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Spraying Process

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Catalogue

Spraying process

> ## Robot Control System Operation Manual - Spraying Process

Digital setting

Turn on the controller, enter the "Process" interface, select "**Spraying process**" - "**Digital setting**" interface, click the "Modify" button to modify it, and click "Save" after modification. (As shown below)

After clicking "Modify", the "Modify" button changes to "Save", and the selection box turns white. At this time, you can select the gun number, and select the port, effective value and color number after the respective functions. Please use the 16-bit RGB format for the color number. After filling in the color number, the corresponding "Color oil circuit" box will change to the corresponding color.

Analog setting

Select the group number you want to modify, and click the "Modify" button to modify the analog group number and fill in the notes. A total of 99 groups of sequence and their corresponding notes can be set, each group of sequence includes flow analog, sector analog and atomization analog, here is only for modification, you need to use the corresponding instruction to call the corresponding group number, and click "Save" after modification. (As shown below)
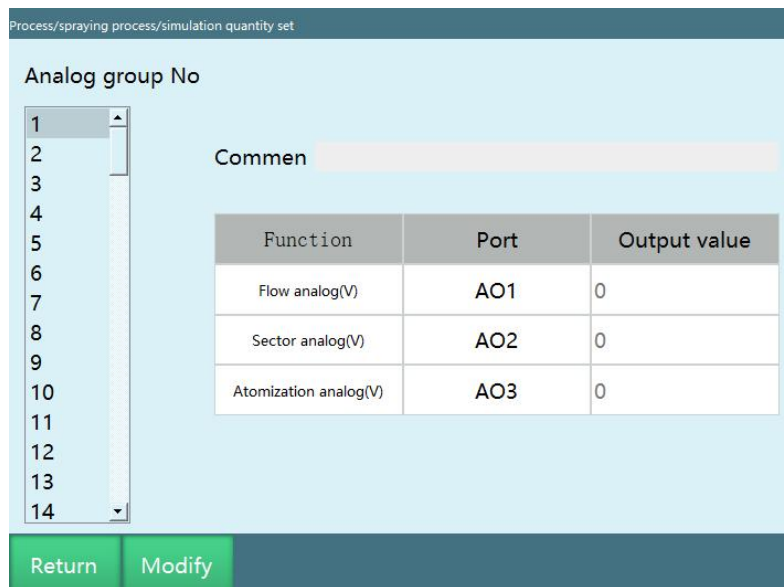
Sequence

Select the group number you want to modify, and click the "Modify" button to modify the sequence group number. A total of 99 groups of sequence can be set. Each group of sequence includes firing sequence and refueling sequence, here is only for modification, you need to use the corresponding instruction to call the corresponding group number, and click "Save" after modification. (As shown below)

Firing sequence

This is the firing sequence, and the time to be set for each signal on the left corresponds to the sequence diagram on the right. The flow, sector, and atomization signals correspond to the ports set in the digital setting, and the oil circuit signals correspond to the ports set in the digital settings for the current color. (As shown below)

Example: (The example is only for illustration, please set according to the actual needs) Set the fire signal 1-1, sector signal 1-3, atomization signal 1-4, color oil circuit 1-5 on the IO board. The spraying time is 10s (that is, the firing time is 10s), t1=1, t2=1, t3=3, t4=3, t5=2, t6=2, t7=4, t8=4.

After spraying starts:

0s fire signal 1-1 output is 1	After 10s, fire signal 1-1 output is 0
After 1s, atomization signal 1-4 output is 1	After 11s, atomization signal 1-4 output is 0
After 2s, sector signal 1-3 output is 1	After 12s, sector signal 1-3 output is 0
After 3s, flow signal 1-2 output is 1	After 13s, flow signal 1-2 output is 0
After 4s, color oil circuit 1-5 output is 1	After 14s, color oil circuit 1-5 output is 0

Gun on (io 1-1 set to 1)   Sector (io 1-3 set to 1)   Atomization end (io 1-4 set to 0)   Flow off (io 1-2 set to 0)
Oil circuit access (io 1-5 set to 1)

1s 2s 3s 4s 10s 11s 12s 13s 14s 15s

Atomization (io 1-4 set to 1)   Flow adjustment (io 1-2 set to 1)   Gun off (io 1-1 set to 0)   Sector end (io 1-3 set to 0)   Oil circuit access (io 1-5 set to 0)

Refueling sequence

Process/spray process/sequence

Group
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Firing sequence   Refueling sequence

Step	Definition	Time(s)
1	Flow sign...	0
2	Flow sign...	0
3	Sector sig...	0
4	Sector sig...	0
5	Fog signal...	0
6	Fog signal...	0
7	Oil circuit ...	0
8	Oil circuit ...	0

open signal
flow signal   t1   t2
sector signal   t3   t4
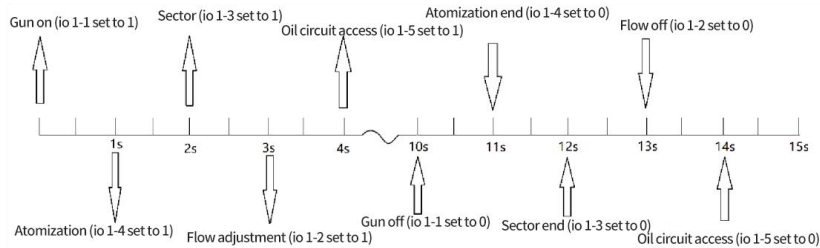atomization signal   t5   t6
oil way signal   t7   t8

Return   Modify

This is the refueling sequence, and the time to be set for each signal on the left corresponds to the sequence diagram on the right. The air purge, clean solvent, and fire signals correspond to the ports set in the digital setting. (As shown below)

Example: (The example is for illustration only, please set according to actual needs) Set gun signal 1-1, flow signal 1-2, air purge 1-3, clean solvent 1-4, color oil circuit 1-5 on the IO board. The firing time is 10s, t1=1, t2=3, t3=1, t4=4, t5=1, t6=3, t7=4.

Refueling process:

0s fire signal 1-1 output is 1	9s air purge 1-3 output is 1	13s fire signal 1-1 output is 1
0s flow signal 1-2 output is 1	10s air purge 1-3 output is 0	13s flow signal 1-2 output is 1
0s air purge 1-3 output is 1	10s fire signal 1-1 output is 0	13s oil circuit signal 1-5 output is 1
1s air purge 1-3 output is 0	10s flow signal 1-2 output is 0	17s fire signal 1-1 output is 0
4s clean solvent 1-4 output is 1		17s flow signal 1-2 output is 0
5s clean solvent 1-4 output is 0		17s oil circuit signal 1-5 output is 0
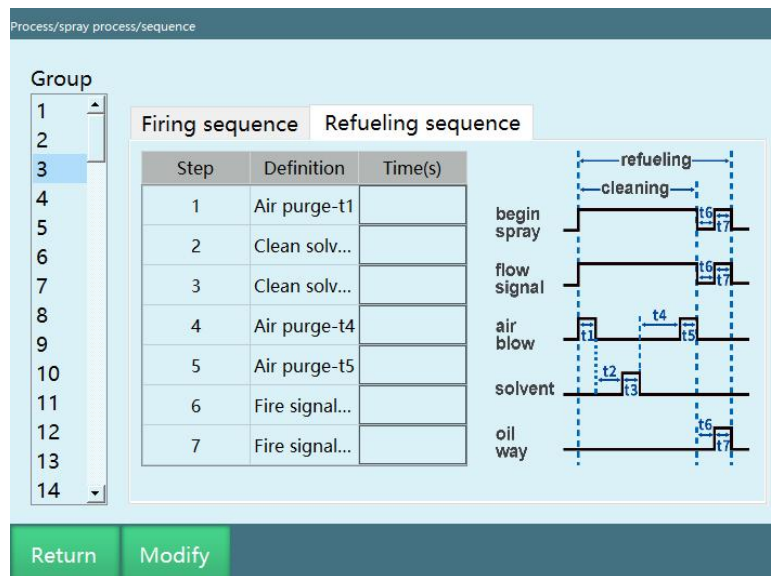
Track parameters

A total of 99 track group numbers can be set. Each **track group number includes track type, track kind, number of spray layers, additional times, and**

mark points. Click the "Modify" button to modify it, and click "Save" after modification. (As shown below)
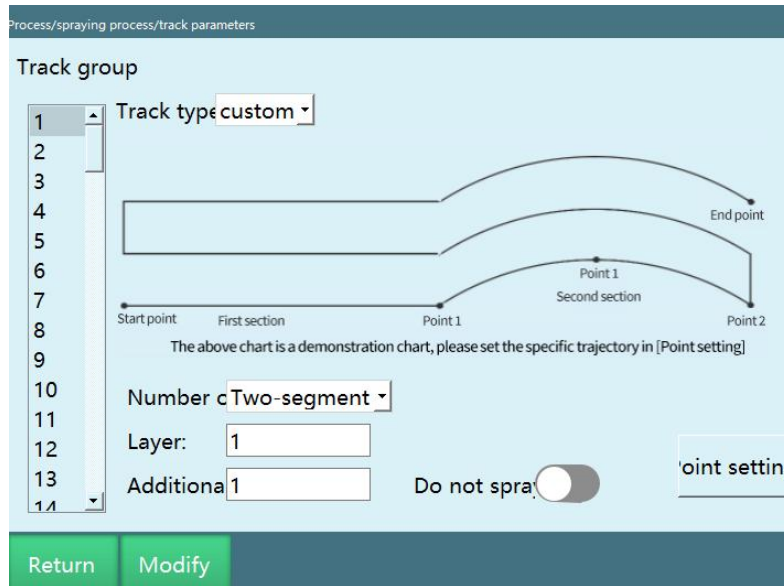

- Spraying type: divided into three types: flat, solid and custom, you can set it according to your needs.

- Spraying kind: four kinds of flat spraying and two kinds of solid spraying, you can set it according to your needs.

- Number of layers: The number enclosed in the red box in the picture below is the number of layers. Fill in the number and the corresponding number of layers will be sprayed.

- Additional times: Additional spraying times per layer, for example, if "Additional times" is set to 3, then spray each layer back and forth 4 times before entering the next layer.

- Mark points: The mark points correspond to the point on the right side of the graph. The first/second kind of flat type needs to mark three points, the third/fourth kind of flat type and the first/second kind of solid type need to mark four points.

Example: (The example is only for illustration, please set according to actual needs) Set the number of layers to 1, the additional times to 0, then the spray gun will spray from point A to point B;

Set the number of layers to 1, additional times to 1, then the spray gun will spray from point A to point B and then spray back to point A;
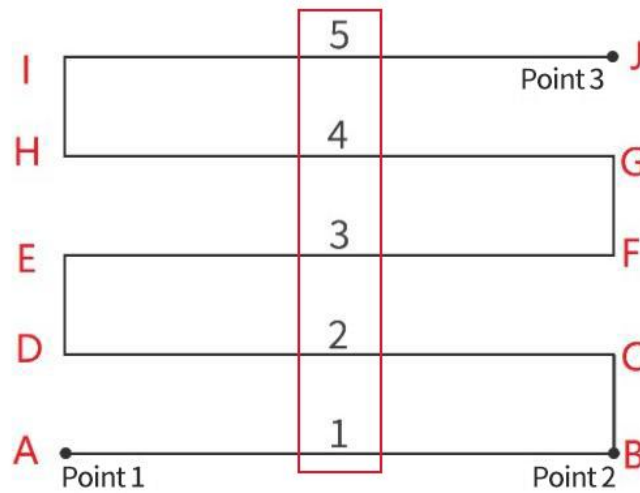
Set the number of layers to 2, additional times to 1, then the spray gun will operate in the sequence of points A → B → A → D → C → D;

Set the number of layers to 3, additional times to 2, then the spray gun will operate in the sequence of points A→B→A→B→C→D→C→D→E→F→E→F.

Manual operation

In the "Manual operation" interface, you can choose the spray gun number and sequence group number to be used, and click the corresponding color at the "Color switch" part to change the current color (the corresponding IO port will be set according to the sequence-refueling sequence). (As shown below)
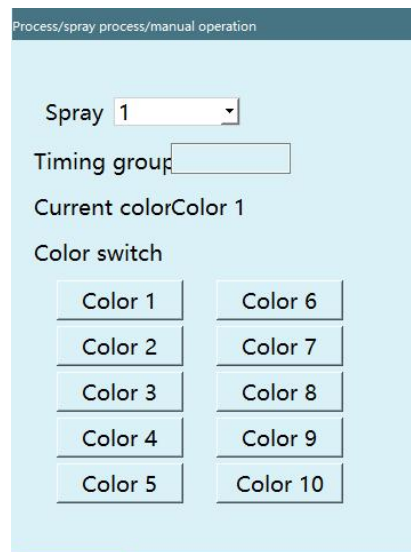
When the value of the "Analog group number" input box is 0, the button "Modify analog" is valid and can be clicked and manually modified. When it is not 0, the button "Modify analog" in the spray paint, aspirate, and oil test is invalid and grayed out. The corresponding three values become the values in the input analog group number. The analogs in the spray paint, aspirate, and oil test all use the 3 analogs set in the spray paint.

(As shown below)

The "Test" button of the oil test is OFF by default. After setting the test time, press it to perform the oil test for the corresponding time. At this time, the io port of the oil circuit of the current color will become a valid value. (As shown below)
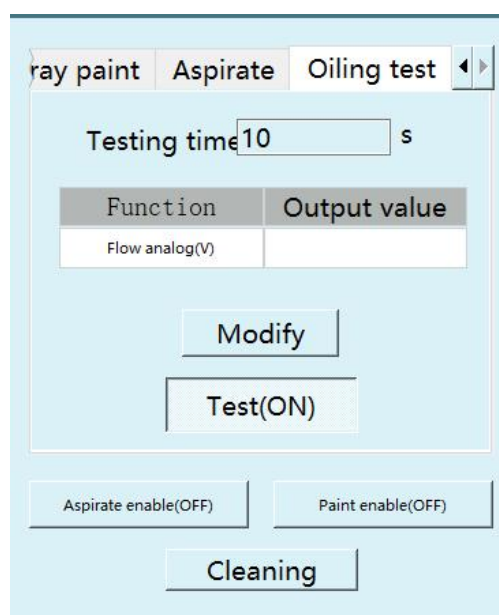
"**Aspirate enable**" and "**Paint enable**" are OFF by default, and they will switch to ON when pressed. (As shown below)

Press "**Aspirate enable"**, the IO port corresponding to "Digital setting - Air purge" will become a valid value; press "**Paint enable**", the corresponding IO port will be set according to the sequence-firing sequence; press "**Cleaning**"

*"Color switch", "Aspirate enable", "Paint enable", "Cleaning", and "Oil test" are interlocked, and only one function can be used at the same time. For example: if you press "**Cleaning**" when the "**Paint enable**" is ON, it will stop painting immediately for cleaning.

> Spraying instructions

SPRAY_ON - Spraying start

The instruction to identify the start of spraying, run this instruction to start the spraying process.

Function: spraying process start

Gun: Gun 1-2

Sequence group number: fill in the sequence group number

Analog group number: fill in the analog group number

Flow analog, sector analog, atomization analog: modify when the analog group number is 0

Example: SPRAY_ON G=1 T=1 AO=1

SPRAY_OFF - Spraying end

The instruction to identify the end of spraying, run this instruction to end the spraying process

Function: spraying process end

Gun: Gun 1-2

Example: SPRAY_OFF G=1

SPRAY_CHANGE - Spray color change

The instruction to change the spray gun color, run this instruction to make the corresponding spray gun change the corresponding color according to the instruction parameters

Function: change color

Gun: Gun 1-2

Sequence group number: sequence group number 1-99

Color: gun color number 1-10

Example: SPRAY_CHANGE G=1 T=2 COLOR=1

SPRAY_MOVE - Spraying track

Spraying action instruction, spray according to the set track group number, speed, pl and acceleration

Function: Make the robot move according to the spraying track

Track group number: track group number 1-99

Spraying speed: 2-9999mm/s

Spraying PL: position level 0-5

Spraying acceleration: 1-100%

Spraying deceleration: 1-100%

Example: SPRAY_MOVE ID=1 V=10mm/s PL=0 ACC=1 DEC=1

SPRAY_POSE - Spray start position

Change the attitude at the start of spraying. If this instruction is not used, the spray gun will start spraying according to the attitude of the first point during calibration.

Function: switch robot attitude

Track group number: track group number 1-99

Point status: Absolute mark point/Attitude only

Speed: attitude changing speed

Acceleration: attitude changing acceleration

Deceleration: attitude changing deceleration

TIME: early execution time

Example: SPRAY_POSE ID=2 V=40mm/s ACC=4 DEC=4

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Website

YouTube

Official Website: http://ligentrobot.com
E-Mail: info@sotrobot.com
whatsapp:+86-13551010933

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