Configuration of WnjDDI

Release: V1.00 - 03/04/20121
http://www.skynam.com

Skynam Machine management

Configuration of WnjDDI

Software licence

Licence registration

IMPORTANT PRELIMINARY

This documentation has been specially updated for the WnjDDI versions distributed from April 3rd 2021, notably WnjDDI V1.00

DDI DRIVERS :

The family of Drivers DDI01, DDI04,... performs High tension pulse & Peak & Hold commands.
They are to be used to control gasoline direct injection type injectors.
The number of commands tracks is shown in the number of the name of the driver:
- DDI01 has only one command track
- DDI04 has 4
- DDI08 has 8
- …

It is not allowed to connect in parallel several injectors per command track.

Your driver DDI is provided with a standard tuning that is to be adapted to each injectors type:
For the High tension pulse:
- Time of Pulse: 250 µs
- Level of Pulse 65 Volts

For the Peak:
- Time of Peak: 400 µs
- Level of Peak 6 Amps

For the Hold:
- Level of Hold 3 Amps

For the driver configuration, Skynam has developed a user-friendly, performing software called WNJDDI.
With your PC, you'll need:
- A USB-FTDI interface provided by Skynam.
- WnjDDI software, properly installed on a PC (Microsoft Windows operating system, XP SP3, Vista, 7, 8 or 10 or later)

PRESENTATION OF DDI DRIVER

I) GENERAL CHARACTERISTICS:

ELECTRICAL CHARACTERISTICS

After key power supply from 8 volts to 18 volts DC.
Separated supply ground and power ground
Consumption minimum while operating at 13 volts: 100 milliamperes,
Consumption on stop: 0 milliamperes,
Limit of maximal consumption: following the number of command tracks and of the current commands configuration.

TEMPERATURE CHARACTERISTICS

In operation, -40 ° to +85 °.

SEALING CHARACTERISTICS

IP67 (on request).

II) OPERATION CHARACTERISTICS:

INJECTORS COMMAND

From 1 to 8 tracks following the DDI type

Trigger inputs commands by the ground, 1 KOhm pull-up resistor to +12V After Key integrated into the Driver.

Injection covering of a channel on the other one (between cylinders) allowed

Programmable High tension pulse duration from 10 to 500 microseconds
Programmable High tension level from 20 to 65 Volts
Programmable Peak duration from 10 to 1000 microseconds
Programmable Peak current from 0.5 to 8 Amperes
Programmable Hold current from 0.5 to 8 Amperes

COMMUNICATIONS

A serial communication by USB-FTDI for the tuning of the commands control.

INSTALLATION OF DRIVER DDI

These installation recommendations are simple but very important.

I) ELECTRICAL INSTALLATION :

When the engine is running, make sure that the driver is properly powered and that on-board tension (battery) at the input of the driver voltage is around 13.7 volts.
The wiring of the grounds between the driver, the engine block and the battery must be impeccable, the resistance must be at most 0.1 Ohm taking account of the heel resistance of your multimeter (consult the installation instructions of the engine management ECU).

If the quality of the grounds is bad, the driver can be destroyed.

II) MECHANICAL INSTALLATION :

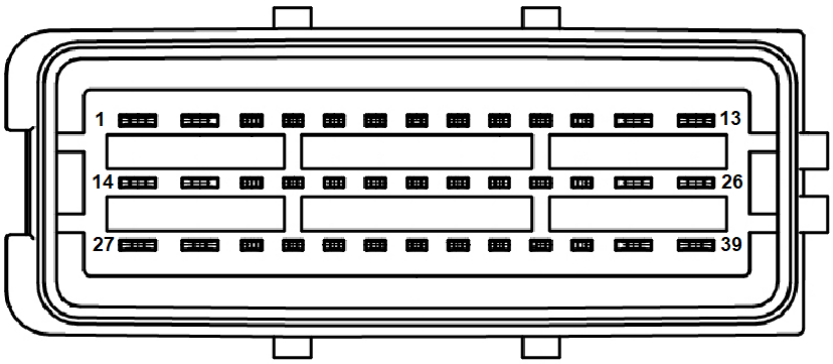
The driver must be installed in a vehicle area as cool and ventilated as possible, far from the exhaust heating.
Maximum ambient heat in the area in which the driver must be installed is 60 degrees.

Very often, in the series vehicles, the engine management electronic is installed behind a headlight, taking advantage of the circulation of fresh air, but protected from the weather.
In competition, it may be more difficult to protect the electronics from the weather if it is placed in a cool and well-ventilated area under the engine bonnet.

DDI08 LOOM

CON. J39	COLOR	SECTION	FUNCTION	COMMENTARY	CHARACTERISTICS
1	Brown	0.5	ENGINE SUPPLY GROUND	Ground supply input for the Driver and the female jack 3.5	
2					
3					
4	White black	0.5	TRIGGER INPUT INJECTION H	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
5	Grey-black	0.5	TRIGGER INPUT INJECTION G	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
6	Green	0.5	TRIGGER INPUT INJECTION F	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
7	Yellow	0.5	TRIGGER INPUT INJECTION E	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
8	Black	0.5	TRIGGER INPUT INJECTION D	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
9	Blue	0.5	TRIGGER INPUT INJECTION C	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
10	White	0.5	TRIGGER INPUT INJECTION B	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
11	Grey	0.5	TRIGGER INPUT INJECTION A	Command trigger - signal by the ground	internal pull-up to +15, consumes 15 mA
12					
13	White	0.5	TX SERIAL INTERFACE	Driver tuning by FTDI communication	Pre-wired on female jack 3.5
14	Brown	min 1.5	ENGINE POWER GROUND	Ground input for power commands	
15	Brown	min 1.5	ENGINE POWER GROUND	Ground input for power commands	
16					
17	White black	0.75	INJECTION H -	Injecteur H return	Injector negative command
18	Grey-black	0.75	INJECTION G -	Injecteur G return	Injector negative command
19	Green	0.75	INJECTION F -	Injecteur F return	Injector negative command
20	Yellow	0.75	INJECTION E -	Injecteur E return	Injector negative command
21	Black	0.75	INJECTION D -	Injecteur D return	Injector negative command
22	Blue	0.75	INJECTION C -	Injecteur C return	Injector negative command
23	White	0.75	INJECTION B -	Injecteur B return	Injector negative command
24	Grey	0.75	INJECTION A -	Injecteur A return	Injector negative command
25					
26	Blue	0.5	RX SERIAL INTERFACE	Driver tuning by FTDI communication	Pre-wired on female jack 3.5
27	White	min 1.5	AFTER KEY POWER SUPPLY + 15	12 volts after key power supply	8-18 volts
28	White	min 1.5	AFTER KEY POWER SUPPLY + 15	12 volts after key power supply	8-18 volts
29					
30	White black	0.75	INJECTION H +	8th injected cylindre	Injector positive command
31	Grey-black	0.75	INJECTION G +	7th injected cylindre	Injector positive command
32	Green	0.75	INJECTION F +	6th injected cylindre	Injector positive command
33	Yellow	0.75	INJECTION E +	5th injected cylindre	Injector positive command
34	Black	0.75	INJECTION D +	4th injected cylindre	Injector positive command
35	Blue	0.75	INJECTION C +	3nd injected cylindre	Injector positive command
36	White	0.75	INJECTION B +	2nd injected cylindre	Injector positive command
37	Grey	0.75	INJECTION A +	1st injected cylindre	Injector positive command
38					
39					

Note: The wires section is given in mm^2



DRIVER CONNECTOR - FRONT VIEW
LOOM CONNECTOR - REAR VIEW

TYPE OF DRIVER

Following the Driver type, all the commands do not exist

DDI01 Only Command A
DDI04 Only Commands A B C D
DDI06 Only Commands A B C D E F
DDI08 Commands A B C D E F G H

COMMANDS OUTPUTS

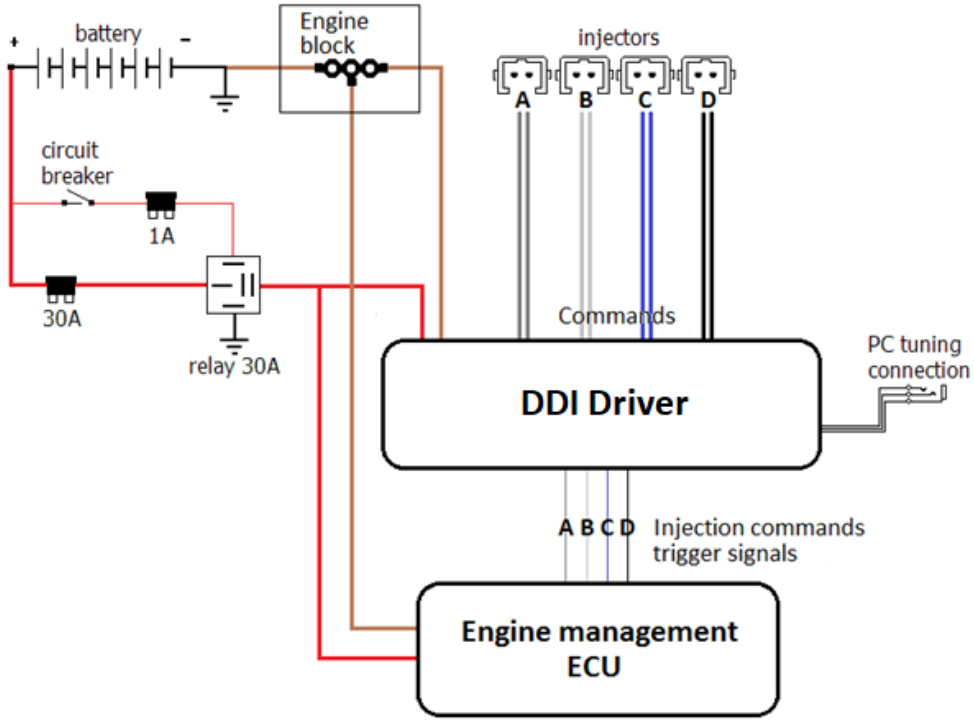
Each output command has two wires of the same color (gray-gray, white-white, blue-blue, …).
The coils of injectors to control have no polarity. The command + and command - can connect either one side or the other of the injector as long as you do not mix the colors (two gray together, two white together, ...).

COMMANDS TRIGGER INPUTS

The wire color matches the color of the wires of the corresponding output.
Each command trigger input has a 1 KOhm pull-up resistor to 12 volt.
The device controlling the Driver (example engine management ECU) must provide an open-drain command:
- put this input to the ground when it wants to command the track
- do nothing when it wants to stop the track command

PRINCIPLE OF INSTALLATION

Example for 4 injectors



GROUNDS

- The power ground of the driver is wired at the same place than the engine management ECU one, on the engine block.
- The supply ground of the driver is wired at the same place than the engine management ECU one, on the engine block.

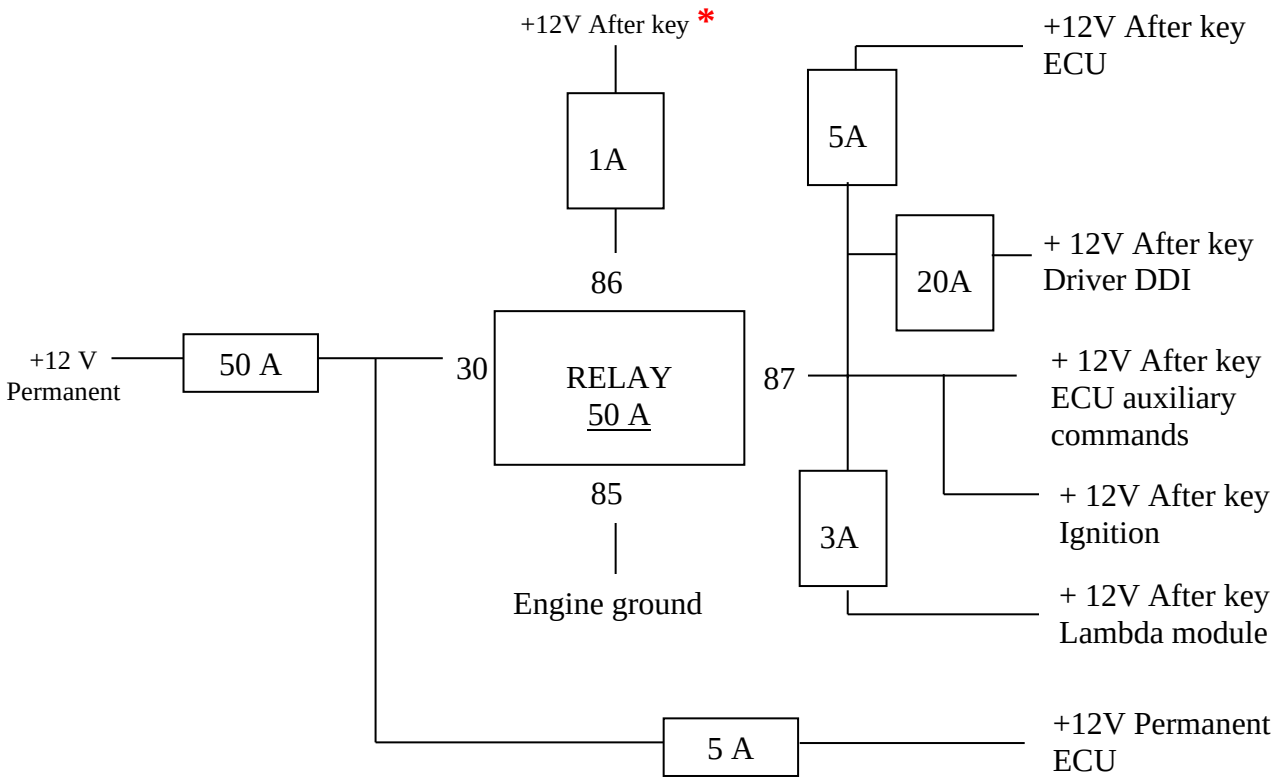
POWER SUPPLY

The After key power supply of the driver is wired to the output of the relay which supplies the engine management ECU.

INJECTION TRIGGER COMMANDS

These are the injection commands of the engine management ECU.
The driver is interposed between these ECU commands and the injectors.

POWER SUPPLY INSTALLATION
WITH SYBELE ECU



If not installed as described, we can't guarantee proper operation of the system.

NOTE:
In any case we advise static relays 300 Amperes type Nagares 250.1-12

*** The +12V after key has to be connected onto a switch for engine switching-off.**

When cutting off with the circuit-breaker, you would also switch off the alternator tension regulation, which may severely damage the ECU and the Driver: alternator tension not charged by the battery may jump over 30 volts.

DDI DRIVERS CONFIGURATION

I) WNJDDI SOFTWARE LAUNCHING:

Before launching the WnjDDI software

USB-FTDI CONNECTION

Plug the USB-FTDI device into your PC and int the Driver female Jack.

SPECIAL DDI OPERATION FOR THE CONFIGURATION

During all the configuration, The DDI should not receive a command signal on its trigger inputs (the DDI trigger signal inputs must remain at rest) because it does not communicate while it is performing commands.

When the configuration will be completed, you can immediately make it work.

RUN THE WNJDDI SOFTWARE

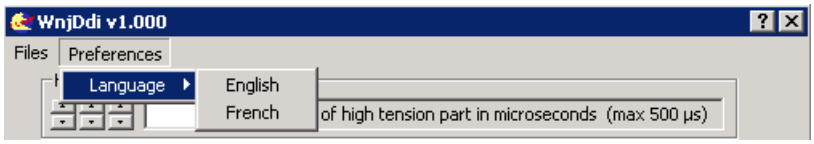
Launch the software by double clicking on its icon on the computer desktop.

POWER THE DDI

If you need to configure or verify it, switch ignition on to start the DDI.

II) LANGUAGE SELECTION:

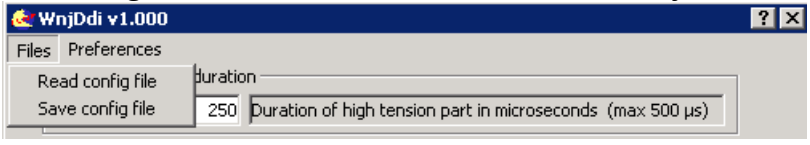
WnjDDI owns a main menu with a Preferences item.
Two languages can be dynamically selected by the 'Preferences' menu, English and French.



Note : two software packs are allowed, one French pack WnjDDI_FRA.1.0.0.0 and one English pack WnjDDI_ENU.1.0.0.0. These two packs do not concern the language used by WnjDDI but only the documentation language. So, whichever is the installed pack, you can select the operating language of the WnjDDI.

III) SAVING DDI CONFIGURATION ON THE HARD DISK:

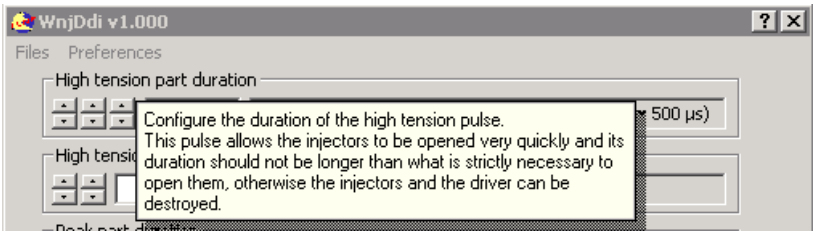
WnjDDI owns a main menu with a Files item.
You can save and reread DDI configurations on your PC hard drive.
The configurations are stored in the 'Documents\WnjDDI' folder.



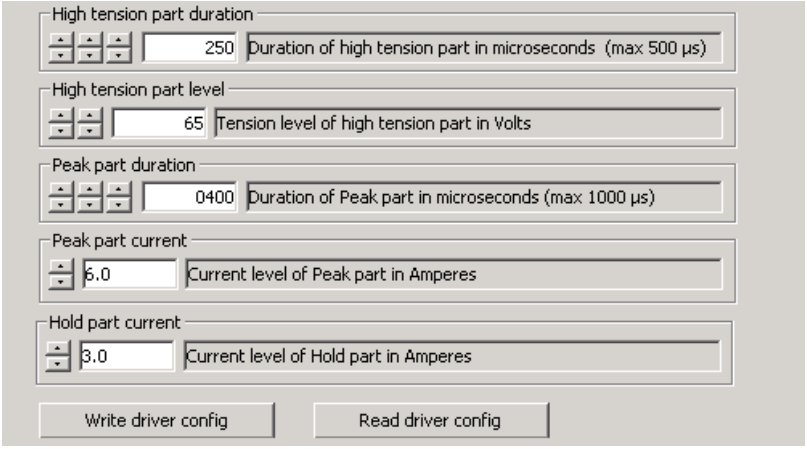
So, if you need to program a DDI with the same configuration, you just have to reread the configuration that you saved the previous time.

IV) CONTEXT HELP:

All the tunings owns a context help which remembers you what is the tuning used for and how you must use it.
To use the context help, click in the "?" in the upper left corner of the window. The mouse cursor becomes itself a "?".
Then click again on the tuning or the value or any part for which you need some help.
For example, if you require help on the High tension pulse duration:



COMMAND CONFIGURATION



I) HIGH TENSION PULSE REGULATION:

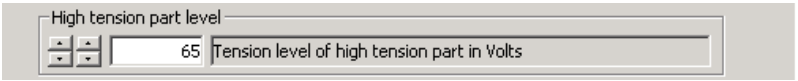
DURATION OF THE PULSE

This pulse allows the injectors to be opened very quickly and its duration should not be longer than what is strictly necessary to open them, otherwise the injectors and the driver will can destroyed.
Set 0 to not have a high tension pulse.

Use the left Spin to modify the time by 100 µs, the center one to modify by 10 µs and the right one to modify by 1 µs

HIGH TENSION LEVEL

In general, this is the maximum level that the driver can provide. Can range from 20 to 65 Volts in steps of 1 Volt.

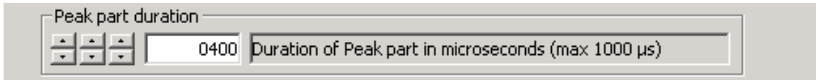


Use the left Spin to modify the tension by 10 Volts and the right one to modify by 1 Volt

II) PEAK REGULATION:

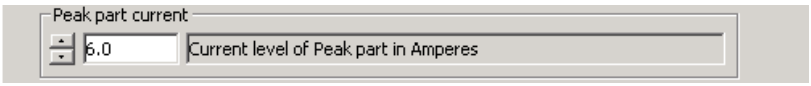
PEAK DURATION

The Peak is the part of strong current needed to reinforce the opening of the injectors after the high voltage pulse.
The driver controls the current on all the Peak duration.
Set 0 to not have a Peak part.



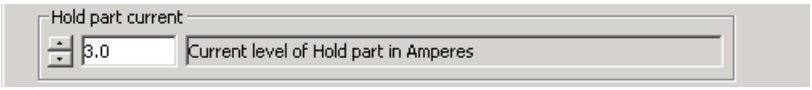
Use the left Spin to modify the time by 100 µs, the center one to modify by 10 µs and the right one to modify by 1 µs

PEAK CURRENT
Can range from 0.5 to 8.0 Amperes by 0.5 Amperes steps



III) HOLD REGULATION:

HOLD CURRENT
The Hold is the low current part needed to keep the injectors open after the peak. It lasts as long as the injectors must remain open.
Can range from 0.5 to 8.0 Amperes by 0.5 Amperes steps

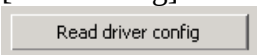


IV) WRITING THE CONFIGURATION:

When you have configured the command, to send this configuration to the DDI device, click on the [Write config] button.

V) REREADING THE CONFIGURATION :

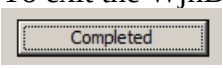
If you want to read the configuration back from the DDI device connected to your PC, click on the [Read config] button.



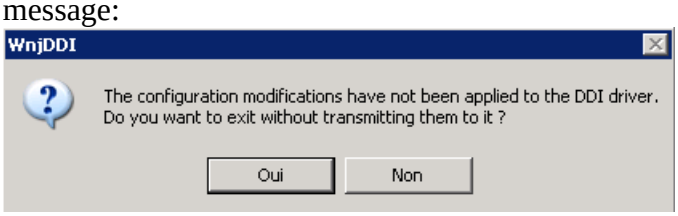
The configuration read in the DDI is then displayed, replacing the one displayed previously.

VI) EXIT OF THE SOFTWARE :

To exit the WjnDDI software, click on [Completed] button:



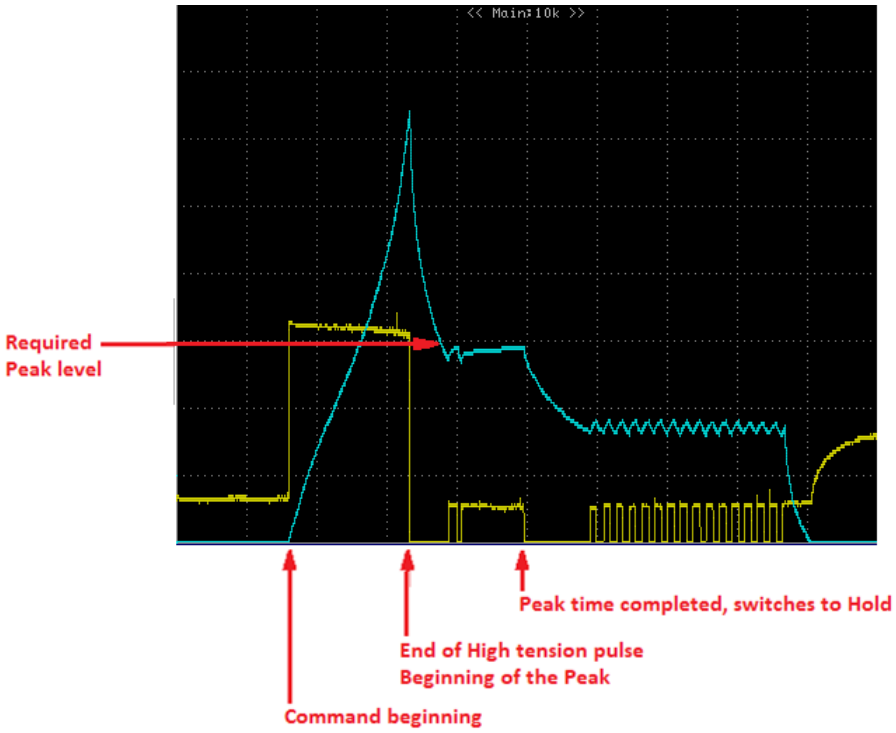
If you forget and try to exit without having applied the configuration, you will receive a warning message:



EXAMPLES OF REGULATION

I) HIGH TENSION PULSE WITH PEAK PART:

See config file "Bosch_0261500073" for the corresponding tuning



II) HIGH TENSION PULSE WITHOUT PEAK PART:

See config file "Bosch_0261500132" for the corresponding tuning