

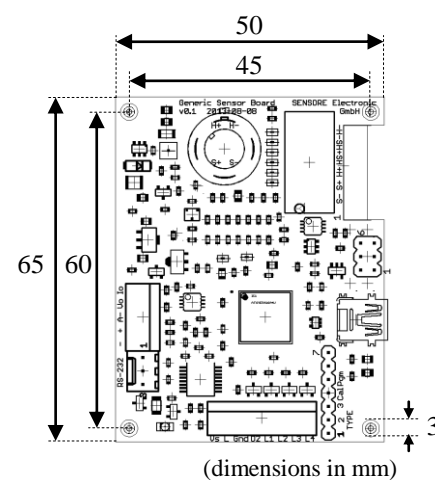
GSB - Generic Sensor Board

Electronic sensor interface for oxygen sensors

- sensor interface board for direct integration in customer application
- demonstration board for laboratory sensor evaluations

Main Features

- microcontroller based interface circuit
- Compatible O₂-Sensor-types:
 - Standard: SO-zz-xxx (amperometric sensor type)
 - On request: SP-zz-xxx (ampero-potentiometric sensor type)
- External voltage supply: 12Vdc (possible range 6-25Vdc)
 - typical current consumption 200mA @ 12Vdc
- Sensor calibration
 - Single point calibration at specified O₂-concentration
 - heater resistance calibration to ensure correct sensor temperature
 - Calibration values are stored in nonvolatile memory
 - possibility to purchase a factory calibrated set (GSB+sensor)
- Linear sensor output signal according to O₂-concentration:
 - analog 0-5V (V_{out})
 - analog 4-20mA (I_{out})
 - digital via RS232
- Configurable sensor operation parameters
 - 6 preinstalled settings for different sensor types
 - optional: customized parameters, e.g. :
 - heatup time and heater operation mode
 - sensor voltage
 - Measurement range and corresponding output signals
- Heater temperature control:
 - 4-wire heater resistance measurement
 - constant heater resistance control for temperature compensation
 - optional: constant heater voltage or constant power control
- Sensor connection:
 - connection via 6pol RAST 2.5
 - connection via screw terminal
 - optional: directly soldered on GSB-PCB



Advanced options on request

- Configurable digital I/Os, e.g.:
 - Open collector outputs to switch external loads
 - based on programmable O₂-concentration thresholds
 - programmable switching hysteresis
 - customized sensor status indication, e.g. error indicator
- Configuration via RS232
 - flexible configuration of sensor operation parameters
 - configuration interface for Windows-OS
- customized GSBs
 - to implement customer specific digital or analog interfaces
 - customer specific terminals as replacement for screwed terminals
 - cost optimization for higher volumes
- customized firmware

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Basic Specification

Absolute maximum ratings

Values beyond these limits might cause permanent damage

Symbol	Parameter	Condition	min.	typ.	max	Unit
V _{cc}	External power supply voltage		6		25	V
T _{op}	GSB operating temperature range	Sensor not soldered onto board*	0		50	°C
R _{load}	Load on I _{out}	V _{cc} > 11V	0		270	Ω
I _{vout}	load current on V _{out}		0		1	mA
I _{oc}	Open collector sink current (each)		0		50	mA
V _{oc}	Open collector voltage		5		30	V
V _{inR232}	Input voltage range R232		-25		25	V

* Only tested at 25 °C with soldered sensor.

Recommended operating conditions

For optimal measurement performance the GSB should be operated at recommended conditions.

Symbol	Parameter	Condition	min.	typ.	max	Unit
V _{cc}	External power supply voltage		11	12	13	V
T _{op}	GSB operating temperature range		15	25	35	°C
R _{load}	Load on I _{out}		0		270	Ω
I _{vout}	load current on V _{out}		0		1	mA
I _{ocsum}	Open collector sink current (sum)		0		100	mA

Remarks:

- T_{op} refers only to the GSB ambient temperatures, an external connected sensor is not affected by this limitation
- I_{out} refers to the 4-20mA analog output and V_{out} refers to the 0-5V analog output
- I_{oc} and V_{oc} are only of relevance, if the open collector outputs are used

Analog output levels

Symbol	Output level	Condition	min.	typ.	max	Unit
V _{out}	Full scale	recommended conditions, calibrated at full scale	4.975	5.000	5.025	V
	Zero point	recommended conditions, calibrated at full scale	0.000	0.010	0.025	V
I _{out}	Full scale	recommended conditions, calibrated at full scale	19.95	20.00	20.05	mA
	Zero point	recommended conditions, calibrated at full scale	3.95	4.00	4.05	mA

Preinstalled sensor settings for SO-zz-xxx

The basic GSB configuration contains the following preinstalled sensor settings, to be selected via DIP switch. SP-zz-xxx configurations on request

	sensor type	DIP Switch Bit			sensor description	GSB full scale	O2 calibration concentration	sensor voltage	heater control
		1	2	3					
0	reserved	ON	ON	ON	-	-	-	-	
1	SO-zz-001	OFF	ON	ON	ppm	1000 vol.-% O2	1000 vol.-% O2	0,70 Volt	Rconst
2	SO-zz-010	ON	OFF	ON	1 %	1 vol.-% O2	1 vol.-% O2	0,75 Volt	Rconst
3	SO-zz-020	OFF	OFF	ON	2 %	2 vol.-% O2	2 vol.-% O2	0,75 Volt	Rconst
4	SO-zz-050	ON	ON	OFF	5 %	5 vol.-% O2	5 vol.-% O2	0,80 Volt	Rconst
5	SO-zz-250	OFF	ON	OFF	25%	25 vol.-% O2	20,9 vol.-% O2	0,85 Volt	Rconst
6	SO-zz-960	ON	OFF	OFF	96%	100 vol.-% O2*	20,9 vol.-% O2	1,60 Volt	Rconst
7	reserved	OFF	OFF	OFF	-	-	-	-	

* The specified sensor full scale concentration is 96%

Measurement accuracy – sensor characteristic

If operated at recommended conditions the measurement accuracy will be primarily limited by the sensor accuracy. Also the dynamic sensor characteristic will not be significantly changed by the GSB. See Sensor data sheet for more details.