**Barthelme**
LED Solutions

# CHROMOFLEX

# T

SWITCH

Overview:

This manual describes the CHROMOFLEX Module in the version 'SWITCH'. The unique characteristic of this type of Chromoflex is the Switch, to select colours easily. The combination of two Switches works perfect to mount in a panel. With the Switch colour/program is the CHROMOFLEX much easier to handle.

Function:
The controller can be set up by 2 buttons, with one button can be called the 8 programs. With the other button can be one of the 20 solid colours are selected. Alternatively an IR-remote control can be used.

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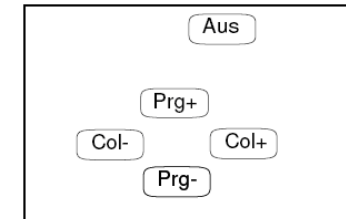
The solid colours of Chormoflex-T is on the remote by pressing the keys "Col-" and "Col +" prefix (each keystroke a step).

Important:
The system runs in networks too. It's important that if pushbuttons and a remote both are used, be sure they are connected to the same module! The default starting program is normal RGB colour change (= program 1).

With 'prg+' and 'prg-' the following 9 programs can be selected:

1. Normal colour change with an transitiontime of 2.5 seconds, the duration per colour is adjustable via the dipswitches in CHROMOFLEX itself (between 5 and 60 seconds, see instructions later on)

2. Slow colour change with a transitiontime of 10 seconds, the duration per colour is adjustable via the dipswitches in CHROMOFLEX itself (between 5 and 60 seconds, see instructions later on)

3. User - colourchange (you can edit the colourchange with the CF_Color-Editor). In comparison with the standard colourchange is this one extreme smooth (transitiontime  30 seconds duration per colour 40 seconds gives a overalltime for 5 minutes!). The perfect Wellness colourchange!

4. Effect 'BLOB'

5. Effect 'LSD'

6. Effect 'FIRE'

7. Effect 'FLASH' (thunderstorm)

8. Effect 'BURSTS'

9. 'OFF' - all LEDs off

*By pressing the switch directly on the Chromoflex-T or by pressing the keys "Col-" and "Col +" can be selected one static colors of 20.*

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**Saving user defined configuration**
The CHOMOFLEX-T saves all actual settings, so each time the module is switched off and then turn on again it will save the last settings (program or static colour). *Please notice: The saving takes about 60 second, so if it's turned off earlier the new changes wouldn't be saved!*

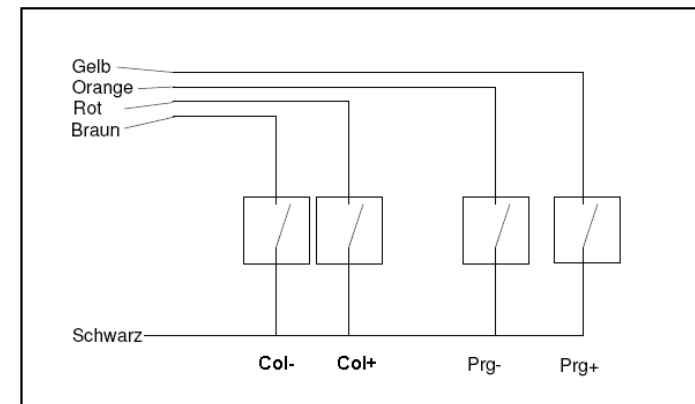**Software**

**CF-Color-Editor:**

With the Color-Editor it is possible to change and edit colourtables and the user-defined colour-change.

Important: Please do not download any effects without any consultation.

**CF-Composer:**

This software is *NOT compatible* with the CHROMOFLEX-T version.

*Schematic how to connect pushbuttons.*

# Barthelme
LED Solutions

# CHROMOFLEX

$C \epsilon$

# Full-Spectrum-Colour-Control

Chromoflex is an excellent value full colour control and was designed for use with modern High-Power RGB LEDs. There are two models available „I350" for use with constant current LEDs and „STRIPE" for use with LED stripes. Chromoflex is able to synthesise up to 16 millions of different colours with 3 (optionally 4) channels. Hence it is the ideal control for all kind of sophisticated effect illuminations, deco and wellness lighting.

Chromoflex comes with several built in effects (from calming colour change, up to show effects). External manual buttons, DIP switches or a PC software can be used to control the modules. Up to 30 modules can be connected as a network.

The complete network can be controlled by standard push-buttons or (very convenient) with a infrared remote control

Thia is only a shortform gude, a more detailed description can be found in the ChromoFlex manual (link at the end of this document)

## Usage

The modules were designed for in-house use in dry places, but the LEDs (if suited) might also be used in wet environments or outdoor.

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Important: The modules must be operated with a power supply, that is matched to the used LEDs! Other loads than LEDs (especially inductive loads like motors, coils, ..) might destroy the module.

## Safety Instructions

The modules might produce some heat. Care must be taken for unrestricted air ventilation.

Connecting the power in reverse polarity (even for a short time) can destroy the module. A fuse is built in, but it can only be changed by soldering.

Important: It is guaranteed by design, that the Chromoflex modules will never generate any higher voltage than the supply voltage. This makes the module on ideal solution for use in low-voltage areas, like pools, steam bathes, SPAs, ...

Do not modify the electronics. Regard the official regulations for electrical devices (like DIN, VDE, EN), especially if the LEDs are used in wet areas! This product is not a toy, keep away from children!

We decline any liability, loss, or damage caused by improperly used modules! Also guarantee is lost in such cases.

Also LEDs can get quite hot. We strongly recommend to take care, that the maximum operating temperature is not exceeded, because this might reduce the expected life time of the LEDs significantly.

WARNING #1: LED light can have very high intensity, even if dimmed. Some modern LEDs even fall under the lasers marking obligation. Particularly in connection with optics also weak LEDs can become very dangerous. Staring into LEDs can cause irreparable damage to the eye's retina. Hence: NEVER STARE INTO THE BEAM. Use diffusers to spread the intensity!

WARNING #2: Please be aware that LED light may cause side effects, because this light can change intensity very fast! Changing light can affect the perception. Light pulses can release complaints or seizures to humans with inclination to epilepsy.

Contents

Each Chromoflex is shipped with (this) short manual, a connector for power supply and a connector for the network interface, s short pigtail (cable) for connecting up to 4 external buttons. The connector cable to a PC (RS232) is available as separate item or can easily be made self (see software documentation, link at the end of this document).

The Infrared-Remote Control (plus receiver) is an optional accessory.

# Connecting the LEDs / Power Supply

Important: The module must be operated with a power supply, that is matched to the used LEDs!

Important: Matched LED lamps, including power supplies are available from us. Also we supply complete kits, including plug-n-play connectors.

Important: Improper power supplies can lead to malfunctions, (unwonted) flickering effects or - as worst case - overheating. We strongly recommend to use high-quality (stabilised) switching power supplies!

Of course, one power supply can be used for several Chromoflex modules in parallel (if the maximum output power of the supply is regarded).

The minimum voltage for correct operation is 7 Volts, maximum voltage is 24 Volts (+ 5%).

# Model „I350"

This model has 3 lines of 350 mA each. The power supply must be matched to the number of used LEDs in series: most high-power LEDs for 350mA constant current require around 3 - 3.7 Volts (depending on the colour, type and manufacturerer). Normally green and blue need the highest voltages, the forward voltage of red is normally much lower. The „I350" itself need additionally about 0.5 Volts to maintain line regulation.

Too high voltages will cause unnecessary heat in the module. For internal temperatures >= 80°C the module will power off (reversible).

Constant current LEDs must be connected in series. Depending on the number we recommend as voltage for the power supply (guidance value, depending on the used LEDs):

1 RGB-Group - abt. 7 - 7.5 Volt Power supply (abt. 7 Volt is the minimum operating voltage of
2 RGB-Groups - abt. 7.5 - 9 Volt Power supply the electronics)
3 RGB-Groups - abt. 10 - 13 Volt Power supply
4 RGB-Groups - abt. 12 - 15 Volt Power supply
5 RGB-Groups - abt. 15 - 18 Volt Power supply
6 RGB-Groups - abt. 18 - 24 Volt Power supply
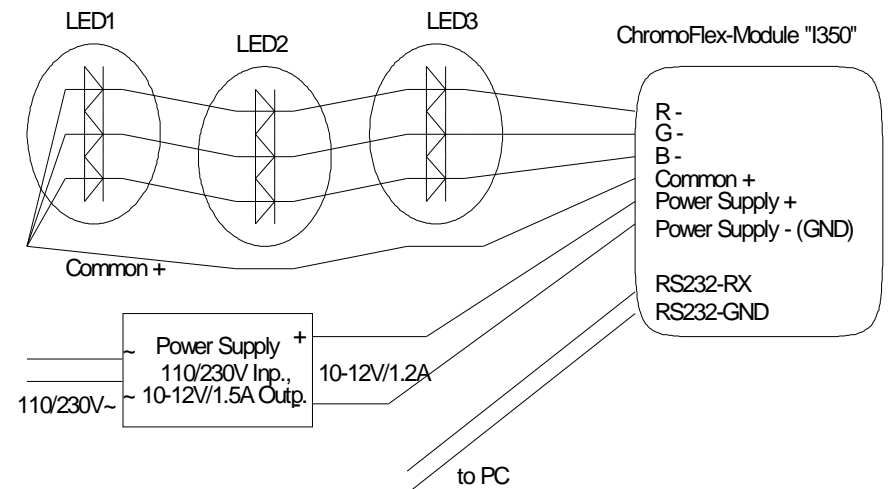
The example above uses 3 LEDs. A 4 wire cable is used, where 1 wire is a simple pass-through for the common +. More details can be found in the manual.
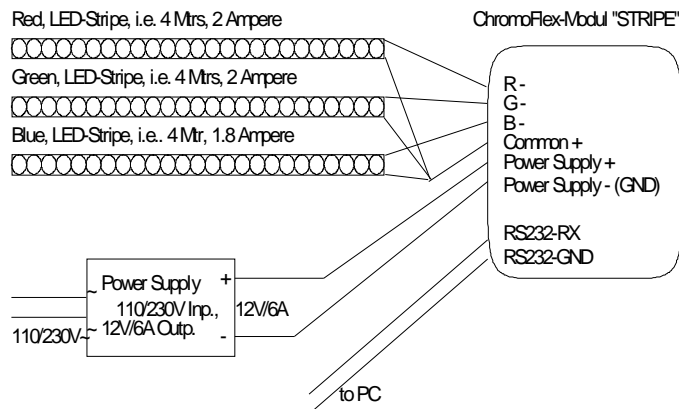
# Model „STRIPE"

This model does not have any internal current regulator. So the supply voltage is passed through and the voltage of the power supply must match the voltage of the LED stripe.

Regarding any possible voltage drop, please see the previous paragraph. Cable lengths up to 5 Mtr. are allowed.

Note: We found LED stripes of 10 Volts, 12 Volts and 24 Volts.

Note: We also deliver (flexible) LED stripes (on wheels) with a length of up to 4 Mtrs. Each colour will draw up to 2 Amperes at 12 Volts.

The model „STRIPE" is designed for currents up to 2.5 Ampere per channel (7.5 Ampere in total) at an operating Voltage of 12 Volts. For 24 Volts maximum is 1.25 Ampere per channel.

Red, LED-Stripe, i.e. 4 Mtrs, 2 Ampere     ChromoFlex-Modul "STRIPE"

Green, LED-Stripe, i.e. 4 Mtrs, 2 Ampere

Blue, LED-Stripe, i.e. 4 Mtr, 1.8 Ampere

R -
G -
B -
Common +
Power Supply +
Power Supply - (GND)

RS232-RX
RS232-GND

Power Supply +
110/230V Inp.,
12V/6A Outp.
110/230V~
12V/6A
-

to PC

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First Test

By using the enclosed connectors installation is very easy.

As first test the module will perform a standard colour change (this is the factory default). This effect consists of 8 colours, each hold for 5 seconds, colour transition time is 2.5 seconds.

Diagnostic LED: The modules are equipped with a small LED. For regular operation this led will change all 2 seconds and it will flicker if data is transmitted (over the Bus).

Remark: It is also possible to use remote controls or relay switches instead of manual buttons...

## Networking

Many Chromoflex modules might be operated in a network. This means each module can either send or receive data! For this the connectors RS232-RX ond RS232-GND are required. Details about networking can be found in the manual.

If you would like to edit a own colour change, this can be done very easily with our free software of PC „Chromoflex Editor". This software can be downloaded for free from our Internet site (see end of this guide).

Note: The Chromoflex-Modules are based on a programmable microprocessor, that is also capable of performing other complex tasks. We will be happy to realise your ideas for professional products. Don't hesitate to send us on email.

Important: Shutdown: if any button is pressed longer than abt. 3 seconds, all modules are switched of, any further button will start its assigned effects,

## The DIP-Switches - Default-Effects

Some settings (i.e. the default effect after reset or power on) can be preset with the internal DIP switches. For this the case of the module must be opened (see attachment).

Important: Please do not touch any of the electronic components, because off the risk of damage by electrostatic discharge. We recommend to use a small non-conductive tool to change the DIP switches.

The switches are separated in 3 groups (as imprinted):

DIP 1,2: These two switches control hold time for effects 1 snd 2 (colour changes):

| DIP 1 | DIP 2 | Effect 1 | Effect 2 | |
|-------|-------|----------|----------|---|
| Off | Off | 5 sec. | 30 sec. | (default) |
| **On** | Off | 10 sec. | 60 sec. | |
| Off | **On** | 30 sec. | 120 sec. | |
| **On** | **On** | 90 sec. | 180 sec. | |

DIP 3,4,5: These switches are for the default effect after reset or power on.

| DIP 3 | DIP 4 | DIP 5 | Effect |
|-------|-------|-------|--------|
| Off | Off | Off | Effect 1: Standard colour change, colour transition time 2.5 seconds (default) |
| **On** | Off | Off | Effect 2: Slow colour change, colour transition time 10 seconds (default) |
| Off | **On** | Off | Effect 3: Randomly faded colours „Blob" |
| **On** | **On** | Off | Effect 4: User defined olour change (can by changed by PC software |
| Off | Off | **On** | Effect 5: Randomly changed colours„LSD" |
| **On** | Off | **On** | Effect 6: Simulation Fire „Fire" |
| Off | **On** | **On** | Effect 7: Simulation Lighnings („Flash") |
| **On** | **On** | **On** | Effect 8: Randomly coloured flashes („Burst") |

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DIP 6,7,8 determine the „Group" of a module. Because the modules can be connected as a network, it should be possible to send command only to a part of the network too. This is what we call a „Group". In example if several modules are used for a pool illumination (ceiling, walls under-water), these modules could be separated into three groups. Now it possible to send command i.e. only to modules on the ceiling. More information can be found in the following paragraph „A Pool Scenario"..

Another important use of the Groups is the starting colour for the preprogrammed colour changes after power on or reset: To achieve impressive effects - even without using a network or PC software - the Groups can be used. Seven different starting colours are available:

| DIP 6 | DIP 7 | DIP 8 | Group | Starting colour | Index of starting colours |
|-------|-------|-------|-------|-----------------|---------------------------|
| Off (Default) | Off | Off | (none) | Red | 1 |
| **On** | Off | Off | Group 1 | Green | 4 |
| Off | **On** | Off | Group 2 | Blue | 7 |
| **On** | **On** | Off | Group 3 | Magenta | 8 |
| Off | Off | **On** | Group 4 | Orange | 2 |
| **On** | Off | **On** | Group 5 | Light Blue | 6 |
| Off | **On** | **On** | Group 6 | Yellow | 3 |
| **On** | **On** | **On** | Group 7 | Red | 1 |

Remark: The colour „indigo" with index 5 is not available by design.

Important: All changes of the DIP switches are recognised only after reset or power on!

## Technical Data

Operating Voltage: 7 - 24 Volt (+ 5%), stabilised.

Important: The used power supply must be able to bear pulsed loads. Unstabilised or to weak power supplies can cause unwanted flickering effects, especially during colour changes!

Module current (without LED lamps): ca. 20 mA

Operating temperature: 0°C - max. +50°C (recommended: <= 30°C) (Use only in dry places with sufficient air ventilation)

Modulation system: The Chromoflex modules are based on a digital System, named „Vector-Fractal-Modulation" or „VFM". This modulation system was optimised for minimising load on power supplies and has considerable advantages compared to traditional systems. The modulation frequency is in the range from 120 Hz up to (max.) 240 Hz. Patent pending.

Maximum cable inductance can be calculated as $L\_max = 40 \mu H/(maximum\ current)$. Note: Standard control cable normally has an inductance of around 0.4-0.8 µH/Mtr.

## Model „I350"

Pulsed constant current abt. 350 mA (+ 5%, -20%) per channel ( 3 channels).

## Model „Stripe"

Pulsed constant voltage, maximum current 2.5 Ampere per channel (3 channels) at 12 Volts, and 1.25 Ampere per channel at 24 Volts.

## Contact / Internet
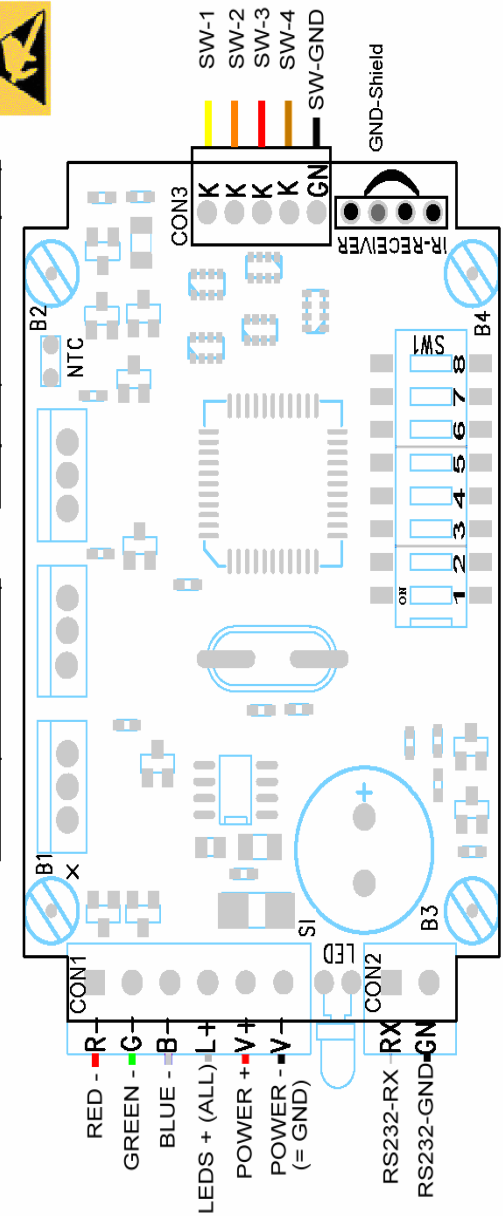
Download of PC-Software, data sheets , technical support:

www.chromoflex.com , www.barthelme.de

Contact (technical support only by Internet / Email):

www.barthelme.de

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**ChromoFlex** - Models "I350" (3x0-350 mA) and "Stripe" (for LED Stripes)
(For Version 2:*)

- ON - Eff3 ("Blobs", Random Colors)

| | | (For Version 2:) |
|---|---|---|
| Eff1 | (Standard Transition, Trans. Time see left) | (Factory Default) |
| Eff2 | (Slow Transition, Trans. Time see left) | |
| Eff3 | ("Blobs", Random Colors) | |
| Eff4 | (User Sequence*, PC programmable with XD.EXE) | |
| Eff5 | ("LSD", Random Color Change) | |
| Eff6 | ("FIRE") | |
| Eff7 | ("FLASH") | |
| Eff8 | ("BURSTS", Random Color Bursts) | |

**DIPSWITCH**

| 3 | 4 | 5 | |
|---|---|---|---|
| - | - | - | Eff1 |
| ON | - | - | Eff2 |
| - | ON | - | Eff3 |
| ON | ON | - | Eff4 |
| - | - | ON | Eff5 |
| ON | - | ON | Eff6 |
| - | ON | ON | Eff7 |
| ON | ON | ON | Eff8 |

**DIPSWITCH**

| 1 | 2 | Eff1 | Eff2 |
|---|---|---|---|
| - | - | 5 | 30 |
| ON | - | 10 | 60 |
| - | ON | 30 | 120 |
| ON | ON | 60 | 180 |
| | | (in secs.) | |

**SPEED for Eff1/Eff2**

**DIPSWITCH**

| 6 | 7 | 8 | Group | Start Color for Eff1/2 |
|---|---|---|---|---|
| - | - | - | No Group | 1 (Default: Red) |
| ON | - | - | Group 1 | 4 (Default: Green) |
| - | ON | - | Group 2 | 7 (Default: Blue) |
| ON | ON | - | Group 3 | 8 (Default: Magenta) |
| - | - | ON | Group 4 | 2 (Default: Orange) |
| ON | - | ON | Group 5 | 6 (Default: Light Blue) |
| - | ON | ON | Group 6 | 3 (Default: Yellow) |
| ON | ON | ON | Group 7 | 1 (Default: Red) |

**Group and Start Color for Eff1/2**

**Default Effect after Reset/Power on**
(*: On Version 2 the User Sequence is a very soft Color Change with 60 secs. Duration per color)

Connector labels:
CON1: RED - R, GREEN - G, BLUE - B, LEDS + (ALL) - L+, POWER + - V+, POWER - (= GND) - V-
CON2: RS232-RX - RX, RS232-GND - GN
CON3: SW-1, SW-2, SW-3, SW-4, SW-GND - GN
GND-Shield, IR-RECEIVER
B1, B2, B3, B4, NTC, SI, LED, SW1 (1 2 3 4 5 6 7 8), ON