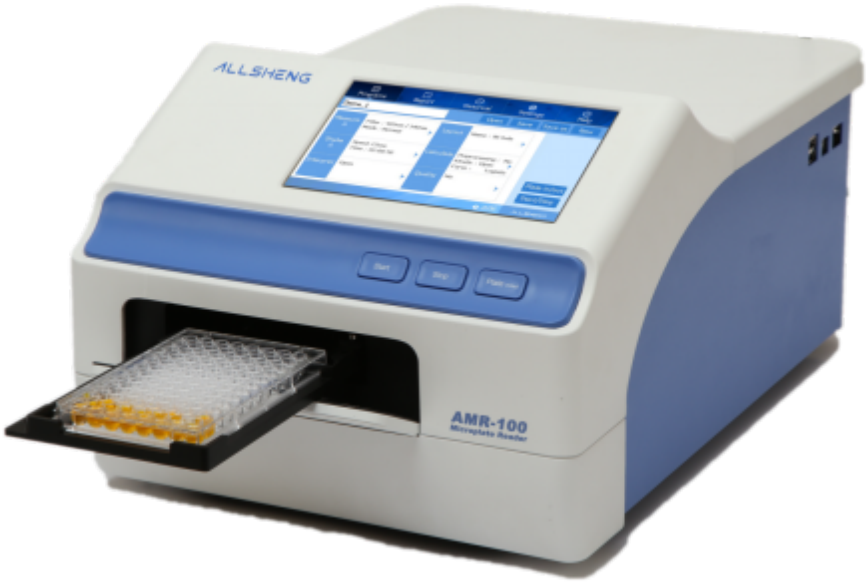
Operation Manual

Version 1.1

AMR-100
Microplate Reader
(PC Software)



ALLSHENG

Hangzhou Allsheng Instruments Co.Ltd.

Version modification Record:

Version No.	Date	Modification Description
V1.0	2019.5.15	➢ Initial Release
V1.1	2022.07.11	➢ Update relevant content ,Software Installation and Operation

Thanks for purchasing AMR-100. This Operation manual describes PC software functions and how to operate. Please read it carefully before operation and keep this operation manual for later use.

Initial Inspection

Please check the instrument, as well as all included accessories according to the packing list when you first open the packaging, if you find any damaged or missing, please contact distributor or manufacturer.

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Contents

Chapter 1 Introduction

This microplate reader is an instrument for EIA test, measuring concentration,absorbance, measuring positive or negative reaction between antibody and antigen in samples by reading enzymatic color change – Enzyme Linked Immunosorbent Assay (ELISA).

Key Features and Benefits:

1) Easy-to-use controls: 7 inch, color touch screen and 3 external keys.

2) Operating system allows acquisition, editing and saving of data.

3) Can be used independently from a computer, data can be saved and transferred by USB drive.

4) 8 position optical filter wheel; 4 standard optical filters are included, additional optional filters are available.

5) 9 channel vertical optical path, zero dispersion single mode fiber measurement system,automatic plate well center position function.

6) 96-well visual layout allows easy setting of blank, sample, positive/negative control, quality control and multi-value control.

7) Multi-choice tests on single plate.

8) Single or double wavelength measurement.

9) Self-checking optical path, top reading, mechanical motion.

10) Adjustable Plate shaking function, time and speed.

11) Quartz Halogen, energy saving light source.

12) Multiple ports for data export.

13) Measurement results can be exported as .CSV file, compatible with MS Excel.

Chapter 2 Features

Operating conditions:

Ambient operating temperature: 4°C ~ 45°C
Relative humidity: 10%~80%
Input power: AC100～240V 50/60Hz 2A

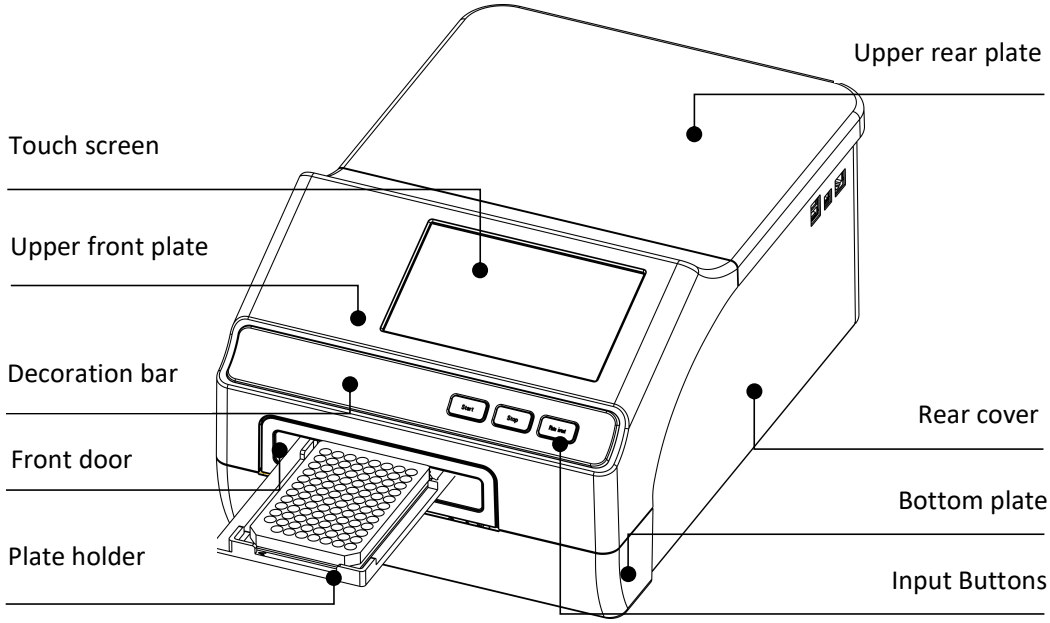
Basic parameters and performance

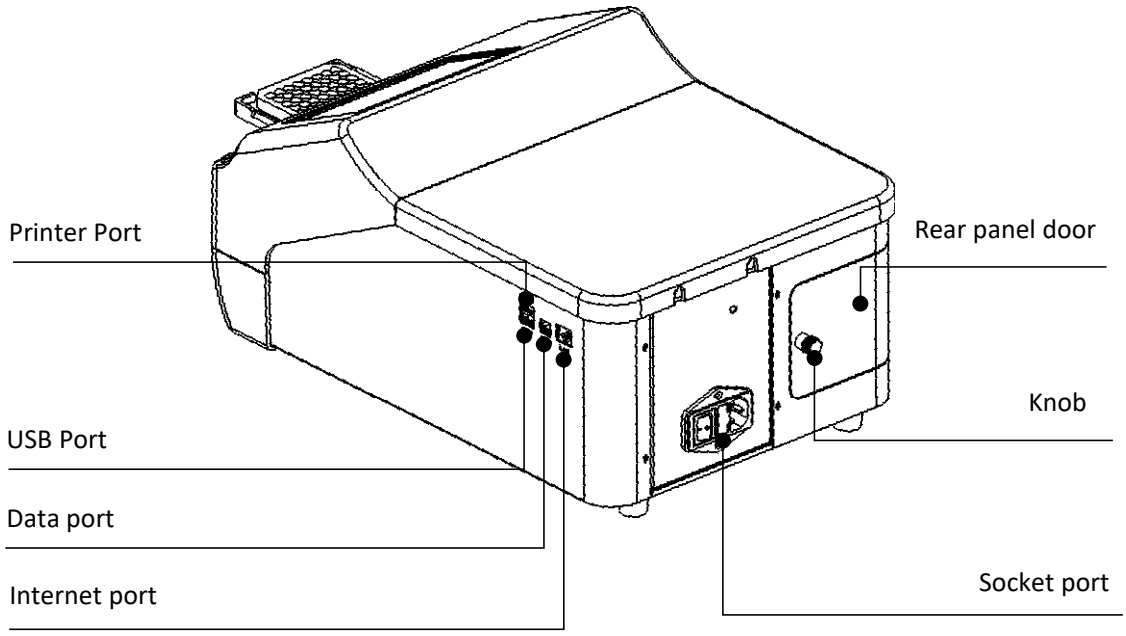
Project	Performance parameters
Light source	6V, 10W, Quartz-Halogen lamp
Wavelength	340～750nm
Optical filter	Four standard filters included: 405,450,492,630nm. Filter wheel holds up to 8 filters.
Read-out range	0.000-4.000Abs
Resolution	0.001Abs
Linearity	R^2≥0.995 [0.0,3.0Abs]
Wavelength accuracy	≤±2nm
Precision	[0,3) CV≤0.3%
Stability	≤0.005Abs [0.0,2.0Abs) ≤0.3% [2.0,3.0Abs)
Accuracy	≤±0.005Abs [0.0,2.0Abs) ≤±1.0% [2.0,3.0Abs)
Sensitivity	≥0.01Abs
Channel deviation	<0.01Abs
Measurement Speed	Single wavelength <15s/96well plate, double wavelength <28s/96well plate (Normal speed setting)
Dimension (WXDXH)	295×440×225mm
Weight (kg)	10

Chapter 3 Instrument Overview

Before first use of this instrument, please read this chapter carefully.

Structure





There are three input buttons: “Start” ”Stop” and “Plate in/out”

USB Ports: For connection of keyboard, mouse and USB drive. (the upper port is for printer

connection)

Data port: for PC connection. (contact Allsheng or distributor for updated software and features)

Internet port: for PC connection. (contact Allsheng or distributor for updated software and features)

Rear door panel: can opened to replace light source and access optical filter wheel.

Knob: To lock and unlock the rear door.

Chapter 4 Software Installation

Section 1 Installation Environment

1. Operation system

windows 7/10,64byte

Section 2 Installation Procedures

2. Software Installation

2.1 Click icon 

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2.2 Enter the installation wizard interface,as Fig 4-1.

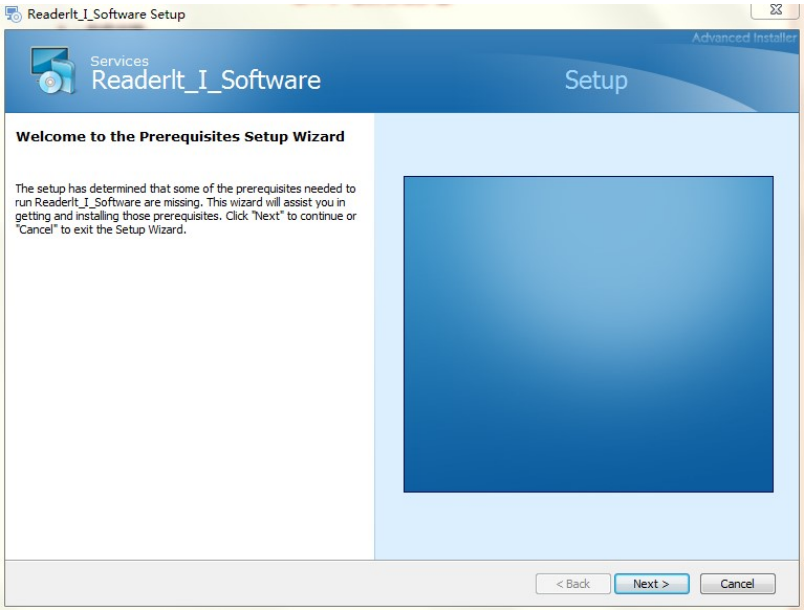

Fig 4- 1 Installation wizard

2.3 Select the installation running environment, as Fig 4-2.

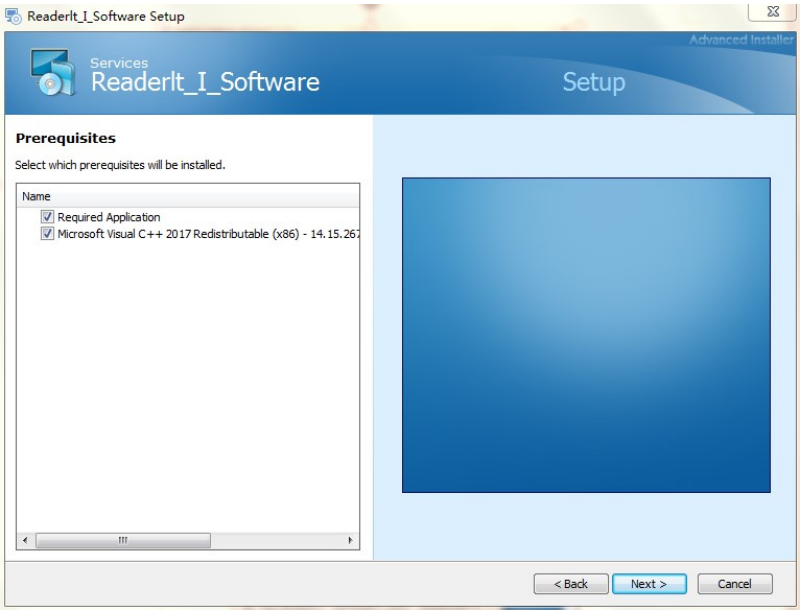

Fig 4- 2 Running environment

2.4 Check the I agree option and click installation operating environment, as Fig 4-3.

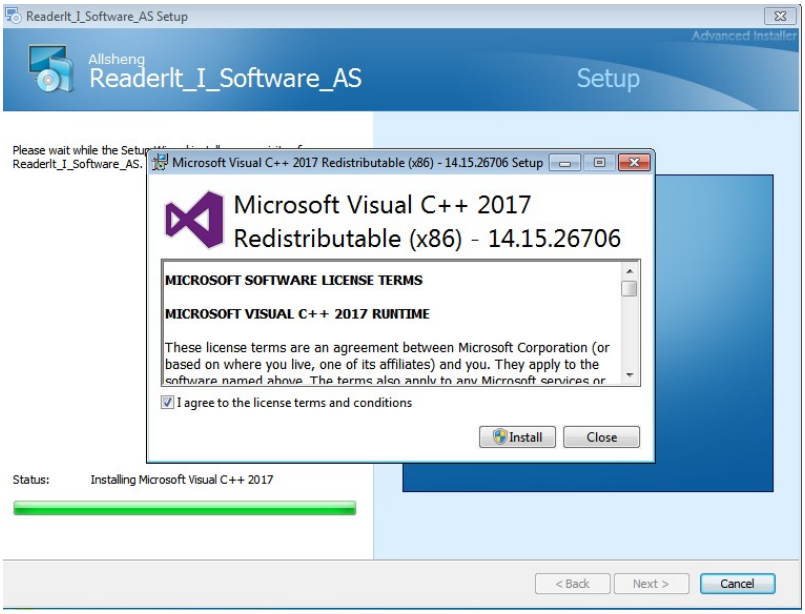

Fig 4- 3 Install operating environment

2.5 Prompt that the operating environment has been installed successfully, as Fig 4-4.

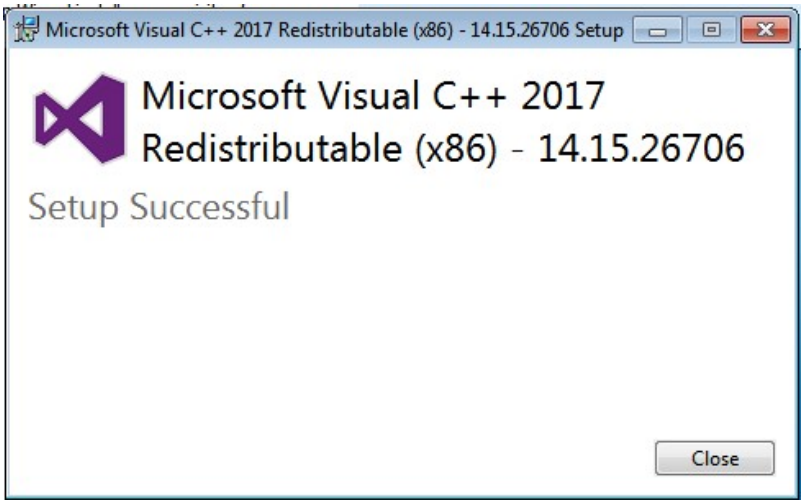

Fig 4- 4 Successful operating of environment installation

2.6 Please confirm if the installation is successful in “Control Panel” which path is “control board”→ “Programs”→ “Programs and Features ” as highlighted in Fig 4-5.

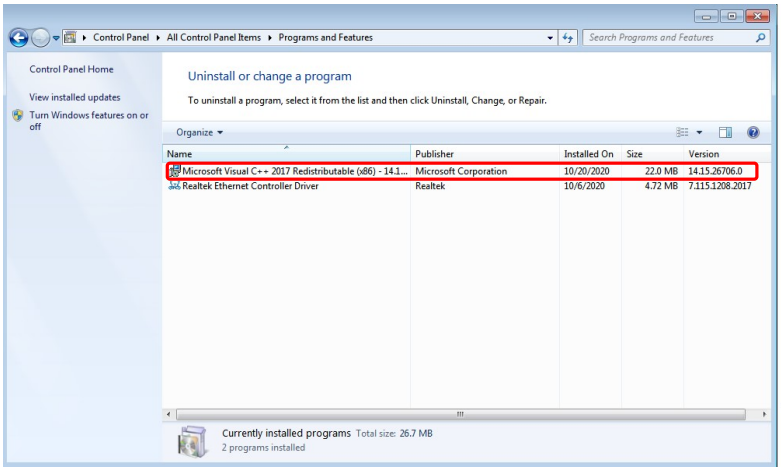

Fig 4- 5 Confirm the successful installation of the environment

2.7 Enter the driver installation interface as Fig 4-6.

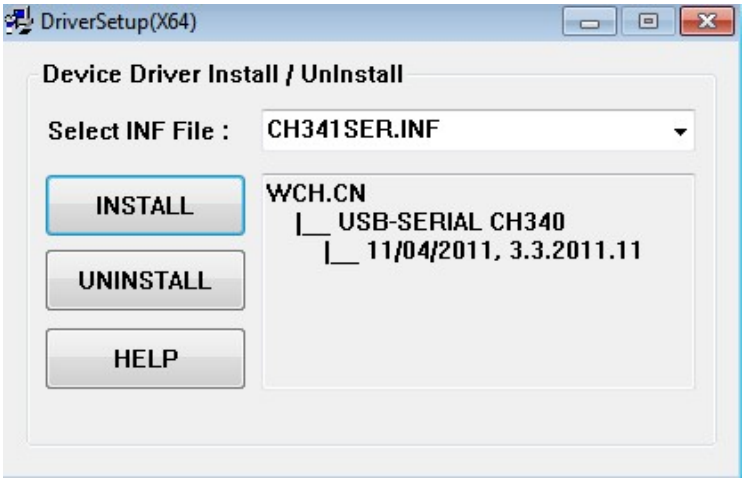

Fig 4- 6 Driver installation

2.8 Driver installation is successful as Fig 4-7.

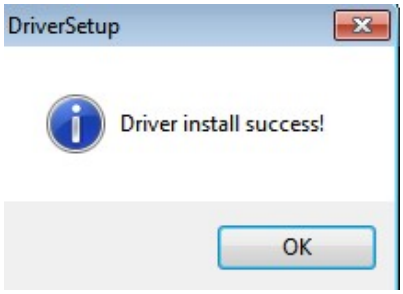

Fig 4- 7 Driver installation is successful

2.9 Click “Next” as Fig 4-8.

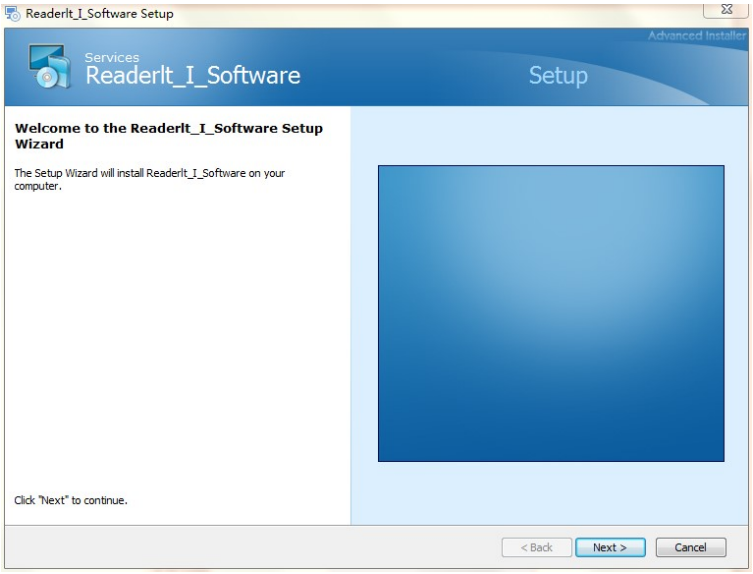

Fig 4- 8 Installation interface

2.10 Choose installation path way, then click “Typical”, as Fig 4-9.

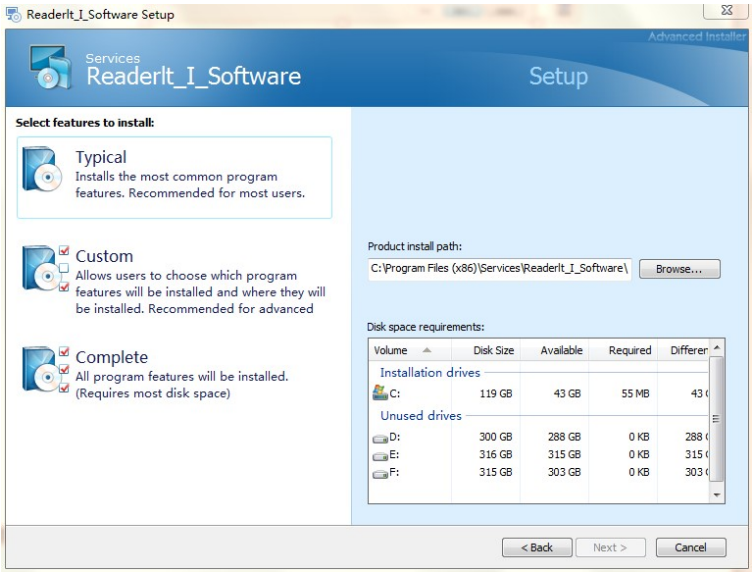

Fig 4- 9 Installation path and function

2.11 Get ready to install, as Fig 4-10.

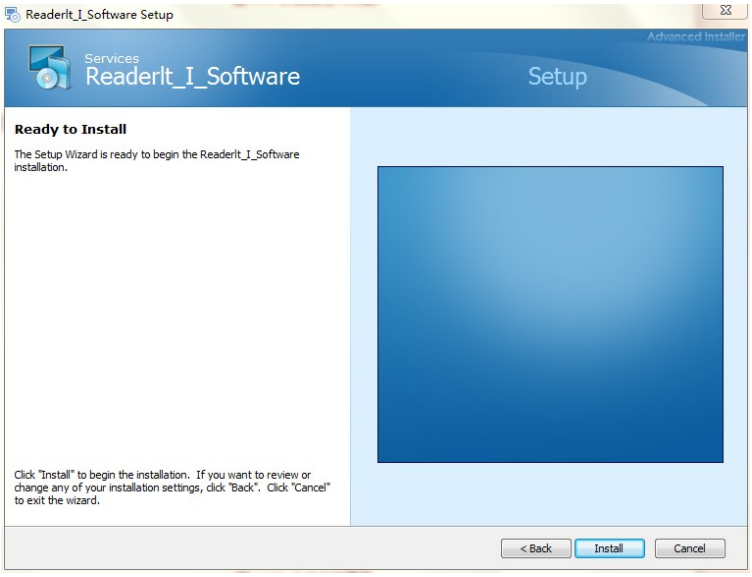

Fig 4- 10 Installation interface

2.12 Installation successful, as Fig 4-11.

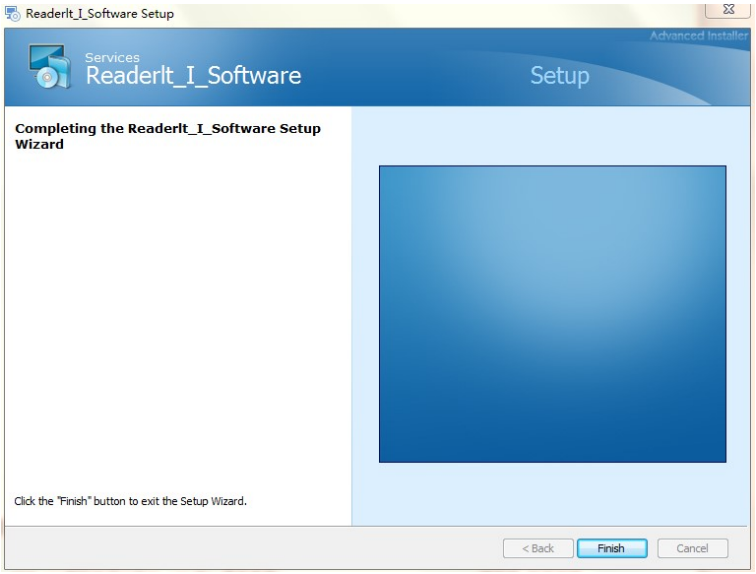

Fig 4- 11 Installation is complete

2.13 Desktop icon as 

Chapter 5 Operation Instruction

Section 1 Instrument connection

Before the software operation, it need to connect the instrument to the PC software specifically through the USB cable(come with the accessories). The connection method is: the A type interface of the cable is connected to the USB interface of the PC, and the B type interface of the cable is connected to the data interface of the instrument.as Fig 5-1.

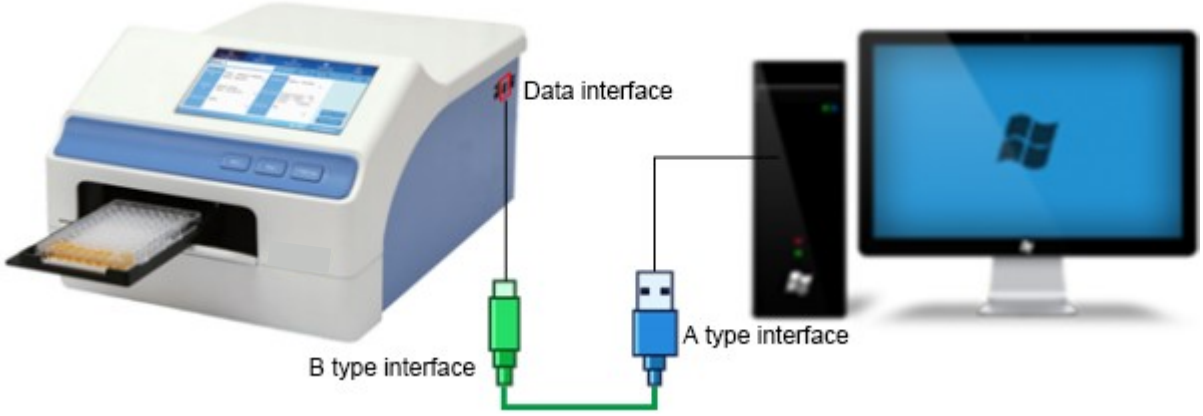

Fig 5- 1 Instrument and PC connection

Section 2 Brief account

2.1 Initial interface

Open the software, appear the initial interface of the boot, initialize the background software, automatically search the connected instrument, and obtain the basic information of the instrument. Initial interface as Fig 5-2.

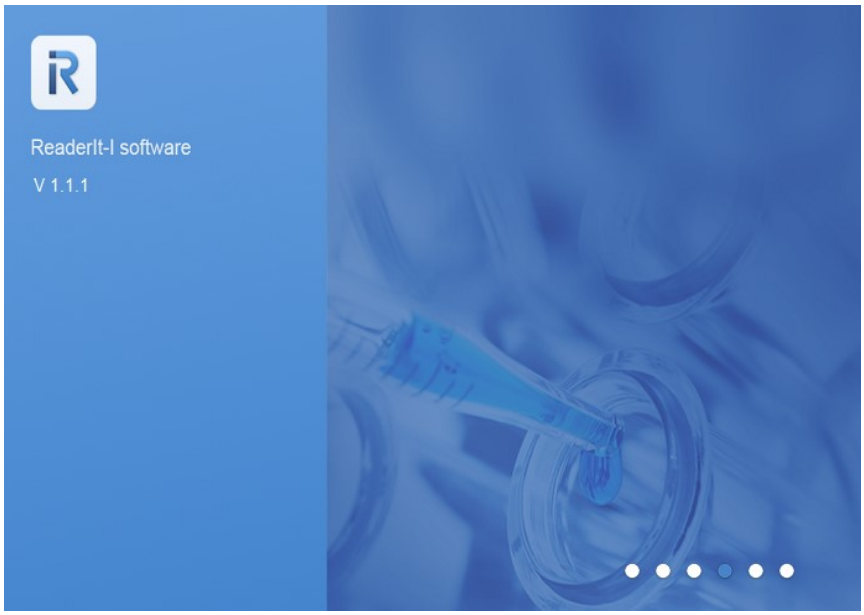

Fig 5- 2 Initial interface

2.2 User registration

Enter the user registration interface, as Fig 5-3. Please contact the manufacturer to obtain the registration code, click the “register” to complete the registration.

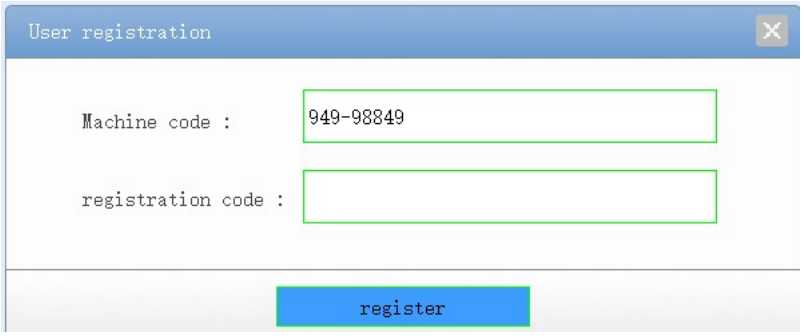

Fig 5- 3 User registration

2.3 Main Interface

After registration, enter the main interface, as Fig 5-4.

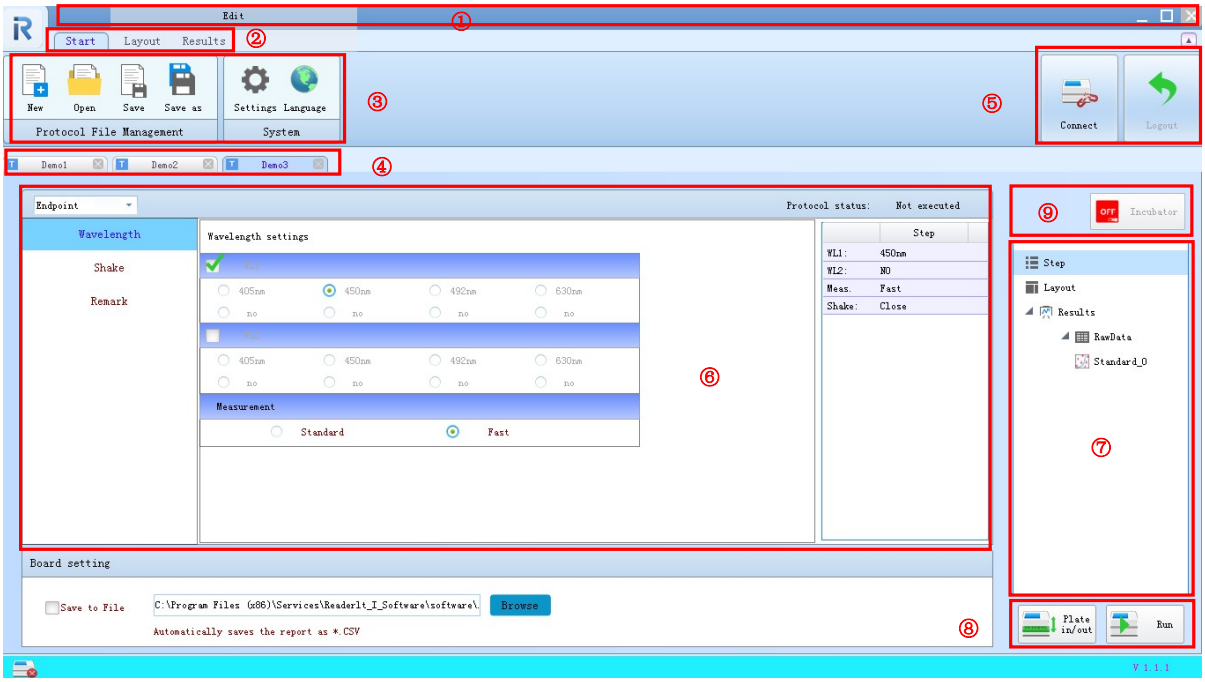

Fig 5- 4 Main interface

No.	Name	Function
①	Title	Including three functions: minimization, maximization and shut off.
②	Menu	Switching among "Start", "Layout" and "Results"
③	Toolbar	Sub-bar of the Menu
④	Protocol	Switching among protocols
⑤	Status	Control connection with Microplate Reader
⑥	Parameter info.	Displays setting information and results
⑦	Protocol tree	Including "Info", "Layout", "Step", "Results" and "Report".
⑧	Control bar	Controlling plate in/out and protocol running
⑨	Incubator bar	Incubation function

2.3.1 Title

This part including three functions: minimize, maximum and shut off.

2.3.2 Menu

Please see below table:

Content	Function
Shortcut	Including "New", "Open", "Save" and "Export".
Start	Including "New", "Open", "Save", "Save as", "Settings", "Language"and "Help".
Layout	Click to Layout interface
Step	Click to Step interface
Results	Click to Result interface
Report	Can export report in excel format.

2.3.3 Toolbar

For protocols operation, like "Demo1" "Demo2" "Demo3" etc.

2.3.4 Protocol

Displays opened protocols, Demo1, Demo2 and Demo3 are three default protocols.

2.3.5 Status

Two buttons included: “Connect/Disconnect” and “Logout”, if click “Connect” in the main interface, it will connect to the Microplate Reader.

*** Remark: If connected, both “Disconnect” button in the upper-right corner and  in the lower-left corner will appear, or “Connect ” and  will appear when instrument disconnected.**

2.3.6 Parameter info.

Including setting information and results.

2.3.7 Protocol tree

Displays the current protocol and newly added steps.
Click protocol tree can switch to selected steps quickly.

2.3.8 Control bar

Including two buttons “Plate in/out” and “Run”.

2.3.9 Incubator bar

Control incubation to turn on or off, and automatically turn on when the instrument recognizes it is a version with incubation function.

Section 3 Protocol creation

The software can set to load three protocol templates,like Demo1, Demo2, Demo3, as Fig 5-5. First time to run protocol, click “New” protocol, then enter the Settings interface to choose the protocol template and confirm after completion.

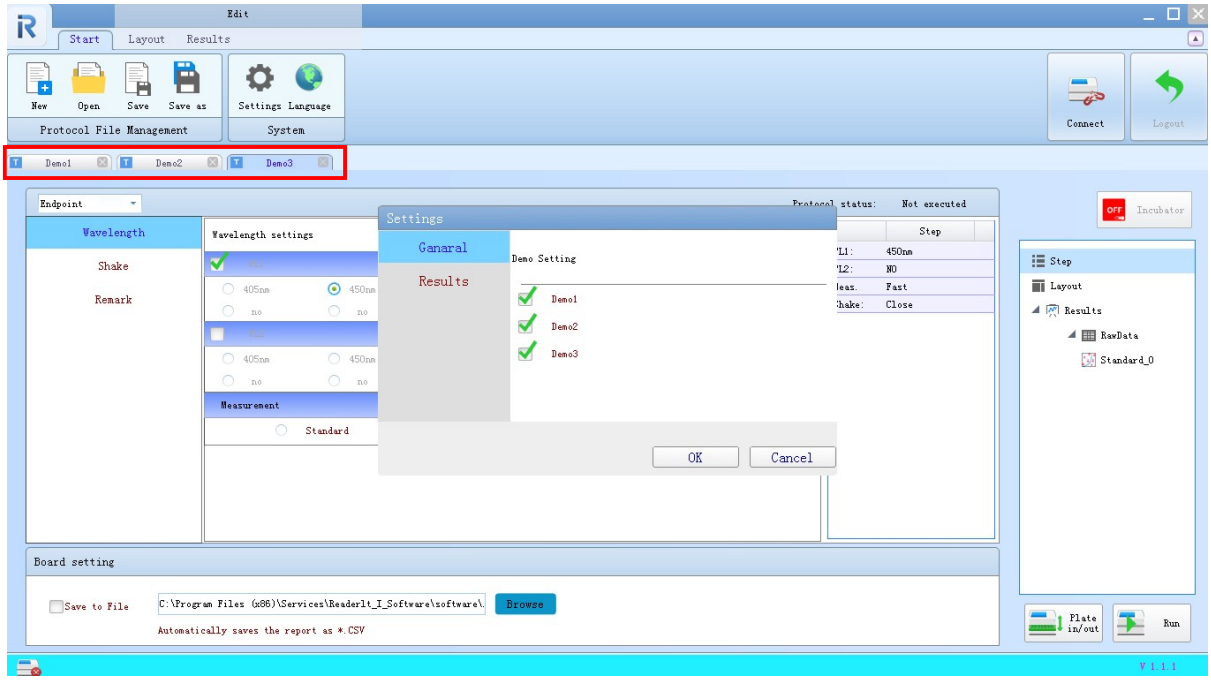

Fig 5- 5 Set the load protocol template

3.1 File management

There are two types of protocol files: One category only has parameter settings and is not tested(which means have no detecting result); And the other category includes parameter settings, detection data and analysis results after detecting.

In the interface, distinguish with “T” before the file, the file with “T”mean does not contain detection data, as Fig 5-6.

Fig 5- 6 Distinguish with”T” before the file

The storage suffix of the two types of files is also different. The file suffix without detection data is .Mth, with detection data is .Dat.

3.1.1 New

Click "New" on the menu bar or in the "start" to create a project protocol. The name of the protocol is accumulated by default. The format is new protocol + serial number,as Fig 5-7.

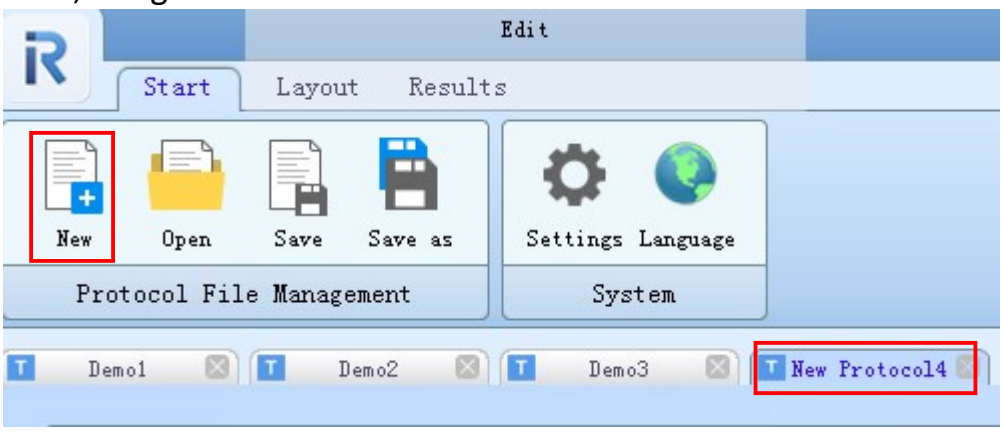

Fig 5- 7 New protocol

3.1.2 Open

Click “Open” in the “Start” to choose the protocol to open.

1) The default open protocol pathway is Pro_Save folder in the installation directory. After exporting the Excel report successfully, the excel report open path way is the last time export path way.

2) The type of protocol file can be chosen to open, .Mth or .Dat, as Fig 5-8.

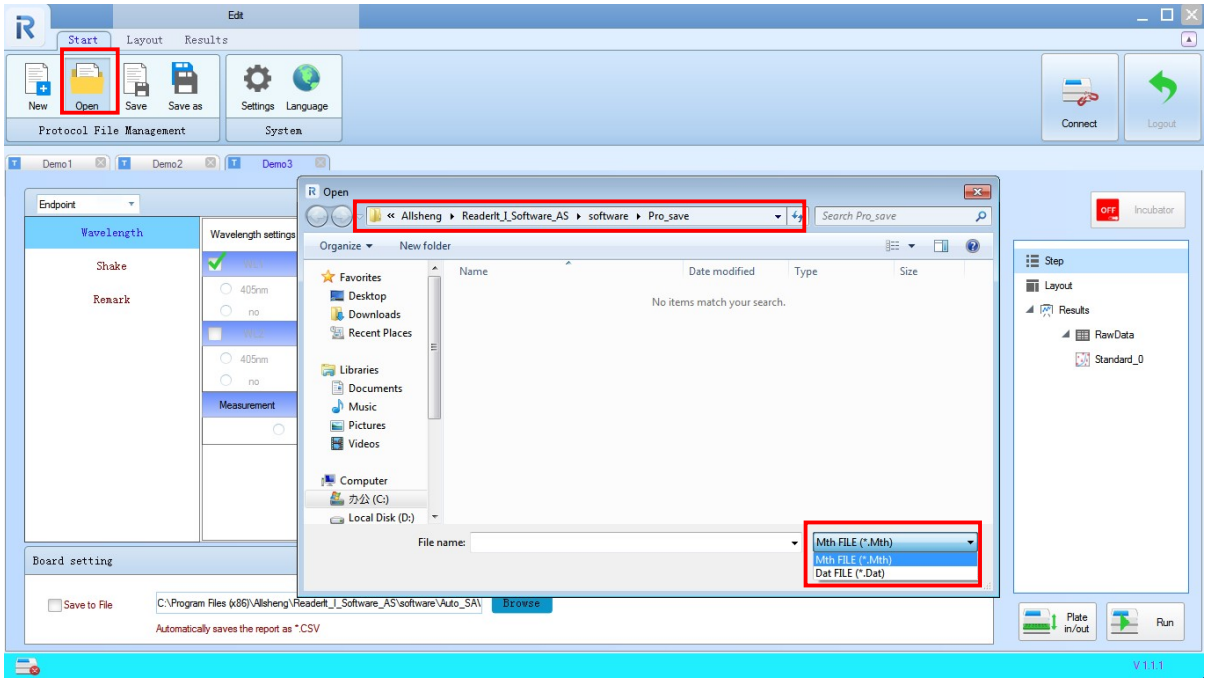

Fig 5- 8 Open protocol

3.1.3 Save

1) Click the below directory can change the path way to save file, and pop-up dialog as Fig 5-9.

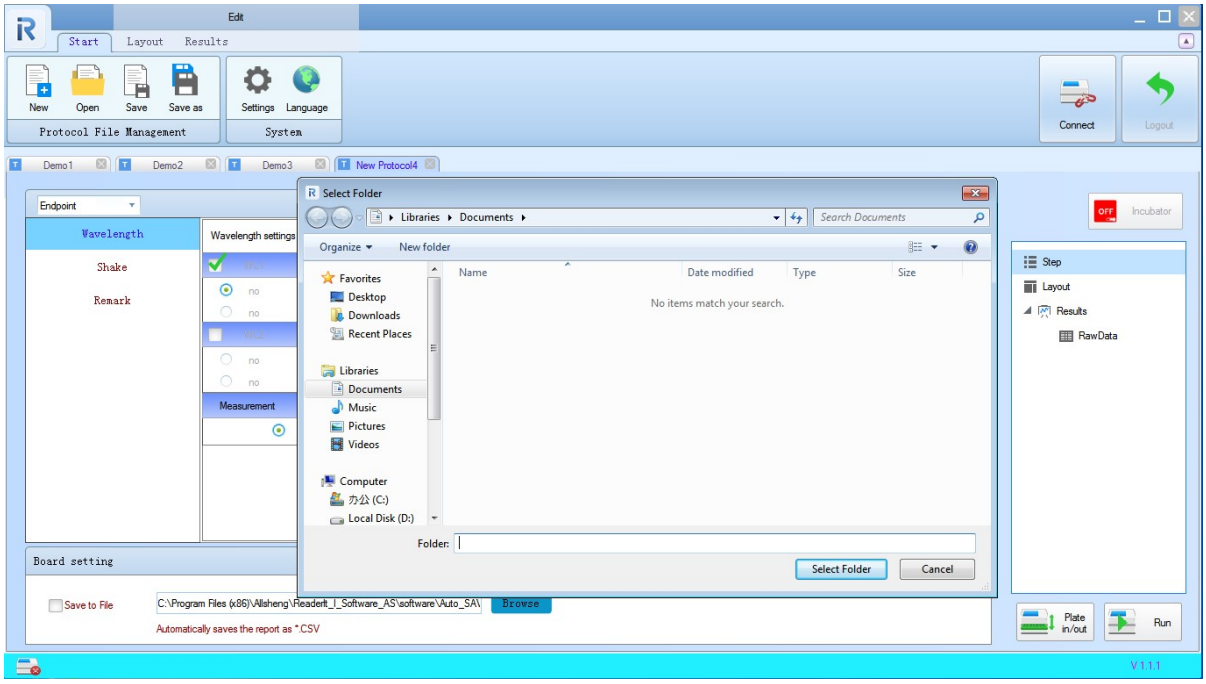

Fig 5- 9 Save path

2) Click “Save” in the menu, and pop-up dialog as Fig 5-10.

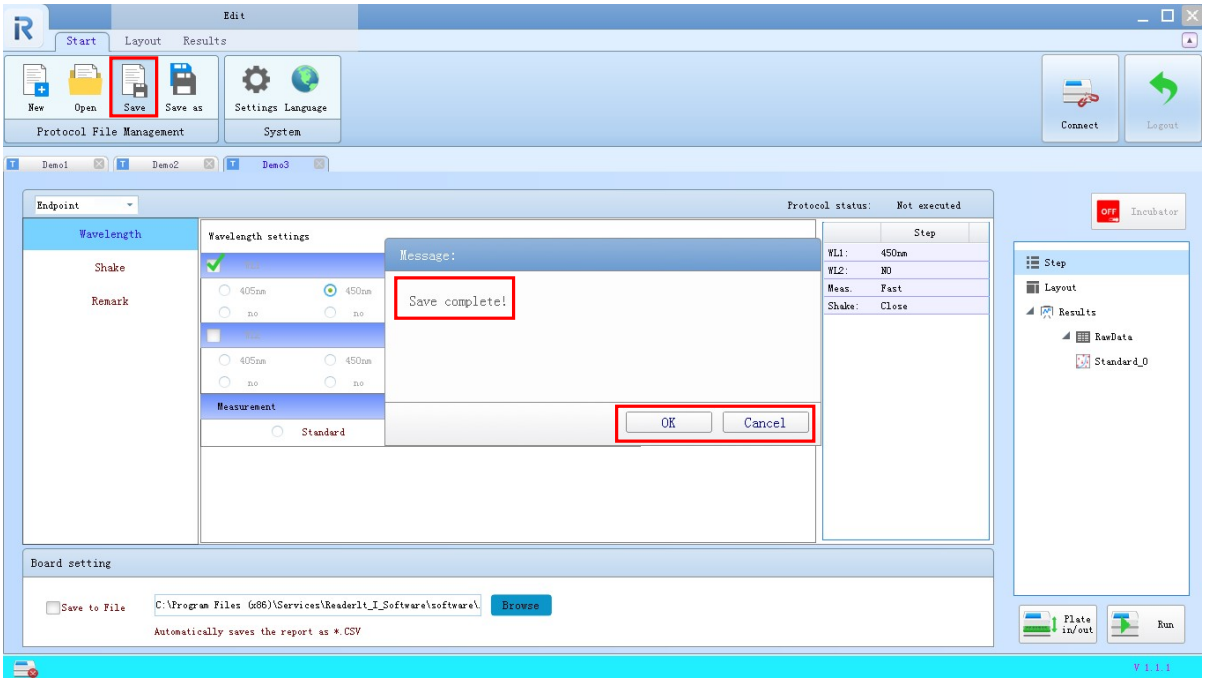

Fig 5- 10 Save in Start

If the saved protocol has the same name as another, the prompt whether to cover will pop-up.

3.1.4 Save as

Click “Save as” in the “Start”, and then pop-up dialog as Fig 5-11. The name and storage location can be changed.

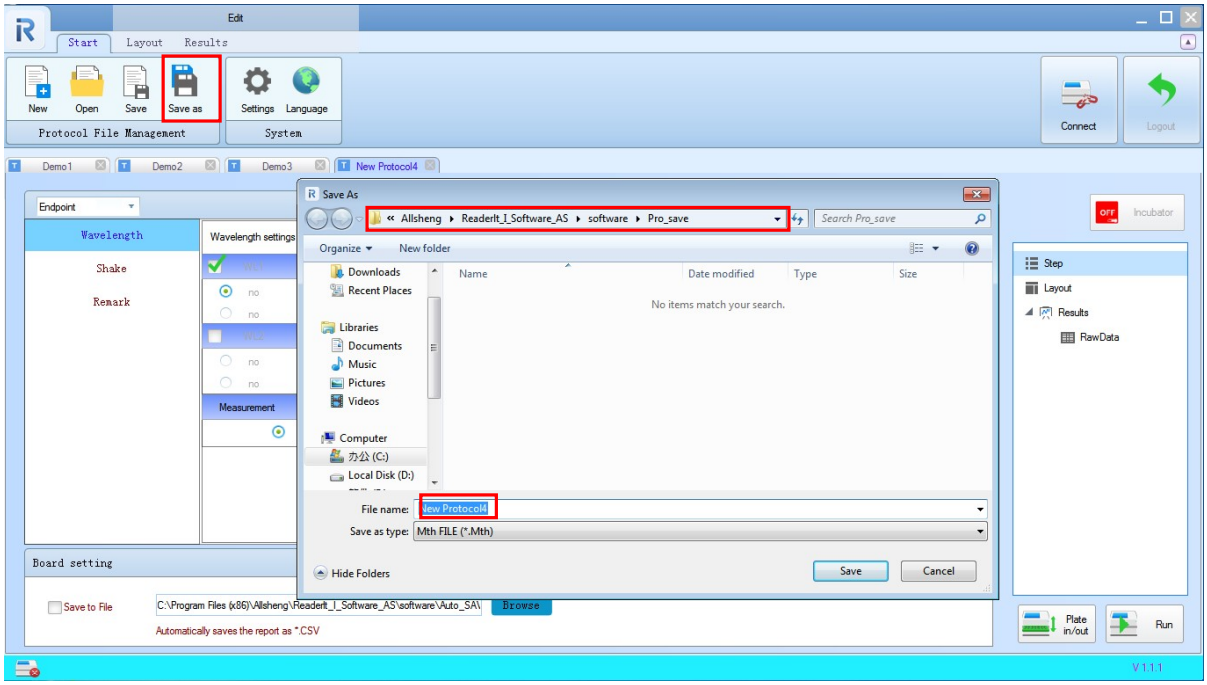

Fig 5- 11 Save as

3.2 Layout

Click the layout in the menu bar or structure tree to enter the layout interface.

3.2.1 Plate layout settings

Click the layout of the structure tree, as Fig 5-12.

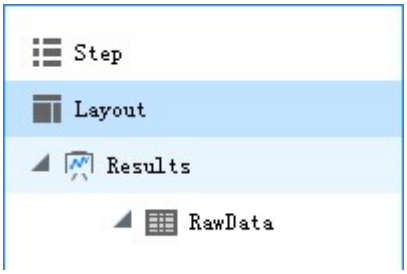

Fig 5- 12 The structure tree settings

The layout interface consists of plate layout and sample type, as Fig 5-13.

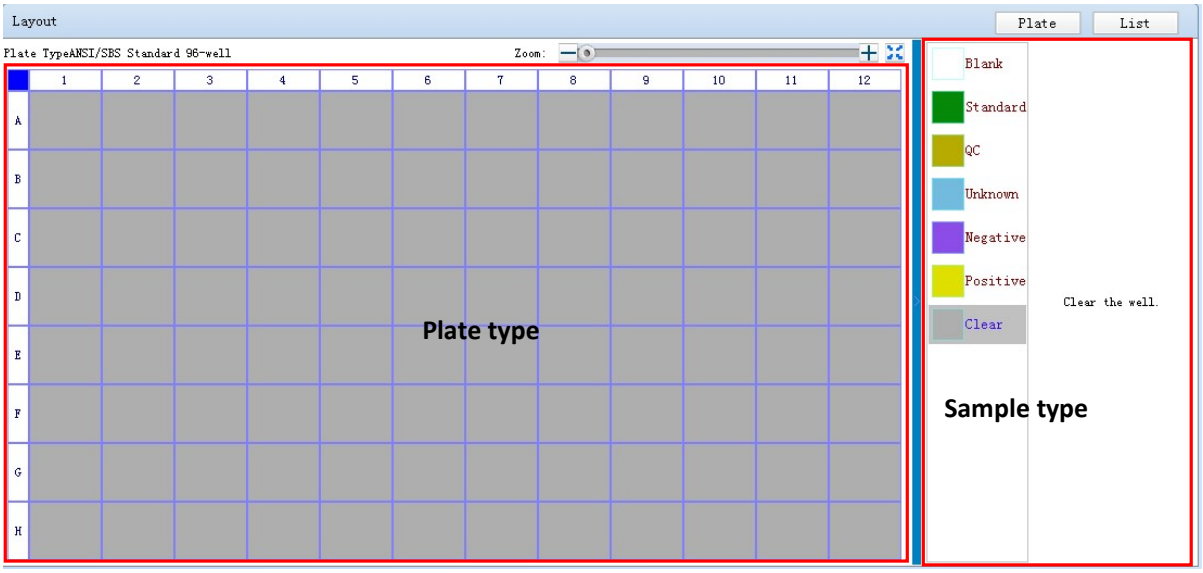

Fig 5- 13 Layout interface

3.2.1.1 Sample type

There are 7 types of well: Blank, Standard, QC, Unknown, Negative, Positive and Clear.

Blank: used for blank control, you can set several wells as blank.

Standard: Standard sample well in dark green are for setting standard curve. Parameter settings see Fig 5-14. “Replicates”: Set colume or row, several wells with the same number of standard sample can be set. “Operator” can be “+”, “-”, “×”, “÷”. “Step by” can be any integer.

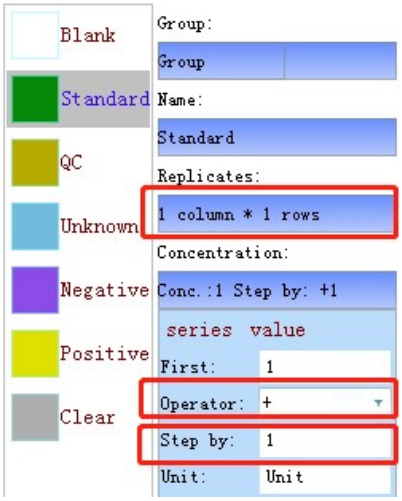

Fig 5- 14 Standard sample settings

QC: QC control positions are in dark yellow, Set several wells for the same serial number of quality control samples,the parameter setting method is same with “Standard”.

Unknown: In light blue, several wells can be set for unknown samples with the same name. The parameter setting method is same with “Standard”.

① The name can be set freely. the prefix part can accept numbers, letters, even Chinese characters, but for the suffix part, only numbers accepted(from 0).

② Dilution ratio can be set, default value is1:200 as below Fig 5-15. If change the dilution ratio for an unknown sample, the dilution ratio for all this samples in the current layout will also change.

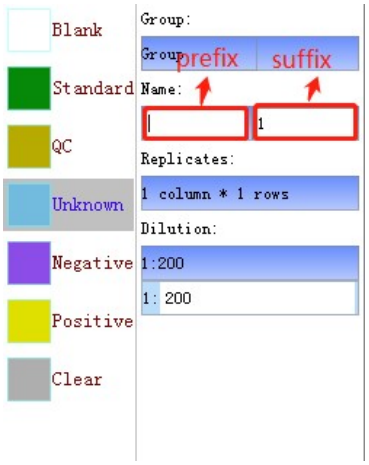

Fig 5- 15 Unknown sample settings

Negative: Negative control well in purple, you can set several wells as negative control.

Positive: Positive control well in light yellow, also several wells can be set as positive control.

Clear: Wells in gray without samples.

3.2.1.2 Single-well operation

Example 1 (do not open replicates): Select the sample type as the standard, the replicates well set to 1 column*1 line, concentration set to 1 ,click A1 ,the well information as Fig 5-16.

Fig 5- 16 Step 1 of example 1

Then click A2, the information as Fig 5-17. The well name is cumulative relationship.

Fig 5- 17 Step 2 of example 1

Example 2 (open replicates well):Select the sample type as the standard, the replicates well set to 1 column*2 line, concentration set to 1 ,click A1 ,the well information as Fig 5-18.

Fig 5- 18 Example 2

3.2.1.3 Area operation

First select the sample type and set parameters, then click select a well in the plate layout area and select an area by dragging. The information of this area is accumulated. The order of accumulation is based on the direction of dragging. The color of this area is consistent with the background color of the selected sample type.

Note: This operation can only be used when the replicates well is not opened.

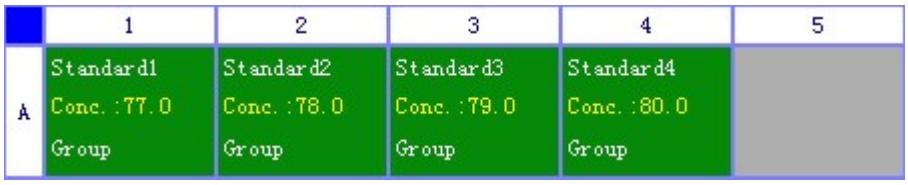

Fig 5- 19 Area operation

3.2.1.4 Change the sample type of well

To change the sample type of a well, first select clear, pop up the prompt dialog box, as Fig 5-20 click ok to clear the well successfully, then select the sample type that needs to be changed.

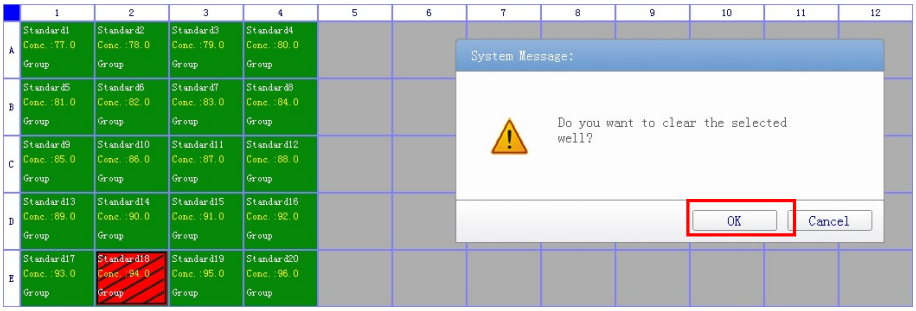

Fig 5- 20 Clear well

3.3 Step settings

Before setting the steps, it need to choose the measurement method. There are two measurement methods: Endpoint and Kinetic, as Fig 5-21.

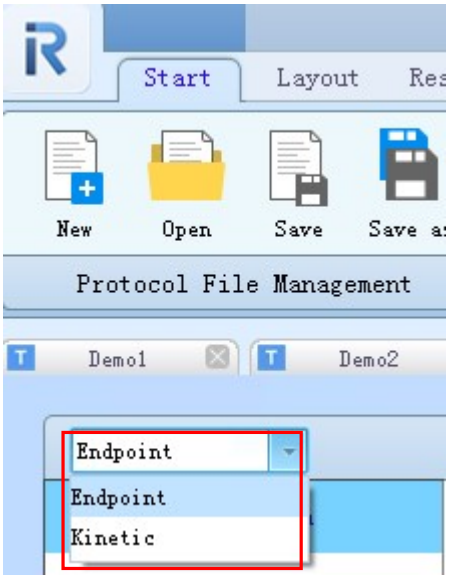

Fig 5- 21 Choose the measurement method

The same and different points of step settings of endpoint and kinetic:

① Wavelength: The kinetic and endpoint methods are the same.

② Shake: Kinetics has one more choice of shake type than the endpoint method, and the rest is same.

③ Time/readings: Only for kinetics.

④ Remark: The kinetics and endpoint methods are the same.

3.3.1 Wavelength

Select the detection wavelength, wavelength1 and wavelength2 are not repeatable,and the detection type can be selected standard or fast.

Fig 5- 22 Wavelength setting

3.3.2 Shake

Shake function can be turned on of off. Shake function includes shake time, wait time, shaking speed, shake type. As Fig 5-23.

Fig 5- 23 Shake setting

3.3.3 Time/Readings(Only for kinetic)

Setting content include total readings(recycle times) and intervals.

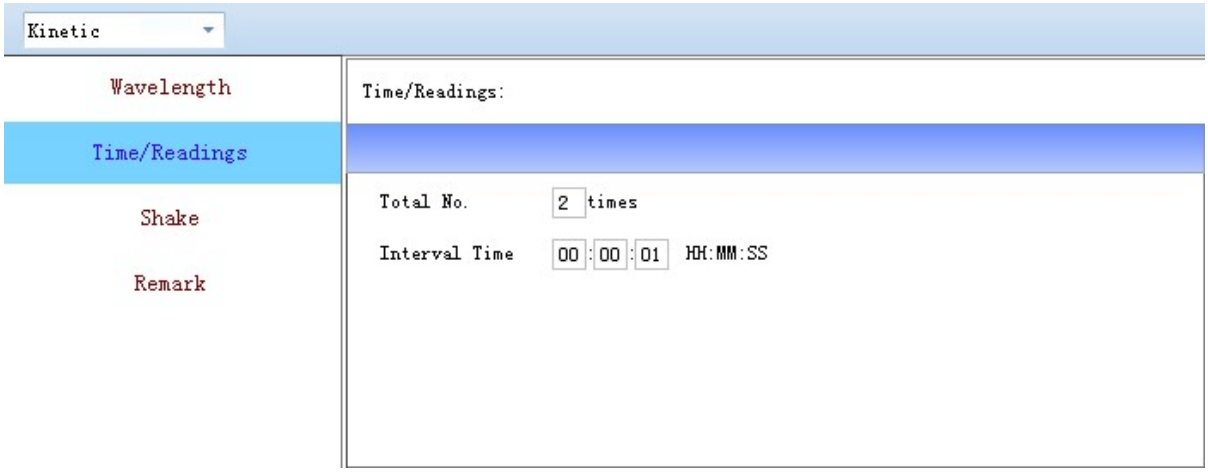

Fig 5- 24 Time/Readings

3.3.4 Remark

Users can fill in relevant information according to the protocol as Fig 5-25.

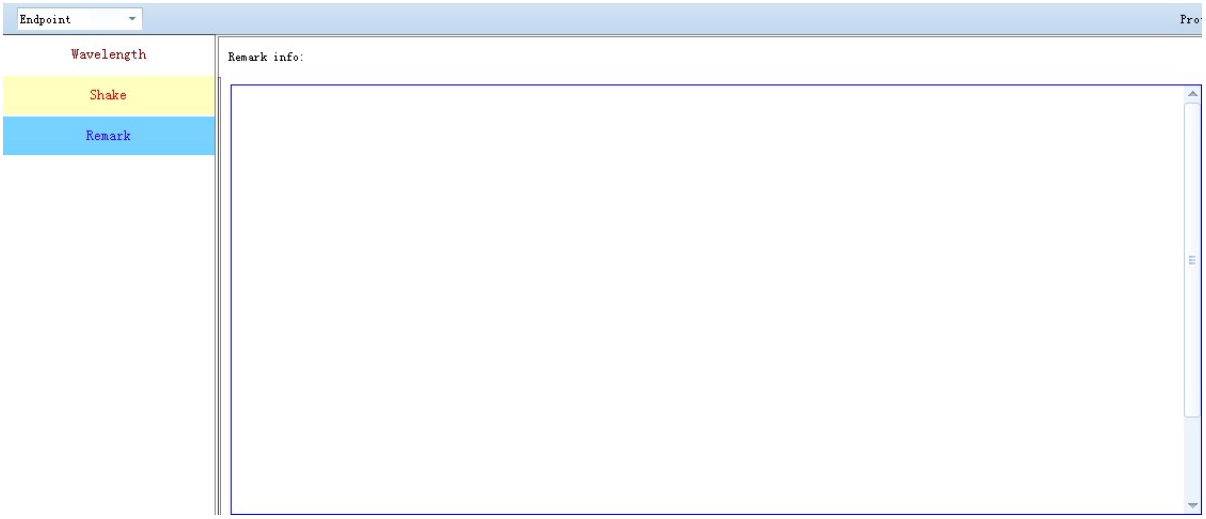

Fig 5- 25 Remark

3.4 Incubator setting (only for Micropalte reader with incubator)

Incubation function can be turned on or off. Incubation function includes target temperature and waiting time. Target temperature setting range 0℃ to 50℃, wait time setting range 00:00:00 to 99:59:59, as Fig 5-26 to 5-28.

Fig 5- 26 Incubator on

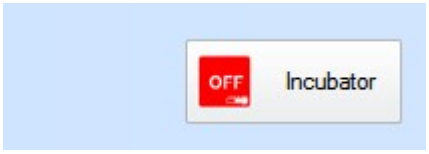

Fig 5- 27 Incubator off

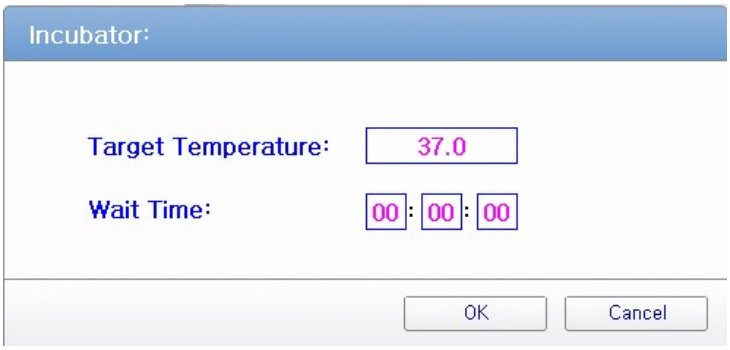

Fig 5- 28 Incubator settings

Section 4 Run the protocol

Open a protocol file(or new one), set the parameters, put in sample plate, and click “Run” to detect it. As Fig 5-29. The plate in/out button is used to control plate bracket to entry and exit instrument.

Fig 5- 29 Run protocol

4.1 Endpoint

After detecting, there are two ways to display the result: Plate and list, as Fig 5-30.

Fig 5- 30 Plate or List

Plate interface of Endpoint method detection result as Fig 5-31:

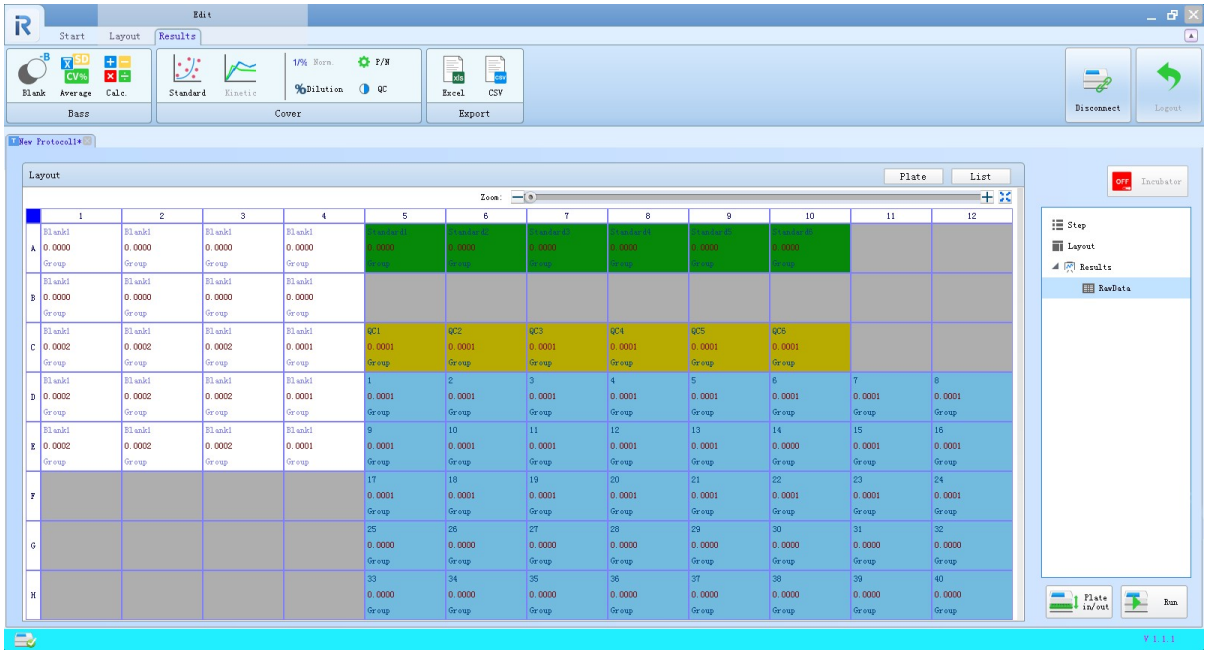

Fig 5- 31 Plate interface of Endpoint

List interface of Endpoint method detection result as Fig 5-32:

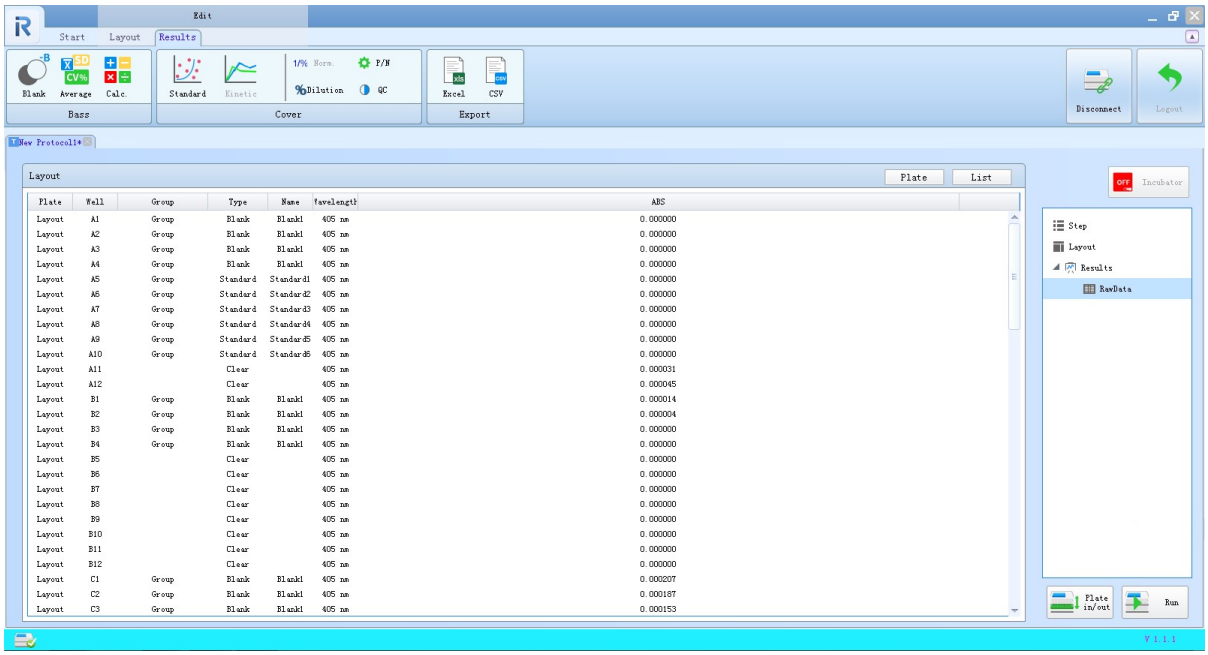

Fig 5- 32 List interface of Endpoint

4.2 Kinetic

Plate interface of Kinetic detection result as Fig 5-33:

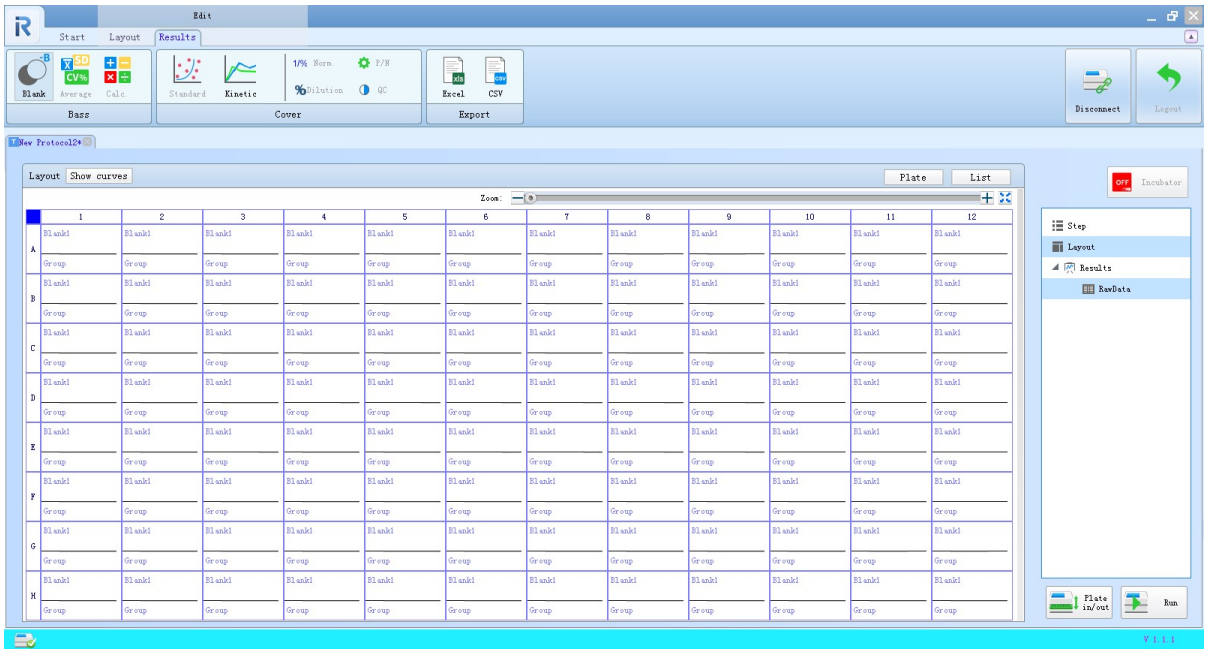

Fig 5- 33 Detection result of Kinetic

4.2.1 View kinetic curves

First select the wells want to view, and then click Show curve, as Fig 5-34 and Fig 5-35.

Fig 5- 34 Show curves

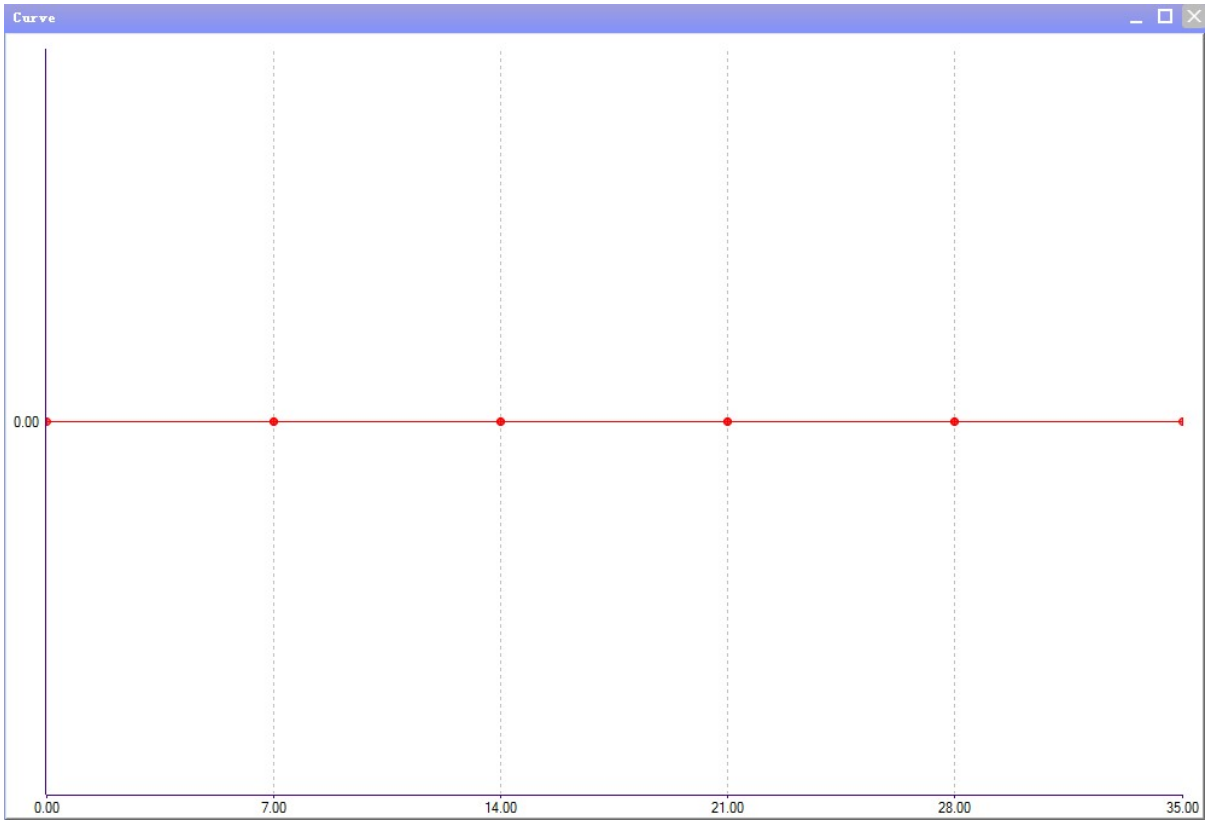

Fig 5- 35 Kinetic curve

Section 5 Data analysis

Data analysis includes subtract the blank, basic calculation, standard curve, kinetic analysis.

5.1 Blank

Click “Blank”, as Fig 5-36, the absorption value will subtract the average value of all blank wells measured.

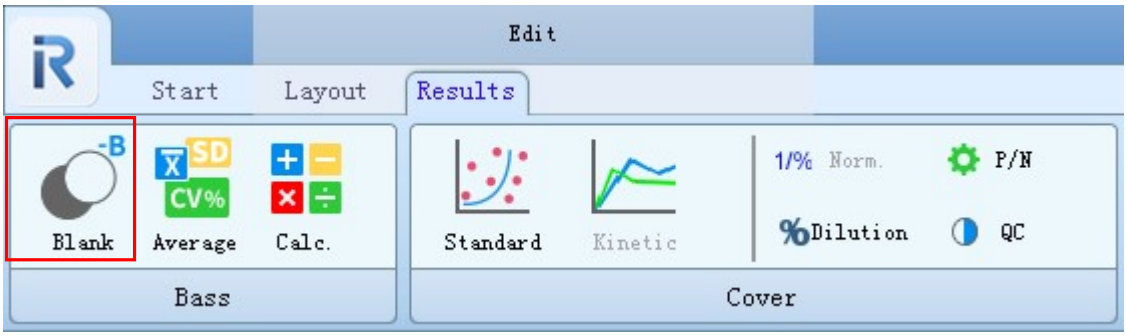

Fig 5- 36 Subtract blank

5.2 5.2 Basic calculation

Click “Calc.”, as Fig 5-37.

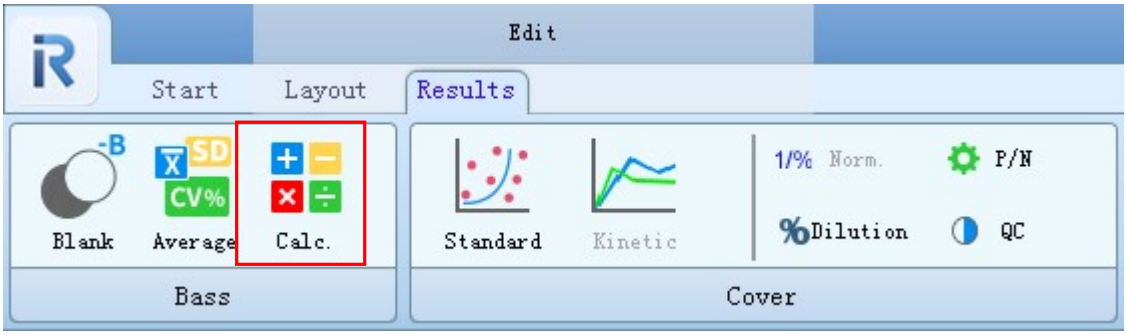

Fig 5- 37 Calculation

Basic calculations contain 4 types: A+B, A-B, A×B, A÷B.

Fig 5- 38 Basic calculation type

5.3 Standard curve(only for endpoint)

Click Standard, as Fig 5-39.

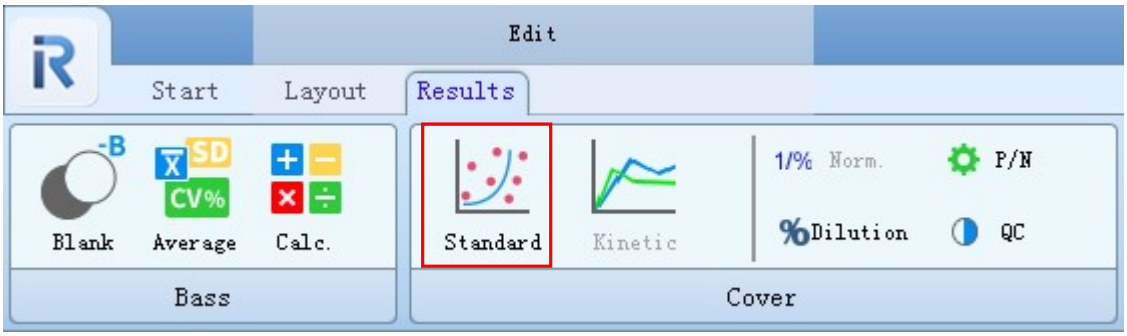

Fig 5- 39 Standard curve

Result interface of curve fitting, as Fig 5-40.

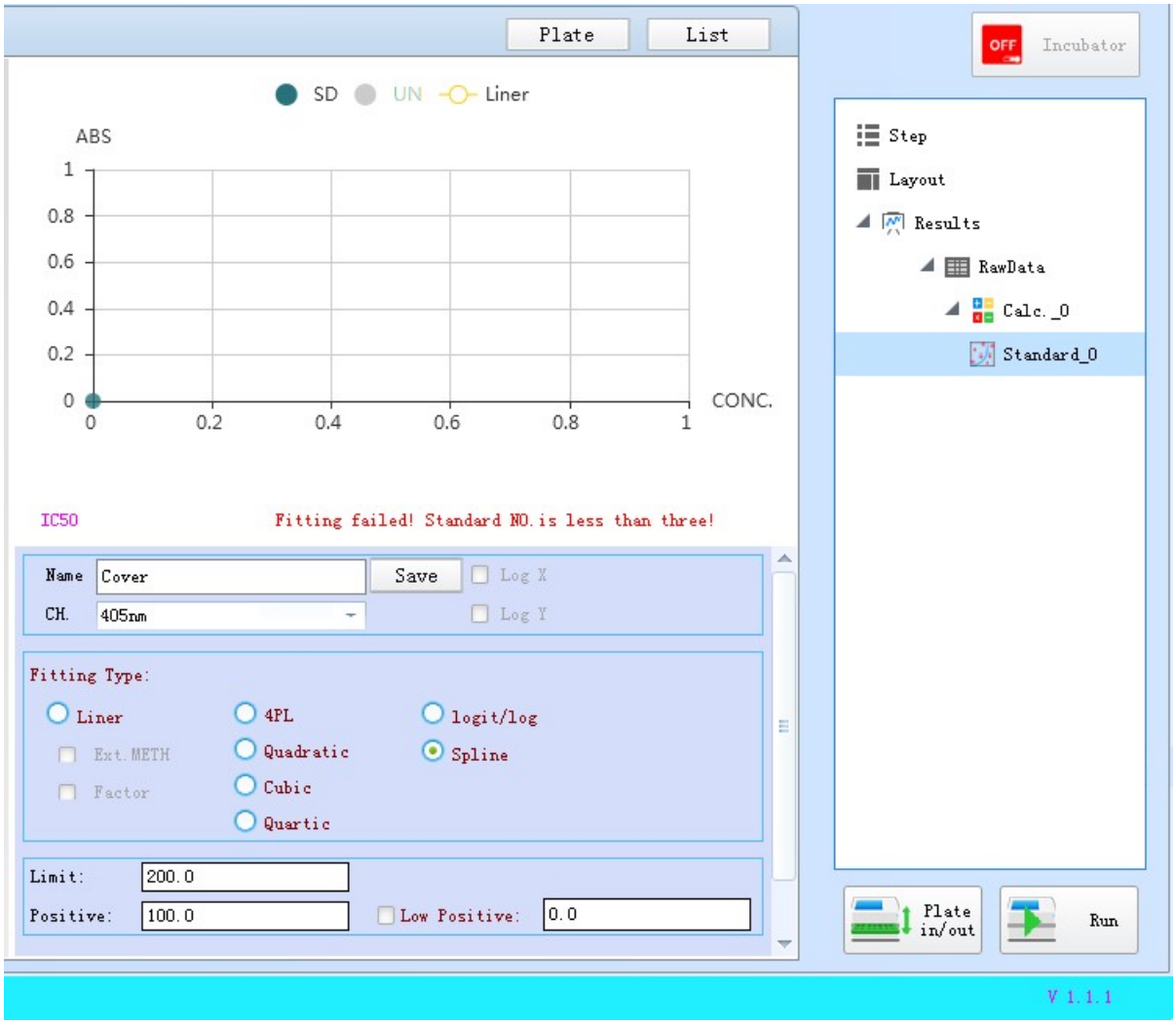

Fig 5- 40 Result of Curve fitting

The left side of the interface displayed the concentration value of each well calculated according to the standard curve, and the right side displayed the

standard curve fitting results, including the curve fitting equation, R^2. If the fitting effect is not good, it can pretreat it before fitting.

5.3.1. Pretreat

Make changes by ticking the checkbox before Log X or Log Y, as Fig 5-41.

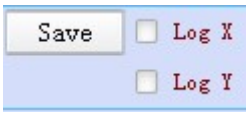

Fig 5- 41 Pretreatment method

Among them, X represents concentration value, Y represents Abs value, there are 4 pretreatment methods:

① Liner/Liner: none of them selected;

② Liner/Log: Only Log Y selected;

③ Log/Liner: Only Log X selected;

④ Log/Log: Logarithm X and Logarithm Y selected.

5.3.2. Fitting type

Fitting type include Liner, 4PL, Logit/Log, Quadratic, Spline, Cubic, Quartic, as Fig 5-42.

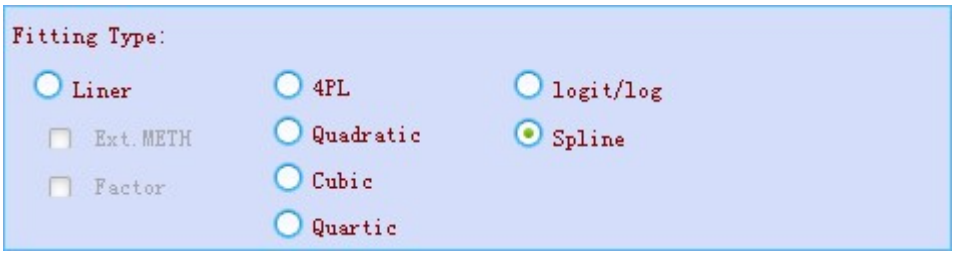

Fig 5- 42 Fitting type

5.4 Kinetic analysis (only for kinetics)

Click “Kinetic”, as Fig 5-43.

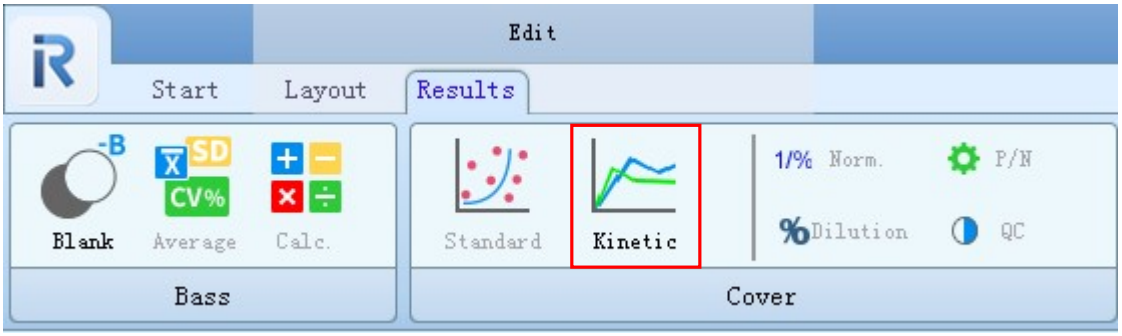

Fig 5- 43 Kinetic analysis

5.4.1. Types of Kinetic analysis

Kinetic analysis types include Average rate, Maximum rate, Maximum rate time, Maximum(peak), Time to change, Maximum(peak) time, as Fig 5-44.

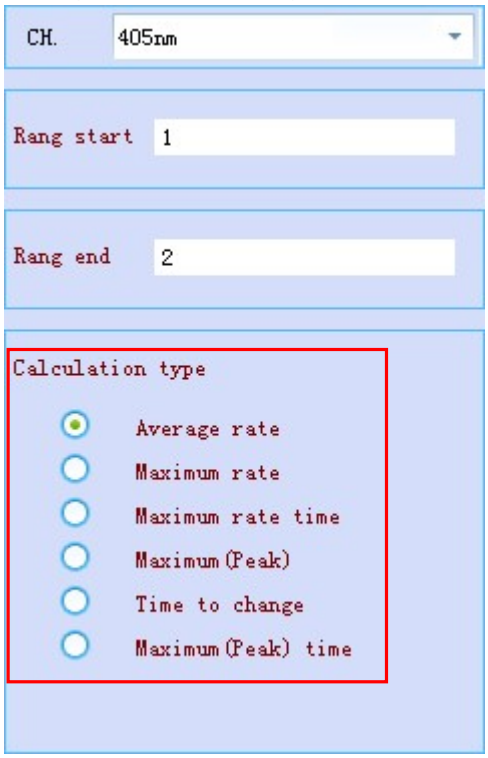

Fig 5- 44 Kinetic analysis type

Section 6 Report

6.1 Report exporting

There are two formats to export report in the reporting interface.

Excel format report: click “Excel”,as Fig 5-45, the name and storage location can be changed.

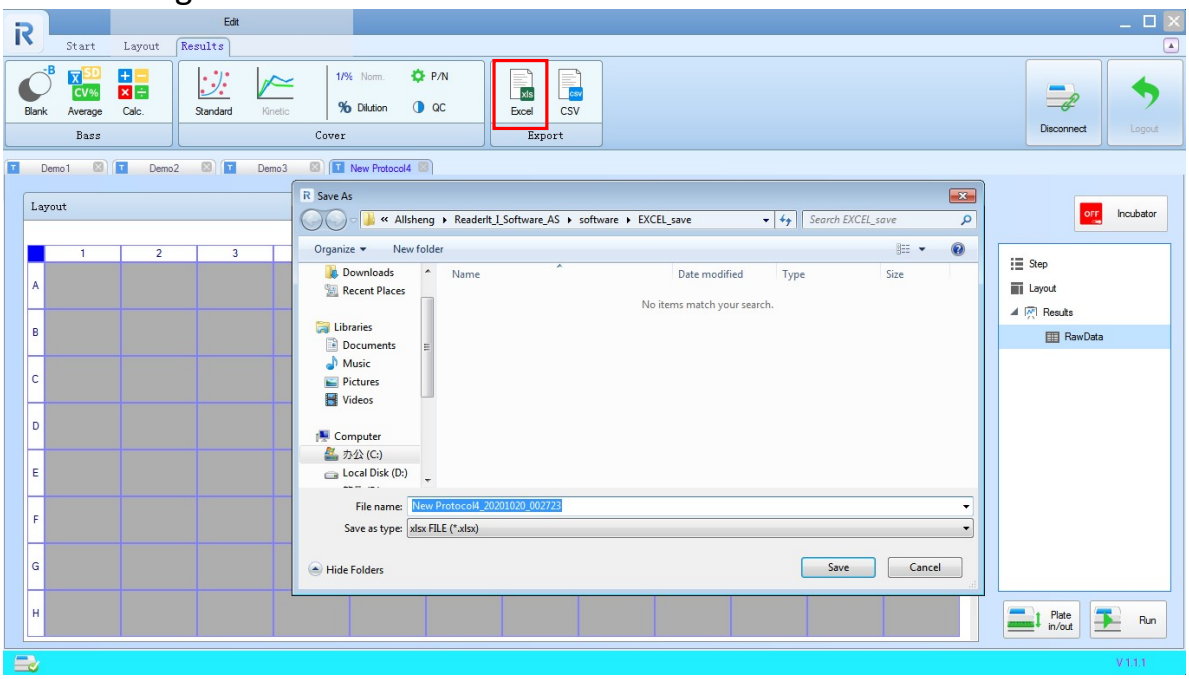

Fig 5- 45 Excel format report

CSV format report: click “CSV”, as Fig 5-46, the name and storage location can not be changed.

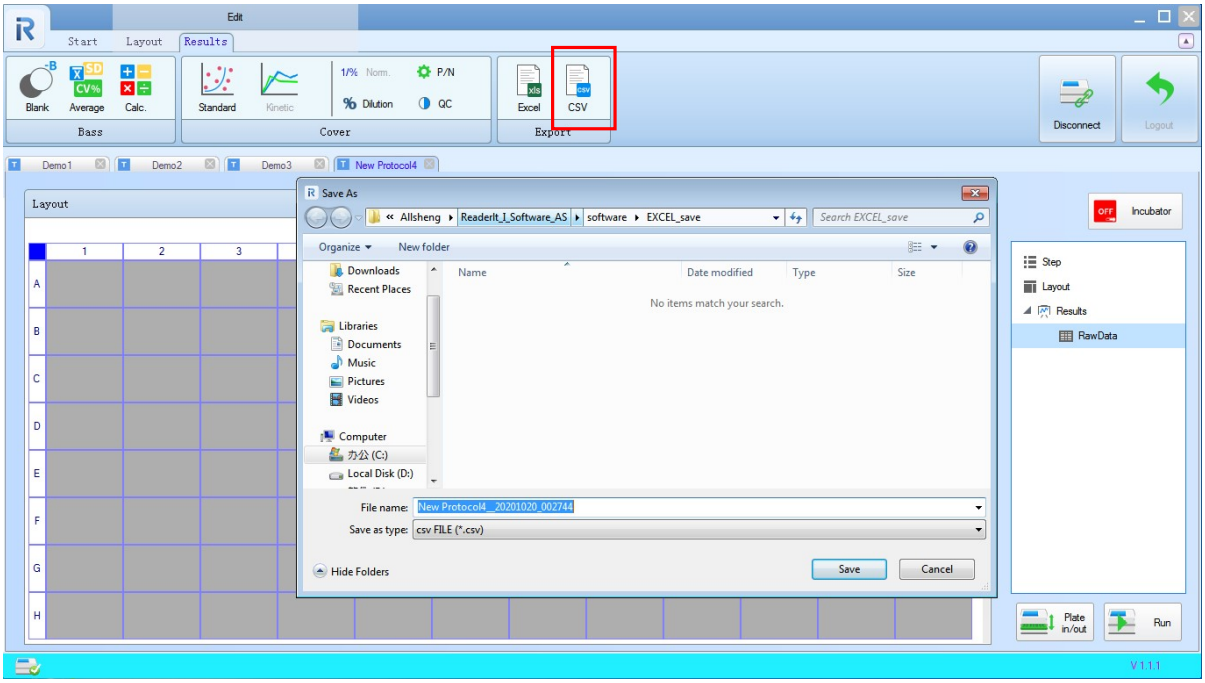

Fig 5- 46 CSV format report

Section 7 System settings

7.1 General settings

Click the general settings in the settings to select the loader, as Fig 5-47.

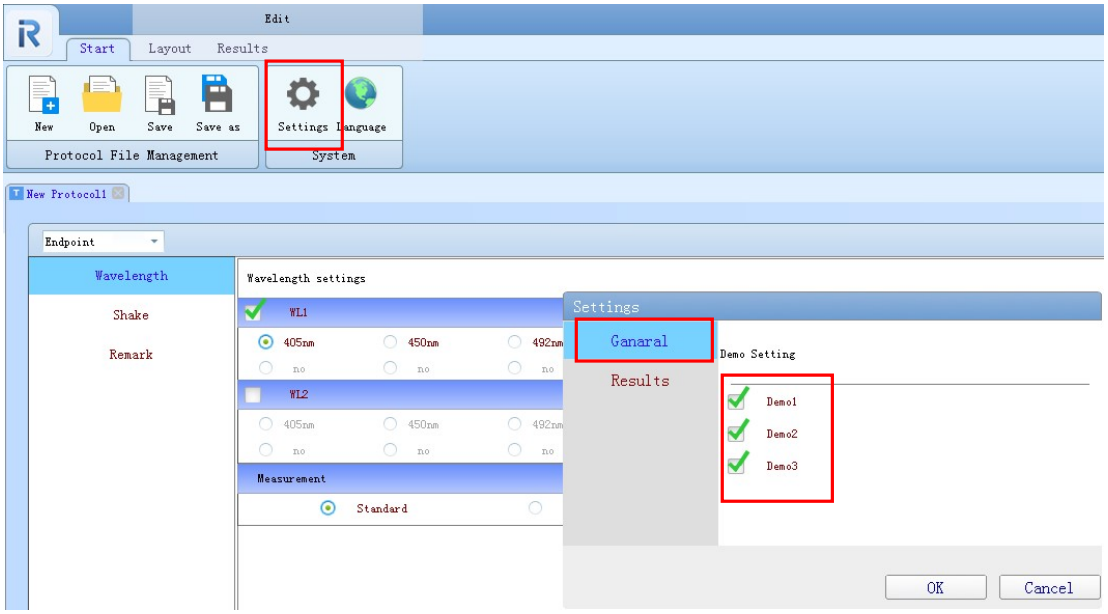

Fig 5- 47 Setting the Demo loading

7.2 Results

The absorbance and concentration can be set, only for their decimal place(Default value of absorbance is three decimal while two for concentration), as below Fig 5-48.

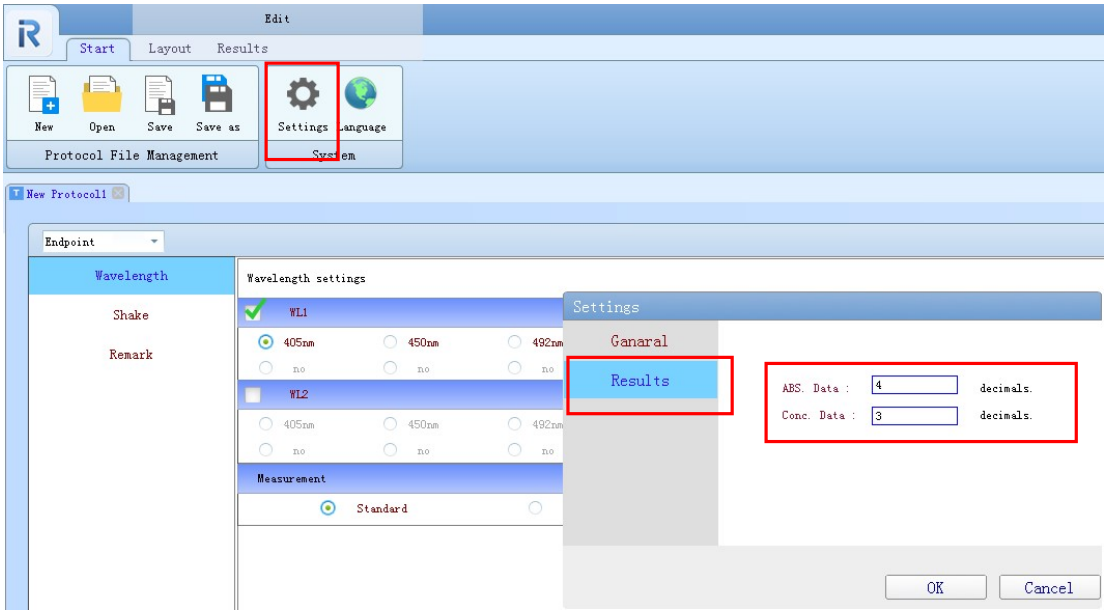

Fig 5- 48 Decimal settings

7.3 Language

Language can be switched between Chinese and English. Restart needed once language changed, as Fig 5-49.

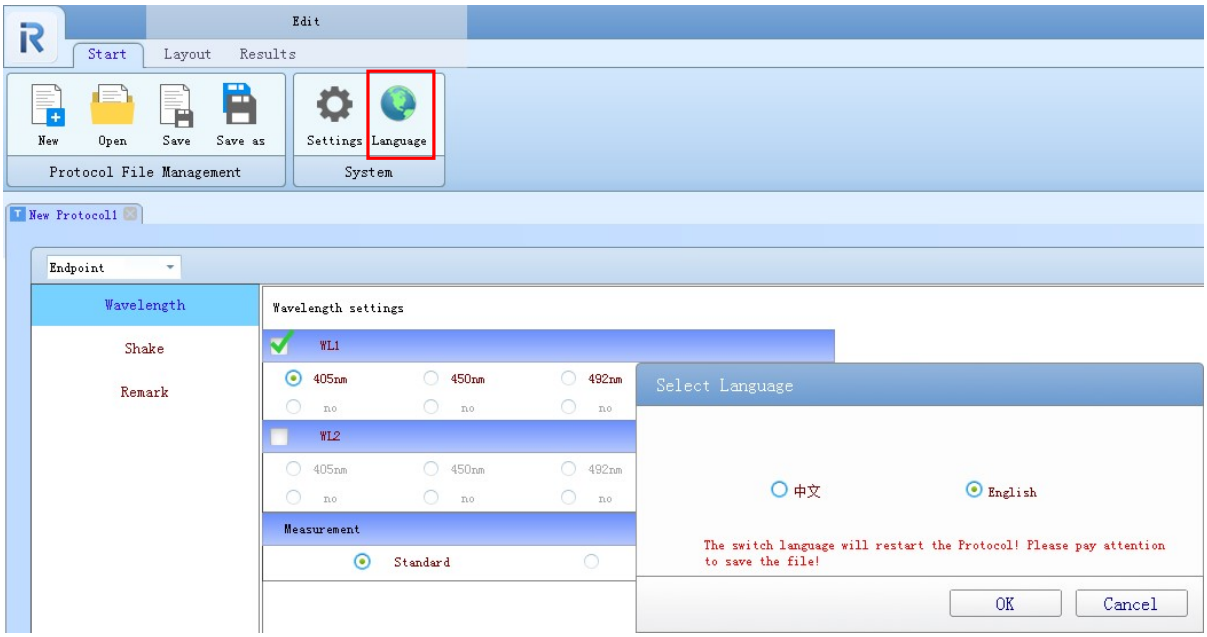

Fig 5- 49 Language switching

Memo

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