



Installation Instruction for WB102 Lambda Wideband Controller

This User Manual Only For Rev1 Boards

Warning

THIS INSTALLATION MAY REQUIRE WELDING OR INTEGRATION INTO A VEHICLE'S ELECTRICAL SYSTEM. DAMAGE TO SENSITIVE ELECTRONICS, FIRE, OR EXPLOSION MAY OCCUR IF PROPER PRECAUTION IS NOT TAKEN. IF THERE IS ANY DOUBT, DO NOT ATTEMPT THE INSTALLATION AND CONSULT A PROFESSIONAL. NOTE: IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM THE CALIBRATION USE FOR ANY PARTICULAR ENGINE IS SAFE FOR ITS INTENDED USE. SPTRONICS HOLDS NO RESPONSIBILITY FOR ANY ENGINE DAMAGE THAT RESULTS FROM THE MISUSE OF THIS PRODUCT.

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Warranty

SPTRONICS warrants to the consumer that all High-Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at SPTRONICS's option, when determined by SPTRONICS that the product failed due to defects in material or workmanship.

This warranty is limited to the repair or replacement of the SPTRONICS part. In no event shall this warranty exceed the original purchase price of the SPTRONICS part nor shall SPTRONICS be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product.

Warranty claims to SPTRONICS must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. SPTRONICS disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by SPTRONICS.

SPTRONICS will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with. Any SPTRONICS electronics product can be returned for repair if it is out of the warranty period.

There is a minimum charge of \$20.00 for inspection and diagnosis of SPTRONICS electronics parts.

Parts used in the repair of SPTRONICS electronic components will be extra.

SPTRONICS will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.

WB102 Features & Specifications:

One channel wideband controller, it combines an accurate, fast response wideband AFR (Air Fuel Ratio) controller with a Bosch LSU4.9 wideband oxygen sensor. The wideband controller works with gasoline, bio diesel, ethanol, methanol, E85, LPG, and CNG. It includes one analog outputs 0-5V for each channel for interfacing with 3rd party devices, CAN bus for interfacing with our aftermarket ECU or Megasquirt family ECUs .

- One channel wideband controller supports Bosch sensor LSU4.9
- Sealed enclosure and automotive connector.
- Accuracy < 0.1 AFR
- Fast response 50mS
- Heating in less than 10 second when the sensor is cold.
- AFR range 10 - 20 AFR
- Compatible with all fuel types
- All analog inputs and outputs are 12bits resolution.
- Factory calibrated, no need for free air calibration.
- PID heater and pump current control.
- 1 linear 0-5V analog output.
- 0v output during heating/error.
- 0.5V at 10 AFR and 5V at 20 AFR
- Power circuit protected with re-settable fuse.
- CAN bus enabled.
- Compatible with Megasquirt MS3 Can Bus protocol.
- Comes with the main 24pins connector and LSU4.9 connector.

Power

Operating Voltage	9.8V to 16V DC
Input Current, O ² heater initial warm-up	2.0A nominal, 3A max
Input Current, O ² normal operation	0.8A nominal, 1.1A max

Environmental

Operating ambient temperature	0° to 140° F (-17.78° to 60° C)
Storage ambient temperature	-40° to 185° F (-40° to 85° C)
Water resistance	Splash resistant, non-submersible

Sensors

Compatible Types	Bosch™ LSU4.9
Bosch™ Heater Control	Digital PID via pump-cell impedance

Measurements

Lambda	.68 to 1.36
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Air/Fuel Ratio 10 to 20 (gasoline), Fuel Type Programmable

Accuracy

For Lambda Accurate to +/- .007 (.1 AFR)

Operation Time

Heating time < 10 S
Response time 50 mS

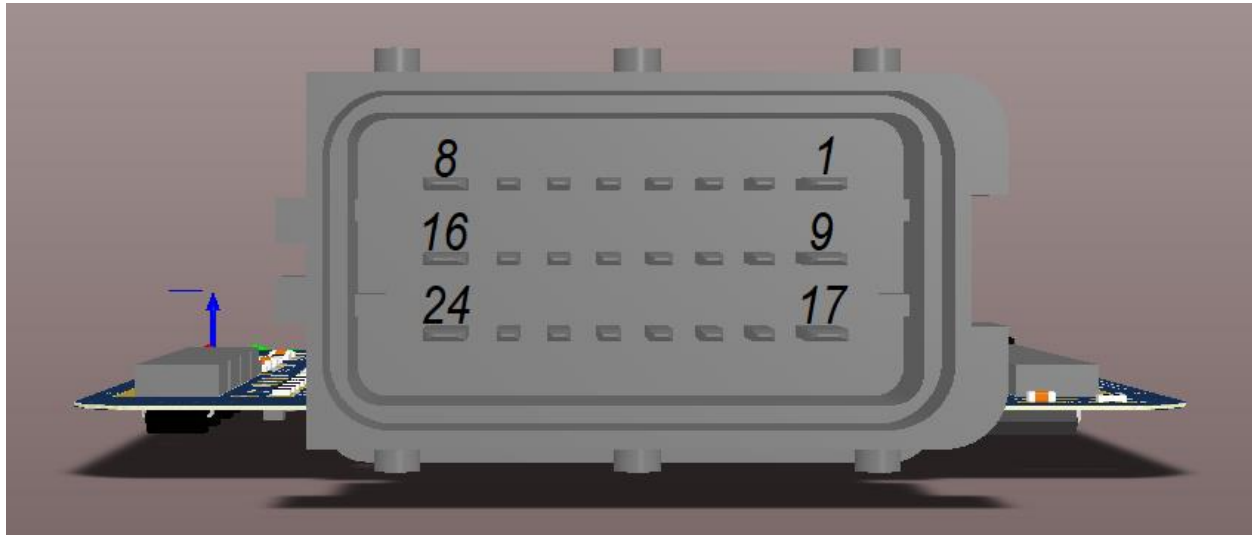
Outputs

Analog 1, 0-5VDC, 12 bit resolution.

Communication

CAN bus High speed CAN bus 1Mbit/sec

Wiring Diagram:



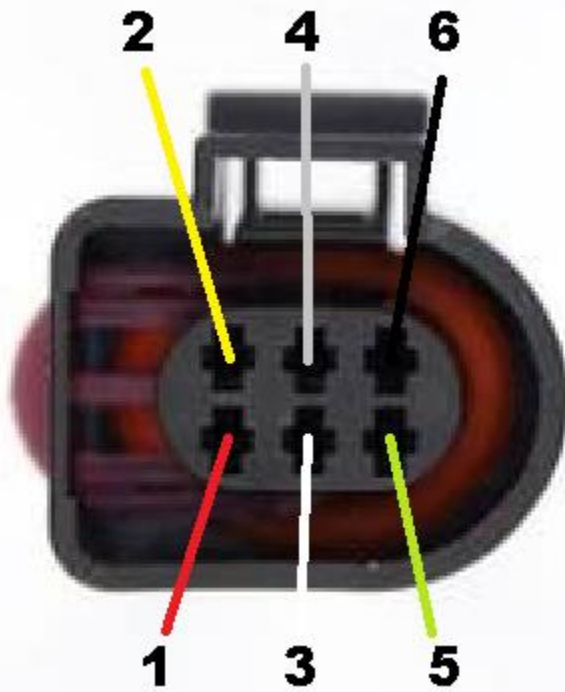
Looking at PCB connectors

Main Connector:

Pin	Name	Comment
1	Sensor 1 Heater+	No. 4 on sensor connector, grey wire
2	Sensor 1 Vs	No. 6 on sensor connector, black wire
3	Sensor 1 Vs/lp	No. 2 on sensor connector, yellow wire
4	NC	
5	NC	
6	NC	
7	NC	
8	NC	
9	Sensor 1 Heater-	No. 3 on sensor connector, white wire
10	Sensor 1 CaIR	No. 5 on sensor connector, green wire
11	Sensor 1 lp	No. 1 on sensor connector, red wire
12	NC	
13	NC	
14	NC	
15	NC	
16	NC	
17	Switched 12V	
18	Analog 1 Output	
19	NC	
20	Analog Ground	

21	NC	
22	CAN L	
23	CAN H	
24	Ground	

Sensor Connector:



Installation:

Grounding:

The device must have an electrically secure ground connection, which means that the battery negative must be properly grounded to the chassis AND engine. The ground wire, whether it is from the battery or to the chassis and engine, must have perfect electrical conductivity. This means that there must not be any paint or rust under the wire terminal. Make sure that when you install the ground wire there is bare metal exposed where the wire contacts the vehicle component. Both of black wires should be connected to secure ground and we also recommend that the ground wire be as short as possible and to be connected directly to the same ECU ground.

Power Requirement:

The WB102 requires a minimum supply voltage of 9V or greater to run. We recommend that the device be supplied with 13.8V nominal operating voltage. Ensure that the vehicle's charging system is in perfect operating condition prior to installation. The red wire should be connected to ignition switched and fused to the switched 12V source.

Analog Outputs:

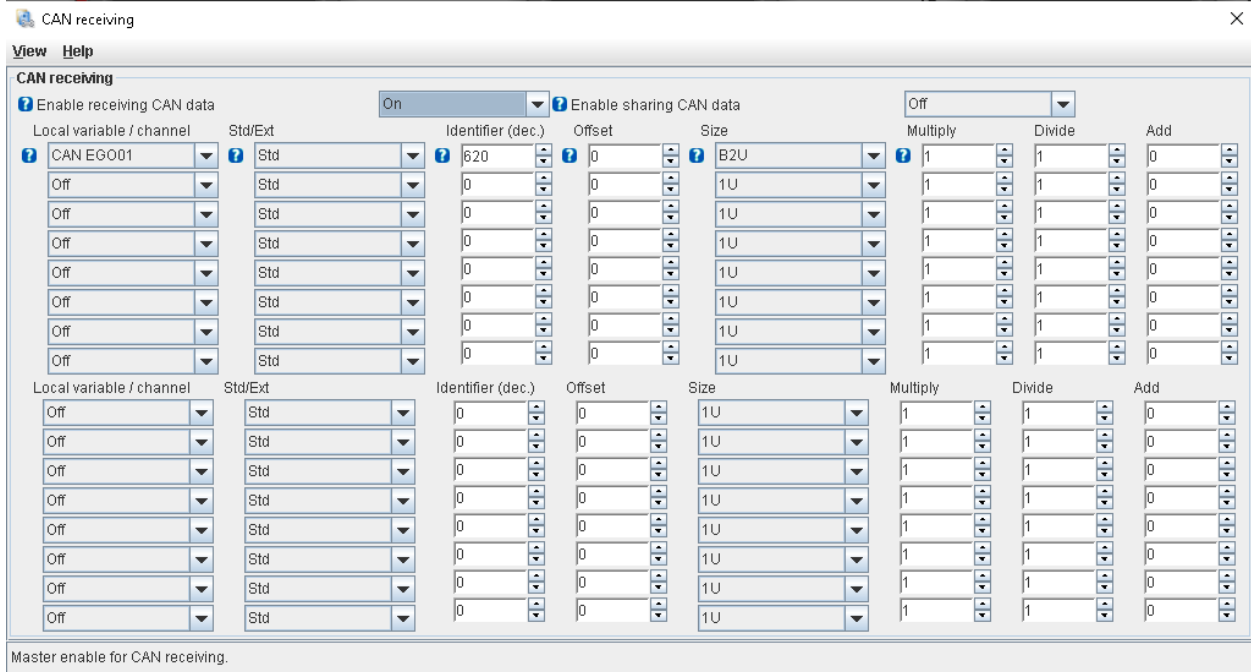
WB102 has 1 analog outputs generates analog voltage from 0.5V at 10 AFR and 5V at 20 AFR.

CAN Bus Connector:

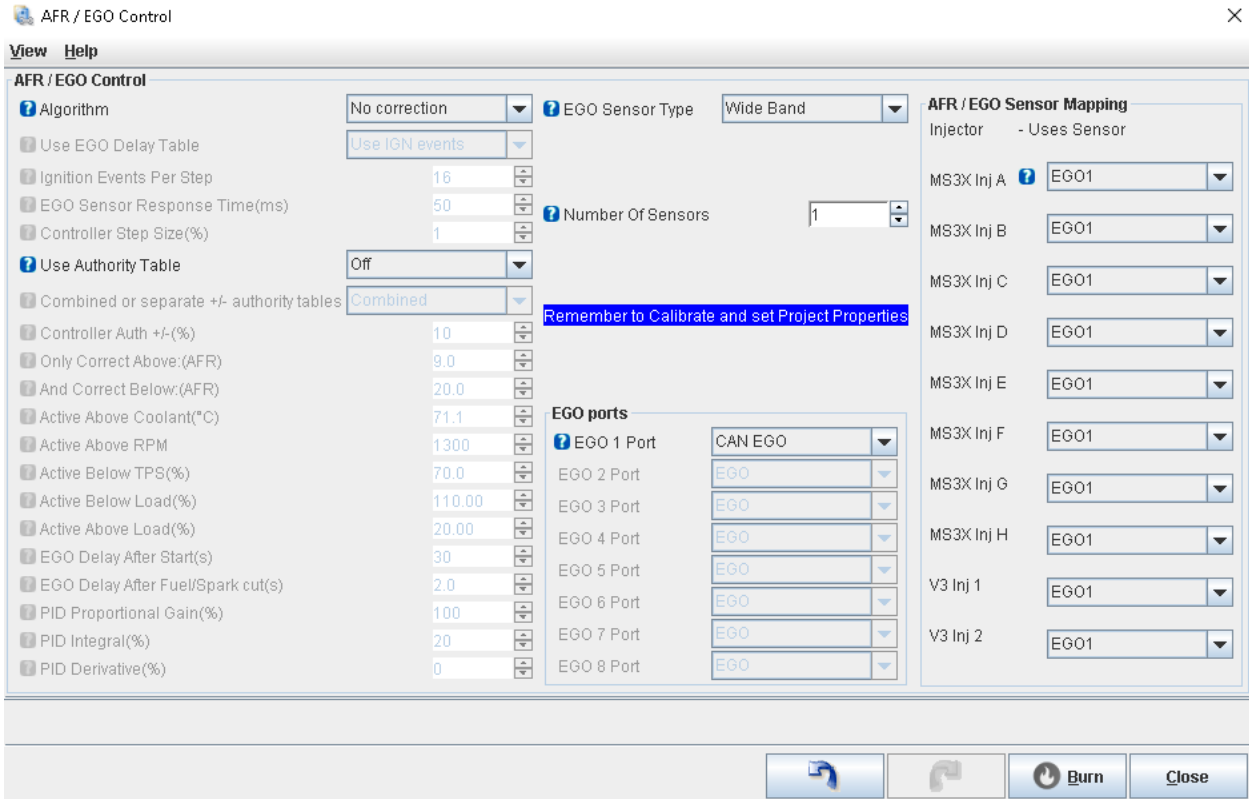
The CAN bus communication port sends the output lambda reading to the ECU, Data transferred digitally is more accurate than analog output voltage. All the settings for the message transferred to the ECU can be adjusted from the SPTRONICS wideband windows software.

Tunerstudio CAN Bus Configurations:

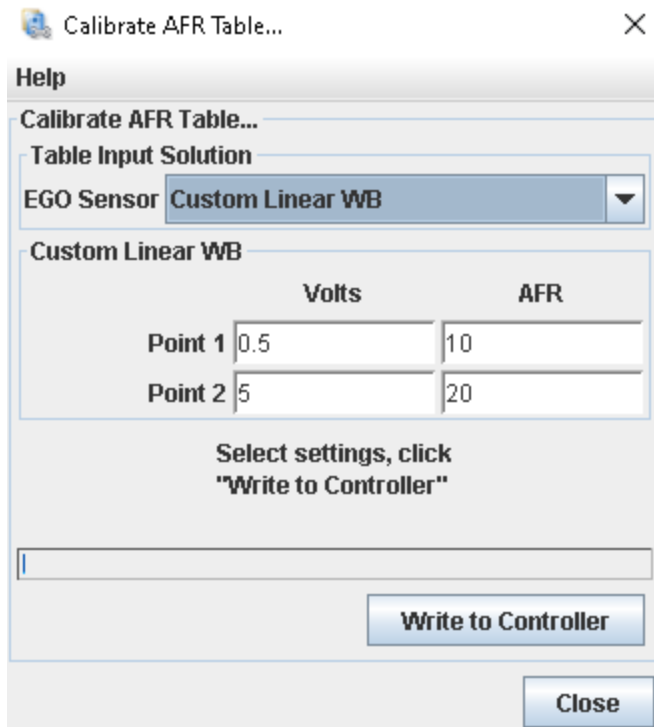
Here is the required configuration to be done in Tunerstudio transfer AFR to Megasquirt ECU over the CAN Bus.



First add the new can CAN device to the tunerstudio from CAN receiving window, change “Enable receiving CAN data” to “On”, then choose “CAN EGO01” or any EGO number required from “Local variable/channel” drop menu. “Std”, “identifier” is “620”, “Offset” is “0”, “Size” is “B2U”, “Multiplicity” is “1”, “Divide” is “1” and “Add” is “0”.



After that, configure the ECU to use the new wideband we have just created from AFR?EGO Control window. Choose “Wide Band” from “EGO Sensor Type” and from “EGO ports” choose “CAN EGO”



Lastly, Configure the Tunerstudio to understand the output coming from wideband controller, at 0.5v the AFR = 10 and at 5V the AFR = 20