Senseair Sunlight Methane

A power efficient NDIR sensor for methane monitoring

Designed for reliable methane monitoring, this sensor is based on proven NDIR technology for stable, long-term performance. Each unit is individually factory calibrated and provides clear status feedback, while UART (Modbus) and I²C interfaces enable easy integration into various systems.

Thanks to its solid-state design, the sensor is maintenance-free and features very low power consumption, making it well suited for industrial, oil & gas, mining, HVAC, and leak detection applications.

Product overview *

Article number	009-4-0003
Operating principle	Non-dispersive infrared (NDIR)
Measured gas	Methane (CH_4)
Measurement range	0–5 %vol
Accuracy	±0.25 %vol
Operating conditions	0–50 °C 0–95 %RH
Power supply	3.05–5.50 V
Peak current	< 95 mA
Average current	390 µA
Communication	UART, I²C
Maintenance	Maintenance free
Life expectancy	> 15 years
Dimensions	34 x 21 x 12 mm

* Preliminary specifications. May be changed without notice.

Key benefits

- Immunity to poisoning
- Fast response time
- Maintenance-free
- Long term stability
- Individually factory calibrated
- Very low power consumption
- Multi gas platform

1. Sensor performance

1.1 Sensing performance

Parameter	Conditions	Value
Target gas	-	Methane (CH_4) [1]
Operating principle	-	Non-dispersive infrared (NDIR)
Gas sampling method	-	Diffusion
Measurement range [2]	Standard	0–1.25 %vol
	Extended	1.25–5 %vol
Accuracy [2, 3, 4]	Standard	±0.25 %vol
	Extended	±0.25 % methane or ±20 % of reading – whichever is greater
Output resolution [5]	-	2 ppm (0.004 %LEL)
Measurement interval	Default	2 s; Configurable x s to xx h
Warm-up time		
Sampling	Default	8 samples; Configurable 1 to 1024
Response time	$T_{90\%}$	<30 s
Compensation [6]	Temperature	On-board sensor element
	Pressure	Pressure value must be provided by host system. Otherwise, dependency is 1.6 % reading per kPa deviation from normal pressure

1. Sensor measures molecules containing C-H bonds
2. Standard operating range 0–25% LEL, 0–50 °C, 0–85% RH and dew point ≤ 35 °C, Extended operating range 25–100% LEL, 0–50 °C, 86–95% RH.
3. Accuracy in the table is defined at 25 °C, 1013 mbar ambient pressure and 50 %RH. The accuracy for the complete operating conditions is specified in chapter 1.6. Specification is referenced to uncertainty of calibration gas mixtures ±1 %.
4. Shipping, rough handling and assembly can temporarily affect the accuracy of the sensor. Accuracy can be fully restored by forced recalibration or after a maximum of 3 ABC periods after mounting the sensor.
5. Convert to %LEL: $CH_{4\ \%LEL} = \frac{Sensor_{reading}}{250}$
6. CH_4 readings are temperature compensated. Optional host system can provide an ambient pressure value for pressure compensated CH_4 readings. Senseair Sunlight does not have an integrated pressure sensor.

1.2 General performance

Parameter	Conditions	Value
Operating temperature [1]		0–50 °C
Operating humidity	Non-condensing	0–95 %RH
Power supply		3.05–5.5 V
Peak current [2]		< 95 mA
Average Current [3]	Default settings	120 µA
Dimensions	(L x W x H)	34 x 21 x 12 mm
Life expectancy		> 15 years
Storage temperature		-40–85 °C
Weight		5 g
Communication interface		UART / I²C
Maintenance [4]		Maintenance-free

1. Sensor is calibrated to meet product specifications within standard range 10–40 °C, extended range 0–50 °C. Sensor can survive temperatures outside of operating range, but measurement accuracy is not guaranteed.
2. At sampling start/stop there is a fast transient current. See "Customer Integration Guideline Senseair Sunlight HC-R" (TDE13064) for details. To guarantee the functionality of the sensor, the voltage supply must be kept, and the maximum current must be considered.
3. The average current consumption depends on configured measurement period and number of samples per measurement, see chapter 1.7 for further information's and dependency between configuration and average current consumption.
4. For maintenance-free operation, ABC (Automatic Baseline Correction) must be enabled.

1.3 Pin configuration and functions

Pin #	Symbol	I/O Type	Description
1	GND	Power	Ground
2	VBB	Power	Supply voltage
3	VDDIO	Power	I/O supply voltage for TxD/SCL and nRDY
4	RxD / SDA	I/O	UART receive input / I²C bidirectional serial data. True open drain when operating as output.
5	TxD / SCL	I/O	UART transmit output / I²C clock input. True open drain when operating as output. 100kΩ internal pull-up to VDDIO
6	COMSEL	Input	Communication select – Valid at power-up. High = UART (Internal pull-up, can be left floating) Low = I²C (Connect to GND)
7	nRDY	Output	Measurement ready output. True open drain, active low, 1 MΩ internal pull-up to VDDIO
8	DVCC	Power	Internal supply voltage output. Not intended to supply external system. Leave floating if not used.
9	EN	Input	Enable sensor (active high). Drive this pin >1.2 V to turn on the sensor. Drive this pin <0.4 V to shut down the sensor. Do not leave floating. Connect to VBB if not used.

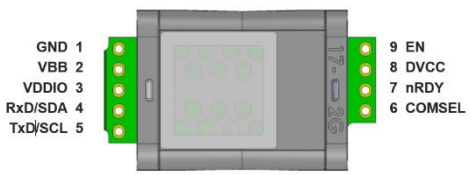

Figure 1. Pin configuration of Senseair Sunlight Methane

1.4 Drawing - Dimensions – Handling

Dimensional drawing of sensor with dimensions and their tolerances in millimetres. Note that the black particle filter on top of the sensor must not be removed or modified to ensure specified sensor performance over the sensor's lifetime.

Additional information about the integration and handling can be found in the *"Handling guideline ANO4947"* at our webpage.

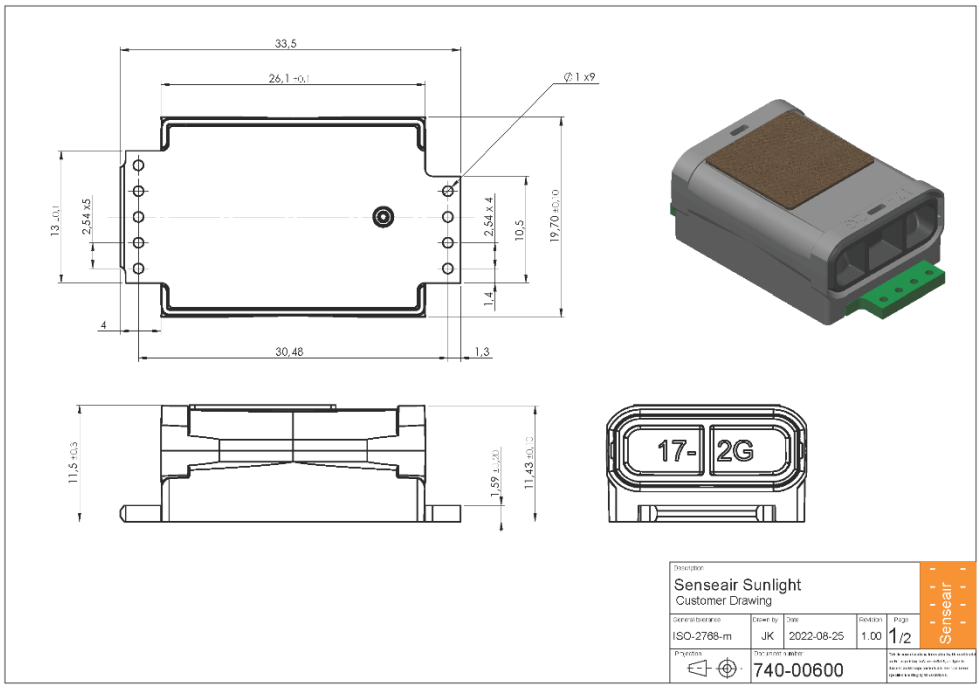

Figure 2. Dimensions of Senseair Sunlight Methane

1.5 Recommended operating conditions

Over operating temperature range, unless otherwise noted.

1.5.1 Operating conditions for voltage

Symbol	Description	Min	Typ	Max	Unit	Test conditions
VBB	Supply voltage	3.05	3.3	5.5	V	
VDDIO	I/O supply voltage TxD/SCL and nRDY	-	-	5.5	V	
COMSEL	Communication select	-	-	DVCC	V	
EN	Enable	-	-	VBB	V	
RxD/SDA	UART / I²C	-	-	VDDIO	V	
TxD/SCL	UART / I²C	-	-	VDDIO	V	

1.5.2 Operating conditions for current

Symbol	Description	Min	Typ	Max	Unit	Test conditions
I_{COMSEL} [1]	DC injection current	-2	-	2	mA	(V_{IN}<GND, V_{IN}>DVCC)
I_{DVCC} [1,2]	Internal supply current	-	-	25	mA	

1. Limited to the value specified
2. Leave floating if unused

1.6 Sensor accuracy over the nominal operating range

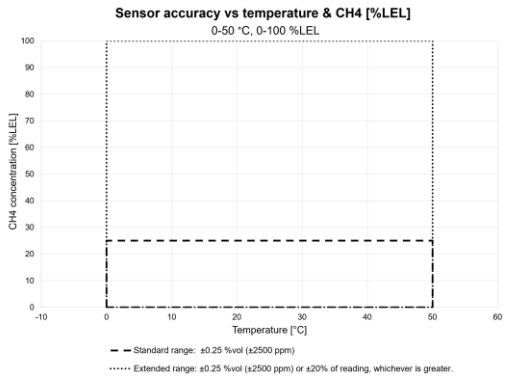

Figure 3: Accuracy over temperature and CH_4

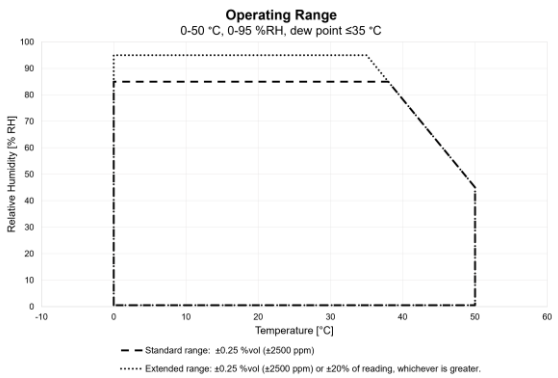

Figure 4: Operating range

1.7 Average current consumption depending on sensor configuration

1.7.1 Average current consumption at different measurement intervals

Measurement period [s]	2 samples		8 samples		32 samples	
	Continuous	Single	Continuous	Single	Continuous	Single
2	34 µA	-	120 µA[1]	-	390 µA	-
16	18 µA	-	25 µA	-	56 µA	-
60	16 µA	8 µA	18 µA	10 µA	26 µA	20 µA
180	16 µA	4 µA	17 µA	5 µA	21 µA	10 µA

1. Default setting.

2. Sensor documentation

2.1 Measurement mode

The Senseair Sunlight supports two modes of operation:

1. Continuous measurement mode
2. Single measurement mode

The **default** operation mode for Senseair Sunlight is **Continuous measurement mode**.

1) In Continuous measurement mode, the sensor measures at regular intervals (measurement period, default setting 2 s). The host can read measurement data after each measurement and does not need to send any command to trigger measurements.

2) In Single measurement mode, the sensor waits for the hosts command to measure. The host needs to send a command sequence to trigger each measurement. By using this function, the current consumption can be further optimized and gives more flexibility how often the sensor should start a measurement without changing basic settings of the sensor.

See *"Customer Integration Guidelines Senseair Sunrise and Sunlight CO_2" (TDE7318)* for details.

2.2 Communication

Refer to *"Modbus on Senseair Sunrise and Sunlight" (TDE5514)* and *"I2C on Senseair Sunrise and Sunlight" (TDE5531)*. Follow the *"Customer Integration Guidelines Senseair Sunlight HC-R" (TDE13064)* for additional instructions.

2.3 Maintenance

Senseair Sunlight Methane has a built-in self-correcting ABC algorithm. ABC period is adjustable by host and per default enabled. Discuss your application with Senseair in order to get advice for a proper calibration strategy.

2.4 User- and integration-guide

Further and detailed information for the use and integration of the sensor are described in the customer integration guideline *TDE7318* and can be download from the Senseair webpage.

2.5 Handling

See "*Senseair Sunrise and Sunlight Handling manual" (ANO4947)*

2.6 Revision History

Date	Version	Page(s)	Changes
April 2026	3	All	Update to new template. Initially for release of Marketing page.

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