PRODUCT INFO

Technical product specifications

Motion sensor and air quality sensor (SENMax)

Figure 1 SENMax/RW (white flush mounted version)

Figure 2 SENMax/TW (white surfce mounted version)

1. Product description

SENMax is an inconspicuous, flat, white, round, multifunctional detector that combines five different sensing capabilities in one compact unit. The SENMax can detect movement, light (lux), humidity (RH%), CO2 (ppm) and temperature (°C). This makes it a very versatile detector. Small holes in the surface are used to measure the air quality. To be able to create a healthy living environment and improve energy efficiency, smart ventilation and heating controls are essential. SENMax is suitable for use in HVAC applications, lighting control and other applications suited to its sensing capabilities.
It is designed for indoor ceiling installation. This sensor may be connected directly to a Qbus two-wire bus using the included flexible cable. It is configured using System Manager III.

Like every Qbus module, the SENMax has a unique serial number which is entered in the System Manager III configuration software during configuration. All programmed data is stored internally in a permanent memory. This module is capable of receiving firmware updates over the Qbus bus.

The unit can control different types of I/O based on the values for its five sensors:

- Temperature: Range from -10°C to +60°C. Creation of HVAC or thermostat mode is not required.
- · Motion: There are two sensitivity levels available. “Initial trigger” specifies the amount of movement required to turn on the I/O. “Maintenance trigger” can be used to specify a lower amount of movement at which the I/O should stay on. Once the detected movement has stopped, a timer can be used to set a delay of between 2 seconds and 127 minutes. After the timer has run out, the linked I/O will be turned off. A scan feature allows for visual testing of the current detection settings. The timer will start running as soon as the detected movement drops below the yellow line (maintenance level).
- Lux: Threshold ≥ or ≤ adjustable between 0 and 3000 lux (surface measurement)
- CO2: Threshold ≥ or ≤ adjustable between 400–2000 ppm
- RH%: Threshold ≥ or ≤ adjustable between 0–95%

The controlled I/O may be either Bistable or a Dimmer. This means the sensor can control a dimmer address directly based on light and motion detection. Night mode will cause the dimmed lighting circuit to turn on at reduced intensity. This day/night feature can be activated using timers, logic or manually.

A blue LED indicates motion detection and/or lights up when it’s dark.

2. Safety rules

Read the entire manual before installing and activating the module.

ATTENTION

- The module must be installed, commissioned and maintained by a qualified electrician in accordance with applicable national legislation.
- The power must be switched off before working on the SENMax.
- Never connect external voltages (e.g. 230 VAC) to the Qbus bus! This will cause irreparable damage to the modules.
- Keep out of reach of children.
- Do not open the module. Opening the module voids the warranty!

3. Installation and cables

Installation: For the recessed version, provide a round opening of 40mm. Connect the supplied cable to the bus cable. Then push the connections deep enough so that the sensor has sufficient clearance. Next, gently push the sensor into an opening of minimum 40mm and maximum 45mm without applying excessive force. Avoid pressing on the sensor face. Take note of the direction of the barbs to position the detection field as desired.
For the surface-mounted version, first mount the base with cable entry, then make the connection and click the sensor onto the base.
Power supply: The module is powered by the bus.

LED indicator on module:
The blue LED can be configured via SMIII to briefly light up upon motion detection. The frequency can be set to 2 seconds or 5 seconds (default). The LED can also blink for safety reasons when it gets darker than 40 lux.

Motion sensor and air quality sensor (SENMax)

4. Commissioning

SENMax configuration in SMIII:
By entering the unique serial number, the configuration software System Manager III recognizes the module. The serial number of the SENMax always starts with 0047 followed by 6 hexadecimal digits (0 to 9 & A to F). For example, 0047 B0255A.

If the sensor has been installed and the number is not known, the module can be registered via the "Search for modules" button by quickly changing the lux value. Once the sensor has been registered in System Manager III, the blue LED will stop blinking.

The following "Modes" are applicable in the trigger table:

- Bistable (with On/Off delay)
- Dimmer 1T
- Dimmer 2T

Creating a Universal address for lux measurement, HVAC, or Thermostat is not necessary for the trigger table.!

Operation of motion detector:
The built-in PIR sensor detects passive infrared radiation. For SENMax/Rx, the detection from the detection plane is 106° x 96.8°. At a height of 2.5m, the detection field measures 6.65m by 5.65m. For SENMax/Tx, the detection angle from the detection plane is 91° x 76.7°. At an installation height of 2.5m, the detection field is 5m by 4m. It is best to place the sensor with the pressure springs facing the walls with the smallest spacing to obtain an optimal detection range. You can determine the detection field during installation using Figure 2.

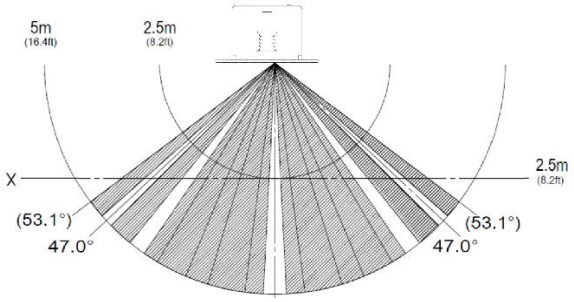
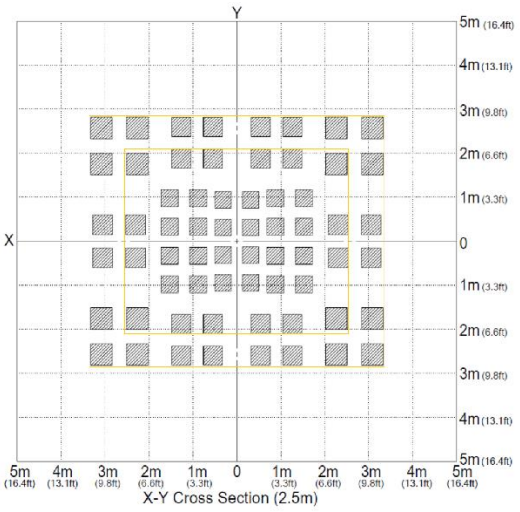


Figure 3 Detection field of PIR sensor for SENMoLi/SENMax

The most sensitive detection zone at floor level is centrally located in an area of 2.2m x 3m at a height of 2.5m.



Operation of LDR
The LDR (Light Dependent Resistor) is used for lux measurement. By default, it measures the lux value without the need to create an I/O for it. If you wish to use lux measurement as a variable in analog logic, you can create an I/O with the "Universal" mode.

When multiple motion sensors of the SEN04xx, SENMax, or SENMoLi type need to send the same I/O, logic is used. You can add the I/O sent by the logic to the "Overrule LDR" function. This ensures that the sensors only use the motion condition when this I/O is active.

Once an I/O is assigned to "Overrule LDR," an additional column appears in the triggers. You can assign a bistable or dimmer type I/O to "Overrule LDR.".

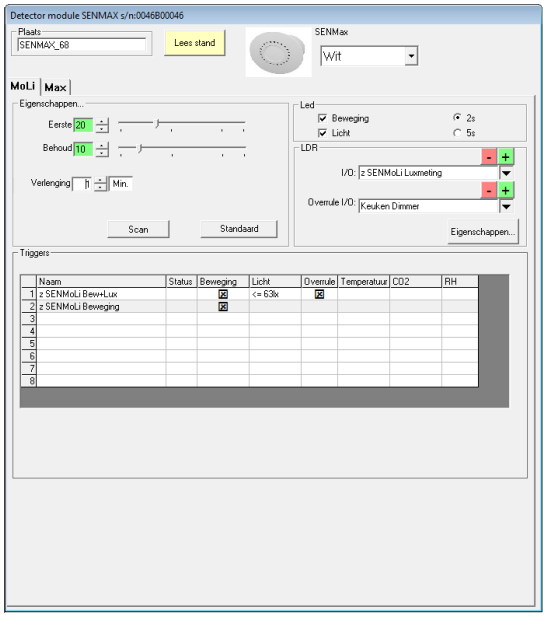


Figure 4 Example configuration movement + Lux + Overrule

Motion sensor and air quality sensor (SENMax)

In the example of figure 4, the first I/O is activated when there is "Motion" AND when it is darker than 64lux. Once the I/O is active in "Overrule LDR," the sensor only considers "Motion" as a condition to send this I/O until the delay time has elapsed and the I/O is extinguished.
The current lux measurement is displayed next to the text "LDR" in parentheses under "Read State.".

Operation of HVAC
The CO2 sensor measures the CO2 concentration in a living space. The CO2 level is determined, among other factors, by the number of people present or by activities such as gas cooking. The measured value is transmitted via the bus to the Qbus Controller. Depending on the measurement results, the controller activates other modules to bring fresh air into the room (e.g., relay contacts or 0-10V controls on fans or windows) and to remove stale air (via an exhaust system or hood). A CO2 value of >= 1200ppm should be avoided for health reasons.
The humidity sensor on the SENMax also measures the relative humidity (RH%) in a room. Humidity is an indicator of air quality, especially in wet areas (bathroom, toilets, kitchen, etc.). RH% and temperature values can be used to calculate the dew point, and thus control the ventilation system based on the dew point. The ideal humidity level in a building is between 40% and 60%. Below 40% is considered too dry, and above 60% is too much. The Qbus controller automatically calculates the dew point based on the HVAC address. This mode is ideal for combining with fan coil units such as those from Jaga Oxygen.

5. Technical specifications

General specifications SENMax
- Ambient temperature:
- Operating temperature: -10°C to 50°C
- Storage temperature: -10°C to 60°C
- Maximum humidity: 95%, no condensation
- Power supply: Bus
- Peak load Qbus bus: 15mA
- Max. mounting height: 2,000 metres above sea level

Elektrische safety:
- Qbus bus: 13.8Vdc - 18Vdc very low safety voltage
- Non-toxic, in accordance with WEEE/RoHS
- Overvoltage CAT. I (CAT.1)

CE:
- Qbus declares that this product satisfies all applicable European directives and regulations.
- An EU declaration of conformity is available on request.

Physical specifications:
- Housing white variant: ASA plastic, UV-resistant, self-extinguishing according to UL94-V0
- · Protection rating: IP20, EN 60529
- · Net housing dimensions (h x d): 28mm x 36mm
- · Housing dimensions with connecting wire / plug (h x d): 35mm x 36mm / board diameter 40mm
- · Cover plate / sensor surface dimensions: (h x d) 1.5mm x 52mm
- · Surface-mounted version dimensions: (h x d) 40mm x 60mm
- · Weight: approximately 30g (built-in) - 100g (surface-mounted)
- · CO2 sensor range: 400 – 40,000ppm, accuracy 50ppm between 400 – 2000 ppm
- · RH% sensor range: 0 – 100%RH
- Accuracy: 6%RH (15°C – 35°C & RH20% - RH65%)
- Accuracy: 9%RH (-10°C – 15°C / 35°C-60°C and <RH20% or >RH60%)
- · Temperature sensor range: -10 - 60°C
- Accuracy: 0.8°C (15°C to 35°C)
- Accuracy: 1.6°C (0-15°C or 35-60°C)
- · Direct light intensity measurement 0-1200lux

6. Declaration of symbols

Equipment where protection against the risk of electric shock is not only based on basic insulation but also on additional protection such as double insulation or reinforced insulation. There is no possibility of grounding.

Before connecting the device, it is mandatory to read the manual of the respective product. ISO7000-0434.

CE conformity. All conformity statements are available upon request.

7. Warranty provisions

Warranty period: 2 years from the date of delivery. The warranty is void if the module has been opened! The warranty period is extended by 2 years if installed by an authorized Qbus installer.
In case of defects, Qbus support must be contacted first. Defective modules will be sent, free of seal, to our service department:

Qbus NV
Joseph Cardijnstraat 19
B-9420 Erpe-Mere
Tel: +32 (0)53 60 72 10
Fax: +32 (0)53 60 72 19
Email: support@qbus.be