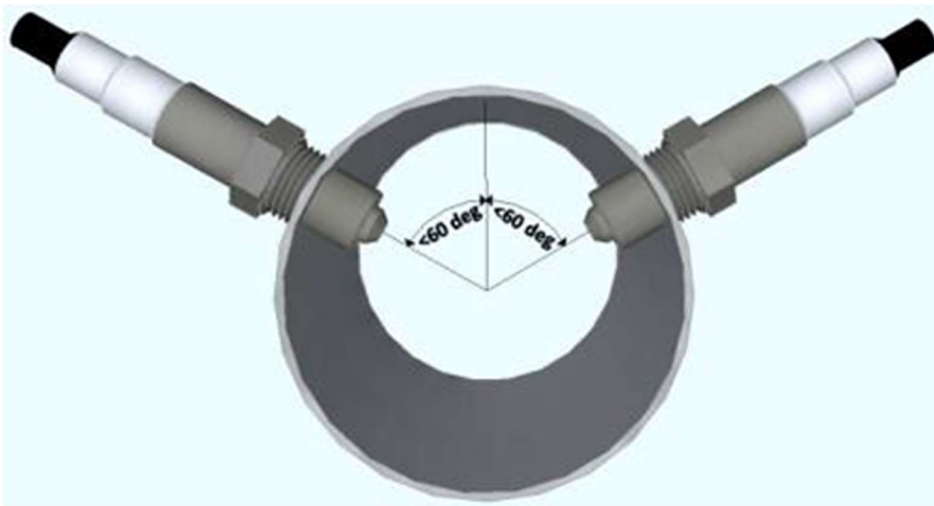


Spartan3v2 setup

This document is available here: <https://yourdyno.com/Spartan3.pdf>

1.1 Warnings

- Do not connect or disconnect the Lambda Sensor while Spartan 3 is powered.
- The Lambda Sensor will get very hot during normal operation, please be careful when handling it.
- Do not install the Lambda Sensor in such a manner that the unit is powered before your engine is running. An engine start can move condensation in your exhaust system to the sensor, if the sensor is already heated this can cause thermal shock and cause the ceramic internals inside the sensor to crack and deform.
- While the Lambda Sensor is in an active exhaust stream, it must be controlled by Spartan 3. Carbon from an active exhaust can easily build up on an unpowered sensor and foul it.
- Lambda sensor life when used with leaded fuels is between 100-500 hrs.



1.2 Exhaust Installation

The Lambda sensor should be installed between the 10 o'clock and the 2 o'clock position, less than 60 degrees from vertical, this will allow gravity to remove water condensation from the sensor.

For all Oxygen sensor installations, the sensor must be installed before the catalytic converter.

For normally aspirated engines the sensor should be installed about 2ft from the engine exhaust port. For Turbocharged engines the sensor should be installed after the turbocharger. For Supercharged engines the sensor should be installed 3ft from the engine exhaust port.

1.3 Power connection

Connect a 12V power supply or battery to the Red(+), Black(-) and White (-) wires. The power supply should be capable of at least 3 Amps per Wideband sensor. Do NOT use the 12V power from the YourDyno Ultimate box, it is not powerful enough to drive O2 sensors.

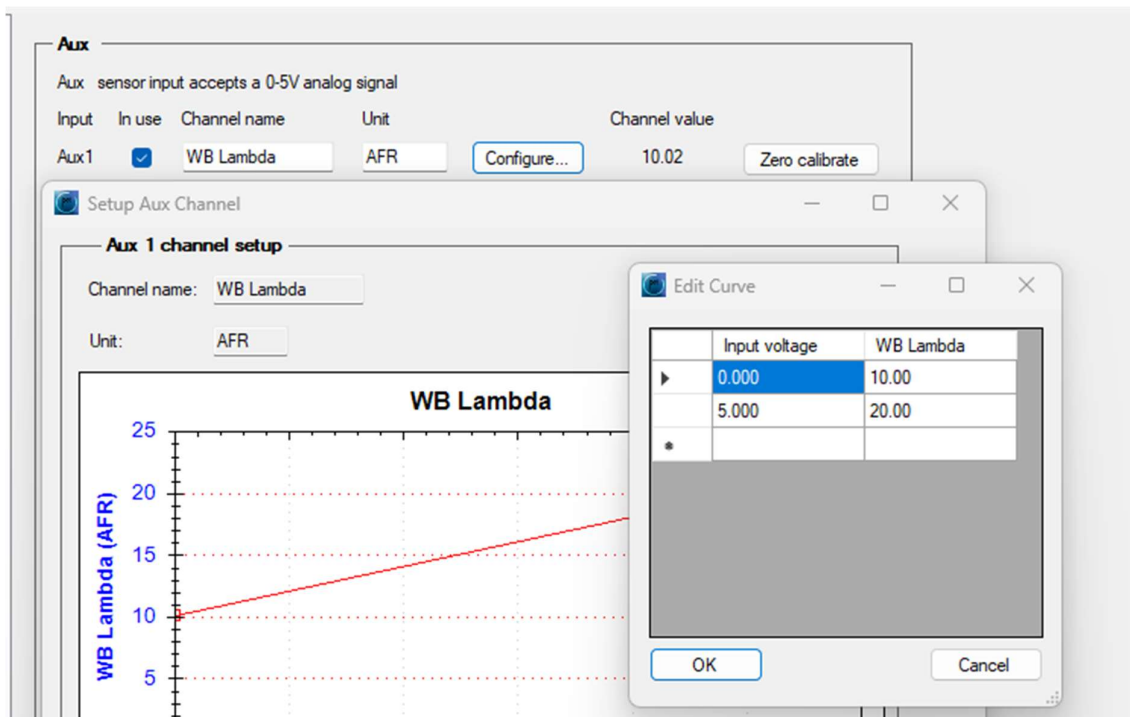
Make sure to use a suitable fuse on the 12V.

1.4 Connection to YourDyno

The WB Lambda controller can be connected either through CAN bus or use an analog input (Aux).

1.4.1 Aux connection

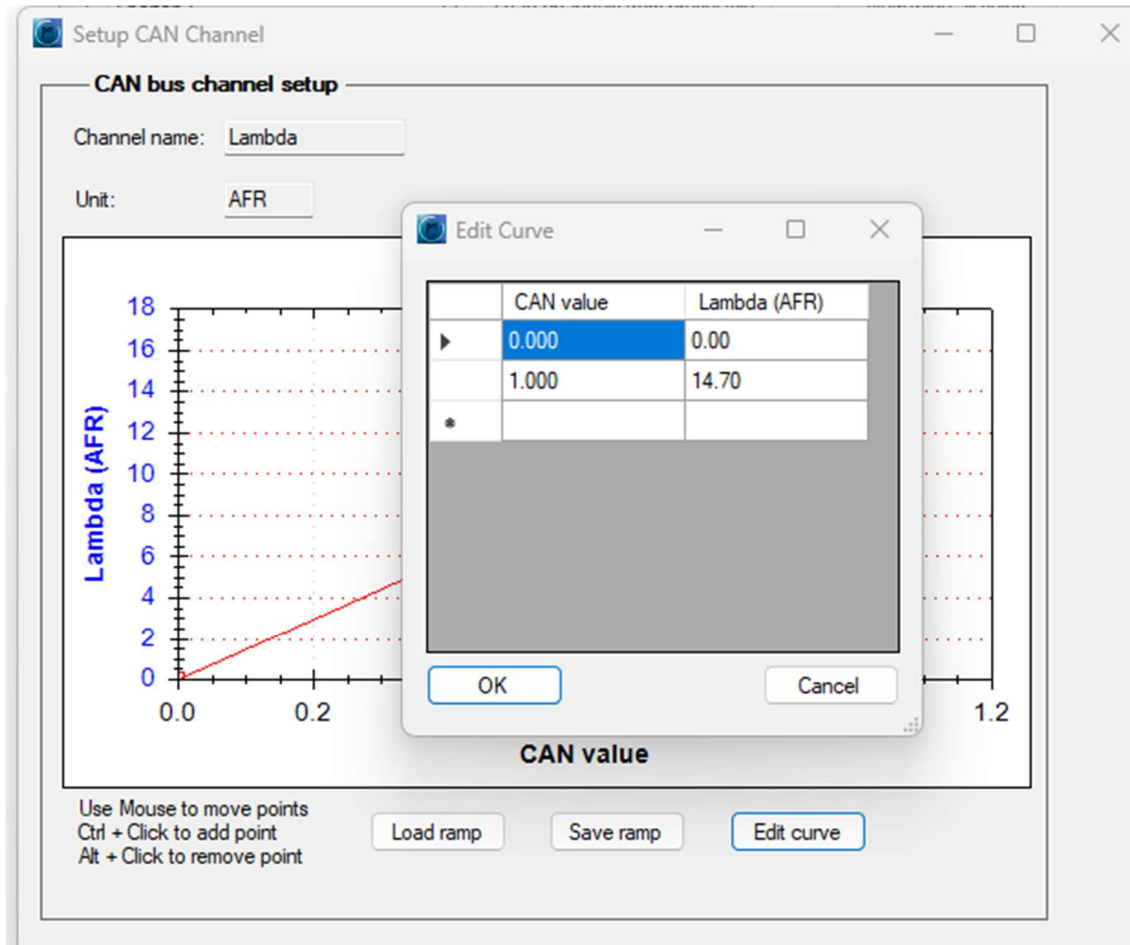
Use a YourDyno Aux input and connect Black to 0V and Green to Signal. Define 0V = 0.68 lambda and 5V = 1.36 lambda (10-20 AFR for gasoline). Configure it like below:



1.4.2 Using the CAN bus

- 1) Open Options->CAN bus and make sure Enable CAN bus is turned on
- 2) Go to the CAN input channels tab
- 3) Select the Spartan3 from the drop-down menu and click Load channels from preset/file
- 4) Click View/Hide all fields and double check that Start bit is 0 for the Lambda channel

The channel is now configured, called Lambda and it is in lambda format (not AFR). To change to AFR click the More button and fill in the translation like in the below picture.



1.4.3 Multiple wideband controllers

Multiple wideband controllers can be connected on the same CAN bus. In this case each device has its own address.

The CAN bus termination resistor is enabled on device 1.

CANIDs are:

AFR#	CANID
AFR1	0x400
AFR2	0x401
AFR3	0x402
AFR4	0x403
AFR5	0x404
AFR6	0x405
AFR7	0x406
AFR8	0x407

Click the View/Hide all fields and copy the same configuration as for AFR1 and just modify the CAN id to configure more channels. Like this:

CAN bus setup and Analyser														
CAN input channels														
CAN bus input channel setup														
Spartan3		Load channels from preset/file			View/hide all fields									
	CAN id (hex)	Id mask (hex)	Channel name	Start bit	Data length (bits)	Big endian	Is signed	Offset	Factor	Raw CAN value	Configure	Channel Value	Unit	Log data
▶	00000400	FFFFFFF	Lambda1	0	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0.001	0.00	More	0.00	AFR	<input checked="" type="checkbox"/>
	00000401	FFFFFFF	Lambda2	0	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0.001	0.00	More	0.00	AFR	<input checked="" type="checkbox"/>
	00000402	FFFFFFF	Lambda3	0	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0.001	0.00	More	0.00	AFR	<input checked="" type="checkbox"/>
	00000403	FFFFFFF	Lambda4	0	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0.001	0.00	More	0.00	AFR	<input checked="" type="checkbox"/>
*						<input type="checkbox"/>	<input type="checkbox"/>							<input type="checkbox"/>

1.4.4 Manually configuring the CAN bus

Data Rate is 50 hz, data is sent every 20[ms]. Big-endian for all data

Data format:

Data[0] = Lambda x1000 High Byte

Data[1] = Lambda x1000 Low Byte

Data[2] = LSU_Temp/10

Data[3] = Status

$\text{Lambda} = (\text{Data}[0] \ll 8 + \text{Data}[1]) / 1000$

$\text{Sensor Temperature [C]} = \text{Data}[2] * 10$

Status Value	Meaning
0	Reserved
1	Waiting for trigger before heating up
2	Sensor is heating up
3	Sensor in normal operation
4+	Reserved