velbus® makes life easy DOMOTICS

Installation Guide

Part 1: Hardware and Cabling

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Table of contents

1 INTRODUCTION

VELBUS - A MODULAR BUS SYSTEM

Velbus is a **modular** system. Each module works autonomously of the others and for a rule does not need a central controller for its operation. This makes the system very flexible and robust. Even in case of a local failure, the system keeps working as a whole.

There is no pre-set starting price (for example a master controller or central processor) therefore you will only pay for the modules that are really needed. If you later require additional shutters, lights, dimmers etc. to be automated, you need only purchase and install the relevant modules. There are many different modules to choose from, including: input modules (push buttons, glass touch panels…), relay modules (lights, sockets, …), dimmers (halogen, LED ...), shutter modules, motion and twilight sensors, etc.

Velbus is a **bus** system. This means that only four cable cores are required in order to control the whole system (two power supply conductors and two data conductors).The data bus is based on

the CAN bus, as commonly used in the automotive industry and as such is proven to be very stable and reliable. Bus lengths of several hundreds of meters are possible!

PRINCIPLE

The simplest setup would consist of just two modules: an input and an output module.

Input modules process the information coming from the outside world. Push-buttons, switches, sensors, etc. send their status to the bus in small commands or packets of data.

Output modules interpret these commands and control lighting, heating, air conditioning, electrical outlets, shutters, etc. via relays, dimmers or low voltage signals. The conditions of these output modules are then fed back (fully customizable) to the LEDs in buttons or panels.

1. Push-button 1 is pressed.
2. A push-button module converts this action into a pulse on the CAN bus.
3. A relay module reads this pulse and responds by closing the contacts, so that the light turns on.
4. The relay module creates a feedback pulse on the CAN bus
5. The push-button module reads this feedback pulse and responds by lighting the LED associated with push button 1.
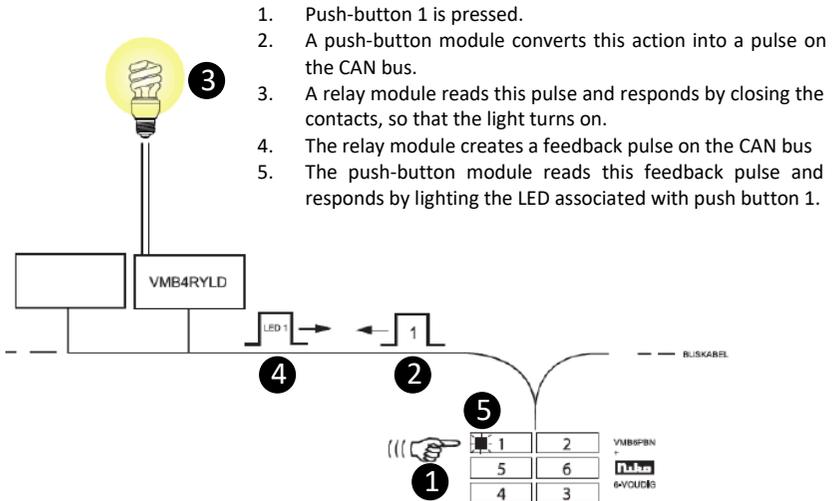
QUALITY AND STABILITY

Velbus is a modular system in which each single module complements your installation. In turn its failure can never block or damage the operation of the overall system, contrary to centrally controlled systems. Each module is fully independent because of its own processor. Each Velbus module monitors the bus continuously and executes an action as required by the conditions set within it.

The bus itself is based on the CAN-bus which is commonly used in the automotive sector. The CAN-bus is very stable and by lowering the baud rate it can effectively operate without problems over very long distances (up to 1.1 km using EIB cable).

The bus operates on pulses or packets of data. Even during the dimming of lights or the activation of an "all off" function there is very little traffic on the bus. This obviously has great advantages over other systems. Dozens of simultaneous requests can be processed seamlessly (on/off, dimming, moods …) while sending of feedback pulses remains very fast. This style of control also ensures that no unnecessary energy is consumed.

Configuration modules can be mounted anywhere along the bus cable (in storage spaces, offices, bedrooms, and the like) allowing you to connect your PC wherever you want to monitor the modules or make changes to their configuration. During these changes your Velbus system will continue to function normally, without causing any hindrances to users.

The physical cabling of the bus may, if desired, run in a loop in order to make the system even more resistant to bus cable ruptures. The bus power supply voltage may vary between 12 V and 18 V.

The Velbus modules are developed in our own Velleman-buildings in Gavere (Belgium) where the software is written and all production is planned and co-ordinated. Because everything is developed in-house, we can make changes quickly and efficiently and ensure that the high quality standards of our product lines are at all times met. It also allows us to easily incorporate new features requested by clients, resulting in an ever growing array of possibilities. As a company, Velleman has 40 years of experience in the development and production of high quality electronics.

VELBUS AUTOMATION VERSUS A CONVENTIONAL INSTALLATION

A Velbus system offers several advantages compared to a conventional installation. The investment in a Velbus system is minimal and, compared to the advantages it offers, even negligible.

With a Velbus system the question changes from "Should we automate?" to "How much will we automate?". "Home automation" or "Domotics" still calls to mind for many people, images of expensive and complicated installations. This could not be further from the truth. A standard "everything off" or panic button is already the start of an automation system.

A Velbus automation system can consist of only a few modules and be fully functional. It can also be very large and complex, providing full automation and very advanced features. Velbus proves its worth every day in thousands of installations, not only in standard homes but also in industrial buildings, cruise ships, large residences with out houses, and so on.

In a Velbus system all modules work independently, in any possible combination. With only a few mouse clicks the existing connections can be altered, removed and reconnected elsewhere. In a few seconds a push-button that switches a light can be reconfigured to function as an "all off", a dimmer, a timer, and so on, at your desire.

The Velbus configuration software (Velbuslink) is free. Accessing the settings and statuses of modules is possible at all times, even permitting continuous or instant adaptation while everything on the bus continues working. A system will be fully functioning moments after the set of instructions is issued to the modules during the initial configuration.

Shortly after taking into operation the system, in many cases users will want to make changes to the configuration. With Velbus this can be easily achieved without breaking open any walls or hindering normal functioning of the working system.

Since a Velbus system is modular, it will at all times be ready for future developments. Velbus invests continuously in the development of new modules and features, which can be easily added to an existing system. If you want to be able to dim the lights in the living room after all, all you need to do is add a dimmer module and change a few configuration settings.

A Velbus installation needs no extra modules or special configuration to provide feedback. Standard feedback is provided out of the box: the LEDs on push-buttons for instance will be on if the coupled light is on, they will blink if a timer is running, and so on. This standard feedback is also completely reconfigurable, for example by coupling the LED of a pushbutton in the living room to give feedback about a light in a nursery, and so on.

Properly configured, your Velbus automation system also saves energy. Imagine for instance a light in the hallway that automatically turns off, a feedback LED that reminds you the light on

the driveway is still on, an "all off" switch that takes care of all hidden consumers and automatically puts the heating in energy saving mode, and so on.

The benefits of an automated home are plentiful because of the many options and functions. Alarm timers, remote control (by iPod®, iPad®, iPhone®, smartphone or web browser), burglar alarm, fire alarm, email and SMS notifications, and many more are just waiting to be dreamt up. Velbus can take care of it all. Not to forget the added value that your home or investment property will enjoy.

PRICING VS. FUNCTIONALITY

Both for small (residential) and larger (commercial) automation projects, Velbus always offers the most economical solution. A Velbus system does not require a central (or master) controller, so you will neither have to buy one, nor pay for maintaining, repairing or upgrading it. For the same reason a Velbus installation is also less likely to suffer a total systemic failure or need expensive repairs. This implies considerable cost savings right from the start of your project.

Furthermore, you need only purchase modules that you really need: relay modules according to the number of switched circuits; dimmer and shutter modules; movement-, twilight- and temperature sensors; interface modules for the switches that you wish to use and/or glass touch panels with integrated thermostat functions; and so on.

The total price of these modules is the total price of your Velbus materials and is one of the lowest on the market! The configuration software is free, including any future updates! When compared to competitive brands, you will be amazed by the big difference in price, flexibility and transparency.

2 CABLING

Cabling for a Velbus system consists of **electrical cabling** (mains voltage) on the one hand, and **bus cable** (low voltage) on the other hand.

ELECTRICAL CABLING

Each light circuit, socket circuit, blind, or other device that you wish to control separately has to be directly connected by an uninterrupted electrical cable to the electrical cabinet (radial circuit).

Attention: shutters cannot be wired in parallel and should therefore be separately connected to the shutter modules. There are single and dual shutter modules available.

Unlike a conventional installation, you do **not** need to include any switching in the path of these cables. This detail alone saves you cabling costs and lets you benefit from the ease with which electric cables are installed around the property (no multiway or two way switching needed).

In larger installations you will save even more on the wiring by using one or more electrical cabinets per zone. You can place these centrally to each floor or zone, reducing the overall amount of mains voltage cabling.

If you want Velbus to control your heating, you will also need a cable from the electrical cabinet to every heating valve (controlling the flow of hot water to the various circuits). The type of cable will be determined by the devices, for example low voltage or mains.
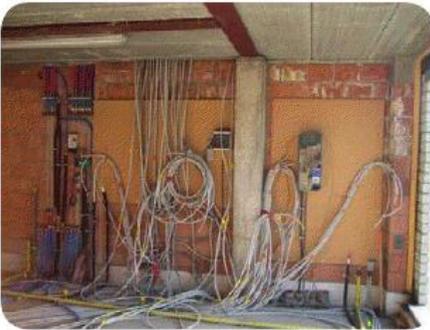
Savings on cabling for blinds and sunscreens can also be achieved by using the VMB1BLS 1-channel blind module for universal mounting. This very compact module can be integrated in the blind case.

BUS CABLE

Apart from standard mains electrical cable, a Velbus installation also needs a bus cable. The bus cable must have four wires: two wires to provide 12…18 V DC power supply to the Velbus modules, and two other (twisted) wires for bus communication.

This cable must start at (or at least pass through) the electrical cabinet that contains your DIN RAIL modules, then pass through each and every point where some form of control, temperature measurement or Velbus user interface will be located.

You may want to extend your bus cable to "non-automated" areas to "future proof" your installation. (Keep the loose ends disconnected from the active installation for as long as they are not in use). The additional cost of a few metres of cable will greatly outweigh the costs in the future. It is worth considering using flexible conduit in your installation to protect the cables and greatly reduce the time necessary to modify or extend the installation in the future.

Caution: If you use different low voltage power supplies, the negative poles must always be connected to ensure the correct potential difference across all parts of the installation.

As stated above, the Velbus bus cable must have four wires (two for power and two for the data). This can be done with stranded EIB or UTP cable. The EIB cable is robust and professional; we would normally recommend this cable for the Velbus backbone.

Velbus does not impose many demands on the way the bus cable is installed: branches, loops, parallel connections and tree style installations are all permissible and can be used together in the same installation. If you install the bus in a grand loop, users will not suffer a failure even if it were completely interrupted at any point, for example during expansion or alteration. You can run a data bus for several hundred meters without problems.

To connect the bus between DIN modules in the electrical cabinet, there is also the busbar VMBRAIL.
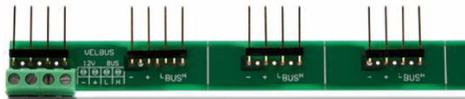
In order to keep the bus cables tidy and well organized, the VMBTB distribution terminal block comes in handy. It also allows for easy isolation of parts of the installation when necessary.
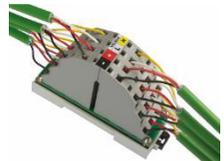
For your convenience, it is best to work with deep recessed pattress boxes so that you have ample room afterwards when mounting pushbutton interface modules or other Velbus material.

3 WHICH MODULES WILL I NEED IN MY ELECTRICAL CABINET?

SIGNUM IOT GATEWAY

The Signum IoT Gateway simultaneously serves as a configuration module (via USB, LAN and internet), as a server for smartphone and tablet operation, as an NTP server that ensures that the time is always correct throughout the installation, and as an IoT coupling module to connect with other brands and protocols.

DIN RAIL POWER SUPPLY

You can use the Velbus web based consumption calculator (www.velbus.eu > Professionals > Installers) to find out how much control power your full installation will consume. For a normal home one 4.5 A power supply will suffice (the rule of thumb is: 1 A maximum current consumption for every 4 relay modules).

In larger installations, a low voltage power supply can be installed in each electrical cabinet containing Velbus modules. The negative poles of the various low voltage power supplies (per floor for example) must always be connected to each other.

The power supply of the bus cable to input modules (push button interfaces, glass touch panels …) can be branched off at any electrical cabinet, since input modules consume very little current.

DIN RAIL RELAY MODULES

Relay modules can switch lighting, sockets, LED power supplies and much more, since they can handle currents of up to 16 A (AC resistive) per channel. For the VMB4RYLD the total current across the whole module is also maximum 16 A. For devices that consume large currents, we recommend adding a contactor between the module and the load.
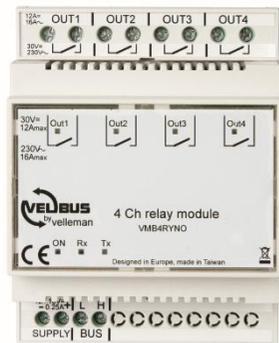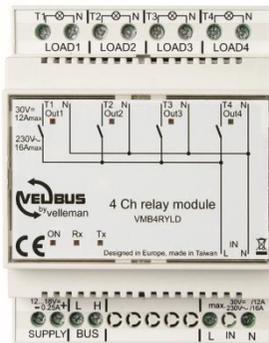
The VMB4RYLD is a 4-channel voltage-out relay module with common neutral poles, where only the live pole is switched on each channel. The live and neutral wires, normally coming from an isolated and protected circuit breaker, are simply connected to the input contacts of this module, which makes them available as 4 relay outputs.

The VMB4RYNO has 4 single pole single throw dry configurable relay contacts. As mentioned above, each channel can handle currents of up to 16 A (AC resistive).

Each 4-channel relay module has (under the protective cover) four push buttons for directly controlling the relay, mainly for test purposes.

To control heating and cooling systems with a Velbus system, you will need to connect a separate relay channel to each of your heating or cooling functions, motorised valves, wax thermal actuators and other devices.
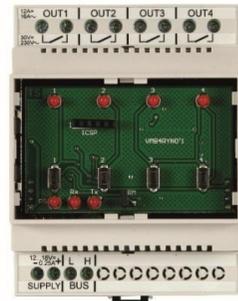
DIN RAIL DIMMER MODULES

Depending on the type of load, you will need a particular dimmer.

To directly connect your mains voltage lighting circuits you can use the Velbus VMDBMI-R dimmer module, or a Velbus four-channel 0-10 V control VMB4DC together with (third party) dimmers that use 0-10 V analogue signalling as input.

For dimming LED strips (PWM) we have the VMB2LEDDC 0-10 V 2-channel dimmer to be used in combination with the dimmer controller module VMB4DC.

For more information about dimming with Velbus, please refer to www.velbus.eu (dimmer products pages, FAQ and downloads).

DIN RAIL SHUTTER MODULE

Every two shutters or screens require a VMB2BLE 2-channel shutter controller. (As an alternative to this DIN rail module, there is also the VMB1BLS, a small 1-channel shutter controller that easily fits in the shutter casing).

Shutters cannot be run in parallel, so each shutter will require its own controller channel. These modules can also control various motorised platforms and moving devices, on a timed movement basis.
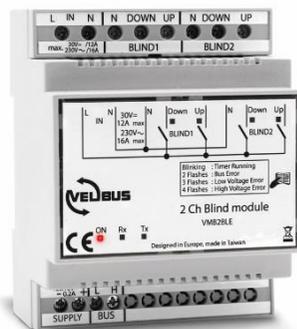
DIN RAIL CONFIGURATION MODULE

If there is no Signum IoT Gateway in the installation, a USB PC interface module can be used. Through the interface modules you will be able to use the free configuration software Velbuslink to configure and monitor the Velbus modules.

The VMBRSUSB (shown here with its dust protection cover removed) is a dual RS232 and USB slave socketed version for installation onto a DIN rail. (As an alternative to this DIN rail module, there are also the VMB1USB and VMB1RS interfaces for universal mounting along the bus cable). Please note that the VMBRSUSB only supports one connection type at a time.

After having configured your Velbus installation, you will only need access to this module when you want to make changes to the Velbus modules.

DIN RAIL INPUT MODULE

Usually push buttons are connected to the bus cable by a push button interface that is installed directly behind the banks of push buttons (eg. the VMB8PBU).

In case long cables need to be used, or an existing teleruptor installation replaced, the VMB7IN is needed. This is a 7-channel input module for mounting on a DIN rail. This module does not offer feedback to the switches, but does have status LEDs in its body.

The VMB7IN also allows for a maximum of 4 pulse counters (eg. kWh-counters) to be connected to the Velbus installation. The measured values can be displayed on VMBGPOD glass panels with OLED display, and also used as triggers in Velbus.

4 WHICH MODULES CAN I USE IN MY HOME ALONG MY BUS CABLE?

INPUT MODULES

Interfaces for buttons

The two most commonly used types of input modules are the universal push-button interface module VMB8PBU and the various glass panels in the VMBGPxxx range.

The universal VMB8PBU input module can easily be mounted behind push button panels of your choice. This module allows you to connect up to eight switches, each with feedback indicators (if LEDs are fitted, sold separately). Feedback can also be configured with a night mode. Please note that the wires connecting the push buttons should not be extended.

For Niko® buttons a 1 or 2 button interface VMB2PB(A)N with integrated LEDs (blue or amber) and a 4 & 6 button version VMB6PB(A)N are also available.

Velbus glass touch panels

Our VMBGPxxx and VMBELxxx glass touchpanels (VMBGPOD shown left, VMBGP1, VMBGP2 and VMBGP4, each in black or white) offer a fantastic choice of operating modes and functions. These include, amongst others temperature sensing, thermostat functions, multi-element programs, IR receiver, built-in clock with sunset and sunrise times, LED feedback and heating/cooling control of up to 12 other glass panels. The VMBGP1, -2 and -4 have resp. 1, 2 and 4 touch buttons (with short and long press each), the VMBGPOD offers 32 possible touch button functions and a fully configurable OLED display.
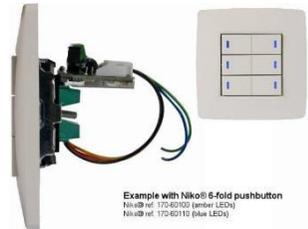
MOTION AND TWILIGHT SENSORS

Velbus has its own motion, twilight and temperature sensors to be installed along the bus.

The VMBPIROW (white) and VMBPIROB (black) outdoor motion, twilight and temperature sensors allow for simultaneous motion, light-dependent motion and twilight detection as well as temperature measurement.

The VMBPIRC ceiling motion and twilight sensor, and the VMBPIRM miniature motion and twilight sensor have the same features as the VMBPIRO, apart from temperature measurement. By using the included housing (not shown here), the VMBPIRM is also suited for surface mounting.

The built-in astronomical clock allow the VMBPIRO and VMBPIRC to operate time-dependently. Both the VMBPIROx and VMBPIRC can simultaneously detect motion for a passage signal (2 independent output channels) and light dependent movement for lighting control (also 2 independent output channels).

HEATING / COOLING CONTROL

Velbus control of the heating/cooling system is possible by using glass touch panels (VMBGPxxx or VMBELxxx). These all have built-in temperature sensors and thermostat functions. At least one VMBGPOD or VMBELO (with OLED display) will be needed to operate the heating/cooling control. Using one VMBGPOD or VMBELO the complete heating/cooling functions of up to 12 other glass panels can be commanded.

Each of these solutions allows also simple button events to change modes (day, night, anti-freeze, …) if required (eg. using the "all off" to change to night mode). Program steps can be used to automate the working modes of course (eg. set the heating to "day" every morning, et cetera).

VMB1BLS ONE CHANNEL BLIND MODULE

The VMB1BLS one channel blind module for universal mounting serves the same purpose as the VMB2BLE DIN rail blind module, but is much smaller and has only one output channel. The potted enclosure fits easily in a shutter casing.

The VMB1BLS can also be used as a 16A changeover contact.

VMB1RYS ONE CHANNEL RELAY MODULE

The VMB1RYS is a compact relay module for universal mounting. It has 1 voltage free normal open contact and four virtual relays (to be used in more advanced configurations).

5 CONNECTING THE MODULES

TERMINATORS

Each Velbus module has a terminator that is open on delivery. In a normal Velbus system two terminators should be closed, ideally at the extreme ends of the installation. Usually a terminator is closed in a module somewhere in the first electrical cabinet and another one in a module at the end of (more or less) the longest bus cable. This is done simply by closing the circuit between the two header pins on a module; a standard jumper is supplied for this purpose. (Some modules have a switch instead of a jumper, putting the switch on "1" closes the terminator.)

It is best to note where these terminators are closed, given that they may be hidden later on in the wall (or cabinet). In Velbuslink a terminator icon 🖥 can be manually set next to the modules with closed terminators. (Note that for most modules this information is not stored in the modules themselves, but only in the Velbuslink project file on your PC). In case modules would be added at a later date, do not forget to change the terminators if needed.

ADDRESSES

Velbus modules must each have a unique 8 bit address, meaning that a maximum of 253 addresses[1] can be assigned on any single Velbus installation.

All recent modules have their addresses set electronically using Velbuslink. (Some of the first generation modules have a pair of rotary switches to be manually set on the module itself.)

Most modules have one single address. Velbus glass touch panels (the VMBGPxxx series) have one to four addresses for the button functions (one address for every 8 buttons), and an optional additional address for the thermostat function.

Addresses versus channels

Each **address** in Velbus is further subdivided in **channels** (max. 8 channels per address). An **address** corresponds in general to a module as a whole, **channels** correspond to the individual buttons, relay contacts, shutter channels etc. of a specific module.

In the screenshot below, taken from Velbuslink, we see for instance that:

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[1] 255 minus two (0 and 255) which are reserved addresses

- module VMB4RYNO has address 01 and 5 channels (CH1-CH5), namely 4 relay contacts and 1 virtual relay
- module VMB8PBU has address 02 and 8 channels (CH1-CH8), corresponding to 8 push buttons

Name	Addr. (hex) ▲
⊟ 🏠 MyProject.vlp	
└ ▣ VMB4RYNO	01
🗗 Relay 1	CH1
🗗 Relay 2	CH2
🗗 Relay 3	CH3
🗗 Relay 4	CH4
🗗 Virtual Relay	CH5
└ ◉ VMB8PBU	02
◉ Push button 1	CH1
◉ Push button 2	CH2
◉ Push button 3	CH3
◉ Push button 4	CH4
◉ Push button 5	CH5
◉ Push button 6	CH6
◉ Push button 7	CH7
◉ Push button 8	CH8

Channels and modules can also be named (see Part 2: Configuration).

BUS WIRING

Modules can be mounted anywhere along the four wire Velbus cable line.

At every joint the polarity of the power supply (+ and -) and data bus (H and L) must be maintained! If mistakes are made in this respect, nothing will be broken but your Velbus system will not work. Prevention is better than cure so due attention should be paid in order to avoid problems later on.

If problems should occur while installing or during initial configuration, these are almost always due to faulty wiring or bad contacts and can easily be fixed by correcting the wiring problem. **We strongly advise to pay special attention to the bus wiring while installing the system**, as fixing a wire problem afterwards is much more difficult. Make sure all wires are correctly connected (pay attention to +/- and H/L polarities), that they are inserted deep enough into the connectors and on the correct side of the fastening cage, that the screws are well fastened and the wires not broken or bent too far. Also make sure that the wires make good contact with the screws, and that there is no isolation between the two.

When working with UTP cable, make sure that the wires do not break in the module terminals, especially if these are put in and taken out of the wall repeatedly. This attention to detail will save a lot of searching later. Stranded core cables are more forgiving in this respect.

The modules in your electrical cabinet must be connected in the same way. The wiring rail VMBRAIL can be used along a DIN rail to link multiple modules at once.
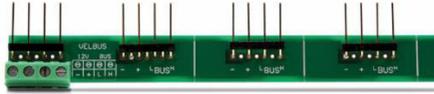
This rail can be easily cut so you can also use it to link fewer modules if required.

Distribution terminal block

To facilitate wiring in the electrical cabinet and allow for easy isolating of branches of the installation, Velbus also provides the VMBTB bus terminal. This distribution terminal block easily connects up to 8 bus cables of 4 wires. The spring contacts allow to connect or disconnect each cable separately.
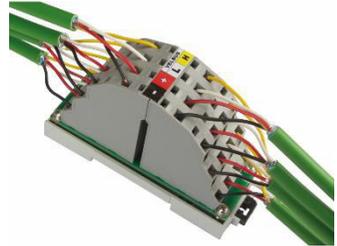
OTHER WIRING

The mains voltage wiring (for example coming from circuit breakers) can be connected to the voltage-out relay modules (VMB4RYLD), on which switched lighting circuits can be directly connected in turn. It goes without saying that your dimmable lighting circuits should be connected to dimmer module channels (see "DIN rail dimmer modules" p.12), and so on.

Once power is up on your Velbus system, you can already control each module (relay, dimmer, shutter, etc.) using the small button located behind each plastic cover, even before any configuration has taken place. This way you can test for electrical cabling problems.

6 CONFIGURING THE MODULES

Once all the hardware has been installed, the next step is to configure the modules by means of the free configuration software Velbuslink.

GENERAL PRINCIPLES OF CONFIGURING A VELBUS INSTALLATION

The Velbus home automation system works without a central control unit. Every Velbus module has its own micro-processor and therefore works autonomously.

Whenever the status of a channel changes (eg. a button is pressed or a relay contact closes), the associated Velbus module will send a pulse on the data bus containing its own address and the channel number.

All modules monitor the Velbus data bus for pulses coming from other modules. Whenever a pulse passes that they should respond to (according to the configuration that has been written into their memory), they will carry out the corresponding action. For example, a relay unit, if configured to do so, will respond to the push of a button elsewhere. Inversely, a push button module will respond to a pulse by a relay module by setting its feedback LEDs.

Actions are normally retained within the output modules (for instance relay, dimmer and blind modules). Input channels (eg. buttons), when activated, do not send a signal "to" a certain output channel. They just notify the entire system that they have been activated (with additional data, but not a destination address). All modules (eg. relay modules) that have been configured to respond to this input channel, will do so. The others will simply ignore the signal. The responding modules will then put a signal on the bus notifying the rest of the system of their change in status (again, without destination address).

If an output module is configured to respond to several input channels, a failure in a single input module will not affect the interaction between the output module and the other modules. This way any local failure will remain local without infecting the system as a whole.

Each output module can be configured to respond to any button or event on the Velbus system (eg. also movement sensors, temperature sensors, alarm times, temperature alarms, …).

For example, configuring an "all off" function in a Velbus installation is fairly straight forward, because input modules (like push button interfaces or glass touch panels) will not have tasks assigned to them. Only the output modules need to be configured to turn off when the "button pressed" pulse appears on the bus. This command is very simple for the Velbus network to react to as very few pieces of information need to be present on the data bus at any one time. This way the bus remains empty most of the time, which greatly improves the stability and reliability of the system.

Equally, opening and closing a Velbus relay channel also generates a pulse on the Velbus data bus and can in turn trigger other actions. It can have an effect on other output modules, or it can act as specific status feedback to input modules. A typical example of this cascading interaction between output modules would be to temporarily close a relay contact (ventilation fan), once another relay contact has closed and opened (for example a toilet light).

VELBUSLINK

Velbus modules are configured by means of the free configuration software Velbuslink (see screenshot below).
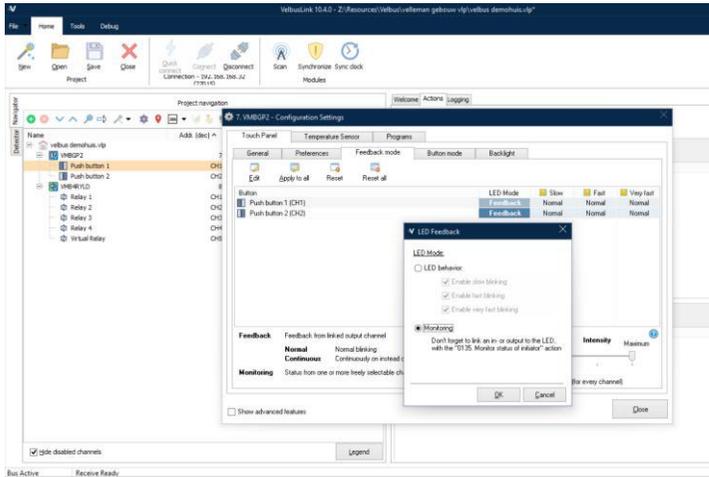
For a detailed guide to using Velbuslink, please refer to "**Installation Guide, Part 2: Configuration"**.

7 SIGNUM IOT GATEWAY

The Velbus Signum is an IoT Gateway for the Velbus home automation system. Its main functions are:

• to control your Velbus installation using an iOS app, Android app or browser on mobile devices (smartphone, tablet...)

• periodically sync the time on your Velbus installation with an NTP server

• time and date backup (48 hours) in case of power failure

• connect VelbusLink (Velbus configuration software) directly (with a USB cable plugged into the Velbus Signum, or an IP (LAN) connection)

• secure access to your Velbus Signum and home automation system from anywhere in the world

The Velbus Signum is a DIN-rail module that is powered by and connected directly to the Velbus bus.

8 FREQUENTLY ASKED QUESTIONS

CAN I RUN MULTIPLE SIMULTANEOUS OPERATIONS (SUCH AS PUSH TEN BUTTONS SIMULTANEOUSLY)?

Except when a button is pressed or released, there is almost no communication on the Velbus data bus. For example, during the process of dimming a light fixture, the data bus remains empty. Multiple buttons being pressed simultaneously will not cause any problems at all.

WHAT HAPPENS TO MY SYSTEM IF THE DATA BUS POWER IS LOST?

Once the power comes back, all relays will be open for the sake of safety. If this would create discomfort you can configure your installation to be set to a certain state on power up (for more information on configuration, see Part 2: Configuration).

You can also buffer the power supply with a battery backup system, so that all modules retain their status.

The actions and settings that have been configured in the modules will never be affected by a power loss.

Time and date can in certain cases be lost. This can be prevented or solved by:

- using a VMBHIS Home Center server, which synchronizes time and date regularly with an online time server
- incorporating a VMBLCDWB module in the installation, which can be set to function as master clock and can be equipped with a backup battery
- or, of course, by manually setting the time and date on power restoration, on any of the modules equipped with a display. The other modules in the installation will instantly copy the new time and date

On www.velbus.eu > Support > FAQ a detailed explanation of these options can be found.

TO WHAT EXTENT ARE LOGICAL FUNCTIONS POSSIBLE?

A modular, decentral system can have some limits as far as configuring conditions goes.

However, Velbus solves this by using several strategies, making complex configurations possible. This way, almost anything can be achieved with a Velbus installation.

To begin with, most modules have a large range of built-in actions, including: inhibiting and forcing actions with two levels of priority, multiple types of timers and time-dependent

configuration of channels. Free (real or virtual) channels of relay modules can also be used as virtual switches, allowing conditional actions to be configured, and many different actions and program steps can be used together in the same module.

Interval timers are also available, for example, an eight hour timer where the contact closes for 10 minutes, then opens again and waits for an hour. Actions can be triggered by closing or opening of channels, by pressing or releasing buttons, by temperature or time alarms, and so on, while virtual relay channels allow all kinds of AND-, OR-, IF-THEN and other logical configurations.

For those who need even more advanced configurations, the VMBHIS Home Center server comes with a built-in logical module, allowing all inputs and outputs and various special elements (Sonos® triggers, IR command codes, e-mail messages, SMS, et cetera) to be connected through a high-level programming interface.

See also:

Velbus Installation Guide, Part 2: Configuration.