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BC-LSU4_xx-000 4 channel Lambda (A/F) to CAN interface for probe 4.2 & 4.9

4 channel air fuel ratio lambda measurement

- Module usable with 2 different lambda probes:
  - Bosch LSU probe 4.2
  - Bosch LSU probe 4.9
- Highly dynamic control
- High signal resolution and accuracy because of linear sensor range
- No temperature drift through heater control
- Long life operating (lambda sensor)

Technical specifications

Electrical characteristics (lambda controller)

Power supply.....		
Interface.....	12-20	V dc
Heater.....	10-14	V dc
Current consumption@12V.....	120	mA
+ Heater current (max. 2A per probe)		
Channels.....	4	A/F
Resolution.....	0.01	A/F
Sampling rate (per channel).....	400	Hz

Electrical characteristics (lambda probe)

Sensor supply.....	12	V dc
Maximum exhaust gas temperature...		
LSU 4.2.....	< 1030	°C
LSU 4.9.....	< 1030	°C
Operating exhaust gas temperature..		
LSU 4.2.....	930	°C
LSU 4.9.....	< 930	°C
Heating current.....	max. 2	A
Measuring range (linear output)		
LSU 4.2.....	6.0 to 38.0	A/F
LSU 4.9.....	6.0 to 38.0	A/F
Fast light on (ready for control).....	~ 30	sec
Quick response time.....	≈ 50	Hz

Documentation reference

Download operating manual:
Art.No.: AC-DOC_2D-LambdaControllerUnit_e-000
You can download it from the homepage/CD
<Manuals> → <Hardware manuals> <Product references>

Mechanical characteristics

Dimensions (incl. connector)..	75 x 45 x 30	mm
Weight		
device.....	96	g
sensor (LSU 4.2 w/o cable).	120	g
sensor (LSU 4.9 w/o cable).	120	g
Lambda probe.....		
thread.....	M18x1,5	
length (approx.).....	84	mm
Wrench size.....	22	mm
Tightening torque.....	40..60	Nm

Vibration resistance

Shock.....	40	G
.....	10	ms
Vibration tested at.....	12	G
.....	1000	Hz

Environmental data

Ambient operating range.....	0 to +75	°C
Humidity.....	5 to 95	%
Sealing class.....	IP	66

Ordering information

Art.No.:	
for Bosch lambda probe 4.9	BC-LSU4_4.9-000
for Bosch lambda probe 4.2	BC-LSU4_4.2-000

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Formulas

Use the following formulas to calculate the physical values, if you don't use a 2D recording unit.
The offset of the formula changes dependant to the used lambda probe (BOSCH LSU 4.2 or BOSCH LSU 4.9)

Description	CAN ID	Byte		Formula		Offset		Dimension
						BOSCH LSU 4.9	BOSCH LSU 4.2	
A/F Value Probe#1	ID 0x7B8	0 & 1	=	0,001 * digits	+	0	0	[A/F]
A/F Value Probe#2	ID 0x7B8	2 & 3	=	0,001 * digits	+	0	0	[A/F]
A/F Value Probe#3	ID 0x7B8	4 & 5	=	0,001 * digits	+	0	0	[A/F]
A/F Value Probe#4	ID 0x7B8	6 & 7	=	0,001 * digits	+	0	0	[A/F]
Temperature#1	ID 0x7B0	0	=	2 * digits	+	496,9	539,4	[°C]
Temperature#2	ID 0x7B0	1	=	2 * digits	+	496,9	539,4	[°C]
Temperature#3	ID 0x7B0	2	=	2 * digits	+	496,9	539,4	[°C]
Temperature#4	ID 0x7B0	3	=	2 * digits	+	496,9	539,4	[°C]
Heat#1	ID 0x7B0	4	=	0.3921 * digits	+	0	0	[%]
Heat#2	ID 0x7B0	5	=	0.3921 * digits	+	0	0	[%]
Heat#3	ID 0x7B0	6	=	0.3921 * digits	+	0	0	[%]
Heat#4	ID 0x7B0	7	=	0.3921 * digits	+	0	0	[%]

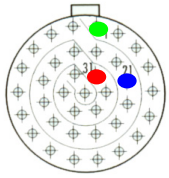
To convert into λ values use the following formulas:
$\lambda_{Value\ Probe1} = A/F_{Value\ Probe1} / 14{,}57 = A/F_{Probe1\ Digits} / 14570$ or $A/F_{Probe1\ Digits} * 0{,}00006863418$
$\lambda_{Value\ Probe2} = A/F_{Value\ Probe2} / 14{,}57 = A/F_{Probe2\ Digits} / 14570$ or $A/F_{Probe2\ Digits} * 0{,}00006863418$
$\lambda_{Value\ Probe3} = A/F_{Value\ Probe3} / 14{,}57 = A/F_{Probe3\ Digits} / 14570$ or $A/F_{Probe3\ Digits} * 0{,}00006863418$
$\lambda_{Value\ Probe4} = A/F_{Value\ Probe4} / 14{,}57 = A/F_{Probe4\ Digits} / 14570$ or $A/F_{Probe4\ Digits} * 0{,}00006863418$

Connector layout

Pin	Name	Description
1	Vext1	Power +12V for CPU
2	BGND	GND for heater 1 & 2
3	BGND	GND for heater 3 & 4
4	LSU1 UN	Inv. input of pum current control
5	LSU1 IP	Inv. input of pum current amp
6	LSU IA	Non Inv. input of pum current amp
7	LSU2 UN	Inv. input of pum current control
8	LSU2 IP	Inv. input of pum current amp
9	LSU2 IA	Non Inv. input of pum current amp
10	LSU3 UN	Inv. input of pum current control
11	LSU3 IP	Inv. input of pum current amp
12	LSU3 IA	Non Inv. input of pum current amp
13	LSU4 UN	Inv. input of pum current control
14	LSU4 IP	Inv. input of pum current amp
15	LSU4 IA	Non Inv. input of pum current amp
16	n.c.	not connected
17	RPM in	RPM input (option)
18	TxD	TxD serial interface
19	RxD	RxD serial interface
20	BGND	Power GND for CPU
21	LSU1 VM	Virtual GND
22	Heater1 GND	Ground for heater 1
23	LSU2 VM	Virtual GND
24	Heater2 GND	Ground for heater 2
25	LSU3 VM	Virtual GND
26	Heater3 GND	Ground for heater 3
27	LSU4 VM	Virtual GND
28	Heater4 GND	Ground for heater 4
29	n.c.	not connected
30	CAN H	Can Bus High
31	CAN L	CAN Bus low
32-37	n.c.	not connected

Connector type

Connector at module



Deutsch AS6 14-35 PN, 37PM (front side)

● = Pin 1
● = Pin 21
● = Pin 31

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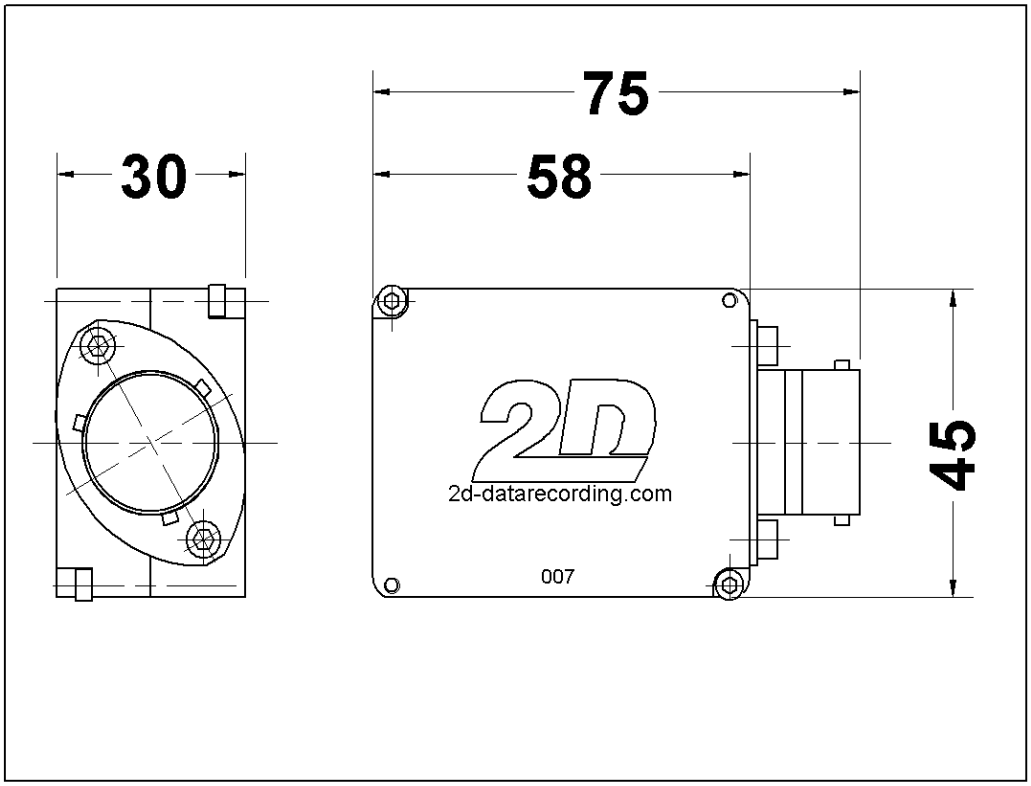
Dimensions



Value and error codes

- The probe temperature is displayed in values between 540°C and 1050°C
- The Heat channel shows heating value for the probe (denoted in %)
- If the probe temperature is not reaching 600°C the channel shows the status as you can see in the following table.

A/F (λ-value)	Description
0.016	The probe temperature is under 600°C
0.100	Probe is not connected or short circuit to
0.110	Open load (probe is not connected)
0.120	Short circuit to Vbat.
0.3	In the automatic mode: “no CAN data”
1.0	The probe temperature is under 600°C after the heating phase (approx. 20sec) → measurment is not possible
2.0	The probe is heating during the start
3.0	In the automatic mode the A/F value measuring (λ-value measuring) is off according to the switch value
10.0-38.0	Measurment range

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