Finecare III plus service manual

Contents

1. Instrument introduction

1.1 Instrument components introduction

1.2 Basic parameters

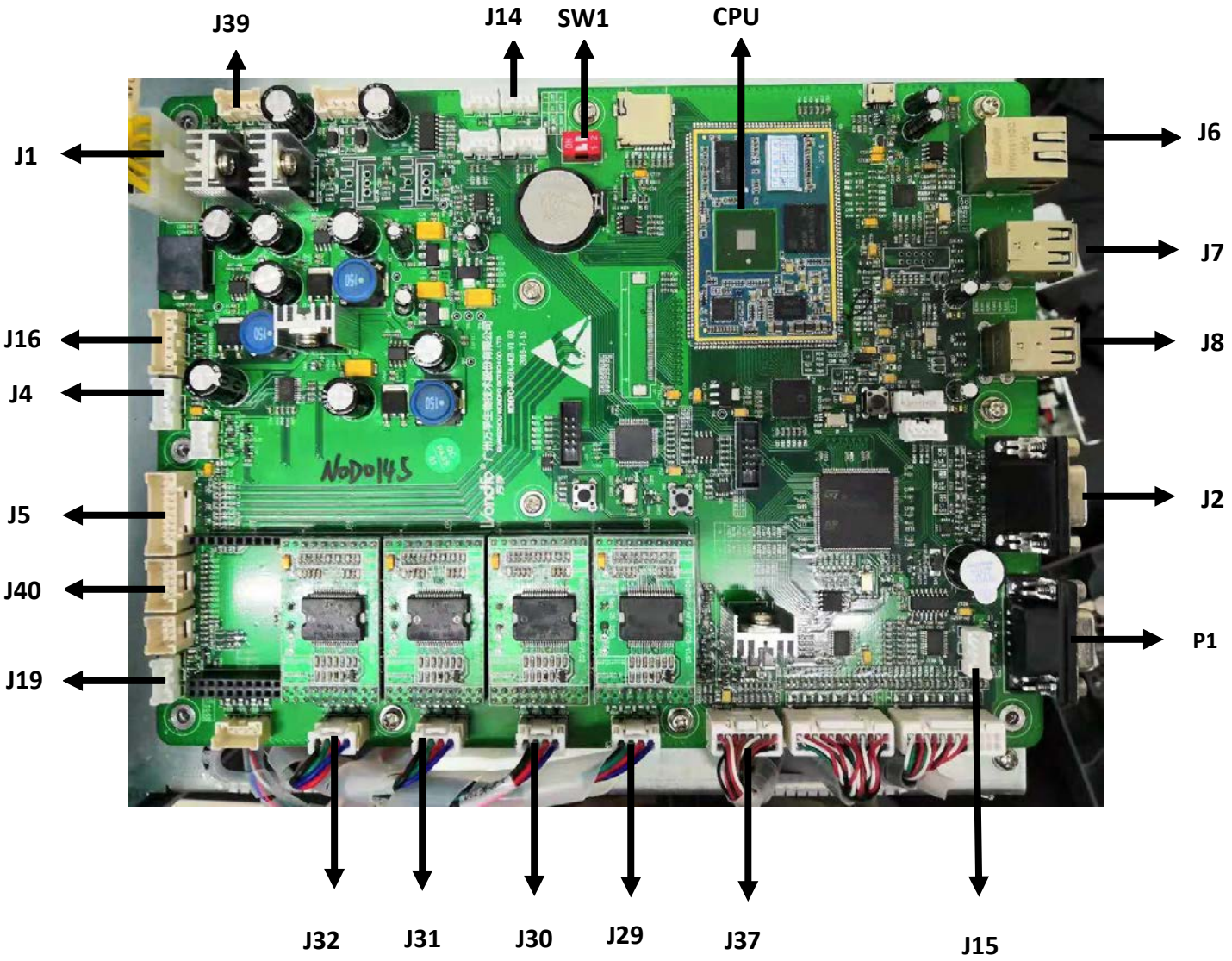
Power	Power Input: 230Vac, 50Hz, 240VA Power Output: 120VA
Excitation light source	Blue LED light
Excitation spectrum wavelength (λ0)	λ0 = 470nm
Absorption spectrum wavelength (λ1)	λ1 = 525nm
Operation system	Linux 3.0.8
Detector	Photodiode
Operating System	Linux 3.0.8
Dimensions	374(L)*396(W)*480.5(H) mm
Weight	About 19.5 kg
Fuse	250V/3A, Φ5*20mm
Ports	USB×4, COM×1, Ethernet ×1, 1 VGA×1
Miscellaneous	Thermal printer 10" touch screen USB*4, COM×1, 1 Ethernet Port, 1 VGA port Optional: can be connected to an external printer via USB port

1.3 Contents of the package

No.	Item	Quantity
1	Finecare™ FIA Meter III Plus	1
2	Power cord	1
3	Operation Manual	1
4	Printer Paper	1
5	Packaging List	1
6	Quality Control card	1
7	Warranty Card	1
8	Routine Operation Instruction for Use	1

2. Instrument structure and hardware function introduction

2.1 Circuit system introduction



2-1-1 Main control board

J1	24V power line	J39	Fan/ platform heater band	J14	NB-LOT module
BT	CR2032/CR1320	SW1	dial switch	CPU	CPU module
J6	Ethernet port	J7/J8	USB interface	J12	VGA Interface
P1	COM	J15	Touch screen line	J29	Closing door motor
J30	Ejecting card motor	J31	Platform motor	J32	light source motor
J19	ID chip reader	J40	temperature sensor	J5	Screen signal line
J4	Backlight line	J16	printer	J37	Light source line

Illustration:

1.J39/J40： The platform is heated by the heater band, and in the meantime, the temperature sensor determines whether the fan or heater band is required to adjust the temperature based on the room temperature detected. Therefore, the temperature sensor cannot be detached freely.

2.J14： NB-LOT is the data transmission module. Since this module interface was not reserved during the initial design, there is no space for the corresponding potential interface as well. Therefore, the signal line of the module is connected to J14, and the power supply line shared with the printer power supply line is connected to J16.

3.SW1: Dip switch is needed when downloading infrastructure program. Turn it ON when downloading and turn it OFF when finished. This switch is normally-off.

4.CR1320/CR2032: The button battery. If the system time need to be reset to the factory time, the battery should be changed.

5.CPU： The core control chip. It often causes overheating due to long time working, therefore, the regular shutdown of the instrunment is necessary to extend the instrument’s service life.

6. COM interface: Serial transportation port, serial line is RS232 type cross serial line

7. VGA interface: Video transmission port, mostly for external monitors

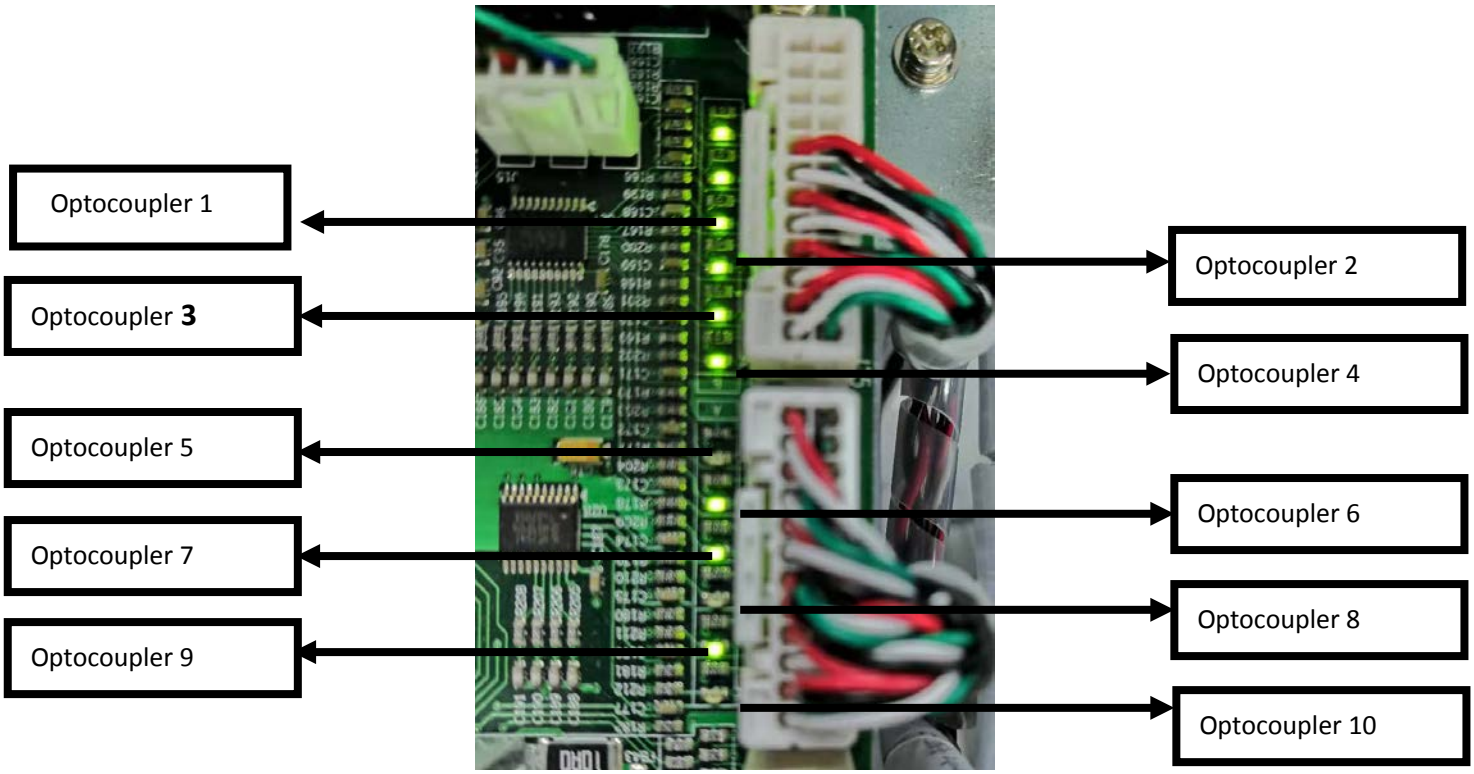
8.J15/J4/J5： The circuit related to the screen, please refer to the 2.7 Screen Component for details.

9. J29/J30/J31/J32: Four motor wirings are responsible for controlling each motor

10.J16: Printer wiring is responsible for powering the printer.

11.J19： Reader wiring is responsible for reading the ID card information and transmitting the signal.

12.J37： Light source signal line, the main board is connected to the AD collection board at the light source, transmiting the photoelectric collection signal.



optocoupler 1: U-type optocoupler

optocoupler 2: Light Source initial position optocoupler

optocoupler 3: judge whether cartridge exist optocoupler

optocoupler 4:left-right bijection optocoupler

optocoupler 5:door closing initial position optocoupler

optocoupler 6: door closing limit position optocoupler

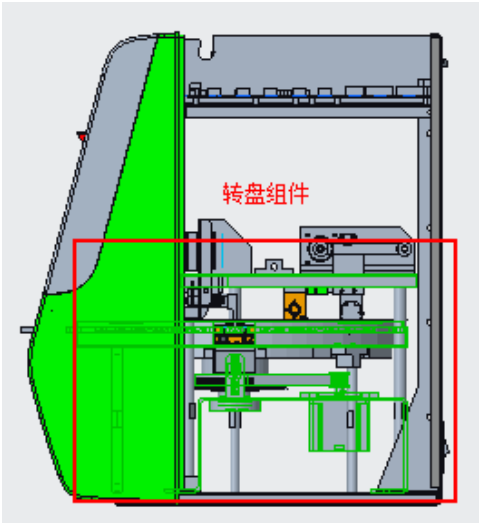
optocoupler 7:card ejecting initial position optocoupler

optocoupler 8: card ejecting limit position optocoupler

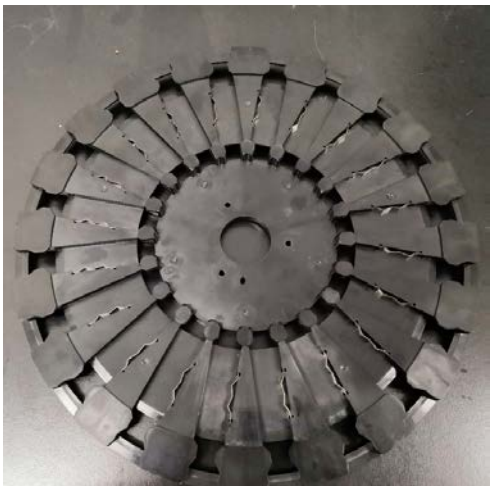
optocoupler 9: platform reset optocoupler

optocoupler 10: platform counting optocoupler

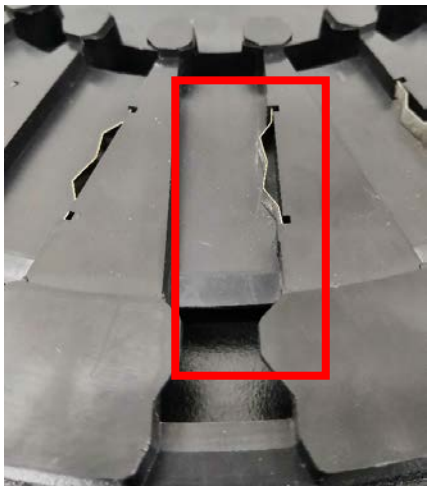
2.2 platform assembly



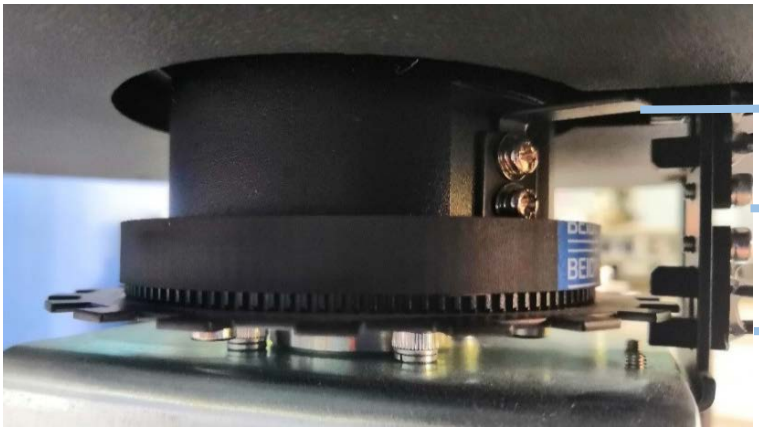
2-2-1 section view



2-2-2 real product picture



2-2-3 platform shrapnel



2-2-4 platform optocoupler

Reset optocoupler separation blade, Reset optocoupler, counting optocoupler

Illustration:

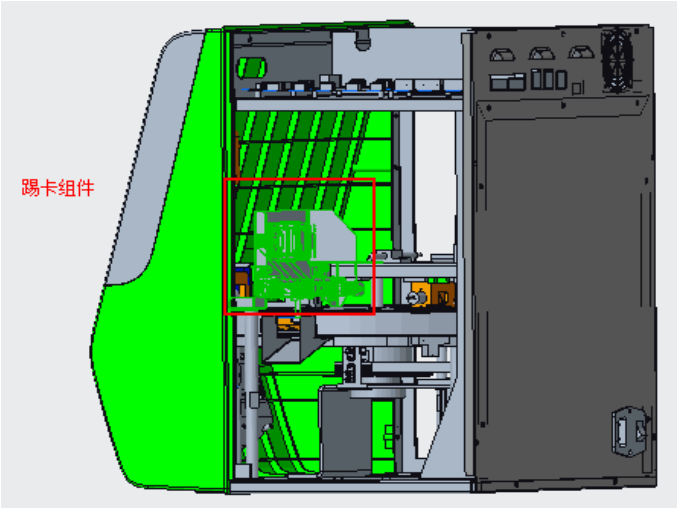
1. The platform with 20 positions is located at the core of the instrument and is fixed at the bottom plate depending on four pillars. It is used in conjunction with a light source assembly, a discarding card assembly, and an opening/closing door assembly. Therefore, there are a light collection position, the discarding and inserting card position on the platform.

2. The platform shrapnel is used to fix the test cartriage. If the error occurs when discarding cards or the results is abnormal due to waveform shift, it may be related to the deformation of the platform shrapnel.

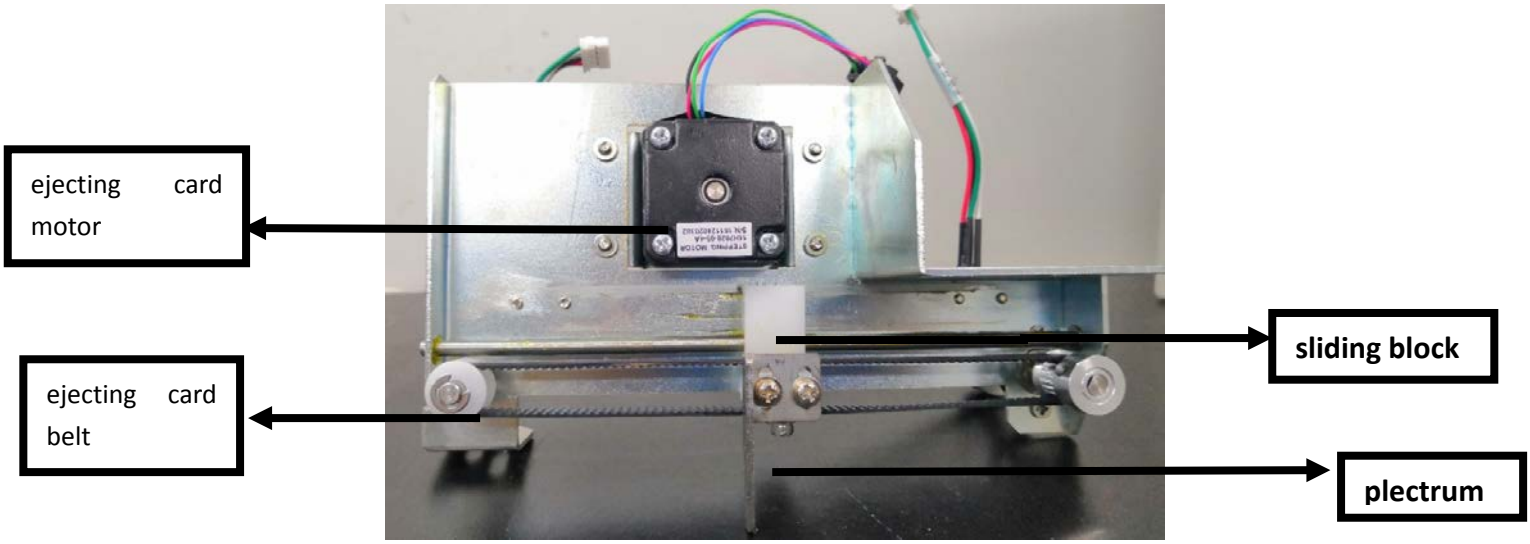
3. Platform counting optocoupler: it passes the optocoupler position through the grating disc to determine the slot position. Regular cleaning is needed.

4. Platform reset optocoupler: It passes optocoupler through optocoupler separation blade to determine the initial position of the platform.

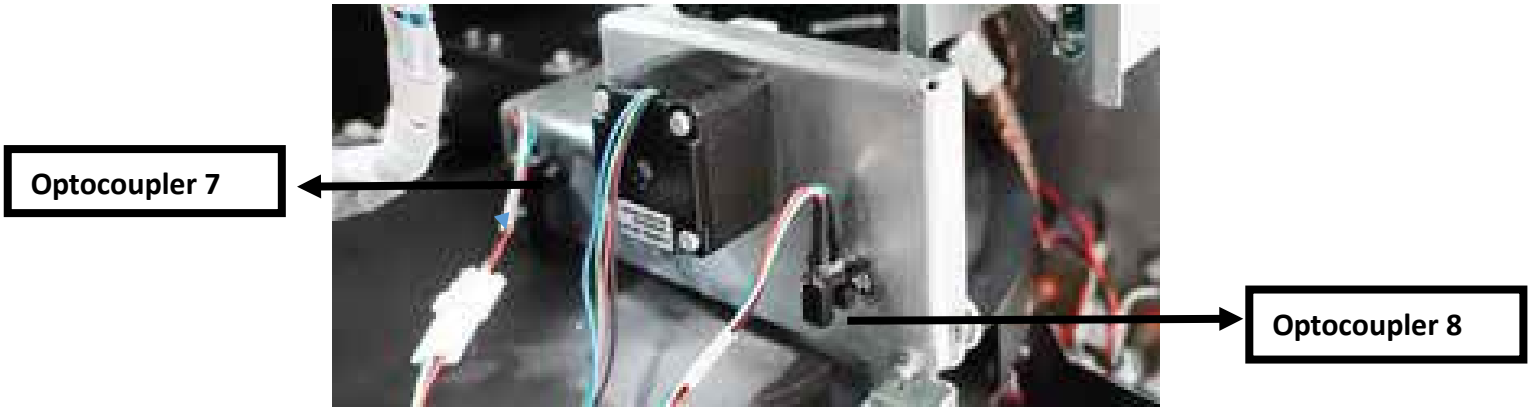
2.3 discarding card assembly



2-3-1 discarding card motor profile map



2-3-2 ejecting card motor

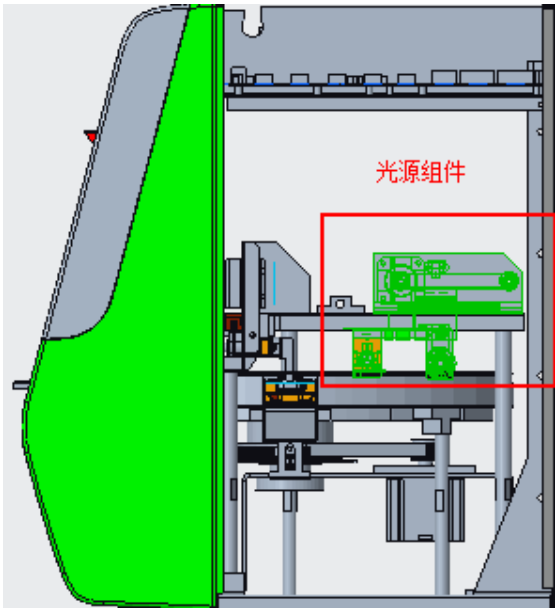


Illustration

1.The discarding card assembly is located above the platform on the right side of the instrument (front view). Through motor powering and belt linked movement, discarding card function can be performed.

2. The discard slider is fixed on the sliding raft. It is a vulnerable component. After long-term usage, the vertical working of discard plectrum may be malfunctioning, causing the abnormality for discarding card.

2.4 light source assembly

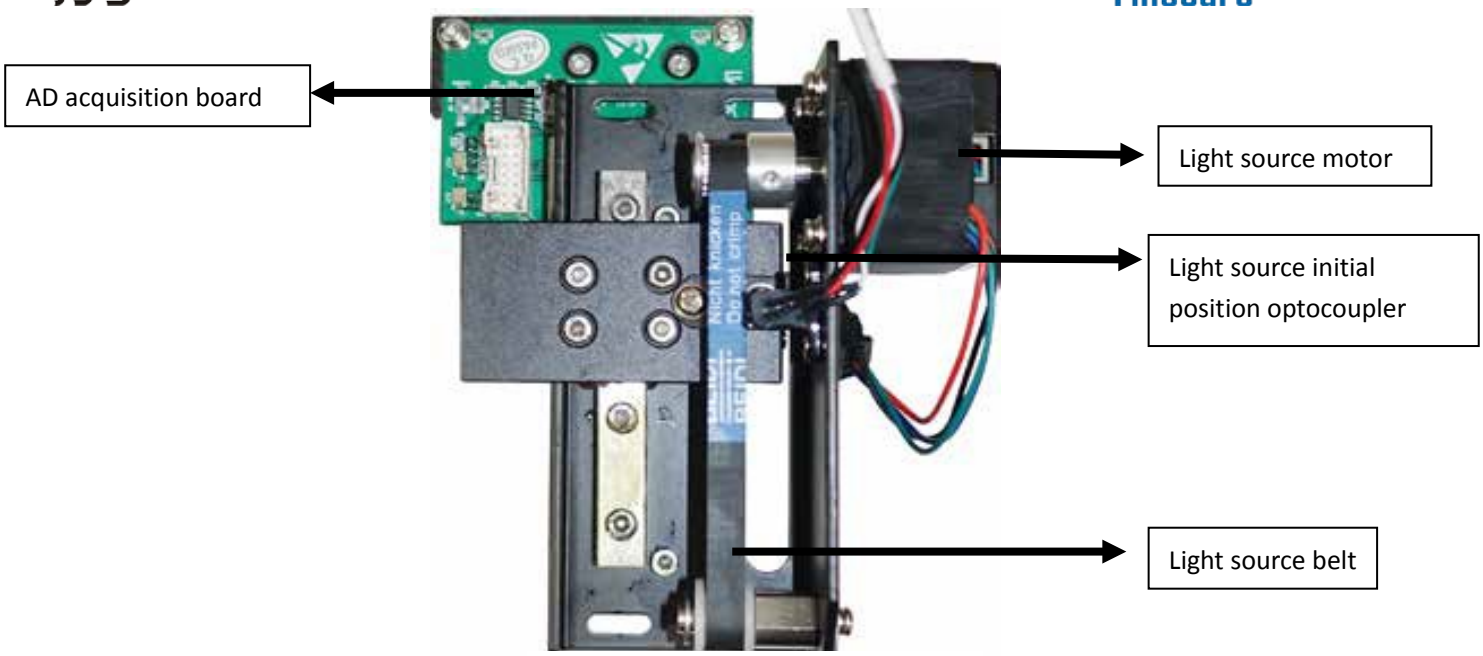


2-4-1 light source assembly profile map

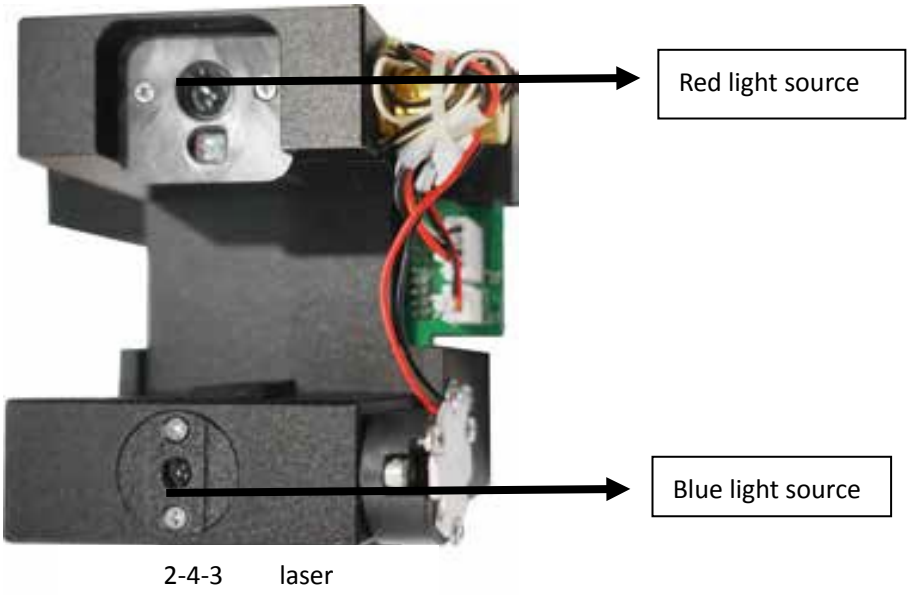
Illustration:

1. The light source component is located above the platform, behind the structure of the instrument (front view), powered by the motor. The laser scans the test cartriage to read the information, generating the signal that can be transmited to the main board through the AD collection board.

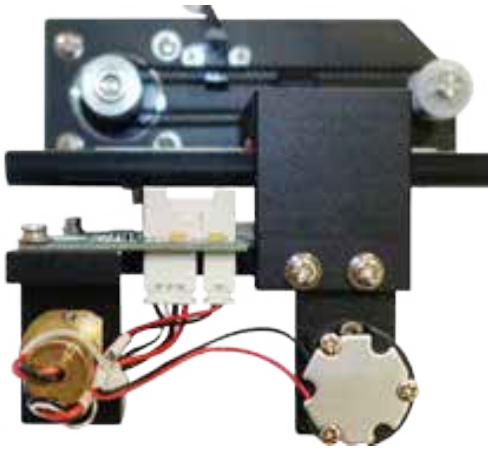
2. The red light source scans the test cartriage barcode, and the blue light source records the fluorescent signal.



2-4-2 light source assembly

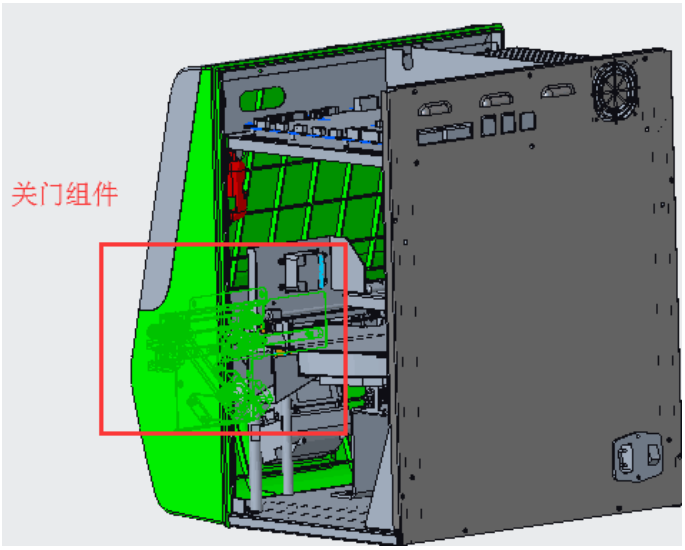


2-4-3 laser

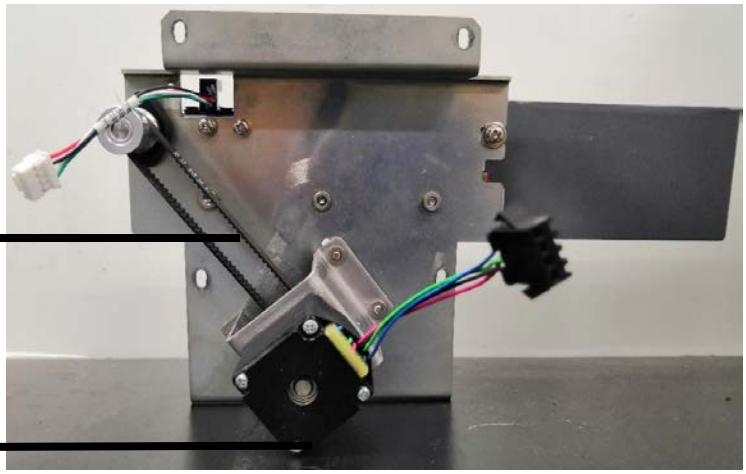


2-4-4 laser

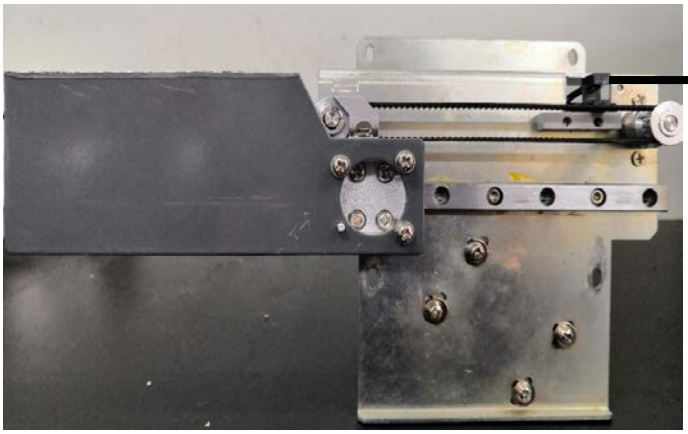
2.5 opening/closing door assembly



2-5-1 opening/closing door assembly



2-5-2 opening/closing door assembly



2-5-3 opening/closing door assembly

2.6 Left-right bijection optocoupler

2-6-1 U-type bijection optocoupler

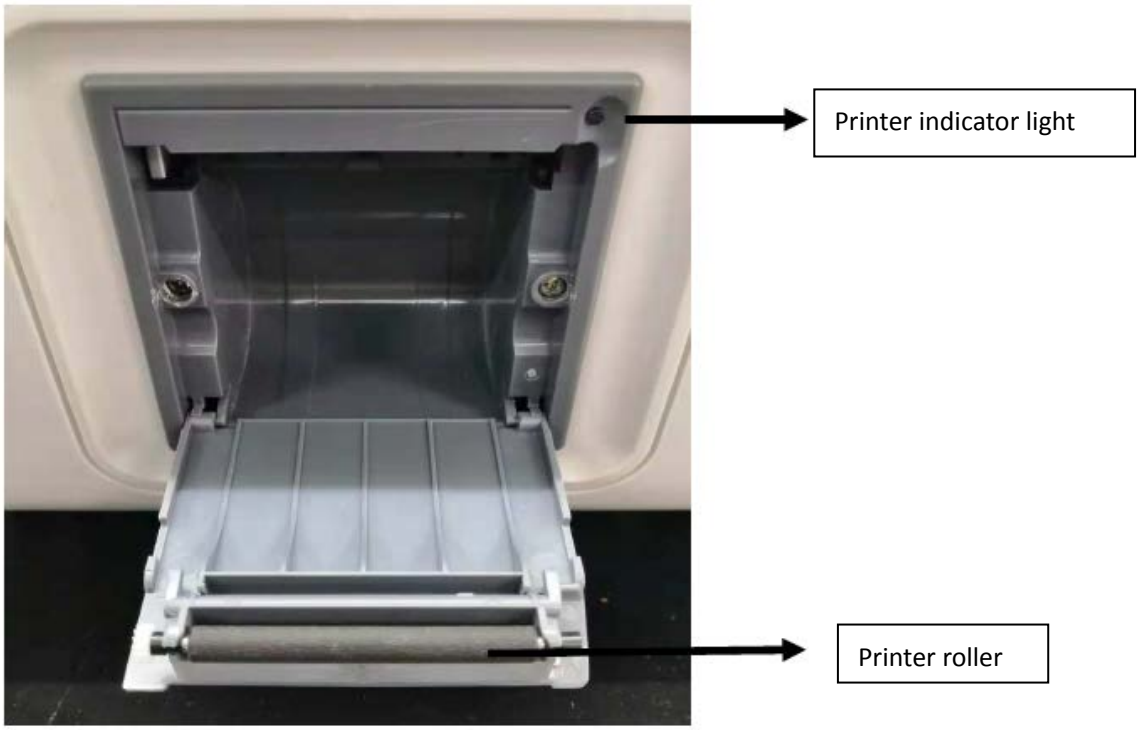
2-6-2 left-right bijection optocoupler

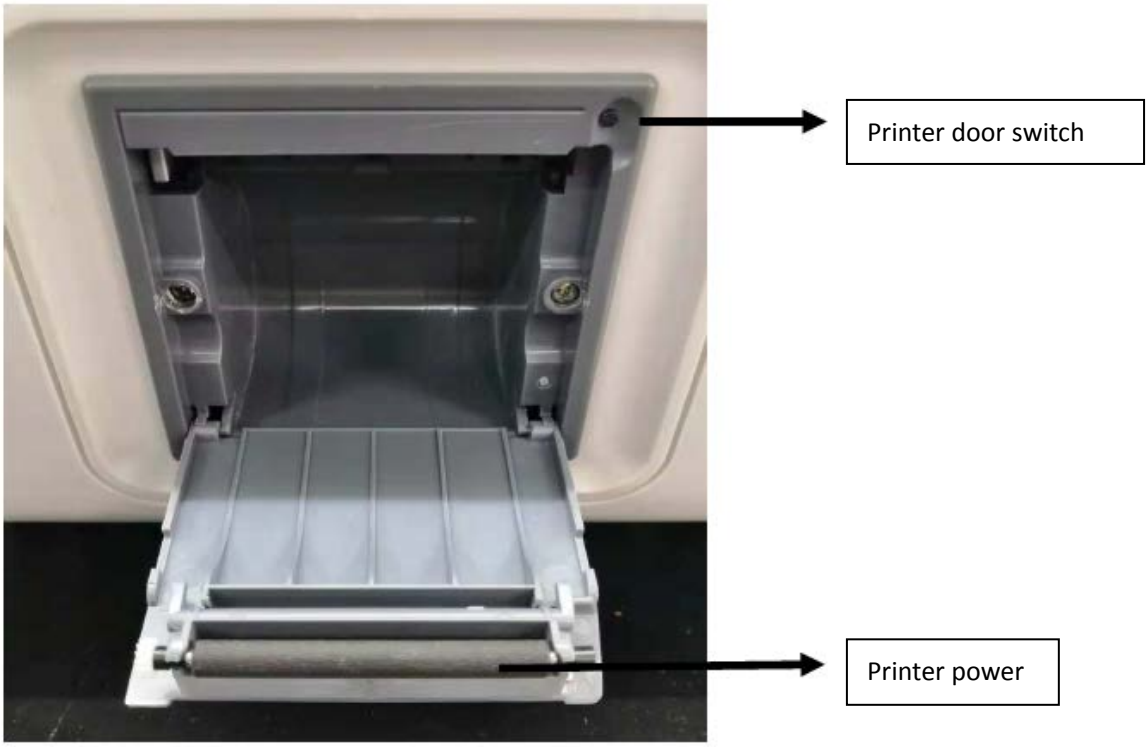
2-6-3 left-right bijection optocoupler

Illustration:1. Through the up and down/left and right sensors to sense whether your hand is nearby the door opening/closing area. If yes, it will notice you to remove your hand.

2. When assembling the front shell, please note that the optocoupler cannot be blocked, otherwise it may result in repeatitive door closing or frequent door closing alarm.

2.7 Printer





Illustration：1.The printer is a built-in thermal printer, the driver has been downloaded to the infrastructure program. It cannot be connected to other thermal printers.

2. The printer indicator light is green under normal condition. Frequent blinking indicates the abnormality may occur.

2.8 Screen assembly

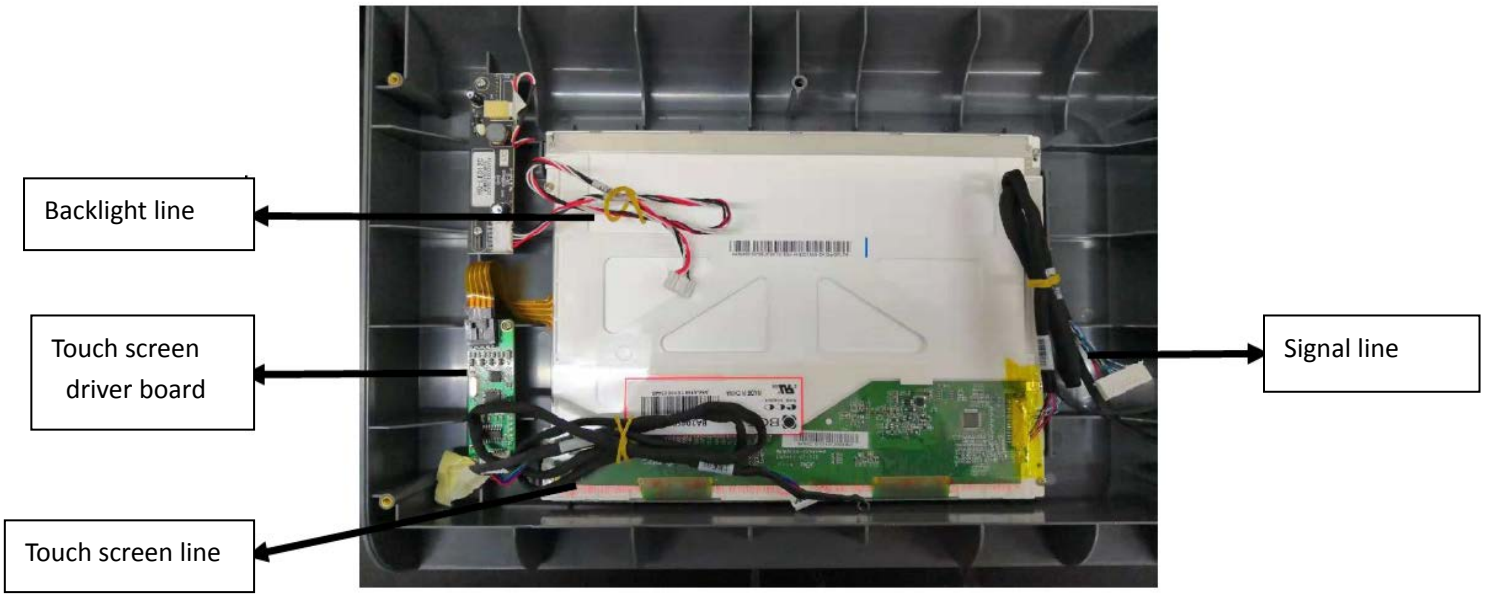


Illustration:

Backlight line: Connect the screen to the main board J4, backlight display function. The black screen may indicate this line is malfunctioning.

Touch screen line: Connect the screen and the main board J15, screen touch sensing function. The malfuncitioning touch screen may indicate this line is abnormal.

Screen signal line: Connect the screen to the main board J5, signal transmission function, the white screen may indicate this line is abnormal.

3.Installation Process and maintenance

3.1 Installation

3.1.1 Installation Preparation

[Information of Communication]

Information of Hospital: Name, Address, Department, Person to contact etc.

Information of Instrument: Model, Time of instrument to terminal, Installation department.

Information of Report: Whether connect LIS for issuing reports (LIS engineers in place).

Information of Logistics: Time of instruments/ reagents to terminal.

Information of Dealer: Person in charge, Date of installation, Whether go together.

Information of Reagents: Item, Time of reagent to terminal.

Other information: Whether equipped with computer/ printer etc.

[Site Preparation]

1. Ask department director whether to open packages for checking instruments, if yes, open them and check whether reagents are normal.

2. Ask department director the place for installation, pay attention to matters such as enough space all around for instrument, avoiding direct sunlight, avoiding shocking, avoiding centrifuge etc.

3. Ask department director whether three power supplies, whether grounding protection, if yes, turn on the power to start up and confirm if resetting successfully.

3.1.2 Installation debugging

1. Preparation for consumables: Open packages of reagents, check them whether normal, if yes, insert ID card to read it.

2. Preparation for quality control: If have control materials with random goods, conduct dissolution and wait for testing. If no, test with standard fluorescent color card and check the result whether similar to the target value.

3.1.3 Train for operation

1. Ask department director the starting time for training, gather teachers in front of instruments for representation. Notice not shielding instruments.

2. Train all the teachers with simplification, demonstrate with sample and make teacher operate it, observe whether mistakes or not and answer questions raised by teachers. Emphasize the common problems.

3. Ask the teacher in charge of instruments and tell him/her the matters and common problems clearly, add WeChat number with each other for communication.

4. Fill in the acceptance of installation and test and sign it by director. The required information includes name,

department of installation, instrument model, model and code number, date of installation, items of training, supplier, installation engineer, the sign and tel number of department director.

5. Insert the contact into the Run Sign and stick it to the right side of instrument. Entry the information of installation in CRM system.

3.2 Quality Control

3.2.1 Introduction of Quality Control

[Product Specifications]

Freeze-dried powder-type, Level1: 0.5ml x 1; Level2: 0.5ml x 1; Level3: 0.5ml x 1

[Intended Use]

Used to monitor and evaluate the precision of results detected by reagents produced by Guangzhou Wondfo Biotech Co., Ltd.

[Principle of detection]

Reaction between combined antigen contained in Quality Control and specific antibody contained in reagents causes formation of complex, which could be used as quantitative results by detected quantity of complex.

[Components]

Package contains Quality Control including level1, level2 and level3 and instructions. Quality Control is Freeze-dried powder-type containing combined antigen, BCS, glycine, NaN.

[Storing Conditions]

2℃ -8℃, seal and avoid light

[Term of validity]

24 months

[Applicable Instruments]

Immune-fluorescence detector produced by Guangzhou Wondfo Biotech Co., Ltd. Limitation is these products can not be used to calibrate instruments since they are not standards.

3.2.2 Dissolution and Uses of Quality Control

[dissolution]

Take Quality Control out from fridge, balance at room temperature for 30 min. Add 0.5ml distilled water and shake it until no powder.

Notes: standard of distilled water: Distilled water for injection or purified water produced by water engines which can be shared with biochemical instruments, normal temperature Wastons distilled water, Yibao pure water could also be used, other brand pure water not recommend.

[Uses]

Treat Quality Control as serum sample of patients and consult instructions of reagents and immune-fluorescence detector produced by Guangzhou Wondfo Biotech Co., Ltd.

[Attentions]

1. Exhaust the Quality Control in 8 hours after opening and dissolving

2. Accuracy: Test Quality Control after calibration and the value should be in range of target value.

3. Water used for dissolving freeze-dried Quality Control balances to room temperature in advance and the volume added should be accurate while dissolving.

4. Conduct operations in terms of instructions including control room temperature, sampling volume, shaking and detecting time etc.

5. Ensure the results deviation whether caused by detecting card out of date or inappropriate operations if you can't get expected value. Please replace other packaged Quality Control to detect again after excepting mentioned influential factors.

6. Replace a new group of Quality Control if there are clumps or flocci after dissolving which might be caused by overheating or freezing.

7. These products contains no materials from other animals except Human or BCS (having been inactivated), which means having no potential infection.

8. Forbid using outdated Quality Control or using it as standard.

3.2.3 Operations of Quality Control

[Operating Process]

1. Quality Control Preparation: Dissolve Quality Control and sample in terms of serum types as mentioned before.

2. Entry information: click [Function], [Quality Control], [Quality Control Collection], [Add] Quality Control information including batch number, target value, limited sphere etc.

3. Quality Control Operations: click [Test], [Sample types] chose Quality Control, [chose Items and Levels], [Start], insert card to test.

4. Fill in Quality Control Report: Fill in reports in terms of terminal demands.

5. Analyse abnormal results

①Check whether the Quality Control term and preparation process normal and Quality Control dissolved.

②Check whether Hmailton normal and sample volume enough.

③Check whether value normal using constant fluorescent card, if yes, check whether light source normal and reagents damped etc.

3.3 Maintenance

3.3.1 Check wave form

Check whether wave form normal, T,C peak in correct range when paying regular return visits. Pay more attention

while C peak less than 3000.

3.3.2 Check optocoupler

Shield optocoupler with paper to check up and down bijective optocoupler, left and right bijective optocoupler, Kicking card limit optocoupler, light source initial optocoupler and check them whether normal by indicator light.

3.3.3 Check bands

Check bands whether too tight or loose, impaired. Check band of door motor and kicking card motor mainly.

3.3.4 Check platforms shrapnel

Insert reagent card manually to check card whether too tight or light in plates. Check whether having abnormal sound with kicking card test. Loose of slideway caused by distortion of plates might make wave form abnormal.

3.3.5 Check light source

Check whether optocoupler of light source normal, check whether wave form in the best position, if no, adjust the initial position of light collected. Check whether light source could work normally by single instruction red/blue light campaign.

3.3.6 Check bijective optocoupler

Check whether the bijective optocoupler shielded by front cabinet, feel the bijective optocoupler with hands and check whether indicator of optocoupler on or off.

3.3.7 Update software

Focus on content of updating software issued by headquarters of company and update software as needed. Do not change the content of updating software randomly.

3.3.8 Calibration of screen

Calibrate screen as needed while it’s not sensitive. Remember the position of screen calibration, which could be guided on telephone.

3.3.9 Paint lubricant

Having squeak inside the instrument, try to paint lubricant to reduce it.

3.3.10 External maintenance of instruments

Sterilize instruments with ethanol and wipe away bloodstain, imprint etc.

4. Troubleshooting

4.1 Platform

4.1.1 Report errors: insert card inappropriately or not move hands away

Reasons for trouble: Insert card appropriately but have hands or others field bijective optocoupler.

Resolutions: Move hands or other objects away and clean left and right bijective optocoupler / up and down bijective optocoupler with cotton sticks.

4.1.2 Tips: Card Insert error, please insert again

Reasons for trouble: 1. Insert card inappropriately or card insertion optocoupler impaired.

Resolutions: 1. Insert card appropriately 2. Plug the lines of card insertion optocoupler or replace card insertion optocoupler.

4.1.3 Report errors: fall to turn off door motor because of overtime, optocoupler shielded

Reasons for trouble: Left and right bijective optocoupler of the door shielded or the optocoupler impaired.

Resolutions: Plug lines of left and right optocoupler to ensure lines connected right or replace

the left and right optocoupler.

4.1.4 Report errors: Errors on initializing optocoupler of door motor (errors on overtime)

Reasons for trouble: Lines of initializing optocoupler of door closing motor loosen or optocoupler is impaired.

Resolutions: plug lines of initializing optocoupler or replace initializing optocoupler.

4.1.5 Report errors: Fail to turn on door motor

Reasons for trouble: Lines of door motor loosen or the door motor is impaired.

Resolutions: Plug lines of door motor or replace door motor.

4.1.6 Report errors: Errors on platforms resetting optocoupler

Reasons for trouble: Lines of platforms resetting optocoupler loosen or the optocoupler is impaired.

Resolutions: Plug lines of resetting optocoupler or replace platforms resetting optocoupler.

4.1.7 Report errors: Errors on photopotential found by platforms (errors on overtime)

Reasons for trouble: Lines of platforms counting optocoupler loosen or optocoupler is impaired.

Resolutions: Plug lines of counting optocoupler or replace platforms counting optocoupler.

4.1.8 Report errors: Temperature of plates too low or high

Reasons for trouble: Temperature of department is too low or instrument is close to heat source.

Resolutions:

1. Make target temperature of platforms appropriate with steeps: Function-Maintenance-Parametter setting-Temperature control (Unit of 100 is 1℃).

2. Adjust strength of fan with steeps: Function-Maintenance-Parametter setting-Temperature control.

3. Turn off temperature of platforms with steeps: Function-Maintenance-Parametter setting-Temperature control.

4.2 Door closing module

4.2.1 Tips: Door closing, please put hands away

Reasons for trouble: Hands or other objects shield the left and right bijective optocoupler as door closing.

Resolutions: Move hands or other objects away.

4.2.2 Phenomenon: Door opens and closes over and over again

Reasons for trouble: The edge of reagent card shields the up and down bijective optocoupler.

Resolutions:

1. Open cover and pull the bracket of up and down bijective optocoupler out slightly to avoid optocoupler shielded by reagent card.

2. Replace up and down bijective optocoupler.

4.2.3 Phenomenon: Door closing process stops at a certain position

Reasons for trouble:

1. Four screws of door closing elements are too tight, which produces large resistance in the process.

2. Door closing elements are askew, which makes door offset up or down to stop the process.

3. Door closing elements miss steps.

4. Door closing motor breaks down.

5.The number of working steps of the card door motor is low

Solution:

1. Disassemble the face shell and loosen the 4 screws of the door closing assembly slightly

2. Disassemble the face shell and the rear cover of the door, unscrew the door closing assembly, close the door stop, and ensure that the door stop is in the middle of the door.

3. Replace the drive belt

4. Replace the door closing motor

5.Function - Maintenance - Parameter configuration - Platform unit - Inlet door motor is adjusted to "Incoming door motor working steps", save the message

4.3 light source component

4.3.1 Error - Operation error in photoelectric reset (timeout error)

Fault cause:

1. Light source component reset optocoupler wiring is loose

2. Light source component reset optocoupler damage

3. The light source component slide rail has large resistance and is stuck

Solution:

1. Reinsert the line of light source component reset optocoupler

2. Replace the light source component reset optocoupler

3. Turn off the mechine state, apply lubricant to the slide of the light source assembly, and slide it back and forth to keep it smooth.

4. Replace the light source component

4.3.2 Prompt - Unauthorized or Barcode Read Is Incorrect

Fault cause:
1. ID chip without reading the corresponding item
2. Reagent card barcode printing is abnormal
3. The red light of light source component is abnormal
Solution:
1. Read the ID chip of the corresponding project
2. When the prompt box for selecting the ID chip appears, manually select the reagent batch number corresponding to the test item.
3. Replace the light source component

4.3.3 Tip – Cartridge not adding sample or sample insufficient! serial number: (...), sample number: (X)

Fault cause :
1. Insufficient sample volume
2. Reagent card reaction time is not enough
3. Light source component blue light abnormality
Solution:
1. Operate according to the test kit instructions.
2. Replace the light source component

4.4 Ejecting card module

4.4.1 Error - kick card initial position optocoupler error

Fault cause :The initial position optocoupler line of the kick card component is loose, or the optocoupler is damaged.
Solution: Reinsert the initial position optocoupler line of the kick card component, or replace the initial position optocoupler of the kick card component.

4.4.2 Error – Kicking card Limit position Optocoupler Error

Fault cause :The limit position optocoupler line of the kick card component is loose, or the optocoupler is damaged.
Solution: Reinsert the limit position optocoupler line of the kick card component, or replace the limit position optocoupler of the kick card component.

4.5 Thermal Printer module

4.5.1 Phenomenon - no paper out in thermal printing

Fault cause :
1. Thermal printer is out of paper
2. Thermal paper is reversed
3. Thermal printer wiring is damaged
4. Thermal printer is damaged
5. The main control board J16 interface output power is unstable
Solution:
1. Put the thermal paper inside,with rough side toward the roll and the glossy side facing outwards.

2. Reload thermal paper
3. Replace the line of main control board J16 connecting to the printer
4. Replace the thermal printer
5. Replace the main control board

4.5.2 Phenomenon - In the printed report , the report header is inconsistent with the specific item

Fault cause:
1. The reagent type in the instrument software version consumables has no information about the print item.
2. Instrument incorrectly read reagent card's barcode of the specific item, mistakenly selected other items on the pop-up prompt box.
Solution:
1. Upgrade the software to Version 1.0.0.0.1.62... and later versions
2. Add information about the print item to the reagent type in the consumable
3. When instrument incorrectly read reagent card's barcode, select the corret item on the pop-up prompt box.

4.6 Screen module

4.6.1 Phenomenon - the touch screen does not respond, the system time is on

Fault cause:
1. The screen touch screen cable is loose or damaged.
2. The touch drive board cable is loose or damaged.
3. The touch drive board inside the screen is damaged.
4. Screen damage
Solution:
1. Plug the main control board J15 to connect the touch driver board line and the touch driver board cable, or replace the main control board J15 to connect the touch driver board line.
2. Plug and unplug the touch driver board cable, or replace the touch driver board cable
3. Replace the touch driver board
4. Replace the screen components (Figure 5-6-1)

4.6.2 The touch screen does not respond, the system time stops.

Fault cause:
1. Software sporadic bugs
2. The main control board is damaged.
Solution:
1. Shut down and restart the instrument
2. Replace the main control board

4.6.3 The screen displays a white screen, a black screen, a splash screen, and a flower screen.

Fault cause :
1. The white/flower/splash screen is the main control board J4 backlight line is loose or damaged 2. The backlight driver board wiring is loose or damaged
3. The black screen appears as the main control board J5 signal line is loose or damaged.
4. The screen backplane cable is loose
5. Screen damage

Solution:
1. Plug in the main control board J4 backlight line, or replace the main control board J4 backlight line
2. Plug in the backlight driver board wiring, or replace the backlight driver board
3. Plug in the main control board J5 signal line, or replace the main control board J5 signal line
4. Plug and unplug the screen backplane cable
5. Replace the screen components

4.6.4 The boot screen stays in the “finecare” interface

Fault cause:
1. The main control board basic program burns out the problem
2. The main control board is damaged.
Solution:
1. Re-burn the basic program on the main control board
2. Replace the main control board

4.6.5 System time resets to factory settings after the instrument is shut down and restarted

Fault cause:
1. The battery power on the main control board is exhausted
2. Time crystal oscillator damage on the main control board
Solution:
1. Replace the main control board battery
2. Replace the main control board

4.6.6 Test results are not displayed in the history

Fault cause:
1. The main control board is damaged
2. The DATA packet corresponding to the software version does not match.
Solution:
1. Replace the main control board
2. Re-import the DATA data of the corresponding software version

4.6.7 The instrument interface is not fully displayed (the interface is mixed with gray)

Fault cause:
1. The main control board is damaged
2. DATA import is not complete when upgrading system
Solution:
1. Replace the main control board
2. Re-import the DATA data of the corresponding software version

4.7 ID chip slot

4.7.1 Prompt - ID card read error, please try again!

cause of issue:
1.ID chip damage without chip information
2. The instrument does not have an ID chip inserted, or the ID chip is not fully inserted.
3. Loose wiring or ID card reader damage
Solution:
1. The company re-brushed the ID card or brushed the same batch of reagent kits to read the normal ID chip.

2. Insert the ID chip and insert the ID chip completely into the ID card reader.
3. Plug and unplug the wiring or replace the ID card reader

4.7.2 Prompt - ID card is incorrect, please replace the fly test 3plus ID card! Fault reason: Insert ID chip as single calibration ID chip

Solution: Stop using the batch of reagents, contact the company to replace the double calibration reagent

4.8 network port, USB port

4.8.1 Phenomenon - The network port does not respond. The local connection on the computer prompts "The network cable is removed."

Fault cause:
1. Instrument network port is abnormal
2. The computer network port is abnormal.
3. The network cable connected to the instrument is abnormal.

Solution:
1. Replace the main control board
2. Replace other computers
3. Replace the network cable

4.8.2 Phenomenon - The computer can accept the instrument data, and the data may occasionally be broken or leaked during use.

Fault cause: the instrument network port rate and the computer network port rate are inconsistent
Solution: In the local connection corresponding to the connected computer, enter the "Microsoft Network Client" configuration, enter the advanced interface, set the "connection speed and duplex mode" value to "10Mbps full duplex"

4.8.3 Prompt - When prompted, "The upgrade file is not found, please confirm that the U disk is inserted and there is an upgrade file!"

Fault cause:
1. U disk is damaged
2. U disk is not placed in the upgrade file

Solution:
1. Replace other identifiable U disk
2. Put the "MultiChannelUpgrade" upgrade folder in the U disk home directory.

4.8.4 Prompt - When exporting data, the prompt "U disk is not connected or the root directory of the U disk does not have a "pe" folder".

Fault cause:
1. U disk is damaged
2. U disk is not placed in the "pe" folder

Solution:
1. Replace other identifiable U disk

2. Put the "pe" folder in the U disk home directory

4.9 Tips

4.9.1 Judging motor failure

1. Single command operation corresponds to motor reset, or take a fixed number of steps to observe whether the motor is running
2. Check if the corresponding optocoupler of the motor is running normally.
3. Check if the structural parts interfere or are damaged.
4. Try replacing the drive board to see if the motor can work.

4.9.2 Judging Optocoupler Failure

Power on the machine, use the blank to cover the optocoupler back and forth, the indicator light flashes normally, and the rest is abnormal.

4.9.3 Reasons for poor reproducibility of analytical instruments

First, the reagent angle
1. Confirm that the batch is consistent, preferably the same batch of reagents
2. Confirm the reagent opening time and the amount of buffer is sufficient
3. Confirm whether the sample type and sample size meet the requirements of the specification.
Second, the instrument angle
1. Confirm that the result waveform is offset, causing the instrument to take an abnormal peak. The result is not allowed.

4.9.4 Software Upgrade/Downgrade Method

1. Backup machine data (for manual recovery of data in special cases)
a. Photo backup main control unit interface parameters
b. Photo backup backup disk unit compensation steps / compensation steps (optical 1) / compensation steps (optical 2) parameters
c. Hospital setting information and IP information in the photo backup settings
d. Prepare the ID chip used by the hospital, re-read after upgrading
2. Upgrade operation
a. Download the upgrade installation package, after decompressing, put the folder named “MultiChannelUpgrad” in the root directory of the USB flash drive.
b. Insert the USB flash drive with the upgrade folder into the instrument, and click the function on the instrument-System-Upgrade-U disk upgrade.
3. Test equipment
a. Check all data backed up to ensure that the data has not changed
b. Improve the instrument settings in the hospital settings information and IP information
c. Ensure that the instrument is operating normally.

4.9.5 Repairing DATA Data

1. Backup machine data (for manual recovery of data in special cases)
a. Photo backup main control unit interface parameters
b. Photo backup backup disk unit compensation steps / compensation steps (optical 1) / compensation steps (optical 2) parameters
c. Hospital setting information and IP information in the photo backup settings
d. Prepare the ID chip used by the hospital, re-read after upgrading

2. Brush DATA operation

a.U disk root directory to create a new "MultiChannelUpgrad" folder b. Put the "data-multi.tar.gz" compression package in the same version upgrade installation package into the "MultiChannelUpgrad" folder

c. Insert the U disk with the DATA data into the instrument, click on the function - System - Upgrade - U disk upgrade

3. Test equipment

a. Check all data backed up to ensure that the data has not changed

b. Improve the instrument settings in the hospital settings information and IP information

c. Ensure that the instrument is operating normally.

4.9.6 Analysis of the reasons why the sample results are inconsistent with the clinical

1. Waveform anomaly - the waveform of the resulting peak is left/right. a. The starting position of the effective point of the photoelectric sampling is not adjusted, and the starting position of the effective point of the photoelectric sampling is adjusted.

b. The reaction disk shrapnel is loose, the reaction disk shrapnel is disassembled, and the "M" shape with the large arc of the elastic piece is put back into the platform.

2. Waveform abnormality - reagent card is damp, contaminated or reagent card hemolysis

a. Disassemble the foil bag after the reagent card is placed on the console for too long, causing the reagent card to get wet or contaminated.

b. Part of the red blood cells are collected during the blood collection process, resulting in reagent card hemolysis