CYT-LED Dotcolor® Controller

Basic Functions

- Single-line data input transmission mode
- 16-ports data output
- Each port supports 512 pixels.
- Adopt Manchester encoding
- Work with SD card
- Supporting video editing software

Product Application

- Decorative lighting
- Advertisement signboard
- Neon light substitute
- Christmas lights
- RGB decorative string

Order Information

| Model	Content	MPQ
CYT9000	CYT9000 controller; SD card video editing software	1 set

Product Description

CYT9000 Dotcolor® controller is a control system developed for LED spot light source and mainly aims at neon light substitute scheme, advertisement signboard and other market applications.

CYT9000 Dotcolor® controller adopts single-line data transmission mode, support CYT3000 series of single-line data transmission IC and visualized graph editing function.

CYT9000 is a full-color spot light source off-the-computer controller with high function/price ratio during CYT Dotcolor® controller series. This controller has 16 port outputs. Each port can control 512 pixel points, so total 8,192 pixel points can be controlled, with port differential signal output. This controller supports CYT single-line series LED driven IC, such as CYT3005, CYT3006, CYT3007, CYT3008, etc.

Use CYT video editing software to complete various kinds of heterogenic spot light source screen projects. CYT9000 can play various flash animations and are mainly used for building lighting, bar, dance hall, billboard and other decorations.
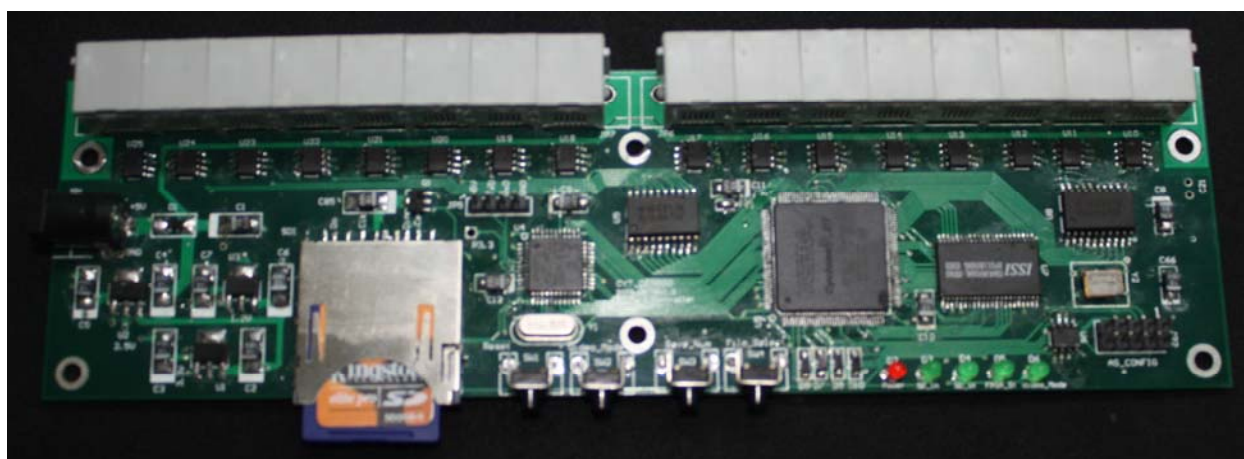
Application Principle

LED Dotcolor® technology is the application of a kind of product starting from the application of single pixel. Based on minimum trichromatic principle, its future applications will be broad.

Three primary colors refer to red, green and blue, their corresponding wavelength is 625nm, 546nm and 435nm respectively, which are called as primary colors, namely the basic colors used for mixing other colors. Three primary colors are usually divided into two categories, one category refers to three primary colors of color, and the other refers to three primary colors of pigment. Red, green and blue are usually defined as three primary colors of color. CYT®Dotcolor® technology, according to the addition principle of three primary colors of color, has developed and designed the dedicated chip and driven R, G and B LED to form high-quality image.
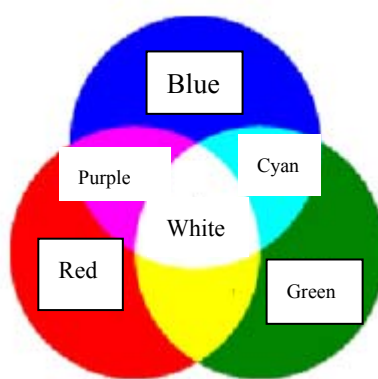
Work Mode

SD card works out of computer and supports 128M-2G SD card.

SD card can save many video files. The naming rule is that SD card can support 8 video files at most for all Chinese characters; and support as much as 16 video files for Chinese Pinyin, figures or letters. Suffix string of video description is .CYT

SD card must be formatted as FAT16 (Note: Select FAT during formatting) file system. Write in order. Do not write many video files simultaneously. It's allowable to directly delete files or modify file name in SD card. But the file number to be read may be increased or decreased due to different name characters of file name. If the written effect is not played, please format SD and then write in files.

The naming rule is shown as the diagram below:

Operation Interface
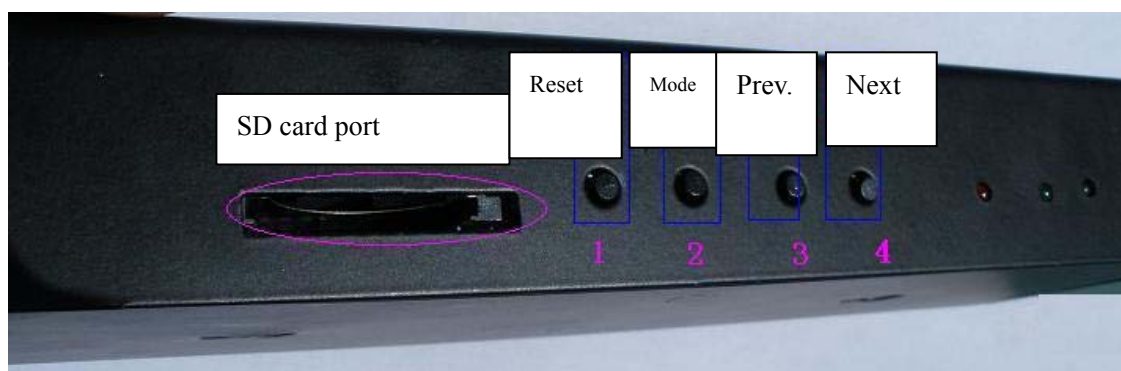
1. Reset key

2. Mode key: Press this key and loosen it, two video play modes switch;

　　　　　　　Mode indicator light on: Multi-file circulation play mode;

　　　　　　　Mode indicator light off: Single-file circulation play mode

3. Select previous file, press key to select previous file output;

4. Select next file, press key to select next file output.

Status Indication

1. Power indicator light;
2. SD_IN, read SD card status indicator light;
3. Port transmission status indicator light;
4. Video file play mode indicator light;

　　Mode indicator light on: Multi-file circulation play mode;

　　Mode indicator light off: Single-file circulation play mode.

Output Port Connection

Output connection port adopts RJ11 telephone line wiring terminal for connection, with differential signal output. The first pixel point needs to adopt RS485 differential reception mode. For differential transmission, the distance between pixel point and controller reception is longer, enough output driven ability is required. CYT9000 output differential signal works at 5V, and connection CYT3000 series is 3.3V input. Keep in mind that it's required to obtain 3.3V voltage via partial pressure.
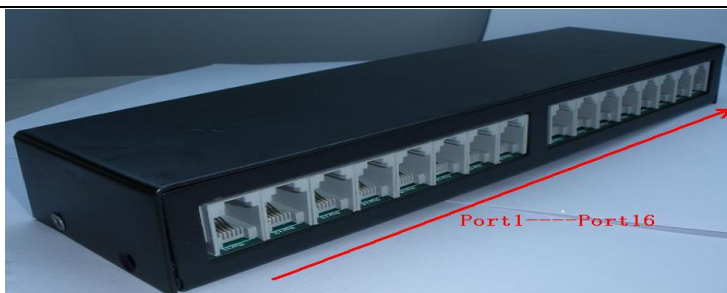
1. Port array: 16 ports are Port1------Port16 in order from left to right. Light ribbon shall correspond to the port set according to the software of upper computer.

2. Definition of Port Signal

Port pins are shown as follows from left to right:

  (1) Suspension, without connection;

  (2) GND, need common ground for non differential transmission, use No.2 and No.4 pins, or No.4 and No.5 pins;

  (3) RS485_B, select common ground for differential transmission, use No.2, No.3 and No.4 pins; or No.3, No.4 and No.5 pins; or No.2, No.3, No.4 and No.5 pins;

  (4) RS485_A, select common ground for differential transmission, use No.2, No.3 and No.4 pins; or No.3, No.4 and No.5 pins; or No.2, No.3, No.4 and No.5 pins;

  (5) GND, need common ground for non differential transmission, use No.2 and No.4 pins, or No.4 and No.5 pins;

  (6) Suspension, without connection.

3. Plug Pressing Methods

Select differential or non differential output according to the input distance of controller and pixel point. Difference supports 100m, but non-difference is suggested within 1m. Plug pressing order is made according to the above Article 2 and port signal definition. Note: please do not plug or unplug when light source and controller electrify so as to avoid damaging the devices at port.

Frequently Asked Questions

1. When power indicator light is off, please inspect whether AC power supply is electrified, DC power 5V output is normal, and LED indicator light is damaged or not;

2. SD_IN indicator light is off, which indicates no SD card;

3. Card-reading indicator light flashes at intervals, which indicates wrong card reading. Please inspect whether SD card is FAT16 file system format;

4. If the indicator light for port status is off, please press Reset key, and observe whether the indicator lights at two statuses flash. One status represents the working status of main device, and the other represents the working status of reading card. Flash indicates normal working status. SD card is FAT16 file format.

Transmission of Pixel Pitch

The maximum characteristic of the application of spot light source is that the variation range of pixel pitch is larger which leaves creative space for designers. Make different pixel pitches according to the requirements of the project. CYT3005 can directly drive the pixel pitch with 6m long. 6m distance is actual test distance, but a longer distance requires designer to consider actually again. Overlong transmission distance will influence transmission quantity of single-line pixel point. Clients need appropriate adjustment according to different projects. The closer the pixel pitch is, the more reliable the data transmission is.
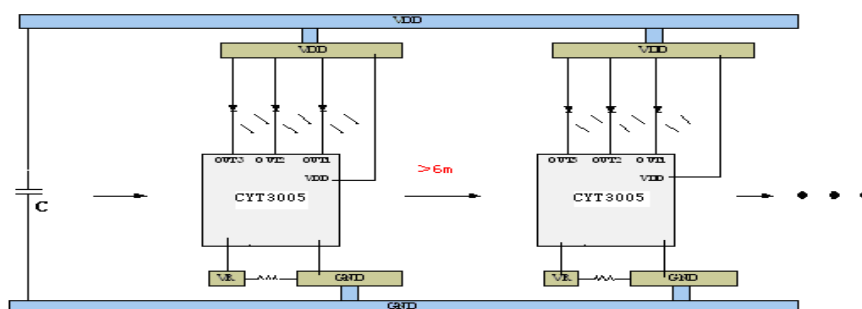
During engineering application, we will use longer transmission distance, like several tens of meters even a hundred meters. CYT3005 is unable to realize such long transmission distance, so we recommend RS-458 differential transmission mode, Maxim MAX3486 differential transmission speed is 2.5Mbps, which can meet the demand of CYT3005 transmission speed. CYT3005 data output is 3.3V amplitude value, MAX3486 is also 3.3V differential mode, and voltage value is also matching.
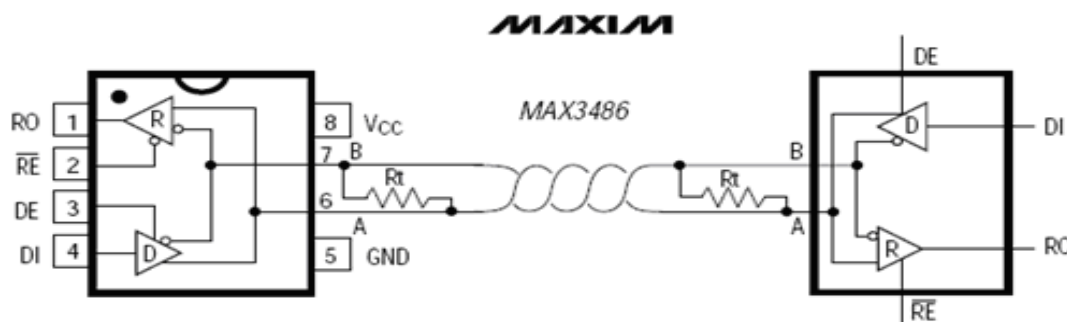

RS-485 is multi-point communication standard made by Electronic Industries Alliance (EIA) by taking balance twisted pair as transmission line. It adopts differential signal for transmission, the maximum theoretical transmission distance can reach 500m, and the actual measurement 100m is reliable. Minimum sensitivity of receiver can reach ±200 Mv, and the maximum transmission rate can reach 2.5 Mb/s.

As can be seen from the diagram, both structure and pin of MAX3486 chip are very simple, and internal MAX3486 chip contains a driver and a receiver. CYT3005 output OUT1 directly connects to MAX3486 input DI. Differential A and B ultra-five twisted pairs connect between two MAX3486. /RE and DE ends are the receiving and sending function ends respectively. When /RE is logic 0, the device is in the stage of receiving; and when DE is logic 1, the device is in the state of sending. Because MAX3486 works in the half-duplex state,

A and B ends are the receiving and sending differential signal ends respectively. When electrical level of A pin is higher than that of B pin, the sent data is 1; and when electrical level of A pin is lower than that of B pin, the send data is 0. Wiring at connection is vey simple. You only need a signal to control the receiving and sending of MAX3486. Meanwhile, add the matched resistance between A and B ends. The resistance of 120 Ω is generally selected. MAX3486 output and CYT3005 input INI access, and long-distance transmission design is declared to be completed.
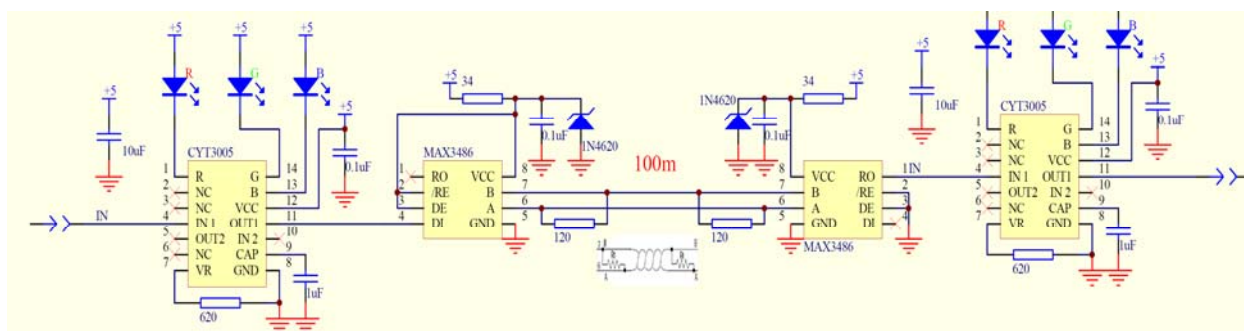
Device List

No.	Model	Name	Parameters	Qty.	Brand/Remarks
1	CYT3005	IC	CYT3005B SOP14	2	CYT
2	MAX3486	Differential transmission IC	MAX3486CSA SO8	2	Maxim
3	-	Electrolytic capacitor	10uF 100V ±20%	2	-
4	-	Ceramic capacitor	0.1uF 50V ±10% X7R 0805	4	Guoju
5	-	Ceramic capacitor	1uF 50V ±10% X7R 0805	2	Guoju
6	-	Resistance	34 ±5% 1/8W CF 0805	2	Guoju
7	-	Resistance	120Ω ±5% 1/8W CF 0805	2	Guoju
8	-	Resistance	620Ω ±1% 1/8W MF 0805	2	Guoju
9	1N4620	Zener diode	IN4620UR 3.3V DO-213AA	2	-
10	R、G、B	LED	-	-	-

Power Consumption

Internal working voltage: DC 5.0V
Max. power consumption: AC 5W

Power Adapter CYT5V5W-1L

Power Specifications			
Secondary Parameters OUTPUT	Output DC voltage	DC VOLTAGE	5V
	Rated current	RATED CURRENT	1A
	Rated power	RATED POWER	5W
	Range of current	CURRENT RANGE	0-1A
	Ripple and noise	RIPPLE &NOISE	$7V^{p-p}$
	Current test value	CURRENT ADJ.RANGE	1.A
	Voltage error scope	VOLTAGE TOLERANCE	±5%
	Line regulation rate	LINE REGULATION	3.00%
	Load regulation rate	LOAD REGULATION	5%
	Setting time	SETUP TIME	1000ms/230VAC, 2000ms/115VAC at full load
Primary Parameters INPUT	Input voltage range	VOLTAGE RANGE	90V-264VAC
	Frequency range	FREQUENCY RANGE	47-63Hz
	Efficiency	EFFICIENCY(TYPE)	65.00%
	AC input current	AC CURRENT	0.04A/115VAC,0.02A/230VAC
	Excitation surge (max.)	INRUSH CURRENT (Max.)	2A/230VAC
	Leakage current	LEAKAGE CURRENT	<0.75mA/240VAC

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Power Protection			
Protection	Over-current protection	OVER CURRENT	105-115%
			Protection type: constant current limiting, recovers automatically after fault. Recover automatically after removing over current.
	Short-circuit protection	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed. Recover automatically after removing short circuit.
	Over-voltage protection	OVER VOLTAGE	Protection type: shut down o/p voltage, re-power on to recover. Recover automatically after removing over voltage.
			57-63v，
ENVIRONMENT Parameters	Working temperature	WORKING TEMP.	-30-+70℃(Refer to output load derating curve)
	Working humidity	WORKING HUMIDITY	20-95% RH non-condensing
	Storage temperature & humidity	STORAGE TEMP. ,HUMIDITY	-40-80℃,10-95%RH
	Temperature coefficient	TEMP. COEFFICIENT	0.03%/℃(0-50℃)
	Anti-vibration	VIBRATION	10-500Hz,2G 12min./1cycle,period for72min. Each alongX,Y,Z axes
SAFETY &EMC	Safety standards	SAFETY STANDARDS	-40℃-+80℃,10-95%RH
	Insulation level	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:1.88KVAC O/P-FG:0.5KVAC
	Insulation resistance	ISOLATION RESISTANCE	I/P-O/P,I/P-FG,O/P-FG:100M Ohms/500VDC/25℃/70%RH
	EMC Standards	EMI CONDUCTION	Compliance to EN55015 ClassB
	Harmonic current	HARMONIC CURRENT	Compliance to EN61000-3-2 ClassC(≧25W);EN61000-3-3
	Environmental standards	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11;ENV50204,EN61547,light indutry
OTHERS		MTBF	
		DIMENSION	72*56*35mm(L*W*H)
		PACKING	
Each parameter is measured at 230Vac, rated load and ambient temperature 25℃. ALL parameters NOT specially mentioned are measured at 230vac,rated load and 25℃ of ambient temperature			

List of Sales Products

No.	Model	Name	Parameters		Qty.	Brand/Remarks
1	CYT9000	Dotcolor® controller	CYT3005B	SOP14	1	CYT
2	-	SD memory card			1	-
3	CYT5V5W-1L	Power adapter	5V，1A		1	CYT
4	-	Instructions for use	E-record		1	CYT

Product Application Statement

1. Shenzhen CYT IC Design Co. Ltd. reserves the right to update the product specifications in the future.

2. Product information is renewed without prior notice.

3. Changyuntong®, CYT® and Dotcolor® are the registered trademarks of Shenzhen CYT IC Design Co. Ltd. and are protected by law.

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