Full Version: Lemmiwinks - Download and Information

jwelty@VWFixx 6-23-2004 08:16 AM

I know this has been available for quite some time, but I'm sure quite a few people were not aware of it.

Download the software here: http://www.vwfixx.com/lemmiwinks.exe

The Lemmiwinks program allows you to make changes to the adaptation channels and can be used to tweak the ecu. PLEASE note that making changes can potentially cause major damage.

Information from REVO

AN EXPLANATION OF ADAPTATION CHANNELS
This will be an explanation of the adaptation channels in VW/Audi ECUs, how they can be modified, and what effect they have on engine operating parameters.

Adaptation channels allow VW/Audi dealers to make minor tweaks to engine operating parameters (e.g. engine idle speed adjustment). These settings can be modified using the dealer's diagnostic equipment or VAG-COM.

These settings are stored in a serial eeprom which means the settings will not be lost if the ECU loses power. This is the same eeprom that stores data that can change from time to time like diagnostic trouble codes. This serial eeprom is different from the flash memory chip that stores the main engine control program, and therefore changes made to adaptation channels will not affect code checksums.

As an example, let us take a VR6 owner who is happy with the performance of his engine but would like to have his speed limiter raised. There is an adaptation channel that can be used to raise or lower the speed limiter setting, and if there were a way to change this adaptation channel then there would be no need for this owner to even buy a chip. He would be able to continue running with bone stock ECU programming with no worries about a dealership detecting a chip (since there is no chip), and if he were particularly worried he would simply restore the default factory setting before bringing the car in for service.

So, he connects to his ECU with VAG-COM, goes to adaptation channel 7, and tries raising the speed limiter. But it doesn't work: the commands that request the setting of new adaptation channel values have built in limit checks and reject the new values. In this particular case, the speed limiter related adaptation channel is effectively disabled since

the stock ECU programming limits the control range so that the only valid value is zero (i.e. no change).

So the issue boils down to this: is it possible to change these adaptation channels in such a manner that the original factory limits are bypassed? There are two possible approaches. First, one can make a chip with the preset adaptation channel limits extended to allow a larger adjustment range. Second, one can bypass the VAG adaptation channel routines and directly place the new adaptation channel settings into the ECU.

Changing the preset adaptation channel limits in a chip is the only option for VAG group diesel ECUs, Magneti Marelli ECUs, and older Bosch ECUs. These codes check the adaptation channel limits after the values have been read out of the serial eeprom. Motronic 7 ECUs do not do this check which opens up the second method.

Directly transferring the new adaptation channel values into the ECU works by finding the RAM memory location where the ECU stores the adaptation channel data and directly writing the changes to those RAM memory locations. When the ignition key is turned off the ECU enters a housekeeping mode where among other tasks the modified adaptation channel data is written into the serial eeprom. This roundabout method is required because memory writes directly to the serial eeprom are blocked.

Interestingly, this method will not work using the VAG mode protocol. Write access is allowed to any ECU RAM location except those locations that store the serial eeprom data. Someone at Bosch clearly knew about this vulnerability and took measures to close this loophole. But for some reason this loophole was left in the KWP2000 routines.

Each ECU code stores this adaptation channel data in different RAM locations. To make this method work with any ECU one runs through the following steps: 1) Establish communications with the ECU using KWP2000 mode; 2) Read data directly from serial eeprom (since read access is allowed); 3) Search for this data in the ECU's RAM; 4) Write the new adaptation channel settings to the RAM location; 5) Cycle ignition key to have ECU transfer the new settings into the serial eeprom.

The KWP2000 protocol is not as reliable as the VAG protocol. Some cars will have communications problems which often can be worked around by pulling the instrument cluster fuse (make sure VAG-COM will be able to clear you air bag DTC light before doing this!!!).

Using the KWP2000 protocol gives one the ability to change settings in any VAG Motronic 7 ECU regardless of whether the ECU is stock or chipped.

[Adaptation Channel Functions]

This lists all Bosch Motronic 7 adaptation channels with a typical factory VAG control range and the maximum possible control range if one were to directly write changes to the serial eeprom.

Note that Bosch Motronic 7 codes have differences in what adaptation channels are actually implemented.

Channel 1: Additive Engine Idle Speed Offset

This channel allows one to adjust the engine idle speed in steps of 10 rev/min.

Typical VAG control range : -50 rev/min to +50 rev/min
Maximum possible control range : -1280 rev/min to +1270 rev/min

Channel 2: Tweak on fuel enrichment based on increasing loads (i.e. accel pump)

This channel adjusts a fuel enrichment term that is proportional to load rate of change and that acts to enrich full when the engine load is increasing. This is equivalent to an accelerator pump function

Typical VAG control range : 100% to 110%
Maximum possible control range : 0% to 200%

Channel 3: Tweak on fuel enrichment based on decreasing loads

This is very similar in function to channel 2 but adjusts a term that works to decrease fuel when engine load is decreasing.

Typical VAG control range : 90% to 100%
Maximum possible control range : 0% to 200%

Channel 4: Tweak on Startup Fuel Enrichment

This adjusts the startup fuel enrichment term.

Typical VAG control range : 100% to 110%
Maximum possible control range : 0% to 200%

Channel 5: Tweak on Warmup Fuel Enrichment

This adjusts the warmup fuel enrichment term.

Typical VAG control range : 90% to 100%
Maximum possible control range : 0% to 200%

Channel 6: Lambda Regulation

This tweaks a lambda regulation system's narrowband oxygen sensor cycle time in steps of 10 milliseconds.

Typical VAG control range : -100 ms to +100 ms
Maximum possible control range : -1280 ms to + 1270 ms

Channel 7: Additive Offset On Speed Limiter

This is allows one to adjust the speed limiter in steps of 1 kmh.

Typical VAG control range : 0 kmh (no adjustment allowed)
Maximum possible control range : -128 kmh to + 127 kmh

Channel 8: Secondary Fuel Tweak

This adjusts the main fuel term.

Typical VAG control range : 100% to 110%
Maximum possible control range : 0% to 200%

Channel 9: Additive offset on ignition timing angle

Allows one to shift the ignition timing angle up or down in steps of 0.75 degrees.

Typical VAG control range : No adjustment allowed
Maximum possible control range : -96 Degrees to +95.25 Degrees

Channel 10: Primary Fuel Tweak

This adjust the main fuel term.

Typical VAG control range : No adjustment allowed
Maximum possible control range : -25% to +24.8%

Channel 11: Unused

Typical VAG control range : No adjustment allowed
Maximum possible control range : -128 to +127

Channel 12: Specified Engine Load Scaling Factor (Turbocharged cars only)

This factor allows one to scale the specified engine load. The default value comes set at the maximum value, so specified engine loads can only be reduced with this adaptation channel.

Typical VAG control range : only 100% allowed (no adjustment allowed)
Maximum possible control range : 0% to 100%

Channel 13: Control Bits

These control bits affect engine idle control.

Typical VAG control range : limited to 2 control bits
Maximum possible control range : 8 different control bits can be set or cleared

Channel 14: Additive Offset To Idle Torque

This channel allows one to raise the minimum torque maintained at idle.

Typical VAG control range : 0 to 31 (arbitrary units)

Maximum possible control range : 0 to 255 (arbitrary units)

Adaptation channels used by various Bosch Motronic 7 VW/Audi Group codes:

Channel #	Turbo Charged	Naturally Aspirated	FSI
1	YES	YES	YES
2	YES	YES	YES
3	YES	YES	YES
4	YES	NO	NO
5	YES	NO	NO
6	YES	NO	NO
7	YES	YES	YES
8	YES	YES	YES
9	YES	YES	NO
10	YES	NO	YES
11	NO	NO	NO
12	YES	NO	NO
13	YES	YES	YES
14	YES	YES	YES

[Checking and resetting adaptation channel settings using VAG-COM]

Adaptation channel settings can be checked, tweaked according to the preset factory limits, and reset to the factory defaults using VAG-COM.

Connect to the car's ECU by opening the "Select Control Module" screen from the start screen, then select the "01-Engine" Module. Once you are connected to your ECU open the "Adaptation-10" screen.

You can cycle through each adaptation channel. For each channel you will have the currently stored adaptation value read in; you can then enter a new test value and press the "Test" button to see whether the new value is acceptable to the ECU; then you can hit the “Save” button to store the new adaptation value.

If you would like to restore all adaptation channel factory defaults you can save a test value of “000” to channel zero.

The following shows the factory default adaptation channel settings:

Channel #	Factory Default
1	128
2	128
3	128
4	128
5	128

6 128
7 128
8 128
9 128
10 128
11 128
12 255
13 0
14 0

Revo Technik

PSI 6-23-2004 11:15 PM

Very nice emthup.gif

GrantMax 6-27-2004 08:30 PM

justin- can i use lemmiwinks with apr programming?

eoworm 6-27-2004 09:24 PM

good info justin! i was looking for a manual for this and i think u just wrote it!

i've used lemmiwinks with my apr 93 chip- funny how this works and v-tune just won't even connect to my ecu. prolly coz i got an awd KWP2000 abortion.
so yes i'm funked if my airbag light goes on too.
havn't toyed around with timing or lambata... yet. i did enrich primary fuel delivery a tad b/c i was getting intermittant system too lean cel's.

again, this is good stuff! here's what the gui looks like:

jwelty@VWFixx 6-28-2004 07:38 AM

you can use it with ANY software, even stock. I cant take credit for the write up, thats all from REVO!

Military1.8T 6-28-2004 09:56 AM

you can use any hardware as well. doesn't matter what kind of serial OBDII interface you use, it will work.

GrantMax 6-28-2004 03:54 PM

great guys...thanks goodjob.gif

im always looking for ways to tweak wink.gif

KNIGHTRYDER1 6-28-2004 04:04 PM

QUOTE (Military1.8T @ 6-28-2004 10:56 AM)

you can use any hardware as well. doesn't matter what kind of serial OBDII interface you use, it will work.

so i am guessing it worked with your USB - Serial converter!

GrantMax 6-28-2004 04:20 PM

laugh.gif

im also going to guess that i need a vag-com cable first before using anything from my Vtune to VAG and lemmiwinks... haha

can someone give me a cable wink.gif

KNIGHTRYDER1 6-28-2004 04:20 PM

no! I need a serial cable too

GrantMax 6-28-2004 04:24 PM

well if i had just bought one a year ago when i spent 500 to have 5 of the same code cleared.... mad.gif

can i get a serial USB cable from ross-tech?

KNIGHTRYDER1 6-28-2004 04:27 PM

no...you can get either a Serial or USB...i would get a serial if you want to do lemmiwinks, usb are better for quick access!

Military1.8T 6-28-2004 05:35 PM

the biggest difference between USB and serial, I found out this weekend, is that the USB hold the sample rate a lot higher and more steady than the serial. I'm still working on the USB to serial adapter, I used a guys old VAG-COM iso-whatever cable. Like I said in the other thread, a homemade interface will work fine for Lemmiwinks. The main thing you're paying for with VAG-COM interfaces is the software registration and the tech support.

KNIGHTRYDER1 6-28-2004 05:41 PM

true

GrantMax

6-28-2004 05:42 PM

will a ross-tech usb operate VTUNE, lemmiwinks AND vag-com????

KNIGHTRYDER1 6-28-2004 06:08 PM

ross-tech makes the Vagcom.... the usb wont work...buy the Serial port VAGCOM! Vtune and lemmi should work as follows

GrantMax 6-28-2004 07:49 PM

cool thanks goodjob.gif

This is a "lo-fi" version of our main content. To view the full version with more information, formatting and images, please click here.

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