wieland

# *gesis* LON RM

Installation System for the LON Bus

## Manual

**Product and Object Description**

Doc. no. BA000336

## Contents

### Further Documentation

When configuring and installing the LON network, please consult the latest versions of the relevant documentation published by LonMark International (www.lonmark.org).

### Revision Listings

Document BA000335

| Revision | Date | Author(s) |
|---|---|---|
| A | 05/2008 | T. Nieborg, A. Fenn, T. Kluck |

**Dear customer,**

Congratulations on purchasing your new components for the gesis LON RM building installation system. You are now the owner of a product with LON technology, which provides you with a user-friendly method of dealing with a host of building control tasks.

Please familiarise yourself with the descriptions in this manual. It will provide you with all the information and assistance required for faultless operation of your gesis system. Should you have additional questions or require further assistance, please contact our team of specialists using the contact information below and they will be happy to help you.

Wieland Electric GmbH
Brennerstrasse 10-14
96052 Bamberg, Germany

Technical customer service hotline (for technical issues concerning accessories, functions, product features and possible applications):
Tel.: +49 (0) 9 51 / 93 24-9 96
Fax: +49 (0) 9 51 / 93 26-9 96
E-mail: BIT.TS@wieland-electric.com

Sales hotline (for information about availability, lead times and prices):
Tel.: +49 (0) 9 51 / 93 24-9 90
E-mail: BIT.info@wieland-electric.com

# 1 About This Operating Manual

## General Information

This operating manual will provide you with support for installing and parameterising gesis LON RM modules. In it, you will find information on how devices are programmed, configured and parameterised.

This operating manual contains the information required for proper usage of the products it describes. It describes the gesis LON RM components, their technical features, conditions of use, boundary conditions and parameterisation. Installation and connection with the gesis CON connector system are described in the document entitled "System Handling Information" (item no. 0060.2), which is available separately.

gesis systems must only be installed by trained personnel and the applicable regulations observed while doing so. For this reason, the gesis LON RM system manual is aimed at:

- Persons responsible for configuring, parameterising and activating LON systems
- System integrators
- Electricians

Specific prerequisites are:

- Basic knowledge of LON bus technology
- Basic knowledge of building installation systems
- Programming knowledge relating to LON objects

## Identifying Safety Notices

This operating manual uses various safety notices that are assigned according to the severity of a potential hazard:

**DANGER**

"Danger" indicates an imminently hazardous situation or state which, if not avoided, will result in death or serious injury. The use of "Danger" is limited to the most extreme situations.

**WARNING**

"Warning" indicates a potentially hazardous situation or state which, if not avoided, could result in death or serious injury.

**CAUTION**

"Caution" indicates a potentially hazardous situation or state which, if not avoided, could result in minor or moderate injuries. "Caution" is also used to warn against unsafe practices or obvious misuse, as well as for situations which may result in material damage or personal injury.

**NOTICE**

"Notice" indicates information that is directly or indirectly related to the safety of personnel or property. It is not directly associated with hazards or hazardous situations.

"Danger" or "Warning" are strictly used for cases which present a risk to life or limb. Damage to property only falls into these categories if there is also a risk of personal injury that corresponds to these levels.

## Prescribed Application

**WARNING**

- Electrical installations, activation and maintenance work, as well and configuring and programming work, must only be performed by qualified electrical technicians with relevant accident prevention training, and in compliance with the applicable regulations.
- Safety precautions and safety devices must comply with the applicable regulations.
- Compliance with the required regulations is achieved when the devices are correctly processed in order to create an end product.
- Damaged products must neither be installed nor put into operation.

**NOTICE**

- On account of the class and degree of protection, all devices must be installed in a gesis distribution box (gesis RAN) or similar housing.
- Due to their holding equipment, devices without locking feet may only be installed in a gesis RAN housing provided by Wieland Electric.
- A power supply from the gesis RM series of devices is required for operating the basic module. If a power supply other than the gesis product intended for this purpose is used, Wieland Electric GmbH cannot guarantee that faultless operation will take place.
- The extension modules can only be used in conjunction with a basic module from the gesis RM series of devices.
- When looping through the voltages, the maximum current of 16 A must not be exceeded.

The control system must only be used when in proper working condition, as well as according to its prescribed usage, with due regard given to safety, awareness of any hazards and following the instructions contained in the operating manual. Reliable and safe handling assumes proper shipping, storage and installation, as well as careful operation. In particular, safety-related faults must be rectified immediately by a professional.

The control systems are exclusively intended for controlling building equipment. Other applications, or use beyond this scope, are considered to be improper. The manufacturer assumes no responsibility for any damage resulting from usage of this nature.

In order to use the control systems as prescribed, the instructions outlined in this operating manual must be followed for mechanical and electrical installation procedures, as well as for activation and operation of the systems.

## Selecting Personnel and Personnel Qualifications

**WARNING**

- Electrical installations, activation and maintenance work, as well and configuring and programming work, must only be performed by qualified electrical technicians with relevant accident prevention training, and in compliance with the applicable regulations.
- Configuring and programming personnel must be familiar with the safety concepts involved in building installation technology.
- Operating personnel must be trained in handling the control system and familiar with the operating instructions.
- Installation, activation and maintenance personnel must have a training background which authorises them to carry out work on the control system.

## Tests and Repairs

When measurement or testing procedures are being performed on the active device, the specifications and implementation guidelines of the relevant accident prevention regulations must be observed. Only suitable tools may be used for this.

Repairs to control components may only be carried out by the manufacturer.

**CAUTION**

Unauthorised opening and improper intervention or repairs can result in material damage or bodily harm.

In the event of a fault, send devices back to:

Wieland Electric GmbH
Abteilung (Department) TQM 3
Brennerstrasse 10-14
96052 Bamberg, Germany

## Hazards due to Electrical Energy

The user must ensure that unauthorised and improper intervention is prevented. Personnel must be familiar with all sources of hazards and all procedures involved in activating the equipment. This includes not only data contained in the gesis "System Handling Information" document (item no. 0060.2) and device packaging inserts, but also the relevant content from this manual.

# 2 The LON Bus System

## Technology

LON systems are based on an "installation bus": this refers to the cable which links all the devices that are connected and transfers signals between all the bus nodes.

LONs are concerned with a remote bus system. A central unit is not required since each node (bus device) has its own intelligence. Software is used to download all the required parameters to the individual devices via the bus. Different transfer media are available within the LON.

All Wieland LON devices use twisted pair (TP) 2-wire bus technology and a TP/FT-10 transceiver with external supply. A separate cable is used, which is laid when the standard electrical installation takes place and provides the medium for transporting status messages or switching commands for communication purposes.

In larger LON systems, the subnets are logically linked and electrically isolated from one another by means of routers. The routers ensure that the telegram load on the coupled subnets does not become too great. They prevent telegrams that are only required in particular areas from entering other areas, thereby reducing the bus load. The LON is an event-controlled bus system, which means that telegrams are only created when they are actually needed.

## Topology

Each bus connection represents a node, regardless of whether this is concerned with a straightforward button or complex visualisation.

The nodes in each system are divided into sensors (e.g. buttons, temperature sensors), actuators (e.g. switching outputs, shutter outputs) and system devices (e.g. line couplers, power supplies).

The smallest unit in the LON system is a subnet. A subnet can link up to 127 nodes. Routers enable up to 255 subnets to be connected to form a domain (a network). This means that networks with over 32,000 nodes in a domain can be implemented. In the case of extremely complex installations, special couplers can be used to interconnect several domains.

## Addressing

Unique "addresses" are used for identifying and addressing specific bus nodes. The LON system uses two address types:

- **Neuron ID**

The Neuron ID is a 48-bit identifier that is unique worldwide (similar to an Ethernet MAC address) and which is assigned to every LON chip during manufacture. It enables any node to be unambiguously identified at any time. This allows separate LON networks to be automatically combined at a later date in order to create one single network, for example.

- **Subnet/Node ID**

The subnet/node ID is assigned to each node during activation. It unambiguously defines each node. Since this address is based on the subnet structure, the bus system itself remains clear, right up to the final extension stage. In addition, the subnet/node ID ensures

that the activation engineer has enough leeway to take building structures into account as well. Each device can be addressed in such a way that it can easily be assigned to existing building structures (e.g. "west building, 1st floor, north side").

## Communication

The LONTALK protocol is used for communication between nodes. Logical links are created between buttons, controllers and actuators, for example, by means of "bindings". These links can be established within the same subnet or via multiple routers. If the latter is the case, the required filter tables in the routers are created and stored automatically.

Special routers can also be used to interconnect individual subnets via TCP/IP links. This allows an existing Ethernet infrastructure to serve as a backbone.

## Software

A variety of software tools is available for planning, activating and documenting an LON system. This means that, whatever the requirements of the project or the level of training undergone by the activating engineer, there will always be an appropriate tool.

The LNS common network operating system has really established itself and is used by all relevant tools. Subnet/node IDs, bindings, parameters, etc. can be defined and changed via LNS not only for each device, but also for the system as a whole.

The manufacturers provide specific data for the devices used in the system free of charge, in the form of application files, and input it into the LNS. As well as the standard configuration options offered by activation tools, the majority of manufacturers also provide configuration tools (plug-ins) free of charge, which are integrated in the software tool, to make activation easier.

LNS plug-ins are available free of charge for all Wieland LON devices and can be used in an LNS environment of version 3 or higher.

## Installation of the LNS Plug-In

### System requirements

- PC/laptop with an LNS installation tool installed and a suitable interface for connecting to the LON system
- LNS version 3.x or higher with all available service packs
- Standard device resource files (SDRF) version 12 or higher (available free of charge at www.lonmark.org)

### Device and parameter description files (SDRF, UDRF)

Standard device resource files (SDRF) version 12 or higher must be installed prior to installation of the plug-in. The user-defined description files (UDRF) that are required to display Wieland-specific parameters correctly are automatically copied and initialised when the Wieland plug-in is installed.

### Availability

The Wieland LNS plug-in for the gesis LON RM series of devices can be downloaded free of charge from the downloads area of the Wieland website (www.gesis.com).

It is advisable to download the latest version of the plug-in before starting each new project, as the available device templates (module combinations) and extension modules are constantly being updated.

If the device template for the module combination you require is not yet available, please contact the Wieland hotline (refer to page 1.1).

### Installation

To install the plug-in, please launch the "setup.exe" file and follow the on-screen instructions.

### Installation routine

The installation routine automatically performs all the steps required to install the plug-in, register the Wieland parameter descriptions (UDRFs) and copy the device templates. The following default directories within the LonWorks basic directory (usually C:\LonWorks\) are used:

- The plug-in is installed in ..\PlugIns\Wieland Electric\WLD_GESIS\
- The UDRFs are stored under ..\types\User\Wieland Electric\
- The device templates are stored under ..\import\Wieland Electric\

Following successful installation, a new program folder called "Plug-In for gesis LON RM Devices" is created in the Windows Start menu, which can be used for direct access to the manual (this document).

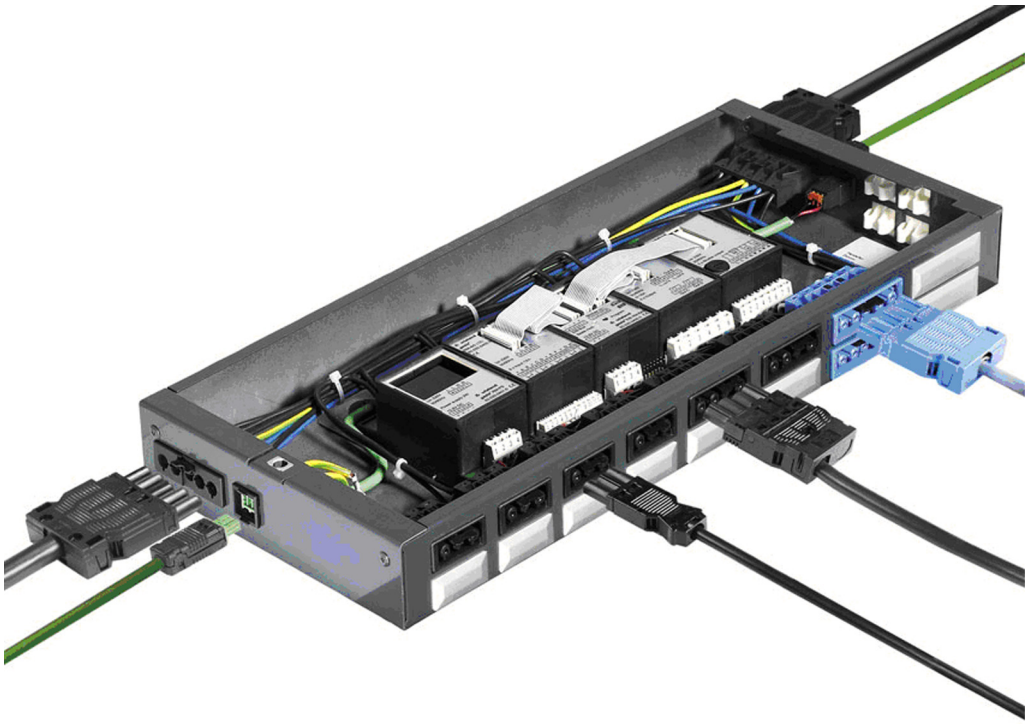
### Registration in the Windows registry

The installation routine automatically enters the plug-in in the Windows registry. If the entry is not made automatically, it must be done manually before the LNS activation tool can be used. To do this, launch one instance of the plug-in directly via the Windows Start menu and select the "Register" button. The plug-in can then be registered using the procedure for individual LON projects, which is specific to each activation tool.

If the Wieland plug-in needs to be removed from the Windows registry, please launch the plug-in directly once again via the Windows Start menu and select "Unregister".

# 3 gesis LON: System Overview

## gesis LON RM-BAS with gesis RM extension modules



As the basic module is interchangeable, the input/output modules (extension modules) can be operated on LON or EIB/KNX. The LON basic module and the extension modules operated on it are described here.

This series of devices is intended for installation in gesis RAN boxes (distribution boxes with pluggable connections from the gesis CON series of connectors), followed by remote mounting. Since the extension modules can be freely selected from the range of gesis RM devices, and there are no restrictions other than that a maximum of four extension modules may be connected, the arrangement of the modules can easily be adapted to the requirements presented by different systems. 8 binary inputs, 16 EnOcean radio inputs, 4 switching outputs, 2 shutter outputs (AC or DC), 2 switching/dimming outputs, 2 universal dimmer outputs and 4 semiconductor outputs are available as extension modules. A power supply is required to operate a basic module that has extension modules added to it.

Although the module block is extremely flexible and can be extended up to a maximum of 16 switching outputs, for example, the entire arrangement of modules only requires one LNS licence. The extension modules used are selected in the LNS activation tool by means of the corresponding device application (template/XIF).

The entire arrangement is installed in a pluggable gesis RAN distribution box. Usually, this box is fully equipped with connectors from the gesis CON series. This reduces the amount of assembly work at the place of installation, so all that is required is to attach the box and plug in the connections. If gesis CON connectors are used throughout the installation, a significant amount of time will be saved and considerably fewer on-site errors will

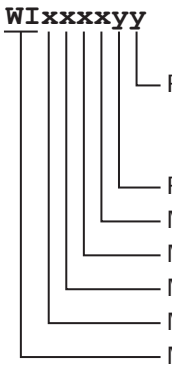
occur. Since the distribution boxes are designed in consultation with our customers, there is also the option of having project-specific labels attached to the inputs and outputs.

The functionality of the extension modules is stored in the basic module directly using the LNS plug-in, by means of parameter settings. The extensive parameter sets that are available mean that even complex requirements can be met. For example, shutter outputs feature an option for positioning the shutters and setting the louvre angle. There is no need to create any function groups for this; each output has its own complete parameter set, whose settings can be made separately from all the others. Prioritised or logically combined control is also possible.

The applications meet the requirements laid down by the LONMARK Association and have been implemented in accordance with published LONMARK profiles.

## Selection of an Application Program

The appropriate application program can be selected from the application library by means of the Wieland type number of the gesis RAN (e.g. LON2345). The file name of the device template is structured as follows:




| | |
|---|---|
| Program revision | Indicates the program revision number with an identical network interface to the program version specified |
| Program version | Indicates various network interfaces |
| Module 4 | Type of the fourth connected module |
| Module 3 | Type of the third connected module |
| Module 2 | Type of the second connected module |
| Module 1 | Type of the first connected module |
| Manufacturer | Manufacturer ID |

In each case, the penultimate digit of the order number (e.g. for gesis RM-8/0 (12), 8 binary inputs: order no.: 83.020.0402.0, for other modules see the overview of order numbers on page 3.1) corresponds to the extension module type of the modules specified in the file name.

For example, a gesis RAN "LON2345" would require application "WI2345xy" and would correspond to a distribution box with eight binary inputs, four switching actuator outputs, two shutter outputs (AC) and two switching/dimming outputs (1 to 10 V).

The device templates are installed together with the LNS plug-in or can be downloaded individually from the downloads area of the website found at www.gesis.com.

If your gesis RAN product has been assembled by Wieland, the correct application will already have been loaded into the basic module. If the module combination has not been created by Wieland, please contact the Wieland hotline in order to obtain the right application.

## Module Addresses - Extension Modules

The basic module can manage a maximum of four extension modules (please also refer to the chapter relating to extension modules). These extension modules are managed in accordance with the requirements laid down by the device template. The LNS plug-in can

be used to check whether the connected extension modules meet the specifications of the device template or not.

| NOTICE |
| --- |
| The extension modules must always be connected to the basic module in ascending order as regards their model numbers (e.g. 2345, not 2453 or 5432). |

## Modules With No Mounting Feet

In order to achieve a minimum installation height of approximately 55 mm when installing modules in the gesis RAN pluggable distribution box, they are also manufactured without feet. These modules are installed in the gesis RAN in the factory with the help of special equipment.

## Place of Installation

The modules must be installed in a gesis RAN or similar housing. If a gesis RAN distribution box is used, the modules are installed by Wieland and wired to gesis CON series connectors. The distribution box is designed and manufactured in accordance with customer requirements, meaning it can be adapted to almost any conditions. The system/customer-specific planning and design of the distribution box also extends to labelling of the inputs and outputs. External connections are established using the gesis CON connector system. As terminal blocks, transformers and other similar devices can also be installed in these distribution boxes, this allows complete room functions to be created and efficiently integrated into the pluggable electrical installation.

# 4 gesis LON RM: System Overview

The gesis LON series of devices arose from combining LONs with the gesis CON connector system. As a manufacturer of compact connectors for electrical installation, Wieland developed LON switching devices with pluggable connections which can be connected to gesis connectors.

gesis LON RM/RM2 is a modular device series characterised by a very low installation height (50 mm). The basic and power supply modules are adapted to the building control task at hand using up to four extension modules. The LON module groups are prefabricated in the factory (installed in a distribution box, wired and checked). When the distribution box then reaches the site of installation, it only needs to be connected using gesis connectors. All gesis device series are compatible with all LON devices from other manufacturers and can be used in an extensive range of applications. The gesis LON range facilitates remote installation and places inputs and outputs directly at the consumer. This results in shorter cables, a reduction in thermal loads, smaller cable channels and more space in the distribution box. The pluggable connections and prefabricated gesis components also enable faster assembly and help to prevent installation errors.

## Overview of gesis LON RM Module Descriptions

### Overview according to type

| Chap. | Type | Order no. | Page | Techn. data | Installation | Applic. progr. |
|---|---|---|---|---|---|---|
| **4.1** | gesis RM2-BAS | 83.020.0300.3 | 4.1.1 | 4.1.3 | 4.1.4 | 4.1.6 |
| | gesis RM2-BAS B | 83.020.0300.4 | | | | |
| **4.2** | gesis RM-PS | 83.020.0401.0 | 4.2.1 | 4.2.3 | 4.2.3 | – |
| | gesis RM-PS B | 83.020.0401.1 | | | | |
| **4.3** | gesis RM-PS 12/5 | 83.020.0421.0 | 4.3.1 | 4.3.3 | 4.3.3 | – |
| | gesis RM-PS 12/5 B | 83.020.0421.1 | | | | |
| **4.4** | gesis RM-0/8 12 | 83.020.0402.0 | 4.4.1 | 4.4.3 | 4.4.3 | 4.4.5 |
| | gesis RM-0/8 12 B | 83.020.0402.1 | | | | |
| **4.5** | gesis RM-0/4 | 83.020.0403.0 | 4.5.1 | 4.5.3 | 4.5.3 | 4.5.5 |
| | gesis RM-0/4 B | 83.020.0403.1 | | | | |
| **4.6** | gesis RM-0/2W SI | 83.020.0404.0 | 4.6.1 | 4.6.3 | 4.6.4 | 4.6.6 |
| | gesis RM-0/2W SI B | 83.020.0404.1 | | | | |
| **4.7** | gesis RM-0/2SD | 83.020.0405.0 | 4.7.1 | 4.7.1 | 4.7.3 | 4.7.5 |
| | gesis RM-0/2SD B | 83.020.0405.1 | | | | |
| **4.8** | gesis RM-0/4HL | 83.020.0406.0 | 4.8.1 | 4.8.3 | 4.8.4 | 4.8.6 |
| | gesis RM-0/4HL B | 83.020.0406.1 | | | | |
| **4.9** | gesis RM-0/2W DC | 83.020.0407.0 | 4.9.1 | 4.9.3 | 4.9.3 | 4.9.5 |
| | gesis RM-0/2W DC B | 83.020.0407.1 | | | | |
| **4.10** | gesis RM-16/0 (RC) | 83.020.0408.0 | 4.10.1 | 4.10.3 | 4.10.4 | 4.10.6 |
| | gesis RM-16/0 (RC) B | 83.020.0408.1 | | | | |
| **4.11** | gesis RM-0/2D | 83.020.0409.0 | 4.11.1 | 4.11.3 | 4.11.4 | 4.11.6 |
| | gesis RM-0/2D B | 83.020.0409.1 | | | | |
| **4.12** | gesis RM-0/2DA | 83.020.0410.0 | 4.12.1 | 4.12.3 | 4.12.4 | 4.12.6 |
| | gesis RM-0/2DA B | 83.020.0410.1 | | | | |
| **4.13** | gesis RM-0/4HL AC | 83.020.0411.0 | 4.13.1 | 4.13.3 | 4.13.3 | 4.13.5 |
| | gesis RM-0/4HL AC B | 83.020.0411.1 | | | | |

| Chap. | Type | Order no. | Page | Techn. data | Installation | Applic. progr. |
|---|---|---|---|---|---|---|
| 4.14 | gesis RM-0/4HL DC | 83.020.0412.0 | 4.14.1 | 4.14.2 | 4.14.3 | 4.14.5 |
| | gesis RM-0/4HL DC B | 83.020.0412.1 | | | | |

## Overview according to order number

| Chap. | Order no. | Type | Page | Techn. data | Installation | Applic. progr. |
|---|---|---|---|---|---|---|
| 4.1 | 83.020.0300.0 | gesis RM-BAS | 4.1.1 | 4.1.3 | 4.1.4 | 4.1.6 |
| | 83.020.0300.1 | gesis RM-BAS B | | | | |
| 4.2 | 83.020.0401.0 | gesis RM-PS | 4.2.1 | 4.2.3 | 4.2.3 | – |
| | 83.020.0401.1 | gesis RM-PS B | | | | |
| 4.3 | 83.020.0421.0 | gesis RM-PS 12/5 | 4.3.1 | 4.3.3 | 4.3.3 | – |
| | 83.020.0421.1 | gesis RM-PS 12/5 B | | | | |
| 4.4 | 83.020.0402.0 | gesis RM-0/8 12 | 4.4.1 | 4.4.3 | 4.4.3 | 4.4.5 |
| | 83.020.0402.1 | gesis RM-0/8 12 B | | | | |
| 4.5 | 83.020.0403.0 | gesis RM-0/4 | 4.5.1 | 4.5.3 | 4.5.3 | 4.5.5 |
| | 83.020.0403.1 | gesis RM-0/4 B | | | | |
| 4.6 | 83.020.0404.0 | gesis RM-0/2W SI | 4.6.1 | 4.6.3 | 4.6.4 | 4.6.6 |
| | 83.020.0404.1 | gesis RM-0/2W SI B | | | | |
| 4.7 | 83.020.0405.0 | gesis RM-0/2SD | 4.7.1 | 4.7.1 | 4.7.3 | 4.7.5 |
| | 83.020.0405.1 | gesis RM-0/2SD B | | | | |
| 4.8 | 83.020.0406.0 | gesis RM-0/4HL | 4.8.1 | 4.8.3 | 4.8.4 | 4.8.6 |
| | 83.020.0406.1 | gesis RM-0/4HL B | | | | |
| 4.9 | 83.020.0407.0 | gesis RM-0/2W DC | 4.9.1 | 4.9.3 | 4.9.3 | 4.9.5 |
| | 83.020.0407.1 | gesis RM-0/2W DC B | | | | |
| 4.10 | 83.020.0408.0 | gesis RM-16/0 (RC) | 4.10.1 | 4.10.3 | 4.10.4 | 4.10.6 |
| | 83.020.0408.1 | gesis RM-16/0 (RC) B | | | | |
| 4.11 | 83.020.0409.0 | gesis RM-0/2D | 4.11.1 | 4.11.3 | 4.11.4 | 4.11.6 |
| | 83.020.0409.1 | gesis RM-0/2D B | | | | |
| 4.12 | 83.020.0410.0 | gesis RM-0/2DA | 4.12.1 | 4.12.3 | 4.12.4 | 4.12.6 |
| | 83.020.0410.1 | gesis RM-0/2DA B | | | | |
| 4.13 | 83.020.0411.0 | gesis RM-0/4HL AC | 4.13.1 | 4.13.3 | 4.13.3 | 4.13.5 |
| | 83.020.0411.1 | gesis RM-0/4HL AC B | | | | |
| 4.14 | 83.020.0412.0 | gesis RM-0/4HL DC | 4.14.1 | 4.14.2 | 4.14.3 | 4.14.5 |
| | 83.020.0412.1 | gesis RM-0/4HL DC B | | | | |

# 4.1 gesis LON RM2-BAS (83.020.0300.3/4)

## Device Description

- Designation: Basic module, LON coupling
- Type/model no.: gesis LON RM2-BAS 83.020.0300.3
  gesis LON RM2-BAS B 83.020.0300.4
- Device type: Basic module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

### Function

The basic module acts as the interface between the gesis RM extension modules and the LON bus. It receives and sends telegrams via the LON bus, and manages the extension modules that are connected.

A maximum of four extension modules from the gesis RM series of devices may be connected to one basic module. A power supply that conforms to the type of system being used is required for operating a basic module with extension modules connected to it.

Since the extension modules can be freely selected from the range of gesis RM devices, and there are no restrictions other than that a maximum of four extension modules may be connected, the arrangement of the modules can easily be adapted to the requirements presented by different systems. Binary inputs for both floating contacts and radio telegrams conforming to the EnOcean standard are available as inputs. A wide range of extension modules is available for light controllers (switching and dimming), shutter controllers and valve controllers.

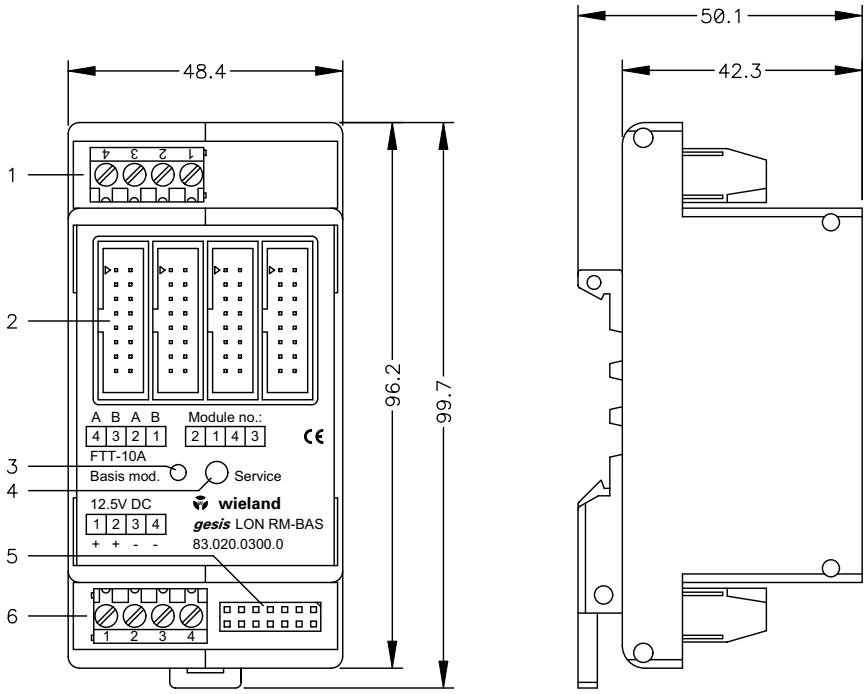
Although the modules can be extended up to a maximum of 16 outputs, for example, and although the module block is flexible on account of its freely selectable configuration, the entire arrangement of modules is managed as one single LON node and therefore only requires one LNS licence.

The entire arrangement is installed in a pluggable gesis distribution box. This box is fully equipped with connectors from the gesis CON series. This reduces the amount of assembly work at the place of installation, so all that is required is to attach the box and plug in the connections. If gesis CON connectors are used throughout the installation, not only will a vast amount of time be saved, but the system will also be installed with virtually no errors. Since the distribution boxes are designed in consultation with our customers, there is also the option of having neat and accurate labels attached to the inputs and outputs.

The functionality of the extension modules is defined by means of parameter settings in the basic module, which are made with the help of an LNS plug-in that is available free of

charge. Each parameter set covers a wide scope, so that virtually any requirement can be accommodated. They meet the specifications of the profiles certified by LonMark International. There is no need to create any function groups for this; each output has its own complete parameter set, whose settings can be made separately from all the others.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | Terminal strip for connecting the LON bus (for details please refer to "Terminal Assignment") |
| 2– Slots | For connecting the extension modules (16-pin ribbon cable header). Please make a note of which module addresses are assigned to which slots (by providing a label with "Module no.:"). |
| 3– Red LED | Node status:<br>On = Network access error<br>Flashing = Module not configured |
| 4– Programming button | Service button (for sending the Neuron ID) |
| 5– Programming port | For service purposes (servicing to be performed by Wieland Electric GmbH only) |
| 6– X2 | Terminal strip for connecting the operating voltage (for details please refer to "Terminal Assignment") |
| 7– Locking slide | With 83.020.0300.3 only |

## Terminal Assignment

**X1**: Connection and routing of the LON bus; terminals 1/2 and 3/4 are bridged internally

1– LON B
2– LON A
3– LON B
4– LON A

**X2**: Connection and routing of the operating voltage; terminals 1/2 and 3/4 are bridged internally

1– Operating voltage: 12.5 V DC SELV +
2– Operating voltage: 12.5 V DC SELV +
3– Operating voltage: 12.5 V DC SELV –
4– Operating voltage: 12.5 V DC SELV –

## Technical Data

| | |
|---|---|
| **Operating voltage** | 12,5 V DC ± 5% (SELV) |
| Rated current | 160 mA |
| Current consumption | Approx. 42 mA |
| Rated insulation voltage | 250 V |
| LON bus safety precautions | SELV |
| Bus connection | FTT10-A |
| Connection to extension modules | Pluggable flat cable |
| Interfaces | Four extension modules from the gesis RM series of devices |
| Connection type | Screw clamp terminals<br>0.14 to 4 mm², solid<br>0.14 to 2.5 mm², stranded<br>6.5 mm stripped in each case |
| Physical address | One (independent of number of extension modules) |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| EMC requirements | Conforms to EN 61000-6-2/-6-3 and EN 50090-2-2 |
| Operating conditions | |
| Field of application | For installation in gesis distribution boxes, which are in turn intended for fixed installation in interior and dry areas |
| Temperature ranges | |
| – Operating environment | -5°C to +45°C |
| – Storage | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| Climate resistance | Acc. to EN 50090-2-2 |
| General data | |
| Housing material | Plastic, halogen-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 120 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Approvals | None, developed in acc. with LonMark guidelines |
| CE certification | In acc. with EMC Directive (residential and functional buildings); Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0300.3)

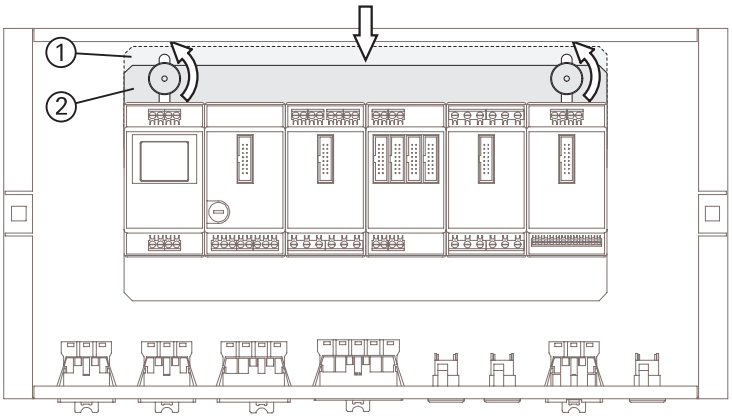
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and LON using the appropriate terminal strips.

### Disassembly (83.020.0300.3)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0300.4)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open). Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

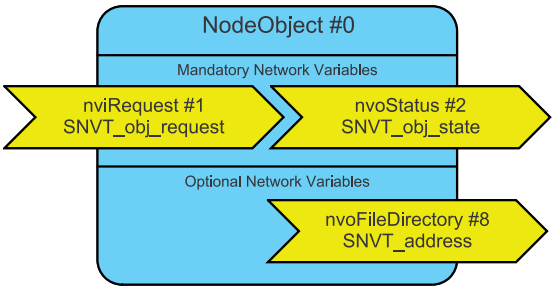
## Accessories

| | |
|---|---|
| • Power supply gesis RM-PS | 83.020.0401.0 |
| • Power supply gesis RM-PS B | 83.020.0401.1 |
| • Power supply gesis RM-PS 12/5 | 83.020.0421.0 |
| • Power supply gesis RM-PS 12/5 B | 83.020.0421.1 |

## Application Program

The most important object parameters and variables can be set via the LNS plug-in. Certain special variables can only be parameterised using the LNS tool. The application program description indicates which variables can be set via which applications.

### NodeObject

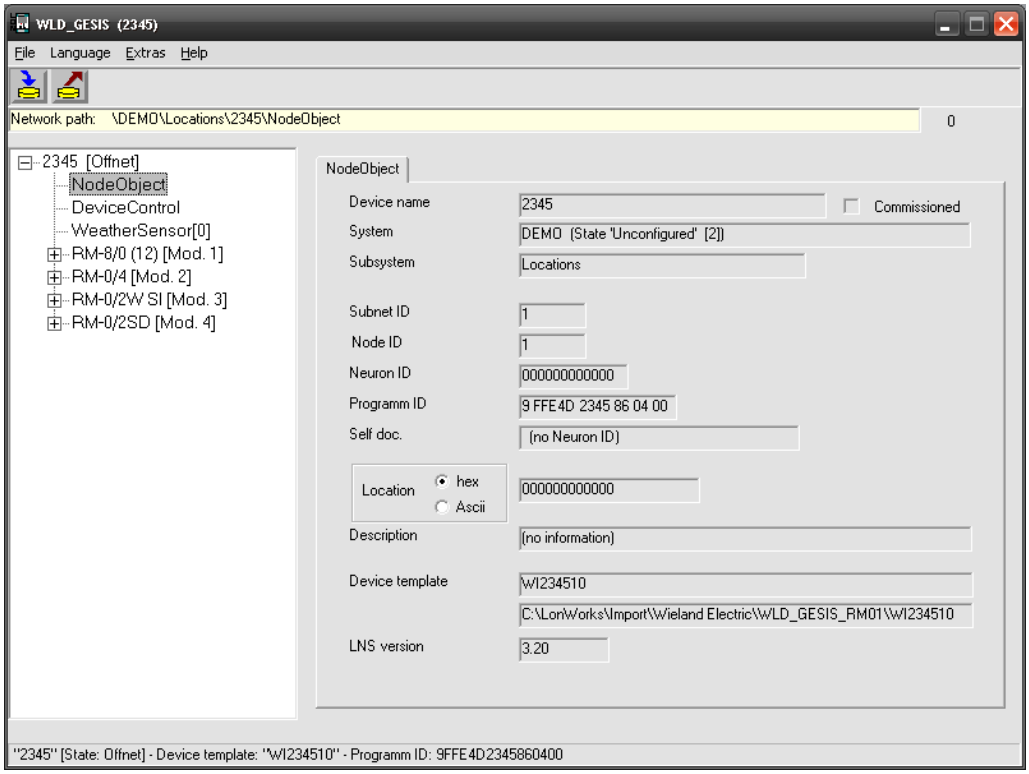



In a LonMark-compliant LON application, the NodeObject (object_ID: 0) is used to manage other LonMark objects present in the node. When implemented, it is always given FB_ID: 0; in other words, it is the first object in the node. Only one such object may be present in each node.

In the application described here, the functionality has only been implemented in accordance with LonMark on a basic level, i.e. the NodeObject is only used to test the node's communication capability.

The status of a particular function block in the node is requested via RQ_UPDATE_STATUS. If the ID of the NodeObject is used in the request as the object_ID, the status of the entire node and of all the function blocks that are present is reported by means of `nvoStatus`.

## Object parameters (plug-in)




NodeObject

No operator functions are available for NodeObject; information relating to the current device status is merely displayed.

## Object parameters (LNS tool)

### Network variables

*nviRequest*

| | |
|---|---|
| Type | SNVT_obj_request |
| Range of values | Valid object ID (0) together with RQ_UPDATE_STATUS |
| Default value | RQ_NORMAL |
| Description | Node status messages can be initiated via this input. |

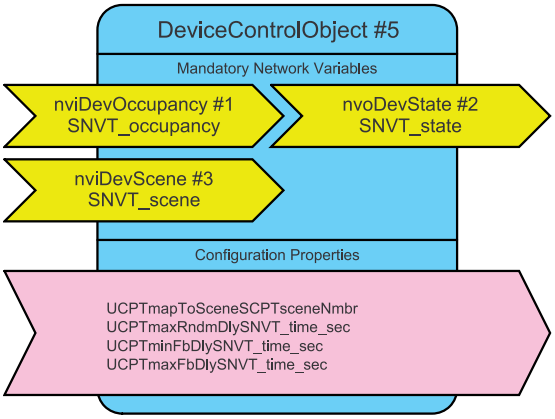
*nvoStatus*

| | |
|---|---|
| Type | SNVT_obj_status |
| Range of values | The status bits supported by the object:<br>.report_mask<br>.invalid_id<br>.invalid_request |
| Default value | All bits = 0 |
| Description | Sent if an update has been received at nviRequest. |

*nvoFileDirectory*

| | |
|---|---|
| Type | SNVT_address |
| Range of values | Dependent on the chip used and the application in question |
| Default value | Undefined |
| Description | Only used for internal functionality. |

## DeviceControlObject




This object simplifies centralised visualisation and control functions for the building services management system or facility management system and makes handling easier for the system integrator. It is used to control the entire node and affects all implemented objects.

### Global control

A "scene memory" is provided for every available output being controlled; this memory stores information about the permanently defined states of the associated actuator, in a format that complies with the input network variable belonging to the actuator (same type). The corresponding configuration parameter is called `UCPTdevScene`, which takes the form of an array of five memory locations for each actuator object.

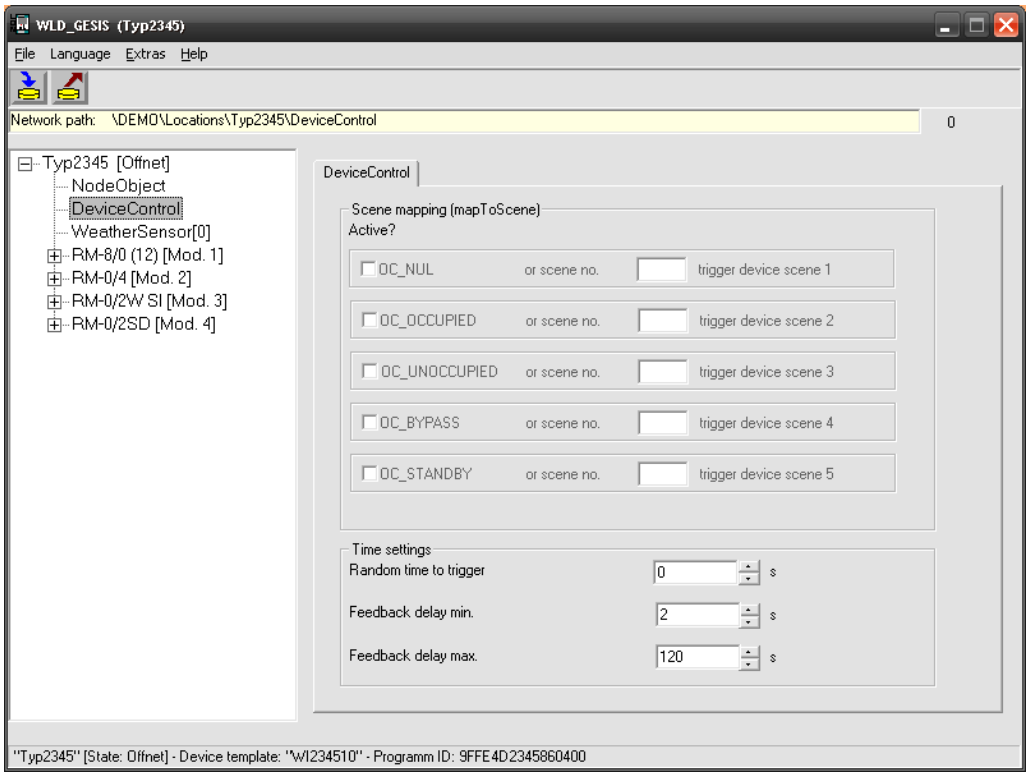
If a particular scene is now called up via the DeviceControl object, e.g. alarm, "cleaner present", etc. all available actuators will assume the corresponding state assigned to them.

Both inputs are entirely equal and the input values at `nviDevOccupancy` are assigned to the scene numbers as described under "Network variables" (page 4.1.10).

### Global visualisation

A cross-module network variable output (`nvoDevState`) is provided to make visualisation tasks easier; this output represents all output states within a network variable by means of a 16-bit value.

## Object parameters (plug-in)




DeviceControl

The DeviceControl object can be used to determine the general behaviour of the outputs when telegrams are received at the central scene and occupancy inputs. The individual scene values are then defined in the associated output objects.

### Scene mapping (UCPTmapToScene)

*Active*

| | |
|---|---|
| Range of values | Yes/no; yes = ☑, no = ☐ ("no" corresponds to scene 0) |
| Default value | ☐ (deactivated) |
| Description | Determines whether the assigned occupancy value will be evaluated for central control purposes or not. |

*Scene no. (UCPTmapToScene) (field of 5 values)*

| | |
|---|---|
| Range of values | 1…255 |
| Default value | (none) |
| Description | Defines which scene number is assigned to this occupancy value. A function can then be allocated to the scene number in the output object. |

*Random delay before activation (UCPTmaxRndmDly)*

| | |
|---|---|
| Range of values | 0…120 s; resolution 1 s |
| Default value | 0 (deactivated) |
| Description | Defines the maximum random delay for executing global commands. Spacing out the commands in this way is designed to prevent the supply network being overloaded by too many consumers being activated simultaneously.<br>A value of 0 deactivates this function. |

*Feedback delay min. (UCPTminFbDly)*

| | |
|---|---|
| Range of values | 0 to 120 s; resolution 1 s |
| Default value | 2 s |
| Description | The time specified here delays the status telegram at nvoDevState.<br>A value of 0 deactivates this function. |

*Feedback delay max. (UCPTmaxFbDly)*

| | |
|---|---|
| Range of values | 0…6553 s; resolution 1 s |
| Default value | 120 s |
| Description | Specifies the cycle time for sending status information to nvoDevState periodically.<br>A value of 0 deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviDevOccupancy*

| | | |
|---|---|---|
| Type | SNVT_occupancy | |
| Range of values | OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY | |
| Default value | OC_NUL | |
| Description | Input variable for accepting global control commands. The permissible input commands are permanently assigned to the available scenes. | |
| | OC_NUL | Triggers the action specified in UCPTdevScene[0]. |
| | OC_OCCUPIED | Triggers the action specified in UCPTdevScene[1]. |
| | OC_UNOCCUPIED | Triggers the action specified in UCPTdevScene[2]. |
| | OC_BYPASS | Triggers the action specified in UCPTdevScene[3]. |
| | OC_STANDBY | Triggers the action specified in UCPTdevScene[4]. |

*nvoDevState*

| | |
|---|---|
| Type | SNVT_state |
| Range of values | 16 individual bits |
| Default value | Configuration-dependent |
| Description | The individual bits return the status of the available outputs:<br>.bit0 to .bit3 Output status of the first module<br>.bit4 to .bit7 Output status of the second module<br>.bit8 to .bit11 Output status of the third module<br>.bit12 to .bit15 Output status of the fourth module<br>Interpretation of the assigned bits (application-dependent):<br>RM-8/0 (12) Not supported, as input<br>RM-0/4 Every bit describes an output channel: 0 = OFF, 1 = ON<br>RM-0/2W SI Every two bits describe an output channel: 00 = drive active, 01 = lower limit position, 10 = upper limit position, 11 = no limit position, drive not active<br>RM-0/2 SD Even bits (.bit0, .bit2, .bit4, etc.) each describe an output channel: 0 = OFF, 1 = ON<br>RM-0/4 (HL) Every bit describes an output channel: 0 = OFF, 1 = ON<br>RM-0/2W (DC) Every two bits describe an output channel: 00 = drive active, 01 = lower limit position, 10 = upper limit position, 11 = no limit position, drive not active<br>RM-16/0 (RC) Not supported, as input<br>RM-0/2D Even bits (.bit0, .bit2, .bit4, etc.) each describe an output channel: 0 = OFF, 1 = ON |

*nviDevScene*

| | |
|---|---|
| Type | SNVT_scene |
| Range of values | .function SC_NUL, SC_RECALL<br>.scene_number 1…255 |
| Default value | SC_NUL; 0 |
| Description | Input variable for accepting global control commands. The valid scene values are defined in UCPTmapToScene. |

## Parameters

*UCPTmapToScene (field of 5 values)*

| | |
|---|---|
| Type | SNVT_count |
| Range of values | 0…255 |
| Default value | All 0 (deactivated) |
| Description | Defines the valid scene numbers that will result in evaluation and further processing. Note the permanent assignment to the commands received at nviDevOccupancy.<br>The scene specified in UCPTmapToScene[0] corresponds to the action on OC_NUL.<br>The scene specified in UCPTmapToScene[1] corresponds to the action on OC_OCCUPIED.<br>The scene specified in UCPTmapToScene[2] corresponds to the action on OC_UNOCCUPIED.<br>The scene specified in UCPTmapToScene[3] corresponds to the action on OC_BYPASS.<br>The scene specified in UCPTmapToScene[4] corresponds to the action on OC_STANDBY. |

*UCPTmaxRndmDly*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…120 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum random delay for executing global commands.<br>This is designed to prevent the supply network being overloaded by too many consumers being activated simultaneously.<br>A value of 0 s deactivates this function. |

*UCPTminFbDly*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…120 s; resolution 1 s |
| Default value | 2 s |
| Description | The time specified here delays the status telegram at nvoDevState. A value of 0 s deactivates this function. |

*UCPTmaxFbDly*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s; resolution 1 s |
| Default value | 120 s |
| Description | Specifies the cycle time for sending status information to nvoDevState periodically. A value of 0 s deactivates this function. |

# 4.2 gesis RM-PS (83.020.0401.0/1)

## Device Description


- Designation — Power supply
- Type, model no. — gesis RM-PS 83.020.0401.0; gesis RM-PS B 83.020.0401.1
- Device type — Power supply
- Construction — Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

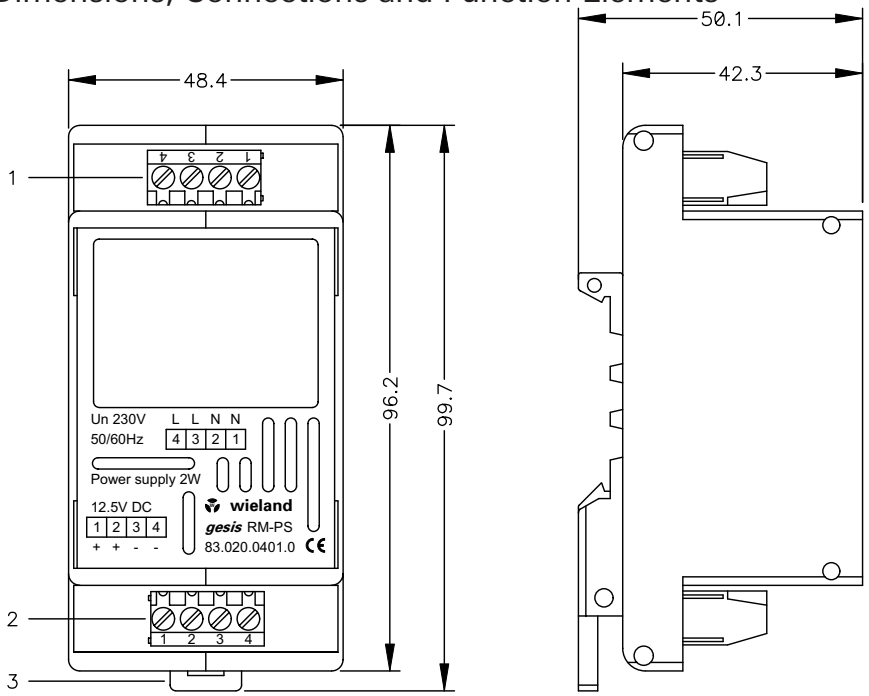
### Function

The power supply provides the power that is used to operate the basic module. The extension modules connected to the basic module using the flat cable also receive the current required for switching the relays from this power supply. The output voltage is a 12 V DC safety extra-low voltage (SELV).

**CAUTION**

If you are using the basic module with four extension modules of type RM-0/2W SI (83.020.0404.0/83.020.0404.1) or RM-0/2W DC (83.020.0407.0/83.020.0407.1) for shutter control, the power supply RM-PS 12/5 (83.020.0421.0/83.020.0421.1) must be used.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | Terminal strip for connecting the operating voltage (for details please refer to "Terminal Assignment") |
| 2– X2 | Terminal strip for connecting the output voltage (for details please refer to "Terminal Assignment") |
| 3– Locking slide | With 83.020.0401.0 only |

## Terminal Assignment

**X1**: Connection and routing of the operating voltage; terminals 1/2 and 3/4 are bridged internally

1– Operating voltage 230 V AC N
2– Operating voltage 230 V AC N
3– Operating voltage 230 V AC L
4– Operating voltage 230 V AC L

**X2**: Connection and routing of the output voltage; terminals 1/2 and 3/4 are bridged internally

1– Output voltage 12.5 V DC SELV +
2– Output voltage 12.5 V DC SELV +
3– Output voltage 12.5 V DC SELV –
4– Output voltage 12.5 V DC SELV –

## Technical Data

| | |
|---|---|
| **Operating elements** | None |
| Indicators | None |
| **Inputs/outputs** | |
| Connection type | Screw clamp terminals |
| Connection cross-section | 0.14 – 4 mm², solid<br>0.14 – 2.5 mm², stranded |
| **Input** | |
| Operating voltage | 230 V AC, +6% / -10%, 50/60 Hz |
| **Output** | |
| (connection to basic module) | |
| Rated voltage | 12,5 V DC SELV |
| Rated current | 160 mA |
| Number of modules that can be connected (max.) | One basic module plus four extension modules; any peak loads occurring with central commands are buffered. |
| **Electrical safety** | |
| Protection class | None (depends on subsequent work) |
| Degree of protection | IP00, min. IP20 following installation of module in gesis® RAN distribution box |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| Electrical isolation | Air gap/creepage paths > 5.5 mm (supply/output) |
| **Environmental conditions** | |
| Field of application | For fixed installation (installation in gesis RAN distribution boxes) in interior and dry areas |
| Ambient operating temperature | -5 to +45°C |
| Storage temperature | -25 to +70°C |
| Relative humidity | 5…93% |
| Moisture condensation | None |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| Climate resistance | Acc. to EN 50090-2-2 |
| Housing material | Plastic, halogen and phosphorous-free; colour: black |
| Behaviour in fire (housing) | Conforms to UL 94 V-2 |
| Weight | Approx. 240 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| CE certification | In acc. with EMC Directive (residential and functional buildings), Low Voltage Directive |

## Installation

### Assembly (83.020.0401.0)

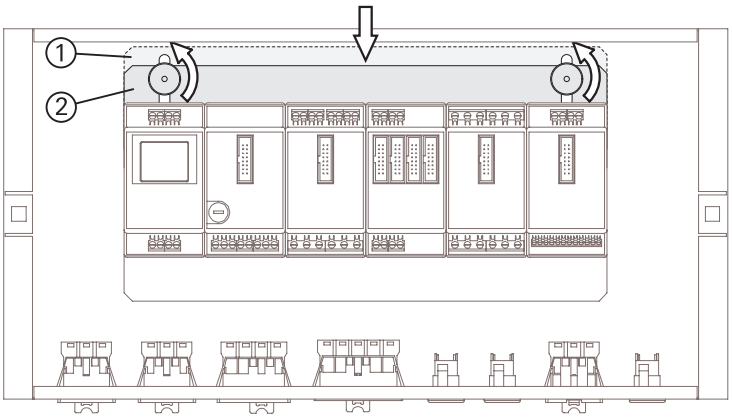
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0401.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0401.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

# 4.3 gesis RM-PS 12/5 (83.020.0421.0/1)

## Device Description

- Designation: Power supply
- Type, model no.: gesis RM-PS 12/5 — 83.020.0421.0
  gesis RM-PS 12/5 B — 83.020.0421.1
- Device type: Power supply
- Construction: Device with screw clamp terminals for installation in a gesis RAN distribution box

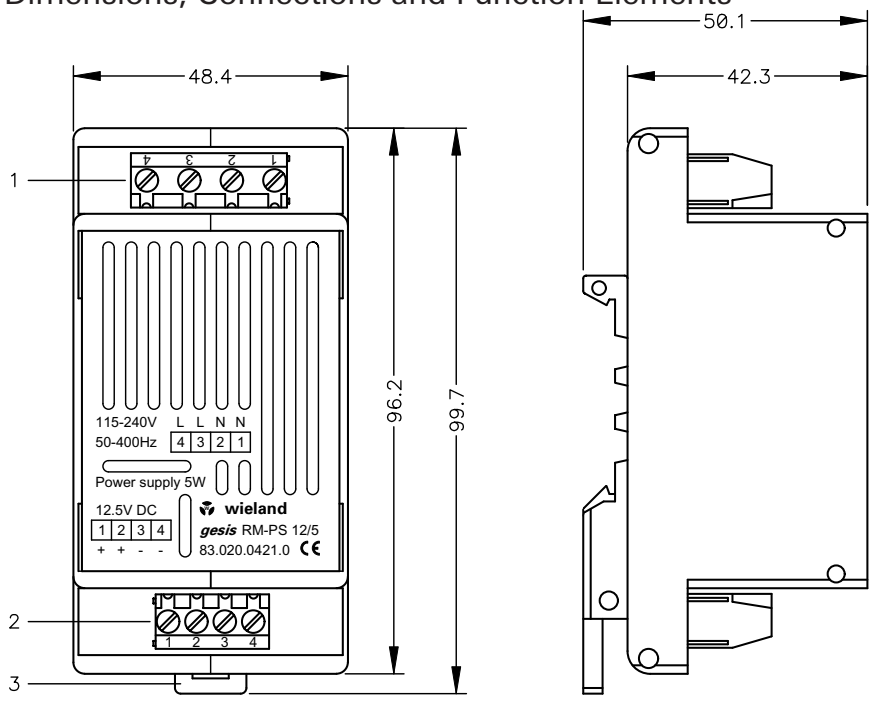
**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Function

The power supply is suitable for operating up to two basic modules, including the extension modules that are connected to them, from the gesis RM series of devices. It has a wide-range input and is suitable for both DC and AC voltage networks. The output (12.5 V DC/5 W) is protected against short circuits, overload and overtemperature.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | 4-pin connection terminal strip for connecting the mains voltage (for details please refer to "Terminal Assignment") |
| 2– X2 | 4-pin connection terminal strip for connecting the output voltage (for details see "Terminal Assignment") |
| 3– Locking slide | With 83.020.0421.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the mains voltage; terminals 1/2 and 3/4 are bridged internally

1– Connection for neutral conductor of the mains voltage (N or -)
2– Connection for neutral conductor of the mains voltage (N or –)
3– Connection for phase/external conductor of the mains voltage (L or +)
4– Connection for phase/external conductor of the mains voltage (L or +)

**X2**: Connection and routing of the output voltage; terminals 1/2 and 3/4 are bridged internally

1– Connection for output voltage, 12.5 V DC +
2– Connection for output voltage, 12.5 V DC +
3– Connection for output voltage, 12.5 V DC –
4– Connection for output voltage, 12.5 V DC –

## Technical Data

| | |
|---|---|
| **Power input** | 85…264 V AC (at 85 V AC with 80% power, from 115 V AC with 100%) |
| **(connection X1)** | 120…370 V DC |
| Frequency range | 47…440 Hz |
| Efficiency | Typ. 73% |
| AC current consumption | Typ. 0.12 A/115 V AC |
| | Typ. 0.08 A/230 V AC |
| **Output (connection X2)** | |
| Rated voltage | 12,5 V DC ± 4% (SELV) |
| | (I/O isolation in acc. with EN 60601-1) |
| Rated current | 400 mA |
| Power | 5 W |
| Short circuit withstand capability | Yes |
| Overload protection | Yes |
| Overtemperature protection | Yes |
| Connection type (X1 and X2) | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP20 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| Electrical isolation | Air gap/creepage paths > 5.5 mm (supply/output) |
| **Environmental conditions** | |
| Ambient operating temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| **General data** | |
| Housing material | Plastic, halogen-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 110 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height inc. TH 35-7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings), |
| | Low Voltage Directive |
| Mounting | On TH 35 mounting rail |

## Installation

### Assembly (83.020.0421.0)

1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.

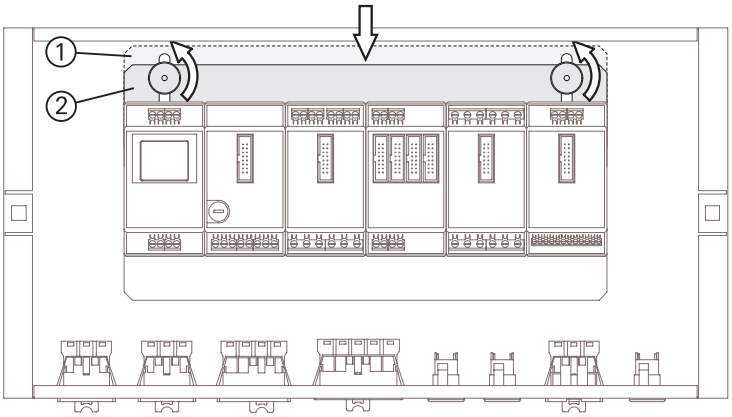
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0421.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0421.1)

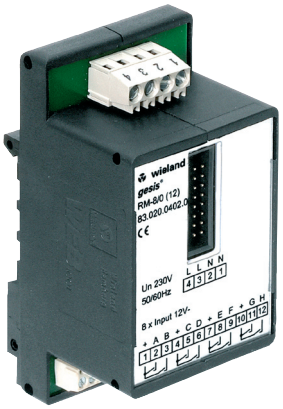
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

# 4.4 gesis RM-8/0 12 (83.020.0402.0/1)

## Device Description




- Designation — Extension module with 8 binary inputs
- Type/model no. — gesis RM-8/0 12 — 83.020.0402.0
  gesis RM-8/0 12 B — 83.020.0402.1
- Device type — Extension module
- Design type — Device with screw clamp terminals for installation in a gesis RAN distribution box

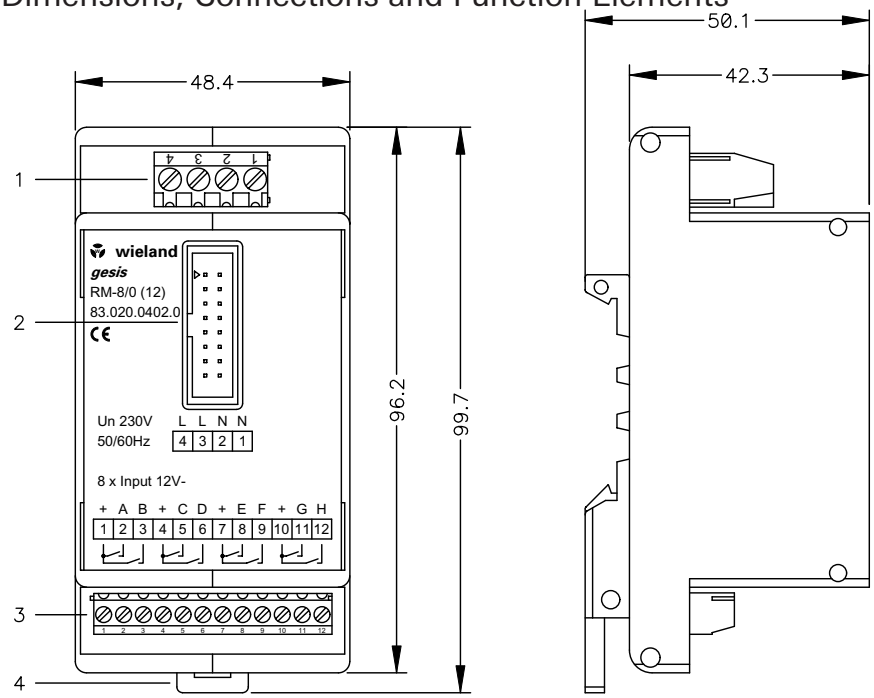
**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

### Function

gesis RM-8/0 12 is an input module with eight floating contacts. All of the corresponding configurations and software settings must be made via the basic module; the extension module does not have its own intelligence. The inputs can be used for light (switching/dimming), shutter and scene control, evaluated separately from one another, and transferred to the network as stand-alone output variables.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | Connection terminal strip for the operating voltage, in order to generate the sampling voltage (for details please refer to "Terminal Assignment") |
| 2– Slot | Connection to the basic module (16-pin ribbon cable header) |
| 3– X2 | Connection terminal strip for the external floating contacts (for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0402.0 only |

## Terminal Assignment

**X1**: Connection of the operating voltage; terminals 1/2 and 3/4 are bridged internally

1– Operating voltage 230 V AC N
2– Operating voltage 230 V AC N
3– Operating voltage 230 V AC L
4– Operating voltage 230 V AC L

**X2**: Connection of the external floating contacts; terminals 1/4/7/9 are bridged internally and on the "+" potential of the sampling voltage

1– Sampling voltage SELV +
2– Input A connection of the external contact
3– Input B connection of the external contact
4– Sampling voltage SELV +
5– Input C connection of the external contact
6– Input D connection of the external contact
7– Sampling voltage SELV +
8– Input E connection of the external contact
9– Input F connection of the external contact
10– Sampling voltage SELV +
11– Input G connection of the external contact
12– Input H connection of the external contact

## Technical Data

| | | |
|---|---|---|
| Operating voltage | | 230 V AC +10% / -15%; 50/60 Hz |
| Connection to basic module | | Pluggable flat cable |
| **Inputs** | | |
| – Number | | Eight binary inputs (floating contacts) |
| – Voltage range | | 10…25 V DC SELV (load-dependent) |
| – Detection of "low" signal | | 0…5,5 V DC |
| – Detection of "high" signal | | > 9.5 V DC |
| – Contact detection | Open | > 70 kΩ |
| | Closed | < 300 Ω |
| Cable length | | Max. 100 m (distance between module and contact) |
| Connection type | | |
| – X1 (operating voltage) | | Screw clamp terminals |
| | | 0.14 to 4 mm², solid |
| | | 0.14 to 2.5 mm², stranded |
| | | 6.5 mm stripped in each case |
| – X2 (external contacts) | | Screw clamp terminals |
| | | 0,14…1,5 mm², solid |
| | | 0.14…1 mm², stranded |
| | | 5 mm stripped in each case |
| **Electrical safety** | | |
| Protection class | | None |
| Degree of protection | | IP00 |
| Degree of soiling | | 2 |
| Surge voltage category | | III |
| Rated insulation voltage | | 250 V |
| **Environmental conditions** | | |
| Field of application | | For fixed installation in interior and dry areas |
| Ambient temperature | | –5°C to +45°C (during operation) |
| Storage temperature | | –25°C to +70°C |
| Relative humidity | | 5% - 93% |
| Moisture condensation | | Not permitted |
| EMC requirements | | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | | |
| Housing material | | Plastic, halogen-free |
| Housing colour | | Black |
| Behaviour in fire | | V2 acc. to UL (housing) |
| Weight | | Approx. 145 g |
| Dimensions | | Refer to "Dimensions, Connections and Function Elements" |
| Approvals | | EIB/KNX-certified |
| CE certification | | In acc. with EMC Directive (residential and functional buildings); Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0402.0)

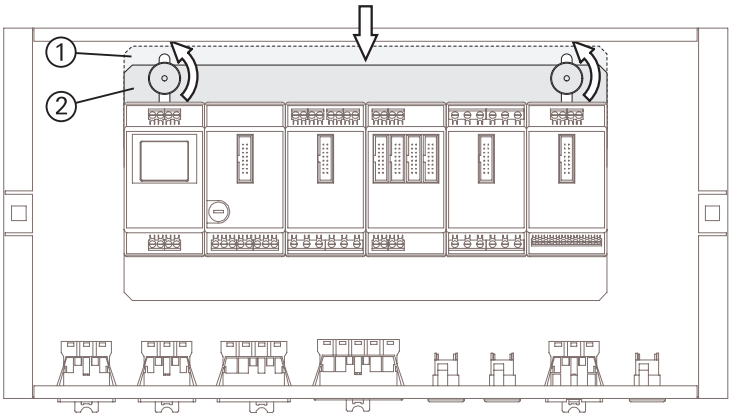
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0402.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0402.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).

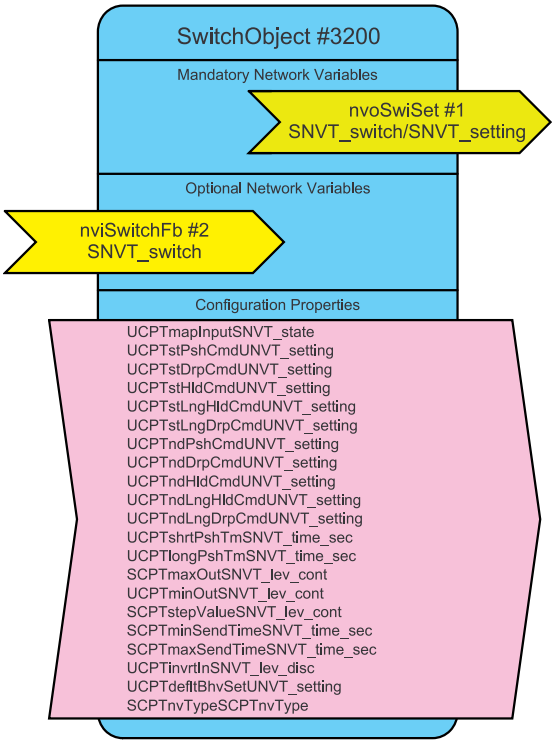



5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open). Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

The most important object parameters and variables can be set via the LNS plug-in. Certain special variables can only be parameterised using the LNS tool. The application program description indicates which variables can be set via which applications.

### SwitchObject



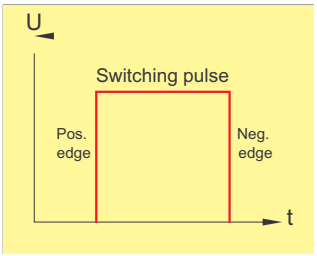

The input object is used to control lights and shutters and is always connected to at least one physical input. It has been kept flexible so that it can be used in a wide range of different application areas.

#### Input mode

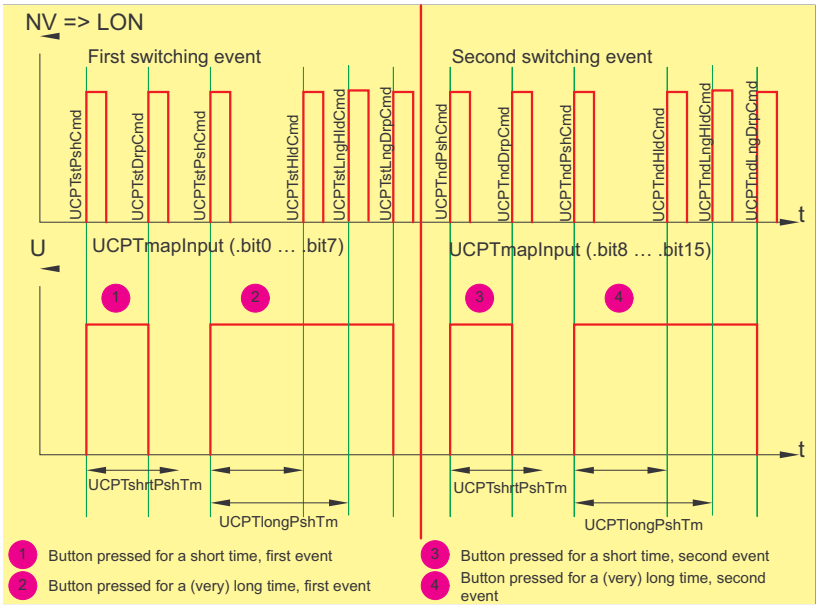
The inputs on extension module RM-8/0 (12) can be operated in one of six modes (please also refer to the figures below):

- **Single-face button input** (one rocker button) connected to one input in order to switch and/or dim lights, type used SNVT_switch; SNVT_setting optional
- **Double-face button input** (two rocker buttons) connected to two inputs in order to switch and/or dim lights, type used SNVT_switch; SNVT_setting optional
- **Edge evaluation,** i.e. single-face switch operation (one rocker switch) connected to one input, type used SNVT_switch; SNVT_setting optional
- **Double-face shutter button** (two rocker buttons) connected to two inputs, for UP/DOWN/STOP, type used SNVT_setting
- **Single-face scene button** (one rocker button) connected to one input (managed via the "ScenePanel" object, see graphic below), type used SNVT_scene
- **Single or double-face occupancy button** (one or two rocker buttons) connected to one or two inputs (managed via the "OccupancySensor" object (see below), type used SNVT_occupancy

The associated electronics must always be designed such that, when a contact closes, it results in a positive edge (LOW => HIGH threshold).




Definition of a switching event at the hardware input of an input object




Assignment of configuration parameters to the time response at the HW input

Parameterisation is performed by defining one or two different, alternating (one-button operation) telegram sequences. Each button press is specified by means of several events. Parameterisation is performed in a format similar to SNVT_setting, but with the addition of the "no action" or "no function" option.

| **UNVT_setting.function** | **SNVT_switch.state** | **SNVT_switch.value** |
|---|---|---|
| SET_NO_FUNC (-2/0xFE) | No change | No change |
| SET_NUL (-1/0xFF) | - 1/0xFF | UNVT_setting.setting |
| SET_OFF (0) | 0 | 0 |
| SET_ON(1) | 1 | SCPTmaxOut or nviSwitchFb.value |
| SET_DOWN (2) | 1 | Last sent value or nviSwitchFb.value - SCPTstepValue |
| SET_UP (3) | 1 | Last sent value or nviSwitchFb.value + SCPTstepValue |
| SET_STOP (4) | 1 | Last sent value or nviSwitchFb.value |
| SET_STATE (5) | 0/1 | UNVT_setting.setting |

UNVT_setting/SNVT_switch conversion table

Configuration parameter UCPTmapInput determines which of the eight digital inputs affect which input object on which button press/switching event.

There are two different types of operating element: single-face and double-face. In the case of a single-face operating element, one of the eight digital inputs generates both the first and second switching events, i.e. both events must be assigned to the same input in UCPTmapInput. The corresponding bit is set to "1".

By contrast, in double-face mode two digital inputs are used together, with one generating the first switching event and the other generating the second. The same telegrams are always generated at both associated input objects, so the first switching event must be assigned to the first input and the second switching event to the second input in UCPTmapInput accordingly.

The modes are explained in detail below.

- *"Single-face button input" mode (nvoSwiSet; nviSwitchFb optional)*

A button is connected to one of the eight digital inputs of extension module RM-8/0 (12). When it is pressed (positive edge), the associated input object alternately transmits an ON or OFF command, for example. Inverse switching is implemented with the help of the associated nviSwitchFb feedback network variable, i.e. if ON is present there, OFF is transmitted and vice versa. The standard output variable (in accordance with LonMark Profile #3200) is of the SNVT_switch type. As an option, nvoSwiSet can be changed to the SNVT_setting type, in accordance with the draft profile created by the "Wohnen mit LON" ("Living with LON") research group of LonMark Deutschland (formerly known as LNO).

The associated configuration parameters must be configured as follows for operation as a single-face, switching button input:

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTndPshCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face button, straightforward switching function

If a value other than ON (SET_ON, with .value = 100% and .state = 1) or OFF (SET_OFF, with .value = 0 and .state = 0) is to trigger a control response, .function must be set to SET_STATE. UCPTinvrtIn has to be re-parameterised in order to work with a normally closed contact.

In order to implement a dimming function, it must be possible to make a distinction between a short and a long button press. Two different time intervals are specified for each configuration parameter: UCPTshrtPshTm for short and long button presses and UCPTlongPshTm for long and very long button presses.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstDrpCmd | SET_ON | xxx | xxx |
| UCPTndDrpCmd | SET_OFF | xxx | xxx |
| UCPTstHldCmd | SET_UP | 100 % | xxx |
| UCPTndHldCmd | SET_DOWN | 100 % | xxx |
| UCPTstLngDrpCmd | SET_STOP | xxx | xxx |
| UCPTndLngDrpCmd | SET_STOP | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face button during dimming operation

For lighting control, SNVT_switch (in accordance with LonMark) or SNVT_setting can be used as the network variable type of nvoSwiSet. If the SNVT_switch type is used, a SET_UP or SET_DOWN command generates several telegrams that have different SCPTstepValue values irrespective of .setting and that are sent at the intervals specified in SCPTminSendTime until SCPTmaxOut or UCPTminOut is reached or a stop command is received. If the SNVT_setting type is used, each telegram is sent just once (in the example, short button press ON/OFF, long button press dim by 100% UP/DOWN or until stop).

The UCPTlongPshTm time interval can also be used for special applications for which longer times are defined. Switching operation using a single-face button can assume the following states:

– ON
– OFF
– Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoSwiSet output variable)
– Toggle (with feedback network variable)
– Button pressed for a short time: ON/OFF/enable
– Button pressed for a long time: ON/OFF/enable or no function

The following applies to dimming operation:

– Short button press: = Toggle (ON/OFF)
– Long button press: = "Toggle dimming", i.e. change dimming brightness

- *"Edge control" mode (nvoSwiSet only, no feedback)*

A single-face switch (one rocker switch) is connected to one of the eight digital inputs of extension module RM-8/0 (12). The switching event of a switch corresponds to that of a button that is pressed for a very long time. When it is pressed, the positive edge causes an ON telegram to be sent and when it is released (rocker function, negative edge) an OFF telegram is sent, both via the associated input object. As no distinction is required between a short and a long button press, UCPTshrtPshTm must be 0, i.e. deactivated. The remaining configuration parameters are configured as follows:

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTstLngDrpCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face switch, UCPTshrtPshTm irrelevant

In certain circumstances it may make sense to use UCPTstLngHldCmd too, thus triggering another event with a delay specified by UCPTlongPshTm.

As the second switching event is not needed here, the associated bits in UCPTmapInput (.bit8 to .bit15) are set to 0.
Switching operation using a single-face switch (edge control) can assume the following states for rising and falling edges:

– ON
– OFF
– Toggle
– Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoSwiSet output variable)
– No function

The following adjustable parameters are set via configuration parameters:

– Cyclical sending = SCPTmaxSendTime
– Setting of initial value = UCPTdefItBhvSet

- *"Double-face button input" mode (nvoSwiSet/nviSwitchFb)*

In double-face operation, two digital inputs are always used on the module. One generates the first switching event and the other generates the second. As each rocker button always has to generate the same telegram when pressed, the first event (.bit0 to .bit7 set to 1) must be permanently assigned to one button and the second event (.bit8 to .bit15 set to 1) to the other button via UCPTmapInput; in so doing, each of the two events is permanently assigned to a separate digital input on the module.

So, a double-face button input is a button module with two rocker buttons connected to two of the eight digital inputs of extension module RM-8/0 (12). If one rocker button is pressed, an ON command is sent via the associated output variable in the network; if the other rocker button is pressed, an OFF command is sent via the same associated output variable. The same configuration parameters apply to operation as a double-face button as for a single-face button.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTndPshCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for double-face button

Switching operation using a double-face button can assume the following states:

– ON
– OFF
– Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoSwiSet output variable)
– No function

The following applies to dimming operation:

– Short button press: = Toggle (ON/OFF)
– Long button press: = "Toggle dimming", i.e. change dimming brightness

The same configuration parameters and time intervals apply to dimming operation as for a single-face button.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstDrpCmd | SET_ON | xxx | xxx |
| UCPTndDrpCmd | SET_OFF | xxx | xxx |
| UCPTstHldCmd | SET_UP | 100 % | xxx |
| UCPTndHldCmd | SET_DOWN | 100 % | xxx |
| UCPTstLngHldCmd | SET_NO_FUNC | xxx | xxx |
| UCPTstLngDrpCmd | SET_STOP | xxx | xxx |
| UCPTndLngHldCmd | SET_NO_FUNC | xxx | xxx |
| UCPTndLngDrpCmd | SET_STOP | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for double-face button during dimming operation

- *"Double-face shutter button" mode (nvoSwiSet)*

A button module with two rocker buttons connected to two digital inputs of the extension module is used here too. The information provided above about the double-face button input also applies in this case. Both inputs are combined via the nvoSwiSet output variable (now of type SNVT_setting) for shutter control. Two different time intervals are specified for each configuration parameter here too: UCPTshrtPshTm for short and long button presses and UCPTlongPshTm for long and very long button presses.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_DOWN | INVALID (end angle) | xxx |
| UCPTndPshCmd | SET_UP | 100 % | xxx |
| UCPTstDrpCmd | SET_STOP | 0 % | xxx |
| UCPTndDrpCmd | SET_STOP | 0 % | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

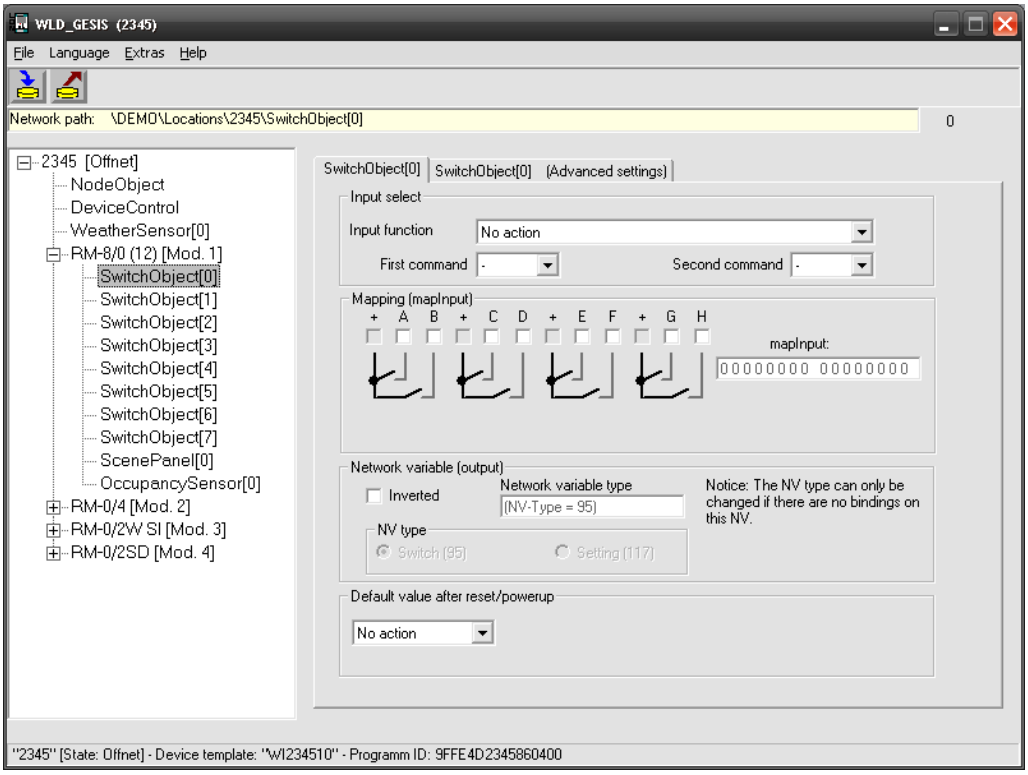
Configuration parameters for double-face shutter button

When the buttons are pressed for a short time, only the louvre is turned UP or DOWN. When the buttons are released after being pressed for a short time, the STOP command is issued. If a long button press is detected, the shutter moves to the TOP or BOTTOM limit position. All configuration parameters for the associated input can be freely configured.

- *"Single-face scene button" mode and "single or double-face occupancy button" mode*

Explanations of these modes can be found in the object descriptions (4.4.22 and 4.4.25).

### Object parameters (plug-in)




Switch – "Standard" tab

The most frequently used configuration values are parameterised in the Switch object's standard view.

Pre-defined input functionalities (button lighting, button shutter, etc.) can be selected here. Binary inputs are also assigned to software objects in this view. Furthermore, the network variable type of the nvoSwiSet output (SNVT_switch or SNVT_setting) can be defined here, as can sending behaviour following restoration of the supply voltage or a reset.

## Input selection

*Input function (affects all parameters of type UCPTxxxCmd)*

| | |
|---|---|
| Range of values | Button, single-face (switching); Button, double-face (switching); Button, double-face (dimming); Button, single-face (dimming); Button, double-face (shutter), with end angle; Button, double-face (shutter), without end angle; Switch, single-face (edge control); Set value |
| Default value | No action |
| Description | Pre-defined parameter values for controlling actuators via operating elements connected to the binary inputs can be specified using this selection list, in accordance with LonMark definitions.<br>Individual telegram values can be parameterised in the "Advanced Settings" view. |

*First command/Second command (affects all parameters of type UCPTxxxCmd)*

| | |
|---|---|
| Range of values | A to H |
| Default value | - |
| Description | In the case of functions with double-face operating elements, the ON and OFF switching functions can be assigned to the selected binary inputs here. |

*Mapping (UCPTmapInput)*

| | |
|---|---|
| Range of values | A to H, each ticked or not ticked |
| Default value | None ticked |
| Description | Binary inputs are assigned to software objects here. A maximum of 2 inputs can be allocated to a switch object.<br>The parameter settings resulting in UCPTmapInput are shown in the "mapInput" field. |

## Output

*Inverted (UCPTinvrtIn)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The parameterised output signal can be inverted here. |

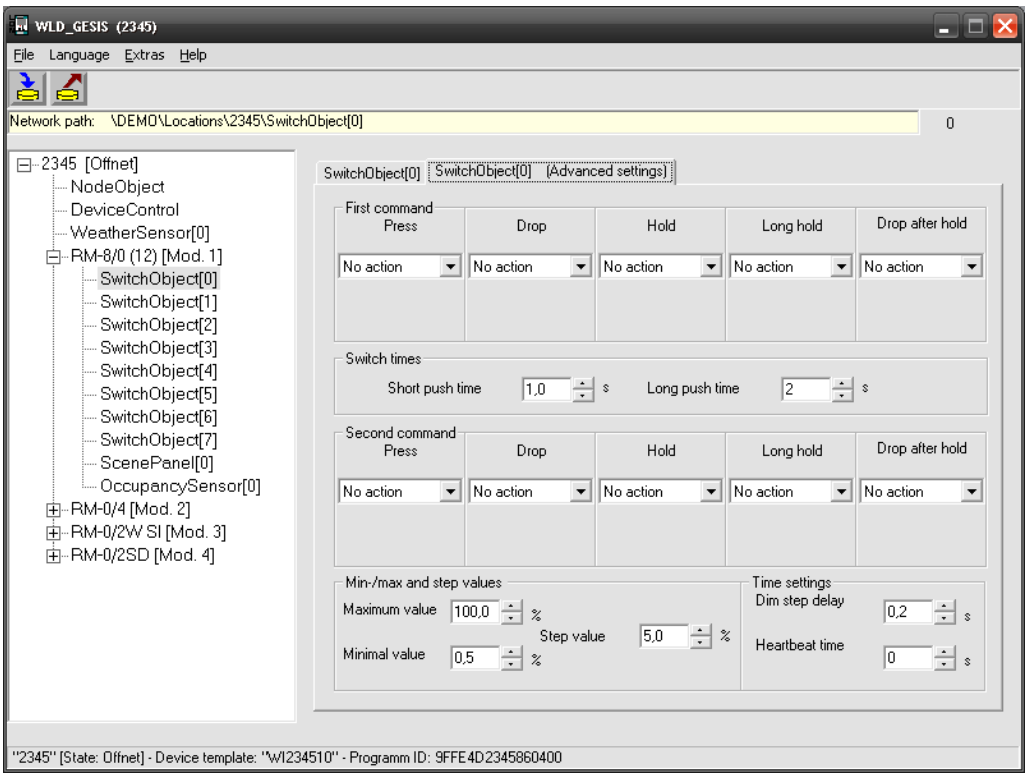
*NV type (SCPTnvType)*

| | |
|---|---|
| Range of values | Switch (95), Setting (117) |
| Default value | Switch (95) |
| Description | The network variable type of the output is dynamic. Here it can be set as Switch (standard for controlling lighting actuators, for example) or Setting (standard for controlling controllers or shutter actuators, for example).<br>Attention! In the case of connected network variables, the system will not allow the network variable type to be modified.<br>Attention! The plug-in must be exited before bindings can be created or deleted. |

*Default send value after reset/power-up (UCPTdefltBhvSet)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | The "start telegram" following a reset or power-up can be defined here. If "Value" is selected, the percentage and/or angle value can also be parameterised. In order to restrict the bus load when the supply voltage is restored, this setting only affects network variables that are also parameterised with a cyclical send interval (SCPTmaxSendTime). |

## Advanced object parameters (plug-in)




Switch – "Advanced" tab

The telegrams and the time responses used when evaluating the binary inputs can be individually set in the Switch object's advanced view. This serves to adapt the telegram sequence to specific requirements that may arise due to the actuators being controlled.

It is always assumed that each button press will trigger five consecutive event; each input can manage two different switching events (telegram sequences) alternately. This means that one button can be used to switch on and off (alternately), please also refer to page 4.4.6.

## First command

*Press (UCPTstPshCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is pressed for the first time (contact closes) in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Release (UCPTstDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released for the first time (contact opens) before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Hold (UCPTstHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held for the first time (contact remains closed) after the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Long hold (UCPTstLngHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held for the first time (contact remains closed) after the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Release after hold (UCPTstLngDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released for the first time (contact opens) after the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Short button press (UCPTshrtPshTm)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 1 s |
| Description | Distinguishes between a short and a long button press. Usually used to differentiate between switching (short) and dimming (long) commands or louvre step (short) and limit position (long) commands.<br>A value of 0 s deactivates this distinction. "Press" and "hold" will be sent immediately after one another. |

*Long button press (UCPTlongPshTm)*

| | |
|---|---|
| Range of values | 0 to 120 s, resolution 1 s |
| Default value | 2 s |
| Description | Distinguishes between a long and a very long button press. Usually used to evaluate switches or other sensors.<br>A value smaller than or equal to UCPTshrtPshTm deactivates this distinction. The commands "hold" and "long hold" will be sent immediately after one another. |

## Second command

*Press (UCPTndPshCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is pressed for the second time (contact closes) in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Release (UCPTndDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released for the second time (contact opens) before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Hold (UCPTndHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held for the second time (contact remains closed) after the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Long hold (UCPTndLngHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held for the second time (contact remains closed) after the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Release after hold (UCPTndLngDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released for the second time (contact opens) after the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*Maximum value (SCPTmaxOut)*

| | |
|---|---|
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 100,0% |
| Description | Defines the maximum output value when dimming via SNVT_switch or the absolute starting value. |

*Minimum value (UCPTminOut)*

| | |
|---|---|
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 0,5% |
| Description | Defines the minimum output value when dimming via SNVT_switch. |

*Step size (SCPTstepValue)*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 5,0% |
| Description | Defines the step size for an absolute dimming procedure. Each new dimming telegram causes it to become brighter or darker as per this particular value. |

*Dimming step delay (SCPTminSendTime)*

| | |
|---|---|
| Range of values | 0.1 to 6,553.4 s, resolution 0.1 s |
| Default value | 0.2 s |
| Description | Defines the minimum time interval between two telegrams at the output variable (telegram limit). It also implements a dimming step delay (time interval between absolute dimming telegrams). |

*Cyclical send interval (SCPTmaxSendTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

### Object parameters (LNS tool)

Network variables

*nvoSwiSet*

| | | |
|---|---|---|
| Type | Dynamic (SNVT_switch standard, SNVT_setting optional) | |
| Range of values (SNVT_switch) | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| | Enable | .state = -1 |
| Range of values (SNVT_setting) | .function | SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | 0.0%; 0 (SNVT_switch) | |
| Description | Output variable for controlling actuators or controllers | |

*nviSwitchFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status input variable for implementing inverse/cross switching or for accepting the actual dimming value | |

## Parameters

*UCPTmapInput*

| | |
|---|---|
| Type | SNVT_state |
| Range of values | .bit0 to .bit15 Each 0 or 1 |
| Default value | .bit0 to .bit15 = 0 |
| Description | Assigns hardware inputs to software objects and to the first or second switching event.<br>.bit0 First input (A), first switching event (UCPTstxxxCmd)<br>.bit1 Second input (B), first switching event (UCPTstxxxCmd)<br>.bit2 Third input (C), first switching event (UCPTstxxxCmd)<br>.bit3 Fourth input (D), first switching event (UCPTstxxxCmd)<br>.bit4 Fifth input (E), first switching event (UCPTstxxxCmd)<br>.bit5 Sixth input (F), first switching event (UCPTstxxxCmd)<br>.bit6 Seventh input (G), first switching event (UCPTstxxxCmd)<br>.bit7 Eighth input (H), first switching event (UCPTstxxxCmd)<br>.bit8 First input (A), second switching event (UCPTndxxxCmd)<br>.bit9 Second input (B), second switching event (UCPTndxxxCmd)<br>.bit10 Third input (C), second switching event (UCPTndxxxCmd)<br>.bit11 Fourth input (D), second switching event (UCPTndxxxCmd)<br>.bit12 Fifth input (E), second switching event (UCPTndxxxCmd)<br>.bit13 Sixth input (F), second switching event (UCPTndxxxCmd)<br>.bit14 Seventh input (G), second switching event (UCPTndxxxCmd)<br>.bit15 Eighth input (H), second switching event (UCPTndxxxCmd) |

*UCPstPshCmd*

| | |
|---|---|
| Type | UNVT_setting |
| Range of values | .function SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE<br>.setting 0.0 to 100.0%, resolution 0.5%<br>.rotation -180.00° to 80.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° |
| Description | Defines the command output when the button is pressed for the first time (contact closes) in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*UCPTstDrpCmd*

| | |
|---|---|
| Type | UNVT_setting |
| Range of values | .function SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE<br>.setting 0.0 to 100.0%, resolution 0.5%<br>.rotation -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° |
| Description | Defines the command output when the button is released for the first time (contact opens) before the time specified via UCPTshrtPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6 and possibly with the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). |

*UCPTstHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held for the first time (contact remains closed) after the time specified via UCPTshrtPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTstLngHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held for the first time (contact remains closed) after the time specified via UCPTlongPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTstLngDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is released for the first time (contact opens) after the time specified via UCPTshrtPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTndPshCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is pressed for the second time (contact closes) in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTndDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is released for the second time (contact opens) before the time specified via UCPTshrtPshTm has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. | |

*UCPTndHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held for the second time (contact remains closed) after the time specified via UCPTshrtPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTndLngHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held for the second time (contact remains closed) after the time specified via UCPTlongPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTndLngDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is released for the second time (contact opens) after the time specified via UCPTlongPshTm has elapsed, in accordance with the time response shown in the figure on page 4.4.6; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.4.6). | |

*UCPTshrtPshTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 1 s |
| Description | Distinguishes between a short and a long button press. Usually used to differentiate between switching (short) and dimming (long) commands or louvre step (short) and limit position (long) commands.<br>A value of 0 s deactivates this distinction. UCPTxxDrpCmd is not evaluated; UCPTxxPshCmd and UCPTxxHldCmd will be sent immediately after one another. |

*UCPTlongPshTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 120 s, resolution 1 s |
| Default value | 2 s |
| Description | Distinguishes between a long and a very long button press. Usually used to evaluate switches or other sensors.<br>A value smaller than or equal to UCPTshrtPshTm deactivates this distinction. UCPTxxhldCmd and UCPTxxlngHldCmd will be sent immediately after one another. |

*SCPTmaxOut*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 100,0% |
| Description | Defines the maximum output value when dimming or the absolute starting value. |

*UCPTminOut*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 0,5% |
| Description | Defines the minimum output value when dimming. |

*SCPTstepValue*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 5,0% |
| Description | Defines the step size for an absolute dimming procedure. Each new dimming telegram causes it to become brighter or darker as per this particular value. |

*SCPTminSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0.1 to 6553 s, resolution 0.1 s |
| Default value | 0.2 s |
| Description | Defines the minimum time interval between two telegrams at the output variable (telegram limit). It also implements a dimming step delay (time interval between absolute dimming telegrams). |

*SCPTmaxSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

*UCPTinvrtIn*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | The input's contact positions can be inverted via this parameter. The inversion will become active on the next edge change. | |
| | ST_OFF | The input is not inverted. When the contact closes, this triggers a logical "positive" edge. |
| | ST_ON | The input is inverted. When the contact closes, this triggers a logical "negative" edge. |

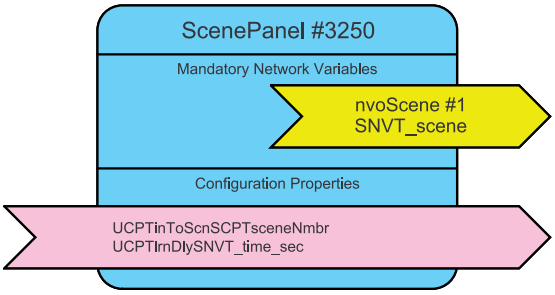
*UCPTdefltBhvSet*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. | |

*SCPTnvType*

| | |
|---|---|
| Type | SNVT_nv_Type |
| Range of values | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95,<br>NVT_CAT_STRUCT, 2 bytes, A=1, B=0, C=0<br>PID 0:0:0:0:0:0:0:0, Scope 0, Index 117,<br>NVT_CAT_STRUCT, 4 bytes, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95,<br>NVT_CAT_STRUCT, 2 bytes, A=0, B=0, C=0 |
| Description | Defines the SNVT type of the output variables. "..., Index 95, ..., 2 bytes, ..." means SNVT_switch (e.g. direct control of actuators) and "..., Index 117, ..., 4 bytes, ..." means SNVT_setting (e.g. control of shutter or controllers).<br>**Attention:**<br>Modifications can only be made if the output variables are not connected. |

## ScenePanel




The scene panel is used for digital inputs/operating elements that control particular scenes in terms of lighting or shutters. All inputs in the extension module can be used as a scene panel for setting/calling up scenes. When a contact closes (opens), a corresponding scene number is sent via nvoScene.

The nvoScene output variable only supports

- SC_NUL (-1/0xFF)
- SC_RECALL (0)
- SC_LEARN (1)

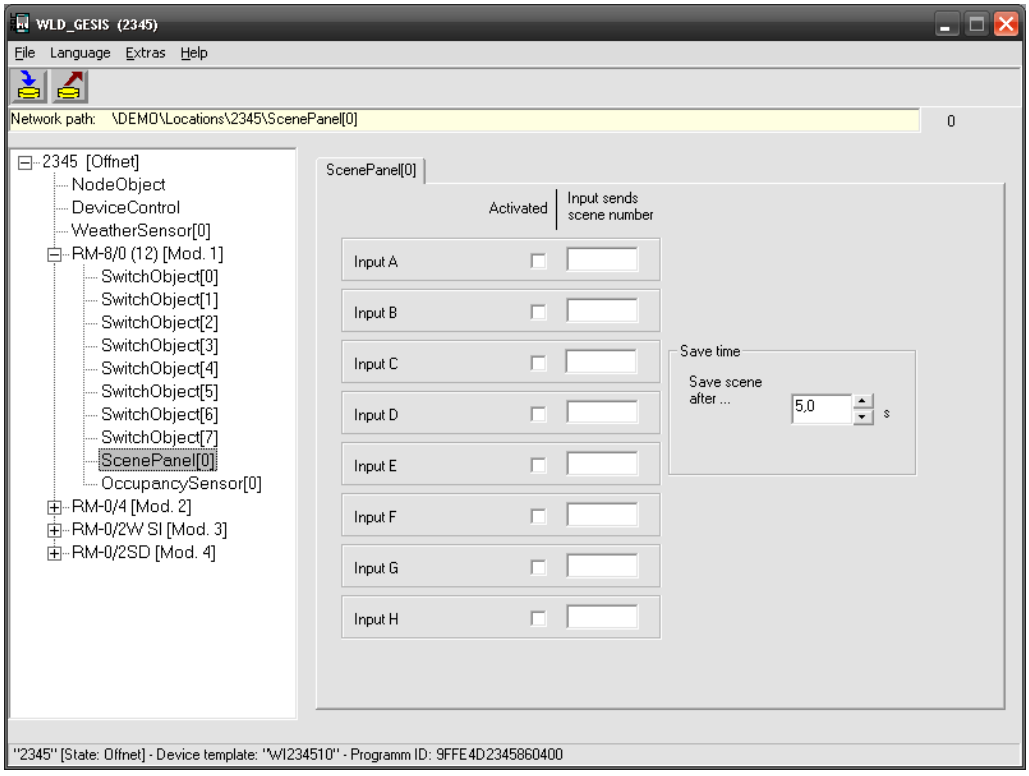
These are all values of the associated enumeration in the .function element. The range of scene number values in the .scene_number element runs from 0 to 255, where .function = SC_NUL and .scene_number = 0 are invalid values but also the default settings for the output variable.

A scene number can now be assigned to every input via UCPTinToScn; these scene numbers are sent to the network via nvoScene when the associated button/operating element is pressed. If a 0 (invalid value) is set at the corresponding location, no telegram is generated.

### Saving scenes

UCPTlrnDly is used to distinguish between a short and a long button press. A short button press calls a scene up via nvoScene (SC_RECALL), whilst a long button press activates the teach-in command (SC_LEARN), i.e. the corresponding manipulated variables are saved in the scene memory of the receiver (scene controller, for example) under the scene number that has been sent (.scene_number).

### Object parameters (plug-in)




ScenePanel – "Standard" tab

The scene function can be activated/deactivated for each binary input on an individual basis. The corresponding telegram is then sent in parallel with a command parameterised in the Switch object, if such a command has been parameterised.

The scene number to be sent and the delay time for a teach-in command are also specified here.

#### Channel A (input 1) to Channel H (input 8)

*Ticked*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | Activates/deactivates the scene functionality for the designated channel. |

*Input sends scene number (UCPTinToScn)*

| | |
|---|---|
| Range of values | 1 … 255 |
| Default value | 0 |
| Description | Assigns a scene number to be sent on a falling edge (contact opening) to the hardware inputs. |

*Save time (UCPTlrnDly)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 5.0 s |
| Description | Distinguishes between a short and a long button press. A short button press calls the specified scene number up (SC_RECALL), whilst a long button press saves the scene (SC_LEARN). |

## Object parameters (LNS tool)

### Network variables

*nvoScene*

| | | |
|---|---|---|
| Type | SNVT_scene | |
| Range of values | .function | SC_NUL, SC_RECALL, SC_LEARN |
| | .scene_number | 0…255 |
| Default value | SC_NUL; 0 | |
| Description | Output variable for controlling scene controllers or similar | |

### Parameters

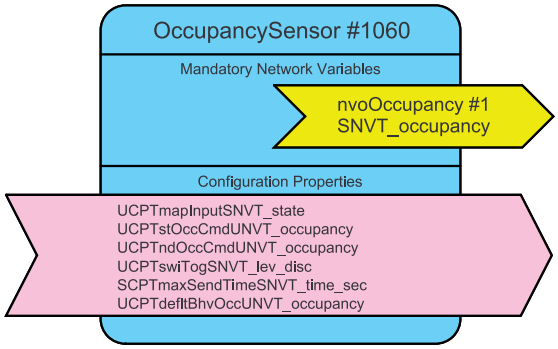
*UCPTinToScn (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | SCPTsceneNmbr |
| Range of values | 0…255 |
| Default value | 0 (deactivated) |
| Description | Assigns a scene number to be sent on a falling edge to the hardware inputs. |

*UCPTlrnDly*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 5.0 s |
| Description | Distinguishes between a short and a long button press. A short button press calls the specified scene number up (SC_RECALL), whilst a long button press saves the scene (SC_LEARN). |

## OccupancySensor




The occupancy sensor is used to control/manage conditions in accordance with the occupancy status of the room or building. All digital inputs on the extension module can be configured as single or double-face occupancy buttons. The rising and falling edges are evaluated in a similar way to how they are evaluated in the input object (Switch).

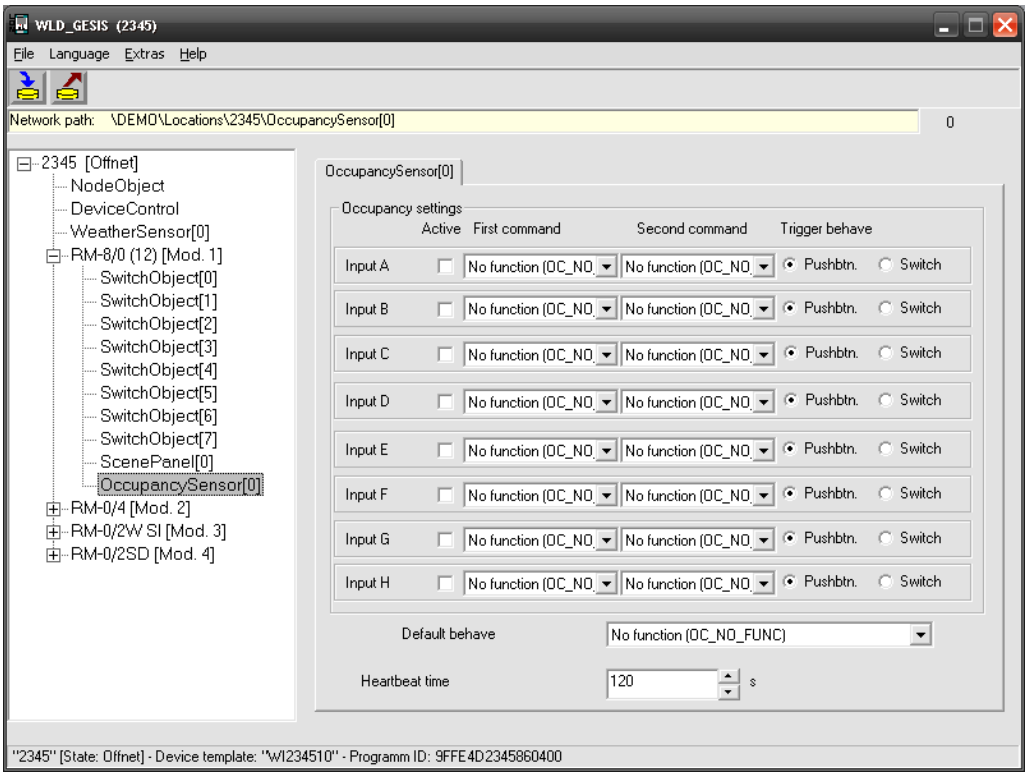
UNVT_occupancy, which is based on SNVT_occupancy but has an additional definition in the form of OC_NO_FUNC, has been introduced for some configuration parameters. This indicates that "no action" is to be executed.

| Value | Designation | Function |
|---|---|---|
| -2/0xFE | OC_NO_FUNC | No action/no telegram |
| -1/0xFF | OC_NUL | Invalid value/enable |
| 0 | OC_OCCUPIED | Occupied (comfort mode) |
| 1 | OC_UNOCCUPIED | Unoccupied (reduced mode) |
| 2 | OC_BYPASS | Temporarily occupied (temporary comfort mode, "party switching") |
| 3 | OC_STANDBY | Temporarily unoccupied (standby mode) |

UNVT_occupancy

If a single-face button is used as the occupancy button, the UCPTstOccCmd and UCPTndOccCmd parameters are used to configure what occupancy information will be sent via the nvoOccupancy output variable on each switching event, in a procedure that is similar to the one performed for the input object (Switch) that has been defined earlier. If the parameter is set to OC_NO_FUNC, no information is sent to the network.

### Object parameters (plug-in)




OccupancySensor – "Standard" tab

An occupancy function can be activated/deactivated for each binary input on an individual basis. The corresponding telegram is then sent in parallel with a command parameterised in the Switch object, if such a command has been parameterised. The commands to be sent and the connected operating hardware are also specified here.

#### Occupancy settings (Input A to Input H)

*Active (UCPTmapInput)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | Activates/deactivates the occupancy functionality for the designated channel. |

*First command (UCPTstOccCmd)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output when the button is pressed for the first time (contact closes) in accordance with the time response shown in the figure on page 1.3. |

*Second command (UCPTndOccCmd)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output when the button is pressed for the second time (contact closes) in accordance with the time response shown in the figure on page 1.3. |

*Tripping behaviour (UCPTswiTog)*

| | |
|---|---|
| Range of values | Button; Switch |
| Default value | Button |
| Description | Defines the connected operating unit as a button or a switch. With a button, only the positive (contact closing) edge is evaluated; with a switch, both the positive and negative (contact opening) edges are evaluated. |

*Start-up behaviour (UCPTdefltBhvOcc)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. |

*Cyclical send behaviour (SCPTmaxSendTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nvoOccupancy*

| | |
|---|---|
| Type | SNVT_occupancy |
| Range of values | OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NUL |
| Description | Output variable for occupancy-dependent control |

## Parameters

*UCPTmapInput*

| | | |
|---|---|---|
| Type | SNVT_state | |
| Range of values | .bit0 to .bit15 | Each 0 or 1 |
| Default value | .bit0 to .bit15 = 0 | |
| Description | Assigns hardware inputs to output variables and to the switching event. | |
| | .bit0 | First input (A), UCPTstOccCmd |
| | .bit1 | Second input (B), UCPTstOccCmd |
| | .bit2 | Third input (C), UCPTstOccCmd |
| | .bit3 | Fourth input (D), UCPTstOccCmd |
| | .bit4 | Fifth input (E), UCPTstOccCmd |
| | .bit5 | Sixth input (F), UCPTstOccCmd |
| | .bit6 | Seventh input (G), UCPTstOccCmd |
| | .bit7 | Eighth input (H), UCPTstOccCmd |
| | .bit8 | First input (A), UCPTndOccCmd |
| | .bit9 | Second input (B), UCPTndOccCmd |
| | .bit10 | Third input (C), UCPTndOccCmd |
| | .bit11 | Fourth input (D), UCPTndOccCmd |
| | .bit12 | Fifth input (E), UCPTndOccCmd |
| | .bit13 | Sixth input (F), UCPTndOccCmd |
| | .bit14 | Seventh input (G), UCPTndOccCmd |
| | .bit15 | Eighth input (H), UCPTndOccCmd |

*UCPTstOccCmd (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output when the button is pressed for the first time (contact closes) in accordance with the time response shown in the figure on page 1.3. |

*UCPTndOccCmd (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output when the button is pressed for the second time (contact closes) in accordance with the time response shown in the figure on page 1.3. |

*UCPTswiTog*

| | | |
|---|---|---|
| Type | UNVT_state_8 | |
| Range of values | .bit0 to .bit7 | Each 0 or 1 |
| Default value | .bit0 to .bit7 = 0 | |
| Description | Defines the connected operating unit as a button (0) or a switch (1). With a button, only the positive edge is evaluated; with a switch, both the positive and negative edges are evaluated. | |

*SCPTmaxSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 120.0 s |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

*UCPTdefltBhvOcc*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. |

# 4.5 gesis RM-0/4 (83.020.0403.0/1)

## Device Description


- Designation: Extension module with 4 switching actuators
- Type/model no.:
  - gesis RM-0/4 — 83.020.0403.0
  - gesis RM-0/4 B — 83.020.0403.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

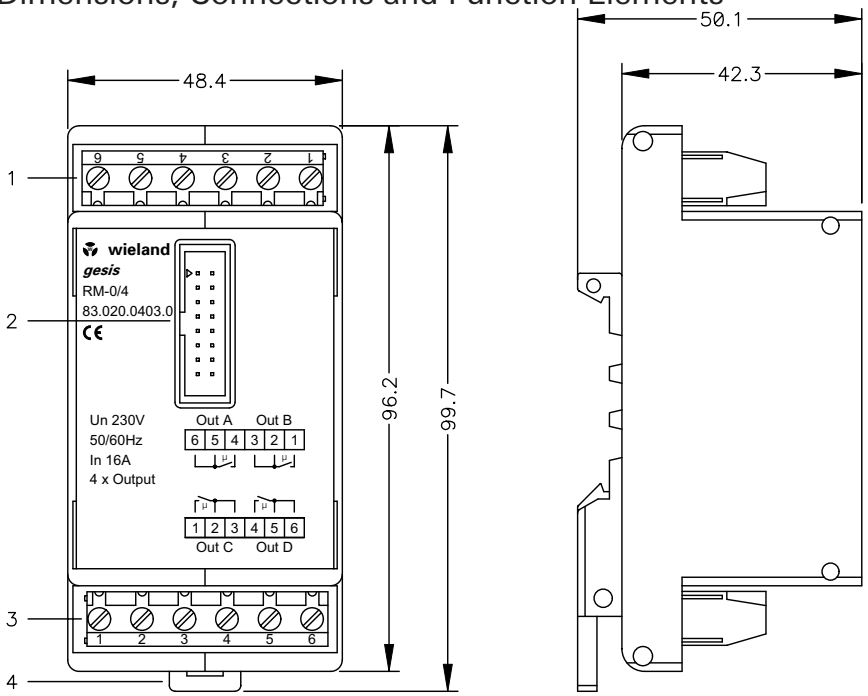
**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Function

The gesis RM-0/4 has four controllable and floating outputs that are separate from one another. They can be parameterised and controlled separately from one another. Communication with the bus takes place via the basic module. For this, switching commands are accepted and status values provided. The connection to the basic module is established using a flat cable that is provided as part of the scope of supply.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | 4-pin connection terminal strip for outputs A and B (for details please refer to "Terminal Assignment") |
| 2– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 3– X2 | 4-pin connection terminal strip for outputs C and D (for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0403.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the switching voltage, and connection of outputs A and B (terminals 2/3 and 5/6 are bridged internally)

1– Connection for output B
2– Connection/routing of the switching voltage for output B
3– Connection/routing of the switching voltage for output B
4– Connection for output A
5– Connection/routing of the switching voltage for output A
6– Connection/routing of the switching voltage for output A

**X2**: Connection and routing of the switching voltage, and connection of outputs C and D (terminals 2/3 and 5/6 are bridged internally)

1– Connection for output C
2– Connection/routing of the switching voltage for output C
3– Connection/routing of the switching voltage for output C
4– Connection for output D
5– Connection/routing of the switching voltage for output D
6– Connection/routing of the switching voltage for output D
7–

## Technical Data

| Connection to basic module | Pluggable flat cable |
|---|---|
| **Outputs** | |
| – Number | Four switching outputs (bistable relay, floating contacts) |
| – Rated voltage | 230 V AC, 50 to 60 Hz (per output) |
| – Rated current | 16 A (ohmic load) |
| – Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| | 400 V external conductor to external conductor |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material | Plastic, halogen and phosphorous-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 160 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| CE certification | In acc. with EMC Directive (residential and functional buildings), |
| | Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0403.0)

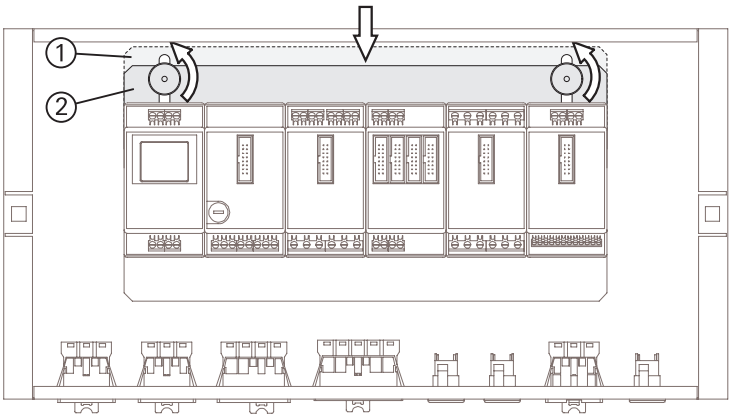
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0403.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0403.1)

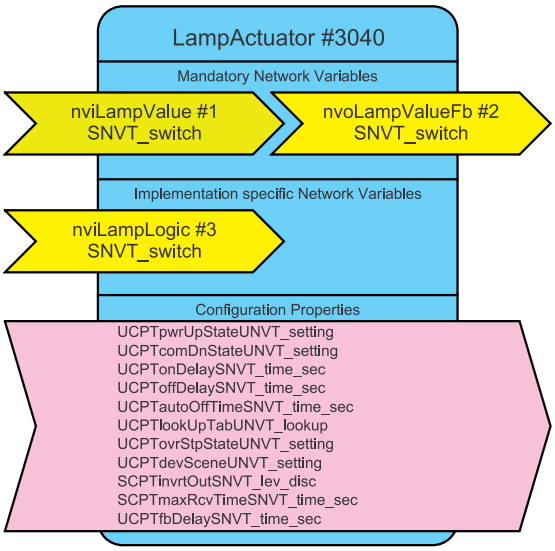
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips. .
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### LampActuator




The software application section assigned to the extension module contains a total of 4 LonMark objects based on a LampActuator in accordance with LonMark Profile #3040 (see figure), i.e. one such object is available for each channel.

#### Logic functions

The LampActuator is used to directly control lights or other electrical consumers in accordance with the relevant technical specifications (see below). It supports the prescribed functionality of LonMark Profile #3040 and also adds to it by providing the option of logic operations with nviLampLogic as the second input.

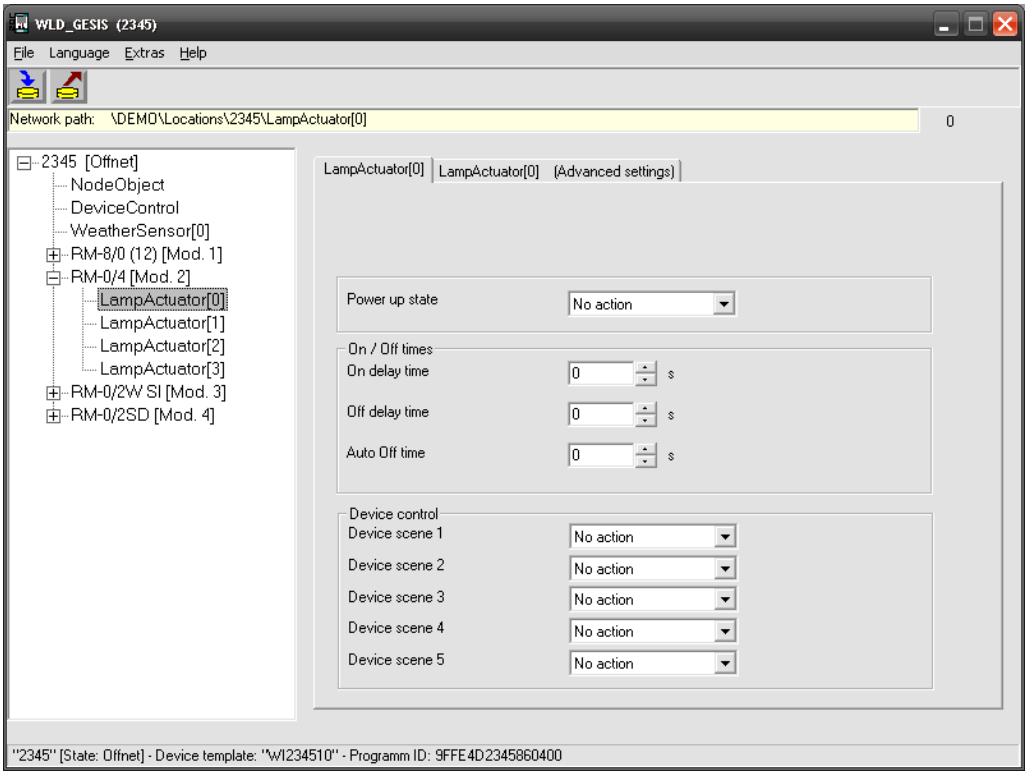
All types of logic operation, including multi-stage operations, are available via a reference table with two inputs and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviLampLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated CP. Prioritised control is now possible (override function).

#### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/`UCPToffDelay`), automatic switch-off (stairway light via `UCPTautoOffTime`) and feedback delays (`UCPTfbDelay` for `nvoLampValueFb`).

In addition, the output's response to particular situations can also be set (power-up or reset with `UCPTpwrUpState`, communication failure with `UCPTcomDnState`).

## Object parameters (plug-in)




LampActuator – "Standard" tab

The most frequently used configuration values are parameterised in the LampActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

### Parameters

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLampValue. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoLampValueFb status output is updated immediately, subject to the feedback delay. A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLampValue. Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoLampValueFb status output is updated immediately, subject to the feedback delay. A value of 0 s deactivates this delay. |

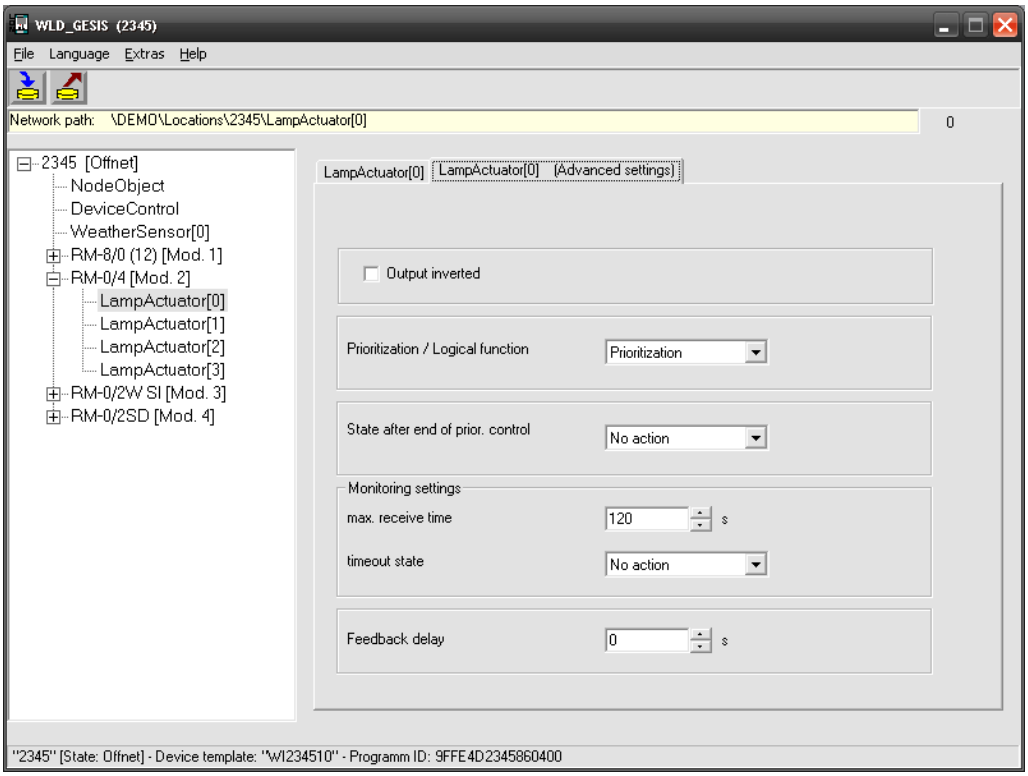
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised. The time is only evaluated if there are telegrams at nviLampValue. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviLampValue (usually a manual operation). The nvoLampValueFb status output is updated when the channel is deactivated, depending on the feedback delay. A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. |

### Advanced object parameters (plug-in)




LampActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the LampActuator object's advanced view.

The output can be inverted here. It is also possible to activate a prioritised control or a logic operation in this view. Furthermore, the time response of the feedback output and telegram monitoring at the network variable input can be specified here.

#### Parameters

*Invert output (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. The inversion will become active on the next control command. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviLampValue and nviLampLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs. |

*State at end of prioritised control (UCPTovrStpState)*

| | | |
|---|---|---|
| Range of values | OFF; ON; No action; Current value | |
| Default value | No action | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviLampLogic). | |
| | No action | No action is performed, the relay remains in its current position. |
| | Current value | The output is switched to the value present at nviLampValue. |
| | OFF | The output is deactivated (usually, the contact is opened). |
| | ON | The output is activated (usually, the contact is closed). |

### Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviLampValue or nviLampLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoLampValueFb.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviLampValue*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviLampLogic. | |

*nvoLampValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0; 100,0% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value = 100.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay. Following a restart, if no initialisation behaviour is defined (UCPTpwrUpState), an invalid value is output here until the first switching telegram is issued. | |

*nviLampLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0 % |
| | OFF | .state = 0 or .state = 1 and .value = 0.0 % |
| | Enable | .state = -1 |
| Default value | 0,0 %; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab). | |

## Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | . SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLampValue. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoLampValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLampValue. Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoLampValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTautoOffTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after a delay configured via UCPTonDelay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviLampValue. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised via UCPToffDelay, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviLampValue (usually a manual operation).<br>The nvoLampValueFb status output is updated when the channel is deactivated, depending on UCPTfbDelay.<br>A value of 0 s deactivates this function. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 | |
| Description | This parameter configures how the nviLampValue and nviLampLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviLampValue, the second (e.g. IN10) the value at nviLampLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviLampValue, 1 = nviLampLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input nviLampLogic has priority over input nviLampValue. If a valid value is present at nviLampLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviLampLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviLampValue.<br>In the event of control via nviLampValue, the time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviLampLogic). Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_NUL | The output is switched to the value present at nviLamp-Value. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |

*SCPTinvrtOut*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | The relay's contact positions can be inverted via this parameter. The inversion will become active on the next control command. | |
| | ST_OFF | The output is not inverted. A switch-on telegram closes the relay; a switch-off telegram opens it. |
| | ST_ON | The output works in an inverted manner. A switch-on telegram opens the relay; a switch-off telegram closes it. |

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviLampValue or nviLampLogic within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoLampValueFb.<br>A value of 0 s deactivates this function. |

# 4.6 gesis RM-0/2W SI (83.020.0404.0/1)

## Device Description

- Designation: Extension module with 2 shutter actuators (230 V AC)
- Type/model no.: gesis RM-0/2W SI 83.020.0404.0; gesis RM-0/2W SI B 83.020.0404.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Function

gesis RM-0/2W SI is an output module with floating relay outputs that are designed for 230 V switching. All of the corresponding configurations and software settings must be made via the basic module; the extension module does not have its own intelligence. The outputs can be controlled separately from one another. The consumers are connected by means of screw clamp terminals.

A shutter with louvres for controlling the amount of light that is let in can be used with the aid of shutter outputs. It is possible to move the shutter UP and DOWN or adjust the louvres. It is also possible to move the shutter and louvres into the required position by means of direct commands. Each adjustment is factored into the position (on an incremental or decremental basis), enabling the control system to recognise the positions of both the shutter and louvres at any time. Position commands that are received will be interpreted accordingly, and the new position will be calculated and approached immediately without the need to control a reference position.

Since deviations may arise over time when calculating the current position, the travel time (which is used to determine the position) is adjusted whenever either of the two limit switches is reached.

In the case of mechanical limit switches, scanning takes place automatically and the corresponding travel time is accepted on an individual basis by means of a reference movement following commissioning. In this case, only the louvre turning time needs to be calculated manually (using a stopwatch). As for the travel time itself, an extremely long default value is entered, which the module will then correct of its own accord using mechanical end switches at the first available opportunity (for example, when the user moves the shutter all the way down). A reference movement (for determining the travel time) can also be triggered by means of a special telegram.

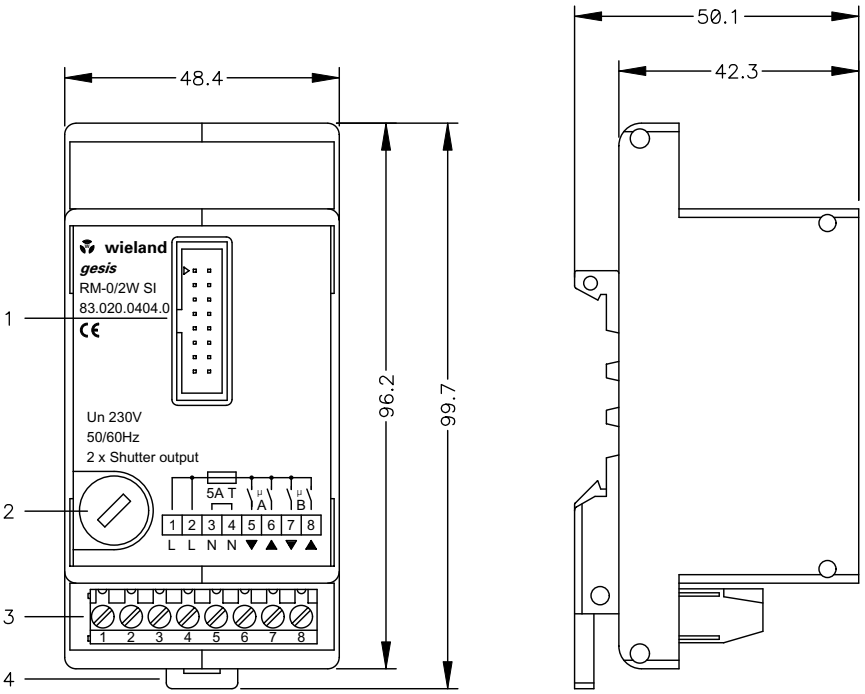
As a basic principle, a synchronisation procedure is initiated prior to the first travel command being triggered after a restart or recovery of the supply voltage. This means that,

following the first travel command, the shutter moves into the upper limit position before the required position is approached. The only exception to this is when a direct command is made for travelling to the lower limit position (with no position or angle specified): this is executed without a synchronisation procedure being initiated first.

In the case of electronic limit switches or shutters that move in parallel, the time for moving upwards or downwards must be measured using a stopwatch, and the controller informed of this by means of the application program or corresponding plug-in.

A centralised weather sensor object is implemented in the application for the purpose of processing weather information.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 2– Fine fuse | 5 A, slow-acting |
| 3– X1 | Terminal strip for the switching voltage and outputs A and B (for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0404.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the switching voltage, and connection of outputs A and B; terminals 1/2 and 3/4 are bridged internally

1– Connection/routing of L
2– Connection/routing of L
3– Connection/routing of N
4– Connection/routing of N
5– Connection for output A, down
6– Connection for output A, up
7– Connection for output B, down
8– Connection for output B, up

## Technical Data

| | |
|---|---|
| Basic module connection | Pluggable flat cable |
| **Outputs** | |
| – Number | Two, with reverse voltage detection, can be controlled separately |
| – Rated voltage (switching voltage) | 230 V AC, 50 to 60 Hz (the same for outputs) |
| – Rated current | 2,5 A (motor load $\cos\varphi \geq 0.95$) |
| – Connection type | Screw clamp terminals<br>0.14 to 4 mm², solid<br>0.14 to 2.5 mm², stranded<br>6.5 mm stripped in each case |
| – Device protection | Fine fuse, 5 A, slow-acting (internal, can be replaced)<br>Time/current characteristic<br>at 25°C ambient temperature:<br>x times $I_N$ — Tripping time<br>1,5 — > 1 h<br>2,1 — < 30 min.<br>4 — 150 ms to 5 s<br>10 — 20 ms to 100 ms |
| Permissible reverse voltage of connected motors | Max. 300 V AC, min. 140 V AC for automatic detection of shutter operating time |
| Operating time for drives | |
| – With reverse voltage | 50% with max. 10 min. cycle time |
| – Without reverse voltage | 100% |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material | Plastic, halogen and phosphorous-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 140 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| CE certification | In acc. with EMC Directive (residential and functional buildings);<br>Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0404.0)

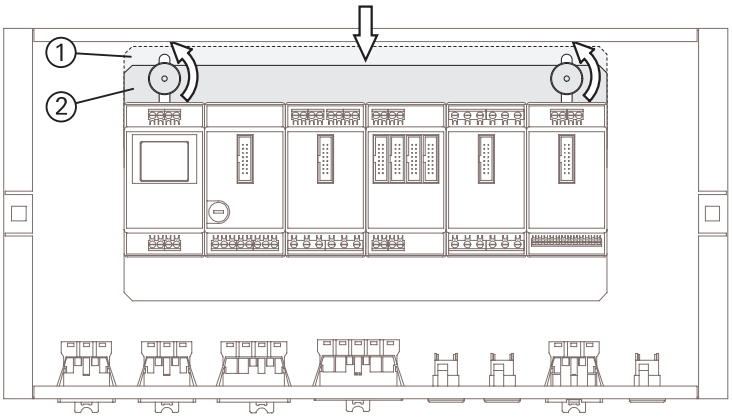
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the
   basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0404.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0404.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips. .
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).

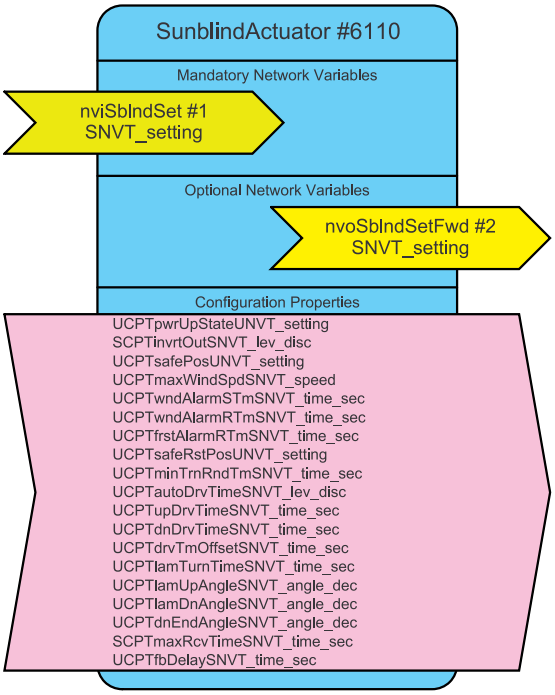



5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.

7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### SunblindActuator




This object is used to move (motor-driven) shutters to certain positions and, if present, to turn shutter louvres. The actuator receives its control commands from buttons, controllers or the building services management system. The current position of the shutter is reported to the building services management system, for example, for visualisation purposes via a feedback output network variable.

The shutter properties, which are defined via the associated configuration parameters, are used to calculate the shutter's current position and a new position is approached directly by means of a time-driven control system.

A shutter is controlled on two axes: in the direction of travel ("up" or "down") and by turning the louvres, if present. The input variable `nviSblndSet` provides all necessary information in this regard. `nviSblndSet`.setting specifies the height of the shutter as a percentage and `nviSblndSet.rotation` defines the angle of rotation of the louvres.

#### Control functions

`nviSblndSet.function = SET_STATE` is always used to control an absolute position. The command "`SET_STATE, 50.0%, 45°`" means that the shutter will be lowered halfway and the louvres will then be raised to open them at an angle of 45°.

`nviSblndSet.function = SET_UP/SET_DOWN` is always used to control a relative position. The command "`SET_DOWN, 50.0%, 45°`" means that the shutter will be lowered from its current position by a further 50% and the louvres will then be opened by an additional 45° from their current position. To reach the respective limit positions with relative control, `.setting = 100.0%` and `.rotation = 180°` must always be set.

In accordance with LonMark, the angle of rotation is negative when the shutter is lowered and positive when it is raised. The direction of travel can be reversed via `SCPTinvrtOut`.

If the shutter is controlled via a manual button, for `.function = SET_UP`, `.setting = 100.0%` and `.rotation = 180°` should be set and for `.function = SET_DOWN`, `.setting = 100.0%` and `.rotation = 180°`. This causes the shutter to move to the corresponding limit positions when the buttons are pressed for a long time.

A movement will be interrupted by travel commands relating to the opposite direction, as well as by `nviSblndSet.function = SET_STOP` and `.function = SET_OFF` (stop function). Every change to a movement causes `nvoSblndSetFwd` to be updated.

### Evaluation of "setting" commands

| .function | .setting | .rotation | Description | Shutter behaviour |
|---|---|---|---|---|
| | | | | |
| SET_OFF | --- | --- | Stop | Shutter stops. |
| SET_ON | --- | --- | --- | Not implemented. |
| SET_DOWN | Invalid (0xFF)/100% | Invalid (0x7FFF) | Move downwards | Shutter moves downwards, stopped by SET_STOP/SET_OFF/ limit position being reached, if a position for fanning out (UCPTdnEndAngle) has been parameterised, the value set here will be approached once the limit position has been reached; direct command for travelling to the lower limit position. |
| | 0,0% | -180°...180° Invalid (0x7FFF) | louvres turn on a relative basis | No change to position, turning only (current angle - .rotation), .rotation = 0° or invalid => no turning. |
| | 0,0...100,0% | -180°...180° Invalid (0x7FFF) | Shutter moves downwards on a relative basis, louvres turn on a relative basis | Shutter moves on a relative basis (current position + .setting, current angle - .rotation), .rotation = 0° or invalid => no turning (louvre is reset to previous angle once shutter has been moved). |
| SET_UP | Invalid (0xFF) | Invalid (0x7FFF) | Move upwards | Shutter moves upwards, stopped by SET_STOP/SET_OFF/limit position being reached. |
| | 0,0% | -180°...180° Invalid (0x7FFF) | louvres turn on a relative basis | No change to position, turning only, .rotation = 0° or invalid => no turning. |
| | 0,0...100,0% | -180°...180° Invalid (0x7FFF) | Shutter moves upwards on a relative basis, louvres turn on a relative basis | Shutter moves on a relative basis (current position - .setting, current angle + .rotation), .rotation = 0° or invalid => no turning (louvre is reset to previous angle once shutter has been moved). |
| SET_STOP | --- | --- | Stop | Shutter stops. |
| SET_STATE | 0,0...100,0% | Invalid (0x7FFF) | Shutter moves on an absolute basis | Shutter moves on an absolute basis to the .setting position (louvre is reset to previous angle once shutter has been moved). |
| | Invalid (0xFF) | 180°...-180° | Shutter turns on an absolute basis | Shutter turns on an absolute basis to the .rotation angle. |

| | | | | |
|---|---|---|---|---|
| | Invalid (0xFF) | Invalid (0x7FFF) | Reference movement | Triggers a reference movement, automatic detection of times for moving upwards and downwards. |
| | 0,0…100,0% | 180°…-180° | Shutter moves and turns on an absolute basis | Shutter moves on an absolute basis to the .setting position, turns on an absolute basis to the .rotation angle. |
| SET_NUL | --- | --- | Command is ignored | For enable, for example. |

### Positioning/Status display

Following a restart of the control system (restart or restoration of the supply voltage, for example), the actuator does not know the exact position of the shutter. For this reason, nvoSblnd`SetFwd.function = SET_NUL` (invalid). Even if `nviSblndSet.function = SET_DOWN` with a position specified, following a restart the shutter will still move to the upper limit position and then all the way down for the purposes of synchronisation. This also applies to `nviSblndSet.function = SET_STATE`.

### Priority levels

The alarm generation function of the associated configuration parameters for wind and risk of frost and for communication problems (`SCPTmaxRcvTime`) can now be used to differentiate between two different operating states in the actuator.

- Safety state/alarm (in the event of wind, frost or rain and problems with communication)
- Normal operation

In the highest-priority safety state, all control commands at nviSblndSet are ignored. This state is controlled via a time and value hysteresis in the event of alarms triggered by wind, frost or rain. Only alarms triggered by communication problems are not subject to time delays. If such a problem occurs, the alarm is activated immediately and the corresponding position in `UCPTsafePos` is adopted. When communication is restored, the corresponding alarm is cancelled straightaway and the actuator activates the position received via `nviSblndSet`. Time-controlled alarms are reset with `UCPTsafeRstPos`.

In addition, there is another alarm that is triggered by the weather data found at the weather sensor described on page 1.19. This alarm also features a communication monitoring function in the form of a receive heartbeat. If problems occur in this regard, the weather sensor has an internal function that ensures all the shutter actuators located in the extension module move to the preset safety position, as they would if they themselves experienced a communication problem.

### Specification of shutter data

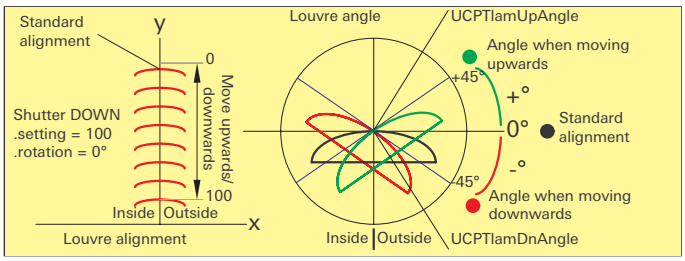
Wieland recommends you follow the procedure below to ensure efficient activation:

1. Set the maximum permissible travel time offset `UCPTdrvTmOffset` to 0 s; this will make it easier to control the movement of the shutter.
2. In the case of automatic travel time detection, first of all each of the limit positions is approached automatically one time in order to determine the corresponding parameters (using any travel command). Otherwise you must determine the travel times for "up" and "down", `UCPTupDrvTime` and `UCPTdnDrvTime`, manually.

3. Now set the louvre turning time `UCPTlamTurnTime` such that the shutter will come to rest when horizontal (angle of 0°) when the relevant command (e.g. `SET_STATE, 50.0%, 0°`) is received at `nviSblndSet`.
4. A test is then performed to check whether the shutter can turn its louvres horizontally when it is moving down from the upper limit position or up from the lower limit position. If it cannot do this, you must correct the deviating values for moving downwards via `UCPTlamDnAngle` or for moving upwards via `UCPTlamUpAngle`.
5. Set `UCPTlamDnAngle` or `UCPTlamUpAngle` such that louvre positions of ± 45° can be approached. In the actuator, the angles approached are determined solely by the travel time, i.e. the angles are directly proportional to the time. This can lead to inaccuracies, i.e. if the angles for moving upwards and downwards are different, it could be the case that only one of the two could be approached with accuracy. For certain shutters, you may also have to enter angles that are much greater than the positions that can actually be reached, particularly if the louvres are pressed against each other very tightly when in their limit position. If a high degree of pressing pressure such as this is present, it can take a little more time before the louvre will start to turn in the opposite direction. In the actuator this time is added to the turning time, even though all that happens is the guide bands are relieved of tension.
6. Finally, set a safety time value of, for example, 15% of the times set in `UCPTupDrvTime` or `UCPTdnDrvTime` in `UCPTdrvTmOffset`; this value is added to the standard travel time in `UCPTupDrvTime` and `UCPTdnDrvTime` to ensure that the shutter will reach its limit positions even after it has performed a number of movements.

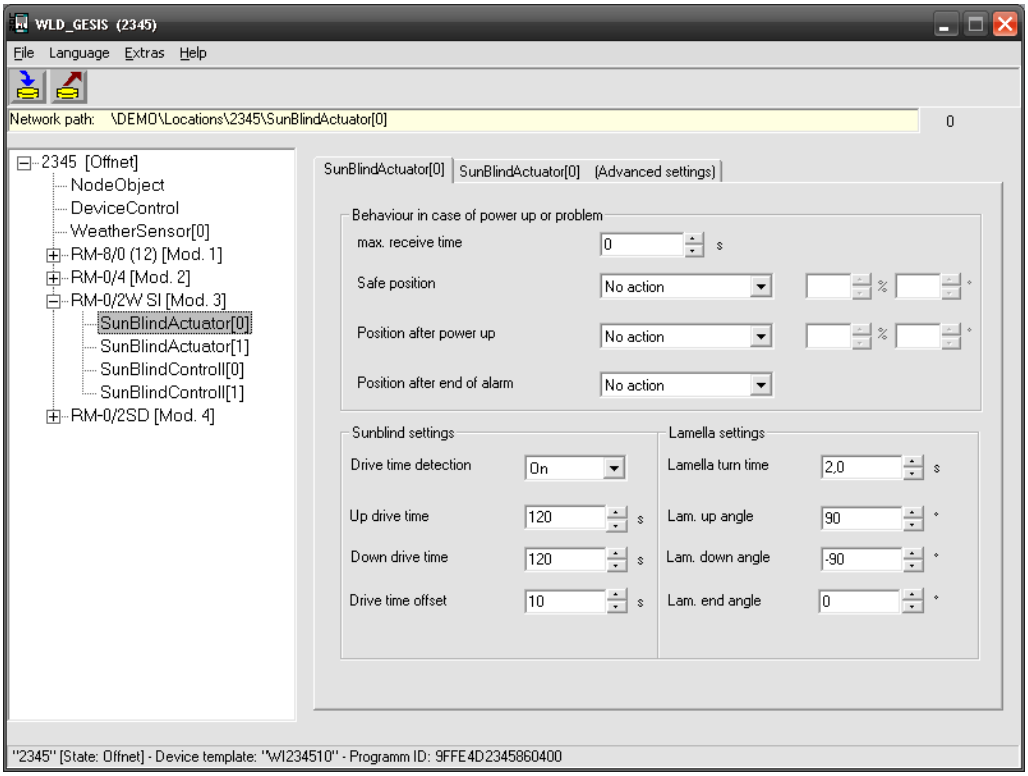
**NOTICE**

When the louvres turn, with some products this can alter the height of the shutter too, but by such a minimal amount that it does not have to be taken into account or corrected here.




Positions to which a standard shutter with louvres will move

## Object parameters (plug-in)




SunblindActuator – "Standard" tab

Basically, the parameter values that define the key mechanical and physical data of the shutter being controlled are set in the SunblindActuator object's standard view.

Travel times for moving upwards and downwards, louvre turning times and safety positions, etc. are specified here.

### Behaviour on switch-on and if a problem should occur

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviSblndSet within the time interval specified here, otherwise the shutter channel performs the action parameterised in "Safety position".<br>A value of 0 s deactivates this function. |

*Safety position (UCPTsafePos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the safety position of the associated actuator channel. This position is approached once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received or in the event of critical weather conditions (wind, frost, etc.). If the shutter is being moved at the time when the alarm is triggered, it is stopped before being moved to the required position.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the position of the shutter following restoration of the supply voltage.<br>A synchronisation procedure to the upper limit position is first initiated in order to synchronise the shutter with the actuator. The only exception to this is if the lower limit position is to be approached.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after alarm (UCPTsafeRstPos)*

| | |
|---|---|
| Range of values | No action; Previous position |
| Default value | No action |
| Description | The action to be taken once an alarm state has been deactivated can be defined via this parameter. |

## Shutter settings

*Autom. travel time detection (UCPTautoDrvTime)*

| | |
|---|---|
| Range of values | ON; OFF |
| Default value | ON |
| Description | Automatic travel time detection. This function determines the times for moving the shutter upwards and downwards automatically and, if significant deviations occur over time, repeatedly corrects them. For this to work, the drive must be directly connected to the shutter actuator channel and mechanical limit switches must be in place.<br>In all other cases (connection via a coupling relay/"shutter coupler", use of electronic limit switches, etc.), this function must be deactivated and the travel times determined manually. |

*Travel time upwards (UCPTupDrvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Up" travel time. If automatic travel time detection is deactivated, the time required to move all the way from the lower to the upper limit position is defined in this parameter. |

*Travel time downwards (UCPTdnDrvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Down" travel time. If automatic travel time detection is deactivated, the time required to move all the way from the upper to the lower limit position is defined in this parameter. |

*Travel time offset (UCPTdrvTmOffset)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 10 s |
| Description | For ensuring the limit position is reached. Defined top-up time that is added to the parameterised time when the shutter is moving to a limit position in order to ensure that this limit position is reached. |

## Louvre settings

*Louvre turning time (UCPTlamTurnTime)*

| | |
|---|---|
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 2,0 s |
| Description | Louvre turning time. Defines the time required for the louvres to turn fully. If roller blinds or other shutters that do not have louvres to adjust are used, a 0 must be parameterised here. |

*Louvre angle up (UCPTlamUpAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | 90° |
| Description | "Up" louvre angle. Defines the louvre angle when the shutter is being raised. |

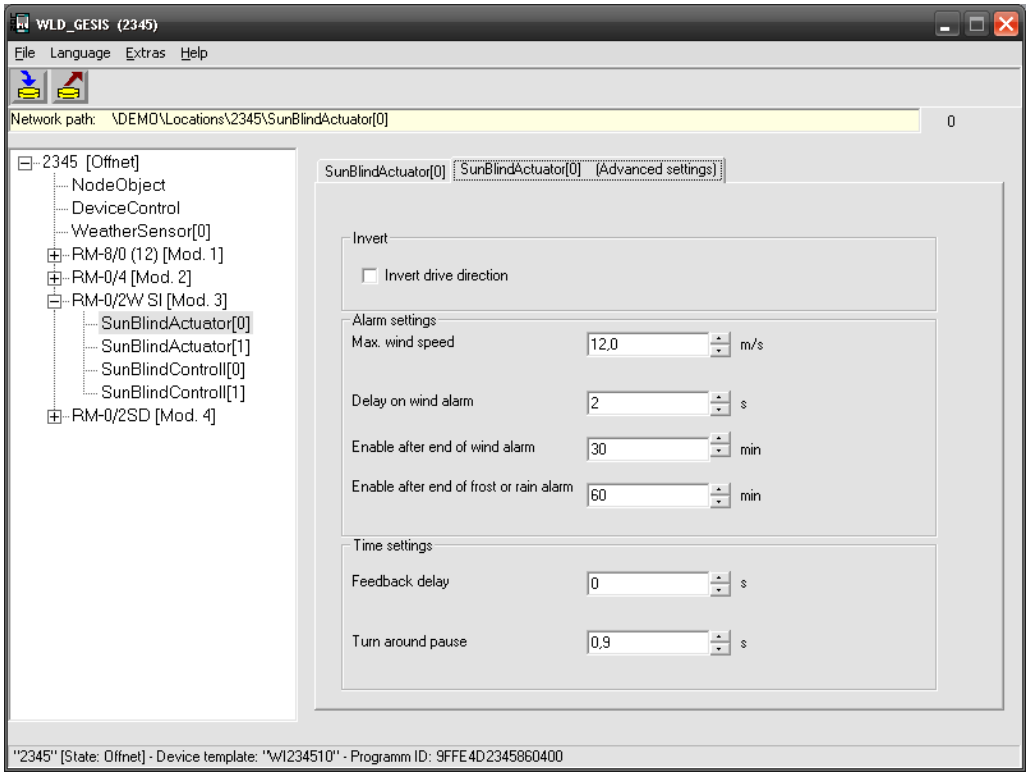
*Louvre angle down (UCPTlamDnAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | -90° |
| Description | "Down" louvre angle. Defines the louvre angle when the shutter is being lowered. |

*Louvre end angle down (UCPTdnEndAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | 0° |
| Description | Automatic fanning out. The angle specified here is set automatically when the lower limit position is reached by means of a relative travel command with .function = SET_DOWN, .setting = INVALID (0xFF), .rotation = INVALID (=0x7FFF), in order to prevent the room being plunged into complete darkness. |

## Advanced object parameters (plug-in)




SunblindActuator – "Advanced" tab

Safety functions and the behaviour of the status output are defined in the SunblindActuator object's advanced view.

### Inversion

*Inversion of direction of travel (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked; not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. |

### Alarm settings

*Max. permissible wind speed (UCPTmaxWindSpd)*

| | |
|---|---|
| Range of values | 0…6553,0 m/s, resolution 0.1 m/s |
| Default value | 12.0 m/s |
| Description | Maximum permissible wind speed for this actuator channel. If this value is exceeded, the shutter moves to the safety position and further operation is blocked.<br>This value features a parameterisable time hysteresis. |

*Delay for wind alarm (UCPTwndAlarmSTm)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 2 s |
| Description | Time hysteresis for activating a wind alarm. If a wind value that exceeds the defined upper limit is present at the weather sensor object during the time parameterised here, the wind alarm is activated and the action specified in "Safety position" is triggered.<br>Further operation is blocked. A value of 0 s deactivates this function. |

*Enable after wind alarm after (UCPTwndAlarmRTm)*

| | |
|---|---|
| Range of values | 0 to 1,023 min., resolution 1 min. |
| Default value | 30min. |
| Description | Time hysteresis for deactivating a wind alarm. If a wind value that falls below the defined upper limit is present at the weather sensor object during the time parameterised here, the wind alarm is deactivated and the action specified in "Position after alarm" is triggered.<br>Operation is enabled. A value of 0 s deactivates this function.<br><br>NOTICE:<br>If the wind value suddenly falls to 0 m/s after a wind alarm has been triggered, the alarm is not cancelled, as it must be assumed that a sensor has been damaged. |

*Enable after frost alarm after (UCPTfrstAlarmRTm)*

| | |
|---|---|
| Range of values | 0 to 1,023min., resolution 1 min. |
| Default value | 60min. |
| Description | Time hysteresis for deactivating a frost alarm or taking a drying time into account. If a temperature value that exceeds 3°C, but no rain, is present at the weather sensor object during the time parameterised here, the frost alarm is deactivated or it is assumed that the shutter is dry and the action specified in "Position after alarm" is triggered.<br>Operation is enabled. A value of 0 min. deactivates this function.<br>Notice: If only a rain sensor is to be connected (no temperature or frost sensor), the time set here is doubled, as a lower temperature, which would in turn require a longer drying time, must always be assumed. |

## Time settings

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoSblndSetFwd.<br>A value of 0 s deactivates this function. |

*Inhibit time for reversing the direction of rotation (UCPTminTrnRndTm)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 0.9 s |
| Description | Pause on reverse. Defines a minimum pause that must be observed in order to protect the drives when the direction of movement is changed. This value is determined by the drive's technical data (contact the manufacturer if necessary). |

## Object parameters (LNS tool)

### Network variables

*nviSblndSet*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_ |
| | .setting | STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -359.00° to 360.00°, resolution 0.02° |
| Default value | SET_NUL; 0.0%; 0.00° | |
| Description | Standard input variable for the associated shutter channel. The telegrams are evaluated in accordance with the table on page 1.4. | |

*nvoSblndSetFwd*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_DOWN, SET_UP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | UCPTlamDnAngle to UCPTlamUpAngle, resolution 1° |
| Default value | SET_NUL; 0.0%; 0 | |
| Description | Status output variable for the associated shutter channel. If the output channel is activated, only the current direction of movement is output. The current position is output once the shutter has stopped. Can be sent with a delay via UCPTfbDelay. | |

### Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_DOWN, SET_UP, SET_STATE, |
| | .setting | SET_STOP |
| | .rotation | 0.0 to 100.0 %, resolution 0.5 % |
| | | -359° to 360°, resolution 1° |
| Default value | SET_NO_FUNC; 0.0%; 0° | |
| Description | Defines the position of the shutter following restoration of the supply voltage. A synchronisation procedure to the upper limit position is first initiated in order to synchronise the shutter with the actuator. The only exception to this is if the lower limit position is to be approached. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |

*SCPTinvrtOut*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | The relay's contact positions can be inverted via this parameter. | |
| | ST_OFF | The output is not inverted. |
| | ST_ON | The output works in an inverted manner. An up telegram closes the down contact; a down telegram closes the up contact. |

*UCPTsafePos*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_DOWN, SET_UP, SET_STATE, |
| | .setting | SET_STOP |
| | .rotation | 0.0 to 100.0 %, resolution 0.5 % |
| | | -359° to 360°, resolution 1° |
| Default value | SET_NO_FUNC; 0.0%; 0° | |
| Description | Defines the safety position of the associated actuator channel. This position is approached once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received or in the event of critical weather conditions (wind, frost, etc.). If the shutter is being moved at the time when the alarm is triggered, it is stopped before being moved to the required position. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |

*UCPTmaxWindSpd*

| | |
|---|---|
| Type | SNVT_speed |
| Range of values | 0…6553,0 m/s, resolution 0.1 m/s |
| Default value | 12.0 m/s |
| Description | Maximum permissible wind speed for this actuator channel. If this value is exceeded, the shutter moves to the safety position and further operation is blocked.<br>This value features a parameterisable time hysteresis. |

*UCPTwndAlarmSTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 2 s |
| Description | Time hysteresis for activating a wind alarm. If a wind value that exceeds the upper limit defined in UCPTmaxWindSpd is present at the weather sensor object during the time parameterised here, the wind alarm is activated and the action specified in UCPTsafePos is triggered.<br>Further operation is blocked. A value of 0 s deactivates this function. |

*UCPTwndAlarmRTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0 to 1,023 min., resolution 1 min. |
| Default value | 30 min. |
| Description | Time hysteresis for deactivating a wind alarm. If a wind value that falls below the upper limit defined in UCPTmaxWindSpd is present at the weather sensor object during the time parameterised here, the wind alarm is deactivated and the action specified in UCPTsafeRstPos is triggered.<br>Operation is enabled. A value of 0 s deactivates this function.<br><br>NOTICE:<br>If the wind value suddenly falls to 0 m/s after a wind alarm has been triggered, the alarm is not cancelled, as it must be assumed that a sensor has been damaged. |

*UCPTfrstAlarmRTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0 to 1,023min., resolution 1 min. |
| Default value | 60 min. |
| Description | Time hysteresis for deactivating a frost alarm or taking a drying time into account. If a temperature value that exceeds 3°C, but no rain, is present at the weather sensor object during the time parameterised here, the frost alarm is deactivated or it is assumed that the shutter is dry and the action specified in UCPTsafeRstPos is triggered.<br>Operation is enabled. A value of 0 min. deactivates this function. |

*UCPTsafeRstPos*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF | |
| Description | The action to be taken once an alarm state has been deactivated can be defined via this parameter. | |
| | ST_ON | Approach previous position |
| | ST_OFF | No action |

*UCPTminTrnRndTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 0.9 s |
| Description | Pause on reverse. Defines a minimum pause that must be observed in order to protect the drives when the direction of movement is changed. This value is determined by the drive's technical data (contact the manufacturer if necessary). |

*UCPTautoDrvTime*

| | |
|---|---|
| Type | SNVT_lev_disc |
| Range of values | ST_OFF, ST_ON |
| Default value | ST_ON (activated) |
| Description | Automatic travel time detection. This function determines the times for moving the shutter upwards and downwards automatically and, if significant deviations occur over time, repeatedly corrects them. For this to work, the drive must be directly connected to the shutter actuator channel and mechanical limit switches must be in place.<br>In all other cases (connection via a coupling relay/"shutter coupler", use of electronic limit switches, etc.), this function must be deactivated and the travel times determined manually.<br>ST_ON — Automatic travel time detection activated<br>ST_OFF — Manual travel time detection for moving up and down (stopwatch) |

*UCPTupDrvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Up" travel time. If automatic travel time detection is deactivated, the time required to move all the way from the lower to the upper limit position is defined in this parameter. |

*UCPTdnDrvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Down" travel time. If automatic travel time detection is deactivated, the time required to move all the way from the upper to the lower limit position is defined in this parameter. |

*UCPTdrvTmOffset*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 10 s |
| Description | For ensuring the limit position is reached. Defined top-up time that is added to the parameterised time when the shutter is moving to a limit position in order to ensure that this limit position is reached. |

*UCPTlamTurnTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 2.0 s |
| Description | Louvre turning time. Defines the time required for the louvres to turn fully.<br>If roller blinds or other shutters that do not have louvres to adjust are used, a 0 must be parameterised here. |

*UCPTlamUpAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | 90° |
| Description | "Up" louvre angle. Defines the louvre angle when the shutter is being raised. |

*UCPTlamDnAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | -90° |
| Description | "Down" louvre angle. Defines the louvre angle when the shutter is being lowered. |

*UCPTdnEndAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | 0° |
| Description | Automatic fanning out. The angle specified here is set automatically when the lower limit position is reached by means of a relative travel command with .function = SET_DOWN, .setting = INVALID (0xFF), .rotation = INVALID (=0x7FFF), in order to prevent the room being plunged into complete darkness. |

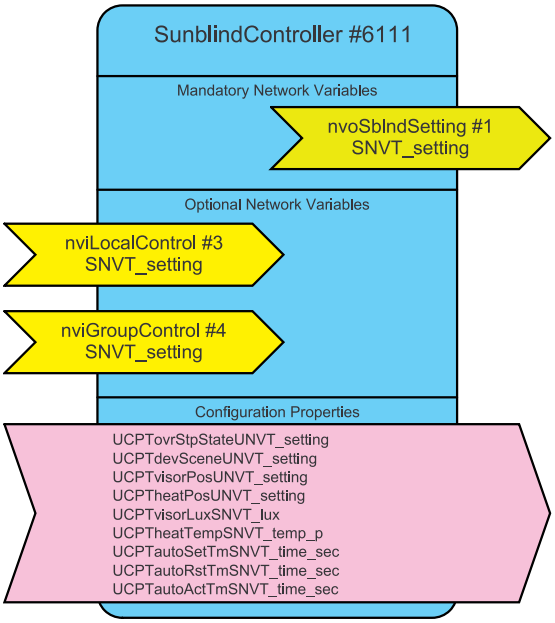
*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviSblndSet within the time interval specified here, otherwise the shutter channel performs the action parameterised in UCPTsafePos.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6553 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoSblndSetFwd.<br>A value of 0 s deactivates this function. |

## SunblindController




The shutter controller is usually used in conjunction with the associated shutter actuator to implement a wide range of different shutter control operations. In this way, priority control operations or those that depend on light or temperature can be performed.

The following priority levels, where "1" has the highest priority, are implemented together with the weather sensor object:

| | |
|---|---|
| 1. Alarms | For protecting the connected shutters |
| 2. Central/group control | For prioritised control by means of a building services management system or a group |
| 3. Manual control/scene call-up | By means of a button or a scene, for example |
| 4. Light/temperature control | By means of network variables at the weather sensor, which internally controls the function in the shutter controller |

If the controller is controlled via its prioritised input variable `nviGroupControl`, it ignores all control commands of a lower priority (levels 2 and 3) until an enable is executed at this input variable via `SET_NUL`.

If a situation that could have a critical effect on the shutter is detected in the weather sensor, it is dealt with in the shutter immediately. For this reason, all relevant limits such as those for wind speed are available in the actuator too. This prevents the protection mechanism being bypassed by an incorrect binding, for example, in the form of a shutter button that has been linked to the shutter actuator directly with no safety mechanism.

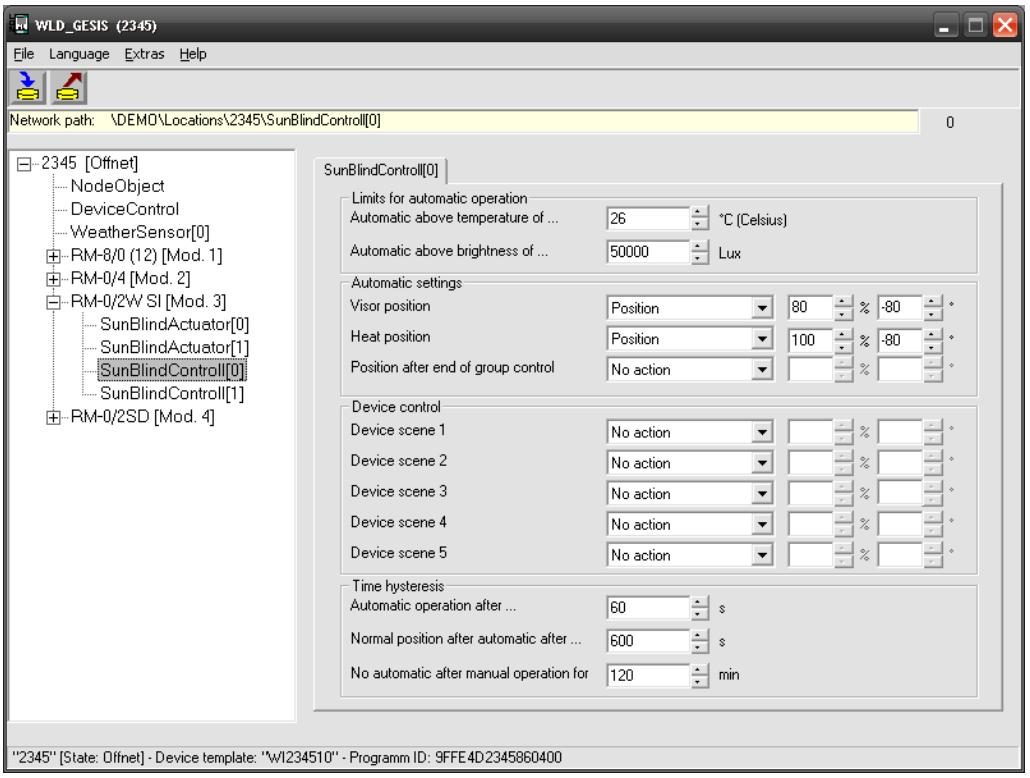
The current shutter position is controlled inside the shutter controller in accordance with the outdoor brightness (`UCPTvisorLux`) and temperature (`UCPTheatTemp`). If these limits are exceeded, the corresponding shutter position defined in `UCPTvisorPos` (anti-glare protection) or `UCPTheatPos` (overheating protection) is approached once the parameterisable time hysteresis (`UCPTautoSetTm`) has elapsed.

The hysteresis is provided so that the shutter will only move to the corresponding position after a fairly long period where the level of brightness or the outdoor temperature is too

high, thus ignoring temporary changes. A similar principle applies as regards the brightness and temperature limits being undershot.

Manual switching processes take priority; `nviLocalControl` commands take precedence over internal automatic light/temperature systems. Only once the time defined in `UCPTautoActTm` has elapsed does automatic control become active again. This ensures that the building cannot overheat at weekends, for example, or that the automatic anti-glare protection function provides the user with an appropriate level of comfort.

### Object parameters (plug-in)




SunblindController – "Standard" tab

Comfort functions relating to anti-glare protection and overheating protection, as well as their time responses, can be defined in the shutter controller. In addition, the response to calling up scenes can also be parameterised via the central DeviceControl object.

#### Limits for protection positions

*Automatic at temperatures above … (UCPTheatTemp)*

| | |
|---|---|
| Range of values | -40°C to 100°C, resolution 1°C |
| Default value | 26°C |
| Description | Parameterisable upper temperature limit for the automatic overheating protection function. In order for this function to be activated, the maximum outdoor brightness value (Automatic at brightness above …) must also be exceeded.<br>This value features a parameterisable time hysteresis. |

*Automatic at brightness above … (UCPTvisorLux)*

| | |
|---|---|
| Range of values | 0 to 65,534 lux, resolution 1 lux |
| Default value | 50,000 lux |
| Description | Parameterisable upper outdoor brightness limit for the automatic anti-glare protection function.<br>This value features a parameterisable time hysteresis. |

## Automatic settings

*Anti-glare protection position (UCPTvisorPos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | Position; 80.0%; -80° |
| Description | Defines the output's response to outdoor brightness values that exceed the upper limit specified for activating an anti-glare protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Heat protection position (UCPTheatPos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | Position; 100.0%; -80° |
| Description | Defines the output's response, when anti-glare protection is activated, to temperature values that exceed the upper limit specified for activating an overheating protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after nviGroupControl (UCPTovrStpState)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position; Automatic |
| Default value | No action |
| Description | Defines the output's response once prioritised control has been deactivated (via nviGroupControl). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields.<br>If "Automatic" is selected, the parameterised position will be approached if the comfort function is active. |

## Device control

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the response of the output when a scene telegram has been received at the central DeviceControl object. Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

### Time hysteresis

*Activate automatic after … (UCPTautoSetTm)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 60 s |
| Description | Time hysteresis for activating automatic anti-glare and overheating protection. If an outdoor brightness value or a temperature value that exceeds the defined upper limit is present at the weather sensor object during the time parameterised here and no manual operations have been performed, the action specified in the anti-glare protection or heat protection position is triggered. A value of 0 s deactivates this function. |

*Standard state following automatic after ... (UCPTautoRstTm)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 600 s |
| Description | Time hysteresis for deactivating automatic overheating protection. If a temperature value that falls below the defined upper limit is present at the weather sensor object during the time parameterised here, the position defined as the anti-glare protection position is approached. A value of 0 s deactivates this function. |

*With manual operation, no automatic for … (UCPTautoActTm)*

| | |
|---|---|
| Range of values | 0 to 1,023 min., resolution 1 min. |
| Default value | 120 min. |
| Description | Deactivation of automatic anti-glare and overheating protection. Following manual operation (via nviLocalControl), automatic control is deactivated for the period of time defined here. A value of 0 min. deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nvoSblndSetting*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_STOP, |
| | .setting | SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0° | |
| Description | Control output variable for linking to the corresponding shutter channels. | |

*nviLocalControl*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_OFF, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0° | |
| Description | Standard input variable for linking to button/scene control systems. | |

*nviGroupControl*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_ |
| | .setting | STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0° (enabled) | |
| Description | Prioritised input variable for linking to group control systems, a building services management system or a facility management system. To enable local control, .function = SET_NUL must be set here. | |

## Parameters

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NO_FUNC; 0.0%; 0° | |
| Description | Defines the output's response once prioritised control has been deactivated (via nviGroupControl). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NO_FUNC; 0.0%; 0° | |
| Description | Defines the response of the output when a scene telegram has been received at the central DeviceControl object. Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |

| | | |
|---|---|---|
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTvisorPos*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_STATE; 80.0%; -80° | |
| Description | Defines the output's response to outdoor brightness values that exceed the upper limit specified for activating an anti-glare protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTheatPos*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_STATE; 100.0%; -80° | |
| Description | Defines the output's response, when anti-glare protection is activated, to temperature values that exceed the upper limit specified for activating an overheating protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTvisorLux*

| | |
|---|---|
| Type | SNVT_lux |
| Range of values | 0 to 65,534 lux, resolution 1 lux |
| Default value | 50,000 lux |
| Description | Parameterisable upper outdoor brightness limit for the automatic anti-glare protection function.<br>This value features a parameterisable time hysteresis. |

*UCPTheatTemp*

| | |
|---|---|
| Type | SNVT_temp_p |
| Range of values | -40.00°C to 100.00°C, resolution 0.01°C |
| Default value | 26.00°C |
| Description | Parameterisable upper temperature limit for the automatic overheating protection function. In order for this function to be activated, the maximum outdoor brightness value (UCPTvisorLux) must also be exceeded.<br>This value features a parameterisable time hysteresis. |

*UCPTautoSetTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 60 s |
| Description | Time hysteresis for activating automatic anti-glare and overheating protection. If an outdoor brightness value or a temperature value that exceeds the upper limit defined in UCPTvisorLux or UCPTheatTemp is present at the weather sensor object during the time parameterised here and no manual operations have been performed, the action specified in UCPTvisorPos or UCPTheatPos is triggered.<br>A value of 0 s deactivates this function. |

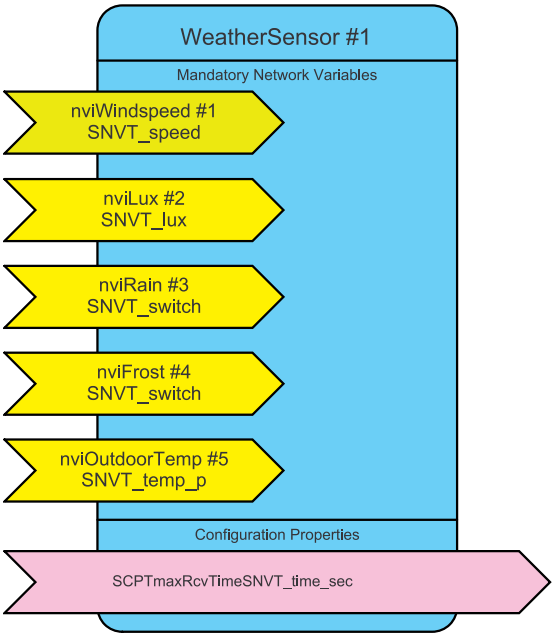
*UCPTautoRstTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 600 s |
| Description | Time hysteresis for deactivating automatic overheating protection. If a temperature value that falls below the upper limit defined in UCPTheatTemp is present at the weather sensor object during the time parameterised here, the position defined as UCPTvisorPos is approached.<br>A value of 0 s deactivates this function. |

*UCPTautoActTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0 to 1,023 min., resolution 1 min. |
| Default value | 120 min. |
| Description | Deactivation of automatic anti-glare and overheating protection. Following manual operation (via nviLocalControl), automatic control is deactivated for the period of time defined here.<br>A value of 0 min. deactivates all comfort functions. |

## WeatherSensor




Experience has shown that the majority of mistakes are made when binding the `nviSblndSet` input variable of the shutter actuator. For example, if you connect the output variable of a button to this input variable directly, you bypass the entire protection mechanism such as that relating to current weather data; this mechanism is anchored in the shutter controller according to LonMark Profiles #6110 and #6111 but, viewed logically, it should actually belong to the actuator. This is why the protection mechanism relating to weather data has been swapped out and implemented in a stand-alone object (weather sensor). Its data is processed internally and made available to the shutter actuators.

### Safety functions provided by the weather sensor

The weather sensor is designed to detect situations which could be dangerous for the shutter and to respond accordingly. In order to achieve this, processing is focussed on the most important weather data:

- Wind
- Rain
- Frost

The weather sensor also provides data relating to outdoor brightness and temperature, which helps to operate an automatic control system inside the shutter controller that executes anti-glare and overheating protection functions.

A receive heartbeat can be used to identify communication problems in both the shutter actuator and the weather sensor. If the cyclic telegram is not received from the corresponding input variable, the actuator moves to the safety position that has already been defined via `UCPTsafePos`.

If the shutter actuator is in an alarm state, it takes the highest priority; prioritised and standard control commands at the shutter controller (`nviLocalControl` and `nviGroupControl`) and at the shutter actuator (`nviSblndSet`) are ignored until the alarm is no longer active and the corresponding time `UCPTalarmRstTm` (does not apply to communication errors) has elapsed.

This concept does not exactly match the optional functions of LonMark Profiles #6110 and #6111, but it does have one advantage in the form of improved safety, and it also reduces the amount of binding work required.

### Wind protection

The current wind speed is monitored via the `nviWindspeed` input. If it exceeds the limit `UCPTmaxWindSpd`, which varies according to the type of shutter used, for the period `UCPTalarmSetTm`, an alarm is triggered and the shutter moves to the safety position defined in `UCPTsafePos`. If the current wind speed falls below `UCPTmaxWindSpd` for the period `UCPTalarmRstTm`, the alarm is cancelled and the actuator approaches the shutter position defined via `UCPTsafeRstPos`.

### Frost protection

This concept offers two mechanisms for protecting the shutter against frost and ice. The first option is to use a special ice/frost sensor, which is connected to the nviFrost input variable at the weather sensor.

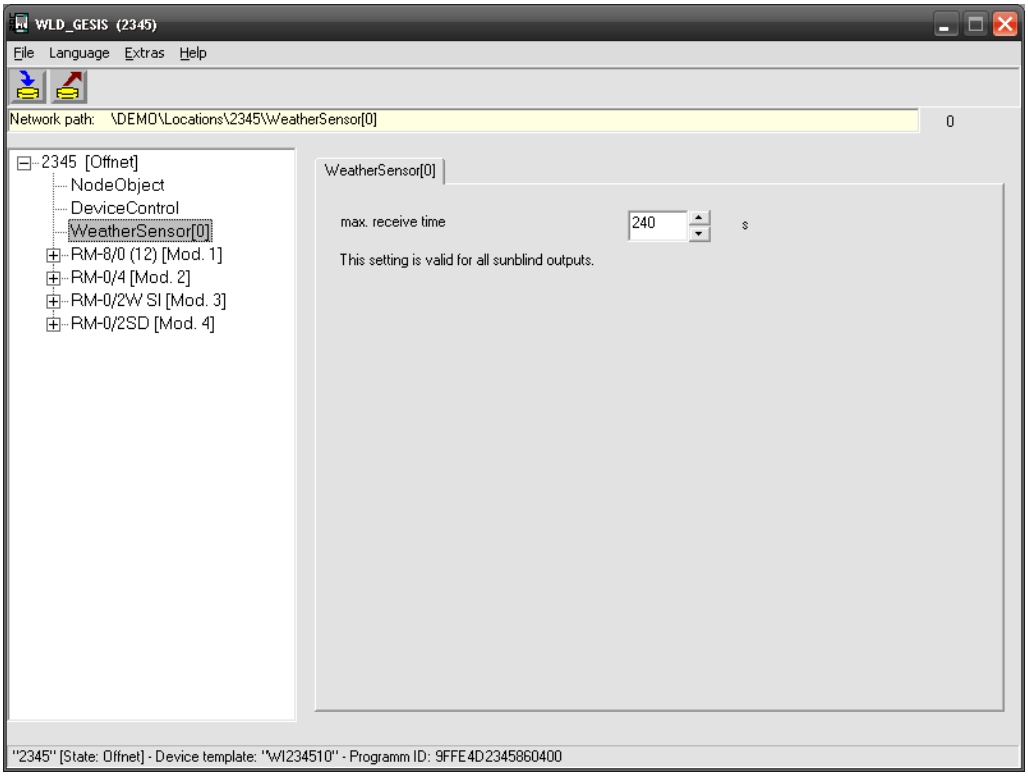
Alternatively, the sensor can be moved to the safety position directly via the `nviRain` input variable (rainfall sensor). If no ice/frost sensor or rainfall sensor is connected, it is also possible to generate a corresponding alarm via `nviOutdoorTemp`.

The internal decision on whether or not there is a risk of frost is made as described below. If the rain sensor reports rainfall, the shutter is not considered to be dry again until the rain has stopped and the time in `UCPTfrstRstTm` has elapsed. If the outdoor temperature drops below the frost point (this value is permanently set to 3°C, as is standard in the automotive industry, for example) when the shutter is wet, a frost alarm is triggered and `UCPTsafePos` is approached. The frost alarm will be cancelled once the temperature has been above the fixed limit for longer than the time set in `UCPTfrstRstTm`.

If no rain sensor is present (not installed or not connected), the shutter is always considered to be "wet", i.e. the frost alarm is always triggered whenever the fixed outdoor temperature limit is undershot.

The shutter always moves to the safety position when wet, unless no rain sensor is connected, in which case the shutter will move to the safety position if frost has formed.

## Object parameters (plug-in)




Weather sensor

Only the time monitoring value for receive telegrams needs to be specified for the weather sensor.

### Parameters

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 240 s |
| Description | A telegram must be received at the connected input variable within the time interval specified here, otherwise an alarm situation will be triggered in the shutter actuator.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviWindspeed*

| | |
|---|---|
| Type | SNVT_speed |
| Range of values | 0 to 6,553.4 m/s, resolution 0.1 m/s |
| Default value | 6,553.5 m/s (invalid value) |
| Description | Input variable for accepting the current wind value from a weather station, for example. |

*nviLux*

| | |
|---|---|
| Type | SNVT_lux |
| Range of values | 0 to 65,534 lux, resolution 1 lux |
| Default value | 65,535 lux (invalid value) |
| Description | Input variable for accepting the current outdoor brightness value from a weather station, for example. |

*nviRain*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | 0, 1 |
| | ON | .state = 1 or .value > 0.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0.0%; -1 (invalid value) | |
| Description | Input variable for accepting the current rain value from a weather station, for example. | |

*nviFrost*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | 0, 1 |
| | ON | .state = 1 or .value > 0.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0 %; -1 | |
| Description | Input variable for accepting the current frost value from a weather station, for example. | |

*nviOutdoorTemp*

| | |
|---|---|
| Type | SNVT_temp_p |
| Range of values | -40.00°C to 100.00°C, resolution 0.01°C |
| Default value | 327.67°C (invalid value) |
| Description | Input variable for accepting the current outdoor temperature value from a weather station, for example. |

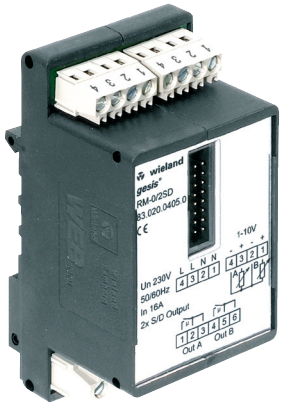
## Parameters

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 240 s |
| Description | A telegram must be received at the connected input variable within the time interval specified here, otherwise an alarm situation will be triggered in the shutter actuator.<br>A value of 0 s deactivates this function. |

# 4.7 gesis RM-0/2SD (83.020.0405.0/1)

## Device Description




- Designation — Extension module with 2 switching/dimming actuators
- Type/model no. — gesis RM-0/2SD 83.020.0405.0; gesis RM-0/2SD B 83.020.0405.1
- Device type — Extension module
- Design type — Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

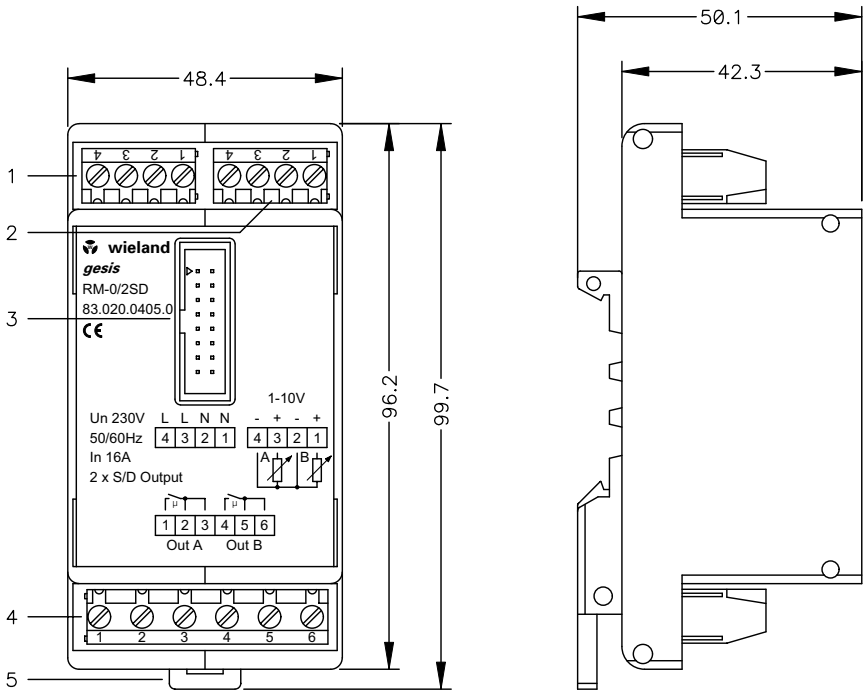
Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Functional Description

The gesis RM-0/2SD is a module with 2 switching/dimming outputs. It can switch two relays that are independent from one another and operate two assigned 1 to 10 V control outputs. The extension module receives the switching/dimming commands from the basic module, and the possible status messages of the outputs are sent by the basic module to the bus. The floating contacts of the relay are designed for 230 V/16 A and can be wired using separate external conductors (which can also be of different types).

The control outputs are used to control lighting applications with a 1 to 10 V control input (such as dimmable electronic ballasts). The consumers are connected by means of screw clamp terminals. Different functions can be assigned to the outputs by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for every pair of outputs.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | Connection of the operating voltage |
| 2– X2 | 1 to 10 V terminal strip for outputs A and B (for details please refer to "Terminal Assignment") |
| 3– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 4– X3 | Connection of switching outputs A and B |
| 5– Locking slide | With 83.020.0405.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the operating voltage; terminals 1/2 and 3/4 are bridged internally

1– Connection/routing of N
2– Connection/routing of N
3– Connection/routing of L
4– Connection/routing of L

**X2**: Connection of control outputs A and B; terminals 2/4 are bridged internally

1– +1-10V, output B
2– –1-10V, output B
3– +1-10V, output A
4– –1-10V, output A

**X3**: Connection of switching outputs A and B; terminals 2/3 and 5/6 are bridged internally

1– Output A
2– Connection/routing of switching voltage A
3– Connection/routing of switching voltage A
4– Output B
5– Connection/routing of switching voltage B
6– Connection/routing of switching voltage B

## Technical Data

| | |
|---|---|
| Operating voltage | 230 V AC +10% / –15%, 50 to 60 Hz |
| Connection to basic module | Pluggable flat cable |
| **Switching outputs** | |
| Number | Two bistable relays, floating contacts, can be controlled separately |
| Rated voltage | 230 V AC, 50 to 60 Hz |
| Rated current | 16 A (ohmic load) |
| Switching capacity | 25 x electronic ballasts, dynamic, for 18 W fluorescent lamps |
| | 17 x electronic ballasts, dynamic, for 36 W fluorescent lamps |
| | 15 x electronic ballasts, dynamic, for 58 W fluorescent lamps |
| **Control outputs** | |
| Number | Two |
| Rated voltage | 1-10 V, passive, adjusted for dynamic electronic ballasts |
| Rated current | 50 mA |
| Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| | 400 V external conductor to external conductor |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material | Plastic, halogen and phosphorous-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 180 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| CE certification | In acc. with EMC Directive (residential and functional buildings); |
| | Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0405.0)

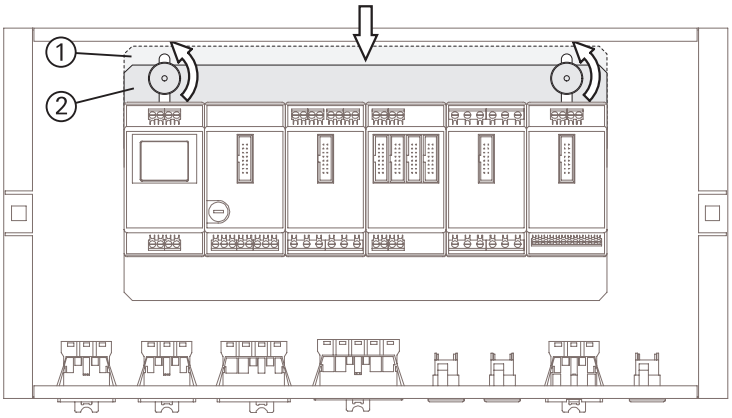
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0405.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0405.1)

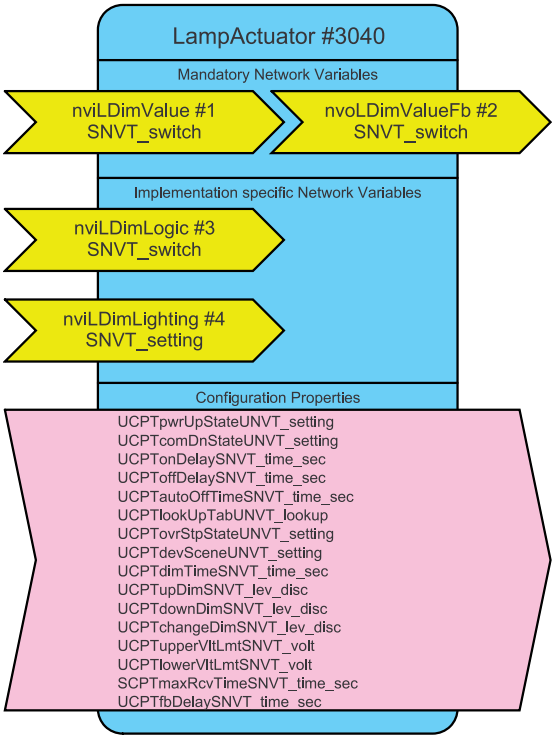
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips. .
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### LampActuator




The software application section assigned to the extension module contains a total of 2 LonMark objects based on a LampActuator in accordance with LonMark Profile #3040 (see figure above), i.e. one such object is available for each channel.

#### Relative control

In addition to the functions stipulated here, the extension module also features another input for relative control (`nviLDimLighting`). This input can be used to control lights in accordance with the specifications of the "Wohnen mit LON" ("Living with LON") research group of LonMark Deutschland e.V.

#### Logic functions

The LampActuator directly controls dimmable lights with a 1 to 10 V control input. It supports the prescribed functionality of LonMark Profile #3040 and also adds to it by providing the option of logic operations with `nviLDimLogic` as an additional input.

All types of logic operation, including multi-stage operations, are available via a reference table with two inputs (`nviLDimValue` and `nviLDimLighting` are evaluated next to one another as equivalent inputs, as only one of the two is usually used) and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviLDimLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated configuration parameters. Prioritised control is now possible (override function).

The four highest bits (.bit7 to .bit4) are used to specify the source of the percentage dimming values. This means that the reference table can not only be used for digital operations, but also for a type of "logic operation" between dimming values.

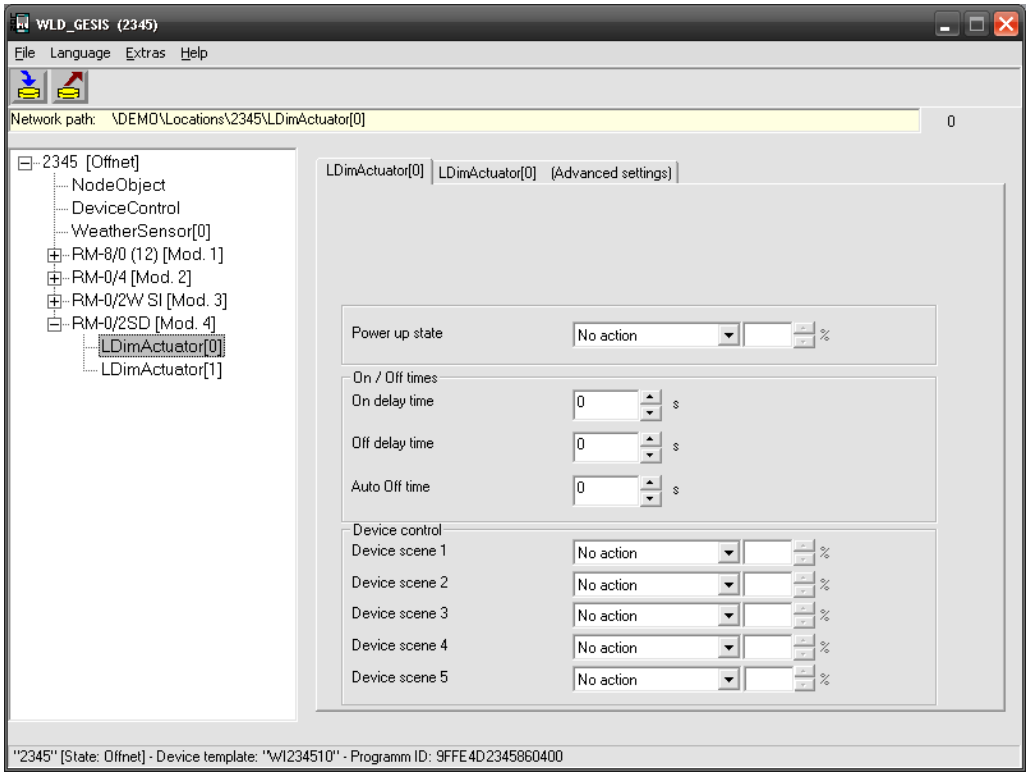
### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/ `UCPToffDelay`), automatic switch-off (stairway light via `UCPTautoOffTime`) and feedback delays (`UCPTfbDelay` for `nvoDimValueFb`).

The behaviour on switching from one dimming value to the next required dimming value can be controlled via parameters `UCPTdimTime`, UCPTupDim, `UCPTdownDim` and `UCPTchangeDim`. Parameter `UCPTdimTime` also defines the dimming time response when controlled via input `nviLDimLighting` (relative control, `SNVT_setting`).

In addition, the output's response to particular situations can also be set with `UCPTpwrUpState` (restoration of supply voltage or restart) or `UCPTcomDnState` (communication failure).

## Object parameters (plug-in)




LDimActuator – "Standard" tab

The most frequently used configuration values are parameterised in the LDimActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

### Standard

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLDimValue or nviLDimLighting.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoLDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLDimValue or nviLDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoLDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

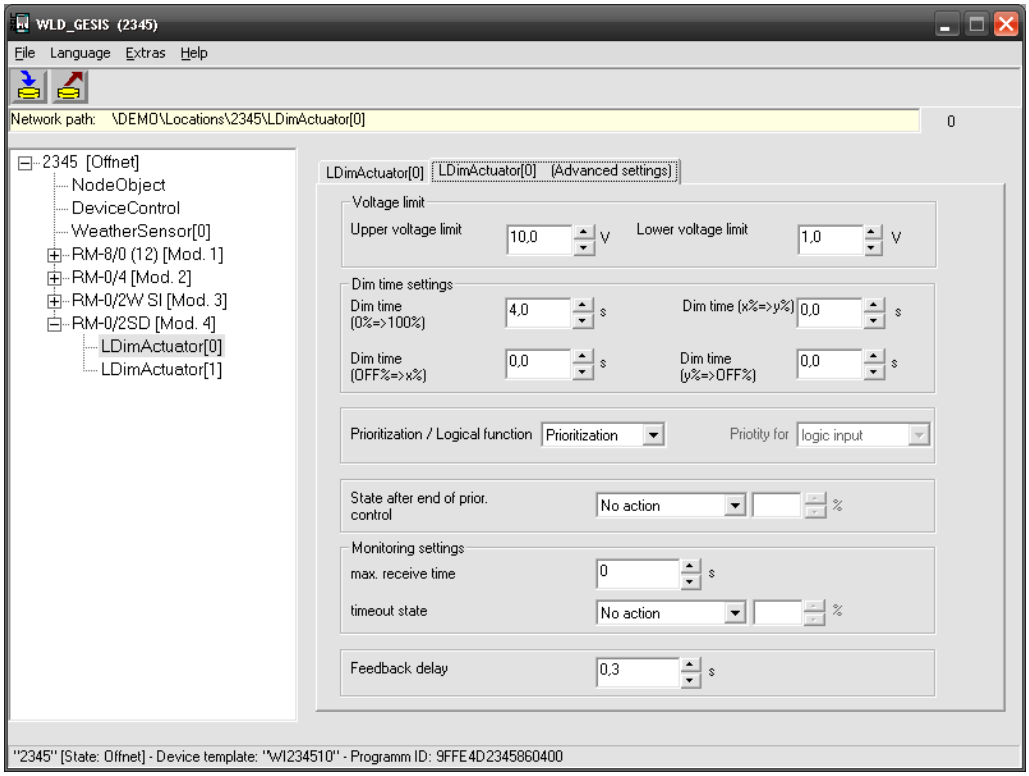
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviLDimValue or nviLDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviLDimValue or nviLDimLighting (usually a manual operation).<br>The nvoLDimValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object.<br>If "Value" is selected, the dimming value can be specified in the "%" field. |

## Advanced object parameters (plug-in)




LDimActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the LDimActuator object's advanced view.

### Voltage limits

*Upper voltage limit (UCPTupperVltLmt)*

| | |
|---|---|
| Range of values | 1,0…10,0 V, resolution 0.1 V |
| Default value | 10,0 V |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>If is often advisable to set the upper limit to a value of just below 10 V in order to extend the service life of the lighting appliances, as barely any more light is emitted if the value is set above this level anyway. |

*Lower voltage limit (UCPTlowerVltLmt)*

| | |
|---|---|
| Range of values | 1,0…10,0 V, resolution 0.1 V |
| Default value | 1,0 V |
| Description | This value specifies the minimum output value (lower limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>It is often advisable to set the lower limit to a value of over 1 V, as the lighting appliances emit barely any light at all if the value is set below this level. |

## Dimming time settings

*Dimming time (0% to 100%) (UCPTdimTime)*

| | |
|---|---|
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 4.0 s |
| Description | If the nviLDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the other parameters in this area of the window. |

*Change in value (x% to y%) (UCPTchangeDim)*

| | |
|---|---|
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviLDimValue or nviLDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-on (OFF to x%) (UCPTupDim)*

| | |
|---|---|
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to increase the level of brightness if nviLDimValue is being used for control. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-off (y% to 0%) (UCPTdownDim)*

| | |
|---|---|
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to dim the lights if nviLDimValue is being used for control. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviLDimValue and nviLDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs.<br>The "Percentage value" field is used to define which network variable the percentage value should be adopted from. |

*State at end of prioritised control (UCPTovrStpState)*

| | | |
|---|---|---|
| Range of values | OFF; ON; No action; Value; Current value | |
| Default value | No action | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviLDimLogic). | |
| | No action | No action is performed, the relay remains in its current position. |
| | Current value | The output is switched to the value present at nviLDimValue. |
| | Value | The value specified in the "%" field is adopted for the actuator. |
| | OFF | The output is deactivated (usually, the contact is opened). |
| | ON | The output is activated (usually, the contact is closed). |

### Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviLDimValue or nviLDimLighting/nviLDimLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received.<br>If "Value" is selected, the dimming value can be specified in the "%" field. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 0.1 s |
| Default value | 0.3 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoLDimValueFb.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviLDimValue*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviLDimLogic. | |

*nvoLDimValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0, 100,0% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay. | |

*nviLDimLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab, page 1.11). | |

*nviLDimLighting*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | Invalid value |
| Default value | SET_NUL; 0.0; Invalid value | |
| Description | Input variable for the associated actuator channel for relative control. The input is equivalent to nviLDimValue and only one of these two inputs should ever be used. Can be logically combined via nviLDimLogic. | |

## Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviLampValue and nviLDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoLampValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. The time is only evaluated if there are telegrams at nviLDimValue and nviLDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoLampValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTautoOffTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after a delay configured via UCPTonDelay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviLDimValue and nviLDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised via UCPToffDelay, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviLDimValue or nviLDimLighting (usually a manual operation).<br>The nvoLDimValueFb status output is updated when the channel is deactivated, depending on UCPTfbDelay.<br>A value of 0 s deactivates this function. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 | |
| Description | This parameter configures how the nviLDimValue, nviLDimLighting and nviLDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviLampValue, the second (e.g. IN10) the value at nviLampLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviLampValue, 1 = nviLampLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | AND operation: The output is only switched on if a switch-on telegram is present at both inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | OR operation: The output is switched on if a switch-on telegram is present at at least one of the two inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | Prioritised input: Input nviLDimLogic has priority over the nviLDimValue and nviLDimLighting inputs. If a valid value is present at nviLDimLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviLDimLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviLDimValue or nviLDimLighting.<br>In the event of control via nviLDimValue or nviLDimLighting, the parameterised time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviLDimLogic). Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |

| | | |
|---|---|---|
| | SET_NUL | The output is switched to the value present at nviLDimValue or nviLDimLighting. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated (usually, the contact is opened). |
| | SET_ON | The output is activated (usually, the contact is closed). |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdimTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 4.0 s |
| Description | If the nviLDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the UCPTupDim, UCPTdownDim and UCPTchangeDim parameters. |

*UCPTupDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to increase the level of brightness. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*UCPTdownDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to dim the lights. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*UCPTchangeDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviLDimValue or nviLDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*UCPTupperVltLmt*

| | |
|---|---|
| Type | SNVT_volt |
| Range of values | 1.0 to 10.0 V, resolution 0.1 V |
| Default value | 10.0 V |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>If is often advisable to set the upper limit to a value of just below 10 V in order to extend the service life of the lighting appliances, as barely any more light is emitted if the value is set above this level anyway. |

*UCPTlowerVltLmt*

| | |
|---|---|
| Type | SNVT_volt |
| Range of values | 1,0…10,0 V, resolution 0.1 V |
| Default value | 1.0 V |
| Description | This value specifies the minimum output value (lower limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>It is often advisable to set the lower limit to a value of over 1 V, as the lighting appliances emit barely any light at all if the value is set below this level. |

*SCPTmaxRcvTime*

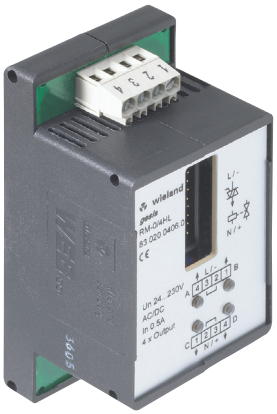
| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at the connected input nviLDimValue or nviLDimLighting within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,4 s, resolution 0.1 s |
| Default value | 0,3 s |
| Description | The time specified here delays the status telegram at nvoLDimValueFb.<br>A value of 0 s deactivates this function. |

# 4.8 gesis RM-0/4HL (83.020.0406.0/1)

## Device Description



- Designation: Extension module with 4 switching actuators
- Type/model no.:
  - gesis RM-0/4HL 83.020.0406.0
  - gesis RM-0/4HL B 83.020.0406.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

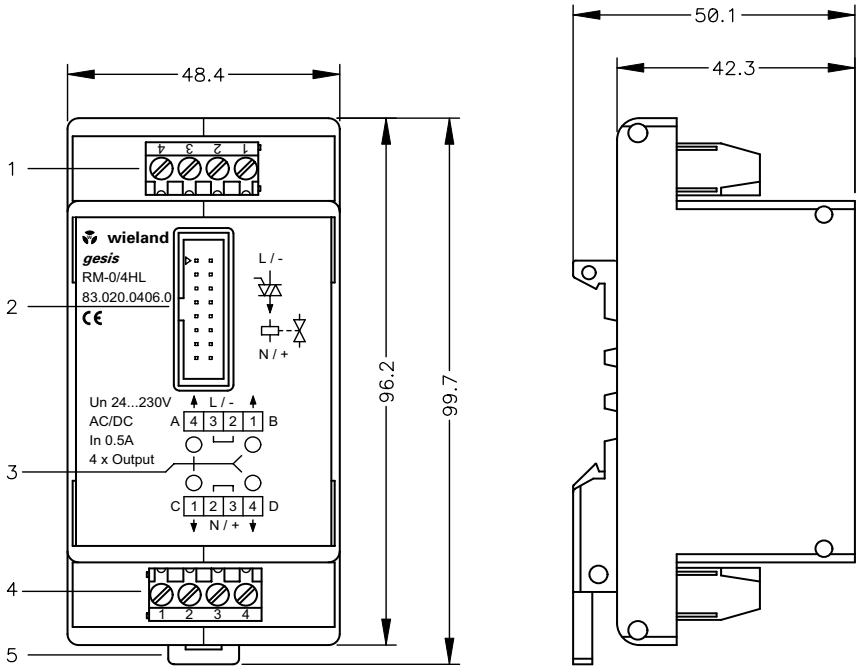
## Functional Description

The gesis RM-0/4HL can switch four outputs that are independent from one another. The extension module receives the switching commands from the basic module, and the possible status messages of the outputs are sent by the basic module to the bus.

The 4 semiconductor outputs are used to control thermodynamic drives, but can also be used to switch other electrical consumers independently from one another. The wide-range semiconductor enables switching of AC and DC voltages in the 24 to 230 $V_{rms}$ range. The same switching voltage supplies all four outputs. The outputs are electronically protected against short circuits and overloading. The consumers are connected by means of screw clamp terminals.

Different functions can be assigned to the outputs by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for every group of four outputs.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | 4-pin connection terminal strip for the switching voltage and outputs A and B (for details please refer to "Terminal Assignment") |
| 2– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 3– Red LED (4x) | Display for controlling the outputs |
| 4– X2 | 4-pin connection terminal strip for outputs C and D and reference potential of switching voltage (for details please refer to "Terminal Assignment") |
| 5– Locking slide | With 83.020.0406.0 only |

## Terminal Assignment:

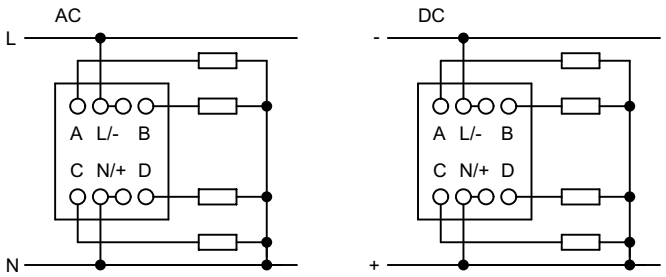
**X1**: Connection and routing of the switching voltage, and connection of outputs A and B (terminals 2/3 are bridged internally)

1– Connection for output A
2– Connection/routing of the switching voltage (L or –) for outputs A to D
3– Connection/routing of the switching voltage (L or –) for outputs A to D
4– Connection for output B

**X2**: Connection and routing of the reference potential, and connection of outputs C and D (terminals 2/3 are bridged internally)

1– Connection for output C
2– Connection/routing of the switching voltage reference potential (N or +) for outputs A to D
3– Connection/routing of the switching voltage reference potential (N or +) for outputs A to D
4– Connection for output D

### Connection example




= load, e.g. electrothermal valve actuator

## Technical Data

| | |
|---|---|
| Connection to basic module | Pluggable flat cable |
| Internal current consumption | Max. 1.5 mA per output (from switching voltage) |
| **Outputs** | |
| – Number | Four (outputs switch the same voltage) |
| – Rated voltage | 24…230 V AC 50 to 60Hz (–15% / +10%) or |
| | 24 to 230 V DC (–15%/+10%) |
| – Rated current | 0,5 A ohmic load, 100% operating time |
| | 0.6 A ohmic load, 50%/10 min. operating time |
| – Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| – Overcurrent trip | From approx. 0.65 A |
| – Short circuit withstand capability | Yes |
| – Minimum switching current | 200 µA |
| – Switching capacity at 230 V AC | 115 VA, cos φ = 1 (ohmic load) |
| – Restarting | Cyclic at overcurrent/short circuit, approx. every 800 ms |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material | Plastic, halogen and phosphorous-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 90 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height inc. TH 35–7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings); |
| | Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0406.0)

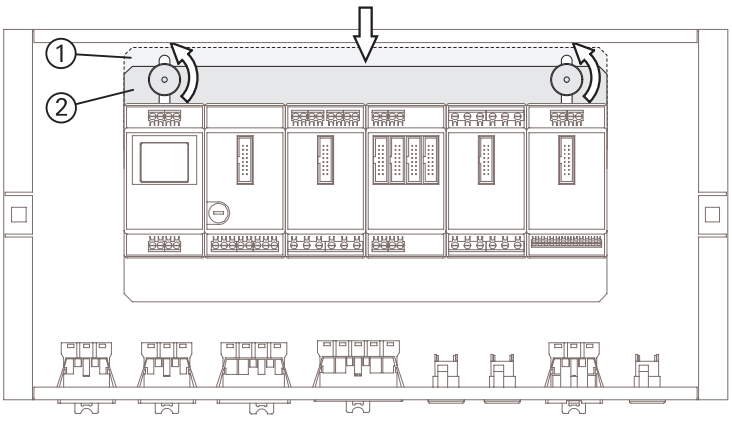
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0406.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0406.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).

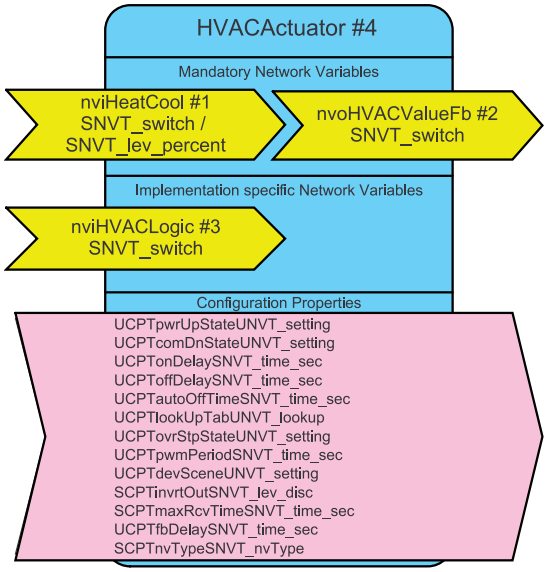



5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open). Notice: This will release all the modules.
6. Replace the relevant module.

7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### HVACActuator




The software application section assigned to the extension module contains a total of 4 LonMark objects based on an HVACActuator in accordance with LonMark Profile #4 (see figure), i.e. one such object is available for each channel.

#### Logic functions

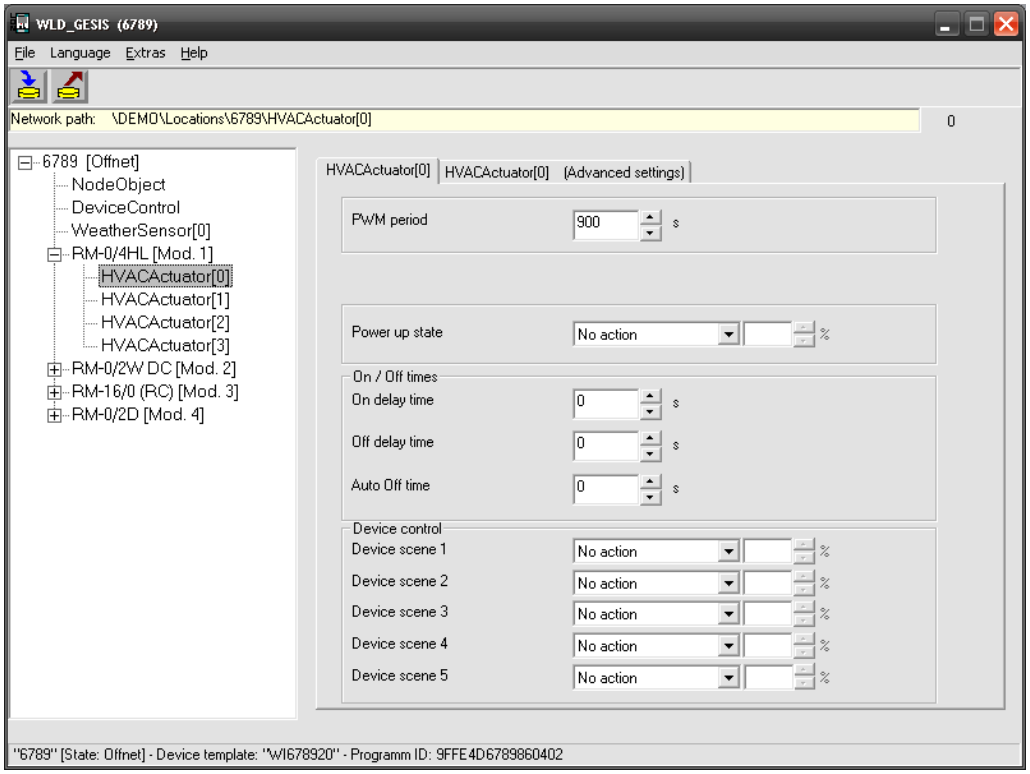
The semiconductor switch is used to control thermodynamic valves or other electrical consumers in accordance with the relevant technical specifications (see below). It supports the prescribed functionality of LonMark Profile #4 and also adds to it by providing the option of logic operations with `nviHVACLogic` as the second input.

All types of logic operation, including multi-stage operations, are available via a reference (look-up) table with two inputs and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviHVACLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated CP. Prioritised control is now possible (override function).

#### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/ `UCPToffDelay`), automatic switch-off (automatic switch-off after the time parameterised in UCPTautoOffTime) and a feedback delay (`UCPTfbDelay` for `nvoHVACValueFb`).
In addition, the output's response to particular situations can also be set (power-up or reset with `UCPTpwrUpState`, communication failure with `UCPTcomDnState`).

## Object parameters (plug-in)




HVACActuator – "Standard" tab

The most frequently used configuration values are parameterised in the HVACActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

### Parameters

*PWM cycle duration (UCPTpwmPeriod)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

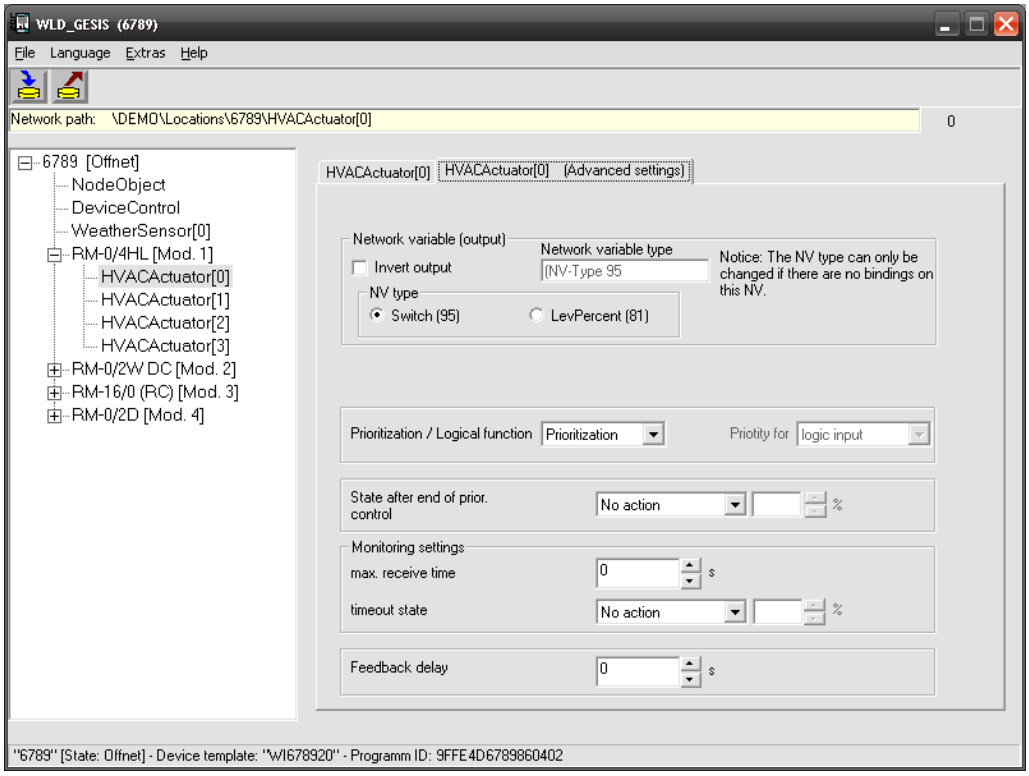
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Automatic switch-off function (not to be confused with the OFF delay).<br>The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviHeatCool (usually a manual operation).<br>The nvoHVACValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. |

## Advanced object parameters (plug-in)




HVACActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the HVACActuator object's advanced view.

The `nvoHVACValueFb` output network variable can be inverted here and the NV type of the `nviHeatCool` input network variable can be toggled between `SNVT_switch (95)` and `SNVT_lev_percent (81)`. It is also possible to activate a prioritised control or a logic operation in this view. Furthermore, the time response of the feedback output and telegram monitoring at the network variable input can be specified here.

### Parameters

*NV type of the nviHeatCool input network variable (SCPTnvType)*

| | |
|---|---|
| Range of values | SNVT_switch (95) or SNVT_lev_percent (81) |
| Default value | SNVT_switch (95) |
| Description | This parameter can be used to toggle the NV type of the `nviHeatCool` input network variable between SNVT_switch (95) and SNVT_lev_percent (81).<br>Notice:<br>If the network variable is already connected, the NV type can no longer be modified and the input elements will be deactivated. If you do need to change the type, all bindings of the relevant network variable must be removed and recreated once the type has been changed. |

*Invert output (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. The inversion will become active on the next control command. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs. |

*State at end of prioritised control (UCPTovrStpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Current value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). |
| | No action — No action is performed, the semiconductor remains in its current switching state. |
| | Current value — The output is switched to the value present at nviHeatCool. |
| | OFF — The output is deactivated. |
| | ON — The output is activated. |

## Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or nviHVACLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at `nvoHVACValueFb`.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviHeatCool*

| | | |
|---|---|---|
| Type | SNVT_switch/SNVT_lev_percent | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviHVACLogic. | |

*nvoHVACValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0; 100,0% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value = 100.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay.<br>Following a restart, if no initialisation behaviour is defined (UCPTpwrUpState), an invalid value is output here until the first switching telegram is issued. | |

*nviHVACLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0 % |
| | OFF | .state = 0 or .state = 1 and .value = 0.0 % |
| | Enable | .state = -1 |
| Default value | 0,0 %; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab). | |

### Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 (prioritisation) | |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviHeatCool, the second (e.g. IN10) the value at nviHVACLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = `nviHeatCool`, 1 = `nviHVACLogic`). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input `nviHVACLogic` has priority over input `nviHeatCool`. If a valid value is present at `nviHVACLogic` (`.value` = 0.0 to 100.0%, `.state` = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at `nviHVACLogic` (`.state` = -1) triggers the action parameterised in `UCPTovrStpState` and enables control via the non-prioritised input `nviHeatCool`.<br>In the event of control via `nviHeatCool`, the time response (`UCPTonDelay`, `UCPToffDelay`, `UCPTautoOffTime`) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_NUL | The output is switched to the value present at nviHeatCool. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTpwmPeriod*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*SCPTinvrtOut*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | This parameter can be used to invert the output behaviour. The inversion will become active on the next control command. | |
| | ST_OFF | The output is not inverted. A switch-on telegram allows current to flow through the semiconductor; a switch-off telegram blocks the flow of current. |
| | ST_ON | The output works in an inverted manner. A switch-on telegram blocks the flow of current; a switch-off telegram allows current to flow. |

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or `nviHVACLogic` within the time interval specified here, otherwise the actuator channel switches to the state parameterised via `UCPTcomDnState`.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at `nvoHVACValueFb`.<br>A value of 0 s deactivates this function. |

*SCPTnvType (nviHeatCool)*

| | |
|---|---|
| Type | SNVT_nv_Type |
| Range of values | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT, 2 bytes, A=0, B=0, C=0<br>PID 0:0:0:0:0:0:0:0, Scope 0, Index 81, NVT_CAT_STRUCT, 1 byte, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT, 2 bytes, A=0, B=0, C=0 |
| Description | Defines the SNVT type of the input variables. "…, Index 95, …, 2 bytes, …" means SNVT_switch (e.g. direct control of actuators) and "…, Index 81, …, 1 byte, …" means SNVT_lev_percent (e.g. input of controllers).<br>**Attention**: Modifications can only be made if the output variables are not connected. |

# 4.9 gesis RM-0/2W DC (83.020.0407.0/1)

## Device Description

- Designation: Extension module with 2 shutter actuators (230 V AC)
- Type/model no.: gesis RM-0/2W DC 83.020.0407.0; gesis RM-0/2W DC B 83.020.0407.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

**CAUTION**

Only motors with limit switches may be connected. At the limit position, switch-off must be executed automatically by the connected motor or drive.

### Function

The gesis RM-0/2W DC is an output module with floating relay outputs that are designed for 230 V DC switching. All of the corresponding configurations and software settings must be made via the basic module; the extension module does not have its own intelligence. The outputs can be controlled separately from one another. The consumers are connected by means of screw clamp terminals.

A shutter with louvres for controlling the amount of light that is let in can be used with the aid of shutter outputs. The shutter can move up and down; the louvres can be adjusted. The shutter and louvres can also be moved into the required position by means of direct commands. Each adjustment is factored into the position (on an incremental or decremental basis), enabling the control system to recognise the positions of both the shutter and louvres at any time. Position commands that are received will be interpreted accordingly, and the new position will be calculated and approached immediately.

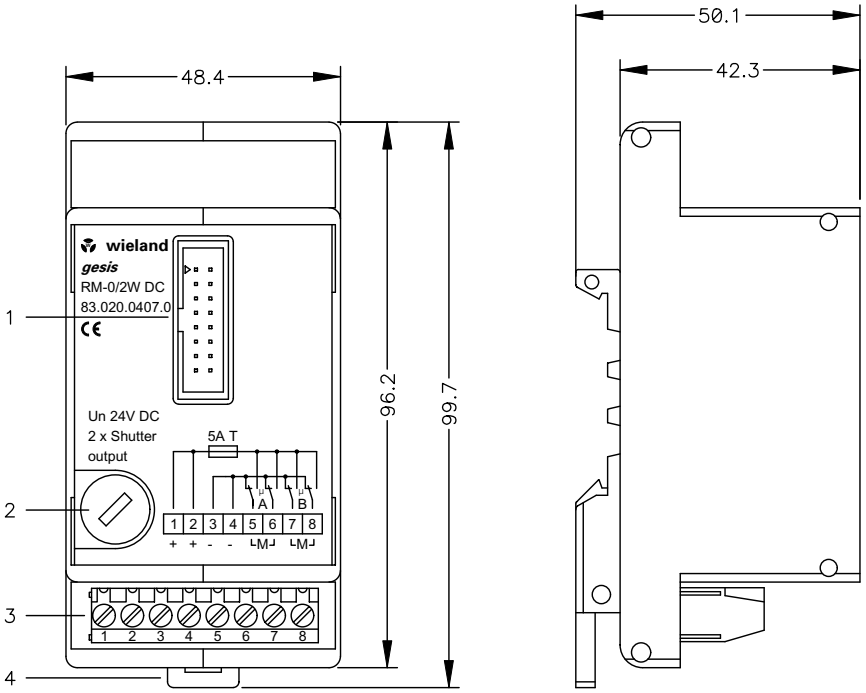
Since deviations may arise over time when calculating the current position, the travel time (which is used to determine the position) is adjusted upwards or downwards to align with the relevant limit value whenever the parameterised travel time is exceeded.

The travel time and the louvre turning time must be determined manually (using a stopwatch) and set using the plug-in. As precise a value as possible should be specified for the travel time. A "reference movement" (for ensuring the upper limit position is reached) can also be triggered by means of a separate telegram.

As a basic principle, a synchronisation procedure is initiated prior to the first travel command being executed after a restart or recovery of the supply voltage. This means that, following the first travel command, the shutter moves into the upper limit position before the required position is approached. The only exception to this is when a direct command is made for travelling to the lower limit position (with no position or angle specified): this is executed without a synchronisation procedure being initiated first.

A centralised weather sensor object is implemented in the application for the purpose of processing weather information.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 2– Fine fuse | 5 A, slow-acting |
| 3– X1 | Terminal strip for the switching voltage and motors A and B (for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0407.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the switching voltage and connection of motors A and B. Terminals 1/2 and 3/4 are bridged internally

1– Connection/routing of switching voltage +
2– Connection/routing of switching voltage +
3– Connection/routing of switching voltage –
4– Connection/routing of switching voltage –
5– Connection for motor A
6– Connection for motor A
7– Connection for motor B
8– Connection for motor B

## Technical Data

| | |
|---|---|
| Connection to basic module | Pluggable flat cable |
| **Outputs** | |
| Number | Two, can be controlled separately |
| Rated voltage | 6 to 24 V DC (switching voltage) |
| Rated current | 5 A (ohmic load) as total current for outputs |
| Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| Device protection | Fine fuse, 5 A, slow-acting (internal, can be replaced) |
| | Time/current characteristic |
| | at 25°C ambient temperature: |
| | x times $I_N$ — Tripping time |
| | 1,5 — > 1 h |
| | 2,1 — < 30 min. |
| | 4 — 150 ms to 5 s |
| | 10 — 20 ms to 100 ms |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Electrical isolation | Air gap/creepage paths > 5.5 mm (int. supply/24 V DC) |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material | Plastic, halogen and phosphorous-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 130 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height inc. TH 35–7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings); Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.
- In a switched-off state, the motor winding is short-circuited and connected to the "-" potential.

### Assembly (83.020.0407.0)

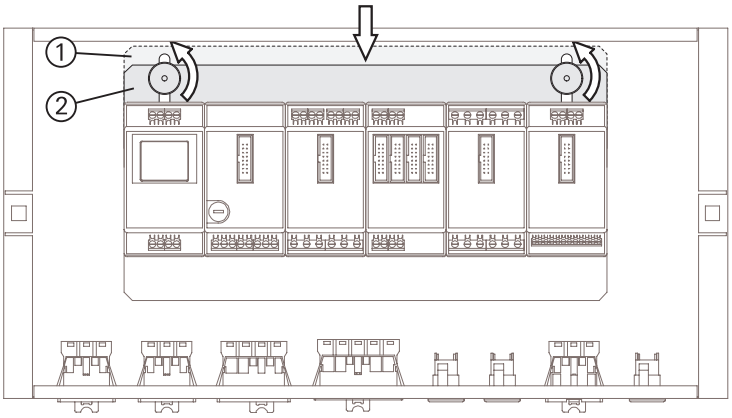
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the
   basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0407.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0407.1)

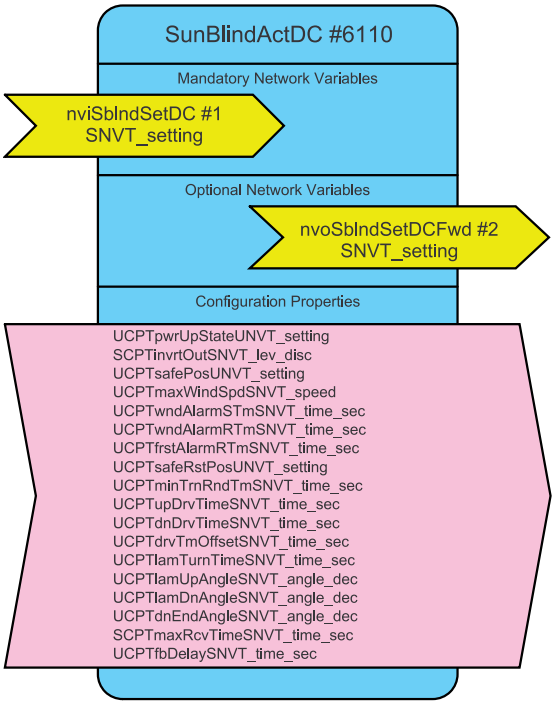
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### SunBlindActDC




This object is used to move (motor-driven) shutters to certain positions and, if present, to turn shutter louvres. The actuator receives its control commands from buttons, controllers or the building services management system. The current position of the shutter is reported to the building services management system, for example, for visualisation purposes via a feedback output network variable.

The shutter properties, which are defined via the associated configuration parameters, are used to calculate the shutter's current position and a new position is approached directly by means of a time-driven control system.

A shutter is controlled on two axes: in the direction of travel ("up" or "down") and by turning the louvres, if present. The input variable `nviSblndSetDC` provides all necessary information in this regard. `nviSblndSetDC.setting` specifies the height of the shutter as a percentage and `nviSblndSetDC.rotation` defines the angle of rotation of the louvres.

#### Control functions

`nviSblndSetDC.function = SET_STATE` is always used to control an absolute position. The command "`SET_STATE, 50.0%, 45°`" means that the shutter will be lowered halfway and the louvres will then be raised to open them at an angle of 45°.

`nviSblndSetDC.function = SET_UP/SET_DOWN` is always used to control a relative position. The command "`SET_DOWN, 50.0%, 45°`" means that the shutter will be lowered from its current position by a further 50% and the louvres will then be opened by an additional 45° from their current position. To reach the respective limit positions with relative control, `.setting = 100.0%` and `.rotation = 180°` must always be set.

In accordance with LonMark, the angle of rotation is negative when the shutter is lowered and positive when it is raised. The direction of travel can be reversed via `SCPTinvrtOut`.

If the shutter is controlled via a manual button, for `.function = SET_UP`, `.setting = 100.0%` and `.rotation = 180°` should be set and for `.function = SET_DOWN`, `.setting = 100.0%` and `.rotation = 180°`. This causes the shutter to move to the corresponding limit positions when the buttons are pressed for a long time.

A movement will be interrupted by travel commands relating to the opposite direction, as well as by `nviSblndSetDC.function = SET_STOP` and `.function = SET_OFF` (stop function). Every change to a movement causes `nvoSblndSetDCFwd` to be updated.

### Evaluation of "setting" commands

| .function | .setting | .rotation | Description | Shutter behaviour |
|---|---|---|---|---|
| SET_OFF | --- | --- | Stop | Shutter stops. |
| SET_ON | --- | --- | --- | Not implemented. |
| SET_DOWN | Invalid (0xFF)/100% | Invalid (0x7FFF) | Move downwards | Shutter moves downwards, stopped by SET_STOP/SET_OFF/ limit position being reached, if a position for fanning out (UCPTdnEndAngle) has been parameterised, the value set here will be approached once the limit position has been reached; direct command for travelling to the lower limit position. |
| | 0,0% | -180°...180° Invalid (0x7FFF) | louvres turn on a relative basis | No change to position, turning only (current angle - .rotation), .rotation = 0° or invalid => no turning. |
| | 0,0...100,0% | -180°...180° Invalid (0x7FFF) | Shutter moves downwards on a relative basis, louvres turn on a relative basis | Shutter moves on a relative basis (current position + .setting, current angle - .rotation), .rotation = 0° or invalid => no turning (louvre is reset to previous angle once shutter has been moved). |
| SET_UP | Invalid (0xFF) | Invalid (0x7FFF) | Move upwards | Shutter moves upwards, stopped by SET_STOP/SET_OFF/limit position being reached. |
| | 0,0% | -180°...180° Invalid (0x7FFF) | louvres turn on a relative basis | No change to position, turning only, .rotation = 0° or invalid => no turning. |
| | 0,0...100,0% | -180°...180° Invalid (0x7FFF) | Shutter moves upwards on a relative basis, louvres turn on a relative basis | Shutter moves on a relative basis (current position - .setting, current angle + .rotation), .rotation = 0° or invalid => no turning (louvre is reset to previous angle once shutter has been moved). |
| SET_STOP | --- | --- | Stop | Shutter stops. |
| SET_STATE | 0,0...100,0% | Invalid (0x7FFF) | Shutter moves on an absolute basis | Shutter moves on an absolute basis to the .setting position (louvre is reset to previous angle once shutter has been moved). |
| | Invalid (0xFF) | 180°...-180° | Shutter turns on an absolute basis | Shutter turns on an absolute basis to the .rotation angle. |

| | | | | |
|---|---|---|---|---|
| | Invalid (0xFF) | Invalid (0x7FFF) | Reference movement | Triggers a reference movement, controls the upper limit position. |
| | 0,0…100,0% | 180°…-180° | Shutter moves and turns on an absolute basis | Shutter moves on an absolute basis to the .setting position, turns on an absolute basis to the .rotation angle. |
| SET_NUL | --- | --- | Command is ignored | For enable, for example. |

### Positioning/Status display

Following a restart of the control system (restart or restoration of the supply voltage, for example), the actuator does not know the exact position of the shutter. For this reason, `nvoSblndSetDCFwd.function = SET_NUL` (invalid). Even if `nviSblndSetDC.function = SET_DOWN` with a position specified, following a restart the shutter will still move to the upper limit position first for the purposes of synchronisation. This also applies to `nviSblndSetDC.function = SET_STATE`.

### Priority levels

The alarm generation function of the associated configuration parameters for wind and risk of frost and for communication problems (`SCPTmaxRcvTime`) can now be used to differentiate between two different operating states in the actuator:

- Safety state/alarm (in the event of wind, frost or rain and problems with communication)
- Normal operation

In the highest-priority safety state, all control commands at `nviSblndSetDC` are ignored. This state is controlled via a time and value hysteresis in the event of alarms triggered by wind, frost or rain. Only alarms triggered by communication problems are not subject to time delays. If such a problem occurs, the alarm is activated immediately and the corresponding position in `UCPTsafePos` is adopted. When communication is restored, the corresponding alarm is cancelled straightaway and the actuator activates the position received via `nviSblndSetDC`. Time-controlled alarms are reset with `UCPTsafeRstPos`.

In addition, there is another alarm that is triggered by the weather data found at the weather sensor described on page 4.9.27. This alarm also features a communication monitoring function in the form of a receive heartbeat. If problems occur in this regard, the weather sensor has an internal function that ensures all the shutter actuators located in the extension module move to the preset safety position, as they would if they themselves experienced a communication problem.

### Specification of shutter data

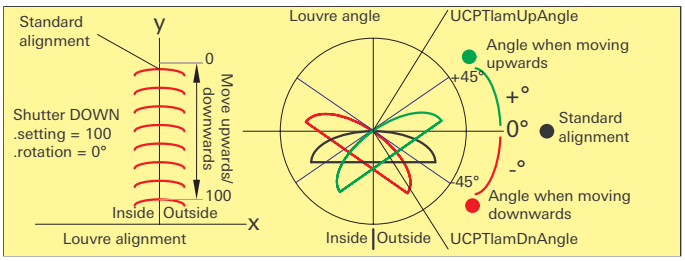
Wieland recommends you follow the procedure below to ensure efficient activation:

1. Set the maximum permissible travel time offset `UCPTdrvTmOffset` to 0 s; this will make it easier to control the movement of the shutter.
2. Determine the travel times for "up" and "down", `UCPTupDrvTime` and `UCPTdnDrvTime` manually.
3. Now set the louvre turning time `UCPTlamTurnTime` such that the shutter will come to rest when horizontal (angle of 0°) when the relevant command (e.g. `SET_STATE, 50.0%, 0°`) is received at `nviSblndSet`.

4. A test is then performed to check whether the shutter can turn its louvres horizontally when it is moving down from the upper limit position or up from the lower limit position. If it cannot do this, you must correct the deviating values for moving downwards via `UCPTlamDnAngle` or for moving upwards via `UCPTlamUpAngle`.
5. Set `UCPTlamDnAngle` or `UCPTlamUpAngle` such that louvre positions of ± 45° can be approached. In the actuator, the angles approached are determined solely by the travel time, i.e. the angles are directly proportional to the time. This can lead to inaccuracies, i.e. if the angles for moving upwards and downwards are different, it could be the case that only one of the two could be approached with accuracy. For certain shutters, you may also have to enter angles that are much greater than the positions that can actually be reached, particularly if the louvres are pressed against each other very tightly when in their limit position. If a high degree of pressing pressure such as this is present, it can take a little more time before the louvre will start to turn in the opposite direction. In the actuator this time is added to the turning time, even though all that happens is the guide bands are relieved of tension.
6. Finally, set a safety time value of, for example, 15% of the times set in `UCPTupDrvTime` or `UCPTdnDrvTime` in `UCPTdrvTmOffset`; this value is added to the standard travel time in `UCPTupDrvTime` and `UCPTdnDrvTime` to ensure that the shutter will reach its limit positions even after it has performed a number of movements.

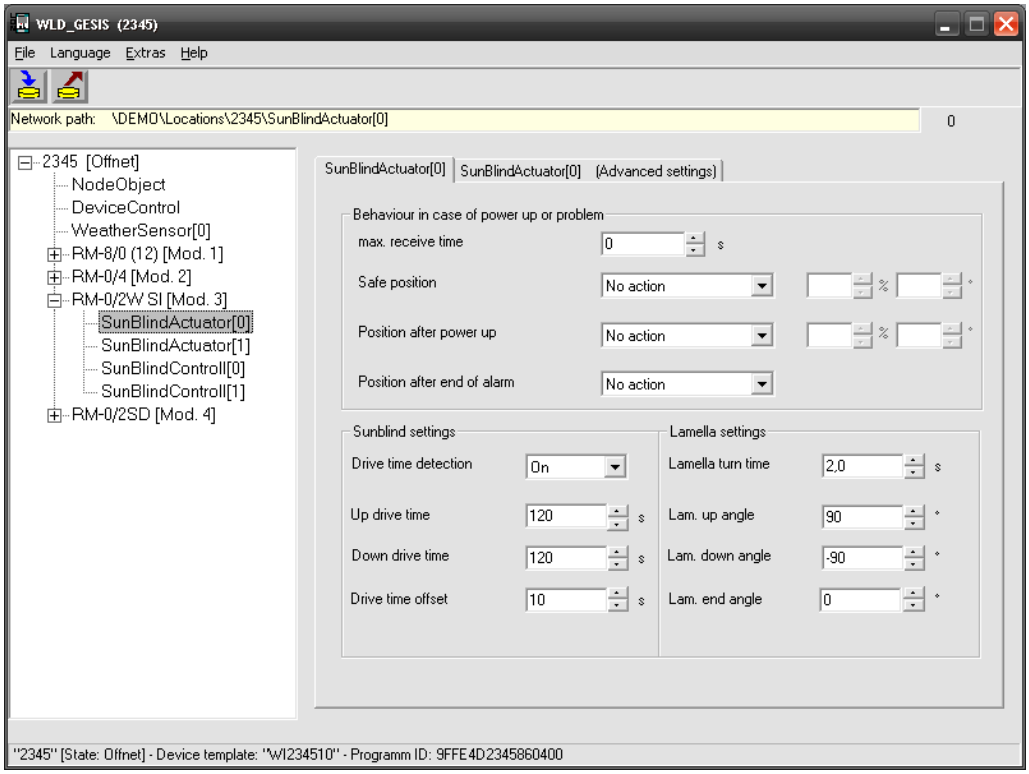
**NOTICE**

When the louvres turn, with some products this can alter the height of the shutter too, but by such a minimal amount that it does not have to be taken into account or corrected here.




Positions to which a standard shutter with louvres will move

## Object parameters (plug-in)




SunBlindActDC – "Standard" tab

Basically, the parameter values that define the key mechanical and physical data of the shutter being controlled are set in the SunBlindActDC object's standard view.

Travel times for moving upwards and downwards, louvre turning times and safety positions, etc. are specified here.

### Behaviour on switch-on and if a problem should occur

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviSblndSetDC within the time interval specified here, otherwise the shutter channel performs the action parameterised in "Safety position".<br>A value of 0 s deactivates this function. |

*Safety position (UCPTsafePos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the safety position of the associated actuator channel. This position is approached once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received or in the event of critical weather conditions (wind, frost, etc.). If the shutter is being moved at the time when the alarm is triggered, it is stopped before being moved to the required position.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the position of the shutter following restoration of the supply voltage.<br>A synchronisation procedure to the upper limit position is first initiated in order to synchronise the shutter with the actuator. The only exception to this is if the lower limit position is to be approached.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after alarm (UCPTsafeRstPos)*

| | |
|---|---|
| Range of values | No action; Previous position |
| Default value | No action |
| Description | The action to be taken once an alarm state has been deactivated can be defined via this parameter. |

*Travel time upwards (UCPTupDrvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Up" travel time. The time required to move all the way from the lower to the upper limit position is defined in this parameter. |

*Travel time downwards (UCPTdnDrvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Down" travel time. The time required to move all the way from the upper to the lower limit position is defined in this parameter. |

*Travel time offset (UCPTdrvTmOffset)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 10 s |
| Description | For ensuring the limit position is reached. Defined top-up time that is added to the parameterised time when the shutter is moving to a limit position in order to ensure that this limit position is reached. |

## Louvre settings

*Louvre turning time (UCPTlamTurnTime)*

| | |
|---|---|
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 2.0 s |
| Description | Louvre turning time. Defines the time required for the louvres to turn fully. If roller blinds or other shutters that do not have louvres to adjust are used, a 0 must be parameterised here. |

*Louvre angle up (UCPTlamUpAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | 90° |
| Description | "Up" louvre angle. Defines the louvre angle when the shutter is being raised. |

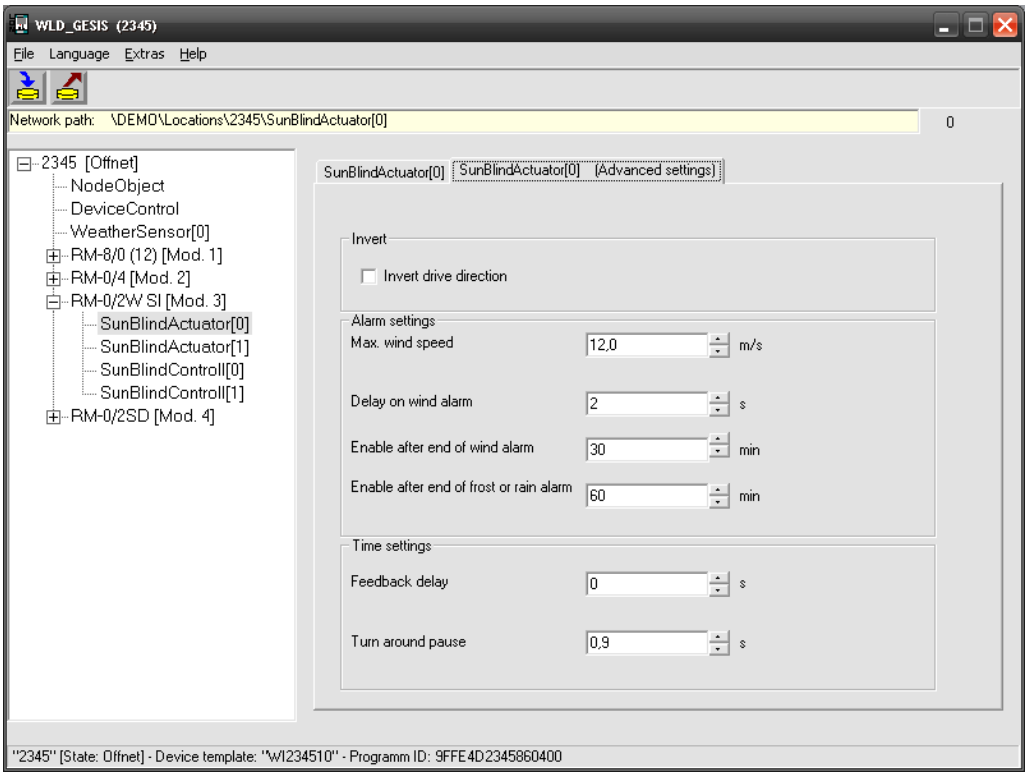
*Louvre angle down (UCPTlamDnAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | -90° |
| Description | "Down" louvre angle. Defines the louvre angle when the shutter is being lowered. |

*Louvre end angle down (UCPTdnEndAngle)*

| | |
|---|---|
| Range of values | -180° to 180°, resolution 1° |
| Default value | 0° |
| Description | Automatic fanning out. The angle specified here is set automatically when the lower limit position is reached by means of a relative travel command with .function = SET_DOWN, .setting = INVALID (0xFF), .rotation = INVALID (=0x7FFF), in order to prevent the room being plunged into complete darkness. |

### Advanced object parameters (plug-in)




SunBlindActDC – "Advanced" tab

Safety functions and the behaviour of the status output are defined in the SunBlindActDC object's advanced view.

#### Inversion

*Inversion of direction of travel (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked; not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. |

#### Alarm settings

*Max. permissible wind speed (UCPTmaxWindSpd)*

| | |
|---|---|
| Range of values | 0…6553,0 m/s, resolution 0.1 m/s |
| Default value | 12.0 m/s |
| Description | Maximum permissible wind speed for this actuator channel. If this value is exceeded, the shutter moves to the safety position and further operation is blocked.<br>This value features a parameterisable time hysteresis. |

*Delay for wind alarm (UCPTwndAlarmSTm)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 2 s |
| Description | Time hysteresis for activating a wind alarm. If a wind value that exceeds the defined upper limit is present at the weather sensor object during the time parameterised here, the wind alarm is activated and the action specified in "Safety position" is triggered.<br>Further operation is blocked. A value of 0 s deactivates this function. |

*Enable after wind alarm after (UCPTwndAlarmRTm)*

| | |
|---|---|
| Range of values | 0…1023 min., resolution 1 min. |
| Default value | 30min. |
| Description | Time hysteresis for deactivating a wind alarm. If a wind value that falls below the defined upper limit is present at the weather sensor object during the time parameterised here, the wind alarm is deactivated and the action specified in "Position after alarm" is triggered.<br>Operation is enabled. A value of 0 s deactivates this function.<br><br>Notice: If the wind value suddenly falls to 0 m/s after a wind alarm has been triggered, the alarm is not cancelled, as it must be assumed that a sensor has been damaged. |

*Enable after frost alarm after (UCPTfrstAlarmRTm)*

| | |
|---|---|
| Range of values | 0…1.023 min., resolution 1 min. |
| Default value | 60 min. |
| Description | Time hysteresis for deactivating a frost alarm or taking a drying time into account. If a temperature value that exceeds 3°C, but no rain, is present at the weather sensor object during the time parameterised here, the frost alarm is deactivated or it is assumed that the shutter is dry and the action specified in "Position after alarm" is triggered.<br>Operation is enabled. A value of 0 min. deactivates this function.<br>Notice: If only a rain sensor is to be connected (no temperature or frost sensor), the time set here is doubled, as a lower temperature, which would in turn require a longer drying time, must always be assumed. |

## Time settings

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoSblndSetDCFwd.<br>A value of 0 s deactivates this function. |

*Inhibit time for reversing the direction of rotation (UCPTminTrnRndTm)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 0.9 s |
| Description | Pause on reverse. Defines a minimum pause that must be observed in order to protect the drives when the direction of movement is changed. This value is determined by the drive's technical data (contact the manufacturer if necessary). |

## Object parameters (LNS tool)

### Network variables

*nviSblndSetDC*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_STOP, |
| | .setting | SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -359.00° to 360.00°, resolution 0.02° |
| Default value | SET_NUL; 0.0%; 0.00° | |
| Description | Standard input variable for the associated shutter channel. The telegrams are evaluated in accordance with the table on page 1.4. | |

*nvoSblndSetDCFwd*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_DOWN, SET_UP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | UCPTlamDnAngle to UCPTlamUpAngle, resolution 1° |
| Default value | SET_NUL; 0.0%; 0.00° | |
| Description | Status output variable for the associated shutter channel. If the output channel is activated, only the current direction of movement is output. The current position is output once the shutter has stopped. Can be sent with a delay via UCPTfbDelay. | |

### Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_DOWN, SET_UP, SET_STATE, SET_ |
| | .setting | STOP |
| | .rotation | 0.0 to 100.0 %, resolution 0.5 % |
| | | -359° to 360°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the position of the shutter following restoration of the supply voltage. A reference procedure to the upper limit position is first initiated in order to synchronise the shutter with the actuator. The only exception to this is if the lower limit position is to be approached. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |

*SCPTinvrtOut*

| | |
|---|---|
| Type | SNVT_lev_disc |
| Range of values | ST_OFF, ST_ON |
| Default value | ST_OFF (deactivated) |
| Description | The relay's contact positions can be inverted via this parameter.<br>ST_OFF The output is not inverted.<br>ST_ON The output works in an inverted manner. An up telegram closes the down contact; a down telegram closes the up contact. |

*UCPTsafePos*

| | |
|---|---|
| Type | UNVT_setting |
| Range of values | .function SET_NO_FUNC, SET_DOWN, SET_UP, SET_STATE, SET_<br>.setting STOP<br>.rotation 0.0 to 100.0 %, resolution 0.5 %<br>-359° to 360°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° |
| Description | Defines the safety position of the associated actuator channel. This position is approached once the time specified in `SCPTmaxRcvTime` has elapsed without any telegrams being received or in the event of critical weather conditions (wind, frost, etc.). If the shutter is being moved at the time when the alarm is triggered, it is stopped before being moved to the required position.<br>SET_NO_FUNC No action is performed, the relay remains in its current position. |

*UCPTmaxWindSpd*

| | |
|---|---|
| Type | SNVT_speed |
| Range of values | 0…6553,4 m/s, resolution 0.1 m/s |
| Default value | 12.0 m/s |
| Description | Maximum permissible wind speed for this actuator channel. If this value is exceeded, the shutter moves to the safety position and further operation is blocked.<br>This value features a parameterisable time hysteresis. |

*UCPTwndAlarmSTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 2 s |
| Description | Time hysteresis for activating a wind alarm. If a wind value that exceeds the upper limit defined in `UCPTmaxWindSpd` is present at the weather sensor object during the time parameterised here, the wind alarm is activated and the action specified in `UCPTsafePos` is triggered.<br>Further operation is blocked. A value of 0 s deactivates this function. |

*UCPTwndAlarmRTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0 to 1,023 min., resolution 1 min. |
| Default value | 30min. |
| Description | Time hysteresis for deactivating a wind alarm. If a wind value that falls below the upper limit defined in UCPTmaxWindSpd is present at the weather sensor object during the time parameterised here, the wind alarm is deactivated and the action specified in UCPTsafeRstPos is triggered.<br>Operation is enabled. A value of 0 s deactivates this function.<br><br>**NOTICE:**<br>If the wind value suddenly falls to 0 m/s after a wind alarm has been triggered, the alarm is not cancelled, as it must be assumed that a sensor has been damaged. |

*UCPTfrstAlarmRTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0 to 1,023min., resolution 1 min. |
| Default value | 60 min. |
| Description | Time hysteresis for deactivating a frost alarm or taking a drying time into account. If a temperature value that exceeds 3°C, but no rain, is present at the weather sensor object during the time parameterised here, the frost alarm is deactivated or it is assumed that the shutter is dry and the action specified in UCPTsafeRstPos is triggered.<br>Operation is enabled. A value of 0 min. deactivates this function. |

*UCPTsafeRstPos*

| | |
|---|---|
| Type | SNVT_lev_disc |
| Range of values | ST_OFF, ST_ON |
| Default value | ST_OFF |
| Description | The action to be taken once an alarm state has been deactivated can be defined via this parameter.<br>ST_ON Approach previous position<br>ST_OFF No action |

*UCPTminTrnRndTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 0.9 s |
| Description | Pause on reverse. Defines a minimum pause that must be observed in order to protect the drives when the direction of movement is changed. This value is determined by the drive's technical data (contact the manufacturer if necessary). |

*UCPTupDrvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Up" travel time. The time required to move all the way from the lower to the upper limit position is defined in this parameter. |

*UCPTdnDrvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 120 s |
| Description | "Down" travel time. The time required to move all the way from the upper to the lower limit position is defined in this parameter. |

*UCPTdrvTmOffset*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 10 s |
| Description | For ensuring the limit position is reached. Defined top-up time that is added to the parameterised time when the shutter is moving to a limit position in order to ensure that this limit position is reached. |

*UCPTlamTurnTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,4 s, resolution 0.1 s |
| Default value | 2,0 s |
| Description | Louvre turning time. Defines the time required for the louvres to turn fully. If roller blinds or other shutters that do not have louvres to adjust are used, a 0 must be parameterised here. |

*UCPTlamUpAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | 90° |
| Description | "Up" louvre angle. Defines the louvre angle when the shutter is being raised. |

*UCPTlamDnAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | -90° |
| Description | "Down" louvre angle. Defines the louvre angle when the shutter is being lowered. |

*UCPTdnEndAngle*

| | |
|---|---|
| Type | SNVT_angle_dec |
| Range of values | -180° to 180°, resolution 1° |
| Default value | 0° |
| Description | Automatic fanning out. The angle specified here is set automatically when the lower limit position is reached by means of a relative travel command with `.function = SET_DOWN`, `.setting = INVALID` (0xFF), `.rotation = INVALID` (=0x7FFF), in order to prevent the room being plunged into complete darkness. |

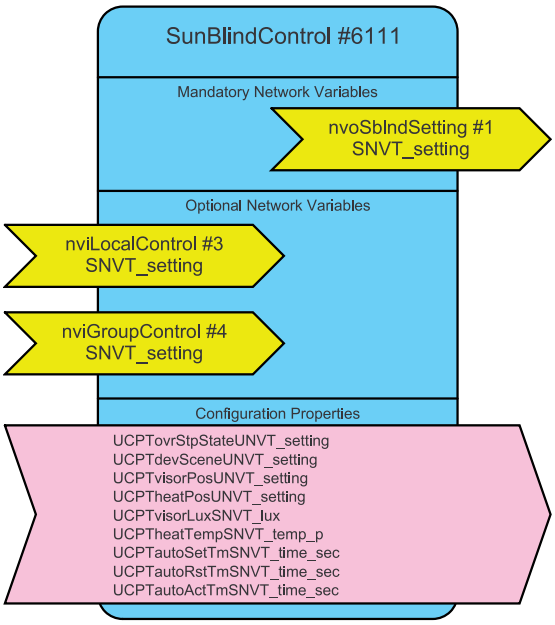
*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | A telegram must be received at `nviSblndSetDC` within the time interval specified here, otherwise the shutter channel performs the action parameterised in `UCPTsafePos`.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | The time specified here delays the status telegram at `nvoSblndSetFwd`.<br>A value of 0 s deactivates this function. |

## SunBlindControl




The shutter controller is usually used in conjunction with the associated shutter actuator to implement a wide range of different shutter control operations. In this way, priority control operations or those that depend on light or temperature can be performed.

The following priority levels, where "1" has the highest priority, are implemented together with the weather sensor object:

| | |
|---|---|
| 1. Alarms | For protecting the connected shutters |
| 2. Central/group control | For prioritised control by means of a building services management system or a group |
| 3. Manual control/scene call-up | By means of a button or a scene, for example |
| 4. Light/temperature control | By means of network variables at the weather sensor, which internally controls the function in the shutter controller |

If the controller is controlled via its prioritised input variable `nviGroupControl`, it ignores all control commands of a lower priority (levels 2 and 3) until an enable is executed at this input variable via `SET_NUL`.

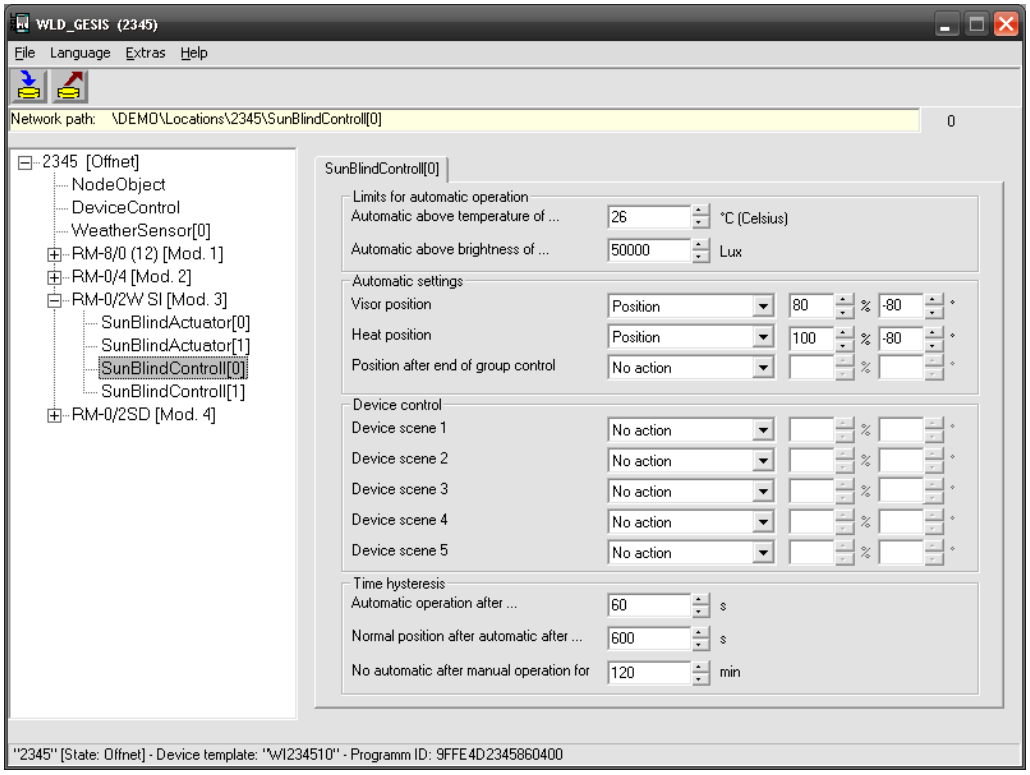
If a situation that could have a critical effect on the shutter is detected in the weather sensor, it is dealt with in the shutter immediately. For this reason, all relevant limits such as those for wind speed are available in the actuator too. This prevents the protection mechanism being bypassed by an incorrect binding, for example, in the form of a shutter button that has been linked to the shutter actuator directly with no safety mechanism.

The current shutter position is controlled inside the shutter controller in accordance with the outdoor brightness (`UCPTvisorLux`) and temperature (`UCPTheatTemp`). If these limits are exceeded, the corresponding shutter position defined in `UCPTvisorPos` (anti-glare protection) or `UCPTheatPos` (overheating protection) is approached once the parameterisable time hysteresis (`UCPTautoSetTm`) has elapsed.

The hysteresis is provided so that the shutter will only move to the corresponding position after a fairly long period where the level of brightness or the outdoor temperature is too high, thus ignoring temporary changes. A similar principle applies as regards the brightness and temperature limits being undershot.

Manual switching processes take priority; `nviLocalControl` commands take precedence over internal automatic light/temperature systems. Only once the time defined in `UCPTautoActTm` has elapsed does automatic control become active again. This ensures that the building cannot overheat at weekends, for example, or that the automatic anti-glare protection function provides the user with an appropriate level of comfort.

## Object parameters (plug-in)




SunBlindControl – "Standard" tab

Comfort functions relating to anti-glare protection and overheating protection, as well as their time responses, can be defined in the shutter controller. In addition, the response to calling up scenes can also be parameterised via the central `DeviceControl` object.

### Limits for protection positions

*Automatic at temperatures above … (UCPTheatTemp)*

| | |
|---|---|
| Range of values | -40°C … 100°C, resolution 1°C |
| Default value | 26°C |
| Description | Parameterisable upper temperature limit for the automatic overheating protection function. In order for this function to be activated, the maximum outdoor brightness value (Automatic at brightness above …) must also be exceeded.<br>This value features a parameterisable time hysteresis. |

*Automatic at brightness above … (UCPTvisorLux)*

| | |
|---|---|
| Range of values | 0 … 65.534 lux, resolution lux |
| Default value | 50,000 lux |
| Description | Parameterisable upper outdoor brightness limit for the automatic anti-glare protection function.<br>This value features a parameterisable time hysteresis. |

## Automatic settings

*Anti-glare protection position (UCPTvisorPos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | Position; 80.0%; -80° |
| Description | Defines the output's response to outdoor brightness values that exceed the upper limit specified for activating an anti-glare protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Heat protection position (UCPTheatPos)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | Position; 100.0%; -80° |
| Description | Defines the output's response, when anti-glare protection is activated, to temperature values that exceed the upper limit specified for activating an overheating protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

*Position after nviGroupControl (UCPTovrStpState)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position; Automatic |
| Default value | No action |
| Description | Defines the output's response once prioritised control has been deactivated (via `nviGroupControl`). Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields.<br>If "Automatic" is selected, the parameterised position will be approached if the comfort function is active. |

## Device control

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | TOP; BOTTOM; STOP; No action; Position |
| Default value | No action |
| Description | Defines the response of the output when a scene telegram has been received at the central DeviceControl object. Processing then takes place in the actuator immediately.<br>If "Position" is selected, the desired position can be defined by means of the "%" and "°" fields. |

### Time hysteresis

*Activate automatic after … (UCPTautoSetTm)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 60 s |
| Description | Time hysteresis for activating automatic anti-glare and overheating protection. If an outdoor brightness value or a temperature value that exceeds the defined upper limit is present at the weather sensor object during the time parameterised here and no manual operations have been performed, the action specified in the anti-glare protection or heat protection position is triggered. A value of 0 s deactivates this function. |

*Standard state following automatic after ... (UCPTautoRstTm)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 600 s |
| Description | Time hysteresis for deactivating automatic overheating protection. If a temperature value that falls below the defined upper limit is present at the weather sensor object during the time parameterised here, the position defined as the anti-glare protection position is approached. A value of 0 s deactivates this function. |

*With manual operation, no automatic for … (UCPTautoActTm)*

| | |
|---|---|
| Range of values | 0…1023 min., resolution 1 min. |
| Default value | 120 min. |
| Description | Deactivation of automatic anti-glare and overheating protection. Following manual operation (via `nviLocalControl`), automatic control is deactivated for the period of time defined here. A value of 0 min. deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nvoSblndSetting*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0° | |
| Description | Control output variable for linking to the corresponding shutter channels. | |

*nviLocalControl*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_OFF, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0.00° | |
| Description | Standard input variable for linking to button/scene control systems. | |

*nviGroupControl*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_DOWN, SET_UP, SET_STOP, |
| | .setting | SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 1° |
| Default value | SET_NUL; 0.0%; 0.00° (enabled) | |
| Description | Prioritised input variable for linking to group control systems, a building services management system or a facility management system. To enable local control, .function = SET_NUL must be set here. | |

## Parameters

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_ STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the output's response once prioritised control has been deactivated (via nviGroupControl). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_ STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the output when a scene telegram has been received at the central DeviceControl object. Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |

| | | |
|---|---|---|
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTvisorPos*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_STATE; 80.0%; -80.00° | |
| Description | Defines the output's response to outdoor brightness values that exceed the upper limit specified for activating an anti-glare protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTheatPos*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_STATE; 100.0%; -80.00° | |
| Description | Defines the output's response, when anti-glare protection is activated, to temperature values that exceed the upper limit specified for activating an overheating protection function (in conjunction with the data provided by the weather sensor object). Processing then takes place in the actuator immediately. | |
| | SET_NO_FUNC | No telegrams are sent. |
| | SET_NUL | The controller switches to comfort mode (anti-glare and overheating protection). |
| | Plug-in values: | |
| | SET_DOWN | The output sends "SET_DOWN; 100.0%; -180°" (lower limit position). |
| | SET_UP | The output sends "SET_UP; 100.0%; 180°" (upper limit position). |
| | SET_STOP | The output sends "SET_STOP; 0.0%; 0°" (immediate stop). |
| | SET_STATE | The output sends "SET_STATE; position; louvre angle" (move to position). |

*UCPTvisorLux*

| | |
|---|---|
| Type | SNVT_lux |
| Range of values | 0 … 65534 lux, resolution lux |
| Default value | 50000 lux |
| Description | Parameterisable upper outdoor brightness limit for the automatic anti-glare protection function.<br>This value features a parameterisable time hysteresis. |

*UCPTheatTemp*

| | |
|---|---|
| Type | SNVT_temp_p |
| Range of values | -40,00°C to 100.00°C, resolution 0.01°C |
| Default value | 26,00°C |
| Description | Parameterisable upper temperature limit for the automatic overheating protection function. In order for this function to be activated, the maximum outdoor brightness value (`UCPTvisorLux`) must also be exceeded.<br>This value features a parameterisable time hysteresis. |

*UCPTautoSetTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 60 s |
| Description | Time hysteresis for activating automatic anti-glare and overheating protection. If an outdoor brightness value or a temperature value that exceeds the upper limit defined in `UCPTvisorLux` or `UCPTheatTemp` is present at the weather sensor object during the time parameterised here and no manual operations have been performed, the action specified in `UCPTvisorPos` or `UCPTheatPos` is triggered.<br>A value of 0 s deactivates this function. |

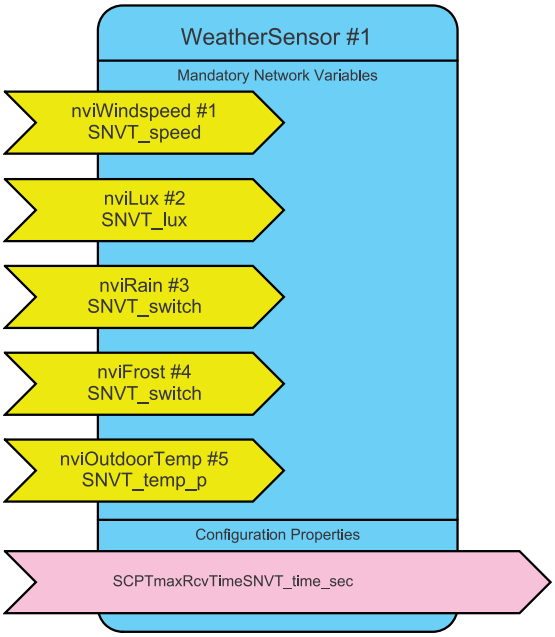
*UCPTautoRstTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 600 s |
| Description | Time hysteresis for deactivating automatic overheating protection. If a temperature value that falls below the upper limit defined in `UCPTheatTemp` is present at the weather sensor object during the time parameterised here, the position defined as `UCPTvisorPos` is approached.<br>A value of 0 s deactivates this function. |

*UCPTautoActTm*

| | |
|---|---|
| Type | SNVT_time_min |
| Range of values | 0…1023 min., resolution 1 min. |
| Default value | 120 min. |
| Description | Deactivation of automatic anti-glare and overheating protection. Following manual operation (via `nviLocalControl`), automatic control is deactivated for the period of time defined here.<br>A value of 0 min. deactivates this function. |

## WeatherSensor




Experience has shown that the majority of mistakes are made when binding the `nviSblndSet` input variable of the shutter actuator. For example, if you connect the output variable of a button to this input variable directly, you bypass the entire protection mechanism such as that relating to current weather data; this mechanism is anchored in the shutter controller according to LonMark Profiles #6110 and #6111 but, viewed logically, it should actually belong to the actuator. This is why the protection mechanism relating to weather data has been swapped out and implemented in a stand-alone object (weather sensor). Its data is processed internally and made available to the shutter actuators.

### Safety functions provided by the weather sensor

The weather sensor is designed to detect situations which could be dangerous for the shutter and to respond accordingly. In order to achieve this, processing is focussed on the most important weather data:

- Wind
- Rain
- Frost

The weather sensor also provides data relating to outdoor brightness and temperature, which helps to operate an automatic control system inside the shutter controller that executes anti-glare and overheating protection functions.

A receive heartbeat can be used to identify communication problems in both the shutter actuator and the weather sensor. If the cyclic telegram is not received from the corresponding input variable, the actuator moves to the safety position that has already been defined via `UCPTsafePos`.

If the shutter actuator is in an alarm state, it takes the highest priority; prioritised and standard control commands at the shutter controller (`nviLocalControl` and `nviGroupControl`) and at the shutter actuator (`nviSblndSetDC`) are ignored until the alarm is no longer active and the corresponding time `UCPTalarmRstTm` (does not apply to communication errors) has elapsed.

This concept does not exactly match the optional functions of LonMark Profiles #6110 and #6111, but it does have one advantage in the form of improved safety, and it also reduces the amount of binding work required.

### Wind protection

The current wind speed is monitored via the `nviWindspeed` input. If it exceeds the limit `UCPTmaxWindSpd`, which varies according to the type of shutter used, for the period `UCPTalarmSetTm`, an alarm is triggered and the shutter moves to the safety position defined in `UCPTsafePos`. If the current wind speed falls below `UCPTmaxWindSpd` for the period `UCPTalarmRstTm`, the alarm is cancelled and the actuator approaches the shutter position defined via `UCPTsafeRstPos`.

### Frost protection

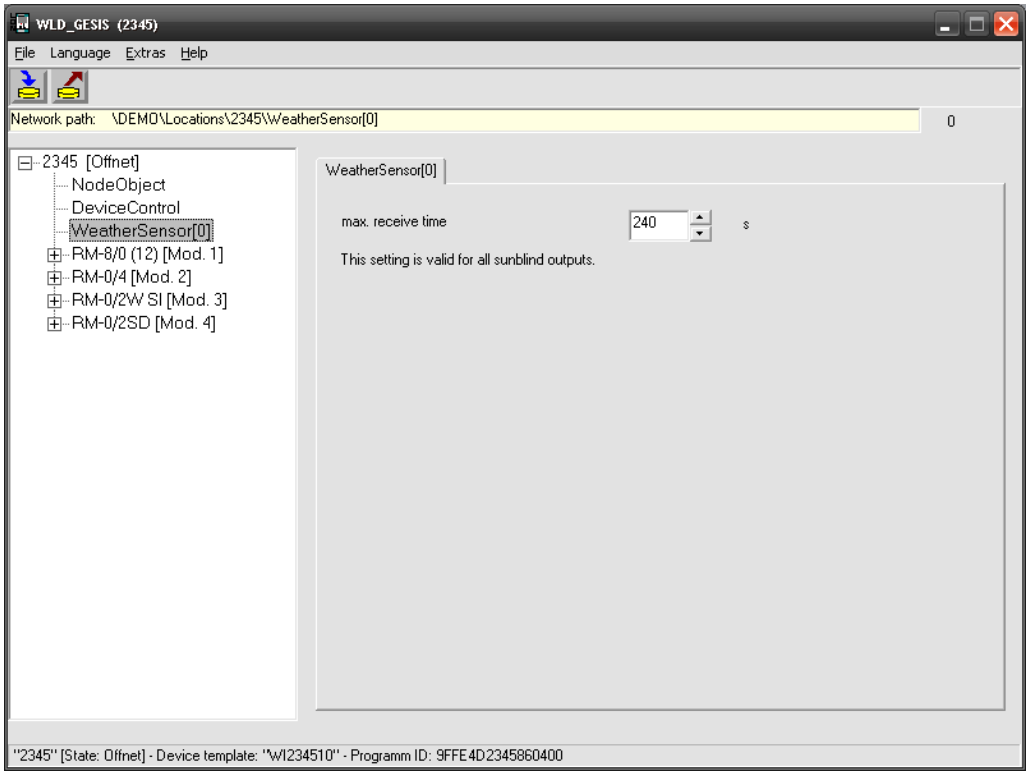
This concept offers two mechanisms for protecting the shutter against frost and ice. The first option is to use a special ice/frost sensor, which is connected to the `nviFrost` input variable at the weather sensor.

Alternatively, the sensor can be moved to the safety position directly via the `nviRain` input variable (rainfall sensor). If no ice/frost sensor or rainfall sensor is connected, it is also possible to generate a corresponding alarm via `nviOutdoorTemp`.

The internal decision on whether or not there is a risk of frost is made as described below. If the rain sensor reports rainfall, the shutter is not considered to be dry again until the rain has stopped and the time in UCPTfrstRstTm has elapsed. If the outdoor temperature drops below the frost point (this value is permanently set to 3°C, as is standard in the automotive industry, for example) when the shutter is wet, a frost alarm is triggered and `UCPTsafePos` is approached. The frost alarm will be cancelled once the temperature has been above the fixed limit for longer than the time set in `UCPTfrstRstTm`.
If no rain sensor is present (not installed or not connected), the shutter is always considered to be "wet", i.e. the frost alarm is always triggered whenever the fixed outdoor temperature limit is undershot.

The shutter always moves to the safety position when wet, unless no rain sensor is connected, in which case the shutter will move to the safety position if frost has formed.

## Object parameters (plug-in)




WeatherSensor

Only the time monitoring value for receive telegrams needs to be specified for the weather sensor.

### Parameters

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 240 s |
| Description | A telegram must be received at the connected input variable within the time interval specified here, otherwise an alarm situation will be triggered in the shutter actuator.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviWindspeed*

| | |
|---|---|
| Type | SNVT_speed |
| Range of values | 0…6553,4 m/s, resolution 0.1 m/s |
| Default value | 6553.5 m/s (invalid value) |
| Description | Input variable for accepting the current wind value from a weather station, for example. |

*nviLux*

| | |
|---|---|
| Type | SNVT_lux |
| Range of values | 0 to 65,534 lux, resolution 1 lux |
| Default value | 65,535 lux (invalid value) |
| Description | Input variable for accepting the current outdoor brightness value from a weather station, for example. |

*nviRain*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | 0, 1 |
| | ON | .state = 1 or .value > 0.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0.0%; -1 (invalid value) | |
| Description | Input variable for accepting the current rain value from a weather station, for example. | |

*nviFrost*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | 0, 1 |
| | ON | .state = 1 or .value > 0.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0 %; -1 | |
| Description | Input variable for accepting the current frost value from a weather station, for example. | |

*nviOutdoorTemp*

| | |
|---|---|
| Type | SNVT_temp_p |
| Range of values | -40.00°C to 100.00°C, resolution 0.01°C |
| Default value | 327.67°C (invalid value) |
| Description | Input variable for accepting the current outdoor temperature value from a weather station, for example. |

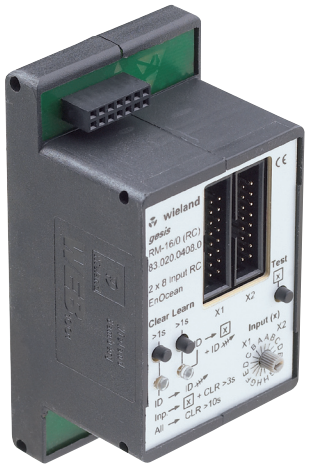
## Parameters

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 240 s |
| Description | A telegram must be received at the connected input variable within the time interval specified here, otherwise an alarm situation will be triggered in the shutter actuator.<br>A value of 0 s deactivates this function. |

# 4.10 gesis RM-16/0 (RC) (83.020.0408.0/1)

## Device Description




- Designation: EnOcean extension module with 16 radio inputs
- Type/model no.:
  - gesis RM-16/0 (RC) 83.020.0408.0
  - gesis RM-16/0 (RC) B 83.020.0408.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Function

The gesis RM-16/0 (RC) is an input module with 16 radio inputs that is based on the EnOcean radio protocol.

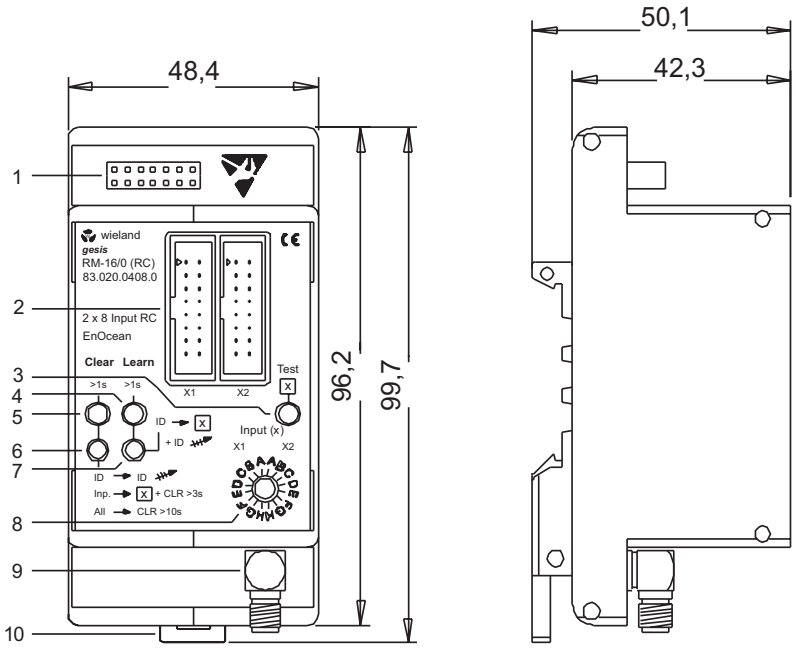
All of the corresponding configurations and software settings must be made via the basic module; the extension module does not have its own intelligence. The inputs can be used for light (switching/dimming), shutter and scene control, evaluated separately from one another and transferred to the network as stand-alone output variables (nvoRCswiSet).

The RM-16/0 (RC) occupies two slots on the basic module and must therefore be connected to this using two flat cables.

There is also the option of using only one of the two slots. Either the first or the second group of eight radio inputs can be used in such cases, along with the corresponding scene and presence objects.

Due to the limitations placed on the system by the Neuron Chips used, a maximum of 62 network variables are available. As a result of this, when the RM-16/0 (RC) (radio input) extension module described here is used on its own, or when a combined system containing this module and the RM-8/0 (12) extension module is used, only a maximum of 3 slots on the basic module can be occupied for the functionality described here. If 4 slots are required, please contact the Wieland Hotline before proceeding.

## Dimensions, Connections and Function Elements




1– JTAG programming port (for service purposes only)
2– X1, X2: Slots for connection to the basic module
3– "Test" button
4– "Learn" button
5– "Clear" button
6– Red "Clear" LED
7– Green "Learn" LED
8– Selector switch for input channels
9– SMA antenna socket
10– Locking slide (with 83.020.0408.0 only)

## Teaching-In and Deleting Radio Transmitters

### Teaching-in

1. Select the required input, A to H (X1/X2), using the selector switch.
2. Press and hold the "Learn" button for more than a second. The green LED will flash.
3. Allow the transmitters that are to be taught-in to transmit three times within two seconds (e.g. press the button three times in succession).
4. Following teaching-in, the green LED will go out and the actuator will automatically exit programming mode.
5. Test whether the required function is correct.

### Clearing radio transmitters (IDs) from all assignments

1. Press and hold the "Clear" button for more than a second. The red LED will flash.
2. Transmitting an ID three times (e.g. using the button) will delete it from module X1 and X2.
3. The red LED will go out and clearing mode will be exited.

### Clearing all radio transmitters (IDs) for an input (A to H, X1/X2)

1. Use the selector switch to select the input to be cleared.
2. Press and hold the "Clear" button for more than a second. The red LED will flash.
3. Press the "Clear" button again (for > 3 s) until the red LED flashes quickly.
   Release the button.
4. The red LED will go out and clearing mode will be exited.

### Clearing all radio transmitters (IDs) (as-delivered state)

1. Press and hold the "Clear" button for more than a second. The red LED will flash.
2. Press the "Clear" button again (for > 10 s) until the red LED goes out. Release the button.
3. Clearing mode will be exited.

### Test function

1. The "Test" button enables you to check the parameterised network assignments for the basic module.
2. Select the input to be checked using the selector switch.
3. Press/release the "Test" button. The parameterised function will be triggered.

## Technical Data

| | |
|---|---|
| Interface with basic module | Two pluggable flat cables |
| Inputs | 2 x 8 EnOcean radio inputs via antenna |
| **Electrical safety** | |
| Protection class/degree of protection | None/IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| **Radio receivers** | |
| Radio protocol | EnOcean |
| Frequency | 868.3 MHz |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Range in buildings (with external antenna): | |
| – Line-of-sight: | Typically 30 m in corridors; up to 100 m in halls |
| – Plasterboard/dry wood walls: | Typically 30m through max. 5 walls |
| – Brick/aerated concrete walls: | Typically 20 m through max. 3 walls |
| – Reinforced concrete walls/ ceilings: | Typically 10 m through max. 1 ceiling |
| – Materials that may limit the range: | Insulation wool on metal foil, intermediate ceilings and floors made from metal or carbon fibre, ESD floorboards, lead glass or glass with metal coating, steel furniture, antennae or transmitters mounted on metal walls. Fire protection walls, lift shafts, stairways and supply areas should be sealed off. The angle at which the radio signals meet a wall also has a role to play. The effective wall thickness and, therefore, the signal attenuation will vary depending on the angle. Where possible, signals should meet a wall at a slight angle. Wall alcoves should be avoided. |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |

| | |
|---|---|
| Relative humidity/moisture condensation | 5% to 93%/not permitted |
| Housing material/colour | Plastic, halogen and phosphorous-free/black |
| Behaviour in fire (housing) | V2 acc. to UL |
| Weight | Approx. 98 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height with TH 35–7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings); Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.
- EnOcean receivers should be placed at least 0.5 m away from other types of transmitter that emit high-frequency signals (such as computers or audio and video systems).

### Assembly (83.020.0408.0)

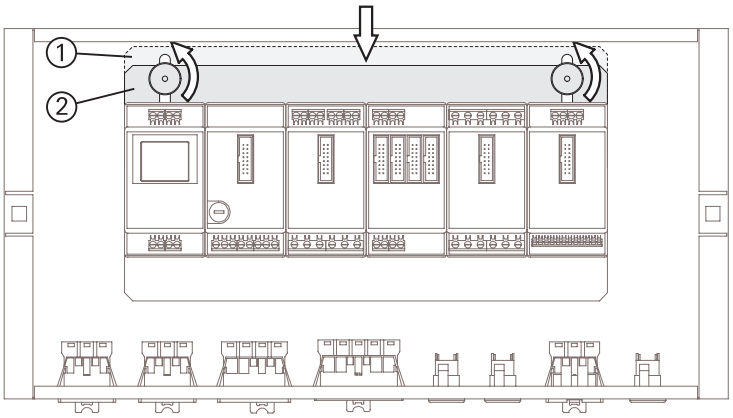
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0408.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0408.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).

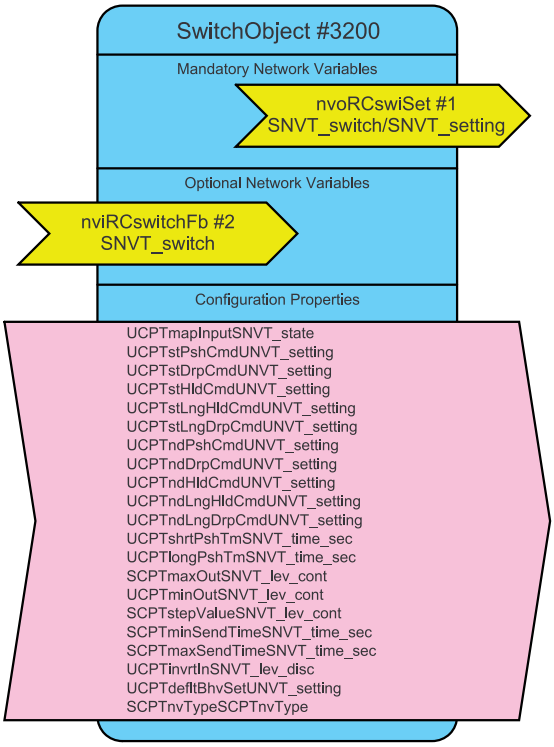



5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

The most important object parameters and variables can be set via the LNS plug-in. Certain special variables can only be parameterised using the LNS tool. The application program description indicates which variables can be set via which applications.

### SwitchObject




The input object is used to control lights and shutters and is always connected to at least one physical input. It has been kept flexible so that it can be used in a wide range of different application areas.

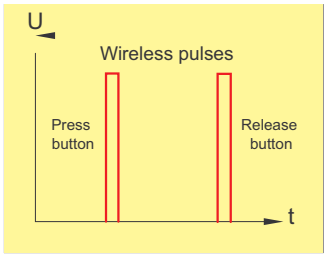
#### Input mode

The inputs on extension module RM-16/0 (RC) can be operated in one of six modes (please also refer to the figures below):

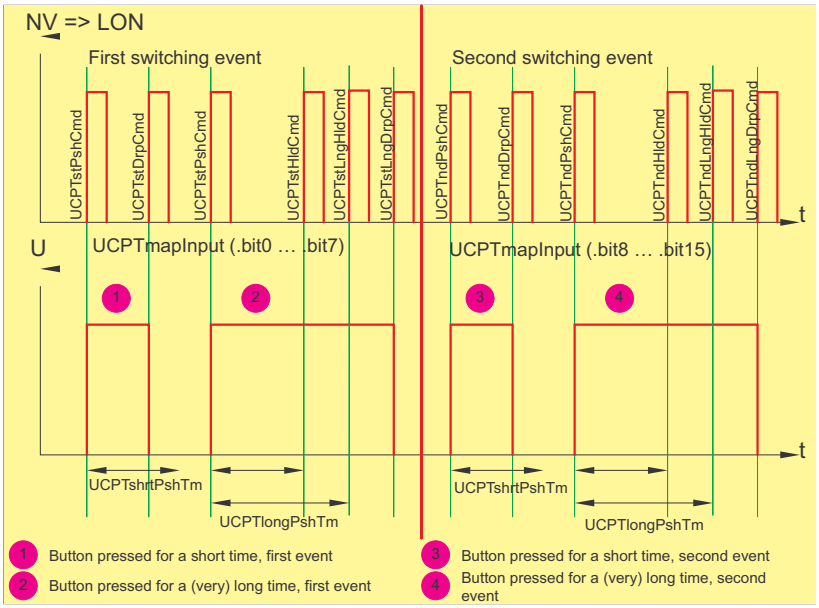
- **Single-face button input** (one rocker button) connected to one input in order to switch and/or dim lights, type used `SNVT_switch`; `SNVT_setting` optional
- **Double-face button input** (two rocker buttons) connected to two inputs in order to switch and/or dim lights, type used `SNVT_switch`; `SNVT_setting` optional
- **Edge evaluation,** i.e. single-face switch operation (one rocker switch) connected to one input, type used `SNVT_switch`; `SNVT_setting optional`
- **Double-face shutter button** (two rocker buttons) connected to two inputs, for UP/DOWN/STOP, type used `SNVT_setting`
- **Single-face scene button** (one rocker button) connected to one input (managed via the "ScenePanel" object, see graphic below), type used `SNVT_scene`

- **Single or double-face occupancy button** (one or two rocker buttons) connected to one or two inputs (managed via the "OccupancySensor" object (see below)), type used `SNVT_occupancy`

The associated electronics must always be designed such that, when a contact closes, it results in a positive edge (LOW => HIGH threshold):




Definition of a witching event at the hardware input of an input object




Assignment of configuration parameters to the ime response at the HW input

Parameterisation is performed by defining one or two different, alternating (one-button operation) telegram sequences. Each button press is specified by means of several events. Parameterisation is performed in a format similar to `SNVT_setting`, but with the addition of the "no action" or "no function" option.

| UNVT_setting.function | SNVT_switch.state | SNVT_switch.value |
|---|---|---|
| SET_NO_FUNC (-2/0xFE) | No change | No change |
| SET_NUL (-1/0xFF) | - 1/0xFF | UNVT_setting.setting |
| SET_OFF (0) | 0 | 0 |
| SET_ON(1) | 1 | SCPTmaxOut or nviRCswitchFb.value |
| SET_DOWN (2) | 1 | Last sent value or nviRCswitchFb.value - SCPTstepValue |
| SET_UP (3) | 1 | Last sent value or nviRCswitchFb.value + SCPTstepValue |
| SET_STOP (4) | 1 | Last sent value or nviRCswitchFb.value |
| SET_STATE (5) | 0/1 | UNVT_setting.setting |

UNVT_setting/SNVT_switch conversion table

Configuration parameter `UCPTmapInput` determines which of the eight digital inputs affect which input object on which button press/switching event.

There are two different types of operating element: single-face and double-face. In the case of a single-face operating element, one of the eight digital inputs generates both the first and second switching events, i.e. both events must be assigned to the same input in `UCPTmapInput`. The corresponding bit is set to "1".

By contrast, in double-face mode two digital inputs are used together, with one generating the first switching event and the other generating the second. The same telegrams are always generated at both associated input objects, so the first switching event must be assigned to the first input and the second switching event to the second input in `UCPTmapInput` accordingly.

The modes are explained in detail below.

- *"Single-face button input" function (nvoRCswiSet; nviRCswitchFb optional)*

With this function, a button press is evaluated at one of the two groups of eight radio inputs of extension module RM-16/0 (RC). When a switch-on telegram is received, the associated input object alternately transmits an ON or OFF command, for example. Inverse switching is implemented with the help of the associated `nviRCswitchFb` feedback network variable, i.e. if ON is present there, OFF is transmitted and vice versa. The standard output variable (in accordance with LonMark Profile #3200) is of the `SNVT_switch` type. As an option, `nvoRCswiSet` can be changed to the `SNVT_setting` type, in accordance with the draft profile created by the "Wohnen mit LON" ("Living with LON") research group of LonMark Deutschland (formerly known as LNO).

The associated configuration parameters must be configured as follows for operation as a single-face, switching button input:

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTndPshCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face button, straightforward switching function

If a value other than ON (SET_ON, with .value = 100% and .state = 1) or OFF (SET_OFF, with .value = 0 and .state = 0) is to trigger a control response, .function must be set to

SET_STATE. UCPTinvrtIn has to be re-parameterised in order to achieve the response of a normally closed contact.

In order to implement a dimming function, it must be possible to make a distinction between a short and a long button press. Two different time intervals are specified for each configuration parameter: UCPTshrtPshTm for short and long button presses and UCPTlongPshTm for long and very long button presses.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstDrpCmd | SET_ON | xxx | xxx |
| UCPTndDrpCmd | SET_OFF | xxx | xxx |
| UCPTstHldCmd | SET_UP | 100 % | xxx |
| UCPTndHldCmd | SET_DOWN | 100 % | xxx |
| UCPTstLngDrpCmd | SET_STOP | xxx | xxx |
| UCPTndLngDrpCmd | SET_STOP | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face button during dimming operation

For lighting control, SNVT_switch (in accordance with LonMark) or SNVT_setting can be used as the network variable type of nvoRCswiSet. If the SNVT_switch type is used, a SET_UP or SET_DOWN command generates several telegrams that have different SCPTstepValue values irrespective of .setting and that are sent at the intervals specified in SCPTminSendTime until SCPTmaxOut or UCPTminOut is reached or a stop command is received. If the SNVT_setting type is used, each telegram is sent just once (in the example, short button press ON/OFF, long button press dim by 100% UP/DOWN or until stop).

The UCPTlongPshTm time interval can also be used for special applications for which longer times are defined.
Switching operation using a single-face button can assume the following states:

- ON
- OFF
- Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoRCswiSet output variable)
- Toggle (with feedback network variable)
- Button pressed for a short time: ON/OFF/enable
- Button pressed for a long time: ON/OFF/enable or no function

The following applies to dimming operation:

- Short button press: = Toggle (ON/OFF)
- Long button press: = "Toggle dimming", i.e. change dimming brightness

- *"Edge control" function (nvoRCswiSet only, no feedback)*

A single-face switch (one rocker switch) is evaluated at one of the 16 radio inputs of extension module RM-16/0 (RC). The switching event of a switch corresponds to that of a button that is pressed for a very long time. When it is pressed, a switch-on telegram causes an ON telegram to be sent and when it is released (switch-off telegram) an OFF telegram is sent, both via the associated input object. As no distinction is required between a short and a long button press, `UCPTshrtPshTm` must be 0, i.e. deactivated. The remaining configuration parameters are configured as follows:

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTstLngDrpCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for single-face switch, UCPTshrtPshTm irrelevant

In certain circumstances it may make sense to use UCPTstLngHldCmd too, thus triggering another event with a delay specified by UCPTlongPshTm.

As the second switching event is not needed here, the associated bits in UCPTmapInput (.bit8 to .bit15) are set to 0.

Switching operation using a single-face switch (edge control) can assume the following states for rising and falling edges:

– ON
– OFF
– Toggle
– Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoRCswiSet output variable)
– No function

The following adjustable parameters are set via configuration parameters:

– Cyclical sending = SCPTmaxSendTime
– Setting of initial value = UCPTdefltBhvSet

- *"Double-face button input" function (nvoRCswiSet/nviRCswitchFb)*

In double-face operation, two radio inputs are always used on the module. One generates the first switching event and the other generates the second. As each rocker button always has to generate the same telegram when pressed, the first event (.bit0 to .bit7 set to 1) must be permanently assigned to one button and the second event (.bit8 to .bit15 set to 1) to the other button via UCPTmapInput; in so doing, each of the two events is permanently assigned to a separate radio input on the module.

So, a double-face button input is a button module with two rocker buttons taught-in at two of the 16 radio inputs of extension module RM-16/0 (RC). If one rocker button is pressed, an ON command is sent via the associated output variable in the network; if the other rocker button is pressed, an OFF command is sent via the same associated output variable. The same configuration parameters apply to operation as a double-face button as for a single-face button.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_ON | xxx | xxx |
| UCPTndPshCmd | SET_OFF | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for double-face button

Switching operation using a double-face button can assume the following states:

– ON
– OFF

– Enable (.value = 0 and .state = -1/0xFF are transferred via the nvoRCswiSet output variable)
– No function

The following applies to dimming operation:

– Short button press: = Toggle (ON/OFF)
– Long button press: = "Toggle dimming", i.e. change dimming brightness

The same configuration parameters and time intervals apply to dimming operation as for a single-face button.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstDrpCmd | SET_ON | xxx | xxx |
| UCPTndDrpCmd | SET_OFF | xxx | xxx |
| UCPTstHldCmd | SET_UP | 100 % | xxx |
| UCPTndHldCmd | SET_DOWN | 100 % | xxx |
| UCPTstLngHldCmd | SET_NO_FUNC | xxx | xxx |
| UCPTstLngDrpCmd | SET_STOP | xxx | xxx |
| UCPTndLngHldCmd | SET_NO_FUNC | xxx | xxx |
| UCPTndLngDrpCmd | SET_STOP | xxx | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

Configuration parameters for double-face button during dimming operation

- *"Double-face shutter button" function (nvoRCswiSet)*

A button module with two rocker buttons taught-in at two radio inputs of the extension module is used here too. The information provided above about the double-face button input also applies in this case. Both inputs are combined via the nvoRCswiSet output variable (now of type SNVT_setting) for shutter control. Two different time intervals are specified for each configuration parameter here too: UCPTshrtPshTm for short and long button presses and UCPTlongPshTm for long and very long button presses.

| Associated CP | UNVT_setting.function | UNVT_setting.setting | UNVT_setting.rotation |
|---|---|---|---|
| UCPTstPshCmd | SET_DOWN | INVALID (end angle) | xxx |
| UCPTndPshCmd | SET_UP | 100 % | xxx |
| UCPTstDrpCmd | SET_STOP | 0 % | xxx |
| UCPTndDrpCmd | SET_STOP | 0 % | xxx |
| Other UCPTxxxs | SET_NO_FUNC | xxx | xxx |

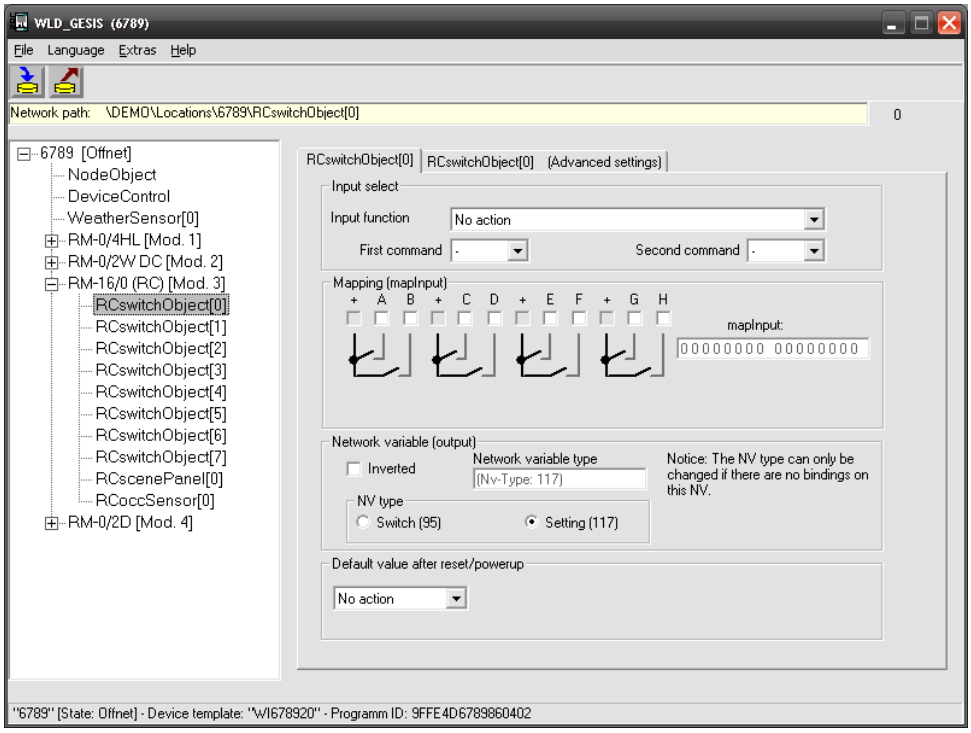
Configuration parameters for double-face shutter button

When the buttons are pressed for a short time, only the louvre is turned UP or DOWN. When the buttons are released after being pressed for a short time, the STOP command is issued. If a long button press is detected, the shutter moves to the TOP or BOTTOM limit position. All configuration parameters for the associated input can be freely configured.

- "*Single-face scene button*" *mode and* "*single or double-face occupancy button*" *mode*

Explanations of these modes can be found in the object descriptions (4.10.24 and 4.10.27).

## Object parameters (plug-in)




SwitchRC – "Standard" tab

The most frequently used configuration values are parameterised in the SwitchRC object's standard view.

Pre-defined input functionalities (button lighting, button shutter, etc.) can be selected, binary inputs can be assigned to software objects and the network variable type of the `nvoRCswiSet` output (`SNVT_switch` or `SNVT_setting`) can be defined here, as can sending behaviour following restoration of the supply voltage or a reset.

### Input selection

*Input function (affects all parameters of type UCPTxxxCmd)*

| | |
|---|---|
| Range of values | Button, single-face (switching); Button, double-face (switching); Button, double-face (dimming); Button, single-face (dimming); Button, double-face (shutter), with end angle; Button, double-face (shutter), without end angle; Switch, single-face (edge control); Set value |
| Default value | No action |
| Description | Pre-defined parameter values for controlling actuators via operating elements connected to the binary inputs can be specified using this selection list, in accordance with LonMark definitions.<br>Individual telegram values can be parameterised in the "Advanced Settings" view. |

*First command/Second command (affects all parameters of type UCPTxxxCmd)*

| | |
|---|---|
| Range of values | A to H |
| Default value | - |
| Description | In the case of functions with double-face operating elements, the ON and OFF switching functions can be assigned to the selected binary inputs here. |

*Mapping (UCPTmapInput)*

| | |
|---|---|
| Range of values | A to H, each ticked or not ticked |
| Default value | None ticked |
| Description | Radio inputs are assigned to software objects here. A maximum of 2 radio inputs can be allocated to a switch object.<br>The parameter settings resulting in UCPTmapInput are shown in the "mapInput" field. |

### Object parameters (LNS tool)

Network variable (output)

*Inverted (UCPTinvrtIn)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The parameterised output signal can be inverted here. |

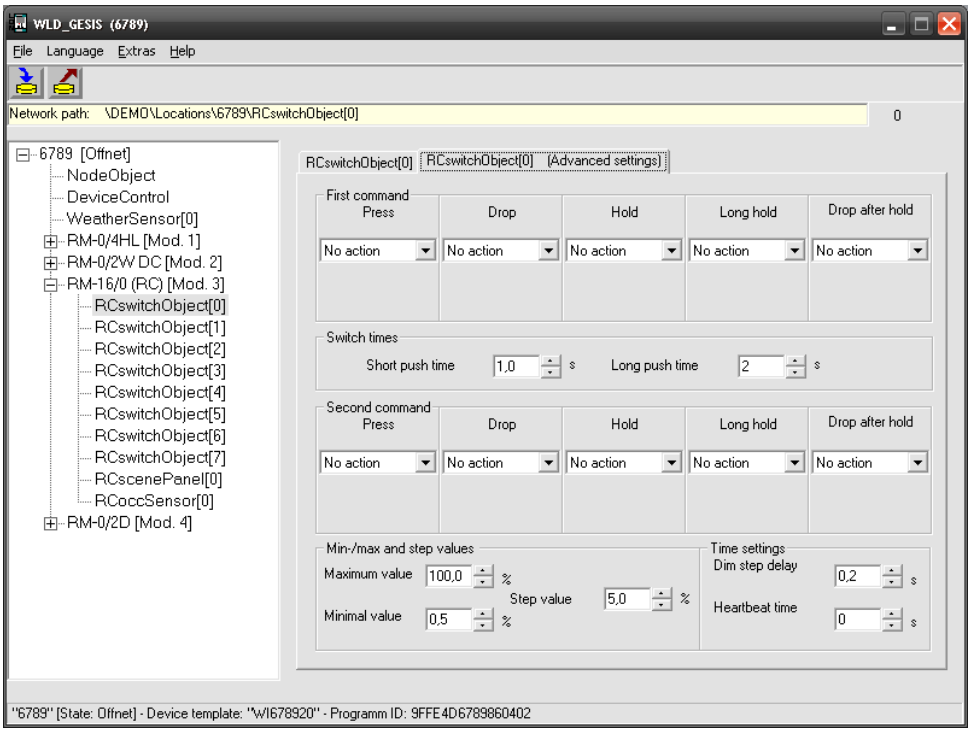
*NV type (SCPTnvType)*

| | |
|---|---|
| Range of values | Switch (95), Setting (117) |
| Default value | Setting (117) |
| Description | The network variable type of the output is dynamic. Here it can be set as Switch (standard for controlling lighting actuators, for example) or Setting (standard for controlling controllers or shutter actuators, for example).<br>Attention! In the case of connected network variables, the system will not allow the network variable type to be modified.<br>Attention! The plug-in must be exited before bindings can be created or deleted. |

*Default send value after reset/power-up (UCPTdefltBhvSet)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | The "start telegram" following a reset or power-up can be defined here. If "Value" is selected, the percentage and/or angle value can also be parameterised. In order to restrict the bus load when the supply voltage is restored, this setting only affects network variables that are also parameterised with a cyclical send interval (SCPTmaxSendTime). |

## Advanced object parameters (plug-in)




SwitchRC – "Advanced" tab

The telegrams and the time responses used when evaluating the radio inputs can be individually set in the SwitchRC object's advanced view. This serves to adapt the telegram sequence to specific requirements that may arise due to the actuators being controlled.

It is always assumed that each button press will trigger five consecutive event; each input can manage two different switching events (telegram sequences) alternately. This means that one button can be used to switch on and off (alternately), please also refer to page 4.10.7.

### First command

*Press (UCPTstPshCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when a radio telegram is received for the first time in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Release (UCPTstDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when a release telegram is received before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Hold (UCPTstHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when, after the switch-on telegram has been received, the "Short button press" (UCPTshrtPshTm) time has elapsed, but the UCPTlngPshTm time has not yet been reached, possibly in accordance with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Long hold (UCPTstLngHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held (not yet released) for the first time once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Release after hold (UCPTstLngDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released (switch-off telegram sent) once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Short button press (UCPTshrtPshTm)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 1 s |
| Description | Distinguishes between a short and a long button press. Usually used to differentiate between switching (short) and dimming (long) commands or louvre step (short) and limit position (long) commands.<br>A value of 0 s deactivates this distinction. "Press" and "hold" will be sent immediately after one another. |

*Long button press (UCPTlongPshTm)*

| | |
|---|---|
| Range of values | 0 to 120 s, resolution 1 s |
| Default value | 2 s |
| Description | Distinguishes between a long and a very long button press. Usually used to evaluate switches or other sensors.<br>A value smaller than or equal to UCPTshrtPshTm deactivates this distinction. The commands "hold" and "long hold" will be sent immediately after one another. |

## Second command

*Press (UCPTndPshCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when a radio telegram is received for the second time in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Release (UCPTndDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the second release telegram is received before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Hold (UCPTndHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when, after the second switch-on telegram has been received, the "Short button press" (UCPTshrtPshTm) time has elapsed, but the UCPTlngPshTm time has not yet been reached, possibly in accordance with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Long hold (UCPTndLngHldCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is held (not yet released) for the second time once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Release after hold (UCPTndLngDrpCmd)*

| | |
|---|---|
| Range of values | No action; OFF; ON; Down; Up; Stop; Down to end angle; Value; Reference movement; INVALID |
| Default value | No action |
| Description | Defines the command output when the button is released (switch-off telegram sent) once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figure on page 1.3 and possibly with the conversion from UNVT_setting to SNVT_switch described on page 1.4. |

*Maximum value (SCPTmaxOut)*

| | |
|---|---|
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 100,0% |
| Description | Defines the maximum output value when dimming or the absolute starting value. |

*Minimum value (UCPTminOut)*

| | |
|---|---|
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 0,5% |
| Description | Defines the minimum output value when dimming. |

*Step size (SCPTstepValue)*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 5,0% |
| Description | Defines the step size for an absolute dimming procedure. Each new dimming telegram causes it to become brighter or darker as per this particular value. |

*Dimming step delay (SCPTminSendTime)*

| | |
|---|---|
| Range of values | 0,1…65534 s, resolution 0.1 s |
| Default value | 0.2 s |
| Description | Defines the minimum time interval between two telegrams at the output variable (telegram limit). It also implements a dimming step delay (time interval between absolute dimming telegrams). |

*Cyclical send interval (SCPTmaxSendTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

## Advanced object parameters (LNS tool)

### Network variables

*nvoRCswiSet*

| | | |
|---|---|---|
| Type | Dynamic (SNVT_switch standard, SNVT_setting optional) | |
| Range of values (SNVT_switch) | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| | Enable | .state = -1 |
| Range of values (SNVT_setting) | .function | SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_ |
| | .setting | STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5%<br>-180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC 0.0%; 0.00° (SNVT_setting) | |
| Description | Output variable for controlling actuators or controllers | |

*nviRCswitchFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status input variable for implementing inverse/cross switching or for accepting the actual dimming value | |

## Parameters

*UCPTmapInput*

| | | | | |
|---|---|---|---|---|
| Type | SNVT_state | | | |
| Range of values | .bit0 to .bit15 (each 0 or 1) | | | |
| Default value | .bit0 to .bit15 = 0 | | | |
| Description | Assigns hardware inputs to software objects and to the first or second switching event. | | | |
| | .bit0 | First input | (A), first switching event | (UCPTstxxxCmd) |
| | .bit1 | Second input | (B), first switching event | (UCPTstxxxCmd) |
| | .bit2 | Third input | (C), first switching event | (UCPTstxxxCmd) |
| | .bit3 | Fourth input | (D), first switching event | (UCPTstxxxCmd) |
| | .bit4 | Fifth input | (E), first switching event | (UCPTstxxxCmd) |
| | .bit5 | Sixth input | (F), first switching event | (UCPTstxxxCmd) |
| | .bit6 | Seventh input | (G), first switching event | (UCPTstxxxCmd) |
| | .bit7 | Eighth input | (H), first switching event | (UCPTstxxxCmd) |
| | .bit8 | First input | (A), second switching event | (UCPTndxxxCmd) |
| | .bit9 | Second input | (B), second switching event | (UCPTndxxxCmd) |
| | .bit10 | Third input | (C), second switching event | (UCPTndxxxCmd) |
| | .bit11 | Fourth input | (D), second switching event | (UCPTndxxxCmd) |
| | .bit12 | Fifth input | (E), second switching event | (UCPTndxxxCmd) |
| | .bit13 | Sixth input | (F), second switching event | (UCPTndxxxCmd) |
| | .bit14 | Seventh input | (G), second switching event | (UCPTndxxxCmd) |
| | .bit15 | Eighth input | (H), second switching event | (UCPTndxxxCmd) |

*UCPTstPshCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 80.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when a radio telegram is received for the first time in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTstDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when a release telegram is received before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTstHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when, after the switch-on telegram has been received, the "Short button press" (UCPTshrtPshTm) time has elapsed, but the UCPTlngPshTm time has not yet been reached, possibly in accordance with the conversion from UNVT_setting to SNVT_switch described on page 1.4. | |

*UCPTstLngHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held (not yet released) for the first time once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTstLngDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_ |
| | .setting | DOWN, SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is released (switch-off telegram sent) once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTndPshCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_ |
| | .setting | DOWN, SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when a radio telegram is received for the second time in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTndDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the second release telegram is received before the time specified via "Short button press" (UCPTshrtPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTndHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when, after the second switch-on telegram has been received, the "Short button press" (UCPTshrtPshTm) time has elapsed, but the UCPTlngPshTm time has not yet been reached, in accordance with the conversion from UNVT_setting to SNVT_switch described on page 4.10.8. | |

*UCPTndLngHldCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is held (not yet released) for the second time once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTndLngDrpCmd*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, |
| | .setting | SET_UP, SET_STOP, SET_STATE |
| | .rotation | 0.0 to 100.0%, resolution 0.5% |
| | | -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the command output when the button is released (switch-off telegram sent) once the time specified via "Long button press" (UCPTlongPshTm) has elapsed, in accordance with the time response shown in the figures on page 4.10.7; refer also to the conversion table (UNVT_setting to SNVT_switch, page 4.10.8). | |

*UCPTshrtPshTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 1 s |
| Description | Distinguishes between a short and a long button press. Usually used to differentiate between switching (short) and dimming (long) commands or louvre step (short) and limit position (long) commands.<br>A value of 0 s deactivates this distinction. UCPTxxDrpCmd is not evaluated; UCPTxxPshCmd and UCPTxxHldCmd will be sent immediately after one another. |

*UCPTlongPshTm*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 120 s, resolution 1 s |
| Default value | 2 s |
| Description | Distinguishes between a long and a very long button press. Usually used to evaluate switches or other sensors.<br>A value smaller than or equal to UCPTshrtPshTm deactivates this distinction. UCPTxxhldCmd and UCPTxxlngHldCmd will be sent immediately after one another. |

*SCPTmaxOut*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 100,0% |
| Description | Defines the maximum output value when dimming or the absolute starting value. |

*UCPTminOut*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 0,5% |
| Description | Defines the minimum output value when dimming. |

*SCPTstepValue*

| | |
|---|---|
| Type | SNVT_lev_cont |
| Range of values | 0.5 to 100.0%, resolution 0.5% |
| Default value | 5,0% |
| Description | Defines the step size for an absolute dimming procedure. Each new dimming telegram causes it to become brighter or darker as per this particular value. |

*SCPTminSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0.1 to 6553 s, resolution 0.1 s |
| Default value | 0.2 s |
| Description | Defines the minimum time interval between two telegrams at the output variable (telegram limit). It also implements a dimming step delay (time interval between absolute dimming telegrams). |

*SCPTmaxSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

*UCPTinvrtIn*

| | |
|---|---|
| Type | SNVT_lev_disc |
| Range of values | ST_OFF, ST_ON |
| Default value | ST_OFF (deactivated) |
| Description | The input's contact positions can be inverted via this parameter. The inversion will become active on the next edge change.<br>ST_OFF The input is not inverted. When the contact closes, this triggers a logical "positive" edge.<br>ST_ON The input is inverted. When the contact closes, this triggers a logical "negative" edge. |

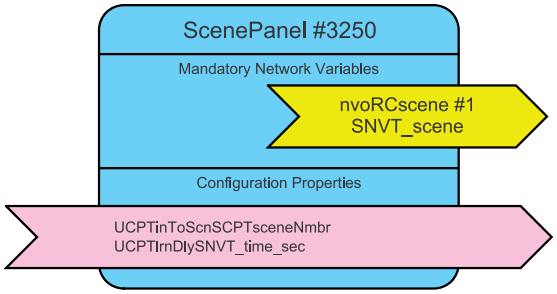
*UCPTdefltBhvSet*

| | |
|---|---|
| Type | UNVT_setting |
| Range of values | .function SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE<br>.setting 0.0 to 100.0%, resolution 0.5%<br>.rotation -180.00° to 180.00°, resolution 0.02° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. |

*SCPTnvType*

| | |
|---|---|
| Type | SNVT_nv_Type |
| Range of values | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT, 2 bytes, A=1, B=0, C=0<br>PID 0:0:0:0:0:0:0:0, Scope 0, Index 117, NVT_CAT_STRUCT, 4 bytes, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 117, NVT_CAT_STRUCT, 4 bytes, A=1, B=0, C=0 |
| Description | Defines the SNVT type of the output variables. "..., Index 95, ..., 2 bytes, ..." means SNVT_switch (e.g. direct control of actuators) and "..., Index 117, ..., 4 bytes, ..." means SNVT_setting (e.g. control of shutter or controllers).<br>Attention! Modifications can only be made if the output variables are not connected. |

## ScenePanel




The scene panel is used for digital inputs/operating elements that control particular scenes in terms of lighting or shutters. All inputs in the extension module can be used as a scene panel for setting/calling up scenes. When a switch-on telegram (switch-off telegram) is received, a corresponding scene number is sent via `nvoScene`. The nvoScene output variable only supports

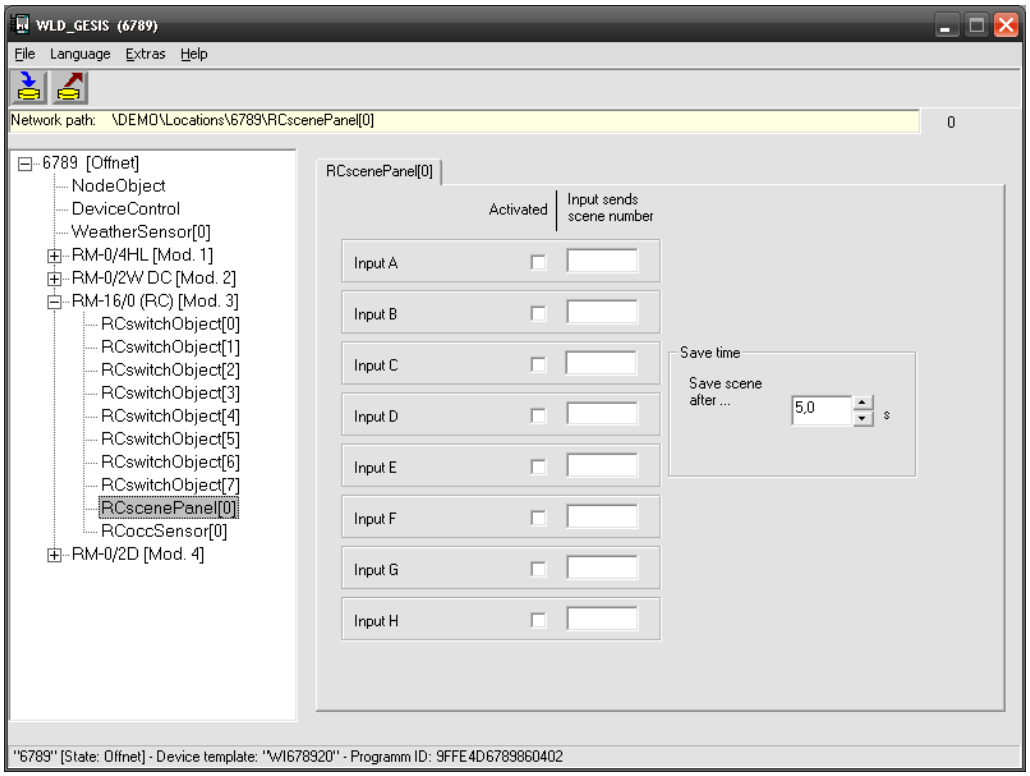
- SC_NUL (-1/0xFF)
- SC_RECALL (0)
- SC_LEARN (1)

These are all values of the associated enumeration in the .function element. The range of scene number values in the `.scene_number` element runs from 0 to 255, where `.function = SC_NUL` and `.scene_number = 0` are invalid values but also the default settings for the output variable.
A scene number can now be assigned to every input via `UCPTinToScn`; these scene numbers are sent to the network via `nvoScene` when the associated button/operating element is pressed. If a 0 (invalid value) is set at the corresponding location, no telegram is generated.

### Saving scenes

`UCPTlrnDly` is used to distinguish between a short and a long button press. A short button press calls a scene up via `nvoScene` (`SC_RECALL`), whilst a long button press activates the teach-in command (`SC_LEARN`), i.e. the corresponding manipulated variables are saved in the scene memory of the receiver (scene controller, for example) under the scene number that has been sent (`.scene_number`).

## Object parameters (plug-in)




RCscenePanel – "Standard" tab

The scene function can be activated/deactivated for each binary input on an individual basis. The corresponding telegram is then sent in parallel with a command parameterised in the switch object, if such a command has been parameterised.

The scene number to be sent and the delay time for a teach-in command are also specified here.

### Channel A (input 1) to Channel H (input 8)

*Ticked*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | Activates/deactivates the scene functionality for the designated channel. |

*Input sends scene number (UCPTinToScn)*

| | |
|---|---|
| Range of values | 1 … 255 |
| Default value | 0 |
| Description | Assigns a scene number to be sent when a switch-off telegram is received to the hardware inputs. |

*Save time (UCPTlrnDly)*

| | |
|---|---|
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 5 s |
| Description | Distinguishes between a short and a long button press. A short button press calls the specified scene number up (SC_RECALL), whilst a long button press saves the scene (SC_LEARN). |

## Object parameters (LNS tool)

### Network variables

*nvoRCScene*

| | | |
|---|---|---|
| Type | SNVT_scene | |
| Range of values | .function | SC_NUL, SC_RECALL, SC_LEARN |
| | .scene_number | 0…255 |
| Default value | SC_NUL; 0 | |
| Description | Output variable for controlling scene controllers or similar | |

### Parameters

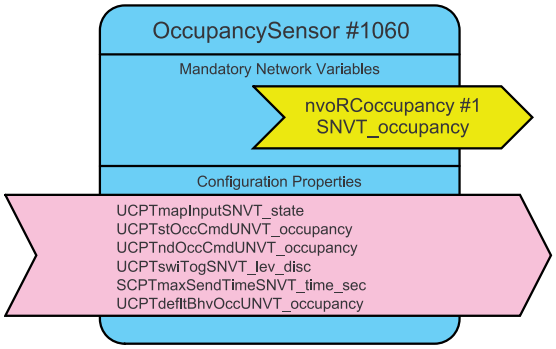
*UCPTinToScn (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | SCPTsceneNmbr |
| Range of values | 0…255 |
| Default value | 0 (deactivated) |
| Description | Assigns a scene number to be sent on a falling edge to the hardware inputs. |

*UCPTlrnDly*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 10.0 s, resolution 0.1 s |
| Default value | 5 s |
| Description | Distinguishes between a short and a long button press. A short button press calls the specified scene number up (SC_RECALL), whilst a long button press saves the scene (SC_LEARN). |

## OccupancySensor

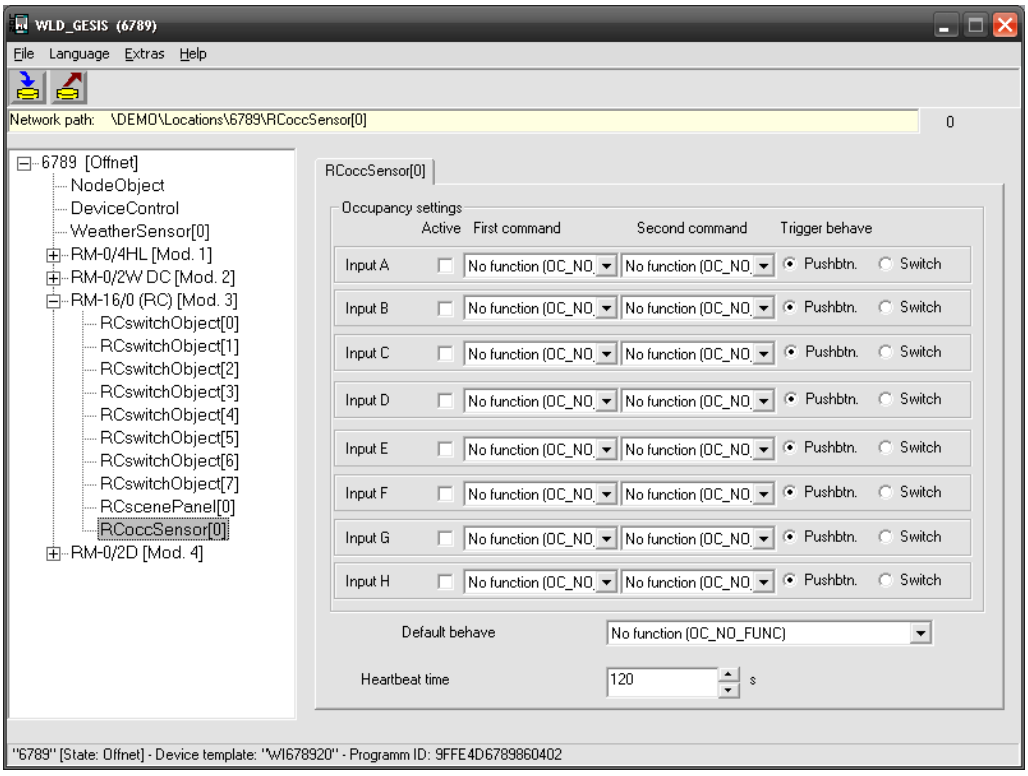



The occupancy sensor is used to control/manage conditions in accordance with the occupancy status of the room or building. All inputs on the extension module can be configured as single or double-face occupancy buttons. Switch-on and switch-off telegrams are evaluated in a similar way to how they are evaluated in the input object (SwitchRC).

`UNVT_occupancy`, which is based on `SNVT_occupancy` but has an additional definition in the form of `OC_NO_FUNC`, has been introduced for some configuration parameters. This indicates that "no action" is to be executed.

If a single-face button is used as the occupancy button, the `UCPTstOccCmd` and `UCPTndOccCmd` parameters are used to configure what occupancy information will be sent via the `nvoOccupancy` output variable on each switching event, in a procedure that is similar to the one performed for the input object (SwitchRC) that has been defined earlier. If the parameter is set to `OC_NO_FUNC`, no information is sent to the network.

### Object parameters (plug-in)




RCoccupancySensor – "Standard" tab

An occupancy function can be activated/deactivated for each radio input on an individual basis. The corresponding telegram is then sent in parallel with a command parameterised in the SwitchRC object, if such a command has been parameterised.

The commands to be sent and the connected operating hardware are also specified here.

#### Occupancy settings (Input A to Input H)

*Active (UCPTmapInput)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | Activates/deactivates the occupancy functionality for the designated channel. |

*First command (UCPTstOccCmd)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output when a switch-on telegram is received for the first time in accordance with the time response shown in the figures on page 4.10.7. |

*Second command (UCPTndOccCmd)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output when a switch-on telegram is received for the second time in accordance with the time response shown in the figures on page 4.10.7. |

*Tripping behaviour (UCPTswiTog)*

| | |
|---|---|
| Range of values | Button; Switch |
| Default value | Button |
| Description | Defines the connected operating unit as a button or a switch. With a button, only the positive edge (receipt of a switch-on telegram) is evaluated; with a switch, both switch-on and switch-off telegrams are evaluated. |

*Start-up behaviour (UCPTdefltBhvOcc)*

| | |
|---|---|
| Range of values | No function; Occupied; Unoccupied; Temporary comfort mode; Night-time reduction; Invalid |
| Default value | No function |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. |

*Cyclical send behaviour (SCPTmaxSendTime)*

| | |
|---|---|
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 120 s |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

### Object parameters (LNS tool)

Network variables

*nvoRCoccupancy (one for the first and one for the second group of eight inputs)*

| | |
|---|---|
| Type | SNVT_occupancy |
| Range of values | OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NUL |
| Description | Output variable for occupancy-dependent control |

## Parameters

*UCPTmapInput (one for the first and one for the second group of eight inputs)*

| | | | | |
|---|---|---|---|---|
| Type | SNVT_state | | | |
| Range of values | .bit0 to .bit15 | Each 0 or 1 | | |
| Default value | .bit0 to .bit15 = 0 | | | |
| Description | Assigns hardware inputs to output variables and to the switching event. | | | |
| | .bit0 | First input | (A), | UCPTstOccCmd |
| | .bit1 | Second input | (B), | UCPTstOccCmd |
| | .bit2 | Third input | (C), | UCPTstOccCmd |
| | .bit3 | Fourth input | (D), | UCPTstOccCmd |
| | .bit4 | Fifth input | (E), | UCPTstOccCmd |
| | .bit5 | Sixth input | (F), | UCPTstOccCmd |
| | .bit6 | Seventh input | (G), | UCPTstOccCmd |
| | .bit7 | Eighth input | (H), | UCPTstOccCmd |
| | .bit8 | First input | (A), | UCPTndOccCmd |
| | .bit9 | Second input | (B), | UCPTndOccCmd |
| | .bit10 | Third input | (C), | UCPTndOccCmd |
| | .bit11 | Fourth input | (D), | UCPTndOccCmd |
| | .bit12 | Fifth input | (E), | UCPTndOccCmd |
| | .bit13 | Sixth input | (F), | UCPTndOccCmd |
| | .bit14 | Seventh input | (G), | UCPTndOccCmd |
| | .bit15 | Eighth input | (H), | UCPTndOccCmd |

*UCPTstOccCmd (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output when a switch-on telegram is received for the first time, in accordance with the time response shown in the figure on page 1.3. |

*UCPTndOccCmd (8x available, each with one parameter per input)*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output when a switch-on telegram is received for the second time, in accordance with the time response shown in the figure on page 1.3. |

*UCPTswiTog (one for the first and one for the second group of eight inputs)*

| | |
|---|---|
| Type | UNVT_state_8 |
| Range of values | .bit0 to .bit7 Each 0 or 1 |
| Default value | .bit0 to .bit7 = 0 |
| Description | Defines the connected operating unit as a button (0) or a switch (1). With a button, only a switch-on telegram is evaluated; with a switch, both switch-on and switch-off telegrams are evaluated. |

*SCPTmaxSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 120.0 s |

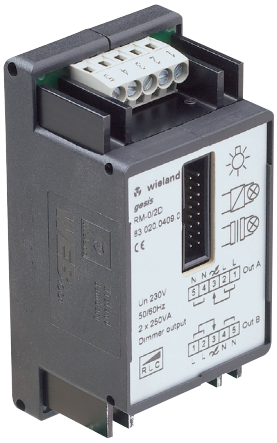
| | |
|---|---|
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

*UCPTdefltBhvOcc (one for the first and one for the second group of eight inputs)*

| | |
|---|---|
| Type | UNVT_occupancy |
| Range of values | OC_NO_FUNC, OC_NUL, OC_OCCUPIED, OC_UNOCCUPIED, OC_BYPASS, OC_STANDBY |
| Default value | OC_NO_FUNC |
| Description | Defines the command output after a reset, restoration of the supply voltage or another similar fault. |

# 4.11 gesis RM-0/2D (83.020.0409.0/1)

## Device Description



- Designation: Extension module with 2 universal dimmers, 230 V AC
- Type/model no.:
  - gesis RM-0/2D 83.020.0409.0
  - gesis RM-0/2D B 83.020.0409.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

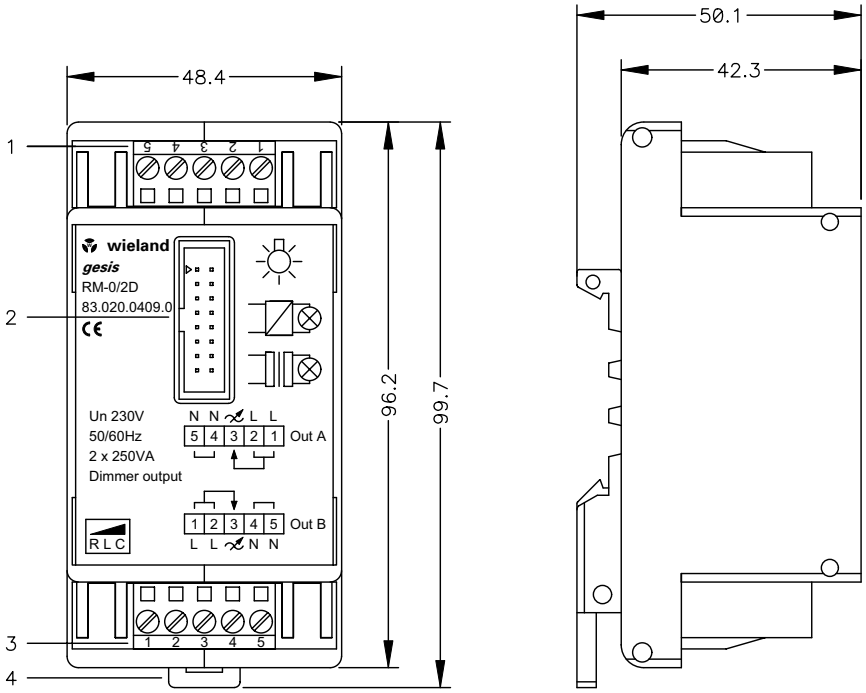
## Function

The 230 V AC gesis RM-0/2D module with 2 universal dimmers switches or dims two groups of consumers that are independent of one another. The extension module receives the switching/dimming commands from the basic module, and the possible status messages of the outputs are sent by the basic module to the bus.

Lamps with incandescent light bulbs, high-voltage halogen lamps and low-voltage halogen lamps with an upstream transformer (either conventional or electronic) are all suitable for connection. (For dimming low-voltage halogen lamps, we recommend using our electronic transformers.)

Consumers are connected by means of screw clamp terminals. Different functions can be assigned to the outputs by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for each pair of outputs.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | 5-pin connection terminal strip for output A (for details please refer to "Terminal Assignment") |
| 2– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 3– X2 | 5-pin connection terminal strip for output B (for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0409.0 only |

## Terminal Assignment:

**X1**: Terminals 1/2 and 4/5 are bridged internally

1– Connection or routing of the mains voltage (potential L)
2– Connection or routing of the mains voltage (potential L)
3– Connection for output A
4– Connection or routing of the mains voltage (potential N)
5– Connection or routing of the mains voltage (potential N)

**X2**: Terminals 1/2 and 4/5 are bridged internally

1– Connection or routing of the mains voltage (potential L)
2– Connection or routing of the mains voltage (potential L)
3– Connection for output B
4– Connection or routing of the mains voltage (potential N)
5– Connection or routing of the mains voltage (potential N)

## Technical Data

| | |
|---|---|
| Connection to basic module | 16-pin pluggable flat cable<br>(conforming to EN 60603-13, without interlocking) |
| **Mains connection/outputs** | |
| Dimming outputs | Two, independent of one another |
| Connected load | Max. 250 VA per output |
| Rated voltage | 230 V AC +10% / –15%, 50-60 Hz |
| Minimum load | 30 VA |
| Automatic load detection | Yes |
| Dimming process | ading edge or trailing edge phase,<br>depending on the type of load |
| Overload protection | Yes |
| Short circuit protection | Yes |
| Overtemperature protection | Yes |
| No-load power consumption | Approx. 0.7 W per channel |
| Power loss | pprox. 2 W per channel at 250 W incandescent bulb load |
| Connection type | Screw clamp terminal<br>0,14…4 mm², solid<br>0,14…2,5 mm², stranded<br>6.5 mm stripped in each case |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE<br>400 V external conductor to external conductor |
| **Environmental conditions** | |
| Field of application | Fixed installation in interior and dry areas |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| Housing material/colour | Plastic, halogen and phosphorous-free, black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 135 g |
| CE certification | In acc. with EMC Directive (residential and functional buildings),<br>Low Voltage Directive |

## Installation

**CAUTION**

- Only transformers that are permitted for dimming operation may be used.
- Conventional transformers may only be used if they are VDE-approved and have a thermal fuse.
- No-load operation of conventional, dimmable transformers is not permitted.
- Combined operation, involving both inductive loads (e.g. conventional transformers) and capacitive loads (e.g. electronic transformers), is not permitted.
- The device features varistor protection. Neutral conductor interruption, overvoltage and conventional transformers operating under no-load conditions may lead to damage and failure.
- It should be ensured that the place of installation offers sufficient capacity for heat dissipation.

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0409.0)

1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the
   basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

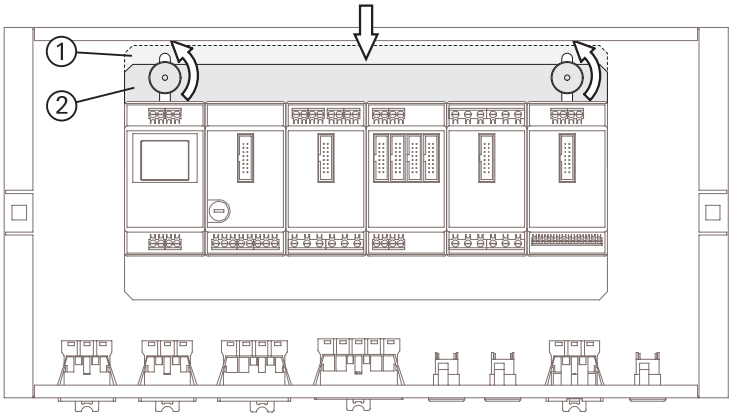
### Disassembly (83.020.0409.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0409.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.

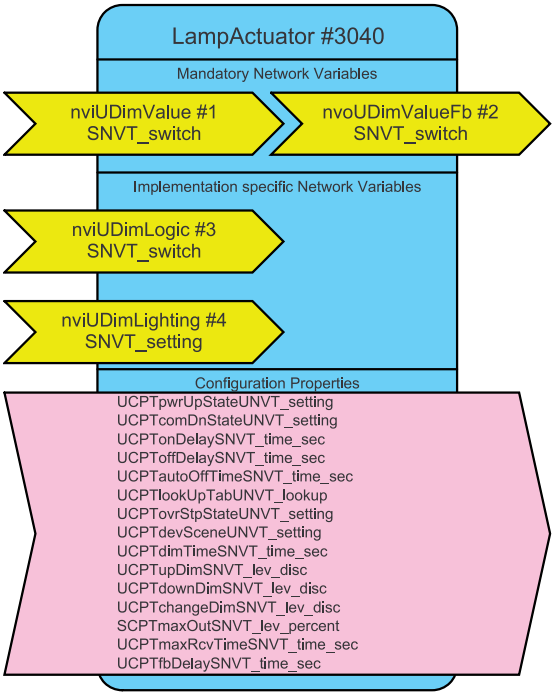
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### LampActuator




The software application section assigned to the extension module contains a total of 2 LonMark objects based on a LampActuator in accordance with LonMark Profile #3040 (see figure above), i.e. one such object is available for each channel.

#### Relative control

In addition to the functions stipulated here, the extension module also features another input for relative control (`nviUDimLighting`). This input can be used to control lights in accordance with the specifications of the "Wohnen mit LON" ("Living with LON") research group of LonMark Deutschland e.V.

#### Logic functions

The LampActuator is used to directly control dimmed lights. It supports the prescribed functionality of LonMark Profile #3040 and also adds to it by providing the option of logic operations with `nviUDimLogic` as an additional input.

All types of logic operation, including multi-stage operations, are available via a reference (look-up) table with two inputs (`nviUDimValue` and `nviUDimLighting` are evaluated next to one another as equivalent inputs) and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviUDimLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated configuration parameters. Prioritised control is now possible (override function).

The four highest bits (.bit7 to .bit4) are used to specify the source of the percentage dimming values. This means that the reference table can not only be used for digital operations, but also for a type of "logic operation" between dimming values.

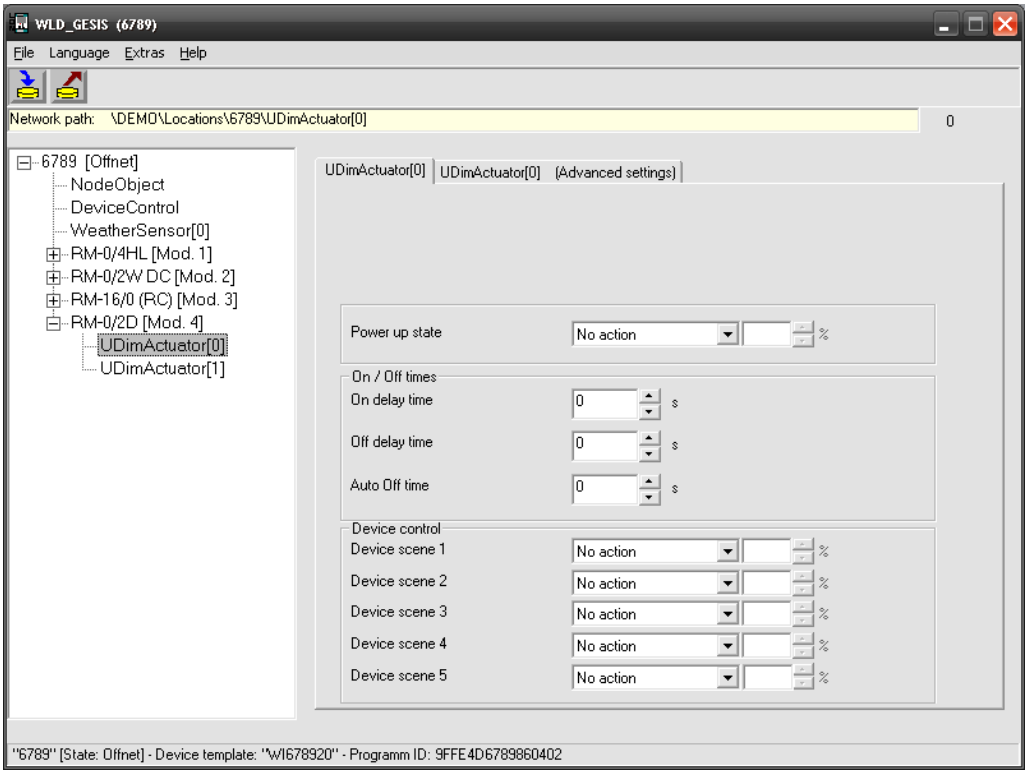
### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/ `UCPToffDelay`), automatic switch-off (stairway light via `UCPTautoOffTime`) and feedback delays (`UCPTfbDelay` for `nvoDimValueFb`).

The behaviour on switching from one dimming value to the next required dimming value can be controlled via parameters `UCPTdimTime`, `UCPTupDim`, `UCPTdownDim` and `UCPTchangeDim`. Parameter `UCPTdimTime` also defines the dimming time response when controlled via input `nviUDimLighting` (relative control, `SNVT_setting`).

In addition, the output's response to particular situations can also be set with `UCPTpwrUpState` (restoration of supply voltage or restart) or `UCPTcomDnState` (communication failure).

### Object parameters (plug-in)




UDimActuator – "Standard" tab

The most frequently used configuration values are parameterised in the UDimActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

## Parameters

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviUDimValue or nviUDimLighting.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoUDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviUDimValue or nviUDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoUDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

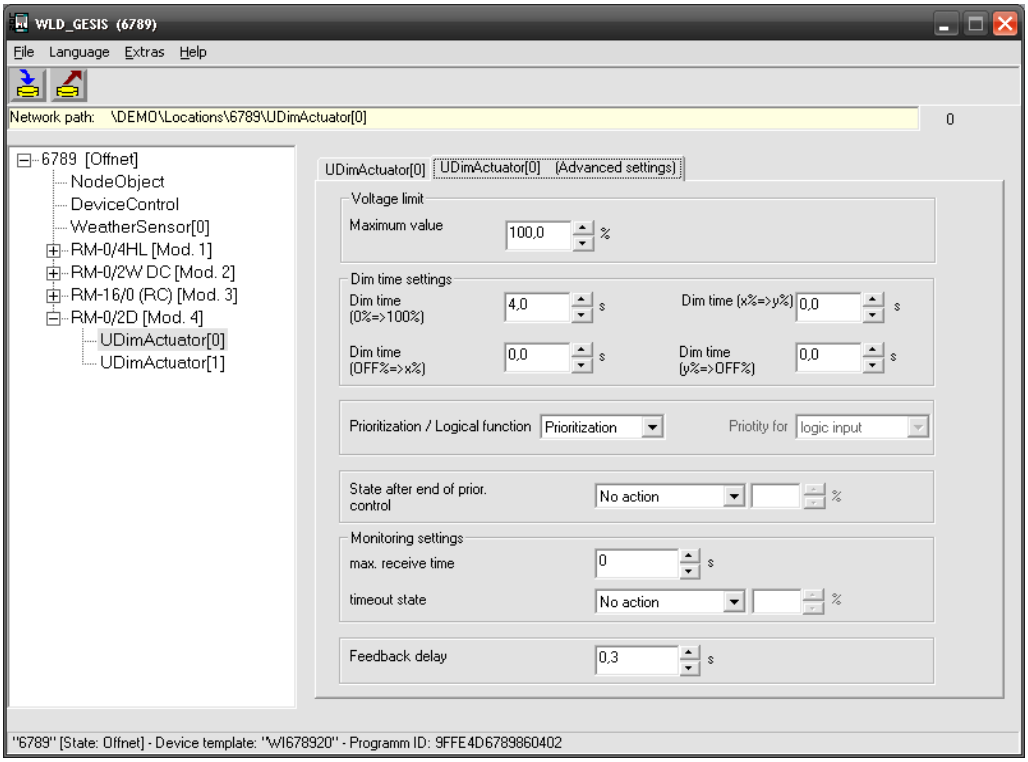
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviUDimValue or nviUDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviUDimValue or nviUDimLighting (usually a manual operation).<br>The nvoUDimValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object.<br>If "Value" is selected, the dimming value can be specified in the "%" field. |

### Advanced object parameters (plug-in)




UDimActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the UDimActuator object's advanced view.

#### Voltage limits

*Upper voltage limit (SCPTmaxOut)*

| | |
|---|---|
| Range of values | 0.0 to 100.0%, resolution 0.1% |
| Default value | 100,0% |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected. |

#### Dimming time settings

*Dimming time (0% to 100%) (UCPTdimTime)*

| | |
|---|---|
| Range of values | 0…60,0 s, resolution 0.1 s |
| Default value | 4,0 s |
| Description | If the nviUDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the other parameters in this area of the window. |

*Change in value (x% to y%) (UCPTchangeDim)*

| | |
|---|---|
| Range of values | 0…60,0 s, resolution 0.1 s |
| Default value | 0,0 s (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviUDimValue or nviUDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-on (OFF to x%) (UCPTupDim)*

| | |
|---|---|
| Range of values | 0…60,0 s, resolution 0.1 s |
| Default value | 0,0 s (deactivated) |
| Description | This parameter can be used to increase the level of brightness if nviUDimValue is being used for control. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-off (y% to 0%) (UCPTdownDim)*

| | |
|---|---|
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to dim the lights if nviUDimValue is being used for control. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviUDimValue and nviUDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs.<br>The "Percentage value" field is used to define which network variable the percentage value should be adopted from. |

*State at end of prioritised control (UCPTovrStpState)*

| | | |
|---|---|---|
| Range of values | OFF; ON; No action; Value; Current value | |
| Default value | No action | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviUDimLogic). | |
| | No action | No action is performed, the relay remains in its current position. |
| | Current value | The output is switched to the value present at nviUDimValue. |
| | Value | The value specified in the "%" field is adopted for the actuator. |
| | OFF | The output is deactivated. |
| | ON | The output is activated. |

### Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviUDimValue or nviUDimLighting/nviUDimLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received.<br>If "Value" is selected, the dimming value can be specified in the "%" field. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0,3 s |
| Description | The time specified here delays the status telegram at nvoUDimValueFb.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviUDimValue*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviUDimLogic. | |

*nvoUDimValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0, 100,0% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay. | |

*nviUDimLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab). | |

*nviUDimLighting*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | Invalid value |
| Default value | SET_NUL; 0.0%; 0.00°; Invalid value | |
| Description | Input variable for the associated actuator channel for relative control. The input is equivalent to nviUDimValue and only one of these two inputs should ever be used. Can be logically combined via nviUDimLogic. | |

## Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviUDimValue and nviUDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoUDimValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. The time is only evaluated if there are telegrams at nviUDimValue and nviUDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoUDimValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTautoOffTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6.553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after a delay configured via UCPTonDelay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviUDimValue and nviUDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised via UCPToffDelay, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviUDimValue or nviUDimLighting (usually a manual operation).<br>The nvoLDimValueFb status output is updated when the channel is deactivated, depending on UCPTfbDelay.<br>A value of 0 s deactivates this function. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 (prioritised input) | |
| Description | This parameter configures how the nviUDimValue, nviUDimLighting and nviUDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviUDimValue, the second (e.g. IN10) the value at nviUDimLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviUDimValue, 1 = nviUDimLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input nviUDimLogic has priority over the nviUDimValue and nviUDimLighting inputs. If a valid value is present at nviUDimLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviUDimLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviUDimValue or nviUDimLighting.<br>In the event of control via nviUDimValue or nviUDimLighting, the parameterised time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviUDimLogic). Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_NUL | The output is switched to the value present at nviUDimValue or nviUDimLighting. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the output remains at its current setting. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdimTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 4.0 s |
| Description | If the nviUDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the UCPTupDim, UCPTdownDim and UCPTchangeDim parameters. |

*UCPTupDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 (deactivated) |
| Description | This parameter can be used to increase the level of brightness. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0.0 s deactivates this function. |

*UCPTdownDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 (deactivated) |
| Description | This parameter can be used to dim the lights. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0.0 s deactivates this function. |

*UCPTchangeDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviUDimValue or nviUDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0.0 s deactivates this function. |

*SCPTmaxOut*

| | |
|---|---|
| Type | SNVT_lev_percent |
| Range of values | 0.0 to 100.0%, resolution 0.1% |
| Default value | 100,0% |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>If is often advisable to set the upper limit to a value of just below 100.0% in order to extend the service life of the lighting appliances, as barely any more light is emitted if the value is set above this level anyway. |

*SCPTmaxRcvTime*

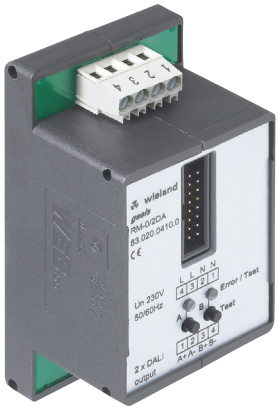
| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | A telegram must be received at the connected input nviUDimValue or nviUDimLighting within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState.<br>A value of 0.0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0.3 s |
| Description | The time specified here delays the status telegram at nvoUDimValueFb.<br>A value of 0.0 s deactivates this function. |

# 4.12 gesis RM-0/2DA (83.020.0410.0/1)

## Product Description



- Designation: Extension module with 2 switching/dimming actuators
- Type/model no.:
  - gesis RM-0/2DA 83.020.0410.0
  - gesis RM-0/2DA B 83.020.0410.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

## Function

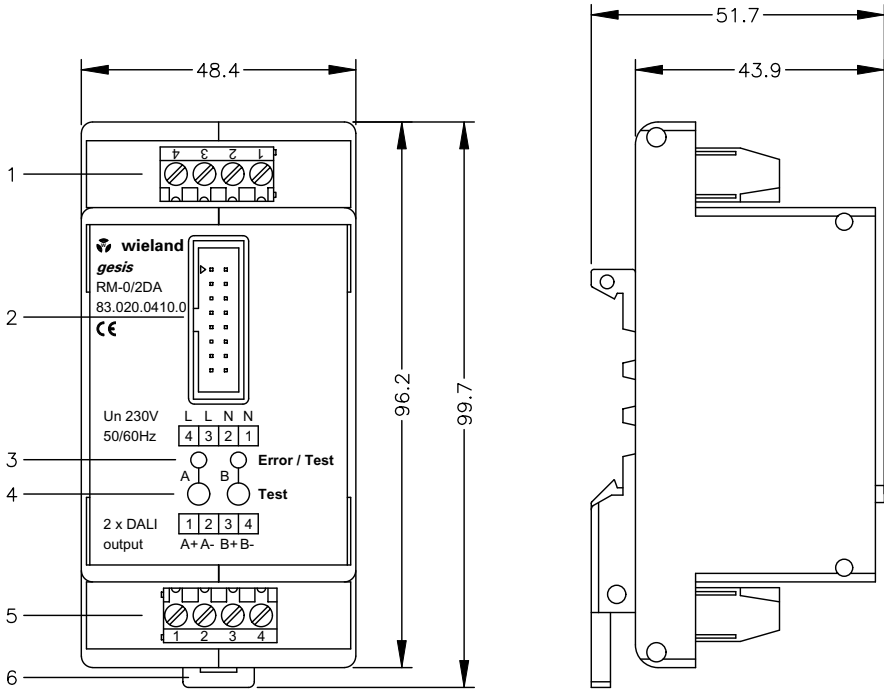
The extension module with 2 DALI actuators is part of the gesis RM series of devices. It has two DALI channels that can be controlled separately from one another.

The maximum of eight DALI electronic ballasts that can be connected to each channel work in parallel (broadcast transmission). Messages from DALI electronic ballasts which are sent via the basic module to the connected bus system are gathered as group messages for each DALI channel. The DALI electronic ballasts do not have to be taught-in. The front of the module features a button and a status LED for the respective purposes of manual operation and displaying the status for each DALI channel.

Communication with the bus takes place via the basic module. For this, switching commands are accepted and status values provided. The connection to the basic module is established using the flat cable supplied.

The consumers are connected by means of screw clamp terminals. Different functions can be assigned to the output channels by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for every pair of output channels.

## Dimensions and Connections




| | |
|---|---|
| 1– X1 | Connection for the operating voltage |
| 2– Slot | Connection to the basic module |
| 3– LEDs | H1 (left), H2 (right); for displaying the status and errors of DALI channel A/B |
| 4– Button | S1 (left), S2 (right); for DALI channel A/B test mode |
| 5– X2 | For connecting DALI channels A and B |
| 6– Locking slide | With 83.020.0410.0 only |

## Function Elements

### Operating elements

Pressing button S1 or S2 activates the test mode for DALI channel A or B. In test mode, LED H1 or H2 lights up.

Button S1/S2:
Short button press: Switches channel A/B on or off
Long button press: Switches brightening/dimming for channel A/B on or off

If neither of the buttons are pressed again, the device will wait for 10 seconds before automatically switching back to normal mode, and the value transferred by the basic module will be set.

### Indicators:

| LED H1/H2 | |
|---|---|
| Off | Normal mode, channel A/B, no errors |
| Lit up | Test mode, channel A/B |
| Flashing | Lamp error or communication error on channel A/B |

## Terminal Assignment:

**X1**: Connection and routing of the mains voltage; terminals 1/2 and 3/4 are bridged internally

1– Connection/routing of N
2– Connection/routing of N
3– Connection/routing of L
4– Connection/routing of L

**X2**: Connection of the DALI control outputs

1– DALI channel A+
2– DALI channel A–
3– DALI channel B+
4– DALI channel B–

## Technical Data

| | |
|---|---|
| Operating voltage | 230 V AC +10% / –15%, 50 to 60 Hz |
| Connection to basic module | Pluggable flat cable |
| **Outputs** | |
| Number | Two, DALI channels |
| DALI bus voltage | Approx. 16 V |
| Load capacity | Eight DALI electronic ballasts per channel acc. to EN 60929 (input impedance per electronic ballast ≥ 8 kΩ) |
| Connection type | Screw clamp terminals<br>0.14 to 4 mm², solid<br>0.14 to 2.5 mm², stranded<br>6.5 mm stripped in each case |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Electrical isolation | Air gap/creepage paths > 5.5 mm |
| **Environmental conditions** | |
| Field of application | For fixed installation in interior and dry areas |
| Temperature ranges | |
| – Operating environment | –5°C to +45°C |
| – Storage | –25°C to +70°C |
| Relative humidity | 5% – 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material/colour | Plastic, halogen and phosphorous-free, black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 190 g |
| Dimensions | See "Dimensions and Connections" |
| – Height with TH 35–7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings),<br>Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0410.0)

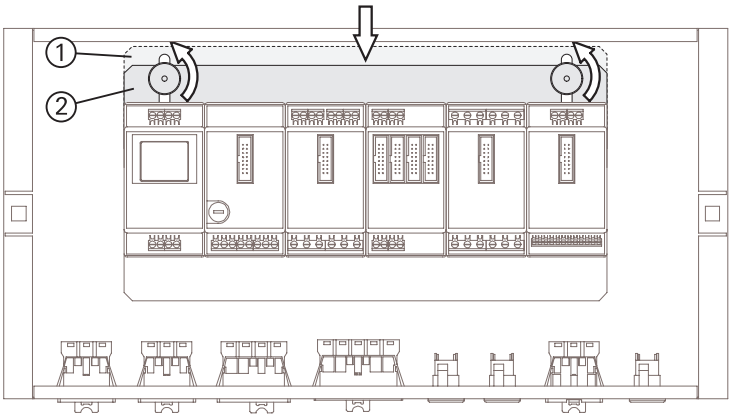
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0410.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0410.1)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).

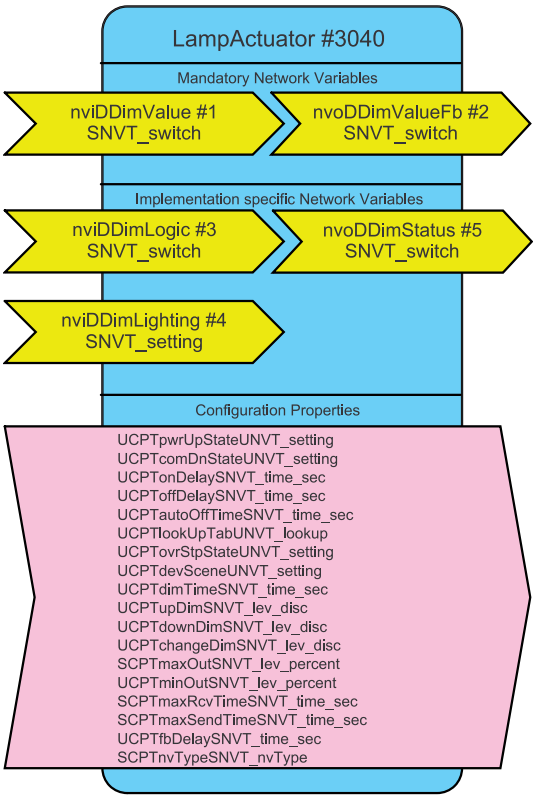



5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.

7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### LampActuator




The software application section assigned to the extension module contains a total of 2 LonMark objects based on a LampActuator in accordance with LonMark Profile #3040 (see figure above), i.e. one such object is available for each channel.

#### Relative control

In addition to the functions stipulated here, the extension module also features another input for relative control (`nviDDimLighting`). This input can be used to control lights in accordance with the specifications of the "Wohnen mit LON" ("Living with LON") research group of LonMark Deutschland e.V.

#### Logic functions

The DDimActuator (DALI actuator) is used to directly control lighting applications with a DALI control input. It supports the prescribed functionality of LonMark Profile #3040 and also adds to it by providing the option of logic operations with `nviDDimLogic` as an additional input.

All types of logic operation, including multi-stage operations, are available via a reference table with two inputs (`nviDDimValue` and `nviDDimLighting` are evaluated next to one another as equivalent inputs) and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviDDimLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated configuration parameters. Prioritised control is now possible (override function).

The four highest bits (.bit7 to .bit4) are used to specify the source of the percentage dimming values. This means that the reference table can not only be used for digital operations, but also for a type of "logic operation" between dimming values.

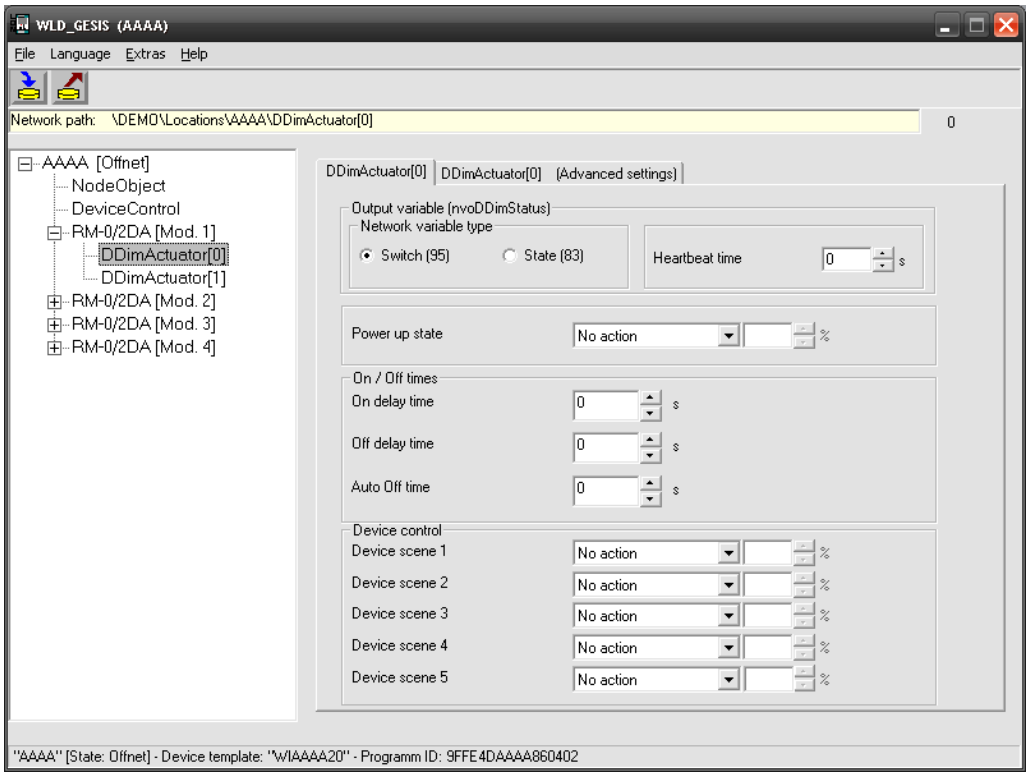
### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/ `UCPToffDelay`), automatic switch-off (stairway light via `UCPTautoOffTime`) and feedback delays (`UCPTfbDelay` for `nvoDDimValueFb`).

The behaviour on switching from one dimming value to the next required dimming value can be controlled via parameters `UCPTdimTime`, `UCPTupDim`, `UCPTdownDim` and `UCPTchangeDim`. Parameter `UCPTdimTime` also defines the dimming time response when controlled via input `nviDDimLighting` (relative control, `SNVT_setting`).

In addition, the output's response to particular situations can also be set with `UCPTpwrUpState` (restoration of supply voltage or restart) or `UCPTcomDnState` (communication failure).

### Object parameters (plug-in)




DALI actuator (DDimActuator) – "Standard" tab

The most frequently used configuration values are parameterised in the DDimActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

## Parameters

*nvoDDimStatus - Network variable type (SCPTnvType)*

| | |
|---|---|
| Range of values | Switch (95), State (83) |
| Default value | Switch (95) |
| Description | This parameter can be used to toggle the NV type of the "nvoDDimStatus" output network variable between Switch (95) and LevPervcent (81).<br>Attention:<br>The system will not allow connected network variables to be modified.<br>If the network variable is already connected, the NV type can no longer be modified and the input elements will be deactivated. If you do need to change the type, all bindings of the relevant network variable must be removed and recreated once the type has been changed. |

*Cyclical send interval (SCPTmaxSendTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Defines the maximum time interval between two telegrams (cyclical sending) at the output variable (heartbeat function). This can be used to monitor communication at the receiver.<br>A value of 0 s deactivates this function. |

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage.<br>If "Value" is selected, the dimming value can be specified in the "%" field (0 to 100). |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviDDimValue or nviDDimLighting.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoDDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviDDimValue or nviDDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoDDimValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

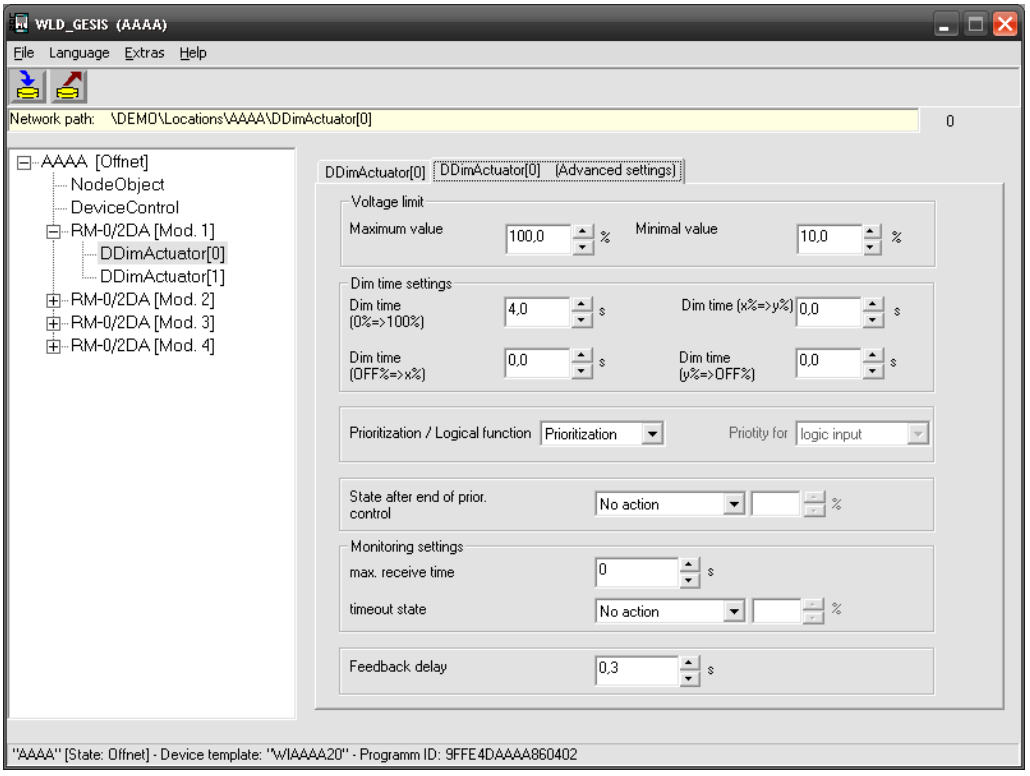
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviDDimValue or nviDDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviDDimValue or nviDDimLighting (usually a manual operation).<br>The nvoDDimValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object.<br>If "Value" is selected, the dimming value can be specified in the "%" field (0 to 100). |

## Advanced object parameters (plug-in)




DALI actuator (DDimActuator) – "Advanced" tab

Special configuration values that are seldom used are parameterised in the DDimActuator object's advanced view.

### Voltage limits

*Maximum value (SCPTmaxOut)*

| | |
|---|---|
| Range of values | 10.0 to 100.0%, resolution 0.1% |
| Default value | 100,0% |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>If is often advisable to set the upper limit to a value of just below 100% in order to extend the service life of the lighting appliances, as barely any more light is emitted if the value is set above this level anyway.<br>Attention!<br>The maximum value must always be greater than or equal to the minimum value. If a maximum value is set that is lower than the minimum value, the minimum value's input field is highlighted and it is not possible to switch to a different object or to execute a save procedure. |

*Minimum value (UCPTminOut)*

| | |
|---|---|
| Range of values | 10.0 to 100.0%, resolution 0.1% |
| Default value | 10,0% |
| Description | This value specifies the minimum output value (lower limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>It is often advisable to set the lower limit to a value of over 1 V, as the lighting appliances emit barely any light at all if the value is set below this level.<br>**Attention:**<br>The minimum value must always be lower than or equal to the maximum value. If a minimum value is set that is greater than the maximum value, the input field is highlighted and it is not possible to switch to a different object or to execute a save procedure. |

## Dimming time settings

*Dimming time (0% to 100%) (UCPTdimTime)*

| | |
|---|---|
| Range of values | 0.0 to 60.0 s, resolution 0.1 s |
| Default value | 4.0 s |
| Description | If the nviDDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the other parameters in this area of the window. |

*Change in value (x% to y%) (UCPTchangeDim)*

| | |
|---|---|
| Range of values | 0.0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviDDimValue or nviDDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-on (OFF to x%) (UCPTupDim)*

| | |
|---|---|
| Range of values | 0.0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to increase the level of brightness. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Switch-off (y% to 0%) (UCPTdownDim)*

| | |
|---|---|
| Range of values | 0.0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to dim the lights. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviDDimValue and nviDDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs.<br>The "Percentage value" field is used to define which network variable the percentage value should be adopted from. |

*State at end of prioritised control (UCPTovrStpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value; Current value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviDDimLogic).<br>No action — No action is performed, the output remains in its current position.<br>Current value — The output is switched to the value present at nviDDimValue.<br>Value — The value specified in the "%" field is adopted for the actuator.<br>OFF — The output is deactivated.<br>ON — The output is activated. |

## Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0 to 6,553.4 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviDDimValue or nviDDimLighting/nviDDimLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received.<br>If "Value" is selected, the dimming value can be specified in the "%" field (0 to 100). |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 0.1 s |
| Default value | 0.3 s |
| Description | The time specified here delays the status telegram at nvoDDimValueFb.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviDDimValue*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviDDimLogic. | |

*nvoDDimValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0, 100,0% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay. | |

*nviDDimLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab, page 1.11). | |

*nviDDimLighting*

| | | |
|---|---|---|
| Type | SNVT_setting | |
| Range of values | .function | SET_NUL, SET_OFF, SET_ON, SET_DOWN, SET_UP, SET_STOP, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | Invalid value |
| Default value | SET_NUL; 0.0; Invalid value | |
| Description | Input variable for the associated actuator channel for relative control. The input is equivalent to nviDDimValue and only one of these two inputs should ever be used. Can be logically combined via nviDDimLogic. | |

*nvoDDimStatus*

| | | |
|---|---|---|
| Type | SNVT_switch/SNVT_setting | |
| Range of values | SNVT_switch | 0.0; 0 = no failure / 100.0%; 1 = lamp failure / 0.0; -1 = other failure |
| | SNVT_state8 | .bit0 = 1 = lamp failure;<br>.bit1 = 1 = other failure<br>.bit7 = 1 = lighting appliance active |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the DALI/lighting appliance status of the associated actuator channel. | |

## Parameters

*SCPTnvType*

| | | |
|---|---|---|
| Type | SNVT_nvType | |
| Range of values | Switch (95) | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT, 2 bytes, A=0, B=0, C=0 |
| | State (83) | PID 0:0:0:0:0:0:0:0, Scope 0, Index 83, NVT_CAT_STRUCT, 2 bytes, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT, 2 bytes, A=0, B=0, C=0 | |
| Description | Defines the SNVT type of the nvoDDimStatus output variable. "…, Index 95, …, 2 bytes, …" means SNVT_switch (e.g. direct control of actuators) and "…, Index 83, …, 2 bytes, …" means SNVT_state.<br>**Attention:** Modifications can only be made if the output variable is not connected. | |

*SCPTmaxSendTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoDDimValueFb.<br>A value of 0 s deactivates this function. |

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |

| | |
|---|---|
| Default value | SET_NO_FUNC; 0.0 %; 0.00° |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated.<br>SET_NO_FUNC No action is performed, the relay remains in its current position.<br>SET_OFF The output is deactivated.<br>SET_ON The output is activated.<br>SET_STATE The output is dimmed to the parameterised value. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviDDimValue and nviDDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoDDimValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. The time is only evaluated if there are telegrams at nviDDimValue and nviDDimLighting.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoDDimValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTautoOffTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Stairway light function. The time specified here starts when a channel is activated (possibly after a delay configured via UCPTonDelay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviDDimValue and nviDDimLighting. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised via UCPToffDelay, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviDDimValue or nviDDimLighting (usually a manual operation).<br>The nvoDDimValueFb status output is updated when the channel is deactivated, depending on UCPTfbDelay.<br>A value of 0 s deactivates this function. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 (prioritisation of nviDDimLogic) | |
| Description | This parameter configures how the nviDDimValue, nviDDimLighting and nviDDimLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviDDimValue, the second (e.g. IN10) the value at nviDDimLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviDDimValue, 1 = nviDDimLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. The % value is adopted from the input specified via .SRC. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input nviDDimLogic has priority over the nviDDimValue and nviDDimLighting inputs. If a valid value is present at nviDDimLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviDDimLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviDDimValue or nviDDimLighting.<br>In the event of control via nviDDimValue or nviDDimLighting, the parameterised time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviDDimLogic). Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_NUL | The output is switched to the value present at nviDDimValue or nviDDimLighting. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON, SET_STATE |
| | .setting | 0.0 to 100.0%, resolution 0.5% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the relay remains in its current position. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |
| | SET_STATE | The output is dimmed to the parameterised value. |

*UCPTdimTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 4.0 s |
| Description | If the nviDDimLighting input is being used for control, this time is used for dimming from 0 to 100%. This time is also used for the changes activated via the UCPTupDim, UCPTdownDim and UCPTchangeDim parameters. |

*UCPTupDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0 (deactivated) |
| Description | This parameter can be used to increase the level of brightness. When the channel is switched on, the lights are made brighter in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*UCPTdownDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to dim the lights. When the channel is switched off, the lights are dimmed in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*UCPTchangeDim*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 60.0 s, resolution 0.1 s |
| Default value | 0.0 s (deactivated) |
| Description | This parameter can be used to activate a slow changeover when the dimming value is altered. If the channel is dimmed via nviDDimValue or nviDDimLighting (with SET_STATE), the lights are dimmed slowly in accordance with the time specified here.<br>A value of 0 s deactivates this function. |

*SCPTmaxOut*

| | |
|---|---|
| Type | SNVT_lev_percent |
| Range of values | 10.0 to 100.0%, resolution 0.1% |
| Default value | 100,0% |
| Description | This value specifies the maximum output value (upper limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>If is often advisable to set the upper limit to a value of just below 100% in order to extend the service life of the lighting appliances, as barely any more light is emitted if the value is set above this level anyway.<br>Attention!<br>The maximum value must always be greater than or equal to the minimum value. |

*UCPTminOut*

| | |
|---|---|
| Type | SNVT_lev_percent |
| Range of values | 10.0 to 100.0%, resolution 0.1% |
| Default value | 10,0% |
| Description | This value specifies the minimum output value (lower limit) of the control output. This enables the actuators to be adapted to the lighting hardware that is connected.<br>It is often advisable to set the lower limit to a value of over 10%, as the lighting appliances emit barely any light at all if the value is set below this level.<br>Attention!<br>The minimum value must always be lower than or equal to the maximum value. |

*SCPTmaxRcvTime*

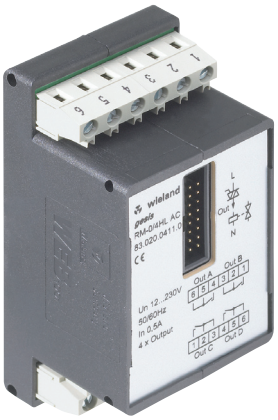
| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at the connected input nviDDimValue or nviDDimLighting within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState. A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.4 s, resolution 0.1 s |
| Default value | 0.3 s |
| Description | The time specified here delays the status telegram at nvoDDimValueFb.<br>A value of 0 s deactivates this function. |

# 4.13 gesis RM-0/4HL AC (83.020.0411.0/1)

## Device Description



- Designation: Extension module with 4 switching actuators
- Type/model no.: gesis RM-0/4 HL AC 83.020.0411.0
  gesis RM-0/4HL AC B 83.020.0411.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

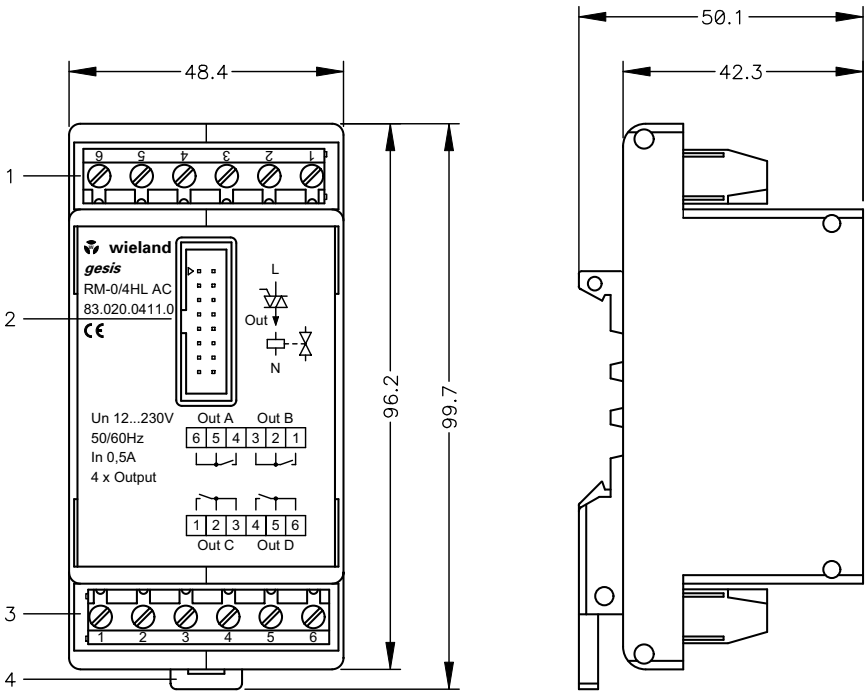
## Function

The extension module with 4 semiconductor outputs is part of the gesis RM series of devices. It can switch four outputs that are independent of one another. The extension module receives the switching commands from the basic module, and the possible status messages of the outputs are sent by the basic module to the bus.

The 4 semiconductor outputs are used to control thermodynamic drives, but can also be used to switch other electrical consumers independently from one another. The semiconductor enables switching of AC voltages with 230 V rms. The same switching voltage supplies all four outputs. The outputs are electronically protected against short circuits and overloading. The consumers are connected by means of screw clamp terminals.

Different functions can be assigned to the outputs by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for every group of four outputs.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | 6-pin connection terminal strip for outputs A and B<br>(for details please refer to "Terminal Assignment") |
| 2– Slot | For connection to the basic module (16-pin ribbon cable header) |
| 3– X2 | 6-pin connection terminal strip for outputs C and D<br>(for details please refer to "Terminal Assignment") |
| 4– Locking slide | With 83.020.0411.0 only |

## Terminal Assignment:

**X1**: Connection and routing of the switching voltage, and connection of outputs A and B. Terminals 2/3 and 5/6 are bridged internally.

1– Connection for output B
2– Connection/routing of the switching voltage for output B
3– Connection/routing of the switching voltage for output B
4– Connection for output A
5– Connection/routing of the switching voltage for output A
6– Connection/routing of the switching voltage for output A

**X2**: Connection and routing of the switching voltage, and connection of outputs C and D. Terminals 2/3 and 5/6 are bridged internally.

1– Connection for output C
2– Connection/routing of the switching voltage for output C
3– Connection/routing of the switching voltage for output C
4– Connection for output D
5– Connection/routing of the switching voltage for output D
6– Connection/routing of the switching voltage for output D

## Technical Data

| | |
|---|---|
| Connection to basic module | Pluggable flat cable |
| **Outputs** | |
| Number | Four |
| Rated voltage | 230 V (min. 12 V, max. 253 V) |
| Rated frequency | 50-60 Hz |
| Rated current | 0,5 A |
| Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| Short circuit protection | No |
| Internal fuse | No (the use of an external back-up fuse is recommended for the purpose of protecting the output) |
| I2t value (10 ms) | 144 A²s |
| Leakage current in off state | Typ. 10 mA at 12 V AC/50 Hz |
| | Typ. 250 mA at 230 V AC/50 Hz |
| Voltage drop in on state | Typ. 1.1 V at 12 V AC/0.15 A |
| | Typ. 0.9 V at 230 V AC/0.5 A |
| Recommended minimum load | 2 W (allow for leakage current and voltage drop) |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Rated insulation voltage | 250 V external conductor to N or PE |
| | 400 V external conductor to external conductor |
| **Environmental conditions** | |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material/colour | Plastic, halogen-free |
| Housing colour | Black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 110 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height inc. TH 35-7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings), Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0411.0)

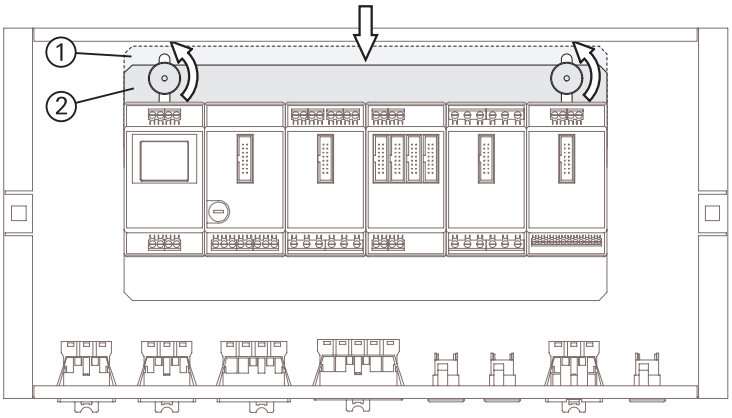
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0411.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0411.1)

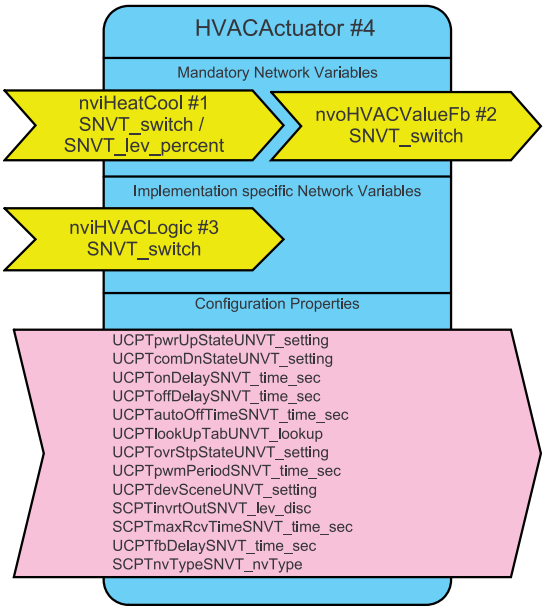
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### HVACActuator




The software application section assigned to the extension module contains a total of 4 LonMark objects based on an HVACActuator in accordance with LonMark Profile #4 (see figure), i.e. one such object is available for each channel.

#### Logic functions

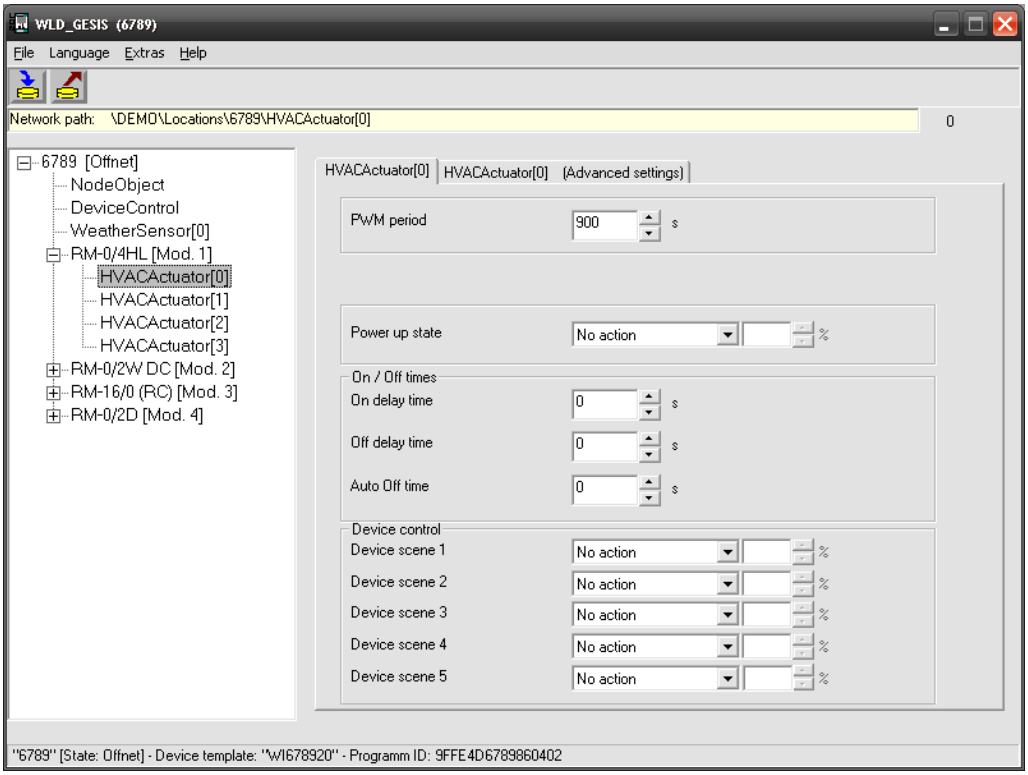
The semiconductor switch is used to control thermodynamic valves or other electrical consumers in accordance with the relevant technical specifications (see below). It supports the prescribed functionality of LonMark Profile #4 and also adds to it by providing the option of logic operations with `nviHVACLogic` as the second input.

All types of logic operation, including multi-stage operations, are available via a reference table with four inputs and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviHVACLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated CP. Prioritised control is now possible (override function).

#### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay`/ `UCPToffDelay`), automatic switch-off (automatic switch-off after the time parameterised in `UCPTautoOffTime`) and a feedback delay (`UCPTfbDelay` for `nvoHVACValueFb`).
In addition, the output's response to particular situations can also be set (power-up or reset with `UCPTpwrUpState`, communication failure with `UCPTcomDnState`).

### Object parameters (plug-in)




HVACActuator – "Standard" tab

The most frequently used configuration values are parameterised in the HVACActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

## Parameters

*PWM cycle duration (UCPTpwmPeriod)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |

| | |
|---|---|
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

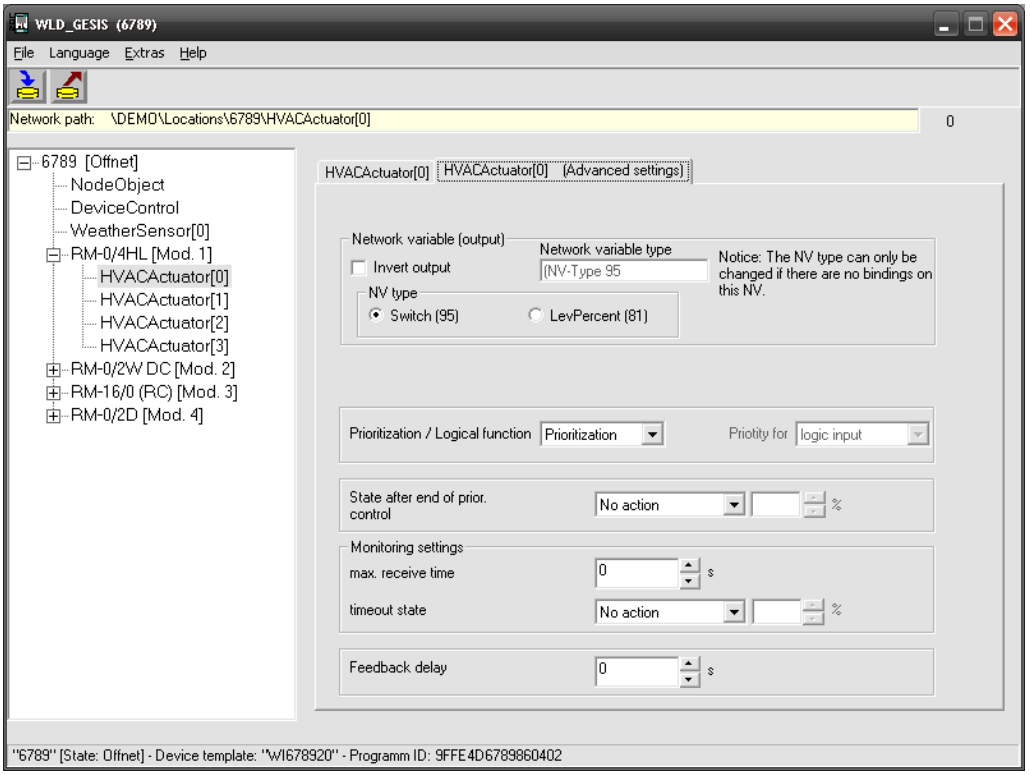
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Automatic switch-off function (not to be confused with the OFF delay).<br>The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviHeatCool (usually a manual operation).<br>The nvoHVACValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. |

### Advanced object parameters (plug-in)




HVACActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the HVACActuator object's advanced view.

The `nvoHVACValueFb` output network variable can be inverted here and the NV type of the `nviHeatCool` input network variable can be toggled between `SNVT_switch (95)` and `SNVT_lev_percent (81)`. It is also possible to activate a prioritised control or a logic operation in this view. Furthermore, the time response of the feedback output and telegram monitoring at the network variable input can be specified here.

#### Parameters

*NV type of the nviHeatCool input network variable (SCPTnvType)*

| | |
|---|---|
| Range of values | SNVT_switch (95) or SNVT_lev_percent (81) |
| Default value | SNVT_switch (95) |
| Description | This parameter can be used to toggle the NV type of the "nviHeatCool" input network variable between SNVT_switch (95) and SNVT_lev_percent (81).<br>**Notice**:<br>If the network variable is already connected, the NV type can no longer be modified and the input elements will be deactivated. If you do need to change the type, all bindings of the relevant network variable must be removed and recreated once the type has been changed. |

*Invert output (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. The inversion will become active on the next control command. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs. |

*State at end of prioritised control (UCPTovrStpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Current value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). |
| | No action — No action is performed, the semiconductor remains in its current switching state. |
| | Current value — The output is switched to the value present at nviHeatCool. |
| | The output is deactivated. |
| | OFF — The output is activated. |
| | ON |

## Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or nviHVACLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoHVACValueFb.<br>A value of 0 s deactivates this function. |

## Object parameters (LNS tool)

### Network variables

*nviHeatCool*

| | | |
|---|---|---|
| Type | SNVT_switch/SNVT_lev_percent | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviHVACLogic. | |

*nvoHVACValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0; 100,0% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value = 100.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay.<br>Following a restart, if no initialisation behaviour is defined (UCPTpwrUpState), an invalid value is output here until the first switching telegram is issued. | |

*nviHVACLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0 % |
| | OFF | .state = 0 or .state = 1 and .value = 0.0 % |
| | Enable | .state = -1 |
| Default value | 0,0 %; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab). | |

### Parameters

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | . SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 (prioritisation) | |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviHeatCool, the second (e.g. IN10) the value at nviHVACLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviHeatCool, 1 = nviHVACLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input nviHVACLogic has priority over input nviHeatCool. If a valid value is present at nviHVACLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviHVACLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviHeatCool. In the event of control via nviHeatCool, the time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). Only the .function component is evaluated. | |

| | | |
|---|---|---|
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_NUL | The output is switched to the value present at nviHeatCool. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTpwmPeriod*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*SCPTinvrtOut*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | This parameter can be used to invert the output behaviour. The inversion will become active on the next control command. | |
| | ST_OFF | The output is not inverted. A switch-on telegram allows current to flow through the semiconductor; a switch-off telegram blocks the flow of current. |
| | ST_ON | The output works in an inverted manner. A switch-on telegram blocks the flow of current; a switch-off telegram allows current to flow. |

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or nviHVACLogic within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

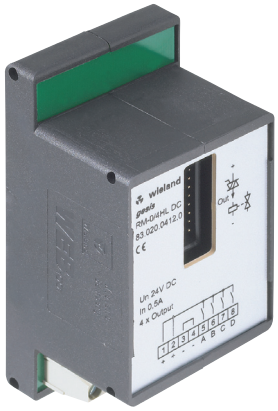
| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoHVACValueFb.<br>A value of 0 s deactivates this function. |

*SCPTnvType (nviHeatCool)*

| | |
|---|---|
| Type | SNVT_nv_Type |
| Range of values | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT,<br>2 bytes, A=0, B=0, C=0<br>PID 0:0:0:0:0:0:0:0, Scope 0, Index 81, NVT_CAT_STRUCT,<br>1 byte, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT,<br>2 bytes, A=0, B=0, C=0 |
| Description | Defines the SNVT type of the input variables. "..., Index 95, ..., 2 bytes, ..." means SNVT_switch (e.g. direct control of actuators) and "..., Index 81, ..., 1 byte, ..." means SNVT_lev_percent (e.g. input of controllers).<br>**Attention:**<br>Modifications can only be made if the output variables are not connected. |

# 4.14 gesis RM-0/4HL DC (83.020.0412.0/1)

## Device Description



- Designation: Extension module with 4 switching actuators
- Type/model no.: gesis RM-0/4HL DC 83.020.0412.0
  gesis RM-0/4HL DC B 83.020.0412.1
- Device type: Extension module
- Design type: Device with screw clamp terminals for installation in a gesis RAN distribution box

**NOTICE**

Please ensure that you pay attention to the warnings and notes in the sections entitled "Prescribed Application" and "Selecting Personnel and Personnel Qualifications" in Chapter 1.

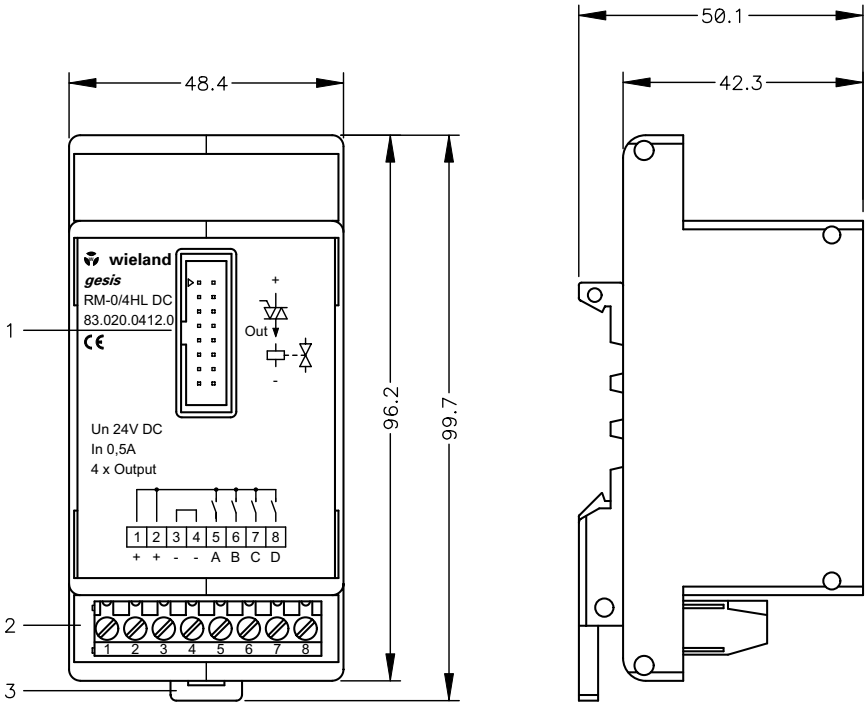
## Function

The extension module with 4 semiconductor outputs is part of the gesis RM series of devices. It can switch four outputs that are independent of one another. The extension module receives the switching commands from the basic module, and the possible status messages of the outputs are sent by the basic module to the bus.

The 4 semiconductor outputs are used to control thermodynamic drives, but can also be used to switch other electrical consumers independently from one another. The semiconductor enables switching of DC voltages with 24 V. The same switching voltage supplies all four outputs. The outputs are electronically protected against short circuits and overloading. The consumers are connected by means of screw clamp terminals.

Different functions can be assigned to the outputs by means of parameterisation, which must only be performed in the basic module. In this regard, all time lapses within the device can be parameterised, and it is possible to activate a lock using an external binding. The setting options are available separately for every group of four outputs.

## Dimensions, Connections and Function Elements




| | |
|---|---|
| 1– X1 | For connection to the basic module (16-pin ribbon cable header) |
| 2– Terminal strip | 8-pin, for connection of switching voltage and outputs A to D (for details please refer to "Terminal Assignment) |
| 3– Locking slide | With 83.020.0412.0 only |

## Terminal Assignment:

Terminals 1/2 and 3/4 are bridged internally

1– Connection/routing of the switching voltage (+) for outputs A to D
2– Connection/routing of the switching voltage (+) for outputs A to D
3– Connection/routing of the switching voltage (–) for outputs A to D
4– Connection/routing of the switching voltage (–) for outputs A to D
5– Connection for output A
6– Connection for output B
7– Connection for output C
8– Connection for output D

## Technical Data

| | |
|---|---|
| Connection to basic module | Pluggable flat cable |
| **Outputs** | |
| Number | Four switching outputs |
| Internal current consumption | Max. 1.6 mA per output, from the switching voltage |
| Rated voltage | 24 V DC (min. 12 V, max. 45 V) |
| Rated current | 0,5 A |
| Connection type | Screw clamp terminals |
| | 0.14 to 4 mm², solid |
| | 0.14 to 2.5 mm², stranded |
| | 6.5 mm stripped in each case |
| Short circuit withstand capability | Yes (not with reverse polarity) |

| | |
|---|---|
| Short circuit detection | 0,7…2,5 A (typ. 1.4 A) |
| Leakage current | Max. 10 µA (typ. 3.5 µA) |
| **Electrical safety** | |
| Protection class | None |
| Degree of protection | IP00 |
| Degree of soiling | 2 |
| Surge voltage category | III |
| Electrical isolation | Air gap/creepage paths > 5.5 mm (internal supply/output) |
| **Environmental conditions** | |
| Ambient temperature | -5°C to +45°C |
| Storage temperature | -25°C to +70°C |
| Relative humidity | 5% - 93% |
| Moisture condensation | Not permitted |
| EMC requirements | Conforms to EN 61000-6-2, EN 61000-6-3 and EN 50090-2-2 |
| **General information** | |
| Housing material/colour | Plastic, halogen and phosphorous-free, black |
| Behaviour in fire | V2 acc. to UL (housing) |
| Weight | Approx. 90 g |
| Dimensions | Refer to "Dimensions, Connections and Function Elements" |
| Height inc. TH 35-7.5 mounting rail | 52 mm |
| CE certification | In acc. with EMC Directive (residential and functional buildings), Low Voltage Directive |

## Installation

**CAUTION**

- The flat cable may only be connected or disconnected when the power is off.
- When connecting and disconnecting the flat cable, you must ensure that no power is being supplied to the basic module.
- The maximum length of the flat cable (120 mm) must not be exceeded.

### Assembly (83.020.0412.0)

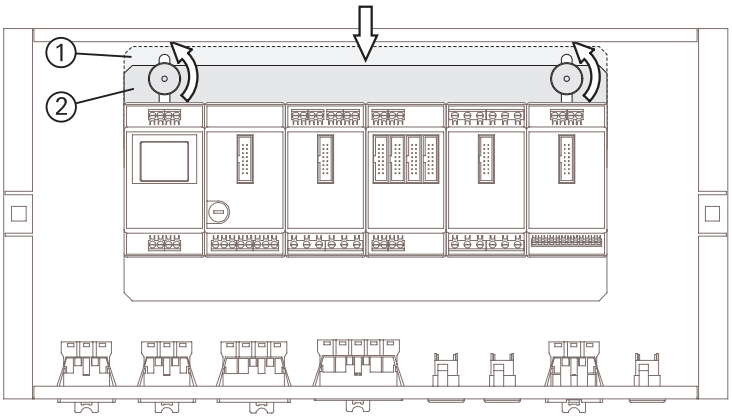
1. Latch the module onto the DIN rail.
2. Connect the extension modules to the basic module using the flat cables supplied. Ensure that, for each pair of extension modules, there is one on the right-hand and one on the left-hand side of the basic module. Please make a note of which module addresses are assigned to which slots on the basic module (by providing a label with "Module no.:"; see diagram under C.). Place the power supply on the outside of the extension modules, either to the left or right.
3. Establish the connections to both the power supply and EIB using the appropriate terminal strips.

### Disassembly (83.020.0412.0)

1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Insert a screwdriver into the locking slide and release the module from the DIN rail.

### Replacing modules (83.020.0412.1)

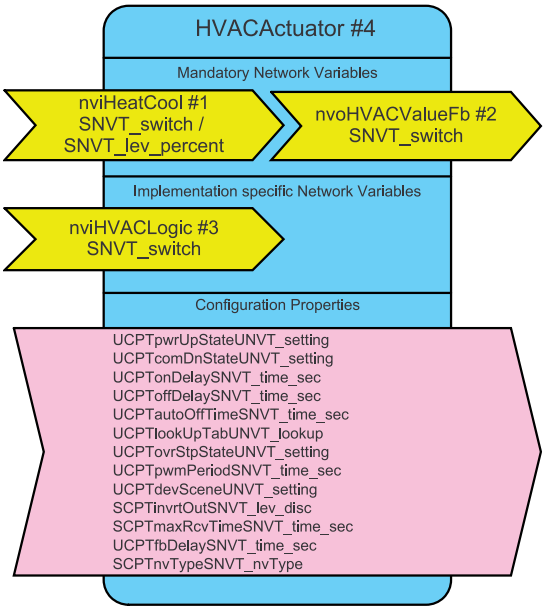
1. Disconnect the power supply from the module.
2. Remove the flat cable from the front of the device.
3. Release the connections at the terminal strips.
4. Slacken the knurled-head screws in the gesis RAN housing (see Fig.).




5. Push the slide towards the modules as shown
   ("1": slide closed; "2": slide open).
   Notice: This will release all the modules.
6. Replace the relevant module.
7. Reattach the modules by following steps 1 to 5 in reverse order.

## Application Program Description

### HVACActuator




The software application section assigned to the extension module contains a total of 4 LonMark objects based on an HVACActuator in accordance with LonMark Profile #4 (see figure), i.e. one such object is available for each channel.

#### Logic functions

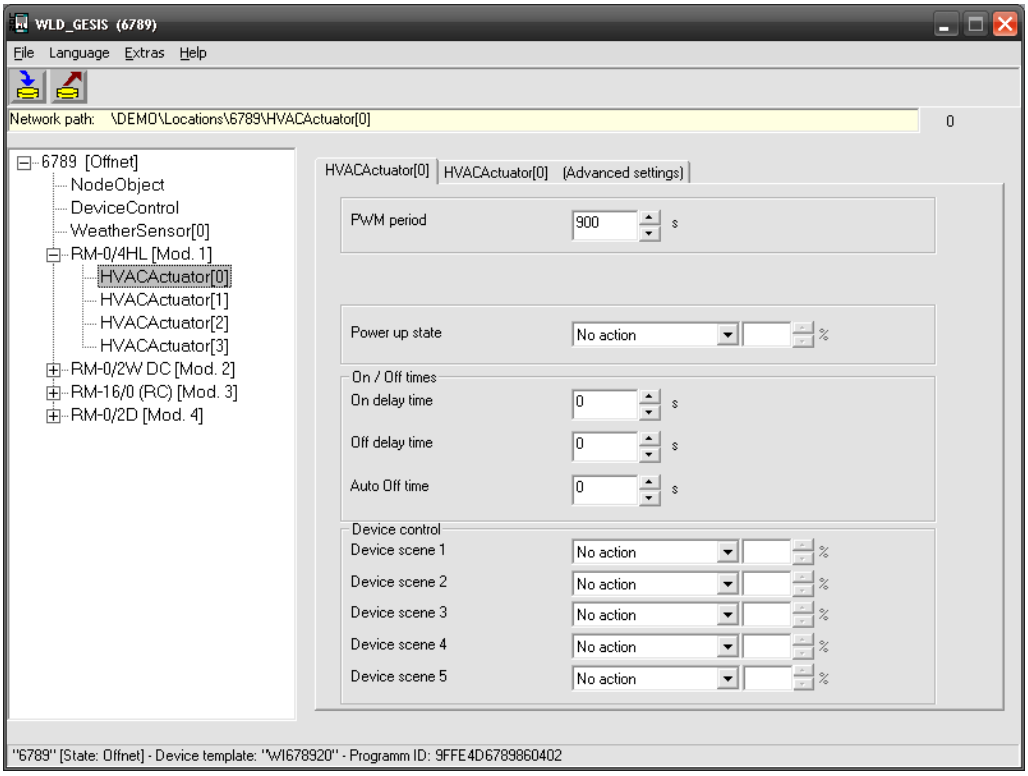
The semiconductor switch is used to control thermodynamic valves or other electrical consumers in accordance with the relevant technical specifications (see below). It supports the prescribed functionality of LonMark Profile #4 and also adds to it by providing the option of logic operations with nviHVACLogic as the second input.

All types of logic operation, including multi-stage operations, are available via a reference table with two inputs and a 4-bit memory. The plug-in contains default settings for the Boolean operations AND/OR/NOR/NAND/prioritised control (control commands at `nviHVACLogic` take precedence), which are then converted in accordance with the reference table and saved in the associated CP. Prioritised control is now possible (override function).

#### Timing functions

Various timing functions can be configured such as ON and OFF delays (`UCPTonDelay/UCPToffDelay`), automatic switch-off (automatic switch-off after the time parameterised in `UCPTautoOffTime`) and a feedback delay (`UCPTfbDelay` for `nvoHVACValueFb`).
In addition, the output's response to particular situations can also be set (power-up or reset with `UCPTpwrUpState`, communication failure with `UCPTcomDnState`).

## Object parameters (plug-in)




HVACActuator – "Standard" tab

The most frequently used configuration values are parameterised in the HVACActuator object's standard view.

The time responses of the outputs and the function in the case of cross-module control can be defined here via the DeviceControl object.

### Parameters

*PWM cycle duration (UCPTpwmPeriod)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*State after switch-on (UCPTpwrUpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the actuator channel following restoration of the supply voltage. |

*ON delay (UCPTonDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

*OFF delay (UCPToffDelay)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to the feedback delay.<br>A value of 0 s deactivates this delay. |

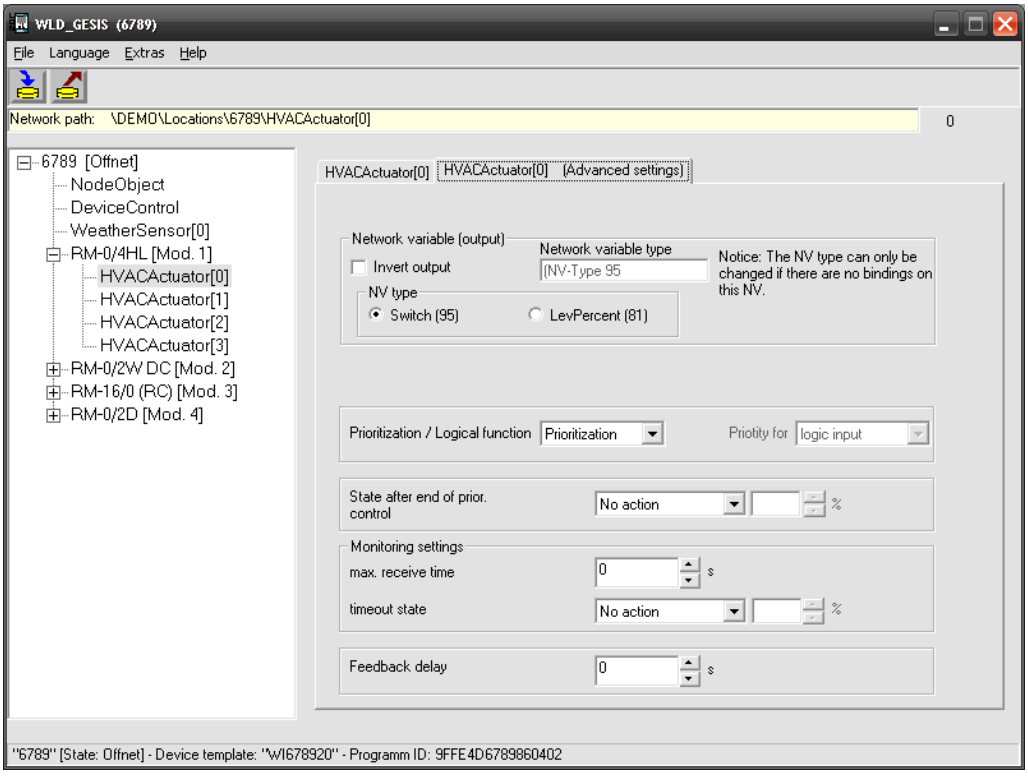
*Stairway light function (OFF after …) (UCPTautoOffTime)*

| | |
|---|---|
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | Automatic switch-off function (not to be confused with the OFF delay).<br>The time specified here starts when a channel is activated (possibly after an ON delay); the channel is deactivated automatically once the time has elapsed, irrespective of any logic operations that may have been parameterised.<br>The time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will switch the channel off. If an OFF delay has been parameterised, it will be ignored once the automatic switch-off time has elapsed and is only effective if an OFF telegram has been sent previously via nviHeatCool (usually a manual operation).<br>The nvoHVACValueFb status output is updated when the channel is deactivated, depending on the feedback delay.<br>A value of 0 s deactivates this function. |

*Device scene 1 to 5 (UCPTdevScene)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. |

### Advanced object parameters (plug-in)




HVACActuator – "Advanced" tab

Special configuration values that are seldom used are parameterised in the HVACActuator object's advanced view.

The `nvoHVACValueFb` output network variable can be inverted here and the NV type of the `nviHeatCool` input network variable can be toggled between `SNVT_switch (95)` and `SNVT_lev_percent (81)`. It is also possible to activate a prioritised control or a logic operation in this view. Furthermore, the time response of the feedback output and telegram monitoring at the network variable input can be specified here.

#### Parameters

*NV type of the nviHeatCool input network variable (SCPTnvType)*

| | |
|---|---|
| Range of values | SNVT_switch (95) or SNVT_lev_percent (81) |
| Default value | SNVT_switch (95) |
| Description | This parameter can be used to toggle the NV type of the "nviHeatCool" input network variable between SNVT_switch (95) and SNVT_lev_percent (81).<br>Notice:<br>If the network variable is already connected, the NV type can no longer be modified and the input elements will be deactivated. If you do need to change the type, all bindings of the relevant network variable must be removed and recreated once the type has been changed. |

*Invert output (SCPTinvrtOut)*

| | |
|---|---|
| Range of values | Ticked or not ticked |
| Default value | Not ticked |
| Description | The relay's contact positions can be inverted via this parameter. The inversion will become active on the next control command. |

*Prioritisation/Logic function (UCPTlookUpTab)*

| | |
|---|---|
| Range of values | Prioritisation; AND; OR; XOR; NAND; NOR; NXOR |
| Default value | Prioritisation |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for the two inputs. |

*State at end of prioritised control (UCPTovrStpState)*

| | |
|---|---|
| Range of values | OFF; ON; No action; Current value |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). |
| | No action — No action is performed, the semiconductor remains in its current switching state. |
| | Current value — The output is switched to the value present at nviHeatCool. |
| | OFF — The output is deactivated. |
| | ON — The output is activated. |

## Monitoring settings

*Receive telegram time monitoring (SCPTmaxRcvTime)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or nviHVACLogic within the time interval specified here, otherwise the actuator channel switches to the value parameterised via "State on time-out".<br>A value of 0 s deactivates this function. |

*State on time-out (UCPTcomDnState)*

| | |
|---|---|
| Range of values | OFF; ON; No action |
| Default value | No action |
| Description | Defines the state of the associated actuator channel once the time specified in "Receive telegram time monitoring" has elapsed without any telegrams being received. |

*Feedback delay (UCPTfbDelay)*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoHVACValueFb.<br>A value of 0 s deactivates this function. |

## Object variables (LNS tool)

### Network variables (LNS tool)

*nviHeatCool*

| | | |
|---|---|---|
| Type | SNVT_switch/SNVT_lev_percent | |
| Range of values | .value | 0.0 to 100.0%, resolution 0.5% |
| | .state | 0, 1 |
| | ON | .state = 1 and .value > 0.0% |
| | OFF | .state = 0 or .state = 1 and .value = 0.0% |
| Default value | 0,0%; 0 | |
| Description | Standard input variable for the associated actuator channel. Can be logically combined via nviHVACLogic. | |

*nvoHVACValueFb*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0,0; 100,0% |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value = 100.0% |
| | OFF | .state = 0 and .value = 0.0% |
| Default value | 0,0%; -1 | |
| Description | Status output variable for the associated actuator channel. Can be sent with a delay via UCPTfbDelay.<br>Following a restart, if no initialisation behaviour is defined (UCPTpwrUpState), an invalid value is output here until the first switching telegram is issued. | |

*nviHVACLogic*

| | | |
|---|---|---|
| Type | SNVT_switch | |
| Range of values | .value | 0.0 to 100.0 %, resolution 0.5 % |
| | .state | -1, 0, 1 |
| | ON | .state = 1 and .value > 0.0 % |
| | OFF | .state = 0 or .state = 1 and .value = 0.0 % |
| | Enable | .state = -1 |
| Default value | 0,0 %; -1 | |
| Description | Logic input variable for the associated actuator channel (see description of UCPTlookUpTab). | |

### Parameters (LNS tool)

*UCPTpwrUpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel following restoration of the supply voltage. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTcomDnState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0 %; 0.00° | |
| Description | Defines the state of the associated actuator channel once the time specified in SCPTmaxRcvTime has elapsed without any telegrams being received. Only the .function component is evaluated. | |
| | . SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTonDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | ON delay. Switch-on commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool. Additional switch-on telegrams will not cause this time to restart; switch-off telegrams will cancel the switch-on procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay. A value of 0 s deactivates this delay. |

*UCPToffDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 0 s (deactivated) |
| Description | OFF delay. Switch-off commands are not executed until the time specified here has elapsed. Irrespective of any logic operations that may have been parameterised, the time is only evaluated if there are telegrams at nviHeatCool.<br>Additional switch-off telegrams will not cause this time to restart; switch-on telegrams will cancel the switch-off procedure. The nvoHVACValueFb status output is updated immediately, subject to UCPTfbDelay.<br>A value of 0 s deactivates this delay. |

*UCPTlookUpTab*

| | | |
|---|---|---|
| Type | UNVT_lookup | |
| Range of values | .IN00 | 0, 1 |
| | .IN01 | 0, 1 |
| | .IN10 | 0, 1 |
| | .IN11 | 0, 1 |
| | .SRC | 0, 1 |
| | .INP | Not used |
| Default value | 1 1 1 1 1 0 (prioritisation) | |
| Description | This parameter configures how the nviHeatCool and nviHVACLogic inputs will interact. Priority can be given to one input or a logic operation can be implemented for two of the inputs. | |
| | .IN00 to .IN11 | The first digit of the field designation (e.g. IN10) indicates the value at input nviHeatCool, the second (e.g. IN10) the value at nviHVACLogic (0 = OFF, 1 = ON). The fields parameterised with "1" represent a valid input constellation on which the output is switched. |
| | .SRC | This field defines the input that contains the output value to be switched (0 = nviHeatCool, 1 = nviHVACLogic). This field is only needed to specify the prioritised input. |
| Examples | .IN00 = 0<br>.IN01 = 0<br>.IN10 = 0<br>.IN11 = 1 | **AND operation**: The output is only switched on if a switch-on telegram is present at both inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 0<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1 | **OR operation**: The output is switched on if a switch-on telegram is present at at least one of the two inputs. In this case, the .SRC field is of no significance. |
| | .IN00 = 1<br>.IN01 = 1<br>.IN10 = 1<br>.IN11 = 1<br>.SRC = 1 | **Prioritised input**: Input nviHVACLogic has priority over input nviHeatCool. If a valid value is present at nviHVACLogic (.value = 0.0 to 100.0%, .state = 0/1), the command is executed immediately (without a time delay) and any parameterised stairway light function is ignored. An invalid telegram (enable telegram) at nviHVACLogic (.state = -1) triggers the action parameterised in UCPTovrStpState and enables control via the non-prioritised input nviHeatCool.<br>In the event of control via nviHeatCool, the time response (UCPTonDelay, UCPToffDelay, UCPTautoOffTime) is taken into account. |

*UCPTovrStpState*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_NUL, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the state of the associated actuator channel once prioritised control has been deactivated (via nviHVACLogic). Only the .function component is evaluated. | |

| | | |
|---|---|---|
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_NUL | The output is switched to the value present at nviHeatCool. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*UCPTpwmPeriod*

| | |
|---|---|
| Range of values | 0…6553 s, resolution 1 s |
| Default value | 900 s |
| Description | PWM cycle duration. This period acts as the time base for a pulse width modulation (PWM) cycle.<br>If the value is 0, the output is permanently ON. |

*UCPTdevScene*

| | | |
|---|---|---|
| Type | UNVT_setting | |
| Range of values | .function | SET_NO_FUNC, SET_OFF, SET_ON |
| | .setting | 0,0% |
| | .rotation | 0,00° |
| Default value | SET_NO_FUNC; 0.0%; 0.00° | |
| Description | Defines the response of the associated actuator channel when a scene telegram has been received at the central DeviceControl object. Only the .function component is evaluated. | |
| | SET_NO_FUNC | No action is performed, the semiconductor remains in its current switching state. |
| | SET_OFF | The output is deactivated. |
| | SET_ON | The output is activated. |

*SCPTinvrtOut*

| | | |
|---|---|---|
| Type | SNVT_lev_disc | |
| Range of values | ST_OFF, ST_ON | |
| Default value | ST_OFF (deactivated) | |
| Description | This parameter can be used to invert the output behaviour. The inversion will become active on the next control command. | |
| | ST_OFF | The output is not inverted. A switch-on telegram allows current to flow through the semiconductor; a switch-off telegram blocks the flow of current. |
| | ST_ON | The output works in an inverted manner. A switch-on telegram blocks the flow of current; a switch-off telegram allows current to flow. |

*SCPTmaxRcvTime*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0…6553,0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | A telegram must be received at nviHeatCool or nviHVACLogic within the time interval specified here, otherwise the actuator channel switches to the state parameterised via UCPTcomDnState.<br>A value of 0 s deactivates this function. |

*UCPTfbDelay*

| | |
|---|---|
| Type | SNVT_time_sec |
| Range of values | 0 to 6,553.0 s, resolution 0.1 s |
| Default value | 0 s (deactivated) |
| Description | The time specified here delays the status telegram at nvoHVACValueFb.<br>A value of 0 s deactivates this function. |

*SCPTnvType (nviHeatCool)*

| | |
|---|---|
| Type | SNVT_nv_Type |
| Range of values | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT,<br>2 bytes, A=0, B=0, C=0<br>PID 0:0:0:0:0:0:0:0, Scope 0, Index 81, NVT_CAT_STRUCT,<br>1 byte, A=1, B=0, C=0 |
| Default value | PID 0:0:0:0:0:0:0:0, Scope 0, Index 95, NVT_CAT_STRUCT,<br>2 bytes, A=0, B=0, C=0 |
| Description | Defines the SNVT type of the input variables. "…, Index 95, …, 2 bytes, …" means SNVT_switch (e.g. direct control of actuators) and "…, Index 81, …, 1 byte, …" means SNVT_lev_percent (e.g. input of controllers).<br>**Attention**:<br>Modifications can only be made if the output variables are not connected. |

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