



IVD



Samsung **LABGEO** PA20

User Manual

Version 1.0

REF BCA-PA20

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San Diego, CA 92121 USA / Tel : 858-410-4600, Fax : 858-410-4700, www.nexus-dx.com

For proper use of the analyzer, please refer to the product manual.

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Correct Disposal of This Product

(Waste Electrical & Electronic Equipment)

(Applicable in countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

Table of Contents

1. Safety Warnings and Caution	7
User's Manual and Labeled Symbols	9
Cautions for system installation	11
Cautions for system move	12
Cautions before use	12
Cautions during use	13
Precautions Before Testing	14
Preparing to Test Samples	14
Cautions for storage and maintenance after use	15
2. Introduction	17
Intended Use	18
Introduction	19
Operating Principle	20
What's in the box	20
Box contents	20
Sold separately	21
Introduction of features	22
Front (Right)	22
Front (Left)	23
Back	24
3. Installation	25
Installation	26
Replacing printer paper	27

Disc.....	29
Handling and Storage of the Disc	30
Adding the sample to the Disc.....	31
4. Analyzing	35
Analyzing	36
Turning power on.....	36
Preparing analysis	40
Canceling analysis in progress	43
Analysis completed	45
Viewing analysis results	47
Viewing results.....	48
Viewing results of patient's analysis	50
Viewing QC results.....	52
Searching results	54
Printing results	56
Transferring results	61
Deleting results.....	63
Quality control	65
Starting quality control.....	65
Analyzer settings (General User Settings)	69
Display settings	71
Calibration (touch screen calibration)	72
LCD Brightness	73
Screensaver settings.....	74
LCD Off settings	75
Volume settings	76
Analysis settings	77
Unit settings	78
Change order	80
Reference range settings	82

QC material	84
Registering QC Material	84
Changing QC material	89
Deleting QC material	91
Print settings	93
Barcode settings	95
Language settings	97
Self-test	99
Analyzer settings (Administrator Settings)	103
Lock settings	105
Setting security levels for each function.....	105
Locking quality control	107
Changing password	109
Network settings	112
Connecting to a network.....	112
Setting network connections	114
Setting EMR/LIS.....	116
Lock settings.....	117
Changing Date&time format	119
System settings	121
System Reset	123
USB Backup	127
System updates	129
Turning off power	131
5. Using the LABGEO Data Manager	133
Introduction to the LABGEO Data Manager.....	134
Installation of the LABGEO Data Manager	135

Running the LABGEO Data Manager	139
Home screen.....	140
Registering a blood analyzer device	141
Viewing analysis results	147
Editing analysis results	148
Selecting and editing multiple analysis results.....	150
Printing analysis results	151
Removing the LABGEO Data Manager	153
6. Maintenance.....	155
Maintenance.....	156
Maintenance	156
Cleaning the exterior	156
Cleaning the Disc Tray	157
Transportation and Storage.....	157
7. Troubleshooting.....	159
Troubleshooting	160
Check before requesting repair.....	160
Restoring factory settings	160
Error List	161
8. Other Information.....	165
Quality control policy	166
Westgard multi-rule technique	166
System information.....	167
Other information	168
Product Service	169
Index	170

1

Safety Warnings and Caution

User's Manual and Labeled Symbols	9
Cautions for system installation	11
Cautions for system move	12
Cautions before use	12
Cautions during use	13
Precautions Before Testing	14
Preparing to Test Samples.....	14
Cautions for storage and maintenance after use	15

Safety Warnings and Caution

Please follow the safety warnings and cautions in this manual for safe and appropriate use of the product.

Repairs and maintenance work not explained in this User Manual are to be performed by a designated Samsung service provider. Any attempt to repair the product by the user may result in injury. Do not use the product in an area with combustible gas or high levels of contamination for an extended period of time.

Malfunctions and damage caused by any other use than specified in the User Manual is excluded from the manufacturer's warranty.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

■ User's Manual and Labeled Symbols

Symbol	Explanation
	Biohazard. A sample as well as a used cartridge containing a sample are potentially hazardous. Handle with care.
	Caution. In order to safely and properly use this product, safety precautions and cautions in this manual must be followed.
	Consult instruction for use.
	Temperature limitation/ Allowed Temperature Range Shows temperature limit for storage or transport
	Fragile/Fragile contents; handle with care
	Keep dry/Package should avoid wetting
	This way up
	Loading Unit/Avoid loading more than the marked number of units
	In Vitro diagnostic device
	Serial number
	Manufacturer
	USB port
	Ethernet port

Symbol	Explanation
	'New' waste The bar can be replaced by the date of manufacture
	Catalog number
	North American Safety Certification Mark
	Alternating current
	Power On
	Power Off
	Hot Surface
	Risk of electronic shock
	Stand-by switch
	LASER CLASSIFICATION This Clinical Chemistry and Immunology Analyzer is confirmed as the class 1 laser product in IEC60825-1:2007 - Wavelength: 808 nm - Maximum output of laser radiation: Max. 1.5 W

■ Cautions for system installation



- Keep the analyzer at least 6 inches (15 cm) away from any wall to provide adequate ventilation and prevent overheating.
- Be careful not to expose the analyzer to sources of vibration such as placing it near a centrifuge.
- Do not use the analyzer where liquids or chemicals are used or where gas may be produced. Insure that no liquids are spilled into the Unit if there is any spillage disconnect mains immediately and return to product for servicing.
- The analyzer must be used at an operating temperature of 10 - 32 °C (50 - 89 °F). The analyzer might be affected by:
 - Condensing humidity and water
 - Heat and extreme temperature variations
 - Electromagnetic radiation
 - Movement of the analyzer during sample processing
- Only use the cable provided with the analyzer.
- To avoid risk of fire or electric shock, do not use a damaged power cable.
- Always use the correct voltage supply. Incorrect voltage can cause damage to the analyzer or result in fire. Be sure that the electrical outlet is properly grounded.
- Do not attempt to disassemble, repair or modify the analyzer as damage could occur. Opening the unit will void the warranty. Contact Samsung Technical Support.
- Do not place any objects on the analyzer.
- Do not cover the rear ventilation panel. This may damage the internal parts, resulting in a fire or electric shock.
- Do not introduce foreign substances into the servicing hole.
- Turn on the power switch at the rear of the Analyzer. (Grounding Proper grounding is required when installing the system. Check the wall outlet ground (Earth) for proper grounding to the facilities electrical ground. If you are unsure of the outlet grounding, contact your facilities engineer to verify the proper outlet ground). Next, turn the power switch on the front of the Analyzer on and check that the program starts normally.
- Do not touch the power plug with wet hands. This may result in an electric shock.

■ Cautions for system move



- Dropping the product while moving or carrying may cause damage to the product.
- Be careful of impact when moving the product at all times.
- When moving the product by car, please use the original packaging material.

When moving the analyzer, first turn off the power and disconnect the power cable from the product.

■ Cautions before use



- When the blood is not used immediately, be sure to store it appropriately to prevent it from contamination.
- Check for dust or other impurities on a regular basis.
- Always install the product in a well-ventilated, clean, and dry area.
- Keep the product away from heat-emitting products (such as heaters). It may cause deformation of the product, fire, or adversely influence analysis results.

■ Cautions during use

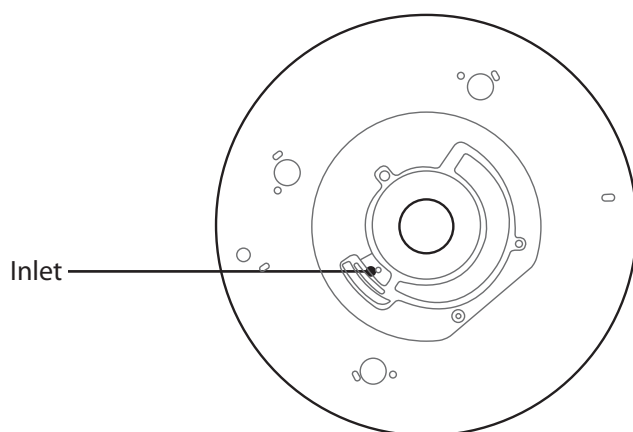


- This system is for professional use only. The user must be a physician, clinical laboratory personnel, or healthcare professionals.
- Avoid external shock or vibration during analysis.
- Do not use expired discs.
- Do not open the tray while the disc is being analyzed. During the analysis, LED lamp or laser radiation may cause hazard due to improper operation.
- The Analyzer contains UV/Visible LED Light source and laser. The users are not exposed to Optical radiation in normal conditions. Because it is blocked with analyzer cover cabinet. Do not open the tray during analysis. Do not look into the analyzer during analysis. Your vision will be damaged due to UV-lamp.
- Powder-free gloves must be worn when operating the product.
- Do not move the analyzer during operation.
- When inserting a disc into the tray, check the orientation of the disc. It must be inserted with the label side up. Consult test Instructions for Use.
- Always use designated power cable. Do not unplug the device in the middle of an analysis.
- If the product produces smoke or strange odors, discontinue use, unplug the power cord from the outlet, and contact your local distributor for service information.
- If operation has been aborted due to abnormal circumstances such as a power outage during operation, discard the disc and start over with a new disc.
- Do not turn off the power during analysis. Press Cancel to abort a test if needed. Discard the disc and start over with a new disc.
- Be careful not to damage the barcode on the disc. If the barcode is damaged, the test will not perform accurately.
- Do not use the analyzer where liquids or chemicals are used or where gas may be produced.
- Do not allow liquid to spill into the analyzer. If there is any spillage, disconnect power immediately and contact your local distributor.
- If you wish to stop the analysis in progress without turning the analyzer off, press the Cancel button and stop the analysis. After stopping an analysis in progress, throw away the cartridge and replace it with a new one.
- The operating temperature of the analyzer is 10 - 32 °C (50 - 89 °F); the analyzer automatically maintains an internal temperature of 37°C. (The device shuts off automatically if it exceeds normal operating temperature.)

■ Precautions Before Testing

Preparing to Test Samples

- 1 Prepare a disc, sample, and injecting tool (pipette) to be used for the test.
- 2 Consult Test Instructions for Use.
- 3 Use a pipette to inject the sample into the disc as described in the Test Instructions for Use.



- 4 Inject into the inlet shown in the figure above as described in the Test Instructions for Use.



Refer to the Test *Instructions for Use* for the correct sample volume to be injected into the disc.

■ Cautions for storage and maintenance after use



- Do not store the product in humid areas or areas influenced by temperature, humidity or wind.
- Store the device on a flat surface and keep it away from vibration or impact.
- Do not store the product with chemicals or gas.
- Operating conditions and temperature: 10 - 32 °C (50 - 89 °F), Humidity: 0% - 80%
- Storage conditions and temperature: -10°C - +40°C , Humidity: 0% - 80%
- If there is blood residue from a specimen or any contaminants in the disc tray and the interior or exterior of the analyzer, remove the contaminant using a soft cloth while wearing gloves.
Wet the cloth using 30% isopropyl alcohol when removing contaminants.
Do not use highly corrosive agents such as benzene or acetone.
These agents may damage the analyzer.
- When moving or transporting the product, follow the conditions for using and storing the product specified in this manual. Follow all cautions when moving the product.



- A specimen may be contaminated with pathogens or viruses that cause infectious illnesses such as Hepatitis B. All specimens must be considered and handled as potential contaminants.
- Used discs must be processed using Medical Waste Treatment Laws after use.

2

Introduction

Intended Use	18
Introduction	19
Operating Principle	20
What's in the box	20
Box contents	20
Sold separately.....	21
Introduction of features	22
Front (Right)	22
Front (Left)	23
Back.....	24

Introduction

■ Intended Use

The Samsung LABGEO^{PA20} provides quantitative in-vitro measurements of clinical chemistry analytes and immunological reactions in lithium-heparinized whole blood, plasma, or serum in a clinical or point-of-care setting. It is designed to use a disposable reagent disc which contains reagents and buffers for a complete test. The Analyzer unit contains the Laser which is for controlling microfluidics. UV LED is light source is for detection chemical reaction.

For use in moderate complexity labs with whole blood, plasma or serum.



If the Samsung LABGEO^{PA20} is used in any way other than described in this manual, the analyzer may not operate as intended, may produce inaccurate or no results, and may pose a safety hazard.



Use only Samsung LABGEO^{PA20} reagent disc with the Samsung LABGEO^{PA20}.

■ Introduction

The Samsung LABGEO^{PA20} is a fully integrated photometric device that can perform both clinical chemistry analyses and immunoassays simultaneously. Innovative laser-actuated microvalves together with the centrifugal microfluidics makes the total process of plasma separation, metering, mixing, incubation, washing, and detection fully automatic.

A lithium-heparinized whole blood, plasma, or serum sample of 450uL is applied directly to a disposable reagent disc and the disc is inserted into the analyzer by an operator. Each reagent disc is self-contained clear plastic with diameter of 12 cm and thickness of 0.8 cm, which consists of different kinds of reagents and buffers.

The entire process is activated once the operator touches the "Run" button on the display. The 'self-test' function is initiated, whereby the main power, main motor, laser motor, temperature IC, photometer, laser, heater and barcode reader are checked. The 'self-test' function is conducted automatically before each test or control run. This built-in self testing function minimizes maintenance costs. After inserting a reagent disc into a tray, the analyzer automatically detects the disc type and identifies the clinical chemistry and immunoassay tests before performing the assays. The analysis is completed in about 12 to 25 minutes depending on the disc type.

The results are displayed on the LCD screen along with the reference ranges, can be printed out by an internal thermal printer, and can be transferred to a laboratory information system and electronic medical record systems (LIS/EMR) via an Ethernet and wireless LAN ports. Data storage is up to 5,000 patient results and 3,000 control results in the instrument.

The system provides user-friendly and easy interface for analysis that minimizes user manipulation. Handy compact design (246(W) x 375(D) x 289(H) mm³) allows maximized space utilization and the light weight (~ 9.2 kg) provides portability.

Compared to conventional blood analyses done in clinical laboratories, the analyzer system is suitable for point-of-care applications because it requires a smaller amount of blood takes less time, and does not require specially trained operators, or expensive instruments to run biochemical assays and immunoassays separately.

■ Operating Principle

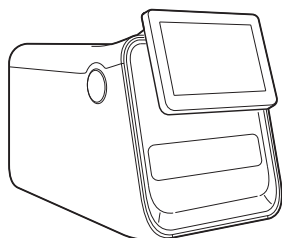
The analyzer is equipped with two optical detection modules. One is a photometer and the other is a fluorometer. The photometer can measure absorbance at 10 different wavelengths (340, 405, 450, 500, 550, 570, 600, 630, 660, and 700 nm) to accommodate various chemical and immunological reaction protocols. The measured absorbance is converted into the concentration of the analytes.

For endpoint reactions, the final absorbance is used for the calculation of the concentration of the analyte. For kinetic reactions, the absorbance change during a predetermined time is utilized for the calculation of the concentration instead of the final absorbance.

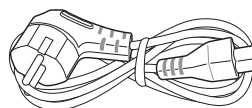
The fluorometer utilizes a time-resolved fluorescence method to support high-sensitivity immunoassay based on europium nanoparticle labels. A 365 nm LED is used as an excitation light source and a red-sensitive photomultiplier tube is used as a photodetector. The measured fluorescence intensity is converted into the concentration of the analyte.

■ What's in the box

Box contents



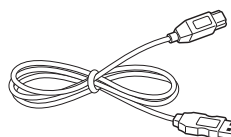
Analyzer Samsung
LABGEO^{PA20}
BCA-PA20



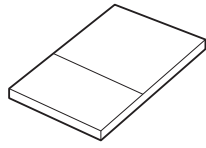
Power Cable
A 1.8m long cable used to supply power to the system. The effective voltage range is between 100-240 VAC (50-60Hz).



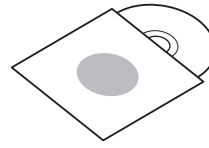
Printer paper



USB Cable

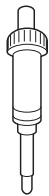


User Manual



Software installation CD

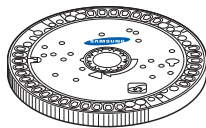
Sold separately



Pipette



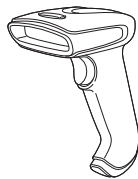
tips



Disc



Control Serum

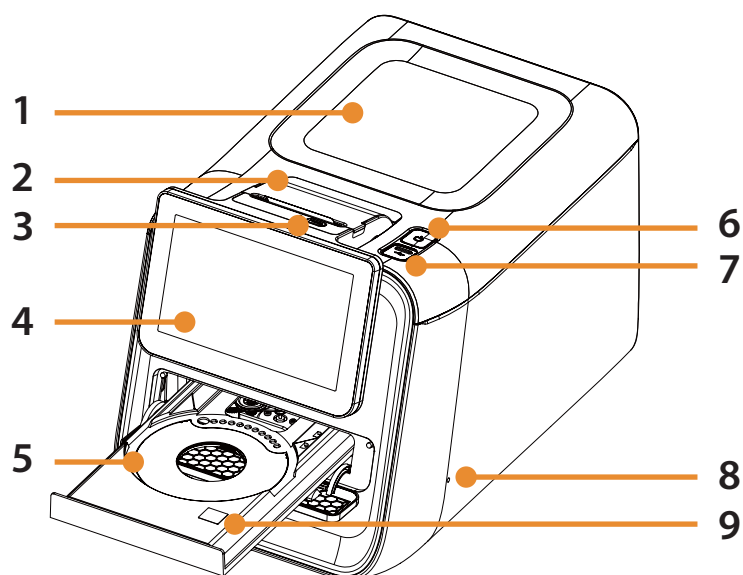


Barcode scanner (optional)

- Please check the above contents of the box after purchase.
- If any of the contents are missing or damaged. Do not use the product and contact your retailer for a replacement.

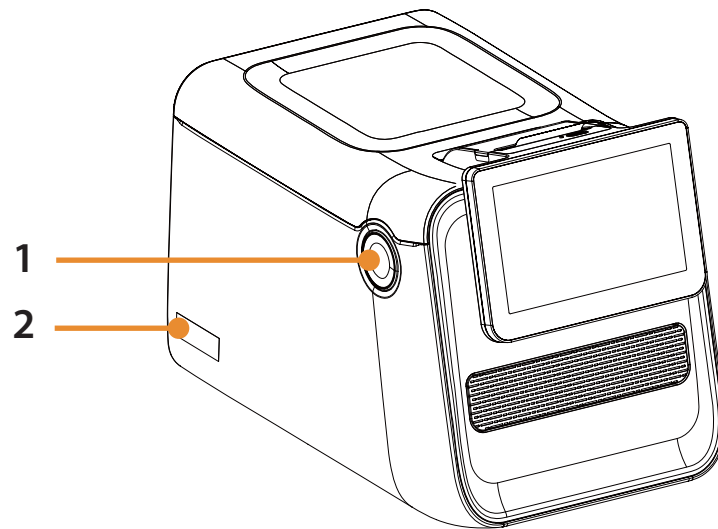
■ Introduction of features

Front (Right)



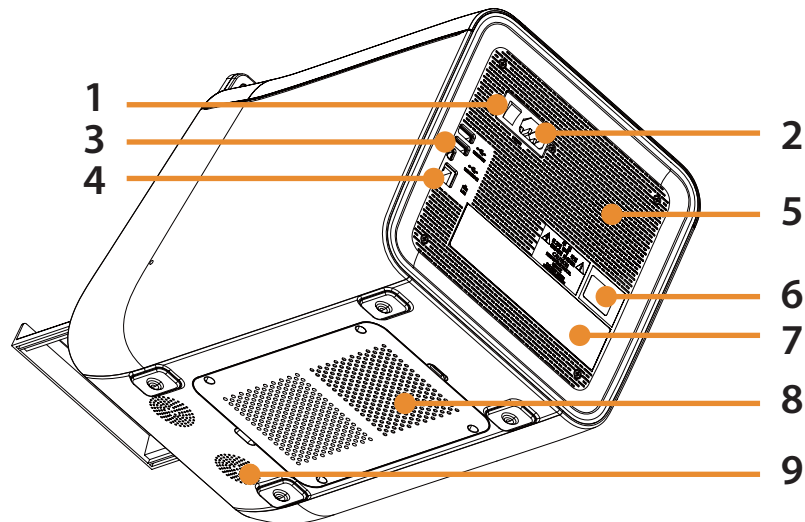
1. Main Unit
2. Printer
3. Printer feed button
4. 7-inch Color TFT LCD Monitor
5. Tray
6. Power Button: Used to turn the analyzer on or off
7. USB Port: Used to update the software and to back up the analysis results in the USB memory
8. Servicing Hole: For qualified Samsung Technical Support personnel only
9. HOT SURFACE label

Front (Left)



- 1. Class 1 laser product label
- 2. Monitor tilting button

Back



1. Power Switch: Used to turn the power to the analyzer on or off, turning off this switch completely cuts the power off.
2. Power Input: Connect the Power Cable here
3. USB Port  : Used to update the software and to back up. The smaller port is provided for connecting to a computer
4. Ethernet Port  : Used to connect to LAN or the Internet
5. Cooling Fan
6. Biological Hazard Warning
7. Displays basic information of the analyzer including product name, manufacturer, manufactured date and serial number
8. Motor Cover: To be removed for maintenance and only by authorized Samsung Technical Support personnel
9. Speaker

3

Installation

Installation	26
Replacing printer paper	27
Disc	29
Handling and Storage of the Disc	30
Adding the sample to the Disc	31

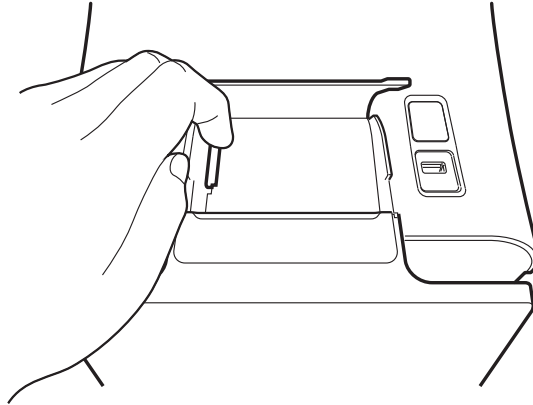
Installation

■ Installation

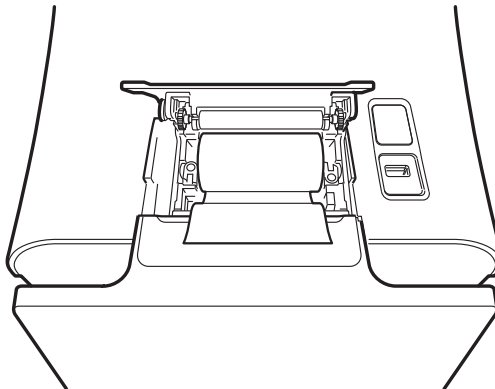
- 1** Carefully remove the analyzer from the packaging, and check for any damage that may have occurred during transport. If it is damaged, contact your courier or retailer immediately. Check and make sure that the contents of the box match the contents described in the User Manual. Contact your retailer if any component is missing.
- 2** Place the analyzer on a level surface near an appropriate AC electrical outlet.
- 3** Connect the power cable to the power input on the rear panel of the analyzer.
- 4** Plug the power cable into the AC power outlet. The analyzer uses a switching-mode power supply (100 - 240 V).
- 5** LAN and USB cables are used for PC software (LABGEO Data Manager) connections.

■ Replacing printer paper

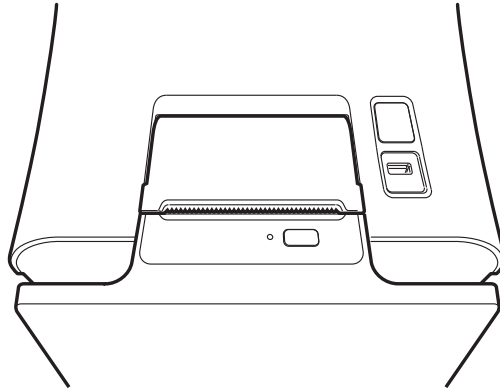
- 1 Open the paper lid (pull the lid upward by the handle).



- 2 Remove the used roll.
- 3 Unwind a new paper roll so that the leading edge comes out from the bottom, facing the user.
- 4 Gently insert a new roll into the receptacle, and confirm that the paper comes out through the front of the printer while holding the leading edge.

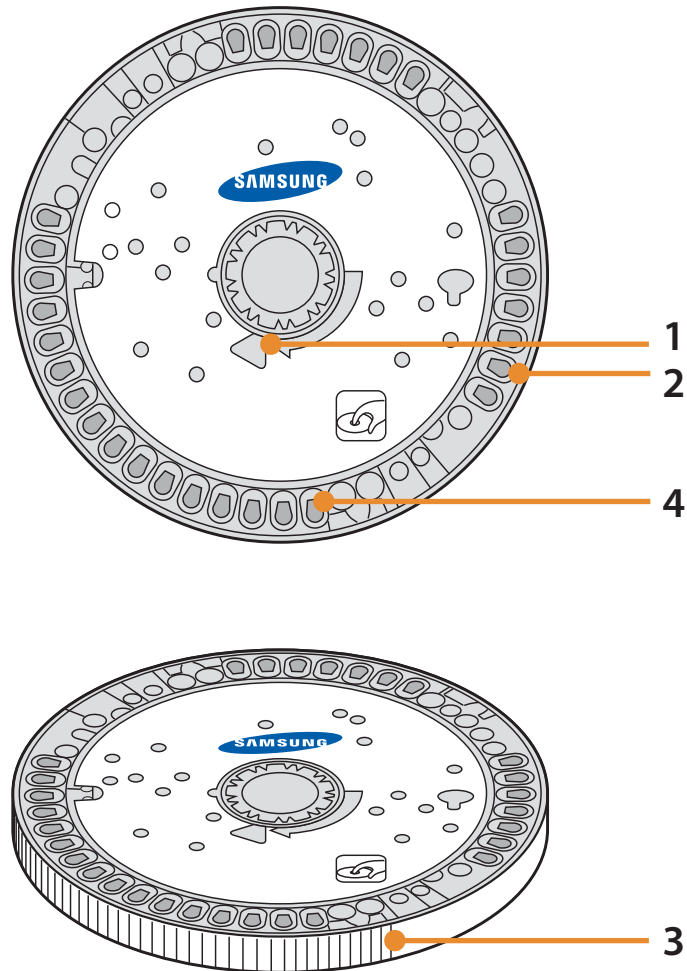


- 5 Close the lid and confirm that the paper is positioned between the lid and the front of the printer.



■ Disc

The actual disc may differ from the images shown below.



1. Sample injection Hole
2. Reagent
3. Disc Barcode
4. Detection area (gray-colored zone)



Care must be taken to keep the detection area clear of fingerprints or other foreign substances.
Contamination of the detection area may affect the analysis results.

■ Handling and Storage of the Disc



Handle the discs carefully to avoid damaging them. The disc is a high-technology integrated product but is vulnerable to impacts. Be careful not to bump the disc when transporting, handling or loading it. Do not use the disc if it has been dropped.

- Always use powder-free gloves when handling the product.
- Store the disc LEVEL between 2 - 8 °C (36 - 46 °F).
- Use by the expiry date marked on the disc pouch or the package label. The analyzer detects and rejects a disc that has expired.
- Bring the disc in its unopened pouch to room temperature (18 - 25 °C or 64 - 77 °F) for at least 10 minutes before using it on the analyzer.
- The disc can be left at room temperature (18 - 25 °C or 64 - 77 °F) for a total of up to 12 hours if the pouch remains sealed. Do not use the disc if left at room temperature more than 12 hours.
- Do not expose the open disc to direct sunlight.
- Do not expose the disc to temperatures over 32 °C (89 °F).
- Do not use a disc if the pouch is cut or torn as the reagents inside may be damaged by moisture.
- Tear open the pouch at the notch located at the top edge. Once the pouch is opened, the disc must be used within approximately 10 minutes or discarded. It cannot be put back in the refrigerator for use at a later time.
- Be careful not to leave fingerprints or other contaminants in the detection areas of the disc.
- Keep the disc level at all times!



BIOHAZARD! Operator health and safety regulations require that Universal Precautions are to be observed whenever handling human blood samples or working with the Samsung LABGEO^{PA20}. For additional information refer to OSHA 29 CFR Part 1910, Standard number 1910.1030 (Toxic and Hazardous Substances: Bloodborne Pathogens"). This can be found on the internet at <http://www.osha.gov> and going to "1910.1030." Used discs contain human blood. Care must be taken in handling used discs as the blood may have been infected by microbes that may cause infectious diseases such as hepatitis B. The disc, once used, should be disposed of according to medical waste disposal rules.

For additional guidelines on handling and disposing of hazardous medical wastes, refer to "Clinical Laboratory Waste Management, Approved Guideline—Second Edition (GPS-A2) issued by the Clinical and Laboratory Standards Institute (previously known as NCCLS).

This can be found at <http://clsi.org>.

■ Adding the sample to the Disc

It is advisable to power up the instrument prior to loading the sample on the disc. See page xx.

- Bring the refrigerated, unopened disc to room temperature for at least 10 minutes before opening it. Once opened, the disc must be used within 10 minutes. Load the disc on the Analyzer within 10 minutes after injecting the sample.

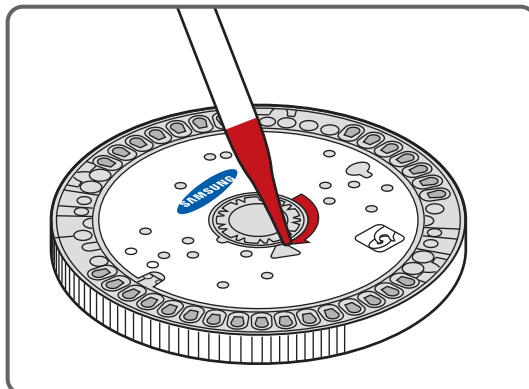


Discs are fragile — always handle with care. Do not tap discs on the workbench. Do not use a disc that has been dropped. Inspect every disc for damage before use. Never use a damaged disc.

- Use a pipette to inject 450 μ L into the sample injection hole. The disc requires a minimum of 450 μ L, maximum of 750 μ L. Slowly inject the blood sample into the disc through the sample injection hole.

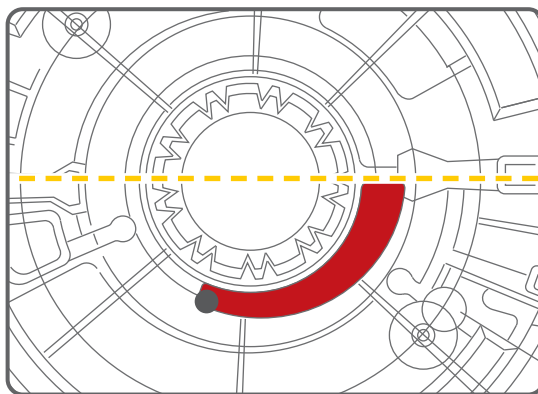


Be careful not to pipette with excessive force or pull back on the plunger when removing the pipette from the hole. Be careful not to inject a bubble into the sample injection hole.



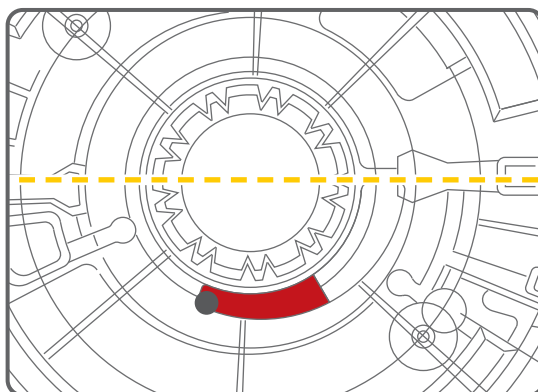
■ SAMPLE INJECTION

- Correct injection volume



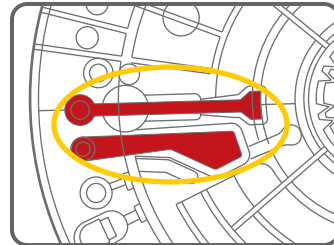
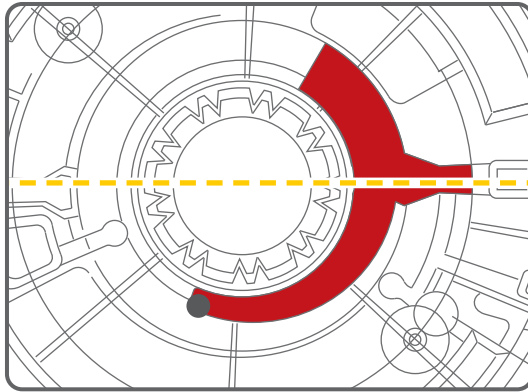
- Insufficient sample volume

Analyzer will show message that insufficient sample has been injected. Carefully pipette an additional 100 μL ~ 250 μL into the sample injection hole. Tap Retry on analyzer.



- Excessive sample injection

During analysis, any surplus sample will move into the overflow chamber as shown below:



(surplus sample → overflow sample chamber)



Injecting more than 750 μL may cause sample chamber to overflow.

- Do not use expired discs.
- Be careful to insert the disc into the analyzer properly. When inserting the disc the blood sample hole should be facing up.

4

Analyzing

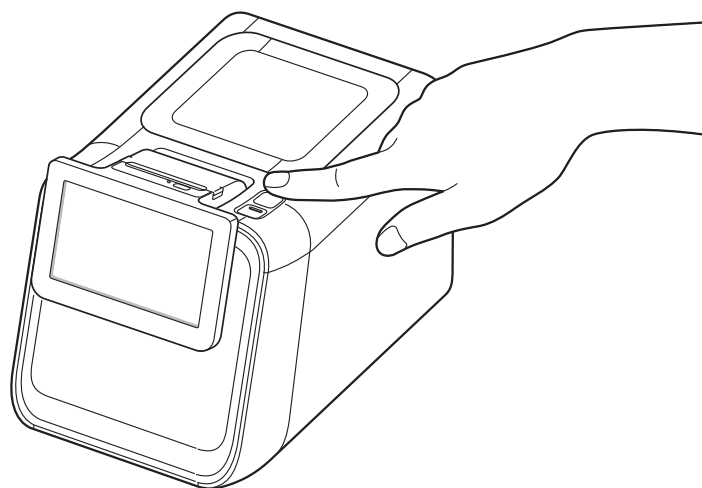
Analyzing	36	QC material	84
Turning power on	36	Registering QC Material.....	84
Preparing analysis.....	40	Changing QC material	89
Canceling analysis in progress	43	Deleting QC material	91
Analysis completed	45	Print settings	93
Viewing analysis results.....	47	Barcode settings	95
Viewing results.....	48	Language settings	97
Viewing results of patient's		Self-test	99
analysis	50	Analyzer settings	
Viewing QC results	52	(Administrator Settings).....	103
Searching results.....	54	Lock settings	105
Printing results.....	56	Setting security levels for each	
Transferring results.....	61	function	105
Deleting results	63	Locking quality control	107
Quality control	65	Changing password	109
Starting quality control.....	65	Network settings	112
Analyzer settings		Connecting to a network	112
(General User Settings).....	69	Setting network connections	114
Display settings	71	Setting EMR/LIS.....	116
Calibration		Lock settings.....	117
(touch screen calibration)	72	Changing Date&time	
LCD Brightness	73	format	119
Screensaver settings.....	74	System settings	121
LCD Off settings	75	System Reset	123
Volume settings	76	USB Backup	127
Analysis settings	77	System updates	129
Unit settings	78	Turning off power.....	131
Change order	80		
Reference range settings	82		

Analyzing

■ Analyzing

Turning power on

- 1 Before beginning analysis, turn the device's power on.



Turn the analyzer's power on. (Set the power switch in the back to ON, and press the POWER button on the front of the device.)
Once the analyzer is turned on, it requires about 2~5 minutes to preheat.
If the power doesn't turn on, refer to page 159 "7. Troubleshooting".

- 2 Once the analyzer is turned on, it performs a hardware check, and the home screen, shown below, is displayed.



1. **Results:** Select Results menu to view the results of a completed analysis. Please refer to '4. Analyzing - Viewing results (page 48)' for more details.

Results			
Back Search			
All Patient Results QC Results			
☐	Analysis Date ▾	Patient ID	Disc
☐	16/Jun/2012 09:24AM	Alice	P13
☐	16/Jun/2012 09:03AM	0007_Control1	P13
☐	15/Jun/2012 05:59PM	Tom	P13
☐	15/Jun/2012 03:23PM	Emma	P13

- 2. Analysis Information:** Select Run menu to enter analysis information and perform blood analysis.

Back Analysis Information

Patient ID Maximum 14 digits

Date of Birth (MM/DD/YYYY) / /

Gender Male Female Unknown

Operator ID Maximum 14 digits

OK

- 3. QC Run:** This is the start menu of QC Run.

Back QC Run

Material

Default_C03 (Level 1)
Lot# DC03
Expiration Date: 31/Dec/2999

Default_C02 (Level 1)
Lot# DC02
Expiration Date: 31/Dec/2999

Analyte

OK

4. **Settings:** Select Settings menu to adjust display, volume, analysis, language, peripherals and self-testing options. When logging in as an administrator, you can view the status of locking, network, time, and system settings.



Preparing analysis

- 1 Press the **Run** button.

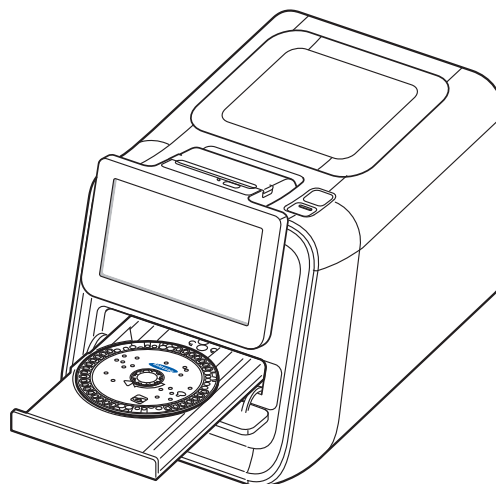
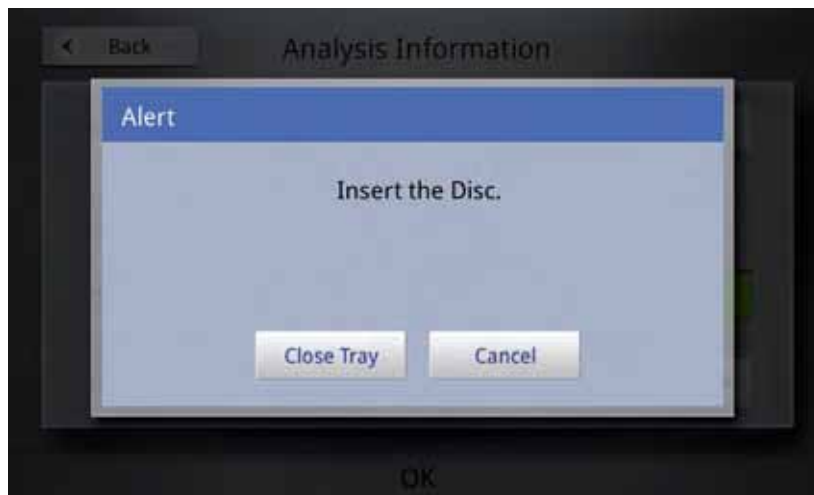


- Up to 5,000 analysis results can be stored on the analyzer. The device shows a backup warning when the available space is less than 100 records. Please refer to '4. Analyzing - USB Backup (page 127)' for instructions on backing up analysis results.

- 2 Screen for entering **Analysis Information** is displayed on the LCD. Enter patient information and press the **OK** button.
 - To display the keypad, tap on an empty field.
 - You may enter the Patient ID by scanning a barcode with the barcode scanner.

The image shows the "Analysis Information" screen. At the top left is a "Back" button with a left arrow. The title "Analysis Information" is centered at the top. Below the title, there are four input fields: "Patient ID" with a text box labeled "Maximum 14 digits", "Date of Birth (MM/DD/YYYY)" with a text box containing "/", "Gender" with three buttons labeled "Male", "Female", and "Unknown" (the "Unknown" button is highlighted in green), and "Operator ID" with a text box labeled "Maximum 14 digits" and a small green triangle icon to its right. At the bottom center, there is an "OK" button.

- 3 Insert a disc loaded with a sample into the tray when it opens, and press the **Run** button.

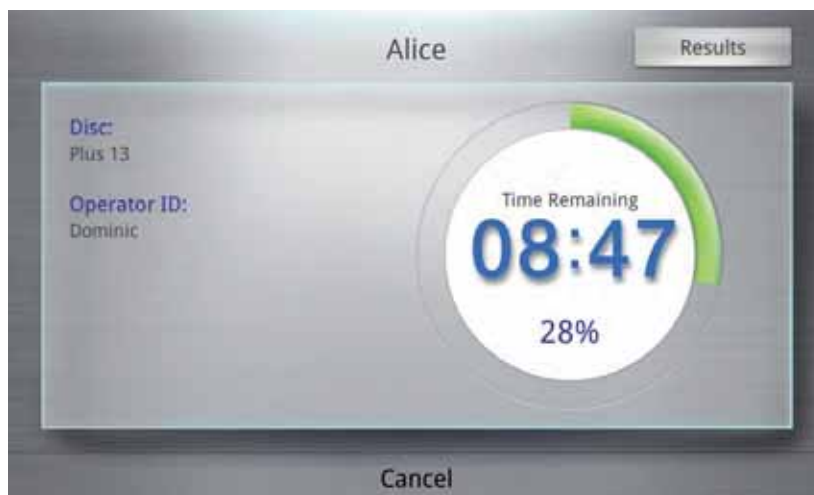


The disc tray closes automatically if the **Run** button is not tapped within 30 seconds after inserting the disc.

- 4 As the tray closes, the analyzer performs a disc validity check.

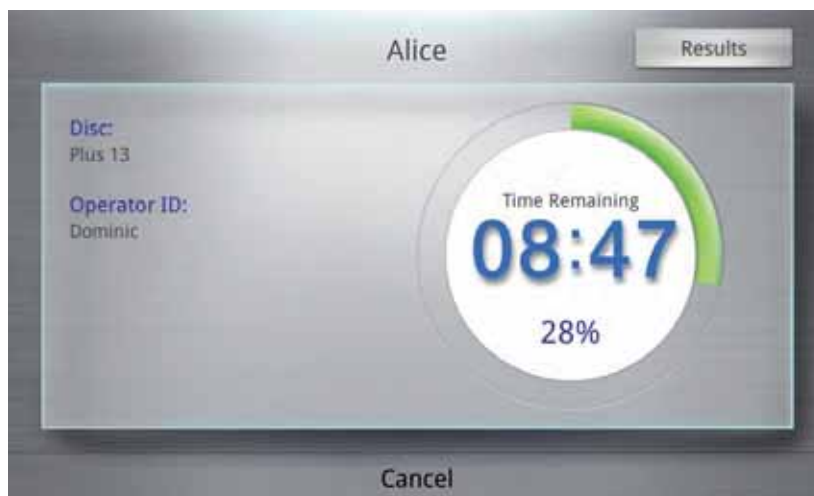


- 5 After completing the validity check, the test starts while the remaining time and progress is displayed on the screen.

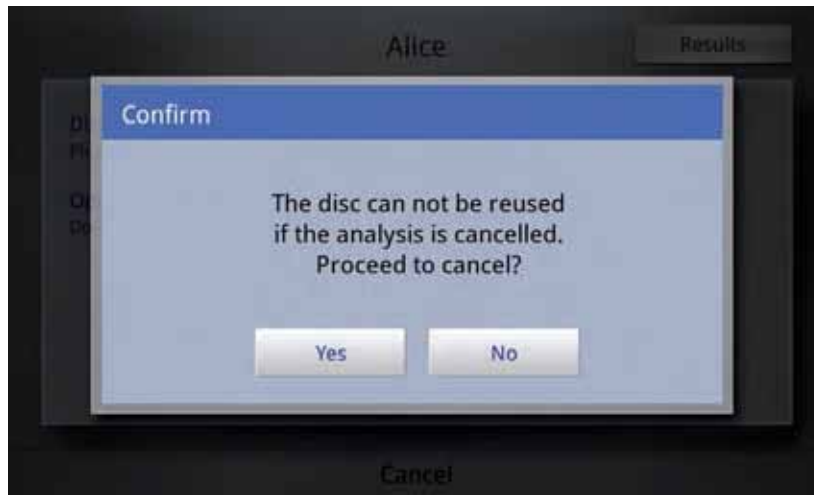


Canceling analysis in progress

- 1 To cancel a test for Disc Validity Check or during the blood analysis stage, press the **Cancel** button.



- 2 Press the **Yes** button to cancel, and the **No** button to resume the analysis.



- When an analysis in progress is canceled, the disc cannot be used again.

Analysis completed

- 1 When the analysis is completed, an audio notification plays and the analysis results are displayed on the LCD.



- Analytes and analysis results are displayed.
- If auto-print is turned on, the device automatically prints the analysis results upon completion.
 - ✓ For instructions on adjusting auto-print settings, please refer to "Settings – Peripherals" (page 93).
- If the device is connected to a PC, the analysis results are automatically transmitted to the PC application (LABGEO DATA MANAGER) upon completion.
 - ✓ For more details on the PC software (LABGEO Data Manager), please refer to page 133.
- If the EMR/LIS settings are correctly set, the analysis results are automatically transmitted to the EMR/LIS server program.
 - ✓ Please refer to page 116 for instructions on setting the EMR/LIS.

Glossary

HEM (Hemolysis)	Specimen's level of hemolysis
LIP (Lipemia)	Specimen's level of lipemia
ICT (Icterus)	Specimen's level of icterus

The following symbols are displayed when the results are not within normal values.

	When results exceed the reference range
	When results exceed the analyzer's detection range
	When QC fails



The audio notification for completion of the test can be adjusted. To adjust the volume, please refer to Settings – Volume (page 76).

- 2 Press the button to remove disc from the open tray.



Viewing analysis results

- Once the analysis is completed, the results are displayed on the LCD.
 - Analysis results can also be viewed by selecting Results on the home menu.



- To view detailed results of each analyte, press the Show detail button on the upper right corner.
 - Press the Up/Down button to select an analyte from the list.

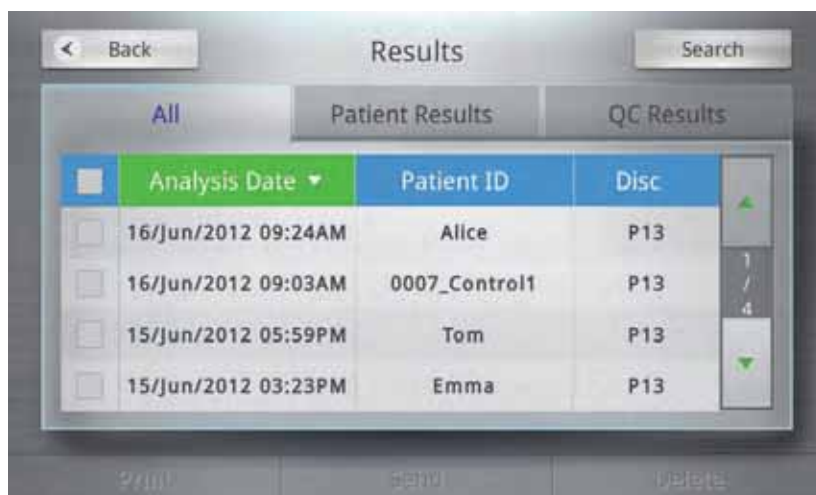


■ Viewing results

Press the Result button on the home screen to display the **Results**.

Results are grouped by All, Patient and Material QC.

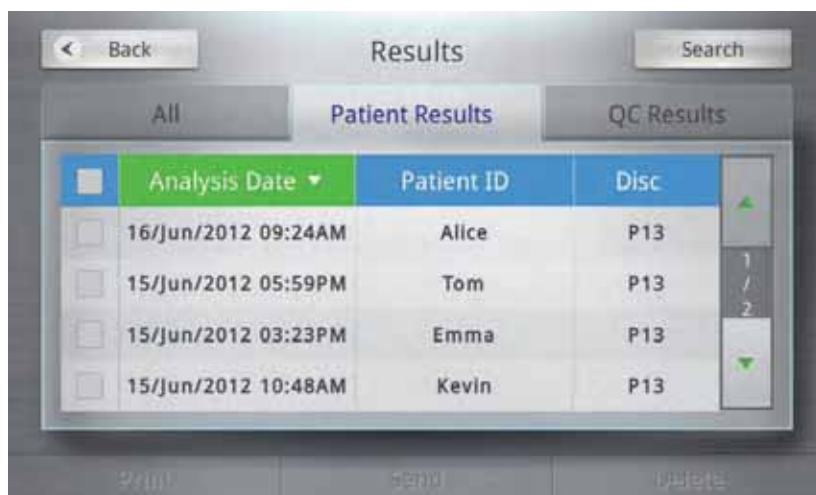
■ All



Back		Results		Search	
All		Patient Results		QC Results	
	Analysis Date ▼	Patient ID	Disc		
☐	16/Jun/2012 09:24AM	Alice	P13	▲	
☐	16/Jun/2012 09:03AM	0007_Control1	P13	1 / 4	
☐	15/Jun/2012 05:59PM	Tom	P13	▼	
☐	15/Jun/2012 03:23PM	Emma	P13		

Print Send Delete

■ Patient



Back		Results		Search	
All		Patient Results		QC Results	
	Analysis Date ▼	Patient ID	Disc		
☐	16/Jun/2012 09:24AM	Alice	P13	▲	
☐	15/Jun/2012 05:59PM	Tom	P13	1 / 2	
☐	15/Jun/2012 03:23PM	Emma	P13	▼	
☐	15/Jun/2012 10:48AM	Kevin	P13		

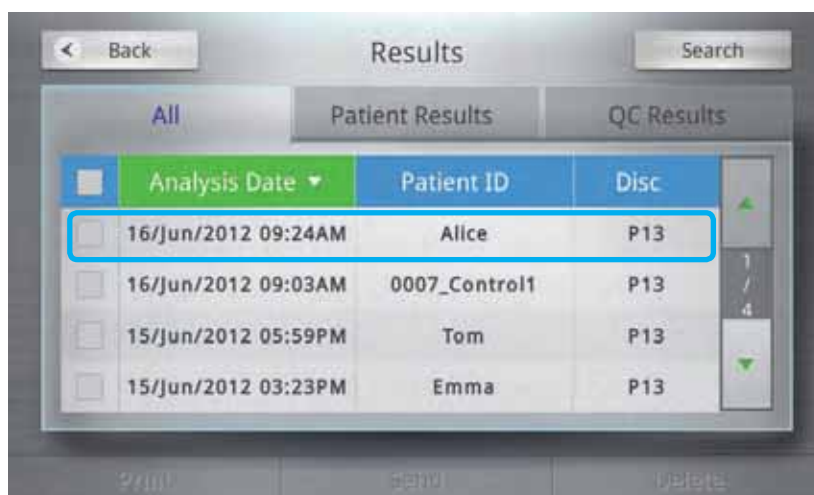
Print Send Delete

■ Quality Control

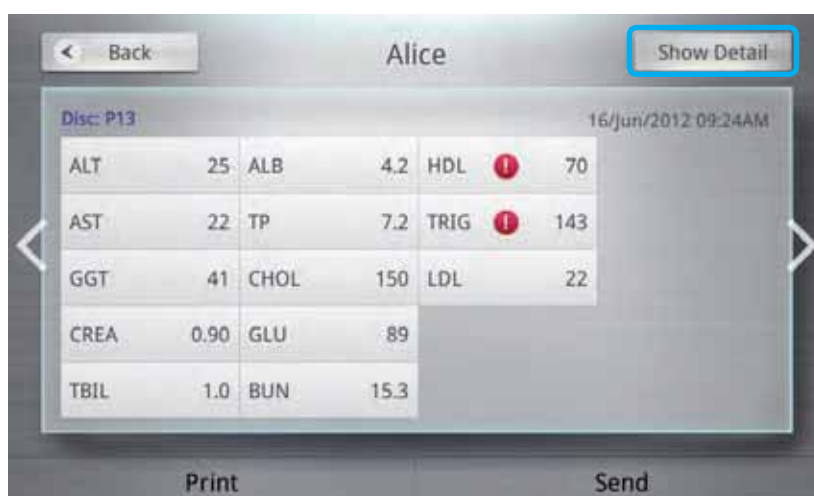
	Analysis Date ▼	Patient ID	Disc
☐	16/Jun/2012 09:03AM	0007_Control1	P13
☐	15/Jun/2012 08:58AM	0006_Control1	P13
☐	14/Jun/2012 09:02AM	0005_Control1	P13
☐	13/Jun/2012 08:52AM	0004_Control1	P13

Viewing results of patient's analysis

- 1 Press the **Patient Results** button to enter the Simple View screen.



- 2 To view detailed results of each analyte, press the **Show Detail** button in the upper-right corner.



- 3 When you select the patient ID, you can view the patient's date of birth, gender and operator ID.

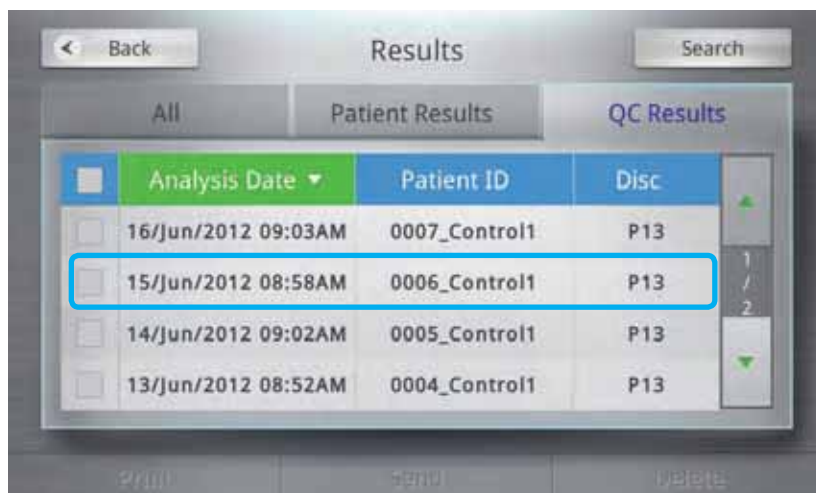
Analyte	Result	Ref. Range	Unit
ALT	25	0-45	U/L
AST	22	0-40	U/L
GGT	41	5-66	U/L
CREA	0.90	0.50-1.30	mg/dl

- 4 To switch to the previous or next result screen, press the arrow buttons on the left and right side of the screen.

ALT	25	ALB	4.2	HDL	70
AST	22	TP	7.2	TRIG	143
GGT	41	CHOL	150	LDL	22
CREA	0.90	GLU	89		
TBIL	1.0	BUN	15.3		

Viewing QC results

- 1 Press the **QC Results** button to switch to the simple view screen.



- 2 To view detailed results of each analyte, press the **Show Detail** button on the upper right corner.



- 3 To switch between the simple view and show detail screens, press the arrow buttons on the left and right side of the screen.
- 4 Press each analyte to enter the QC chart screen.

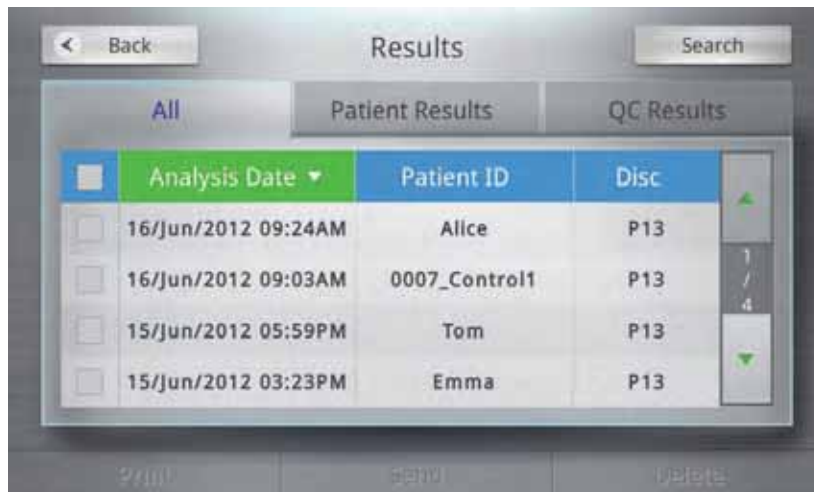


- 5 QC chart screen displays the QC results of each analyte in a graph.

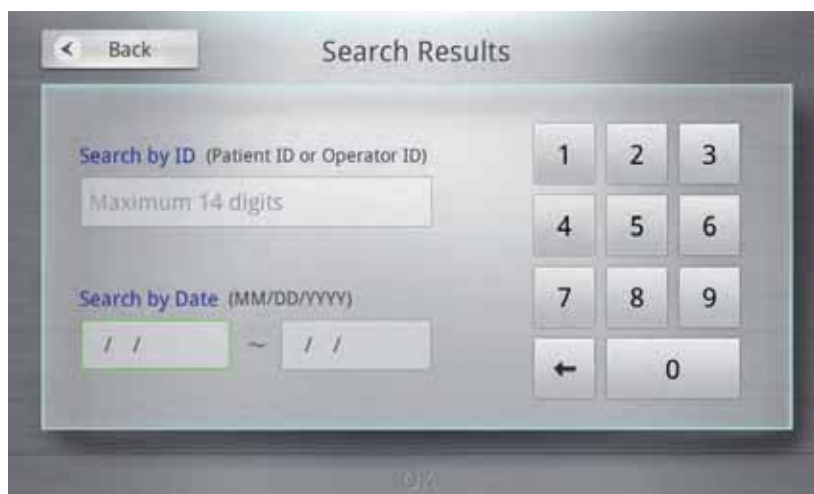


Searching results

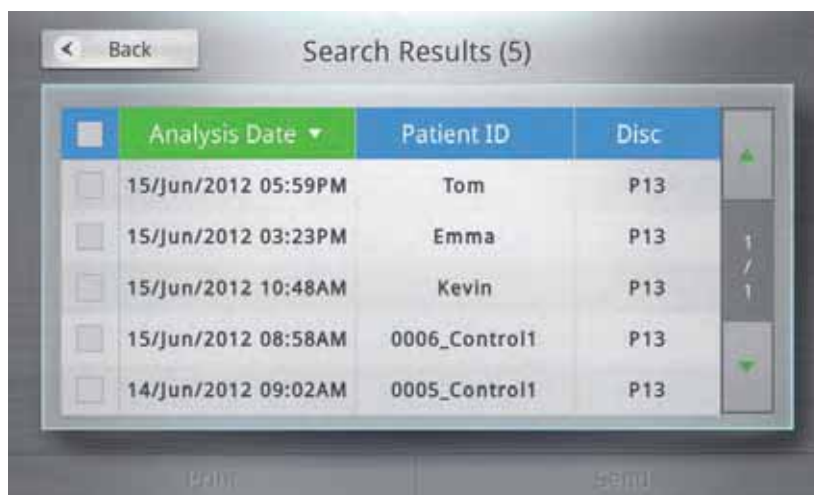
- 1 Press the **Results** button on the home screen to display the Results screen.



- 2 Press the **Search** button in the upper-right corner to enter the **Search Results** screen.



- 3 Enter an **ID** or **date** and press the **OK** button to see matching results.



☐	Analysis Date ▼	Patient ID	Disc
☐	15/Jun/2012 05:59PM	Tom	P13
☐	15/Jun/2012 03:23PM	Emma	P13
☐	15/Jun/2012 10:48AM	Kevin	P13
☐	15/Jun/2012 08:58AM	0006_Control1	P13
☐	14/Jun/2012 09:02AM	0005_Control1	P13

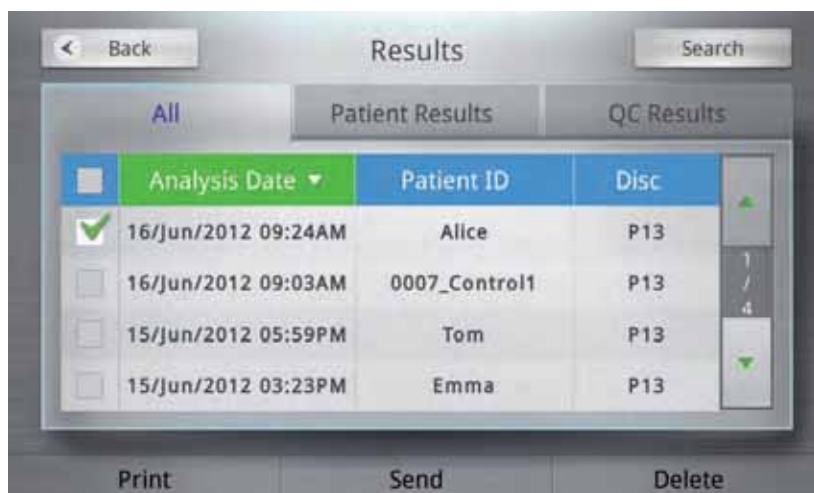
- 4 To print the results, select the results you wish to print and press the Print button.
To transfer the results to a PC software (LABGEO Data Manager) or EMR/LIS, select the results you wish to transfer and select the Send button.

Printing results

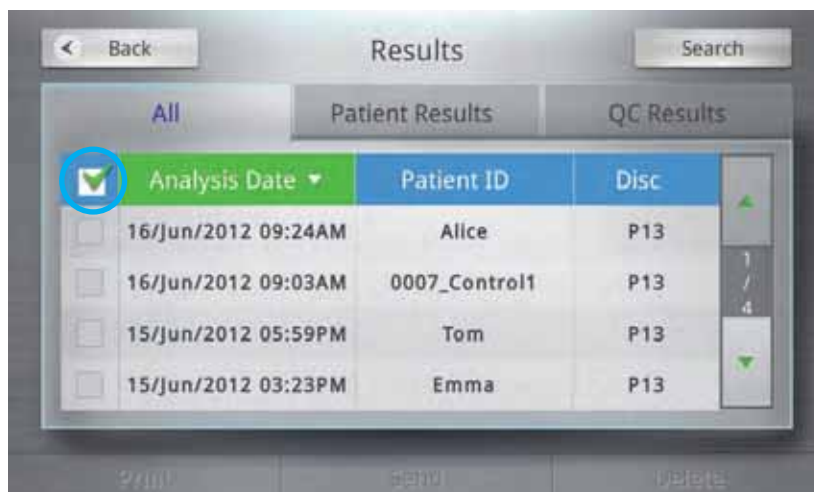
Printing analysis results, including patient ID in certain languages, requires the analyzer's language setting to be set in that language to print correctly.

Printing multiple analysis results

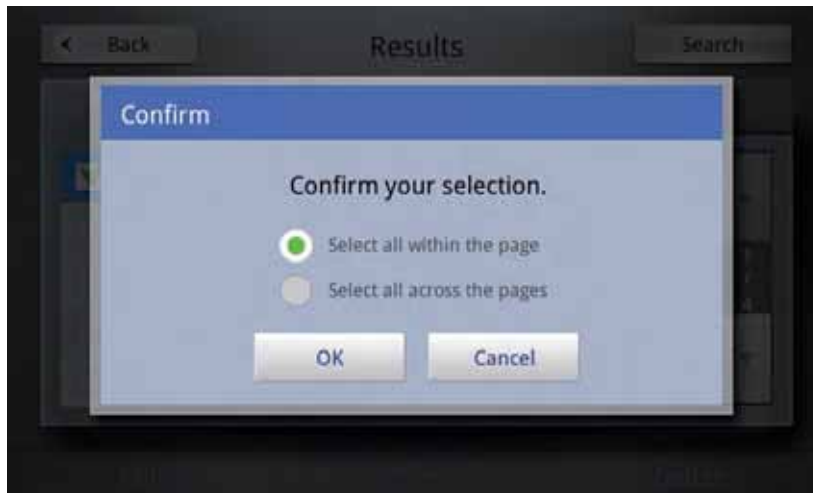
- 1 From the results screen, check the boxes next to the results you wish to print.



- 2 To print all the analysis results on the page or all the analysis results stored, **check the box** in the upper-left corner of the chart.



- 3 Select either print range option: Select all within the page or Select all across the pages.



- 4 When you press the Print button, a pop-up window is displayed. Press the OK button to begin printing.
 - Press the Cancel button to cancel printing.
 - Only results requested with the check box will be printed.



- 5 Once the data is transferred, the printer prints the results.



Printing analysis results by analytes

Specific analytes of analysis results can be selectively printed.

- 1 On the Results screen, press **Patient Results** to enter the simple view screen.



- 2 In the Show detail screen, results for each analyte can be selectively printed by checking the boxes.



- 3 Uncheck the **Analyte** you wish to exclude, and press the **Print** button.



- 4 A print confirmation pop-up window appears on the display. Press the **OK** button to begin printing.



- 5 While the data is printing, the transfer status is shown.

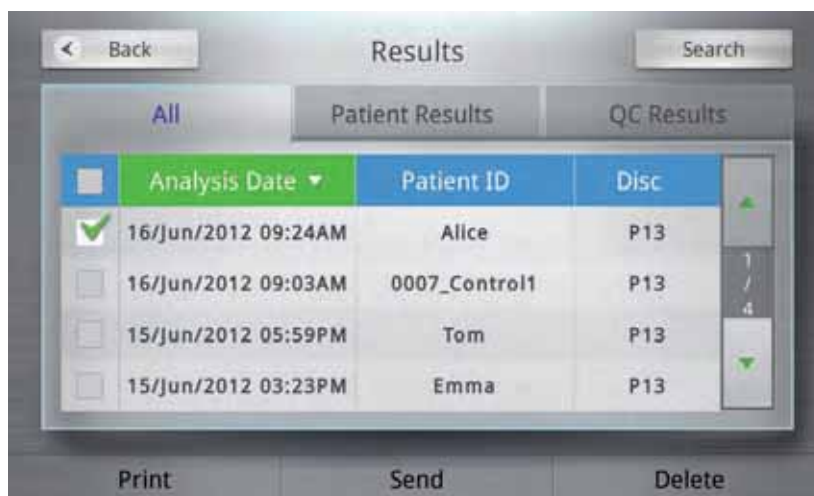


- The analysis results view is displayed again after printing.

Transferring results

Results can be sent to PC application(LABGEO DATA MANAGER) and EMR/LIS.

- 1 Select the results you wish to transfer from the Results screen. Check the boxes next to the results you wish to transfer.
 - The device must be connected to a PC to transfer results. Please refer to page 133 for instructions on using the PC application.
 - Please refer to page 116 for instructions on setting the EMR/LIS.



- 2 Press the **Send** button and select the transferring method.
 - If you select EMR/LIS, only results requested through EMR will be transferred.
 - To cancel the transfer, press the Cancel button.

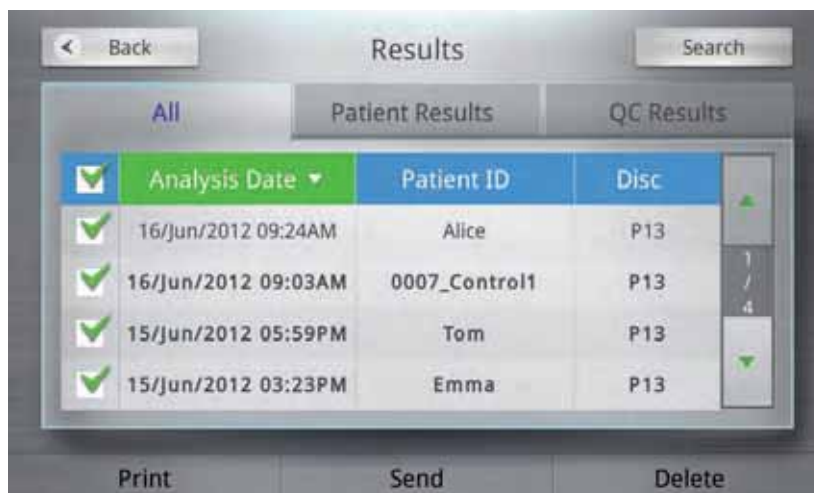


- 3 If you select PC and the device is connected to a PC, the transfer will begin. If you select EMR/LIS and the device is connected to EMR, the transfer will begin. To cancel the transfer, press the Cancel button.



Deleting results

- 1 From the results screen, check the boxes next to the results you wish to delete and press the Delete button.



- 2 Press OK to begin deleting.



- 3 Press **Cancel** to cancel deleting.



Deleted results cannot be restored before you press the Cancel button.

■ Quality control

The QC menu is for checking whether the QC results are within a valid range. QC is performed according to the regulations of each analysis lab. QC materials can be registered in the Settings menu. Please refer to page 84 for instructions on registering QC materials.

Starting quality control

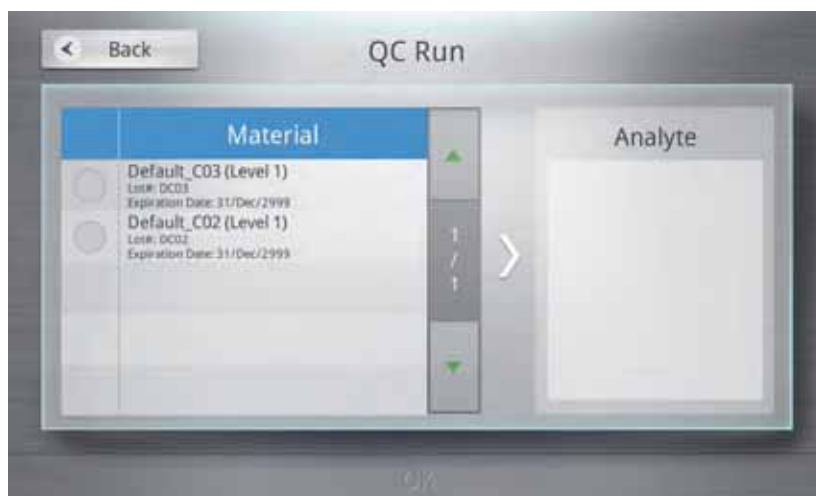
- 1 Press the QC button on the home screen.



- 2 When the pop-up window requests that you insert a disc, insert a disc into the tray.
To cancel QC, press the **Cancel** button.



- 3 Select the **QC material** and press the **OK** button to begin QC.



- 4 To cancel analysis, press the **Cancel** button. Once canceled, the disc cannot be used again.



- 5 Once QC completes, the result screen shown on the right is displayed.
- If the device is connected to the LABGEO Data Manager, the analysis results are transferred automatically.
 - If auto-print is turned on, the analysis results are printed automatically.
 - To print the results, press the Print button.



If the results are outside of QC range,  is displayed.

- 6 Press the Disc Out button and remove the disc.



■ Analyzer settings (General User Settings)

- 1 Press the Setting button on the home screen.



- 2 **General user settings:** General user settings can be adjusted by anyone. After entering the Settings screen, the general user settings are displayed.



Display	Calibration, LCD brightness, screensaver, and LCD off settings can be adjusted.
Volume	Master volume, booting/ending sound, touch screen, warning/ error sound, and analysis completion sound can be adjusted.
Analysis	Unit of analytes, printing order, reference range, and QC materials can be adjusted.
Peripherals	Auto-print and starting point after barcode scanning can be adjusted.
Language	The analyzer language can be adjusted.
Self-Test	A self-test of the analyzer can be performed to check whether it is operating normally.

3 Administrator settings: Administrator settings require an admin login for security.



Lock	Functions of analyzer can be locked and a new password can be set.
Network	Settings for network connection, server settings for EMR/LIS connection can be set.
Date&Time	The analyzer's date, time, and display settings can be adjusted.
System	Device information checking, updates, initialization and results backups can be performed.

■ Display settings

Display settings consist of calibration, LCD brightness, screensaver, and LCD off settings.

- 1 Press the **Setting** button on the home screen.



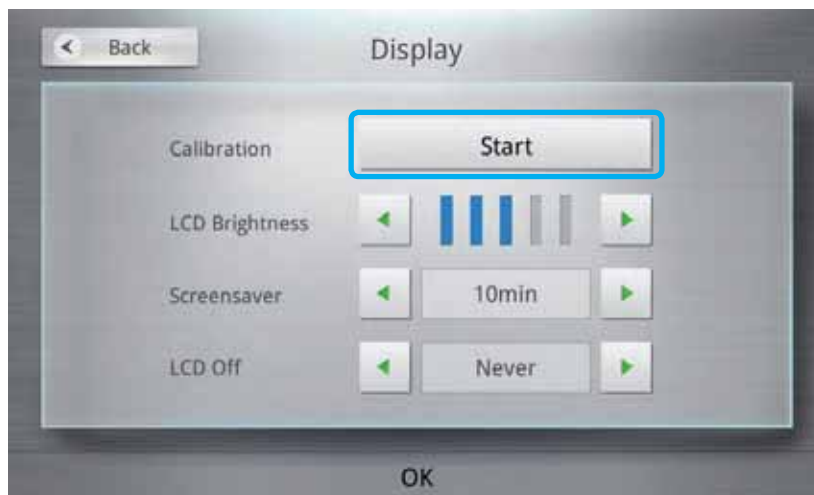
- 2 Press the **Display** button.
You can cancel any changes by pressing the **Back** button without pressing the **OK** button.



Calibration (touch screen calibration)

Calibration is performed to adjust settings to improve recognition accuracy of the touch screen.

- 1 Select Calibration.



- 2 Press the center of the crosshairs (+) as they appear on the display to calibrate the touch screen recognition.



- The crosshairs (+) turn blue after being selected.
- If the touch screen recognition is not calibrated accurately after 2-3 calibrations, please contact Samsung Electronics Technical Support.

LCD Brightness

The brightness of the LCD can be adjusted. The brightness can be adjusted in 5 levels.

- 1 Press  or  for the LCD brightness.



- 2 Press the OK button to set the brightness.
You can cancel any changes by pressing the Back button without pressing the OK button.

Screensaver settings

A screensaver is automatically activated after a set period of time to protect the analyzer's LCD screen. The screensaver can be turned on or off, and the time for activating the screensaver can be adjusted.

- 1 Press ◀ or ▶ to select when the Screensaver starts.



Never ▶ 10 min ▶ 20 min ▶ 30 min ▶ 1 hr.
When set to Never, the screensaver is turned off.

- 2 The screensaver (a clock) is activated after the set amount of time has passed without use.



LCD Off settings

The LCD Off function protects the analyzer's LCD screen and saves power by turning the LCD off after a set period of time.

- 1 Press ◀ or ▶ to select when the LCD is to be turned Off.



Never ▶ 30 min ▶ 1 hr ▶ 2 hrs ▶ 3 hrs.
When set to Never, the LCD remains on.

- 2 The LCD turns off automatically after the set amount of time has passed without use.

■ Volume settings

- 1 Press the Settings button on the home screen.
- 2 Press the Volume button.
- 3 Set each volume by pressing ▼ or ▲.



- 4 Press the OK button to set the volume. Press the Back button to cancel.

■ Analysis settings

Unit of analytes, printing order, reference range, and QC materials can be adjusted.

- 1 Press the Settings button on the home screen.



- 2 After pressing the Analysis button, select **Units&Order**, Reference Range, and QC Material.



Unit settings

The units of analytes displayed in analysis results can be adjusted.

- 1 Press the Units&Order button.



- 2 SI and Non-SI (Conventional) can be chosen for each analyte. Check the box on the left to select SI or Non-SI for all analytes.



Conversion between SI and non-SI Units (Non-SI X Factor = SI)

NO	Abbr.	Full Name	Conventional Unit	Conversion Factor	SI Unit
1	ALT	Alanine Aminotransferase	U/L	1	U/L
2	AST	Aspartate Aminotransferase	U/L	1	U/L
3	CK	Creatine kinase	U/L	1	U/L
4	LD	Lactate dehydrogenase	U/L	1	U/L
5	BUN	Blood Urea Nitrogen	mg/dL	0.357	mmol/L
6	K	Potassium	mEq/L	1	mmol/L
7	TCO2	Total CO2	mEq/L	1	mmol/L
8	AMY	Amylase	U/L	1	U/L
9	GGT	r-Glutamyltransferase	U/L	1	U/L
10	ALP	Alkaline Phosphatase	U/L	1	U/L
11	Na	Sodium	mEq/L	1	mmol/L
12	Cl	Chloride	mEq/L	1	mmol/L
13	CHOL	Total Cholesterol	mg/dL	0.0259	mmol/L
14	GLU	Glucose	mg/dL	0.0555	mmol/L
15	TRIG	Triglyceride	mg/dL	0.0113	mmol/L
16	TBIL	Total Bilirubin	mg/dL	17.1	μmol/L
17	TP	Total Protein	g/dL	10	g/L
18	DBIL	Direct Bilirubin	mg/dL	17.1	μmol/L
19	CREA	Creatinine	mg/dL	88.4	μmol/L
20	Ca	Calcium	mg/dL	0.25	mmol/L
21	ALB	Albumin	g/dL	10	g/L
22	HDL	High-density lipoprotein cholesterol	mg/dL	0.0259	mmol/L
23	UA	Uric Acid	mg/dL	59.48	μmol/L
24	LDL	Low-density lipoprotein cholesterol	mg/dL	0.0259	mmol/L
25	HbA1c	HbA1c	%	$((\%) - 2.15) \times 10.929$	mmol/mol
26	TnI	Troponin I	ng/ml	1	ug/L
27	CK_MB	Creatine Kinase-MB	ng/ml	1	ug/L
28	Myo	Myoglobin	ng/ml	1	ug/L
29	NT-BMP	N-terminal pro-Brain Natriuretic Peptide	ng/ml	1	ug/L

Change order

The order of analytes displayed when viewing analysis results can be adjusted. The changes affect the Results screen and print-outs.

- 1 Press the **Units&Order** button.



- 2 Press the **Change Order** button in the upper-left corner of the screen.



3 Select Disc.



4 Select the analyte you wish to change the order of, make your changes by pressing the **Up** and **Down** buttons, then press the **OK** button.

Reference range settings

The reference range of analytes can be adjusted.

- 1 Press the **Reference Range** button.



- 2 Press the entry field of the analyte and a number pad appears on the screen. Enter a value for the analyte and press the **OK** button.

Reference Range

Analyte ▲	Reference Range (Min~Max)
ALB	3.5 ~ 5.3
ALP	42.0 ~ 141.0
ALT	0.0 ~ 45.0
AMY	14.0 ~ 97.0
AST	0.0 ~ 40.0

Number Pad: 1, 2, 3, 4, 5, 6, 7, 8, 9, ←, 0, .

OK

■ QC material

QC materials can be set.

Registering QC Material

- 1 Press the **QC Material** button.



- 2 Press the **Add** button in the lower-right corner.



- 3 To display the keypad, tap an empty field.

The screenshot shows the 'Add QC Material' screen. At the top, there is a 'Back' button and an 'Add Analyte' button. Below them is a table with the following columns: Material (1-12 Characters), Lvl. (1-3), Lot. No. (1-12 Characters), Expiration Date (MM/DD/YYYY), Analyte, Target Mean, Target SD, Target Range (Min, Max), Unit, and Rules. The table is currently empty, and a keypad is visible at the bottom of the screen.

- Keyboard IME

The screenshot shows the 'Add QC Material' screen with the 'Material' field selected. A virtual keyboard is displayed below the field, showing numbers, letters, and special keys like 'Enter' and 'Space'. The 'Material' field is empty, and the keyboard is ready for input.

■ Numeric Keypad

The screenshot shows the 'Add QC Material' screen. At the top, there are buttons for 'Back' and 'Add Analyte'. Below these is a table with columns: Material, Lvl., Lot. No., and Expiration D. The first row contains 'DC-01', '1', 'C1235267', and '0'. Below this table is another table with columns: Analyte, Target Mean, Target SD, and Target Range (Min, Max). The first row under 'Analyte' is 'GGT'. To the right of these tables is a numeric keypad with buttons for digits 1-9, 0, and a decimal point, along with a back arrow button.

4 Select the analyte to add and press **OK**.

The screenshot shows the 'Add Analyte' screen. At the top, there are buttons for 'Back' and 'Add Analyte'. Below these is a list of analytes arranged in three columns. Each analyte has a checkbox next to it. The analytes are: ALB, ALP, ALT, AMY, AST, BUN, CA, CHOL, CK, CK_MB, CREA, CI, DBIL, GGT, GLU, HDL, HGB, and K. The checkboxes for ALB, ALT, AST, BUN, CHOL, CREA, and GGT are checked. To the right of the list is a vertical scroll bar with a '1/2' indicator. At the bottom of the screen is an 'OK' button.

- 5 To add the selected analyte, press the **Add Analyte** button.

The screenshot shows the 'Add QC Material' screen. At the top, there is a 'Back' button on the left and an 'Add Analyte' button on the right. Below these is a table with columns: Material, Lvl., Lot. No., and Expiration D. The table contains the following data:

Material	Lvl.	Lot. No.	Expiration D
DC-01	1	C1235267	

Below the table is a grid for adding analytes. The grid has columns: Analyte, Target Mean, Target SD, Target Range (Min, Max), and a numeric keypad. The analytes listed are ALB, ALT, AST, and CHOL. The numeric keypad has buttons for 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, and a decimal point. The 'Add Analyte' button is highlighted in the top right corner.

- 6 To change the QC rules for the analyte, press the **Yes** button on the right.

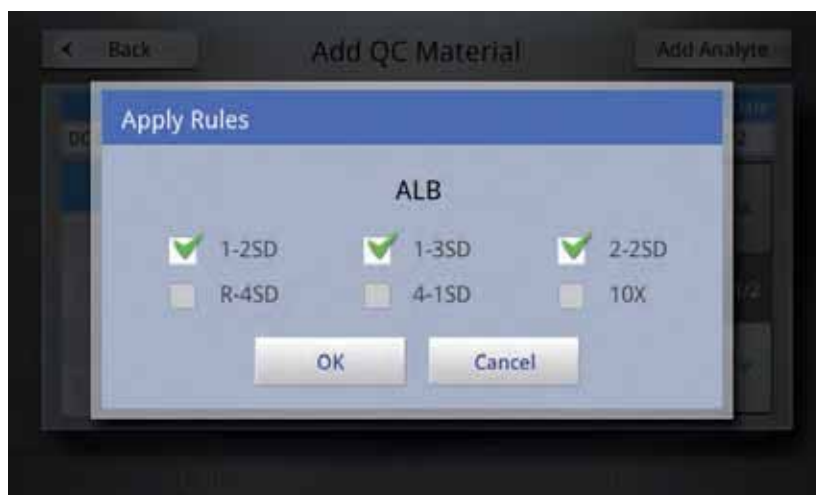
The screenshot shows the 'Add QC Material' screen. At the top, there is a 'Back' button on the left and an 'Add Analyte' button on the right. Below these is a table with columns: Material, Lvl., Lot. No., and Expiration Date. The table contains the following data:

Material	Lvl.	Lot. No.	Expiration Date
DC-01	1	C1235267	11 / 30 / 2012

Below the table is a grid for adding analytes. The grid has columns: Analyte, Target Mean, Target SD, Target Range (Min, Max), Unit, Rules, and a 'Yes' button. The analytes listed are ALB, ALT, AST, and CHOL. The 'Yes' button for the 'Rules' column is highlighted. The 'Unit' column shows units for each analyte: g/dl for ALB, U/L for ALT and AST, and mg/dl for CHOL. The 'Rules' column shows 'Yes' for all analytes. The 'Yes' button for the 'Rules' column is highlighted.

7 Set the rules and press the **OK** button.

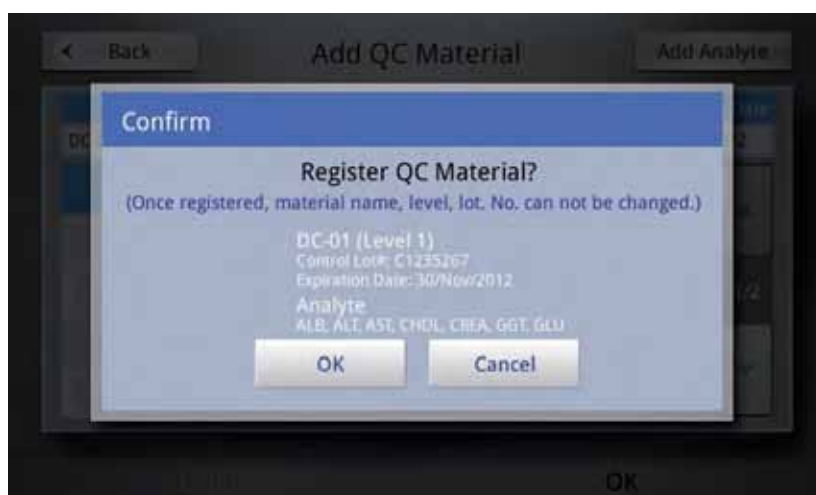
When none of the options have been selected, the minimum and maximum target range can be entered manually.



The quality control policy should comply with the Westgard multi-rule. For more details, refer to Other information in Chapter 8.

8 Press the **OK** button after inputting the values.

Press the **OK** button in the pop-up confirmation window, and QC material registration is completed.

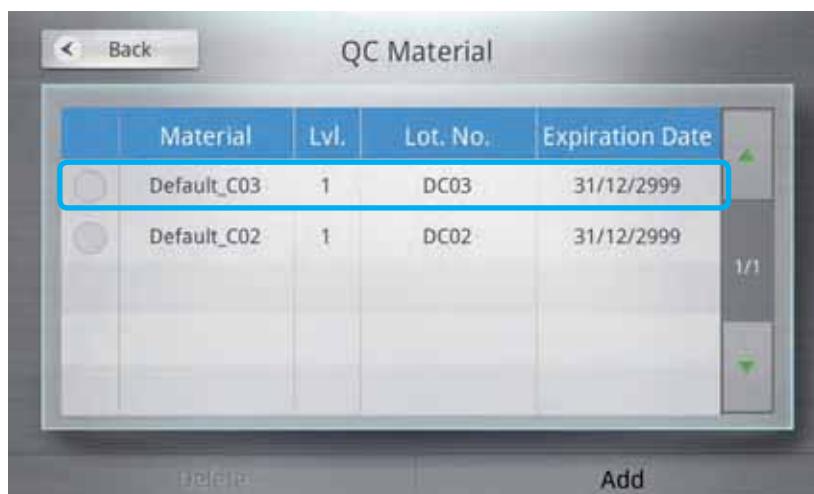


Changing QC material

- 1 Press the **QC Material** button.



- 2 Select the Material to change.



- 3 Change the material information.
The name of the material, level, and Lot. No. cannot be changed.

The screenshot shows the 'Default_C03' screen with the following data:

Material	Lvl.	Lot. No.	Expiration Date
Default_C03	1	DC03	12 / 31 / 2999

	Analyte	Target Mean	Target SD	Target Range		Unit	Rules
				Min	Max		
☐	TP	50.00	1.00			g/dl	Yes
☐	TBIL	50.00	1.00			mg/dl	Yes
☐	GLU	50.00	1.00			mg/dl	Yes
☐	GGT	50.00	1.00			U/L	Yes

Navigation buttons: Back, Add Analyte, OK, and a 'Delete' button (partially visible).

- 4 Make changes and press the OK button.
Press the **OK** button in the pop-up confirmation window to save your QC material changes.

The screenshot shows a 'Confirm' dialog box with the following text:

Confirm

Save QC material information change?

Modified Analyte (Could affect the L-j chart)
GLU, CHOL, AST

Buttons: Yes, No

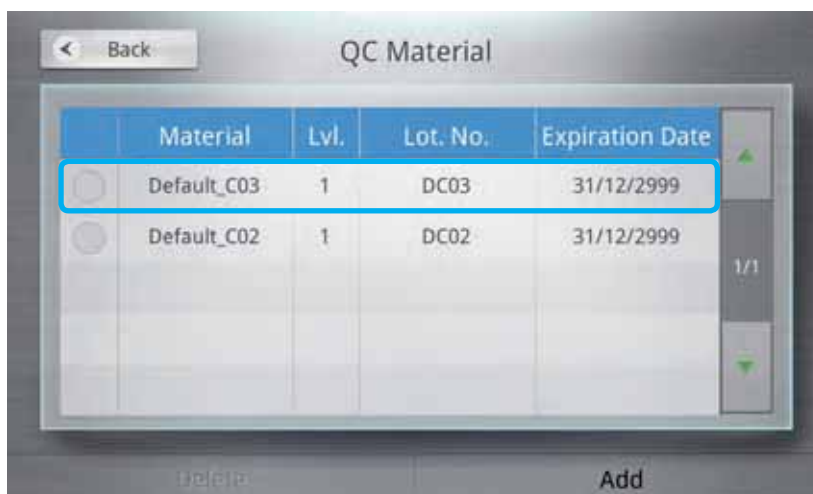
Background screen shows 'Default_C03' and 'Add Analyte' buttons.

Deleting QC material

- 1 Press the **QC Material** button.



- 2 Select a Material to delete.



- 3 Press the **OK** button in the pop-up confirmation window to delete the QC material.



■ Print settings

Set the auto-print function to automatically print results when an analysis completes.

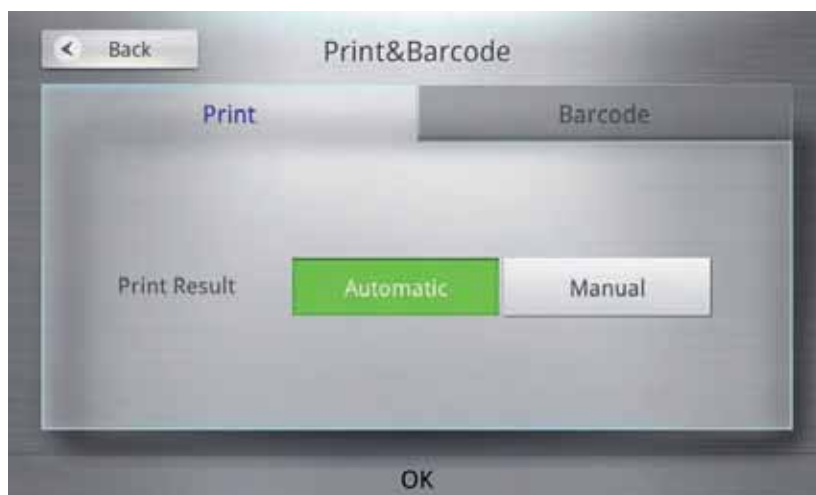
- 1 Press the **Setting** button on the home screen.



- 2 Press the **Peripherals** button.



3 Press **Print** and set the Print Result.



Manual	The results are not printed automatically when the analysis is completed. To print a result, the user must select the Print button manually from the analysis completion screen or the analysis result viewing screen in the order list.
Automatic	Analysis results are printed automatically when the analysis completes and the printer is connected. Results can also be printed manually from the Results screen and the analysis result viewing screen in the order list.

■ Barcode settings

Set the format of input values (Start Point, ID Length) when an ID is entered using a barcode reader.

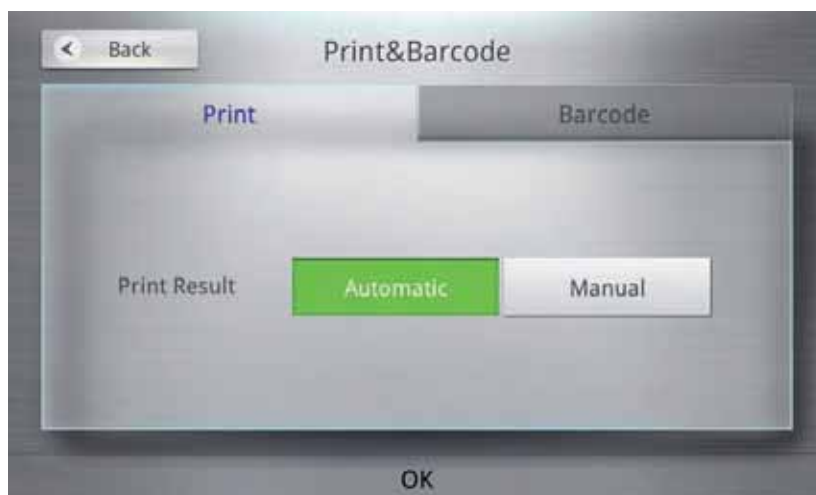
- 1 Press the **Setting** button on the home screen.



- 2 Press the **Peripherals** button.



3 Select the **Barcode** tab.



4 Set the barcode format (Start Point, ID Length).



Start Point	Set a valid start point for analysis ID input by the barcode scanner.
ID Length	Set a valid ID length for analysis ID input by the barcode scanner.

■ Language settings

Select the language to be used by the analyzer.

- 1 Press the **Setting** button on the home screen.



- 2 Select the **Language** button.



- 3 Select a language from English, Spanish, or Korean, and press the OK button. Press the Back button to cancel.



■ Self-test

Tests the hardware status of the analyzer.

- 1 Press the **Setting** button on the home screen.



- 2 Press the **Self-Test** button.



When performing a self-test without a disc, the home position, barcode and RFID are marked as **N/A**.



- Press the **Diagnosis** button. A pop-up window prompts you for a disc to be inserted. Select **Without Disc** if you wish to perform the self-test without a disc.



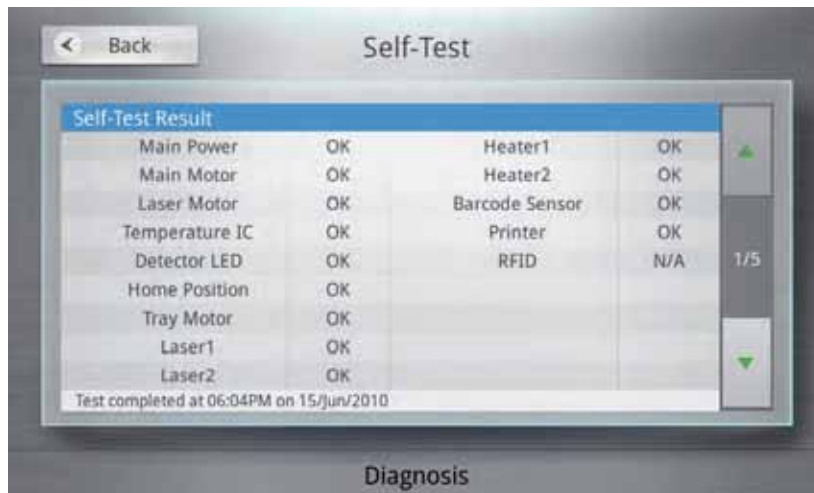
- 4 The Self-test runs.



- 5 A pop-up window prompts you to **Remove the Disc** when the self-test is completed.



- 6 Check the self-test results.
Press the **Back** button to go back to the previous screen.



■ Analyzer settings (Administrator Settings)

Enter the analyzer settings in administrator mode.

- 1 Press the **Setting** button on the home screen.



- 2 Press the **Admin Login** button.



- 3 Enter a **Password** and press the **OK** button.
(The factory default password is "0000")



- 4 The Lock, Network, Time, and System buttons are also displayed among the Settings options.



■ Lock settings

Analyzer functions can be locked and new password can be set.

Setting security levels for each function

- 1 Press the **Setting** button on the home screen.
Lock settings only appear in **Admin Login mode**.



- 2 Press the **Security&Lockout** button.



- 3 Press the **Lock** button for the items you wish to lock with a password. You can view locked items after entering the password.



- 4 Press the **OK** button to save your changes. Press the **Back** button to cancel changes.



Locking quality control

- 1 Press the **Setting** button on the home screen.
Security&Lock out settings only appear in Admin Login mode.



- 2 Press the **Security&Lockout** button.



3 Select the **Lockout** tab.



4 Change the **QC** lock settings.



If the lock feature is activated for QC, you cannot perform additional tests. Perform QC or deactivate the lock to test additional samples.



If the QC lock is engaged for longer than a day without QC being performed, you cannot perform additional tests.

Changing password

- 1 Press the **Setting** button on the home screen.
Password settings only appear in Admin Login mode.



- 2 Press the **Security&Lockout** button.



- 3 To change the password, press the **Change Password** button.



- 4 Enter a password and press the **OK** button.



- 5 Enter a new password in the Password and the Confirm password fields and press the **OK** button.

The screenshot shows the 'Change Password' interface. At the top, there is a 'Back' button on the left and the title 'Change Password' in the center. Below the title, there are two input fields. The first is labeled 'Password' and has a 'Clear' button to its right. The second is labeled 'Confirm Password' and has a 'Clear' button to its right. Below the 'Confirm Password' label, there is a hint text '4-8 digit Require'. To the right of the input fields is a numeric keypad with buttons for digits 1 through 9, 0, and a back arrow. At the bottom center of the screen, there is an 'OK' button.

■ Network settings

Network selection, IP address, subnet mask, gateway, and DNS servers can be set in Network settings. (These settings are used to connect to the LABGEO Data Manager and EMR/LIS.)

Connecting to a network

- 1 Press the **Setting** button on the home screen.
Network settings only appear in Admin Login mode.



- 2 Press the **Network** button.

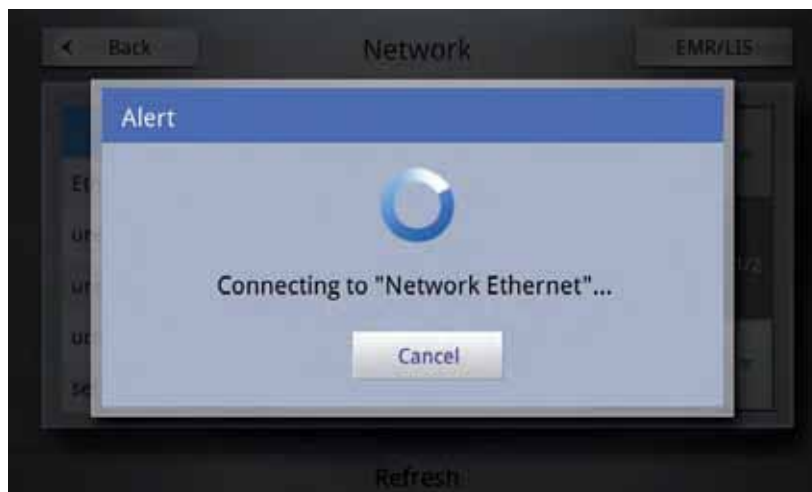


3 Ethernet and wireless access point list is displayed. To connect the network, press  button.

- : The wireless AP needs the password to connect.
- signal (): The signal strength of wireless AP.



4 Attempts to connect to the network. If the connection is successful, the button is changed .



Setting network connections

- 1 Select the network.



- 2 Select **Auto** or **Manual**.



3 Enter IP Address, Subnet Mask, Gateway, and DNS Server information.

IP Address	Choose Auto if the IP address is automatically leased from a DHCP server, and Manual to specify an IP address manually.
Subnet Mask	Subnet mask can only be changed if the IP address is entered manually. The Factory default setting is 255.255.255.0. The subnet mask can be changed according to your network settings. When entering an IP address manually, not entering a correct subnet mask may result in connection failures.
Gateway	Gateway can only be changed if the IP address is entered manually. Enter a gateway according to your network settings. Entering a gateway address is optional.
DNS Server	DNS server can only be changed if the IP address is entered manually. Enter a DNS server address according to your network settings. Entering a DNS server address is optional.

4 Press the OK button to save your network settings, then go back to the previous screen.



If you set the IP address to Automatic, the address may be set incorrectly and may not work with EMR or the LABGEO Data Manager. Set the IP address to Manual to avoid this problem.

Disconnecting to a network

To disconnect the connected network, press  button.



Setting EMR/LIS

- 1 Press the EMR/LIS button.
- 2 Select EMR/LIS protocol.
- 3 Enter the server IP address and port.
- 4 Press the OK button to save connection information and the analyzer can be access to EMR/LIS server program.



■ Lock settings

Select the time and date for the analyzer.

- 1 Press the **Setting** button on the home screen.
Date&Time settings only appear in Admin Login mode.



- 2 Press the **Date&Time** button.



- 3** Enter the date and time, then press the **OK** button. Press the **Back** button to cancel changes.

The year can be chosen between 2000 and 2037.
Enter HH:MM in 12-hour notation.



■ Changing Date&time format

Select the format of the date and time displayed by the analyzer.

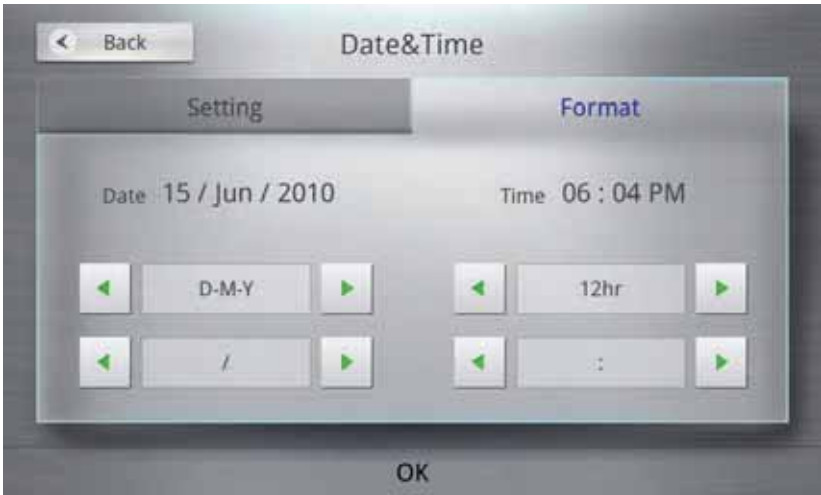
- 1 Press the Setting button on the home screen.
Date&Time settings only appear in Admin Login mode.



- 2 Press the **Date&Time** button.



3 Select the **Format** tab.



4 Select display format by pressing or , then press the OK button. Press the Back button to cancel changes

Display format options are as follows.

Display formatting does not apply when setting the date.

Date		Date Separator	
YYYY-MM-DD	e.g.) 2012/10/31	/	e.g.) 2012/10/31
MM-DD-YYYY	e.g.) 2012/10/31	-	e.g.) 2012-10-31
DD-MM-YYYY	e.g.) 2012/10/31	,	e.g.) 2012, 10, 31

Time	Time Separator
12 hour, 24 hour	: e.g.) 12:30 PM
	. e.g.) 12.30 PM
	, e.g.) 12,30 PM

■ System settings

System information checks, updates, and initialization of the analyzer can be performed.

- 1 Press the **Setting** button on the home screen.
System settings only appear in Admin Login mode.



- 2 Press the **System** button.



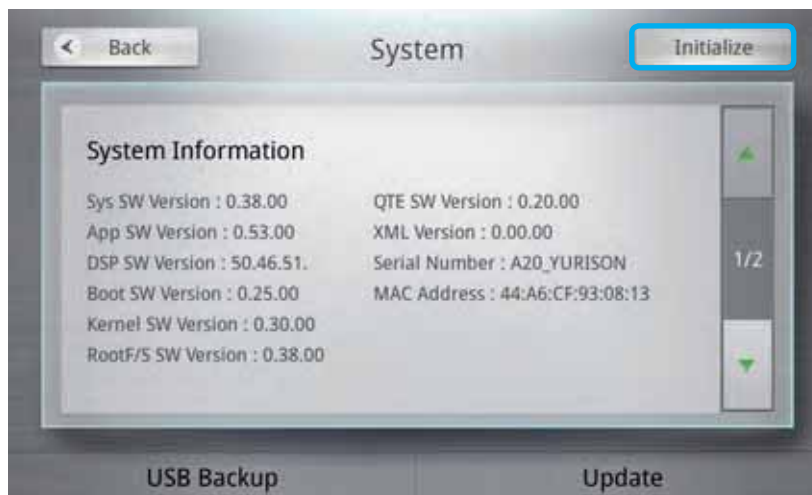
3 Check the current system information.



System Reset

Initializes the analyzer system.

- 1 To initialize the system to its factory defaults, press the **Initialize** button in the upper right corner of the display.



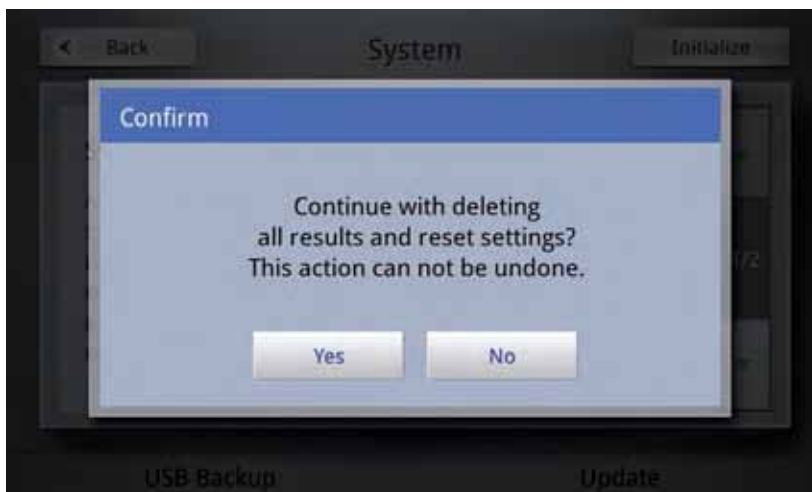
- 2 Enter the password for the analyzer.



- 3** A pop-up window 'Initialize the device now?' prompts you to initialize the system. Select your initialization options and press the **OK** button.
- Delete all results:** Only deletes analysis results.
- Delete all results and settings:** Deletes all saved analysis results and all other settings.



- 4** Press the **Yes** button when a pop-up window prompts you to **Confirm** the initialization. Press the **No** button to cancel the initialization.

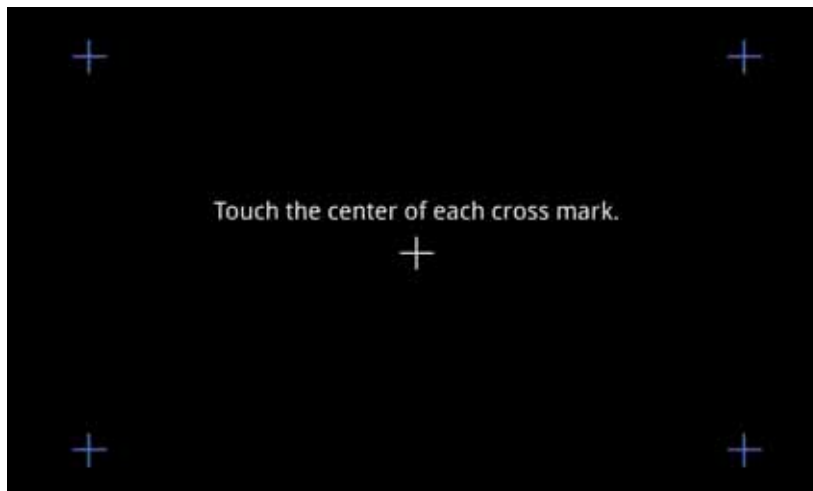


- 5 When selecting **Delete all results**, the home screen is displayed when the initialization completes.

When selecting **Delete all results and settings**, the analyzer reboots when the initialization completes.



In this case, the touch screen must be calibrated and the Time and Date, password must be changed.



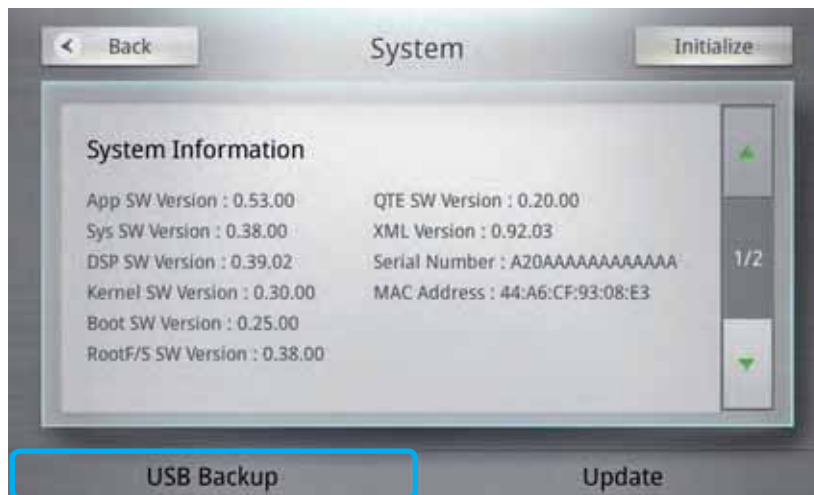


USB Backup

Saves the analysis results saved in the analyzer to a USB memory device.

- QC results cannot be backed up.
- Results backed up to a USB memory device can be transferred to a PC using the import function in the LABGEO Data Manager.

- 1 Press the USB Backup button in the lower-left corner of the system display.



- 2 Press the **Yes** button when a pop-up window prompts you to Confirm backup. You can check the **Delete the internal memory after backup is complete**.



- 3 Press the **Cancel** button to cancel the USB backup.



- 4 When a pop-up window notifies you that the backup has completed, press the **OK** button, then remove the USB memory device.



System updates

Updates the analyzer system.

- 1 Press the **Update** button in the lower-right corner of the system display.



- 2 The system can be updated using a PC, a USB memory device, or online. Select the desired update source.
 - **PC, Internet:** The analyzer must be connected to a LAN or USB cable.
 - **USB memory:** A USB memory device can be used to update the system by copying the update files to the USB memory device and plugging it into the USB port on the rear of the analyzer.

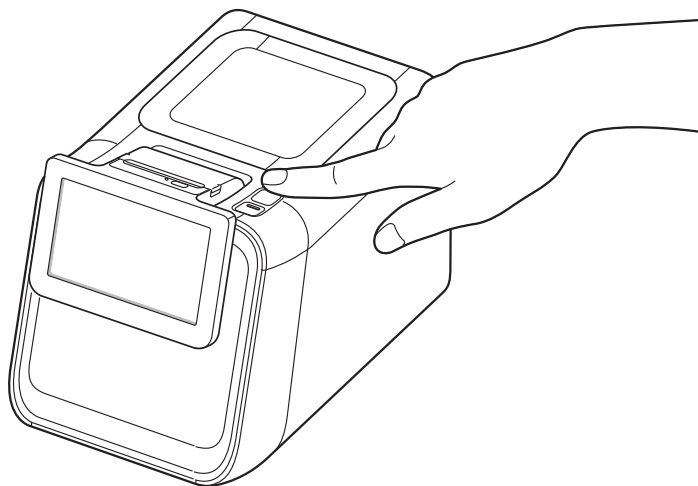


- 3 The analyzer reboots when the update completes.
The system does not reboot when only the disc information(XML) has been updated.



■ Turning off power

- 1 Press the **power** button on the right-hand side of the analyzer.



- 2 Press the **OK** button in the system shutdown confirmation pop-up window.



5

Using the LABGEO Data Manager

Introduction to the LABGEO Data Manager	134
Installation of the LABGEO Data Manager	135
Running the LABGEO Data Manager	139
Home screen.....	140
Registering a blood analyzer device	141
Viewing analysis results	147
Editing analysis results	148
Selecting and editing multiple analysis results.....	150
Printing analysis results	151
Removing the LABGEO Data Manager	153

Using the LABGEO Data Manager

■ Introduction to the LABGEO Data Manager

The LABGEO Data Manager connects to the blood analyzer, update server, and printer to provide an easy way to save the blood analyzer's results, download the latest software updates, and print the analysis results.

The features of the LABGEO Data Manager are as follows.

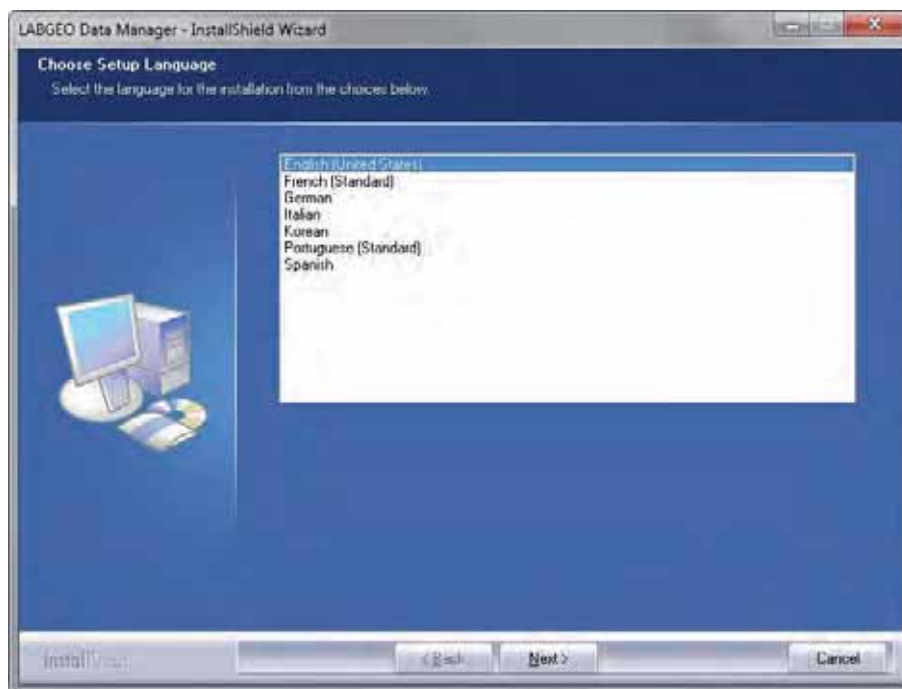
- Analysis results management
 - Transfer analysis results: Receive analysis results transferred from the blood analyzer
 - Display analysis results: Displays analysis results on the PC screen
 - Sort analysis results: Sorts analysis results by analytes chosen by the user
 - Search analysis results: Searches analysis results that meet search criteria
 - Print analysis results: Prints analysis results
 - Decide which analytes from analysis results to print: Allows users to print only selected analytes from analysis results
 - Edit analysis results: Allows users to add and edit patient information to analysis results
 - Import analysis results: Allows users to import and add analysis results from a USB memory device
- Blood analyzer and the LABGEO Data Manager updates
 - Analyzer software update: Downloads the latest software and updates the analyzer software
 - LABGEO Data Manager update: Updates the LABGEO Data Manager
- Other functions
 - Account management: Create and delete accounts, change passwords
 - Language selection: Change the language you use
 - Login/Logout: Login and logout for individual user-controlled access
 - Auto-print: Automatically prints data received from the analyzer depending on user preferences

■ Installation of the LABGEO Data Manager

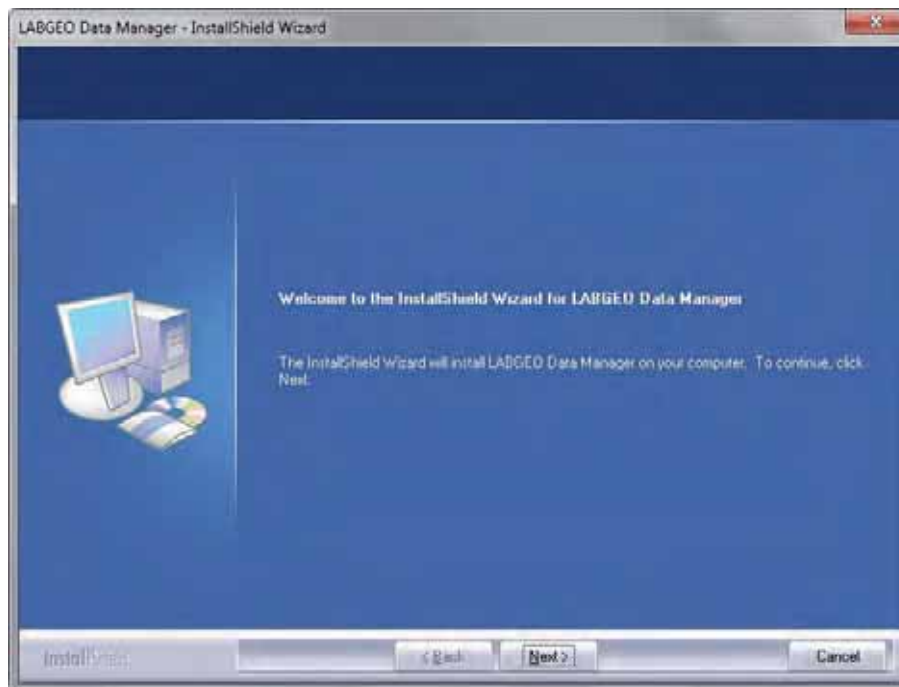
- 1 Insert the installation CD into your computer's CD/DVD drive; the LABGEO Data Manager installer should begin automatically. If the installation does not begin automatically, run LABGEOSetup.exe in the CD as an administrator (for Windows XP, select Open).



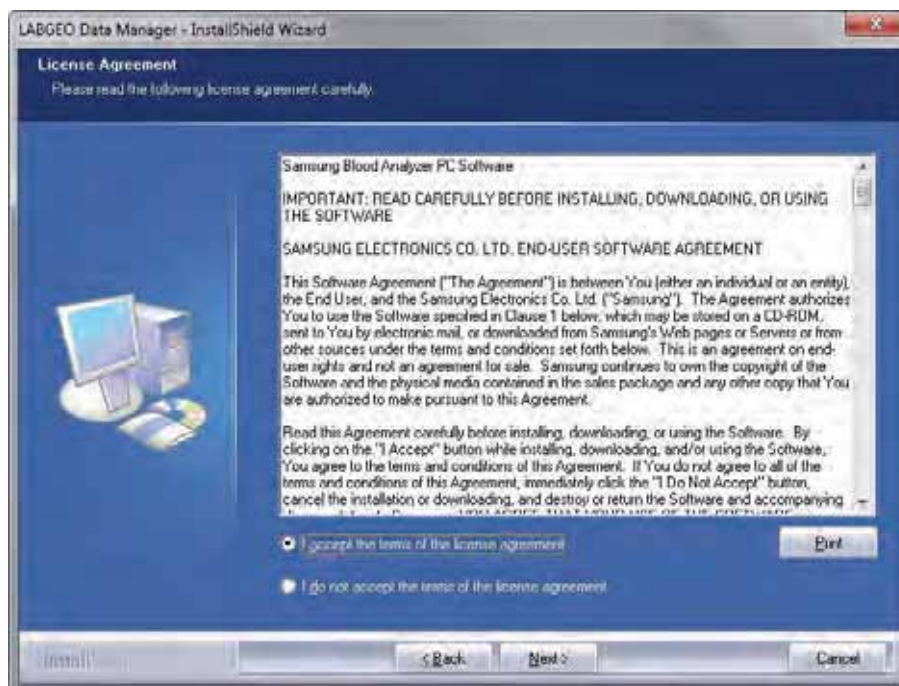
- 2 Select the language to install and click the Next button.



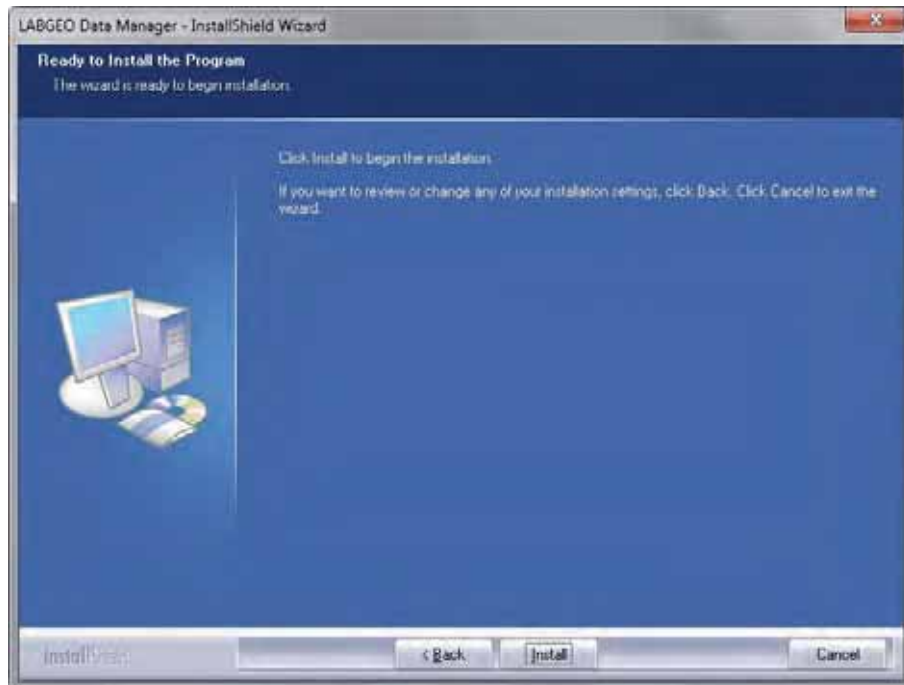
3 Click the Next button.



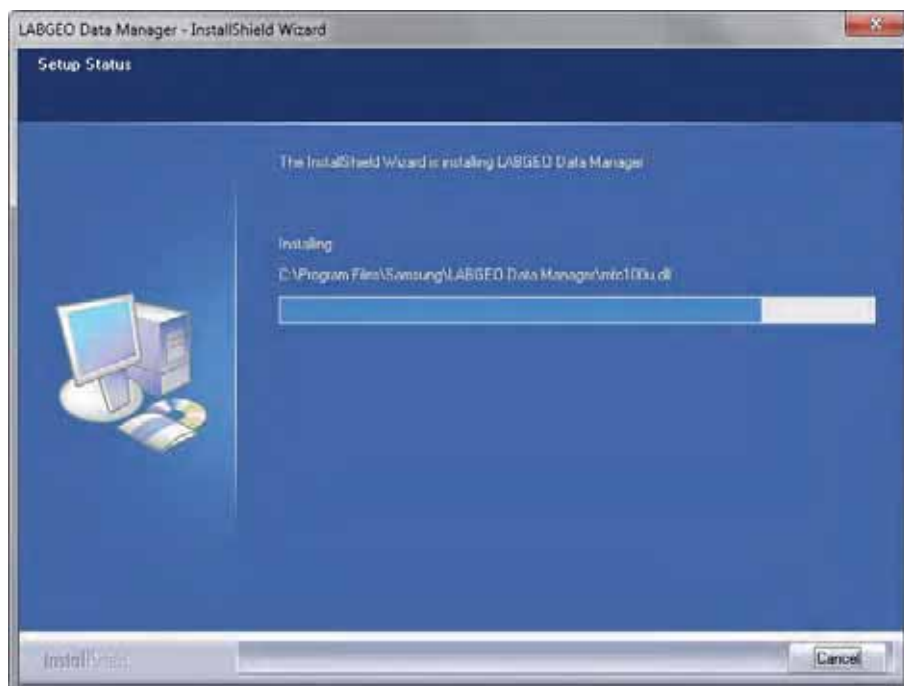
4 Check "I agree to end-user license agreement" and click Next.



- 5 Click Install to start installing the LABGEO Data Manager.



- 6 Installation begins.

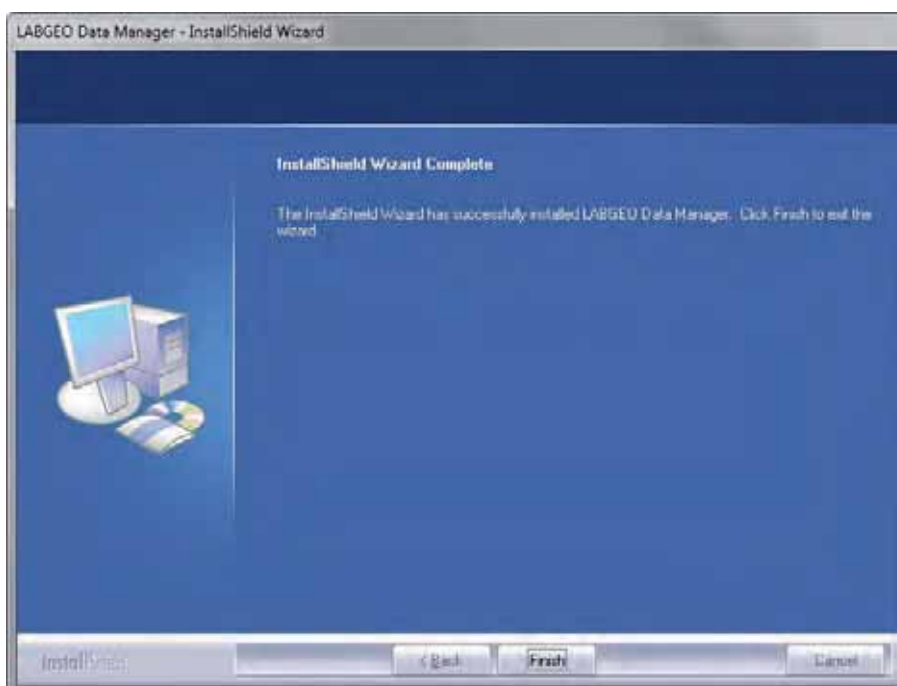




When a pop-up window like the one below appears, select “Install this driver anyway” and proceed (in Windows XP, click Continue).

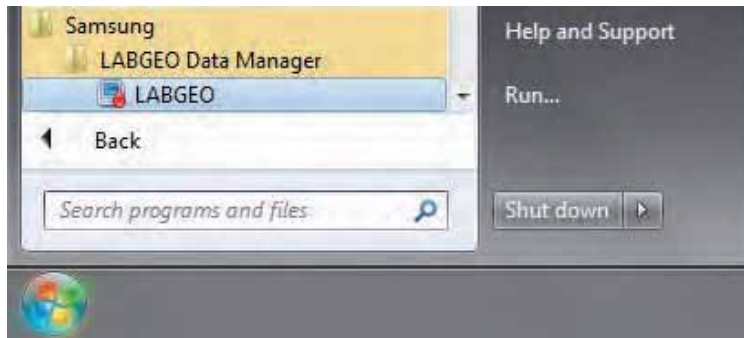


7 Click the Finish button when the installation is finished.



■ Running the LABGEO Data Manager

- 1 Run the LABGEO Data Manager from the shortcut in the desktop or under (All) Programs in the Start Menu.

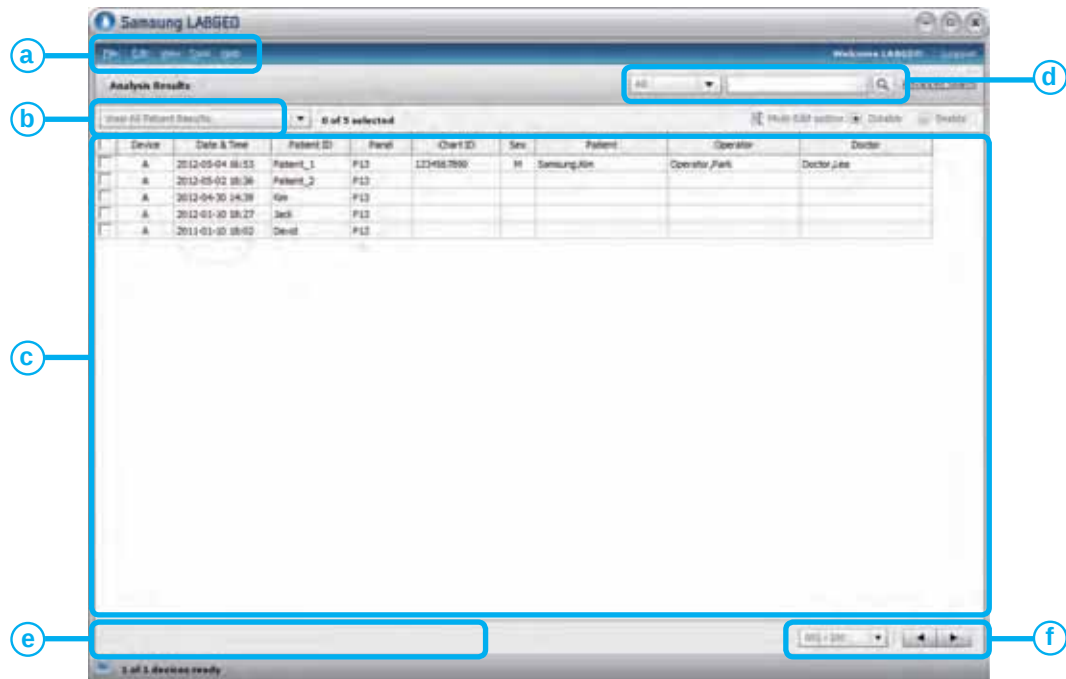


- 2 When the program runs, a window for creating a new account is displayed. Enter your ID and a 6 to 12 character password using a combination of letters and numbers, then click the "Add" button. The message, "New account has been added," is displayed and the program begins.



■ Home screen

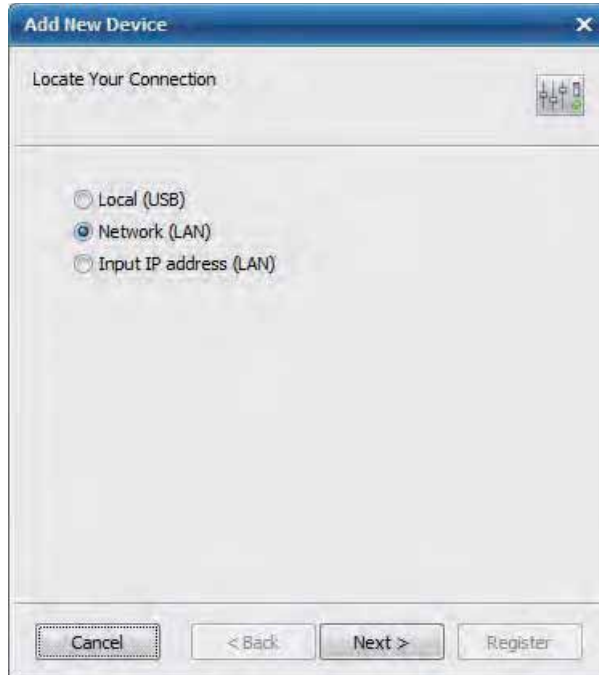
This is the home screen of the LABGEO Data Manager.



- a. Menu bar
- b. Dropdown selector for results viewing categories:
View results for all patients,
Only view results without patient information,
View QC results (Old),
View QC results (New)
- c. Results list
- d. Search results menu
- e. Shortcut buttons
- f. View next result

Registering a blood analyzer device

- 1 Select "Blood Analyzer Administrator" under the Tools menu. Select the connection type and click the Next button.



Local (USB)	Choose when the blood analyzer is connected to the PC by a USB cable.
Network (LAN)	Choose when the analyzer and the PC are connected to the same local area network
Input IP address (LAN)	Choose when connecting to the analyzer by manually entering the IP address.

USB connection settings

- When the analyzer is connected to the PC by a USB cable, the following settings are required.



- a. Select "USB Connection Settings" under the Tools menu.
- b. Select the model number of the connected blood analyzer, select the adapter connected to the analyzer, and click Apply.



If connecting the analyzer via USB does not work, remove the Linux USB Ethernet/RNDIS gadget via the Device Manager (in the Control panel). Then, reboot the PC and try again.

- 2 Click the Next button and a list of available blood analyzers is displayed. Select the blood analyzer to connect with and click Next.



<USB Connection>



<LAN Connection>



If the analyzer does not appear on the list, check the connection between the analyzer and the PC. If the firewall is activated, register LABGEO.exe (as an exception) and try again.

- 3 When entering an IP address, enter the IP address of the analyzer you wish to connect to see a connection screen similar to <Network (LAN)>.



<Enter IP address (LAN)>

- 4 Select the password for the blood analyzer you wish to connect to, designate a letter for identification, and click "Register".



The screenshot shows the 'Add New Device' dialog box with the following fields and options:

- Device Information:**
 - Type : Local(USB)
 - Address :
 - Serial No. : H004M3AC500011R
 - Status : Ready
- Authorize:**
 - Device Password :
 - Device Name : A (dropdown menu)
- Buttons:** Cancel, < Back, Register

<USB Connection>



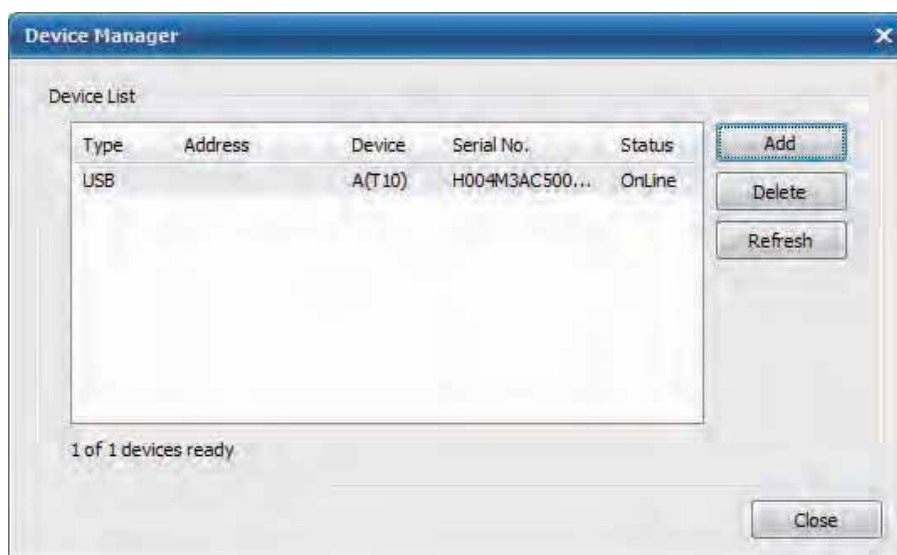
The screenshot shows the 'Add New Device' dialog box with the following fields and options:

- Device Information:**
 - Type : LAN
 - Address : xxx.xxx.xxx.xxx
 - Serial No. : H004M3AC500011R
 - Status : Ready
- Authorize:**
 - Device Password :
 - Device Name : A (dropdown menu)
- Buttons:** Cancel, < Back, Register

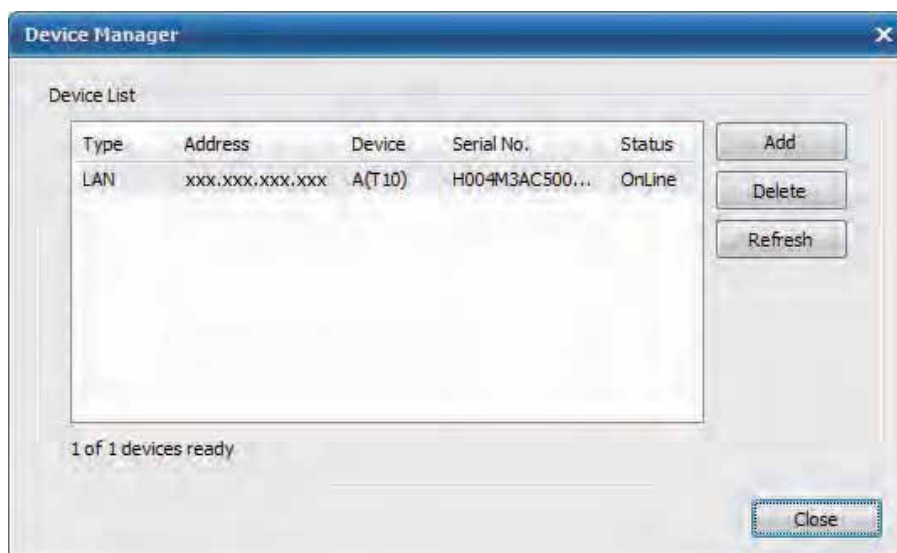
<LAN Connection>

- 5** When registration is completed, a list of registered analyzers is displayed, as shown in the figure below.

You can use the “Add”, “Delete” and “Refresh” buttons to add, delete or update the connection status of blood analyzers.



<USB Connection>



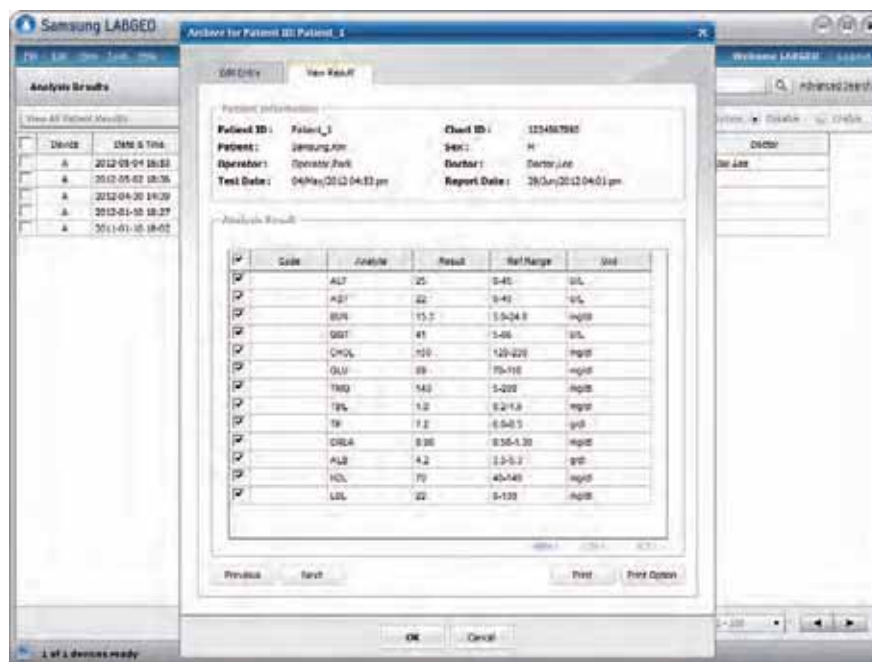
<LAN Connection>

■ Viewing analysis results

You can view the results by double-clicking on the result you wish to view from the analysis results list or select a result and click on the View button.

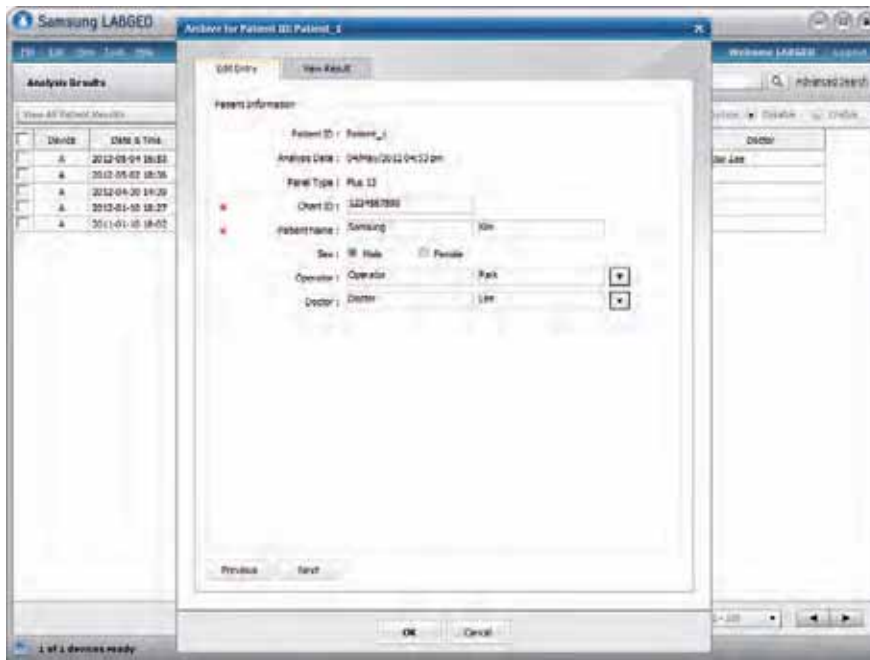
You can sort the analysis results by clicking on the name of each analyte.

An analysis results list shows up to 100 results in a single page.



■ Editing analysis results

- 1 To edit one analysis result, select the result and then click on the Edit button on the bottom or click on the Edit Patient Information Tab in the analysis result view screen.



- 2 To edit multiple analysis results, switch to multiple-edit mode by clicking Edit > Multiple-Edit Mode in the menu or switch the multiple-edit mode on in the upper-right corner of the screen to edit the list like a spreadsheet. When editing patient information, chart number and patient name are required information.



Selecting and editing multiple analysis results

- 1 Hold down Ctrl and click individual analysis results you wish to select. Hold down Shift and click to select a group of analysis results.

☐	Device	Date & Time	Patient ID	Panel	Chart ID	Sex	Pat
☒	A	2012-05-04 16:53	Patient_1	P13	12334567890	M	Samsung, Kim
☐	A	2012-05-02 18:36	Patient_2	P13			
☒	A	2012-04-30 14:39	Kim	P13			
☒	A	2012-01-10 18:27	Jack	P13			
☐	A	2011-01-10 18:02	David	P13			

- 2 You can also select multiple analysis results by clicking one result, and dragging the cursor.

☐	Device	Date & Time	Patient ID	Panel	Chart ID	Sex	Pat
☐	A	2012-05-04 16:53	Patient_1	P13	12334567890	M	Samsung, Kim
☒	A	2012-05-02 18:36	Patient_2	P13			
☒	A	2012-04-30 14:39	Kim	P13			
☒	A	2012-01-10 18:27	Jack	P13			
☒	A	2011-01-10 18:02	David	P13			

■ Printing analysis results

Entering hospital information and insurance codes

- 1 Hospital information and insurance codes can be added and modified under the Tools > Customization menu.



Customize

Hospital Information

Hospital Name :

Address 1 :

Address 2 :

City / State :

Zip Code :

Phone 1 :

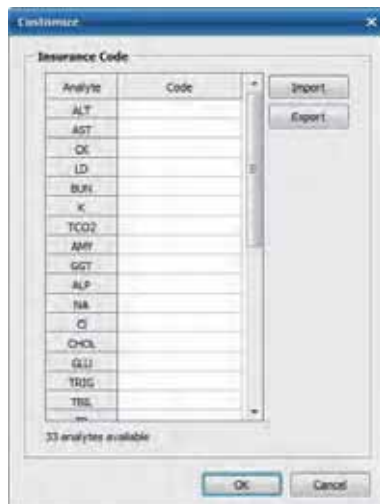
Phone 2 :

Fax :

E-mail :

OK Cancel

<Hospital information editing screen>



Customize

Insurance Code

Analyte	Code
ALT	
AST	
CK	
LD	
BUN	
K	
TCO2	
AMY	
GGT	
ALP	
HA	
CI	
CHOL	
GLU	
TRIG	
TBL	

33 analytes available

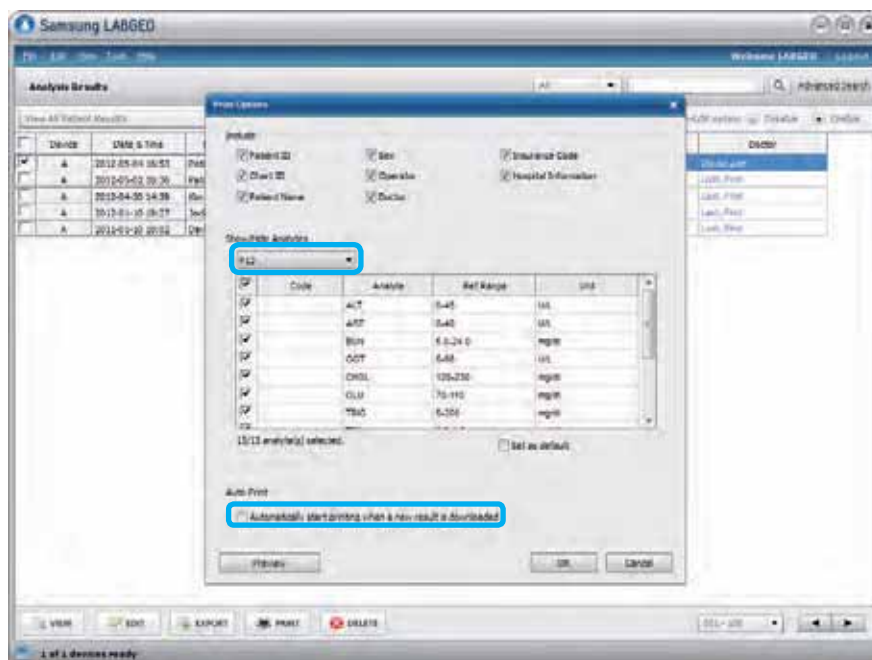
Import Export OK Cancel

<Insurance code editing screen>

- 2 To print the selected results, click the Print button at the bottom or click File > Print in the menu.



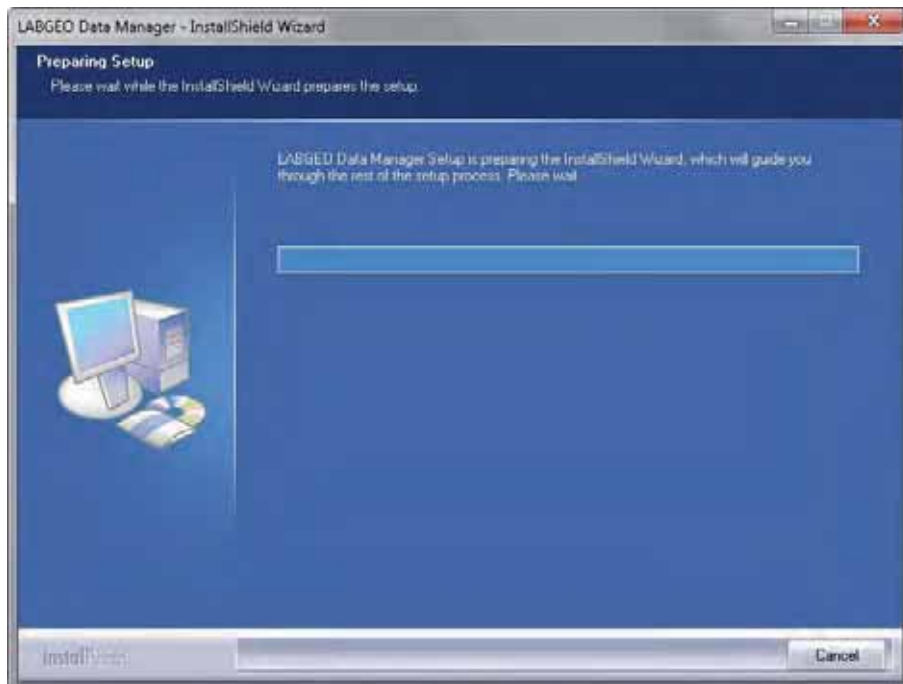
- 3 By clicking File > Print Options in the menu, you can select analytes to include when printing by panel.
 - By checking Auto-print under File > Print Options, the software automatically prints any new analysis result received from the blood analyzer.



■ Removing the LABGEO Data Manager

- 1 **Caution:** You must close the program before uninstalling it. Uninstalling the program also erases all the program's data stored on the PC.
- 2 To uninstall the LABGEO Data Manager, run LABGEOSetup.exe in the installation CD or go to Control Panel > Add/remove Programs, select the LABGEO Data Manager, and click Remove.

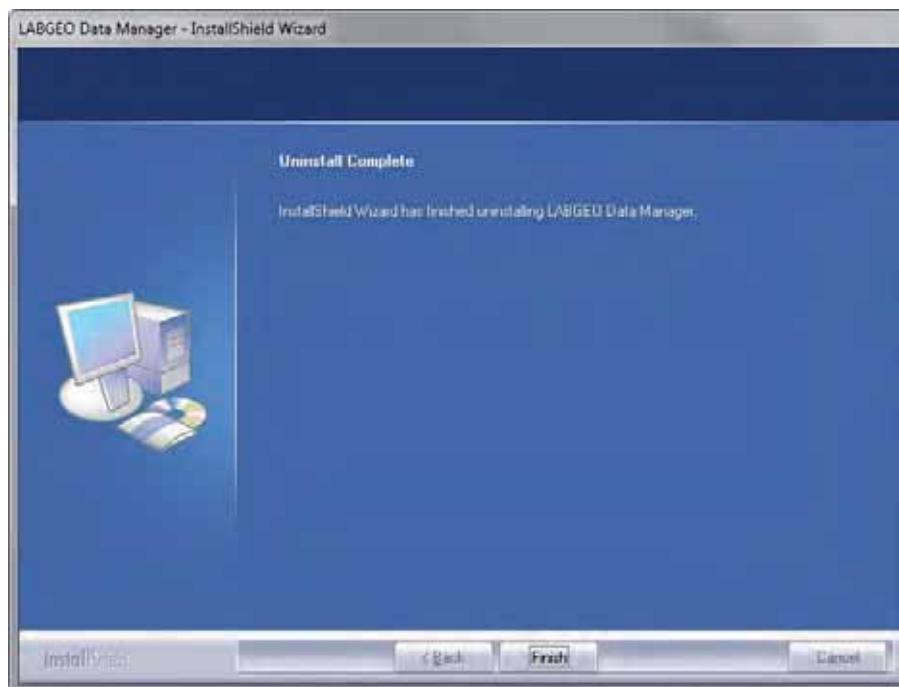
When the software uninstallation begins, the following screen is displayed.



- 3 Click Yes when you see the pop-up as below.



- 4 Click the Complete button when the uninstallation of the LABGEO Data Manager is completed.



6

Maintenance

Maintenance.....	156
Maintenance	156
Cleaning the exterior	156
Cleaning the Disc Tray	157
Transportation and Storage	157

Maintenance

■ Maintenance

No maintenance of the Samsung LABGEO^{PA20} is required other than cleaning the exterior and disc tray.

Maintenance

- Check the analyzer on a regular basis even when it works properly. If you find a problem with the analyzer, stop operating it and contact Samsung Technical Support.
- Clean the analyzer on a regular basis.

Cleaning the exterior

Cleaning the exterior of the Samsung LABGEO^{PA20} should be performed whenever necessary. Most spills and stains can be removed with water or mild detergent.

- Switch the Analyzer off and unplug the power supply when the shutdown procedure is completed.
- Clean the outside of the Analyzer and the touch display with a clean, lint-free and non-abrasive cloth dampened in water or a mild detergent.
 - To disinfect the exterior of the instrument, first remove as much of the spilled material as possible with a cloth dampened in disinfectant (e.g., 30% isopropyl alcohol). The surface of the Analyzer should be exposed to the disinfectant for at least 10 minutes before wiping off with a fresh damp cloth.
- Allow the Analyzer to air dry.
- Plug in the power supply and switch on the Analyzer.



Do not use any cleaning liquid or equipment other than those recommended above. Do not immerse the Analyzer in water or other liquids. The Analyzer must be switched off and unplugged before cleaning.

Cleaning the Disc Tray

- To clean or disinfect the disc tray, tap "Run" on the home screen to open the tray and follow the instructions above.

Transportation and Storage

- Do not move the analyzer while the disc is being analyzed. Please be careful with physical impact or vibration when transportation when moving the analyzer.
- The main body should be cleaned up. Store and keep in a steady place avoiding the moisture, dust, chemicals, flammable gases and direct sunshine when you do not use this device for a long term.

7

Troubleshooting

Troubleshooting	160
Check before requesting repair	160
Restoring factory settings	160
Error List	161

Troubleshooting

■ Troubleshooting

Check before requesting repair

- The power switches of the blood analyzer are located on the front and back of the device.
The front power switch only responds when the rear power switch is turned on. Please make sure that the rear power switch is turned on first.
- If the power still doesn't turn on, contact Samsung Electronics Technical Support.

Restoring factory settings

- The analyzer's factory setting can be restored when it functions abnormally or when settings need to be restored to factory settings.
Please refer to System Reset under Settings. You can delete only the stored data or all data and all settings.



Select Settings > System > Initialization > Delete all results and settings.

■ Error List

Error Code	Message	Problem	Solution
202001B	Setting Error	Unable to save settings after making changes.	Contact Technical Support.
203001C	Lack of Storage Space Error	Insufficient storage space.	Backup analysis results on the device to a USB memory device or a PC, then delete the results from the analyzer.
203002C	System Error	USB memory device is not compatible or shows a file error in the drive.	Try again or use a compatible
204012B	Update Server Connect Error	Connection to update server is unstable.	Contact Technical Support.
205001C	Data Transfer Error	Analyzer's LAN connection is unstable.	Make sure that the LAN cable is plugged in securely. If the problem persists, contact Technical Support.
205003C	Data Transfer Error	Connection between the analyzer and PC is unstable.	Make sure that the LAN cable connection between the analyzer and PC are secure.
205004C	Data Transfer Error	There are no analysis results to transfer to the PC.	Make sure that there are analysis results to backup in the analyzer.
205006C	Data Transfer Error	There is insufficient storage space on the PC to receive analysis results from the analyzer.	Check the available space on the PC (HDD and external storage) and make more space available.
205007C	Printer Connect Error	Connected to the internal printer is unstable.	Contact Technical Support.
205101B	Data Transfer Error	Response from the PC has timed out.	Check your network connections.
205201B	Data Transfer Error	Response from EMR has timed out.	Check your network connections.

Error Code	Message	Problem	Solution
205102B	Data Transfer Error	Connection to the PC has connection errors.	Check your network connections.
205202B	Data Transfer Error	Connection to the EMR has connection errors.	Check your network connections.
206001A	Barcode Read Error	The barcode on the disc is contaminated.	Try again after replacing the contaminated disc with a new one.
206002A	Barcode Error	The disc is not for the blood analyzer.	Replace the disc with a disc for analysis.
206003A	Barcode Error	The disc has expired.	Replace the disc with one with a valid expiration date and run the analysis again.
206004A 206005A	Barcode Error	Analyzer is unusable due to disc barcode error.	Contact Technical Support.
206007A	Barcode Error	Using disc with new analytes requires a software update.	Contact Technical Support.
206008A - 206010A	Barcode Error	Unable to use the device due to disc barcode error.	Contact Technical Support.
206020A	Barcode Error	Unable to use the device due to disc barcode error.	Contact Technical Support.
206100A- 206103A	RFID Error	Unable to use the device due to RFID error.	Contact Technical Support.
207002A	Analysis Info Error	Analyzer requires new analysis information.	Contact Technical Support.
207042C	Used Disc	The disc has been used before.	Try again after replacing the contaminated disc with a new one.
208202B	Insufficient Sample	The amount of the injected blood sample is insufficient.	Make sure that a sufficient amount of blood has been injected.

Error Code	Message	Problem	Solution
209001C	Out of USB storage space	Insufficient space on the external USB memory device connected for backing up data from the analyzer.	Delete the files on the USB memory device or use a new USB memory device.
209002C	USB is Locked	The external USB memory device connected to the analyzer is write-protected.	Make sure that the write-protection on the USB memory device is unlocked.
209003C	Not Connected USB	The connection to the external	Make sure that a sufficient amount of blood has been injected.
305010A	Temperature IC Error	Unable to use the internal temperature IC.	Contact Technical Support.
305011A	Temperature Error	Unable to temperature monitoring when analyzing.	Contact Technical Support.



If the display shows other error code besides listed codes or if you have a question regarding the error codes, contact Samsung Technical Support at XXX-XXX-XXXX.

Other Information

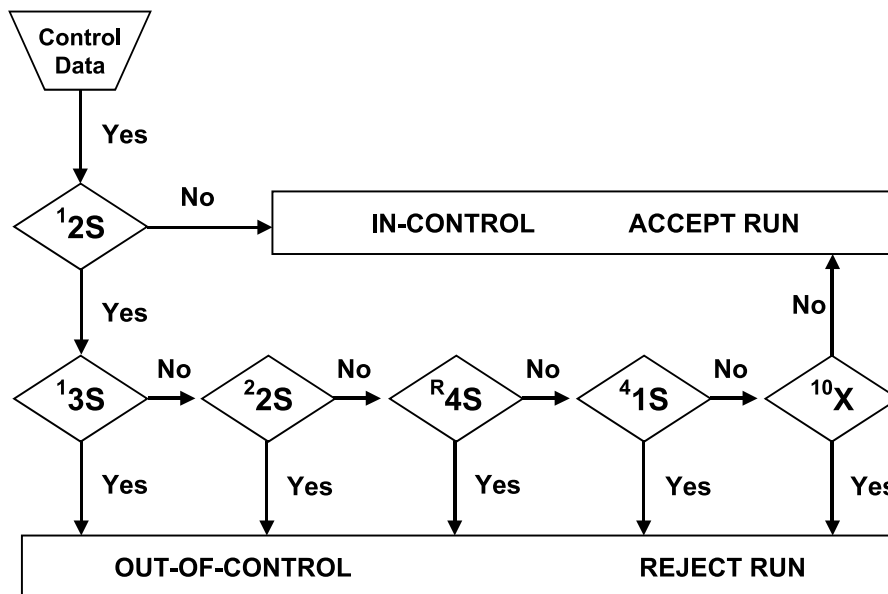
Quality control policy	166
Westgard multi-rule technique.....	166
System information.....	167
Other information	168
Product Service.....	169
Index	170

Other information

Quality control policy

Westgard multi-rule technique

Levey-Jenning Approach



1:2S Warning rule: 1 control outside 2SD and 1 control within 2SD.

1:3S Rejection rule (random error): 1 of the controls is outside 3SD.

2:2S Rejection rule (systematic error): 2 consecutive controls are outside 2SD. The problem should be corrected before running the control again.

R:4S Rejection rule (random error): 1 control is outside 2SD in one direction 1 control is outside 2SD in the other direction (separating them by 4SD).

4:1S Rejection rule (systematic error): 4 consecutive controls exceed the same mean plus or minus 1SD.

10:mean Rejection rule (systematic error): 10 consecutive controls fall on one side of the mean (shift).

■ System information

Category	Item	Specifications	Notes
Processor/OS		ARM Cortex™-A8 1GHz CPU/Embedded Linux	
System Memory	NAND	512MB x 8bit x 1ea (2Gbit)	
	SDRAM	64MB x 16bit x 4ea (2Gbit)	
I/O	Display	7 inch wide, 800 x 480, TFT LCD	
	Touch	7 inch 4-wire panel	
	LED	Power Status	
	Key	Power, Stop	
	Printer	Built-in Thermal Printer (2 inch)	
	Thermal Paper (recommended)	HANSOL PAPER 65GSM Paper width (58mm, 2.36") Paper roll size : max. 40mm (1.57")	
	Barcode	USB Barcode Reader (Option)	
Interface	Ethernet	10/100 Base-T	
	Wireless Lan	802g.11a/b/g/n. Dual band	
	USB Host	USB 2.0 3 port (Front 1ea, Rear 2ea)	
	USB Client	USB 2.0 1 port	
Power	SMPS	Input : 120W, 100-240V~, 50-60Hz Output : DC +24V, +15V, -15V, +5V, +3.3V	
Light Source	LEDs	340nm - 700nm	
Laser	Laser Diode	Class IV, 808 nm, Power < 1.5W, Fiber-Coupled Output (NA=0.22)	
Size		246mm(W) x 375mm(D) x 289mm(H)	
Weight		9.2Kg	
Temperature		Operating : 10 - 32°C Storage & Shipping : -10 - 40 °C	

Category	Item	Specifications	Notes
Type of Installation		For Indoor use only	
Humidity		Operating : 0% to 80% Storage & Shipping : 0% to 80%	
Altitude		Operating : 3,048m Storage & Shipping : 10,668m	

■ Other information

Medical Device Name	Clinical Chemistry and Immunology Analyzer	
Model Name	Samsung LABGEO PA20	
Manufacturer and Address	Samsung Electronics Co., Ltd., 129 Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do	
Operating System	2.6.32.9	
Maximum Analysis Capability	Normal : 5,000	
	Quality Control : 3,000	
PC S/W Operation Environment	OS	Windows XP, Windows 2000, Windows Vista, Windows 7
	H/W	Pentium 4 or higher
		More than 100 MB of available HDD space

■ Product Service

Samsung Electronics Co., Ltd.

129 Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do

Please contact your retailer for service inquiries.

License Notification

The complete text of the license can be seen in the License.pdf file under the PA20 folder in the installation CD.

■ Index

B

- Backup 127
- Beginning analysis 36

C

- Calibration 72
- Canceling analysis 43
- Cautions before analyzing 12
- Cautions during use 13
- Cautions for system installation 14
- Cautions in preparing blood samples 14
- Change language 97
- Changing password 109
- Check before requesting repair 160
- Cleaning 156

D

- Display settings 64

E

- Error List 161
- Executing software 139

I

- ID 55, 56, 95
- Initialization 123
- Installation 25
- Intended use 18
- Introduction of features 23

L

- LABGEO Data Manager 133
- LCD Brightness 73
- LCD Off settings 75

P

- Preheating 36
- Preparing blood for analysis 14
- Printing analysis results 56

Q

- Quality control 84

R

- Registering analyzer 141
- Restoring factory settings 160

S

- Safety Warnings and Caution 8
- Screensaver settings 74
- Searching results 54
- Security 105
- Self-test 99
- Setting auto-mode 114
- Setting date and time 117
- Setting network 112
- Setting viewing method 80
- Setting volume 76
- Storage and maintenance after use 156
- System information 167
- System settings 121

T

- Trouble shooting 159
- Touch calibration 72
- Transferring analysis results 61
- Turning power off 131
- Turning power on 36

U

- Update 129
- User setting screen 103

V

- Viewing results 47

W

- What's in the box 21



Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

