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Winding Machine

Manual

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This machine can wind enameled wire, alloy wire, stainless steel wire, black gold wire, nylon wire and other wires of different materials. It can realize simultaneous retraction and release, control the tension of the wire, measure meters, and achieve tight wire arrangement.

Reel speed: 0--600 rpm (other speeds can be customized)

Wire arrangement width: 0--170mm

Winding width: Φ60---Φ200mm

Servo motors are used for winding, arranging and releasing wires. The operation interface uses touch screen input, which is intuitive and convenient to input.

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Current product name: Displays the name of the current winding product

Target line speed: Displays the set line speed (click the number to modify)

Penguin balance position: Click + - to modify (fine-tune the tension value)

Starting point: Displays the current product starting position (click outward, inward, can be modified in real time)

Width: Displays the current product line width (click width +, width -, can be modified in real time)

Wire diameter: Displays the current product wire spacing (click increase +, decrease -, can be modified in real time)

Penguin position: Displays the current tension pendulum real-time position value (each time

the power is restarted, the value must be around 0 when the wire is relaxed. If the deviation is too large, be sure to click the pendulum reset button for 3 seconds to reset).

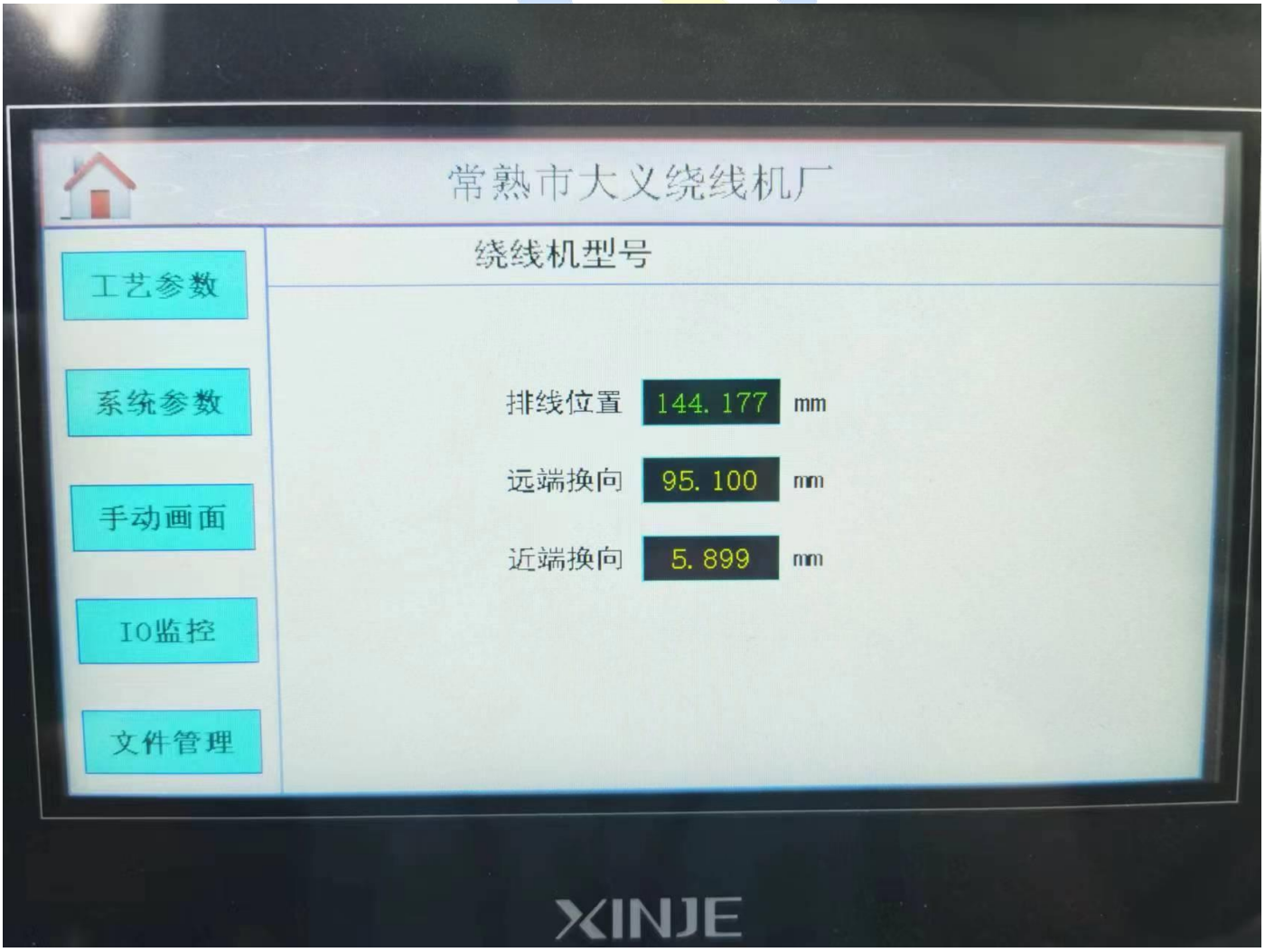
Current meters: Displays the real-time meters of the current product winding. If you want to reset, you can click the meter reset button.

Current line speed: Displays the real-time line speed value of the current take-up shaft

Set meters: Click the number to set the number of meters that the current product needs to be wound in real time.

Diameter of the pay-off reel: Displays the diameter value of the pay-off reel in real time.

Take-up reel diameter: Real-time display of the take-up reel diameter value.



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Internal interface 1:

Process parameters: Click the button to enter the product process parameter setting interface

System parameters: Click the button to enter the system parameter setting interface

Manual interface: Click to enter the manual operation interface

IO monitoring: Click to enter the input and output point monitoring interface

File management: Click to enter the file management interface

Wire position: Display the current wire axis position

Far-end reversing: Display the far-end reversing position of the wire axis

Near-end reversing: Display the near-end reversing position of the wire axis

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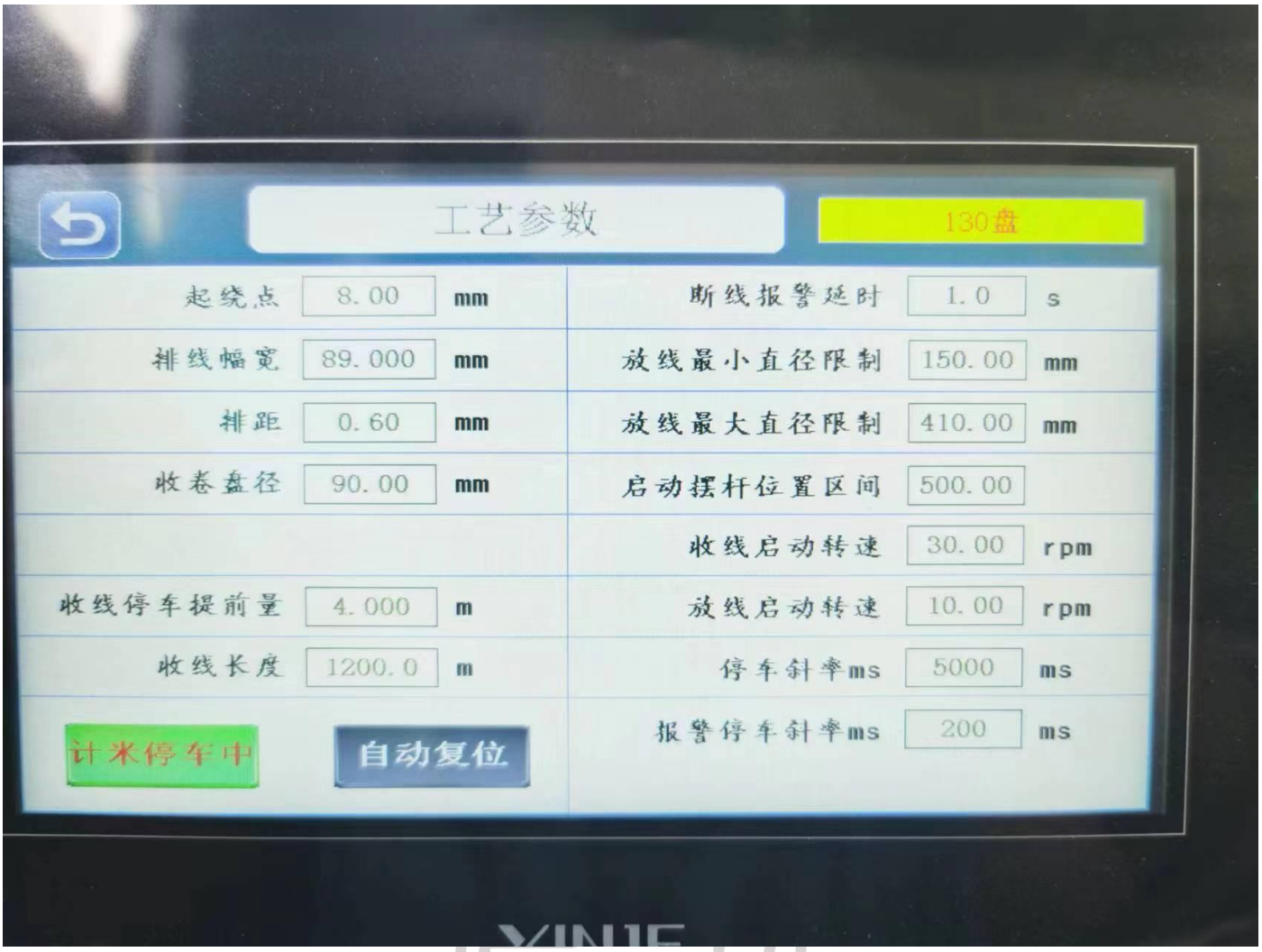

Process parameter interface: (all values can be modified by clicking on the numbers)

Starting point: starting position of wire arrangement
Wire arrangement width: wire arrangement width
Range spacing: wire arrangement spacing
Reel diameter: input of initial diameter of reel
Reel stop advance: advance deceleration value of reel motor
Reel length: set the number of meters required for winding of the current product
Wire break alarm delay: the time from meter wheel stop to alarm stop
Minimum diameter limit of wire release: minimum diameter limit of reel
Maximum diameter limit of wire release: maximum diameter limit of reel
Starting swing lever position: when the tension swing lever turns to this value, the wire release motor starts (the tension value should be close to 0 when the tension swing lever is not hanging the wire)
Reel-in start speed: The speed value when the reel-in shaft starts
Reel-out start speed: The speed value when the reel-in shaft starts
Parking slope: the buffer slope of the take-up motor when it stops. If the pay-off motor stops while the take-up motor is still rotating, the wire will break and the slope data should be reduced. If the take-up motor stops while the pay-off motor is still rotating, the wire will become loose and the slope data should be increased. This data should be fine-tuned according to different reel diameters and recorded and saved

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after the test is completed.
Alarm stop slope: The stop buffer slope when disconnection alarm occurs.

Meter counting and stopping: When the button is clicked and it turns green, the winding machine will automatically stop when it reaches the set number of meters.

When the button is clicked and it is gray, the winding machine will not stop at the set number of meters, and will only stop when the stop button is pressed manually.

Automatic reset: When the button is green, the winding machine stops automatically after reaching the set number of meters, and the winding shaft automatically moves to the starting point and then waits.

When the button is clicked and displayed in gray, the winding machine automatically stops after reaching the set number of meters, and the wire arrangement shaft stops at the current end point and waits. If you want the wire arrangement shaft to return to the starting point, you need to manually click the external reset button.

System parameters: (all values can be modified by clicking on the numbers)

Fine-tuning amount of winding point: the value adjusted each time the (outward) or (inward) button is

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clicked when adjusting the position of the winding point
Fine-tuning amount of width: the value adjusted each time the (width +) or (width -) button is clicked when adjusting the product winding width
Fine-tuning amount of wire diameter: the value adjusted each time the (increase +) or (decrease -) button is clicked when adjusting the product winding spacing
Reeling speed: the speed of the reeling motor per minute when the reeling button is clicked during manual operation,
Reeling speed: the speed of the reeling motor per minute when the reeling button is clicked during manual operation,
Arranging displacement speed: the distance the arranging motor moves per second when it is displaced,
Wire traversing inching speed: the distance the traversing motor moves per second when the traversing moving button is clicked during manual operation,
Wire traversing fast reset speed: the fastest moving distance per second when the traversing motor is reset,
Wire traversing slow reset speed: the slowest moving distance per second when the traversing motor is reset,
Wire traversing shaft speed ratio: the speed ratio of the traversing motor and the ball screw,
Wire traversing pulses per revolution: the traversing motor servo driver P0-11 sets the pulse number, and P0-12 is set to 0,
Wire traversing shaft pitch: the traversing ball screw pitch,
Number of flying pulses: system internal parameters, default is 2000, no need to modify.
Maximum follow frequency limit: system parameters, default is 100000, no need to modify.
Cable gain: system parameters, default is 200, no need to modify.
Note: The above three parameters are based on the situation that the number of pulses per circle of the cable servo is 1000.
Cable commutation width: system parameter, default is 0mm, no need to modify.
Spindle error pulse limit: system parameter, default is 200. When the line sequence of the encoder is incorrect, for example, if -200 pulses are received, the system will alarm. At this time, you need to change the wiring sequence of the encoder。

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Meter wheel diameter: The bottom diameter of the roller on which the meter encoder is installed (set according to the bottom diameter of the meter wheel installed).

Number of pulses per revolution of meter wheel: number of lines of meter encoder,

Speed ratio of pay-off shaft: speed ratio of pay-off motor and pay-off shaft,

Number of pulses per revolution of pay-off shaft: set pulse number in P0-11 of pay-off motor servo driver, set P0-12 to 0,

Speed ratio of take-up shaft: speed ratio of take-up motor and take-up shaft,

Number of pulses per revolution of take-up shaft: set pulse number in P0-11 of take-up motor servo driver, set P0-12 to 0,

Wire arrangement mirror image: set 〖0〗 to arrange wire from left to right, set 〖1〗 to

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arrange wire from right to left,

Pole PID: click button to enter tension pole value setting,

Simulation operation off: select off during normal operation, if you do not want to hang wire test, you can click simulation operation on, in on state, wire break alarm function is canceled,

Wire arrangement minimum limit: left limit value of wire arrangement shaft (alarm and shutdown will be triggered if this value is exceeded)

Wire arrangement maximum limit: right limit value of wire arrangement shaft (alarm and shutdown will be triggered if this value is exceeded)

Click→enter the next interface, click←enter the previous interface, and click つ return the maininterface

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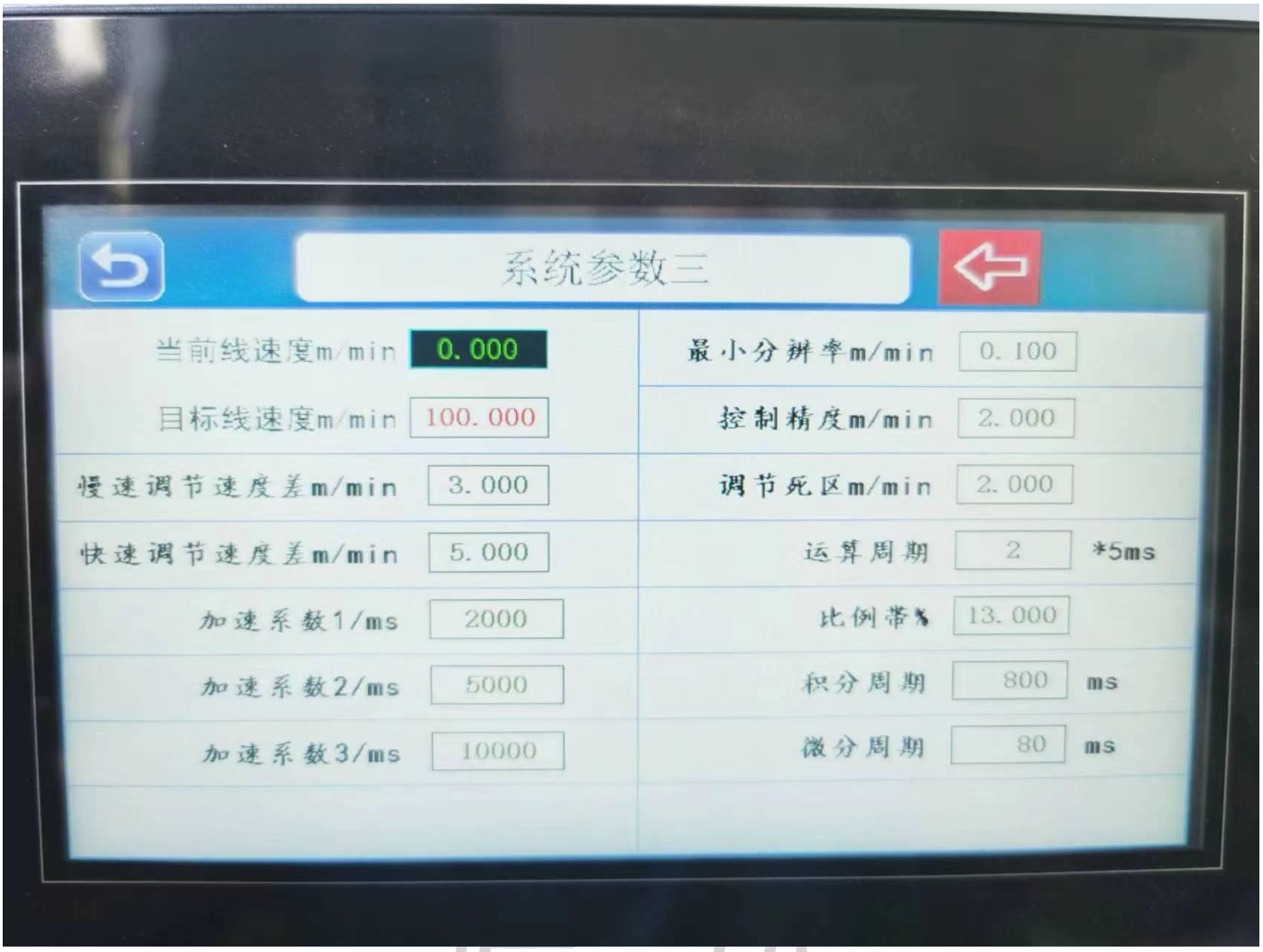

System Parameter 3:
Current Line Speed: Displays the real-time line speed value of the current take-up shaft per minute,
Target Line Speed: Displays the target line speed value when the current product is wound,
Slow speed adjustment speed difference: When the difference between the current line speed and the target line speed enters this range, the line speed adjustment will be slow to prevent overshoot of speed adjustment. The default difference is 2m/min.
Fast speed adjustment speed difference: When the difference between the current line speed and the target line speed is large, the line speed adjustment will be very fast, so that the desired speed can be reached quickly. The default difference is 10m/min.
Acceleration coefficient 1: Indicates the speed of acceleration, in ms. The smaller the value, the faster the acceleration.
Acceleration coefficient 2: Indicates the speed of acceleration, in ms. The smaller the value, the faster the acceleration.
Acceleration coefficient 3: Indicates the speed of acceleration, in ms. The smaller the value, the faster the acceleration.

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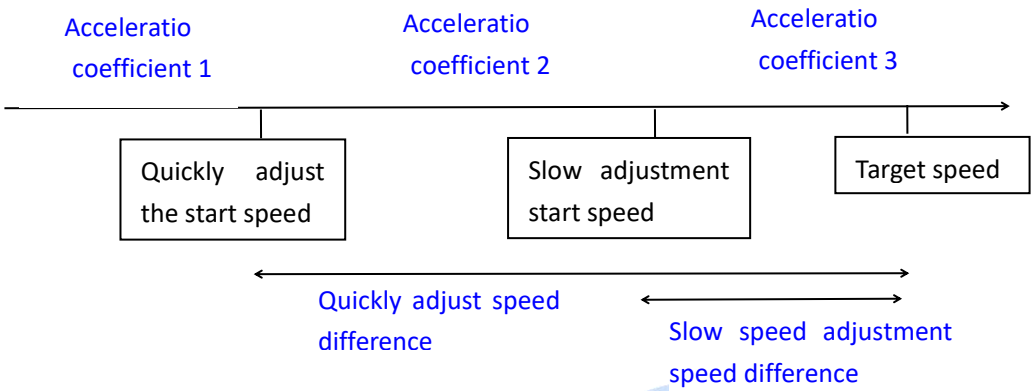

Minimum resolution: the minimum accuracy of linear speed measurement. The default is 0.1m/min
Control accuracy: the linear speed accuracy that the system can theoretically control, the default is 1m/min. If this value is set slightly larger, the control frequency can be reduced, but the control accuracy will decrease.

Dead zone: When the current line speed is within the range of "target line speed ± dead zone", the system does not adjust. The default is 2m/min.

Operation cycle: The period of system acquisition and calculation, in units of 5ms. The default is 2, which means the calculation period is 10ms.

Proportional band: PID related parameter, proportional gain, the larger the value, the faster the adjustment. If the value is too large, the system will have the risk of overshoot oscillation. Adjustment range 1~17, default 10.

Integral cycle: PID related parameter, used to control steady-state error, default 500ms. The larger the value, the weaker the effect; the smaller the value, the stronger the effect. This parameter should not be set too small, otherwise it is easy to cause overshoot and oscillation.

Differential cycle: PID related parameter, used to suppress interference caused by sudden changes in encoder signals, setting range 0~10ms, default 0.

Click←Enter the previous interface and click ⊃ Return to the main interface,

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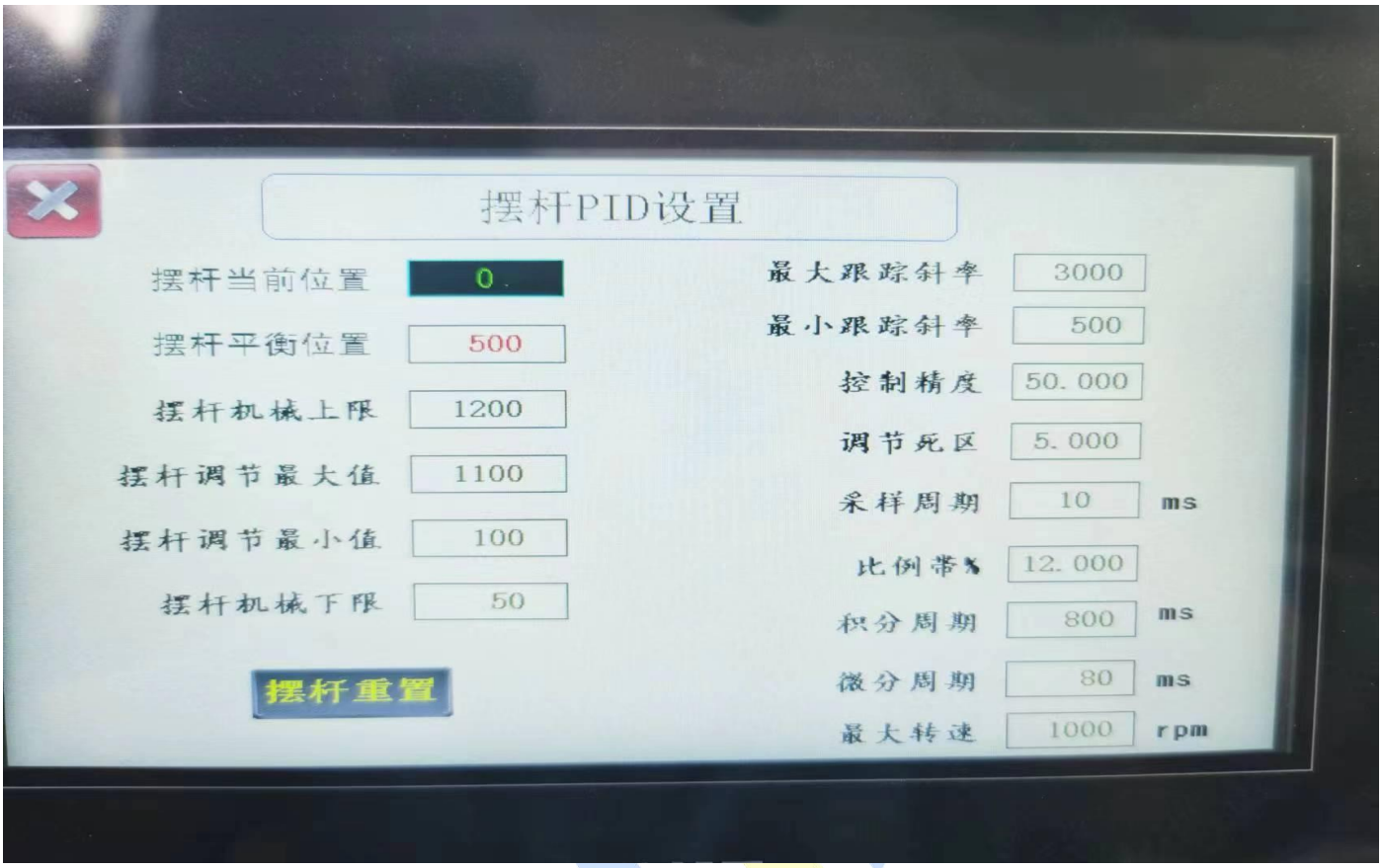


PID settings for the pendulum:
Current position of the pendulum: displays the current real-time value of the tension pendulum,
Balance position of the pendulum: displays the value that the tension pendulum needs to be set to,
Mechanical upper limit of the pendulum: displays the value when the tension pendulum reaches the mechanical upper limit,
Maximum value of pendulum adjustment: displays the maximum value set for the tension pendulum,
Minimum value of pendulum adjustment: displays the minimum value set for the tension pendulum,
Mechanical lower limit of the pendulum: displays the value when the tension pendulum reaches the mechanical lower limit,
Pendulum reset button: click for more than 2 seconds to clear the current value of the pendulum,
Encoder resolution: Tension pendulum encoder resolution，

Control accuracy:
Adjustment dead zone: When the pendulum slightly shakes up and down at the balance position, the system can automatically filter to prevent signal interference. The reel will not make adjustments in this range.

Sampling period: PID data calculation and adjustment period, unit ms.

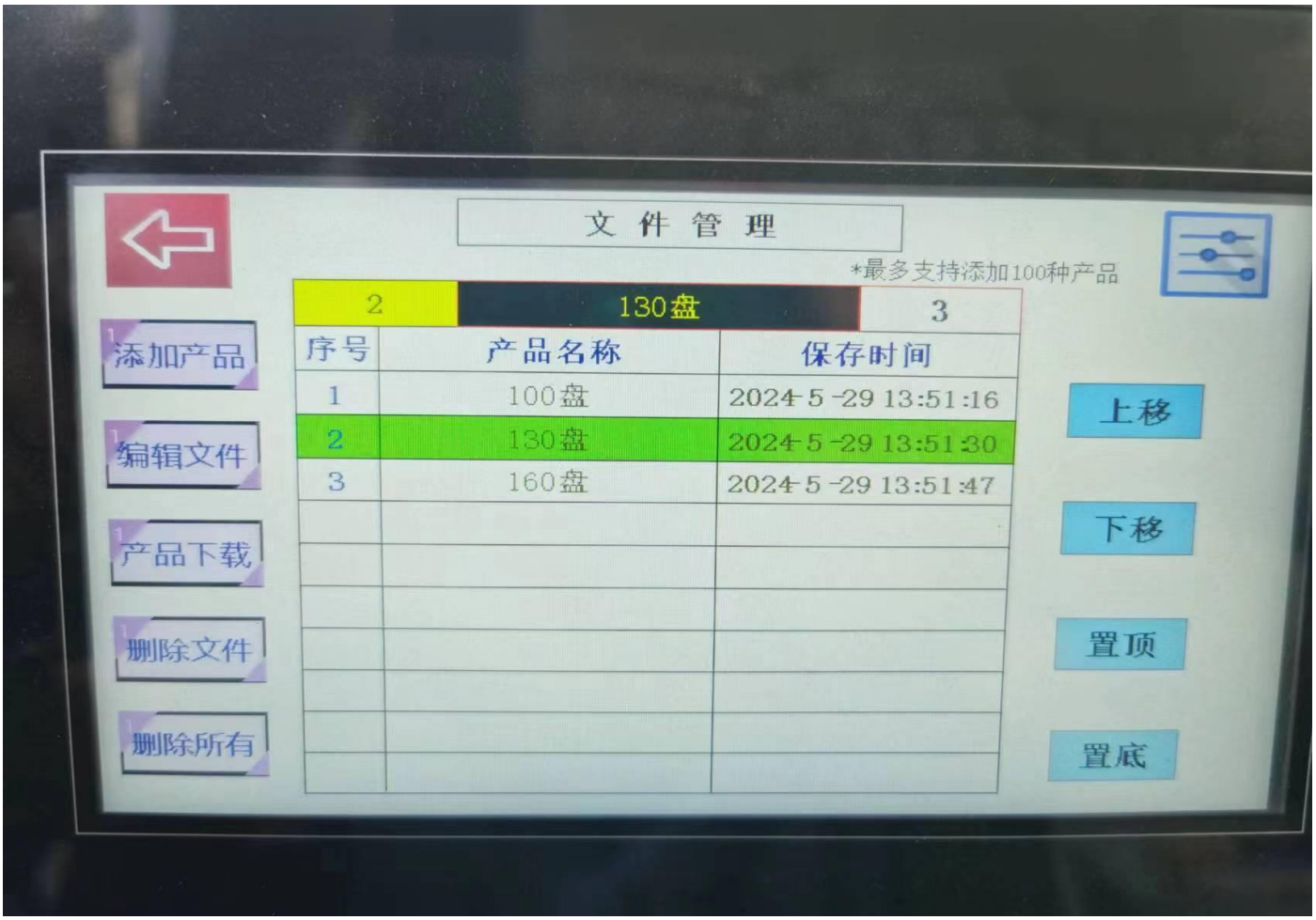
Proportional band: PID related parameters, proportional gain, the larger the value, the faster the adjustment. If the value is too large, the system will have the risk of overshoot oscillation. Adjustment range 1~17, default 10.

Integral period: PID related parameter, used to control steady-state error, the default is 500ms. The larger

the value, the weaker the effect; the smaller the value, the stronger the effect. This parameter should not be set too small, otherwise it will easily cause overshoot and oscillation.

Differential period: PID related parameter, used to suppress the interference caused by sudden changes in encoder signals. The setting range is 0~10ms, and the default is 0.

Maximum speed limit: the maximum range of winding shaft speed adjustment.



File management:

Click to add product: Enter password 123, enter product adding interface, enter product name, click to confirm,

Product download: Click this button to download the product displayed by the cursor bar,

Edit formula: Click this button to edit the formula data of the product displayed by the current cursor bar,

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Delete file: Click this button to delete the product displayed by the current cursor bar,

Delete all: Click this button to delete all products, operate with caution!!!

Move up: Click this button to move the cursor bar up one grid,

Move down: Click this button to move the cursor bar down one grid,

Pin to top: When adding a product, click this button to pin the current product to the top,

Pin to bottom: When adding a product, click this button to pin the current product to the bottom,

Click←Enter the previous interface and click≡Button to enter the process product data configuration interface,

Process product data configuration:

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Recipe data storage address:

1: Start address: HD510---Number = 60----End address HD559

Move up: Click this button, the cursor bar moves up one grid,

Move down: Click this button, the cursor bar moves down one grid,

Delete file: Click this button to delete the product currently displayed by the cursor bar,

Delete All: Click this button to delete all products. Please operate with caution!!!

Click←Go to the previous interface,

Enter the manual screen: click the left or right button to adjust the position of the arranging axis,

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click the release button and recycle button to rotate the release axis,

click the reel button to rotate the winding axis.

Button arrangement from left to right: emergency stop switch----reset button-----stop button----startbutton

On the left is the main power switch.

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On the right is the fine-tuning button for the position of the cable shaft: when the left and right ends are uneven during the winding process, you can press the outward or inward button to correct it. When the right side is higher than the left side, click the outward button. When the left side is higher than the right side, click the inward button. Each press moves 0.1mm (the amount of movement can be set in the system parameters).