



Additional Injectors Setup for Group VAG TFSi Engines

Ultratech CHRONO



CAUTION

1. This product may be used **solely** on vehicles used in sanctioned competition which may never be used upon a public road or highway.
2. Installation and tuning should be made by **qualified** personnel ONLY!
3. It is the responsibility of the installer and/or user to ascertain that this product is used in **compliance** with applicable laws and regulations.
4. If you have purchased the product by **error** or have further **questions**, please contact us through www.ultratech-electronics.com with any questions.

Connections

Injectors

The Ultratech CHRONO device has 2 power outputs (max 5A load each). Each output can be assigned to **4 high-resistance injectors (> 70hm)**. In this example, we use **4 high-resistance** injectors in Power Output 1.

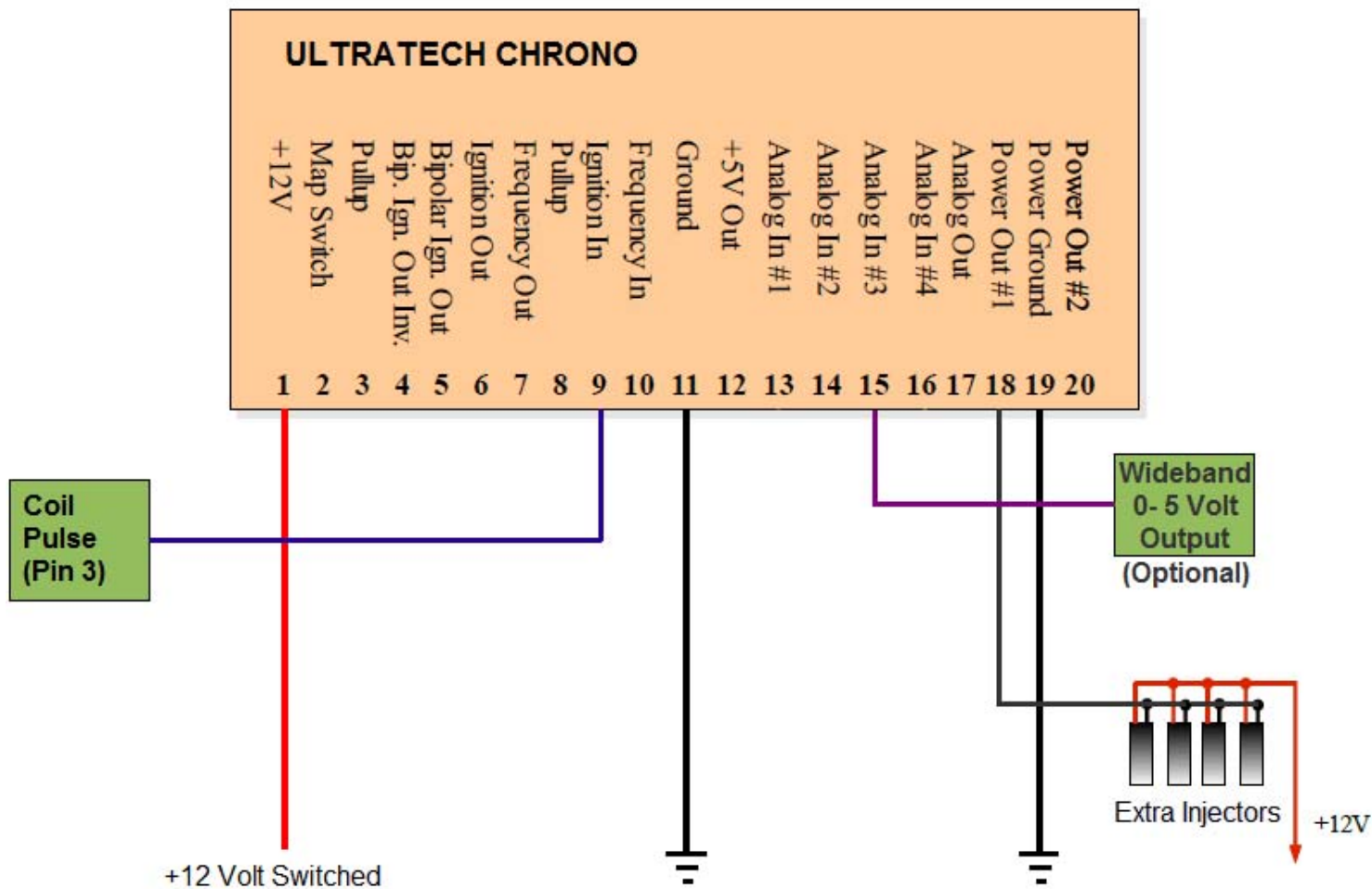
Grounds – Wires

When connecting the Ultratech CHRONO device, special attention should be paid to the connection of device's grounds and their wiring in the car's electrical system. Wrong connections can create loops, so called *Ground loops*. Bad ground connections can cause many problems, such as noisy readings from analogue sensors or problems with trigger errors.

Device ground (pin 11) is a ground used to power the device and *power ground* (pin 19) is used to supply power outputs (Pin 18 , Pin 20). A sound technical solution is when the device's ground and *power ground* are connected to one ground point on the block / engine's head and are lead through separate wires. Power ground, Power Outputs and +12 Volt supply should be connected using wires of 1mm².

The connection wires should not be longer than 30cm. Power Supply (Pin 1) +12V (switched) should be connected through a 3A fuse. Every unused input should be connected to the Ground. All signals from the variable reluctant sensors should be connected by using shielded cables.

Wiring Diagram:



This Wiring Diagram is for Ultratech CHRONO with Built in MAP Sensor

Software Setup

The software you will use is the Ultratech Chrono (Client Mode) and also the Firmware must be updated to Client Mode. Firmware is the internal software of the device which is responsible for its functioning. Because Firmware is upgradeable, it is possible to update it, which will make the device more functional in the future. Additionally, to use a new firmware, a proper software (Client) should be used for Windows.

Firmware's update

Due to the changes in the device's firmware, (for example: improvements, additional functions) it is possible to change the firmware. To do this, the Upgrade firmware... function should be used (in the File menu). To choose a new firmware, press Open. In the Firmware History window there will be displayed a list of conducted changes for a given firmware. To continue, press the Upgrade button. A window with a warning will be displayed: "All your tables and configuration will be lost."

After accepting, a window informing about the progress of the firmware's change will be displayed. At this time, do not switch off the computer nor the device! If, during the installation, communication with the device is interrupted, please follow the following procedure to recover the unit:

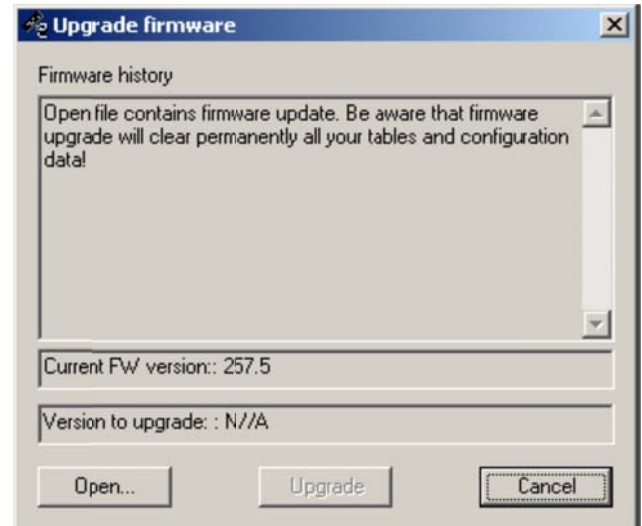
- 1) Connect the device to a laptop.
- 2) Power up the device.
- 3) Start the client for Windows.
- 4) Choose Upgrade Firmware from the menu and follow the above directions.

Attention!

Updating the firmware causes the loss of the saved tables and setup parameters! The project should be saved on the hard disc before updating!

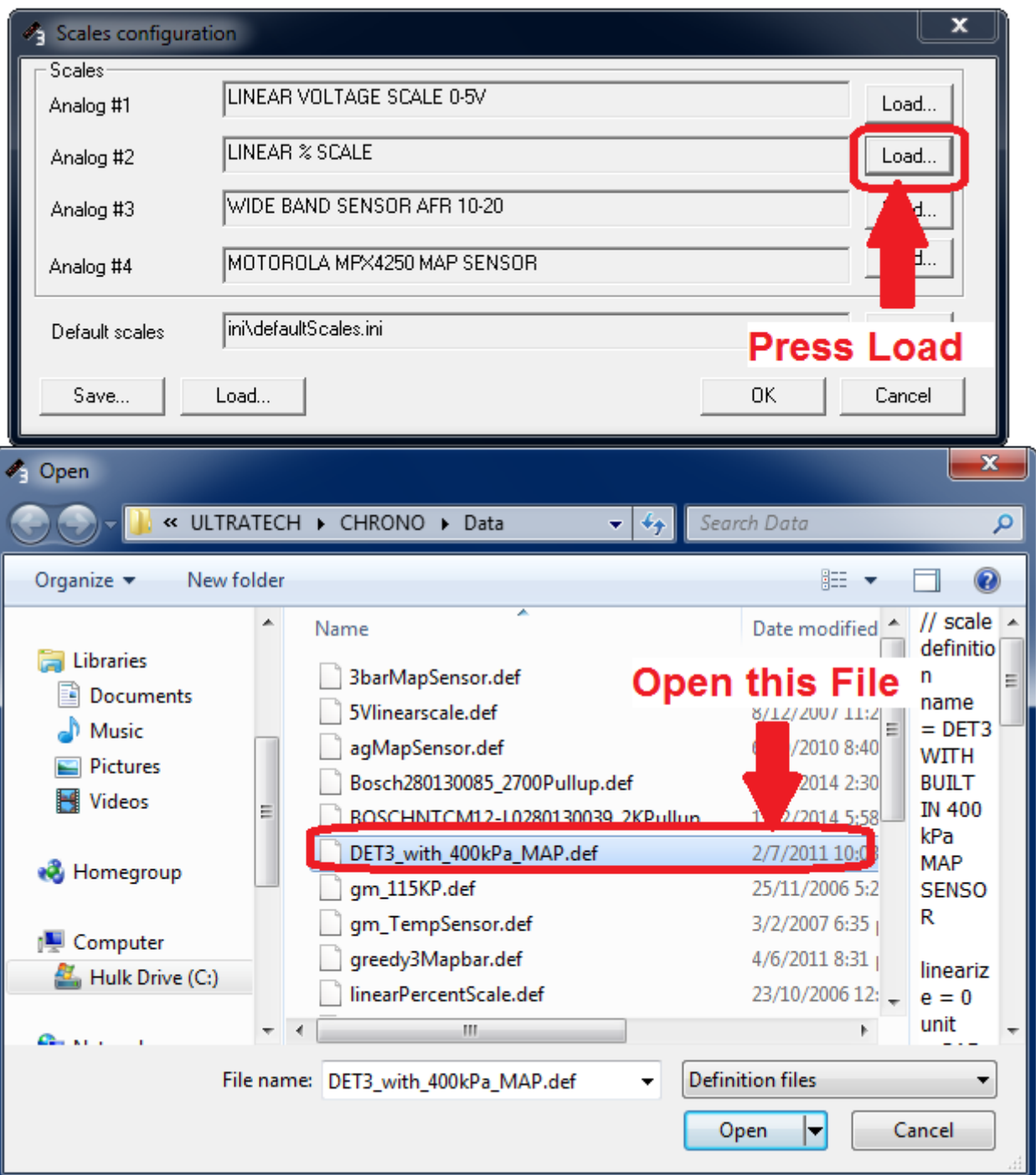
Warning!

Firmware change should not be conducted if there are communication problems between the device and your PC!!!



Scale Configuration for Built-in MAP sensor

In this example we use Ultratech CHRONO Device with **Built in Map Sensor** (Input Of Load Axis), so you must setup the scale configuration (Setup-> Scales Configuration):



Scale Configuration for Wideband Input (Optional)

Similarly, for analog input #3, select 'wideBandO2SensorLinear10to20AFR' for most wideband controllers.

Ignition Configuration

Ignition mode

Retard single signal

This ignition mode is suitable retarding low resolution signals and signals driving ignition modules. In this mode both edges of signal are considered (eg. proper dwell time). For ignition modules driving signals use Hall effect or optical sensor input type.

Ignition input configuration

Ignition input type Other sensors

Input mode suitable for VR sensors with fixed threshold at 200mV.

General

Maximum RPM	7500	Maximum retard(deg)	15
Num signals per 720	4	Maximum advance(deg)	15
Max RPM ever	0	Reset RPM	

Max RPM - maximum rpm represented on map Y axis.
Num sig. per 720 - number of cran/cam signals per 2 engine revolutions.
Max RPM ever - maximal RPM that was recorded by device.
Reset RPM - reset maximum RPM ever value.
Maximum retard - maximum allowable spark retard
Maximum advance - maximum allowable spark advance.

Apply OK Cancel

Adjust Num Signals Per 720 to match Engine RPM.

Tuning Table

Extra Fuel Injectors Table

0	0	0	0	0	0	0	0	0	30	37	45	53	61	69	77	85	7500
0	0	0	0	0	0	0	0	0	27	34	41	49	56	64	80	80	7031
0	0	0	0	0	0	0	0	0	24	31	38	45	52	59	79	79	6562
0	0	0	0	0	0	0	0	0	22	28	34	41	48	55	72	72	6093
0	0	0	0	0	0	0	0	0	19	25	31	37	44	50	66	67	5625
0	0	0	0	0	0	0	0	0	17	22	28	33	40	45	59	61	5156
0	0	0	0	0	0	0	0	0	14	19	24	30	35	41	53	55	4687
0	0	0	0	0	0	0	0	0	12	16	21	26	31	36	46	49	4218
0	0	0	0	0	0	0	0	0	9	13	18	22	27	31	40	43	3750
0	0	0	0	0	0	0	0	0	7	10	14	18	23	27	33	37	3281
0	0	0	0	0	0	0	0	0	4	7	11	14	19	22	27	31	2812
0	0	0	0	0	0	0	0	0	2	5	8	11	15	18	21	25	2343
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1875
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1406
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	937
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468
-0.80	-0.70	-0.43	-0.15	0.13	0.40	0.68	0.96	1.23	1.51	1.79	2.06	2.34	2.62	2.89	3.00	BAR	

Analogue in #2

100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	%
10.0	10.7	11.3	12.0	12.7	13.3	14.0	14.7	15.3	16.0	16.7	17.3	18.0	18.7	19.3	20.0	AFR	

Analogue in #3

100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	%
-0.80	-0.65	-0.49	-0.34	-0.19	-0.03	0.12	0.27	0.43	0.58	0.73	0.89	1.04	1.19	1.35	1.50	BAR	

Analogue in #4

HW ver. FW ver.

Log

Analogue#1 In Analogue#1 Out RPM

Analogue#2 In Analogue#2 Out Freq In

Analogue#3 In PWM 1 DC Freq Out

Analogue#4 In PWM 2 DC Inj. in

User output Acc. voltage Inj. out

Cannot connect!

PWM table #1 (Power Out #1) is a 3D table of Extra Fuel Injectors Duty Cycle as a function of Engine RPM and Load (Ultratech CHRONO Built In MAP Sensor, Analog #2 Input)