SY-408 MANUAL

Version: 4.5.1

Model: SY-408-N19.01
SY-408G-N19.01

2021-10

Contents

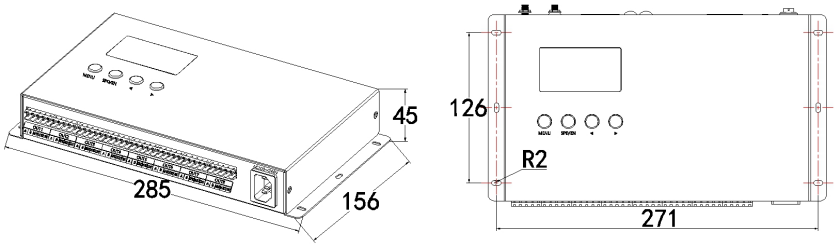
1. FUNCTION OVERVIEW

1. 8-channel output signal (data-independent). Apply to large project and long distance transmission. Support several controllers cascade using.
2. Realization according to the configuration of the software, a simple operation of the keys can be addressed.
3. Control variety of regular chips in LED digital tube screen, LED pixel light screen, and etc.
   MCU: D**S series, D**J series.
   SPI: TM180*-400K/800K, UCS19**, UCS29**, SM167**.
   DMX512 lighting fixture: SW-D, SW-U, UCS512A/B/C0/C4/D/E, DMX512AP/SM512, SM16500/12, SM17500P/12P/22P, standard DMX512 lighting fixture in the market.
   Break point resume: UCS5603, WS2818, GS8206, P9883, TM1914, XT1506S.
4. Effect, speed, sensitivity of volume and brightness are adjustable while the latter two are optional.
5. Cascade, time controller, GPS synchronization are optional as additional functions.
6. Specialized software of making animation is included, user can make their own effects and save in SD card.

2. TECHNICAL PARAMETERS

2.1. PRODUCT INFORMATION

Cover material:	Aluminum alloy
Input voltage:	AC 100V - 240V
Output port:	TTL & RS-485 * 8 channels
Pixel driven:	MCU: 2880 channels ×8 ports, SPI: 3072 channels ×8 ports, standard DMX512: 512 channels ×8 ports, extensible DMX: 1024 channels ×8 ports, Breakpoint resume: 2880 channels ×8 ports.
Output power:	<3W
Working temperature:	-15℃～60℃
Relative humidity:	≤50% RH
IP grade:	IP20 (Prevent people from touching the components inside electrical appliance, prevent object which diameter is more than 12.5mm from getting in, no special protection to water or moisture.)
Working environment:	1.Please do not install the controller in magnetic, high pressure, high temperature or seriously wet environment. 2.Please do connect the earth safely in order to reduce risks of fire and damage which cause by short circuit. 3.Please ensure AC100-240V power supply is used, and same polarity is connected between transformer and controller in order to guarantee the proper supply voltage. 4.No waterproof function in the control system, please pay attention on rainproof and waterproof during installing.
Net weight:	1.3KG
Size:	L285*W156*H45
(Unit mm)	



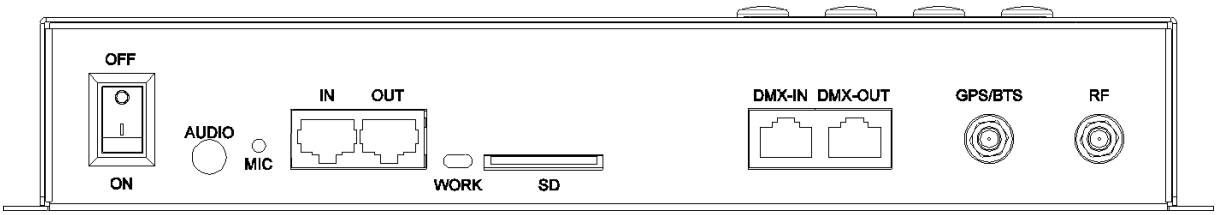
2.2. ERROR CODE

Error	Introduction	Reason
ER01	No SD card	Poor seat connection. / No SD card.
ER02	SD card no response	Card is broken. / Card doesn't support read sequentially.
ER03	Cannot reset SD card	Card is broken. / Card doesn't support read sequentially.
ER04	Cannot activate SD card	Card is broken. / Card doesn't support read sequentially.

Error	Introduction	Reason
ER05	Cannot read SD card	Cannot read part of the card. / Bad connection.
ER06	Cannot find feature code	Card is unformatted. / No file.
ER07	SD card file sequence doesn't match the controller	SD card file error. / Unfinished video merging.
ER09	Control sequence doesn't match file sequence	Player setting does not match the cover number.
ER10	Wrong password	Input wrong password.
ER11	UID does not match	Two UID in controller are not matched.
ER12	UID error in config file	UID in player does not match the one in controller.
ER13	Controller is not fully unlocked/mismatched UID	Controller is not fully unlocked.
ER14	UID error in SD card	UID in SD card does not match the one on controller.

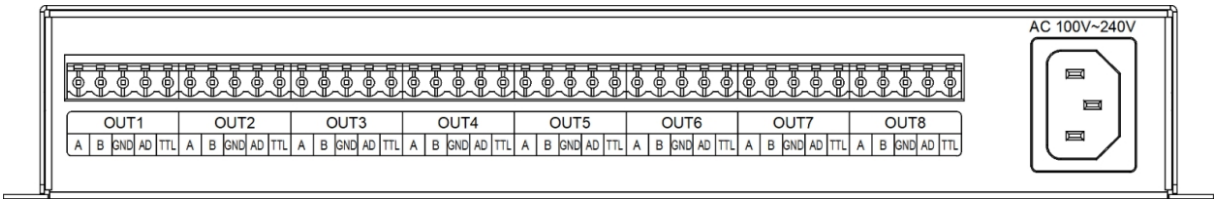
3. CONNECTION INSTRUCTION

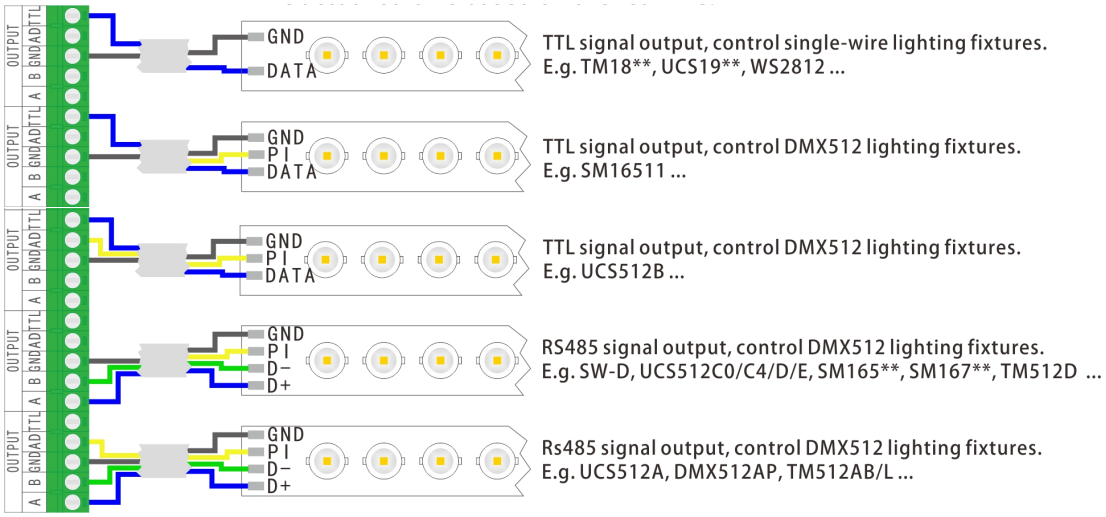
3.1. FUNCTIONAL INTERFACE



Interface	Function
IN & OUT	Input / output of cascade.
WORK	Working light, it flickers according to frame rate when working properly. No flicker indicates abnormal or non-working status.
SD	SD card slot.
GPS	GPS antenna interface. (Optional function.)
DMX IN & DMX OUT	Reserved interface.
AUDIO	Reserved interface.
MODE & SPEED	Reserved interface.
RF	Reserved interface.

3.2. CONTROLLING LIGHTING FIXTURE INTERFACE





TTL signal output, control single-wire lighting fixtures.
E.g. TM18**, UCS19**, WS2812 ...

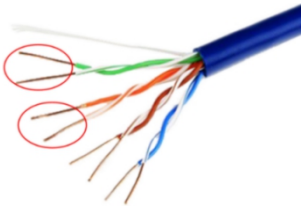
TTL signal output, control DMX512 lighting fixtures.
E.g. SM16511 ...

TTL signal output, control DMX512 lighting fixtures.
E.g. UCS512B ...

RS485 signal output, control DMX512 lighting fixtures.
E.g. SW-D, UCS512C0/C4/D/E, SM165**, SM167**, TM512D ...

Rs485 signal output, control DMX512 lighting fixtures.
E.g. UCS512A, DMX512AP, TM512AB/L ...

★ Signal cables connection cautions:



1. Use UTP—Unshielded Twisted Pair (resistance per 100M<10Ω), low quality Ethernet cables, telephone cables and copper wires are unavailable.
2. Use one group twisted pair, suggest green + green white or orange + orange white. The quality and color of the cable are very important. Blue and brown wires greatly influence the signal transmission. Please don't use several groups of twisted pairs together.
3. Controller signal output GND must connect directly with input GND of lighting fixture. ***Cannot connect with lighting fixture through power supply***.
4. Switch on the controller after all hardware signal and power cables are connected. Please *don't CONNECT / DISCONNECT* the signal cables while the controller is power on;avoid back-flow current burning circuit and components of output port.

★ Transmission distance:

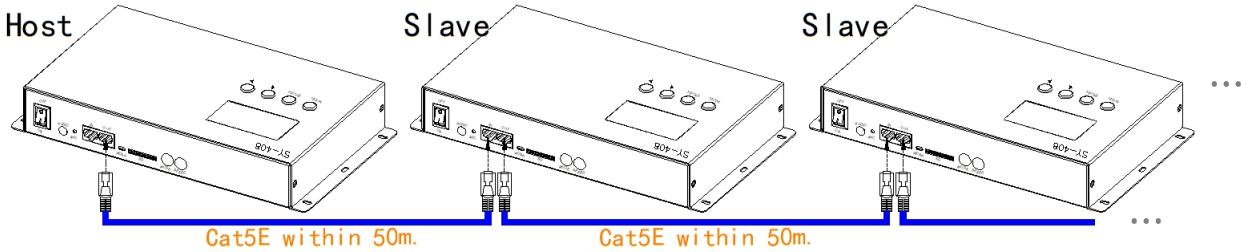
Transmission Type	Signals	Medium	Distance (M)	Remark
Master control ⟶ slave control	RS-485	UTP-Unshielded Twisted Pair	50-100	
Master/slave control ⟶ SW lighting fixture	TTL	UTP-Unshielded Twisted Pair	30-50	
		Two core wire	5-30	
Master/slave control ⟶ SPI lighting fixture	TTL	UTP-Unshielded Twisted Pair	5-20	
		Two core wire	1-5	
Master/slave control ⟶ DMX lighting fixture	RS-485	UTP-Unshielded Twisted Pair	30-50	The address cable must be no more than 5m.
		Three core wire	1-20	
		Four core wire	1-20	
Master/slave control ⟶ SW lighting fixture Master/slave control ⟶ DMX lighting fixture	TTL	UTP-Unshielded Twisted Pair	5-20	Controllable pixels reduce if wire is over 5m.
		Two core wire	1-5	
		Three core wire	1-5	
Single-wire lighting fixture ⟶ SPI lighting fixture	TTL	UTP-Unshielded Twisted Pair	1-2	Controllable pixels reduce if wire is over 1m.
		Two core wire	0.1-1	

3.3. CASCADE CONNECTION

When the project needs to be controlled by multiple cascading controllers, connect the host with slave controllers by cables to make the whole project synchronous The distance must be no more than 50M. (Add an AP100 in every 50m to enhance transmission signal.)

User can extend the cables based on real requirement (cable extension should follow T568B method).

Operation refers to the "CASCADE CONTROL" section.



3.4. GPS ANTENNA NOTES

2m GPS antenna is provided. User can also purchase GPS marine antenna with standard SMA interface according to on-site engineering requirement. The longer the antenna is, the more difficult to search satellite.

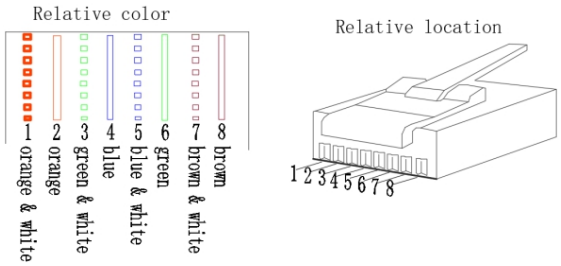
Notes:

a) GPS Antenna should be installed in open space to guarantee view angle within 30 degree, there is no big shades (such as trees, iron towers, buildings etc.). GPS Antenna should be more than 2m away from the metal objects which size is bigger than 20cm.

b) Due to the satellite appearing on the equator more than other places, it preferably put the GPS antenna in the south of location for the north hemisphere.

c) Please don't put GPS antenna around other transmitting and receiving equipment to avoid radiation of other transmitting antenna facing to GPS antenna. Please keep them 2m away with each other.

3.5. T568B WIRES

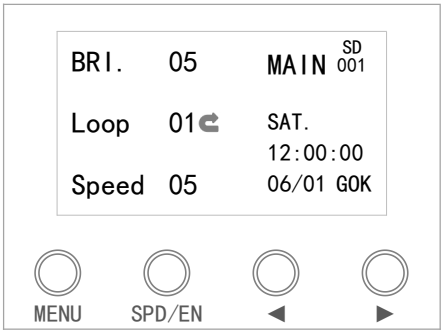


4. BASIC OPERATION

4.1. BUTTONS

Button	Operation	Introduction
MENU	Short press	Return.
	Long press	Enter/exit the "parameter setting" interface.
SPD/EN	Short press	Set the effect speed and save the parameter Settings.
◄	Short press	Decrease, suitable for changing effect and setting parameters.
	Long press	Quickly decrease the value of the effect/parameter.
►	Short press	Increase, suitable for changing effect and setting parameters.
	Long press	Quickly increase the value of the effect/parameter.

4.2. INTERFACE INTRODUCTION



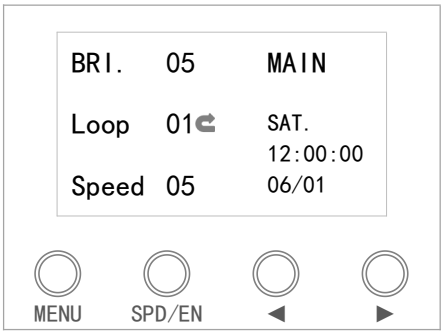
The icon of unsupported functions will not display on interface.

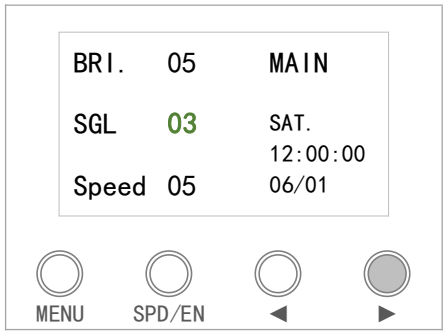
Display	Introduction
BRI.	Current brightness of controller output.
SGL/Loop/Rand.	Current display effect. ↻ is Multi-loop play status.
Speed	Current display speed.
MAIN	Main control.
Sat. 12:00:00 06/01	Current setting date and time.
SD 001	Enter Time control. (001 is the Nth list.)
G OK	Signal of searched GPS satellite. ER: no GPS information detected. NG: no signal. OK: The effects have been Sync.

4.3. CONTROL SETTING

Press "◄" and "►" to select effects. And the effect is changed from random/multi-loop to single-loop.

It can switch increased or decreased quickly with long press "◄" or "►".

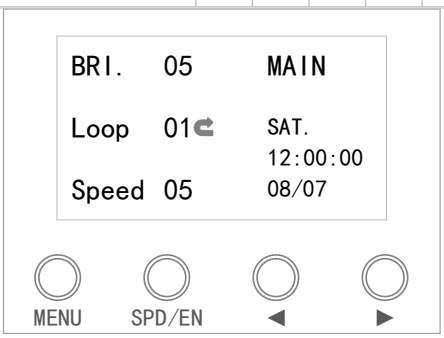


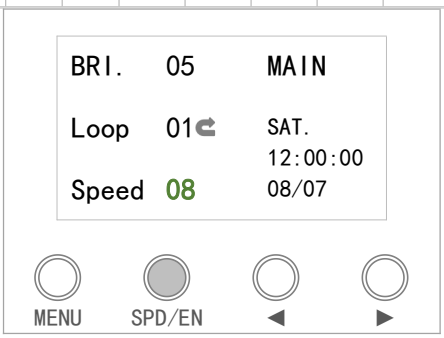


4.4. SPEED SELECTION

Press button "SPD/EN" on control panel to select play speed, the less the rate, the quicker the speed. All the controllers set same speed and same mode, connect to power in the same time in the AC speed.

Parameters	Speed															
Interface	03	04	05	06	07	08	09	10	11	12	15	20	30	50	80	99
		04AC		06AC		08AC		10AC		12AC		20AC		50AC		99AC
Frame Rate(ms)	30	40	50	60	70	80	90	100	110	120	150	200	300	500	1000	2000
(fps)	33	25	20	17	14	13	11	10	9	8	7	5	3	2	1	0.5

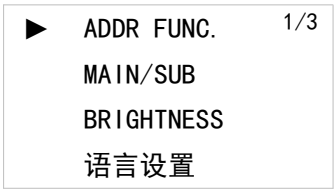


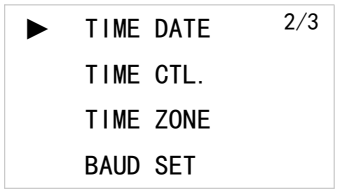


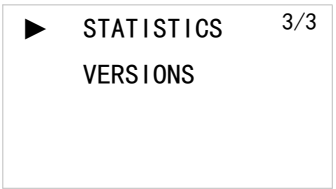
4.5. MENU SETTING

Long press "MENU" enter/exit "MENU SETTING".

Press "◄" and "►" to select function. Press "SPD/EN" to confirm.







First Menu	Second Menu	Introduction
ADDR.FUNC.	One Key Addr. Addr. Check Addressing	Set the address parameters of lighting fixtures.
MAIN/SUB	MAIN/SUB	Set main control or sub control.
BRIGHT.	Brightness **	Set the brightness of lighting fixture. Data: 0 | 1 | 2 | 3 | 4 | 5 Brightness: 0% | 6.25% | 12.5% | 25% | 50% | 100%
语言设置	English/Chinese	Set the language.
TIME DATE	SATURDAY 12:00 2021/08/07	Set the time. Press "◄" / "►" to set value and press "SPD/EN" to confirm. **It does not support modification when enabling GPS function.**

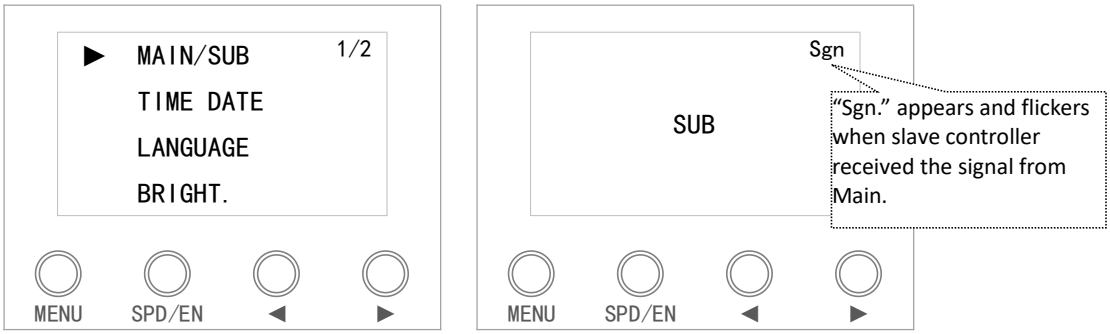
First Menu	Second Menu	Introduction
TIME CTL.	SD_CTL OFF	Set the time control.
TIME ZONE	Time Zone Set + 08	Set the time zone of the controller.
BAUD SET	Reset Valve: 700K Set Valve: 700K	Set the baud rate for transmission
STATISTICS	E03: **** E05: ****	Count the time of E03/E05.
VERSIONS	Versions *****	Get the information of current version.

5. ADDITIONAL FUNCTION

5.1. CASCADE CONTROL

When the project needs to be controlled by multiple cascading controllers, connect the host with slave controllers by cables to make the whole project synchronous.

1. In the MAIN/SUB interface, Press "◄" and "►" to select "SUB" control.
2. Then two controller are connected by UTP CAT5e. Connection refer to the “CASCADE CONNECTION” section.



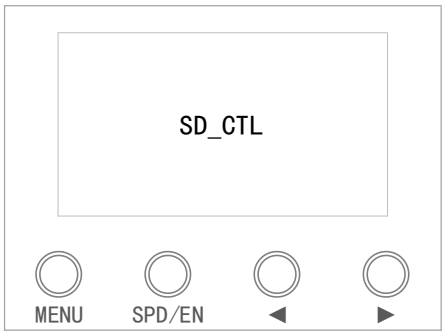
5.2. TIME CONTROL

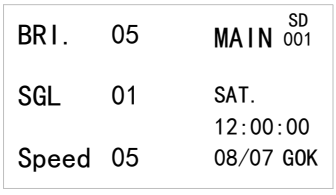
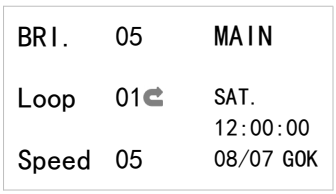
It has time control function. After enabling time control, the specified effect can be triggered within a specified time.

Enter "parameter setting" - "time control function" to enable.

Maximum time control lists of player is 100, and maximum 10 pcs effects can be set in each list.

PS: This function only applies to pattern effects.



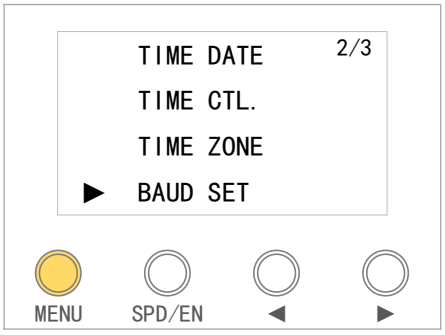
Mode	Description	Dispaly
SD_CTL	The lighting fixture is black while waiting. The controller will switch to corresponding effect mode when it reaches the time set. (The mode buttons are disabled.)	
OFF	Manually set the off time control state, the recovery is controllable.	

6. ADVANCED SETTING

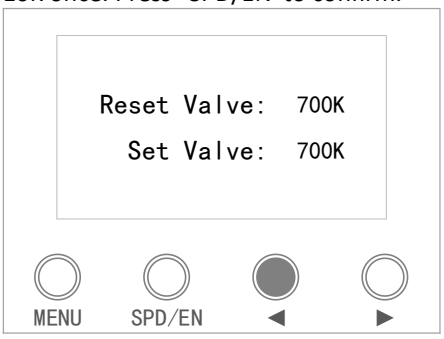
6.1. BAUD RATE SETTING

The controller can set the baud rate of single-wire lighting fixture to enhance transmission signal.

1) Long press “MENU” enter “MENU SETTING”. and select BAUD SET.



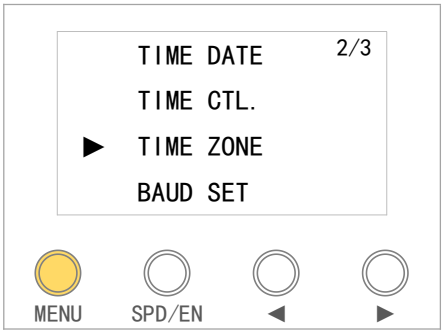
2) Press “◀” or “▶” to set the rate (600K-800K), 10K once. Press “SPD/EN”to confirm.



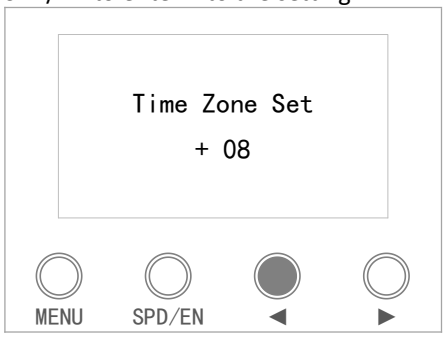
6.2. TIME ZONE SETTING

User can manually set the time zone of controller when using GPS function, to match local GPS time.

1) Long press “MENU” enter “MENU SETTING”. and select TIME ZONE.



2) Press “◀” or “▶” to select the option. Press SPD/EN to enter into the setting.



7. ADDRESSING

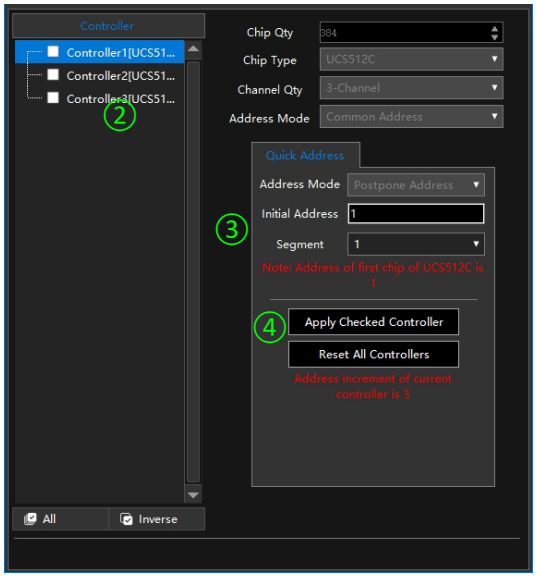
7.1. CONFIGURATE ADDRESS AND WRITE PARAMETER

7.1.1.CHIP SUPPORTED

Chip	Addressing	Custom Channel	Set parameters					
			No signal State	Power-on Setting	Current	Forward	Issue	GAMMA
UCS512A	√	×	×	×	×	×	×	×
UCS512B	√	×	×	×	×	×	×	×
UCS512C0	√	×	×	×	×	×	×	×
UCS512C4	√	×	×	√	×	×	×	×
UCS512CN	√	×	√	√	×	×	×	×
UCS512D	√	×	√	√	√	×	×	×
UCS512E0	√	√	√	√	√	√	×	×
UCS512EH	√	√	√	√	√	√	×	×
DMX512AP	√	×	×	×	×	×	×	×
SM16511	√	×	×	×	×	×	×	×
SM16512	√	×	×	×	×	×	×	×

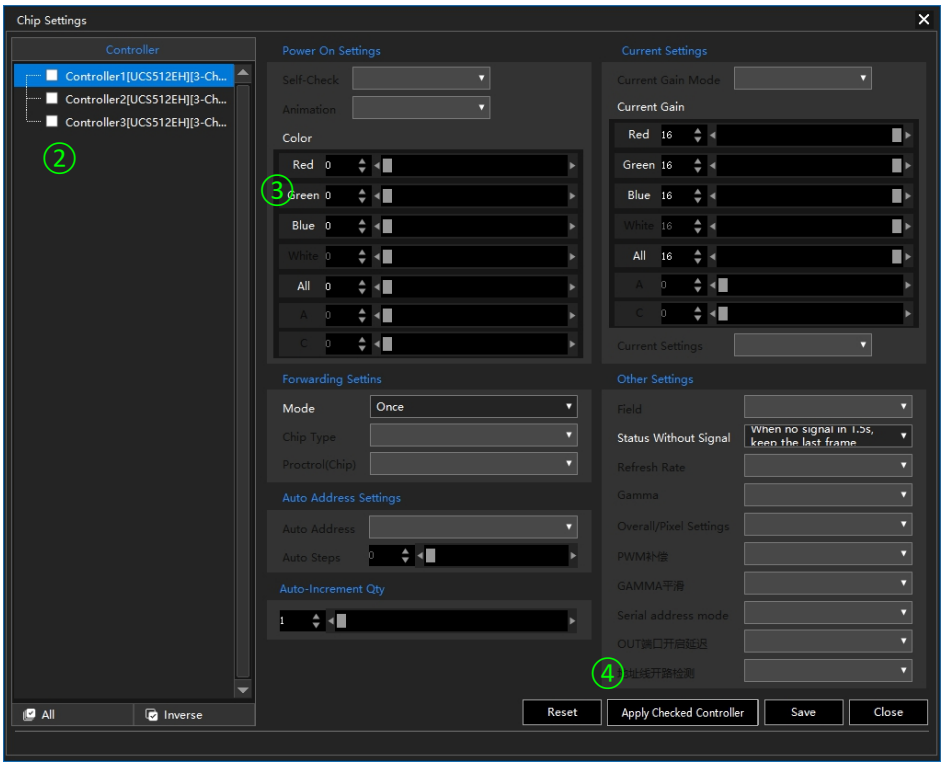
Chip	Addressing	Custom Channel	Set parameters					
			No signal State	Power-on Setting	Current	Forward	Issue	GAMMA
SM16520	√	×	×	×	×	×	×	×
SM16500	√	×	√	√	×	×	×	×
SM17500	√	√	√	√	√	×	×	×
SM17512	√	×	√	√	√	×	×	×
SM17522	√	×	√	√	√	×	×	√
SM18522P	√	×	√	√	√	×	×	√
SM18522PH	√	×	√	√	√	×	×	√
SW-D	√	×	×	×	×	×	×	×
Hi512A0	√	√	×	×	×	×	×	×
Hi512A4	√	×	√	√	×	×	×	√
Hi512A6	√	×	√	√	×	×	×	√
Hi512D	√	×	√	√	√	√	×	√
Hi512E	√	×	√	√	√	√	×	√
TM512AB3	√	×	×	×	×	×	×	×
TM512AL1	√	×	×	×	×	×	×	×
TM512ACx	√	×	×	×	×	×	×	×
TM512AD	√	×	√	√	√	×	×	×
QED512P	√	×	√	√	√	×	×	×
GS8511	√	×	×	×	×	×	×	×
GS8512	√	×	×	×	×	×	√	√
GS8513	√	×	×	×	×	×	√	√
GS8515	√	×	×	×	×	×	√	√

7.1.2.SETTING THE ADDRESSING IN LED PLAYER



1. Click “Quickly Addressing” of Debug, and open the setting windows.
2. Select the controller be set.
3. Set the initial address and segment.
4. Click “Apply Checked Controller” to save.
5. Close and quit.
6. Output and copy the SD card. (Please refer to OUTPUT AND COPY THE SD CARD FILE.)

7.1.3.SETTING THE PARAMETERS IN LED PLAYER



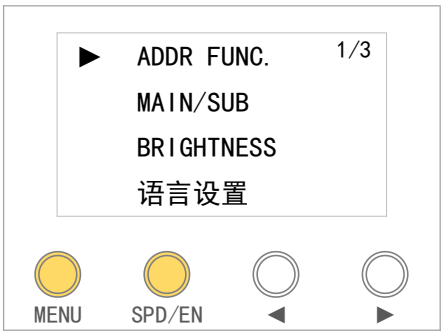
1. Click “Chip” of Settings, and open the setting windows.
2. Select the controller be set.
3. Set the parameters of chip.
4. Click “Apply Checked Controller” to save.
5. Close and quit.
6. Output and copy the SD card. (Please refer to OUTPUT AND COPY THE SD CARD FILE.)

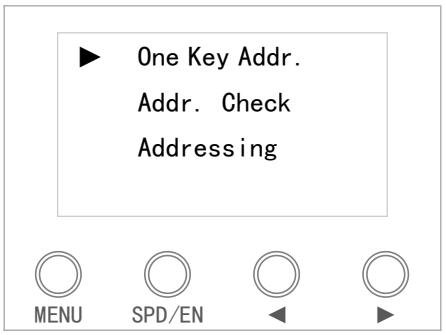
Note: If the chip is not supported setting parameters, it only can be addressed.

7.1.4.OPERATION ON THE CONTROLLER

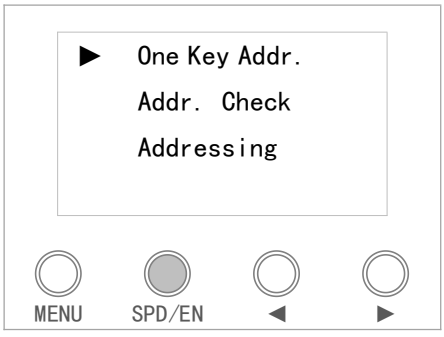
Put into the SD card.

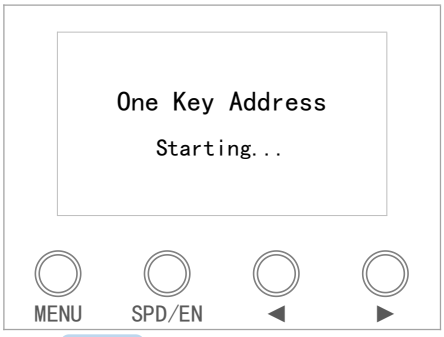
1) Long press “◀” and “▶” together and Power on, the screen shows addressing option.



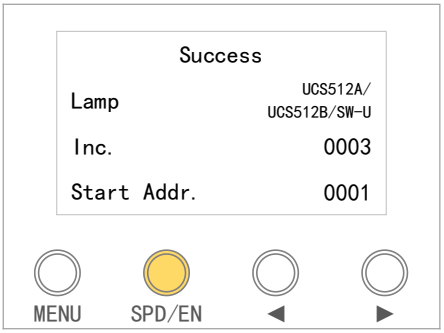


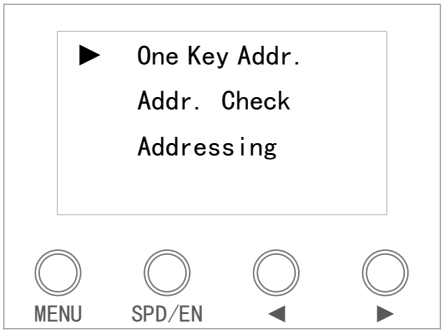
2) Press “SPD/EN” to start addressing.





3) Long press “SPD/EN” to enter the addressing option after the addressing is finished.





Order of setting parameters: Sets self channel value → Writes the parameters of chips → Writes the address of chips

7.2. RAW ADDRESSING

7.2.1.SUPPORTED CHIPS

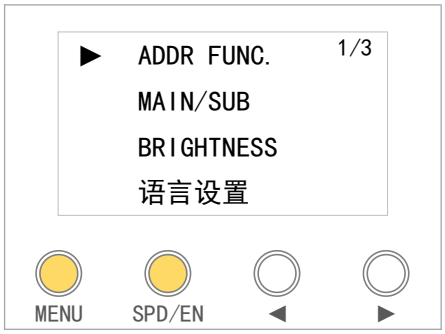
Chip	Address	Custom Channel	Write parameters			
			No signal State	Power-on Setting	Current	Forward
UCS512A	√	×	×	×	×	
UCS512B	√	×	×	×	×	
UCS512C0	√	×	×	×	×	
UCS512C4	√	×	×	×	×	
UCS512D	√	×	×	×	×	
UCS512E0	√	√	×	×	×	
DMX512AP	√	×	×	×	×	
SM16512	√	×	×	×	×	
SM16511	√ (SM16512)	×	×	×	×	
SM16520	√ (SM16512)	×	×	×	×	
SM16500	√	×	×	×	×	×
SM17500	√	√	×	×	×	×
SM17512	√	×	×	×	×	×
SM17522	√	×	×	×	×	×
SW-D	√	×	×	×	×	

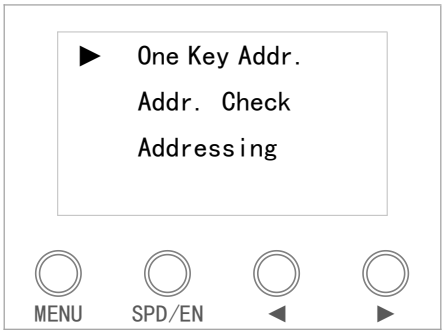
※ The controller will write default values.

7.2.2.ADDRESSING OPERATION

For addressing operations please refer to following example. (Ensure the card is in during complete process.)

1) Long press “◀” and “▶” together and Power on, the screen shows addressing option.

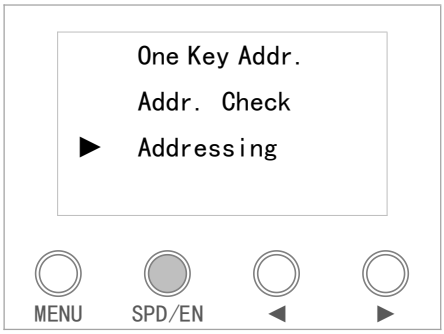


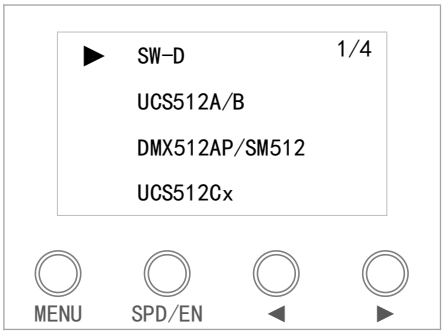


2) Press “◀” and “▶” to select the option.

Press “SPD/EN” to enter the chip selection ***.

Long press “SPD/EN” to return addressing interface.



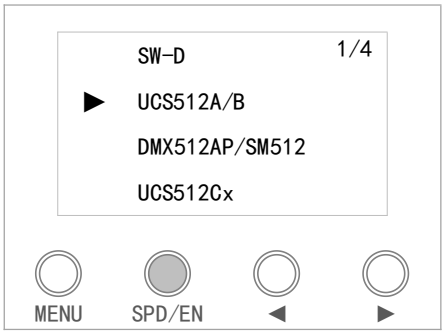


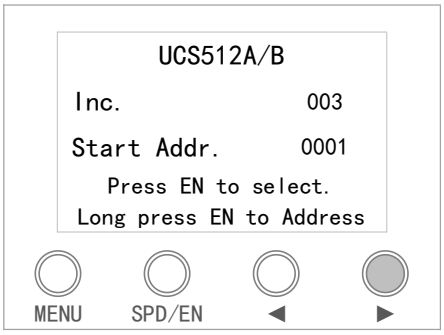
Addressing mode must be consistent with lighting fixture, otherwise the addressing will be invalid.

☺ Press "◀" and "▶" can change the type of chip.

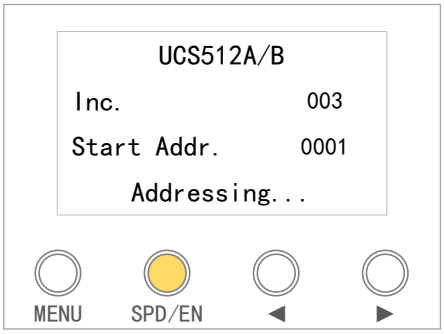
3) Press "SPD/EN" to enter the addressable interface.

Press "SPD/EN" to change the setup, and press "◀" or "▶" to change the value.



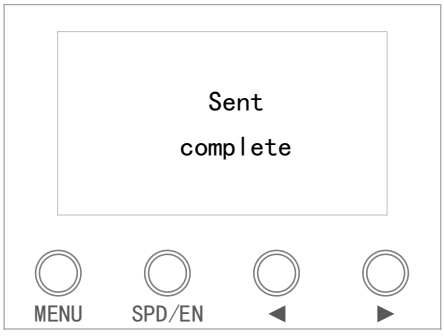


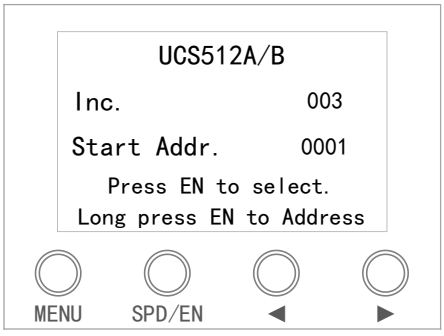
4) Long press "SPD/EN" and send the addressable setup to lighting fixtures.



※ The buttons are useless during sending data.

5) It displays Sent Complete when it is sent out successfully. Then it returns to address set interface. Long press "MENU" to enter the Addr. Check. Operations refer to the "ADDRESSING CHECK" section.





When DMX lighting fixture is addressed successfully, the lighting fixture will glow different colors. Refer to the "SUCCESSFUL ADDRESSING" section for more details.

7) **It has memory function that only need to set the address once.** When the controller and lighting fixture are power on again, controller enters normal control mode and the lighting fixture plays effect properly.

7.3. SUCCESSFULLY ADDRESSED AND SET PARAMETERS

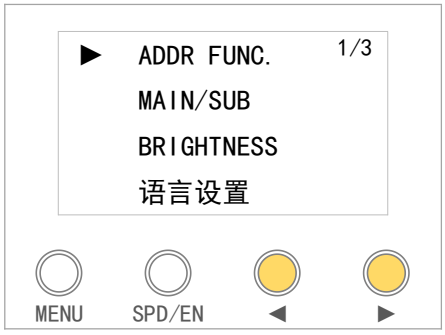
Chip	Lighting color after power on	Addressed		Byte + No signal + No signal		Current parameter		Self-Channel Setting	
		First chip	Other chip	First chip	Other chip	First chip	Other chip	First chip	Other chip
UCS512A	White	Blue	Blue	-	-	-	-	-	-
UCS512A1	White	Blue	Blue	-	-	-	-	-	-
UCS512A2	White	Blue	Blue	-	-	-	-	-	-
UCS512B3	White	Blue	Blue	-	-	-	-	-	-
UCS512C	Custom	White	White	-	-	-	-	-	-
UCS512C0	-	White	White	-	-	-	-	-	-
UCS512C3	Custom	White	White	Red	Red	-	-	-	-
UCS512C4	Custom	White	White	Red	Red	-	-	-	-
UCS512CN	Custom	Yellow	White	Yellow	Power on	-	-	-	-
UCS512D	Custom	Yellow	White	Yellow	Power on	Yellow	Red	-	-
UCS512E0	Custom	Yellow	White	Yellow	Power on	-	-	Yellow	Green
UCS512EH	Custom	Yellow	White	Yellow	Power on	Yellow	Red	Yellow	Green
UCS512G4	Custom	Yellow	White	White (Or custom)	White (Or custom)	White	White	-	-
UCS512G6	Custom	Yellow (Or custom)	White (Or custom)	White (Or custom)	White (Or custom)	White	White	-	-
DMX512AP	-	White	White	-	-	-	-	-	-
SM16512	-	Green	Green	-	-	-	-	-	-
SM16511	-	Green	Green	-	-	-	-	-	-
SM16520	-	Green	Green	-	-	-	-	-	-
SM16500	Custom	Red	Green	Red	Power on	-	-	-	-
SM17500	Custom	Red	Green	Red	Power on	Red	Yellow	Red	Purple
SM17512	Custom	Red	Green	Blue	Blue	Blue	Blue	-	-
SM17522	Custom	Red	Green	Red	Blue	Red	Yellow	-	-
SM18522	Custom	Red	Green	Blue	Blue	-	-	-	-
SM18522PH	Custom	Red	Green	Red	Power on	Red	Yellow	-	-
SW-D	-	Yellow	Green	Red	Power on	Red	Yellow	-	-
Hi512A4	Custom	Red	Green	Red_	Green	-	-	-	-
Hi512A6	Custom	Red	Green	Red	Green	-	-	-	-
Hi512A0	-	White	White	-	-	-	-	-	-
Hi512D	-	Red	Green	Green	Green	Green	Green	-	-
Hi512E	-	Red	Green	Green	Green	Green	Green	-	-
TM512AB3	White	Blue	Blue	-	-	-	-	-	-
TM512AL1	White	Blue	Blue	-	-	-	-	-	-
TM512AC0	-	White	White	-	-	-	-	-	-
TM512AC2	Custom	White	White	-	-	-	-	-	-
TM512AC3	Blue	White	White	-	-	-	-	-	-
TM512AC4	Blue	White	White	-	-	-	-	-	-
TM512AD	Blue	Yellow	White	Yellow	Power on	Yellow	Red	-	-
GS8512	Custom	Red	Cyan	-	-	-	-	-	-
GS8513	Red+Cyan	Red	Cyan	-	-	-	-	-	-
GS8515	Red+Cyan	Red	Cyan	-	-	-	-	-	-

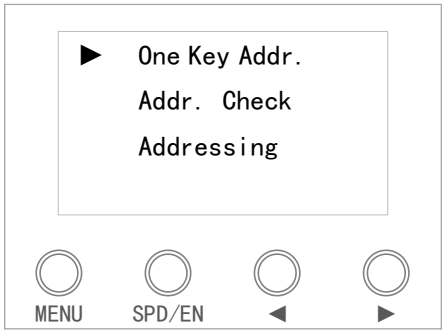
7.4. ADDRESSING CHECK

Light up the appointed DMX lighting fixture to verify the address. The Operations are as below.

1) Method 1,Long press “SPD/EN” to return addressing selection interface after addressing completed.

Method 2, Long press “◄” and “►” together to power on.

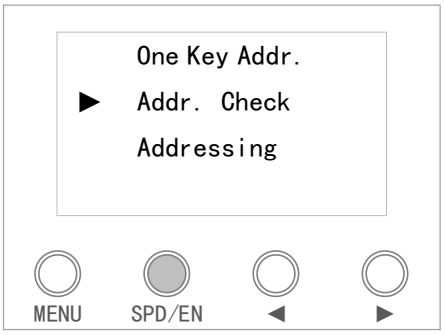


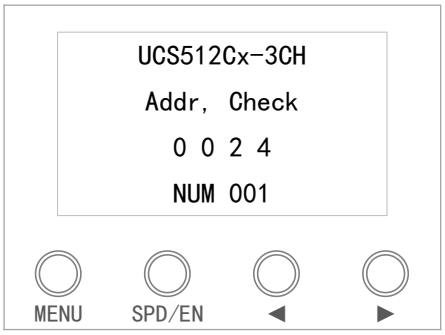


2) Press “◄” and “►” to select “Addr.Check”, and press “SPD/EN” to enter.

“0024” shows the latest data. If need to change it, please long press “SPD/EN” to return to address set interface, operations refer to “ADDRESSING OPERATION”.

Press “◄” and “►” to set the number of lighting fixture which to be lighted up. It will light up in white when loosen the button.



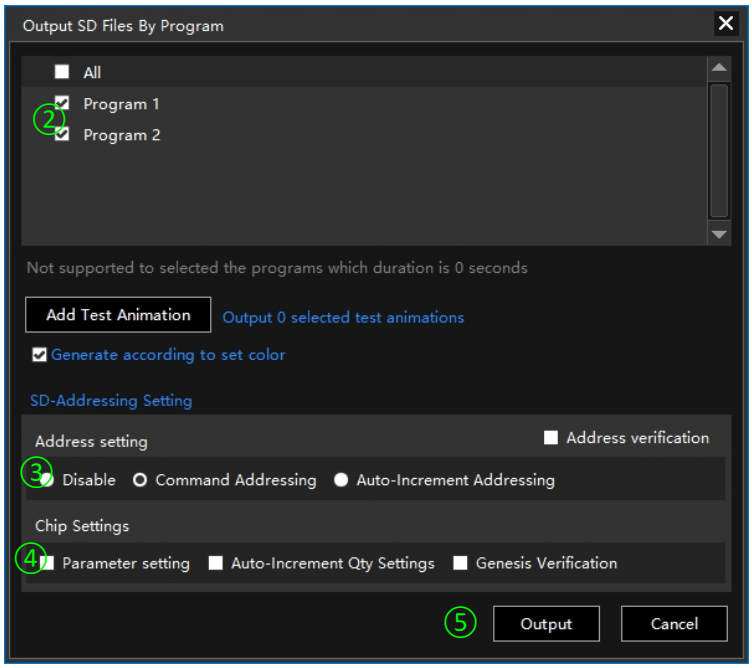


Tips: It can switch quickly by long pressing “◄” or “►”.

3) Long press “MENU” or power-off the controller to quit the check.

8. OUTPUT AND COPY THE SD CARD FILE

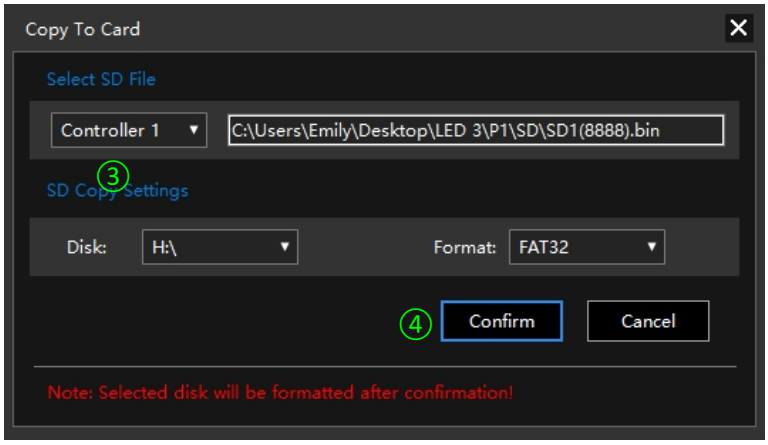
8.1. OUTPUT THE SD CARD FILE



1. Click “SD” of Output, and open the windows.
2. Select the program be out-put.
3. Select the addressing setting.
4. Select the chip settings.
5. Click Output.

Note: please don’t select the addressing setting and chip settings if no address and parameters need to be set.

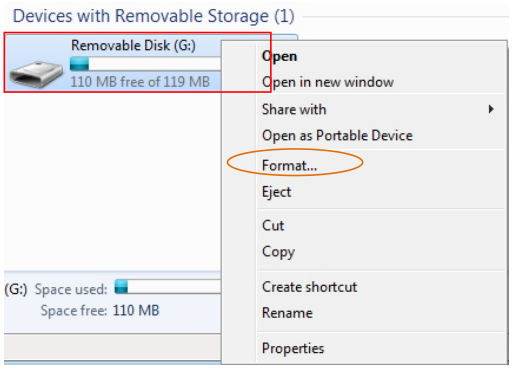
8.2. COPY THE SD FILE BY LED PLAYER



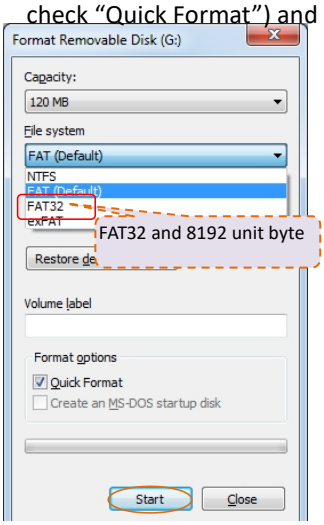
1. Input the SD card.
2. Click “Copy to SD” of Output, and open the windows.
3. Select the controller number be copied.
4. Click Confirm.

8.3. MANUAL FORMAT AND COPY CARD

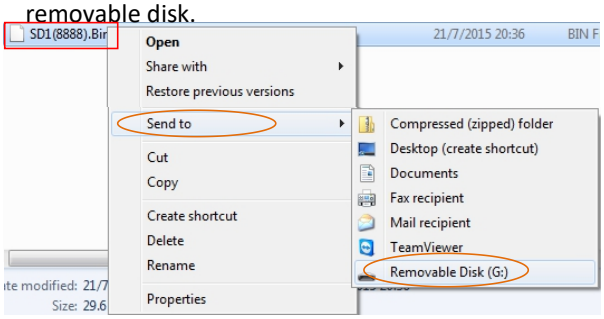
1) Right click the disk where the SD card locates.



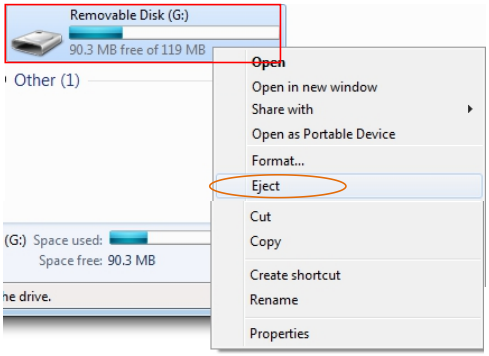
2) Select FAT32 and 8192 unit byte (can check “Quick Format”) and click START.



3) Right click SD1(8888).Bin file, send the file to removable disk.



4) Right click removable disk and click “Eject”.



9. FITTINGS

Shows	Item	Number	Remark
	SD Card	1	
	Power line	1	
	Cat5E (T568B to T568B)	1	Selected
	GPS Antenna	1	Only use with corresponding functions.