MR-96A

Microplate Reader

Operator's Manual

CE

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WARNING:

It is important for the hospital or organization that employs this equipment to carry out a reasonable service/maintenance plan. Neglect of this may result in machine breakdown or personal injury.

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This equipment must be operated by skilled/trained clinical professionals.

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Preface

Before using the MR-96A, please read this operation manual thoroughly for relevant operation instructions.

Please keep this manual properly for convenient use.

What Can You Find in This Manual

The MR-96A Microplate Reader should be operated and maintained strictly as instructed by this manual. This operation manual covers principles, operations, daily maintenance and troubleshooting of the equipment. Please operate and service the equipment strictly as instructed by this manual.

Conventions

Safety Symbols

Safety symbols alert you to potentially dangerous conditions and information that requires your attention. These safety symbols, together with related text, apply to specific procedures and appear as needed throughout this manual.

| When yo | ou see | Then | | | | |
|---------|-----------|---|--|--|--|--|
| Ŵ | WARNING | Read the statement following the symbol. The statement is alerting you to an operating hazard that can cause personal injury. | | | | |
| Ś | BIOHAZARD | Read the statement following the symbol. The statement is alerting you to a potentially biohazardous condition. | | | | |
| Â | CAUTION | Read the statement following the symbol. The statement is alerting you to a possibility of system damage or unreliable results. | | | | |
| Â | NOTE | Read the statement following the symbol. The statement is alerting you to information that requires your attention. | | | | |

Labels

The labels attached to the surface of the instrument use symbols to clarify the meaning of the text. If any of the labels peels off, contact Mindray customer service department or your local distributor for replacement. The chart below explains the symbols on the labels.



Graphics

All graphics, including screens, are for illustration purpose only and must not be used for any other purposes.

Safety Precautions

Observe theses safety precautions when using the MR-96A Microplate Reader. Ignoring any of the precautions may lead to personal injury or equipment damage.

WARNING

If the instrument is used in a manner not specified by Mindray, the protection provided by the system may be impaired.

Preventing Electric Shock

Please observe the following instructions to prevent electric shock.



WARNING

When the instrument is turned on, users must not open the cover.

Spillage of reagent or sample on the analyzer may cause equipment failure and even electric shock. Do not place sample and reagent on the analyzer. In case of spillage, switch off the power immediately, remove the spillage and contact Mindray customer service department or your local distributor.

This instrument is supplied with a slow-blow fuse (250V, 3.15A), which must not be replaced by the user.

Power supply: AC100-240V~, 50/60Hz.

The instrument is supplied with a three-wire power cord and should be properly grounded during application.

Preventing Personal Injury Caused by Moving Parts

Please observe the following instructions to prevent personal injury caused by moving parts.



WARNING

Do not touch such moving parts as plate carrier, etc. when the system is in operation.

Do not put your finger or hand into any open part when the system is in operation.

Preventing Infection

Please observe the following instructions to protect against the biohazardous infection.



BIOHAZARD

Inappropriately handling samples may lead to biohazardous infection. Do not touch the sample, mixture or waste with your hands. Wear gloves and lab coat and, if necessary, goggles.

In case your skin contacts the sample, follow standard laboratory safety procedures and consult a doctor.

Treating Waste Microplates

Please observe the following instructions to dispose of the waste microplates to prevent from environmental pollution or harm to human body.



BIOHAZARD

Substances in reagent and microplates are subject to contamination regulations. Dispose of the reagent and microplate in accordance with your local or national guidelines for waste disposal and contact the reagent manufacturer or distributor for details.

Treating Waste

Please observe the following instructions to prevent environmental pollution and personal injury caused by waste.



BIOHAZARD

Materials of the waste components and microplate reader are subject to contamination regulations. Dispose of them in accordance with your local or national guidelines for waste disposal. Wear gloves and lab coat and, if necessary, goggles.

Preventing Fire or Explosion

Please observe the following instructions to prevent fire and explosion.

WARNING

Do not use flammable substance around this instrument. Ethanol is flammable substance. Please exercise caution while cleaning the instrument with ethanol.

Precautions on Use

To use the MR-96A Microplate Reader safely and efficiently, please pay much attention to the following operation notes.

Intended Use



WARNING

The MR-96A Microplate Reader is a chemical instrument that is designed for photometric measurements in ELISA or other experiments and to perform qualitative or quantitative determination of blood, etc. Please consult Mindray first if you want to use the instrument for other purposes.

Operator



WARNING

The MR-96A Microplate Reader is to be operated only by clinical professionals, doctors or laboratory experimenters trained by Mindray or Mindray-authorized distributors.

Environment

CAUTION

Please install the instrument in an environment specified by this manual. Installation in other environment may lead to unreliable results and even equipment damage.

To relocate the system, please contact Mindray customer service department or your local distributor.

Preventing Interference by Electromagnetic Noise



CAUTION

Electromagnetic noise may interfere with operations of the system. Do not install devices generating excessive electromagnetic noise around the system.

Do not use this device in close proximity to sources of strong electromagnetic radiation (e.g. mobile phones or radio transmitters), as these may interfere with the proper operation.

The electromagnetic environment should be evaluated prior to operation of the device.

This device has been designed and tested to CISPR 11 Class A, and in a domestic environment may cause radio interference, in which case, you may need to take measures to mitigate the interference.



It is the manufacturer's responsibility to provide equipment electromagnetic compatibility information to the customer or user.

It is the user's responsibility to ensure that a compatible electromagnetic environment for the equipment can be maintained in order that the device will perform as intended.

Communication interface



CAUTION

The MR-96A is provided with a USB port and a serial port, which are respectively used to connect an external printer or a U disk for upgrading the system, and to connect a PC to transfer data.

User must not perform other operations via these two interfaces. Otherwise the system may be damaged.

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1 The Basics

1.1 System Description

The MR-96A Microplate Reader consists of the hardware, built-in operating software and recorder.

1.1.1 Principles

The MR-96A Microplate Reader is used to perform qualitative or quantitative determination of samples in accordance with the Lamber-Beer Law. In photometric measurement, the enzyme reacts with the substrate and different substances have distinct absorption spectrum. The following figure shows the measurement principles of the microplate reader.

Figure 1-1 Measurement Principles of Microplate Reader



As shown in Figure 1-1, the light beam from the lamp passes through the filter and forms a monochromatic light bundle, which then goes through the sample in the well and reaches the photo detector with partial light absorbed by the sample. The photo detector converts the received light signals into electric signals, which are then

converted by the A/D converter and sent to the microprocessor for processing and calculation. Finally the output unit outputs the measurement results.

1.1.2 Appearance

Figure 1-2 shows the front view of the MR-96A. The printing device is optional.

Figure 1-2 Front View



Figure 1-3 shows the rear view of the MR-96A.

Figure 1-3 Rear View



The USB port is used to connect a USB mouse and the serial port to connect the PC for data transferring. The air vent is for ventilation of the instrument.

1.2 Operating Conditions and System Features

1.2.1 Operating Conditions

- Ambient temperature: 5°C-35°C
- Relative humidity: 15%-85%, without condensation
- Power supply: AC 100-240V~±10%, 50/60Hz
- Power consumption: 120VA
- Atmospheric pressure: 70 kPa-106kPa
- The installation site should be far from strong electromagnetic fields
- The instrument should be shielded from direct sunlight
- The instrument should be installed on a stable platform free of vibration.
- The instrument should be connected to a properly grounded power socket.

1.2.2 Dimensions and Weight

- Dimensions: 437mm×332mm×174mm (L×W×H)
- Weight: 8.5kg

1.2.3 Technical Specifications

| Light source | Tungsten-halogen lamp. Automated control |
|----------------------|--|
| | |
| Optical system | 8-channel fiber measurement system |
| Filter | Interference filters of 405nm, 450nm, 492nm and |
| | 630nm. User can also configure another four if needed. |
| Photosensor | Silicon photocell |
| Plate type | 96-/48-well plates |
| Spectral range | 400-700nm |
| Measurement range | 0-2.5A |
| Readout range | 0-3.5A |
| Precision | 0.001A |
| Operation speed | Step mode: 12s/plate for single wave and 26s/plate for dual wave; |
| | Continuous mode: 5s/plate for single wave and 12s/plate for dual wave; |
| Shaking mode | Adjustable among High, Medium and Low |
| Shaking time | Adjustable from 0-60 sec |
| Sample combination | Single-/dual- sample |
| Calibration method | One-point, Point to Point, Multi-point%ABS, Linear, Exponential, Logarithm, Power and Factor |
| Result storage | Up to 20,000 results can be stored on the instrument. |
| Number of tests that | Up to 100 tests |
| can be stored | |
| | |

1.3 Control Mode

The MR-96A is supplied with a touchpen, which is used to operate on the touchscreen.



CAUTION

Be sure to use the supplied pen to operate the touchscreen of MR-96A. Do not touch the screen with sharp-edged tools. Otherwise the screen may be damaged.

1.4 General Operating Procedure

The power indicator is located on the lower-right corner of the touchscreen and indicates different status when on or off:

- On The instrument is powered on.
- Off The instrument cannot work normally.

When powered on, the instrument starts the initialization process, which includes:

- Loading operating system;
- Loading application;
- System initialization;
- Self-check.

After self-check, the main screen is displayed.



NOTE

The initialization process takes about 1.5 minutes.

You should not start measurement until 5 minutes after the system is started up and gets steady.

Follow this procedure to operate the MR-96A (See detailed instructions in chapter 4):

- 1 Switch on the power supply and set up hospital information, system date and time, etc on the System Setup screen.
- 2 Add a new test on the Test Setup screen and configure the parameters.
- 3 Set up plate placement mode on the Run screen.
- 4 Place the microplate on the plate carrier and then start the analysis.
- 5 Review the test data and store it if needed.
- 6 Edit patient information on the Reports screen and print out the patient reports.
- 7 Select Shutdown to exit the operating software with test information saved.
- 8 Switch off the power supply.



CAUTION

Ingression of dust or foreign matters may influence the instrument performance. Be sure to lay down the cover when the instrument is not in use.

1.5 Storage Requirements

The instrument and its packaging materials should be stored in the following environment:

- Temperature: 0°C-40°C;
- Relative humidity: 15%-85%, without condensation;
- Free of corrosive gas;
- Well ventilated.

1.6 Printing Device

1.6.1 Internal Thermal Recorder

The internal thermal recorder is optional. If you want to purchase a recorder, please contact Mindray customer service department or your local distributor.

While feeding printing paper, please pay much attention to the following notes.

- Before feeding printing paper, please ensure the instrument has been powered off.
- After feeding printing paper, be sure to cover the record.



CAUTION

Do not use any tools like sandpaper that may damage the thermal components. Do not squeeze the thermal print head.



NOTE

The paper used for the thermal recorder should be $50 \text{mm} \times 20 \text{m}$.

1.6.2 External Printer

The external printer is optional. If you want to purchase a printer, please contact Mindray customer service department or your local distributor.

The printer is shown in the figure below, connecting to the power supply and USB port.



WARNING

The printer must be connected to properly-grounded power socket.



NOTE

You are recommended to use printers that are compatible with the MR-96A and listed in (not limited to) Appendix C. If you have any questions about the printers, please contact Mindray customer service department or your local distributor.

The printers connected to the MR-96A must comply with the requirements of IEC 60950 or EN 60950.

For the detailed instructions about the printer, please refer to its operation manual.

Figure 1-4 Connection of External Printer



Perform the following steps to install the printer:

- 1 Plug the data cable to the USB port on the back of the instrument.
- 2 Plug the power cord to a properly-grounded power socket.
- 3 Turn on the MR-96A and the printer.

2 Installation

2.1 Unpacking

When you receive the instrument, carefully inspect the package. If you see any signs of mishandling or damage, file a claim immediately with Mindray Customer Service Department or your local distributor.

After opening the package, check the delivered goods against the packing list as well as the appearance of the instrument. If you find anything missing or damaged, alert Mindray customer service department or your local distributor immediately.

2.2 Installation Requirements



CAUTION

Make sure the instrument is installed in a place meeting the requirements. Otherwise, it will not perform as promised.

2.2.1 Environmental Requirements

- Atmospheric pressure: 70 kPa-106kPa
- Ambient temperature: 5°C-35°C
- Relative humidity: 15%-85%, without condensation
- The instrument should be installed in a place that is far from electromagnetic fields and interference voltage and free of direct sunlight.

Installation

2.2.2 Power Requirements

- Power supply: AC 100V-240V~, 50/60Hz, three-wire power cord
- The instrument should be properly grounded.

2.2.3 Space and Accessibility Requirements

Figure 2-1 Space and Accessibility Requirements



- The installation space must be larger than the dimensions (437mm × 332mm × 174mm, L×W×H) of the instrument.
- The installation platform should be level with gradient less than 1:200.
- The bearing platform should be able to bear $5.9 \times 10^{-5} \text{kg/mm}^2$ weight.
- The installation site should be well ventilated.

2.3 Installing the MR-96A

- Connect one end of the supplied power cord to the power jack of the MR-96A and the other end to the power supply.
- Place the power switch to On. The instrument starts initialization which takes about 1.5 minutes. After initialization, the main screen is displayed.



WARNING

Make sure the power socket is grounded correctly. Improper grounding may lead electric shock and/or equipment damage.

Be sure to connect the system to a power socket that meets the above-mentioned requirements and has a proper fuse installed.



3.1 Input Tools and Operation

3.1.1 Touchscreen and Touchpen

The MR-96A Microplate Reader is provided with a touchscreen and pen, which are used as input tools and can be operated as follows:

Click

'Click' means the act of moving the pen to the desired item and then touching the screen gently.

The 'click' operation is used to operate all buttons, options, edit boxes and popup keypad.

Drag

'Drag' means the act of keeping touching the screen with pen and moving to desired place.

The 'drag' operation is used to move the scroll bars.



WARNING

Be sure to use the supplied pen to operate the touchscreen of MR-96A. Do not touch the screen with sharp-edged tools. Otherwise the screen may be damaged.

3.1.2 Popup Keypad

The popup keypad is used to input numbers, letters and characters.

- To view more words on other pages, select □ and □ to page up and down.
- Select Shift and CapsLock to switch between upper case and lower case. See Figure 3-1, Figure 3-2 and Figure 3-3.
- Select Shift and click a letter. The letter is input in upper case, but the following letters will be input in lower case.
- Select CapsLock . All letters you then enter are input in upper case. Select CapsLock again to switch to the lower case mode.
- To exit the popup keypad, select

| | 1 | | 2 | ; | 3 | 4 | 5 | 6 | | 7 | 8 | 2 | 9 | 0 | - | | = | • | _ |
|------|-------|---|----|---|---|----|---|---|---|-----|----|---|---|---|---|---|----|----|----------|
| Tab | | Q | | W | E | F | 3 | Т | Y | ι | J | Ι | 0 | | Ρ | [| |] | N |
| Caps | Lock | | А | | 6 | D | F | G | | Н | J | | к | L | ; | ; | i. | Er | nter |
| | Shift | | | Z | × | (| | V | В | ľ | 1 | м | , | | | 1 | | t | |
| Cti | rl | | 47 | | ¢ | lt | | | | Spa | се | | | | ø | | + | ÷ | → |

Figure 3-1 Popup Keypad – Upper case (with Caps Lock)

Figure 3-2 Popup Keypad – Lower case

| × 1 | 2 | 3 4 | 5 1 | 6 7 | 8 | 9 | 0 | - | = | + | - |
|----------|-----|-----|-----|-----|-----|-----|---|-----|---|----|------|
| Tab | q w | e r | t | у | u | i o | р | | ſ |] | X. |
| CapsLock | а | s d | f | g h | i | k | I | | | Er | nter |
| Shift | z | хс | v | ь | n r | n, | | | / | 1 | |
| Ctrl | ÷ | Alt | | Sp | ace | | (| LK. | + | ÷ | + |

| ~ | @ | # \$ | % ^ | & | × (|) _ | + | + | - |
|----------|-----|------|-----|-------|-----|-----|---|----|------|
| Tab | Q W | E R | т | Y U | 1 0 | Р | { | } | I |
| CapsLock | A | s d | FG | Н | JK | L : | | Er | nter |
| Shift | z | x c | v | B N | М < | > | ? | t | |
| Ctrl | ÷ | Alt | | Space | | Ľ | + | ÷ | + |

Figure 3-3 Popup Keypad – Upper Case(with Shift)

3.2 Shutdown

During the shutdown process, all data, including test information, system settings, patient information, test results, etc, are stored in the instrument memory. The whole process lasts for about 15 seconds.



When the startup initialization is finished, the main screen is displayed.



Figure 4-1 Main Screen

4.1 Test Setup

Click the *Test Setup* button. The Test Setup screen is displayed. You can set up the test information, such as test name, full name, calculation mode, primary wavelength and secondary wavelength. The test No. is produced automatically by the instrument.

| No. | Test | Full Name | Calc Mode | Pri Wave | Sec Wave |
|-----|-------|-----------|-------------|----------|----------|
| 1 | HBsAg | | Qualitative | 450 | 630 |
| 2 | HBsAb | | Qualitative | 450 | 630 |
| 3 | HBeAg | | Qualitative | 450 | 630 |
| 4 | HBeAb | | Qualitative | 450 | 630 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| • | | | | | |
| | | | | | |
| Add | Modif | fy Delete | Cal Curve | Order | Return |
| | | | | | |

Figure 4-2 Test Setup Screen

The following table introduces the buttons on the screen.

| Button | Function |
|--------------|---|
| Add | Click this button to add a new test, which must not have the same name as existing test. |
| Modify | Click this button to change the test information, such as full name, wavelength, etc. |
| Delete | Click this button to delete the selected test. |
| Cal Curve | Click this button to view the test result and curve of a standard(s) for quantitative test. |
| Order | Click this button the rearrange the tests for printout. |
| Return | Click this button to return to the main screen. |

4.1.1 Adding a Test

Select *Add* from the Test Setup screen. The parameter setup screen is displayed, including three parts: *Basic Parameters*, *Qualitative Parameters* and *Quantitative Parameters*.

| Figure 4-3 Faranneler Selup Screer | Figure 4-3 | Parameter | Setup | screer |
|------------------------------------|------------|-----------|-------|--------|
|------------------------------------|------------|-----------|-------|--------|

| Basic Parame | eters | | | | |
|----------------|-------------------------|----------|--------------|---------------|----------------|
| Test | HBsAg | Reagent | 20080601 | Blank <= | 0.050 |
| Full Name | Hepatitis B surface. | Pri Wave | 450 💌 | 💌 Dual Sample | es |
| Calc Mode | Qualitative 💌 | Sec Wave | None | | |
| Qualitative Pa | arameters | | | | |
| CutOff = 2.1 | 00 * NC + | 2.000 | * PC + 3.000 | * CoCtrl + | 0.000 |
| NC Range | 0.050 | 3.500 | PC Range | 0.000 | - 3.500 |
| Qual Mode | Obverse 💌 | Neg < | ▼ 0.900 s/co | Pos | > 🔽 1.100 s/co |
| Quantitative F | Parameters | | | | |
| Nr of Stds | ▼ S [*] | 1 | S2 | S3 | S4 |
| Unit | ▼ S! | 5 | S6 | S7 | S8 |
| Dual Stds | k 📃 | ь | Referer | nce 0 | - 1 |
| | | | OK | | Cancel |

4.1.1.1 Basic Parameters

Figure 4-4 Basic Parameters area

| Basic Param | eters | | | | |
|-------------|-------------|----------|-------|----------|-------|
| Test | | Reagent | | Blank <= | 0.005 |
| Full Name | | Pri Wave | 405 💌 | Dual Sam | ples |
| Calc Mode | Qualitative | Sec Wave | • | | |

The following table explains the fields in the area.

| Field | Description | | | | | |
|-------|---|--|--|--|--|--|
| Test | Enter name of the test. If an existing name is entered, the followi dialog box pops up. | | | | | |
| | 😍 Error | | | | | |
| | A test with the same name already exists. Please change | | | | | |
| | ОК | | | | | |
| | The test name has maximum of 20 characters. Otherwise the system prompts as follows. | | | | | |

| Field | Description |
|-------|--------------------|
| | Serror |
| | Test name too long |
| | ОК |

Click the edit box next to Test. The keypad pops up.

| Basic Parame | ters | Rea | gent | | | Blank < | = 0.00 | 5 | _ | |
|----------------|-----------|-----|------|------|--------|---------|--------|-----|------|------|
| · 1 | 2 3 | 4 | 5 | 6 7 | 8 | 9 | 0 . | = | + | - |
| Tab | q w | e r | t | у | u | i o | P | [|] | X. |
| CapsLock | a s | d | f | g h | i | k | I g | 1 | Er | iter |
| Shift | z | хс | v | ь | n r | n , | | / | t | |
| Ctrl | 4 | Alt | | S | pace | | Ľ | + | ÷ | + |
| Qual Mode | Obverse | • | Neg< | 1 | s/co | Pos | >= 1 | | s/co | |
| Quantitative F | arameters | | | | | | | | | |
| Nr of Stds | • | S1 | | S2 | | S3 🗌 | S | 4 | | |
| Unit | • | S5 | | S6 🗌 | | S7 | St | 3 | | |
| 🗖 Dual Stds | k [| | Ь | | Refere | nce [| | | | |
| | | | | | | ок | Can | cel | | |

Reagent Enter the reagent information like lot No., manufacturer, etc. This field can be left blank.

Blank Enter the blank limit according to the reagent package insert. This field can be left void. If the blank result exceeds the limit, the following alarm message appears.



Full Name Enter the full name of the test. This field can be left blank.

Pri Wave Select a primary wavelength from the drop-down list box.



| Field | Description |
|----------|--|
| Sec Wave | Select a secondary wavelength from the drop-down list box. This field is not required. |
| | None 405 |

You must not select same one for primary and secondary wavelength. Otherwise the follow error message appears.



Dual Samples 450

492

When the *Dual Samples* check box is selected, the adjacent well of each sample will be set as a replicate with same sample ID. The sample ID can be edited.

| [| Move M | lode | | Place | Mode | | Sh | aking | | | | |
|---|-----------|-----------------|-------|-------|------|--------|------------|----------|-------|------|----|--------|
| | O Step | ● ^{Co} | onti | • Ho | ı O, | Ver | Spe | ed Non | e 🔻 | Time | | |
| | | | | | | | | | | | | |
| | Sample | E | Blank | NC- | | PC+ | CoC | trl | STD | QI | C | Del |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 |
| В | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 | 12 | 12 |
| С | 13 | 13 | 14 | 14 | 15 | 15 | 16 | 16 | 17 | 17 | 18 | 18 |
| D | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 | 23 | 23 | 24 | 24 |
| Е | 25 | 25 | 26 | 26 | 27 | 27 | 28 | 28 | 29 | 29 | 30 | 30 |
| F | 31 | 31 | 32 | 32 | 33 | 33 | 34 | 34 | 35 | 35 | 36 | 36 |
| G | 37 | 37 | 38 | 38 | 39 | 39 | 40 | 40 | 41 | 41 | 42 | 42 |
| Н | 43 | 43 | 44 | 44 | 45 | 45 | 46 | 46 | 47 | 47 | 48 | 48 |
| Т | est: HBsA | g | | | | Calc M | vlode: Qua | litative | | | | |
| | New | | | All | | Cle | ear | | Start | | | Return |

The test with dual samples has two measuring results. See the figure below.

| Field | Descrip | otion | | | | | |
|----------|-------------------------|------------------------|-------------------------|------------------------|---------------------------|--------------|-------------------|
| | No. | Test | Full Name | Result | Unit | Comments | Reference |
| | 2 | HBsAb HBsAb | | 0.765 | S/CO S/CO | | <1.000 <1.000 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | <u>.</u> | | | | | | |
| | | | | Modify | Print | Delete | Close |
| | | | | | | <u>i</u> i | |
| | | | | | | | |
| | \wedge | NOTE | - | | | | |
| | $\langle ! \rangle$ | You ca | n delete (| one of the | - results | for printo | ut if needer |
| | | or both | results w | ill be prin | ted. | | |
| | | | | | | | |
| | - | | | | | | |
| alc Mode | There Qualita | are three tive(Cut- | e calcula off) and G | tion mod Quantitati | ies, whi i ve . | ch are . | Absorband |
| | Quantita | ative m | iode in | cludes: | One-po | oint, Po | oint-to-Poir |
| | Multi-p Factor | oint%AB | S, Linear | ; Expon | ential, L | ogarithm | , Power ar |
| | Select c | | on mode i | from the c | dron dou | n list hav | |
| | | | | | liop-dow | in list box. | |
| | Qualitativ | e 🔽 | | | | | |
| | Absorban | ce 🗖 | | | | | |
| | Qualitativ | e | | | | | |
| | Ope-point | | | | | | |
| | | | | | | | |
| | P-to-P | T | | | | | |

The following table explains the calculation modes one by one.

| Calc Mode | Description |
|------------|---|
| Absorbance | Samples are measured directly with absorbance calculated. |

| Colo Modo | Description | | | | | | |
|-------------|--|--|--|--|--|--|--|
| | | | | | | | |
| Qualitative | A C.O. value is calculated via the Cut-off formula. The qualitati mode judges whether the test result is negative or positive comparing the sample absorbance with the C.O. value. | | | | | | |
| | Cut-Off Threshold Formula: | | | | | | |
| | $CutOff = X \times Neg.Contro l + Y \times Pos.Contro l + Z \times CutOffQC + Fac$ | | | | | | |
| | X, Y, Z and Fac are formula coefficient. Enter the values according to the reagent package insert. Other qualitative formula can also be converted to this one. For instance: If $SampleOD / NCOD \ge 2.1$ means positive, then $X = 2.1$, $Y = 0$, Fac = 0. | | | | | | |
| | Qualitative result is calculated by Sample absorbance/Cut-off, S/Co for short. If necessary, a grey area can be configured. If Negative<0.9S/Co and Positive>1.1S/Co, then the results within 0.9-1.1 are considered doubtful and indicated by \pm . | | | | | | |
| | Basic Parameters | | | | | | |
| | Test HBsAg Reagent kehua Blank <= 0.050 | | | | | | |
| | Full Name Pri Wave 450 🔽 Dual Samples | | | | | | |
| | Calc Mode Qualitative Sec Wave None | | | | | | |
| | Qualitative Parameters | | | | | | |
| | CutOff = 2.100 *NC + 2.000 *PC + 3.000 *CoCtl + 0.000 | | | | | | |
| | NC Range 0.050 - 3.500 PC Range 0.000 - 3.500 | | | | | | |
| | Qual Mode Obverse Veg Veg Sco Pos V 1.100 s/co | | | | | | |
| | Quantitative Parameters | | | | | | |
| | Nr of Stds S1 S2 S3 S4 | | | | | | |
| | Unit S5 S6 S7 S8 | | | | | | |
| | Dual Stds k b Reference 0 ~ 1 | | | | | | |
| | 0K. Cancel | | | | | | |
| | NOTE You can decide whether to set up a grey area as needed. | | | | | | |
| | | | | | | | |

| Calc Mode | Description | | | | |
|----------------|---|--|--|--|--|
| One-point | You should set one standard for one-point calibration. The calibration curve is formed by connecting the zero point and standard point. X-axis means concentration and Y-axis means absorbance. In one-point calibration, a blank point must be set to calibrate the 0 point. | | | | |
| | NOTE The concentration of standard must be greater than 0. | | | | |
| | The k in $A = k \times C$ can be obtained via the concentration of the standard and the measured absorbance. Therefore, the concentration(C _i) of samples can be calculated based on its absorbance(A _i) and factor k. | | | | |
| Point-to-Point | You should set 2 to 8 standards for point-to-point calibration. The calibration curve (ascending or descending) is formed by connecting all the standard points. | | | | |
| | The slope, intercept and range of each line can be obtained by defining a line with two points. | | | | |
| | For instance, there are three standards, which have concentration of C1, C2 and C3, and absorbance of A1, A2 and A3.Therefore two lines can be fit as follows: | | | | |
| | Line $A = k_1C + b_1$ is fit with (C1, A1) and (C2, A2), line $A' = k_2C + b_2$ is fit with (C2, A2) and (C3, A3). | | | | |
| | $k_1 = \frac{A_2 - A_1}{C_2 - C_1}, b_1 = \frac{A_1 \times C_2 - A_2 \times C_1}{C_2 - C_1}$ | | | | |
| | $k_2 = \frac{A_3 - A_2}{C_3 - C_2}, \qquad b_2 = \frac{A_2 \times C_3 - A_3 \times C_2}{C_3 - C_2}$ | | | | |
| | Up to 8 standards are allowed and will constitute a broken line consisting of 7 segments. Therefore, the slope and intercept of each line can be calculated. | | | | |
| | | | | | |
| | The standards must be arranged by concentration (from low to high). | | | | |
| | If the test result is beyond the broken line, failed sample results will be indicated by "*", which means the result is out of calibration range. | | | | |
| Calc Mode | Description | | | | |
|---------------------|--|--|--|--|--|
| Multi-point% ABS | You can set 2 to 8 standards with the greatest absorbance of 100%. The absorbance of other standards and samples are expressed in percentage (%). Multi-point calibration can be done in the same way as the point-to-point method. | | | | |
| | Suppose there are 3 standards. The third standard has the greatest absorbance A3(100%). The ratio between other standard absorbance and A3 is the Y-axis of calibration curve and concentration is the X-axis. | | | | |
| | The slope and intercept of the calibration curve can be calculated in the same way as the point-to-point method. | | | | |
| | ∧ NOTE | | | | |
| | The standards must be arranged by concentration (from low to high). | | | | |
| | If the test result is beyond the broken line, failed sample results will be indicated by "*", which means the result is out of calibration range. | | | | |
| | | | | | |
| Linear | You can set 2 to 8 standards, base on which a line $A = kC + b$ will be fit as the calibration curve. | | | | |
| | There are two calibration parameters k and b. Suppose Ci is the concentration of standard, Ai is the absorbance, and n is the number of standards. k and b can be obtained with the following equations: | | | | |
| | $k = \frac{\sum_{i=1}^{n} CiAi - (\sum_{i=1}^{n} Ci)(\sum_{i=1}^{n} Ai) / n}{\sum_{i=1}^{n} Ci^{2} - (\sum_{i=1}^{n} Ci)^{2} / n}$ | | | | |
| | $b = (\sum_{i=1}^{n} A_{i}) / n - \left[\frac{\sum_{i=1}^{n} C_{i}A_{i} - (\sum_{i=1}^{n} C_{i})(\sum_{i=1}^{n} A_{i}) / n}{\sum_{i=1}^{n} C_{i}^{2} - (\sum_{i=1}^{n} C_{i})^{2} / n}\right] (\sum_{i=1}^{n} C_{i}) / n$ | | | | |
| Exponential | You can set 2 to 8 standards, base on which a line $A = ke^{bC}$ will be fit as the calibration curve. | | | | |
| | Concentration of standards is C1, C2Ci, and absorbance of the standards is A1, A2An. If the logarithm of A is calculated via $A' = LnA$, then A'_1, A'_2,A'_n can be used to replace Ai of linear regression. Therefore, exponential can be transformed into linear regression: $A' = k'C + b'$. | | | | |



NOTE

The concentration of the standards must be greater than 0.

| Calc Mode | Description | | | | | |
|--------------------|---|--|--|--|--|--|
| Logarithm | You can set 2 to 8 standards, base on which a line $A = kLnC + b$ will be fit as the calibration curve. | | | | | |
| | Concentration of standards is C1, C2Ci, and absorbance of the standards is A1, A2An. If the logarithm of C is calculated with $C' = LnC$, then $C'_1, C'_2,, C'_n$ can be used to replace Ci of linear regression. Therefore, logarithm can be transformed into linear regression: $A' = k'C + b'$. | | | | | |
| | NOTE Concentration of the standards must be greater than 0. | | | | | |
| Power | You can set 2 to 8 standards, base on which a line $A = kC^{b}$ will be fit as the calibration curve. The absorbance and concentration of each standard must be greater than 0. | | | | | |
| | Concentration of standards is C1, C2Ci, and absorbance of the standards is A1, A2An. If the logarithm of C is calculated with $C' = LnC$ and logarithm of A is $A' = LnA$, then power can be transformed into linear regression: $A' = k'C' + b'$. | | | | | |
| | NOTE The absorbance and concentration of each standard must be greater than 0. | | | | | |
| Factor | Formula: $A = kC + b$. The k and b are entered by user. | | | | | |
| | NOTE k must not be 0. | | | | | |
| Logistic-Log4 P | There should be at least 4 levels of calibrators. The concentration of the first level calibrator should be 0. The concentrations are aligned from the lowest to the highest. | | | | | |
| | Calibration formula: $R = R_0 + K \frac{1}{1 + \exp[-(a + b \ln C)]}$ | | | | | |
| | If the absorbance of the sample is lower than the calibrator absorbance, no result will be calculated and "R! and *" will appear in the result area. | | | | | |

| Calc Mode | Description |
|-----------|---|
| Spline | Calibration formula: |
| | $R = R_{0i} + a_i (C - C_i) + b_i (C - C_i)^2 + c_i (C - C_i)^3$ |
| | There should be 2-6 levels of calibrators. The concentration of the first level calibrator should be 0. The concentrations are aligned from the lowest to the highest. |
| | If the absorbance of the sample is lower than the calibrator absorbance, no result will be calculated and "R! and *" will appear in the result area; if the absorbance of the sample is higher than the calibrator absorbance, result will be calculated and flagged with "R!". |

4.1.1.2 Qualitative Parameters

When selecting *Qualitative* in the *Calc Mode* field, you must set up the qualitative parameters as shown in the figure below.

Figure 4-5 Qualitative Parameters area

| Qualitative Parameters | |
|----------------------------------|------------------|
| CutOff = ×NC + ×PC + | * CoCtrl + |
| NC Range PC Range | · · |
| Qual Mode Obverse Veg (900 s/co | Pos > 1.100 s/co |

The following table explains the fields in the area.

| Field | Descript | tion |
|---------|--------------------|---|
| Cut-off | You sho package | uld enter the three factors according to the reagent insert. |
| | \wedge | NOTE |
| | <u>/ • \</u> | The Cut-off formula may vary slightly with different reagent manufacturers, but all such formulas can be transformed into the one as shown in Figure 4-5. |
| | | For instance, the manual of a Hepatitis B Surface Antigen kit indicates, if $S_{ampleOD/NCOD > 2.1}$, then it is positive, otherwise it is negative. The formula can also transformed into the Cut-off form: $Cut - off = 2.1 \times NC * OD + 0 \times PC * OD + 0$. Where, the three factors are 2.1, 0 and 0. |
| | | |

| Field | Description |
|-----------|--|
| Range | For the tests of obverse qualitative mode, if the NC absorbance is lower than the low limit, the low limit should be used for calculation. If the NC absorbance exceeds the low limit, it should be used as it actually is. If the NC absorbance exceeds the high limit, an alarm message appears as follows. If the PC absorbance is lower than the low limit, an alarm message appears as follows. If the PC absorbance exceeds the low limit, it should be used as it actually is. If the PC absorbance exceeds the high limit, the high limit should be used instead of the actual absorbance. |
| | For the tests of reverse qualitative mode, if the NC absorbance is lower than the low limit, an alarm message appears as follows. If the NC absorbance exceeds the low limit, it should be used as it actually is. If the NC absorbance exceeds the high limit, the high limit should be used instead of the actual absorbance. If the PC absorbance is lower than the low limit, the low limit should be used for calculation. If the PC absorbance exceeds the low limit, it should be used as it actually is. If the PC absorbance exceeds the high limit, an alarm message appears as follows. |
| | Serror |
| | ОК |
| | PC is out of range |
| | ОК |
| | For example, the manual of a Hepatitis B Surface Antigen kit states, NC OD should be used as 0.05 if less than 0.05 and as the actual value if greater than 0.05. Then the low limit for NC should be set to 0.05. |
| Qual Mode | Select Obverse or Reverse according to the reagent package insert. |
| | Obverse Obverse Reverse |

| Field | Description |
|-----------|---|
| NC and PC | In Obverse mode, if Negative <negative a="" and="" are="" area,="" between="" cut-off="" cut-off,="" doubtful.<="" grey="" in="" interval="" is="" obtained="" positive="" results="" td="" the="" then="" two="" values="" which="" ≥=""></negative> |
| | In Reverse mode, if Negative \geq Negative Cut-off and Positive < Positive Cut-off, then the interval between the two Cut-off values is a grey area, in which the results obtained are doubtful. |
| | If a wrong S/Co is entered, the following message pops up. |
| | <pre>@Error</pre> |
| | S/CO value error |
| | OK |

4.1.1.3 Quantitative Parameters

Figure 4-6 Quantitative Parameters area

| Quantitative Parameters | | | | | | | | |
|-------------------------|--------|----------|----------|-----------|-----------|--|--|--|
| Nr of Stds | 4 💌 | S1 0.000 | S2 5.000 | S3 10.000 | S4 50.000 | | | |
| Unit | IU/I 💌 | S5 0.000 | S6 0.000 | S7 0.000 | S8 0.000 | | | |
| Dual Stds | k 🗌 | Ь | Refere | nce 0.000 | 1.000 | | | |



NOTE

Enter the parameters according to reagent package insert. The concentration (S1-S8) you entered must be consistent with the number of standards.

When the number and concentration of standards are changed, the corresponding calibration parameters and curve of the test will be deleted. The test must be calibrated again.

The following table explains the fields in the area.

| Field | Description | | | | | | | |
|------------|--|--|--|--|--|--|--|--|
| Nr of Stds | Enter the number of standards (maximum of 8).Enter the concentration in the edit boxes (S1-S8) next to Nr of Stds. Please note that the number of standards must be consistent with the selected calculation mode. See 4.1.1.1Basic Parameters. Wrong entry may trigger the following error message. | | | | | | | |
| | Error You must enter one standard for one-point calibration | | | | | | | |
| | ΟΚ | | | | | | | |
| Unit | Select concentration unit from the drop-down list box. This field is required. If no unit is selected, the following message will appear.(You should first set concentration units on the System Setup screen. See 4.5 System Setup) | | | | | | | |
| | 🗣 Error | | | | | | | |
| | You must enter the unit of standard | | | | | | | |
| | ΟΚ | | | | | | | |
| Dual Stds | When Dual Standards is selected, the adjacent well of each standard will be set as a replicate with same number, which can be edited. Un selection means single standard. | | | | | | | |
| k and b | For the Factor calculation mode, you should enter k and b in the edit boxes next to k and b. For other calculation modes, these two fields are disabled. | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

When you finish the settings, click *OK* to save the settings and return to the previous screen. Or click *Cancel* to abort the settings.

When quantitative parameters are changed, the following message appears (Changing k and/or b is another case).Select **Yes** to save the changes. All calibration parameters and curves of the test are deleted, and another calibration is required. Select **No** to abort the changes.



4.1.2 Modifying Parameter Settings

To change parameter settings of the selected test, see 4.1.1.1 Basic Parameters.

4.1.3 Deleting a Test

Select a test and click *Delete*. All information about the test is deleted, except for the test results, which can be recalled.

| HBsAg HBsAb | Hepatitis B surface Antigen | Qualitative | 450 | 630 |
|----------------|-----------------------------|--|--|---|
| HBsAb | | | | |
| UD - 4 - | | Qualitative | 450 | 630 |
| нведд | | Qualitative | 450 | 630 |
| HBeAb | | Qualitative | 450 | 630 |
| HBcAb | | Qualitative | 450 | 630 |
| AFP 😔 Sel | ect | | | None |
| Abs | A | | | None |
| | Are you sure to delete? | | | |
| | Yes | No | | |
| | | 1 | | |
| | HBcAb AFP Abs | HBcAb AFP Abs Tes Modify Delete | HBcAb Qualitative AFP Abs Are you sure to delete? Yes No Modify Delete Cal Curve | HBcAb Qualitative 450 AFP Select Abs Yes No Modify Delete Cal Curve Order |

Figure 4-7 Deleting Test dialog box

4.1.4 Viewing Calibration Curve

Standard results and curve for quantitative tests are saved automatically and can be review as you need.

On the Test Setup screen, select a test and click *Cal Curve*. The calibration curve screen is displayed. You can view the absorbance for each standard concentration and corresponding calibration curve.

Figure 4-8 Calibration Curve screen



To print out the calibration curve, select *Print* in the bottom of the screen. Select *Cancel* to return to the previous screen.

4.1.5 Setting up Printing Order

Select *Order* on the test setup screen, the order setup screen is displayed. You can rearrange the tests in an order, in which the tests will be printed on patient reports.

| No. | Test | Calc Mode | No. | Test | Calc Mode | |
|---------|-------|-------------|---------|--------|-------------|--|
| 1 | AFP | Linear | 1 | HBsAg | Qualitative | |
| 2 | Abs | Absorbance | 2 | HBsAb | Qualitative | |
| 3 | CEA | One-point | 3 | HBeAg | Qualitative | |
| 4 | н | Qualitative | 4 | HBeAb | Qualitative | |
| 5 | HBcAb | Qualitative | 5 | HBcAb | Qualitative | |
| 6 | HBeAb | Qualitative | 6 | AFP | Linear | |
| 7 | HBeAg | Qualitative | 7 | Abs | Absorbance | |
| 8 | HBsAb | Qualitative | 8 | CEA | One-point | |
| 9 | HBsAg | Qualitative | 9 | Н | Qualitative | |
| | | | | | | |
| | | | | | | |
| • | | | • | | | |
| | « » | >>+ | | ··· >> | >>> | |
| Restore | ОК | Return | Restore | ОК | Return | |

Figure 4-9 Order Setup screen

Advanced Operations

- Select to move the selected test to the first position.
- Select
- Select >>> to move the selected test to the last position.
- Select *Restore* to cancel the latest settings.
- Select **OK** to save the settings and return to the Test Setup screen.
- Select *Return* to abort the settings and return to the Test Setup screen.



NOTE

Some test profiles like Hepatitis B(5 tests) should be arranged properly. See Figure 4-9. Otherwise the tests will distribute randomly on printout.

4.2 Run

Select *Run* on the main screen. The following screen is displayed.

| | Move Mode Step © Conti | | | Place | Place Mode | | | Shaking Speed None 💌 Time | | | | |
|---|---------------------------|--|---------|-------|------------|-----|----------|------------------------------|-------|-----|--|--------|
| | Sample Blank | | NC- PC+ | | CoCtrl STD | | STD 9 | | | Del | | |
| A | | | | | | | | | | | | |
| в | | | | | | | | | | | | |
| С | | | | | | | | | | | | |
| D | | | | | | | | | | | | |
| Е | | | | | | | | | | | | |
| F | | | | | | | | | | | | |
| G | | | | | | | | | | | | |
| н | | | | | | | | | | | | |
| T | Test Calc Mode: | | | | | | | | | | | |
| | New | | | All | | Cle | ear | | Start | | | Return |

Figure 4-10 Running Setup screen

The following table explains the fields on the screen.

| Field | Description | | | | | | | | |
|-----------|--|--|--|--|--|--|--|--|--|
| Move Mode | It refers to the mode of plate movement. There are two options available: Step and Conti (Continuous). | | | | | | | | |
| | <i>Step</i> : Higher precision of measurement can be achieved with Step mode. | | | | | | | | |
| | <i>Conti</i> : Measurement speed can be accelerated with Continuous mode. | | | | | | | | |

| Field | Description | | | | | |
|------------|--|--|--|--|--|--|
| Place Mode | t refers to the mode of plate placement. There are two options available: <i>Hor</i> (Horizontal) and <i>Ver</i> (Vertical). | | | | | |
| Shaking | In this area you can set the speed and time of shaking. The options provided for speed are: <i>Void</i> , <i>Low</i> , <i>Med</i> (Medium) and <i>High</i> . <i>Void</i> means no shaking. The shaking time should be within 0-60. 0 means no shaking. | | | | | |
| Test | Name of the test. | | | | | |
| Calc Mode | Calculation method for the test. | | | | | |

The following table introduces the buttons on the screen.

| Button | Function | | | | | | | | | | | | |
|------------------------------------|---|--------|------|-------|-------|------|-------------|-----|--------|-----|--------|--------|-----|
| Sample | Select any well that you want run sample, sample ID (1-999) will be assigned from 1 to the well. To change the sample ID, click the well again. Enter the sample ID in the popup edit box. If a sample with same ID already exists, you will be prompted by a message. | | | | | | | | | | | | |
| | | Move M | lode | | Place | Mode | | Sh | aking | | | | |
| | | O Step | • • | onti | • Ho | " O | Ver | Spe | ed Non | • | Time [| | |
| | | Sample | E | Blank | NC- | | PC+ | CoC | irl 🛛 | STD | Q | | Del |
| | | 1 | 2 | 3 | | | | | | | 10 | 11 | 12 |
| | A | 1 | 2 | 3 | | | | | | | 10 | 11 | 12 |
| | В | 13 | 14 | 15 | | | | | | | 22 | 23 | 24 |
| | С | 25 | 26 | 27 | | | | Re | turn | | 34 | 35 | 36 |
| | D | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| | Е | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| | F | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| | G | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |
| | н | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |
| Test: HBsAg Calc Mode: Qualitative | | | | | | | | | | | | | |
| | | New | | | All | | Clear Start | | | | | Return | |
| | | | | | | | | | | | | | |

| Button | Function | | | | | | | |
|------------------------------|--|--|--|--|--|--|--|--|
| Blank | Blank is used to zero the absorbance of a test and should be subtracted from the absorbance of other wells during measurement. However, blank is not required for all tests and can be run when needed. | | | | | | | |
| | Blank results for each test are saved automatically and will be use for following calculations of same test if new blank is not run. I (N \leq 96) blank wells are allowed for each test on one plate. Th system will average the blank results and save the mean value a the only blank result of the test. | | | | | | | |
| | | | | | | | | |
| | If a blank is set on each plate, its absorbance will be subtracted from that of other wells on the plate. If no blank is set, the previous blank result will be recalled for absorbance calculation. | | | | | | | |
| | Different tests should have different blanks. | | | | | | | |
| NC- (Negative Control) | It is only valid to tests of Cut-Off calculation method. The No. of negative control can be repeated. Multiple negative controls are allowed and the system will average these negative controls to yield a result which will be eventually saved. | | | | | | | |
| | If coefficient is set in front of the NC- in the calibration parameter Cut-Off formula, negative control should be set when running the test for the first time. Proceeding tests can adopt the previous result or new negative control can be set. | | | | | | | |
| PC+ | It is only valid to tests of Cut-Off calculation method. The No. of | | | | | | | |
| (Positive Control) | allowed and the system will average these negative controls are yield a result which will be eventually saved. | | | | | | | |
| | If coefficient is set in front of the PC+ in the calibration parameter Cut-Off formula, positive control should be set when running the test for the first time. Proceeding tests can adopt the previous result or new positive control can be set. | | | | | | | |
| Co.Ctrl | It is only valid to tests of Cut-Off calculation method. The No. of positive control can be repeated. Multiple Co.Ctrls are allowed and the system will average these Co.Ctrls to yield a result which will be eventually saved. | | | | | | | |
| | If coefficient is set in front of the Cut-Off QCs in the calibration parameter Cut-Off formula, Co.Ctrl should be set when running the test for the first time. Proceeding tests can adopt the previous result or new Co.Ctrl can be set. | | | | | | | |

| Button | Function |
|--------|--|
| STD | A standard must be configured for the quantitative tests that are run for the first time. If the tests have already been calibrated, no standard is required, or all standards should be configured again if one standard is changed. |
| | Program standards according to the standard parameters on the Test Setup screen. Only setting partial standards is not allowed. Select the wells that you want to run standards. The wells will be numbered S1, S2, S3When all standards for a test are configured, the system will prompt "Number of standards exceeds the limit" if another standard is set. If you start measurement or create new test when standard settings are not finished, the following message (lower) will appear. |
| | Error Number of standards exceeds the limit |
| | OK ØError |
| | |

| | Number of standards exceeds the limit | | | | | | | | | |
|---------|---------------------------------------|--|--|--|--|--|--|--|--|--|
| | OK | | | | | | | | | |
| 😲 Error | | | | | | | | | | |
| ٩ | You must set up calibrators | | | | | | | | | |
| | ОК | | | | | | | | | |

QC

Before programming QC, you must set up QC parameters on the QC screen. Otherwise the following message pops up.

| 😍 Error | | | | | | | |
|--------------------------------|--|---|-------------------------------|---------------------|--------------|--------------------------|-------------------|
| ٩ | QC rule is not set | for this test | | | | | |
| | | ОК | | | | | |
| Number results a QC resu | of controls and saves th It is saved for | is not limi ne mean val or a test eac | ted. Th lue as t h day. | e syste he final | m av resu | verages a lt. Only th | all QC ne last |
| | | | | | | | |

Del Click this button and click desired well to delete its programmed information.

New Before programming a plate, you must select New to select an existing test. Otherwise the following message will be triggered.



Select a test from the list, then select OK.



Each test can only be programmed once on a plate; otherwise the following message appears.



After programming a test, select **New**. The programmed wells appear grey and cannot be edited.

| Button | Fu | unctio | on | | | | | | | | | | |
|--------|----|-------------------------|----|-------|---------------|----------------------------|-----|-----|----------------------------|-------|----|----|--------|
| | | Move Mode Step Conti | | | Place • Ho | Place Mode Hor Ver | | | Shaking Speed None Time | | | | |
| | | Sample | 1 | Blank | NC- | | PC+ | CoC | rl | STD | Q | | Del |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | A | 1 | 2 | 3 | 4 | 5 | 7 | 6 | 8 | 9 | 10 | 11 | 12 |
| | В | 13 | 14 | 15 | 16 | 17 | 18 | 19 | S1 | S2 | S3 | 20 | 21 |
| | С | NC | PC | CC | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | D | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| | Е | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 |
| | F | | | | | | | | | | | | |
| | G | | | | | | | | | | | | |
| | н | | | | | | | | | | | | |
| | Т | est: HBsA | g | | | Calc Mode: Qualitative | | | | | | | |
| | | New | | | All | | Cle | ear | | Start | | | Return |

Each test must be programmed once on a plate, and up to 12 tests are allowed for each plate. When the 13th test is configured, the following message appears.

| 😲 Error | x |
|---------|-----------------------------------|
| ٩ | Up to 12 tests should be selected |
| | OK |

All

Select All. The following dialog box is displayed.

You can number the samples in an area of the plate. The start sample ID is 1 by default. The start well is A1 and end well is H12.



If **Dual Samples** is selected for a test, two adjacent wells in horizontal or vertical direction will be numbered identically. You can also change the generated numbers as needed.

Each patient sample must have a unique ID during a day. On the printout of test results, each patient should have one sample ID for all tests.

| Button | Function | | | | | | | | | |
|------------|---|--|--|--|--|--|--|--|--|--|
| | NOTE The system gathers all test results of each sample ID on the current day. While programming, please ensure each sample ID corresponds to the patient. | | | | | | | | | |
| Clear | You can change the wells that have been programmed. Click this button to delete all programmed information of the wells on the plate. | | | | | | | | | |
| | Move Mode Place Mode Shaking Speed None Time | | | | | | | | | |
| | Sample Blank NC- PC+ CoCtrl STD QC Del 1 2 3 4 5 6 7 8 9 10 11 12 | | | | | | | | | |
| | A 1 1 2 2 3 3 4 4 5 5 6 6 | | | | | | | | | |
| | B 7 7 2 Select 12 12 | | | | | | | | | |
| | C 13 13 Are you sure to delete all? | | | | | | | | | |
| | | | | | | | | | | |
| | E 25 25 Yes No 30 30 | | | | | | | | | |
| | | | | | | | | | | |
| | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | | | | | | | | |
| | ··· 43 43 44 44 45 45 46 46 4/ 4/ 48 48 | | | | | | | | | |
| | Test: HBsAg Calc Mode: Qualitative | | | | | | | | | |
| | New All Clear Start Return | | | | | | | | | |
| Start | Click this button to start running all tests on the plate. | | | | | | | | | |
| Return | Click this button to return to the main screen | | | | | | | | | |
| i Celui II | | | | | | | | | | |

4.2.1 Starting Analysis

| Figure 4-11 | Starting | Analysis | screen |
|-------------|----------|----------|--------|
|-------------|----------|----------|--------|

| [| Move M | lode | | Place | Mode | | Shaking | | | | | |
|---|--------------------------------------|------|-------|-------|------|--------|-----------------|----------|-----|----|----|--------|
| | O ^{Step} ● ^{Conti} | | | • Ho | · 0′ | Ver | Speed None Time | | | | | |
| ļ | | | | | | | | | | | | |
| | Sample | E | 3lank | NC- | | PC+ | CoCtrl | | STD | QI | | Del |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | NC | PC | CC | | | | | | | | | |
| В | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| С | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| D | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| Е | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| F | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| G | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| Н | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 |
| T | est: HBsA | .g | | | | Cale M | vlode: Qua | litative | | | | |
| | New | | | All | | Cle | Clear Start | | | | | Return |

After programming, select *Start* to start measuring the current plate. The test results will be displayed on each well.



NOTE

When a test is finished, click Return to return to the Running Setup screen. To rerun a test, select *Clear* and then click *New* to select a new test. Otherwise the following test is run using the settings of previous test.

4.2.2 Result Display

When all tests on a plate are finished, the results are displayed on each well as follows.

Figure 4-12 Test Results screen

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------|
| А | 1 - -0.815 | 2 + 0.154 | 3 + 0.249 | 4 + 1.544 | 5 - 0.039 | 6 - -0.045 | 7 - -0.061 | 8 - 0.010 | 9 - -0.004 | 10 - -0.026 | 11 - -0.100 | 12 - -0.087 | |
| | -7.760 | 1.470 | 2.375 | 14.706 | 0.371 | -0.426 | -0.579 | 0.094 | -0.040 | -0.252 | -0.952 | -0.827 | |
| В | 13 + | 14 - | 15 - | 16 - | 17 • | 18 - | 19 - | 20 - | 21 - | 22 - | 23 - | 24 - | |
| | 1.332 | -0.028 -0.267 | -0.008 -0.078 | -0.020 -0.187 | -0.085 -0.807 | -0.117 -1.110 | -0.101 -0.961 | -0.034 -0.322 | -0.050 -0.472 | -0.114 -1.088 | -0.141 -1.341 | -0.137 -1.307 | |
| С | 25 + | 26 + | 27 + | 28 - | 29 - | 30 - | 31 - | 32 - | 33 - | 34 - | 35 - | 36 - | |
| | 1.219 | 0.859 8.178 | 0.444 4.231 | 0.082 | -0.078 -0.747 | -0.091 -0.864 | -0.061 -0.579 | -0.047 -0.446 | -0.057 -0.545 | -0.116 -1.106 | -0.103 -0.983 | -0.091 -0.870 | |
| D | 37 + | 38 - | 39 - | 40 - | 41 - | 42 - | 43 - | 44 - | 45 - | 46 - | 47 - | 48 - | |
| | 0.143 1.364 | 0.018 | -0.013 -0.120 | -0.101 | -0.138 -1.319 | -0.114 -1.089 | -0.040 -0.385 | -0.052 -0.497 | -0.124 -1.185 | -0.152 -1.448 | -0.123 -1.169 | -0.043 -0.406 | |
| F | 49 + | 50 - | 51 - | 52 - | 53 - | 54 - | 55 - | 56 - | 57 - | 58 - | 59 - | 60 · | |
| - | 0.160 | 0.007 | -0.042 -0.399 | -0.118 -1.127 | -0.134 -1.275 | -0.113 | -0.067 -0.634 | -0.074 -0.709 | -0.149 -1.415 | -0.136 -1.292 | -0.087 -0.826 | -0.061 -0.585 | |
| _ | 61 + | 62 + | 63 + | 64 + | 65 + | 66 + | 67 + | 68 + | 69 + | 70 + | 71 + | 72 + | |
| F | 0.636 6.061 | 0.909 8.656 | 0.590 5.615 | 0.401 3.823 | 0.544 5.183 | 0.679 6.471 | 0.746 7.108 | 0.581 5.532 | 0.406 3.863 | 0.522 4.971 | 0.796 7.579 | 0.668 6.359 | |
| | 73 + | 74 - | 75 - | 76 - | 77 · | 78 - | 79 - | 80 - | 81 - | 82 - | 83 - | 84 · | Print |
| G | 0.155 1.472 | 0.022 0.213 | -0.085 -0.808 | -0.105 -1.002 | -0.080 -0.761 | -0.036 -0.342 | -0.049 -0.471 | -0.121 -1.149 | -0.121 -1.156 | -0.079 -0.754 | -0.047 -0.445 | -0.132 -1.253 | Save |
| | 85 + | 86 - | 87 - | 88 - | 89 - | 90 - | 91 - | 92 - | 93 - | 94 - | 95 - | 96 - | |
| н | 0.179 | 0.041 | -0.038 | -0.040 | 0.015 | 0.002 | -0.043 | -0.071 | -0.058 | 0.000 | -0.006 | -0.055 | Return |
| | 1.703 | 0.393 | -0.365 | -0.377 | 0.138 | 0.021 | -0.414 | -0.676 | -0.552 | 0.003 | -0.056 | -0.527 | |

 $\underline{\mathbb{N}}$

NOTE

If the concentration of a well cannot be calculated, no result is displayed and the well is indicated by "*".

The following table introduces the buttons on the screen.

| Button | Fu | nctio | on | | | | | | | | | | | |
|--------|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------|
| Print | Clie | ck th | is bu | tton t | o pri | nt all | test | data | on th | ie cu | rrent | plate |). | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| | A | 1 - -1.281 | 2 - -0.369 | 3 + 0.173 | 4 + 0.458 | 5 - 0.025 | 6 - -0.014 | 7 - 0.019 | 8 - -0.007 | 9 - 0.037 | 10 - -0.057 | 11 · ·0.058 | 12 - -0.004 | Test: |
| | в | 13 + 0.169 | 14 - 0.036 | 15 · ·0.020 | 16 - -0.038 | 17 - -0.070 | 18 - -0.086 | 19 - -0.036 | 20 - -0.051 | 21 - -0.080 | 22 - -0.098 | 23 · -0.116 | 24 - -0.111 | HBsAg |
| | с | 25 + 0.848 | 26 + 1.342 | 27 + 0.634 | 28 - 0.080 | 29 - -0.058 | 30 - -0.075 | 31 - -0.064 | 32 - -0.032 | 33 - -0.085 | 34 - -0.085 | 35 - -0.050 | 36 - -0.091 | Plate No. |
| | D | 37 + 0.168 | 38 - 0.007 | Promp |)t | | F | Printing | | | | × ô | 48 - -0.116 | 8 Date |
| | E | 49 + 0.186 | 50 · 0.024 | | | | | | | | | | 60 · •0.093 | Previous |
| | F | 61 - -0.647 | 62 - -0.055 | 63 - -0.671 | 64 - -0.832 | 65 - -0.537 | 66 - -0.677 | 67 - -0.578 | 68 - -0.667 | 69 - -0.806 | 70 - -0.527 | 71 - -0.564 | 72 - -0.544 | Next |
| | G | 73 + 0.184 | 74 - -0.003 | 75 - -0.069 | 76 - -0.085 | 77 - -0.046 | 78 - -0.051 | 79 - -0.099 | 80 - -0.094 | 81 - -0.088 | 82 - -0.073 | 83 - -0.028 | 84 - -0.079 | Delete |
| | н | 85 + 0.214 | 86 - 0.052 | 87 - -0.020 | 88 - 0.017 | 89 - -0.011 | 90 - 0.019 | 91 - -0.048 | 92 - -0.058 | 93 - 0.002 | 94 - -0.029 | 95 - -0.033 | 96 - 0.013 | Return |

| Button | Function | |
|--------|----------|--|
| | \wedge | NOTE |
| | <u> </u> | The print format differs slightly between the internal recorder and the external printer. Both formats will display the well No., absorbance, qualitative or quantitative result. The printer format for the internal recorder will not display the sample ID. Please pay much attention to the correspondence between well No. and sample ID. |

Save

Click this button to save the test data of current plate.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|----|---------------------------|--------------------------|----------------------------------|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|
| A | 1 + 0.593 5.650 | 2 + 1.151 10.958 | 3 + 0.198 1.889 | 4 + 1.492 14.205 | 5 - 0.077 0.729 | 6 - 0.050 0.479 | 7 - -0.005 -0.050 | 8 - -0.006 -0.058 | 9 - 0.039 0.371 | 10 - 0.007 0.068 | 11 - 0.014 0.133 | PC 0.027 | |
| В | 13 + 0.144 1.371 | 14 - 0.032 0.306 | 15 - 0.007 0.070 | 16 - 0.003 0.025 | 17 · -0.009 -0.086 | 18 - -0.035 -0.334 | 19 - -0.056 -0.530 | 20 - -0.042 -0.403 | 21 - -0.021 -0.205 | 22 - -0.031 -0.299 | 23 - -0.063 -0.601 | NC -0.051 | |
| С | 25 + 0.677 6.448 | 26 + 1.035 9.856 | 27 + 1.185 11.288 | 28 + 0.975 9.285 | 29 · ·0.004 ·0.035 | 30 - -0.030 -0.289 | 31 - -0.035 -0.336 | 32 - -0.015 -0.147 | 33 - -0.031 -0.292 | 34 - -0.028 -0.271 | 35 - -0.047 -0.451 | 36 - -0.034 -0.320 | |
| D | 37 + 0.151 1.436 | 38 - 0.037 0.348 | Promp | t | | (| Saving | | | | × 4 9 | 48 - -0.067 -0.639 | |
| E | 49 + 0.130 1.238 | 50 - 0.036 0.344 | -0.189 | -0.460 | -0.780 | -0.756 | -0.413 | -0.612 | -0.445 | -0.860 | B | 60 - -0.079 -0.751 | |
| F | 61 - -1.343 -12.792 | 62 - -0.450 -4.285 | 63 - -1.314 -12.517 | 64 - -1.619 -15.418 | 65 - -1.658 -15.790 | 66 - -1.627 -15.492 | 67 - -1.516 -14.435 | 68 - -1.543 -14.699 | 69 - -1.648 -15.691 | 70 - -1.697 -16.163 | 71 - -1.617 -15.398 | 72 - -1.657 -15.780 | |
| G | 73 + 0.149 1.418 | 74 - 0.037 0.352 | 75 - -0.011 -0.103 | 76 - -0.069 -0.657 | 77 - -0.060 -0.573 | 78 - -0.059 -0.566 | 79 - -0.045 -0.424 | 80 - -0.029 -0.275 | 81 - -0.080 -0.757 | 82 - -0.084 -0.799 | 83 - -0.019 -0.178 | 84 - -0.045 -0.427 | Print Save |
| н | 85 + 0.163 1.548 | 86 - 0.083 0.789 | 87 - 0.027 0.255 | 88 - 0.000 0.005 | 89 - 0.009 0.086 | 90 - 0.035 0.335 | 91 - 0.020 0.189 | 92 -0.005 -0.050 | 93 -0.016 -0.150 | 94 -0.017 -0.160 | 95 - 0.020 0.193 | 96 - 0.012 0.119 | Return |
| ۹: | Saveo | l suc | cess: | fully | ۰ļ | | | | | | | | |
| | ļ | Data s | aved | | | | | | | | | | |
| | | | | | ОК | 1 | | | | | | | |
| | | | | | | | | | | | | | |
| / | \wedge | ١ | νοτ | E | | | | | | | | | |
| _ | • \ | li S fe | f you Save , or inc | retu the quiry. | rn to test i | the resul | previ ts wi | ous I not | scree be s | en wi stored | thout and | t sele I ava | cting ilable |
| | | li r F | f the emin Histo | data d you ry on | base u to c i the | capa lelete Syste | acity e the em S | is ex earlie etup | ceec est re scree | ded, ecord en. | the s Is usi | yster ing D | n will e lete |
| | | | | | | | | | | | | | |

Return Click this button to return to the Starting Analysis screen.

Results in Absorbance Mode

When all tests on a plate are finished, the sample ID and absorbance value of each well are displayed. On each well, the upper number is sample ID and the lower number is absorbance value. Empty wells will display nothing.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| A | 1 0.343 | 2 0.860 | 3 0.272 | 4 0.938 | 5 0.065 | 6 0.088 | 7 0.040 | 8 -0.020 | 9 -0.029 | 10 -0.021 | 11 0.054 | 12 0.049 | |
| В | 13 0.239 | 14 0.050 | 15 -0.035 | 16 -0.046 | 17 -0.042 | 18 -0.021 | 19 -0.052 | 20 -0.097 | 21 -0.095 | 22 -0.050 | 23 -0.064 | 24 -0.085 | |
| С | 25 0.740 | 26 0.848 | 27 0.824 | 28 0.767 | 29 -0.004 | 30 -0.024 | 31 -0.068 | 32 -0.075 | 33 -0.071 | 34 -0.033 | 35 -0.047 | 36 -0.072 | |
| D | 37 0.267 | 38 0.002 | 39 -0.065 | 40 -0.075 | 41 -0.080 | 42 -0.079 | 43 -0.147 | 44 -0.127 | 45 -0.107 | 46 -0.107 | 47 -0.102 | 48 -0.151 | |
| E | 49 0.233 | 50 -0.016 | 51 -0.067 | 52 -0.048 | 53 -0.091 | 54 -0.092 | 55 -0.139 | 56 -0.127 | 57 -0.066 | 58 -0.094 | 59 -0.133 | 60 -0.125 | |
| F | 61 -1.931 | 62 -1.754 | 63 -2.006 | 64 -2.054 | 65 -2.101 | 66 -2.234 | 67 -2.254 | 68 -2.171 | 69 -2.143 | 70 -2.142 | 71 -2.260 | 72 -2.212 | |
| G | 73 0.214 | 74 -0.006 | 75 -0.027 | 76 -0.086 | 77 -0.093 | 78 -0.145 | 79 -0.120 | 80 -0.060 | 81 -0.103 | 82 -0.143 | 83 -0.124 | 84 -0.082 | Print Save |
| н | 85 0.269 | 86 0.105 | 87 0.064 | 88 0.028 | 89 -0.004 | 90 -0.002 | 91 0.016 | 92 0.026 | 93 0.016 | 94 -0.051 | 95 -0.019 | 96 0.032 | Return |

Figure 4-13 Absorbance Results

Results in Qualitative Mode

In qualitative mode, the test results are displayed on each well, with upper line of sample ID and qualitative result "+"/"-", middle line of absorbance value and lower line of S/Co value. Empty wells will display nothing. The blank or NC/PC wells have no S/Co or qualitative results.

Figure 4-14 Qualitative Test Results

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|
| A | 1 - -0.815 -7.760 | 2 + 0.154 1.470 | 3 + 0.249 2.375 | 4 + 1.544 14.706 | 5 - 0.039 0.371 | 6 - -0.045 -0.426 | 7 - -0.061 -0.579 | 8 - 0.010 0.094 | 9 - -0.004 -0.040 | 10 - -0.026 -0.252 | 11 - -0.100 -0.952 | 12 - -0.087 -0.827 | |
| В | 13 + 0.140 1.332 | 14 - -0.028 -0.267 | 15 - -0.008 -0.078 | 16 - -0.020 -0.187 | 17 - -0.085 -0.807 | 18 - -0.117 -1.110 | 19 - -0.101 -0.961 | 20 - -0.034 -0.322 | 21 - -0.050 -0.472 | 22 - -0.114 -1.088 | 23 - -0.141 -1.341 | 24 - -0.137 -1.307 | |
| С | 25 + 1.219 11.607 | 26 + 0.859 8.178 | 27 + 0.444 4.231 | 28 - 0.082 0.779 | 29 - -0.078 -0.747 | 30 - -0.091 -0.864 | 31 - -0.061 -0.579 | 32 - -0.047 -0.446 | 33 - -0.057 -0.545 | 34 -0.116 -1.106 | 35 -0.103 -0.983 | 36 - -0.091 -0.870 | |
| D | 37 + 0.143 1.364 | 38 - 0.018 0.167 | 39 - -0.013 -0.120 | 40 - -0.101 -0.958 | 41 - -0.138 -1.319 | 42 - -0.114 -1.089 | 43 - -0.040 -0.385 | 44 - -0.052 -0.497 | 45 -0.124 -1.185 | 46 -0.152 -1.448 | 47 - -0.123 -1.169 | 48 - -0.043 -0.406 | |
| E | 49 + 0.160 1.521 | 50 - 0.007 0.067 | 51 - -0.042 -0.399 | 52 - -0.118 -1.127 | 53 - -0.134 -1.275 | 54 - -0.113 -1.072 | 55 - -0.067 -0.634 | 56 - -0.074 -0.709 | 57 - -0.149 -1.415 | 58 -0.136 -1.292 | 59 - -0.087 -0.826 | 60 - -0.061 -0.585 | |
| F | 61 + 0.636 6.061 | 62 + 0.909 8.656 | 63 + 0.590 5.615 | 64 + 0.401 3.823 | 65 + 0.544 5.183 | 66 + 0.679 6.471 | 67 + 0.746 7.108 | 68 + 0.581 5.532 | 69 + 0.406 3.863 | 70 + 0.522 4.971 | 71 + 0.796 7.579 | 72 + 0.668 6.359 | |
| G | 73 + 0.155 1.472 | 74 - 0.022 0.213 | 75 - -0.085 -0.808 | 76 - -0.105 -1.002 | 77 - -0.080 -0.761 | 78 - -0.036 -0.342 | 79 - -0.049 -0.471 | 80 - -0.121 -1.149 | 81 - -0.121 -1.156 | 82 - -0.079 -0.754 | 83 - -0.047 -0.445 | 84 -0.132 -1.253 | Print Save |
| н | 85 + 0.179 1.703 | 86 0.041 0.393 | 87 -0.038 -0.365 | 88 -0.040 -0.377 | 89 0.015 0.138 | 90 - 0.002 0.021 | 91 -0.043 -0.414 | 92 - -0.071 -0.676 | 93 -0.058 -0.552 | 94 - 0.000 0.003 | 95 -0.006 -0.056 | 96 -0.055 -0.527 | Return |

Results in Quantitative Mode

In quantitative mode, the test results are displayed on each well, with upper line of sample ID, middle line of absorbance and lower line of concentration. If the concentration of a well cannot be calculated, an asterisk "*" appears. Empty wells will display nothing. For the standard and blank wells, only absorbance value is displayed without quantitative result.

Figure 4-15 Quantitative Test Results

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|-------------------------|-------------------------|------------------------|------------------------|----------------------------|----------------------|----------------------|------------------------|----------------------|----------------------|----------------------|----------------------|---------------|
| A | 1 -4.737 × RI | 2 2.997 × RI | 3 2.694 × RI | 4 2.387 × RI | 5 2.076 4.794 RI | 6 1.752 3.000 | 7 1.402 2.000 | 8 0.983 × RI | 9 1.973 4.000 | 10 1.973 4.000 | 11 1.973 4.000 | 12 1.973 4.000 | |
| в | 13 -4.737 × | 14 2.997 × RI | 15 2.694 × | 16 2.387 × RI | 17 2.076 4.794 BI | 18 1.752 3.000 | 19 1.402 2.000 | 20 0.983 × RI | 21 1.973 4.000 | 22 1.973 4.000 | 23 1.973 4.000 | 24 1.973 4.000 | |
| С | 25 -4.737 × | 26 2.997 × RI | 27 2.694 × RI | 28 2.387 × RI | 29 2.076 4.794 RI | 30 1.752 3.000 | 31 1.402 2.000 | 32 0.983 × RI | 33 1.973 4.000 | 34 1.973 4.000 | 35 1.973 4.000 | 36 1.973 4.000 | |
| D | 37 -4.737 × | 38 2.997 × RI | 39 2.694 × | 40 2.387 × RI | 41 2.076 4.794 RI | 42 1.752 3.000 | 43 1.402 2.000 | 44 0.983 × RI | 45 1.973 4.000 | 46 1.973 4.000 | 47 1.973 4.000 | 48 1.973 4.000 | |
| E | 49 -4.737 -81 | 50 2.997 × RI | 51 2.694 × RI | 52 2.387 × RI | 53 2.076 4.794 RI | 54 1.752 3.000 | 55 1.402 2.000 | 56 0.983 * RI | 57 1.973 4.000 | 58 1.973 4.000 | 59 1.973 4.000 | 60 1.973 4.000 | |
| F | 61 -4.737 -81 | 62 2.997 .* RI | 63 2.694 * RI | 64 2.387 × RI | 65 2.076 4.794 RI | 66 1.752 3.000 | 67 1.402 2.000 | 68 0.983 * RI | 69 1.973 4.000 | 70 1.973 4.000 | 71 1.973 4.000 | 72 1.973 4.000 | |
| G | 73 -4.737 × RI | 74 2.997 × RI | 75 2.694 × RI | 76 2.387 × RI | 77 2.076 4.794 BI | 78 1.752 3.000 | 79 1.402 2.000 | 80 0.983 × RI | 81 1.973 4.000 | 82 1.973 4.000 | 83 1.973 4.000 | 84 1.973 4.000 | Print Save |
| Н | 85 -4.737 -81 | 86 2.997 × BI | 87 2.694 × BI | 88 2.387 × BI | 89 2.076 4.794 BI | \$3 1.752 | S2 1.402 | S1 0.983 | S4 1.973 | 90 1.973 4.000 | 91 1.973 4.000 | 92 1.973 4.000 | Return |

Results in Calibration Mode

For the standard wells, only absorbance value is displayed without concentration. If the calibration curve cannot be produced according to the calibration parameters and absorbance you've configured, the system will alert you to run a calibration again.



Figure 4-16 Calibration Results

Results in Quality Control (QC) Mode

In QC mode, the wells for quality control display the absorbance value, the wells for qualitative tests display the S/Co value, and the wells for quantitative tests display the concentration. If the QC result is beyond the calibration curve range or out of control, the system will trigger an error message as follows.

| | , | | | | | | , | | | | | |
|---|----------|-------------------------|---------|--------|--------------|------------|-------------|------------------|-------|--------|----|--------|
| | Move M | lode © ^{Cc} | nti | Place | Mode "O` | Ver | Sh Spe | aking ed None | • | Time [| | |
| | Sample | E | 3lank | NC- | | PC+ | CoC | irl 🛛 | STD | Q | : | Del |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | QC | QC | QC | QC | QC | QC | QC | QC | QC | QC | QC | QC |
| В | 1 | 2 | 😲 Alarm | | | | | | | | 11 | 12 |
| С | 13 | 14 | G |) AFP1 | 'his test is | out of con | trol | | | | 23 | 24 |
| D | 25 | 26 | | / | | | | | | | 35 | 36 |
| Е | 37 | 38 | | | | | | 1 | | | 47 | 48 |
| F | 49 | 50 | | | | | UK | | | | 59 | 60 |
| G | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| Н | 73 | 74 | 75 | 76 | 77 | S3 | S2 | S1 | 78 | 79 | 80 | 81 |
| Т | est: AFP | _ | | | | Calc N | /lode: Line | ar | | _ | | |
| | New | | | All | | Cle | ar | | Start | | | Return |

Figure 4-17 QC Results (out of control)

4.3 Result Review

The MR-96A provides two modes for result query: by plate and by test.

Figure 4-18 Select Query Mode

| Condition | | |
|-----------|------|--------|
| By Plate | O By | Test |
| | ОК | Cancel |
| | | Cancer |

Query by Plate

Select the date and enter the desired plate No. The screen displays as follows.



NOTE

The results displayed on the plate are obtained from the latest measurement of the current day.

Figure 4-19 Query by Plate

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------|
| А | 1 + 0.426 | 1 - 0.080 | 2 - 0.087 | 2 - 0.015 | 3 - 0.034 | 3 - -0.039 | 4 - 0.003 | 4 - 0.075 | 5 - -0.005 | 5 - -0.035 | 6 - -0.024 | 6 - -0.021 | Test: |
| В | 7 + 0.171 | 7 - 0.012 | 8 - 0.014 | 8 - -0.017 | 9 - -0.079 | 9 - -0.060 | 10 - -0.044 | 10 - -0.029 | 11 - -0.034 | 11 - -0.095 | 12 - -0.062 | 12 - -0.067 | HBsAb |
| С | 13 + 0.108 | 13 - 0.027 | 14 - -0.018 | 14 - -0.025 | 15 - -0.068 | 15 - -0.047 | 16 - -0.004 | 16 - -0.047 | 17 - -0.055 | 17 - -0.056 | 18 - -0.042 | 18 - -0.023 | Plate No. |
| D | 19 + 0.164 | 19 - 0.045 | 20 - -0.026 | 20 - -0.103 | 21 - -0.074 | 21 - -0.064 | 22 - -0.031 | 22 - -0.051 | 23 - -0.118 | 23 - -0.072 | 24 - -0.051 | 24 - -0.038 | 2 Date |
| E | 25 + 0.182 | 25 - 0.010 | 26 - -0.030 | 26 - -0.085 | 27 - -0.075 | 27 - -0.056 | 28 - -0.085 | 28 - -0.081 | 29 - -0.093 | 29 - -0.073 | 30 - -0.016 | 30 - -0.061 | Previous |
| F | 31 - -0.590 | 31 - -0.809 | 32 - -0.770 | 32 - -0.574 | 33 - -0.556 | 33 - -0.428 | 34 - -0.602 | 34 - -0.750 | 35 - -0.572 | 35 - -0.543 | 36 - -0.525 | 36 - -0.681 | Next |
| G | 37 + 0.179 | 37 - 0.037 | 38 - -0.059 | 38 - -0.047 | 39 - -0.026 | 39 - -0.031 | 40 - -0.043 | 40 - -0.075 | 41 - -0.056 | 41 - -0.004 | 42 - -0.056 | 42 - -0.085 | Delete |
| н | 43 + 0.209 | 43 - 0.069 | 44 - 0.019 | 44 - 0.008 | 45 - 0.057 | 45 - 0.008 | 46 - -0.031 | 46 - -0.003 | B -0.033 | NC 0.018 | PC 0.016 | | Return |

The following table introduces the buttons on the screen.

| Button | Function |
|----------|--|
| Date | Select the date to search for desired test results. |
| Previous | Select to view the test results of the previous plate. |
| Next | Select to view the test results of the next plate. |
| Print | Click this button to print all test data on the current plate. |
| | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|
| A | 1 + 0.426 | 1 - 0.080 | 2 - 0.087 | 2 - 0.015 | 3 - 0.034 | 3 - -0.039 | 4 - 0.003 | 4 - 0.075 | 5 - -0.005 | 5 - -0.035 | 6 · -0.024 | 6 - -0.021 | Test: |
| В | 7 + 0.171 | 7 - 0.012 | 8 - 0.014 | 8 - -0.017 | 9 - -0.079 | 9 - -0.060 | 10 - -0.044 | 10 - -0.029 | 11 - -0.034 | 11 - -0.095 | 12 - -0.062 | 12 - -0.067 | HBsAb |
| C | 13 + 0.108 | 13 - 0.027 | 14 · | 14 · lect | 15 - | 15 - | 16 - | 16 - | 17 - | 17 - | 18 | 18 - -0.023 | Plate No |
| D | 19 + 0.164 | 19 - 0.045 | | Are | e you sure | to delete? | ? | | | | 51 | 24 - -0.038 | 2 Date |
| E | 25 + 0.182 | 25 - 0.010 | | | Y | 'es | | No | | | 16 | 30 - -0.061 | Previou |
| F | 31 - -0.590 | 31 - -0.809 | 32 · -0.770 | 32 - -0.574 | 33 - -0.556 | 33 - -0.428 | 34 - -0.602 | 34 - -0.750 | 35 · -0.572 | 35 · -0.543 | 36 - -0.525 | 36 - -0.681 | Next Print |
| G | 37 + 0.179 | 37 - 0.037 | 38 - -0.059 | 38 - -0.047 | 39 - -0.026 | 39 - -0.031 | 40 - -0.043 | 40 - -0.075 | 41 - -0.056 | 41 - -0.004 | 42 - -0.056 | 42 - -0.085 | Delete |
| н | 43 + 0.209 | 43 - 0.069 | 44 - 0.019 | 44 - 0.008 | 45 - 0.057 | 45 - 0.008 | 46 - -0.031 | 46 - -0.003 | B -0.033 | NC 0.018 | PC 0.016 | | Return |

| Return Click this button to return to the main scree | Return | Click this button to return to the main screer |
|--|--------|--|
|--|--------|--|

Query by Test

The results of the current day are displayed by test in the order of test time.

The query by test screen is show below.

Figure 4-20 Query by Test

| Test | Date/Time | | | | |
|-------|-------------------|-------|--------|------|--------|
| Н | 20070424 16:27:01 | | | | |
| HBsAb | 20070424 16:29:52 | | | | |
| AFP | 20070424 16:53:48 | | | | |
| CEA | 20070424 16:55:27 | | | | |
| 11 | 20070424 17:21:25 | | | | |
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| 1 | | | | | |
| | | | | | 1 |
| | Sur | nmary | Result | Date | Return |
| | | | | | |
| | | | | | |

The following table introduces the buttons on the screen.

| Button | Function | |
|---------|---|--|
| Summary | Select this bu specified test The following o | and condition. Select a test and select <i>Summary</i> . dialog box pops up. |
| | Test | HBsAg |
| | Lomments | Negative- |
| | | |
| | Test | HBsAg |
| | Comments | Negative- |
| | | Position+ Doubtful± |
| | | All |

Select a test and result type, then select OK. The following screen is displayed.

| Button | Functio | n | | | | | | |
|--------|---------|--------|-----|-----------|---------|------|----------|----------|
| | Patient | Gender | Age | Sample ID | Result | Unit | Comments | |
| | | | 0 | 1 | -9.081 | S/CO | | |
| | | | 0 | 1 | -12.199 | S/CO | | |
| | | | 0 | 2 | 0.137 | S/CO | | |
| | | | 0 | 2 | -3.512 | S/CO | | |
| | | | 0 | 5 | -0.193 | S/CO | | |
| | | | 0 | 5 | 0.237 | S/CO | | |
| | | | 0 | 6 | -0.089 | S/CO | | |
| | | | 0 | 6 | -0.134 | S/CO | | |
| | | | 0 | 7 | 0.250 | S/CO | | |
| | | | 0 | 7 | 0.177 | S/CO | | |
| | | | 0 | 8 | 0.243 | S/CO | | |
| | | | 0 | 8 | -0.068 | S/CO | | |
| | | | 0 | 9 | -0.643 | S/CO | | |
| | | | 0 | 9 | 0.349 | S/CO | | |
| | | | 0 | 10 | -0.802 | S/CO | | |
| | | | 0 | 10 | -0.539 | S/CO | | |
| | | | 0 | 11 | -0.333 | S/CO | | T |
| | , | | | | | | Print | Cancel |

Select *Cancel* to return to the Query by Test screen.

Result

On the Query by Test screen, select a test and click **Result**. All results of the test are displayed on the screen.

| Sample ID | Result | Unit | Comments | Reference |
|-----------|--------|----------|----------|-----------|
| 1 | 0.765 | <i>.</i> | | <1.000 |
| 1 | 4.053 | | + | <1.000 |
| 2 | 0.139 | | • | <1.000 |
| 2 | 0.830 | | • | <1.000 |
| 3 | -0.371 | | • | <1.000 |
| 3 | 0.320 | | • | <1.000 |
| 4 | 0.026 | | • | <1.000 |
| 4 | 0.714 | | • | <1.000 |
| 5 | -0.052 | | • | <1.000 |
| 5 | -0.332 | | • | <1.000 |
| 6 | -0.198 | | • | <1.000 |
| 6 | -0.229 | | • | <1.000 |
| 7 | 0.119 | | • | <1.000 |
| 7 | 1.629 | | + | <1.000 |
| 8 | -0.164 | | • | <1.000 |
| 8 | 0.134 | | • | <1.000 |
| 9 | -0.569 | | • | <1.000 |
| | | | Cance | 9 |

Select *Cancel* to return to the Query by Test screen.

| Button | Func | tion | | | | | | | | | |
|--------|-------|------|---------|----|------|-----|-------|---------|-----------|----------|-----------|
| Date | Click | this | button | to | view | the | histo | ory tes | t results | of the | specified |
| | date. | | | | | | | | | | |
| | | | | | | | | | | | |
| | | • / | April 🕨 | | | | | | | ◆ 2007 ▶ | Ī |
| | | Sun | Mon | | Tue | W | ed | Thu | Fri | Sat | |
| | | | 1 : | 2 | 3 | | 4 | 5 | 6 | 7 | |
| | | | 8 : | 9 | 10 | | 11 | 12 | 13 | 14 | |
| | | 1 | 5 1 | 6 | 17 | | 18 | 19 | 20 | 21 | |
| | | 2 | 2 2 | 3 | 24 | | 25 | 26 | 27 | 28 | |
| | | 2 | 9 3 | 0 | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | OK | Cance | ı |

Return

Click this button to return to the main screen.

4.4 Reports

The reports function allows you to enter and edit the patient information and print them out together with corresponding test results on the current day. The printout by an external printer is shown below.

| Patient: John Gender: Male Patient ID: 070207 | Sample ID: (Acie: 25 years | 021 | Departme Bed No.: | nt: Surgery 6010 |
|--|--|-----------------------------|----------------------|---------------------|
| Test | Result | Unit | Comments | Reference |
| HBsAg(HBsAg) | 45.34 | s/co | Positive * | <1.00 |
| HBsAb(HBsAb) | 0.26 | s/co | Negative | <1.00 |
| HBeAg(HBeAg) | 44.00 | s/co | Positive * | <1.00 |
| HBeAb(HBeAb) | 6.30 | s/co | Negative | >1.00 |
| HbcAb(HbcAb) | 0.04 | s/co | Positive * | >1.00 |
| | | | | |
| Sender: Doctor Xu Test Date: 2007-02-02 ☆Tips:The results are for this : | Tester: C Print Time: sample only. | octor Wang 2007-02-02 20 | Review 0:33:00pm | er ; Doctor Zhao |

Figure 4-21 Patient Report

Select *Reports* on the main screen. The following screen is displayed.

Figure 4-22 Reports screen 1

| Prompt X | |
|----------|------------------|
| | |
| | ▼ ▶ Return |

Figure 4-23 Reports screen 2

| | No. | Patient | Sample ID | Date | Gender | Age | Department |
|---|-------------------|---------|-----------|------------------|--------|------|------------|
| | 20070424162702168 | | 1 | 20070424 16:27:0 | | 0 | |
| | 20070424162702195 | | 2 | 20070424 16:27:0 | | 0 | L |
| | 20070424162702719 | | 3 | 20070424 16:27:0 | | 0 | |
| | 20070424162702596 | | 4 | 20070424 16:27:0 | | 0 | |
| | 20070424162954593 | | 5 | 20070424 16:29:5 | | 0 | |
| | 20070424162954269 | | 6 | 20070424 16:29:5 | | 0 | |
| | 20070424162954172 | | 7 | 20070424 16:29:5 | | 0 | |
| | 20070424162954173 | | 8 | 20070424 16:29:5 | | 0 | |
| | 20070424162954143 | | 9 | 20070424 16:29:5 | | 0 | |
| | 20070424162954141 | | 10 | 20070424 16:29:5 | | 0 | |
| | 20070424162954485 | | 11 | 20070424 16:29:5 | | 0 | |
| | 20070424162954327 | | 12 | 20070424 16:29:5 | | 0 | |
| | 20070424162954521 | | 13 | 20070424 16:29:5 | | 0 | |
| | | | | | | | Þ |
| A | ٨dd Modify | Delet | e | Result | rint | Date | Return |
| | | | | | | | |



NOTE

All test results of a sample ID on the current day are gathered by the system. While programming tests, please ensure same IDs correspond to one patient.

The following table introduces the buttons on the screen.

| Button | Function | | | | | |
|--------|---|--|--|--|--|--|
| Add | Click this button to add a new patient. | | | | | |
| Modify | Select a patient and click this button to change the patient information. | | | | | |

Delete Click this button to delete the selected patient. Select a patient from the Reports screen, and click **Delete**. The confirm dialog box pops up. Select **Yes** to delete the patient and associated test results.

| No. | Patie | nt Sample | ID I | Date | Gender |
|------------|-------------|----------------------------------|----------------------|-------------------|--------|
| 2007042416 | 2702168 | 1 | 2 | 20070424 16:27:02 | |
| 2007042416 | 2702195 | 2 | 2 | 20070424 16:27:02 | |
| 2007042416 | 2702719 | 3 | 2 | 20070424 16:27:02 | |
| 2007042416 | 2702596 | 4 | 2 | 20070424 16:27:02 | |
| 2007042416 | 2954593 | 5 | â | 20070424 16:29:54 | |
| 2007042416 | 2 Select | | | | |
| 2007042416 | 2 | | | | |
| | 🌔 A | I test results of this patient w | vill be deleted. Con | ltinue? | |
| 2007042416 | 2: | | | | |
| 2007042416 | 2: | Yes | No | | |
| 2007042416 | 2: | | 110 | | |
| 2007042416 | 2954327 | 12 | 2 | 20070424 16:29:54 | |
| 2007042416 | 2954521 | 13 | 2 | 20070424 16:29:54 | |
| d | | | | | Þ |
| Add | Modify | Delete Result | Print | Date | Return |

Result Select a patient and click *Result*. You can review all test results of the patient.

Print

Click this button to print out the test results of the selected patient. Multiple patient results can be printed out at one time.

| | No. | Patient | Sample ID | Date | Gender | Age | Department 🔺 |
|---|-------------------|---------|-----------|------------------|--------|------|--------------|
| × | 20070424162702168 | | 1 | 20070424 16:27:0 | | 0 | |
| × | 20070424162702195 | | 2 | 20070424 16:27:0 | | 0 | |
| × | 20070424162702719 | | 3 | 20070424 16:27:0 | | 0 | |
| × | 20070424162702596 | | 4 | 20070424 16:27:0 | | 0 | |
| | 20070424162954593 | | 5 | 20070424 16:29:5 | | 0 | |
| | 20070424162954269 | | 6 | 20070424 16:29:5 | | 0 | |
| | 20070424162954172 | | 7 | 20070424 16:29:5 | | 0 | |
| | 20070424162954173 | | 8 | 20070424 16:29:5 | | 0 | |
| | 20070424162954143 | | 9 | 20070424 16:29:5 | | 0 | |
| | 20070424162954141 | | 10 | 20070424 16:29:5 | | 0 | |
| | 20070424162954485 | | 11 | 20070424 16:29:5 | | 0 | |
| | 20070424162954327 | | 12 | 20070424 16:29:5 | | 0 | |
| | 20070424162954521 | | 13 | 20070424 16:29:5 | | 0 | |
| • | | | | | | | Ľ |
| 4 | Ndd Modify | Delete | e F | esult P | rint | Date | Return |

When selected, the test result is indicated by an asterisk "*". To deselect the result, click on other place and then click the result again. The "*" will disappear. Select multiple test results and click *Print*. All results indicated by "*" are printed out.

| Button | Function |
|--------|---|
| Date | Click this button to view the history test results of specified date. |
| Return | Click this button to return to the main screen. |

4.4.1 Entering Patient Information

Select *Add* on the Reports screen. The Edit Patient Information screen is displayed.

|--|

| Patient Tommy Sample ID 1 |
|---------------------------------|
| Age 25 Gender Male 💌 |
| Department surgery Tester David |
| Sender Jack Bed No. 15 |
| Patient ID 20070401 |
| |
| 0K Cancel |

The following table explains the fields on the screen.

| Field | Description |
|------------|--|
| Name | Enter the name of patient. This field is not required. |
| Sample ID | Enter the sample ID of patient. This field is required. |
| Age | Enter the patient age. This field is not required. |
| Gender | Select patient gender from the drop-down list box. The options include <i>Mail</i> , <i>Female</i> and <i>Unknown</i> . This field is not required. |
| Department | Select a department from the drop-down list box. You should first configure the department information on the Dictionary screen. This field is not required. |
| Tester | Select a tester from the drop-down list box. You should first configure the tester information on the Dictionary screen. This field is not required. |
| Sender | Select a sender from the drop-down list box. You should first configure the sender information on the Dictionary screen. This field is not required. |
| Bed No. | Enter the bed No. of patient. This field is not required. |

| Field | Description |
|------------|--|
| Patient ID | Enter the patient ID of patient. This field is not required. |

4.4.2 Modifying Patient Information

Select *Modify* on the Reports screen. You can edit the patient information as needed. Refer to 4.3.1 Entering Patient Information for details.

4.4.3 Inquiring Test Result

Select a patient on the Reports screen and select *Result*. All test results of the patient are displayed.

| Test | Full Name | Result | Unit | Comments | Reference |
|-------|------------------------|-----------------------------------|---|--|---|
| HBsAb | | 0.765 | S/CO | | <1.000 |
| HBsAb | | 4.053 | S/CO | + | <1.000 |
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| | | 1 | | | |
| | | Modify | Print | Delete | Close |
| | | | | | |
| | | | | | |
| | Test HBsAb HBsAb | Test Full Name HBsAb HBsAb | Test Full Name Result HBsAb 0.765 HBsAb 4.053 | Test Full Name Result Unit HBsAb 0.765 S/C0 HBsAb 4.053 S/C0 | Test Full Name Result Unit Comments HBsAb 0.765 S/CD - HBsAb 4.053 S/CD + |

Figure 4-25 Inquiring Test Results screen

The following table introduces the buttons on the screen.



Print

Click this button to print out all test results currently displayed.

| Button | Functio | on | | | | | |
|--------|--|---|--|--|--------------------------------|-------------------------|--------------------------------------|
| Delete | Select a The cor select A | a test on th nfirm dialo lo to abort | he Inquiring og box pops t the deletio | Test F s up. S n. | tesults sc elect Yes | reen and o to delete | click <i>Delete</i> . the data or |
| | No. | Test | Full Name | Besult | Unit | Comments | Beference |
| | 1 | HBsAg | Henatitis B surfac | 2 216 | S/C0 | + | <0.900 |
| | 2 | HBsAb | riopadito bi ouriac | -0.371 | S/C0 | | <1.000 |
| | 2 | HBsAb | | 0.320 | S/C0 | | <1.000 |
| | | ∲ Sel | lect | | | | |
| | | Ę | Are you sure to d | elete? | | | |
| | | | Yes | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | No | | |
| | <u> </u> | | | | | | |
| | | | | Modify | Print | Delete | Close |
| Close | Click th | is button to | o return to t | he mai | n screen. | | |

4.5 System Setup

Select System Setup on the mains screen. The System Setup screen is displayed. You can set up the hospital information, date and time, dictionary, adjust the screen display and delete history data, upload data, etc.



| | | Version 01.05.00.11 0.0 |
|---------------------|--|----------------------------|
| Hospital | | DataSend |
| Date | ✓ June ► | Maintance |
| | Sun Mon Tue Wed Thu Fri Sat 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 | |
| Date/Time | 0 HH 0 MM 6 SS | |
| Contrast Brightness | Print Setup Internal | • • |
| Adjust Screen | Dictionary Delete History OK | Return |

The following table explains the fields on the screen.

| Field | Description |
|------------------|--|
| Hospital | Enter the hospital name in the edit box. |
| Date | Click • and • on two sides of month and year to set the date, then select a day in the date list. |
| Time | Enter the time in the edit boxes next to <i>HH</i> (hour), <i>MM</i> (month) and <i>SS</i> (second). |
| Contrast | Use "-" and "+" to adjust the contrast of the screen. |
| Brightness | Use "-" and "+" to adjust the brightness of the screen. |
| Printer Setup | Select <i>Internal</i> or <i>External</i> from the drop-down list. You can print test results using an internal recorder or an external printer. See 1.6 Printing Device for details. |
| | Internal |

| Internal | |
|----------|---|
| External | |
| | |
| | |
| |] |

Report/pag It is only valid to external printer. You can set to print one report or two reports on one report sheet.

| Button | Function |
|-------------------|--|
| DataSend | When the system is connecting the data management software, click this button to send test information, results and etc to the management software. |
| Maintenan ce | Only available to the service personnel of Mindray or the local distributor. |
| Adjust Screen | When the screen display deviates, that is, the clicking position does not match the pointer, the entering may be degraded and you can click the <i>Adjust Screen</i> button to correct the screen display. |
| Dictionary | Click this button to set up senders, departments, testers and concentration units. |
| Delete History | Click this button to delete specified history test results. |
| OK | Click this button to save your settings. |
| Return | Click this button to return to the main screen. |

Follow this procedure to adjust screen display. Select *Adjust Screen* on the System Setup screen. The following screen appears. Click the red point on the screen using the touch pen.

Figure 4-27 Adjust Screen 1

| • | |
|---|---|
| | |
| | Please enter the first calibration point |
| | |
| | |
| | |

Figure 4-28 Adjust Screen 2



Figure 4-29 Adjust Screen 3



When adjustment is finished successfully, the message "Calibration succeeded" will appear. Otherwise, the system alerts you with "Calibration failed", and you should adjust again.
Figure 4-30 Adjust Screen 4



Select *Dictionary* on the System Setup screen. The following table introduces the buttons on the screen.



Select *Delete History* on the System Setup screen. The following screen is displayed.



Figure 4-31 Delete History screen



| | Hospital | Version 01.00.00 0.0 Hospital |
|--------|---------------------|--|
| | Date | April > 4 2007 > Sun Mon Tue Wed Thu Fri Sat 1 2 3 4 5 6 7 Data deleted |
| | Date/Time | ΟΚ |
| | Contrast Brightness | Print Setup Internal |
| | Adjust Screen | Dictionary Delete History OK Return |
| Cancel | Click this butto | on to return to the previous screen. |

4.6 Quality Control (QC)

Before programming quality controls, you should set up the quality control of the tests. Select **QC** on the main screen, the following screen is displayed.

| Test H | - | Judgment Criteria |
|----------------|---|---|
| НВсАЬ | | ☐ 1 control value exceeds ± |
| HBeAg | | \Box 2 values exceed ± 2SD |
| HBsAb HBsAg | | ☐ 5 values lie on one side of ± 2SD ☐ 7 values lie on one side of the hor. axis |
| Lot No | | |
| Mean | - | Delete QC Data of Current Month |
| SD | | Month Jan 💌 Search |
| | | OK Return |

Figure 4-32 Quality Control screen

The following table explains the fields on the screen.

| Field | Description |
|-------|--|
| Test | Select a test for which you want to run quality control. |
| | |

Field Description

Judgment Criteria There are four criteria provided to judge the QC results. You can select one or all of them as needed. If a QC result is out of control, the system will alert you as follows.





NOTE

If none of the four conditions is selected, the system will not judge whether the QC result is out of control or not.

Lot No.

Enter the lot No. of the control solution. If the lot No. is not entered, the following message will be triggered.



Mean

Enter the mean concentration of the selected control solution. If the mean concentration is not entered, the following message will be triggered.

| 😍 Error | |
|---------------|----------------------------|
| | Mean value cannot be empty |
| $\overline{}$ | |
| | |
| | ОК |

| Field | Description | |
|-------|--|--|
| SD | D Enter the standard deviation of the selected control solution. If t standard deviation is not entered, the following message will triggered. | |
| | 😍 Error | |
| | SD cannot be empty | |
| | ОК | |
| Month | Select a month that you want to review the QC results. | |

| \wedge | NOTE |
|------------|---|
| <u>/:\</u> | Among the multiple QC results of a test during a day, only the last one is saved. |

The following table introduces the buttons on the screen.

| - | |
|---|--|
| Button | Function |
| Clear QC Data of Current Month | Click this button to clear all QC data of the current month. The confirm dialog box pops up. Select Yes to delete the data or select No to abort the deletion. |
| | 2 Judgment Citeria |
| | 4 □ 1 control value exceeds ± |
| | 5 |
| | AFP Abs Are you sure to delete all QC data of current month? |
| | Lot No. |
| | Mean 50 Delete QC Data of Current Month |
| | SD 2 Month Jan 💌 Search |
| | 0K Return |
| | |



4.7 Logs

| Date/Time | Event | Туре | |
|-------------------|----------|--------|--------|
| 20070424 15:20:48 | Startup | Normal | |
| 20070424 18:02:14 | Startup | Normal | |
| 20070424 15:37:51 | Shutdown | Normal | |
| 20070424 15:37:14 | Startup | Normal | |
| 20070424 15:33:45 | Shutdown | Normal | |
| 20070424 15:33:34 | Startup | Normal | |
| 20070424 15:33:21 | Shutdown | Normal | |
| 20070424 15:31:23 | Startup | Normal | |
| 20070424 15:30:08 | Shutdown | Normal | |
| 20070424 15:29:56 | Startup | Normal | |
| 20070424 15:29:44 | Shutdown | Normal | |
| 20070424 15:26:48 | Startup | Normal | |
| 20070424 15:26:35 | Shutdown | Normal | |
| | | Delete | Return |
| | | | |

Figure 4-33 Logs screen

On the Logs screen you can review the event logs of the MR-96A.

Each log should include the following information:

- Date/Time
- Event
- Туре

The log type includes Normal and Error.

- Normal: startup, shutdown, etc
- Error: startup failure, shutdown failure, etc.

The logs are generated by the system and arranged by time. When the database is full, the earliest records will be deleted. Select **Delete**. The confirm dialog box pops up. Select **Yes** to delete all logs currently displayed. Or select **No** to abort the deletion.

Figure 4-34 Confirm dialog box-Delete logs

| Date/Time | Event | Туре | |
|-------------------|-------------------------|--------|--------|
| 20070424 15:20:48 | Startup | Normal | |
| 20070424 18:02:14 | Startup | Normal | |
| 20070424 15:37:51 | Shutdown | Normal | |
| 20070424 15:37:14 | Startup | Normal | |
| 20070424 15:33:45 | Shutdown | Normal | |
| 20070424 15:33:34 | Select | | |
| 20070424 15:33:21 | • Arr way way to delay? | | |
| 20070424 15:31:23 | | | |
| | | | |
| 20070424 15:29:56 | Yes | No | |
| 20070424 15:29:44 | | | |
| 20070424 15:26:48 | Startup | Normal | |
| 20070424 15:26:35 | Shutdown | Normal | |
| | | | |
| | | Delete | Return |
| | | | |

4.8 Shutdown

Select Shutdown on the main screen. The following message appears.

| Selec | st | | |
|-------|---------------------------|-------------|---|
| | Are you sure to shut down | the system? | |
| ~ | | | |
| | | | 1 |
| | Yes | No | |

Select **Yes**. The shutdown procedure is started and will last for about 15 seconds. Select **No** to return to the main screen.

| Prompt | X | |
|-------------|---|----------------------------------|
| | Saving data to FLASH. Please wait | |
| | | |
| | |] |
| \wedge | CAUTION | |
| <u>/:</u> \ | Please ensure the instrument is always conn shutdown process. If the power is interrupt | ected to power ed or switched |

When data is saved, the system will remind you to switch off the power.

shutdown process, the data may be lost.

| Error | |
|-------|---|
| ٩ | Data is saved successfully. You can switch off the power now! |
| | OK |



CAUTION

Do not switch on the power immediately after switching off it. Please wait for at least 30 seconds prior to next startup.

Advanced Operations

5 Maintenance and Troubleshooting

5.1 Tools Required for Maintenance

The following tools will be used for maintenance of the system.

- Hex wrenches (M1.5, M3 and M4)
- Cross-headed screwdrivers (large, medium and small)
- Needle tube
- Tweezers
- Clean gauze
- scissors

5.2 Cleaning

5.2.1 Cleaning Instrument Panels

The MR-96A Microplate Reader is a precise measuring instrument and should be maintained properly to ensure best performance.

Perform the following steps to maintain the instrument:

- Keep the operating environment dry and clean. Cover the measurement assembly after using the instrument everyday to avoid dust ingression.
- Switch off the power supply. Use clean soft cloth dipped with distilled water to wipe the instrument panels and screen.



BIOHAZARD

Wear gloves while cleaning the instrument panels and screen.

Before being serviced or packaged for transportation, the used instrument must be disinfected to avoid personal injury.

5.2.2 Cleaning Recorder

Paper scrap and foreign matters may accumulate on the print head of the recorder which has been used for a long period, and will affect the print quality and service life of the print head and roll shaft.

Follow this procedure to clean the recorder:

- 1 Before cleaning, take necessary measures to avoid damage to the recorder by static charge, such as wear disposable static rings, etc.
- 2 Open the recorder door and remove the recording paper.
- 3 Use cotton balls dipped with ethanol to wipe the print head.
- 4 Wait until the print head is dry, then install the recoding paper and close the recorder door.

5.3 Replacing Lamp



WARNING

Prior to replacement, disconnect the instrument from the power supply.

Follow the procedures in Figure 5-1 to replace the lamp.

Figure 5-1 Replacing Lamp





WARNING

Exercise caution while replacing the lamp. Otherwise you may get burnt. After switching off the power, please wait at least 15 minutes for the lamp to cool down prior to replacing the lamp.

Do not touch the converter while replacing the lamp.



NOTE

Use the lamp (OSRAM64255 8V 20W) specified by Mindray. Other lamp may degrade the system performance.

5.4 Troubleshooting

| Failure | | Probable Causes | | | | Corrective Actions |
|-------------------------|---------------------------|-------------------|------------------|------------|-----|---------------------------|
| The cannot powere | instrument be ed on | Power connecte | cord d propei | is rly. | not | Reconnect the power cord. |

| Failure | Probable Causes | Corrective Actions | |
|--|---|---|--|
| Abnormal sound | Microplate is blocked; | Relocate the microplate. | |
| occurs during operation | Foreign matters exist; | Remove the foreign matter; | |
| | Mechanical movement goes wrong | Contact Mindray customer service department or your local distributor. | |
| Light is too strong | Filter is not installed correctly | Check if the filter and filter wheel are installed correctly | |
| Light is too weak | Lamp is damaged | Replace the lamp | |
| Absorbance of one of the 8 | Photocell of the channel is damaged; | Contact Mindray customer service department or your local distributor. | |
| channels is incorrect | The fiber of the channel is damaged; | | |
| | The circuit of the channel is damaged; | | |
| Filter wheel keeps rotating and cannot stop at specified position | Position sensor goes wrong or the sensor cable is damaged | Contact Mindray customer service department or your local distributor. | |
| Microplate cannot be reset normally | Microplate position sensor goes wrong | Contact Mindray customer service department or your local distributor. | |
| While printing, | Paper jam occurs. | 1. Open the recorder door; | |
| occurs or recording paper is not output | | Remove the recording paper and cut off the crinkled part; | |
| correctly | | 3. Reinstall the recording paper and close the recorder door. | |



This chapter includes specifications, external printer, supplies and index.

Appendix A Specifications

| Environment for Use | Indoor use | | |
|-------------------------|---|--|--|
| Power supply | AC 100-240V~, 50/60Hz | | |
| Voltage fluctuation | ±10% | | |
| Power consumption | 120VA | | |
| Fuse | 250VAC T3.15A | | |
| Dimensions | 437mm×332mm×174mm (L×W×H) | | |
| Weight | 8.5kg | | |
| Input device | Touchscreen and touch pen | | |
| LCD | 7.8" LCD (resolution: 640×480, color: 8) | | |
| Operating temperature | 5℃-35℃ | | |
| Storage temperature | 0℃-40℃ | | |
| Relative humidity | 15%-85%, no condensation | | |
| Altitude height | -400m-3,000m (-1,300feet-6,500 feet) | | |
| Atmospheric pressure | 70 kPa-106kPa | | |
| Noise | No greater than 75dB | | |
| Communication interface | RS-232 serial port | | |
| Printer interface | USB port, which complies with the USB 2.0 protocol. | | |
| EMC | This instrument complies with the emission and immunity requirement description in this part of the EN 61326-1:2006 and EN 61326-2-6: 2006. | | |
| Safety Classification | Overvoltage type: II | | |
| | Pollution level: 2 | | |
| | Working Mode: Continuous | | |
| | IP(Ingress Protection):IPX0, (0 means not waterproof) | | |

The MR-96A is compatible with (not limited to) the following printers:

- HP 2568
- HP 2668
- HP 0J8000
- HP 0J6000

To ensure personal safety and system performance, use only supplies manufactured or recommended by Mindray. Contact the Mindray Customer Service Department or your local distributor for details.

| Part | Part No. | Location | Remark |
|----------------------------------|-------------------|-----------------------------|-------------------------|
| Lamp assembly | 801-0104-00016-00 | Lamp base | Regularly-replaced part |
| CPU board | 801-0104-00023-00 | On the bottom panel | As needed |
| Power supply board | 801-0105-00002-00 | On the t bottom panel | As needed |
| 7.8"LED displayer (touch screen) | 801-0104-00003-00 | On the panel | As needed |
| Analogue board | 051-001301-00 | On the carriage assembly | As needed |
| Carriage assembly | 801-0104-00020-00 | On the bottom panel | As needed |

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