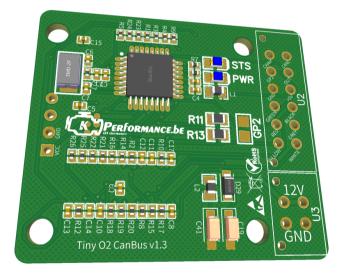


Tiny O2 Controller



Software, drivers and latest info can be downloaded at

www.Kperformance.be

Warning

- Do not connect or disconnect the Lambda Sensor while powered, only do so when unpowered.
- The Lambda Sensor gets very hot during normal operation, be careful when handling it.
- It takes roughly 30 seconds to 2 minutes to warm up the sensor. Once the sensor is warmed up, engine start could create condensation in the sensor, this may cause thermal shock and damage the sensor. It is best to power off a power source that is "live" when the engine starts.

Package Contents

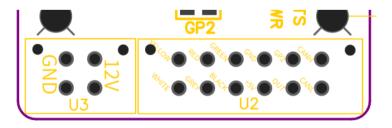
Tiny Wideband should include the following Items:

- 1x circuit board with soldered surface mount components
- 2x MicroMolex connectors
- 16x MicroMolex receptacles
- 1x 3d printed case and cap (optional)
- 1x OLED screen(optional)

Electrical connections

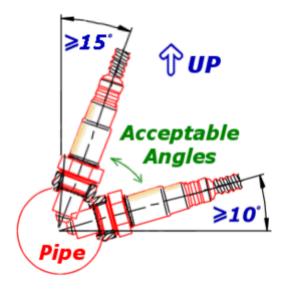
U2	Color	Function
YELLOW	YELLOW	LSU YELLOW
WHITE	WHITE	LSU WHITE
GREY	GREY	LSU GREY
RED	RED	LSU RED
BLACK	BLACK	LSU BLACK
GREEN	GREEN	LSU GREEN
GND		GROUND
+5V		EXTRA +5V SUPPLY MAX 250mA
GP2		EXTERNAL GROUND ACTIVATING
CAN H		CAN bus High
CAN L		CAN bus Low
OUT		ANALOG OUTPUT 0-5V

U3		Function
12V	2X	INPUT VOLTAGE 8-18V
GND	2X	GROUND



Sensor Exhaust Installation

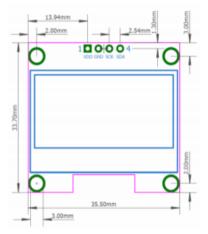
- The Lambda Sensor should be installed between the 10 o'clock and the 2 o'clock position, less than 60 degrees from vertical, this will allow gravity to remove water condensation from the sensor.
- For all Oxygen sensor installations the sensor must be installed before the catalytic converter.
- Avoid running the sensor to hot!
- Never leave an un-powered sensor in the exhaust system



O-LED Display(Optional)

1.3 and 0.96 I2C are supported without software changes.

Double check VCC&GND pins on aftermarket OLED-screens! Low budget/quality screens can cause freeze and hang up of Tiny O2 Controller!



Initial stand-by screen will show:

- Icon Sensor connection
- Icon GP2 ground status (GP2 not grounded= NO START)
- Icon Battery voltage

After succesfull start, the screen will show:

- Temperature value
- Input voltage
- Lambda value

Starting and operating

Linear output settings:

0V = Lambda 10.20 = AFR 22.50

```
4V = Lambda 0.650 = AFR 9.50
```

Starting of the controller can be done by grounding "**GP2**" (solder bridge on PCB) or external start grounding on molex connector, with customer requirements setting.

Ie:start lambda controller only after engine starts. (programmable output function within stand-alone ECU)

Not grounding of pin "**GP2**" will result in a standby controller! Blinking LED.

LED	Status	Function							
STS	Fading in	Heating sensor status							
PWR	Solid								
STS	Blinking Slow	Operational measuring status							
PWR	Solid								
STS	Blinking FlipFlop	Sensor disconnected/Error							
PWR	Blinking FlipFlop								
STS	OFF	Power low							
PWR	Blinking	-							

Operational led Status

PCB Layout

For easy integration we'll share the layout so the controllers can be integrated in to own projects.

CAN-bus Setup

Firstly connect CAN-H & CAN-L wires/connector to your ECU.

The TinyO2 CAN-bus data:

ltem	Function	Detail
CAN Speed	500 Kbit	Default Speed
CAN ID	16	CAN-Bus ID
CAN DLC	8	Data length
Byte 0+1	Lambda out Megasquirt constrained	Value range 500-1023
Byte 2+3	Temperature LSU	Value in degree C°
Byte 4+5	TinyO2 statuses	0-1-2-4-5-6 0:Standby 1:Heating Cycle 2:Measering Cycle 4:Sensor Error 5:Low Power 6:GP2 not grounded
Byte 6+7	Lambda out Full Range	Offset 500 Resolution 1000 Multi 1 Dev 1

Megasquirt Setup

Activate general Canbus under CAN Parameters:

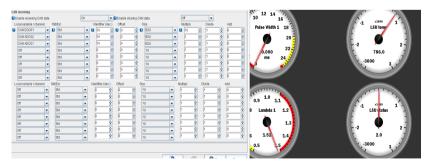
🛃 CAN Parameters	<u> </u>	_	_		-	1.2	34	×
<u>V</u> iew <u>H</u> elp								
CAN Parameters								
My CAN ID		0	÷	Digital ports				
Master Enable	On		-	Remote (CAN Id			×
29bit Megasquirt CAN Enable	Off		-	Enable In	put Port	Disable	1	
CAN baud rate (caution!)	500k		-	Offset(by			77	*
Enable PWM Polling	Disable		-	Enable O		t Disable		-
Remote CAN Id		5	-	Offset(by	es)		75	<u>^</u>
Remote Table Number For P Remote Table Offset For PWI Remote Clock(MHz) Remote Prescale Remote Divider	/I Data(bytes)	7 58 24 16 3	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Enable P Remote (Table	WM Outp CAN Id	uts Disable	5 7	4
				Offset(by		55 Disable	94	÷
Enable ADC Polling	Disable		-	Force Du	ty 1 o 0-2	Disable		
CAN ADC selection								
CAN ADC group on/off		CAN	d	Tab	le	Offse	et	
CAN ADC 1-4 Off	-			÷ 🗊		× 11		*
CAN ADC 5-8 Off	-			*		*		*
CAN ADC 9-12 Off	-			- 		- -		4
CAN ADC 13-16 Off	-]		- 		4		4
CAN ADC 17-20 Off	-]		*		A V		*
CAN ADC 21-24 Off	-	1		A V		n W		÷.
			_					
		l	7	ſ		🕑 Burn	C	lose





Under CAN-Bus/Testmodes → CAN Receiving:

Activate 3 channels



Under Fuel Settings → AFR/EGO control:

EGOx Ports to CAN EGO

Additionaly activate correct sensor mapping

Settings	5	Settings			Settings	Start	· .	•	Accel Enrich	()
uge Cluster Tuning &	Dyno Views	Graph	ing &	Logging	Diagnostics	& High Speed Logg	ers	Tune Analyze Li	ve! - Tune For You	Notes
AFR / EGO Control	-	-								- X
View Help		_								
AFR / FGO Control										
Algorithm	Simple		-	REGO S	ensor Type	Wide Band	-	AFR / EGO Sen	sor Mapping	
Use EGO Delay Table	<u> </u>	/ents	-	02000	insor type	The Dane		Injector - L	Jses Sensor	
Ignition Events Per St		16						MS3X Inj A 🔞	EG01	-
EGO Sensor Respon		1	•	🕜 Numbe	r Of Sensors	1	-	MS3X INJ A	2001	
Controller Step Size(1	-					MS3X Inj B	EGO1	-
Use Authority Table	Off	,	-					MS3X Inj C	EG01	-
Controller Auth +/-(%)		15	÷	Remembe	er to Calibrate	and set Project Prop	erties	MISSA INJ C	2001	`
Only Correct Above:(A	FR)	9.0	-					MS3X Inj D	EGO1	-
And Correct Below:(A	FR)	20.0	-	EGO por	ts			MS3X Inj E	EG01	
Active Above Coolant	°F)	160.0	-	EGO ·	1 Port	CAN EGO	-	mook inj E	EGUI	•
Active Above RPM		1300	-	EGO 2 F	Port	GO	-	MS3X Inj F	EGO1	-
Active Below TPS(%)		70.0	-	EGO 3 E	Port	EGO		MS3X Ini G	EG01	
Active Below Load(%)		90.00	-	EGO 4 E	Port	EGO		mooking G	EGO1	-
Active Above Load(%)		20.00	•	EGO 5 F	··· [EGO	÷.	MS3X Inj H	EGO1	-
BGO Delay After Start		30	÷	EGO 6 F	E	EGO		V3 Ini 1		
PID Proportional Gair	1(%)		*	EGO 0 P		EGO		vo ing 1	EG01	-
PID Integral(%) PID Derivative(%)			4					V3 Inj 2	EG01	-
Est to bonvalive(70)				EGO 8 F	ort	EGO	-		-	
Disabled - No EGO senso	r enabled.									-
Narrowband = Enable nar	rowband ser	isor/s.								-
						3		<i>(</i> 1)	🕐 Burn	Close

Basic CAN-bus setup is now completed and the gauge on your dashboard will now show Lambda/AFR values fetched via CAN.

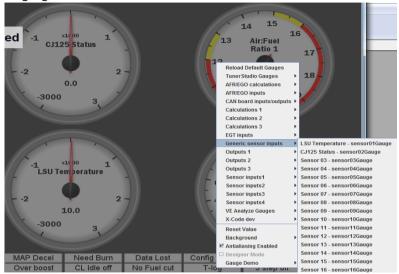
Additional CAN-bus Setup

Under Advanced Settings → Generic Sensor inputs

Activate 2 additional channels if you want to see real time LSU temperature and/or TinyO2 status.

Gene iew	eric Sensor Inputs	50	and the						12	24	1		X
	c Sensor Inputs												
	ors 1-8												
Sens	or - Source	Field Nam	ie	Tra	insformation		0V 1	value	5)	/ value	L	ag Factor	
01	CAN ADC01	🛿 🚺 LSU T	emperature	0	Raw	-	0		÷ 6		× (100	-
02	CAN ADC02	CJ125	5 Status		Raw	-			*		-	100	-
03	Off 🗸	Senso	or 03	-	Raw	-			A W		*		* ¥
04	Off	Senso	or 04	-	Raw	-			*		A V		4 4
05	Off	Senso	or 05		Raw	-			-		* *		4
06	Off	Senso	or 06		Raw	-			* *		* *		4 14
07	Off	Senso	or 07		Raw	-			n W		A. W		4 9
08	Off	Senso	or 08		Raw	-			-		* *		*
Sens	ors 9-16												
Sens	or - Source	Field Nam	е	Tra	nsformation		0V v	alue	5V	value	La	ag Factor	
09	ott	Senso	r 09			•			*		A W		* *
10	Off	Senso	or 10			-			*		* *		A W
11	Off 🗸	Senso	r 11			-			*		*		*
12	Off 🗸	Senso	r 12			-			* *		* ¥		* *
13	Off 🗸	Senso	r 13			-			* *		* *		* *
14	Off	Senso	r 14			-			*		4		*
15	off	Senso	r 15			-			a W		* ¥		* *
16	Off	Senso	r 16		Raw	-			*		× V		× W
Allo	w Input Sharing		Off		- 	CLT/MAT U	Jnits				degF		-
_				-			-		_	_			
						1	3		1	(Burn	C	ose
							4				J ⊇um	2	030

Afterwards Right click on your dashboard to add the newly created gauges:



From firmware MS3 1.5.2 you can also monitor the CAN activity under port statusses.

CANbus full O2 range data

- CANid 16
- Byte 6&7
- Offset 500
- Resolution 1000
- Multi 1
- Dev 1