SENSORADE

Miniaturized aerodynamic flow measurement

Very high frequency sensor conditioning board

1% error – 250 kHz Signal Conditioning Board USB-SC-250-C-0X

Description

Very high frequency acquisition and compensation board for pressure sensors. It enables precise power supply, temperature compensation, and signal amplification of 2 to 4 sensors. This product is optimized for high frequency acquisition (250 kHz per channel) and can provide data either through USB via the provided software.

INPUT CONNECTION	
1	V-
2	V+
3	S-
4	S+

Male connector front view

OVERVIEW

- Dimensions : 220x165x30mm
- Power supply and data : USB Type-C (3.0)
- Sensor output range : -200 to 200 mV
- Number of channels : 2-4
- Acquisition frequency : 250kHz/channel
- Only compatible with “C”-rated* Sensors

APPLICATIONS

- Instrumentation (ie: Automotive, …)
- Aerodynamic testing (ie: wind tunnel)
- Industrial process monitoring
- Pumps and compressors
- Oil and gas
- …

** All sensors have to be ordered with the board connector. Same PartNumber with “C” added.*

CONTACT

Operational Headquarter: Rue des Ormes 151, B-4800 Lambermont, BELGIUM
TEL: +32 87 70 96 69
Email: sales@sensorade.be

SENSORADE

Miniaturized aerodynamic flow measurement

PART NUMBER USB-SC-250-C-0X

Characteristic	Value
Acquisition frequency	1Hz to 250 kHz per channel
Differential input voltage	-200 to 200 mV
Input Impedance	>10 GΩ in parallel with 35 pF
Sensor Bridge Resistance (R_{wb})	1 to 10 kΩ
Sensor power supply	5V
Dimensions (L x W x H)	220x165x30mm
Sensor Compensation Temperature*	20° to 185 °C
Power consumption	4.7 W max
Number of channels	2-4
Accuracy [2σ]	1% FS
Supply voltage	5V USB 3.0
Device Operating Temperature	-20 °C to 60 °C
Storage temperature	-20 °C to 70 °C
Optimal warm-up time	15 min

* *Can be adapted on demand*

Compensation

The board includes a polynomial **temperature compensation model**** of the form:

$$P(S,R) = a(R_{wb}) \cdot S + b(R_{wb})$$

$$a(R_{wb}) = A + B \cdot R_{wb}, \quad b(R_{wb}) = C \cdot R_{wb}^2 + D \cdot R_{wb} + E$$

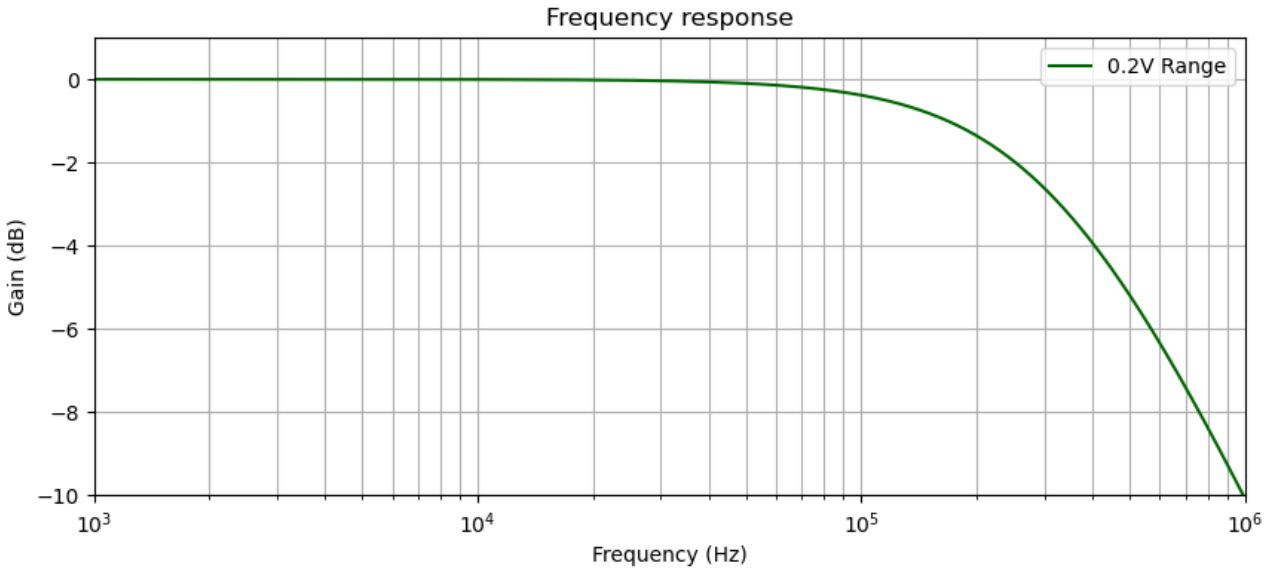
Here, S is the sensor differential output signal and R_{wb} is the equivalent bridge resistance value. This model compensates for the pressure drift due to temperature variations up to 185°C. The five compensation coefficients *A, B, C, D* and *E* are provided by Sensorade along with the pressure sensor datasheet and can be transmitted by the user via USB interface using the provided software. This method allows users to register up to 250k compensated pressure samples per second for each sensor.

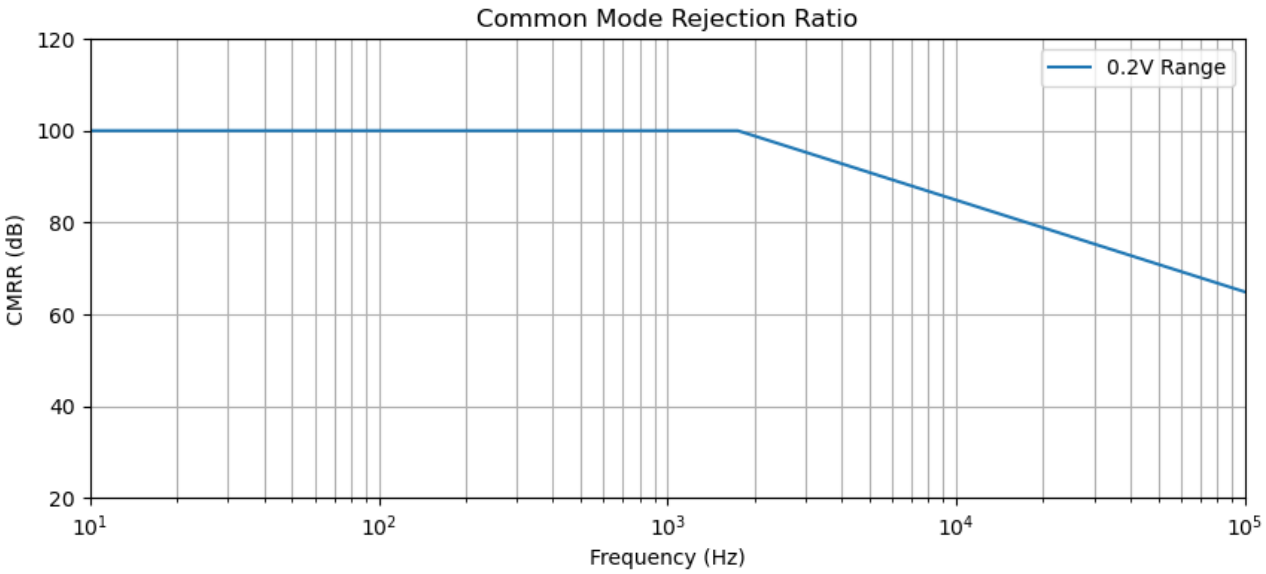
*** This model is based on a static calibration performed on each sensor. The coefficients do not take into account dynamic effects. Refer to the following section for more information.*

CONTACT

Operational Headquarter: Rue des Ormes 151, B-4800 Lambermont, BELGIUM
TEL: +32 87 70 96 69
Email: sales@sensorade.be

Dynamic efficiency





Remark : The board could be reprogrammed to take a dynamic calibration into account for the compensation of sensors. It would then be the responsibility of the end user to perform the calibration and provide Sensorade with the appropriate transfer function.

CONTACT
Operational Headquarter: Rue des Ormes 151, B-4800 Lambermont, BELGIUM
TEL: +32 87 70 96 69
Email: sales@sensorade.be