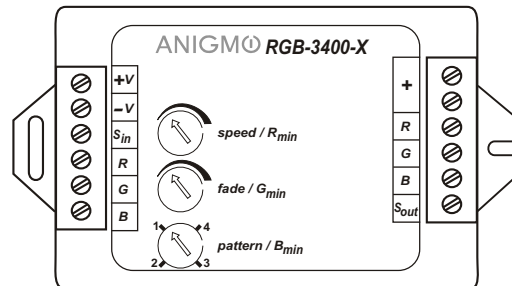


## RGB-3400-X RGB SEQUENCER / 3-CHANNEL UNIVERSAL LED DIMMER



### Description

RGB-3400-X is a dual function unit and can operate in two distinct modes. In Mode 1 the unit acts as a simple, yet versatile RGB sequencer. Output produces RGB color mixing / fading that can be selected and varied with a simple three button control. Colors, rotation speed and fade speed can be set over a wide interval offering limitless options for decorative lighting. RGB sequencer mode is designed for situations, where simple, yet versatile color changing is required without using complex systems. It is designed with special care for high-end applications (capable of slow, elegant and smooth color changes, unique colors etc.) Several unit can be connected together and synchronised to control larger loads. By using multiple units and a programmable inter unit delay even more spectacular effects (moving color wave) can be achieved. All this can be accomplished using very simple wiring and mode selection.

In Mode 2 the unit acts as a simple 3 channel LED dimmer. Three outputs can be controlled with three 0-10V signal or three 100k potentiometers. Three channel LED dimmer mode is designed for smooth, flicker-free dimming of all constant voltage LED modules, including MR16 bulbs as well as 12V/24V Incandescent/Halogen bulbs.

RGB-3400-X (in both modes) includes several protection features against common wiring/lamp malfunctions that can protect the installation and can be powered from DC power supply or batteries. This makes it ideal for use in marine environment such as ships, boats, yachts, sailboats and boat homes.

### Features

- Wide variety of color effects with full control over the speed and fade interval (Mode 1)
- Simple wiring, no complex control systems needed for wide variety of color changing effects (Mode 1)
- Smoothly dims any LED including hard to dim MR16 and G4 lamps (Mode 2)
- Superior safety features including Overheating, No-load, Overload and Short circuit protection with auto restart
- Simple synchronization of multiple units for controlling larger loads or additional color effects
- High frequency PWM delivers flicker-free lighting at any level
- Minimum brightness adjusted with potentiometer (Mode 2)
- High efficiency, low power consumption

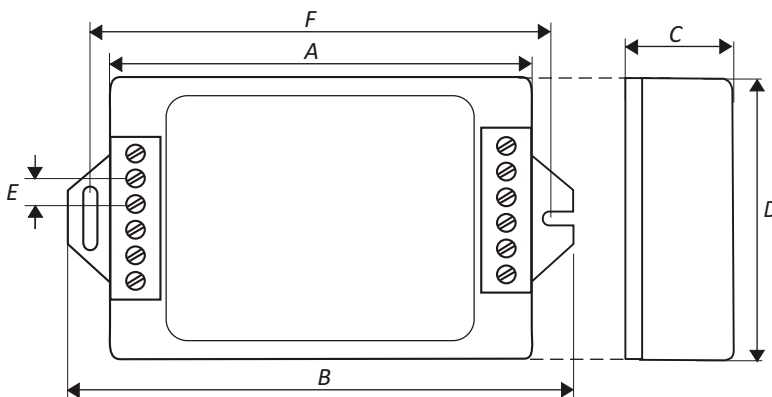
### Applications

- Nautical lighting
- RV / caravan lighting
- RGB color changing decorative illumination (bars, showrooms, restaurants, gardens, pools, yachts, signs etc.)
- Applications when high reliability and safety of installation is needed
- Dimming of MR16, MR11, G4 and other LED lamps with integrated current controller
- Applications not requiring complex controllers for versatile decorative color illumination
- Dimming and color sequencing of any 12/24V DC constant voltage LED module such as:  
Flexible and Rigid RGB LED Strips, Rope RGB Light, Under-cabinet RGB Lights lamps etc.

## Specifications

TECHNICAL DATA	RGB-3400-X
Supply input voltage range nom:	12 - 24 V DC
Supply input voltage (min - max):	6 - 30 V DC
Supply Input current:	12A
Output current max:	3x 4A
Output load max:	3x48W@12VDC / 3x 96W@24VDC
Control voltage:	1-10 V DC (0V - OFF)
Control current max:	0.1mA
Control:	0-10 V controls, Pot 100K Ohm
Dimming mode:	PWM
Operating frequency:	390 Hz
Dimming range:	0-100%
Dimming resolution:	65 000 steps
Temperature range:	0 °C to +50 °C
No-Load proof:	Yes
Short circuit protection:	Yes, automatic shutoff, reversible
Overload protection:	Yes, automatic shutoff, reversible
Overheating protection:	Yes, reversible
Input and output connections:	Screw terminal for wire 2mm <sup>2</sup> (AWG 14) max.
Housing dimensions (W x D x H):	52mm x 95mm x 21mm (2" x 3.75" x 0.8")

## Dimensions



A (top housing length)	78 mm (3")
B (overall length)	95 mm (3.75")
C (height)	21 mm (0.8")
D (width)	52 mm (2")
E (connector pitch)	5 mm (0.2")
F (mounting hole pitch)	86 mm (3,4")

## Installation

Connect the unit according to the control signal used and select desired operating Mode (see connection diagrams below).

A unit can be mounted using two screws, double-sided tape or cable ties.

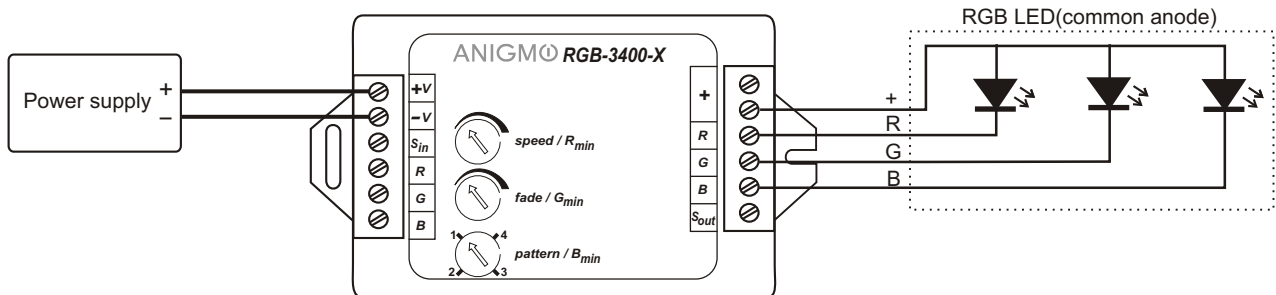
Sufficient heat dissipation of the device needs to be ensured. The ambient temperature must not exceed 50°C.

Power supply and load wires should have a sufficient diameter to minimize a voltage drop across the wires. If the voltage drop is too large, flickering of the lights and unstable operation is possible.

When long supply wires are used, it is recommended that a buffering capacitor of several 10 000µF (low ESR type) of appropriate voltage is used. The capacitor should be connected to the dimmer power supply input. Using a buffering capacitor will also filter and significantly decrease RFI emitted from supply wires.




## Installation diagrams

### MODE 1 - RGB SEQUENCER

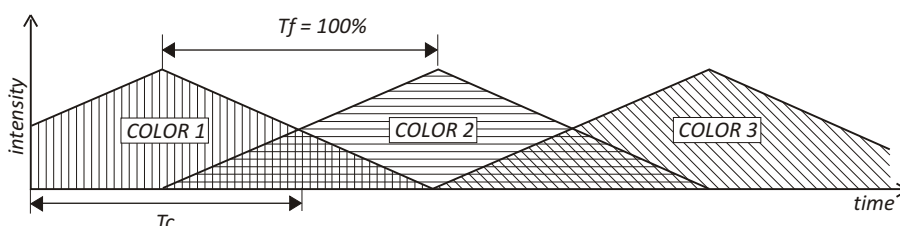
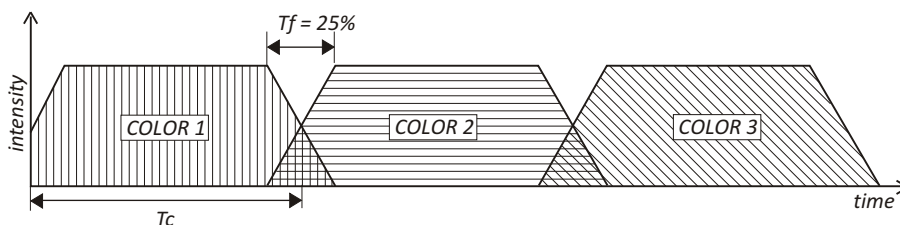
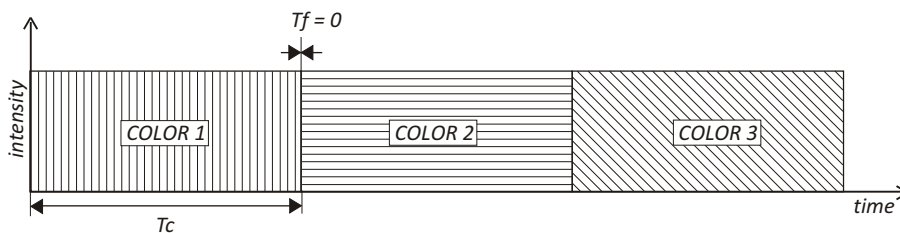


### Parameter settings

Three different parameters determining the color sequencing can be set with corresponding trimmers, located on the front of the unit:

	description	parameter	range
 speed	Color rotation (changing) speed, expressed as a time the color is displayed	$T_c$	150ms - 60s
 fade	Fade time, expressed as a percentage of $T_c$	$T_f$	0 - 100 %
 pattern	Selection of the color changing pattern. Four different patterns can be selected	/	/

### Fade time



## Color patterns

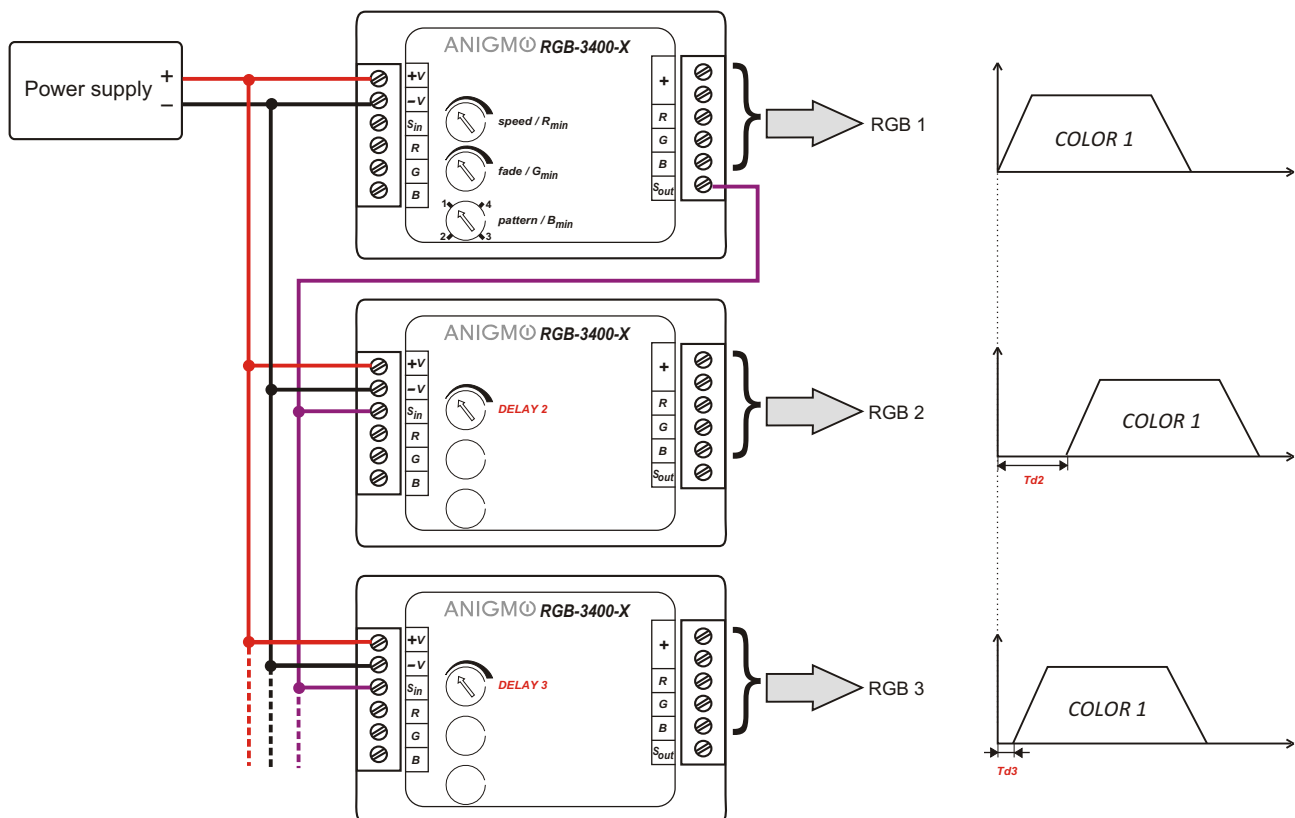
Four color patterns are preprogrammed into the unit

Pattern 1 (classic colors)	RED #FF0000	PURPLE #FF00FF	BLUE #0000FF	CYAN #00FFFF	GREEN #00FF00	YELLOW #FFFF00	
Pattern 2 (winter colors)	GREEN #00FF00	COOL PURP. #E010FF	COOL WHITE #80FFFF	BLUE #0000FF	PINK #FF8080	PALE YELL. #C0FF00	CYAN #00FFFF
Pattern 3 (summer colors)	YELLOW #FFFF00	REDISH PURP. #FF080	ORANGE #FF4000	PINK #FF8080	LIME GREEN #80FF00	RED #FF0000	
Pattern 4 (random colors)	RANDOM						

NOTE: Colors represented in print or on screen could differ slightly from colors emitted from actual RGB source

## Connecting multiple units - constant delay

Multiple units can be synchronized. The first unit sets the color pattern and fade / color rotation speeds. Subsequent (synchronized) units copy exact color output of the first unit. On all synchronized units a fixed delay can be set. The delay ( $T_d$ ) is expressed as a % of  $T_c$  and can span from 0 - 100%. Other trimmer settings on synchronized units do not have any effect on the RGB output.

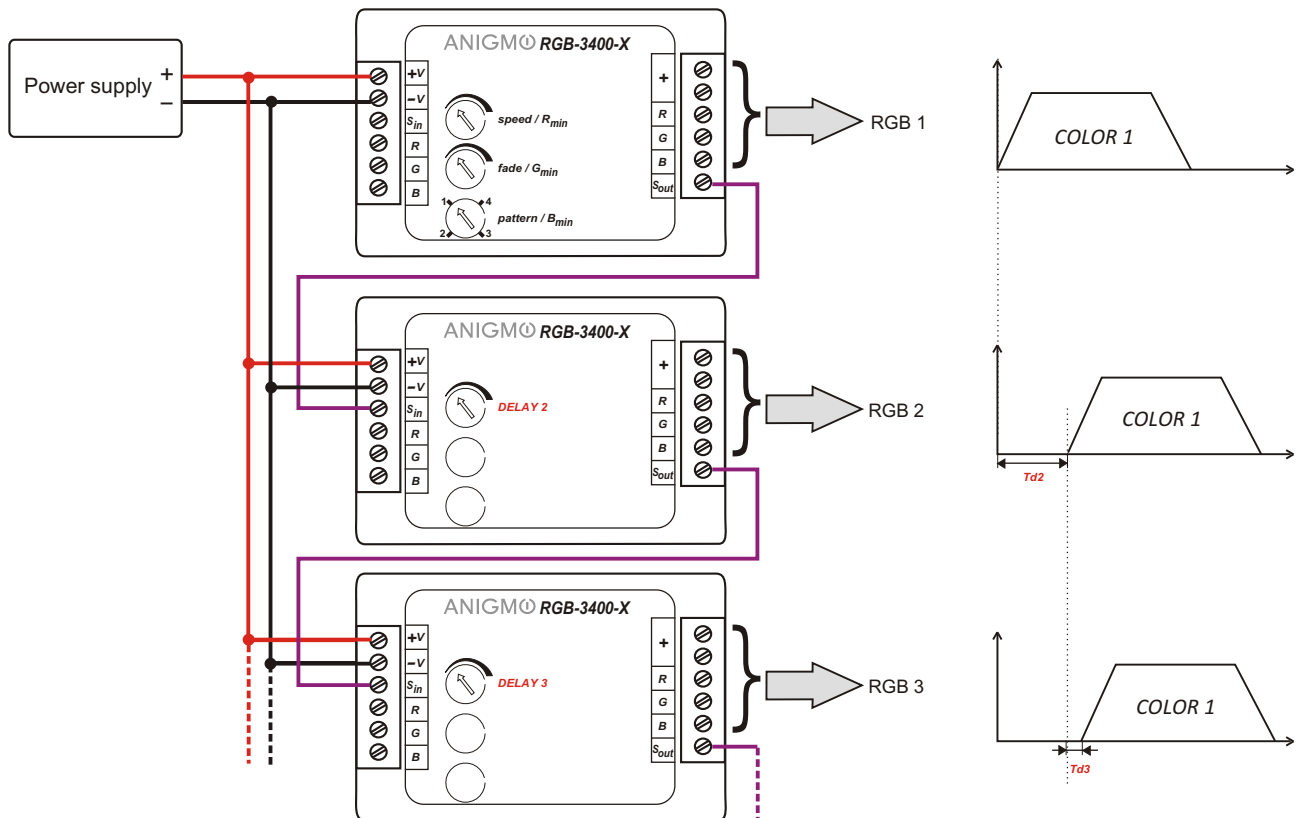


With constant delay connection all units follow the first unit. The delay for each synchronized unit can be different (as shown on the diagram above) but typically all synchronized units have delay set to zero. In this setting all units have exact same output. This is helpful for controlling loads exceeding single unit maximum load capacity.

**IMPORTANT:** Outputs of separate controllers should not be connected in parallel. Each should control its own set of lamps.

## Connecting multiple units - additive delay

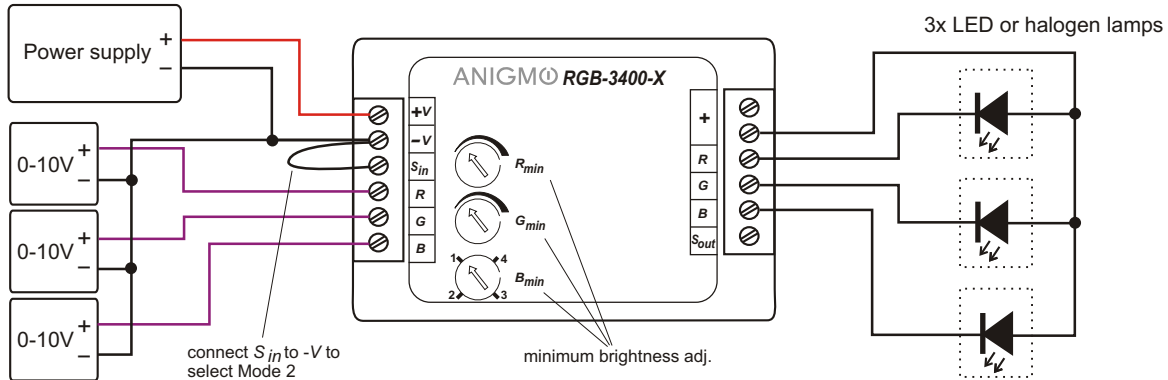
Same as with constant delay connection, the first unit sets the color pattern and fade / color rotation speeds. Subsequent (synchronized) copy exact color output of the first unit but delays are added from one unit to the next. Other trimmer settings on synchronized units do not have any effect on the RGB output.



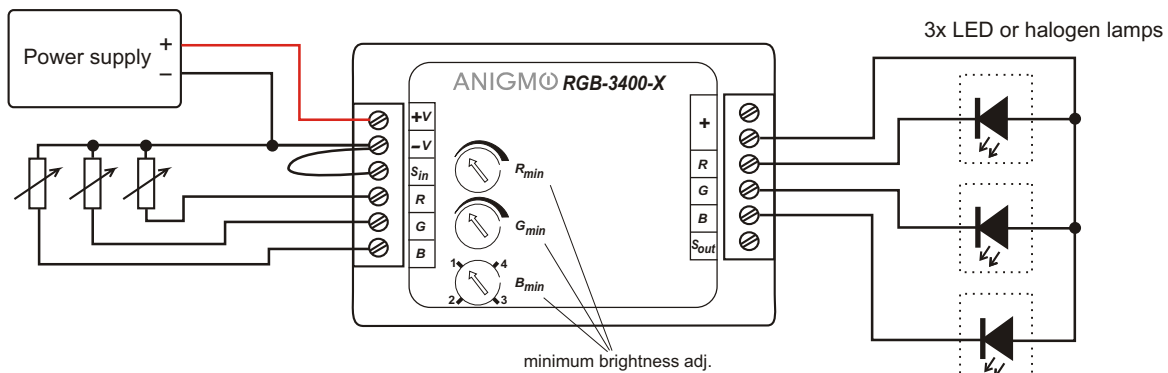
With additive delay connection all units follow the first unit but each subsequent unit gets more delayed. The delay for each synchronized unit can be different (as shown on the diagram above) but typically all synchronized units have delay set to a similar value. In this setting the color initiated by the first unit appears to travel across all the subsequent units, producing a “traveling” light wave effect. The smaller the delay the faster the wave will travel.

## Installation diagrams

### MODE 2 - three channel LED dimmer



**Wiring diagram for 0-10V control**



**Wiring diagram for potentiometer control**

### Connecting multiple units in Mode 2

In Mode 2 multiple units should be connected in constant delay configuration (See Mode 1 "constant delay" connection). The first unit selects operating mode of the whole setup. To select Mode 2, the first unit must have  $S_{in}$  connected to -V. All subsequent (synchronized) units copy exact output of the first unit. No delay can be set in Mode 2

#### INSTALLATION CONSIDERATIONS:

Power should be turned off during installation.

All connections should be secure, connector screws should be tightened.

After connecting the wires, turn the power on. Set the dimmer to the lowest setting. Using minimum brightness control trimmer, set the desired minimum brightness.

#### INPUT SIGNAL CONSIDERATIONS:

If using 0-10V control, make sure that the negative wire of the 0-10V control is not shared (take the same path) with power negative. The 0-10V negative should be connected as close as possible to the dimmer.

Wires (especially negative wires) should be connected in such way to avoid large ground loops.

If ground loops can't be eliminated, a SDU signal conditioning unit should be used (see SDU signal conditioning unit for connection diagrams).

Source of 0-10V control signal should be stable.

#### OUTPUT CONSIDERATIONS:

Output wires should be as short as possible. If possible, connect the dimmer close to the load.

If mounting the dimmer close to the load is not possible, make sure that positive and negative load wires do not form a large loop area. Load wires should run as close as possible to reduce EMI.

For further reduction of EMI, positive and negative load wires can be twisted or shielded and grounded cable can be used.