

# **DCS2.0-2C003W-5PS**

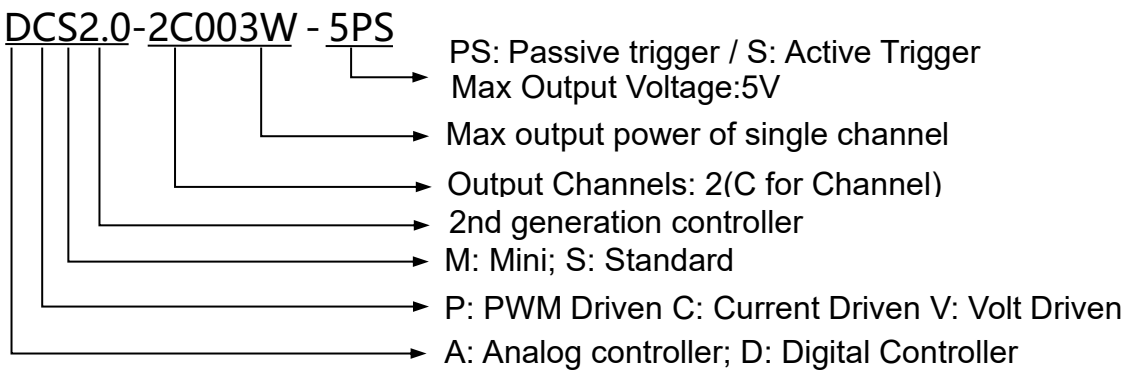
Machine vision light controller operating instructions

# Content

|   |    |
|---|----|
| 1. Controller Classification and Naming ..... | 1  |
| 2. Specifications .....                       | 2  |
| 3. Main Fuctions .....                        | 3  |
| 4. Instructions and Operations .....          | 4  |
| 5. Outline and Dimensions .....               | 12 |
| Accessory List .....                          | 13 |

# 1. Controller Classification and Naming

DCS2.0-2C003W - 5PS



Input Voltage of Standard Controller: AC 100~220V

Input Voltage of Mini Controller: DC 24V

PS (Passive trigger): Input level signal to the controller trigger channel from outside for external trigger control.

S (Active Trigger): Externally trigger the channel switch to ON / OFF (open circuit or short circuit triggers the channel pins).

## 2. Specifications

| Features                               | Values                                     | Description   |
|--|--|---|
| Control Mode                           | constant current                           | /   |
| Input Voltage                          | 100-220V                                   | /   |
| Output voltage                         | DC 5V                                      | /   |
| Channels                               | 2  | /   |
| Manual Control                         | yes  | Adjusted by pressing the key  |
| Remote Control                         | yes  | Adjusted by upper computer software   |
| Brightness Level Memory                | Auto                                       | Automatic memory starts in 8s after adjustment  |
| RS232 Baud rate                        | 9600                                       | /   |
| Adjustable Brightness Level            | 255 levels                                 | Long Press for rough adjustment; Short Press for subtle adjustment; Upper computer software control is available. |
| Maximum output power of single channel | 3 W  | /   |
| External triggering mode               | Passive trigger or high/low level trigger. | Valid trigger voltage range: DC 5-24V   |
| External trigger delay time            | H, ON→OFF <60us                            | H: high level trigger;<br>L: low level trigger;<br>ON and OFF represent the on and off state of LED light.        |
|  | H, OFF→ON <60us                            |   |
|  | L, ON→OFF <60us                            |   |
|  | L, OFF→ON <60us                            |   |
| External trigger frequency             | <1/T                                       | Determined by light flashing frequency, if T= 1ms, the maximum external trigger frequency is 1KHz.                |
| Working condition                      | Temp: -10~50°C                             | /   |
|  | Humidity: 20~80%                           | /   |
| Standby power                          | <1W  | /   |
| Product dimension                      | 128 * 85 * 158mm                           | L * W * H   |
| Weight                                 | 0.9kg                                      | /   |

### **3. Main Functions**

#### **◆ Manually Control Brightness Levels**

Channel switching is performed via the "CH" button on the panel. Pressing the "▼" or "▲" button to decrease or increase the brightness level.

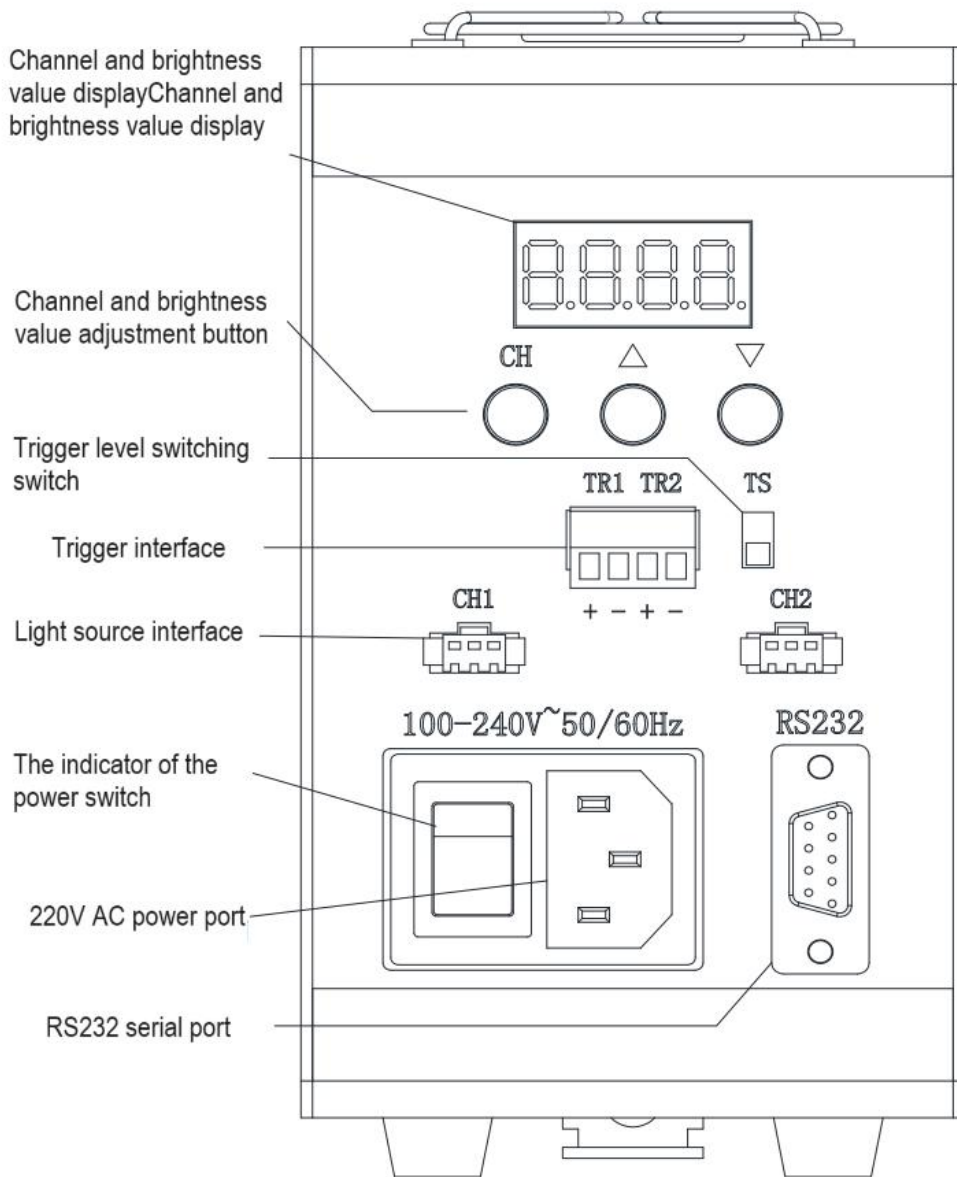
#### **◆ Remotely Control Brightness Levels**

RS232 communication port connects the controller to upper computer. On the upper computer, the brightness levels of each channel can be easily set, and the present brightness levels can also be read and displayed. At the same time, the ON/OFF button of the application on the computer can be used to turn on/off the light.

#### **◆ Brightness Level Memory**

8 seconds after adjusting the brightness level of each channel with the keys on controller panel or upper computer application, the controller automatically starts to record the brightness level of each channel, and the record will not be lost even when power failure happens.

## 4. Instructions and Operations:

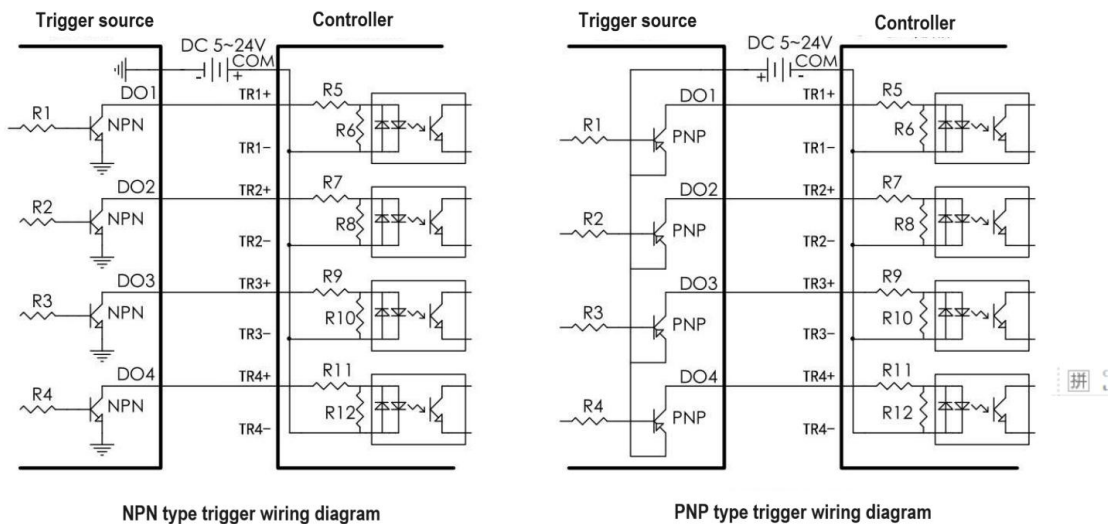


The display adopts a four-in-one digital tube, the first digit indicates the channel number, which can be cut by pressing the "CH" button change the channel number to be set; The last three digits indicate the brightness level of the corresponding channel. The display range is 000-255 (decimal) .

## 4.1 Controller terminal definition

- "CH" : Channel switching button.
- "▼" : To decrease the brightness level, 000 stands for the lowest level.
- "▲" : To increase the brightness level, 255 stands for the highest level.
- "TS" : Trigger mode switch. When the light is in constant ON mode the switch is on TS side, the light will be turned off as the high level triggers and gives a signal; If switched to the other side, and the light is in trigger mode (OFF state), the light will be turned on when t the high level triggers and gives a signa.
- CH 1: the first output channel port.
- CH 2: the second output channel port.
- RS232: communication port.
- TR1+ and TR2+ : are CH1 and CH2 trigger signal cable ports respectively.
- TR1-, TR2- : indicates the internal communication and are the public ends of trigger signal cables. Common end polarity is different, wiring side.

**The method is different. The wiring diagram is as follows:**



## ➤ 4.2 Manual Operation

- "CH" : Channel switching button.
- "▼" : To decrease the brightness level, 000 stands for the lowest level.
- "▲" : To increase the brightness level, 255 stands for the highest level.

The "CH" button is for switching different channels. Each time you press it, the digital displaying number will be automatically increased by 1. (if the present number is 2, the displaying number will return to 1 when pressing the CH button again).

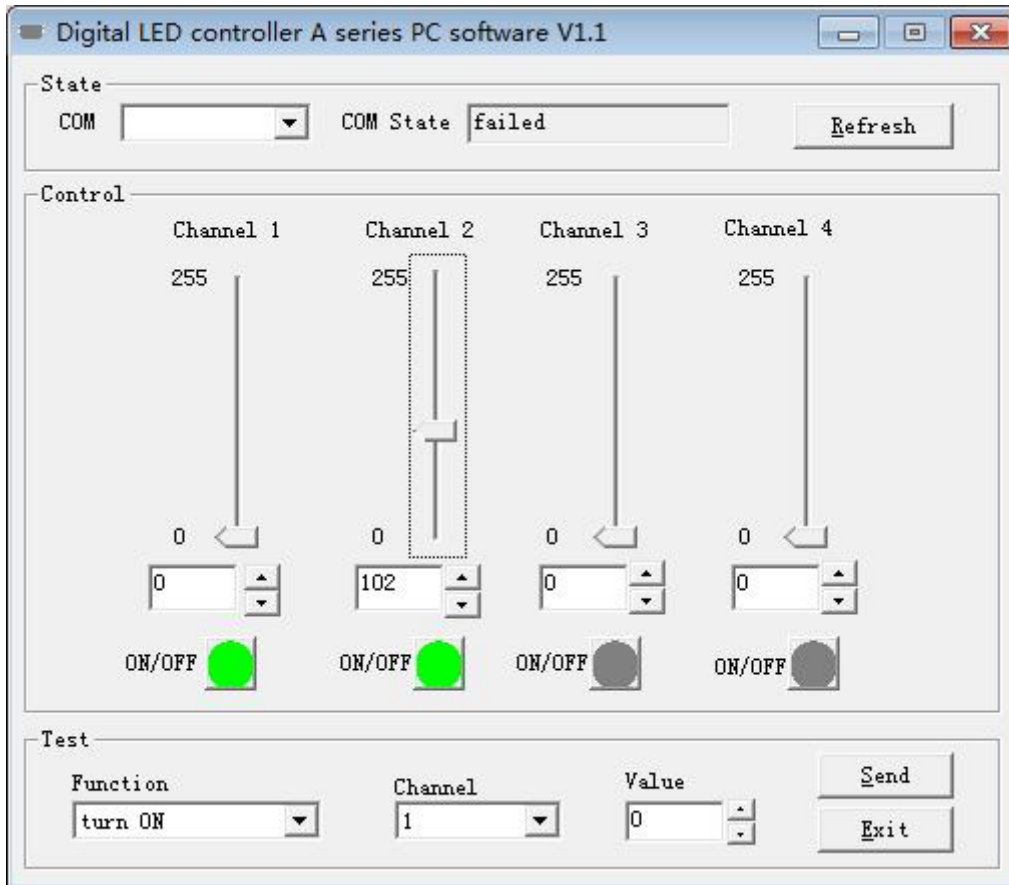
After selecting a channel, the brightness level of the channel can be adjusted continuously (decrease or increase) by short pressing the "▼" or "▲" button. If long pressing the "▼" or "▲" button, the brightness level of the channel will be roughly changed (10 brightness levels each long press).

The controller has brightness memory function and the memory is saved for power failure. It automatically starts to record in 8S after each brightness adjustment. Every time when you recharge the controller, it displays the last channel number and the brightness level when power off.

## **4.3 Remote Operations**

(1). Open the executable file "Controller upper computer software\VC routines\debug\DPS.exe", and the following interface pops up:





upper computer software for digital LED controller of A series

## (2). Interface Introduction

### ◆ Communication status bar

- COM: Selecting COM port for the controller connection.
- State : Communication status bar, showing whether the controller is successfully connected to the computer.  
Failed: connection failed.  
Succeed: connection succeed.
- Refresh: Refreshing the current communication status of the serial port.

◆ **Brightness control bar**

- Channel X (X=1, 2, 3, 4) : Indicating the controlled channel number
- 0-255: brightness level adjustment range, the brightness level can be adjusted by dragging the slider.

- ◆ Communication information: Display the control instructions sent by the host computer to the controller, and the corresponding return received value.

◆ **4.4 Communication Protocol**

Hardware Specifications

| Baud Rate | Byte Length | Stop Bit | Parity Check |
|-----------|-------------|----------|--------------|
| 9600 bps  | 8 bits      | 1 bit    | /            |

Data format (frame format)

| 1 Bit                | 1 Bit             | 1 Bit             | 3 Bit | 2 Bit              |
|----------------------|-------------------|-------------------|-------|--------------------|
| Particular character | Command character | Channel character | Data  | XOR/AND Check word |

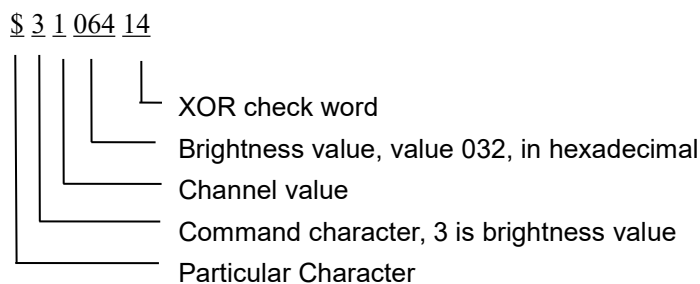
**PS: All communication bytes are in ASCII code**

- ◆ Particular character = \$
- ◆ Command character = 1, 2, 3, 4. **Definition:**
  - 1: Turn on the corresponding channel
  - 2: Turn off the corresponding channel
  - 3: Set parameters of the corresponding channel brightness
  - 4: Read parameters of the corresponding channel brightness

When the command character is 1, 2 or 3, if the controller receives the command successfully, a particular character \$ will be returned; While failed, & will be returned.

When the command character is 4, if the controller receives the command successfully, the brightness setting parameters of the corresponding channel will be returned (the return format is the same as the sent format); While failed, & will be returned.

- ◆ **Channel Character 1, 2, 3, 4 represent 1 to 4 channels.**
- ◆ **Value = 0XX (XX = any value within 00 to FF), corresponding to the setting parameter of the channel power supply, with the high bit ahead and the low bit after.**
- ◆ **XOR/AND Check word = the XOR checksum of the characters excluded particular characters, command characters, channel character and number. With the ASCII code of the higher half-byte of the checksum preceding and the ASCII code of the lower half-byte following.**
- ◆ **E.g. Set the 1st channel brightness to 100, then write "\$3106414" in ASCII code down:**



The procedure of the XOR check word algorithm is as follows:

|                      | String |   | ASCII Code | ASCII code in hexadecimal |    | Higher half-byte and Lower half-byte data in 8421 code |           |
|----------------------|--------|---|------------|---------------------------|----|--|-----------|
| Particular Character | \$     |   | 36         |                           | 24 |  | 0010 0100 |
| Command Character    | 3      | → | 51         | →                         | 33 | →  | 0011 0011 |
| Channel Character    | 1      |   | 49         |                           | 31 |  | 0011 0001 |
| Value                | 0      |   | 48         |                           | 30 |  | 0011 0000 |
|                      | 6      |   | 54         |                           | 36 |  | 0011 0110 |
|                      | 4      |   | 52         |                           | 34 |  | 0011 0100 |
| XOR AND              |        |   |            |                           |    |  | 0001 0100 |
| XOR Check Word       |        |   |            |                           |    |  | 1 4       |

**PS:** During turning on/off the corresponding channel power and reading out the 3 functions of XOR check word algorithm of the channel power parameters, the 3 bytes of the value has no effect on the XOR results, and it is fine if the format remains 0XX (XX=any value within 00 to FF).

The following forms are different sets of experimental data, if users write their own Demo program, they can refer to the following data for comparison test.

2<sup>nd</sup> channel OFF: \$220291f

|                      | String |   | ASCII Code | ASCII code in hexadecimal |    | Higher half-byte and Lower half-byte data in 8421 code |           |
|----------------------|--------|---|------------|---------------------------|----|--|-----------|
| Particular Character | \$     |   | 36         |                           | 24 |  | 0010 0100 |
| Command Character    | 2      | → | 50         | →                         | 32 | →  | 0011 0010 |
| Channel Character    | 2      |   | 50         |                           | 32 |  | 0011 0010 |
| Value                | 0      |   | 48         |                           | 30 |  | 0011 0000 |
|                      | 2      |   | 50         |                           | 32 |  | 0011 0010 |
|                      | 9      |   | 57         |                           | 39 |  | 0011 1001 |
| XOR AND              |        |   |            |                           |    |  | 0001 1111 |
| XOR Check Word       |        |   |            |                           |    |  | 1 f       |

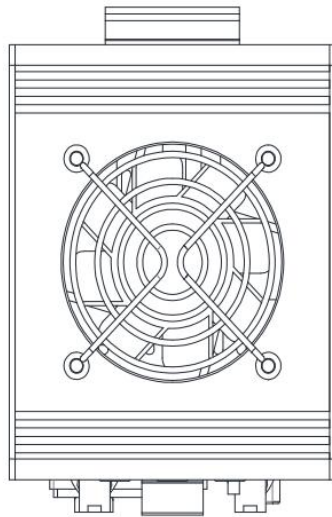
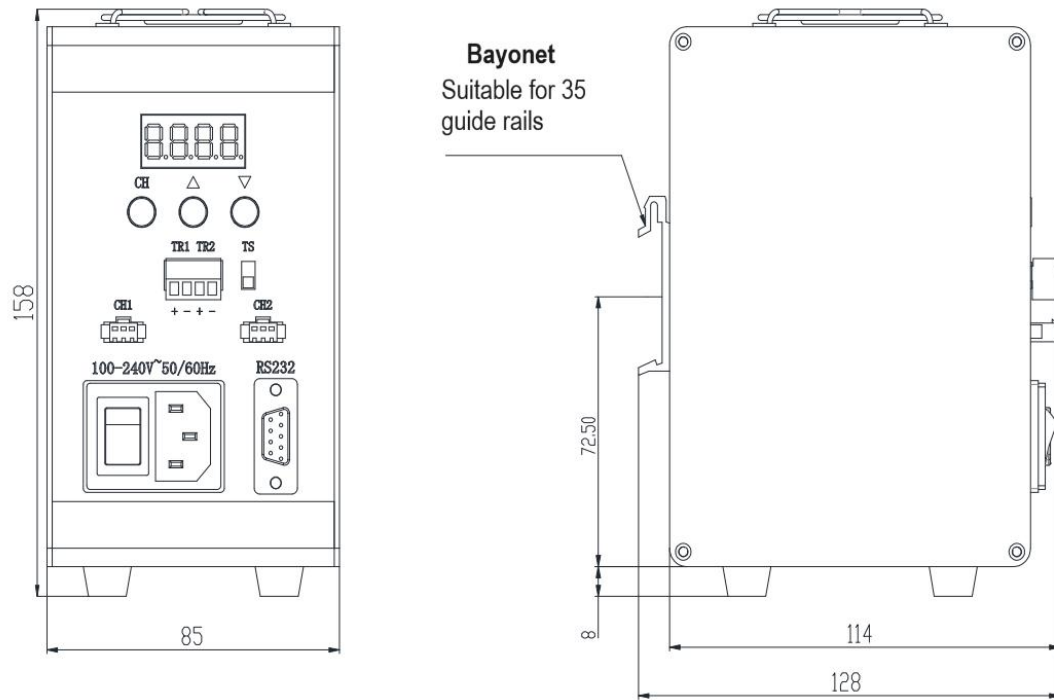
3<sup>rd</sup> channel ON: \$1306414

|                      | String |   | ASCII Code | ASCII code in hexadecimal |    | Higher half-byte and Lower half-byte data in 8421 code |           |
|----------------------|--------|---|------------|---------------------------|----|--|-----------|
| Particular Character | \$     |   | 36         |                           | 24 |  | 0010 0100 |
| Command Character    | 1      | → | 49         | →                         | 31 | →  | 0011 0001 |
| Channel Character    | 3      |   | 51         |                           | 33 |  | 0011 0011 |
| Value                | 0      |   | 48         |                           | 30 |  | 0011 0000 |
|                      | 6      |   | 54         |                           | 36 |  | 0011 0110 |
|                      | 4      |   | 52         |                           | 34 |  | 0011 0100 |
| XOR AND              |        |   |            |                           |    |  | 0001 0100 |
| XOR Check Word       |        |   |            |                           |    |  | 1 4       |

Reading 2<sup>nd</sup> channel power parameters: \$4206410

|                      | String |   | ASCII Code | ASCII code in hexadecimal |    | Higher half-byte and Lower half-byte data in 8421 code |           |
|----------------------|--------|---|------------|---------------------------|----|--|-----------|
| Particular Character | \$     |   | 36         |                           | 24 |  | 0010 0100 |
| Command Character    | 4      | → | 52         | →                         | 34 | →  | 0011 0100 |
| Channel Character    | 2      |   | 50         |                           | 32 |  | 0011 0010 |
| Value                | 0      |   | 48         |                           | 30 |  | 0011 0000 |
|                      | 6      |   | 54         |                           | 36 |  | 0011 0110 |
|                      | 4      |   | 52         |                           | 34 |  | 0011 0100 |
| XOR AND              |        |   |            |                           |    |  | 0001 0000 |
| XOR Check Word       |        |   |            |                           |    |  | 1 0       |

## 5. Outline and Dimensions



### Accessory List

| <b>Item</b>                   | <b>Quantity<br/>(unit)</b> | <b>Remark</b> |
|-------------------------------|----------------------------|---------------|
| DCS2.0-2C003W-5PS Controller  | 1                          |               |
| RS232 Cable                   | 1                          |               |
| 220V/10A Power cable          | 1                          |               |
| 4PIN Green terminal male plug | 1                          |               |