



NTK4000 Uego System

The NTK4000 is a four channel Uego system which enables monitoring of four Lambda channels simultaneously and is designed for individual cylinder tuning.

Interface is via RS232 (USB) and CAN bus and (0-5V optional).

USER MANUAL

4 Channel Uego System wiring

All wiring is via a 36 way connector see pinout below. A 15 amp inline fuse is required on the 12V supply. **Note:** Sensor heater grounds are connected to chassis ground.

Sensor Channel 1

25 Vs+
13 Ip-
1 Ip+
26 Heater

Sensor Channel 2

11 Vs+
23 Ip-
34 Ip+
35 Heater

Sensor Channel 3

12 Vs+
24 Ip-
36 Ip+
33 Heater

Sensor Channel 4

27 Vs+
14 Ip-
2 Ip+
28 Heater

Power Supply

20,21 +12V
6,19 Ground

RS232

3 Rxd
4 Txd
5 Gnd

CAN bus

15 CAN High
16 CAN Low

0-5V Out (option)

7 Channel 1
8 Channel 2
9 Channel 3
10 Channel 4
18 Signal ground

VIEWED FROM BACK OF CONNECTOR



NTK Uego sensor

Sensor Wiring

Gray	Vs+
Black	Ip-
White	Ip+
Blue	Heater
Yellow	Heater ground

NTK Uego sensor has a eight pin connector but only 5 wires are required.

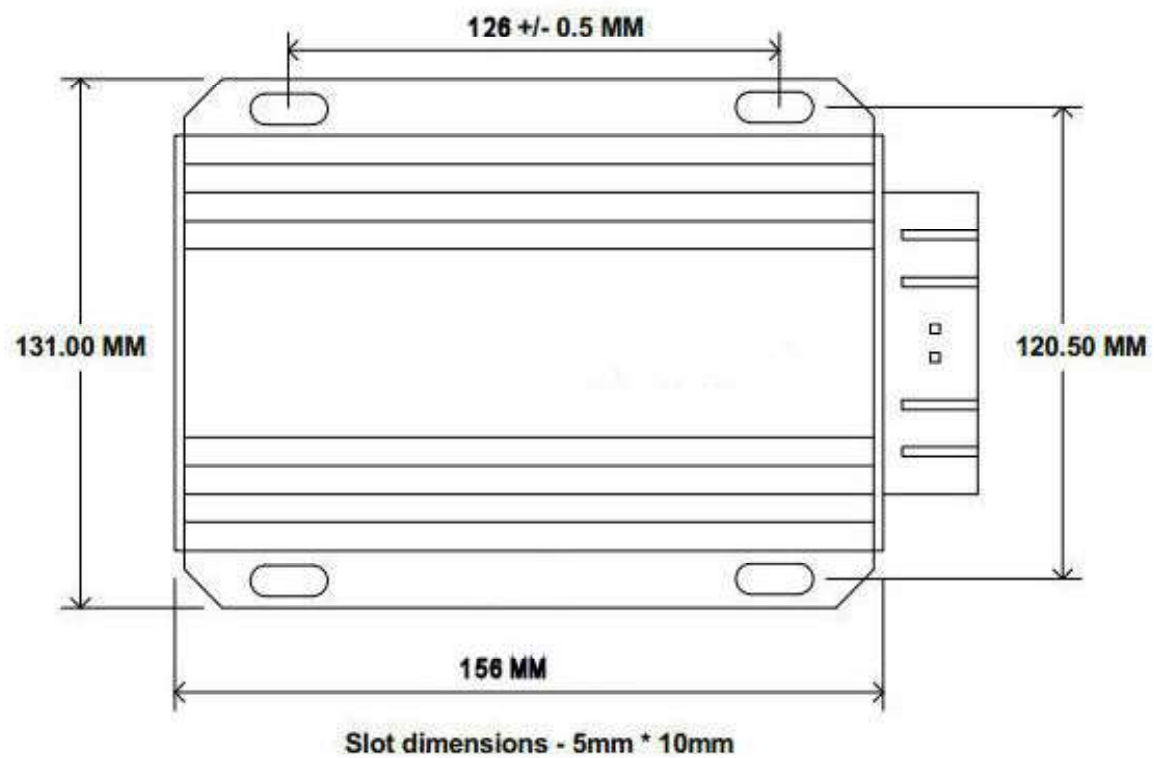


Note: the sensor contains a ceramic module and should not be subject to mechanical or thermal shock or it may be damaged.

DO NOT

- (1) Do not operate the sensor with high lead content fuels as this may reduce the sensor life to under 50 hours.
- (2) Influx of water into the exhaust will destroy the sensor if it is immersed.
- (3) Do not run the engine with the Uego sensor installed without power applied to the controller.

Case Dimensions

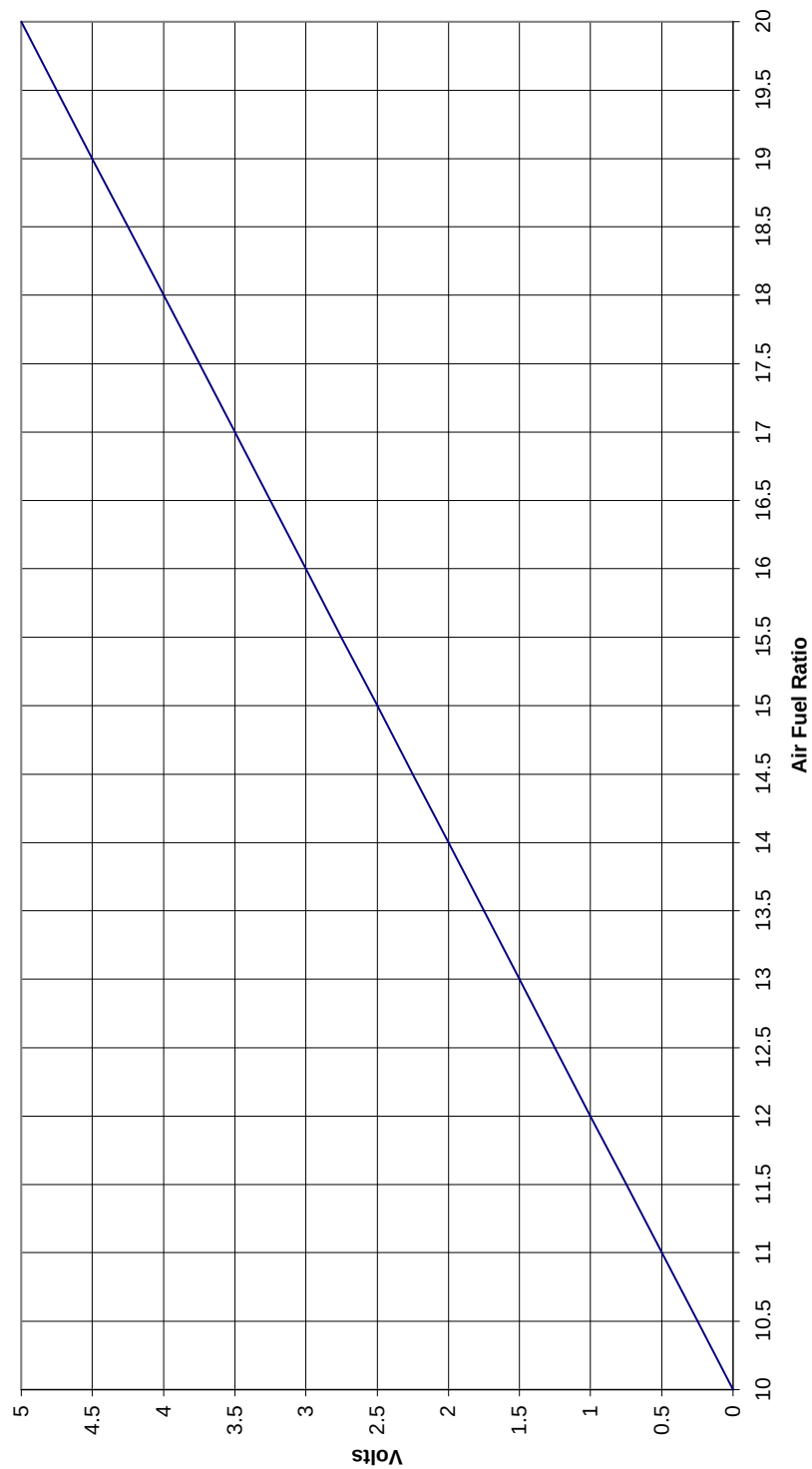


0-5V Output (Note: option) Scaling for Lambda

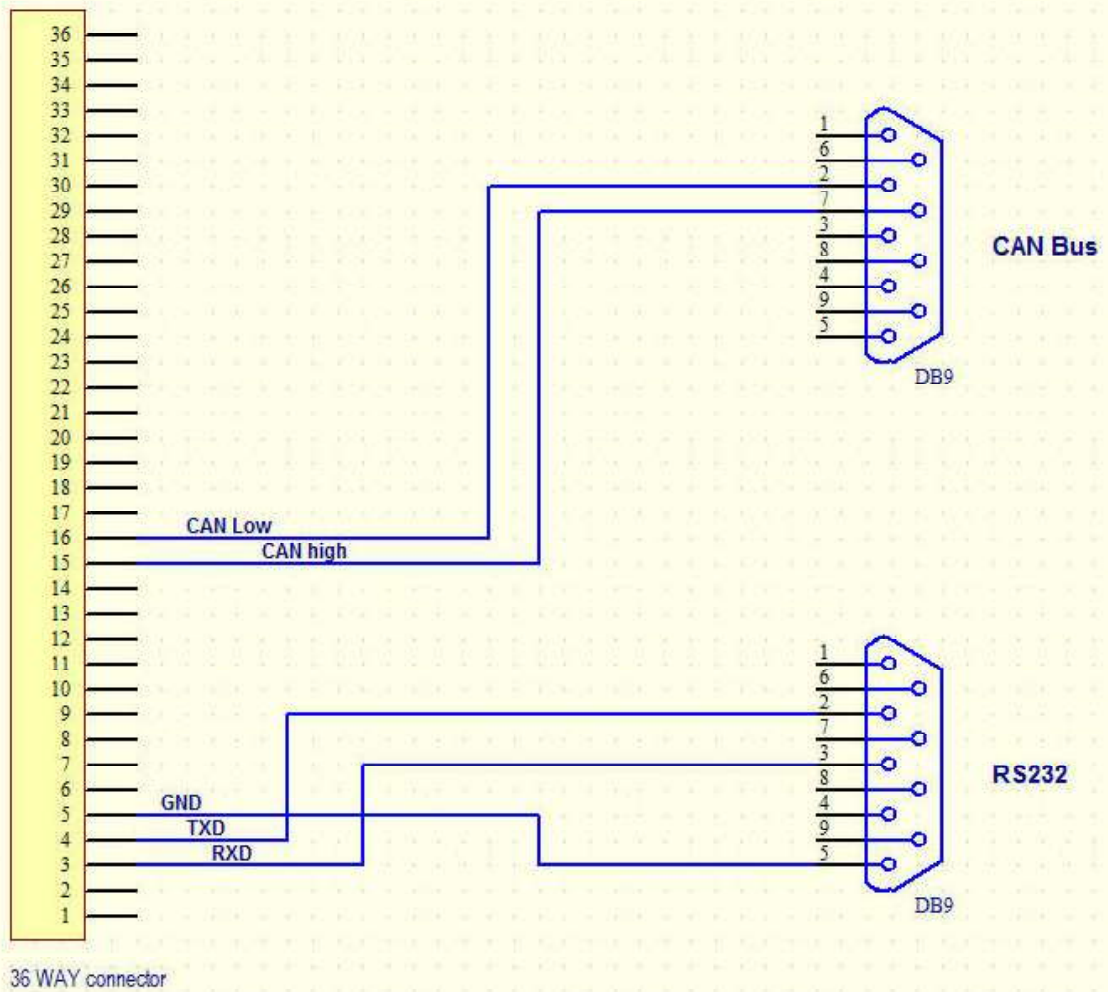
$$\text{Lambda} = 0.680 + (\text{volts} \times 0.1360)$$

$$\text{AFR (Gasoline)} = (\text{volts} \times 2) + 10$$

M&W Uego Controller Analog Output



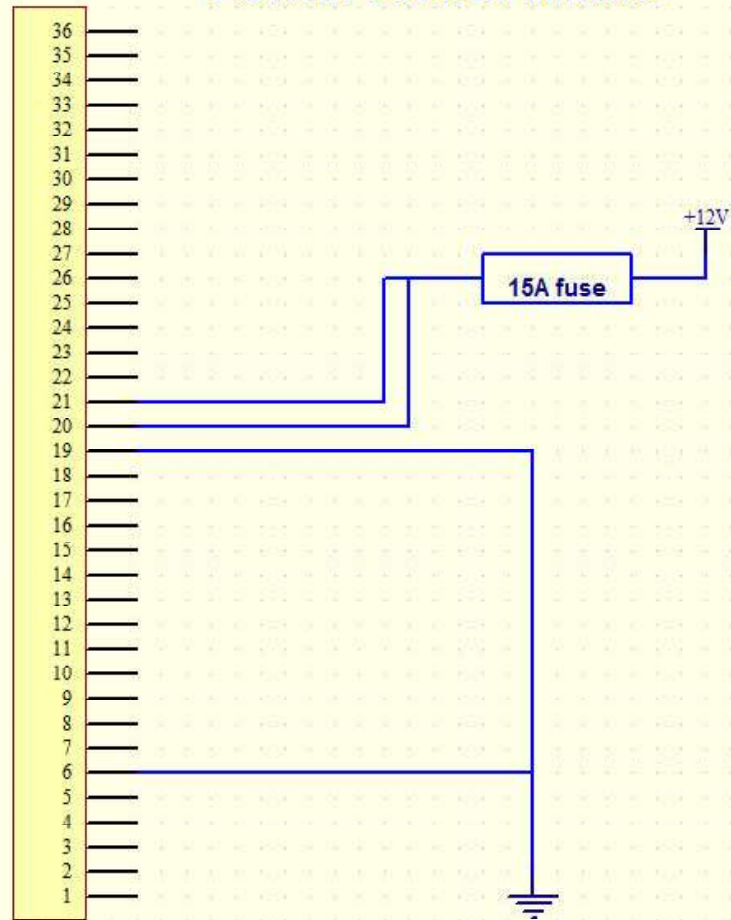
CAN Bus and RS232 wiring



VIEWED FROM BACK OF CONNECTOR



POWER SUPPLY WIRING



36 WAY CONNECTOR

VIEWED FROM BACK OF CONNECTOR



4CH UEGO CAN Data Format

The controller has two modes "warmup" or normal.
The 4CH UEGO uses two standard 8 byte CAN messages.
11 bit CAN address hex 041 (decimal 65) and hex 042 (decimal 66)
The packets are transmitted continuously every 50ms at 1000K.

Note: CAN address can be set using PC interface software.

Packet description:

(Addr) hex 041 (decimal 65)

(bytes) 8

- (0) xx CH1 Lambda msb
- (1) xx CH1 Lambda lsb
- (2) xx CH2 Lambda msb
- (3) xx CH2 Lambda lsb
- (4) xx CH3 Lambda msb
- (5) xx CH3 Lambda lsb
- (6) xx CH4 Lambda msb
- (7) xx CH4 Lambda lsb

Lambda format:

xxxx = Lambda x 1000 (ie. dec 650 = 0.650 lambda,
dec 1100 = 1.100 lambda, dec 1000 = 1.000 lambda)

(Addr) hex 042 (decimal 66)

(bytes) 8

- (0) zz Supply voltage
- (1)
- (2)
- (3)
- (4) yy CH1 status byte
- (5) yy CH2 status byte
- (6) yy CH3 status byte
- (7) yy CH4 status byte

Supply Voltage format:

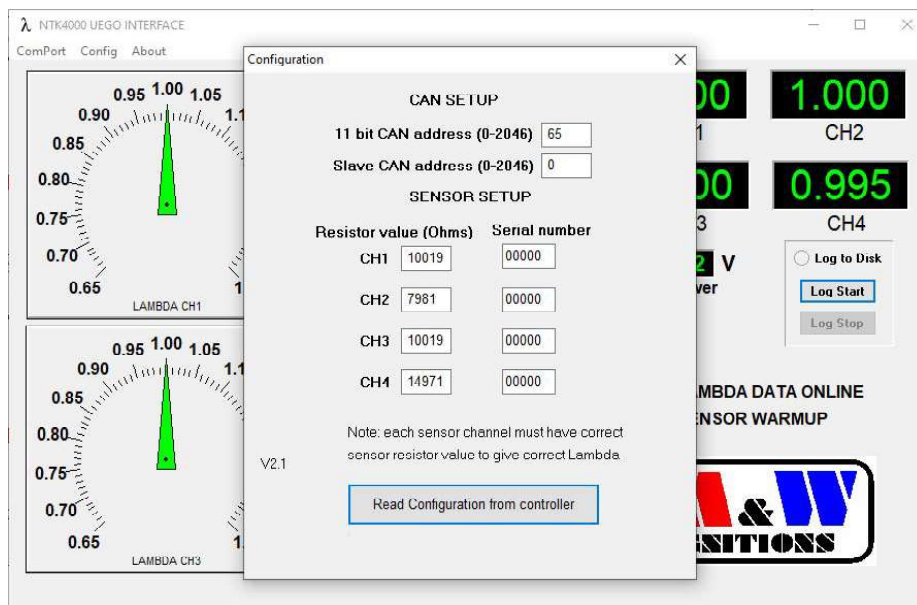
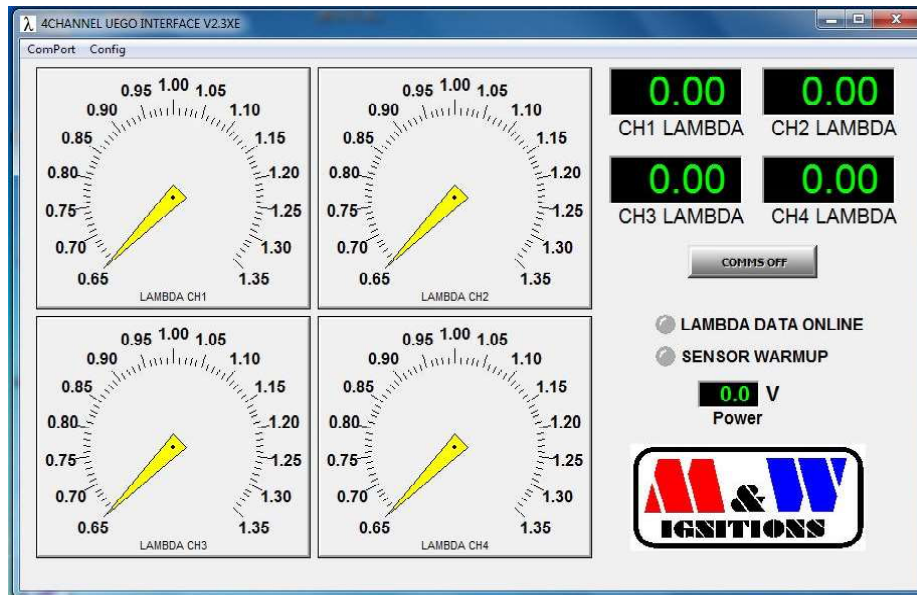
Byte 0 is supply voltage as measured by the controller.
Formula: $zz/10 = \text{volts}$

Status format:

yy = Status byte (ie. 00 = operating, 01 = warmup)

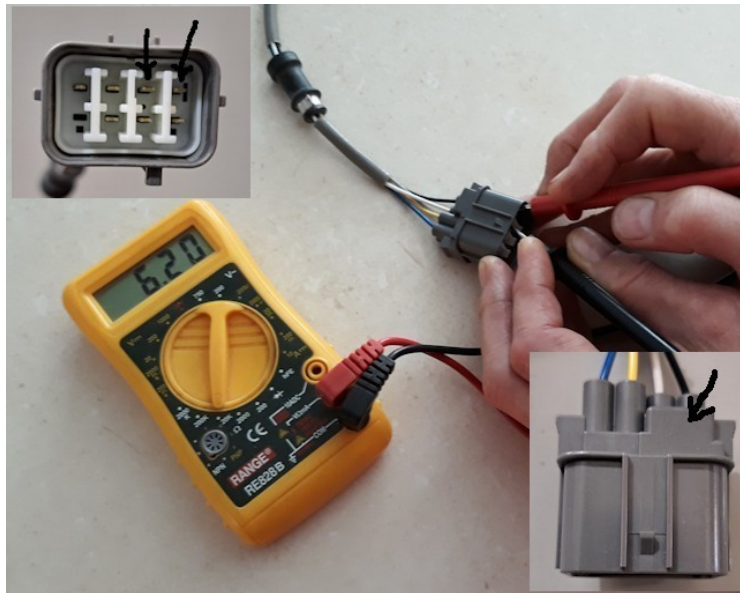
PC Interface software

PC software (using RS232 or using USB to RS232 adapter) allows display of Lambda values and configuration of sensor data and CAN address.



CALIBRATION

Use a multimeter to measure the resistance value of the calibration resistor in the connector. Select "Sensor Setup" and enter the value in ohms. For example if it was 6.3K ohms you would enter 6300 ohms. The "Serial number" field may be used to keep track of which sensor is connected to which channel.



Configuration

×

CAN SETUP

11 bit CAN address (0-2046)

Slave CAN address (0-2046)

SENSOR SETUP

	Resistor value (Ohms)	Serial number
CH1	<input type="text" value="10019"/>	<input type="text" value="00000"/>
CH2	<input type="text" value="7981"/>	<input type="text" value="00000"/>
CH3	<input type="text" value="10019"/>	<input type="text" value="00000"/>
CH4	<input type="text" value="14971"/>	<input type="text" value="00000"/>

Note: each sensor channel must have correct sensor resistor value to give correct Lambda

V2.1

SPECIFICATIONS

CONTROLLER

Supply voltage:

12 to 15 volts DC (negative ground only) 15A

Weight:

560 grams

Dimensions:

See drawing

Inputs:

4 X NTK Uego sensor (6 mA)

Interface:

1 X RS232 port , 1 X CAN bus port (1M)

Analog output (Note: option)

4 X 8 bit DAC 0-5 volt DC

Measuring range:

0.65 to 2.01 Lambda

Update rate CAN/Analog:

20 Hz

System accuracy (see note):

+/- 0.12 @ 10:1 AFR

+/- 0.025 @ 14.7 AFR

+/- 0.25 @ 20:1 AFR

Controller Repeatability (see note):

+/- 0.01 10-20:1 AF

Note: Accuracy and repeatability specifications are valid only when the instrument is installed, operated, and calibrated in accordance with the manufacturer's instructions. MRB Design makes no warranty, expressed or implied, that the system will achieve the stated accuracy under all operating conditions. Be advised sensor ageing can affect accuracy.

SENSOR

Type:

NTK LZA09-E1 wide range 5 wire sensor. (**Note:** Exhaust temperature not recommended to exceed 850°C)

Warmup time:

approx 30 seconds @ 25°C ambient

Weight:

85 grams

Response time (typical):

50 mS

Heater Current 4 sensor:

5-6A at 12.8V typical operating, 9A peak at warmup with sensors starting at ambient temperature, less when sensors are already hot

Mounting:

M18 X 1.5 thread

NOTE: sensor is not rated for continuous operation on high lead content fuels. Operation in this mode may limit sensor life to under 50 hours.



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