Interface card for lambda sensor Bosch model LSU 4.9

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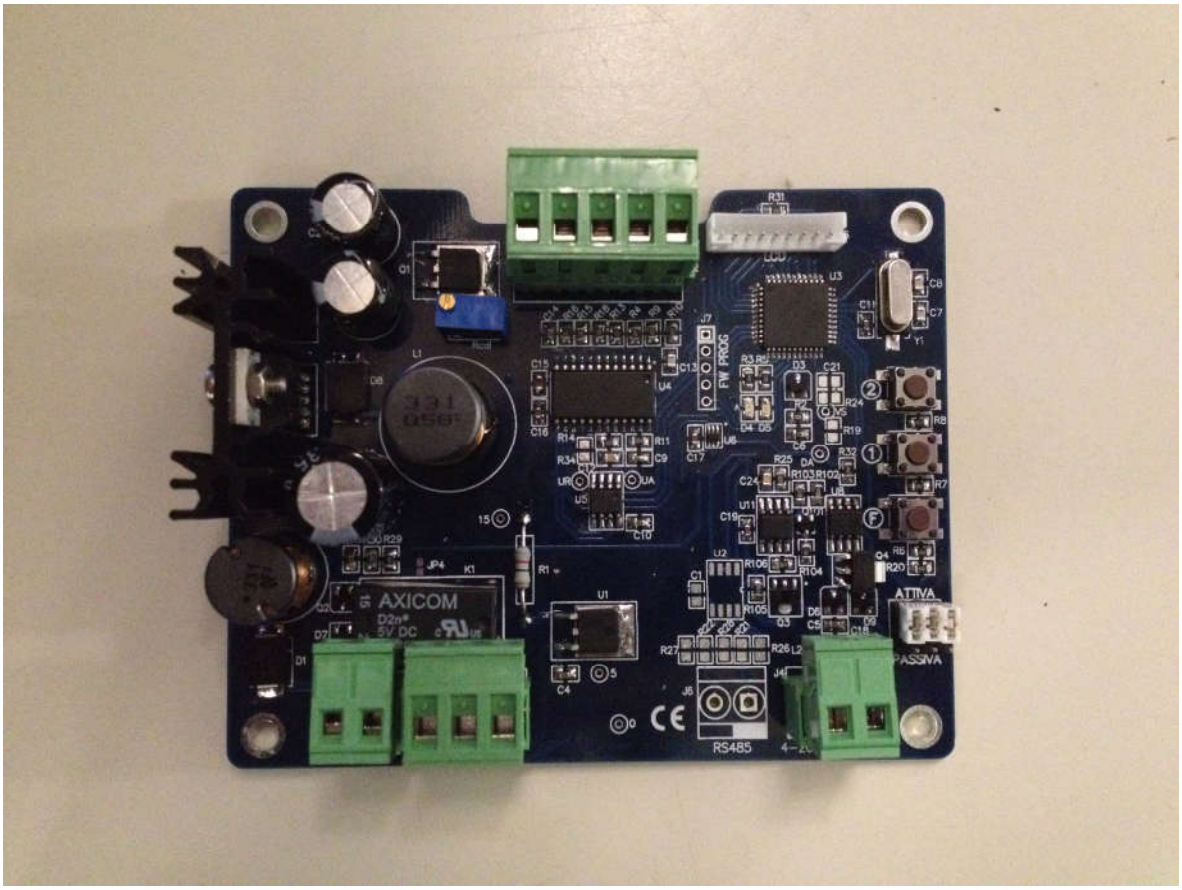
Designed and manufactured exclusively for Ascon Tecnologic by AP Sistemi

INSTRUCTIONS FOR USE
ISTR_M_ZO2-SCHEDA03_E_02_



General Index

1. Introduction

The interface card performs the following functions:

- management model BOSCH LSU 4.9 lambda probe
- calibration in combination with the oxygen sensor
- transmission of linearized 4…20 mA signal active or passive in ranges 0… 20.9 %O2 or 0…25 %O2.

The interface card provides also a relay output for fault and the possibility to regulate toutput with the offset output function.

2. Device specifications

Power supply	24VDC ±5%	
Max Current consumption	1.2 A	
Output	4… 20mA	Active or passive output, non isolated
O2% Measuring range	0.3… 25%	
Accuracy	±1% f.s.	In range 1.4…20.9% O2
Output range 4-20mA	0… 20.9% 0… 25%	Adjustable with keys
Response time	<5 sec	
Sensor heating up time	<15s	Automatic temperature control
Calibration	20.9%	Trimmer calibration in ambient air
Ambient temperature	- 20°C…+55°C	
Error indicator	Relay SPDT NC+NO	Red led on card in case of: -Oxygen % <0.3% -Probe disconnected - Probe failure - Heater failure - Power supply failure
Pluggable screw connectors		Power supply 0…24V Output 4…20mA Failure contacts Probe cabling (5 wires)
Operator interface		2 LEDS (green and red) + 3 keys

3. Power supply and electrical connections

The electronic card appears as in figure 1 below.

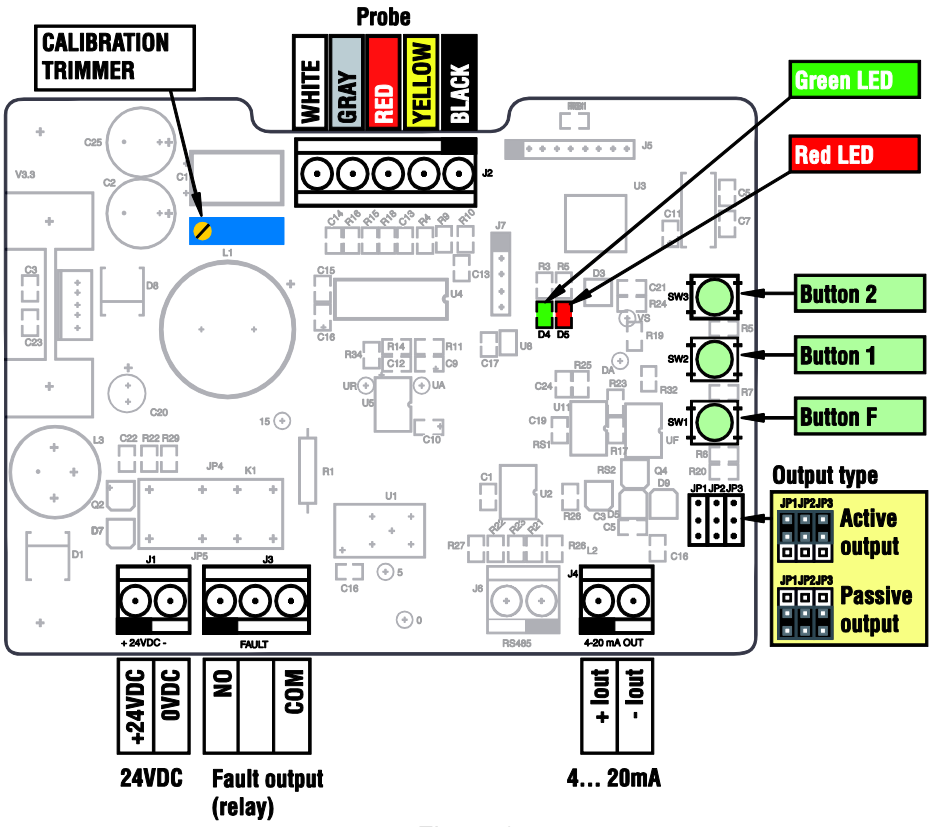


Figure 1

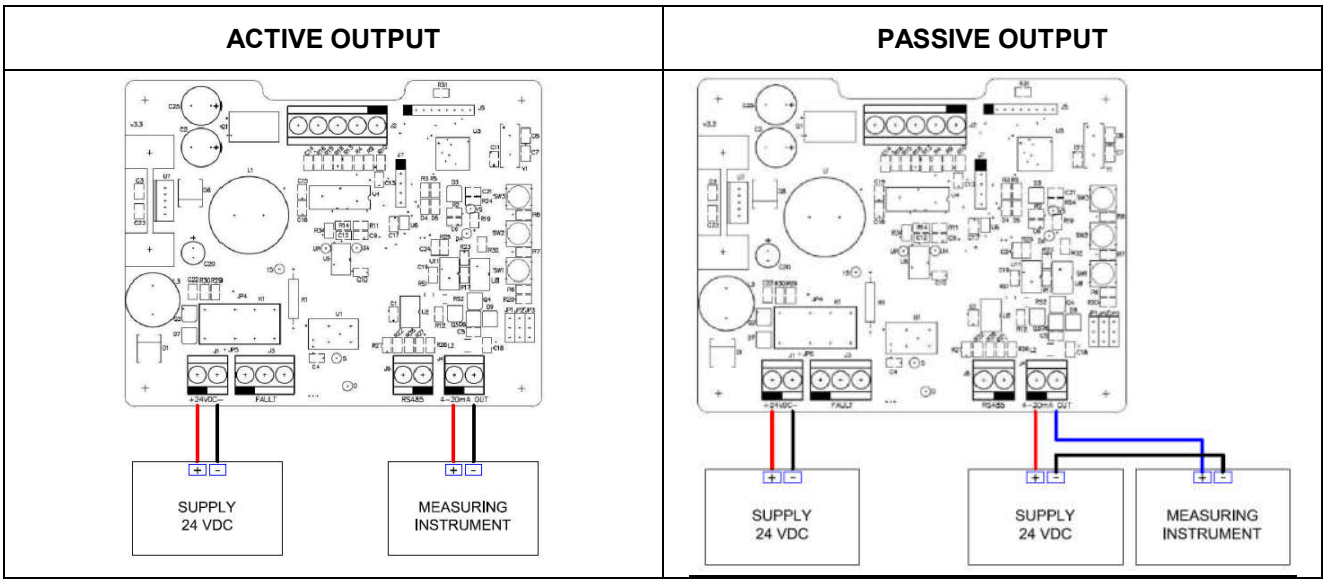


Figure 2

Warning

In passive configuration, the power supply current loop CAN NOT be the same that powers the board.
In particular, the two negative terminals of the two power supplies must not be placed in common, in order to have the board functioning properly.

4. Function of the LEDS

GREEN LED
The green led is switched on during normal board operation.
With card in *configuration mode,* (as described under chapter 5) the led will flash briefly each press of keys 1 and 2 to confirm the execution of the command.

RED LED
The red led is switched off during normal normal board operation.
With card in *configuration mode*, the led will flash briefly indicating the active mode.

> *The lighting of this led indicates a fault in the system. At same time the led lights up, the fault relay switches by closing the NO contact and the output current is set to 2 mA.*

In fault condition, the red led emits a different number of flashes depending on the type of fault:

1 Flash: Temperature regulation fault or sensor in heating phase. During this phase, the reading of the measurement of oxygen is not significant

2 Flashes: Oxygen measurement below the minimum threshold (0.3%)

3 Flashes: Sensor fault or sensor disconnected. Power supply below the minimun limit of operation

5. Configuration mode

Pressing the F key for 2 seconds, the card access to the *configuration mode.*
There are 3 ways of possible configurations, as indicated by the number of flashes of the red led (1, 2 or 3).

To switch from one mode to another, release and then press the F key for 2 seconds.

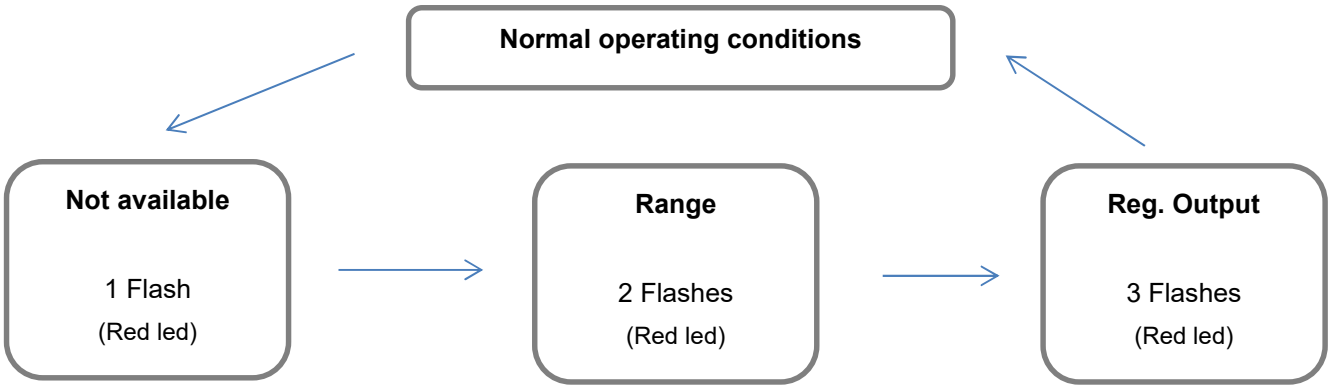


Figure 3

To come out of *configuration mode*, simply press the F key for 2 seconds from mode *Reg. Output,* or wait for about 15 seconds and the transition will happen automatically.

5.1 Not available procedure

5.2 Output range 4-20mA selection procedure

It is possible to set the board for two default output ranges:

- I_{out} = 4…20mA ⇔ O_2 = 0…20.9%
- I_{out} = 4…20mA ⇔ O_2 = 0…25.0%

To set the desired range:

- Access into mode *Range* pushing the F key for 2 seconds and checking that the red led emits 2 short blinks each second
- Push key 1 to set the range 0…20.9%
- Push key 2 to set range 0…25%

5.3 Output current setup procedure

With this procedure, it is possible to compensate for any errors in measurement of the output current.
The maximum adjustment is ±1mA achieved in step of approximately 10µA.

- Access into mode *Reg. Output* pushing the F key for 2 seconds and checking that the red led emits 3 short blinks each second
- Push key 1 to increase the output current
- Push key 2 to decrease the output current

NOTE: The function of the keys is reversed in the case of passive output

6. Quick guide

FUNCTION OF THE LEDS (Ch. 4)

GREEN LED switched on during normal operation of the card

RED LED switched on in case of failure
Possible causes:

1 Flash: Temperature regulation fault or temperature sensor in the heating phase. During this phase the reading of the measurement of oxygen is not significant.

2 Flashes: Oxygen measurement below the minimum threshold (0.3%)

3 Flashes: Sensor fault or probe not connected. Supply voltage below the minimum limit of operation.

CONFIGURATION MODE (Ch. 5)

Pressing the F key for 2 seconds to shift into menu items

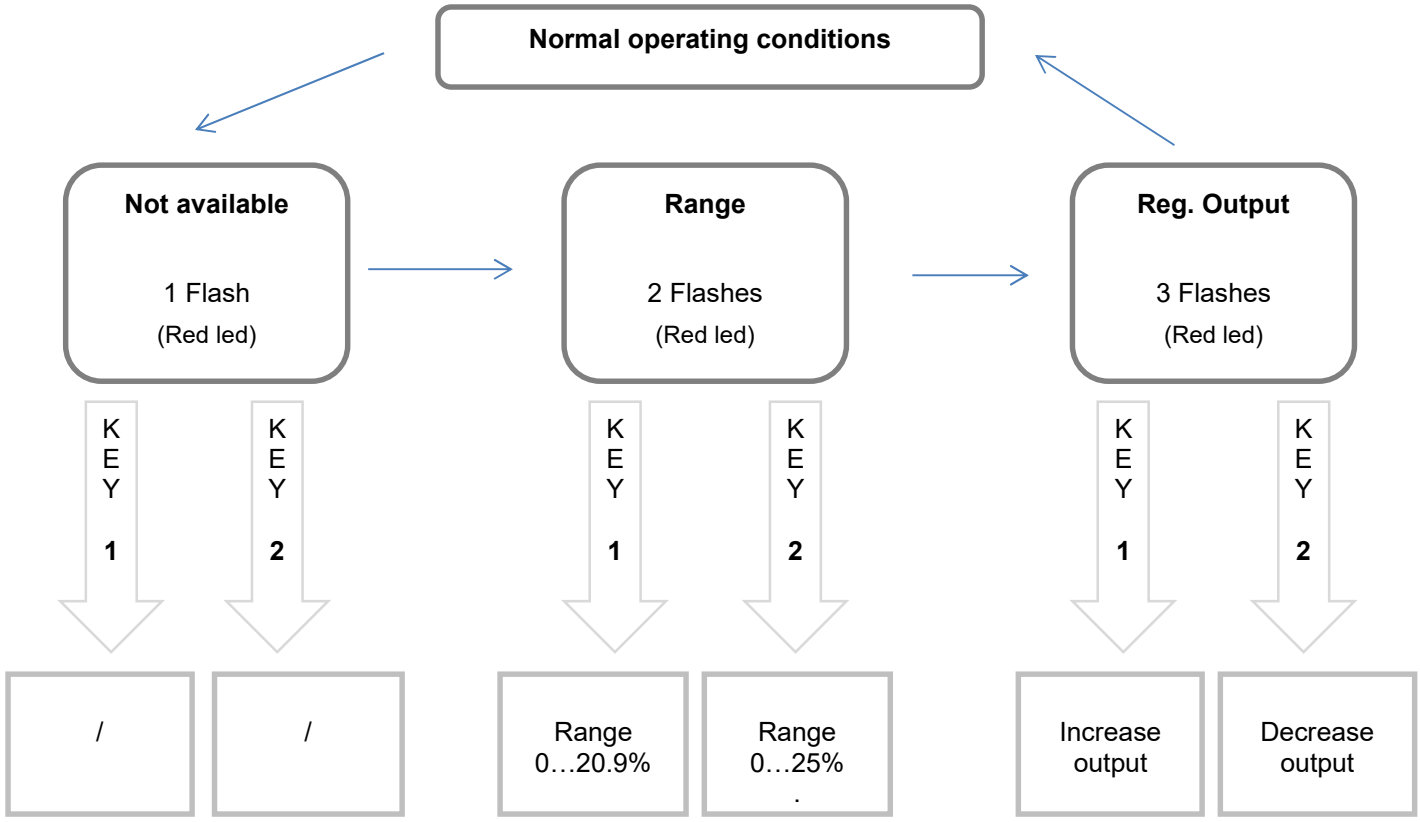


Figure 4

7. Trimmer calibration in ambient air

The following calibration procedure must be performed with maximum range of 12 months.
It is necessary to repeat this process each time the card is connected to a new sensor.

To perform this procedure:

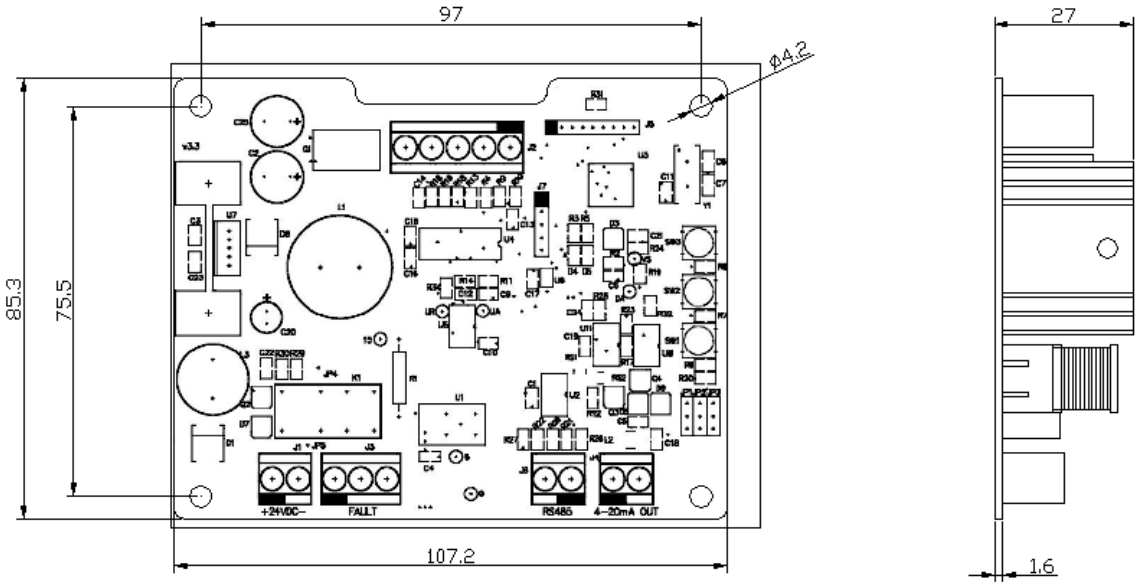
- Connect the output signal 4/20mA to electronics (display, PLC, recorder, etc.)
- Ventilate the probe to ensure ambient air on sensor
- Correct the output value operating on the calibration trimmer (see fig. 4, pag 8) up to full scale set 20.9 %O2 or 25 %O2 (see Cap. 5.2)

IMPORTANT
For accurate calibration, it is necessary to perform the calibration procedure only after reaching a steady state of thermal equilibrium of the probe, usually after about 20 minutes of operation. It is therefore not recommended to perform the calibration procedure in the first minutes after turning on the system PCB + sensor.

8. How to order

CODE	DESCRIPTION
ZO2SCHEDA03	Line ZO – Interface for lambda probe LSU 4.9 ver. 03

9. Dimensions



WARNING!

In order that a interface failure or malfunction does not create dangerous situations for persons, things and animals, please remember that the plant has to be equipped with suitable safety devices.

The product is under warranty for 12 months except for parts subject to fair wear and tear.
The warranty term is ex works our factory.