Gas Meter Modules

Experts for Smart Sensor Solutions

SENSIRION
THE SENSOR COMPANY

Microthermal Gas Meter Modules for Smart Gas Metering

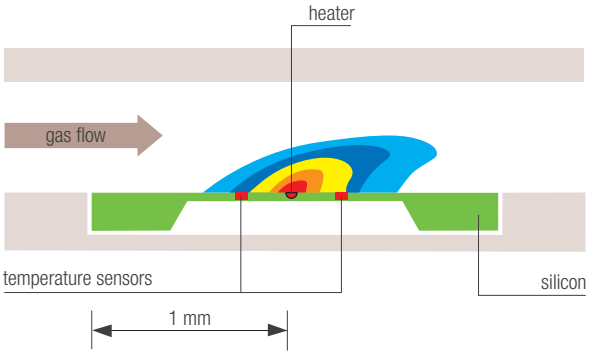
Sensirion's digital gas meter modules are the ideal choice for high-volume residential and industrial smart gas metering applications. They measure the volume flow of natural gas, and achieve MID billing grade accuracy. Sensirion microthermal gas meter modules are based on the proven CMOSens® Technology, which provides excellent sensing performance and robustness at low power consumption and attractive costs.

- Proven by billions of metering hours in the field
- Temperature-compensated
- Certified for natural gas, type H and L
- MID accuracy class 1.5
- Evaluation certification: EN 14236 and OIML R 137
- Long-term reliability
- Very low power consumption
- Zero offset, no drift
- Self-diagnosis capabilities

Smart Gas Metering

MICROTHERMAL MEASUREMENT PRINCIPLE

At the heart of every Sensirion gas meter module is a MEMS-based calorimetric microsensor, which measures the flow of natural gas using the thermal measurement principle. The sensor element is located on a membrane and consists of a micro-heater and upstream and downstream temperature sensors. It is integrated with the signal conditioning electronics, including memory for calibration data, on a single CMOSens® chip.



EVALUATION CERTIFICATE

Sensirion's standard gas meter modules have achieved an evaluation certification in accordance with the harmonized standard EN 14236 and the normative document OIML R 137 for natural gas, type H and L. The evaluation certificate is issued by NMi, one of the leading notified bodies in Europe for type approval examination and certification of measuring instruments. The evaluation certificate enables easier and faster MID approval for gas meter manufacturers that use Sensirion's microthermal sensor modules as the core metrological unit in their gas meters.

Residential Gas Metering

Microthermal Technology – Key Features

CERTIFIED FOR H AND L GAS

Sensirion microthermal technology measures volume flow and achieves MID accuracy class 1.5. It is certified according to OIML R 137 and EN 14236 for natural gas, type H and L.

COMPETITIVE

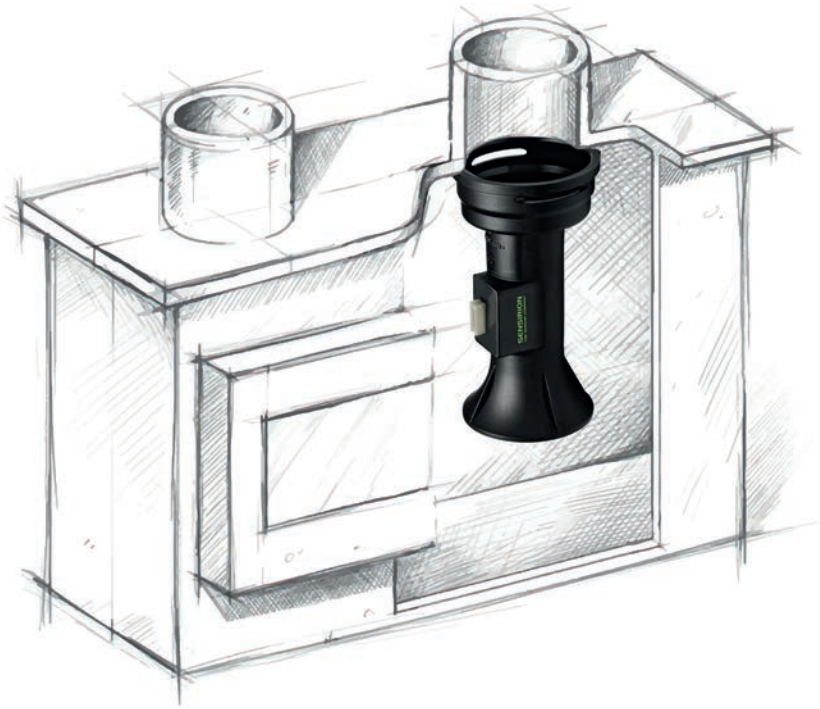
Sensirion microthermal flow modules rely on the economies of scale of the proven CMOSens® Technology and are price competitive with all other MID-approved metering technologies.

CONTAMINATION RESISTANT

Resistance to contamination is ensured by a sophisticated and patented design of the Sensirion gas meter modules and is certified according to EN 14236.

PROVEN TECHNOLOGY

Sensirion microthermal technology has a track record of in total billions of hours of reliable gas metering in the field.



STATIC TECHNOLOGY – NO MOVING PARTS

The microthermal sensing principle is a static metering technology with noiseless operation and no wear of mechanical parts.

COMPACT SIZE

Microthermal flow modules allow compact and thus cost-efficient gas meter products for easy installation in the field.

LOW POWER CONSUMPTION

Sensirion microthermal technology leads to very low power consumption in gas metering applications, thus allowing the use of compact and affordable batteries in gas meter products.

READY FOR THE FUTURE

Sensirion microthermal technology is ready for the future with gas meter self-diagnosis and gas network diagnosis capabilities. Furthermore, the microthermal measurement principle lays the basis for future implementation of real-time energy content monitoring of natural gas.

Class 1.5 Gas Meter Modules

Sensirion offers gas meter modules for residential smart gas metering applications. They fulfill MID accuracy class 1.5 and are available for gas meter sizes G1.6, G2.5, G4, and G6. They feature a digital I²C interface and are fully calibrated for air and natural gas.

Sensirion's gas meter modules have achieved an evaluation certification in accordance with the harmonized standard EN 14236 and the normative document OIML R 137 for natural gas, type H and L.

SPECIFICATION OF FLOW RANGES

Parameter	G1.6	G2.5	G4	G6	Unit
Q_{min}	0.267	0.416	0.67	1.0	l/min
	0.016	0.025	0.04	0.06	m^3/h
Q_t	4.17	6.66	10	16.7	l/min
	0.25	0.4	0.6	1	m^3/h
Q_{max}	41.67	66.7	100	167	l/min
	2.5	4	6	10	m^3/h
$Q_{overflow}$	2 Q_{max}				
$Q_{reverse}$	- 0.2 Q_{max}				

PHYSICAL SPECIFICATIONS

Parameter	Description	Value	Unit
Temperature	Operating temperature	-25 to 55	°C
Humidity	Operating humidity in natural gas	0 to 40	% RH
Initial accuracy (for T = 15°C)	Flow range: $Q_{reverse} \leq Q \leq -Q_{min}$	±10	% m.v.
	Flow range: $-Q_{min} < Q < Q_{min}$	not defined	
	Flow range: $Q_{min} \leq Q < 0.1Q_{max}$	±3.0 (+0.5)	% m.v.
	Flow range: $0.1Q_{max} \leq Q \leq Q_{max}$	±1.5 (+0.5)	% m.v.
	Flow range: $Q_{max} < Q$	not defined	
Initial pressure drop without meter-housing	Pressure drop at Q_{max}	<1.5	mbar in air

ELECTRICAL SPECIFICATIONS

Parameter	Description	Value	Unit
Operating voltage	Sensor module SGM70xx	3.1 to 3.6	Vdc
	Sensor module SGM60xx	2.7 to 3.6	Vdc
Average current consumption (approx.)[1]	Sensor module SGM70xx	20 to 30	µA
	Sensor module SGM60xx	<10	µA

[1] *Exact current consumption depends on the exact electronic host environment.*

Complete Design-In Solution

Sensirion provides a support package to enable fast and easy integration of Sensirion gas meter modules into customer gas meter products.

EVALUATION CERTIFICATION

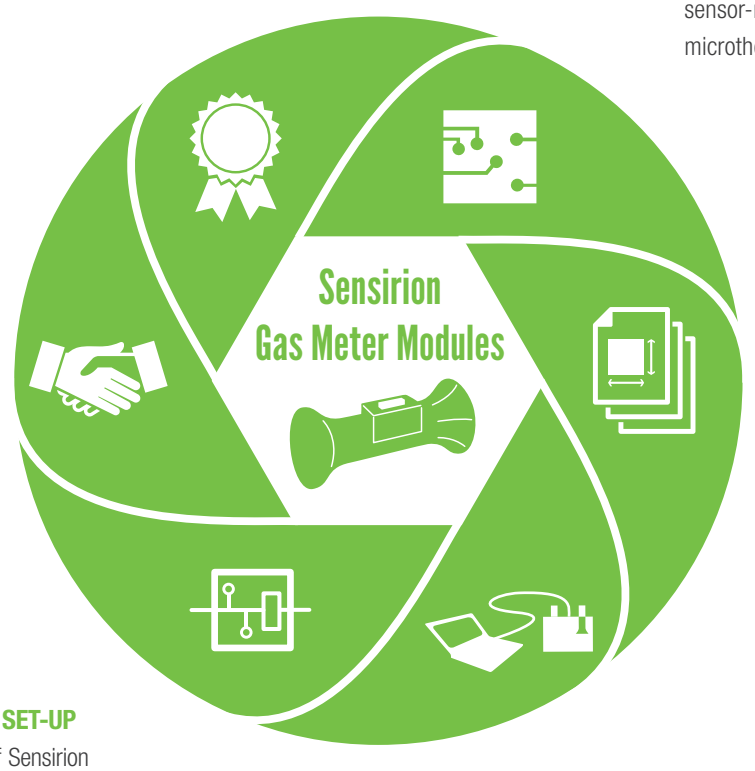
Make use of the Sensirion evaluation certificate to gain MID approval easier and faster for gas meter products that use Sensirion gas meter modules as the core metrological unit.

ELECTRONIC REFERENCE DESIGN

Use the Sensirion electronic board, including sample code, as a reference during implementation of the sensor-relevant firmware code for a microthermal gas meter.

PARTNER NETWORK

Benefit from Sensirion's network in the gas meter component industry.



COMPLETE DOCUMENTATION

Integrate Sensirion gas meter modules into gas meter products quickly and efficiently, thanks to Sensirion's extensive collection of detailed documentation.

BENCHTOP MEASUREMENT SET-UP

Perform flow characterization of Sensirion gas meter modules with Sensirion's compact R&D benchtop set-up for flow measurement.

EVALUATION KIT

Perform a basic technology evaluation of Sensirion's microthermal gas modules using the convenient evaluation kit, including readout software.

Submetering

Industrial Gas Metering

Sensing. Anytime. Anywhere.

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