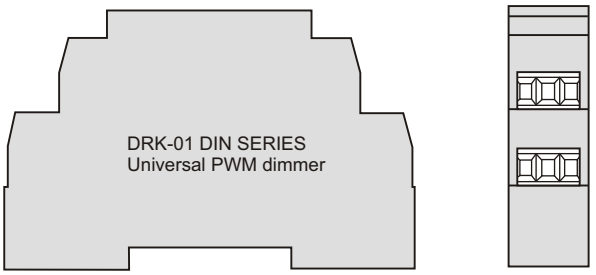
# DRK-01 DIN series PWM Dimmer

## UNIVERSAL LOW VOLTAGE LED DIMMERS
## DRK-01 DIN SERIES




## Description

*DRK-01 DIN series universal PWM dimmers are designed for smooth, flicker-free dimming of all constant voltage LED modules, including MR16 bulbs as well as 12V/24V Incandescent/Halogen bulbs.*

*DRK-01 DIN series dimmers are ideal LED dimmers for any application which calls for low voltage DC lighting for home as well as commercial and industrial applications. It can be used in recreational vehicles (RV), mobile homes, and other large vehicles, such as buses and trucks.*

*DRK-01 DIN series dimmers include several protection features against common wiring/lamp malfunctions that can protect the installation and can be powered from a DC power supply or batteries. This makes them ideal for use in marine environments such as ships, boats, yachts, sailboats, and boat homes.*

## Features

- *Proprietary Adaptive Pulse Modification (APM) PWM delivers flicker-free lighting and extended dimming range*
- *Smoothly dims any LED, including hard to dim MR16 and G4 lamps across the full (0-100%) dimming range*
- *Excellent dimmer for 12V/24V Incandescent/Halogen bulbs as well*
- *Superior safety features including Overheating, No-load, Overload, and Short circuit protection with auto restart*
- *Can be controlled with a variety of input devices including regular wall switches*
- *Simple synchronization of multiple units for controlling larger loads*
- *Non-volatile memory for dimmer output setting*
- *Compact housing*
- *Minimum brightness adjusted with a potentiometer*
- *High efficiency, low power consumption*
- *Fits onto a standard DIN rail*
- *Soft start function limits lamp inrush current, extending its life*

## Applications

- *Nautical lighting*
- *RV / caravan lighting*
- *Low voltage lighting*
- *Applications when high reliability and safety of installation is needed*
- *Dimming of MR16, MR11, G4 and other LED lamps with integrated current controller*
- *Dimming of incandescent low voltage bulbs*
- *Dimming of any 12/24V DC constant voltage LED module such as:*

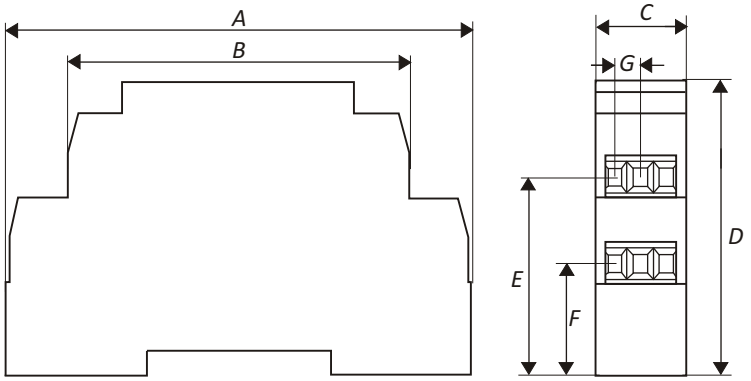
  *Flexible and Rigid Strips, Rope Light, Rigid Light Bars, Under-cabinet Lights etc.*

# DRK-01 DIN series PWM Dimmer

## Specifications

| TECHNICAL DATA | DRK-01-500-DIN | DRK-01-850-DIN | DRK-01-1200-DIN |
|---|---|---|---|
| Supply input voltage range nom: | 12 - 24 V DC | 12 - 24 V DC | 12 - 24 V DC |
| Supply input voltage (min - max): | 6 - 30 V DC | 6 - 30 V DC | 6 - 30 V DC |
| Supply Input current: | 5A | 8.5A | 12A |
| Output current max: | 5A | 8.5A | 12A |
| Output load max: | 60W@12VDC / 120W@24VDC | 100W@12VDC / 200W@24VDC | 144W@12VDC / 288W@24VDC |
| Control voltage: | 1-10 V DC (0V - OFF) | | |
| Control current max: | 0.1mA | | |
| Control: | 0-10 V controls, Pot 100K Ohm, Dry Contact, Open collector | | |
| Dimming mode: | Adaptive Pulse Modification PWM | | |
| Operating frequency: | 390 Hz | | |
| Dimming range: | 0-100% | | |
| Dimming resolution: | 65 000 steps | | |
| Temperature range: | 0 $^{O}$C to +50 $^{O}$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$^2$ (AWG 14) max. | | |
| Housing dimensions (W x D x H): | 17.5mm x 90mm x 56mm (0.7" x 3.5" x 2,2") | | |

## Dimensions




| | |
|---|---|
| A (overall length) | 90 mm (3.5") |
| B (top length) | 66 mm (2.6") |
| C (width) | 17.5 mm (0.7") |
| D (overall height) | 56 mm (2.2") |
| E (top connector height) | 37 mm (1.5") |
| F (bot. connector height) | 21 mm (0.8") |
| G (connector pitch) | 5 mm (0.2") |

## Installation

*Connect the unit according to the control signal used (see connection diagrams below).*
*A unit can be mounted on a standard DIN rail.*
*Sufficient heat dissipation of the device needs to be ensured. The ambient temperature must not exceed 50$^{O}$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 000uF (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.*

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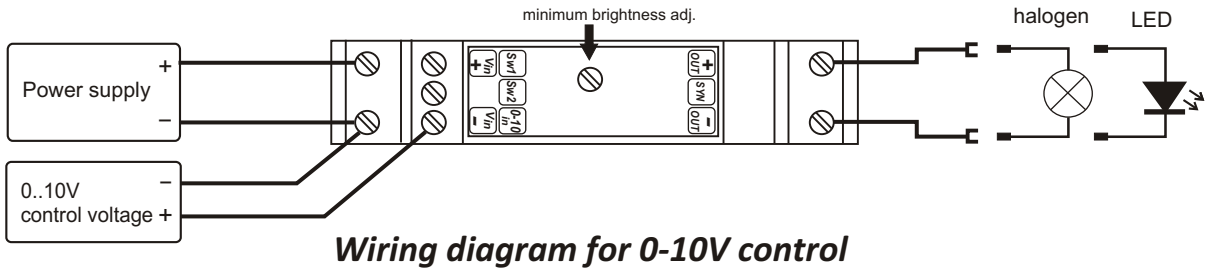
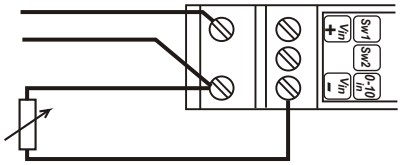
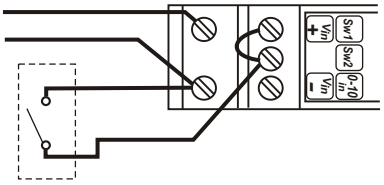
## Installation diagrams




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

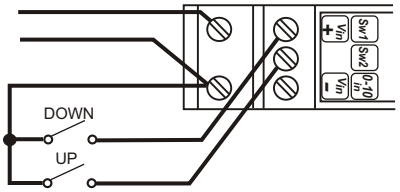


***potentiometer control***



*Vimar Momentary Switch (#16080)*

***single switch control***




***UP/DOWN switch control***

*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 a way to avoid large ground loops.*
*If ground loops can't be eliminated, an SDU signal conditioning unit should be used (see SDU signal conditioning unit for connection diagrams). The source of the 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.*

## *Minimum brightnes adjustment*

*Set the trimmer on the top of the dimmer to the most ACW position using an appropriate screwdriver (about ¾ of the turn). Set the dimmer output to the minimum dimming level. Slowly turn the trimmer CW until the desired minimum brightness is achieved.*
*NOTE: if the minimum brightness trimmer is set too low, lights will not turn on when the dimmer output is set to the minimum dimming level.*

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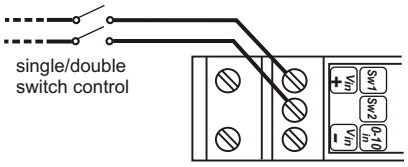
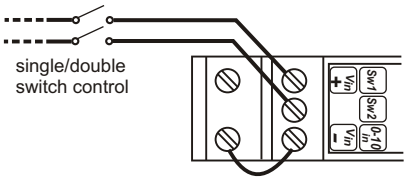
## Power-on output state selection

*When the dimmer is powered on or when it loses power for a short time it sets its output to the power-on state. This state depends on the control used. If controlled by 0-10V voltage or 100k potentiometer the power-on state is set by voltage/ resistance on its 0-10V input. If the dimmer is controlled by momentary switches the power-on states can be selected by following connections:*



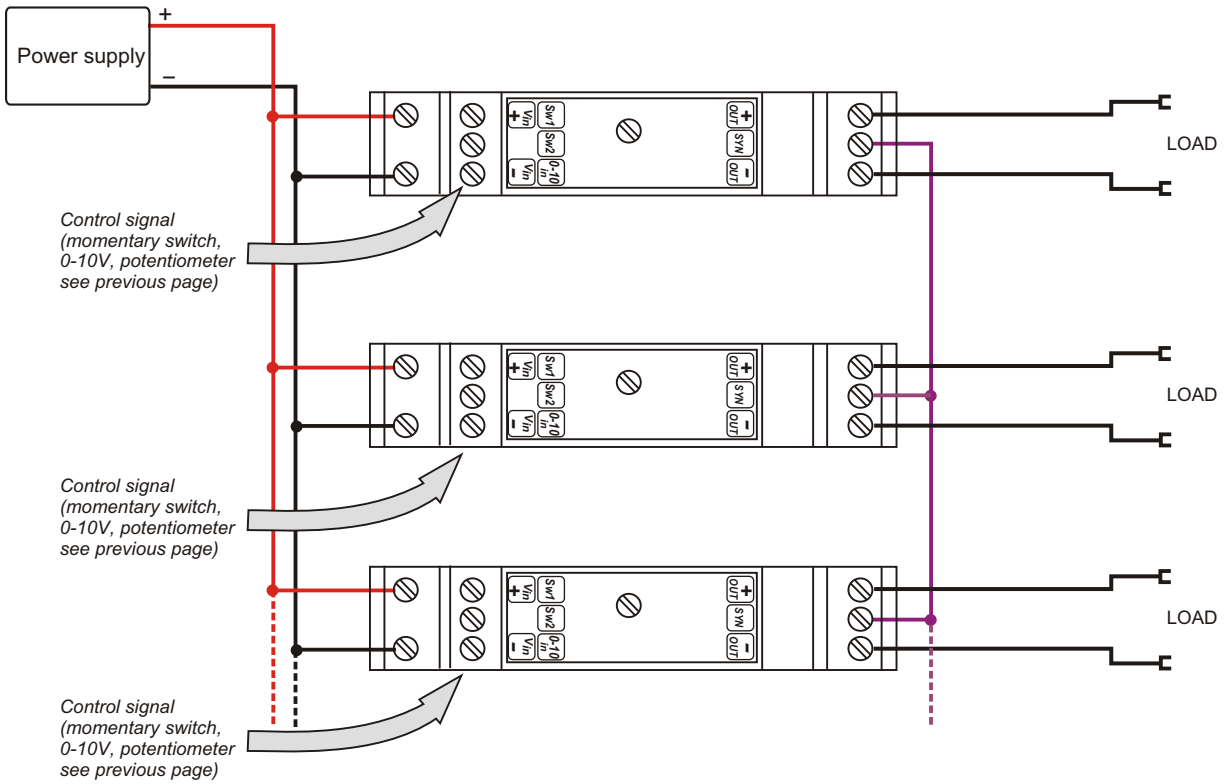

*Dimmer goes to the "last set state" stored in the non-volatile memory at power on/power loss.*




*Dimmer remains "off" at power on / power loss*

## Synchronizing output frequency and phase of multiple units

*If multiple units are connected to a shared power source (PSU of battery), the dimming frequency of each unit can interfere with each other due to the voltage drop on the common power wires. This can cause a flicker in output light intensity. By connecting the SYN output of all units, they operate with the same frequency and phase, eliminating interference.*




### Wiring diagram for Synchronization of output frequency and phase

*The above diagram only shows power connections and SYN pin connections. The control signal and load connection are not shown. In the above configuration, each dimmer still operates as an independent dimmer, using separate and independent controls for each dimmer and separate and independent outputs. Only the operating frequency and phase of the dimmers are synchronized.*

***NOTE:** It is possible to mix different types of DRK-01-DIN series dimmers in the above connection*