Syncrolight

DC03A

Low-Voltage DC Light Controller

User Manual

Version 1.2

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1. Choosing a Power Supply

The controller operates at voltages between 7 and 30 volts DC. All 3 outputs from the card will produce the same voltage as that used to power the controller. When choosing a power supply ensure it is of the correct voltage and has sufficient ampere to power all equipment connected to 3 outputs (when all 3 outputs are on simultaneously).

For Example, if controlling 3 sets of LED lights and each set requires 24v and 600ma. You will need a 24v power supply of **at least** 4800ma (600*3 = 1800) or 1.8 amps.

The maximum recommended output is 2 Amps per channel, or 5 Amps per card. Whilst the components used on the card are rated at 30 Amps, the card has only been designed and tested for use with low power lighting equipment such as individual sets of LED lighting. For animated lighting displays using LED lighting, you seldom require high ampere outputs since it is usual to have lots of individually controllable lights, for animation purposes, rather than lots of sets wired together on one channel.

2. Building a Network

In order for the computer to be able to control the lights, the controllers and computer need to be on a RS-485 based network. This is a serial network, capable of reliably transmitting of data over a distance.

The network starts at the computer, but since computers do not usually have an RS-485 port a converter is required. These can take the form of either:

- RS-242 to RS-485 converter (for older computers with serial COM ports).
- USB to RS-485 converter.

The recommended USB-RS485 converter, shown below, has been tested with the SyncroLight controllers and software. The converter is available for sale, with full installation instructions, on the SyncroLight website.

The network is a 2-wire network, which connects to each controller in a liner multi-drop arrangement, connecting to each controller in turn. The network should not contain any spurs or loops.

To ensure reliable data transmission it is often recommended that RS-485 networks are terminated with a resistor between the two wires. This is optional as in most cases the network will work fine without any terminating resistor. If you find messages on the network are being lost (i.e. lights not coming on/ going off as expected), then it may be worth adding a resistor. This Syncrolight controller has a built in termination resistor which can be activated by placing a PCB jumper onto the resistor. This jumper is not supplied with the controller, however we are happy to supply a PCB jumper upon request. The SyncroLight controllers keep a count of the number of corrupt messages to aid in identification of poor network performance.

We strongly recommend the use of shielded network cable (available on the SyncroLight website) to minimise interference from electrical cables and equipment. When running network and power cables around your light display to controllers and lights, try and run the network cable away from power cables to minimise any risk of electrical interference. Don't worry if you have to run the network cables alongside power cables, you'll probably be Ok. Just remember where you have done so and revisit this area should you have any communication problems on the network.

The shielding of each cable should be joined at each controller and connected to the ground connection provided on the USB-RS485 converter.

Each controller on the network is given a unique numeric address, often called either, controller address, controller id or device id. This controller address, which has a value between 1 and 255, is used by the software to identify and address each output on the network (i.e. Controller Id 3 Channel 1).

New controllers come with a default id of 1, which can easily be changed using the SyncroLight Device Manager Software.

3. Wiring the Controller

Power Supply — Outputs 1-3 — Status Indicator LED — Termination Jumper — RS485 Network
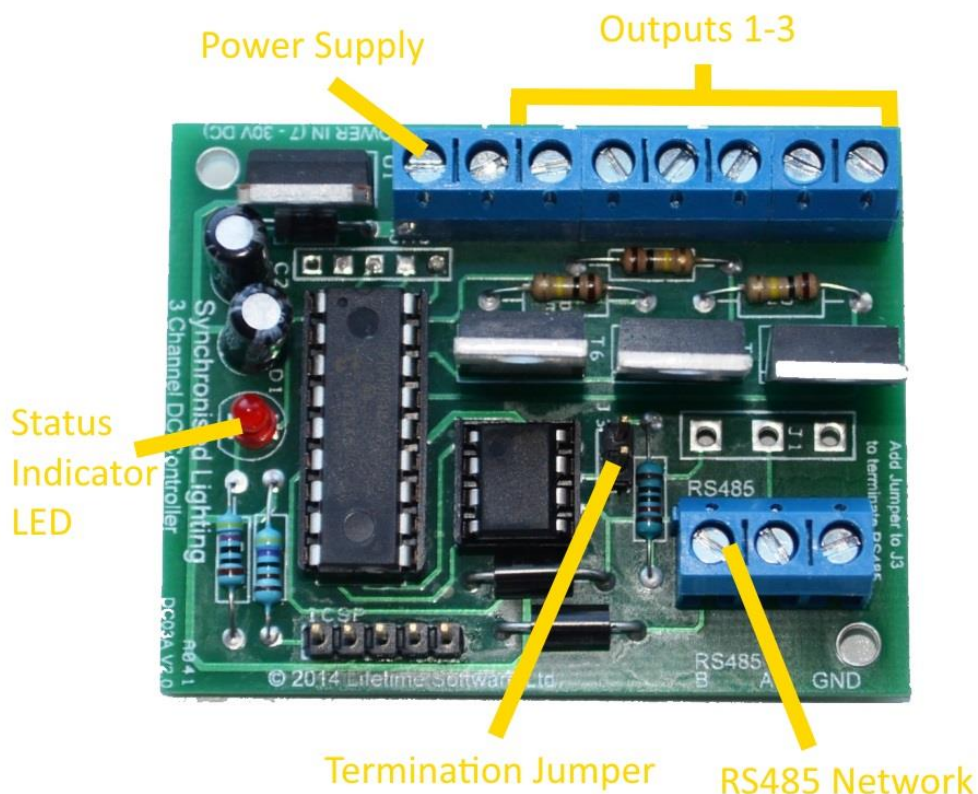
Power

Using a power supply that provides a DC voltage of between 7 and 30 volts, connect the positive and negative supply to the terminal block shown in the diagram. Connect the POSITIVE (+) supply to the terminal labelled 'Power' and the NEGATIVE (-) to the terminal labelled GND. Ensure the polarity is correct as damage to the card will occur if the polarity is reversed.

Outputs

The controller has 3 outputs (channels) each of which are individually controllable. Equipment, such as light strings, should be connected to the controller as follows:

- The negative (-) supply to the equipment is connected to one of the 3 black outputs leads from the card.

- The positive (+) wire to the equipment is connected directly to the red positive (+)
output lead from the card.

This controller is also suitable use with our RGB Strips. The red/positive output lead from the card is connected to the common positive input to the strip whilst the 3 negative output leads are connected to the Red, Green and Blue inputs to the RGB strip. The power supply provided with the RGB strip is used to power the card and is connected to the 7-30v DC input terminal.

Network Connections

We recommend the use of 2-core shielded cable for the network connections. Terminal connection on the controllers are labelled A and B, outputs of the USB-RS485 converter are as shown below.
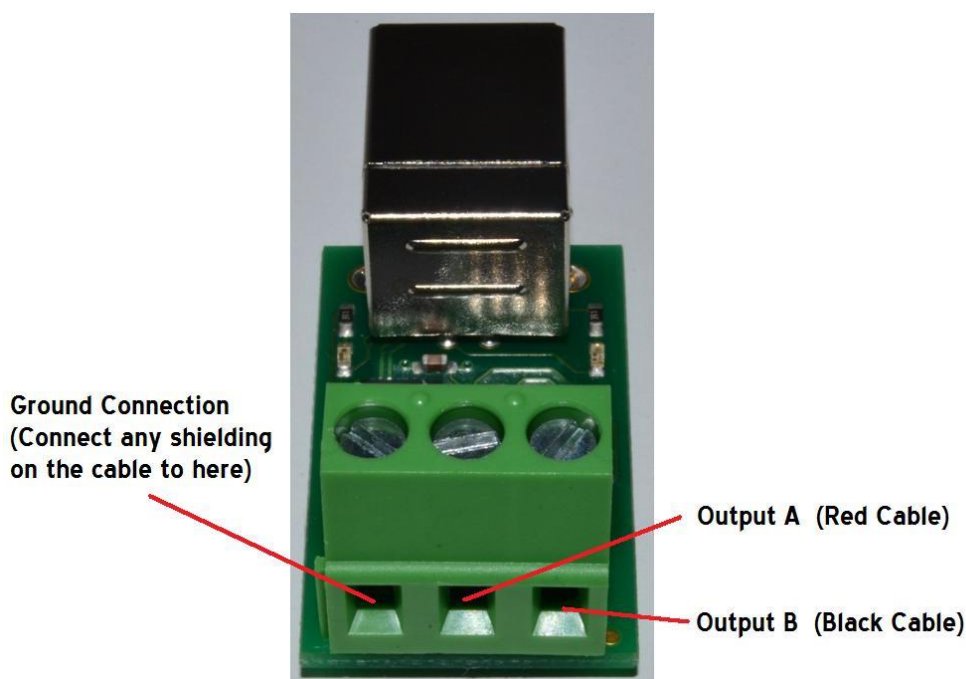
Where the wire colours are red and black, we suggest using the red wire to connect to the 'A' terminals and black wire to connect to the 'B' terminals. Adopt your own colour code if you have different colour wire.

4. Testing and Configuring the Controller

1. Without any network or lights connected, turn on the power to the controller. The status indicator LED should flash to indicate the controller is running but has no network connected.
2. Turn off the power to the controller.
3. Connect the controller to the computer via the USB-RS485 converter (or similar RS-485 interface). If you have multiple controllers, just connect **one** to the network for testing.
4. Start the SyncroLight Device Manager Software. The screen should look like the one below.
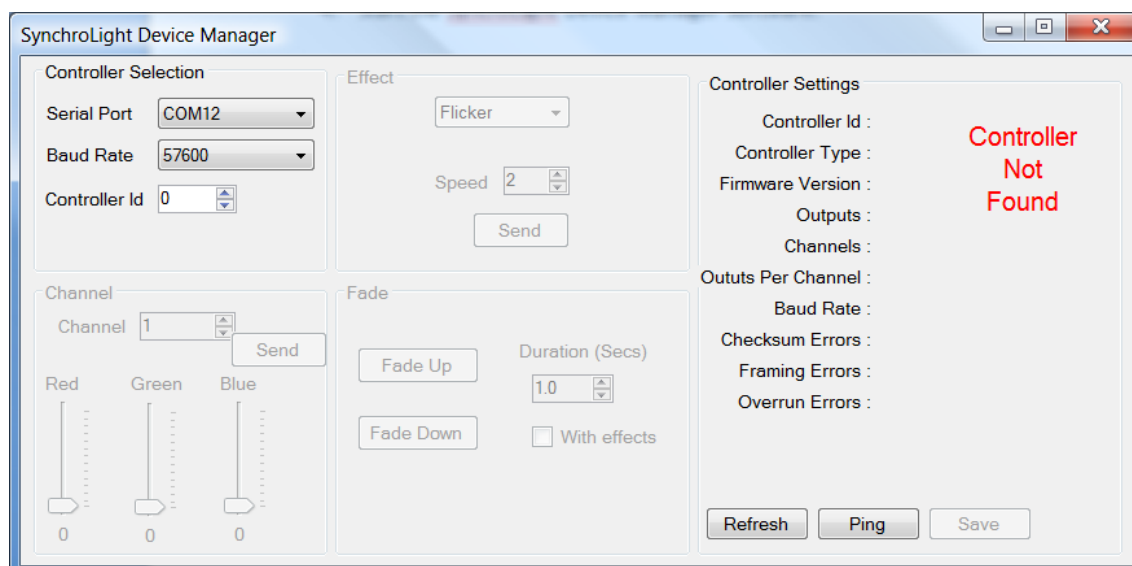
5. Select the appropriate Serial Port from the drop down list for your RS-485 network.
6. Ensure the Baud rate is set to 57600 and controller id set to 0.
7. If you have the USB-RS485 converter you can verify that RS-485 network is active by a little flashing red LED on the USB-RS485 converter.
8. Turn on the power to the controller. The status indicator LED on the controller should now stay lit to indicate an active network. (The little red LED on the converter will continue to flash).

9. If you press the 'Refresh' button on the controller, the controller's details should appear on the right of the window as shown below.
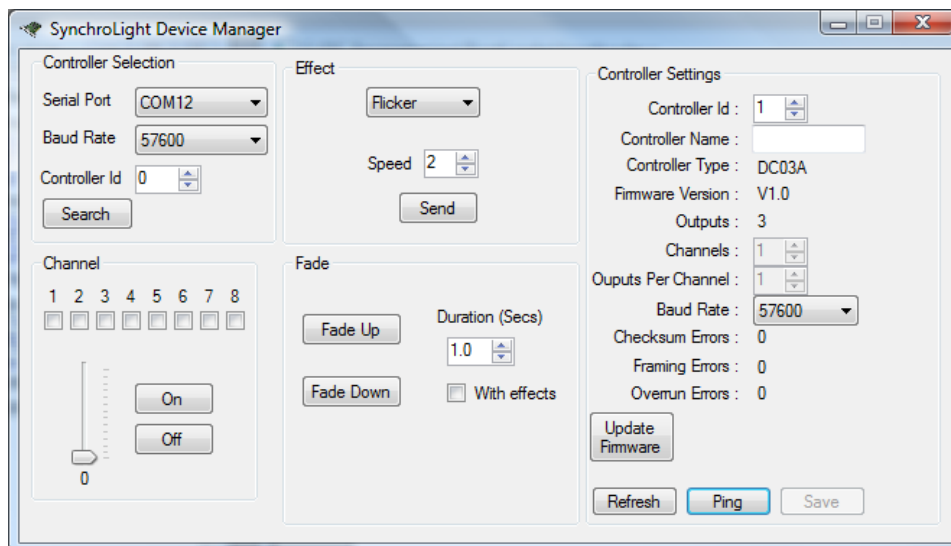
Note: Controllers can have an Id between 1 and 255 inclusive. Address 0 is a special 'broadcast' id that can be used in the Device Manager, ALL controllers will respond to this id. This is useful for testing a controller if you have forgotten its id! (Just ensure only one controller is connected though as all controllers will respond).

10. You can now change the default baud rate and id of the controller using the controller settings on the right. If you make any changes press 'Save' and turn the controller off and on as directed (Screen below shows the controller id being changed to 70).
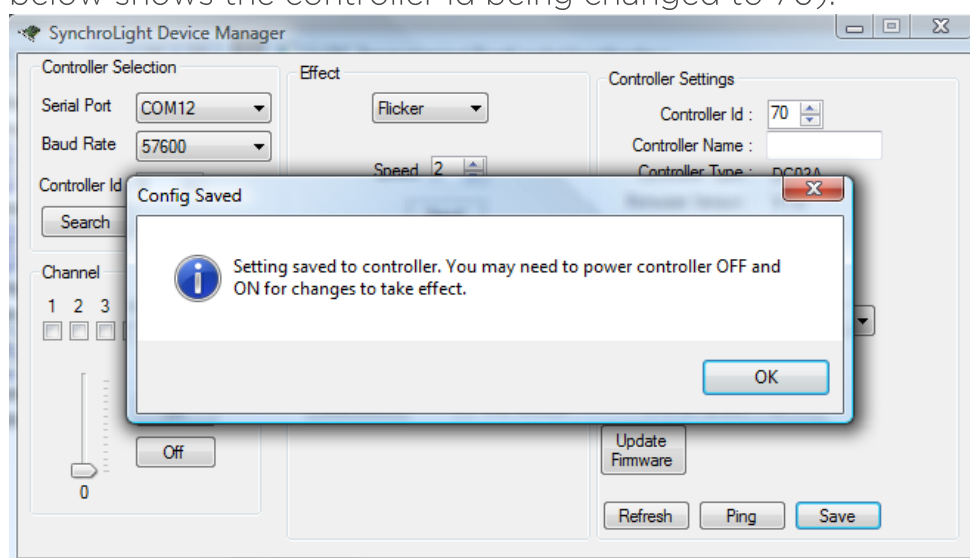
11. You can now connect the lights to your controller and test each channel in turn using the Device Manager software. Check one of the Channel check boxes on the left hand side and press the ON button or move the brightness slider up. The lights connected to channel 1 of your controller should come on. Repeat this to test channels 1 to 3 on your 3 Channel controller.