# ANALOGUE CONTROL MODULE - ANR04SA

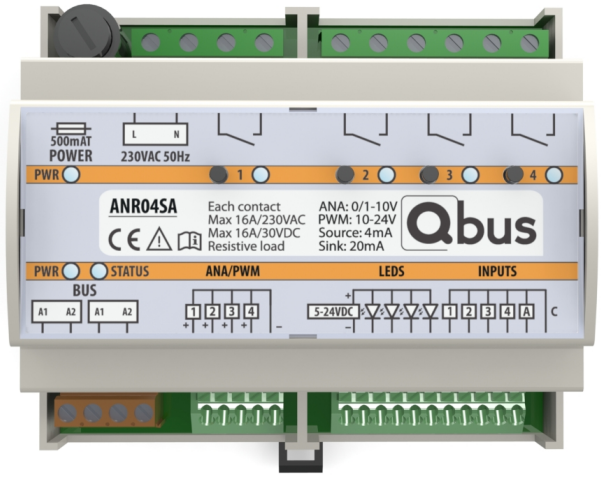


*Figure 1*

## 1. Product Description

This module with 4 analog dimmers with relays and 5 inputs is the most multifunctional module of the Qbus Stand-Alone range. This module can both switch and dim (even with constant light control) and can function both autonomously – so WITHOUT Controller, WITHOUT external power supply and WITHOUT any configuration – but can also be connected to a Controller to become part of a full-fledged Qbus installation.

The ANR04SA is suitable for controlling four analog dimmers (0/1-10V or PWM) or relays (16A each) or a combination of both. Each analog dimmer controls a relay contact which switches off when the analog dimmer is at 0%. These dimmers can be used the control LEDs, Fluorescent Tubular lamps, ventilators,… It is also possible to use the relay output as an ON/OFF switching contact to control lights, sockets,… And all of this without controller and configuration.
**By default, the outputs of the ANR04SA are in Dimmer mode, with a 10% minimal dimming level. Different modes and minimum dim levels can be selected via the buttons on the module.**

For heavy inductive loads (many fluorescent lights) with a high capacity or bipolar applications, contactors need to be added. The ANR04SA module contact will then activate the coil of the contactor.

The ANR04SA module also has 5 potential-free inputs to connect standard push buttons. Input 1 to 4 control respectively output 1 to 4, input A is a scene-input which executes an ALL OFF-scene when pushing for 0,7 seconds (and then releasing the button), or a PANIC-scene (All Outputs on) when pushing the button for 2 seconds. By default, the inputs are in push button mode.

The module also contains four LED outputs to be used as feedback on the push buttons. In order to use the LED feedback, an external 24V power supply needs to be installed.

It is also possible to configure the ANR04SA via a Qbus Controller, and then to remove the Controller. This way, the outputs can be configured to function (in stand-alone mode) with a Delay ON, Delay OFF or Timer Off (=Timer 1) when used in relay mode. If the output is used as Dimmer or PWM, a Time OFF and DimStart (level at which the dimmer will be set when activating the output) can be selected.

Inputs 1-4 always function as pushbuttons when the outputs are in dimmer or PWM mode. If an output is in relay mode, the inputs can function as Normal Open, Normal Closed, pushbutton or toggle. Input 5 (scene-input) can only be set as NO, NC and pushbutton.

When the ANR04SA is used as part of a Qbus home automation installation (with a controller), the functions of the in- and outputs can be adapted further via the Qbus configuration software. Keep in mind that inputs 1 to 4 will always control only outputs 1 to 4 and hence can't be used to control other outputs. In order to continue to use a scenario on Input A, one will need to be defined via the Qbus configuration software and allocated to Input A (scenario-input). This means that any scenario can be executed via this Input A.

All programming remains internally stored in a nonvolatile memory. After a voltage cut-off, the outputs return to their latest position.

A two-pole automatic fuse of a maximum of 16A must be placed on the mains power.

## 2. Safety Instructions

Read the complete manual before carrying out the installation and activating the system.

### ⚠ WARNING

- The device must be mounted, commissioned and serviced by an authorized electrician in accordance with the country-specific regulations.
- This device is exclusively suitable for DIN-rail mounting EN50022. It must be mounted in a fire-enclosure with ventilation holes.
- A safety disconnection of the device must be possible. Before carrying out the installation the ANR04SA should be de-energized.

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- Only one phase is fused. In case the fuse is blown hazardous live voltages can still be present in the ANR04SA.
- The device must not be opened. All guarantee provisions turn void when the module is opened.

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## 3. Mounting and wiring

The ANR04SA can be used in different installation configurations. Following specifications will remain the same across the different configurations:

**FITTING:**
Snap device onto DIN rail to DIN EN50022.

**INPUTS:**
Both solid and stranded wire between 0,5 – 1, 5 mm$^2$ can be used (for stranded use a screwdriver to push on the connection when inserting the wire). Remove approx 7mm of insulation from the wire and push it into the input terminals 1-A. By pushing with a screwdriver on the connector, the wire can be removed from the connector. Input 1/2/3/4 controls respectively output 1/2/3/4. Input A is set as a scene-input. Pushing the pushbutton connected to Input A for 0,7 seconds will turn all outputs on the REL04SA OFF. Pushing the same button for at least two seconds will turn all outputs ON.

**LED OUTPUTS**
An external 24V power supply can be connected to the REL04SA in order to provide LED-feedback on the push buttons.

**LOAD CIRCUITS:**
Connect the loads to the outputs. Conductor cross section : minimum 1,5mm². Remove approx 7mm of insulation from the wire and screw it into the terminals OUT1 – OUT4.
If sockets are to be connected to the ANR04SA (in Relay Mode), this should be done with separate contactors (2P/20A contactor required).
**Warning: the relay outputs are potential free contacts!**

**POWER SUPPLY:**
A two-pole automatic fuse of a maximum of 16A must be placed on the mains power 230Vac.
Conductor cross section : minimum 1,5mm².
Remove approx 7mm of insulation from the wire and screw it into the terminals Ph-N.
*WARNING :*
*BEFORE WORKING ON THE DEVICE DISCONNECT THE MAINS SUPPLY VOLTAGE.*

**LED INDICATION:**
***Green light*** : power supply.
***Red light*** : start-up 2 seconds and during programming. Or when selecting the output mode and the minimum dimlevel in Dimmer and PWM mode. See below under Manual Control.
***Orange light 1-4*** : Output 1 till 4 active.

**MANUAL CONTROL (choice of output mode):**
Used to control the output directly from the module, or to choose the output mode (Dimmer, Relay or PWM) and to set the minimum dim level of a dimmer or PWM output. By default, the outputs are in Dimmer mode, with a 10% minimum dim level. In order to change this, follow the following procedure:

1) Make sure all outputs are OFF (Orange Leds are off)
2) Push buttons 1 and 2 simultaneously for five seconds.
3) The red STATUS LED on the module will flash for 5 seconds, and will then start flashing at a different (slower) speed.
4) 1 second after the LED started flashing at a different speed, release one button, and one second later release the other button. The red STATUS LED will now continue to flash - the module is in configuration mode.
5) The outputs are standard in Dimmer mode. Changing to Relay or PWM mode can be done by pushing the button under the respective output a certain number of times. The orange LED next to the button will flash each time the button has been pushed. The table below indicates how many times the button needs to be pushed to get in to the respective mode:

| *Mode* | *Choice* |
|---|---|
| **Dimmer** | **1** |
| Relay (ON/OFF) | 2 |
| PWM Invers | 3 |
| PWM Positive | 4 |

If during 4 seconds the button has not been pushed, the module will go out of configuration mode - the red Status LED will stop flashing.

6) For Dimmer and PWM outputs, the minimum dim level can also be set via the buttons on the module. Follow steps 1 to 4 above to get into the configuration mode. The table below indicates the number of times the button below the respective output needs to be pushed in order to select the minimum dim level indicated. The output cannot go below the selected minimum dim level - to be used when certain light sources at low dim levels become unstable (flicker)).

| *Low Dimming Limit (DimMin)* | *Choice* |
|---|---|
| 0% | 5 |
| **10%** | **6** |
| 20% | 7 |
| 30% | 8 |

If one of the buttons during configuration mode is pushed for 5 seconds, the respective output will be reset to the Default mode (Dimmer with 10% minimum dim level). A

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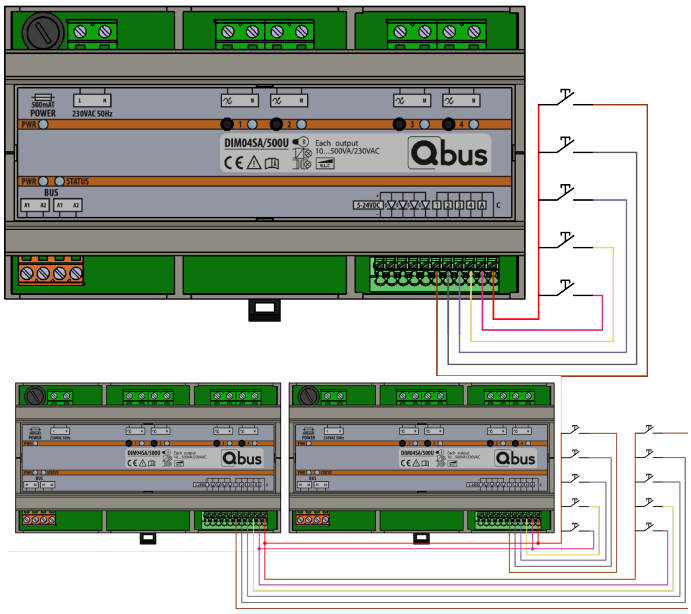
successful reset will result in the LED of the output flashing quickly for 10 times. The setup mode remains active.

**Warning: selecting the output mode and the minimum dim level needs to happen in SEPARATE steps. Put the module in setup mode, select the output mode (pushing the button respectively 1-4 times), go out of the setup mode, go back into setup mode, then select the minimum dim level by pushing the button 5-8 times.**

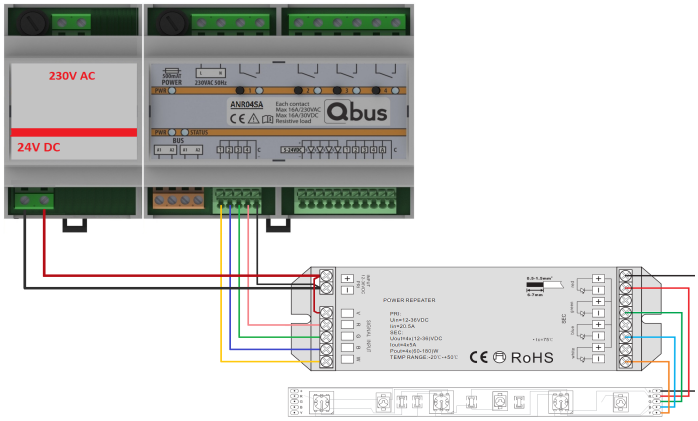
**CABLING OPTIONS**

*Remark: images below show DIM04SA for the connection of the inputs - the input connection for ANR04SA is the same.*

**Option 1: Stand-Alone**

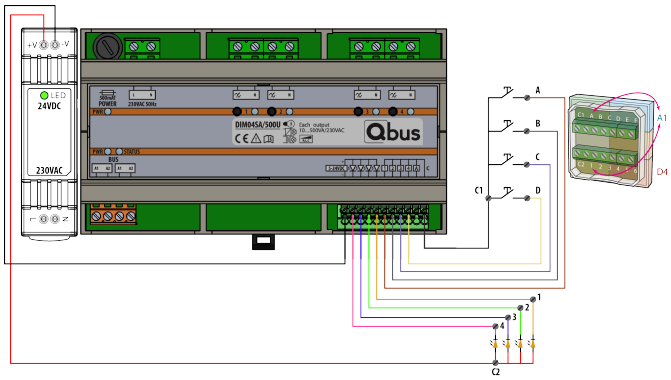


Multiple ANR04SA modules can be connected with each other or with other modules in the SA range (REL04SA, DIM04SA, DIM02SA).



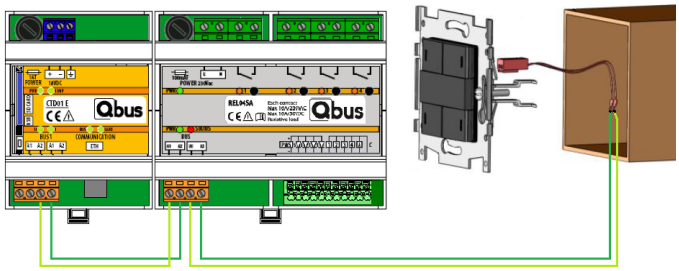

*Wiring diagram of ANR04SA with PWM power repeater*

**Option 2: Stand-Alone with LED-feedback**



With extra 5-24V power supply for LED-feedback on switches.

**Option 3: with controller as part of a complete Qbus system**



- No module, switch or push button needs to be replaced.
- A Qbus controller provides power and data to all in- and output modules via the two-wire bus. This module contains clocks, scenes, presence simulation, logic,… Via the Ethernet port of the controller, the installation can be connected to the internet and can be controlled remotely via smart phones, tablets etc.
- It is recommended to use the EIB cable or any other cable with minimum 2 x 1mm² conductors as bus lead.

## 4. Technical Data

**GENERAL SPECIFICATIONS :**

- Power supply : 230Vac +-10%, 50 Hz - maximum protection 16A/2P
- Insulation voltage : 3 kVac tested
- Characteristic consumption : 9VA maximum – all relays on
- Ambient temperature :
  Working temp. range : 10°C to 50°C
  Storage temp. range : -10°C to 60°C
- Maximum humidity : 93%, no moisture condensation

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- Bus load : 10mA at nominal 13,8V
- Internal fuse : 500mA single-phase
- Max installation altitude : 2.000 meters.

**OUTPUTS : MODES**

- In Stand-Alone mode, the outputs are by default in Dimmer Mode with 10% minimum dim level. By using the buttons on the module, the module can be set in Relay (ON/OFF) or PWM mode, and the minimum dim level can be adapted (see Manual Control).
- Dimmer and PWM Mode:
  - In Stand-Alone, only 1-button dimmer control is possible. If used with a controller, 2-button control is also possible.
  - Parameters:
    - In Stand-Alone, minimum dim level can be selected via the button on the module.
    - Via a Controller (which can be removed after changing the mode and setting the values) the outputs can be configured with a Time Off and a DimStart (dim level when activating the output).
    - When used with a Controller: Fade In and Fade Out possible.
- Relay Mode:
  - Via a Controller (which can be removed after changing the mode and setting the values) the outputs can be configured with a Time Off, a Delay On and Delay Off.
- The relay follows the dimmer (0% = relay off, otherwise relay on) in Dimmer and PWM mode.
- When coupled with a controller, the ANR04SA will receive its input and output modes via the controller. When the controller is taken away, all Timer modes will be turned in to Timer 1 mode.

**OUTPUTS: SPECIFICATIONS**

- ANA/PWM 1-4: 4 analogue outputs. Each output:
  - Max 4mA Source (analog out 0-10V)
  - Max 20mA Sink (analog out 1-10V)
  - PWM out (from internal power supply) 10V max. 4mA
  - PWM out (from external power supply) 10-24V
- Relays 1 – 4: 4 potential-free normally open single contacts
  - If outputs are in Dimmer or PWM mode, the relay will follow the Dimmer (0% = relay off, otherwise relay on).
  - If output is in Relay Mode, the output is ON/OFF

- Relays
  - Rated current : 16A
  - Contact resistance : 100mΩ
  - Set/Reset time : 15ms max / 5ms max
  - Endurance : 20 million operations
  - Rated load :
    - Resistive load (cosφ = 1)
      16A at 230Vac / 30VDC
    - Inductive load (cosφ = 0,4; L/R = 7 ms)
      8A at 230Vac / 30VDC
  - Maximum switching power :
    - Resistive load (cosφ = 1)
      3680VA at 230Vac
      480W at 30Vdc
    - Inductive load (cosφ = 0,4; L/R = 7 ms)
      1840VA at 230Vac
      240W at 30Vdc

We strongly recommend not to exceed these values, otherwise an external contactor should be used!

**INPUTS :**

- IN1 – IN5 : 5 potential-free single contacts
- Input signal delay :
  - when closing the contact : max 100ms
  - after opening the contact : max 100ms
- Input function : standard as push button.
  - Output in Dimmer or PWM mode: input can only work as push button. Only 1-button control possible in Stand-Alone mode, 2-button control possible with Controller.
  - Output in Relay mode: input by default in push button, via a Controller the inputs can be set as Normal Open, Normal Close, Toggle or Push button.
  - Input A (scenario input): by default push button, via Controller NO/NC possible.
    **<u>WARNING</u>: IF THE SCENARIO INPUTS (INPUT A) OF SEVERAL STAND-ALONE MODULES ARE LINKED TOGETHER, AND A CONTROLLER IS ADDED TO THE INSTALLATION, A SCENARIO NEEDS TO BE CONFIGURED VIA THE QBUS CONFIGURATION SOFTWARE. THIS SCENARIO NEEDS TO BE ALLOCATED TO <u>ONLY ONE</u> OF THE INTERCONNECTED INPUT A'S.**

**PHYSICAL SPECIFICATIONS**

- Housing : Plastic, self-extinguishing according to UL94-V0
- Protection Degree : IP20, EN60529
- Installation : rapid mounting on DIN-RAIL, width 6 modules
- Dimensions (HxWxL) : 62mm x 89mm x 107mm
- Weight : approx. 0,412 kg

**ELECTRICAL SAFETY**

- Bus : 13,8VDC safety extra low voltage.
- Complies according to EN50491-5-1, EN50491-5-2 and EN60529

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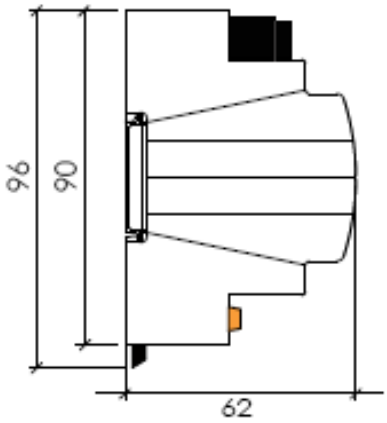
- Dielectric strength : module has been tested (and approved) 3kVac.( 50 Hz, 1 min)
- Non-toxic WEEE/RoHS compliant

## CE

- Complies with the EMC regulations and low voltage regulations. Emission and Immunity EN50491-5-1 en EN50491-5-2. Low voltage EN60950-1

## 5. Dimension Diagram

Dimensions in mm.




Width = 6 modules.
1 Module = 17 mm.

## 6. Guarantee provisions

Standard Warranty Period: 2 years from date of delivery.
Extra Warranty: if installed by an electrical installer or recognized Qbus advisor and if the warranty card has been completely filled out and sent back to Qbus within 2 months, guarantee is extended for two additional years.
Guarantee will not be accepted if the device has been opened!
Any faulty devices should be send postage-free with a description of the defect to our central customer service office :

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