



BS series belt color sorter manual

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Chapter 1 Production Introduction

1.1 Brief Introduction

BS series intelligent cloud belt color sorting machine is a crawler type selection equipment with single and double layer structure。 It adopts the latest CCD color, color-selective lens, high-speed FPGA data processor and high-speed Ejectors, and use easy-to-operate human-interface with touch function. It is light

collecting machine, High-tech products that combine electricity and gas. The impurities in the selected materials can be automatically removed, and the selection precision/efficiency is high, the operation and maintenance are simple, the structure is compact, and the appearance is beautiful. Widely used in food, oil, industrial products and other industries, can be applied to the selection of nuts, peanuts, beans, plastics, seafood, etc.

This series of color sorting machines has a variety of basic models. The manual uses BS1200DY and BS1200DY-2 as examples to introduce the installation, operation and maintenance of the machine.

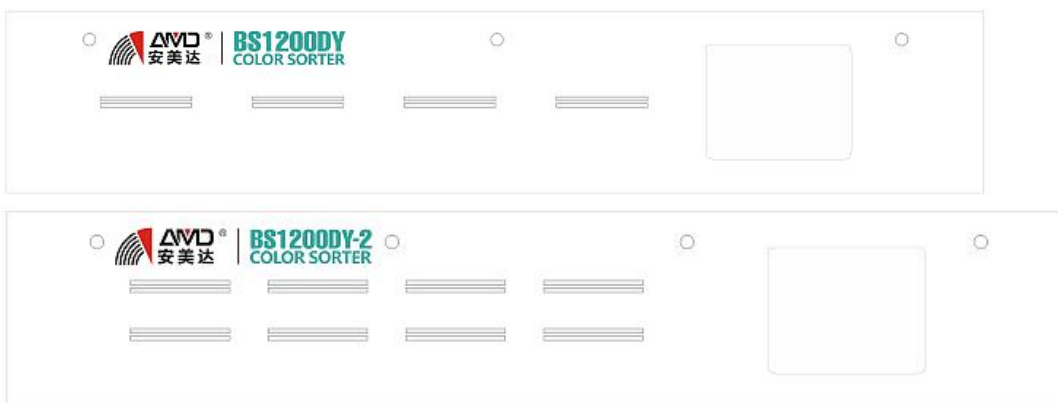
1.2 Requirement

This product is a high-tech product with strict requirements for installation, operation, use and maintenance. Therefore, it must be operated by a full-time staff. The operator must follow the instructions of installation, operation, maintenance, etc. before performing the training according to the training requirements of the company.

If it is improved due to the improvement of the technical level of machine performance, it is not subject to any notice.

1.3 Machine models

1.3.1 Type



1.3.2



is our company registered Trademark.

Model Examples:

BS1200DY-2	BS1200DY
“B”: BELT	“B”: BELT
“S”: SORTER	“S”: SORTER
“1200”: Belt Length	“1200”: Belt Length
“D”: Short Belt	“D”: Short Belt
“Y”: Far focal distance	“Y”: Far focal distance
“2”: Double deck belt	Single deck belt

1.4 Machine specifications

Set the cashew nut as the samples:

Model	capacity (T/h)	Accuracy (%)	Carryover Rate	Power (KW)	Voltage	Dimension L*W*H(mm)	Weight (kg)
BS1200DY	2-4	≥98	>5:1	1.6-2.6	220V/50HZ	3119*1997*1420	1300KG
BS1200DY-2	2-4	≥98	>18:1	3-5	220V/50HZ	2724*1997*2743	1900KG

Remarks: If the above parameters are changed, please contact us without notice.

1.5 Terminology Explanation

Vibratory feeder: Feeding vibration mechanism.

Belt: Material transport carrier.

Sorting Box: Collecting and sorting material devices.

Ejector: Device for rejecting waste in materials.

Feeder Speed: Vibrator vibration volume.

Sensitivity: Precision threshold for sorting materials.



Ejector Time: Contain Ejector keeping time and delay time.

Delay : The interval between the collection of material signals and the action of the valve.

Keep: The time for Ejector work one circle.

Sorting plan: Color selection method.

Chapter 2 Product Installation Instructions

2.1 Safety precautions and installation instructions

The color sorting machine is a high-tech product integrating light, machine, electricity and gas. The requirements for installation, operation, use and maintenance are very strict, especially the use of gas source and power source. There are some warnings, warnings, etc. on this manual and on the machine. All installation, operation and maintenance personnel must read this manual carefully and install and operate it in strict accordance with the regulations.


2.1.1 Safety Mark








The safety signs are divided into four categories: prohibitions, warnings, instructions and warning signs, which apply to all contents in this manual.

All machines have clearly made safety signs in hazardous areas. The following three types are common:

1. **Red:** usually a circular mark used to prohibit certain actions;
2. **Yellow:** usually a triangular mark for some hazard warnings;
3. **Blue:** A generally circular mark used to specify mandatory behavior.

2.1.2 Safety icons and danger levels

Item	Mark	Content
1		<p>Warning 1. Non-professional professionals are strictly forbidden to open, otherwise the color sorter will not work properly and will be at your own risk. 2. The precision main control circuit of the built-in color sorter of the electrical box, in order to prevent dust from entering, do not open.</p>

2		<p>warning</p> <ol style="list-style-type: none"> 1. For your safety you must be reliably grounded. 2. The power supply is required to have a good grounding.
3		<p>The display screen is the main monitoring component of the color sorter. It is fragile and easy to damage. When cleaning the screen, it should be wiped with a soft cloth. Do not press hard. Do not tap.</p>
4		<p>Hoisting operation</p> <p>A yellow hazard symbol attached to the feeder frame indicates that the lifting of the unit is prohibited.</p>
5		<p>High temperature on the surface</p> <p>A yellow hazard symbol attached to the surface of an LED lamp assembly or other object that may cause overheating indicates a high temperature in the area.</p>
6	 <p>旋转齿轮 注意伤手</p>	<p>Rotating gear</p> <p>Attached to the large electrical box of the machine, indicating that there is a rotating gear, pay attention to hurt the hand.</p>
7	 <p>小心夹手</p>	<p>Be careful with the handle</p> <p>Stick to the place where the opponent or finger is hurt, indicating that the instructions in the guide should be strictly followed in this place.</p>
8	 <p>请接地线 注意安全</p>	<p>Ground wire pay attention to safety</p> <p>Attached to the bottom of the machine, it means that in this place the case should be connected to the ground.</p>




9	 气体出口 注意安全	<p>Gas outlets pay attention to safety</p> <p>A red prohibition mark on the filter assembly indicates the air pressure limit of the machine.</p>
10	 禁止电钻	<p>No electric drill</p> <p>Indicates that drilling on the rack is prohibited</p>
11	 查看说明书	<p>View instructions</p> <p>A blue round mark attached to the machine discharge hopper indicates replacement of the ash remover or other operations that may occur in the optical color selection area. See the instructions for instructions.</p>

Table 2.1 Security icons and explanations

2.1.3 Installation instructions

- 1 Unpacking and inspection, please pay attention to safety! Avoid unnecessary damage when unpacking, check the number of parts according to the list in the box, and keep it safe to avoid loss.
- 2 Please carefully check whether the color ring of the color sorter machine is loose when lifting. If it is loose, please tighten it immediately to prevent accidental lifting.
- 3 This product should avoid working in low temperature, high temperature, high humidity, strong magnetic field, strong light, dust and other environments.
- 4 After 8 hours of continuous operation, the product must be shut down for dust removal.
- 5 Grounding method: Use copper core screw welding, the welding points must be wrapped with asphalt, the production method is as shown below.

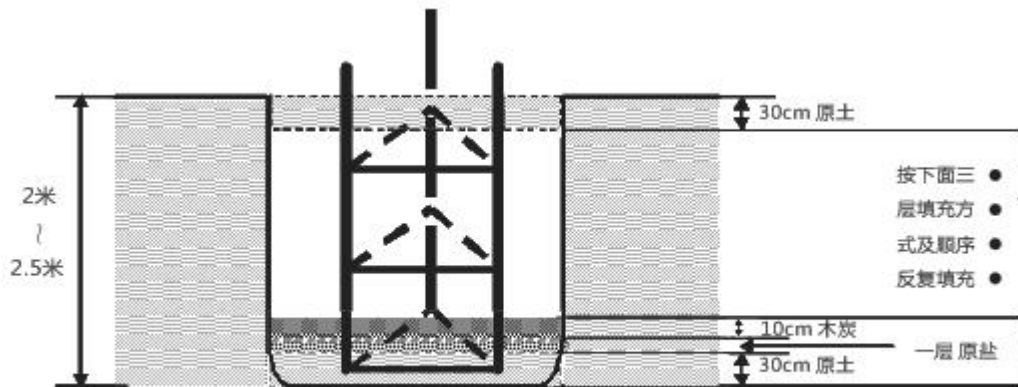


Figure 2.1 Grounding wire making

6 To prevent static interference from the machine, the user must use the iron pipe for the feed pipe and the exhaust pipe. Do not use plastic pipes or other non-metallic pipes.

7 The air compressor necessary for the user shall comply with the relevant national laws, regulations and standards.

8 User power supply terminal should be equipped with dustproof device to prevent dust damage

2.2 Working principle and product structure

2.2.1 Track color sorter working principle

The working principle of the BS series intelligent crawler machine is as follows: the material enters the machine from the top hopper, passes the uniform vibration of the vibrator, enters the crawler belt, is evenly distributed above the crawler belt, accelerates down the crawler belt and enters the observation area in the sorting room, and observes from the observation Pass between the sensor and the background plate.

Under the action of the light source, the CCD sensor receives the synthesized light formed by the reflection and transmission of the material, transmits it to the image recognition module for identification, gives a decision signal, generates an output signal after being processed by the control system, and drives the high-speed injection valve to act. The material to be removed is blown into the waste chamber of the receiving hopper. The remaining material continues to fall into the finished cavity of the hopper to achieve the purpose of material selection.

2.2.2 BS series intelligent track color sorter appearance product structure

Figure 2.2 Appearance structure of BS1200DY-2

2.2.3 BS series intelligent track color sorting machine structure diagram

Figure 2.3 BS1200DY series intelligent single-layer track color sorter machine structure

Figure 2.4 BS1200DY-2 series intelligent double-layer track color sorter machine structure

2.2 Machine exterior dimension drawing

The main components of the BS series intelligent track color sorter are: hopper, background plate, CCD detection lens, discharge hopper, jet valve and filter.

Filter assembly: including filter, pressure regulator, pressure gauge, ball valve, source,

2.3.1 Discharge system: part example

Discharge system:
Contains hopper, lower exhaust, chassis slab, etc.

Figure 2.5 BS1200DY series intelligent single-layer track color sorter front structure

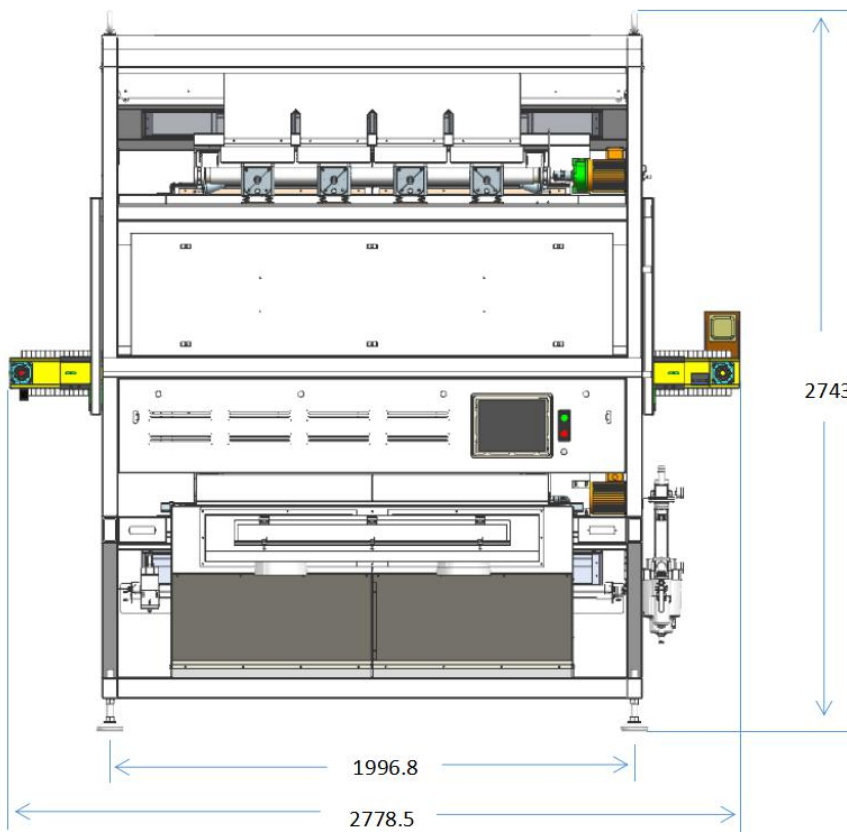


Figure 2.6 BS1200DY-2 series intelligent double-layer track color sorter front structure

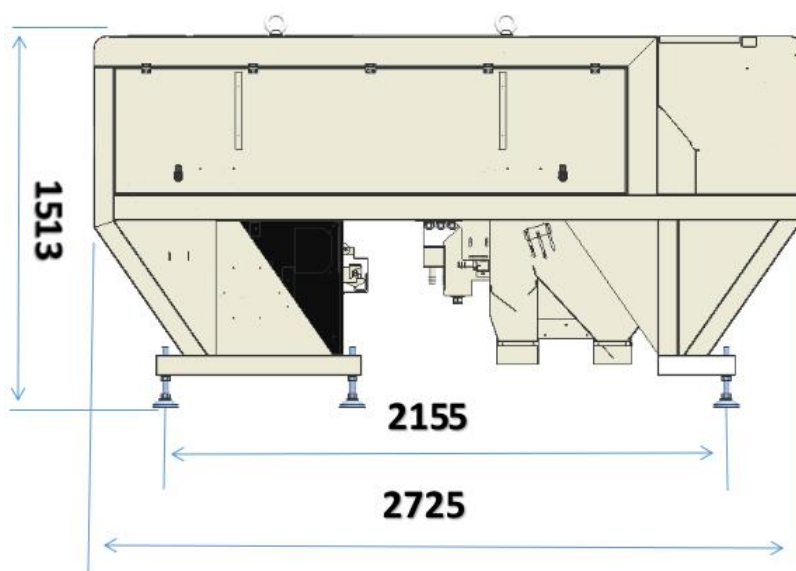


Figure 2.7 BS1200DY series intelligent single-layer track color sorter side view structure

Figure 2.8 BS1200DY-2 series intelligent double-layer track color sorter side view structure

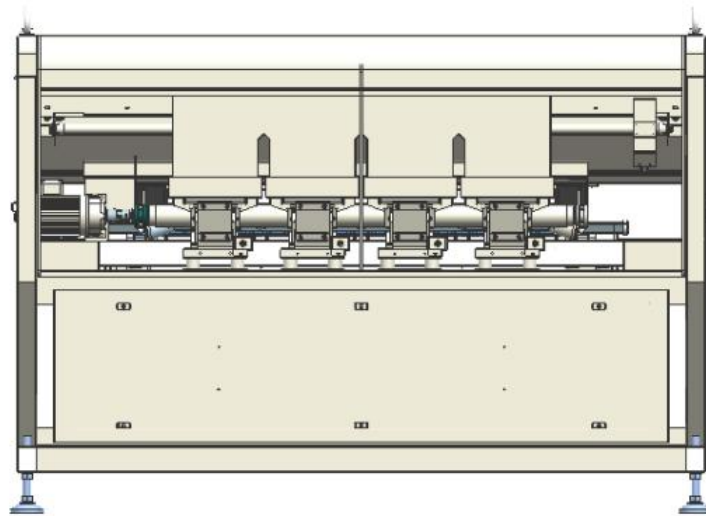


Figure 2.9 BS1200DY series intelligent single-layer track color sorter back view structure

Figure 2.10 BS1200DY-2 series intelligent double-layer track color sorter back view structure

2.4 Machine composition

2.4.1 Feeding system

It consists of components such as a hopper, a vibrator and a track.

The selected material is conveyed to the vibrator via a hoist. The vibrator adjusts the amplitude of its vibration by the associated control element to achieve overall flow regulation.

The feeding device is installed on the vibrator beam, and is separated from the body by the anti-vibration spring, thereby effectively reducing resonance. In addition to providing the color sorter with the function of the selected raw grain, the feeding system can also control the output of the color sorter. Through the adjustment of the vibration amount of the inlet hopper flow control plate and the vibration hopper, the control of the output of the color sorting machine per unit time can be realized. After the material is fed through the vibrator, it is over the track and the aged track is evenly fed.

2.4.2 Photoelectric system

The photoelectric system is the core part of the color sorter. It is mainly composed of visible light LED light source, infrared LED light source (optional), background plate, visible light CCD lens, infrared lens (optional) and related auxiliary devices.

The visible light LED light source provides stable uniform illumination of the material to be tested and the background plate for functions such as visible light selection and shape selection. This product uses a white LED light source as a visible light source. The infrared LED light source is a uniform uniform illumination for infrared color selection. This product uses the near-infrared band LED light source as the infrared illumination source.

The background board provides a reference signal for the electronic control system, and its reflective characteristics are basically equivalent to the reflective characteristics of the material, and the difference from the reject is large, which can effectively complement the color selection function and performance.

2.4.3 Sorting system

The sorting system consists of accessories such as hopper, high-speed solenoid valve, air compressor and air filter purifier.

The discharge hopper is composed of two chambers before and after, and the finished product and the defective product of the color-selected material are separated according to a custom color selection mode. There are suction ports on both sides.

Since the kinetic energy of the selected material after being injected through the high-speed solenoid valve is large, the hopper space is large enough, and the shock absorbing measures are taken at the contact portion between the material and the discharge hopper. Prevent the selected material from bounce twice into the CCD lens detection area, causing mis-selection.

When receiving the execution command, the high-speed electromagnetic jet valve sprays the compressed gas in a timely manner to blow out the material to be rejected. It has been proved by experiments that the delay time of the spray valve, the time of eruption, and the number of spray valves are one of the key factors affecting the performance of the color sorter.

2.4.4 Dust removal system

The dust removal system consists of a rodless cylinder, a cleaning device and the like.

As the raw materials in the material selection process will generate dust and other impurities that are easy to adhere to the glass. Once too much dust and impurities are attached to the window glass, the photoelectric system that sorts and detects the material through the window glass is prone to chain-chain problems such as false detection. Lightly affects the color selection accuracy and color selection ratio. On the other hand, the jet valve frequently works, reducing the life of the spray valve and control system, and even burning the valve control system.

The cleaning device is installed on the rodless cylinder, and the total control system pushes the cylinder piston to slide to control the dust impurity on the glass at a preset time according to the preset time.

※note:

The user must install a vacuuming device (the suction fan needs to be equipped by the user) to reduce the dust inside the closed color sorting machine; otherwise it will directly affect the life and color selection of the machine.

2.4.5 Human Machine Interface

A large-screen wide-angle color touch operation platform is used to preset multiple color selection modes for customers. And establish a friendly man-machine interface, according to the specific conditions of the material to facilitate the adjustment. In addition, it provides a visual image acquisition and simulation analysis interface, which is beneficial to users' use and operation. It uses machine learning related algorithms to automatically set the color selection method according to user settings to achieve better sorting effect. The machine's easy operation is very good. Great improvement.

2.4.6 Electrical control box

The electrical control box is fully sealed. It has protection against lightning, short circuit and leakage. It is mainly a control system composed of a microcomputer, which is the control core of the machine. The system is responsible for automatically collecting, amplifying, and processing digital signals. The control system sends a command to drive the jet valve, ejects compressed air, blows out the rejects, and completes the color selection function to achieve the selected purpose.

The electronic control part has the functions of sensitivity (color selection accuracy) adjustment, flow adjustment, automatic cleaning timing adjustment, air pressure warning, heater control, fault self-test and jet valve inspection.

2.4.7 Pneumatic system

The pneumatic system is equipped with a filter valve, a distribution valve, a pressure regulating valve, etc., to provide a high-purity compressed gas to the whole. It is also equipped with an electric contact barometer. When the intake pressure is lower than 0.2MPa, it will automatically alert and the screen will automatically remind the user to check.

Chapter 3 Color Sorter Installation

3.1 Preparations before installation

It is recommended that the installation site be adjusted according to the following requirements before the machine is installed in order to avoid any problems that may arise during the formal installation of the machine.

Installation location requirements:

- Site and environmental requirements

The machine should be installed on the horizontal plane, if need to install equipment to place the support, the support should be placed according to the color sorter four joint foot position, and fixed with expansion screw. There should be no ground vibration in the installation area.

It should not be installed in low temperature, high temperature, damp and dusty conditions, and indoor ventilation is good.

Users should prevent strong electromagnetic interference at the scene and nearby, such as electric welding, high frequency launch, etc.

Prevent static interference near the machine. The inlet and outlet pipes and suction pipes of the machines must be metal tubes and have good grounding.

The welding work must be completed before the machine is installed.

- Light requirement

Avoid direct sunlight or other illuminated light, but make sure there is enough light to operate and maintain the machine.

- Maintenance space requirements

There must be enough space around the machine for machine operation, inspection, maintenance and repair. Especially before and after the machine, there is enough space for replacing the lamp assembly and repairing the components in the electric box. In connection with the connection, sufficient space must be reserved to ensure the loading and unloading of all the receiving devices. At the same time, attention should be paid to space to meet the maintenance requirements of the spray valve.

3.2 Installation instructions for machine platform

Machine 4 round feet shall not be removed from the installation, and the level of the platform to find the right level, with the standard level meter to adjust the level of the machine up to 2/1000mm or less range. Ensure the stability of the machine.

There should be a working passage around the machine (at least 0.8m on each side) for operation, inspection and maintenance. According to the specific situation of the site, the upper inlet corresponds to the user's feeding pipeline. Flow regulating plate and storage tank should be installed on the pipeline. Care should be taken that the feeding pipeline should not be pressed on the feeding hopper of the machine, otherwise it will cause vibration and affect the color. Choose the effect. The outlet pipe is equipped with corresponding pipelines to remove qualified products and rejected products respectively.

3.3 Schematic diagram of machine installation platform

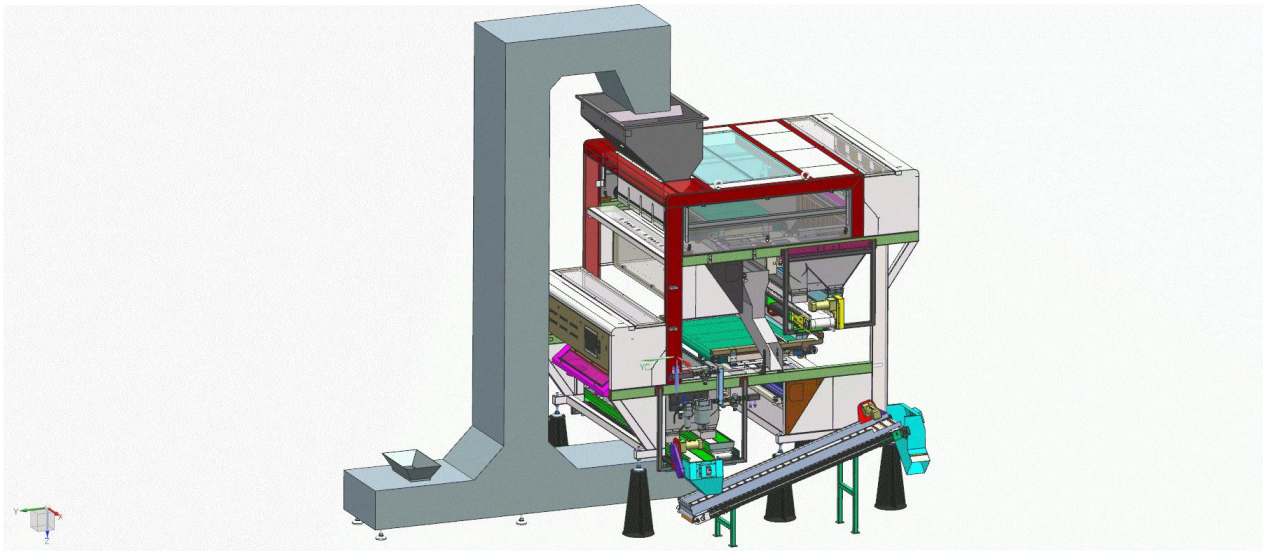


Fig. 3.1 installation instructions of BS1200DY-2 series intelligent double track crawler 1

Fig. 3.2 installation instructions of BS1200DY-2 series intelligent double track crawler 2

Fig. 3.3 installation instructions of BS1200DY-2 series intelligent double track crawler 3

Fig. 3.4 installation instructions of BS1200DY-2 series intelligent double track crawler 4

⚠ Warning - for personal and machine safety:

- 1、 When installing, select the horizontal ground and adjust the machine feet to make the sorting box and the conveyor belt highly consistent. There should be no ground vibration, electromagnetic interference and so on.
- 2、 Before lifting, check the fastness of the rings and pay attention to safety when lifting.

Chapter 4 Electrical installation instructions and circuit board function introduction

4.1 Air source installation

Users must use oil-free and water-free air compressors, and configure oil-water filters (some users must use a multi-stage high-precision air filter system when using screw compressors, and periodically replace the filter element) between the various air passage components of the machine must be connected with Dg25mm galvanized pipes or higher grade pipes. It is recommended that the air compressor be installed in an isolation room nearer to the machine (up to 15 meters), so as to reduce noise and ensure adequate pressure supply.

Warning --- Gas storage tank is a pressure vessel stipulated by the state. According to the Regulations on Safety Supervision of Special Equipment issued by the State Council, "Before or within 30 days after the pressure vessel is put into use, the user should register with the local special equipment supervision and management department (Technical Supervision Bureau) and inspect it regularly." We inform you that you must make the necessary filing procedures in accordance with this Ordinance.

Attention should be paid to installation and operation of gas supply system.

(1) Before all pipes are connected, the debris and dust in the pipes must be cleaned up, and the impurities and dust in the pipes should be properly emptied when connecting to the main pipe interface of the color sorter to prevent entering the color sorter pipes.

(2) Pipes connected from the air compressor are connected with a "1" high-energy hose (2 meters) to avoid the effect of vibration. The "1" high energy hose (3 meters) is also connected to the color sorter.

(3) The air filtration system provided by the machine is a supplement to the user-engineered air filtration system and can not be used as the only filtration method. Make sure that the gas source is closed before connecting, disconnecting pipes and piping fittings.

(4) Air compressors and filters, their operating temperatures are generally between 0-40 degrees C, and in winter (especially in northern areas), the room temperature will fall below 0 degrees C, so at the end of each operation should be its sewage drainage, air-drying, and increase insulation measures, so that room temperature maintained above 0 degrees C. Otherwise, it may cause freezing of filter elements and pipes, which will not only block the flow of air, but also damage the filter elements, resulting in high maintenance costs.

(5) The place where the air compressor is installed should be well ventilated, the environment is clean, the ground is smooth, the air humidity is small, the ambient temperature should be controlled below 40 degrees C, and the maintenance and inspection space should be kept above 50CM from the wall, at the same time, the direct sunlight and rain should be avoided.

(6) The length of the pipe between the air compressor and the gas storage tank should be greater than 3.5m, and the air compressor and the gas storage tank should be installed in different spaces.

(7) Pre-filter equipped with the machine should be installed as far away from the air compressor as possible, so as to ensure that the function of the filter can be brought into full play;

(8) If the pressure gauge on the color sorter shows a significant drop in pressure (over 0.1 MPa), the filter element on the front filter should be replaced in time. The filter element must not be removed, otherwise it will seriously affect and damage the filter elements in the post stage precision filter.

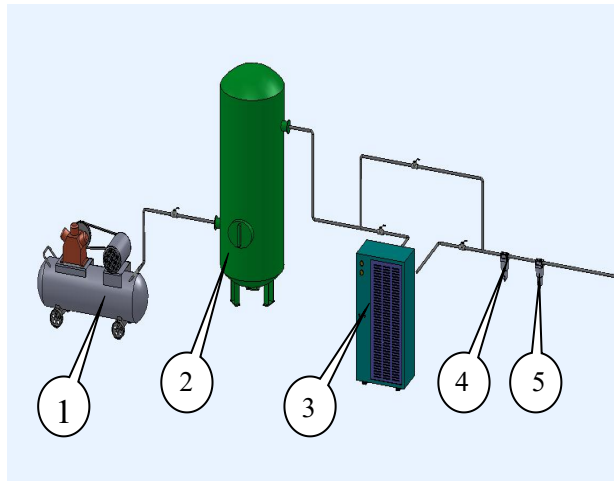


Fig. 4.1 Air path installation

1. Air compressor
2. Air storage tank
3. Cold dry machine (matching)
4. Main road filter
5. Water drop separator

4.2 Electrical installation

4.2.1 Main isolating switch

Some countries require that the connection to the mainline of the power supply must be through an independent disconnecter, so if there is no independent disconnecter facility for customers, try to install the independent disconnecter in advance.

4.2.2 Stabilizer and grounding rod

Where the supply voltage is unstable or affected by other heavy machinery and other factors, the following precautions are recommended to maximize the reliability of the color sorter.

①. Install a power regulator with built-in isolation device between the power supply and the machine.

②. In order to ensure the safety of power supply and the reliability of machine operation, high-quality grounding connection is needed, and the grounding resistance should be as low as possible (<1). It is suggested that each machine must have a special grounding.

I . Stabilizer installation

The regulator is installed according to the power of the main engine and the proper size of the regulator. The regulator must be connected before the power line of the main engine.

II. Grounding rod installation

The grounding rod must meet the following requirements for reliable grounding.

①. The connection between the grounding rod and the grounding cable must be of high quality.

②. The resistance value of the grounding cable should be as low as possible.

③. A high-quality connection or combination should be achieved between the machine frame and the surrounding metal parts, machine grounding, power regulator grounding, and isolation transformer grounding;

④. There should be an isolation of grounding current from other equipment.

In order to ensure high quality grounding, it is necessary to have a good grounding rod, keep the grounding area moist, and the dry ground is too insulated to provide low resistance grounding. The grounding bar will rust over time, so it needs to be replaced. Dry weather resistance will increase. After grounding rods are installed, grounding resistance must be tested.

All power and grounding must be done by a professional electrician, and the machine foundation grounding input (machine power input) must be connected with high quality to ensure thorough grounding. All machine frames must be connected to any supporting frame and independently grounded. The support frame must also be connected to the feeding and discharging device. Where there is no supporting rod, the machine must be directly grounded. Any other conductor near the machine must also be grounded. It is strongly recommended that feeding, discharging or vacuum pipes be made of metallic materials and properly grounded to avoid static electricity.

In order to improve the safety of power supply and the reliability of machine operation, a high quality grounding connection is needed. The grounding resistance should be as low as possible. Theoretically, the grounding resistance should be less than 1Ω. It is suggested that each machine must have a special grounding.

The following describes how to achieve all these conditions:

①. The connection between grounding rod and grounding cable.

The connection between the grounding rod and the grounding cable is that the grounding cable is curled into a ring and fixed to the grounding rod with nuts and bolts. The connection point should be treated with anti-corrosion and sealing.

②. Grounding cable

The cable between the machine and the grounding rod usually needs a copper conductor cable with isolated insulation.

③. Connection with machine frame

It is advisable to press a wire between the grounding cable and the machine frame and fix it on the machine's screw hole with the M8 bolt and washer.

④. Connection of surrounding metal parts

The grounding stud bolts of the machine frame must be connected to the surrounding metal parts, preferably with nuts and bolts.

4.2.3 Mainframe power supply

The external power supply of the main engine used in this machine is single-phase AC 220V + 10% and 50HZ. It needs to be equipped with electric control cabinet facilities within 5 meters of the inlet of the main AC power supply.

4.3 Introduction of machine using PCB

4.3.1 PCB types used by this machine

This machine is mainly divided into the following circuit boards:

Channel board, USB_HUB board, solenoid valve drive plate, vibration cleaning board, panel light board, serial port adapter.

4.3.2 The functions of each circuit board are as follows:

- ①. Channel board: CCD signal reception, AD conversion, FPGA algorithm to achieve, receive display sent configuration parameters, jet valve signal output, panel lamp parameters forward.
- ②. USB_HUB board: integrates all channel boards USB signal forwarding display screen.
- ③. Solenoid valve drive plate: control and drive solenoid valve.
- ④. Vibration cleaning board: control the vibration frequency of the vibrator, dust removal brush, dust removal, valve and feed power switch.
- ⑤. Panel light board: real-time display the front and rear channel plate injection valve status.
- ⑥. Serial port adapter: transmit the serial port information of the display screen.

4.4 Schematic diagram of the whole machine

Chapter 5 Color Sorter Operation Introduction

5.1 Operation Notice

5.1.1 Overview

Wherever the Warning is marked, that is the instruction, if not followed, which may cause accidental personal injury and unnecessary machine damage.

Wherever the Note is marked, that is suggestion. If it is not followed, which may damage the equipment or add some unnecessary process.

5.1.2 Warning

①. Before maintaining all components or the machine, the power and air sources must be cut off, except any other specified in the instructions;

②. Some internal circuits of the machine have high piezoelectric, any circuit maintenance must be completed by specific professional after-sale engineer;

③. Do not move any protective devices when the machine is in the state of power supply. Replacement of protective devices should be carried out before operating the machine, except as otherwise specified in the instructions;

④. Only professionally trained engineer can operate or maintain the machine. Before maintaining the machine, they must read the relevant operating instructions and know about all the common safety signs about control, notification and warning

5.2 Operation Guidelines

5.2.1. Introduction

This chapter describes how to operate the machine in a clean and tidy working environment, and how to use the "operating interface" and related devices. Before using the machine, we must read the chapter carefully.

If the machine has been installed properly, you can carry out material color selection, specific reference to the following operation instructions.

5.2.2. Brief Introduction

Before leaving the factory, some commonly used parameters of the machine has been adjusted and saved in different modes in the machine's system. When the customer is using the machine normally, he just need to do some simple interface operation to sort the material, not too much manual operation.

5.2.3. The confirmation before machine running

Notice

The machine has been strictly tested according to the product inspection standard before leaving the factory. Due to machine loading and unloading, or vibration during transportation and other reasons, which may affect some of the adjusted values, the company's debugging engineers will make further testing according to the materials sorted at the user's site. Once the test of the machine is completed, it is strictly forbidden for other irrelevant personnel to disassemble or repair the machine privately, otherwise it will affect the service life of the machine and the normal operation of color sorter. If this happens, a series of expenses for maintenance and other expenses shall be borne by the customer.

The confirmation content

- ①. To check if there is any foreign body in the hopper. If yes, it should be cleaned up;
- ②. Turning on the air compressor, and the pressure gauge of the air compressor shows the pressure above 0.6mpa (generally, the maximum pressure of the air compressor is adjusted to 0.7mpa during the initial debugging).

③. Clean the waste liquid in the air compressor before turning on it. Especially when used in winter, if there is water in the pressure regulating valve which is not removed, it is easy to freeze, leading to blocked air flow, when this happens, we can use heat source (<45°C) to bake it, but do not frequently adjust the pressure regulating valve, in order to avoid damage to some important parts of it;

④. Check if there is air leakage in the air passage. If there is air leakage, insert the joint of the air leakage part tightly, but which is normal for slight air flow in the jet valve and pipeline;

⑤. Check whether the waste liquid of the filter can discharge automatically;

⑥. Check the tray on the vibrator, the glass surface of the channel and the sorting room, the upper end of the channel if there is any debris or dust, if yes, clean it with an electrostatic air gun or dust-free cloth. Do not use hard metals such as metal to remove, otherwise it will seriously scratch the surface of the channel, affecting the effect of sorting. When installing other components, it is strictly prohibited to splash the welding slag onto the chute so as not to damage the chute

⑦. Confirm that the AC power supply of the color sorter is connected correctly

5.3 Power on/off process

5.3.1 Power on process

(1) Turning on the air compressor and the air dryer machine to make the storage tank reach the working pressure

Notice: air compressor → air tank → air dryer → color sorter. To confirm the valve of the gas supply system is normal before power on.

(2) Connect the power supply.

Switch on the air switch

Power on the stabilizer

(3) Press the "green" button on the screen of the color sorter, and the whole machine will be energized.

(4) Enter the main interface of the display screen and preheat "5-10 minutes" according to the ambient temperature.

(5) Click on "Feed Pass" and the gray "Feed Pass" will turn green "Feed Open" and "Valve Close" will

automatically change to "Valve Open". Color sorter starts normal production



The non working state "feed off" button is displayed as a dark color



The "feed" button turns green, while the "spray valve" button turns green, and starts normal selection operation

Attention: please ensure that the door plates of all parts of the whole machine are closed and locked before starting. Dust prevention

5.3.2 Power off process

(1) Close the feeder and stop feeding



working shows that the "feed on" button is green

The "feed on" feed is turned off, showing "feed off" dark.

Working shows that the "ejector on" button is green

(2) Turn off the color sorter



Press the "shut down" button for 3 seconds, pop up the display interface as shown on the right. After reading the content carefully, click the "know" button, and the system shuts down

After the blank screen, press the red button on the door panel to turn off the power, to turn off the color sorter.

Please shut down the operation according to the normal procedure. Do not directly cut off power, which may affect the performance of sorting.

(3) Disconnect the air switch and turn off the stabilizer

Cut down air switch

Turn off stabilizer

(4) Using the air gun to clean off the dust in and outside of the color sorter.

(5) Using the air gun to clean off the dust on the air compressor and air dryer.

5.4 User interface

5.4.1.Memory setting

Memory is set as for different material parameters. Just to choose the necessary memory which is needed and then press it, totally forty memories.

5.4.2 Vib control

To control the capacity of single vibrator which means to control the capacity of production

The single vibrator, "green" means on and "gray" means off. In addition, the maximum vibration is 100, the minimum is 1, the greater the number the more frequent of vibration, for changing the number, the user has to press "OK" to make it effect.

5.4.3 Global sense

The global sense includes color sorting accuracy, chromatic aberration accuracy, shape selection accuracy, intelligent accuracy, and infrared accuracy, etc.

A. Saturation: Saturation high adjustment range 255-1, normal play to 255 does not work, the smaller the number of the higher precision, saturation distinction color shade, saturation high selection color shade. Saturation low regulation range 1 - 255, normal hitting 1 does not work. The greater the number, the higher the accuracy. Black and white with low saturation.

B.Color: Color high adjustment range 0-359, color low 0-359, color level is the two white lines on the color disk, on the color disk with two white lines to delimit the area needed or need to be removed. The area delimited between two white lines of a dot is reserved when the dot is determined, and the area deleted by vanishing is to be selected, and vice versa. Apart from black and white, other colors can be selected.

C.Gray, red, green, blue: low gray, red low, green low, blue low are based on precision to remove dark materials, such as black. Gray height, red height, green height and blue height are used to eliminate light colored materials, such as white.

5.4.4 Spot accuracy

Color spot, saturation spot, gray spot, red spot, green spot and blue spot correspond to the accuracy of color, saturation, gray, red, green and blue spots respectively. The range is 1-255. The function is to eliminate the size of bad spots on the material, the greater the number, the smaller the accuracy.

5.4.5 AI setting

"Precision intelligence", range -100 - 100, the greater the number, the higher the accuracy. The "spots" range from 1 to 255, the greater the number, the lower the accuracy.

Notice:When using intelligent analysis, a picture must be analyzed with the front and rear cameras respectively. Such accuracy can be approached.

5.4.6 Shape sorting accuracy

In the "shape sorting plan", the corresponding setting will appear in the "precision of shape selection".

A.For example, in the open area of the "select wide open", "_" as the corresponding figure of the "shape selection accuracy" has a large precision, precision range 1-255, the smaller the number, the higher the precision.

B. Open the area in the "select small open", "_" as the figure corresponding to the "shape selection accuracy" appears a small precision, precision range 1-255, the greater the accuracy of the higher the number.

5.4.7 Specific shape sorting

A. edge trim, we need use edge trim to sort some special material. Range 1—255. The sensitivity 0 of edge trim means turn off this function.

B. Bud parameter, special for sorting peanut kernel tail.

C. Outline parameter, outline 50, aid sensitivity 180, this algorithm is for the material is not complete .

5.4.8 texture sensitivity

Reservation algorithm

5.4.9 difference sensitivity

A.Diff Sense include three algorithm: red/green sensitivity、blue/blue sensitivity、blue/red sensitivity, Also divided into upper limit accuracy and lower limit accuracy and defect spot.



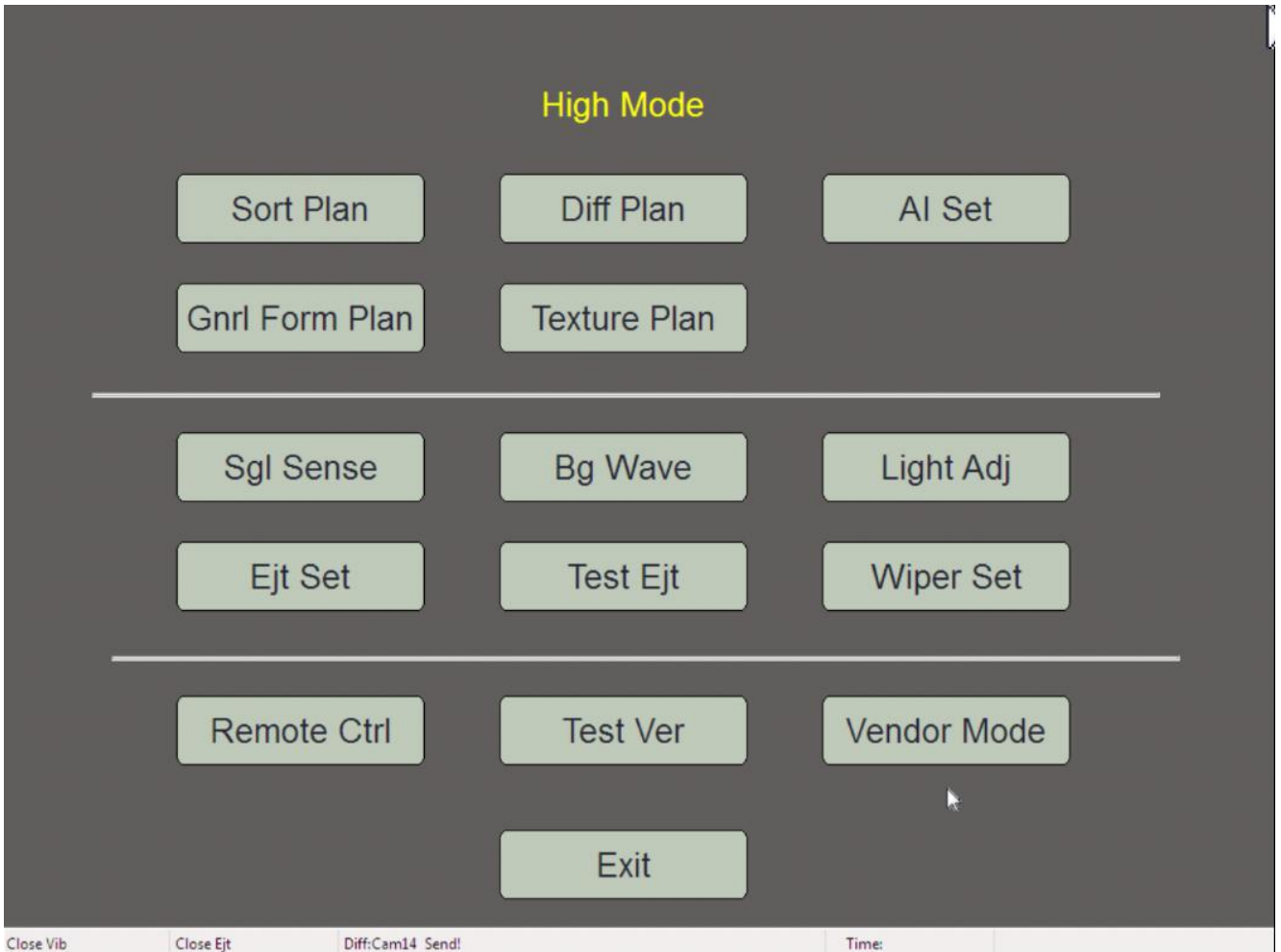
! In "various sensitivity", the front and rear cameras are individually adjustable. Customers also need to pay attention to the sorting times, first/secondary/third/fourth sorting. Any changes to the parameters need to click confirm.

5.4.11 Set Parameter

Click "Set Para" to enter the password, click OK to enter the advanced setting interface, which is the

engineer interface.

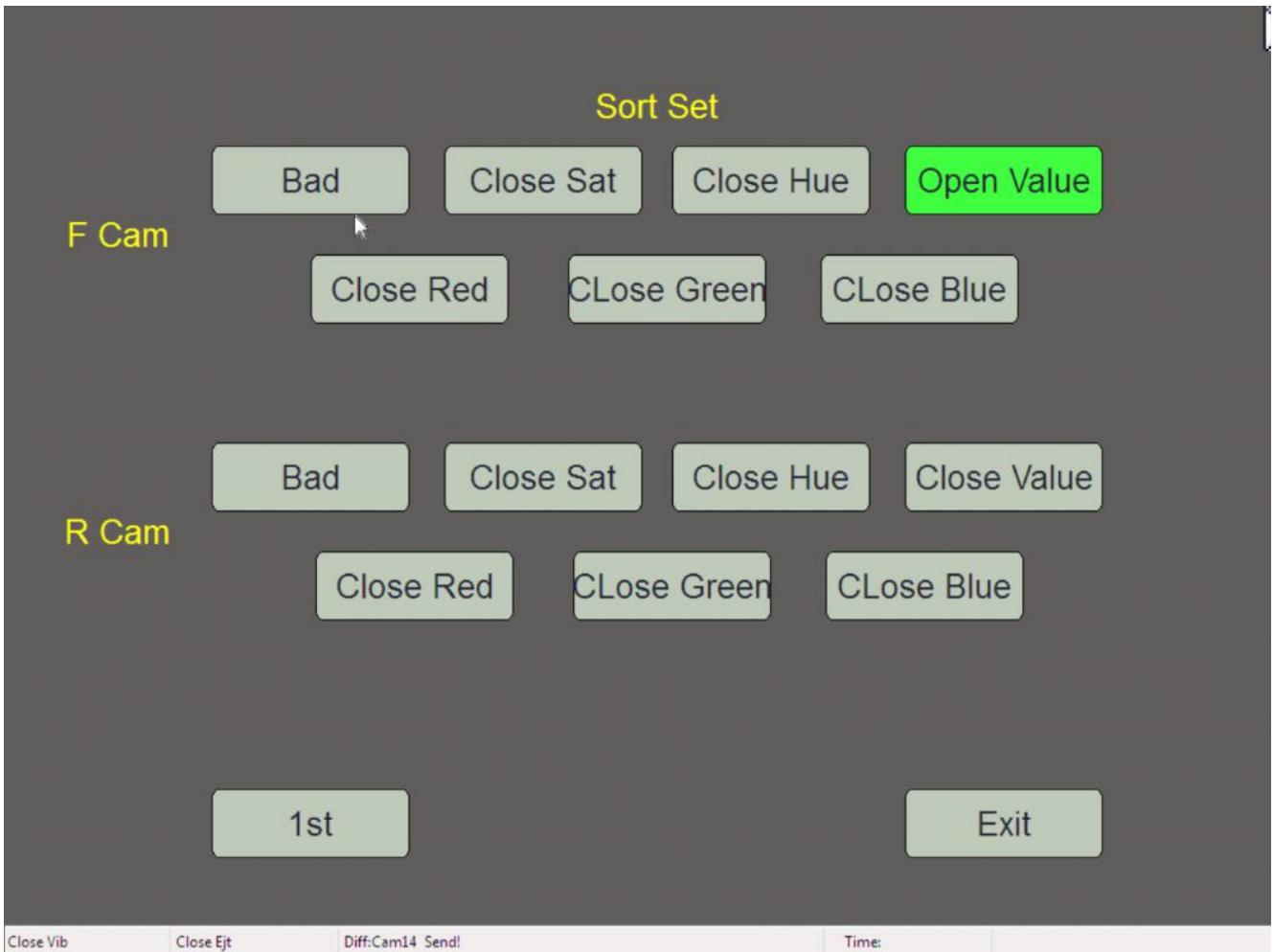
Press OK



5.4.12 Sort Set

According to the material, determine the color scheme that needs to be used.

A.sort mode: bad、reverse sorting.Press bad and it will become reverse sorting.Normally we use bad algorithm.



B. If all color are close. The sort sensitivity will not show on the global sensitivity.

C. If all is on, it will show on the global sensitivity.

! In the "color selection scheme", the switch of each scheme has an open state of green and an off state of gray. And the conversion of the on and off clicks on the name of the corresponding scheme. Adjusting the accuracy after turning on the color selection scheme requires fine tuning to "global accuracy" or "sensitivity".

5.4.13 Differ plan

This plan has three algorithm, red/green、green/blue、blue/red.

Each plan has “↑”“↓”。 According to the actual situation of the material。

5.4.14 General Form



A. There are six options for shape, length, width, circumference, circularity and rectangular shape. Each of these six programs includes three modes “↑”, “↓”, “↑&↓”。

a.: The area is selected as “↑”, the small “↓” is selected, and the size “↑&↓” is selected. The following five options are similar and the icons are the same.

b. The length includes: selection length, short selection, long length selection

c. The width includes: selection of coarse, fine selection, and selection of thickness.

d. The perimeter includes: the upper limit of the perimeter, the lower limit of the perimeter, and the upper and lower limits of the perimeter.

e. The circularity includes: the upper limit of the circularity, the lower limit of the circularity, and the upper and lower limits of the circularity.

f. The rectangularity includes: an upper limit of the rectangularity, a lower limit of the rectangularity, and an upper and lower limits of the rectangularity.

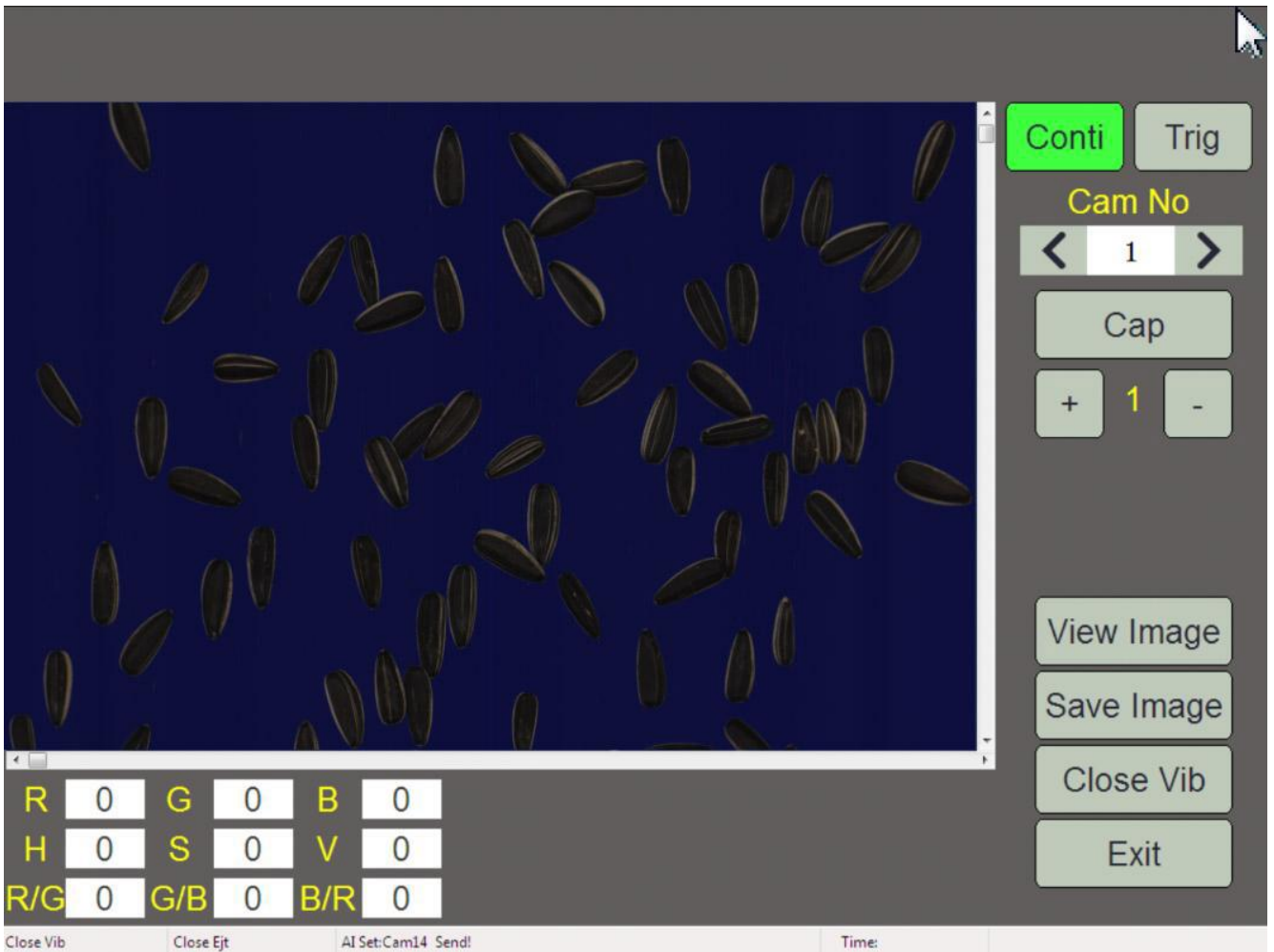
! Lower limit value: No matter whether you choose a small election, you have a starting point for blowing. This lower limit value is to change the starting point size. (For example, if the peanuts are large, then for example, 50 or more elements are large, and my lower limit is added to 20, that is, the material reaches 70 images to start blowing.) The range is 1-255. Benchmark: A multiple of the scale range of the selection. The reference range is 1-255. If the selected material exceeds the initial range, the baseline can be added to

5.4.15 Intelligent setting

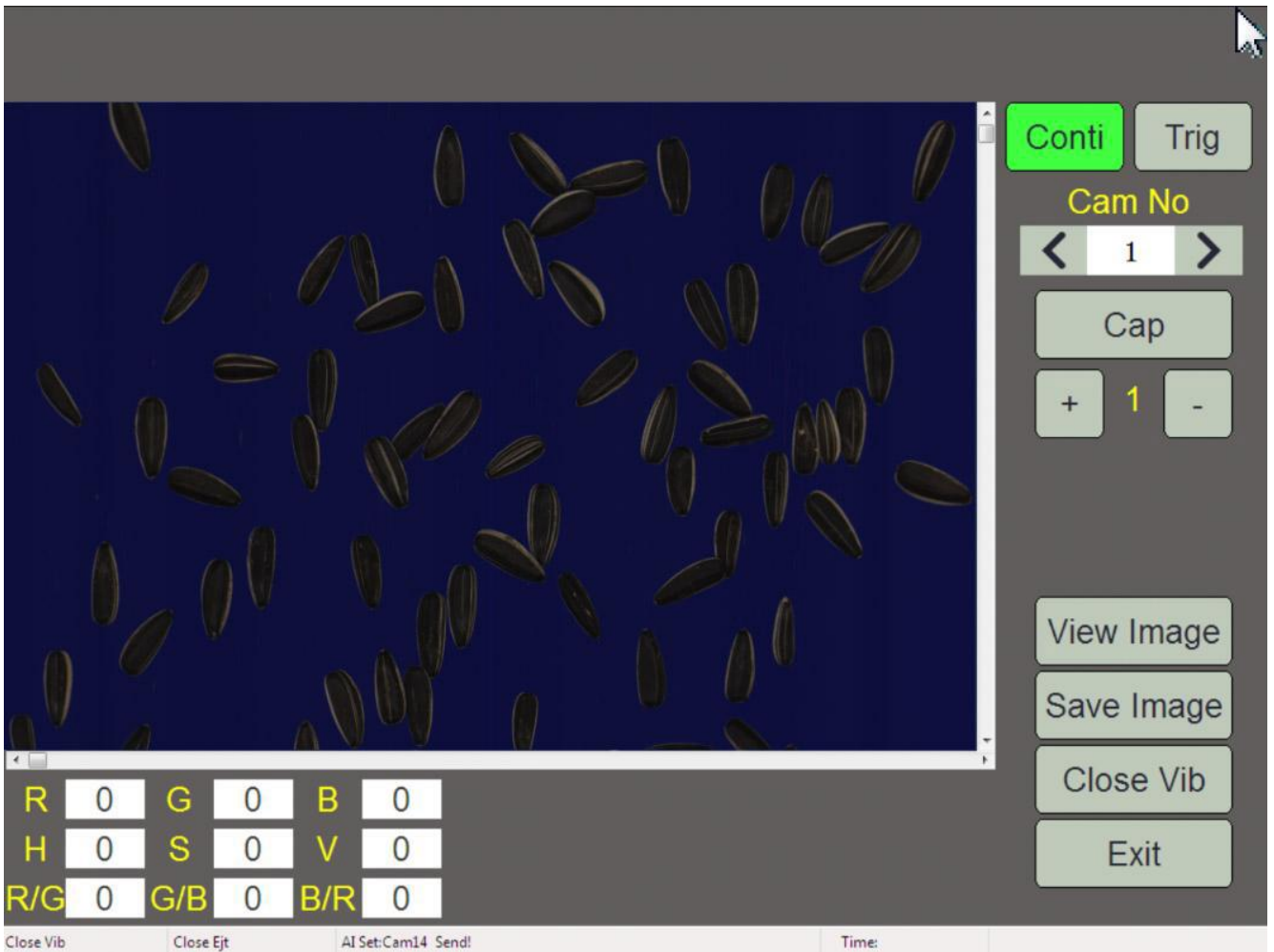
Use "Model 2" as the example.

Press "Model 2" enter.

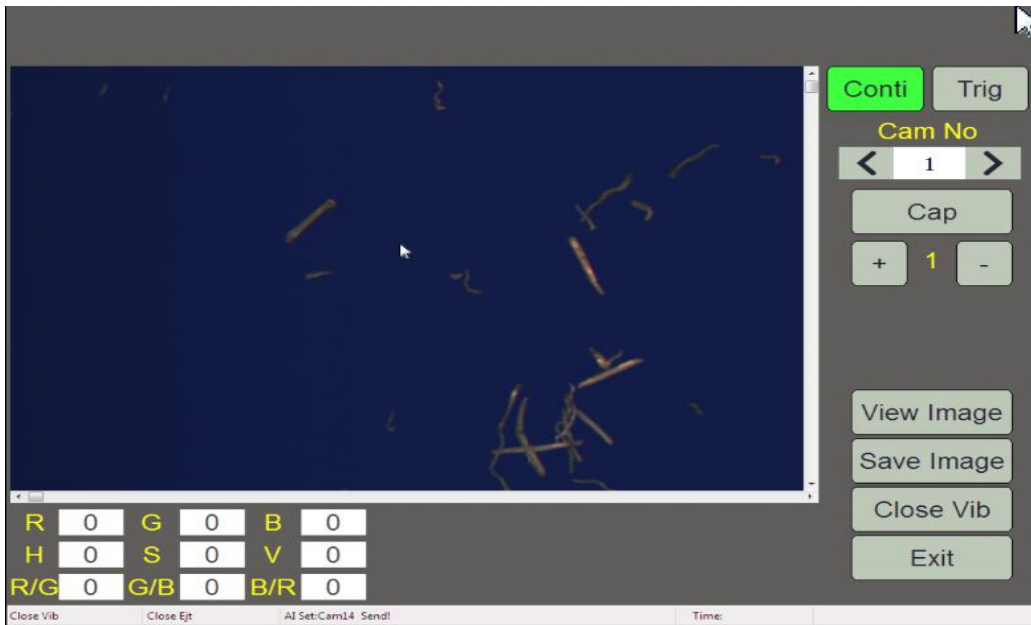
5.4.16 Intelligent Analyze



- Point to the camera that needs to use the sample.
- Open the corresponding vibrator.
- Click "Capture" to make it green, and turn "Feed On" to turn it



d. Find the appropriate image during the capture of the image, click "Capture" to make it gray, then turn off the feed. Then click "Save Image".



e. Start looking for good materials in the captured image, bad materials, first find good materials, use your finger to point to the good material position, pull a square from the upper left corner to the right to draw the desired materials, see here is the best Do not distort. Then click “√” to save, and find a bad material from the image and click “x” to save. If the image is too small to be scratched, there is an enlargement here.

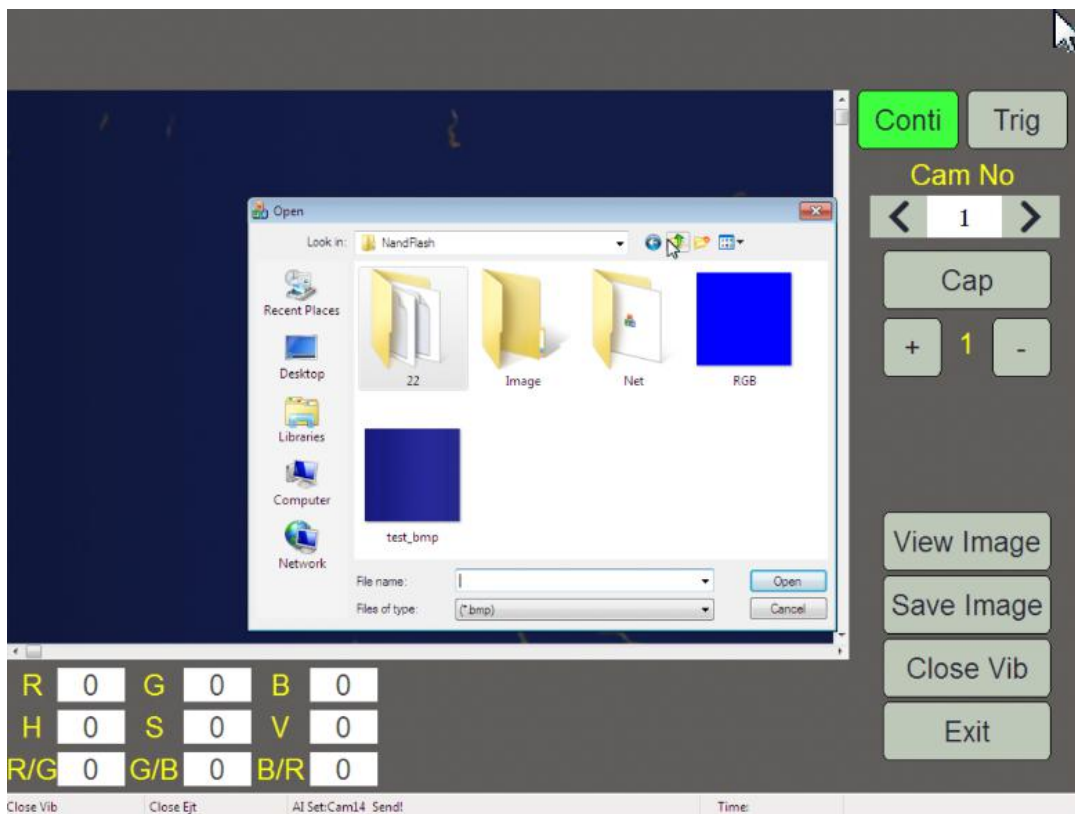
Must be scratched first, otherwise it will not succeed.

f. "One-click recognition" will appear after the good or bad

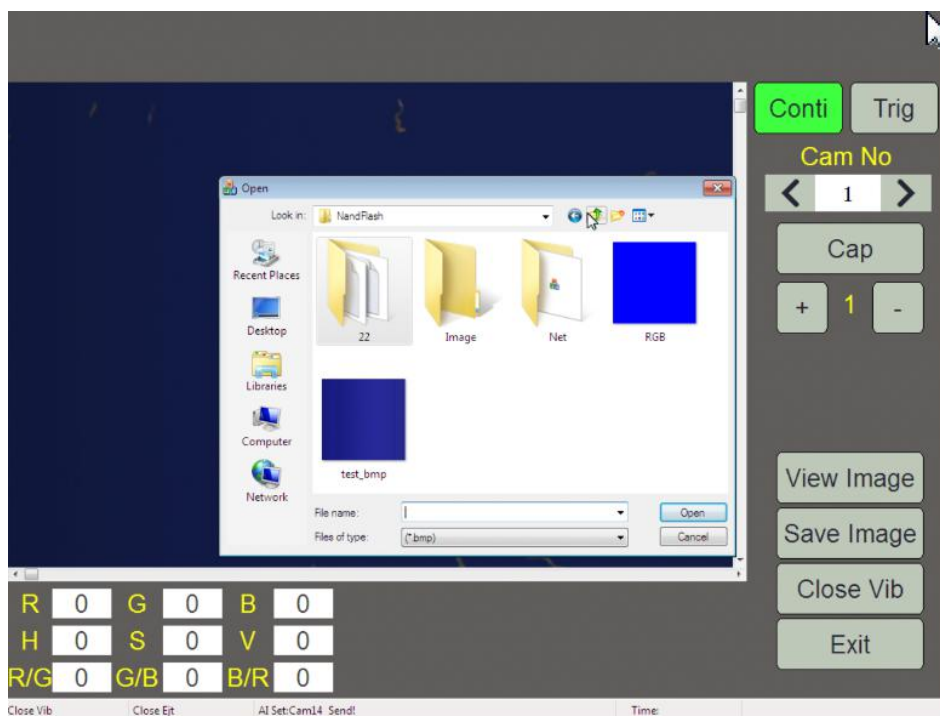
g. Click “One Key Recognition” to display “Simulation”.

h. Click “Simulation” to appear on the page. Select the color that the bad material displays in the image. Mark, the bad part is shown in red in the picture. At this time, adjusting the number in the upper right corner of the picture is the precision of the smart selection, increasing or decreasing, and the red part of the image is increased or decreased.

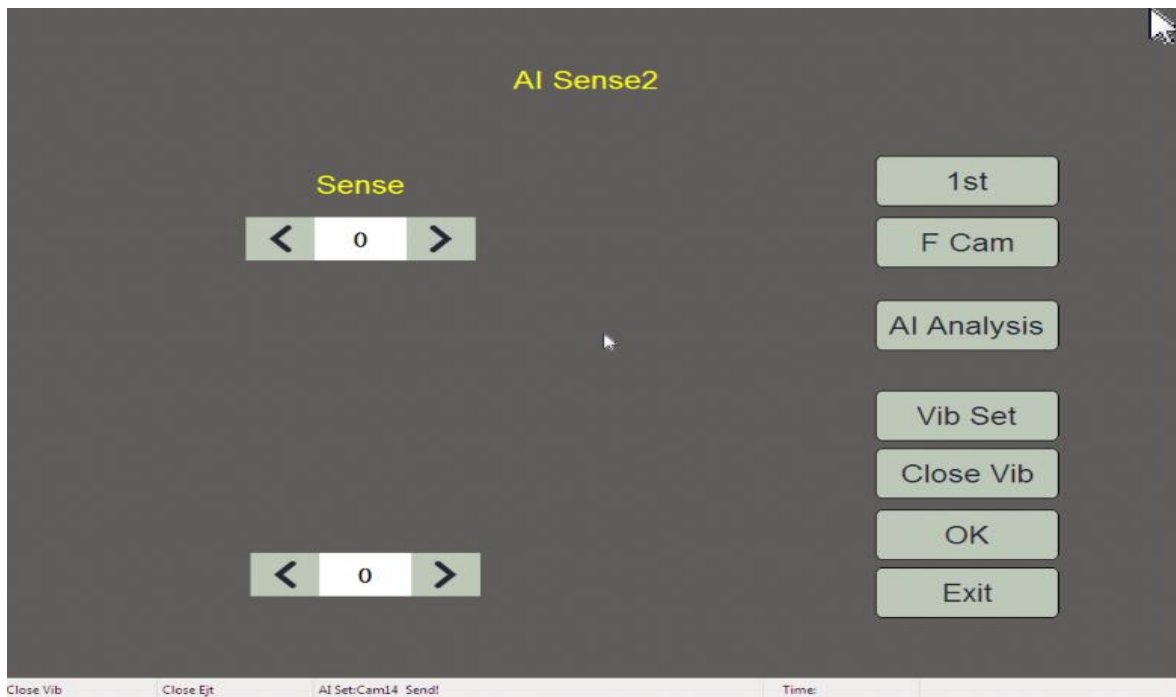
i. At this point, the “back camera” intelligent simulation ends, click “Exit”. Perform a front camera smart analysis and switch the camera to the 15th lens. Click the "View Picture" button below to find the picture point "OPEN" of the 16th lens intelligent analysis.



Enter the camera below for the front camera number 15 for intelligent analysis. Complete intelligent analysis of the camera before and after completion, complete intelligent analysis is over.

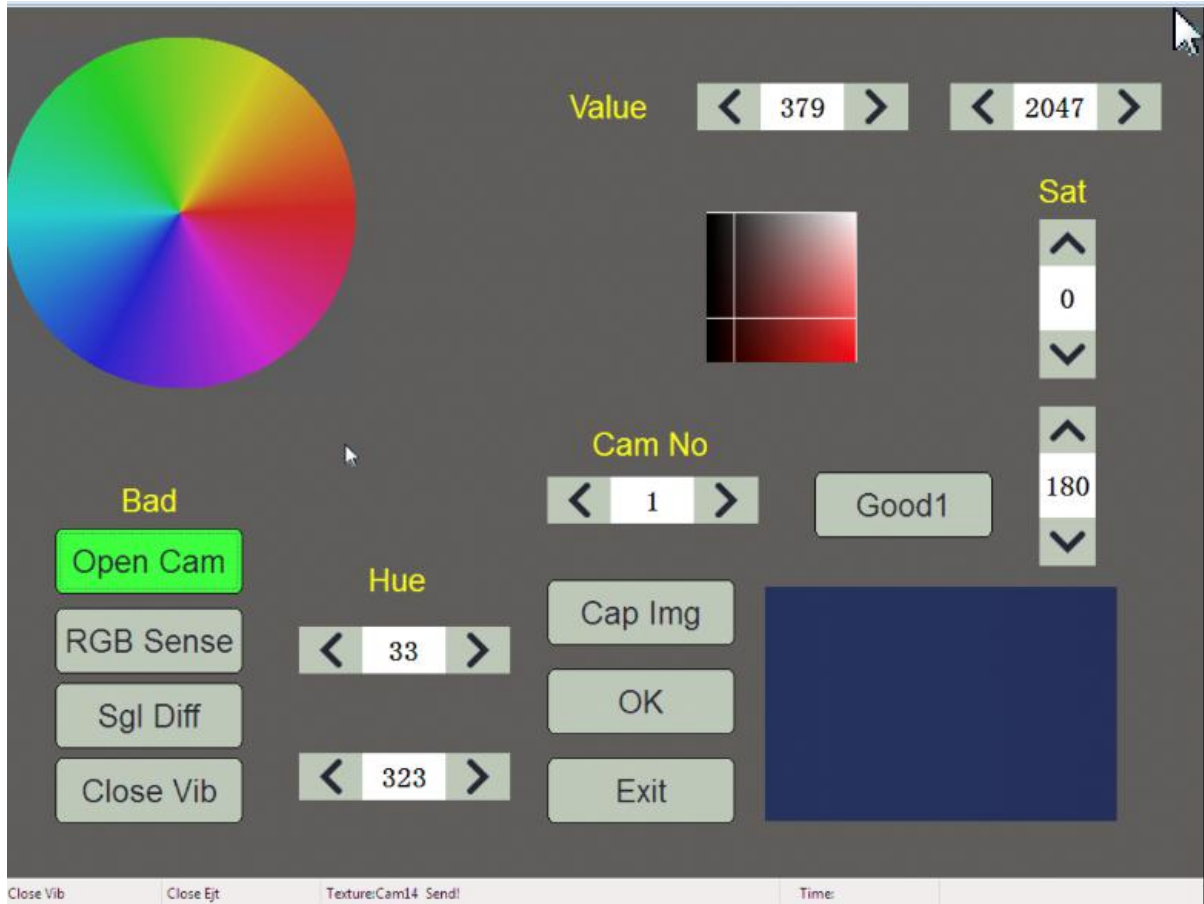


According to the sorting effect, use the spot and the precision to select the appropriate effect.



! Note: The above analysis of the camera with the 16th lens, the front camera 15 lens also needs to use the same picture, draw the same part of the good and bad materials, intelligent analysis, so the front and rear accuracy and selection can be better, Closer.





A. The two white lines on the color wheel are respectively high in color and low in color. Click between the two white lines. When the point is "OK", the color between the two white lines can be retained. If you click on the two white lines, click "OK" to delete the area between the two white lines. The "black line" in the middle is the position of the color wheel where the material itself is located after the photo is taken. After this is good, the "black line" will display the good material, so the position of the color wheel, the bad material "black line" will also display the position of the color wheel where the bad material is located on the color wheel, so that you can pass two white lines. Come to choose good and bad materials.

B. In the upper right corner of the figure above, the gray level is low, the precision range is 1-2047, the color selection is black, and the signal is set. The higher the number, the higher the precision. The gray level is high, the precision range is 2047-1, the color selection is white, and the signal is applied. The smaller the number, the higher the precision.

C. Saturated: low saturation, color selection of whitish and blackened materials. The higher the number, the higher the accuracy. The saturation is high, the color selection is dark, the color is red and

yellow, and the smaller the number, the higher the precision.

D. The RGB precision of the point is as follows, which are red low, green low, and blue low. They are all materials with dark color selection. The accuracy is 1-2047. The higher the number, the higher the precision.



E. "Image capture"

a. Click "Continuous" to open the feeding. At the point "Sampling", the picture will be taken on the left side. Stop sampling at one point and click "Save" to save the picture. In material 1". This photo can take a total of six shots are good material 1, good material 2, good material 3, bad material 1, bad material 2, bad material 3, click "good material 1" to switch to "good material 2" in turn.

b. Color ratio and color threshold, the factory machine will be adjusted at home.

c. What color is used for the program without correction.

d. The program with correction is to point to "white" is the correction, point to other colors is to stop the

correction and save.

Correction method: In the case of waveform, gain, aperture, and all normal conditions of the machine, turn on the vibrator and cut off normally, then enter the “sensitivity” “image capture” and point the front and rear mirrors to “white”, and the calibration starts. The calibration requirements must ensure that the 8 lights in the middle of the panel light are flashing or all bright. If 8 lights do not flash, it can be controlled by precision, add precision until it flashes, and then observe that the panel light flashes evenly. If the front and rear mirrors or different lens panel lights are evenly flashed but the lights are not the same, you can use precision. Control, the premise of these is that the cutting of each channel is very close during the blanking process. After all the lights are flashing normally, quickly enter “image capture” and click “white” to make other colors.

! Note: The lens must be on during calibration and always in the blank. If you only want to correct one of the lenses, you can turn the other lenses off and you can correct the open lens separately.

5.4.19 Background Wave



A. The aperture of the machine's factory aperture is fixed, and the light voltage is fixed. Under these preconditions, you only need to hang the white balance board to find the highest line with the red, green and blue gains at 1, and adjust the height of the two lines to the highest line by gain. White balance, all lenses need to do the same.

B. The background has only two sides, and the background of the point "B" will be switched to "A", and the background can be flexibly used as needed.

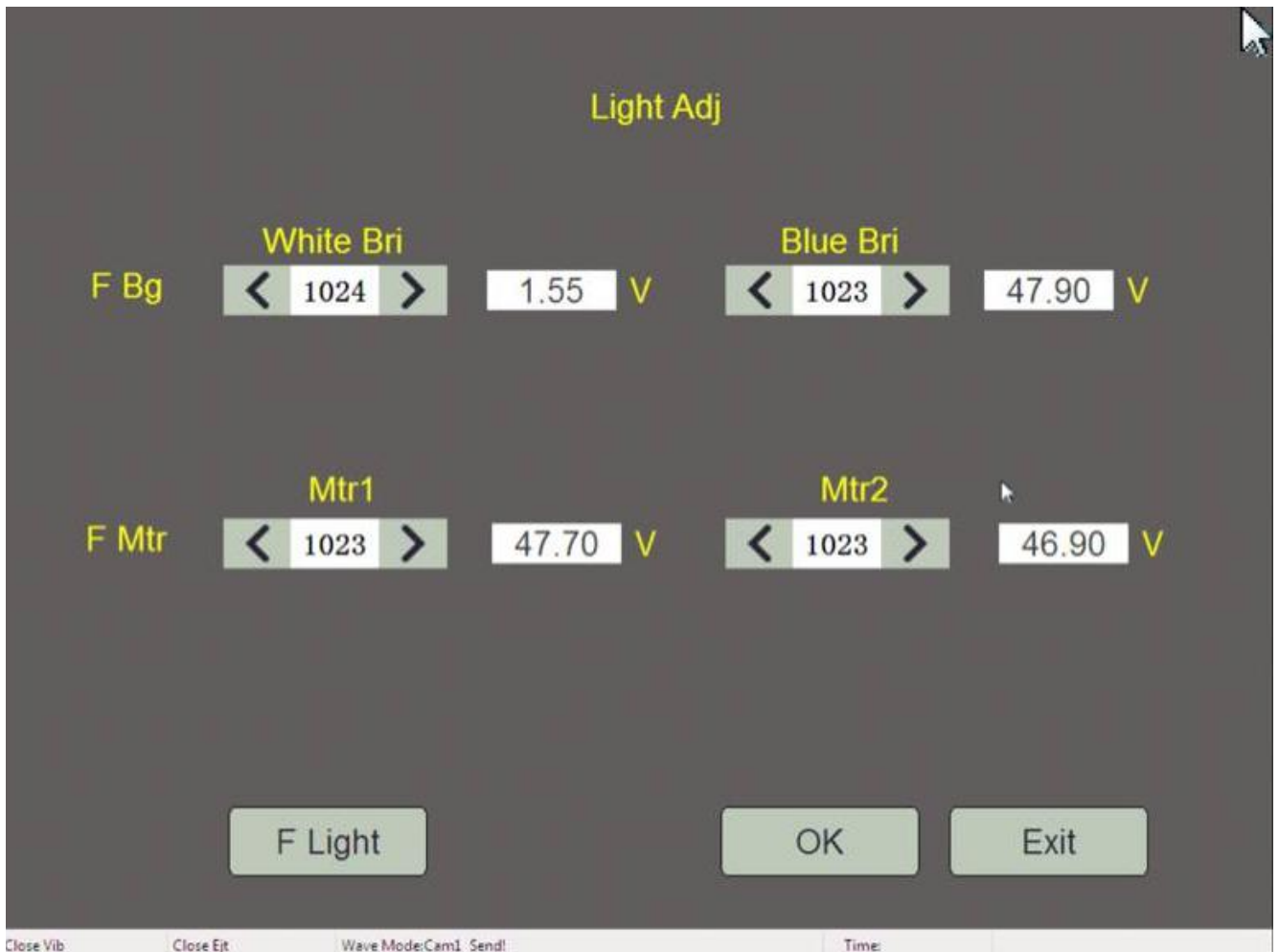
C. Switching colors The red dot on the upper graph will change to "green", and the three "blue" dots will represent the three primary colors in the graph.

D. Capture the signals that can be produced by capturing the material in production. Thereby finding a color selection scheme.

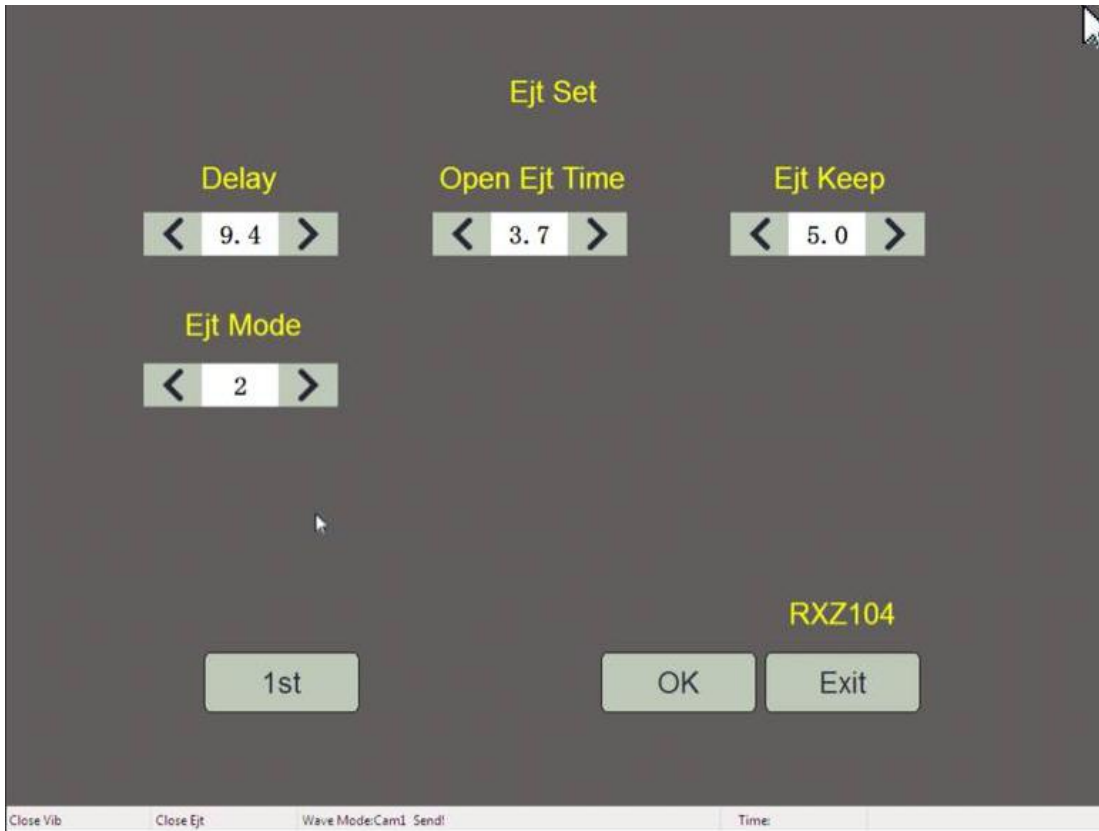
Lighting adjustment

A. When the number hits the 1023 light, the voltage is also the highest, and the 1024 is turned off, and the light is off. The brightness of the lamp can be adjusted from 1 to 023. The higher the number, the brighter the lamp.

B. Be careful when turning "headlights" into "backlights".



5.4.20 Ejector testing



A. Delay: The time the lens sees the material and falls to the mouthpiece.

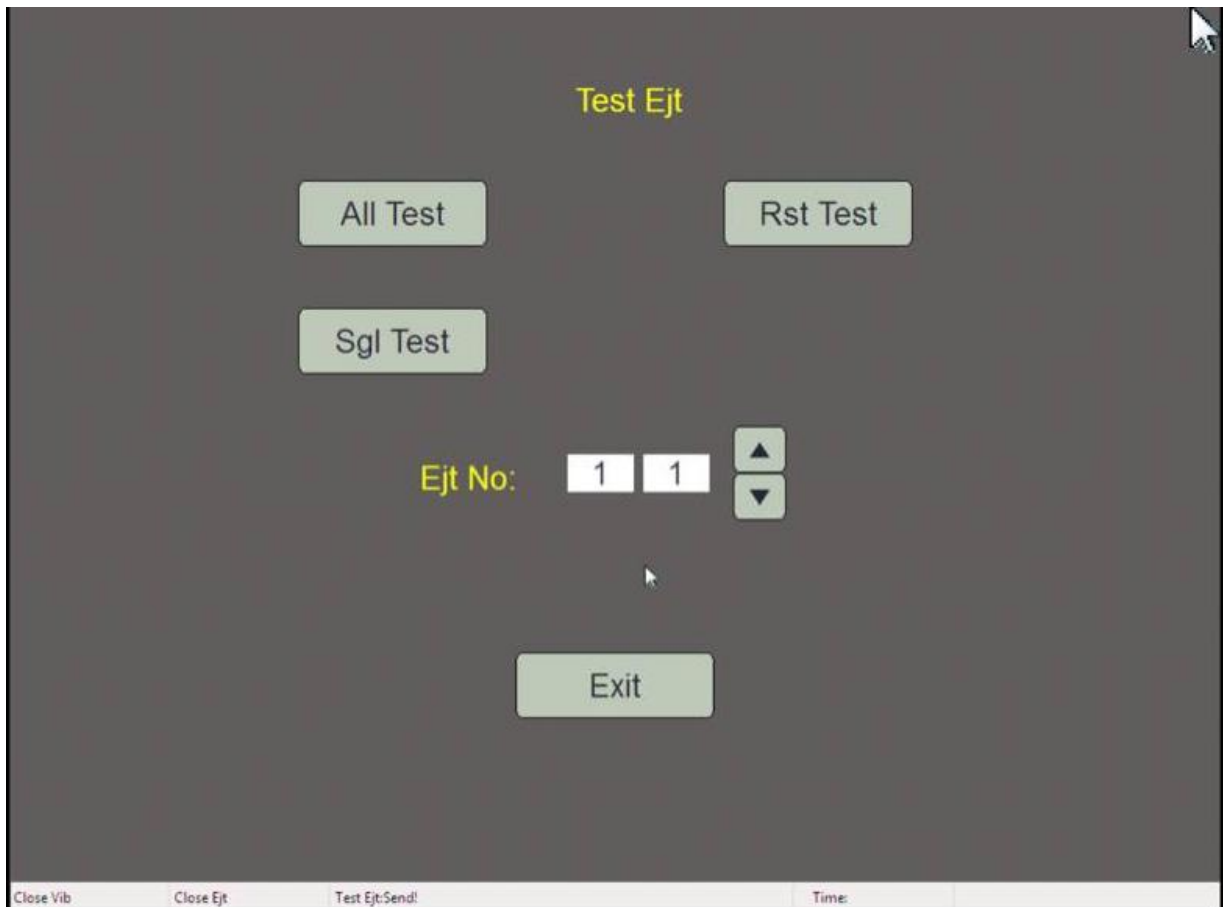
B. Open valve: The length of time the nozzle is blown.

C. Maintenance: If the maintenance is greater than the valve opening, the machine is blown open and the valve is maintained to be replenished. If it remains less than the valve is opened, the maintenance does not work.

! When adjusting, pay attention to "one time" to adjust, "secondary" or "three times", and also need to adjust. After adjusting the parameters, the key points are determined.

5.4.21 Ejector testing

In the case where the gas supply of the color sorter is normal, the "all detection" sound is normal. If there is something wrong with blowing or blowing, it may be that the valve is broken and needs to be repaired.



A. All tests: from 1 to the last cycle detection.

B. Single test: Always check one air valve.

C. Reset: The channel number is reset to 1-1.

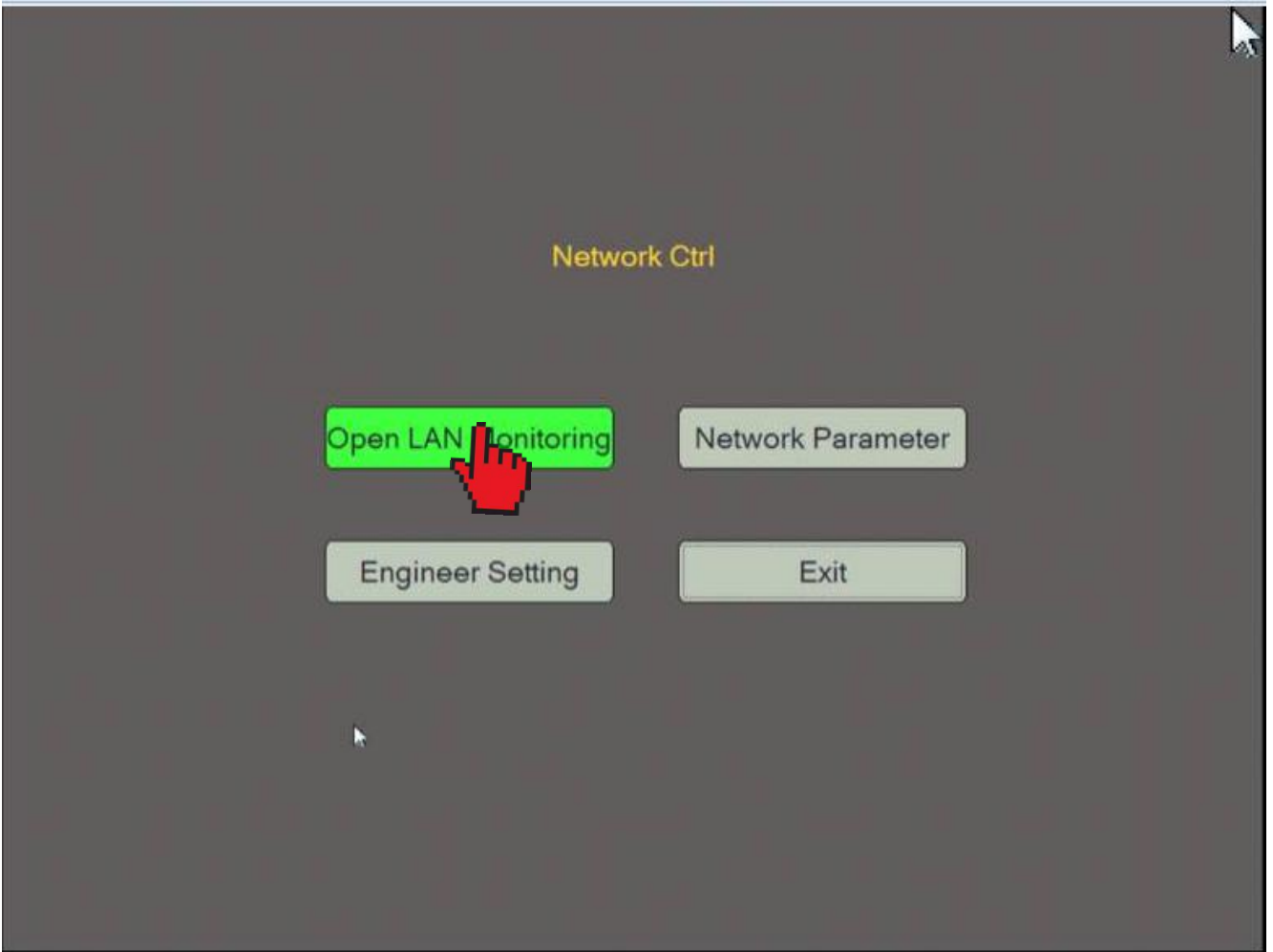
D. Channel number: 1 on the left represents the first slide of the machine, and 1 on the right represents the first valve in the first slide.

5.4.22 Wiper setting



- A. Cleaning time: The cleaning brush cleans the sorting box glass one round trip time, in seconds.
- B. Cleaning interval: every time the machine is produced, it will be cleaned once every minute. The shortest one minute, the longest 30 minutes.
- C. Valve when cleaning: You can choose to open or close. If there is a missing material during the cleaning process, the color is selected. If there is no leakage during the cleaning process, there is no color selection. The valve is off by default when the machine is turned on and off.
- D. "Cleaning": In the "cleaning setting", the machine will be directly cleaned and the production will be stopped. After the ash is finished, the machine will automatically produce normally.

5.4.23 Remote control



Step 1: Click “LAN Monitor Off” and change to “LAN Monitor On”.

Step 2: The mobile phone or PAD is connected to the wireless network of the machine, and the account number and password are the same.

Step 3. Click “Network Parameter Query” to enter the network parameter interface.

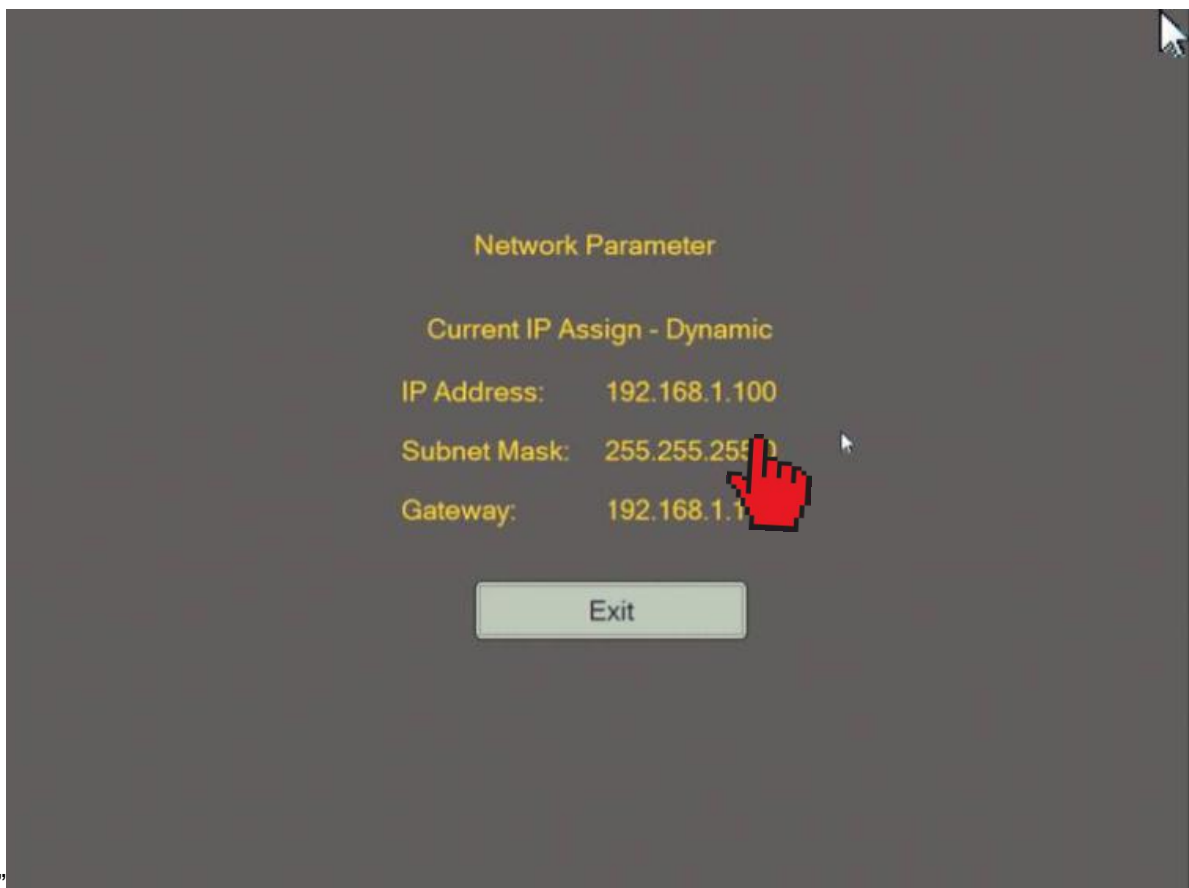


Step 4: Click on the app "VNC" software in the mobile phone or Pad, enter the IP address, and click CONNECT.

Step 5: If the connection is successful, you can remotely control the host via your mobile phone or PAD.

5.4.24 Version testing

">" will display the respective version numbers of "channel board, USB template, dimmer board, valve bottom board, vibration cleaning board,



etc.”



Anhui Zhongke Optic-electronic Color Sorter Machinery⁵³

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