Customer Integration Guidelines

Senseair RDS

The Senseair RDS is a device intended for detecting refrigerant leaks. It features the well-known Senseair Sunlight LED-based sensor inside an IP67 rated protective housing. It comes with different output and communication options and can be tailored to a wide range of specific applications.

Warning: The Senseair RDS products are qualified with default settings of configuration registers. If register values are changed to other values than default factory settings, ensure that changes do not invalidate device qualification.

Contents

Standard Specifications

@ PSP14416, Senseair RDS R32 (009-3-0007, 009-3-0008, 009-3-0009)
@ PSP14811, Senseair RDS R290 (009-3-0010, 009-3-0011, 009-3-0012)

Open the hyperlink of the desired model or find it at Senseair website "www.senseair.com" under "Products"

Electrical Specifications

Absolute maximum electrical ratings & Recommended operating electrical conditions & Electrical and power characteristics

@ PSP14416, Senseair RDS R32 (009-3-0007, 009-3-0008, 009-3-0009)
@ PSP14811, Senseair RDS R290 (009-3-0010, 009-3-0011, 009-3-0012)

Connector pinout

@ IMA14493, Installation manual Senseair RDS

Mating connector

Pin	Symbol	I/O Type	Description
1	RS-485A	I/O	RS-485 "A" signal or UART TxD [1]
2	RS-485B	I/O	RS-485 "B" signal or UART RxD [1]
3	OUT2	O	Analogue voltage output
4	GND		Ground
5	GND		Ground
6	OUT1	O	Digital output [1, 2], software configurable choise between: a) PWM signal, 1kHz frequency b) Digital High/Low signal with software configurable threshold and hysteresis
7	OUT3	O	Analogue current output [1, 2]
8	PWR	Power	Sensor supply voltage [1]

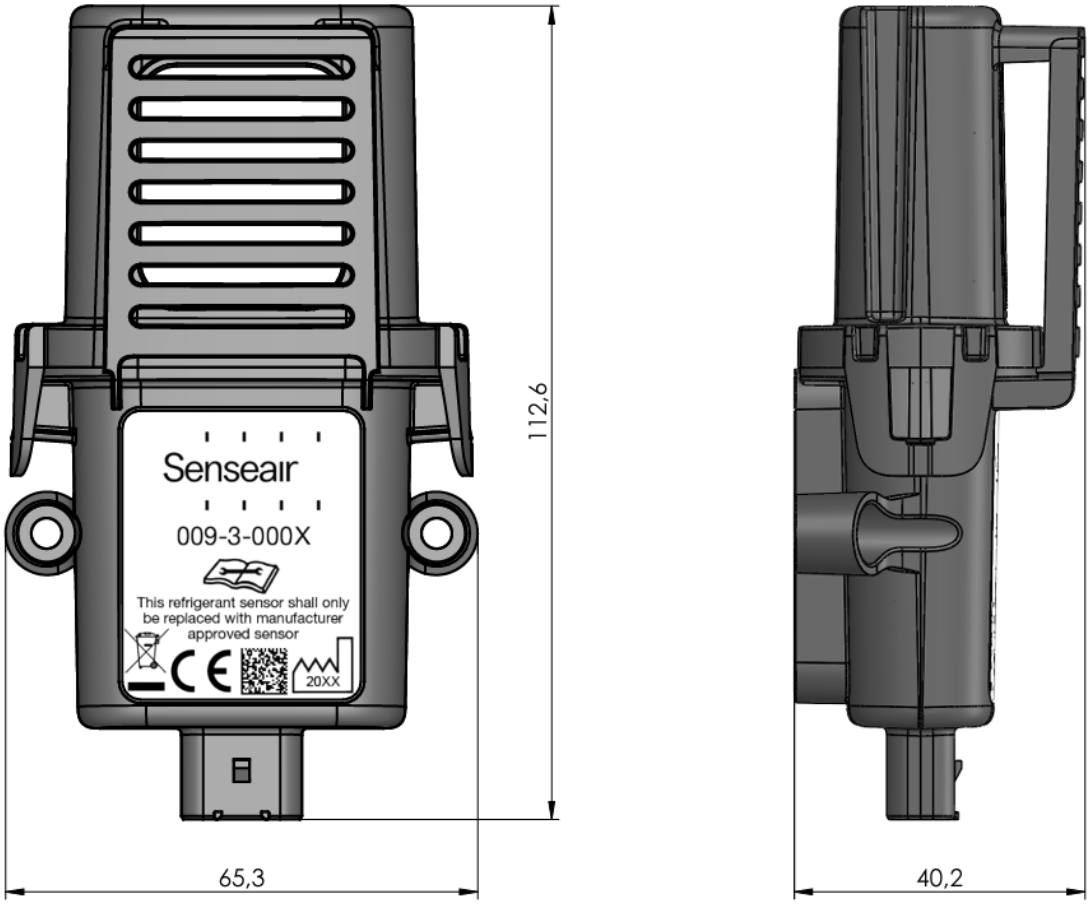
[1] Depending on actual variant; see Product Specification for actual device for details.

[2] Note that the Out1, Out2 and Out3 outputs are not independent.
Connect only one output pin to external circuitry!

Mating connector type: Amphenol MicroSpaceXS™ 10155470-A008LF
Use cable tension relief for power / I/O cables respectively which shall be held in place. Cables shall be straight, without angles and tensions.

Physical Dimensions

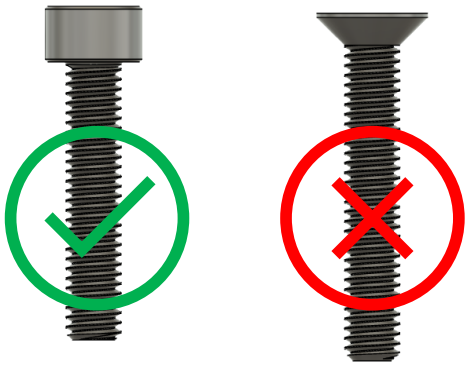
Physical dimensions are specified in drawing 740-01891



Dimensions in mm

Refer to the Senseair RDS installation manual IMA14493 for considerations for mounting distances and correct mounting procedures.

- Maximum screw diameter is d=4.0mm.
- Maximum screw head size is d=7.8mm.
- Avoid countersunk screws!



Operating Environment Specification

Senseair RDS is intended, but not limited, to commercial and residential HVAC installations and industrial applications.

Temperature and humidity operating range

At higher than specified absolute humidity and relative humidity levels, stated accuracy cannot be guaranteed.

To allow operation at low temperatures, the Senseair RDS is equipped with internal resistive heating elements, which will warm the sensor internals above freezing temperatures. The heating elements are controlled by a PI regulator, featuring a configurable setpoint with a default setting of +25°C

At higher temperatures than specified, the internal temperature compensation for gas concentrations will be less accurate. If calibrated accuracy and function is required for wider temperature ranges, please contact Senseair.

Warm-up time

There is no warm-up time required for the Senseair RDS, the very first measurement after a reboot or power cycle would be accurate within stated accuracy specification and average RMS noise. This is due to the miniscule circuitry-heating of Senseair sensor chipset, and with the typical integration of several samples per presented concentration value and measurement period.

Please make a distinction between Senseair RDS´s warm-up and settling time from a shutdown and power-off, and full acclimatization time to conform to a new steady-state from actual changes in the ambient environment. In cold environmental conditions, internal heaters will warm the RDS and this process will increase the time it takes to reach stable operation temperature. The actual temperature inside the device can be read out through Modbus register.

Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration.

Connector assembly

Documentation of the mating connector can be found at Amphenol's website, https://www.amphenol-cs.com/product/10155470a008lf.html

The Application specification GS-20-0657 https://cdn.amphenol-cs.com/media/wysiwyg/files/documentation/gs-20-0657.pdf describes how to assemble the mating connector parts

Warning: If not all 8 pins are populated in the connector, to ensure water & dust protection the open holes must be filled with seal plugs (Amphenol article 10155475-000)

Modbus settings and registers

Communication to the device is by Modbus protocol, see TDE13072 at Senseair website for details and examples.

Communication parameters like baud rate, parity and number of stop bits are configurable.

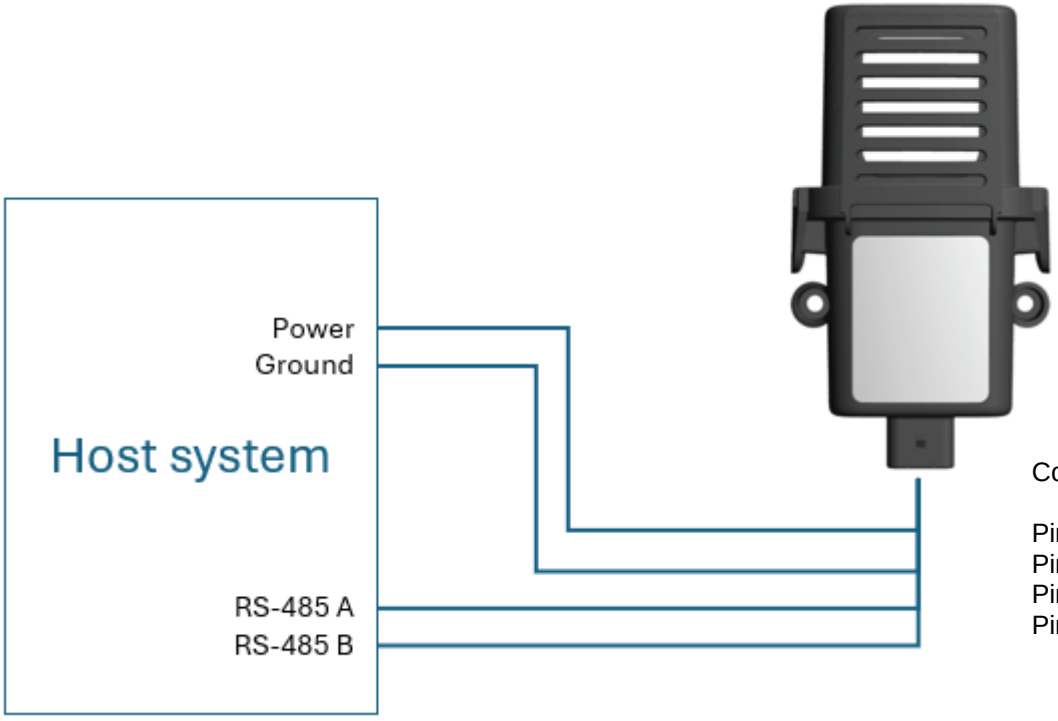
Electrical Integration Illustrations

Modbus over RS-485 integration (Note: only for product variants with RS-485 communication option)

Modbus serial-line over RS-485.

This setup uses the device in standard factory configuration.

Communication parameters like baud rate, parity and number of stop bits are configurable, see TDE13072 at Senseair website for details of and examples.



Connector pins used:

Pin 1: RS-485A
Pin 2: RS-485B
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 24 VAC/DC, or 12 VDC, depending on RDS variant (RS-485 communication is not supported on 5V variant). To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Make sure to follow the general guidelines for RS-485 networks regarding network topology, cable lengths and cable termination

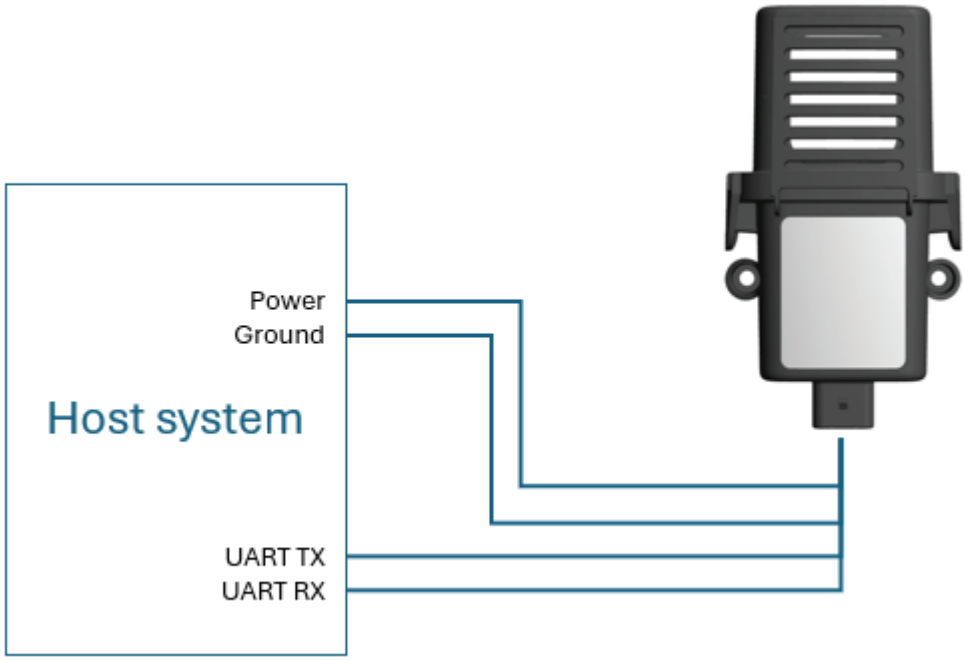
Voltage levels on RS-485A and RS-485B lines is according to the RS-485 specifications.

Modbus over UART integration (Note: only for product variants with UART communication option)

Modbus serial-line over UART.

This setup uses the device in standard factory configuration.

Communication parameters like baud rate, parity and number of stop bits are configurable, see TDE13072 at Senseair website for details of and examples.



Connector pins used:

Pin 1: UART TxD
Pin 2: UART RxD
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 5 VDC (UART communication is not supported on 24 V and 12 V variants). To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Wires for UART communication should be kept short. If longer cables are required, please consider using RS-485 communication.

Voltage levels on UART TxD and RxD are 3V, electrical details can be found in product specifications:

@ PSP14416, Senseair RDS R32 (009-3-0007, 009-3-0008, 009-3-0009)
@ PSP14811, Senseair RDS R290 (009-3-0010, 009-3-0011, 009-3-0012)

Digital high/low output to host (all p/n variants)

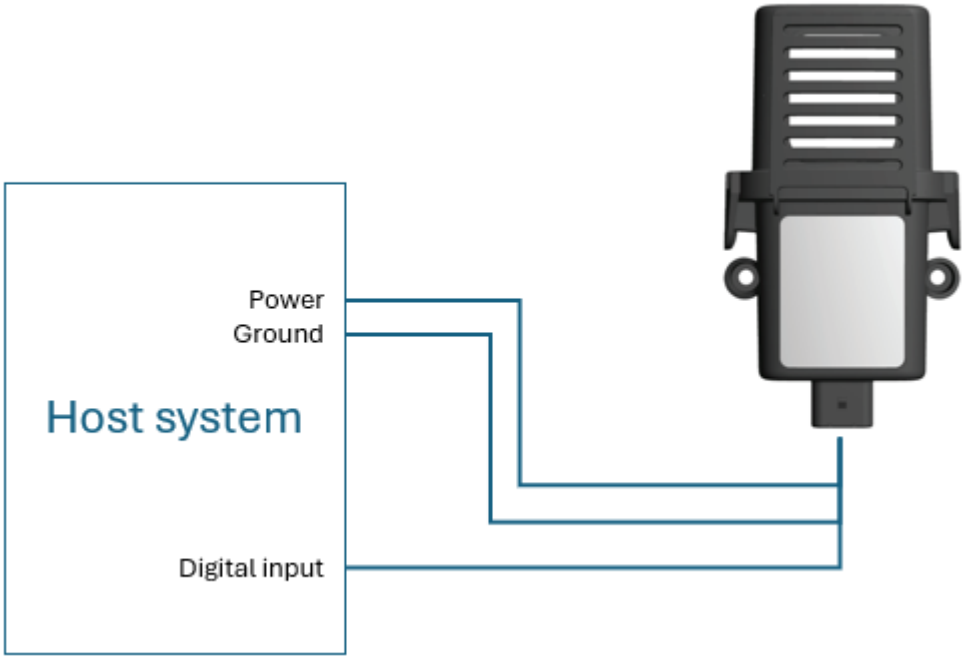
Digital high/low output, with configurable threshold and hysteresis.

This setup is the default factory configuration, with OUT1 set to high level if measured gas concentration is below Detection Threshold Limit Value (DTLV) and low level if above. The default threshold (DTLV) is set to 10% of LFL with hysteresis set to 5% of LFL.

Warning: The IEC / UL 60335-2-40 states that DTLV must not be changeable. When designing a system based on the Senseair RDS, make sure that DTLV cannot be changed by end users and/or service technicians. For details, see IEC / UL 60335-2-40, Annex LL.4

This setup could be used to control an external relay, see circuit proposal under “Digital out to control external relay” below.

For register descriptions and configuration information, see TDE13072 at Senseair website for details of and examples.



Connector pins used:

Pin 6: OUT1
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 24 VAC/DC, 12 VDC or 5 VDC, depending on RDS variant.

To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

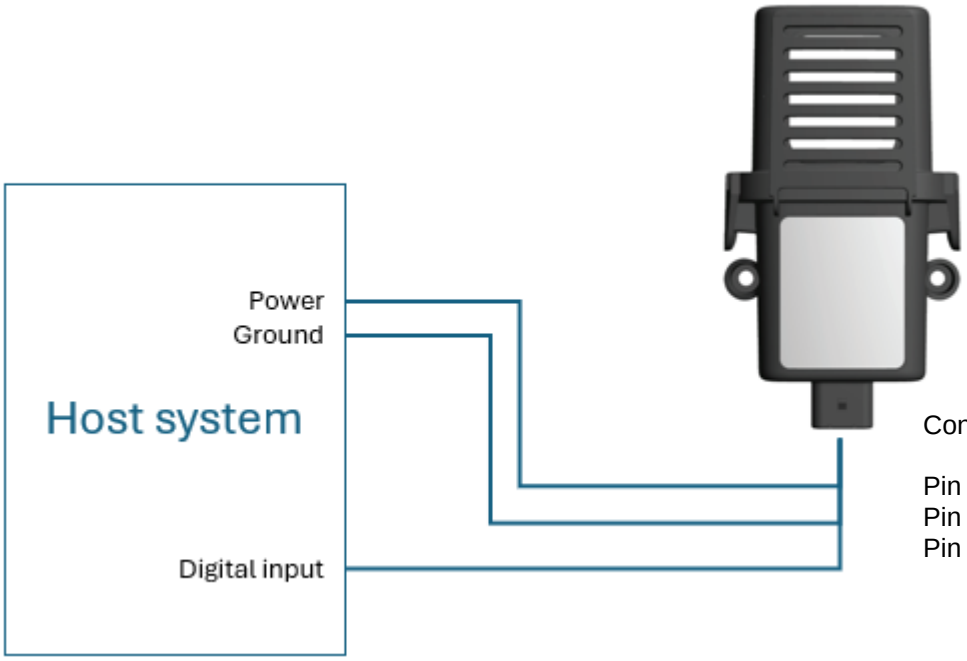
Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration. In case of internal error, the output will be at 0 V.

PWM output to host (all p/n variants)

PWM output proportional to measured gas concentration

This setup requires changes from factory configuration, OUT1 needs to be configured as PWM output.

For register descriptions and configuration information, see TDE13072 at Senseair website for details of and examples.



Connector pins used:

Pin 6: OUT1 (configured as PWM signal)
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 24 VAC/DC, 12 VDC or 5 VDC, depending on RDS variant.

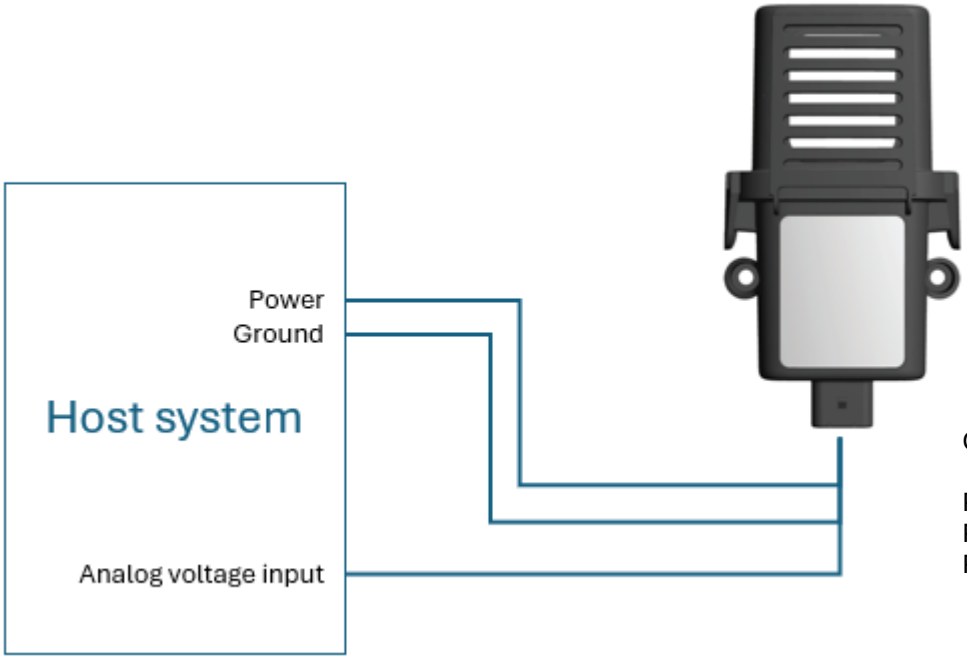
To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration. In case of internal error, the output will be at 0V.

Linear voltage output to host (Note: only for product variants with linear voltage output option)

Linear voltage output proportional to measured gas concentration

This setup requires changes from factory configuration, OUT1 needs to be configured as PWM output. Also, voltage levels and gas concentration range can be configured using Modbus registers. For register descriptions and configuration information, see TDE13072 at Senseair website for details and examples.



Connector pins used:

Pin 3: OUT2
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 24 VAC/DC or 12 VDC depending on RDS variant.

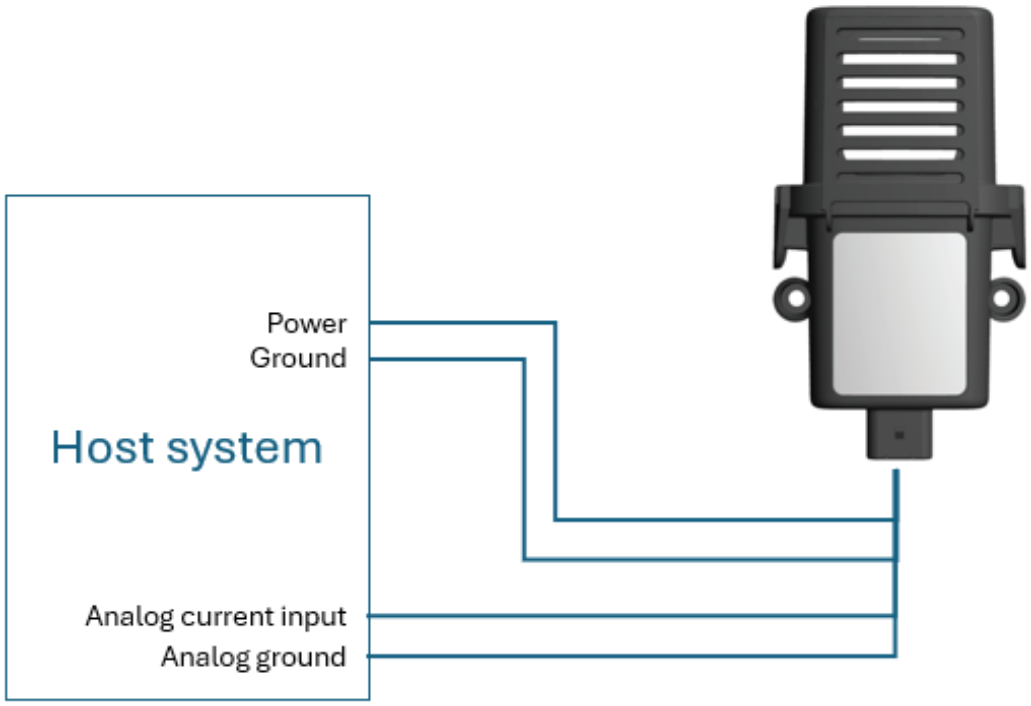
To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration. In case of internal error, the output will be at 0V.

Linear current output to host (Note: only for product variants with linear current output option)

Linear current output proportional to measured gas concentration

This setup requires changes from factory configuration, OUT1 needs to be configured as PWM output. Also, current levels and gas concentration range can be configured using Modbus registers. For register descriptions and configuration information, see TDE13072 at Senseair website for details and examples.



Connector pins used:

Pin 7: OUT3
Pin 5: GND
Pin 4: GND
Pin 8: PWR

Power should be 24 VAC/DC or 12 VDC depending on RDS variant.

Load on OUT3 should be within specifications described in product specifications available from Senseair's website.

@ PSP14416, Senseair RDS R32 (009-3-0007, 009-3-0008, 009-3-0009)
@ PSP14811, Senseair RDS R290 (009-3-0010, 009-3-0011, 009-3-0012)

To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration. In case of internal error, the output will be at 0 mA.

Digital out to control external relay (all p/n variants)

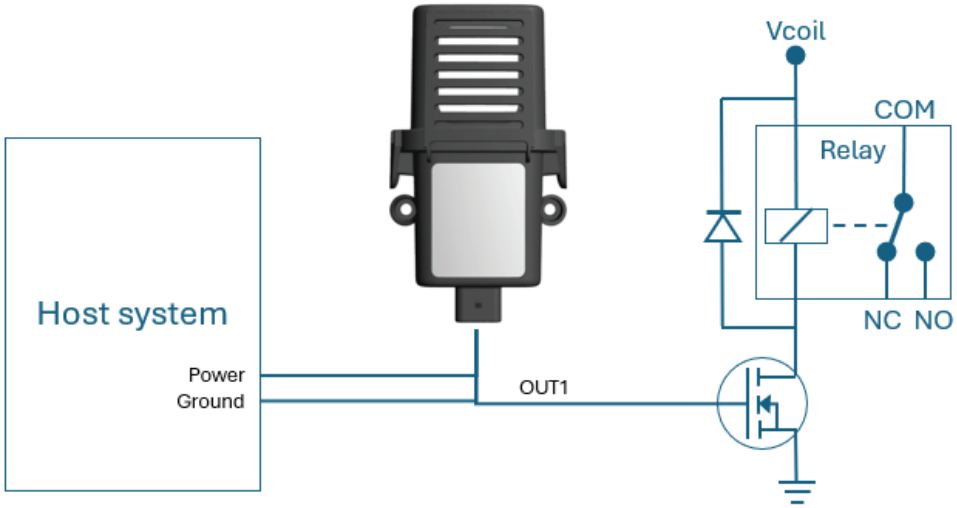
Digital high/low output, with configurable threshold and hysteresis.

This setup uses the default factory configuration, with OUT1 set to high level if measured gas concentration is below Detection Threshold Limit Value (DTLV) and low level if above. The default threshold (DTLV) is set to 10% of LFL with hysteresis set to 5% of LFL.

Warning: The IEC / UL 60335-2-40 states that DTLV must not be changeable. When designing a system based on the Senseair RDS, make sure that DTLV cannot be changed by end users and/or service technicians. For details, see IEC / UL 60335-2-40, Annex LL.4

The current drive capability of OUT1 is limited to 32 mA (009-3-0007, 009-3-0008, 009-3-0010 and 009-3-0011) or 24 mA (p/n 009-3-0009 and 009-3-0012), which means that depending on coil power consumption of the chosen external relay an external drive circuit may be required, see below for circuit idea/proposal.

For register descriptions and configuration information, see TDE13072 at Senseair website for details of and examples.



Connector pins used:

Pin 6: OUT1
Pin 4: GND*
Pin 8: PWR

*Alternatively, Pin 5 can be used as GND

Power should be 24 VAC/DC, 12 VDC or 5 VDC, depending on RDS variant. Coil voltage (V_{coil}) should be adapted to chosen relay type.

To ensure IP classification of device is fulfilled, unused positions in the cable connector should be plugged.

Note that the outputs will be at 0 for a few seconds during power up. As soon as there is a valid measurement, the outputs will assume state based on measured gas concentration. In case of internal error, the output will be at 0 V.

Current consumption

The current consumption of the RDS device will vary depending on ambient temperature, as the built-in heaters will be activated at low temperatures. The heater setpoint is set at default value at factory but can be adjusted by Modbus registers.

If the application requires low power consumption, the built-in heaters can be disabled to save power. Note that this will affect operating temperature range of the device, as the purpose of the heaters is to enable the device to be used in cold temperatures.

The Modbus registers to configure heater parameters are described in the Modbus specification TDE13072 available at Senseair website.

IIR filter on measured gas concentration

The RDS internal software implements an IIR filter on concentration measurements, acting to suppress the noise in the measured gas concentration.

This filter causes some additional lag in sensor response time by actively suppressing the full step change of each new perceived reading compared to the past one, and hence only allowing a fraction of the new change to propagate through and form the next gas concentration measurement value (Static IIR filter).

This is highly effective in improving RMS noise under conditions when there are no actual changes to the environment in which the sensor is sampling. However, when there is a real change event happening, then a Dynamic IIR filter algorithm will modify the static fractional filter to decrease the noise suppression, allowing a bigger part of the step change to propagate through, to help to indicate the environment's changes. This software algorithm is always calculated in parallel with the unfiltered concentration measurement, meaning that both filtered and unfiltered readings are available from Modbus IR registers. Depending on how time-critical or how sensitive to noise and repeatability the system is, either register can be used to obtain measurement data.

The IIR filter is enabled by default factory configuration. The dynamic IIR filter depends on the static IIR filter, therefore if it's desired to disable the static IIR filter, then it is necessary to disable the dynamic IIR filter too.

Atmospheric pressure effect on measured gas concentration

The pressure sensitivity of the RDS is specified to 1% change in measured gas concentration per kPa deviation from mean sea-level pressure (MSLP), 101.325 kPa. This pressure dependence of the measured gas concentration is only valid for typical atmospheric pressure variations around sea level.

To increase the end-customer Sensor experience, Senseair have implemented a software algorithm to compensate the atmospheric pressure effect on measured gas concentration. Note that this function is disabled by default. If required by the end user application, the function can be enabled by the host system.

A Modbus register (HR47 Barometric air pressure value) allows the host system to supply actual air pressure, to allow the pressure compensation algorithm to compensate in cases where actual air pressure deviates from MSLP.

The Modbus registers to configure pressure compensation are described in the Modbus specification TDE13072 available at Senseair website.

Explanation of measurement data registers

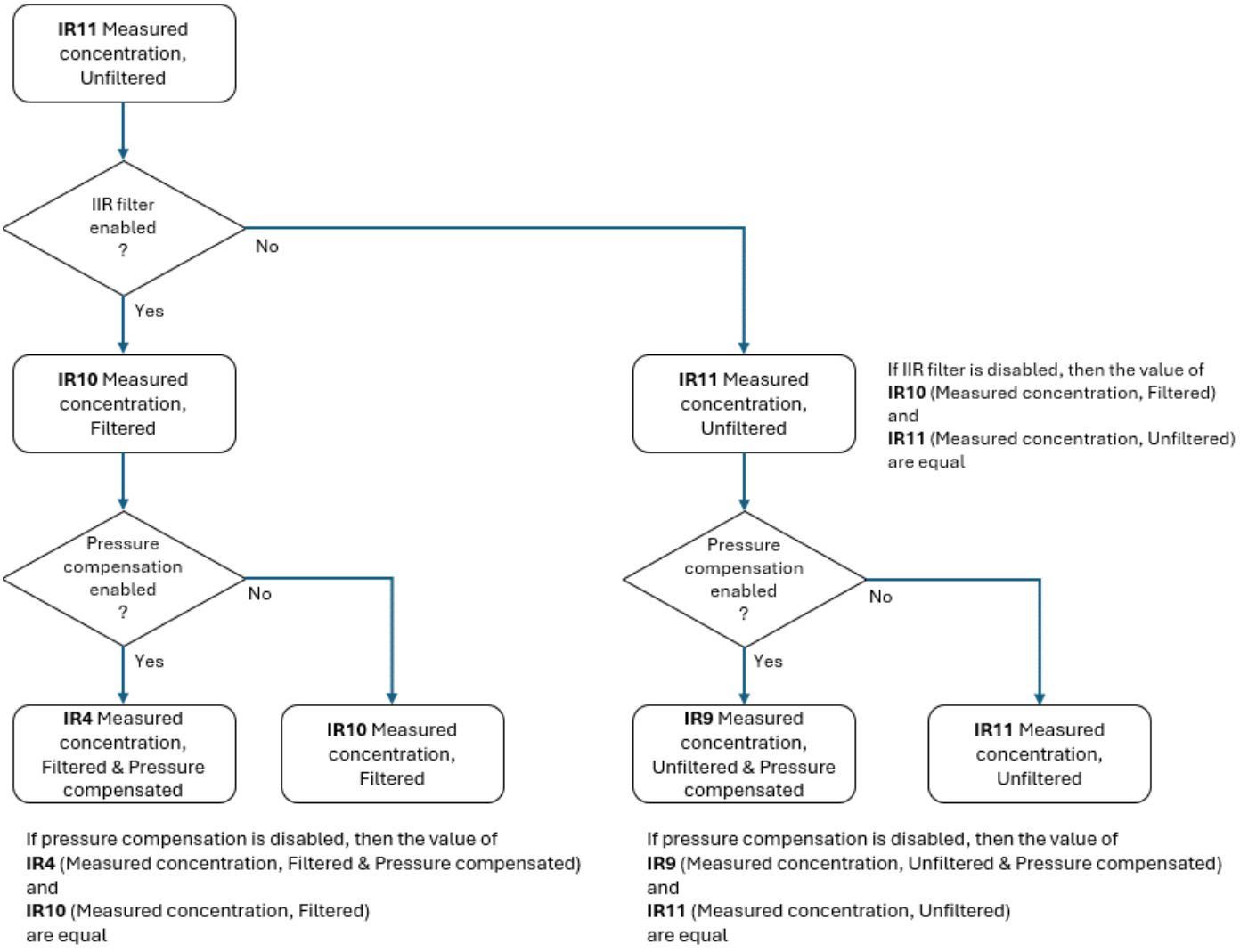
There are 4 different measurement data registers available through Modbus communication.

This section explains the difference between them.

The registers are

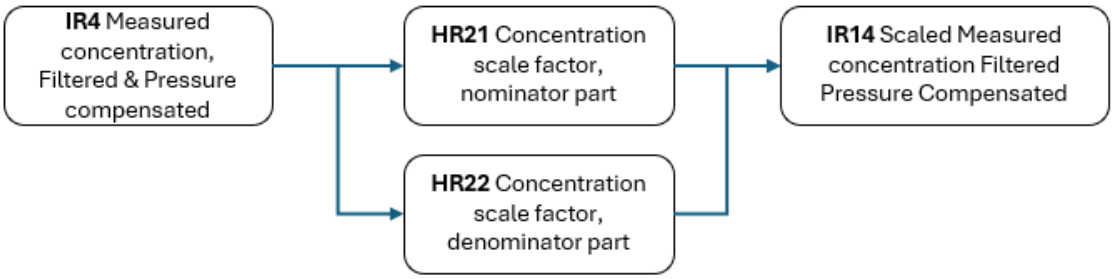
- **IR4** Measured concentration, Filtered & Pressure compensated
- **IR9** Measured concentration, Unfiltered & Pressure compensated
- **IR11** Measured concentration, Unfiltered
- **IR10** Measured concentration, Filtered

The flowchart below shows the connection and difference between these 4 registers.



In addition to the registers above, there is register IR14 Scaled measured concentration, which provides a scaled value of IR4. This register allows end user application to read out measured concentration in units of %LFL (while IR4 provides measured concentration in unit ppm).

The scale factor for IR14 is defined in HR21 and HR22. For more details, see TDE13072 Modbus on Senseair RDS. *Note that the scaling function and the registers IR14, HR21 and HR22 is only available from firmware version 1.2 and above.*



To change scaling factor, one shall write new scaling pair of values into HR21/HR22 registers. For example, if one wants to change representation of value in IR14 for Sunlight R32 sensor to %LFL for R454A gas (see Scaling factors from ppm to %LFL for common gases):

Values to write:

HR21 = 8943 (0x22EF)

HR22 = 4096 (0x1000)

Request:

68 10 00 14 00 02 04 22 EF 10 00 15 80

Response:

68 10 00 14 00 02 08 F5

Validate the writing after sensor reset (or by software command or by hardware reset):

Request:

68 03 00 14 00 02 8D 36

Response:

68 03 04 22 EF 10 00 35 78

Scaling factors from ppm to %LFL for common gases

The Senseair RDS has multiple variants of the articles for different gases and ranges.

To calculate the %LFL or ppm from the sensor reading one can use following formulas:

ppm:

$$ppm = Sensor_{reading} * K_{ppm}$$

%LFL:

$$\%LFL = Sensor_{reading} / K_{\%LFL} * 100\%$$

The sensor resolution in ppm ($Kppm$) and LFL scaling factor ($K\%LFL$) are product dependent values, please consult product specification for exact values - the table below shows these values for most common sensors:

Note! The table below shows theoretically calculated values. To ensure correct operation, user must verify settings and sensor readings in real-world application.

Gas	Kppm, sensor resolution in ppm	K%LFL	Recommended concentration scale factor, nominator part (register HR21)	Recommended concentration scale factor, denominator part (register HR22)	%LFL LSB in IR14
For RDS R32:					
R32	10	144.4	22756	32768	0.01%
R454A	18.47	45.8	8943	4096	0.01%
R454B	12.06	98.2	4171	4096	0.01%
R454C	26.65	29.6	6919	2048	0.01%
R455A	27.67	43.6	18789	32768	0.01%
For RDS R290:					
R290	1	210	100	210	0.01%

Calibration types

The RDS offers different options for performing a manual calibration. Under normal circumstances, manual calibration should not be necessary thanks to the ABC algorithm which compensates for any drifts and shifts of the sensor.

If a manual calibration is activated by Modbus command, the sensor will perform a calibration (Zero, Target or Background) based on the first measurement immediately after the calibration command was received. If a Forced ABC calibration is activated, it will be based on data stored in the ABC parameters registers.
After having performed the calibration, all following measurements will use the adjusted calibration parameters.

It is recommended that Calibration status is cleared before initiating a calibration, and the calibration is initiated by the respective commands. For more details, see TDE13072 Modbus on Senseair RDS.

Warning: The IEC / UL 60335-2-40 states that “Recalibration other than self-recalibration shall not be allowed”. When designing a system based on the Senseair RDS, make sure that calibration cannot be performed by end users and/or service technicians. For details, see IEC / UL 60335-2-40, Annex LL.4

Zero Calibration

Zero-calibration is the most accurate recalibration routine and is not at all affected performance-wise by actual air pressure during the calibration event. A zero-ppm environment is most easily created by flushing the optical cell of the sensor module and filling up the encapsulating enclosure with nitrogen gas, N_2, displacing all previous air volume concentrations.

Target Calibration

Target concentration calibration assumes that the RDS is put into an environment with a known gas concentration. A target concentration value corresponding to the actual environment concentration must be written to the Calibration Target register before initiating the calibration.

See an example in TDE13072 Modbus on Senseair RDS.

Background Calibration

A Background calibration is similar to a Target calibration, but it used the same concentration target value as the ABC algorithm. A “fresh air” baseline environment is by default free from any refrigerant gases, It can be referenced in a crude way by placing the sensor in direct proximity to outdoor air, free of any hydrocarbon sources, preferably by open window or fresh air inlets or similar.

Background calibration and ABC calibration share the same target value (fresh air = 0ppm), this value can be modified by changing the value in register “ABC Target” depending on where the sensor will be placed.

See an example in TDE13072 Modbus on Senseair RDS.

ABC Calibration

The Automatic Baseline Correction algorithm is a proprietary Senseair method for referencing the lowest gas concentration the sensor has measured during a defined time period to fresh air. The time period is by default set to 720hrs, but it can be changed by the host if required. It’s recommended to choose a time period long enough to catch low-occupancy and other lower-emission time periods and favourable outdoor wind-directions and similar which can plausibly and routinely expose the sensor to the most true fresh air environment. To prevent noise or other disturbances to affect the sensor calibration, the sensor requires the environment to remain stable for some time during sampling of the low-concentration point.

In each new ABC time period, the sensor will compare the latest measurement to the stored data in the ABC parameters registers, and if new value show a lower measured gas concentration the stored data will be updated with the new value.

The ABC algorithm also has a limit on how much it is allowed to change the baseline correction offset with, per each ABC cycle, meaning that self-calibrating to adjust to bigger drifts or signal changes may take more than one ABC cycle.

If such a low-concentration environment can be expected to never occur, either due to sensor location or ever-presence of gas emission sources, then ABC recalibration is unsuitable for use. In such cases, it's recommended to disable the ABC algorithm and implement a manual calibration scheme.

Forced ABC Calibration

Forced ABC calibration uses the same reference registers as the ABC calibration do (ABC parameters registers). This calibration function is intended for the case when the host wants to speed up the baseline correction and not to wait the whole ABC period. Forced ABC calibration requires that ABC is enabled.

Error codes and action plan

Below is a list of error flags available in the Error status register

ErrorStatus register		
Bit	**Error description**	**Suggested action**
0	**Fatal error** Indicates that initialisation of analog front end failed	Try to restart sensor by power on/off. Contact local distributor.
1	**Communication error** Attempt to read or write to not exiting addresses/registers detected.	Try to restart sensor by power on/off. Check wires, connectors and communication protocol implementation. Contact local distributor.
2	**Algorithm error** Corrupt parameters detected.	Try to restart sensor by power on/off. Contact local distributor.
3	**Calibration error** Indicates that calibration has failed (ABC, Zero, Background or Target calibration).	Try to repeat calibration. Ensure that the environment is stable during calibration.
4	**Self-diagnostics error** Indicates internal failure. Detailed information of the failure can be found in bit 9-10.	Try to restart sensor by power on/off. Contact local distributor.
5	**Out of range** Indicates that the measured concentration, temperature, or set pressure are outside the sensor's measurement range	Ensure that the environment is within the sensors operating range (see Product specification) If pressure compensation is enabled, provide valid pressure value for pressure compensation. Perform suitable gas calibration (zero, background or target calibration). Contact local distributor.
6	**Memory error** Error during memory operations	Try to restart sensor by power on/off. Contact local distributor.

7	**No measurement completed** Bit set at startup, cleared after first measurement	0 – First measurement cycle completed 1 – No measurement completed
8	**Low internal regulated voltage** Flag is set if sensor's internal regulated voltage dropped below 2.8 V and sensor's reset occurred. Flag shall be cleared by proper power-off/on sequence, reset command or by writing into “Clear ErrorStatus” register.	Check power supply. This means output voltage from internal regulator is too low. Could indicate internal voltage regulator malfunction or too low power supply voltage. Measurement data is not valid.
9	**Measurement timeout** Flag is set if sensor is unable to complete the measurement in time. This flag is set in combination with the Self-diagnostic flag.	Flag is cleared after a successful measurement. If flag is set permanently, try to restart sensor by power on/off. Contact local distributor.
10	**Abnormal signal level** Flag is set if an invalid measurement sample is detected. This flag is set in combination with the Self-diagnostic flag.	Flag is cleared after a successful measurement. If flag is set permanently, try to restart sensor by power on/off. Contact local distributor.
11	**Heater Measurement error**	Measurement of sensor heater element temperature failed. Contact local distributor.
12	**Heater PID config error**	Heater control incorrectly configured. Please check configuration settings.
13	**Output config error**	Output incorrectly configured. Please check configuration settings.
14	**Temperature out of range**	Measured temperature of heater element outside normal operation range. Please check sensor ambient temperature!
15	**Scale factor error** Flag is set if current scaling factor defined by HR21 and HR22 registers is not correct Note: For firmware revision 1.2 and above	Flag is cleared after writing correct scaling factor value and following reset of the sensor

Revision history

Date	Revision	Page (s)	Description
2024-10-24	1	All	New document

IMPORTANT NOTICE

1. Senseair reserves the right to make changes to the information contained in this document without notice. When you consider any use or application of Senseair product stipulated in this document ("Product"), please make inquiries the sales office of Senseair or authorised distributors as to current status of the Products.
2. All information included in this document are provided only to illustrate the operation and application examples of Senseair Products. Senseair neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of Senseair or any third party with respect to the information in this document. You are fully responsible for use of such information contained in this document in your product design or applications. SENSEAIR ASSUMES NO LIABILITY FOR ANY LOSSES INCURRED BY YOU OR THIRD PARTIES ARISING FROM THE USE OF SUCH INFORMATION IN YOUR PRODUCT DESIGN OR APPLICATIONS.
3. The Product is neither intended nor warranted for use in equipment or systems that require extraordinarily high levels of quality and/or reliability and/or a malfunction or failure of which may cause loss of human life, bodily injury, serious property damage or serious public impact, including but not limited to, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signalling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. Do not use Product for the above use unless specifically agreed by Senseair in writing.
4. Though Senseair works continually to improve the Product's quality and reliability, you are responsible for complying with safety standards and for providing adequate designs and safeguards for your hardware, software and systems which minimise risk and avoid situations in which a malfunction or failure of the Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption.
5. Do not use or otherwise make available the Product or related technology or any information contained in this document for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). When exporting the Products or related technology or any information contained in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. The Products and related technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Please contact Senseair sales representative for details as to environmental matters such as the RoHS compatibility of the Product. Please use the Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Senseair assumes no liability for damages or losses occurring as a result of noncompliance with applicable laws and regulations.
7. Resale of the Product with provisions different from the statement and/or technical features set forth in this document shall immediately void any warranty granted by Senseair for the Product and shall not create or extend in any manner whatsoever, any liability of Senseair.
8. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Senseair.

www.senseair.com