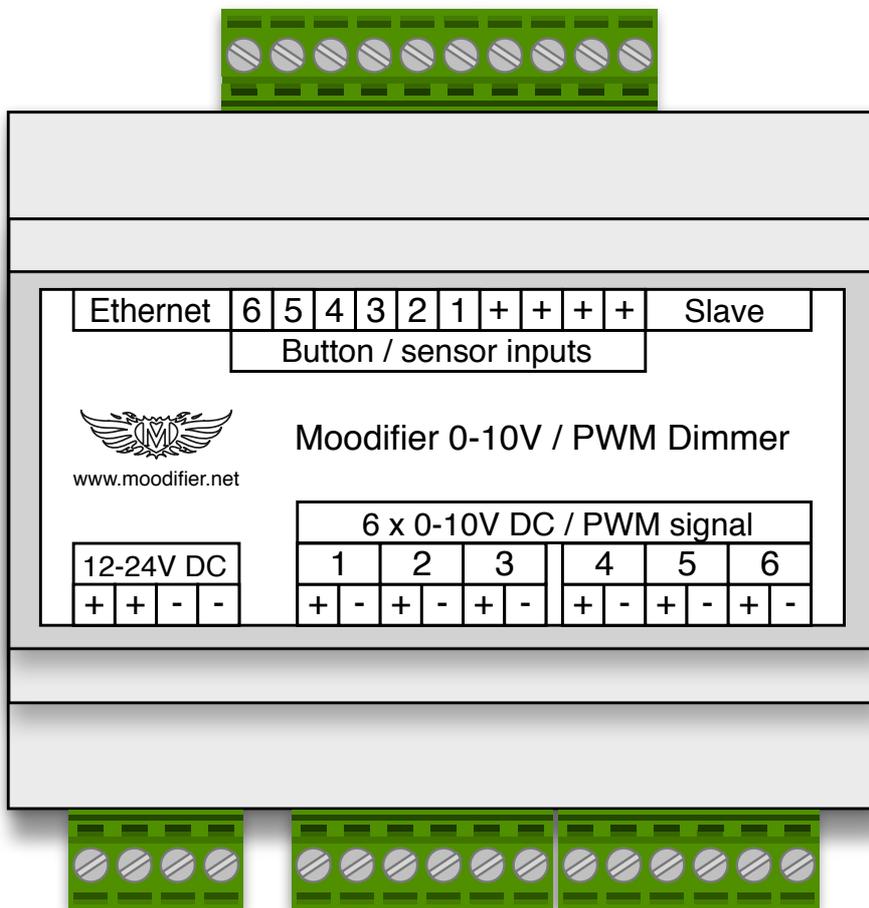




www.moodifier.net

# Moodifier™ Dimmer

- DIN-rail series -



v. 2017-12-15

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# Moodifier Dimmer

The Moodifier Dimmer is a network connected lighting controller for everything that can be controlled with the 0-10V and 1-10V lighting control standard. The Moodifier Dimmer can also be set to output PWM signals instead of 0-10V. Together with the Moodifier control software it opens up new possibilities for how traditional lighting can be controlled and dimmed.

**Power supply, network and other peripherals may only be connected according to the instructions that are printed on top of the Moodifier Dimmer units. A faulty installation may cause harm and/or damage.**

**All Moodifier units should always be installed in a way that ensures good ventilation so that open air can flow freely around the units.**

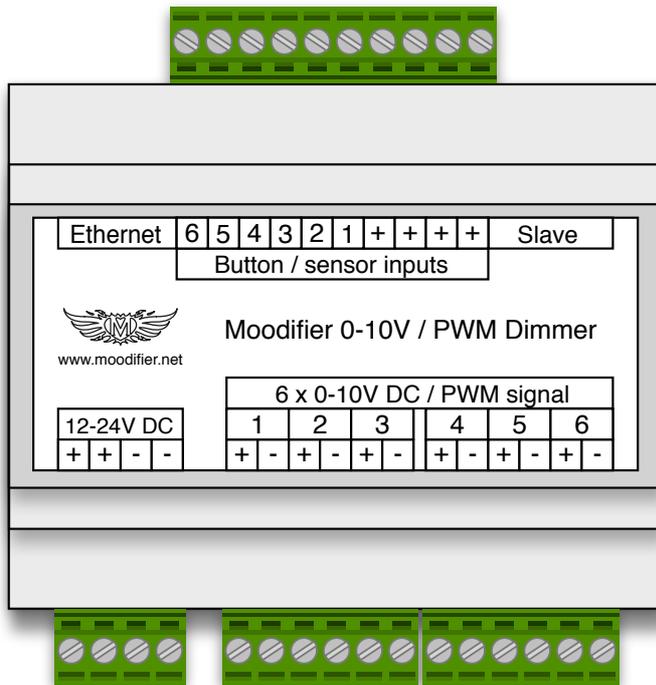
- **Do not short circuit any of the dimmer channels, it could destroy the Moodifier unit and invalidate the guarantee**
- **Do not mix up the plus and minus poles of the power supply, connecting the power supply with the wrong polarity can destroy the Moodifier unit and invalidate the guarantee**
- **Moodifier Dimmer units may only be installed indoors**
- **Moodifier Dimmer units may not be installed in wet or damp areas**
- **Moodifier Dimmer units may not be encapsulated or enclosed in a way that prevents access to the units**

Despite that the Moodifier Dimmer is a low voltage and low current unit it should always be connected in a proper and professional way. You should always consult an authorized electrician if you are insecure on how the units are to be connected or if you are insecure if you are authorized to connect the units.

## The DIN-rail mounted Moodifier Dimmer unit

The Moodifier Dimmer has the following connectors

- 1 Network port (Ethernet)
- 4 ports for connecting and daisy chaining a 12-24V DC power supply
- 1 port for connection of a Slave unit
- 10 sockets for connecting up to 6 push button or sensor inputs
- 12 sockets (6 channels) for connecting 0-10V or PWM signal controllable devices



The DIN-rail mounted Moodifier Dimmer unit seen from above with connectors facing up/down.

# Main features

## Hardware (stand alone) functionality

- Network (Ethernet 10/100 Base-T).
- 6 individually controlled 0-10V or PWM outputs.
- The 0-10V outputs can be configured to instead output a PWM signal with variable PWM frequency (480Hz - 4.8kHz).
- 0-100% dimming in 250 steps.
- Variable dim-transition speeds.
- Up to 6 internally stored user defined light scenes that can be triggered by the button or sensor inputs.
- Button / sensor inputs can be set to function as "push-to-dim", "momentary on, while active" or "auto-default" in 1-250 minutes after an input has been triggered.
- Button / sensor triggering over IP network through UDP and built in HTTP web interface.
- UDP broadcast IP network notifications whenever inputs are triggered (with input index).
- Built in HTTP web server where lights and push buttons can be controlled using any standard web browser.
- Ability to disable and enable push button input triggering with network commands.

## Software (networked) functionality

- Multiple control softwares for Mac, Windows, Linux and Raspberry Pi.
- Easy to use and feature rich softwares for controlling lights and create user defined light settings.
- Unlimited number of user defined light settings.
- Organize light settings in user defined zones.
- Automation through scheduling of light settings, by day / time or in relation to sunrise / sunset.
- Password protected, SSL secured and easy to use web interface for remote control of all light settings, zones etc.
- Full status reporting (ip number, temperature, voltage, 0-10V/PWM frequency, current channel statuses etc).
- Remote control all lights with iPhone, iPad, iPod, Android phones and tablets and any web browser.
- Automated light scenarios with down to 1/100 of a second accuracy.
- Free API for custom software development and integration.

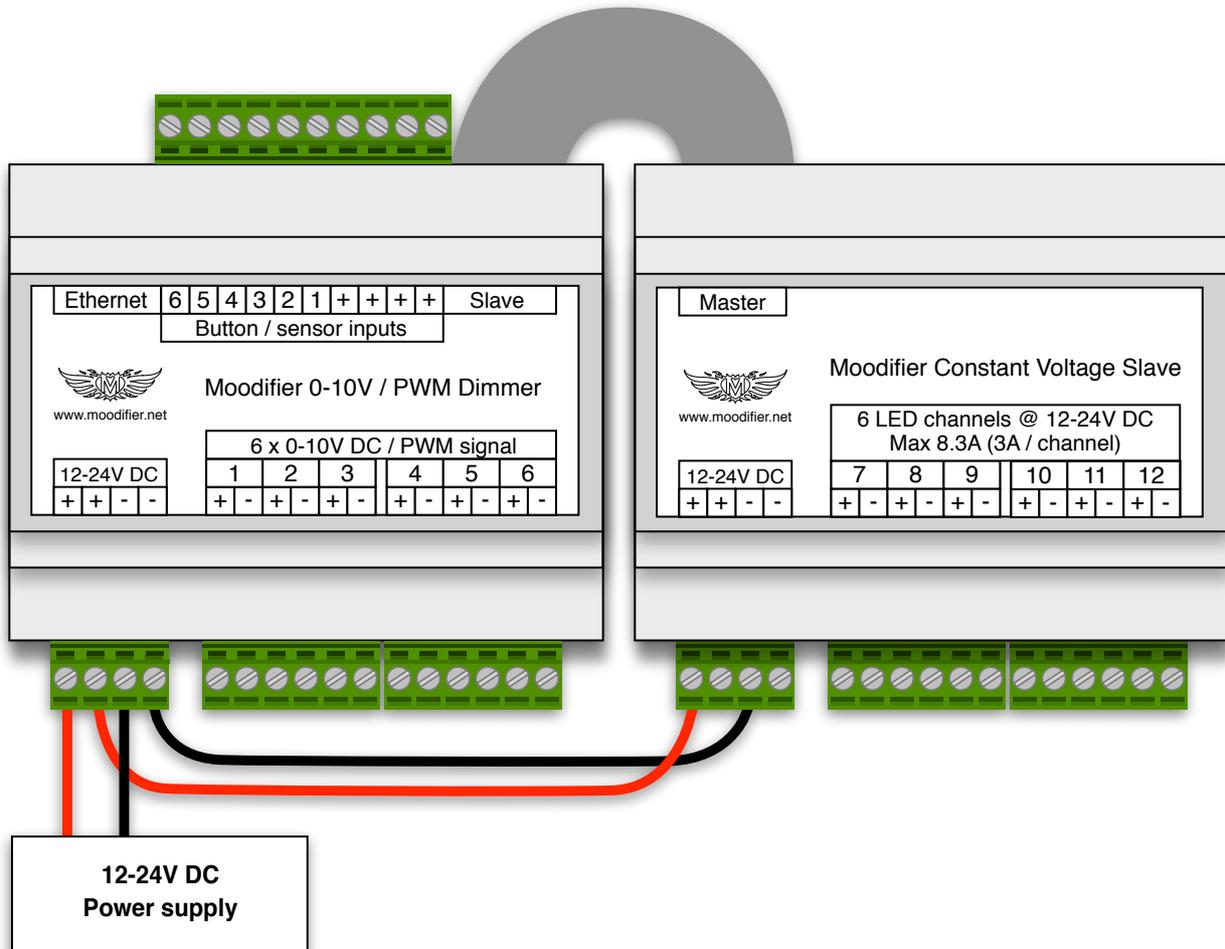
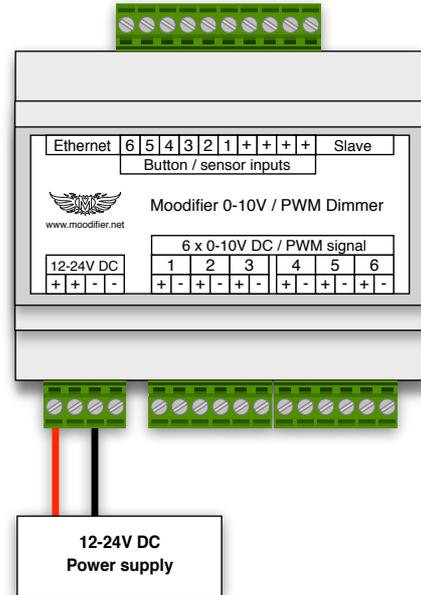
## Connecting the power supply

The Moodifier units must be powered by a 12-24V DC power supply (sold separately).

The power supply needs to be able to provide enough power to drive all LEDs and all other peripherals that are connected to the devices.

The 12-24V DC power supply is easily connected by plugging it in to the appropriate connectors on the Moodifier Dimmer and Slave units.

Do not mix up the plus (+) and minus (-) polarity of the power supply, connecting the power supply with the wrong polarity will destroy the Moodifier unit and invalidate the guarantee.

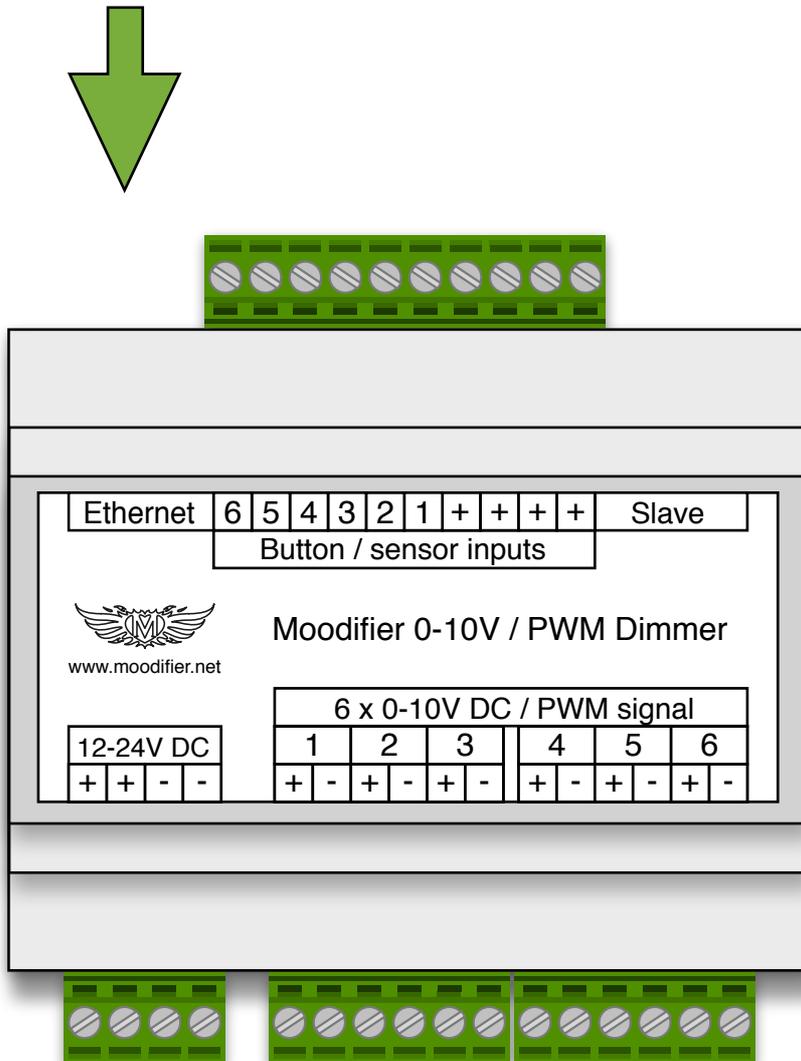


By putting a standard wall switch that cuts the power to the power supply you will get a master power on/off switch for the device. Use the Moodifier application to set the default light setting that is activated whenever the unit is powered up or after power failures.

If you need more sophisticated wall switch you can connect up to 6 wall mounted push buttons or sensors to the button/sensor inputs.

## Connecting to the network (LAN/Internet)

The Moodifier Dimmer connects to the network with a standard ethernet cable. The device may also be connected to a Wifi-network by using a Wifi-adaptor from Netgear<sup>1</sup>.



The Moodifier Dimmer will auto-configure itself on the network with DHCP. Once the unit is connected to the network and powered on it will be ready and available on the network. Use the Moodifier software to auto-detect Moodifier devices on the network. Once a Moodifier device is detected on the network you can start to control the lights that are connected to it.

<sup>1</sup> <http://www.netgear.com/home/products/wireless-adapters/high-performance/WNCE2001.aspx> (sold separately)

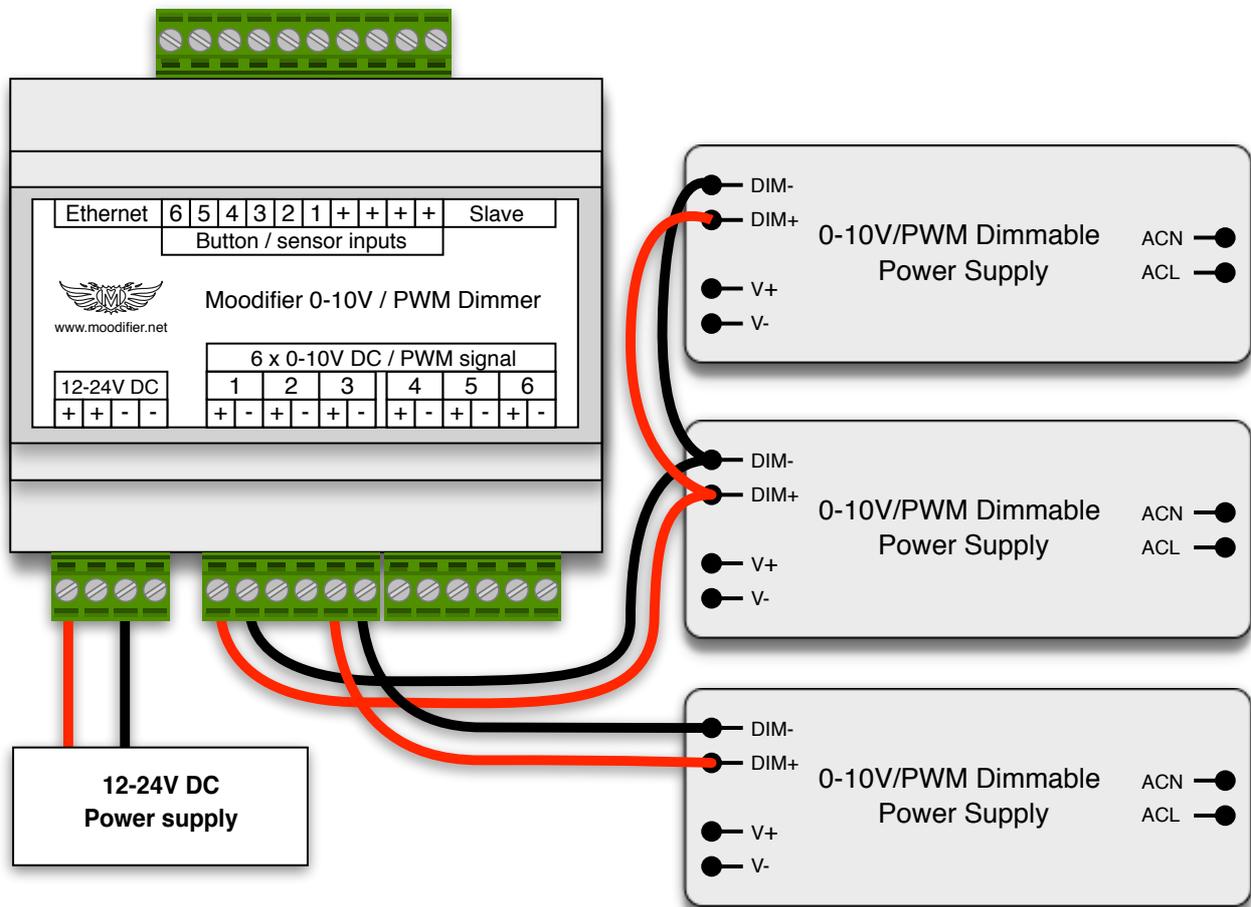
## Configuring network settings

By default the Moodifier Dimmer is set to use DHCP, but you can also disable DHCP and set the IP number, Gateway and Subnet mask manually with the Moodifier Daemon software<sup>2</sup>. For detailed instructions we refer to the Moodifier Daemon software documentation.

## Connecting 0-10V / PWM controllable devices

The Moodifier Dimmer has 6 individually controllable 0-10V / PWM control channels. Each channel can be wired to control one or multiple 0-10V/PWM controllable devices.

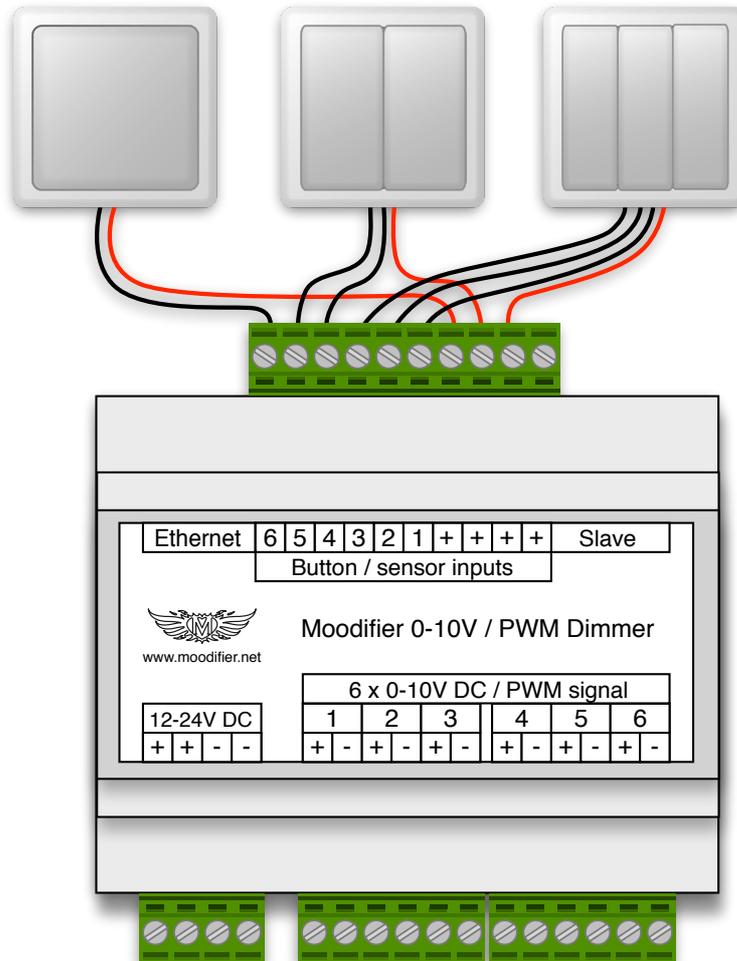
The Moodifier Dimmer can control both 0-10V and 1-10V controllable devices. When controlling a 1-10V external device the device may turn off or halt at around 10% output depending on the type of 1-10V implementation of the external device.



<sup>2</sup> <https://www.barsark.com/moodifier-daemon> (sold separately)

## Connecting push button wall switches and sensors

The Moodifier Dimmer has 10 connectors for connection of up to 6 wall mounted push buttons or sensors. The inputs are triggered whenever a circuit is closed between any of the "+" input connectors and any of the 6 input connectors. The push button inputs can be set to three different modes "push-to-dim", "momentary on, while active" or "auto-default in x minutes".



Moodifier Dimmer with 6 connected push buttons that each activates/de-activates its own light scene.

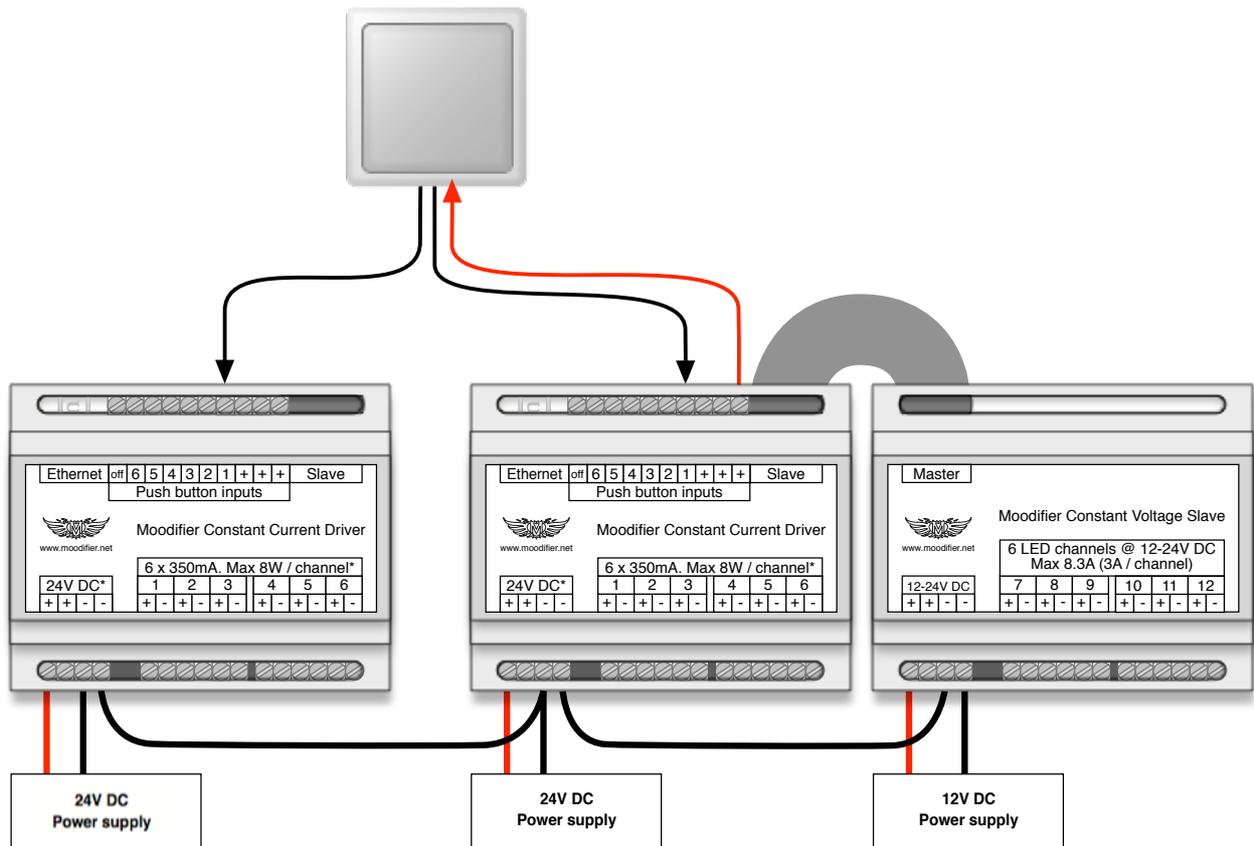
### Virtual input (V-IP 7)

The unit also has a 7th virtual input that acts like the 6 physical inputs (activates a light setting) but it does not have any physical input connectors. The virtual input can however be activated and controlled with network commands, just like the physical inputs.

## Connecting multiple Moodifier units to a single button/sensor

One push button can be wired to control multiple Moodifier units. If doing so you will first need to make sure that all the Moodifier units use a common ground. This is easily accomplished by connecting a wire between the Moodifier units ground (-) connectors.

The push button is then connected so that, when pushed, it closes a circuit between **one** of the Moodifier units push button + ports and a given push button return channel on each Moodifier unit. The push button will then control the given push button channel on each Moodifier unit. See wiring diagram below.



# Input functionality (buttons/sensors)

## Configuring input button/sensor light scenes

The Moodifier software enables you to set the light scenes that are activated/de-activated by the button/sensor inputs of the Moodifier Dimmer. Each channel on the device can be activated and set to any given level when the input is triggered by a button or sensor. Each button/sensor input can optionally be set to auto-return to the default light scene with a delay of 1-250 minutes, this is useful if you have a motion sensor connected to the input and you want the lights to automatically turn off if no motion (presence) is detected within 1-250 minutes.

To disable a button/sensor input you simply deactivate all the channels for that button. When all channels of a button are deactivated the input will do nothing when triggered by a button/sensor.

For further software instructions we refer to the Moodifier software documentation.

## Push-to-dim input mode (default)

A push on each button activates/de-activates a given light scene. Holding in the push button will enable dimming of the light scenes (0-100%). By default each of the 6 push button inputs will control channel 1 through 6, 0-100%, but you can easily use the Moodifier software to define your own custom light scene for any given input. The set light scenes are stored in the Moodifier unit even after a power cut so there is no need for reset after power failures. The inputs enables you to control the Moodifier lighting in a traditional way with standard wall mounted push buttons. The push buttons makes the Moodifier Dimmer fully operational as a stand alone unit if the IP-network goes down or is disconnected.

## Auto-default input mode (optional)<sup>3</sup>

Each of the 6 inputs can optionally be set to "auto default" to the "default setting" in 1-250 minutes. This functionality is useful if you for instance have a motion detecting sensor that should turn the lights on whenever motion (presence) is detected. By using the auto default feature the lights can automatically be set to the default light setting (dimmed to any level) after 1-250 minutes of no motion (no presence).

## Momentary input mode (optional)<sup>4</sup>

Each of the 6 inputs can optionally be set to "momentarily" activate it's light setting while active (while a push button is held in) and return to the "default setting" once de-activated (when the push button is released). The shortest active momentary duration is limited to 1-2 seconds.

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<sup>3</sup> Requires the Moodifier Daemon software for setup <https://www.barsark.com/moodifier-daemon> (sold separately)

<sup>4</sup> Requires the Moodifier Daemon software for setup <https://www.barsark.com/moodifier-daemon> (sold separately)

## Network commands

Network commands and instructions can be sent to the Moodifier Dimmer over HTTP, UDP and optionally UDP-broadcast. All available commands are documented in the Moodifier UDP & HTTP API<sup>5</sup>.

The Moodifier Dimmer also has a built in web server that enables changing of channel settings etc. Visit the IP number of the Moodifier Dimmer with a web browser to access the web interface and explore and try out the available HTTP command options.

To activate all channels at 100% of a given Moodifier Dimmer with IP number 192.168.0.2 you could simply request the URL "http://192.168.0.2/set.html?call=250" with any web browser. To instead turn all the lights off you would instead simply request the URL "http://192.168.0.2/set.html?call=0" with any web browser. To set channel 4 to 50% with a 1 second transition and channel 6 to 100% with a half second transition you simply request the URL "http://192.168.0.2/set.html?c4=125&c6=250&t1=10&t4=5" with any web browser (all channels except 4 and 6 will be left unchanged).

## Delayed Input / button triggering

Inputs/buttons can be set to trigger 1-250 seconds after a network command was received by the unit. The command holds a delay-parameter that controls the delay from when the command is received to when the input/button is triggered (1-250 seconds). Delayed input /button triggering commands can be sent to the Moodifier Dimmer over HTTP, UDP and optionally UDP-broadcast.

Sending a delayed input command with a delay parameter of 10 to a unit will trigger the set input 10 seconds later, but if another command is received within this 10 second delay period the delay period is re-set to the new delay parameter, counting from the time of the last commands arrival.

To send a HTTP delayed input activation command to a Moodifier dimmer with IP number 192.168.0.2 you simply request the following URL:

http://192.168.0.2/set.html?btn=X&del=Y (where X is the button index and Y the delay in seconds). A delay value of 0 will de-activate any active delay timers for the given input/button.

## Network watchdog (emergency light scene)

If you want to activate a light scene whenever a Moodifier dimmer loses it's network connection you simply set up an input/button light scene as you like, then repeatedly, say every 5 seconds, request the unit to activate the input with a delay of 11 seconds. Now, if a unit does not get an instruction to activate the input within 11 seconds (network is down), it will activate the emergency light scene.

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<sup>5</sup> <http://www.moodifier.net/api>

## IP network event notifications

The Moodifier Dimmer can notify other devices on the network (LAN) whenever a status changing event occurs. These IP network event notifications are sent out as UDP broadcast datagrams to IP 255.255.255.255 on port 6060.

### Input event notifications (buttons/sensors)

Each input on the Moodifier Dimmer can be configured to send out a UDP broadcast input event notification whenever a button/sensor input event occurs.

A button/sensor input event occurs when:

- 1) A button/sensor input circuit is closed (pushed in). If any other input circuits are closed (pushed in) at the time of the event it will also report the closed status of those inputs<sup>6</sup>.
- 2) An input "auto-return" delay times out<sup>7</sup>. If any input circuits are closed (pushed in) at the time of the event it will also report the closed status of those input circuits.
- 3) A "momentary" set input button/sensor is released. If any input circuits are closed (pushed in) at the time of the event it will also report the closed status of those input circuits.

The datagram data that is sent out is in the format "btn=X,Y,Z...n", below are some examples.

"btn=0,1" => input circuit 1 was closed when the event occurred.

"btn=0,2,4" => input circuit 2 and 4 were closed when the event occurred.

"btn=0" => no input circuits were closed when the event occurred (an input auto-return timeout or momentary input release event occurred)

Upon interception of this UDP broadcast input event notification the receiver will know that an input event has occurred, and what input circuits were closed at the time of the event.

### HTTP event notifications

The Moodifier Dimmer will send out a UDP broadcast event notification whenever a valid HTTP request is received by the unit. The UDP broadcast datagram will contain the ip address of the Moodifier unit, the command values<sup>8</sup> that were processed by the unit and the IP address of the device that made the request. The format is:

```
"cmd=254 0 2 251 251 251 0 0 0 0 0 0 0 8 8 8 8 8 8 8 8 8 8 8 8 11 12 255&rip=192.168.0.4"
```

Upon interception of this UDP broadcast event notification the receiver will know that a HTTP event (status change) of the unit has occurred, what the command was, and what IP (who) requested the command.

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<sup>6</sup> The minimum closing time of an input should be 0,3 seconds or longer in order to be reported as a closing-event of that particular input. If the closing event is shorter the event notification may be sent out as btn=0.

<sup>7</sup> The timeout counter is started when the initiating closing event is released.

<sup>8</sup> Command values are covered in the Moodifier UDP & HTTP API.

## UDP event notifications

UDP commands that are sent to the unit will prioritize maximum speed in favor of notifications.  
UDP commands that are sent to the unit will therefore not generate any event notifications.

## Event notifications summary

- Physical input triggering can be set to generate an input event notification.
- Input 1-250 min "auto-return" timeout events can be set to generate an input event notification.
- Input triggering via HTTP requests will always generate a HTTP event notification.
- HTTP request commands will always generate a HTTP event notification.
- Input triggering via UDP commands will not generate any notifications.
- UDP commands will not generate any notifications.

If you want to receive event notifications always use HTTP request commands (and physical or HTTP input triggering).

All notifications can be intercepted by any software/server in the LAN.

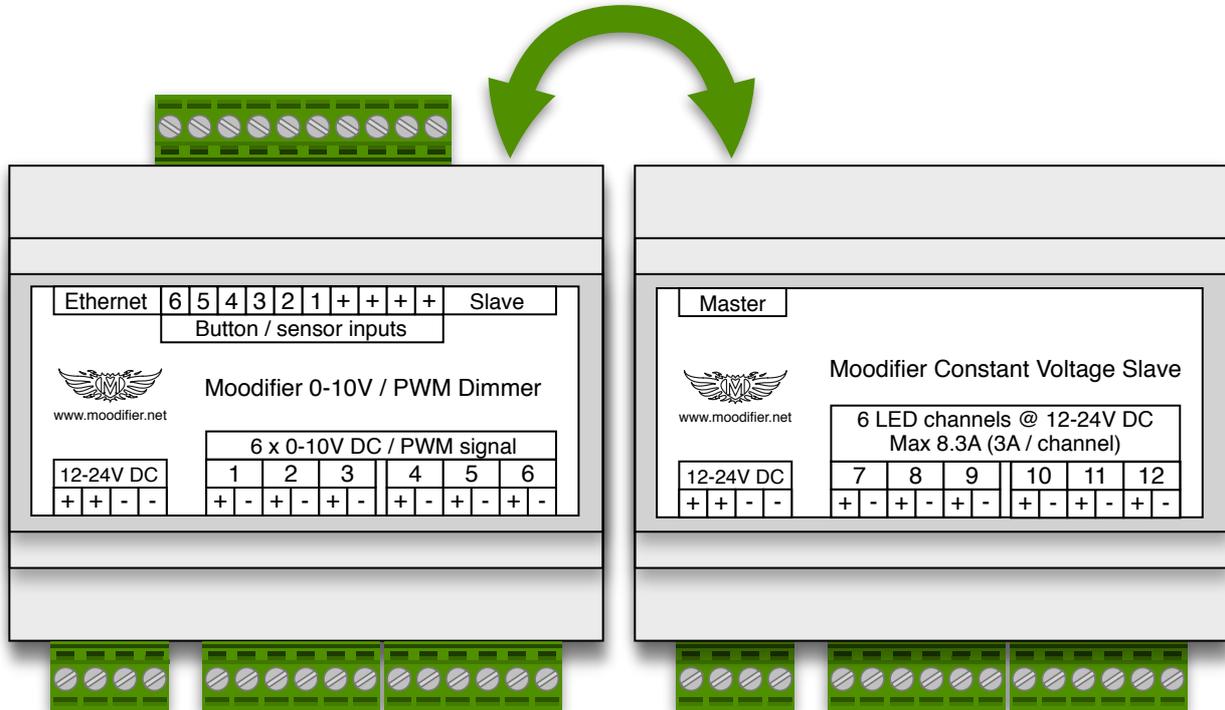
Upon interception of a notification it can also be transformed, complemented and passed on as a HTTP/REST request to other servers/software.

## Disabling inputs (manual IP takeover)

The Moodifier Daemon server application has features that will let you disable push button/sensor inputs based on light scenes. This feature will let you take manual IP control of all lights and devices that are controlled to the unit.

## Master and Slave units.

The Moodifier Dimmer has a socket where you can connect a Slave unit to expand with more channels, more power and more lights. The Slave unit is easily connected with a standard flat cable (included with all Moodifier slave units).



You can connect 2 types of slave units to the Moodifier Dimmer, a Moodifier Constant Current Slave unit or a Moodifier Constant Voltage Slave unit. This adds great flexibility when designing your lighting since it enables a wide range of options for both 0-10V and PWM controlled equipment as well as constant current and constant voltage based LED lighting and relays.

### Connecting a Moodifier Constant Current or Constant Voltage Slave unit

Connecting a Moodifier Constant Current Slave unit will provide 6 extra constant current LED channels.

Connecting a Moodifier Constant Voltage Slave unit will provide 6 extra constant voltage LED channels.

The slave unit can be powered with the same or a different voltage than the Master unit as long as the units use a common grounding. This adds great flexibility when designing your lighting since it enables a wide range of options.

For more information about the Moodifier DIN-rail mounted Constant Current units visit:

[www.moodifier.net/hardware/din-rail-constant-current-driver](http://www.moodifier.net/hardware/din-rail-constant-current-driver)

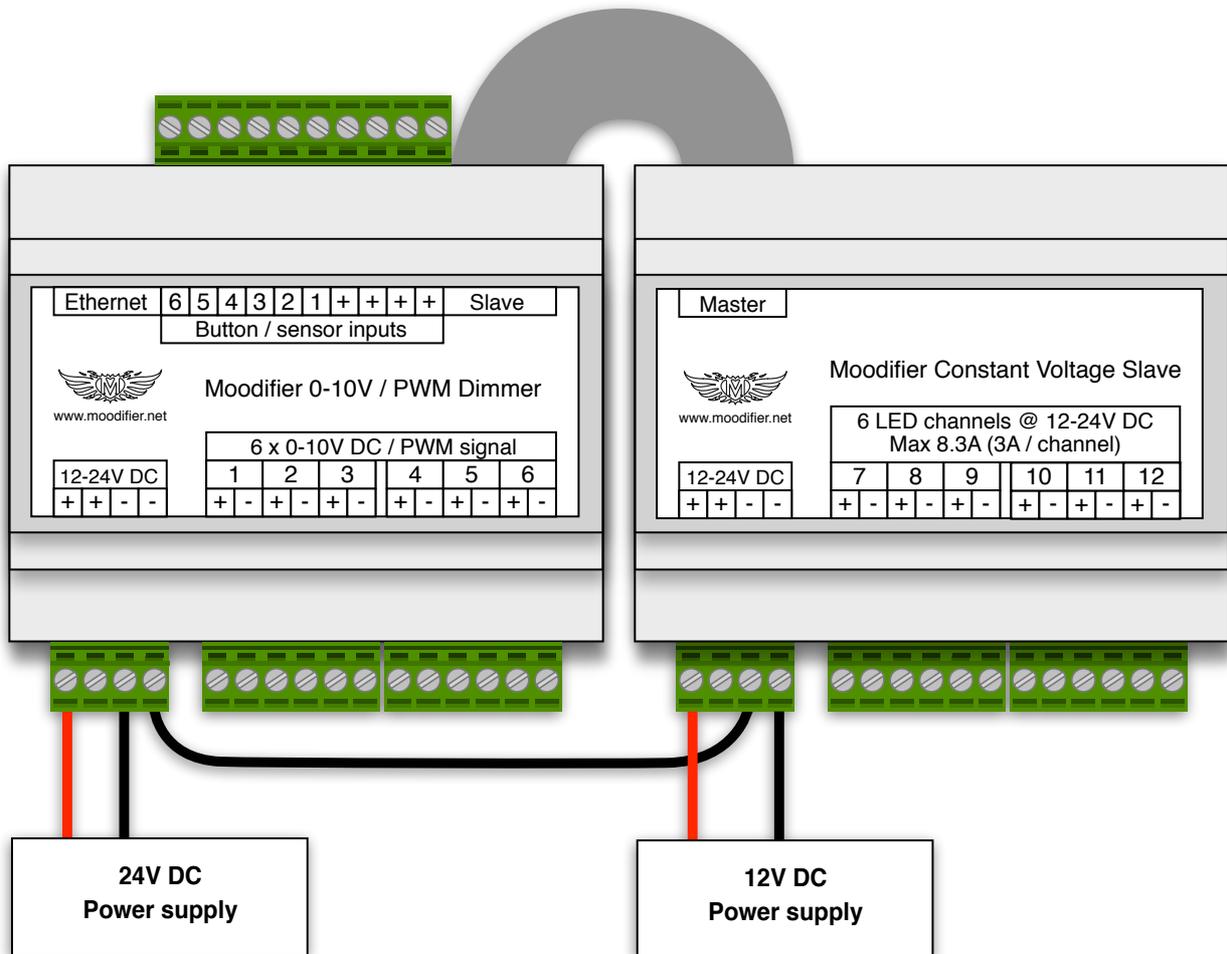
For more information about the Moodifier DIN-rail mounted Constant Voltage units visit:

[www.moodifier.net/hardware/din-rail-constant-voltage-driver](http://www.moodifier.net/hardware/din-rail-constant-voltage-driver)

## Powering master and slave units with different power supplies and/or at different voltages.

Master and slave units that are connected to each other should always use a common ground.

If you need to power an interconnected master and slave unit at different voltages, or using different power supplies of the same voltage, you need to make sure that the two units are commonly grounded. This is easily accomplished by connecting a wire between the two units ground (-) connectors.



Interconnected Master and Slave units running at different voltages and power supplies with common grounding.

# Technical specification

## Moodifier DIN-rail mounted Dimmer

### Connections

- 1 Network port (Ethernet)
- 4 ports for connecting and daisy chaining a 12-24V power supply
- 1 port for connection of a Slave unit
- 10 sockets for connecting up to 6 wall mounted push buttons or sensors
- 12 sockets (6 channels) for connecting 0-10V or PWM controllable devices

### Technical data

Power supply	12-24V DC
Network	Ethernet 10/100
0-10V / PWM channels	6 (max 10mA/channel)
PWM Frequency	480Hz - 4.8kHz (adjustable)
Button/sensor inputs	6
Overheat protection	Yes
Conforms to European EMC regulations	Yes
CE marked	Yes
Dimensions (WxHxD)	104x85x60mm
Ambient temperature (in operation)	0-50°C

### Software

Moodifier software <http://www.moodifier.net/software/>

Moodifier Daemon <https://www.barsark.com/moodifier-daemon/> (sold separately)

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