

Interfacing Spartan 3 to MegaSquirt 3

Section 2 and 2.1. are optional

1. Configuring Spartan 3 to transmit Lambda to MS3 over CAN

Spartan 3's default CAN Baud rate is 500kbit/s and the default CAN Format is 0 and the default CAN ID is 1024. The default settings do not need to be changed for a single Spartan 3 install. For installing Multiple Spartan 3 please refer to "Interfacing Multiple Spartan 3 to MegaSquirt 3.pdf".

Please refer to Section 11 of the Spartan 3 User manual regarding the CAN Termination Resistor.



1.1. Configuring MS3 to receive Lambda from Spartan 3 over CAN

Your Megasquirt 3 ECU must be running Firmware 1.5.1 or newer, earlier firmwares have fewer user adjustable CAN settings. If you find that you are missing CAN options in Tuner Studio; you are most likely running a firmware older than 1.5.1

In Tuner Studio



Click CAN-bus/Testmodes and select CAN Parameters.



	0	-	P	U	-	

CAN Parameters										
My CAN ID				0	÷.	Digital	ports			
📝 🔂 Master Enable			On		-	R	emote C	AN Id	5	4
🖉 🕜 29bit Megasqui	rt CAN Enab	le	On		*	10-	abie nabie im		Disable	1
CAN baud rate	(caution!)		500	k	-		nable inp		77	
🖉 🕜 Enable PWM Po	olling		Dis	able	-		nable Ou	tout Port	Disable	
Remote CAN Id				5	-		ffeet/byte	put i ort	75	
🖉 🕼 Remote Table N	Number For	PWM Da	ta	7	*		insequert	131	10	1.5
Remote Table (Offset For P\	VM Data	(bytes) 58	*	10 E	nable PW	M Outputs	Disable	
Remote Clock(VIHZ) Io			16	*		emote C	AN Id	5	F
Remote Divider	ŕ			3	4	I D T	able		7	
						0	ffset(byte	es)	94	1
C Enable ADC Po	lling		Dis	able	-	20 F	orce Duty	То 0-255	Disable	-
CAN ADC selection										
CAN ADC group on/o	off		CAN IC	i		Table		Offs	et	
CAN ADC 1-4	Off	+	68	5	4 14	68	7		2	* *
CAN ADC 5-8	Off	Ŧ	÷.	5	4	6	7	-		1
CAN ADC 9-12	Off		÷.	5	4	10	7	*	18	4
CAN ADC 13-16	Off	÷	a	5	(A) (W)	65	7	¥	26	4
CAN ADC 17-20	Off	+	6	5	(A) (W)	65	7	*	34	-
CAN ADC 21-24	Off	-	÷.	5	(A) 14	6	7	•	42	4
	State Contract									

Set Master Enable to On. Set CAN baud rate to 500k.



Click CAN-bus/Testmodes and select CAN EGO, GPS

CUTTING EDGE IN MOTION

CAN EGO, GPS X File View Help EGO Data Via CAN Generic C Fetch EGO Data * Remote CAN Id Table × ¥ Offset(bytes) -C Smoothing Off GPS Data Via CAN Off Fetch GPS Data • Remote CAN Id Table 4 Offset(bytes) 128 CAN base address Accelerometer Data Via CAN Fetch Accelerometer Data Off • × V CAN base address Enables collecting EGO/AFR from CAN connected • widebands on expansion board. 3 P Burn Close

Set Fetch EGO Data to Generic



Click CAN-bus/Testmodes and select CAN Receiving



CAN receiving

The Mich	The Tien Helb																			
CAN receiving																				
Carle Ena	Enable receiving CAN data																			
Local	variable / chan	nel	Std/E	xt	_	Ider	ntifier (dec.)	0	ffset		Size		Mult	iply	Di	vide		Add		_
	CAN EGO01	•		Std	•	2	1024 🕂	đ	0	÷ 3	2	B2U 🔹 🤇	20	10	Q	1	4 X		0	•
Q	Off	-		Std	-	<u>i</u>	0		0	÷ 2	i -	10 🔹 🤇	4	1	Ø	1	4 7	Ø.	0	*
3	Off	-		Std	-	2	0		0		ŧ.	10 🗸	2	1		1	* T		0	* *
	Off	-		Std	-		0		0	+ 🛃	į.	10 🗸	1	1		1	4		0	* T
4	Off	-		Std	-		0		0		6	10 👻	1	1	3	1	4 T		0	*
3	Off	-		Std	-		0		0	2	6	10 🗸	1	1		1	• •		0	•
4	Off	-		Std	-	1	0		0		į	10 🗸	4	1		1	4 T		0	•
3	Off	-		Std	-	2	0		0	2	6	10 🗸	Ż	1		1	4		0	-
Local variable / channel Std/Ext			Iden	Identifier (dec.)		Offset		Size	Mult		ultiply		Divide		Add	Add				
2	Off	-	3	Std	-	2	0		0	-	į.	10 -	1	1	1	1	A .	2	0	*
	Off	-		Std	-		0		0		1	10 🗸	1	1		1	4 T		0	•
2	Off	-		Std	-	3	0	đ	0	2	6	10 🗸	1	1		1	* *		0	A 7
3	Off	-	3	Std	-		0		0	÷ 🥑	į.	10 👻	2	1		1	*		0	•
	Off	-		Std	-	3	0	I.	0		6	10 🗸	4	1		1	•		0	-
4	Off	-		Std	-		0	đ	0	÷ 🥑	1	10 🗸	1	1	1	1	4 T		0	•
3	Off	-	3	Std	-	3	0		0		5	10 🗸	1	1	-	1	4 7	2	0	•
	Off	-		Std	-		0		0	2	į	10 🗸	2	1		1	•		0	*
Master en	Vaster enable for CAN receiving.																			
_																				
														n.	j	f ^a	0	Burn	Close	•

Set Enable receiving CAN data to On



Click on Fuel Settings and select AFR/EGO Control

CUTTING EDGE IN MOTION Image: AFR / EGO Control File View Help AFR / EGO Control Image: AFR / EGO Control Image: AFR / EGO Control Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Delay Table Image: AFR / EGO Sensor Mappe Image: AFR / EGO Sensor Response Time(ms) 50 Image: AFR / EGO Sensor Response Time(ms) 50 Image: A controller Step Size(%) Image: AFR / EGO Sensor Response Time(ms) 50 Image: A controller Step Size(%) Image: AFR / EGO Sensor Response Time(ms) 50 Image: A controller Auth +/-(%) Image: AFR / EGO ports Image: A controller Auth +/-(%) Image: AFR / EGO ports Image: A controller Auth +/-(%) Image: AFR / EGO ports Image: A control Image: A control Image: A control Image: A control Image: A contr	M	D@INT7	7					
Eile View Help AFR / EGO Control Image: AFR / EGO Control <th>сит</th> <th>ING EDGE IN MOTION</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	сит	ING EDGE IN MOTION						
Eile View Help AFR / EGO Control Image: Algorithm Image: Algorithm <		R / EGO Control						
AFR / EGO Control Image: Algorithm		<u>File View H</u> elp						
Image: Simple		AFR / EGO Control						
Image: Controller Step Step Image: Controller Step Step Step Image: Controller Step Step Image: Controller Step Step Image: Controller Step Step Step Step Step Step Step Step		Algorithm	Simple	🝷 🥑 🕜 EGO Sensor	Туре	Narrow Band 👻	AFR / EGO Sen	sor Mapp
Image: Second		Use EGO Delay Table	Use IGN events	~			Injector - Us	es Senso
Image: Ego Sensor Response Time(ms) 50 Image: Formula to the form		Ignition Events Per Step	16	·			MS3X Inj A 💜	EGO1
Image: Controller Step Size(%) 1 Image: Controller Step Size(%) 1 Image: Controller Step Size(%) MS3X Inj B MS3X Inj B EGO1 Image: Controller Authority Table Off Image: Controller Authority Table Off Image: Controller Authority Table MS3X Inj C EGO1 Image: Controller Authority Table Image: Controller Authority Table Image: Controller Authority Table Image: Controller Authority Table MS3X Inj C EGO1 Image: Controller Authority Table Image: Control T		EGO Sensor Response T	ime(ms) 50		ensors	1		5004
Image: Controller Auth +/-(%) 0ff Remember to Calibrate and set Project Properties Controller Auth +/-(%) Interpretation Interpret		Controller Step Size(%)	1	•			MS3X Inj B 💜	EGOT
Image: Controller Auth +/-(%) 15 Image: Controller Auth +/-(%) MS3X Inj D EG01 Image: Controller Auth +/-(%) 9.0 EG0 ports MS3X Inj D EG01 Image: Controller Auth +/-(%) 9.0 EG0 ports MS3X Inj D EG01 Image: Controller Auth +/-(%) 20.0 Image: Controller Auth +/-(%) MS3X Inj D EG01 Image: Controller Auth +/-(%) 20.0 Image: Controller Auth +/-(%) MS3X Inj D EG01 Image: Controller Auth +/-(%) 20.0 Image: Controller Auth +/-(%) EG01 MS3X Inj D EG01		Use Authority Table	Off	 Remember to Calil 	brate and set Pr	oject Properties	MS3X Inj C 🧭	EGO1
Image: Second		Controller Auth +/-(%)	15	•			-	
And Correct Below: (AFR) 20.0 20.0 ECO		Only Correct Above: (AFR	9.0	EGO ports			MS3X Inj D 🎑	EG01
		And Correct Below:(AFR)	20.0	EGO 1 Port	CAN EG	O	MS3X Inj E 🧭	EGO1

160.0

1300

70.0

90.00

20.00

30

None - no fuel changes are made in response to oxygen sensor readings.

4 Q

A. W 0

Simple - This method of closed-loop EGO control is well-suited to use with a narrowband O2 sensor.

.

0

.

EGO 2 Port

EGO 3 Port

EGO 4 Port

EGO 5 Port

EGO 6 Port

EGO 7 Port

EGO 8 Port

EGO

EGO

EGO

EGO

EGO

EGO

EGO

Active Above Coolant(°F)

Active Above RPM

Active Below TPS(%)

Active Below Load(%)

Active Above Load(%)

EGO Delay After Start(s)

PID Proportional Gain(%)

Set EGO 1 Port to CAN EGO

PID Integral(%)

PID Derivative(%)

×

-

•

•

•

•

•

-

•

•

•

•

Close

EGO1

EGO1

EGO1

EGO1

EGO1

MS3X Inj F 🥑

MS3X Inj G 🥑

MS3X Inj H 🥑

1

D Burn

V3 Inj 1

V3 Inj 2

Ca.

3

Interfacing Spartan 3 to MegaSquirt 3, Jan 20 2023



2. Configuring Spartan 3 to read engine RPM from MS3 Simplified Dash Broadcasting

Section 2 and 2.1. are optional

By default, Spartan 3 will immediately start heating the oxygen sensor as soon as power is applied. If the serial command, see sections 6 to 8 of the Spartan 3 User manual, "SlowHeat2" is sent to spartan 3 then Spartan 3 will receive engine RPM from MS3 Simplified Dash Broadcasting over CAN and only start heating the sensor once the engine is running. Spartan 3 will wait a maximum of 10 minutes for the engine to run, after 10 minutes Spartan 3 will start heating the oxygen sensor regardless of engine RPM.

This feature requires Spartan 3 to running firmware 1.04 or later. Use the serial command, see section 6 to 8 of the Spartan 3 User manual, "GETFW" to see the firmware version.

Spartan 3 reads engine RPM via the MS3 Simplified Dash Broadcasting. Both Simplified Dash Broadcasting and Advanced Real-Time Data broadcast can operate at the same time.

2.1. Configuring MS3 to transmit Simplified Dash Broadcasting



In Tuner Studio

Click CAN-bus/Testmodes and select Dash Broadcasting.



🍓 Dash Broadcasting			\times
<u>F</u> ile <u>V</u> iew <u>H</u> elp			
Dash Broadcasting			
🖉 🕜 Enable		On	-
Configuration		Advanced	-
🖉 🛿 Base CAN identifier		1512	•
Outputs transmit rate		10Hz	-
Rate to send outputs.			
J (🕐 Bur	n <u>C</u> los	se

Set Enable to On, set Configuration to Advanced, set Outputs transmit rate to 10Hz, and set Base CAN Identifier to 1512.

You can change **the Outputs transmit rate** to any value without problems. The lower the value the less burden there is on the ECU and less traffic there is on the CAN Bus.