i-GEST nanobio Diagnosis

System Manual

i-GEST

Contents

1. Product description

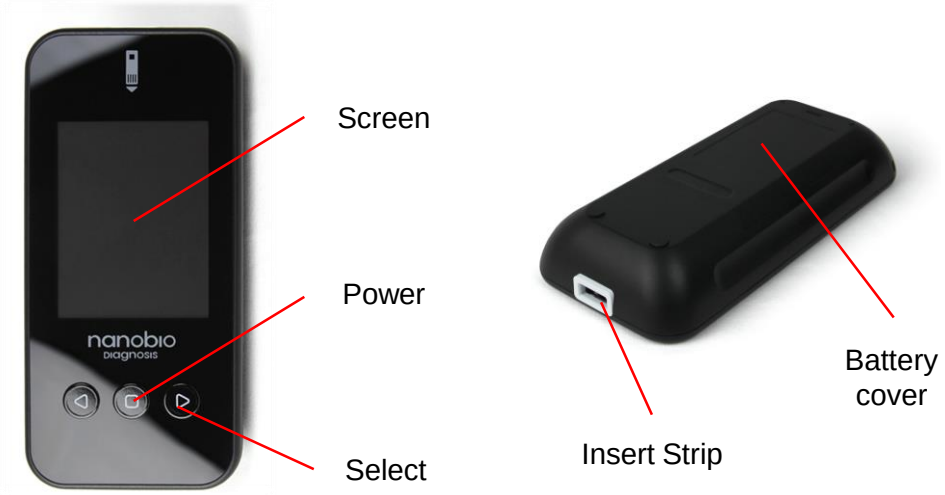
i-GEST's nanobio Diagnosis product uses the electrical characteristics of a field effect transistor (FET) device based on a silicon nano-channel structure to quickly and accurately measure the pH concentration and sensitivity of solution samples.

This product consists of PRD01, a portable leader device, and STP01, a disposable measurement strip. Electronic devices can accurately detect and characterize electrical signal differences in real time in the field using portable reader devices and disposable measurement strips for various liquid reagents used in medical, bio, restaurant and other laboratories, laboratories, and enterprises.

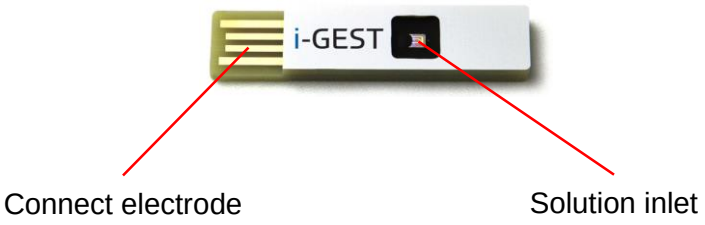
Ergonomically engineered leader devices are easy to carry, easy to measure, and strips with built-in semiconductor devices are disposable and discarded to ensure user safety.

2. Product configuration

1) Portable Reader Device : PRD01



2) Disposable Strip : STP01



There are no AAA batteries for the reader product operation and cables for PC connection, so please purchase them separately.

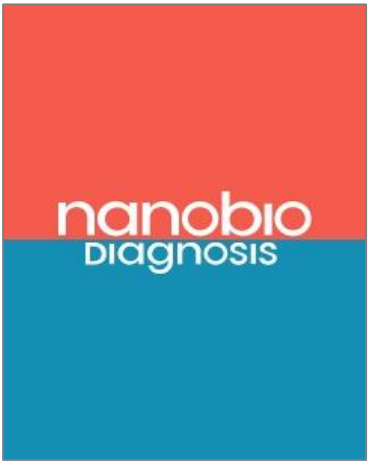
3. How to Use

1) Principle of device operation

The i-GEST nanobio Diagnosis product measures pH and sensitivity properties using electrical properties of field effect transistor(FET) devices based on silicon nano-channel structure. Measure electrical properties after dropping a solution with a reference concentration of 7.4 pH and a reference solution for sensitivity comparison measurement into the inlet of the strip. The measured I-V data is stored in the reader as a reference point. The strip is then rinsed with D.I. wafer and cleaned with N_2 flow. Then, drop the target solution you want to measure into the solution inlet of the strip and proceed with the measurement. Depending on the characteristics of the solution, the electrical signals from the I-V measurement data move, which can be calculated using the leader instrument to measure the exact pH concentration and sensitivity change. Using FET devices based on silicon nano-channel structure, this system provides effective pH concentration and sensitivity measurement in various environments such as outdoors because of its fast detection speed and easy portability.

3. How to Use

2) pH measurement



01. Turn on the device

- Press the front bottom center power button of the reader device for 5 seconds.

02. Select username

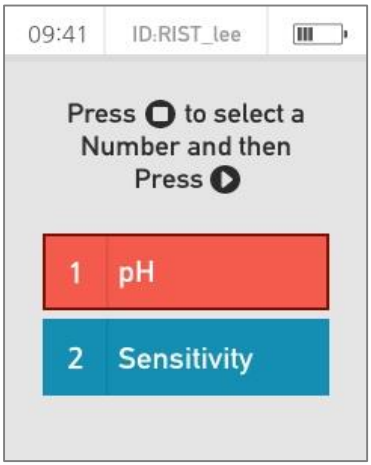
- Select the user name to use for the measurement

3. How to Use

2) pH measurement

03. Select menu

- Select the New item on the screen to start a new measurement.

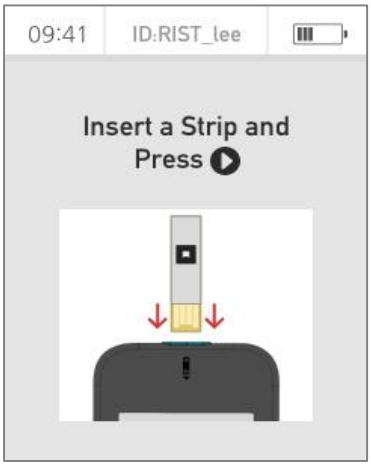


04. Select pH

- Select the pH item on the screen to start the pH measurement.

3. How to Use

2) pH measurement



05. Insert a Strip

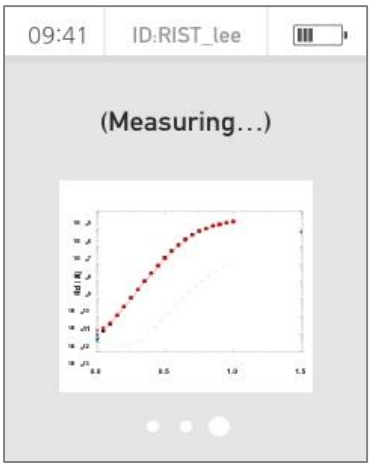
- Fit disposable strips for measurement to the reader device in orientation.

06. Drop a buffer solution

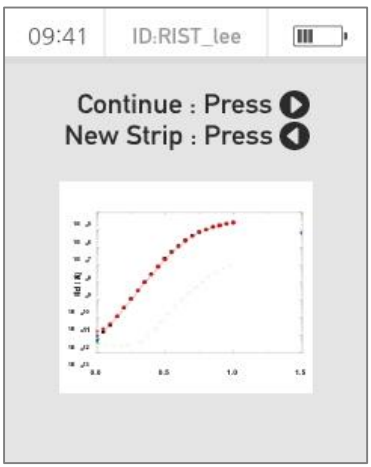
- When measuring pH, drop a solution of pH 7.4, which will be the reference point, into the strip solution inlet.

3. How to Use

2) pH measurement



07. pH measurement



08. Check the data

- Check the normal measurement graph of the reference solution.

- In the event of a measurement error, re-measure the disposable strip by replacing it.

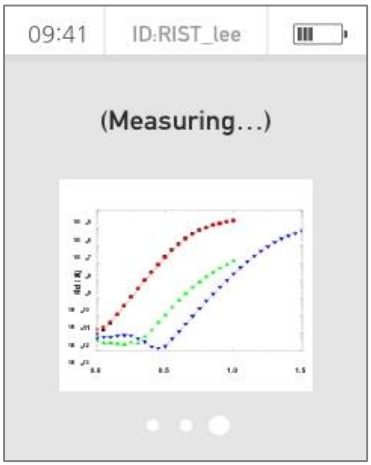
3. How to Use

2) pH measurement

09. Drop a Target solution

- Clean the strip solution inlet with D.I water and N_2 flow.

- Drop the target solution to be measured into the strip inlet.

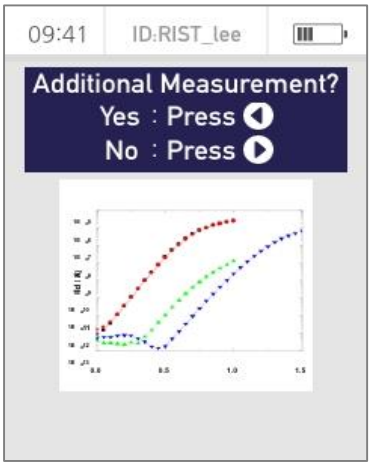


10. pH measurement

- Measure the pH of the target solution that requires a pH concentration measurement.

3. How to Use

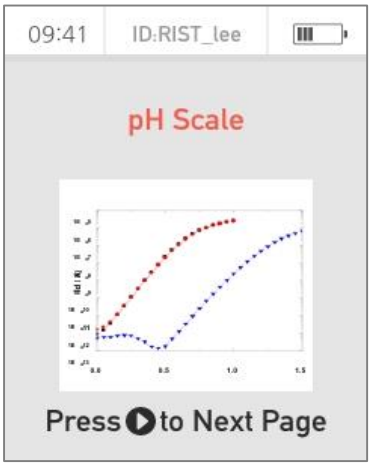
2) pH measurement



11. Additional measurement

- Select whether to measure additional target solutions.

- When measuring additional target solutions, the same process is performed after cleaning, and pH measurement for five target solutions is possible at the same time.



12. Check the result

- The pH concentration value for each target solution may be confirmed through the measured result graph.

3. How to Use

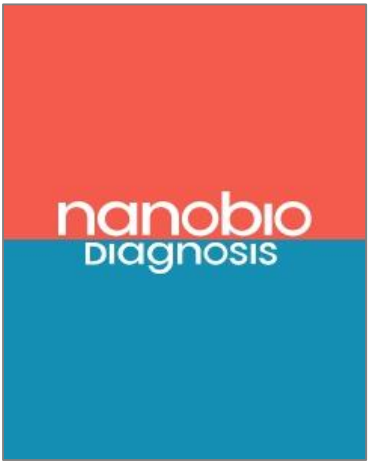
2) pH measurement

13. Save the data

14. Save complete

3. How to Use

3) Sensitivity measurement



01. Turn on the device

- Press the front bottom center power button of the reader device for 5 seconds.

02. Select username

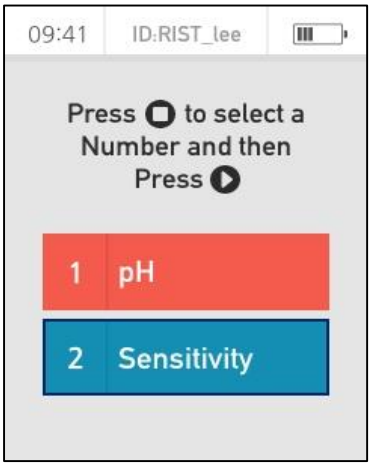
- Select the user name to use for the measurement

3. How to Use

3) Sensitivity measurement

<u>03. Select menu</u>

- Select the New item on the screen to start a new measurement.

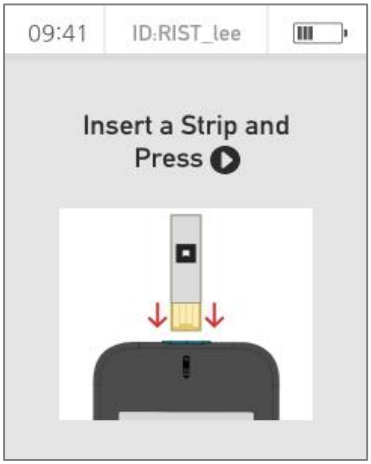


<u>04. Select Sensitivity</u>

- Select the pH item on the screen to start the Sensitivity measurement.

3. How to Use

3) Sensitivity measurement



05. Insert a Strip

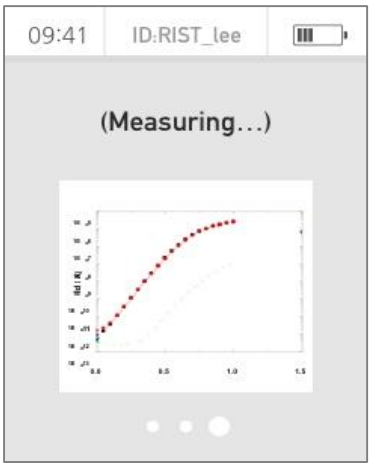
- Fit disposable strips for measurement to the reader device in orientation.

06. Drop a buffer solution

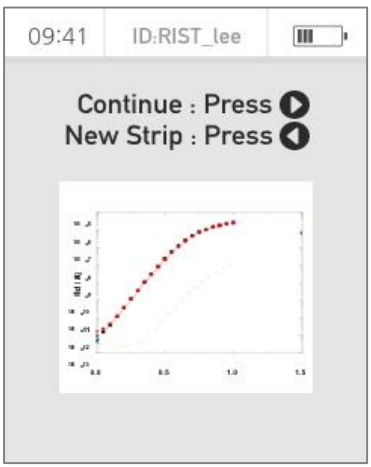
- When measuring sensitivity, drop the reference solution into the strip solution inlet.

3. How to Use

3) Sensitivity measurement



07. Sensitivity measurement



08. Check the data

- Check the normal measurement graph of the reference solution.

- In the event of a measurement error, re-measure the disposable strip by replacing it.

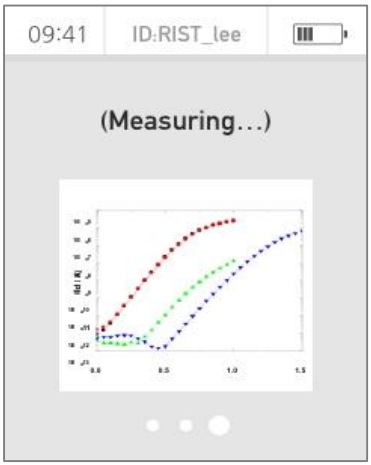
3. How to Use

3) Sensitivity measurement

09. Drop a Target solution

- Clean the strip solution inlet with D.I water and N_2 flow.

- Drop the target solution to be measured into the strip inlet.

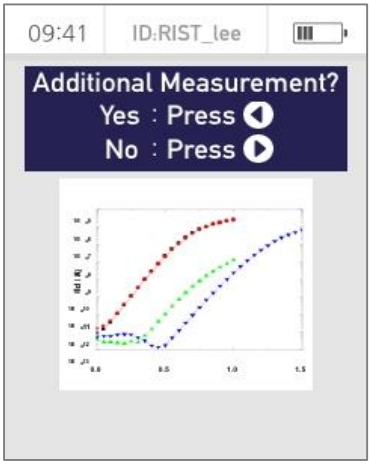


10. Sensitivity measurement

- Measure the sensitivity of the target solution that requires sensitivity measurement.

3. How to Use

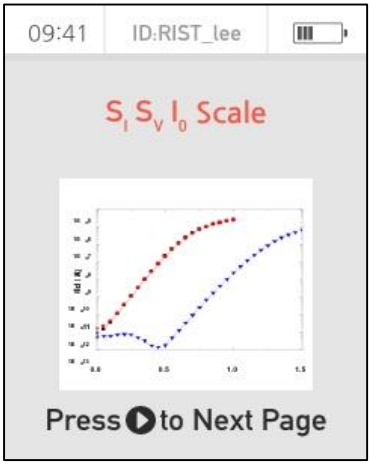
3) Sensitivity measurement



11. Additional measurement

- Select whether to measure additional target solutions.

- When measuring additional target solutions, the same process is performed after cleaning, and Sensitivity measurement for five target solutions is possible at the same time.



12. Check the result

- The measured sensitivity measurement value for each target solution may be confirmed through the measured result graph.

3. How to Use

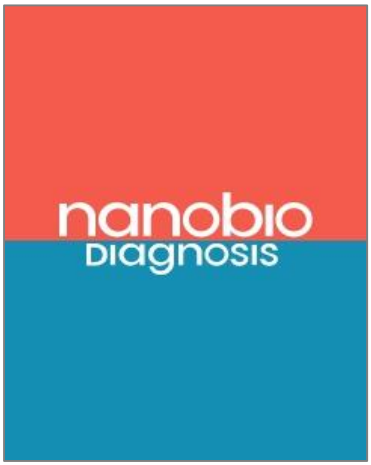
3) Sensitivity measurement

13. Save the data

14. Save complete

3. How to Use

4) Check the Saved data



01. Turn on the Reader device

- Press the front bottom center power button of the reader device for 5 seconds.

02. Select a username

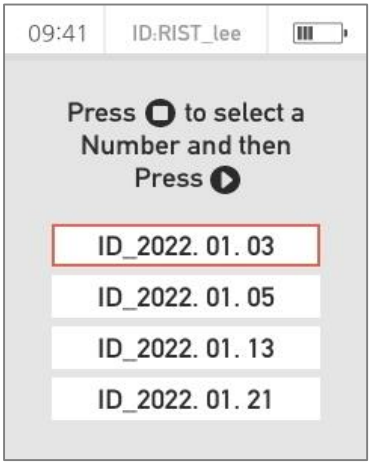
- Select the user name that you specified during the measure-ment.

3. How to Use

4) Check the Saved data

03. Select import

- Start loading data by selecting the import item on the screen.

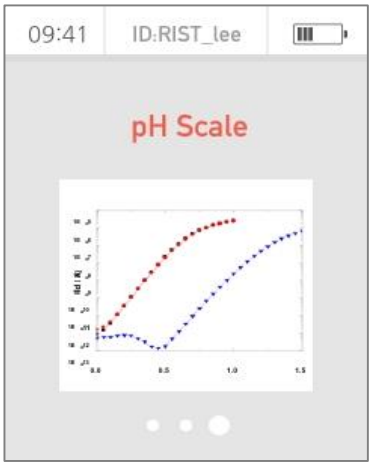


04. Select a data

- From the list of stored data, select the stored data to be recalled.

3. How to Use

4) Check the Saved data

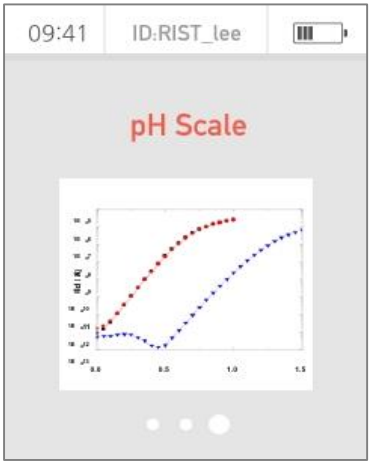


05. Check the data

- Check the graphs and figures of the imported data.

3. How to Use

5) Data download to PC



01. Check the data

- Load data to download to PC and check it.

02. Select the data

- From the list of stored data, select the stored data to be recalled.

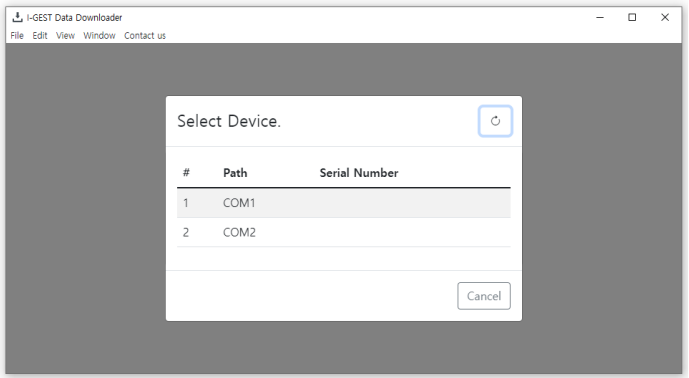
- The reader device waits in the current state and proceeds to the next step.

3. How to Use

5) Data download to PC

03. Program download

- Download a program for downloading data stored in the reader device to an Excel csv file.

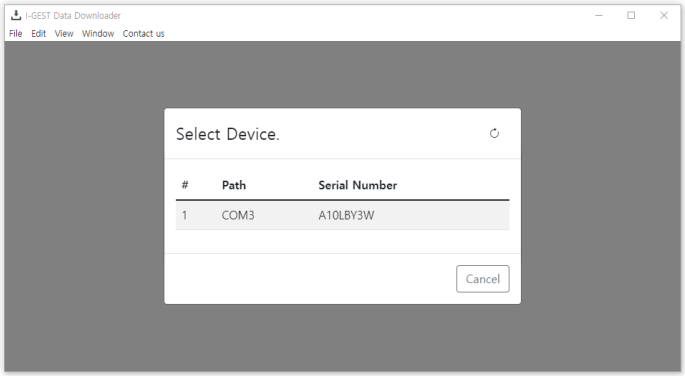


04. Run download program

- Run the installed download program.

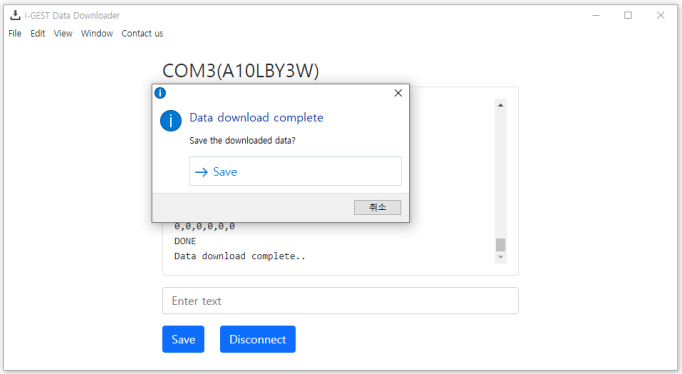
3. How to Use

5) Data download to PC



05. Connect the Reader to PC

- Connect the reader device to the PC using a cable.
- Select the serial number of the connected reader device.



06. Data download complete

- Data is automatically downloaded when the device is selected.

4. Caution for use

1) Always store the reader device in a portable case to prevent damage caused by external shocks.

2) The reader device is an electronic product, so please refer to the product specification for use and storage in a low humidity environment.

3) Make sure that the disposable strip inlet of the reader device is free of foreign substances.

4) STP01 product is only compatible with the PRD01 and cannot be used with other portable measuring devices.

5) Re-measurement is not possible after measuring the pH concentration of the target substance, so please prohibit reuse and discard it according to the procedure.

6) Strips should be inserted to the measuring instrument with care for breakage and deformation during measurement.

7) Protect your body by wearing protective gear when measuring the target substances that are highly acidic and highly basic.

8) Failure to follow these precautions may result in the inability to obtain accurate measurement data.

5. Specification

1) Portable Reader Device

Model	PRD01
Measurement type	Si Nano structure based Field Effect Transistor I-V
Sample type	Solution
Sample capacity	> 3uL
Measurement time	< 30 sec/ each measurement
Voltage	0.0 V ~ 1.5 V
Current	1E-10 ~ 1E10-7 (Compliance line)
Battery	1.5 V AAA Battery 4EA
Current consumption During measurement	1.42 mAh /min
Current consumption On off-state	6 mAh /day
Battery lifetime	Can be measured 120 times
Size	70 mm X 150 mm X 22.3 mm (W x H x D)
weight	145 ± 5 g (except the battery)
Screen	LCD
Interface	4-termical type (3 button)
Memory	Save the 50 data
Temperature Range of Use	-20 ~ 50 ^{o}C
Humidity Range of Use	15 ~ 90 % (noncondensing conditions)

5. Specification

2) Disposable Strip

Model	STP01
Threshold Voltage(Vth)	< 1 V
Subthreshold Swing(SS)	< 150 mV/dec
On/Off current Ratio	~ 10^5
I_{on}	~ 100 nA
Gate bias leakage	~ 10 nA
Molding material	Epoxy
Electrode material	Gold

6. Homepage

1) Homepage and Address

www.igest.co.kr

CEO	Jeong-Soo Lee
Established Year	Mar. 30th. 2016
Tel	+82-54-279-2380
E-mail	ljs6951@igest.co.kr
Website	www.igest.co.kr
Address	#213, Jigok-dong , LG Research Building) 77, Cheongam-ro, Nam-gu, Pohang-si, Gyeongsangbuk-do, Republic of Korea