you use electrical equipment in installations and under ambient conditions subject to stricter safety standards than those described in the manual, you must comply with the provisions as specified in the applicable regulations for installation in your country.

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EU-Konformitätserklärung
EU Declaration of Conformity

Hersteller *Manufacturer*	**Sartorius Lab Instruments GmbH & Co. KG** **37070 Goettingen, Germany**

erklärt in alleiniger Verantwortung, dass das Betriebsmittel
declares under sole responsibility that the equipment

Geräteart *Device type*	**Feuchtebestimmer** *Moisture Analyzer*
Modell *Model*	**LMA100PA-000U, LMA110SA-000U** (Terminal) **LMA100PQ-000U, LMA110SQ-000U** (Sensor)

in der von uns in Verkehr gebrachten Ausführung allen einschlägigen Bestimmungen der folgenden Europäischen Richtlinien - einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen - entspricht und die anwendbaren Anforderungen folgender harmonisierter Europäischer Normen erfüllt:

in the form as delivered fulfils all the relevant provisions of the following European Directives - including any amendments valid at the time this declaration was signed - and meets the applicable requirements of the harmonized European Standards listed below:

2014/30/EU	Elektromagnetische Verträglichkeit *Electromagnetic compatibility* EN 61326-1:2013
2014/35/EU	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen *Electrical equipment designed for use within certain voltage limits* EN 61010-1:2010
2011/65/EU	Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS) *Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)* EN 50581:2012

Jahreszahl der CE-Kennzeichenvergabe / *Year of the CE mark assignment:* 16

Sartorius Lab Instruments GmbH & Co. KG
Goettingen, 2016-04-20

i.V.

Dr. Reinhard Baumfalk
Vice President R&D

i.V.

Dr. Dieter Klausgrete
Head of International Certification Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten EU-Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Bei einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit. Die Sicherheitshinweise der zugehörigen Produktdokumentation sind zu beachten.

This declaration certifies conformity with the above mentioned EU Directives, but does not guarantee product attributes. Unauthorised product modifications make this declaration invalid. The safety information in the associated product documentation must be observed.

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The information and figures contained in these instructions correspond to the version date specified below.
Sartorius reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.
Masculine or feminine forms are used to facilitate legibility in these instructions and always simultaneously denote the other gender as well.

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