



LTS-3DPA24XXX-XM Controller specification

Explanation:

Thank you for purchasing the products from LOTS Automation Technology Co., Ltd. In order to ensure the normal use of the product, please read this specification before use, and keep it for your future reference.

LTS-3DPA24XXX-XM specification is suitable for all 3DPA24 series controllers. For specific controller models, please refer to Table 1.1 LTS-3DPA24XX-XM controller model and specification list.

1.Product presentation

1.1 LTS-3DPA24XXX-XM List of controller models and specifications.

Model	LTS-3DPA2460-2M	LTS-3DPA24120-2M	LTS-3DPA24200-2M
Number of channels	2 CH		
Baud rate	9600bps		
Output voltage	80-264VAC		
Power input frequency range	47/63Hz		
Luminance regulation method	Manual encoder knob adjustment, PC remote adjustment		
Luminance adjustment	Constant current		
Luminance level	256 level	999 level	
Save function	The parameters are automatically saved when the power off		
External trigger voltage	Pulse width trigger, High level 5-24V effective		
External trigger frequency	It is determined by the mode of external trigger signal. If the duty ratio of external trigger signal is 50%, the maximum external effective trigger frequency is 10KHz(Above 1KHz, the current decreases by 2% on average for every 500Hz increase)		
External trigger response time	10us		
Product protection function	Overcurrent protection, short circuit protection, temperature protection		
Communication mode	RS232/LAN		
Fan power output	24V(≤2A)		



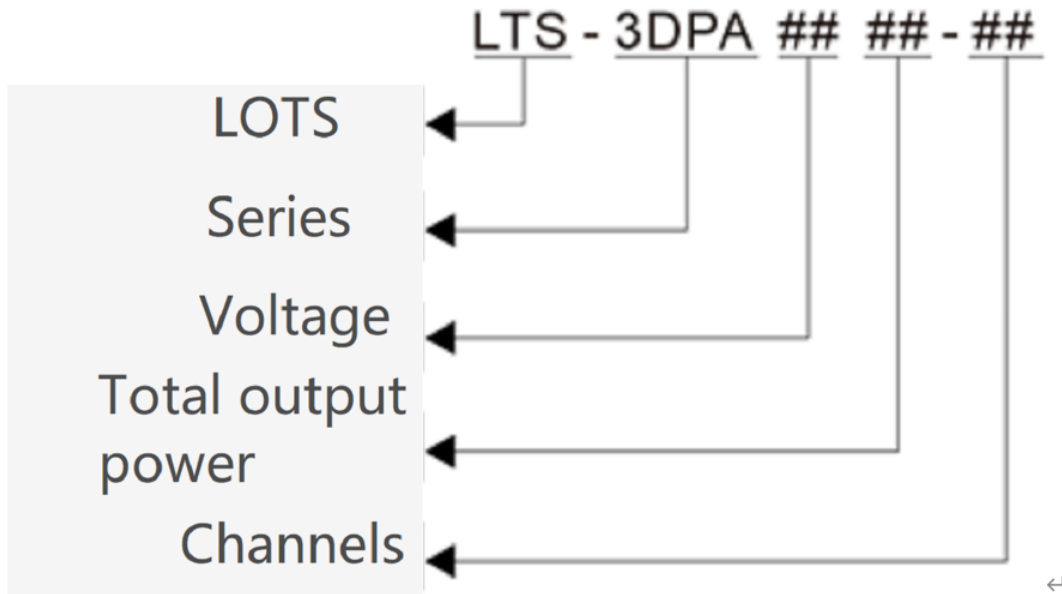
Operating environment	Humidity 20%-85%RH(Frost free state) Temperature 0°C-50°C
Storage environment	Humidity 20%-85%RH(Frost free state) Temperature 0°C-60°C
Normal on/Normal closed mode switch	Switch by toggle switch TS

1.1 LTS-3DPC24XXX-XM List of controller models and specifications

1.2 LTS-3DPA24XXX-XM introduction to the control function

- Luminance can be adjusted manually or by software.
- Flexible, each channel is individually adjustable.
- Simple operation, intuitive display, 4 - bit digital tube clearly displays the current channel Luminance level.
- External trigger, flexible control, quick response.
- The set brightness parameters are automatically saved after power failure.
- Can communicate with PC through serial port or network port.
- High constant current accuracy, ensure the consistency of illumination when the light source is working, extend the service life of the light source.
- **Special reminder: the customers must shut down the controller each time before replacing the light and turn it on after replacing the lights. If replacing the light without turning the controller off, the intensity adjustment of new light may be abnormal. (At this time, the controller still outputs the current according to the light before the replacement, which is not the current of the new light, so the output of the new light is a non-ideal curve) If this phenomenon occurs, shut down and start again**
- **Note: when changing the light each time, it is necessary to shut down and connect the light before starting up again!**

1.3 LTS-3DPA24XXX-XM model selection guide



1.4 LTS-3DPA24XXX-XM controller output power meter

Type	Model	Output adjustable current	Total output power	Number of channels
LTS-3DPA24 series high power constant current controller	LTS-3DPA2460-2M	60W	60W	2
	LTS-3DPA24120-2M	120W	120W	2
	LTS-3DPA24200-2M	200W	120W	2

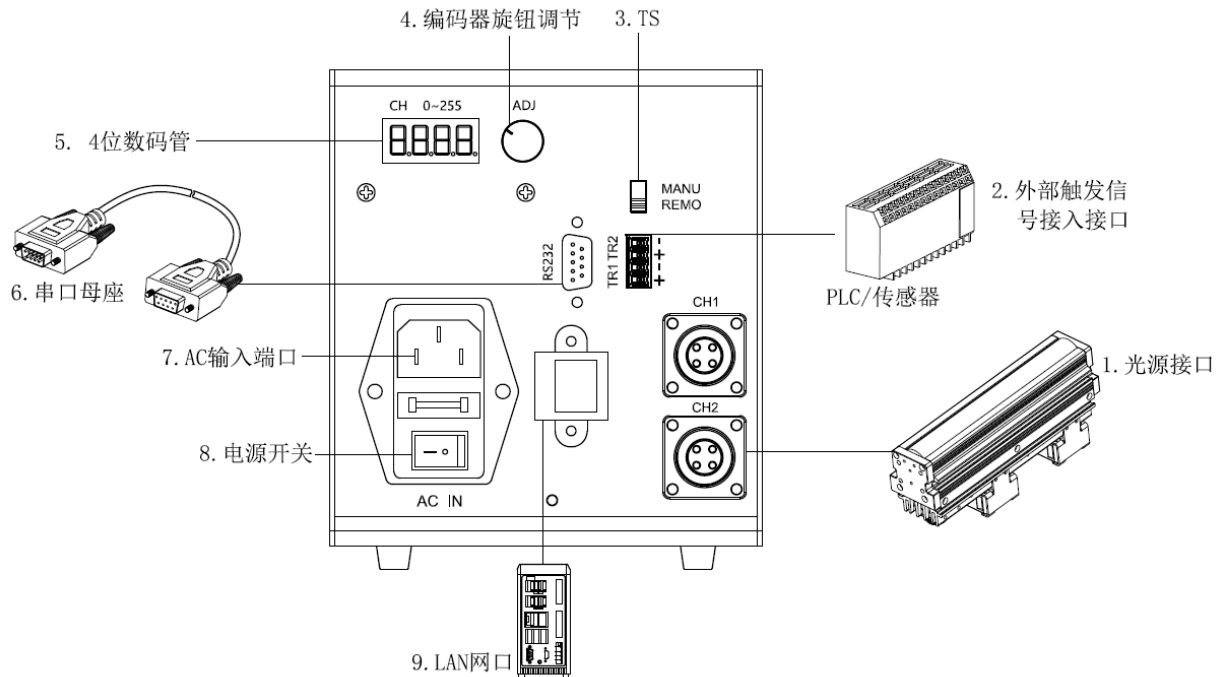
1.5 Shipping list (standard)

- Controller 1 set
- 1.8 meters power supply cable 1 pcs
- 1.5 meters serial cable 1 pcs
- External wiring trigger terminals 1 set

2. Instructions

2.1 LTS-3DPA24XXX-XM panel description

Declaration, this panel description takes LTS-3DPA24200-2S as an example, the operation panel of other controllers is similar.


Picture 2.1 LTS-3DPA24200-2S

No.	Interface	Specifications
1	Light interface	2 way output, each can be controlled independently
2	Trigger interface	Connect external trigger signal to do the frequency trigger working, high level 5-24V effective.
3	TS	Output initial state option switch, move TS up, output open; move TS down, output off
4	Encoder knob adjustment	Adjust the channel, the brightness level of the channel output, press the knob for a short time, adjust the channel value and H value, rotate the knob forward or backward to adjust the brightness level, hold down the knob for 3 seconds to lock the adjustment, and then hold down for 3 seconds to release the lock
5	4 digital tube display	First from left display the channel, other 3 digital tube display the intensity grade
6	RS232 serial port	The controller can be connected with PC through RS232 serial port
7	AC input interface	Input 80-264VAC 47/63Hz
8	Power switch	Power on/off the controller
9	LAN port	Connect the controller and PC by LAN for remote control

2.2 LTS-3DPA24XXX-XM connection steps

Step 1: Connect the light to the controller (refer to picture 2.1)

Step 2: If external trigger control is required, connect the external trigger signal to the trigger port.



Step 3: Connect the power supply (AC 80-264V 47/63Hz), press the red switch button "-", the "O" uplifted, and the indicator light up, indicating power on.

Step 4: If need to control the intensity by PC, please connect the PC with controller by RS232 serial cable or network cable when the power off, then control by our demo program or the program written by yourself. You can still manually set the parameters for each channel when controlled by RS232 or LAN. That's to say, the upper computer and controller all can set-up the parameter, no need mode swapping.

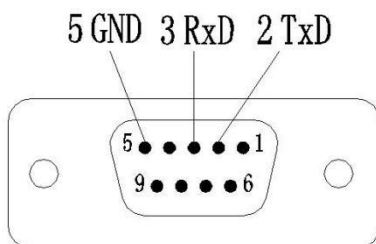
2.3 Intensity setting up

Manual method:

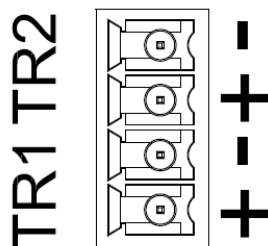
- (1) Every time the encoder switch is pressed, the first digital tube will display from the first channel until H is a cycle. Add 1 each time you press it.
- (2) After choosing the channel, Turn the encoder clockwise to increase the value until 255 no longer increases, Turn the encoder counterclockwise to reduce the value until 0 no longer decreases.
- (3) When the first digit tube displays H, rotate the encoder, the last digit tube displays 1, all output channels open; the last digit tube displays 0, all output channels close.
- (4) Setup method of DEMO software: refer to "Software Operation"

2.4 RS232 Trigger port description

RS232 straight through cable(one side is "pin type", the other side is "hole type" 2-2,3-3,5-5)connection method, connect the PC and the RS232 of the controller with an extension cable

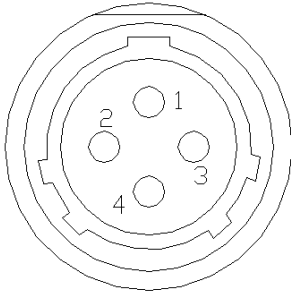


2.5 Trigger port description



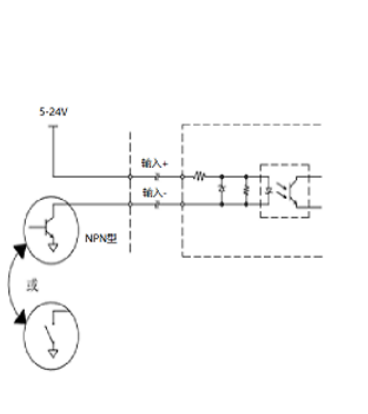
Port	Specification
-TR1+	First Channel trigger signal input port 5~24V -/5~24V +
-TR2+	Second Channel trigger signal input port □ 5~24V -/5~24V +

2.6 Lighting port description

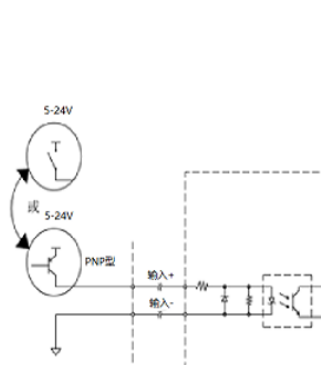


Port	Specification
①	Connect "+ pole" of light
②	Connect "- pole" of light
③	Connect "+ pole" of fan
④	Connect "- pole" of fan

2.7 Wire connection method of the trigger signal



NPN Drive model



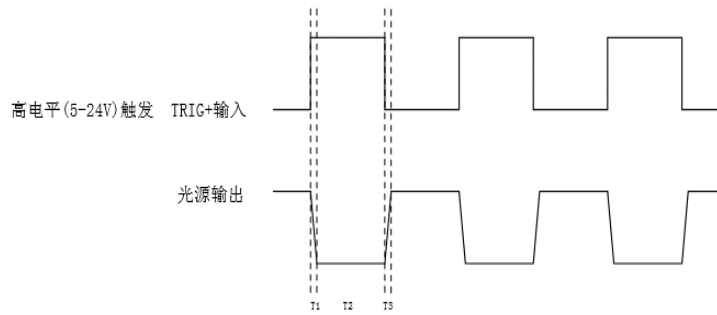
PNP Drive model

Remark: The switch with strong mechanical characteristics cannot be used as the trigger driving mode at outside of the controller.

2.8 Trigger sequence diagram



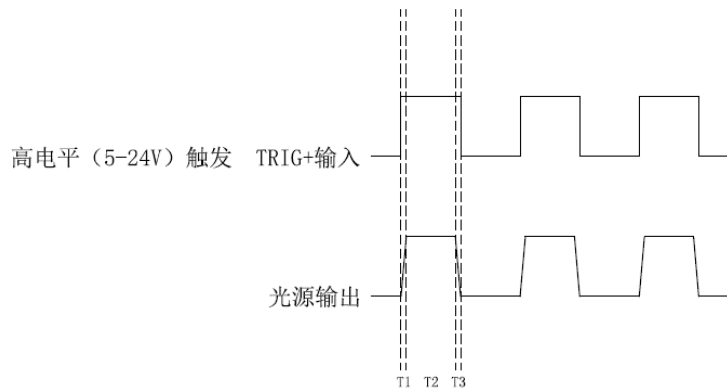
MANU mode trigger sequence diagram



Specification: T1 is the trigger delay time of turning light off, T2 is the time of light triggered off, T3 is the trigger delay time of turning light on, $T1 \leq 10\mu s$, $T3 \leq 10\mu s$

EX: The external input frequency is 100Hz, duty cycle is 50%, $T2 = (1/100 * 1000000) / 2 - 10 = 4990\mu s$.

REMO mode trigger sequence diagram

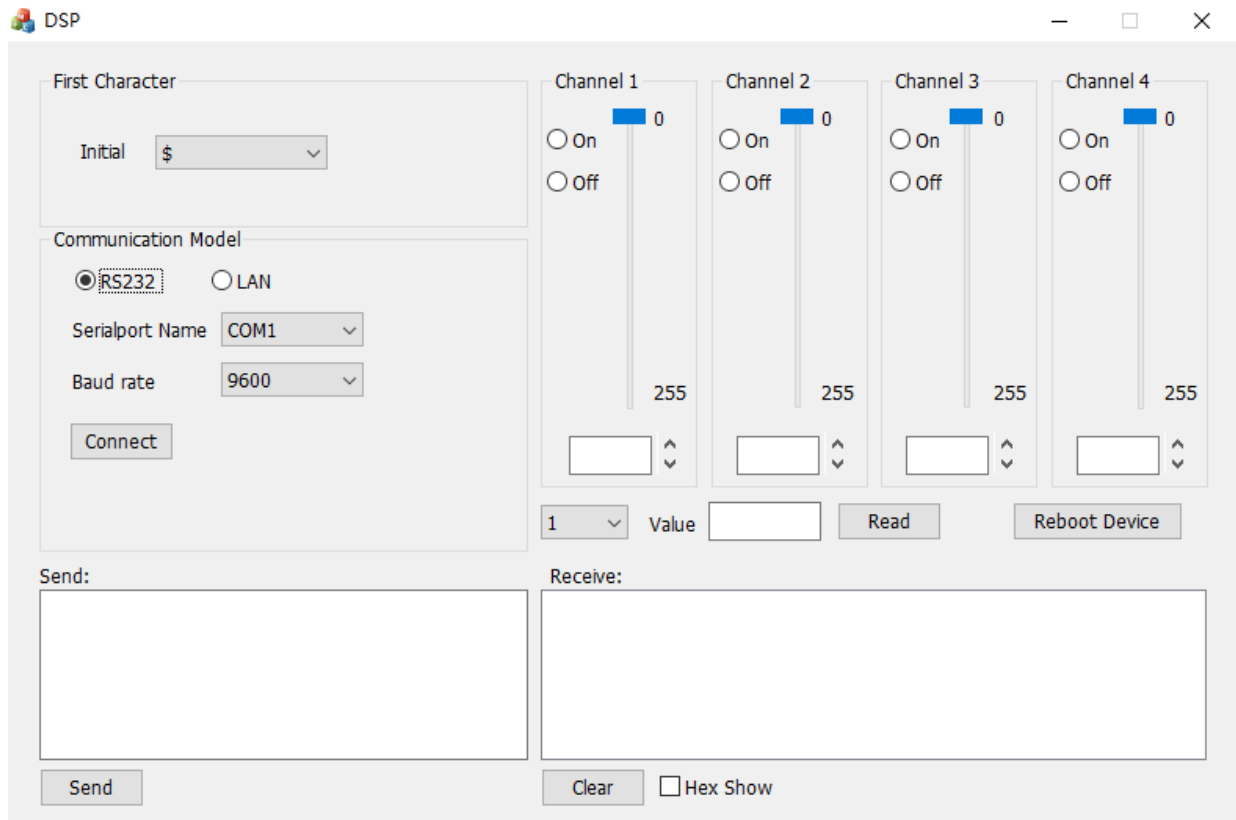


Specification: T1 is the trigger delay time for turning the light on, T2 is the time of light on when triggered, T3 is the trigger delay time for turning the light off, $T1 \leq 10\mu s$, $T3 \leq 10\mu s$.

EX: The external input frequency is 100Hz, duty cycle is 50%, $T2 = (1/100 * 1000000) / 2 - 10 = 4990\mu s$

3. Software operation

3.1 Single channel software interface diagram

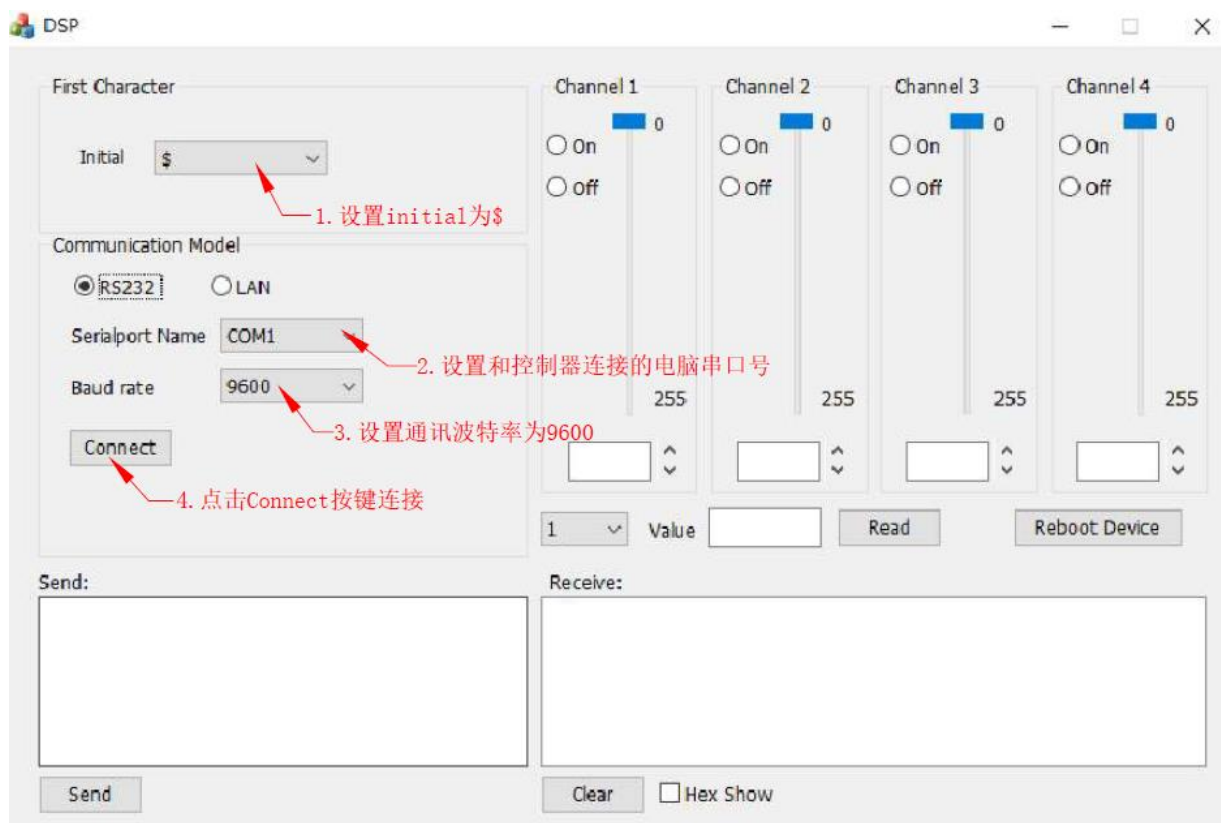


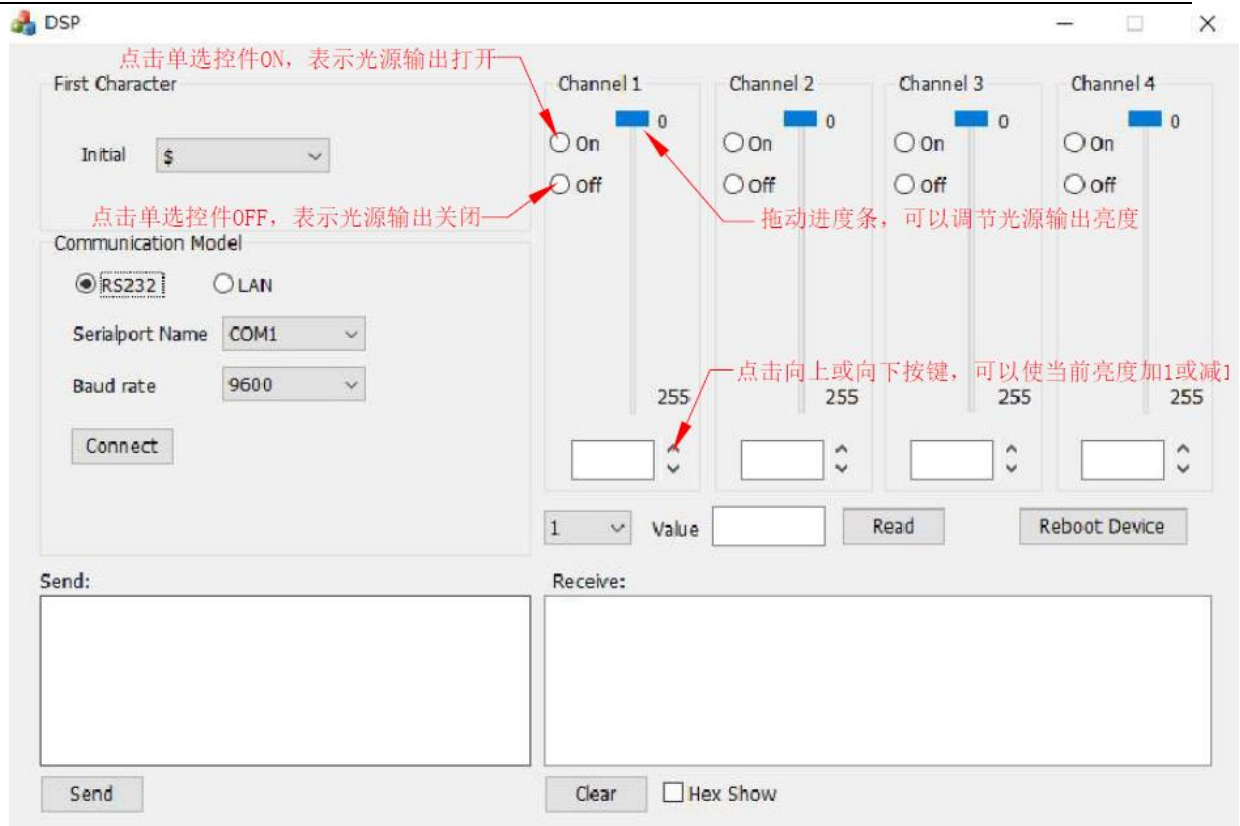
Picture 3.1 single channel software interface diagram

RS232 settings: Click the RS232 status to enter the serial port communication Settings, select the serial port number of the computer connected to the controller, select the baud rate of communication, select the communication start character as \$, click the Connect button to connect, a After the setting is completed, the controller can be controlled and operated.



3.2 Operation description





Picture 3.2 Operation description

operation instructions:

Click the ON radio control to indicate that the controller output is turned on; click the OFF radio control to indicate that the controller output is off; drag the progress bar to set the intensity of the light output; To increase or decrease the current brightness value, you can click the add or subtract button below the text box; Writing instructions in the Send text area can also be controlled.

3.3 Ethernet communication IP parameter setting

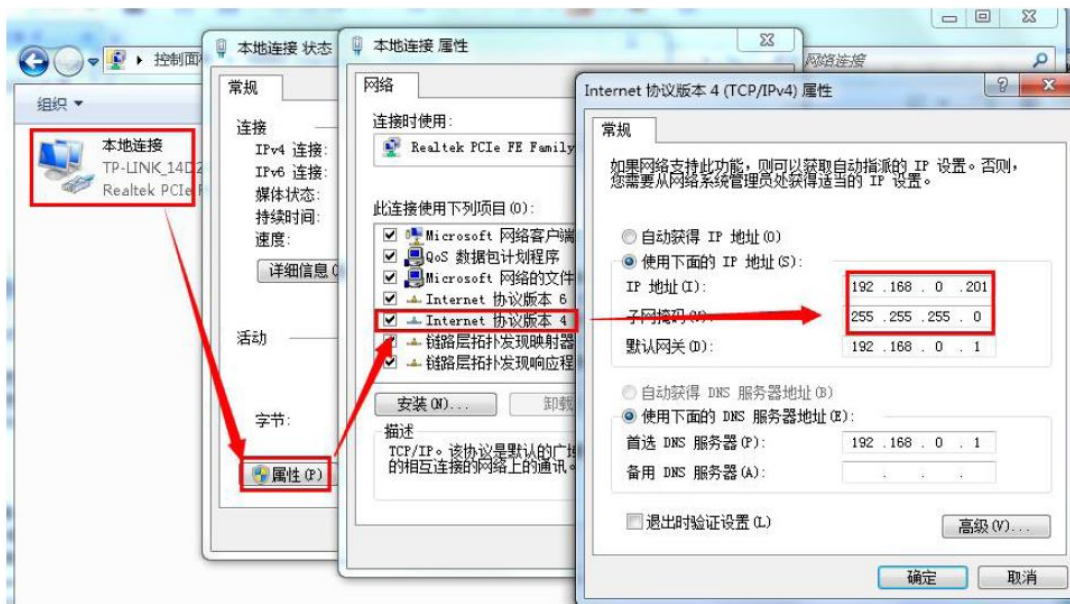
- 1) Open the USR-M0 software to set IP parameters.



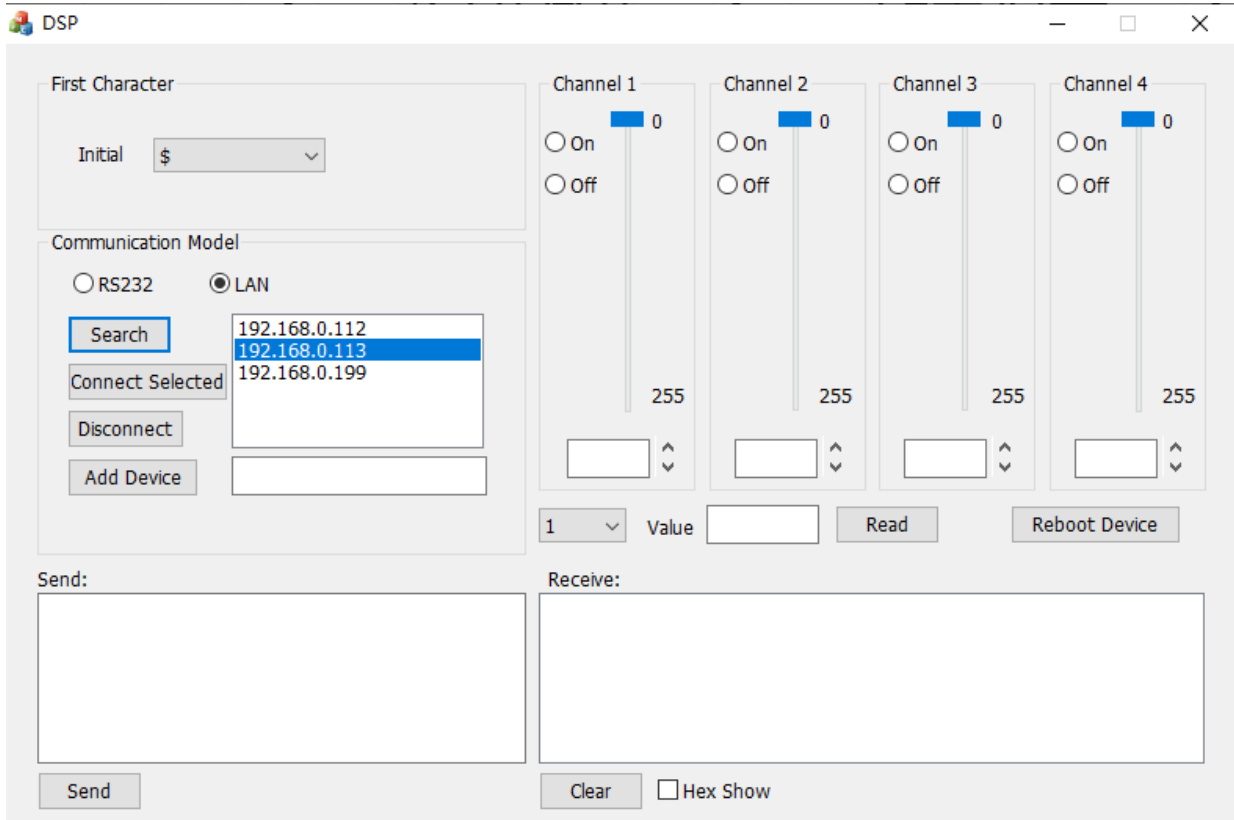
3.4 Ethernet connection Settings

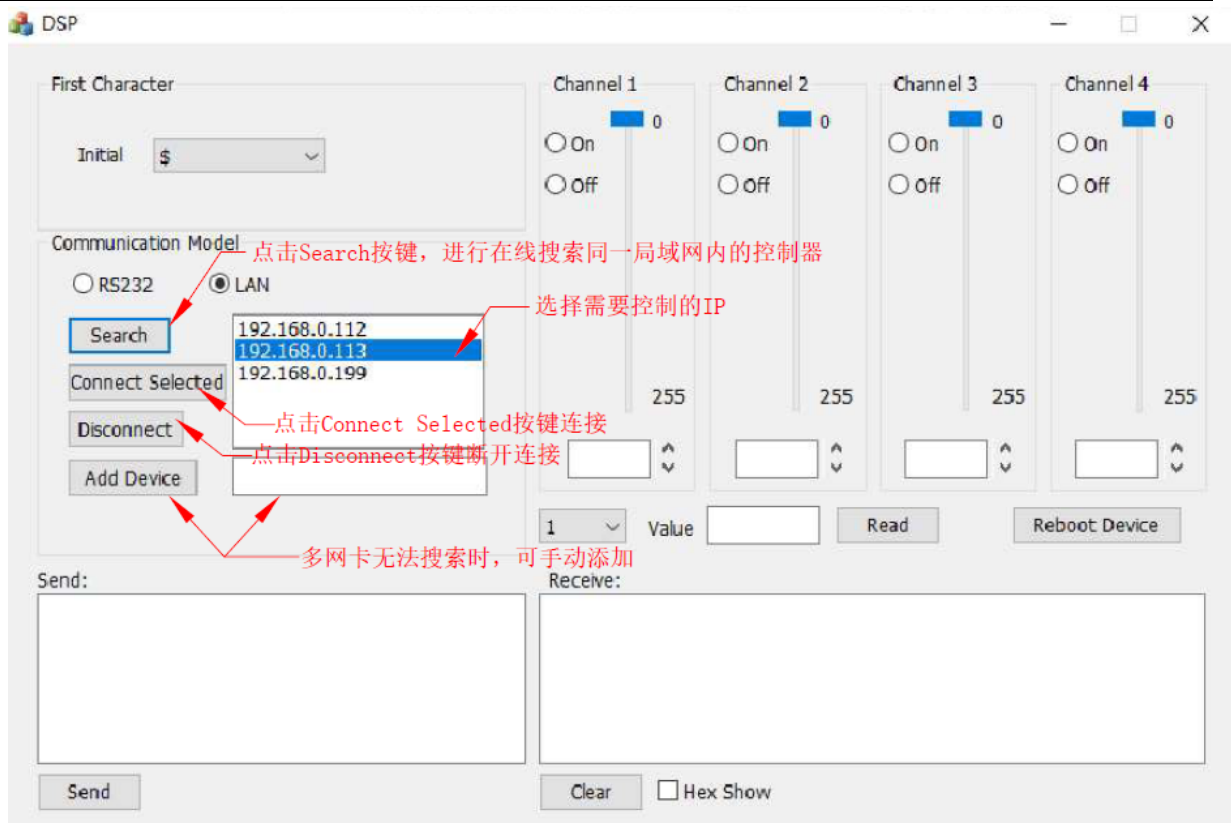
After the controller is connected and before use, check the computer for the following contents:

- 1) Turn off the computer firewall and anti-virus software;
- 2) Close the network adapters that are not related to this test, leaving only one local connection;
- 3) If the PC is directly connected to the controller, you must set a static IP address for the PC in the same network segment as the IP address of the controller; (Note: Computer IP cannot be lower than controller IP)



3.5 TCP connection



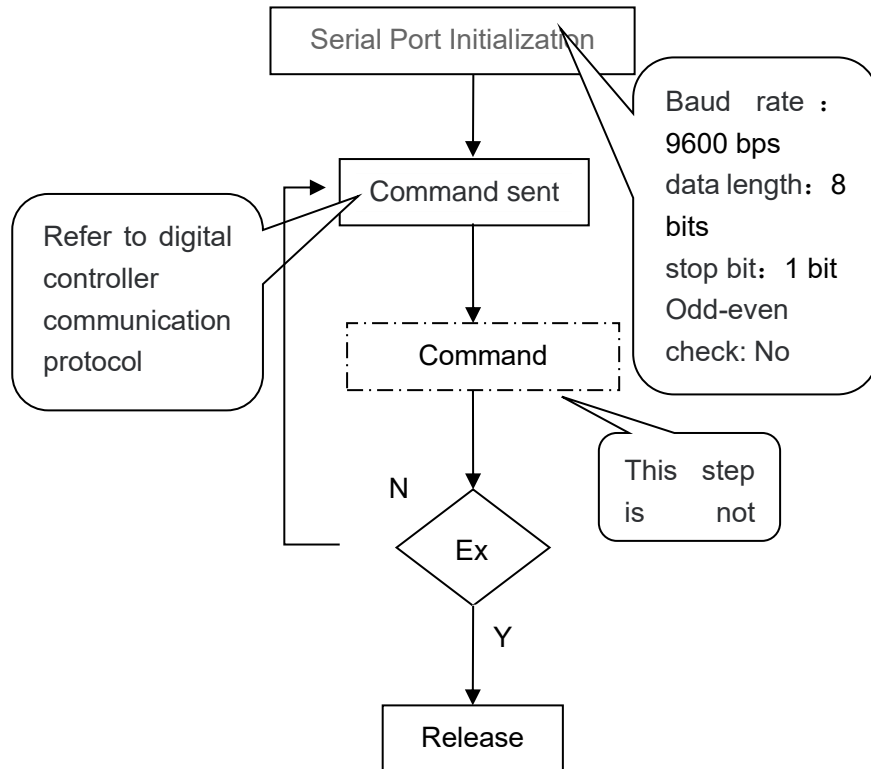


TPC Connection Instructions:

Click the Search button to conduct an online controller Search. The IP address displayed in the search result is in the text area to the right of the search button (if multiple network cards cannot be searched, you can manually enter the IP address in the text box to the right of the Add Device and click Add Device to add it). Select the IP address of the controller that you want to connect to and control. Click the Connect Selected button to make the TCP communication connection. After the connection is successful, you can operate the controller. The switch and brightness setting are same as serial port operation. The Ethernet can be controlled by selecting the IP address and connecting the controller respectively. After selecting the controller to be operated, click the Connect Selected button, Disconnect the connection and click the Disconnect button.

4. Controller communication function

4.1 Communication Protocol



4.1.1 Hardware specification

Baud rate	9600 bps
Data length	8 bits
Stop bit	1 bit
Odd-even check	No

4.1.2 Data format

1byte	1byte	1byte	3bytes	2bytes
tagged word	command	channel word	data	X

All communication bytes are ASCII

Tagged word = \$

Commend word = 1,2,3,4:

- 1: Open the corresponding channel output
- 2: Close the corresponding channel output
- 3: Set corresponding channel power parameters
- 4: Read out the corresponding channel power parameters



When the command word is 1,2,3, if the controller receives the command successfully, the Single channel characteristic word "\$" is returned; Returns & if the controller fails to receive the command.

When the command word is 4, if the controller receives the command successfully, it will return the intensity setting parameters of the corresponding channel (return format is the same as sending format); Returns "&" if the controller fails to receive the command.

Channel words = 1,2,3,4. Represents 4 ways output channels respectively; If there is only 1 channel, then 1

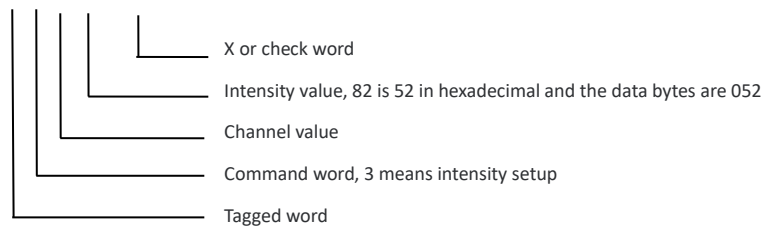
Data = 0XX (any value within XX=00 ~ FF) The setting parameters of the corresponding channel power supply are as follows: the high level is in front and the low level is behind

X or and checksum = X or checksum of bytes other than the checksum (including: tagged word, command word, channel word, and data). The high half-byte ASCII code of the checksum comes before the low half-byte ASCII code




4.1.3 Example of controller communication

Ex: Set the intensity of channel 1 to 82, then write down "\$3105211" in ASCII code

\$ 3 1 052 11



The operation of the X or check word is as follows:

	character string		ASCII code		ASCII codes are expressed in hexadecimal notation ASCII		The high half byte and the low half byte are represented by 8421 codes respectively			
tagged word	\$		36		24		0010 0100			
command word	3		51		33		0011 0011			
channel word	1		49		31		0011 0001			
data	0		48		30		0011 0000			
	5		53		35		0011 0101			
	2		50		32		0011 0010			
X or and							0001 0001			
X or check word							1 1			

Note: In the operation of the X or check word of opening the corresponding channel power supply, closing the corresponding channel power supply and reading the corresponding channel power parameter, the value of the 3 bytes of data has no effect, only affects the X or result. Ensure that the



format is 0XX (XX=00 ~ FF)

The following is a number of groups of experimental data, if users write their own programs, the following data can be compared and tested

Close second channel: \$2206416

	character string		ASCII code		ASCII codes are expressed in hexadecimal notation ASCII		The high half byte and the low half byte are represented by 8421 codes respectively
tagged word	\$		36		24		0010 0100
command word	2		50		32		0011 0010
Channel word	2		50		32		0011 0010
data	0	→	48	→	30	→	0011 0000
	6		54		36		0011 0110
	4		52		34		0011 0100
X or and							0001 0110
X or check word							1 6

Open second channel: \$1206415

	character string		ASCII code		ASCII codes are expressed in hexadecimal notation		The high half byte and the low half byte are represented by 8421 codes respectively
tagged word	\$		36		24		0010 0100
command word	1	→	49	→	31	→	0011 0001
channel word	2		50		32		0011 0010
data	0		48		30		0011 0000
	6		54		36		0011 0110
	4		52		34		0011 0100
X or and							0001 0101
X or check word							1 5



Read power parameter of second channel: \$4206410

	character string		ASCII code		ASCII codes are expressed in hexadecimal notation		The high half byte and the low half byte are represented by 8421 codes respectively
tagged word	\$		36		24		0010 0100
command word	4	→	52	→	34	→	0011 0100
Channel word	2		50		32		0011 0010
data	0		48		30		0011 0000
	6		54		36		0011 0110
	4		52		34		0011 0100
X or and							0001 0000
X or check word							4 0

4.1.4 Frame format reference data

Open operation

data	CH1	CH2	CH3	CH4
000	\$110001 4	\$120001 7	\$130001 6	\$140001 1
150	\$110961 B	\$120961 8	\$130961 9	\$140961 E
255	\$110FF1 4	\$120FF1 7	\$130FF1 6	\$140FF1 1

Open command word-1



Note: in the command to open the corresponding channel, the value of 3 bytes of data is not effective, but indispensable, only affects the X or result, ensure that the format is 0XX (XX=00 ~ FF within any value), open operation will not change the intensity value of the channel. (The above only gives the command and check with data 000,150,255)

Return \$ on success, & on failure

Close operation

data	CH1	CH2	CH3	CH4
000	\$210001 7	\$220001 4	\$230001 5	\$240001 2
150	\$210961 8	\$220961 B	\$230961 A	\$240961 D
255	\$210FF1 7	\$220FF1 4	\$230FF1 5	\$240FF1 2

close common word-2

Note: in the command to close the corresponding channel, the value of 3 bytes of data is not effective, but indispensable, only affects the X or result, ensure that the format is 0XX (XX=00 ~ FF within any value), open operation will not change the intensity value of the channel. (The above only gives the command and check with data 000,150,255)

Return \$on success, & on failure

Write data operation

data	CH1	CH2	CH3	CH4
000	\$310001 6	\$320001 5	\$330001 4	\$340001 3
150	\$310961 9	\$320961 A	\$330961 B	\$340961 C
255	\$310FF1 6	\$320FF1 5	\$330FF1 4	\$340FF1 3

Write data command word-3

Note: in the command to close the corresponding channel, the value of 3 bytes of data is not effective, but indispensable, only affects the X or result, ensure that the format is 0XX (XX=00 ~ FF within any value), open operation will not change the intensity value of the channel. (The above only gives the command and check with data 000,150,255)

Return \$on success, & on failure

Read data operation

data	CH1	CH2	CH3	CH4
000	\$410001 1	\$420001 2	\$430001 3	\$440001 4
150	\$410961 E	\$420961 D	\$430961 C	\$440961 B



255	\$410FF1 1	\$420FF1 2	\$430FF1 3	\$440FF1 4
-----	---------------	---------------	---------------	---------------

Read data command word-4**Open all channels operation**

data	command
000	\$5100010
150	\$510961F
255	\$510FF10

Read data common word-5

Note: in the command of open all channels, the value of 3 bytes of data does not work, but is indispensable, only affects the X or result, ensure that the format is 0XX (XX=00 ~ FF any value). Does not change the intensity value of the channel. (The above only gives the command and check with data 000,150,255)

Return \$on success, & on failure.

Close all channel operations

data	command
000	\$6100013
150	\$610961C
255	\$610FF13

读数据命令字-6

Note: in the command of open all channels, the value of 3 bytes of data does not work, but is indispensable, only affects the X or result, ensure that the format is 0XX (XX=00 ~ FF any value). Does not change the intensity value of the channel. (The above only gives the command and check with data 000,150,255)

Return \$on success, & on failure.



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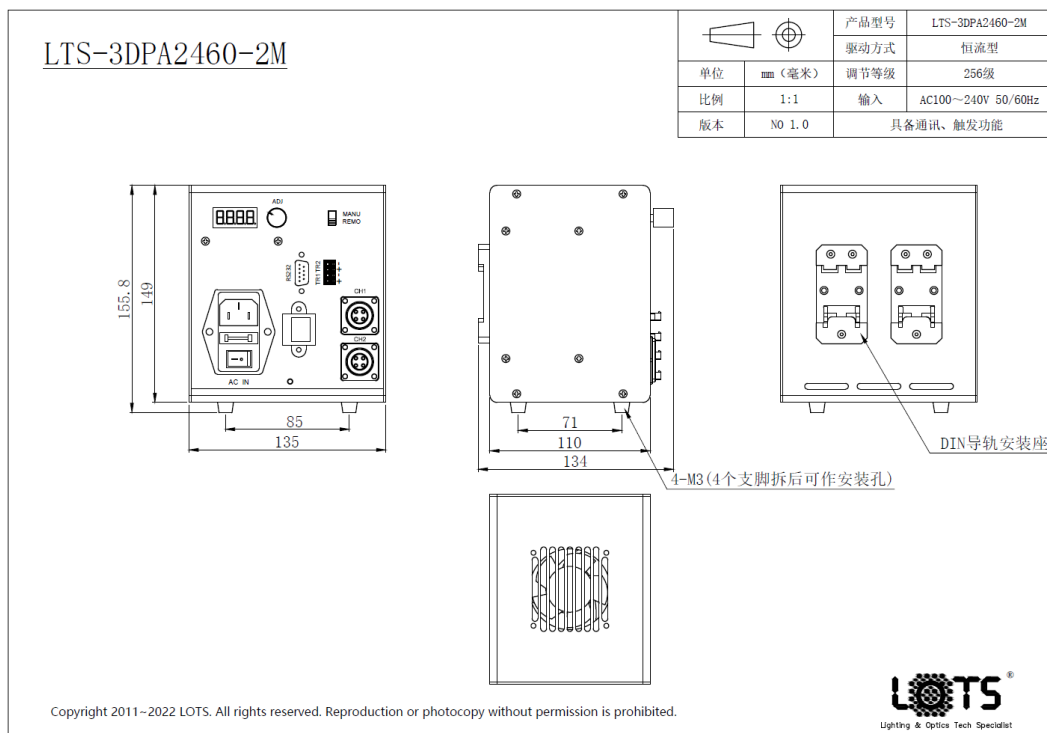
东莞乐视自动化科技有限公司

Dongguan LOTS Automation Technology Co.,Ltd

东莞市厚街镇科技工业城福东路挺丰科技园B栋1~3层

电话：0769-23131500 传真：0769-23131500-888 <http://www.lotsmv.com>

5.Controller dimension drawing

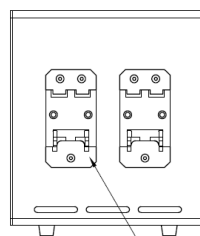
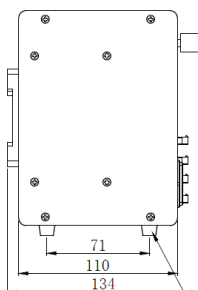
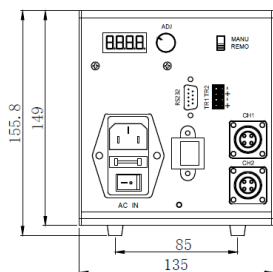


LTS-3DPA2460-2M (256) controller dimension drawing



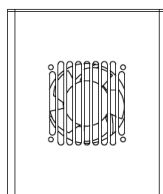
LTS-3DPA24120-2M

		产品型号	LTS-3DPA24120-2M
		驱动方式	恒流型
单位	mm (毫米)	调节等级	256级
比例	1:1	输入	AC100~240V 50/60Hz
版本	NO 1.0	具备通讯、触发功能	



DIN导轨安装座

4-M3 (4个支脚拆后可作安装孔)



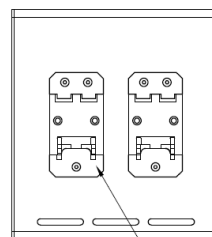
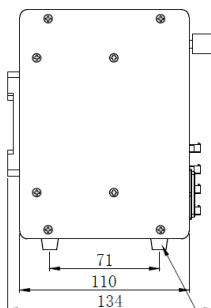
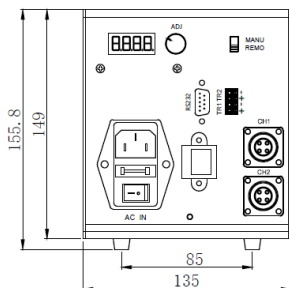
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LTS-3DPA24120-2M (256) controller dimension drawing

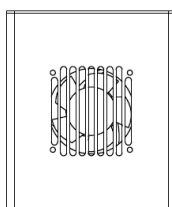
LTS-3DPA24120-2M

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		驱动方式	恒流型
单位	mm (毫米)	调节等级	999级
比例	1:1	输入	AC100~240V 50/60Hz
版本	NO 1.0	具备通讯、触发功能	



DIN导轨安装座

4-M3 (4个支脚拆后可作安装孔)



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LTS-3DPA24120-2M (999) controller dimension drawing



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Dongguan LOTS Automation Technology Co.,Ltd

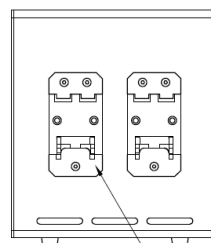
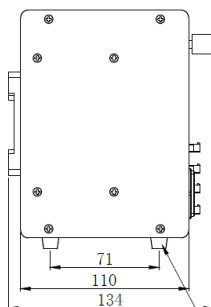
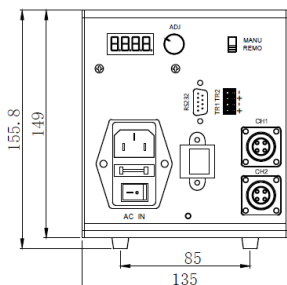
东莞市厚街镇科技工业城福东路挺丰科技园B栋1~3层

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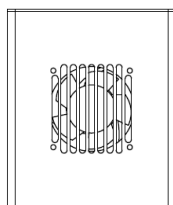
LTS-3DPA24200-2M

		产品型号	LTS-3DPA24200-2M
		驱动方式	恒流型
单位	mm (毫米)	调节等级	256级
比例	1:1	输入	AC100~240V 50/60Hz
版本	NO 1.0	具备通讯、触发功能	



DIN导轨安装座

4-M3 (4个支脚拆后可作安装孔)



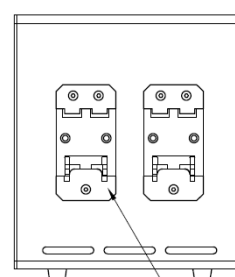
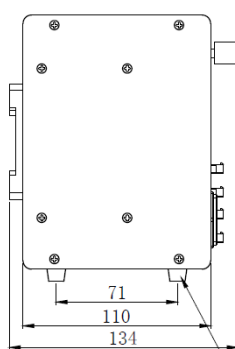
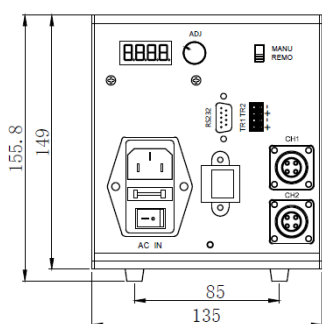
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LTS-3DPA24200-2M (256) controller dimension drawing

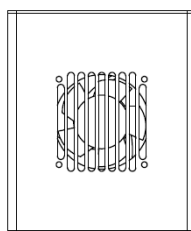
LTS-3DPA24200-2M

		产品型号	LTS-3DPA24200-2M
		驱动方式	恒流型
单位	mm (毫米)	调节等级	999级
比例	1:1	输入	AC100~240V 50/60Hz
版本	NO 1.0	具备通讯、触发功能	



DIN导轨安装座

4-M3 (4个支脚拆后可作安装孔)



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LTS-3DPA24200-2M (999) controller dimension drawing