

## O<sub>2</sub> Measurement / Amperometric ZrO<sub>2</sub>

### Quick Start Guide GSB electronics + sensor

The quick start guide is intended for factory calibrated systems, i.e. systems delivered with pre-installed sensor

#### Mounting, housing and cable pairing

The GSB is supplied as a PCB. Housing and mounting should be provided, to prevent ESD or short circuit issues. For systems with cables, it is important to understand that the calibration data of each sensor is stored on the GSB, so it is not possible to connect a different sensor without recalibration. The orientation of the cable connection is only verified via an electronic polarity check. The GSB will stay in contact check mode until a correctly connected sensor is detected. See Figure 1 for correct cable connector orientation. In case of an onboard mounted sensor (TO8 or TO39 housing), no cable sensor must be connected.

#### Type Label Information

EGa0202std-D0010A300  
C809912-003  
S: 9110225H03 05/25

1. Line: System Type  
e.g. EGa0202std-D0010A300
2. Line: Batch + Ser. No.  
e.g. C809912 - 003
3. Line left: Sensor engraving  
e.g. 9110225H 03  
ID of the factory-calibrated sensor.  
System will only correctly operate  
when this sensor is connected!
3. Line right: calibration date  
e.g. 05/25 => week: 05 year: 25

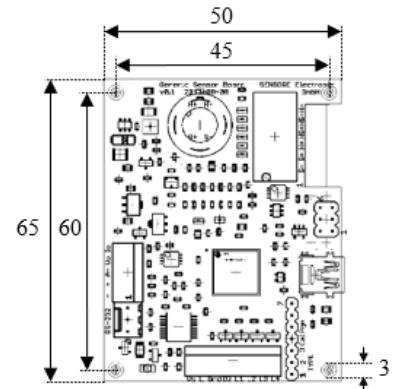
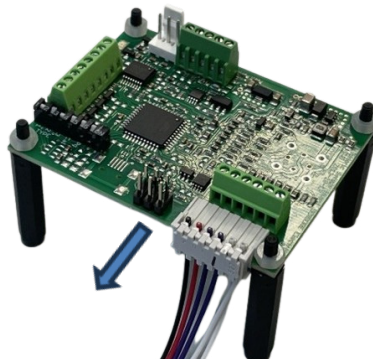


Figure 1 GSB with cabled sensor, orientation!  
(System delivered without mounting accessories)

GSB dimensions in mm

#### Electrical interface and O<sub>2</sub> signal output

The recommendation is to use a dedicated power supply with 12Vdc/500mA, which is also applied during calibration and offers the optimal performance in regards of accuracy and thermal load of the board. The power supply must ensure protection against hazardous voltages, e.g. SELV, NEC Class 2

#### Analogue current output 4-20mA (nominal)

#### Analogue voltage output 0-5V (nominal)

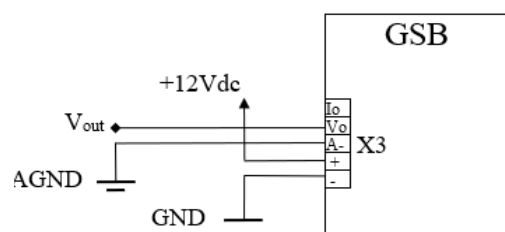
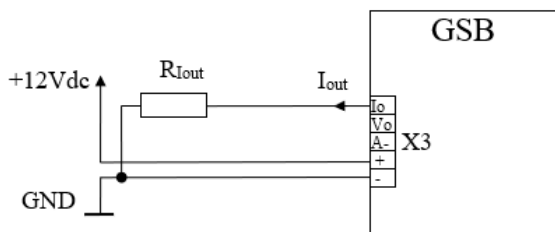


Figure 2 connection circuit

The calculation of the O<sub>2</sub> concentration is based on the analogue output and the O<sub>2</sub> full-scale value

$$O_2 = \frac{I_{out}[mA] - 4mA}{16mA} \cdot O_2 \text{ full-scale}$$

$$O_2 = \frac{V_{out}[V]}{5V} \cdot O_2 \text{ full-scale}$$

#### Overrange capability of analogue outputs and the O<sub>2</sub> measurement:

The analogue current output displays over-ranges up to 125% full scale, i.e. 24mA

The analogue voltage output displays over-ranges up to 120% full scale, i.e. 6V

Exception is the 96% O<sub>2</sub> sensor range, there the outputs are limited to 100% O<sub>2</sub>, respectively 20mA or 5V.

### Behaviour after power-up and indication via LED, 4-20mA / 0-5V Output

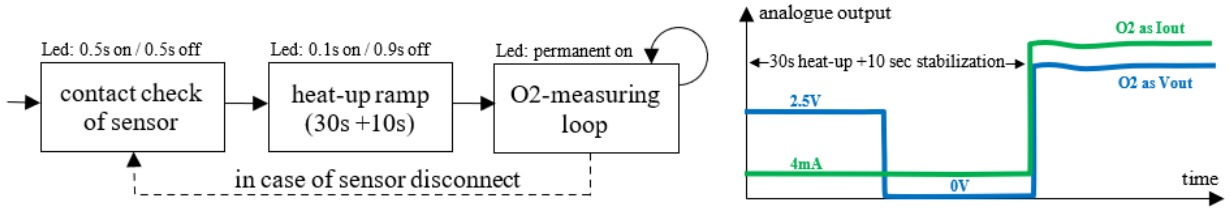


Figure 3 Power-up states and indication via LED and analogue output

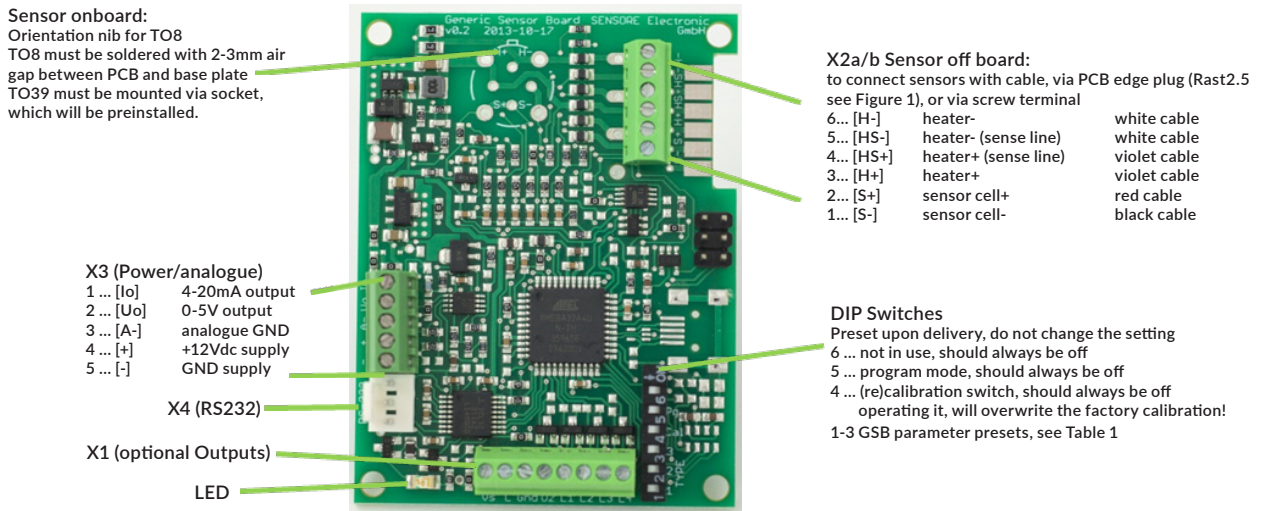


Figure 4 GSB main interfaces and DIP-switches

### GSB Parameter Presets / DIP Switch

For factory calibrated systems there is no need to interfere with the DIP-switch setting. The O2 range is defined by the sensor type, the DIP-switches do not change that, they will just select the matching FW-parameters.

**Warning: operating the calibration DIP-switch will void/overwrite the factory calibration.**

O2 range (min / max)	GSB preset	DIP switch bit			GSB full scale (output)	O2-calibration concentration	Typical Accuracy	Sensor Voltage
		1	2	3				
10-1000ppm	1	OFF	ON	ON	1000 vol.-ppm	1000 vol.-ppm	+/- 20ppm	0.70 Vdc
0.01-1vol.%	2	ON	OFF	ON	1 vol.-%	1 vol.-%	+/- 0.01vol.-%	0.75 Vdc
0.01-2vol.%	3	OFF	OFF	ON	2 vol.-%	2 vol.-%	+/- 0.2vol.-%	0.75 Vdc
0.05-5vol.%	4	ON	ON	OFF	5 vol.-%	5 vol.-%	+/- 0.5vol.-%	0.80 Vdc
0.1-25vol.%	5	OFF	ON	OFF	25 vol.-%	20.9 vol.-%	+/- 0.5vol.-%	0.85 Vdc
50-96vol.%	6	ON	OFF	OFF	100 vol.-%	20.9 vol.-%	+/- 1vol.-%	1.60 Vdc
1-96vol.%	7	OFF	OFF	OFF	100 vol.-%	20.9 vol.-%	+/- 1vol.-%	1.00 Vdc

Table 1 GSB parameter presets as define by DIP switch setting

### Thermal consideration

The GSB, in general, is specified to be operated between 0 and 50°C (ambient). For sensors directly mounted on the GSB, the thermal load on the board is higher, ensure reasonable heat exchange to avoid heat buildup at the board.



**Warning: during operation sensor casings might reach temperatures, which must be rated as "hot surface". Consider the placing of a warning (sticker) if the sensor is accessible by the end user.**