

# ASF1400

## Bidirectional Mass Flow Meter

- \_ Unique dynamic range:  
0.01 sccm – 400 sccm
- \_ Outstanding resolution and accuracy
- \_ Ultra fast response time
- \_ Hysteresis & offset free
- \_ Calibrated & temperature compensated
- \_ RS-232 and



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### ASF1400 Product Summary

The ASF1400 Mass Flow Meter enables extremely accurate bidirectional measurement of gas flow over four orders of magnitude. Its leading performance is based on SENSIRION's unsurpassed CMOSens<sup>®</sup> sensor technology. With CMOSens<sup>®</sup>, the on-chip sensor element forms an integrated whole with the amplification and A/D converter circuit. This results in superior resolution, fast response time and large dynamic range at lowest power consumption.

All measurement data is fully calibrated and temperature compensated by means of an internal microcontroller.

Mounted in rugged, chemically inert PBT housing the ASF1400 is suitable for a wide range of applications. Such include mass flow metering for process control, medical applications, heating ventilation and air conditioning (HVAC) solutions, as well as gas flow metrology.

The sensor housing provides two inlets for measuring the gas flow and withstands overpressures of 2 bar (29 psi).

The ASF1400 requires a supply voltage of 7...18Vdc and provides an RS-232 compliant electrical interface.

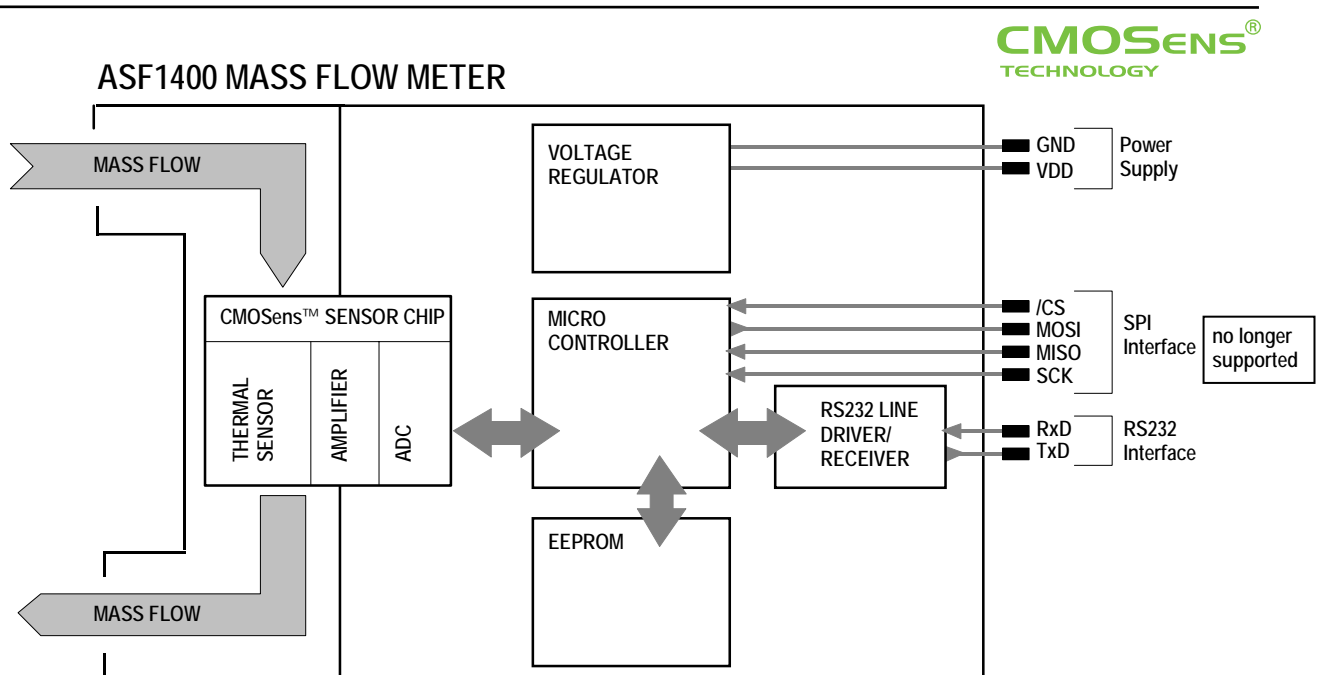


Figure 1: Block Diagram ASF1400 Mass Flow Sensor with CMOSens<sup>®</sup> technology.

## Introductory Description

The heart of the ASF1400 mass flow meter is powered by Sensirion's unsurpassed CMOSens<sup>®</sup> sensor technology. The ASF1400 mass flow meter therefore provides unbeatable performance at very attractive system cost. The lowest detectable gas flow rate is 0.003 sccm, which means a minimum volume of 3 mm<sup>3</sup> gas per minute can be measured. Covering at the same time a flow range of more than 4 orders of magnitude, the ASF1400 sets a new standard wherever mass flow has to be measured or controlled.

The ASF1400 device measures true mass flow independent of the ambient temperature and pressure changes. You simply connect the gas to be measured to the ASF1400 device to get an instantaneous gas flow rate at a sampling rate of up to 7Hz (please contact us for sampling rates of up to 200Hz).

A flow range between ±400 sccm can directly be measured by connecting the ASF1400. To increase the range, a bypass can be used in conjunction with the ASF1400 device (see Section 1.4 of this data sheet).

In addition to mass flow, the ASF1400 device provides information about the temperature on the CMOSens<sup>®</sup> sensor element. Both mass flow and temperature data are accessed through an RS-232. The RS-232 interface allows you to directly connect the ASF1400 device to a PC or PDA using standard terminal software. If a special interface such as 4-20 mA current output or other is required contact Sensirion for a customer specific solution.

In general, all gas types can be measured using the ASF1400 product. However, the standard calibration

gas is nitrogen. Please contact SENSIRION, if you would like to use the sensor for applications with other gases.

To get you started quickly, an evaluation package including ASF1400 devices, software, cables, rubber hose and bypass is available from Sensirion AG.

## CMOSens<sup>®</sup> sensor technology

CMOSens<sup>®</sup> is the base technology for all Sensirion multi sensor modules and sensor systems. The unification of semiconductor chip and sensor technology serves as a platform for highly integrated system solutions with excellent sensor precision and reliability. With CMOSens<sup>®</sup>, the on-chip sensor element forms an integrated whole with a high-end amplification and A/D converter circuit. Due to the compact single-chip design, CMOSens<sup>®</sup> based sensors are very resistant to electromagnetic disturbances (EMC), another important technical advantage of this state of the art sensor technology. As a result, CMOSens<sup>®</sup> based multi sensor modules offer excellent sensor precision, fast response time and a very large dynamic measurement range. In addition, the digital intelligence of the CMOSens<sup>®</sup> sensor technology enables digital interfaces that permit an easy link with the system of the customer, a real advantage and benefit that results in ready-to-use problem solutions ("Mount&Sense").