



## Hb Hemoglobin Testing System

### User's Manual



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# Section 1 Introduction

The *Insight*<sup>®</sup> Hb Hemoglobin Testing System is intended for the quantitative determination of hemoglobin (Hb) and calculated hematocrit (Hct) in capillary and venous human whole blood. The easy to operate system consists of a portable meter that analyzes the intensity and color of light reflected from the reagent area of a test strip, ensuring quick and accurate results.

The *Insight*<sup>®</sup> Hb Hemoglobin Testing System provides results in less than 15 seconds and requires only a single drop of whole blood. The meter can store up to 1,000 results and records can be transferred to a computer for further analysis using the USB port. The meter can be operated by 3 AAA (1.5V) batteries or an optional AC adapter.

To ensure accurate results:

- Read instructions and complete any necessary training before use.
- Use the code chip that accompanies each box of test strips.
- Use only *Insight*<sup>®</sup> Hb Hemoglobin Test Strips with the *Insight*<sup>®</sup> Hb Hemoglobin Meter.
- For *in vitro* diagnostic use only.
- For professional use only.
- Test only whole blood specimens. EDTA or heparin anticoagulants can be used.
- Keep out of reach of children.

**Note:** Throughout this user guide, meter parts or functions will appear in **bold**. Items appearing on displays are identified in ***bold italics***.

## Section 2      Getting Started

Inspect the kit box, meter and accessories for any visible damage. For US customers, call customer service toll free at 1-(800)-838-9502 if any visible damage exists. For customers outside the US, contact your local distributor. Remove the meter and other packaging contents from the kit box. The starter kit consists of the following:



**Hb Meter**



**Canister of Test Strips**



**Code Chip**



**Control Strip**



**AAA Batteries**



**Carrying Case**



**Lancing Device**



**Sterile Lancets**

**For REF C111-3015:**

<b>No.</b>	<b>Component</b>	<b>Quantity</b>
1	Meter	1
2	Canister of Test Strips	1
3	Code Chip	1
4	Capillary Transfer Tubes/Droppers	25
5	AAA Batteries	3
6	Carrying Case	1
7	User's Manual	1
8	Test Strip Package Insert	1
9	Quick Reference Guide	1
10	Warranty Card	1

**For REF C111-3025:**

<b>No.</b>	<b>Component</b>	<b>Quantity</b>
1	Meter	1
2	Canister of Test Strips	1
3	Code Chip	1
4	Lancing Device	1
5	Sterile Lancets	10
6	Control Strips	2
7	Capillary Transfer Tubes/Droppers	10
8	AAA Batteries	3
9	Carrying Case	1
10	User's Manual	1
11	Quick Reference Guide	1
12	Test Strip Package Insert	1
13	Control Strip Package Insert	1
14	Lancing Device Package Insert	1
15	Warranty Card	1

**Hb Meter:** Reads the test strips and displays the hemoglobin (Hb) concentration and calculated hematocrit (Hct) value.

**Test Strips:** Part of the system and used with the meter to measure Hb concentration and calculated Hct in blood.

**Code Chip:** Automatically calibrates the meter with the code number when inserted into the meter.

**Capillary Transfer Tubes/Droppers:** Collects 10 µL of capillary blood for fingertip blood testing and accurate results.

**AAA Batteries :** Provides power for the meter.

**Carrying Case:** Provides portability for testing.

**User's Manual:** Provides detailed instructions on using the Hb Hemoglobin Testing System.

**Quick Reference Guide:** Provides a brief overview of the Hb Hemoglobin Testing System and testing procedures.

**Test Strip Package Insert:** Provides detailed instructions on using the Hb Hemoglobin Test Strips.

**Warranty Card:** Should be completed and returned to the distributor to qualify for the 2-year meter warranty.

**For REF C111-3025:**

**Lancing Device:** Used with sterile lancets to prick the fingertip for blood specimen collection. The packaged lancing device has multiple depth settings, allowing users to adjust the depth of the puncture and minimize discomfort. It can also eject the used lancets.

**Lancing Device Package Insert:** Provides detailed instructions on using the Lancing Device.

**Sterile Lancets:** Used with lancing device to draw blood specimens. Sterile lancets are inserted into the lancing device with each blood draw and discarded after use.

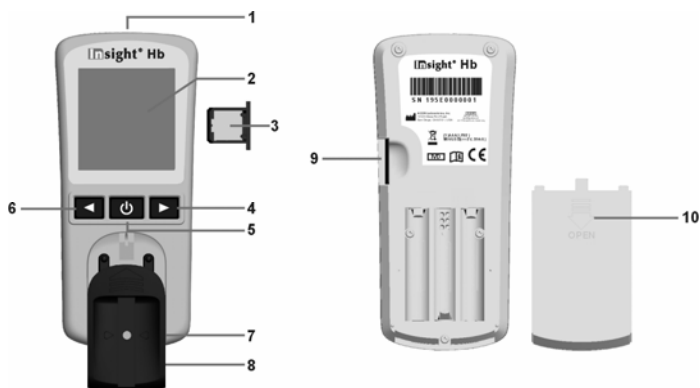
**Control Strip:** Verifies the proper operation of the meter by checking that the meter can detect a pre-calibrated value.

**Control Strip Package Insert:** Provides detailed instructions on using the Hb Hemoglobin Control Strips.

## Section 3 Components

The *Insight*<sup>®</sup> Hb Hemoglobin Meter reads the test strips and displays the hemoglobin (Hb) concentration and hematocrit (Hct) value. Use this diagram to become familiar with all the parts of your meter.

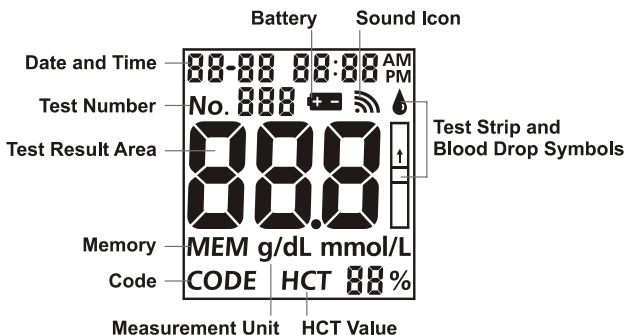
### Meter



- |   |                              |    |                     |
|---|------------------------------|----|---------------------|
| 1 | USB Port                     | 6  | Left Arrow ◀ Button |
| 2 | Liquid Crystal Display (LCD) | 7  | Strip Channel       |
| 3 | Code Chip                    | 8  | Test Strip Holder   |
| 4 | Right Arrow ▶ Button         | 9  | Code Chip Slot      |
| 5 | On/Off ⏻ Button              | 10 | Battery Cover       |

## Meter Display

During testing, the *Insight*<sup>®</sup> Hb Hemoglobin Meter will display icons showing the status, options available and prompts for testing:



**Sound Icon:** Appears when the sound is turned on.

**Battery:** Appears when the battery should be replaced.

**Test Number:** Indicates assigned test number.

**Test Result Area:** Indicates test result or displays menu options.

**Memory:** Indicates a test result is being recalled from memory.

**Code:** Indicates the code number of the test strips.

**Measurement Units:** Indicates the units for the test result.

**HCT Value:** Shows calculated Hct value.

**Test Strip and Blood Drop Symbols:** Indicates when to insert test strip or apply specimen.



## Meter Use and Precautions

- Do not get water or other liquids inside the meter.
- Keep the Strip Channel clean.
- Keep the meter dry and avoid exposing it to extreme temperatures or humidity.
- Do not drop the meter or get it wet. If meter is dropped or has gotten wet, ensure the meter is working properly by running an Optical Check. Refer to Optical System Check in Section 8 for details.
- Do not take the meter apart. Taking the meter apart will void the warranty.
- Refer to Section 10 Maintenance for details on cleaning the meter.
- Keep the meter and all associated parts out of reach of children.

**Note:** Follow proper precautions and all local regulations when disposing of the meter and used batteries.

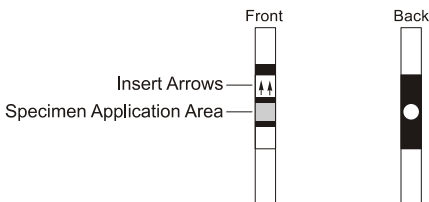
## All Hb systems preventive warnings with regard to EMC

1. This instrument is tested for immunity to electrostatic discharge as specified in IEC 61000-4-2. However, use of this instrument in a dry environment, especially if synthetic materials are present (synthetic clothing, carpets, etc.) may cause damaging static discharges that may cause erroneous results.
2. This instrument complies with the emission and immunity requirements described in EN 61326-1 and EN 61326-2-6. Do not use this instrument in close proximity to sources of strong electromagnetic radiation, as these may interfere with proper operation of the meter.
3. For professional use, the electromagnetic environment should be evaluated prior to operation of this device.

## Test Strips

The *Insight*® Hb Hemoglobin Test Strips are thin plastic strips which contain a chemical reagent system which works with the *Insight*® Hb Hemoglobin Meter to measure the hemoglobin (Hb) concentration in capillary and venous whole blood.

Each test strips appears as shown:

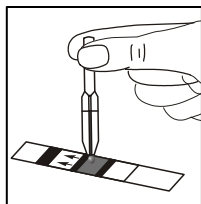


**Specimen Application Area** - After strip is inserted into the Strip Channel, apply a blood drop to the center of test strip. The Specimen Application Area is visible from the front and the back of the Test Strip.

**Insert Arrows** - Located on the front of the test strip, the arrows show the direction in which the test strip should be inserted.

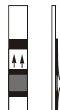
### Specimen Application

For best results, fill the Specimen Application Area with approximately 10  $\mu\text{L}$  of blood specimen. Incorrect results may occur if the specimen is not applied correctly, or if the Specimen Application Area is not filled.

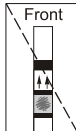


### Before Testing

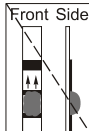
Front Side



Correct



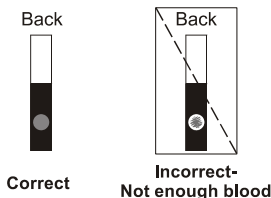
Incorrect-  
Not enough blood



Incorrect-  
Too much blood



After applying the specimen, ensure the Specimen Application Area is completely covered. The Specimen Application Area should remain covered throughout the entire test. If the Specimen Application Area is not covered, or if there is too much specimen covering the Specimen Application Area, repeat the test with a new test strip.

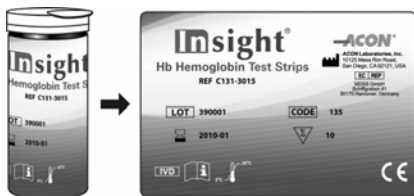
### After Testing



**Note:** Do not add more blood to the test strip if the specimen applied to the Specimen Application Area is too little. Error **E-5** or a low result may appear on the display. Discard the used strip and retest.

## Code Number

Each package of test strips is printed with a code number **CODE**, lot number **LOT**, unopened expiration date  and test quantity . Whenever a new canister is opened, mark the date on the label. Calculate the opened expiration date by adding three months. Record this opened expiration date on the label.



## Test Strip Precautions and Instructions for Use

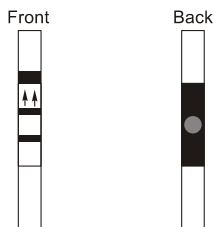
- Test Strips should be stored tightly capped in their protective canister to keep them in good working condition.
- Do not store test strips outside their protective canister. Test strips must be stored in the original canister with the cap tightly closed.
- Do not transfer test strips to a new canister or any other container.
- Replace the cap on the test strip canister immediately after removing a test strip.
- A new canister of test strips may be used for 3 months after first being opened. The opened expiration date is 3 months after the date the canister was first opened. Write the opened expiration date on the canister label after opening. Discard the canister 3 months after it is first opened. Usage after this period may result in inaccurate readings.
- For *in vitro* diagnostic use. Test strips are to be used only outside the body for testing purposes.
- Do not use test strips that are torn, bent, or damaged in any way. Do not reuse test strips.
- Before performing a hemoglobin test, make sure that the code number on the meter display matches the number shown on the test strip canister and on the code chip ink-jet printed.

Refer to the test strip insert for more details.

## Control Strips (REF C111-3025)

The *Insight*® Hb Hemoglobin Control Strips are thin plastic strips which work with the *Insight*® Hb Hemoglobin Meter to ensure the optical system is working properly. After the control strip is inserted into the meter, the optical system of meter detects the color intensity of the control strip. The meter displays **YES** or **no** to show whether the meter is functioning properly. Refer to Section 6 Optical Check for details.

The control strip appears as shown below:



### Precautions

- Store in the closed canister at room temperature within 2-30°C (36 - 86°F) and avoid exposing it to direct sunlight, extreme temperature or humidity.
- Control strips should be stored tightly capped in their protective canister to keep them in good working condition.
- Do not freeze or refrigerate.
- Keep the control strip clean and do not bend. Do not touch the test area of the strip.

Remove the control strip for immediate use. Put the control strip back and close the canister tightly immediately after use. Do not use contaminated, discolored, bent or damaged control strips.

- Do not use after the expiration date.
- For *in vitro* diagnostic use only.

## Storage and Handling

- Store test strips in a cool, dry place. Store away from heat and direct sunlight.
- Transport and store in its closed canister within 2-30 °C (36-86 °F), less than 85% humidity.
- Do not freeze or refrigerate.
- Replace the cap on the test strip vial immediately after removing it from container.
- Do not use your test strips past the unopened expiration date printed on the label. Using the test strips past the unopened expiration date may produce incorrect test results.

**Note:** The expiration date is printed in a Year-Month format.

For example, 2011-01 is January, 2011.

## Section 4 Initial Setup

Before testing, ensure the following procedures are followed.

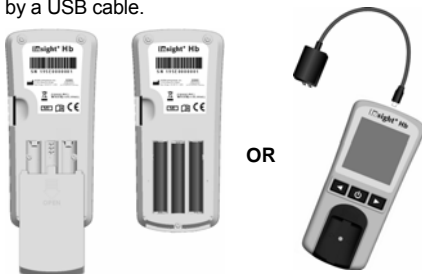
### Turn on Meter

The meter can be operated using the certified AC Adapter or 3 AAA batteries (1.5V).


To use the meter with batteries, insert 3 AAA batteries (1.5V) into the battery compartment located on the back of the meter.

To use the meter with the power adapter, connect the Mini USB port of the power adaptor to the USB port located on the top of the meter with a USB cable, and plug the adaptor into a 100-240V ac, 50-60 Hz primary power outlet.

The meter can also be powered from the USB port of a personal computer, connected by a USB cable.



The meter will turn on automatically after the batteries are inserted. The meter will display the date and time setup screen. Refer to Section 4 Meter Setup for details. After the date and time have been set, the meter will automatically turn off.

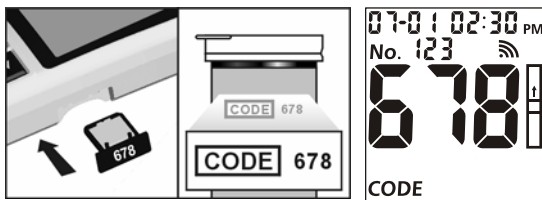
Press  to turn the meter on. The screen will briefly display all of the LCD symbols. Observe the LCD at startup to ensure all segments and display elements are turned on, and there are no missing icons or elements. After startup, observe there are no permanently turned on segments or icons. After the power-on diagnostic check, the Initial Screen will be displayed.

The meter will turn off automatically after 8 minutes of inactivity.

## Coding the Meter

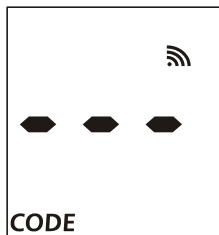
Each time a new box of test strips is used, the **code chip** packaged with the new box of test strips must be inserted into the meter. Take the **code chip** from the test strip box. Compare the code number on the **code chip** with the code number printed on the test strip canister label. Results may be inaccurate if the two numbers are not identical. For US customers, immediately call customer service toll free at 1-(800)-838-9502 if the code number on the code chip does not match the number on the test strip canister with which it was packaged. For customers outside the US, contact your local distributor immediately.

Insert the new **code chip** into the **code chip slot** of the meter. It should easily snap into place. The **code chip** should remain in the meter. Do not take it out until a new box of test strips is needed. The code number will appear on the Initial Screen after startup.




For US Customers, immediately call customer service toll free at 1-(800)-838-9502 if the code number on the **code chip** does not match the number that is displayed on the screen. For customers outside the US, contact your local distributor immediately.

If the **code chip** is not properly inserted into the **code chip slot**, or if it is missing, the meter will display **three dashes** as shown below.









## Section 5 Meter Setup and Options

With the meter turned off, press and hold  for 4 seconds to enter **Meter Setup** mode shown below.



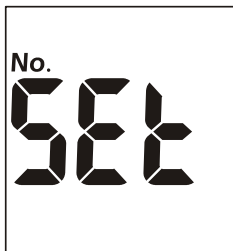
Press  or  to display several setup submodes:

<b>No. SEt</b>	Test number setup. The test number can be set from 1 to 999.
<b>SEt</b>	System setup, including date, time, test number reset, units and sound.
<b>CHE</b>	<b>Optical Check</b> mode. Refer to Section 6.
<b>PC</b>	<b>Data Transfer</b> mode. Refer to Section 6.
<b>dEL</b>	<b>Memory Delete</b> mode. Refer to Section 6.
<b>ElT</b>	Exit setup modes and save changes when  is pressed. The meter will automatically return to the Initial Screen.

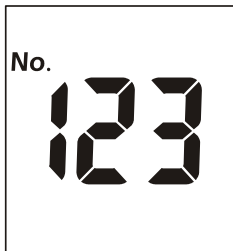
Press  to enter the mode when the desired submode is displayed.

## Test Number Setup


From the **No. SEt** screen, press  to enter **Test Number Setup**.



The test number can be set to any number from 1 – 999.



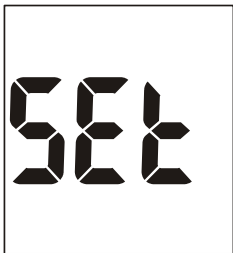
Press ◀ or ▶ until the correct test number is displayed. To quickly cycle to the desired test number, press and hold ◀ or ▶.

Press  to save and return to the **Meter Setup** screen.

**Note:** Once the meter reaches test number 999, the next test number will be 1.

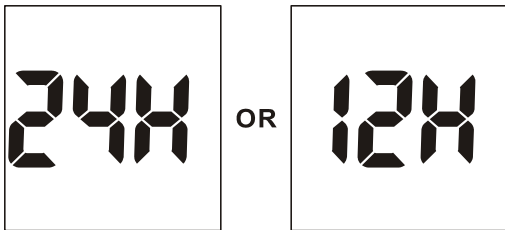
## System Setup


From the **SEt** screen, press  to enter **System Setup**.



### Hour Setup

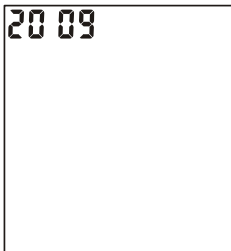
The first option sets the clock to either **12** or **24 hour** mode. Press ◀ or ▶ to switch between the two settings.




Press  to save and advance to **Year Setup**.

## Year Setup

The year will appear at the top of the display. Press ◀ or ▶ until the correct year is displayed.





Press  to save and enter **Month and Date Setup**.

## Month and Date Setup

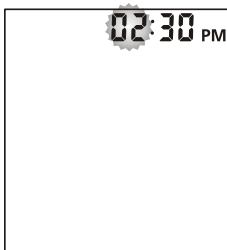
The month and date will appear at the top of the display separated by a single dash (-), with flashing month. Press ◀ or ▶ until the correct month is displayed.



Press  to save. The day will flash. Press ◀ or ▶ until the correct day is displayed, then press  to save and proceed to **Time Setup**.

## Time Setup

The hour and minutes will appear at the top of the display separated by a colon, with flashing hour.



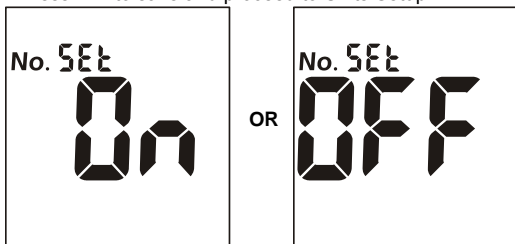
Press ◀ or ▶ until the correct hour is displayed. Press ⏻ to save and proceed to **Minutes**.

**Note:** The meter will display **AM** or **PM** if the 12H time setting is chosen.

**Minutes** will flash. Press ◀ or ▶ until the correct **Minutes** are displayed. Press ⏻ to save and proceed to Test Number Reset Setup.

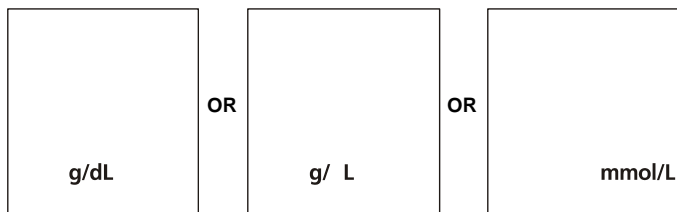
## Test Number Reset Setup


Press ◀ or ▶ to turn the test number reset **ON** or **OFF**. The test number will reset to 1 for each new day of testing when the test number reset is turned on. Press ⏻ to save and proceed to Units Setup.




## Units Setup

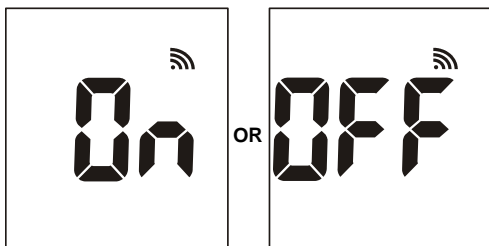
Press ◀ or ▶ to select either **g/dL**, **g/L** or **mmol/L**.




Press  to save and proceed to **Sound Setup**.

## Sound Setup

Press ◀ or ▶ to select sound either **ON** or **OFF**. The **Sound Symbol** will appear on the display when the sound is turned on. Press  to save and return to the setup screen.



Press ◀ or ▶ until **Elit** is displayed and press  to exit setup. The screen will briefly go blank and display the Initial Screen.

## Section 6      Testing

Before performing any test, the user should review the *Insight*® Hb Hemoglobin meter manual for detailed instructions. The following steps show how to use each component to measure the hemoglobin concentration.

### Specimen Collection

The *Insight*® Hb Hemoglobin Meter requires a very small specimen which may be obtained from the whole blood. Fresh or EDTA or heparin-anticoagulated capillary or venous whole blood may be used. Before testing, choose a clean, dry work surface. Review the procedure and make sure all of the items needed to obtain a drop of blood are available.

#### Venous Blood Testing

For fresh whole blood venous specimens, collect the venous blood in a closed container with EDTA or heparin anticoagulants. Mix the specimen well, then collect approximately 10 µL into a plastic syringe or pipette. Apply it to the center of the Specimen Application Area of the strip. Do not touch the strip with the pipette.

- Whole Blood must be tested within 8 hours of collection.
- Mix the specimens well before testing in order to ensure the cellular components are evenly distributed.
- Allow the specimen to come to room temperature (15-30°C or 59-86°F) for approximately 15 minutes if the specimen has been refrigerated.
- Anticoagulants other than EDTA are not recommended for use.

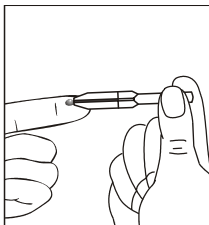
**Note:** Refer to NCCLS Documents H3-A6, Collection of Diagnostic Blood Specimens by Venipuncture.

#### Fingertip Blood Testing

Wipe away the first drop of blood. Apply light pressure to obtain a second drop of blood. Collect 10 µL of capillary blood using a Capillary Transfer Tube or pipette.

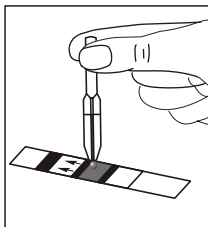
**Note:** Refer to NCCLS Documents H4-A4, Collection of Diagnostic Blood Specimens by Skin Puncture.

For use with the Capillary Transfer Tube, hold the tube horizontally and touch the tip of the Capillary Transfer Tube to the blood sample. Capillary action will automatically draw the sample to the fill line and stop.



**Note :** The Capillary Transfer Tube will fill automatically. Never squeeze the Capillary Transfer Tube while sampling.

Align the tip of the Capillary Transfer Tube with the Specimen Application Area of the strip to apply the second drop of blood (approximately 10  $\mu$ L).

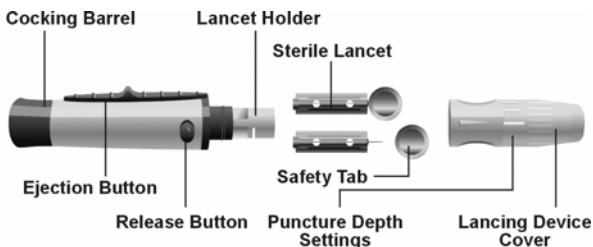


**Note :** Do not touch the strip with the Capillary Transfer Tube or pipette. The capillary blood should be tested immediately after collected. Use of a Capillary Transfer Tube or pipette is recommended for accurate results.



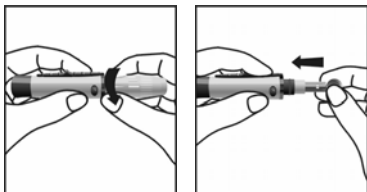
**For REF C111-3025:**

Blood specimens can also be obtained by using a lancing device. Refer to the instructions below for details.

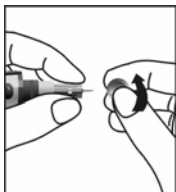


For obtaining a drop of blood from the fingertip, adjust the penetration depth on the lancing device to reduce discomfort.

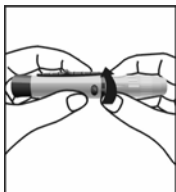
Unscrew the lancing device cover from the body of the lancing device. Insert a sterile lancet into the lancet holder and push it until the lancet comes to a complete stop in the lancet holder.



Hold the lancet firmly in the lancet holder and twist the safety tab of the lancet until it loosens, then pull the safety tab off the lancet. Save the safety tab for lancet disposal.

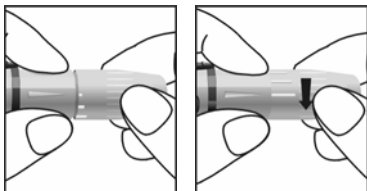


Carefully screw the cover back onto the lancing device. Avoid contact with the exposed needle. Make sure the cover is fully seated on the lancing device.



Adjust the puncture depth by rotating the lancing device cover. There are a total of 6 puncture depth settings. To reduce discomfort, use the lowest setting that still produces an adequate drop of blood.

Use settings 1 and 2 for delicate skin, 3 and 4 for normal skin, and 5 and 6 for calloused or thick skin.



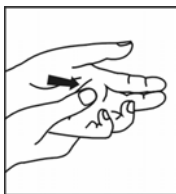
**Note:** Greater pressure of the lancing device against the finger will also increase the puncture depth.

Pull the cocking barrel back to set the lancing device. A click may be heard. The device is now loaded and ready for obtaining a drop of blood.

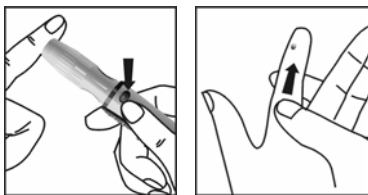


Prior to testing, make sure the patient's hand is warm and relaxed before collecting the capillary blood specimen. Use warm water to increase blood flow if necessary. Massage the hand from the wrist up to the fingertip a few times to encourage blood flow.

Clean the testing site with an alcohol swab and then dry the testing site thoroughly.



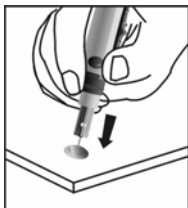
Hold the lancing device against the side of the finger to be lanced with the cover resting on the finger. Push the release button to prick the fingertip. A click should be heard as the lancing device activates. Gently massage from the base of the finger to the tip of the finger to obtain the required blood volume. Avoid smearing the drop of blood. For the greatest reduction in pain, lance on the sides of the fingertips. Rotation of sites is recommended. Repeated punctures in the same spot can make the fingers sore and callused.



**Note:** Make sure the patient's hand is warm and relaxed before collecting a capillary blood specimen. Use warm water to increase blood flow if necessary.

## Disposal of the Lancet

Unscrew the lancing device cover. Place the safety tab of the lancet on a hard surface and carefully insert the lancet needle into the safety tab.



Press the release button to make sure that the lancet is in the extended position. Slide the ejection button forward to eject the used lancet. Place the lancing device cover back on the lancing device.



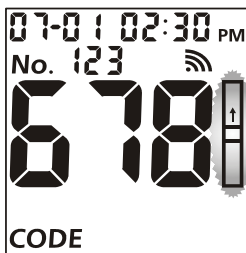
## Strip Processing and Testing

Ensure the meter is set up properly as described in previous sections. Turn the meter on. The screen will briefly display all of the LCD symbols. Observe the LCD at startup to ensure all segments and display elements are turned on, and there are no missing icons or elements. The meter will briefly show a blank display. Observe there are no segments or icons permanently turned on.



After startup, the Initial Screen will be displayed. Ensure the code chip is inserted, and compare the number showed in the display with the code number printed on the test strip canister label. Refer to Section 3 Coding the Meter.

The **strip symbol** will flash when the meter is ready for the strip to be inserted.



## Testing

Insert a test strip into the strip channel in the same direction as the arrows indicated on the strip. Ensure that the test strip is inserted all the way to the end of the strip channel, until the white edge of the test strip above the black line is no longer visible.

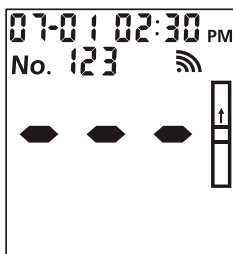


The ***blood drop symbol*** will flash when the meter is ready for the specimen to be applied. Apply approximately 10  $\mu$ L of blood to the middle of the Specimen Application Area of the test strip.

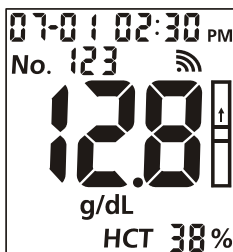


**Note:** For testing capillary blood, use the second drop of blood for accurate results. Refer to Section 6 Fingertip Testing for details.

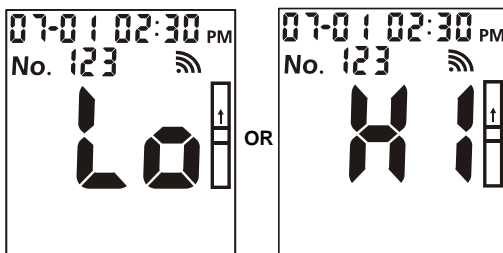
The meter will begin testing automatically with **three dashes** in a line flashing on the display indicating the test is in progress.



**Hb** results will be displayed within 15 seconds, with **Hct** value displayed at the bottom of the screen.




If the concentration of hemoglobin is less than 5 g/dL (50 g/L or 3.1 mmol/L), the meter will display **Lo**. The meter will display **Hi** if the concentration is more than 25.6 g/dL (256 g/L or 15.9 mmol/L).



Remove the used test strip. The meter will return to the initial screen ready for another strip to be inserted and a test performed.

**Note:** Discard all blood specimens, used test strips and materials carefully. Treat all blood specimens as if they were infectious materials. Follow proper precautions and obey all local regulations when discarding blood specimens and materials.

Perform daily cleaning when testing is completed for the day. Refer to **Section 8 Maintenance**.

The meter will automatically turn off after 8 minutes of inactivity, or when  is pressed. If the meter is powered with an AC adaptor, turn off the meter before removing it from the power outlet. Remove the batteries if the meter will not be used for an extended period of time.




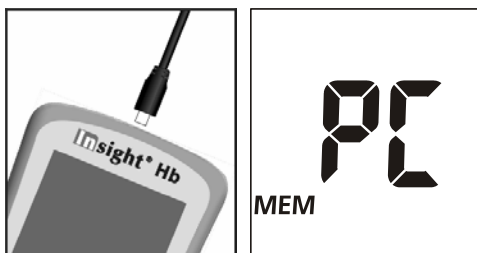
## Section 7 Data/Communication


### Data Transmission

Plug the USB cable into the USB port located on the top of the meter and connect the other end of the USB cable to a suitable PC.

**Note:** The PC must have suitable software installed to receive and process the data being transmitted from the meter.

From the Setup screen (refer to Section 4 Meter Setup), press ◀ or ▶ until **PC** is displayed. Press  to enable the Data Communication mode, **MEM** will be displayed.



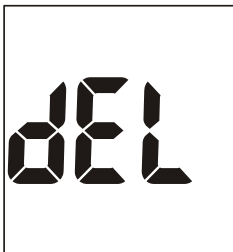
Press  to transmit data to an external certified PC.

After data transmission is complete, the meter will return to the Setup Menu.

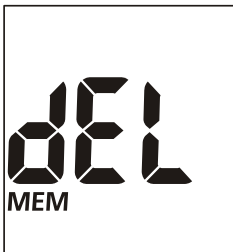
**Note:** Up to 999 test records are automatically stored in memory. After 999 test records are stored, the oldest test record will be replaced by a new record. For example, if 999 records are stored in memory, the next test result (1,000) will replace the first result stored in memory.

## Deleting Data

To delete all data from the meter database, enter the Setup Menu (refer to Section 4 Meter Setup). Press ◀ or ▶ until **dEL** is displayed.



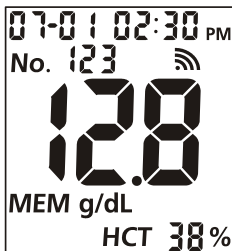
Press  to enable data deletion, **MEM** will be displayed.




Press and hold  until the meter returns to the Setup Menu.

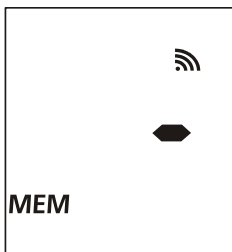
## Memory/Database

From the Initial Screen (refer to Section 5 Meter Operation), press ◀ or ▶ to show the first record.



Press ◀ or ▶ to view each record in date/time sequence. Press and hold  to return to the Initial Screen.

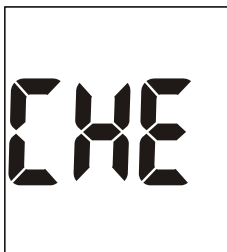
If no data is stored the meter will display **one dash (-)** and **MEM**.



## Section 8 Optical System Check


### Optical Check (REF C111-3021)

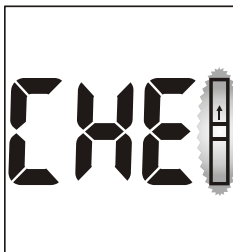
Press ◀ or ▶ from the Setup Screen to select the Optical Check mode as shown.




**Note:**

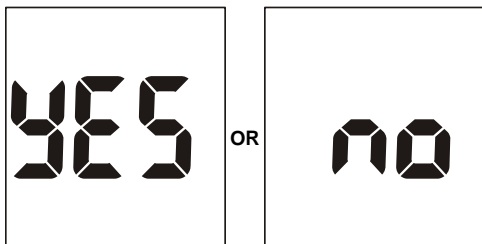
- The control strip is intended for checking the optical system. Refer to Section 8 Quality Control Test for using control solutions.
- Allow the strips and the meter to reach room temperature (15-30°C or 59-86°F) prior to testing.
- The optical check should be performed under normal lab lighting conditions. Do not perform under sunlight or extreme lighting conditions.

Press  to enter this mode. The meter will flash the strip symbol as shown below.




Insert a control strip into the strip channel in the same direction as the arrows indicated on the strip. Ensure that the test strip is inserted all the way.

Press  to start the optical check. If the meter displays **YES**, the meter is normal. If the meter displays **no**, the meter is not functioning properly.



If the meter displays **no**, check the control strip for contamination or if it is bent or damaged. If there are any visible signs of damage or contamination, discard the control strip and retest using a new control strip.

**Note:** For US customers, call customer service toll free at 1-(800)-838-9502 if the meter displays **no** again. For customers outside the US, contact your local distributor to double check if any Problem with system.

Press  to return to the Setup Screen.

## **Section 9      Quality Control**

Each lab should use its own standards and procedures for performance. Test known specimens/controls at each of the following events in accordance with local, state, and/or federal regulations or accreditation requirements.

- Each new day of testing
- A new canister of strips is opened
- A new operator uses the analyzer
- Test results seem inaccurate
- After performing maintenance or service on the analyzer

If QC tests do not provide expected results, perform the following checks:

- Ensure the strips used are not past their expiration date.
- Ensure strips are fresh from a new canister.
- Ensure the controls are not past their expiration date.
- Repeat the test to ensure no errors were made during the test.

For US customers, call customer service toll free at 1-(800)-838-9502 for additional information. For customers outside the US, contact your local distributor.

## Section 10 Maintenance

Proper maintenance is recommended for best results.

### Cleaning

For best results, the meter should be cleaned after each day of testing.

#### Meter Surface

A cotton cloth can be used to clean the surface of the meter. Use a damp cotton cloth if necessary.

A dry, soft cloth may be used to clean the LCD and the sensor area. It is recommended that the meter be stored in the carrying case after each use.

Take care to avoid getting liquids, residue, or control solutions in the meter through the **Strip Channel**, **Code Chip Slot** or **USB Port**.

#### Test Strip Holder

Remove the **Test Strip Holder** by pressing in on middle of the **Test Strip Holder** and sliding it out from the meter. Wipe it with a damp cloth or a mild detergent and dry it with a dry, soft cloth. Slide the **Test Strip Holder** back into the meter by laying it flat on the meter. Firmly press down on the center of the **Test Strip Holder** with your thumb and push it in until it clicks into place.



**Note:** Do not use organic solvents, such as gasoline or paint thinner. This will cause damage to the meter.

## Meter Sensor Area


Remove the **Test Strip Holder** as described in the previous section. Wipe down the **Meter Sensor Area** with a cotton swab. Do not scratch the transparent window covering the sensor.



**Note:** Do not use bleach or alcohol to clean the **Meter Sensor Area**. This will cause damage to the meter.



## Replacing the Batteries

When the battery icon  is flashing, the battery is running low and should be replaced as soon as possible. An **E-4** error message will appear if the battery is too low to perform any more tests. The meter will not function until the battery is replaced.



Make sure the meter is off before removing the battery. Turn the meter over to locate the battery cover. Press the battery cover tab on the top and lift the cover to open it. Remove and discard the old batteries. Insert three AAA batteries on top of the plastic tape. Make sure the two outside batteries are aligned with the plus (+) side down, towards the bottom of the meter, with the middle battery aligned with the plus (+) side facing up, towards the top of the meter.



Close the battery cover and make sure that it snaps shut. Recheck and reset the clock setting as necessary after battery replacement to ensure time is set correctly. Refer to Section 4 Initial Setup.

**Note:** Do not discard batteries along with household waste. Follow local regulations for disposal.

## Section 11      Precautions

Observe the precautions listed below to ensure accurate results and proper operation of the analyzer.

- The protection provided by the equipment may be impaired if used in a manner not defined in this instruction manual.
- Wear gloves to avoid contact with potentially hazardous biological specimens during testing.
- Avoid storing or operating the analyzer in direct sunlight, excessive temperature, or high humidity. Refer to Appendix 1 Meter Specifications for operating condition requirements.
- Keep the unit clean. Wipe it frequently with a soft, clean and dry cloth. Use fresh water when needed.
- Do not clean the unit with substances such as gasoline, paint thinner or other organic solvents to avoid any damage to the meter.
- Do not clean the LCD or sensor area with water. Lightly wipe with a soft, clean, dry rag.
- The Strip Channel must be kept clean. Lightly wipe with a soft, clean, dry rag each day. Use water as needed. Refer to Section 8 Maintenance.
- Follow all local regulations when discarding the unit or its accessories.
- Do not use the unit or the strips outside of the operating temperature ranges listed below.

Analyzer: 10-40 °C (50-104 °F) ; ≤90% RH

Strips: 15-30 °C (59-86 °F) ; ≤85% RH

## Section 12 Troubleshooting

Display	Causes	Solution
<b>E-1</b>	The sensor area is damaged, dirty, or blocked at turn-on, such as a used test strip left in the meter.	Ensure the sensor area is clean and that there are no objects covering the sensor area. Refer to Section 10 Cleaning. Restart the meter. Contact your local distributor if the sensor area window is broken.
<b>E-2</b>	Test strip was removed during the test.	Repeat the test and ensure the test strip remains in place.
<b>E-3</b>	Specimen was applied to the test strip too soon.	Repeat the test and apply specimen after blood drop symbol appears.
	Batteries are discharged but have enough power to run 20 more tests.	Test results will still be accurate, but replace the batteries as soon as possible.
<b>E-4</b>	Batteries have discharged and meter will not allow more tests until discharged batteries are replaced.	Replace the batteries, or connect the meter to the AC Adapter, then repeat the test.
<b>E-5</b>	Insufficient specimen.	Repeat test and apply enough specimen. Use at least 10 µL of whole blood.
<b>E-6</b>	Expired test strip.	Ensure the test strips are within the expiration date printed on the canister label.
<b>E-7</b>	Code chip was removed during testing.	Insert proper code chip. Confirm the code chip matches the test strip code and repeat the test.
<b>Lo</b>	The test result is lower than 5.0 g/dL (50 g/L or 3.1 mmol/L).	If the specimen was taken from a specimen container, ensure the specimen is mixed well and repeat test.
	Insufficient specimen less than 1µL	Repeat test and apply enough specimen. Use at least 10 µL of whole blood.
<b>Hi</b>	The test result is higher than 25.6 g/dL (256 g/L or 15.9 mmol/L).	If the specimen was taken from a specimen container, ensure the specimen is mixed well and repeat test.
	No code chip in the meter; Code chip is damaged or inserted incorrectly.	Insert the code chip that accompanied the box of test strips. If the code chip is damaged, use a new code chip with the correct code number. If the code chip is inserted incorrectly, remove the code chip and insert it into the code chip slot.

For US customers, call customer service toll free at 1-(800)-838-9502 for details. For customers outside the US, contact your local distributor.


















# Appendix 1      Meter Specifications

Feature	Specifications
Methodology	Reflectance Photometer
Test Time	<15 seconds
Measurement Range	5-25.6 g/dL, 50-256 g/L, 3.1-15.9 mmol/L
Specimen	Whole blood
Specimen Volume	10 µL
Power Source	3 AAA batteries (1.5V)
	AC Adapter (Mini USB, 5V dc, 50 mA)
Battery Life	360 hours or 2,700 tests
Units of Measure	g/dL, g/L, mmol/L
Memory	1,000 records
Automatic Shut Off	8 minutes after last use
Meter Size	127 mm × 58 mm × 25 mm (5.0" × 2.28" × 0.09")
Display Size	39 mm × 37 mm (1.54" × 1.46")
Weight	102 g (without batteries)
Meter Storage Conditions	0 - 50 °C (32 -122 °F); ≤90% RH
Operating Conditions	10 - 40 °C (50 -104 °F); ≤90% RH
Meter Connectors	USB cable for Data Transfer or Power (optional)

## Appendix 2      Catalog

Product Name	Catalog No.	Components	Quantity
Hb Hemoglobin Testing System Starter Kit	C111-3015	Meter	1
		Canister of Test Strips	1
		Test Strip Package Insert	1
		Code Chip	1
		AAA Batteries	3
		Capillary Transfer Tubes	25
		Carrying Case	1
		User Manual	1
		Quick Reference Guide	1
		Warranty Card	1
Hb Hemoglobin Testing System Starter Kit II	C111-3025	Meter	1
		Canister of Test Strips	1
		Test Strip Package Insert	1
		Code Chip	1
		Lancing Device	1
		Lancing Device Package Insert	1
		Sterile Lancets	10
		Control Strips	2
		Control Strip Package Insert	1
		Capillary Transfer Tubes	10
		AAA Batteries	3
		Carrying Case	1
		User Manual	1
		Quick Reference Guide	1
		Warranty Card	1
Hb Hemoglobin Meter	C111-3035	Meter	1
		Control Strips	2
		Control Strip Package Insert	1
		AAA Batteries	3
		Carrying Case	1
		User Manual	1
		Warranty Card	1
Hb Hemoglobin Test Strips	C131-3015	Canister of 25 Test Strips	1, 2, or 4
		Code Chip	1
		Test Strip Package Insert	1
Hb Hemoglobin Adapter Kit	C121-3015	Power Adapter	1
Hb Hemoglobin Data Transfer Kit	C121-3025	USB Cable	1
		Installation Disk	1
Hb Hemoglobin Control Strip	C121-3035	Control Strips	2
		Control Strip Package Insert	1
Lancets	C121-3045	Lancets	100
Lancing Device	C121-3055	Lancing Device	1
		Lancing Device Package Insert	1
Capillary Transfer Tube	C121-3085	Capillary Transfer Tube	25, 50 or 100

## Appendix 3 Index of Symbols

	Consult instructions for use		For <i>In vitro</i> diagnostic use only
<b>REF</b>	Catalog #	<b>SN</b>	Serial Number
	Manufacturer		Authorized Representative
	Lot Number		Use by
	Tests per Kit		Store between 2-30°C
	Sterilized using irradiation		Code Number
	Do not discard along with household waste		USB Port
	Fragile, handle with care		This Side Up
	Keep away from sunlight and heat		Keep Dry
	Do not reuse		

## Appendix 4      Warranty

Please complete the warranty card included in the packaging. Mail it to your local distributor to register your purchase within one year of purchase.

For your records, write the purchase date of your starter kit here:

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Note: This warranty applies only to the meter in the original purchase. It does not apply to the other materials included with the meter.

**ACON Laboratories, Inc.** warrants to the original purchaser that this meter will be free from defects in materials and workmanship for a period of two years (24 months). The two years starts from the later of the date of original purchase or installation (except as noted below). During the stated two years period, **ACON** shall replace the meter under warranty with a reconditioned meter or, at its option, repair at no charge a meter that is found to be defective. **ACON** shall not be responsible for shipping charges incurred in the repair of a meter.

This Warranty is subject to the following exceptions and limitations:

This warranty is limited to repair or replacement due to defects in parts or workmanship. Parts required which were not defective shall be replaced at additional cost. **ACON** shall not be required to make any repairs or replace any parts that are necessitated by abuse, accidents, alteration, misuse, neglect, failure to operate the meter in accordance with the user's manual, or maintenance by anyone other than **ACON**. Furthermore, **ACON** assumes no liability from malfunction or damage to meters caused by the use of strips other than strips manufactured by **ACON**. **ACON** reserves the right to make changes in the design of this meter without obligation to incorporate such changes into previously manufactured meters.

### Disclaimer of Warranties

This warranty is expressly made in lieu of any and all other warranties express or implied (either in fact or by operation of law) including the warranties of merchantability and fitness for use, which are expressly excluded, and is the only warranty given by **ACON**.

### Limitations of Liability

In no event shall **ACON** be liable for indirect, special or consequential damages, even if **ACON** has been advised of the possibility of such damages.

For warranty service, please contact your local distributor.