HK-50 PLC+IPC CONTROL FTTH DROP CABLE/SIMPLEX/DUPLEX CABLE PRODUCTION LINE

OPERATION MANUAL

PREFACE

Thank you in advance for using optical cable machines made by FOCC ， Please read carefully this operation manual to ensure that you can run correctly and safely the line. Besides, please take care of it to look up at anytime.

It will be changed without notice in advance.

CONTENT

Chapter 1. SECURITY AND INSTRUCTION

Please strictly follow the instructions below to avoid to cause personal injury or property damage.

1.1 Definitions of safe sign

 Operation and touch without following instructions can cause personal injury or death

 Operations without following instructions can cause personal injury or damage to product or other equipment

1.2 Safety precautions

■ Installation

- Please jack up the bottom of machine or lift the machine when carry equipment
- The material of air hose should be metallic or flameresistant material, and should be connected outside.

■ Wiring

- Please confirm that power shut down before connecting wire.
- Please confirm that power can meet the standard while connecting wire.
- Please confirm that the terminal connected ground is stable, or then maybe cause electric shock or fire.

■ Running

- Please don’t touch the part which is rotating at high speed in order to avoid cause personal injure when machine run.
- Please don’t directly touch the shield of extruder in order to be scalded, that’s because the temperature is so high.
- Please ask operator specified to run the machine in order to avoid to cause personal injury or damage equipment.

■ Inspection and maintenance

- Please don’t inspect and maintain, and also don’t touch terminal when connecting power.
- Please ask professional person to inspect when machine is trouble.
- Please don’t change the wiring and structure without permission.
- Please keep the machine working for at least 6 hours and all parts working for 5 minutes every week, take out screw, clean screw and barrel, take out tools, clean tools and cross head, keep the tool oiled to avoid rust when machine is off for a long time.

Chapter 2. MAIN TECHNOLOGY PARAMETER

2.1 Usage condition and machine size

- Power supply AC380V / 50HZ three phase five wire
- Total power 52KW

- Air pressure ≤ 0.5 Mpa
- Working temperature 0 ~ 40 ℃
- Working humidity ≤ 90 ％ (without condensed water)
- Environment there aren't corrosive gas, oil, oil vapour and heavy dust in the air.
- Machine size 25M*3M*2.5M
- Total weight 6T

2.2 Technical specification

- This line is suitable for the production of 1-2 fibers FTTH drop cable, simplex/duplex cable.
- Speed Structure speed 150M/Min

  Production speed 60-120M/Min
- Take up tension 5～50N
- Specification of pay off reel fiber reel: Φ236XΦ160XΦ108

  Inner diameter of shaft: Φ25.4

  Φ280XΦ160X108

  FRP and thin steel wire reel: PN400

  Big steel wire reel:PN630, PN800
- Specification of take up reel PN400 and PN630
- Change cable diameter

（increase and reduce speed 30-150m/min） ≤0.1mm

（average speed30-150m/min） ≤0.08mm

Chapter 3. MACHINE APPEAREANCE

item	All parts' name and specification	Series	Qty	Picture(for reference)
1	2 heads fiber motorized pay-off rack	HK	1set	
	2heads FRP/steel wire pay off	HK	1set	
2	Φ800mm single head motorized pay-off rack with dancer	HK	1set	
3	Steel wire straightening platform	HK	1set	
4	10 heads aramid yarn pay-off rack	HK	1set	
5	Mobile positioning mold support	HK	1set	
6	Φ50x25D Extrusion main motor (with two screws, one is LSZH, another is PVC)	HK	1set	 
	Free-adjustment cross head and adjustment cross head	HK	1set	

7	50KG Dryer machine	TAIRI	1set	
	Automatic hopper	TAIRI	1set	
8	Electric apparatus, main temperature control cabinet (PLC+IPC control, the Kingview software use cracked version)	HK	1set	
9	2.5m moving water trough with water tank and warm water tank	HK	1set	
10	8m single-layer U-type fixed type cooling water trough and cooling water tank (with drying device)	HK	1set	
11	Refrigerating machine	Lechangfeng	1set	
12	Shanghai gongjiu laser diameter gauge (single type)	Shanghai gongjiu	1set	
13	ink-jet printer stand device without ink-jet printer	HK	1set	

14	¢640mm+¢400mm double-wheel capstan	HK	1set	
15	9m horizontal tension wire accumulator with precisely linear slide rail	HK	1set	
16	¢400-630mm double-shaft take-up machine	HK	1set	

Chapter 4. MACHINE STRUCTURE AND WORKING THEORY

4.1 Φ800mm single head motorized pay-off rack with dancer

It can be suitable of the Φ630－Φ800 reel.

The structure of machine frame is shaftless type, electrical lifting, pneumatically clamp, and it's active with swing tension controller. The tension can be adjusted by moving the heavy plate. The control signal from displacement sensor after swing of dancer wheel can control the pay off, use 4KW Siemens Beide AC frequency motor and American Emerson transducer to drive, the pay off is controlled locally. And there's alarm when wire is broken.

4.2 4 heads motorized pay off(2 heads is for fiber, 2 heads is for FRP/Steel wire/tight buffer fiber)

2 heads fiber motorized pay off :it can be suitable of 25KM and 50KM fiber standard reel. Structure is cabinet type, and it's active with swing tension controller.The tension can be adjusted by moving the heavy plate. The control signal from displacement sensor after swing of dancer wheel can control the pay off, use 0.75KW Guangzhou people AC frequency motor and Danfoss transducer to drive, the pay off is controlled locally. And there's alarm when wire is broken.

2 heads FRP/Steel wire/Tight buffer fiber motorized pay off: it's suitable of fiber reel and Φ400 reel. Structure is cabinet type, and it's active with swing tension controller.The tension can be adjusted by moving the heavy plate. The control signal from displacement sensor after swing of dancer wheel can control the pay off, use 0.75KW Siemens Beide AC frequency motor and Danfoss transducer to drive, the pay off is controlled locally. And there's alarm when wire is broken.

4.3 Extruder

Extruder is used for the extrusion of material. The power of main motor is 18.5KW, provide two Φ50mm screw(one is PVC, another is LSZH), REMARK: THESE TWO SCREWS MUSTN'T BE MIXED. And L/D is 25:1, the max rotation speed is 120 rpm. There're four sections for heating barrel and three sections for heating cross head to ensure the degree of plasticification. The barrel is heated for at least 30 minutes when the extruder starts to work.

Dryer unit is installed on the hopper, the temperature can be set to dry extrusion material to keep qualified product.

Temperature control system uses Japan RKC brand PID smart type temperature controller, K type thermocouple measurement temperature, with the up-limit and down-limit alarm function, when temperature is higher than setting value, then fan cooling automatically starts. And it can't be controlled by control system, it works according to technology parameters.

4.4 Warm water tank

Use Japan RKC brand PID smart type temperature-controller control the temperature， thermocouple measurement temperature, temperature control precision is high.Also use water pump control the circulation of water.

4.5 Capstan

It uses double-wheel capstan, it's driven by 3.7KW Siemens Beide frequency motor with American Emerson transducer to keep stable speed.

4.6 Laser diameter gauge

Automatically feedback-control main motor speed, to ensure the setting range of wire diameter.range of wire diameter:0.1-20mm,precision:±0.003mm.

4.7 Accumulator

Use the magnetic powder clutch control the tension， tension can be adjusted by tension controller DC-24V power. The vehicle can be controlled in both ways .the meter indicates tension. Synchronous device can automatically control the take-up speed to avoid overstretch or breaking on the wire. the limit switch are laid at the front and back end. the machine stops at the same time when wire breaking.

4.8 Main control cabinet

Whole machine adopts the control technology between industrial personal computer and programmable logic controller (IPC+ PLC), Siemens S7 series products as PLC, Taiwan ADVANTECH computer control as Upper computer, with 17” Liquid crystal display, keyboard and mouse.

PLC as main control system to realize linkage control system of full production line, operators can choose stop, low speed, fast speed running status by interface. The production line can automatically switch in 3 kinds of status according to operation order and machine all status signal. speed can change according to settable lifting speed time and no sudden change. Can automatically respond to all defaults signal and be with accurate defaults indication. Both production speed and meter-counting data have obvious display. Can pre-set meter-counting length.

Industrial controller can make a record of human machine data exchange and production data. The industrial controller provide human machine interface including: Production main interface,Historical data interface, Alarm interface,Diameter curve interface.

4.9 Take up

The take up motor use AC 2.2KW CPG gear motor+American Emerson transducer and tension deflection detector can automatically control take-up speed.

Traversing: lead screw type control traversing, 400W Japan Panasonic servo motor +drive control+Taiwan WEINEVIEW touch screen plus SIEMENS S7-200 PLC

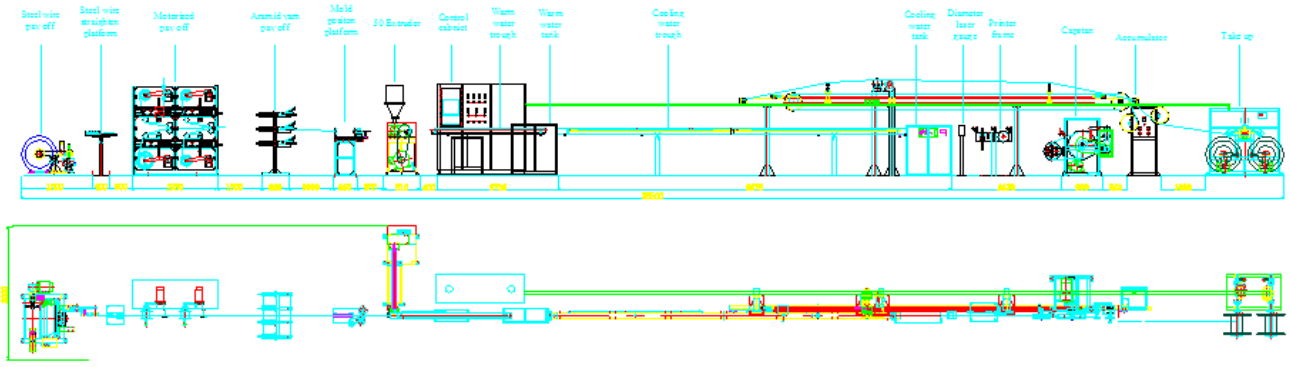
control, the pitch and range of traversing can be adjustable, it is coordinated with take-up speed.

Chapter 5. INSTALLATION AND TRIAL

5.1 Installation

The total length is 25 meter, all parts are put and fixed according to layout and water, electricity, air are ready and the electricity and air are connected according to the circuit diagram. The wire of inlet of power supply should be at least 25 square mm copper wire, is three phase five wire and must connect the ground.

Installation should be followed the professional person.



5.1 Layout

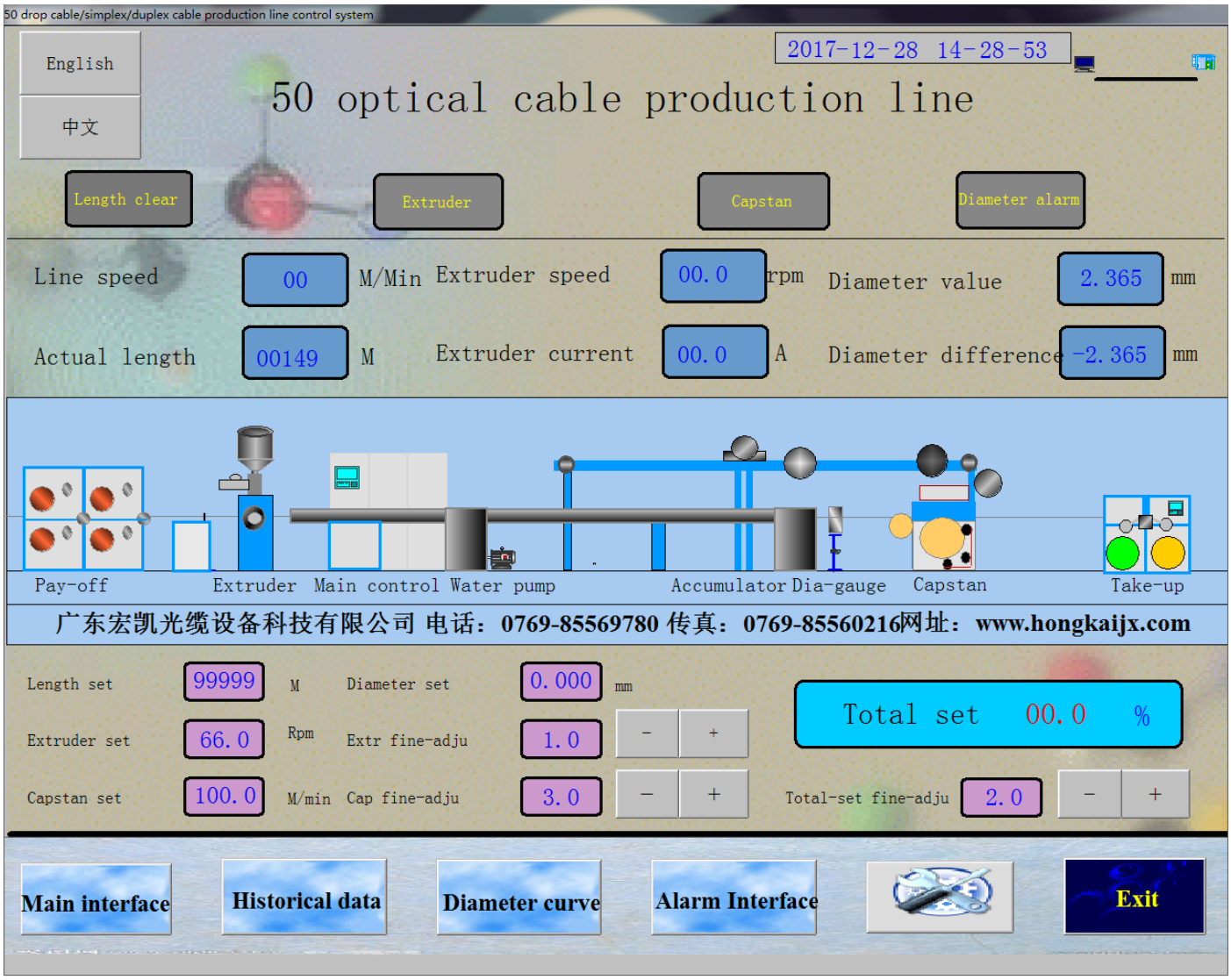
5.2 Trial

The machine has strictly tested before it leave factory, so the machine can run after correct installation.

Chapter 6. MAIN CONTROL CABINET OPERATION

6.1 Main interface

After open the power switch of machine and start the industrial computer, the system will appear the following interface.



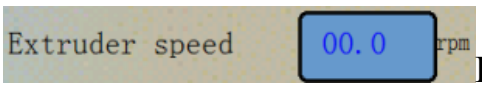
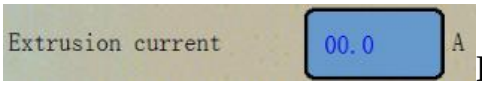
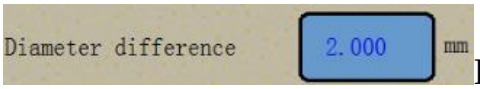
6.1 Main interface

6.1.1 Operation button of main interface

	Choose the English and Chinese language interface.
	Reset the meter-counter
	Start and stop extruder, press this button one time, then start the extruder, press it again,then stop the extruder. It can't start or stop the extruder when theproduction speed is more than 20 m/min.
	Start and stop capstan, press this button one time, then start the capstan, press it again,then stop the capstan.
	It can be alarm when the wire isn't the range of diameter only after pressing this button.
	Appear main interface after pressing this button.
	Appear historical data after pressing this button.
	Appear diameter curve after pressing this button.
	Appear alarm interface after pressing this button.
	Appear system Adjust interface after pressing this button.

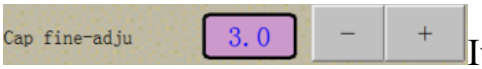
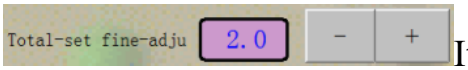
	Exit the interface after pressing this button.

6.1.2 Display production data of main interface

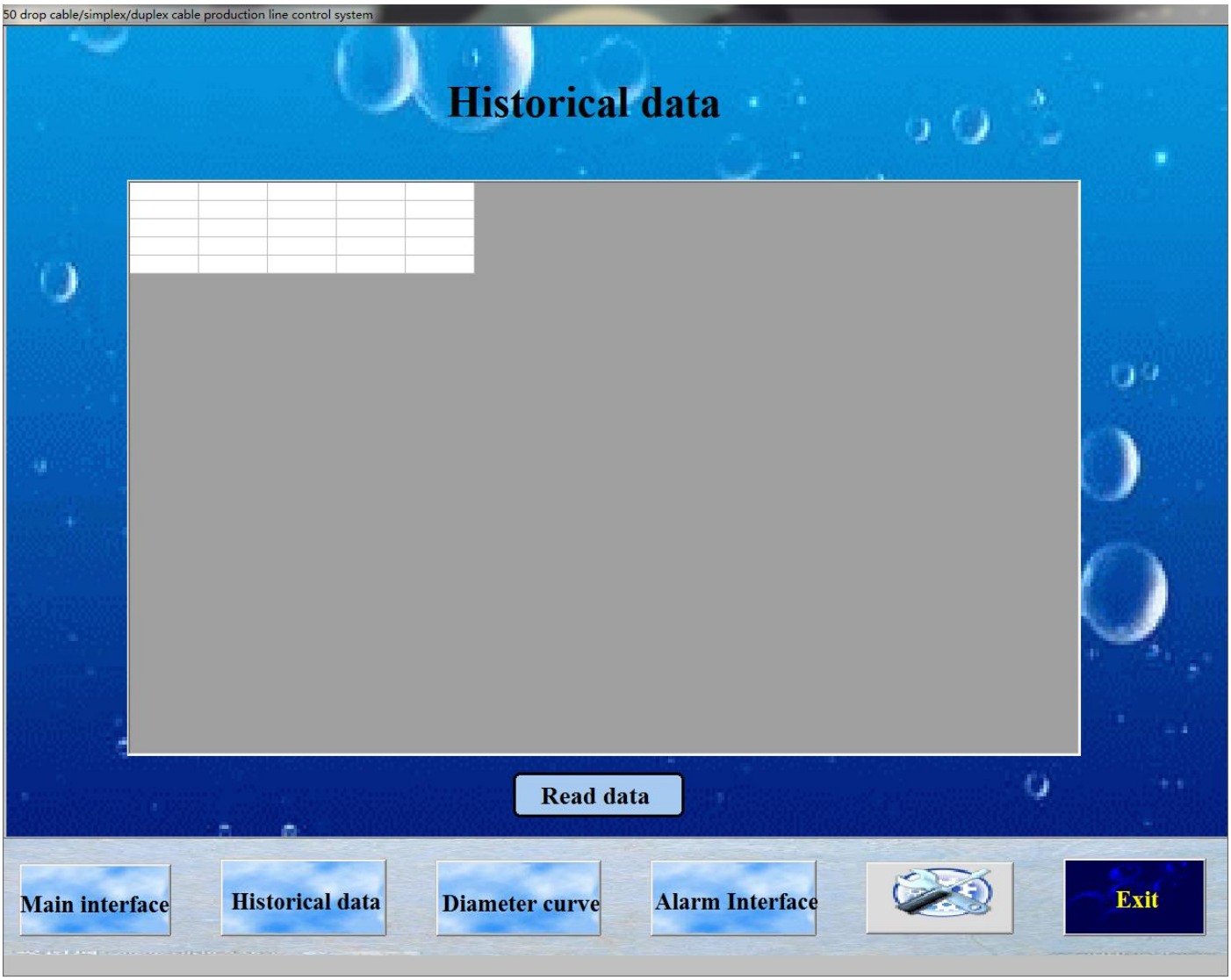
	Display the production speed and the speed is line speed of capstan, line speed =capstan set* total set%.
	Display the rotation speed of extruder, it's rotation speed of screw, Extrusion speed= extrusion set* total set%
	Display the length of product finished.
	Display the electric current of extruder, it can change according to the production speed and different extrusion material. It doesn't change a lot during the normal production. It should check the heating temperature of extruder, material, rotation speed of extruder if the electric current changes a lot suddenly.
	Display diameter of cable produced.
	Display the diameter difference between diameter set and diameter of cable produced currently.

6.1.3 Set production parameter of main interface

	It's used for setting the length every reel, there's alarm when the length of take up reach length set.
	It's used for setting the rotation speed of extruder every minute, it can act with total set. It should be set according to production technology.
	It's used for setting the production speed of the line, it can act with total set. It should be set according to production technology.
	It's used for the alarm when the diameter is exceed the range of diameter, it's set according to the product.
	It's used for fine adjusting the rotation speed of extruder, the min unit is 0.1 rpm. Press  this button, the extruder increase 0.1 rpm. Press  this button, the extruder reduce 0.1 rpm.

	It's used for fine adjusting the speed of capstan, the min unit is 0.1 rpm. Press  this button, the capstan increase 0.1 m/min. Press  this button, the capstan reduce 0.1 m/min.
	It's used for setting the total adjustment of speed, also adjust the line speed and speed of extruder. When only start capstan, capstan speed = capstan set* total set, when only start t, extrusion speed= extrusion set*total set, when start capstan and extruder, the capstan speed and extrusion speed like above.
	It's used for fine adjusting total set, the min unit is 0.1 rpm. Press  this button, the total set increase 0.1 m/min. Press  this button, the total set reduce 0.1 m/min.

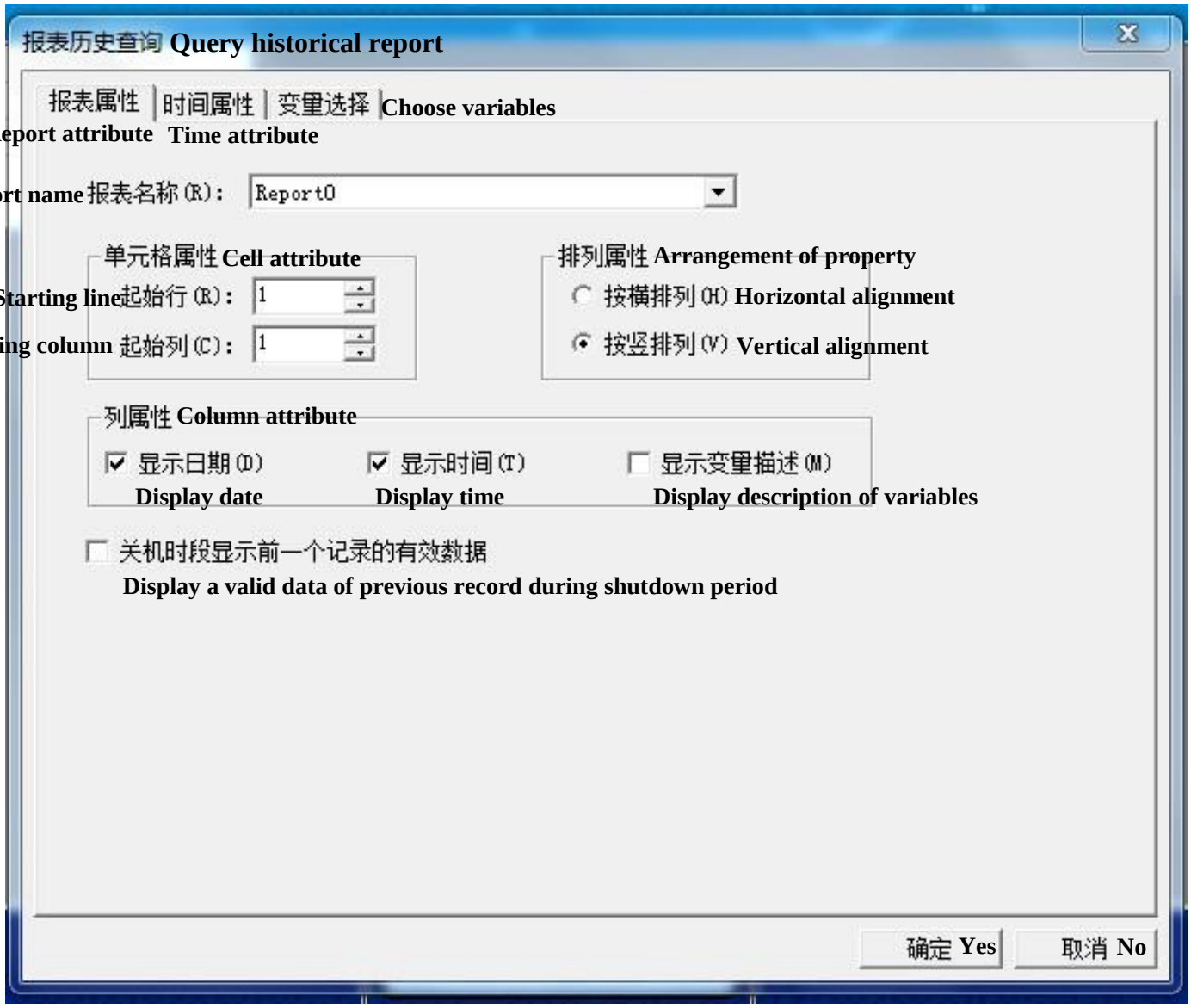
6.2 Historical data interface



6.2 Historical data interface

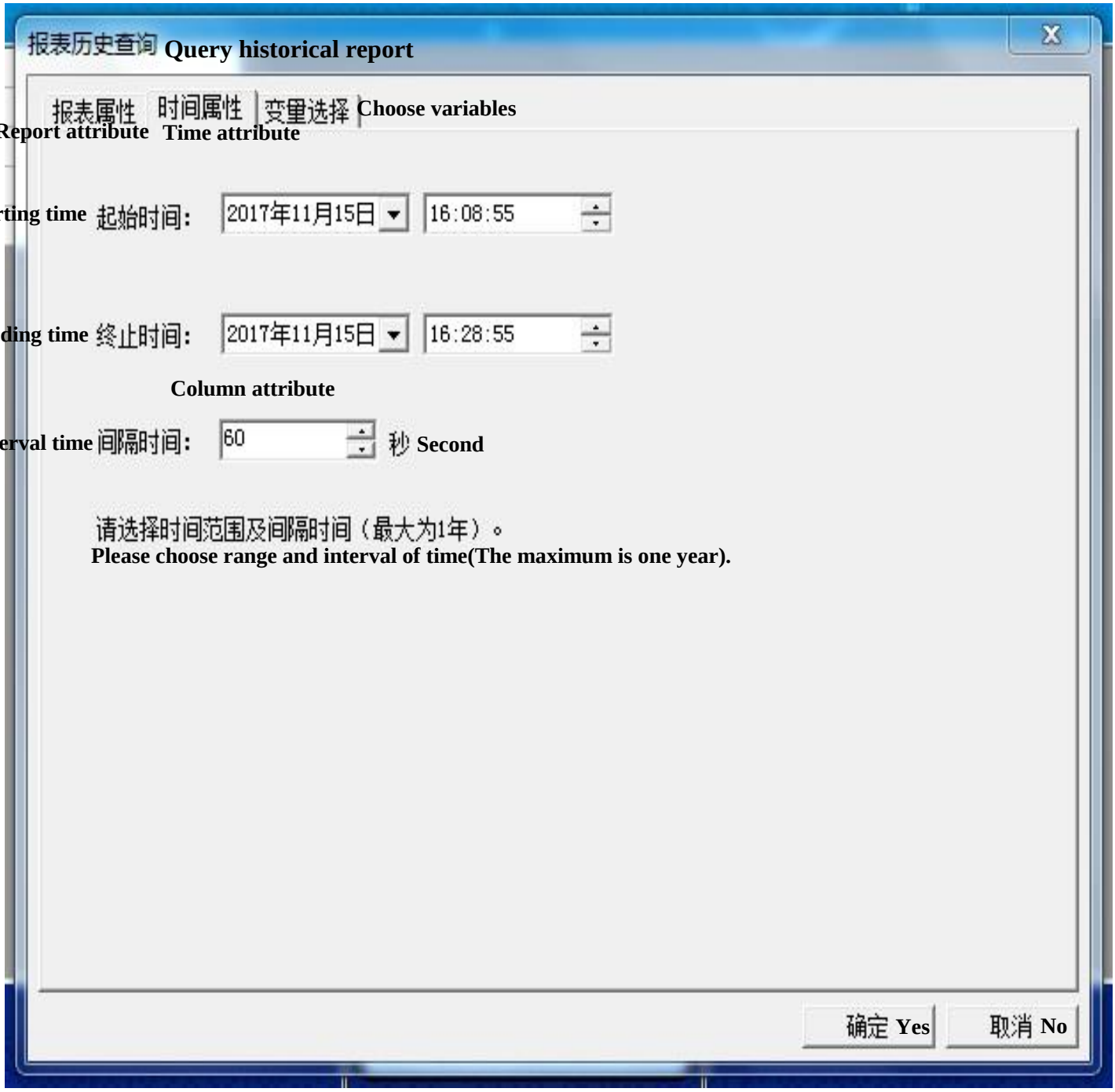
6.1.4.1 Historical data interface operation

读取数据 Press this button, it will appear the interface below(6.1.4.1)



6.1.4.1 Query historical report-report attribute

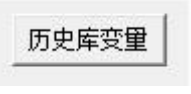
It only shows in Chinese because the software is cracked, please understand. All items are chosen. And check the table 6.1.4.1 about report attribute. Click the “时间属性 Time attribute”,then appear the interface below.



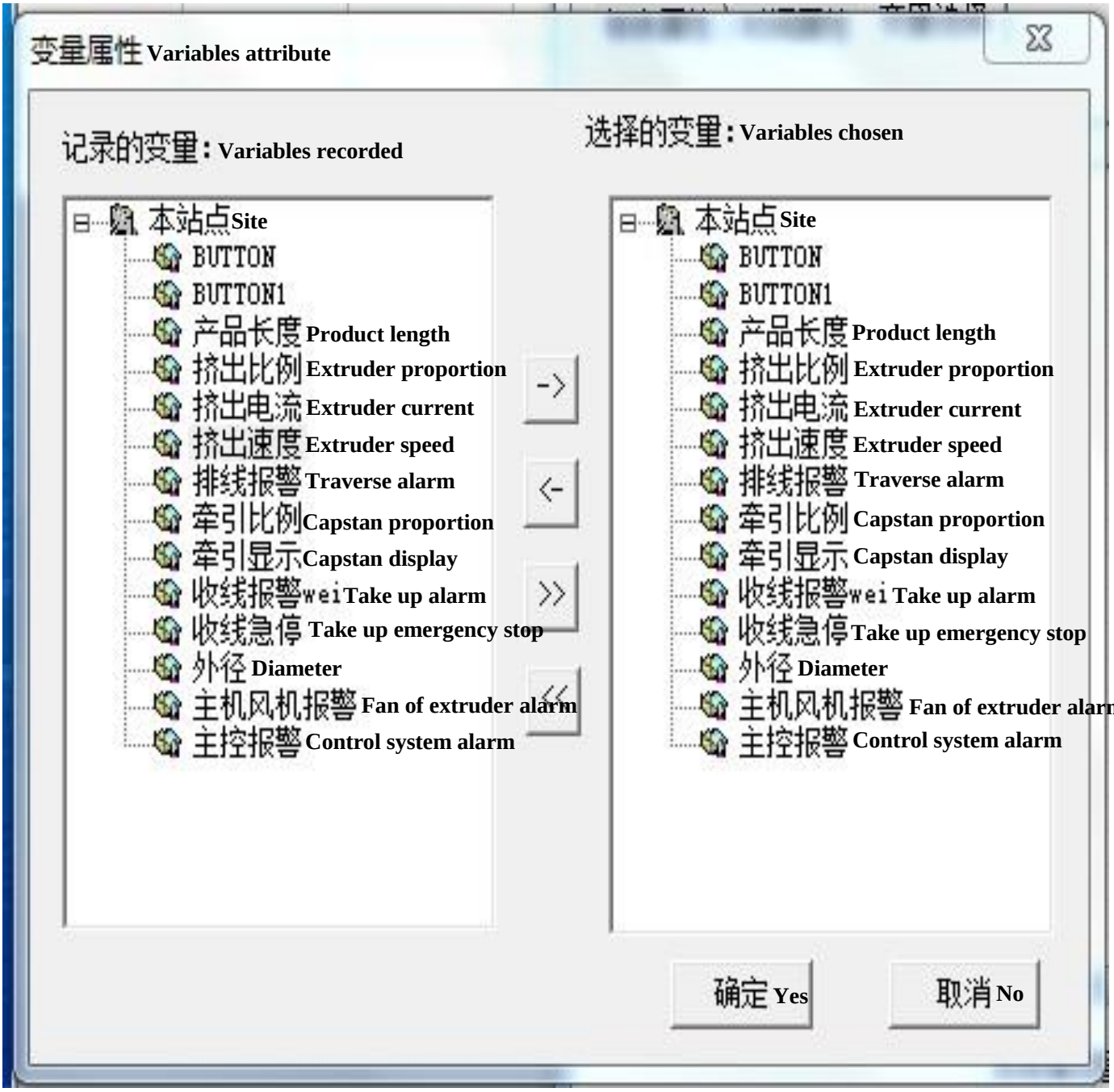
6.1.4.2 Query historical report- time attribute

It only shows in Chinese because the software is cracked, please understand. This interface can query a period of historical data with one year. Click the “变量选择 choose variables”, then appear the interface below(6.1.4.3).

6.1.4.3 Query historical report- choose variables

It only shows in Chinese because the software is cracked, please understand. This interface shows the historical data of variables chosen. Click the 

"variables of historical library", then appear the interface below(6.1.4.4).

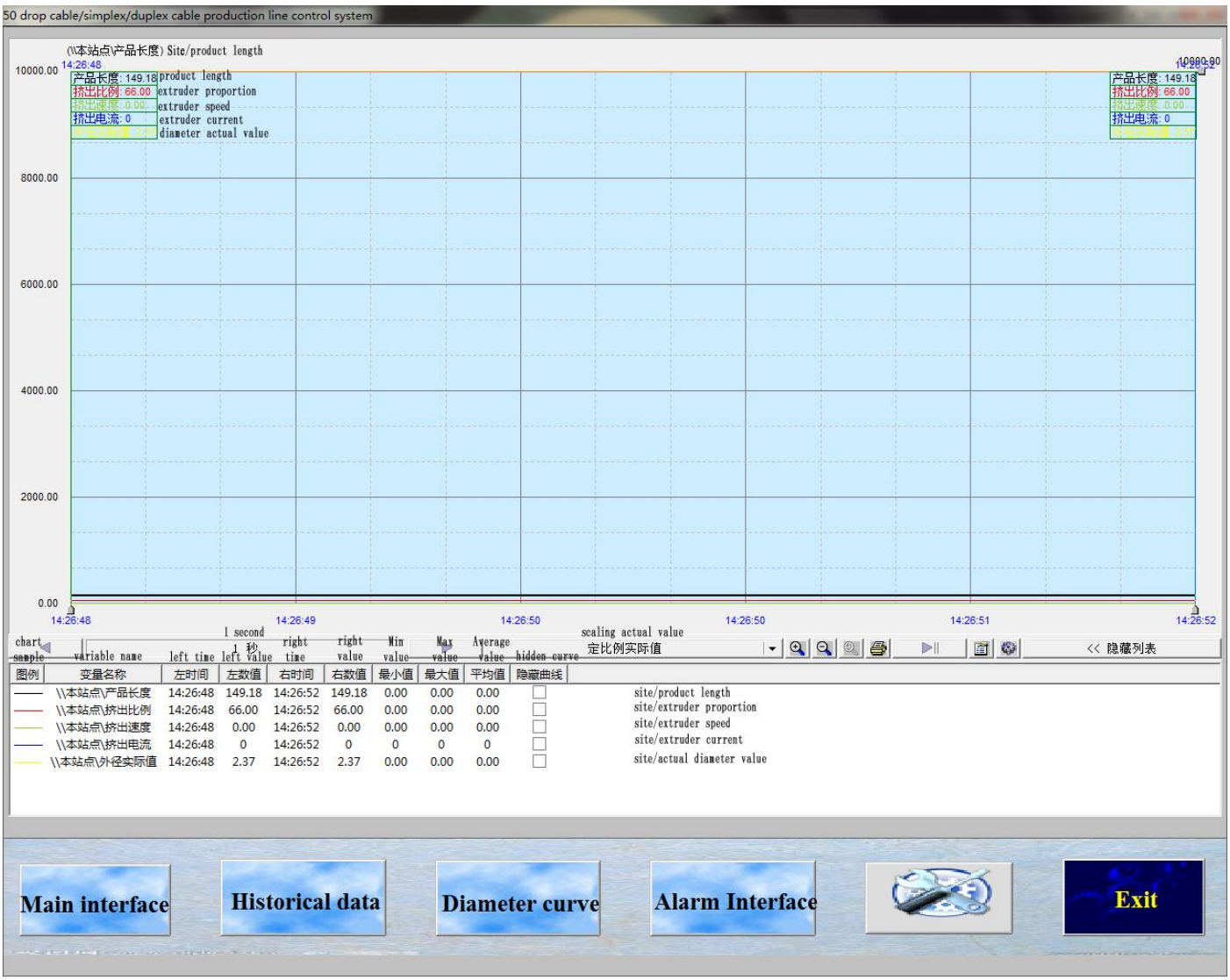


6.1.4.4 Variables attribute

Choose one of variables recorded, can move the variables chosen from left site to right site after click this button.
Choose one of variables chosen, can remove the variables chosen in right site after click this button.

Choose all of variables recorded, can move all variables chosen from left site to right site after click this button.
Choose all of variables chosen, can remove all variables chosen in right site after click this button.

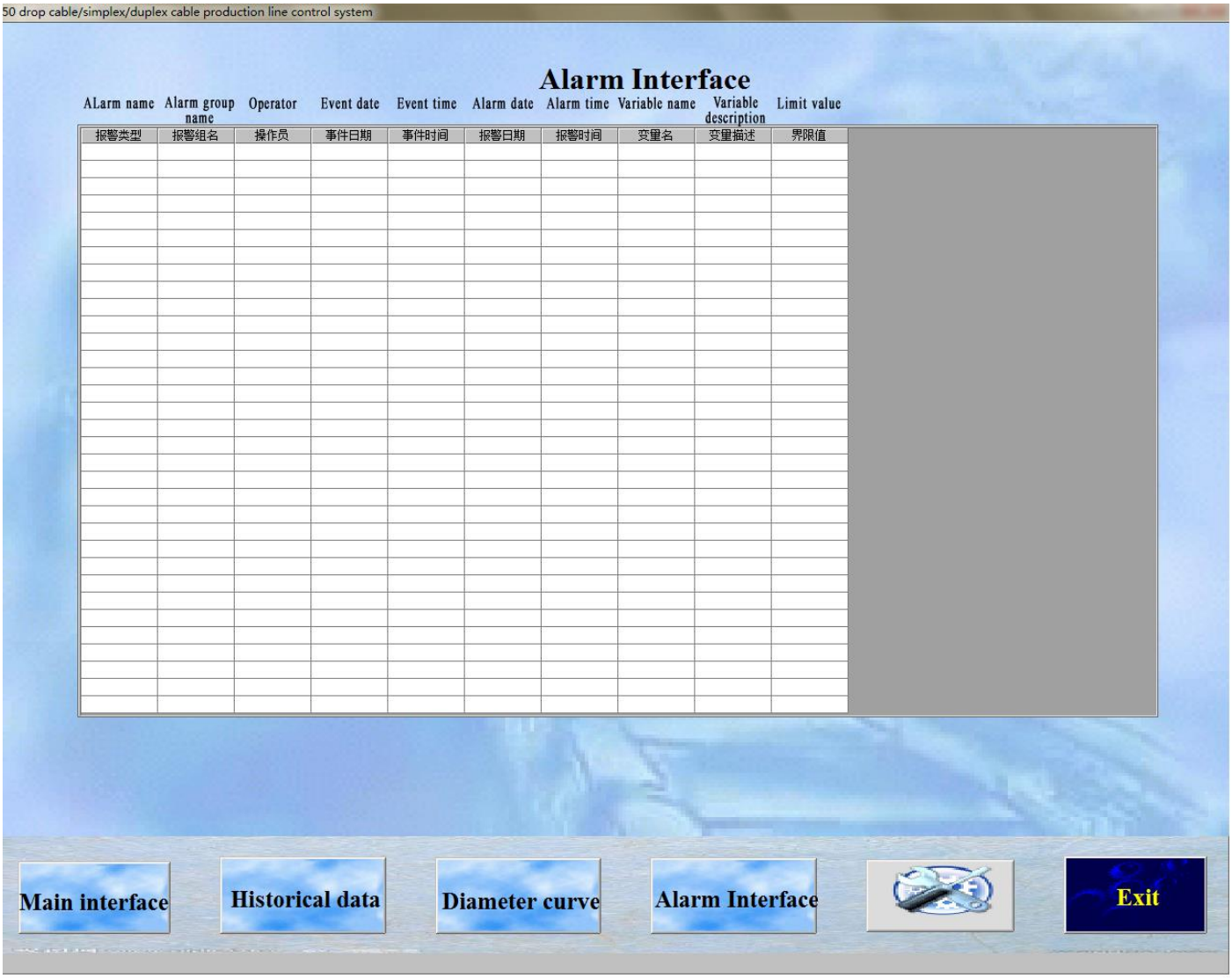
6.3 Diameter curve interface



6.3 Diameter curve interface

It can online display the change of cable diameter during the production.Please see the following interface.

6.4 Alarm interface

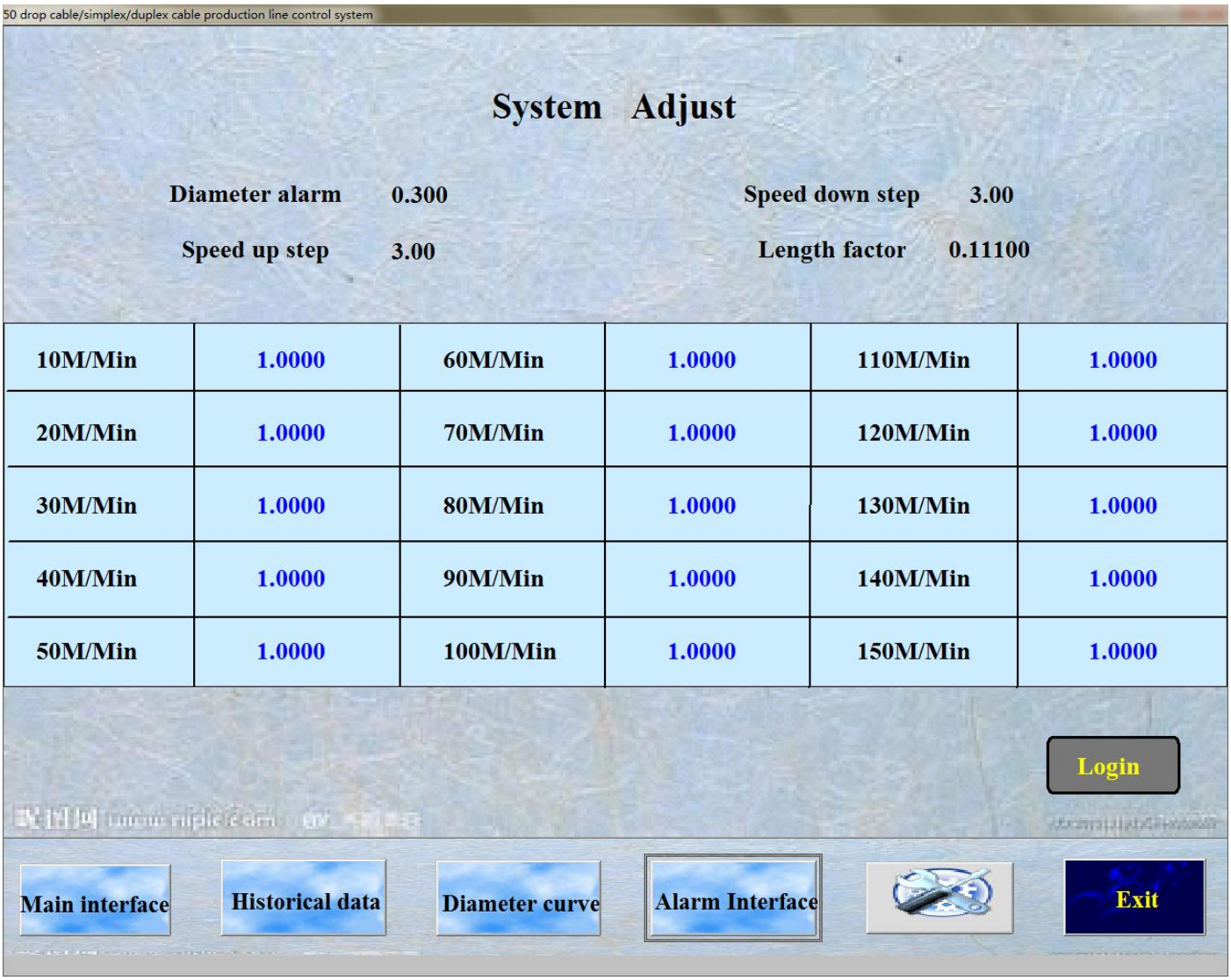


6.4 Alarm interface

This interface has a notice related alarm when the production line is unusual. And there's a alarm record left in this interface, the record can remove after remove the problem and press the reset button. Please see the following interface.

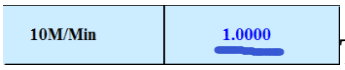
6.1.7 System Adjust interface

 Click this button of main interface, then enter system adjust interface below.



6.1.7 System Adjust interface

Diameter alarm 0.300 It's used for set the cable diameter difference range, When the cable diameter difference is bigger or smaller than the alarm difference, the Alarm lamp of main control cabinet will ring.
Speed down step 3.00 It's used for set the value which the production speed reduces every time, and the range of value is from 0 to 5. But when the value is zero, then the line can't work. Remark: the smaller the value is, the production speed is more stable when reduce

speed, the diameter of product is more stable, but the time is more.
 It's used for set the value which the production speed increases every time, and the range of value is from 0 to 5. But when the value is zero, then the line can't work. Remark: the smaller the value is, the production speed is more stable when increase speed, the diameter of product is more stable, but the time is more.
 It's used for correct the meter length error.
 It should login to revise all parameters of this interface when a password is set for this interface. But here don't need password, so can set all parameters directly without login.
 The blue highlight is a proportion factor which is extruder set. The material output can be changed and the speed of extruder can be changed to keep stable diameter of product after adjust the factor.

Chapter 7. PLC INTERFACE OF TAKE UP OPERATION

7.1 Startup

Switch on the power, and then the equipment starts initialization, the Traverse device shall automatically seek for the origin location. When the approaching origin is the inductor, it shall slow down, until the sensing signal on the origin location disappears, set the traverse location as the zero point, which is actually the absolute zero.

After switching on the power, after about 1 min, it shall show the system startup interface:

7.1 Main startup screen

Press Enter, then show operation main interface;

7.2 Main Operation interface

When entering into the main interface of the system, it shall show the following information:

7.2 Main operation screen

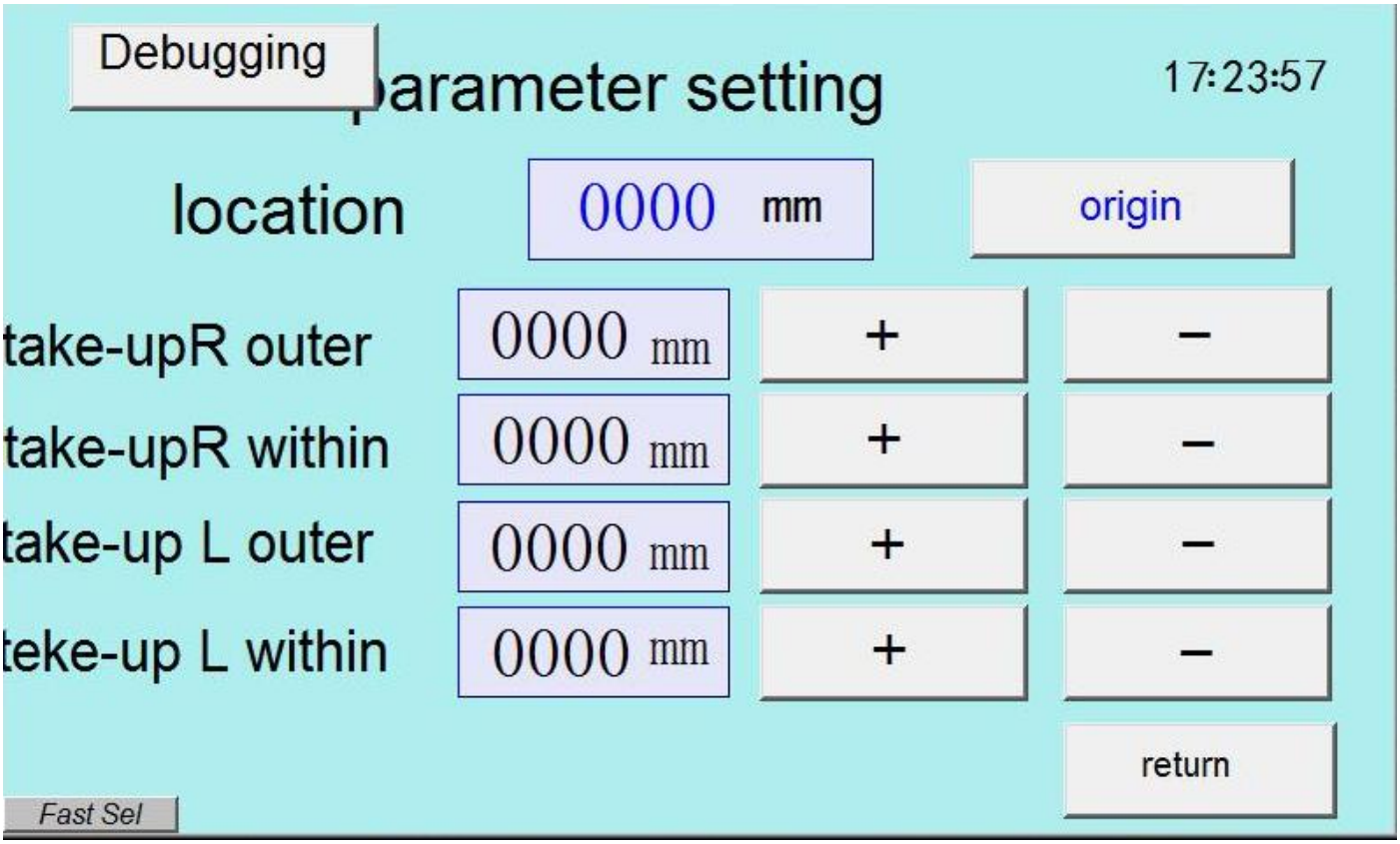
take-up Ltake-up R This icon is used to show the working condition of the take-up reel. When choosing the current take-up reel, it shall turns light.
set length 00000 m This icon is used to set the length required by the production. After setting this parameter, the length setup on the main control cabinet shall be changed simultaneously.
reality length 00000 m This parameter cannot be set, and it is only used to show the current length, which is synchronous with the main control cabinet data.

location 0000 mm This parameter cannot be set, and it is only used to show the current position of the traverse. When adjusting both position of the traverse, it can be taken as a reference. First, move the guide wheel to both ends of the reel, then you can see the traverse value, it can be taken as a reference ,then you can set well both ends of the traverse.
speed 000 m/min This parameter cannot be set, and it is only used to show the actual speed of the take-up reel.
set pitch 00. 0 mm This parameter is used to set the pitch of the traverse, which is set in accordance with the cable diameter.As usual,we can set this value larger than the cable diameter 1mm-2mm.
+ − These two buttons are used to fine adjust the pitch of the traverse. When there is deviation between the setting pitch value and the actual value, fine adjust the pitch with these two buttons.
clear length This button is used to reset the length. When pressing down this button, the length shall be cleared and cannot be recovered. When pressing down this button, the length showed on the main control cabinet shall be cleared simultaneously.
alarm interface This button is used to switch the splash screen. After pressing this button, the screen shall be switched to the alarm interface.
Home This button is used to switch the splash screen. After pressing this button, the screen shall be switched to the startup interface.

parameter setting This button is used to switch the splash screen. After pressing this button, the screen shall be switched to the parameter setup interface.

7.3 Parameter Operation interface

When entering the parameter interface, the following screen shall be shown:



7.3 Parameter setup interface

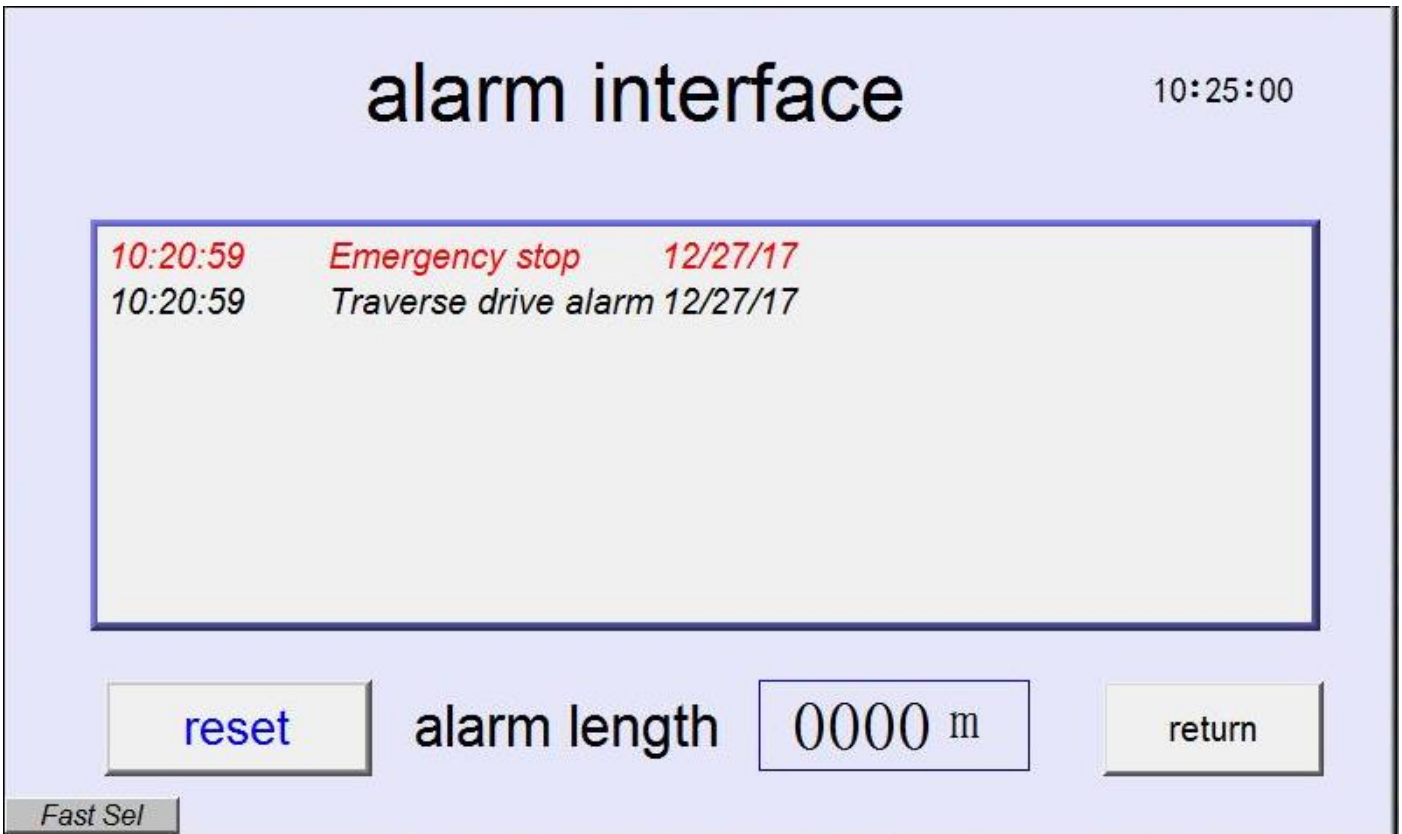
location 0000 mm It displays the location of traverse.
Debugging The English name of this button is Debugging, click this button, then enter the Debugging interface. (Some models of this machine does not have this button, such as if including the accumulator. Only the system controlled with the dancer has this button.)

origin This button is used to find out the position of the absolute zero manually. After long-time running of the take-up, the position of the traverse shall show up an accumulated deviation, which shall lead to the incorrectness of the position of the traverse. So, when the position of the traverse is not correct, press the button, then the machine find the position of the absolute origin automatically.
take-upR outer 0000 mm Take-up R outer refers to the outer of take-up reel R. This is the value relative to the original position of the origin, that is to say, when the cable runs to this position, you need to change the direction.
take-upR within 0000 mm Inside of take-up R refers to the inner end of take-up reel R.
+ − This button is used to fine adjust the position of both ends.
return Press this button to back to the main screen.

The take up L outer and take up L within are same with take up R.

7.4 Operation of alarming interface

When entering into the alarming interface, it shall show the following screen:



7.4 Alarming interface

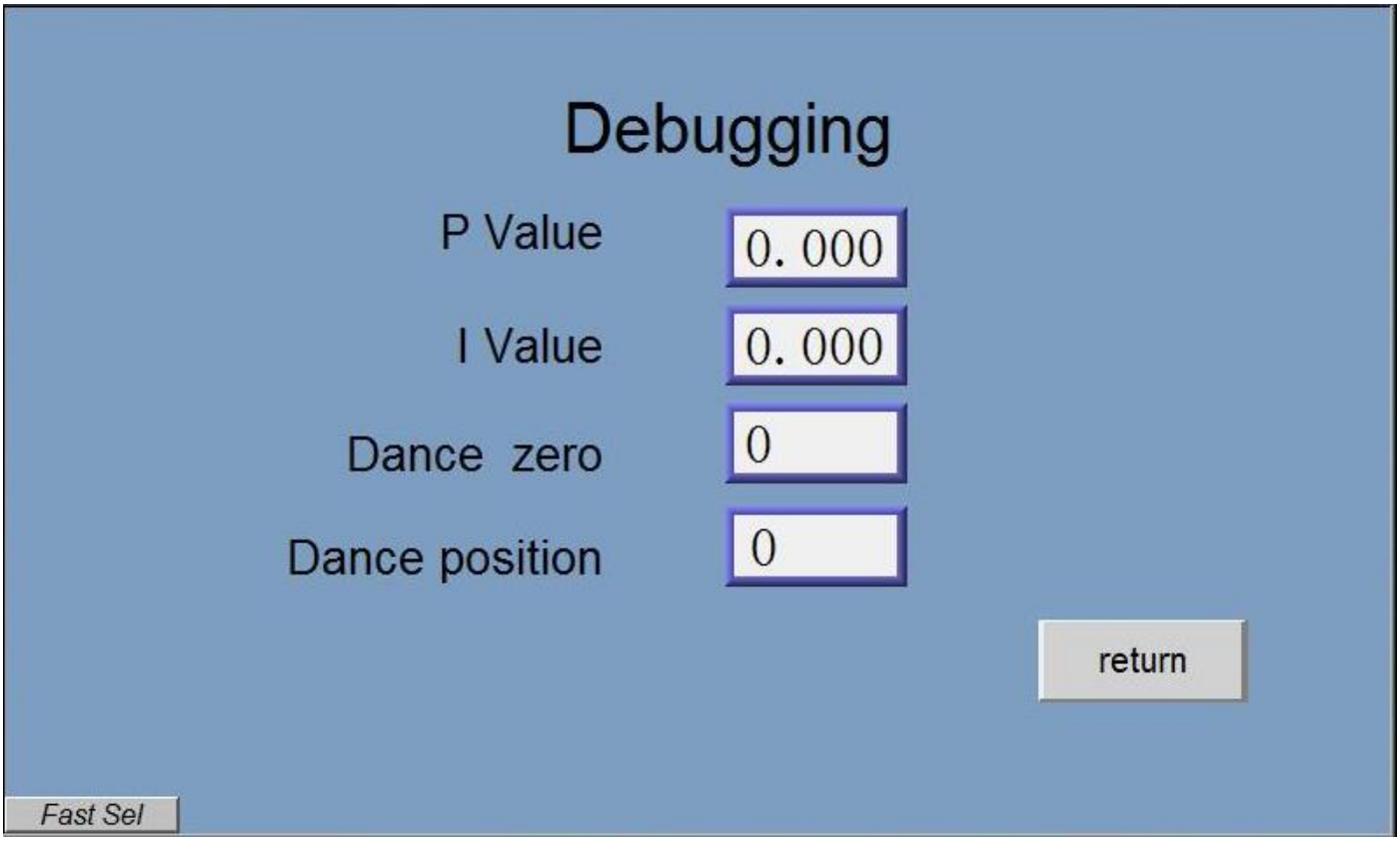
This region is used to show whether there is an alarm. When there is an alarm, it shall show the time, date and the alarming information, etc; when the alarm is removed, the alarming information shall be cleared automatically, but the alarm apparatus is still sending an alarm, now, you must press reset button to remove the alarm .

This parameter is used to set when (how much production length is left) the take-up shall send sound-light alarm, which is used to remind the operator to change for another reel.

This button is used to reset the alarm. When there is alarm, please check the cause of the alarm. Only when removing the alarm and pressing this button,then you can remove the alarm.

Press this button to back to the main screen.

7.5 Operation of maintenance and debugging interface



7.5 Maintenance and debugging interface

(Notes:Some models of this machine does not have this button, such as if including the accumulator. Only the system controlled with the dancer has this button.)

When entering the maintenance and debugging interface, the information shall be displayed as above:

P Value 0. 000 This parameter is used to adjust the P value of the take-up machine in closed loop process; the bigger the value is, the faster the take-up reaction is. If the value is too big, it shall lead to the shake of the dancer, but if the value is too small, the action shall slow down, then there may be situation as below: cable cannot be taken back, or the cable is pulled too high. This value shall be adjusted in accordance with the size of the take-up reel and whether the dancer in the take-up process is stable. The value set is the

decimals between 0 and 1.
I Value 0. 000 This parameter is used to adjust I value of the take-up machine in closed loop process; the bigger the value is, the slower the take-up reaction is. When take-up is not very stable, you can adjust the P value and the I value to make them stable, but the P value and the I value must be adjusted coordinately to achieve the best effect. The value set is the decimals between 0 and 1.
Dance zero 0 The zero position of the dancer is used to set position of the dancer.when the dancer is running,the bigger the value is, the higher the position of the dance is . The value set is the decimals between 0 and 1.
Dance position 0 The position of the dancer is used to show the current position of the dancer. The bigger the value is, the higher the position of the dancer is. This parameter cannot be set.
return Press this button to back to Parameter setup interface.

7.6 Buttons on the operation panel

 **Left receiving/Right receiving:** It is used to switch the take-up reel. When select Left receiving, the take-up left reel rotates, otherwise, take-up right reel rotates. When the

take-up reel is working, this switching button shall not work. Only when the machine is shutdown, this button shall be function.

 **Start/Stop:** It is used to start or stop the take-up reel. The red is stop, green is start.

Single action/linkage: This knob is used to switch from single action to linkage. When switching to single action, the speed of the take-up reel shall be adjusted by the potentiometer on the panel. When switching to linkage, the speed of the take-up reel shall be controlled by the accumulator or dancer, and the speed can be synchronous with the line speed of the main engine.

Reversing: When starting up take-up, press this button to change the direction of the traverse. When the take up machine do not start, this button shall do not work.

Left/Right fast row: It is used to move the position of traverse toward left or right fast.

Starting point: When pressing this button, guide wheel of traverse shall be returned to the outside of the take-up reel automatically. This button shall do not work when starting up take-up.

 **Wire winding speed regulation:** It is used to adjust the speed of take up.
 **Emergency stop:** It can stop line at once when come across unexpected event,and do not press this button normally.
 **Power switch:** It connects the power of take up after open it.

Chapter 8. PRODUCTION OPERATION PROCESS

8.1. Turn on the power switch of the power distribution cabinet;

8.2. Start up the computer until the computer enters into system monitoring system automatically;

8.3. If an error reminder appears for the communication between the PLC and the computer, please quit the monitoring system, and restart the monitoring system after checking and removing the failure;

8.4. If the user needs to choose the production parameters of optical cable this time among commonly-used specifications; once chosen, please do not choose other specifications again during the production, or else, it shall cause unpredictable result; next, the user can enter into automatic operation screen for operation.

8.5. During the heating process of the extruder, clamp well the pay-off reel and adjust the payoff tension.

8.6. Clamp well the take-up reel, check whether the take-up adjustment is on proper position, start up “take-up” button, then rotate take-up reel at low speed, and check whether the axle of the take-up reel is at the same horizontal line.

8.7. After heating,start the extruder,set the screw rotation rate , Extruder discharge material in low speed,set the speed about 5RPM,after the temperature in each area is stable,then increase the speed slowly.and check whether there is anything abnormal, if everything is normal, discharge material is over.

8.8. After discharge material, reset the extruder, start traction and payoff, if there is no alarming, start production;

8.9. Start drying device; pay attention not to splash water drop on the lens of the laser gauge ; the drying device can be started up only when the traction running.

8.10. Confirm the whole production line is running at low speed at the beginning, the screw shall flow the traction to speed up or speed down automatically in accordance with the parameters of the cable diameter set by the user, the user can make proper adjustment in accordance with his needs, until the outer diameter meets the requirement (fine adjusted value is only valid to the startup of the screw , if a certain cable diameter has relatively larger deviation, reset the data in production parameter interface); adjust the regulator potentiometer of payoff and take-up to proper position, let the swing arm guide wheel of the take-up keep in a proper position; during the process of production, pay attention to the position of the take-up and payoff potentiometer at any time, in case of adjustment at any time; after the equipment is running normally and stably, you can choose to run the equipment at regular speed;

8.11. If the motor is running at high speed, please do not shutdown at random. When you need to shutdown the motor, first slow down to below 20M/min, then close traction and extrusion.

8.12. When the production process is over, confirm all parts of the equipment are in shutdown condition, choose Quit button in Normal production interface ,also shut down the computer; close the power switch in the power distribution cabinet.

Chapter 9. NOTICE

9.1. Do not plug in or out the communication plug of the computer at random. Plug-out or the reversing order of the plugs shall cause the incorrect running of the monitoring software;

9.2. Before running the monitoring software of the computer, please make sure the PLC is in running condition, and do not run it after running the monitoring software;

9.3. Please make sure the cleanliness of the lens of the wire diameter detector, and do not splash water drop onto the lens, or else the measurement shall not be accurate;

9.4. Do not delete the software in the computer or alter the set of the computer at random, or else the monitoring software may not running correctly; when shutting down the computer, please shut down the computer as per normal operation steps of the computer, and do not shutdown the power directly without quitting the operation system;

9.5. If preset production parameter has greater deviation with the actual production, please ask the professionals to reset, but not to reset it by yourself;

9.6. Under normal production condition, after click operation button, such as screw, by the mouse, after the computer communicates with the PLC and after the PLC has the action to start up or shut down the extruder, the result of the click produced by the PLC shall be uploaded to the computer to be displayed on the monitoring software, then after communicating twice between the computer and the PLC, the change of the button status lagged slightly, which is normal; if the button status

does not change after a long time, please check whether the communication between the computer and the PLC is normal;

9.7. When clicking the mouse and inputting the data, please pay attention to the hinted input range, in case of false input and re-input;

9.8. When the production is in its normal process, please do not put the mouse arrow on any button, in case of wrong action to cause the shutdown of the motor; because you need to use the mouse too many times to operate, please keep the mouse balls clean;

9.9. When operating, please do not use functional operation buttons, such as startup and shutdown frequently, in case frequent action cause the damage of the controller or the motor;

9.10. When using the take-up or payoff stand, please pay attention to put the knob and the swinging arm guide wheel in proper position; adjust it well and do not touch it.

9.11. If the equipment is not in use for a long time, check whether the driving medium in all transmission parts of the equipment is loose before reproduction, such as the synchronous belt and the chain, if it is loose, adjust the tension device;

9.12. Before startup each time, check the safety situation of the high-speed rotating parts, for example, whether the parts and the screws in each part are loose, if they are loose, tight them in time.

9.13. Before production, check whether each equipment meets the technical requirement.

9.14. Only in emergency situations you can use emergency stop switch to avoid damaging the equipment.

Chapter 10. DAILY MAINTENANCE

- Check if the motors have noise and shake unexpectedly.
- The rotation part should be regularly injected lubricating oil.
- Check if guide wheel rotate normally or not, check if the channel of guide wheel is smooth and cleaned or not.
- Check if wheel of capstan is smooth and cleaned or not.
- Check if the lead screw of traverse is normal or not.
- Check regularly if all screws of equipment is loose or not.
- Regularly inject lubricating oil for lead screw of traverse.
- Keep machine clean.
- Regularly change lubricating oil of gearbox of extruder.

Chapter 11. WARRANTY PERIOD AND INSPECTION

- Warranty period is one year, we maintain for free during guarantee period if the part damaged normally. In case the part is damaged by person or irresistible reason or without warranty period, we aren't responsible for the charge from maintenance.
- Some production fault can be displayed on the industrial computer.
- Please contact us if you can't solve the problem.
- The maintenance should be operated by professional operator.

Chapter 12. COMMON TROUBLES AND TROUBLESHOOTING METHODS

Failure	(Possible) Cause	Troubleshooting
When running the production line, the magnetic powder brake cannot work normally, or even be jammed.	1. Tension controller is destroyed	1. Replace tension controller
Payoff is running abnormally.	1.The position of the dancer (displacement sensor) is incorrect 2. The displacement sensor is destroyed or the thread end has	1. Adjust the position of the displacement sensor 2. Replace displacement sensor

	insufficient soldering 3.The servo controller is abnormal	3. Handle the problem of the controller properly
Production line cannot run normally	1. Emergency stop without reset 2. There is alarming in production line	1.Check whether there is any alarming in production line in alarming interface
Heating system is abnormal	1.The thermocouple has poor contact or the earth wire is not connected well 2.Thermal heater is destroyed	1. Check the joint of the terminal and the earth wire, and handle it well 2. Replace a new thermal relay
Traction is stopped	1. The setup of the controller is incorrect 2. The controller is alarming	1. Correct to the correct setting 2. Find the reason for failure alarming
Metering is incorrect	After removing the mechanical problems: 1. Adjust the metering coefficient 2. The proximity switch destroyed	1. Adjust the metering correction coefficient in the interface 2. Replace a new proximity switch