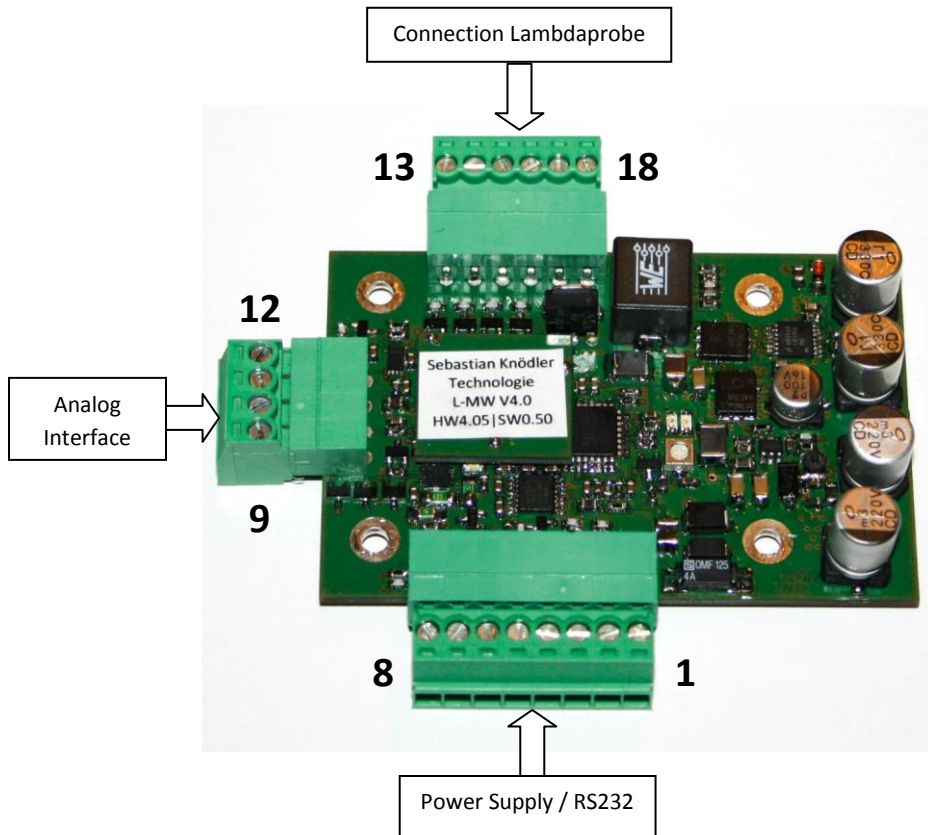


## Quick Guide L-MW V4.0 24V

for LSU4.2 and LSU4.9



**Please Note:**

This is only a short manual!  
The full manual you can find at:  
[www.breitband-lambda.de/en](http://www.breitband-lambda.de/en)

### Pinout:

#### Power Supply and Communication

- 1 Power +24V DC
- 2 Power Ground
- 3 RS232 (TxD)
- 4 RS232 (RxD)
- 5 Start-In
- 6 Error-Out
- 7 Analog-Out (0-5V)
- 8 Ground

#### Analog Interface

- 9 Ground
- 10 Analog-Out (4-20mA)
- 11 Analog-Out (0-10V)
- 12 Alarm (0/5V)

#### Lambdaprobe

Pin L-MW V4.0	LSU4.2	LSU4.9
13	VM (Pin 5, yellow)	VM (Pin 2, yellow)
14	UN (Pin 1, black)	UN (Pin 6, black)
15	RT (Pin 2)	RT (Pin 5)
16	IP (Pin 6, red)	IP (Pin 1, red)
18	H- (Pin 3, grey)	H- (Pin 3, grey)
19	H+ (Pin 4, white)	H+ (Pin 4, white)

### Attention:

The original connector of the Lambdaprobe must not be removed. The connector contains a calibration resistor which is necessary for operating the sensor.

## First Run

Disconnect the power supply from the controller. Connect the cables from the Lambdaprobe with the Controller. Make sure the original connector at the probe is undamaged. It is needed for proper operation.

If you don't have a datasheet orientate yourself on the pin numbers and colors.

Connect now the Pins for communication (RS232, optional), status lines (Error-Out Pin 6: 24V - no error / 0V - Error, please read out with RS232), Start-Input (Start-In Pin 5: 0V - Measurement off / 4...30V - Measurement started) and analog interface (0-5V at Pin 7, 4-20mA at Pin 9 and 10, 0-10V at Pin 11).

Ground pins 7 and 10 are not necessarily needed. Please make sure that all connected devices have same ground level (important for RS232 and analog interface)

After connecting all cables connect the controller with Power 24V DC. If everything is connected properly only the green LED is lighted. The red Status-LED is off.

Without load at Pin 9 and 10 (4-20mA) the red LED beside the analog interface connector is lighted

To start the measurement pull Start-In Pin 5 up to 4...30V for the period of measuring (e.g. clamp 15, fuel pump relay or power supply).

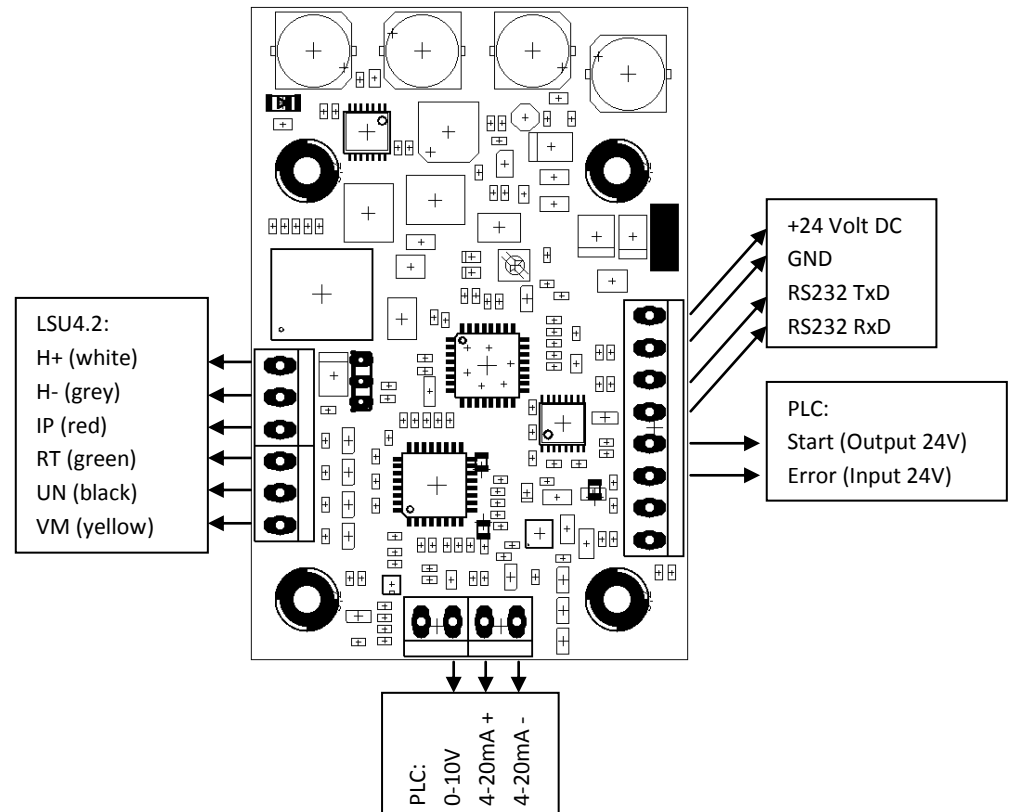
Now the controller starts to heat up the Lambdaprobe to operation temperature. The duration depends on probe age and mounting point and can be up to 60 seconds. The green LED is flashing fast.

All data are invalid while heating up. The analog output is pulled up to 5V, 10V and 20mA in this phase.

After reaching operation temperature the green LED is flashing slower. The data are valid now.

If there is an Error the red LED is lightened and the heater is shut down until the Error is resolved. After the Error is removed the probe is heated up again. This can be avoided by pulling down the Start-In pin to Ground. If there is an error it should be read out with RS232.

## Example for circuitry:



## Analog Interface

Range:	Oxygen 0-21%
0-5V Output:	0V = Oxygen 0,0%
	5V = Oxygen 21,0%
0-10V Output:	0V = Oxygen 0,0%
	10V = Oxygen 21,0%
4-20mA Output:	4mA = Oxygen 0,0%
	20mA = Oxygen 21,0%

The voltage at the Analog-Out pin is proportional to Oxygen content.

There are other measurement ranges too. Please read the extended manual:

Manual: [www.breitband-lambda.de/en](http://www.breitband-lambda.de/en)

## Digital Interface

Use following parameters for RS232:

Baud rate 115200 8N1

The interface can be used with a USB-RS232 converter. Please make sure that the converter uses RS232 levels (not TTL level)

All commands have to be ended with the character "CR - Carriage Return" without "LF - Line Feed".

The interface can be used with terminal programs like HyperTerm (Microsoft), HTerm (der-hammer) and others.

After establishing the connection following string should be shown:

```
0;0;255;65280
```

The format equals Excel "CSV" (Comma Separated Values).

First character is the Lambda value in  $\text{Lambda} \cdot 100$  or Oxygen content in  $\% \cdot 10$  (only valid if Probe is heated up to operation temperature).

Second character is the electronics-diagnosis register.

Third character is the CJ125-diagnosis register.

Fourth character is a checksum.

The electronics-diagnosis register is binary coded:

Place	Description
7	Heater on
6	Watchdog-Reset due to program error
5	Probe at operation temperature
4	Internal communication error
3	Power supply voltage high
2	Power supply voltage low
1	Probe temperature high
0	CJ125 - Error

After heating up the Probe with the value "160" is given out for electronics-diagnosis register. Binary: 1010 0000

Decryption:

Bit 7 set	Heater on
Bit 5 set	Probe at operation temperature

All other bits aren't set.

### Commands for digital interface

Following commands can be sent:

S Slow mode - Refreshing values at RS232 all 500ms  
F Fast mode - Refreshing values at RS232 all 100ms  
  
T Text mode - Clear Text over RS232  
E Excel mode - Excel CSV over RS232  
  
H Heater on - Heating up the Lambdaprobe  
D Heater off - Shut down heater  
  
I Info - Display current settings  
  
U No Heat-Up Delay  
V 15 Seconds Heat-Up Delay  
W 30 Seconds Heat-Up Delay  
X 60 Seconds Heat-Up Delay  
  
2 LSU4.2 - Used Lambdaprobe is LSU4.2  
9 LSU4.9 - Used Lambdaprobe is LSU4.9  
  
3 Output 3 - Range  $\lambda=0,7 \dots 1,3$   
4 Output 4 - Range  $\lambda=1,0 \dots 10,0$   
5 Output 5 - Range AFR 10...20  
6 Output 6 - Range O<sub>2</sub> 0...21%

Factory settings:

Lambdaprobe: LSU4.2  
Output : 6 - O<sub>2</sub> 0...21%  
Heat-Up Delay: 15 seconds  
Refreshing: Slow mode (500ms)  
Transmitting: Excel mode (.csv)

### Technical Data

Voltage Power Supply: 22 - 28 Volt DC  
Current consumption (Stand-By): max. 50mA  
Current consumption (Peak): max. 2A  
  
Refreshing rate (Analog): 98ms  
Refreshing rate (RS232): 499ms (Slow mode) / 98ms (Fast mode)  
  
Dimension: 54 x 45mm  
Drill pattern: 42 x 20.3mm

### Support

Sebastian Knödler Technologie  
Rosenstraße 25  
D-71549 Auenwald

Web: [www.breitband-lambda.de](http://www.breitband-lambda.de)  
Mail: [info@breitband-lambda.de](mailto:info@breitband-lambda.de)

Mobile: +49 (0)162 517 68 48

VAT ID: DE 2859 20322  
WEEE ID: DE 9747 1003