

NISTUNE

REALTIME ECU TUNING



Nistune Emulator Guide

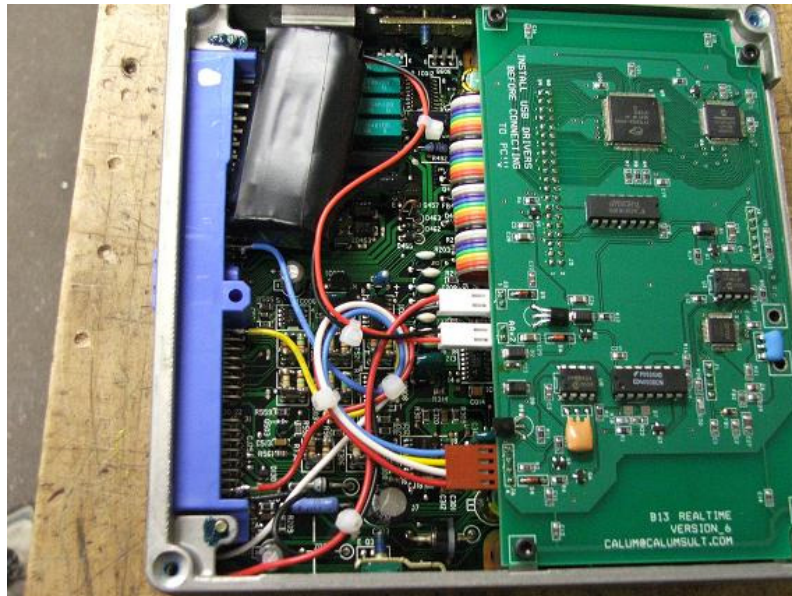
Version 1.1

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CalumSult Boards

Overview

Calumsult boards are available from Calum Johnson in the United States and consist of an internal emulator and consult board via the USB cable.



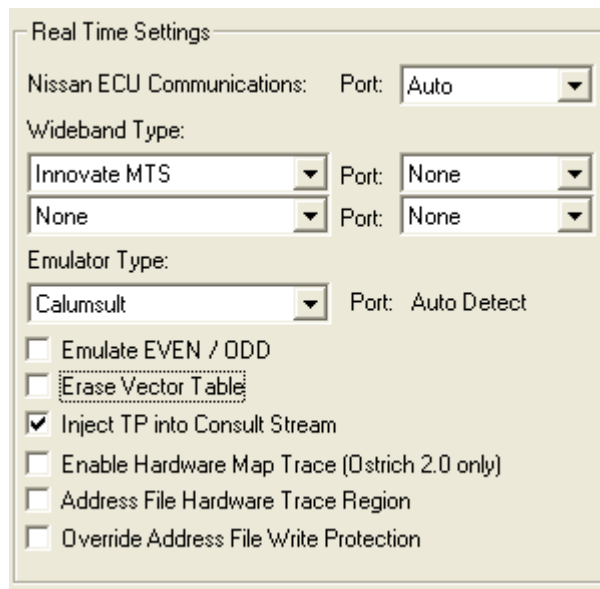
We provide emulation and consult support for these boards inside Nistune.

Note: We have had reported that having consult connectivity running whilst turning off the vehicle may corrupt the board. This appears to be a limitation of the board. Please make sure you disconnect your consult session prior to turning the vehicle off. Otherwise an upload of the ROM to the board may be required to get the vehicle running again.

Settings

File - Configuration options:

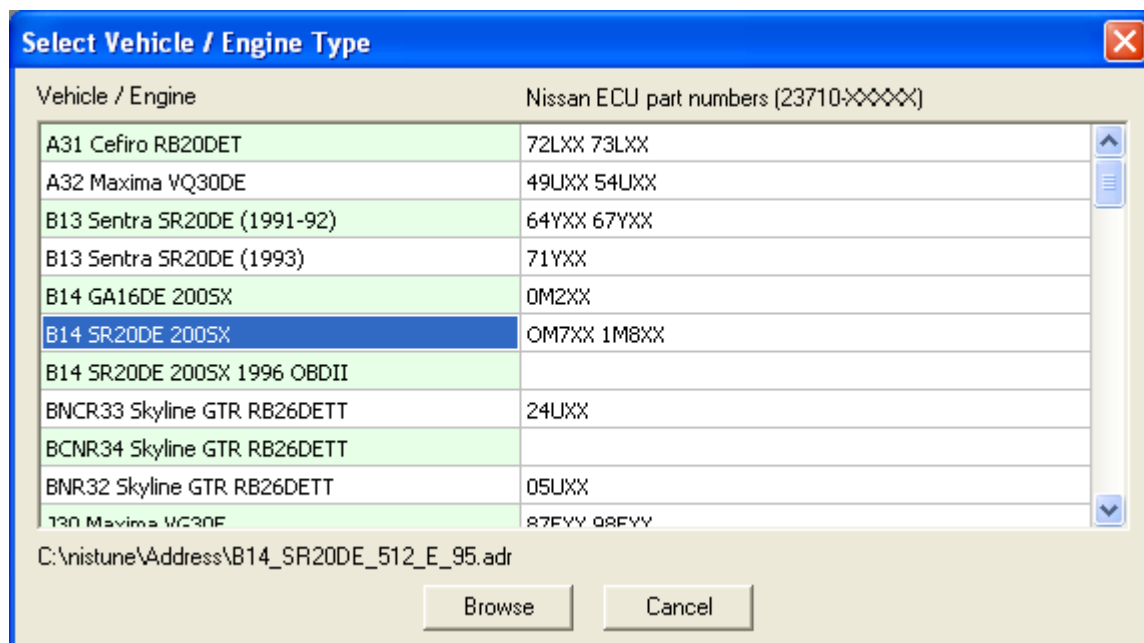
- You can leave the Nissan ECU Communications (ie Consult port) to automatic unless you are having issues with your wideband unit after autodetection
- Set Wideband Type to your desired wideband unit and select the COM port that it is plugged into. A list of available ports are available in the drop box
- Set Emulator Type to Calumsult. Available COM ports in the system will be probed and will detect your Calumsult board when the ECU has been powered
- Untick other options including Emulate EVEN/ODD, Erase Vector table etc
- Tick Inject TP into Consult Stream. This is important. It allows you to see TP as a consult register and is used for maptracing



Following this you can close the configuration window

Getting Started

1. Load your address file inside Nistune



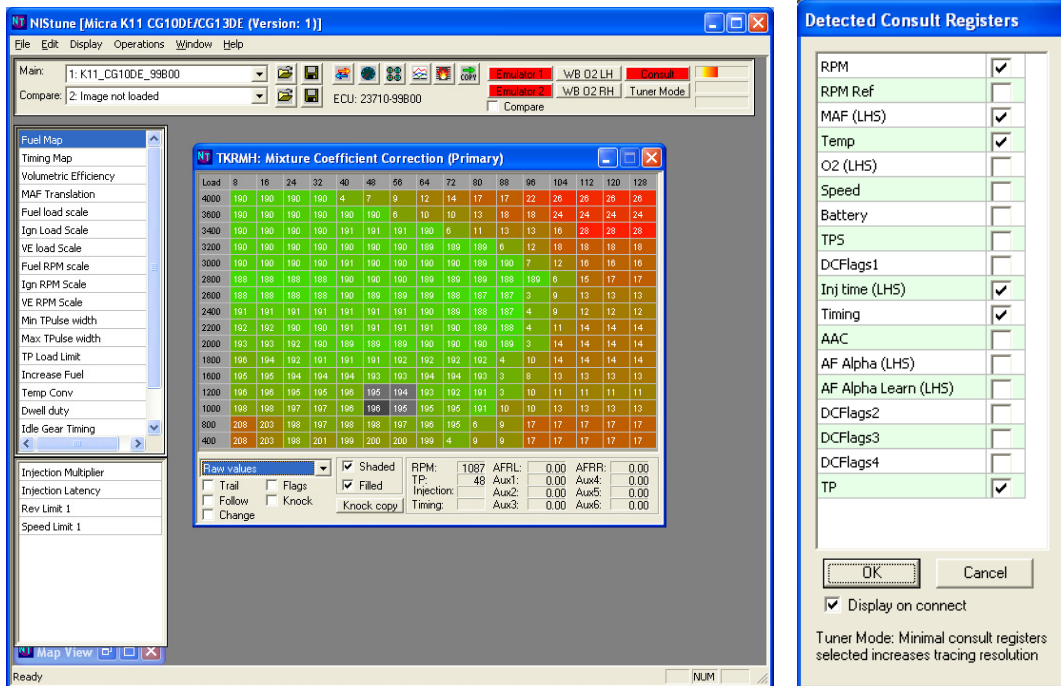
2. Then load your ROM image file either by one supplied by Calum or from the ROM image pack

3. Connect to Emulator 1 and then Operations - Emulator Upload

4. Switch the vehicles Ignition Switch to on

5. Change consult mode from Tuner Mode to Stream Mode. Calum boards dont require tuner mode

6. Connect to consult by pressing the Consult button



7. You will be prompted for the consult registers you wish to view and log from the ECU. Tick the registers that you need. Make sure you have RPM and TP ticked so you can use the map tracing functionality inside Nistune

8. All changes made to the maps will be automatically uploaded to the board and will stay in the board permanently. We suggest saving your changes in case you need to reupload the changes in the future

9. Emulator - Download can pull all the changes currently on the board into Nistune

Note: Several of the Nistune features such as 'sync' has been replaced with upload/download emulator contents and the 'burn' button is not used with these boards. This is because the memory on these boards always stores the last change.

Note: Using other applications for upload will not inject TP into the consult stream. Make sure you use Nistune for uploading your ROM image into the board

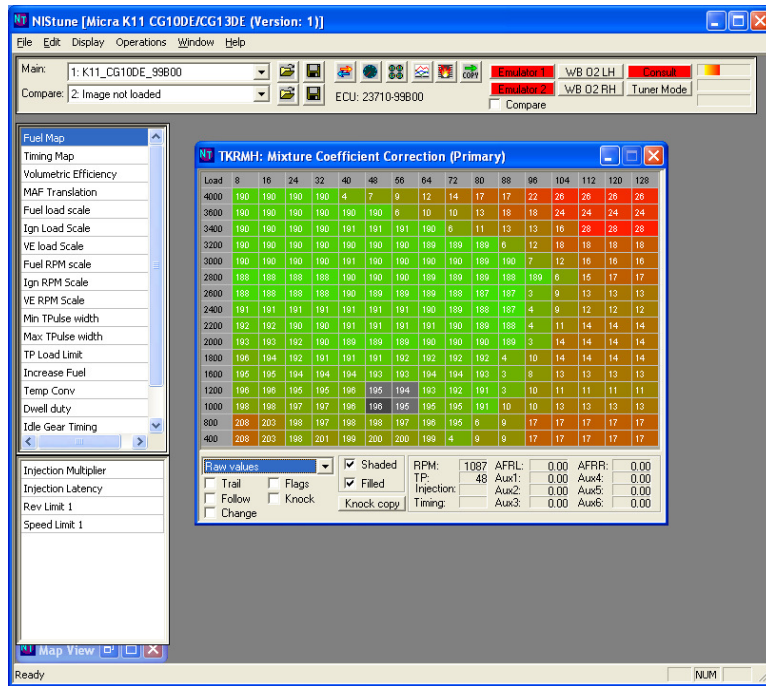
Intronics Pocket Romulator / Moates Ostrich Emulaotrs

Note: If your emulators are Moates Ostrich 20.5 version or later and have been used with Emutility or other software the vendor ID may have changed and NISTune will ask you to reset it

Hints: Mark your emulators as ODD and EVEN. When using ODD/EVEN mode, plug in the one emulator at a time when connecting to them

Use NISTune version 0.9258 or later with this functionality (improvements have been made)

Tracing can occur in Tuner Mode or Stream Mode. Stream mode is recommended since it has a higher update resolution.



Register	Selected
RPM	<input checked="" type="checkbox"/>
RPM Ref	<input type="checkbox"/>
MAF (LH5)	<input type="checkbox"/>
Temp	<input checked="" type="checkbox"/>
O2 (LH5)	<input type="checkbox"/>
Speed	<input type="checkbox"/>
Battery	<input type="checkbox"/>
TPS	<input type="checkbox"/>
DCFlags1	<input type="checkbox"/>
Inj time (LH5)	<input checked="" type="checkbox"/>
Timing	<input checked="" type="checkbox"/>
AAC	<input type="checkbox"/>
AF Alpha (LH5)	<input type="checkbox"/>
AF Alpha Learn (LH5)	<input type="checkbox"/>
DCFlags2	<input type="checkbox"/>
DCFlags3	<input type="checkbox"/>
DCFlags4	<input type="checkbox"/>
TP	<input checked="" type="checkbox"/>

OK Cancel

Display on connect

Tuner Mode: Minimal consult registers selected increases tracing resolution

Ensure that TP and RPM are selected to do your map trace

Emulator Settings

Select Emulator Type under File - Configuration

Supports:

Moates Ostrich (64KB versions 1 and 2)

Pocket Romulator I (32KB) / Pocket Romulator II (64KB)

Calumult boards (32KB / 64KB boards)

Board Type: K11 CG10 / S14 SR20DE / SPLIT mode 32KB

Tested on K11 CG10

- Ensure emulate EVEN/ODD is unticked
- Ensure erase vector table is unticked
- Tick inject TP into Consult Stream
- Disable Hardware Map Trace (not supported for 16 bit)

Open address file (eg. K11_CG10DE_256_E.adr)

Open image file (eg. K11_CG10DE_99B00.bin)

Connect emulators

Press Emulator 1 and Emulator 2

Upload to both emulators (SPLIT)

Should upload to emulator addresses 8000H-FFFFH

See below for instructions for S14 SR20DE

Board Type: SPLIT S13 SR20 (32KB) / PLMS EPROM Daughterboard

- Ensure emulate EVEN/ODD is unticked
- Ensure erase vector table is unticked
- Tick inject TP into Consult Stream
- Disable Hardware Map Trace (not supported for 16 bit)

Change address file:

Open the address file (eg S13_SR20DET_256_E.adr) in Notepad and add the following entry
EMULATOR_OFFSET=&H0000

Then save as a different address file name

This changes the offset to the emulator to the start rather than the middle

Open Address file: (eg S13_SR20DET_256_PLMS_Board_E.adr)

Open image file: (eg S13_SR20DET_50F00_red_top.bin)

Connect emulators

Press Emulator 1 and Emulator 2

Upload to both emulators (SPLIT)

Should upload to emulator addresses 0000H-7FFFH (because of change with emulator offset)

Board Type: M37790 GRID Multiboard (32KB / 64KB SPLIT and ODD/EVEN)

Tested on S14 KA24DE, N16 GA16DE

- Ensure emulate EVEN/ODD is Ticked
- Ensure erase vector table is unticked
- Tick inject TP into Consult Stream
- Disable Hardware Map Trace (not supported for 16 bit)

Ensure GRID board has sockets soldered U1, U2 (27C256) when using ODD/EVEN mode

Following configuration for ODD/EVEN with 64KB

Open Address file: (eg S14_KA24DE_512_E.adr)

Open image file: (eg S14_KA24DE_70f05_auto.bin)

Connect both emulators to board

Connect USB cable to Emulator EVEN. Click Emulator 1 / E to connect EVEN emulator

Connect USB cable to Emulator ODD. Click Emulator 2 / O to connect ODD emulator

Operations - Upload

Should upload to emulator addresses 8000H - FFFFH for this board (hard coded in software to write to this address for 64KB SPLIT mode ROM)

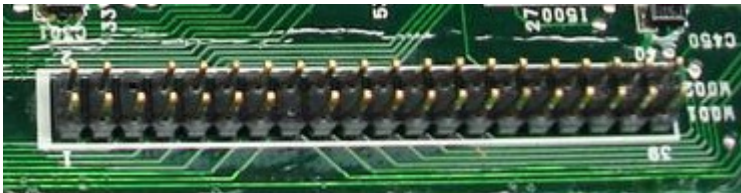
S14/S15/B14 SR20DE Installation

NISTune version used to test this is located at

http://www.nistune.com/secret_squirrel/NISTune_0.9258_setup.exe

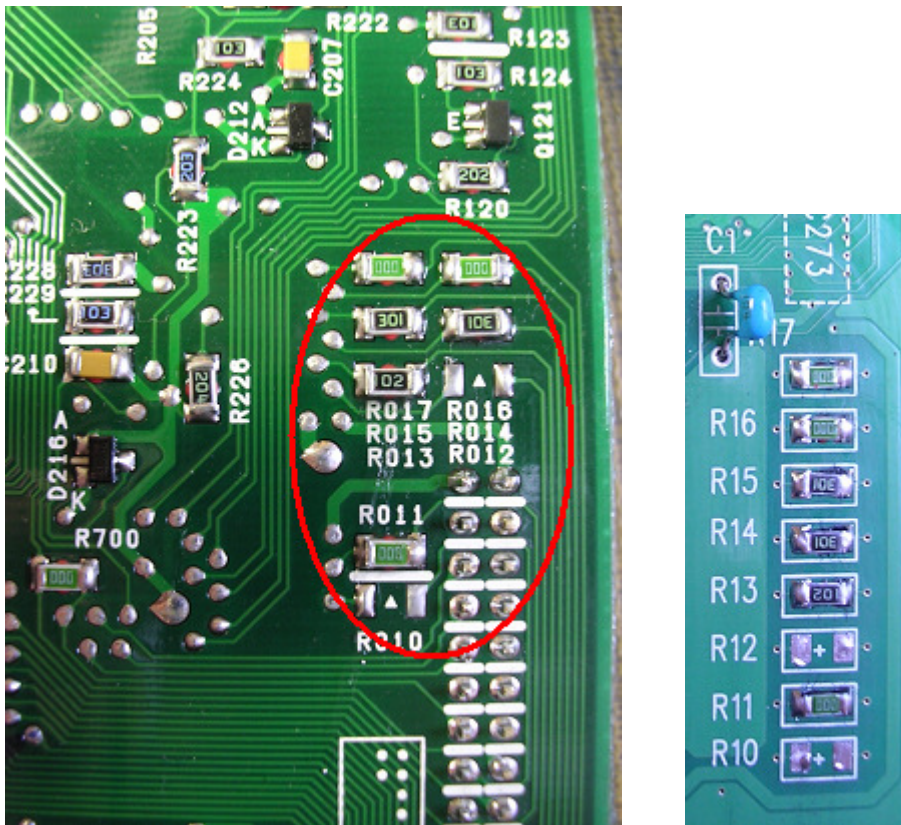


1. Download ROM image firstly from ECU
 - a. Open Address file S14_SR20DE_256_E.adr for example
 - b. Operations - Consult Download
 - c. Save the file to disk
2. Clean away all conformal coating around resistors and 40 pin connector pads using acetone or IPA.
3. Suck solder from connector pads and insert 40 pin connector

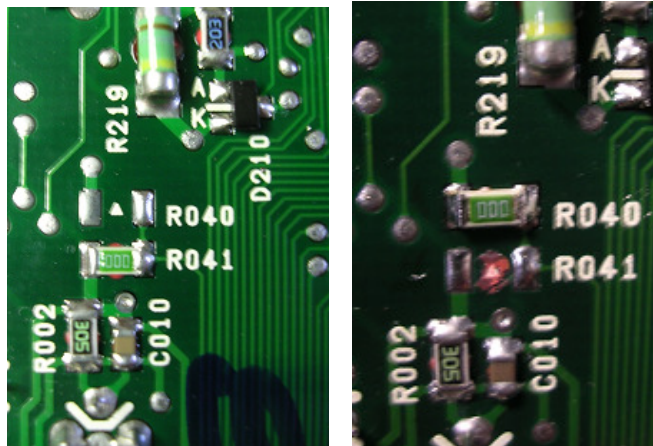


4. Remove all resistors from ECU and install on daughter board

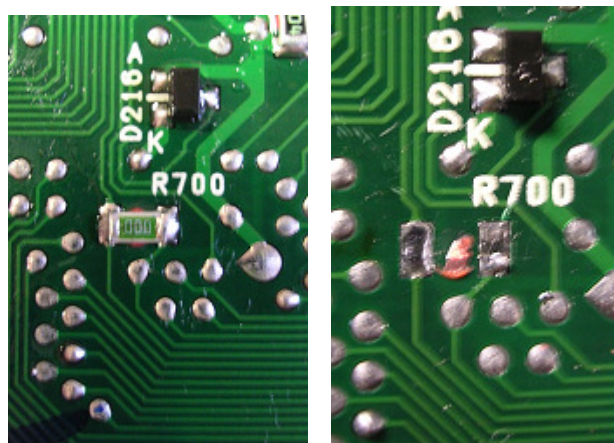
R010 -> R10 (Open - No resistor)
R011 -> R11 (0 ohm resistor)
R012 -> R12 (Open - No resistor)
R013 -> R13 (1K ohm resistor)
R014 -> R14 (300 ohm resistor)
R015 -> R15 (300 ohm resistor)
R016 -> R16 (0 ohm resistor)
R017 -> R17 (0 ohm resistor)



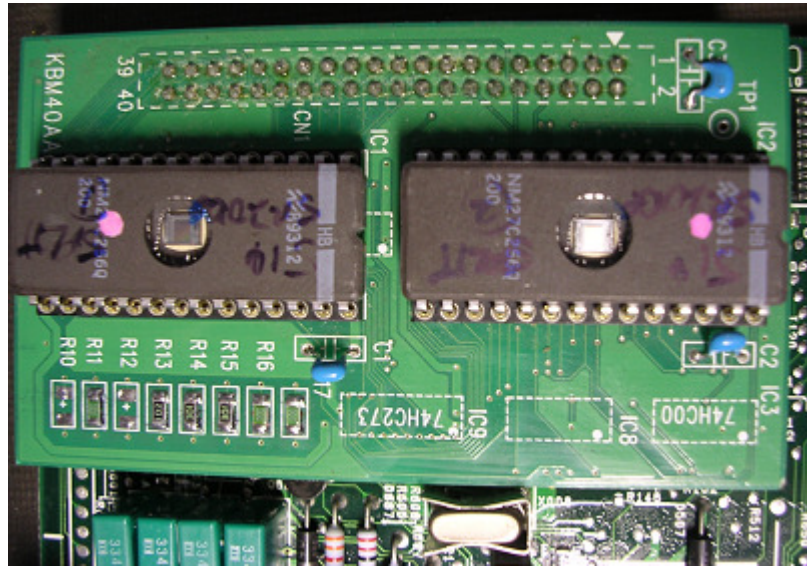
Move R040 to R041



Open Jumper R700

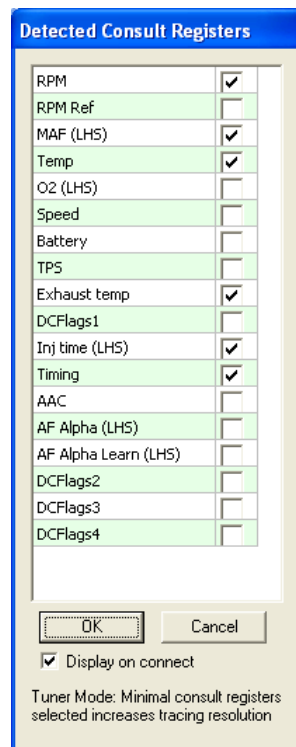


If possible program ROM image into two 27C256 EPROM chips. The chips I used were rated for 200uS which is within the acceptable clock time



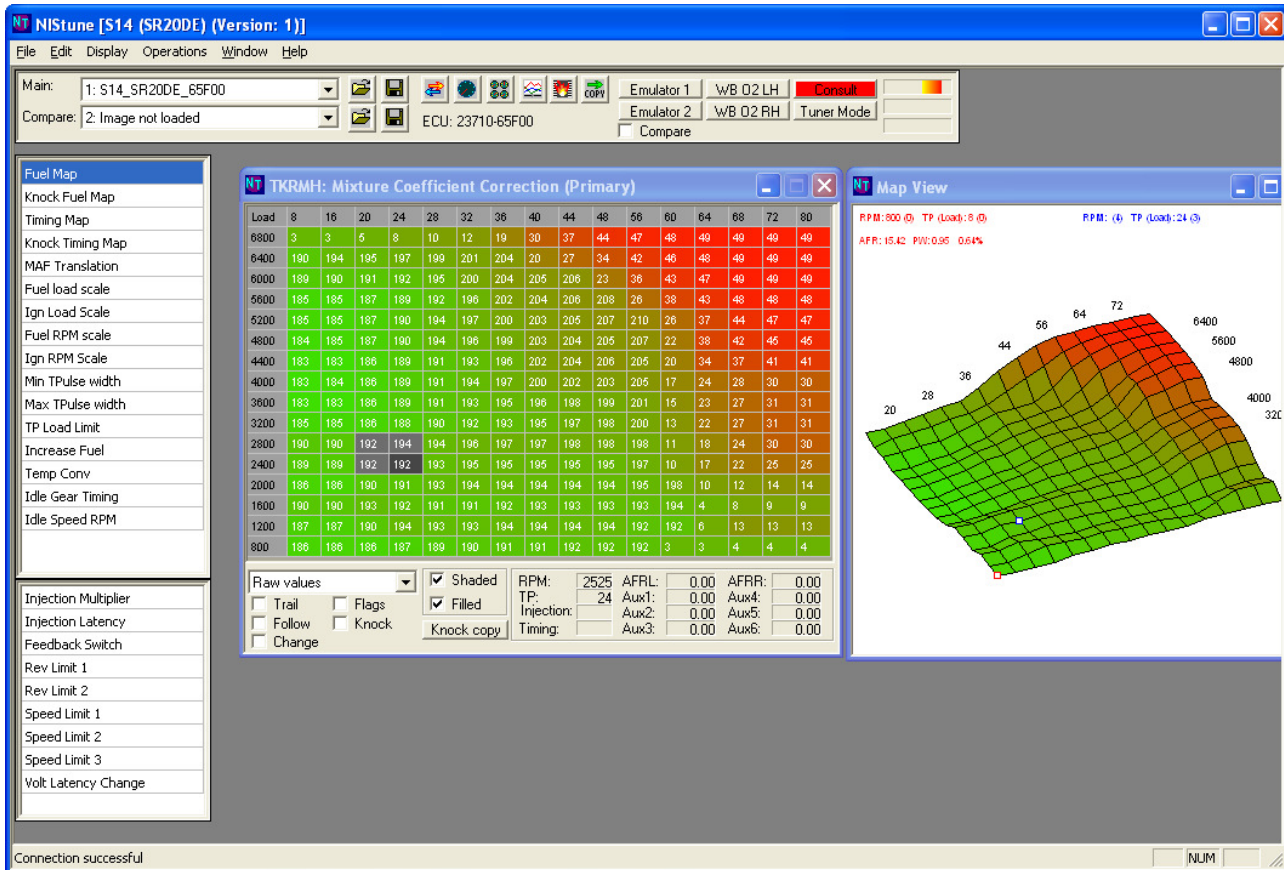
Plug into vehicle and check that ECU doesn't enter limp. Limp mode can be determined if the Check Engine light stays lit and car won't start or you cannot connect to consult

When you connect to consult in streaming mode using EPROM chips you will not have TP available in the gauges



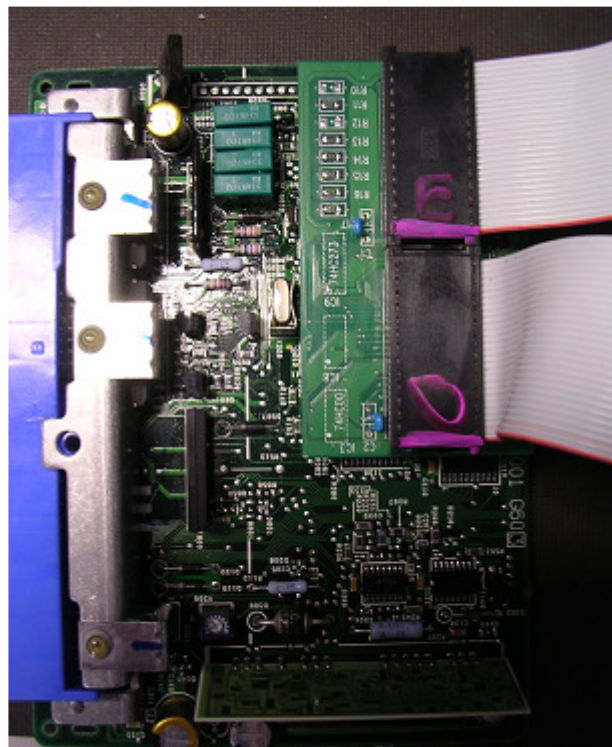
You must in this case use 'tuner mode' which will retrieve all register values directly from the consult table.

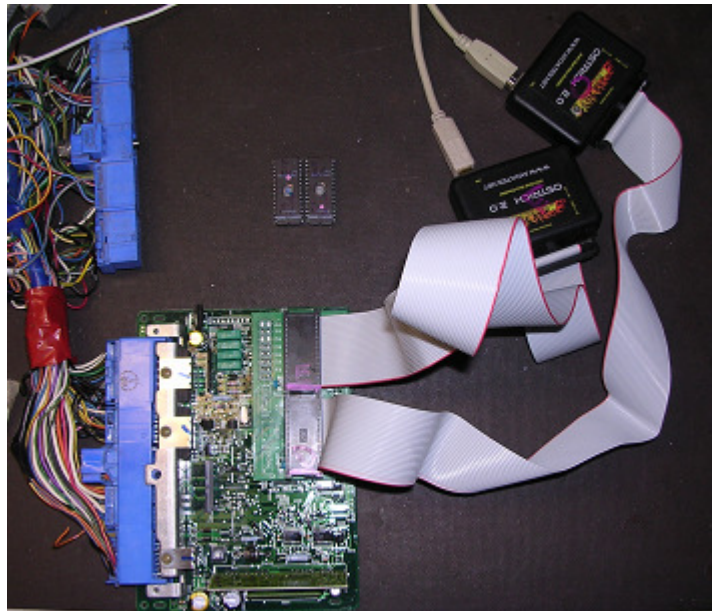
Note that no modifications are required to the address file for S14 SR20DE during this test.



Picture above showing S14_SR20DE_65F00 running consult (tuner mode) with TP in the maptracing

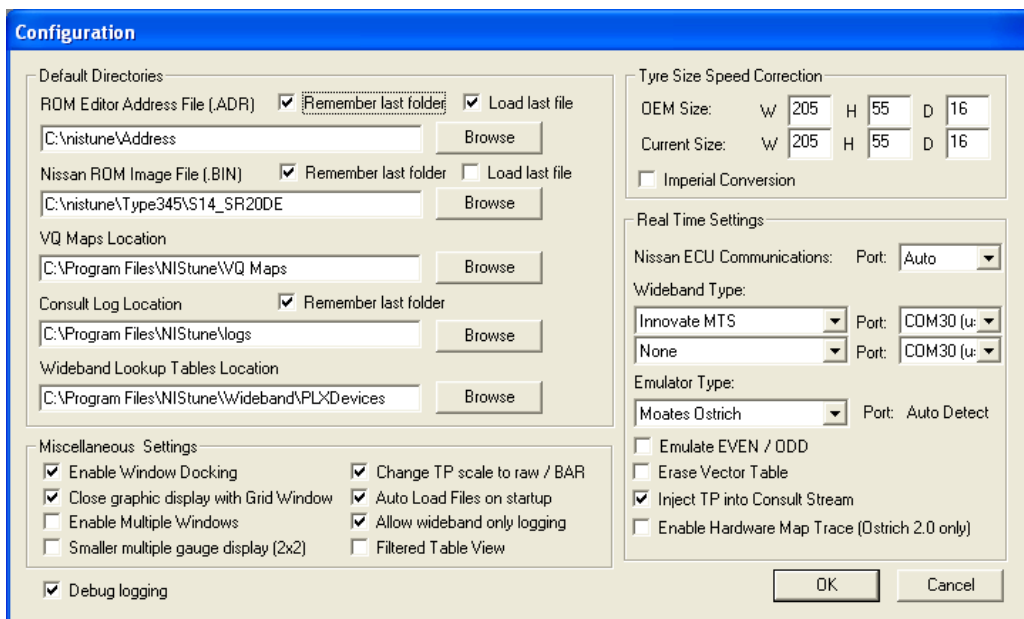
Next connect up your emulators. I use the Moates Ostrich 2 emulators with firmware 20.9 uploaded





Ensure your Moates 2.0 is running the latest firmware. It shouldn't really make any difference but firmware is available from www.nistune.com under 'Emulator Upgrades'

Check your emulator settings and make sure Emulate ODD/EVEN is not ticked.

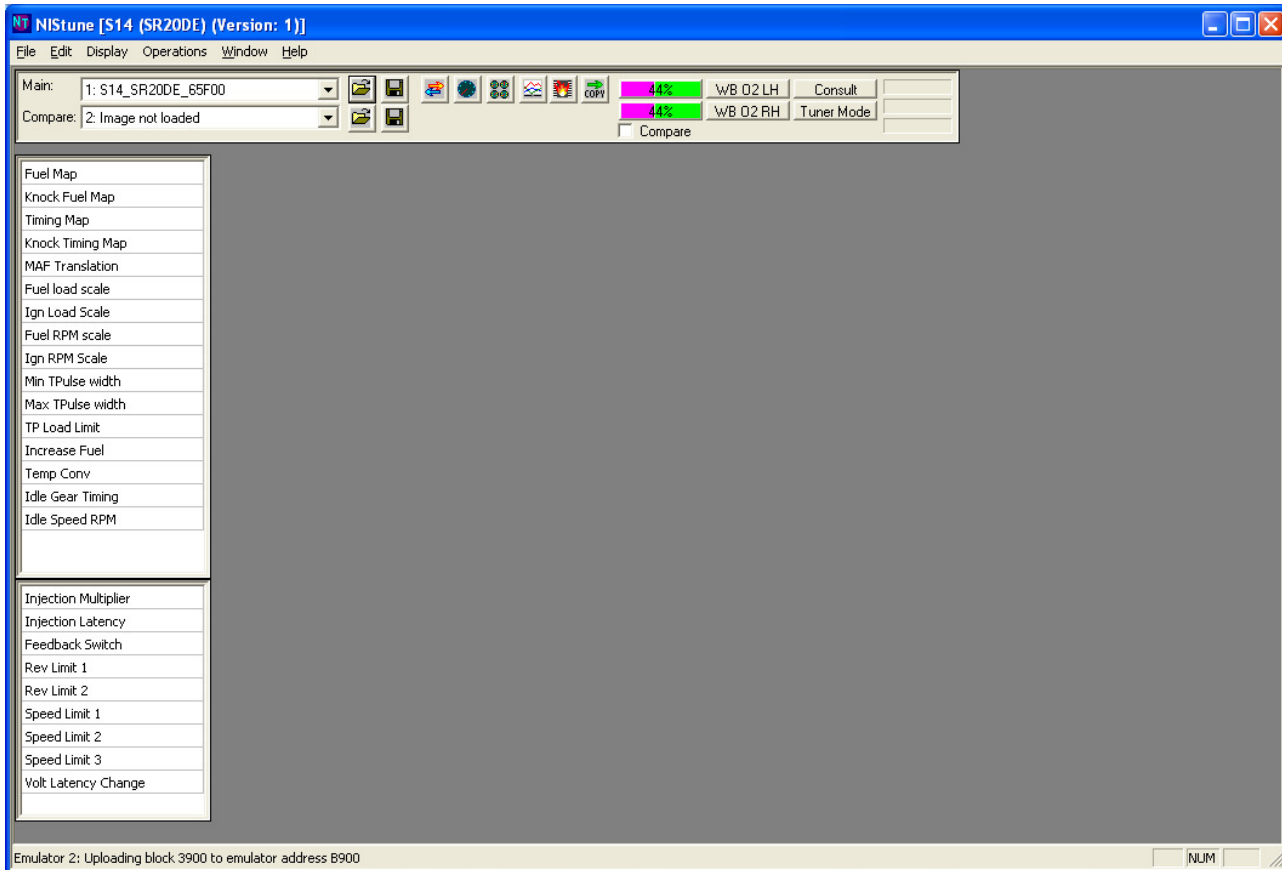


Connect to both emulators and you should see for Emulator 1 and Emulator 2

Moates Emulator (2) Version 20.9: Vendor ID: 00 Serial number: FFFFFFFFFFFFFFFF

Load binary file
eg. S14_SR20DE_65F00.bin

Then Operations - Emulator Upload

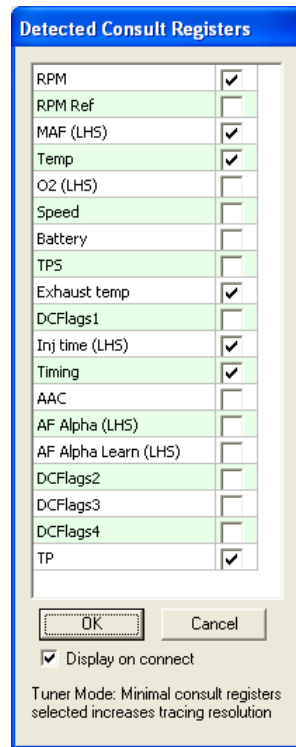


It should upload from internal address &H0000-&H7FFF to emulator address &H8000-&HFFFF

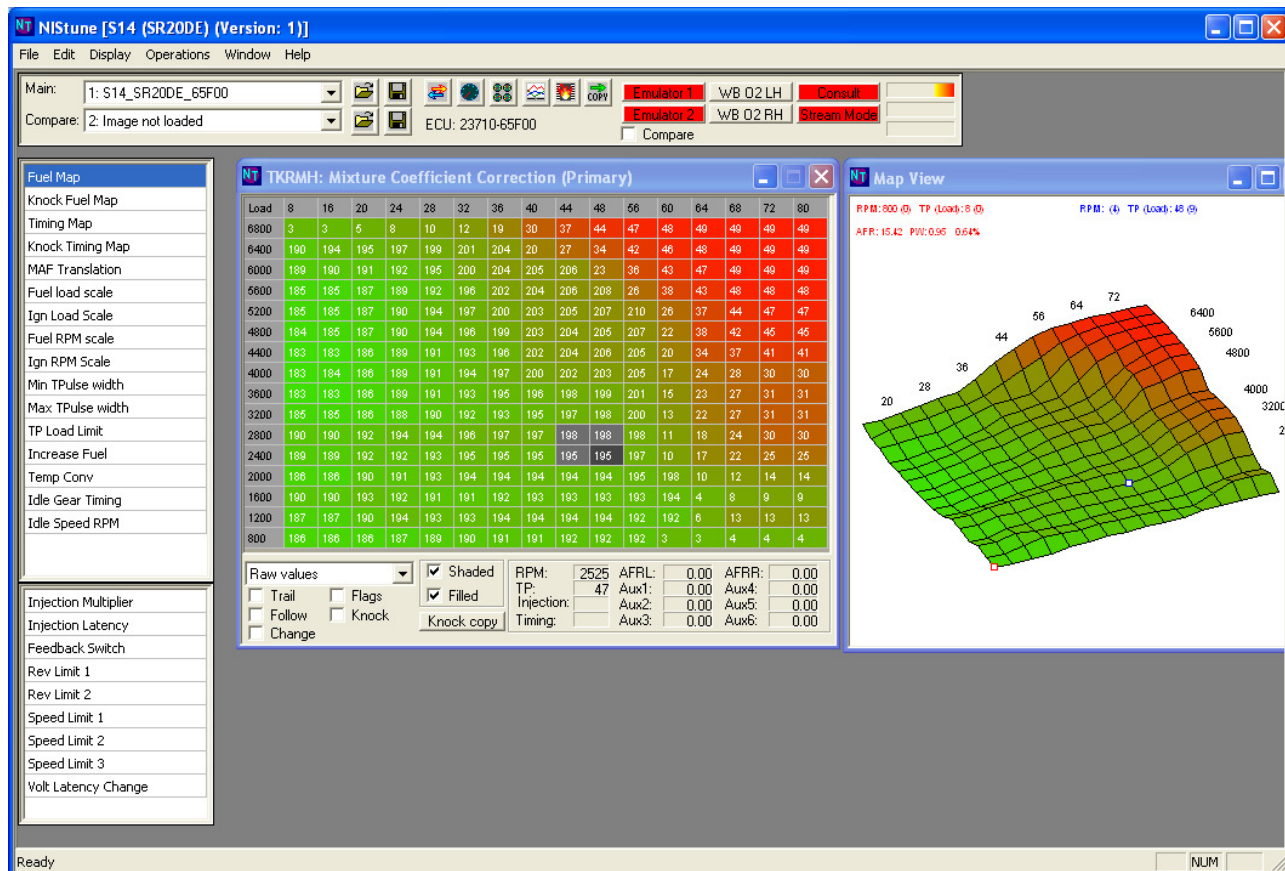
Note: Changing the EMULATOR_OFFSET can override the destination address if required. We did not need to do that for S14 SR20DE however with this particular board

Restart ECU after doing the upload and check if running limp mode. If not then consult should connect and you should be able to get maptrace in 'stream mode'

TP gets injected into the emulator if 'Inject TP into Consult Stream' is enabled



Known issue: If TP does not work straight away in Stream Mode then connect in Tuner Mode first, then disconnect and reconnect in Stream Mode. This was found to occur during this testing.



Congratulations! You now have realtime tuning and maptrace on your S14 SR20DE engine.

Hardware Map Tracing Configuration

Default hardware maptracing only traces specified by the maps defined in the address file. To configure address specific hardware map tracing the following must be configured:

1. Configure your address file

For example using a 16K Address space:

```
EMULATOR_OFFSET=&H8000  
MAPTRACE_START=&H0000  
MAPTRACE_END=&H3FFF
```

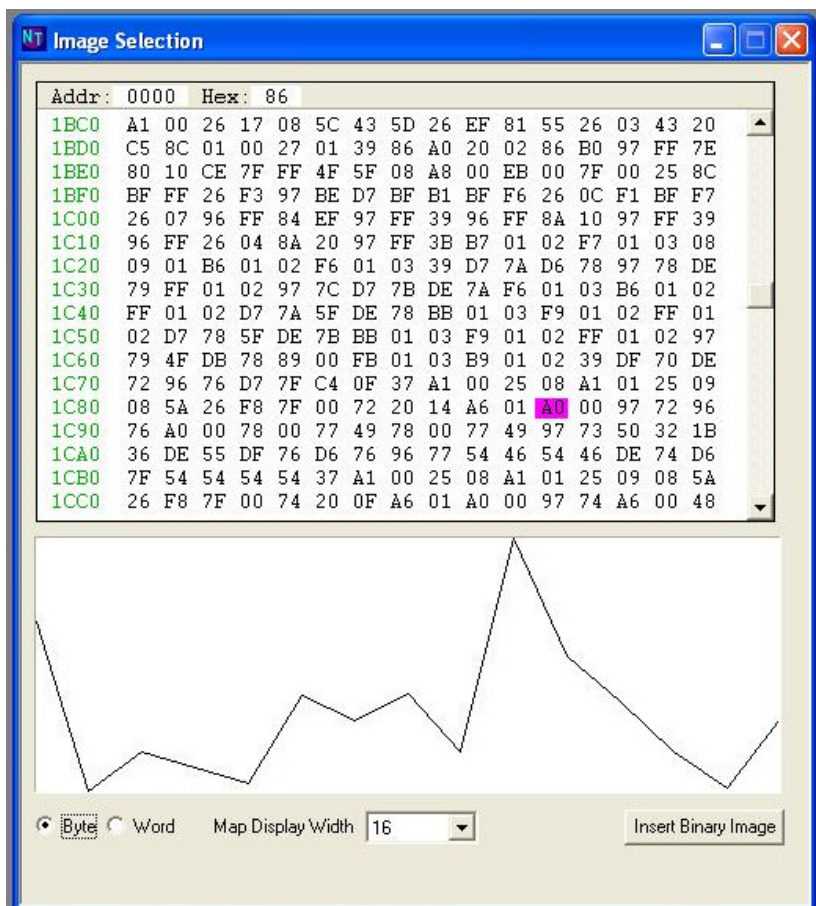
2. Start Nistune and open the modified address file

3. Configure Hardware Tracing

- File – Configuration
Tick Address File Hardware Trace Region

4. Display the traced area

- Display – Hex Editor



The traced portion of the binary file specified in the address file will be traced (including code and previously undefined maps)

REVISION HISTORY

DATE	VERSION	DESCRIPTION	AUTHOR
22 Jun 08	1.0	Document Creation	MB
20 Apr 09	1.1	Updates for Calumsult boards	MB

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