VMBDMI

Dimmer for resistive and inductive loads

CONTENTS

DESCRIPTION

With this module it is possible to dim lamps operating on mains voltage. Also suitable for dimming low voltage lamps in combination with a wire-wound iron core transformer.

PROPERTIES

Use:

- Required mains voltage: 220...240V/50Hz
- Suitable to control incandescence or halogen lamps on mains voltage
- Suitable to control low voltage halogen lamps in combination with a dimmable wire-wound iron core transformer
- Suitable for some types of dimmable LED lamps on mains voltage

Output:

- Maximum load: 400W @ 230V/50Hz
- Leading edge phase control
- Slowly switching on and off (ca. 1.5s) will prolong the life span of the lamp
- Dimming from 0 to 100% in ca. 4 seconds
- Power grid distortion (EMI) conform EN55015

Protection:

- Built-in non-resettable: 4A slow
- Verification of too inductive loads (holding current triac). This protection can be disabled for some types of lamps e.g. dimmable lamps
- Thermal protection:
  - When temperature reaches 80°C, light output is reduced to 25% of the desired value
  - When temperature reaches 90°C, the lamp is switched off
  - Thermal protection is switched off when temperature drops below 60°C
  - Tolerance on thermal protection: ±4°C

LED indications:

- Status of the dimmer:
  - Continuous on: desired dimming value reached
  - Slow flash: timer running
  - Fast flash: dimming value changing
  - Two short flashes: communication error detected
  - Three short flashes: not possible to dim load with this dimmer
  - Four short flashes: temperature alarm (light output reset to 25% of desired value)
  - Five short flashes: thermal protection (lamp is switched off)
- Presence of input voltage
- Sending and receiving Velbus data
- Report status to control modules

Module power:

- Required input voltage: 12...18Vdc
- Consumption in stand-by: 28mA@18Vdc
- Maximum consumption: 30mA@18Vdc

Dimensions:

- Standard DIN-rail housing: 2 modules wide
- Length x width x height: 90 x 36 x 58mm

Configuration:

- Only configurable via Velbus PC interface (VMB1USB, VMB1RS or VMBRSUSB) and the VelbusLink software
- Software addressing (up to 250 possible addresses)
- Storage capacity for 37 different pushbuttons and their function
- Multiple functions and time settings can be set via software
- Learned pushbuttons are maintained during power outage

Operation:

- Local operation on the module (on/off when short push, dimming when push and hold)
- Via Velbus commands or pushbuttons connected to the Velbus system
- Various operation functions:
  - Momentary
  - Off or slowly off
  - On or slowly on
  - On/off or slowly on.off
  - Timer (start/stop, resettable or non-resettable
  - Dim (more or less light output)
  - More light output
  - Less light output
  - Evoke atmospheres
  - Multiple step dimmer
  - Forced off
  - Forced on
  - Suppress

Time settings:

- Only settable via the VelbusLink software
- Switch-off time adjustable between:
  - 1 sec ... 2 min, increment 1 sec
  - 2 min ... 5 min, increment 15 sec
  - 5 min ... 30 min, increment van 30 sec
  - 30 min ... 1 hour, increment 1 min
  - 1 hour ... 5 hours, increment 15 min
  - 5 hours ... 10 hours, increment 30 min
  - 10 hours ... 24 hours, increment 1 hour
  - 2 days
  - 3 days
  - No switch-off time
- Dimming speed adjustable between:
  - 2 sec ... 2 min, increment 1 sec
  - 2 min ... 5 min, increment 15 sec
  - 5 min ... 30 min, increment 30 sec
  - 30 min ... 1 hour, increment 1 min
  - 1 hour ... 5 hours, increment 15 min
  - 5 hours ... 10 hours, increment 30 min
  - 10 hours ... 23 hours, increment 1 hour

VELBUS CHARACTERISTICS

- 2-wire communication for Velbus data + 2 wires for power supply
- Data transmission rate: 16.6 Kbit/s
- Serial data protocol: CAN (Controller Area Network)
- Short circuit protected (both towards '+' and '-' of the power supply)
- Bus error indication: 2 short flashes of the indicator LEDs
- Self repairing after 25 seconds when a bus fault occurs

Each dimmer can be given a name of up to 16 characters (max.).

The dimmer module can send following messages:

- Dimmer status
- Module type: dimmer module (including software version)
- dimmer name
- Communication fault counter
- Memory content

The dimmer module can send following commands:

- Turn off LEDs on a control module
- Turn on LEDs on a control module
- Make LEDs flash slowly or fast on a control module

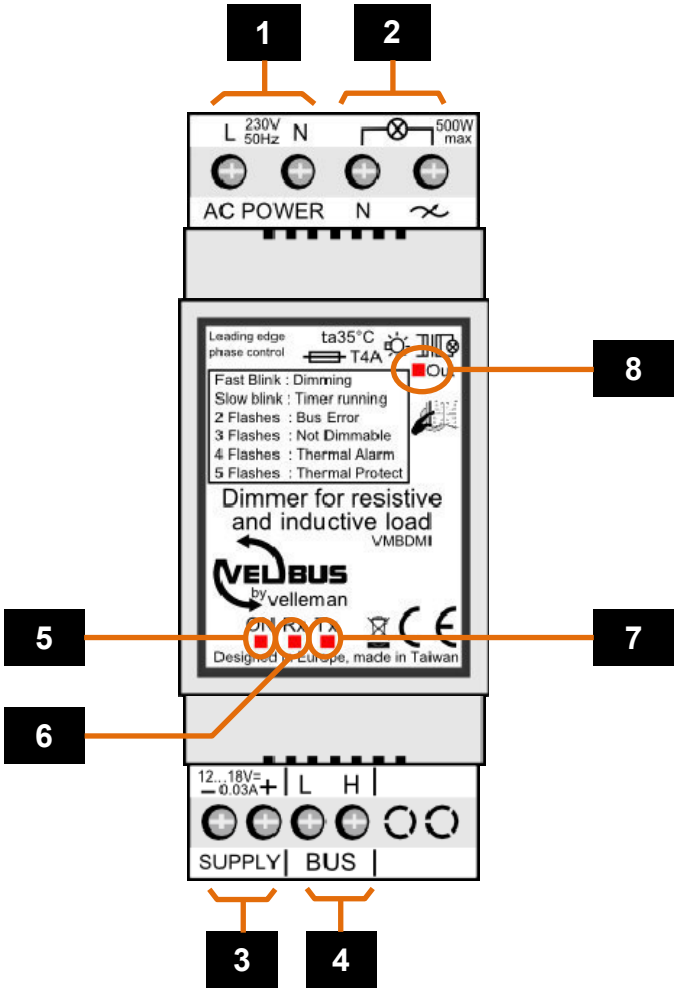
The dimmer module can receive following commands:

- The status of a pushbutton module
- The status of a slider button

The dimmer module can receive following commands:

- Set dimmer value
- Return to last used dimming value
- Stop dimming
- Start timer
- Forced off
- Cancel forced off
- Forced on
- Cancel forced on
- Suppress
- Cancel suppress
- Request dimmer status
- Request type of module and software version
- Request communication fault counter
- Request dimmer name
- Request memory content
- Overwrite memory content
- Clear pushbutton indication LED

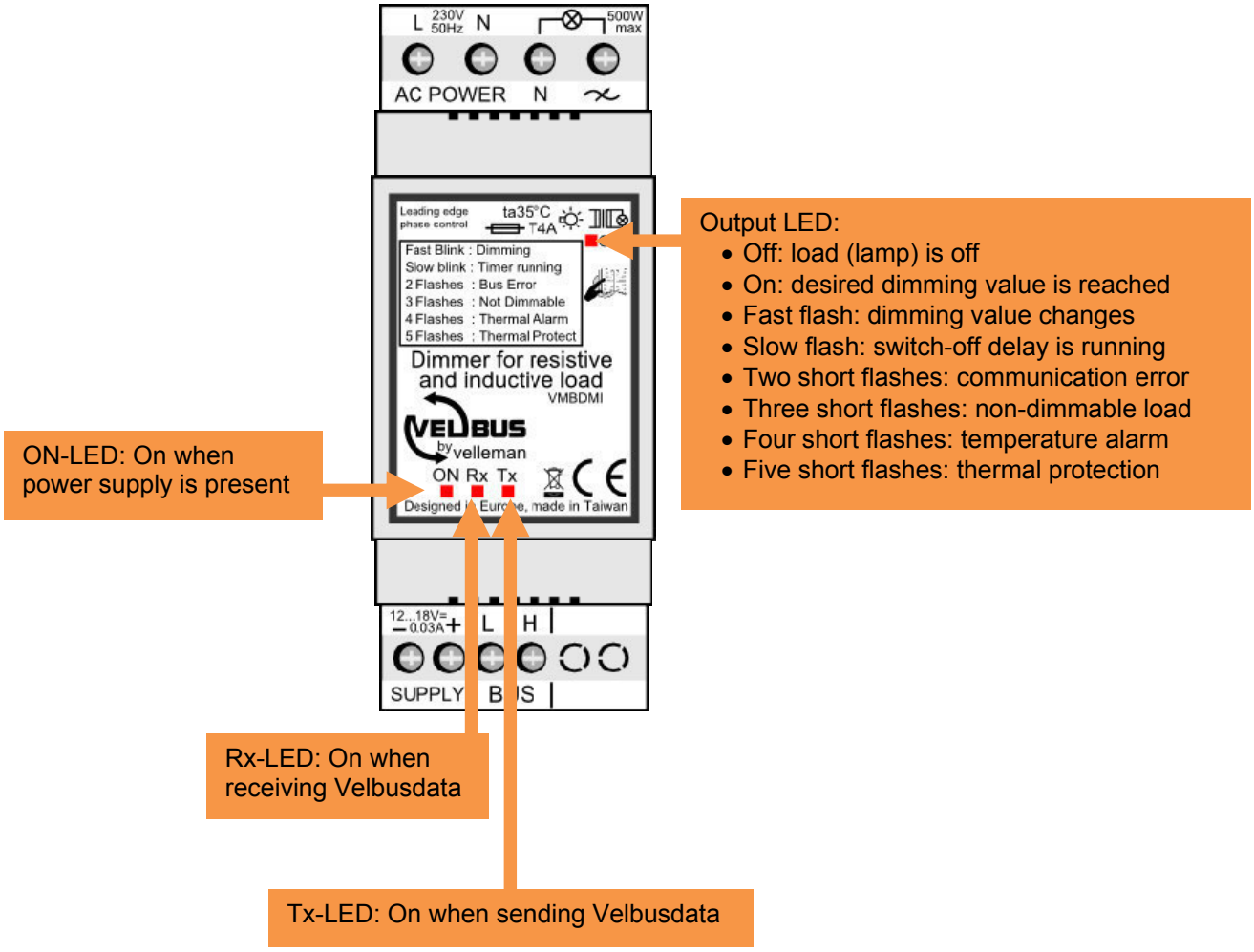
OVERVIEW



Connections	
1	mains voltage
2	Load
3	Velbus power supply
4	Velbus

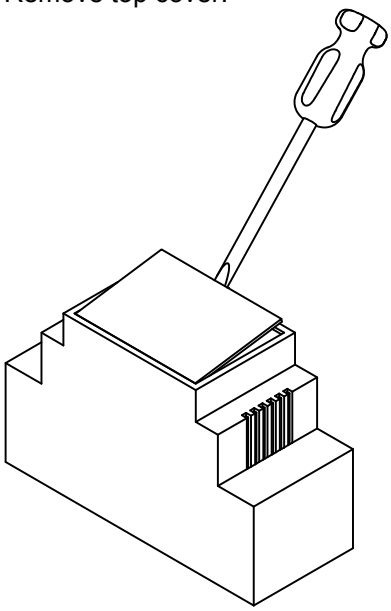
LED indications	
5	Power supply
6	Receiving Velbus data
7	Sending Velbus data
8	Output status

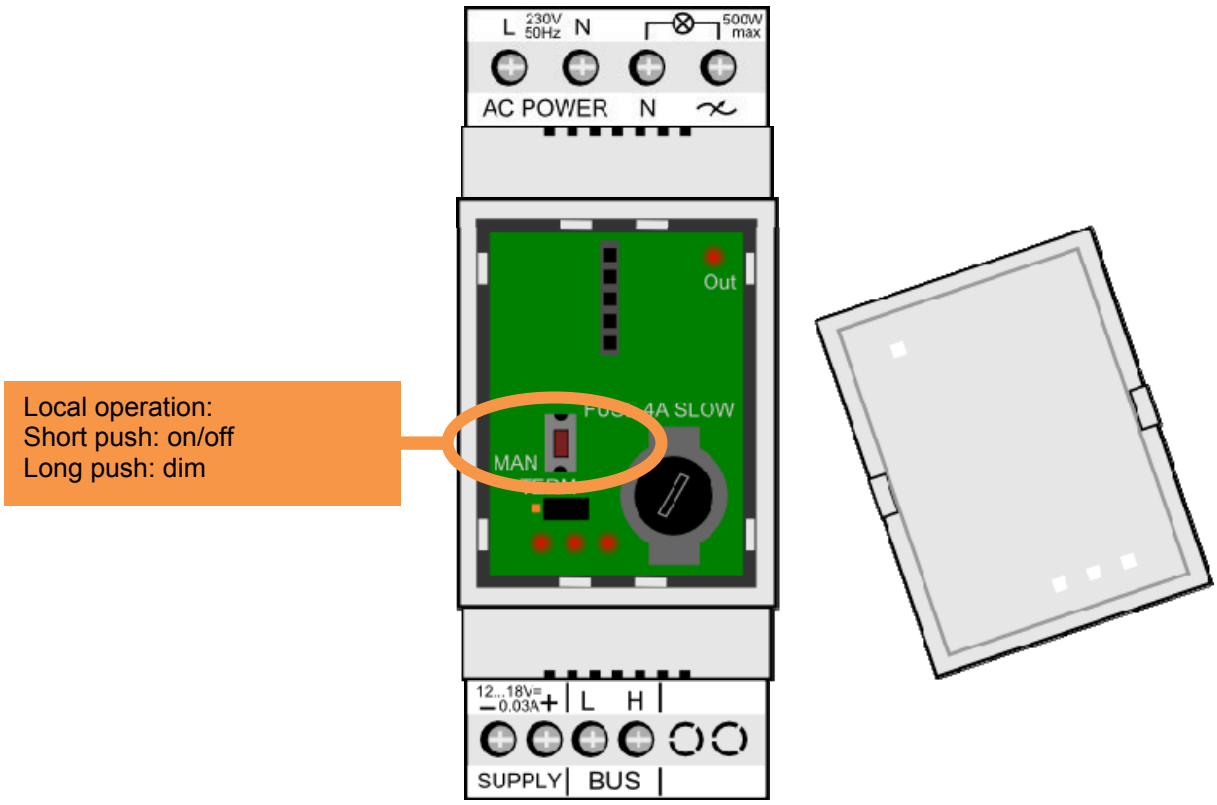
LED INDICATIONS



LOCAL OPERATION

Remove top cover.





Local operation:
Short push: on/off
Long push: dim

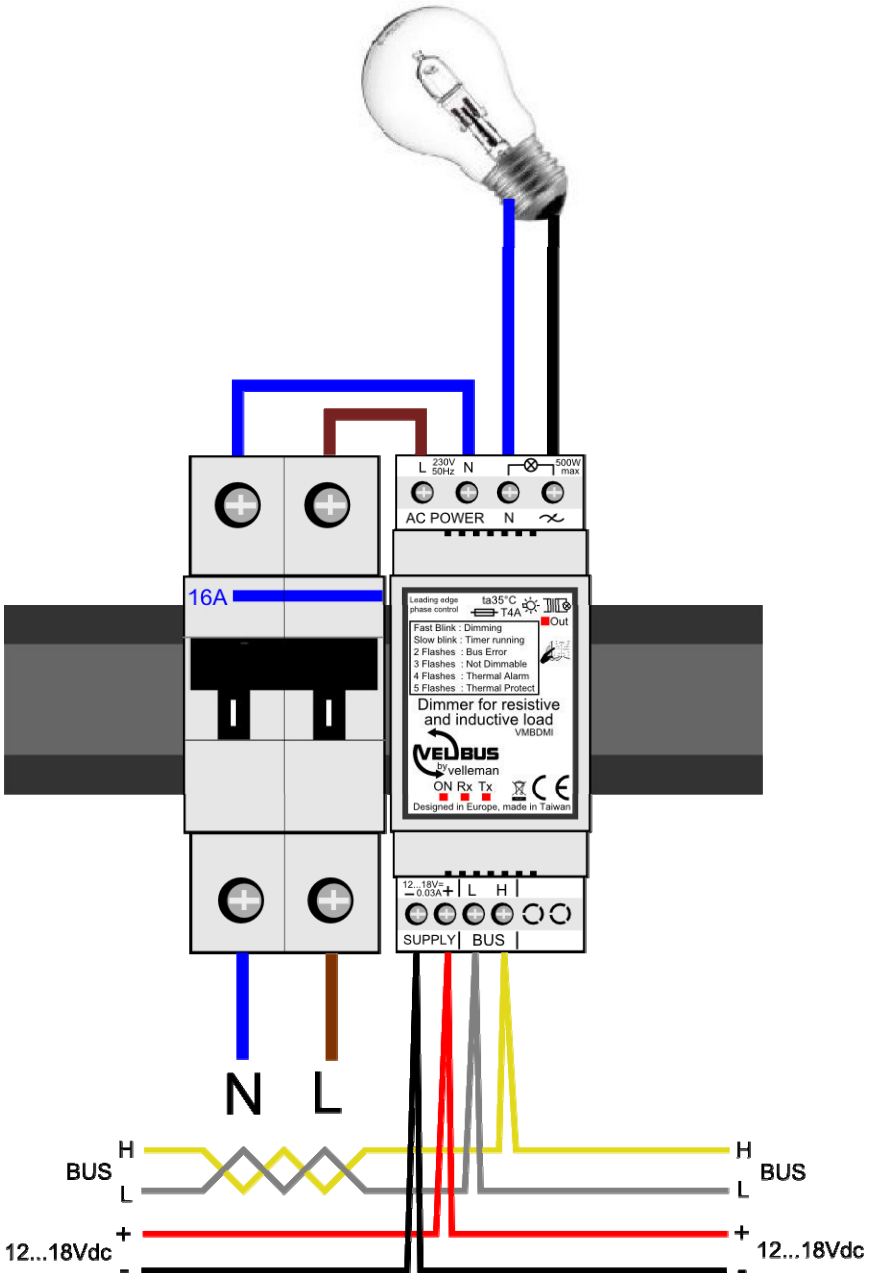
USE

This module can be used to dim dimmable mains voltage lamps or low voltage lamps in combination with a dimmable iron core transformer.

The module is added to the Velbus system and controlled via the control panel VMB4PD or via pushbuttons connected to a pushbutton interface VMB8PB.

To connect the Velbus modules with each other, a twisted pair cable is recommended (EIB 2x2x0.8mm², UTP 4x2x0.51mm² - CAT5 or equivalent).
When a lot of modules (more than 10) are connected on the Velbus cable or the Velbus cable is very long (over 50m) it is important to foresee a cable with sufficient wire diameter (0.5mm^2 of more).
Connect the bus to the module (mind the polarity).

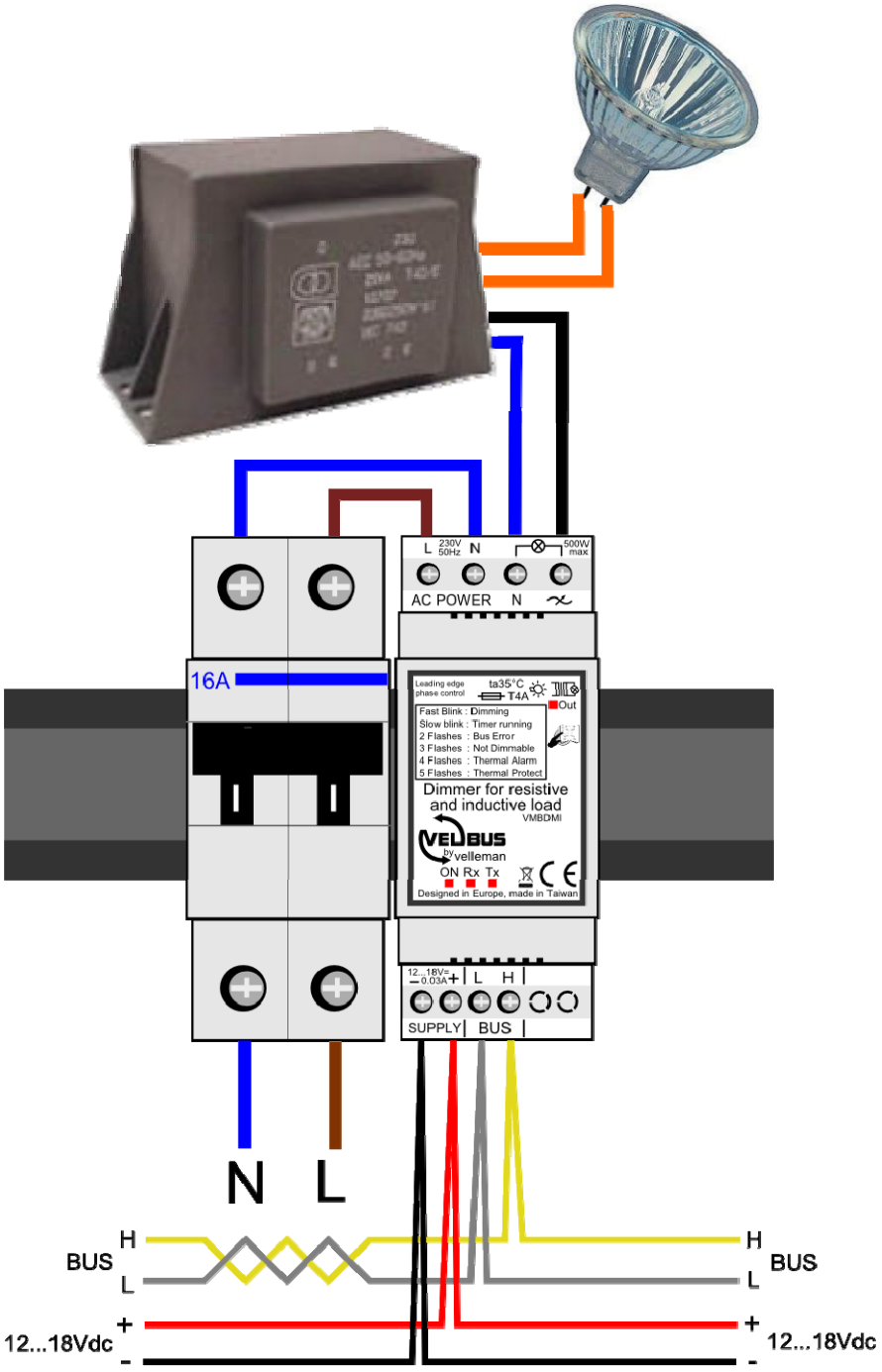
Connection scheme with mains voltage lamps



Attention:
At higher output power the dimmer housing becomes hot. It is strongly recommended to keep sufficient free space around the dimmer to allow adequate ventilation.

Connection scheme with low voltage lamps

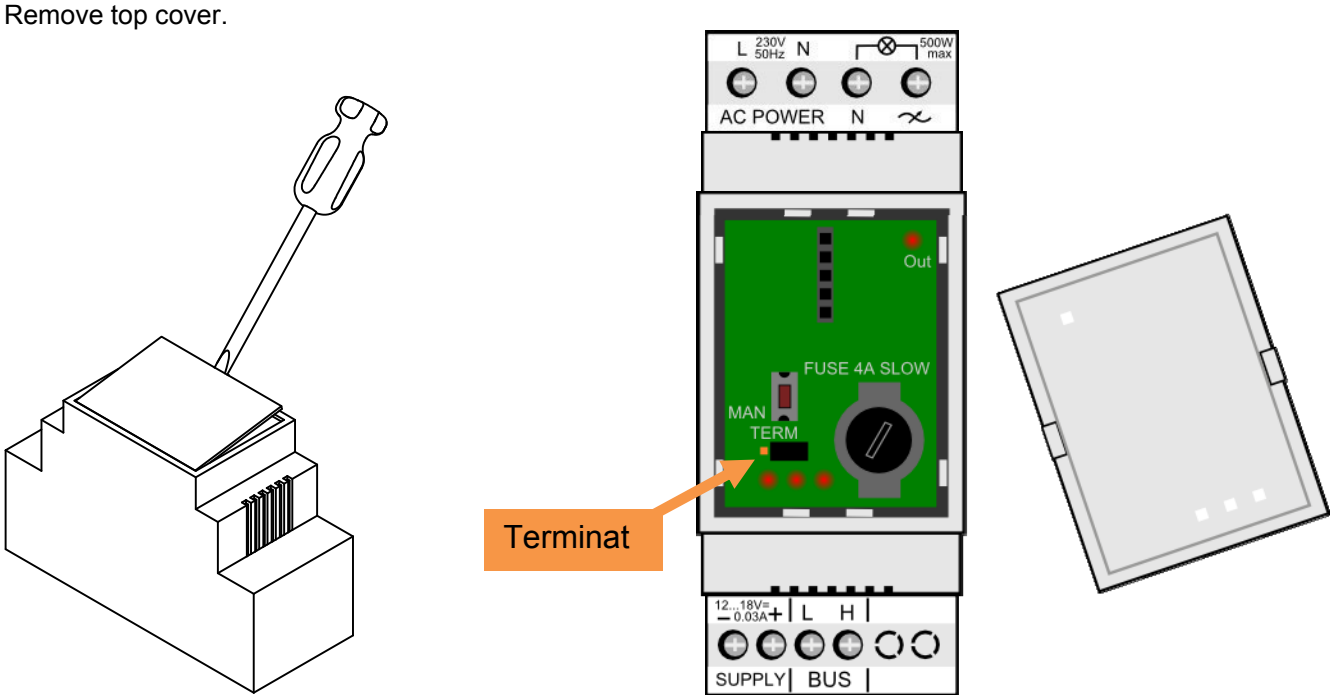
Use a dimmable iron core transformer or an electronic transformer that can be dimmed using leading edge phase control.



Attention:
At higher output power the dimmer housing becomes hot. It is strongly recommended to keep sufficient free space around the dimmer to allow adequate ventilation.

Terminator

Remove top cover.



In normal circumstances only 2 ‘TERM’ terminators must be foreseen in a complete Velbus installation. Usually this will be on one module inside the distribution box and on the module the furthest from the distribution box.

In all other cases it must be removed.

Remark:
In a wiring scheme with a lot of branches a terminator is placed on a module inside the distribution box and on the control panel furthest from the distribution box. Should communication problems occur, an additional terminator can be placed on another branch. However, the number of terminators should be kept to a minimum as additional terminators place a heavy load on the bus.

Configuration

This dimmer module can only be configured using the VelbusLink software.

The address, dimmer mode and control functions can be configured.

Address:

Every module in the Velbus system must have a unique address.
Address setting is done by software.

Dimmer mode:

The dimmer defaults to inductive loads. It will switch off when the load is to inductive. When using dimmable LED lamps it is recommended to disable this protection by setting the dimmer mode to resistive loads.

Control functions:

The dimmer module is controlled via pushbuttons connected to the Velbus system using a pushbutton interface or control panel.
Up to 37 different pushbuttons can be assigned. Every pushbutton can activate a different function.

	Function	Description
1	**Momentary**	Light remains on as long as switch is closed
2	**Off**	Light is switched off. *To create an 'all off' function, on every dimmer the same pushbutton is assigned the 'off' function.*
3	**Off with timer lock**	The light is switched off; the timers can not be started.
4	**Off with timer lock after short push**	A short push on the pushbutton switches off the light; the timers can not be started. A long push will switch off the lights; all timer functions remain available.
5	**Off with timer lock after long push**	A short push on the pushbutton switches off the light; all timer functions remain available. A long push will switch off the lights; the timers can not be started.
6	**Slowly off**	The light slowly dims during the specified time duration.
7	**On**	The light is switched on.
8	**On with timer lock**	The light is switched on; the timers can not be started.
9	**On with timer lock after short push**	A short push on the pushbutton switches on the light; the timers can not be started. A long push will switch on the lights; all timer functions remain available.
10	**On with timer lock after long push**	A short push on the pushbutton switches on the light; all timer functions remain available . A long push will switch on the lights; the timers can not be started.
11	**Slowly on**	The light slowly turns brighter during the specified time.
12	**On/off**	Every push reverses the condition of the light.
13	**On/off with timer lock**	Every push reverses the condition of the light (on/off). When the light is on, timers can not be started.
14	**On/off with timer lock after short push**	Every push reverses the condition of the light. Only when the light was switched on via a short push the timers can not be started.
15	**On/off with timer lock after long push**	Every push reverses the condition of the light. Only when the light was switched on via a long push the timers can not be started.
16	**Slowly on/off**	Every push will slowly switch the light on or off during the specified time durations.
17	**Start/stop timer**	A push will switch on the light during a specified time. Another push while the light is on switches the light off immediately.

18	**Start/stop timer with slow on/off**	A push will slowly switch on the light. After expiration of the switch-off time, the light slowly turns off. Another push will the light is on will slowly switch off the light.
19	**Resettable timer**	A push will switch on the light during a preset time. Another push while the light is on will restart the timer.
20	**Resettable timer with slow on/off**	A push will slowly switch on the light. After expiration of the switch-off time, the light slowly turns off. Another push while the light is on will restart the light timer.
21	**Non-resettable timer**	A push will switch on the light during a preset time. Another push while the light is on will *have no effect*.
22	**Non-resettable timer with slow on/off**	A push will slowly switch on the light. After expiration of the switch-off time, the light slowly turns off.. Another push while the light is on will have no effect.
23	**Slow on when closing and slow off when opening switch**	When closing the switch the light will slowly turn on; when opening the switch it will slowly turn off. If the switch-off timer expired an the switch is still closed, the light will slowly turn off.
24	**Dim on**	A push will make the light turn brighter. After expiration of the switch-off timer, the light switches off.
25	**On when short push, dim on when long push**	A short push will switch on the light at full brightness. A long push will turn the light on brighter. Releasing the button will leave the light on the reached light output. After expiration of the switch-off timer, the light switches off.
26	**Previous dimming value when short push Dim on when long push**	A short push will turn on the light to the last brightness setting. When push and hold, the light will turn brighter, releasing the button will leave the light at the reached light output. After expiration of the switch-off timer, the light switches off.
27	**Dim off**	A push will dim the light. Releasing the button will leave the light at the reached light output. After expiration of the switch-off timer, the light switches off.
28	**Off when short push Dim off when long push**	A short push will turn the light off. When push and hold, the light will dim, releasing the button will leave the light at the reached light output. After expiration of the switch-off timer, the light switches off.
29	**Dimming**	Pushing the button will make the light shine weaker or brighter. Releasing the button will leave the light at the reached light output. Another push will reverse dimming direction. After expiration of the switch-off timer, the light switches off.
30	**On/Off when short push Dim off when long push**	A short push will turn the light on (full brightness) when it was initially off; or switches off when it was on. When push and hold, the light will dim up or down, releasing the button will leave the light at the reached light output. Another push will reverse dimming direction. After expiration of the switch-off timer, the light switches off.
31	**Previous dim value when short push Dim when long push**	A short push will turn on the light to the last brightness setting when the light was off, or switches off when it was on. When push and hold, the light will dim up or down, releasing the button will leave the light at the reached light output. Another push will reverse dimming direction. After expiration of the switch-off timer, the light switches off.
32	**Select dimming atmosphere**	A push will select a preferred lighting brightness. The time required to reach this setting and the switch-off time can be configured.
33	**Dimming with slider**	The position of the slider determines the output brightness.

34	**Multiple position dimmer**	A push will select the next preferred lighting brightness from a table. The time required to reach this setting and the switch-off time can be configured. Up to 14 preferred lighting brightness's can be stored in the table. Factory defaults are: 25, 50, 75, 100, 75, 50 en 25%.
35	**Forced off when switch closed**	As long as the switch is closed, the light can not be switched on.
36	**Forced off when switch open**	As long as the switch is open, the light can not be switched on.
37	**Forced off**	A push will prevent the light from being switched on during a specified time period.
38	**Enable or disable forced off mode**	A push will prevent the light from being switched on during a specified time period. Another push will end forced off mode.
39	**End forced off**	Forced off mode is ended when pushing such a button. ***Remark:*** *The forced off status can still be determined by the forced off when switch open or closed.*
40	**Forced on when switch closed**	As long as the switch is closed the light is switched on and all other operations are ignored. ***Remark:*** *Forced off has precedence over forced on.*
41	**Forced on when switch open**	As long as the switch is open the light is switched on and all other operations are ignored. ***Remark:*** *Forced off has precedence over forced on.*
42	**Forced on**	A push will turn on the light and all other operations are ignored during the preset time. ***Remark:*** *Forced off has precedence over forced on*
43	**Switching on or off in forced-on mode**	A push will turn on the light and all other operations are ignored during the preset time. Another push will cancel forced-on mode. ***Remark:*** *Forced off has precedence over forced on*
44	**Cancel forced-on**	A push will cancel forced-on mode ***Remark:*** *The forced-on condition can still be determined by the forced on when switch open/close function.*
45	**Cancel when switch closed**	As long as the switch is closed the light is off but the internal functions remain active. When the switch is opened, the internal condition is forwarded to the lamp.
46	**Cancel when switch open**	As long as the switch is open the light is off but the internal functions remain active. When the switch is closed, the internal condition is forwarded to the lamp
47	**Suppress**	A push will switch off the light during a preset time, but the internal functions remain active.
48	**Activate/deactivate suppress mode**	A push will switch off the light during a preset time, but the internal functions remain active. Another push will deactivate suppress mode.
49	**Cancel suppress**	A push will forward the internal condition to the relay.

For some functions, a switch-off time can be set between:

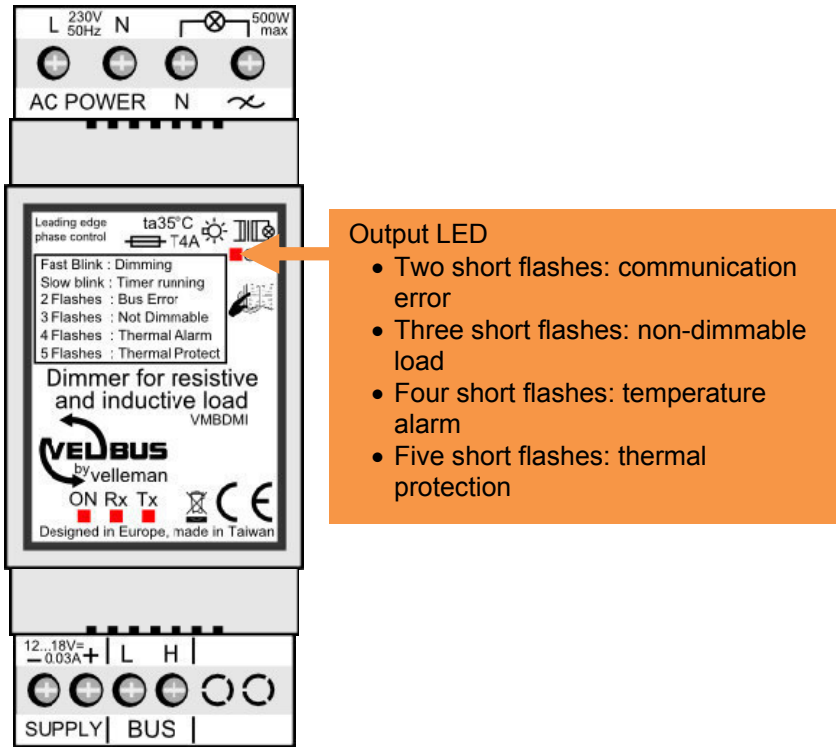
- 1 sec and 2 min, increment 1 sec
- 2 min and 5 min, increment 15 sec
- 5 min and 30 min, increment 30 sec
- 30 min and 1 hour, increment 1 min
- 1 hour and 5 hours, increment 15 min
- 5 hours and 10 hours, increment 30 min
- 10 hours and 24 hours, increment 1 hour
- 2 days
- 3 days
- No switch-off time

And a dimming speed can be set:

- 2 sec to 2 min, increment 1 sec
- 2 min to 5 min, increment 15 sec
- 5 min to 30 min, increment 30 sec
- 30 min to 1 hour, increment 1 min
- 1 hour to 5 hours, increment 15 min
- 5 hours to 10 hours, increment 30 min
- 10 hours to 23 hours, increment 1 hour

PROBLEM SOLVING

The dimmer has an indication LED. This LED indicates a fault condition by a number of light flashes.



Communication error

The LED flashes 2 times briefly.

- Check the bus-wiring for interruptions and reversing of the 'L' and 'H' terminals.
- Check the number of terminators (TERM) in the installation. Too many or not enough can cause problems. Switch off the Velbus power supply and measure the resistance between the 'L' and 'H' terminals of the bus. A value less than 50Ω means too many terminators, more than 250Ω means no terminators present.
- At least two modules must be connected to the bus.

Non-dimmable load

The LED flashes 3 times briefly.

The dimmer protects itself from to inductive loads e.g. like in the case of a transformer without a lamp connected. This error will disappear automatically when a lamp is connected to the transformer and the dimmer is operated again.

For some loads e.g. dimmable LD lamps it is better to disable this control via the configuration software (Velbuslink). Set the dimmer for resistive loads.

Temperature alarm

The LED flashes 4 times briefly.

The dimmer has a temperature sensor built-in. When the internal temperature is too high (>80°C) the dimmer will auto-protect itself by reducing the dimming value to 25% of the desired value. When the temperature drops below 60°C the fault will reset itself automatically.
Check following points:

- Connected power too high
- Not enough free space around the dimmer (leave at least 1 module free)
- Temperature inside distribution box too high (provide ventilation inside distribution box)

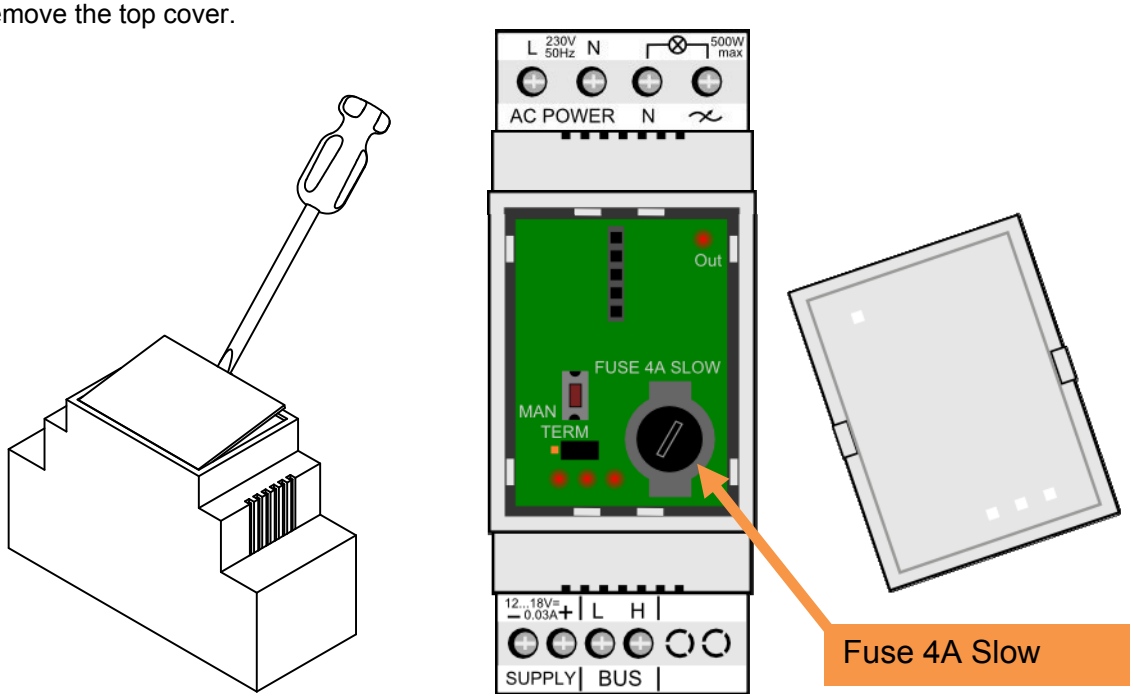
Temperature protection

The LED flashes 5 times briefly.
When the internal temperature is higher than 90°C the dimmer will switch itself off. Temperature has to drop below 60°C to become operational again.
Check following points:

- Connected power too high
- Not enough free space around the dimmer (leave at least 1 module free)
- Temperature inside distribution box too high (provide ventilation inside distribution box)

No fault indication but lamp does not light up

- The lamp is broken or has poor contact with the fitting.
- The circuit breaker or residual current device (RCD) were activated. First find out what caused this action and solve the problem before reinstating the circuit breaker or RCD.
- The fuse inside the dimmer has melted. This sometimes happens when the lamp breaks.
  Remove the top cover.



Use a screwdriver and slightly push the cap of the fuse holder down before unscrewing the fuse holder anticlockwise. Use a pair of long nose pliers to lift the cap. Replace the fuse and screw the cap back in place.

The lamp remains on

A lamp break down might lead to a short current peak. This peak might damage the triac causing it to keep conducting.
In this case the module will have to be shipped back to the manufacturer for repair.

VERIFY SOFTWARE VERSION

The software version can be retrieved via the Velbuslink software.

Via the link http://www.velbus.eu you can verify whether your version is up-to-date. When a more recent version is available, download and install it. Connect the Velbus interface to a PC, run the upgrade-software and follow the instructions on the screen.

Remark:
Upgrading a module is not entirely without risk. **Never** interrupt the process.
When for any reason whatsoever the upgrade fails, the module will not longer be fully functional. In this case the module must be returned to the manufacturer.

Refer to our website for more information: www.velbus.eu