Configuration of WnjDPH

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http://www.skynam.com

Skynam   Machine management

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IMPORTANT PRELIMINARY

This documentation has been specially updated for the WnjDPH versions distributed from January 25th 2016, notably WnjDPH V1.00

DPH DRIVERS :

The family of Drivers DPH01, DPH04,... perform Peak & Hold commands. They are used to control low-impedance devices, such as for example some injectors or solenoid valves whose impedance is less than 4 Ohms, that would not bear a simple On-Off command (also called saturated command) because the current command is too important and destroys these devices or the devices that control them (for example the injectors outputs of an engine management ECU).
The number of commands tracks is shown in the number of the name of the driver:
- DPH01 has only one command track
- DPH04 has 4
- …

It is allowed to connect in parallel several devices per command track, provided that these devices are identical.
The setting of the DPH will then be adapted: multiply the power levels by the number of devices commanded on the same track.
If a device requires a 4 amps Peak level and a 1 amp Hold level, to command 2 devices in parallel on each channel, then tune the DPH on 8 amps Peak current and 2 amps Hold current.

Your driver DPH is provided with a standard tuning:
For the Peak:
- Type of control: Switching to the Hold as soon as the Peak current is reached
- Time of Peak: 5000 µs (maximum time if the Peak current is not reached
- Level of Peak   4 Amps
For the Hold:
- Level of Hold   1 Amp

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

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 +65 °.

SEALING CHARACTERISTICS
Depends on the housing (contact us).

II) OPERATION CHARACTERISTICS:

INJECTORS COMMAND
From 1 to 6 tracks following the DPH 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 Peak current from 0.5to 8 Amperes
Programmable Hold current from 0.5to 8 Amperes
Programmable Peak duration from 10 to 5000 microseconds

Two selectable Peak command types:
- the driver switches to the Hold as soon as the Peak current is reached. The Peak time is the maximum duration before the driver switches to Hold, in the case where the desired current is not reached.
- the driver controls the current during all the Peak time then switches to the Hold.

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

INSTALLATION OF DRIVER DPH

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 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.

LOOM

	FUNCTION	CHARACTERISTICS	WIRE COLOR	WIRE DIAMETER
DRIVER DPH PEAK & HOLD
OUT	COMMAND OUTPUT A +	Positive Peak and Hold command	Grey	0.75 mm
OUT	COMMAND OUTPUT A -	Negative Peak and Hold command	Grey	0.75 mm
OUT	COMMAND OUTPUT B +	Positive Peak and Hold command	White	0.75 mm
OUT	COMMAND OUTPUT B -	Negative Peak and Hold command	White	0.75 mm
OUT	COMMAND OUTPUT C +	Positive Peak and Hold command	Blue	0.75 mm
OUT	COMMAND OUTPUT C -	Negative Peak and Hold command	Blue	0.75 mm
OUT	COMMAND OUTPUT D +	Positive Peak and Hold command	Black	0.75 mm
OUT	COMMAND OUTPUT D -	Negative Peak and Hold command	Black	0.75 mm
OUT	COMMAND OUTPUT E +	Positive Peak and Hold command	Yellow	0.75 mm
OUT	COMMAND OUTPUT E -	Negative Peak and Hold command	Yellow	0.75 mm
OUT	COMMAND OUTPUT F +	Positive Peak and Hold command	Green	0.75 mm
OUT	COMMAND OUTPUT F -	Negative Peak and Hold command	Green	0.75 mm
IN	TRIGGER INPUT COMMAND A	Command trigger -signal by the ground	Grey	0.5 mm
IN	TRIGGER INPUT COMMAND B	Command trigger -signal by the ground	White	0.5 mm
IN	TRIGGER INPUT COMMAND C	Command trigger -signal by the ground	Blue	0.5 mm
IN	TRIGGER INPUT COMMAND D	Command trigger -signal by the ground	Black	0.5 mm
IN	TRIGGER INPUT COMMAND E	Command trigger -signal by the ground	Yellow	0.5 mm
IN	TRIGGER INPUT COMMAND F	Command trigger -signal by the ground	Green	0.5 mm
GROUND	POWER GROUND	Power ground input for the commands	Brown	0.75 to 2.5mm following the driver type
SUPPLY	AK POWER SUPPLY	8-18 volts after key power supply	Red	0.75 to 2.5mm following the driver type
GROUND	SERIAL COM GROUND	FTDI communication ground	Brown	Pre-wired on female jack 3.5
IN	RX SERIAL COM	By FTDI communication	Blue	Pre-wired on female jack 3.5
OUT	TX SERIAL COM	By FTDI communication	White	Pre-wired on female jack 3.5

TYPE OF DRIVER

Following the Driver type, all the commands do not exist

DPH01   Only Command A

DPH04   Only Commands A B C D

DPH06   Commands A B C D E F

COMMANDS OUTPUTS

Each output command has two wires of the same color.

The coils of solenoid valves or of injectors to control have no polarity. The command + and command - can connect either one side or other of the device 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.
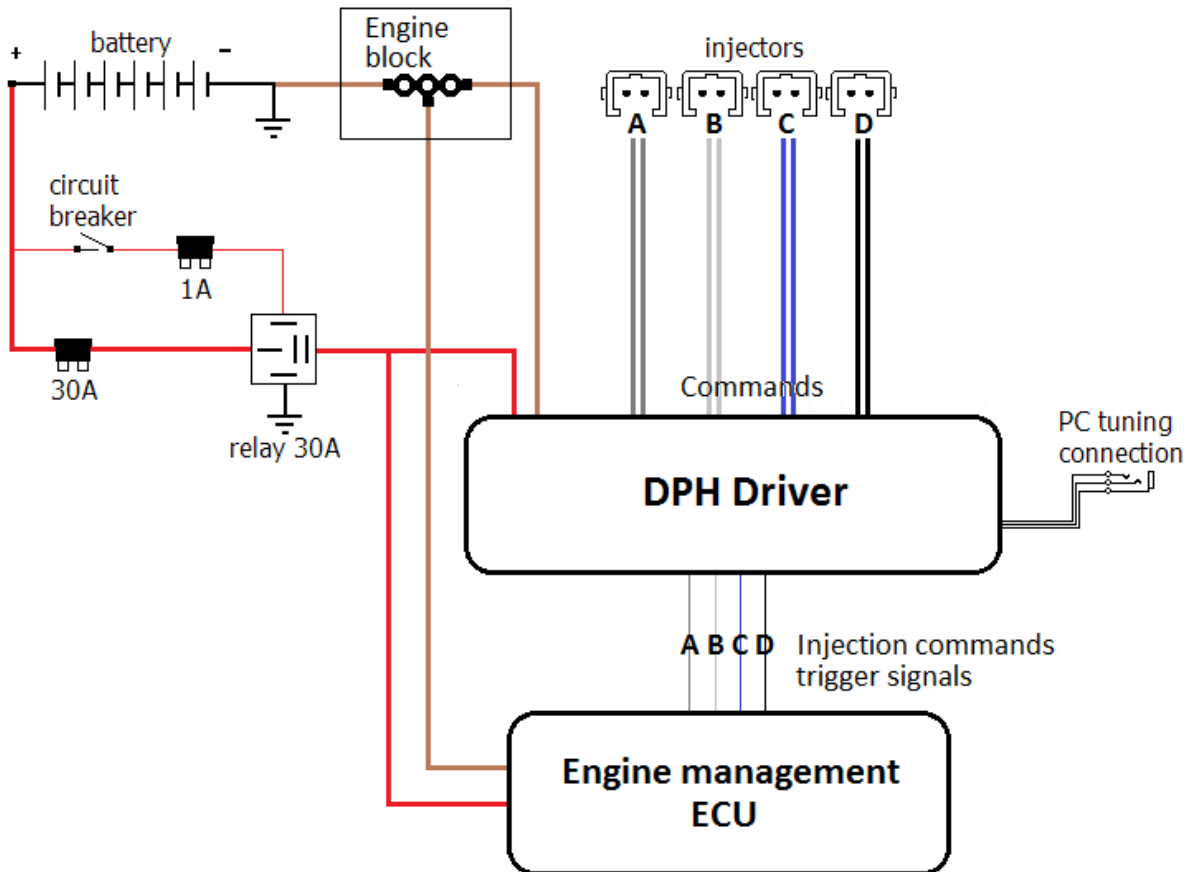
Each command trigger input has a 1 KOhm pull-up resistor to 12 volt.

The device controlling the Driver (example engine management ECU) must provide an open-drain command:

- put this entry to the ground when it wants to control the track
- do nothing when it wants to stop the command track

PRINCIPLE OF INSTALLATION

Example for 4 injectors

GROUNDS
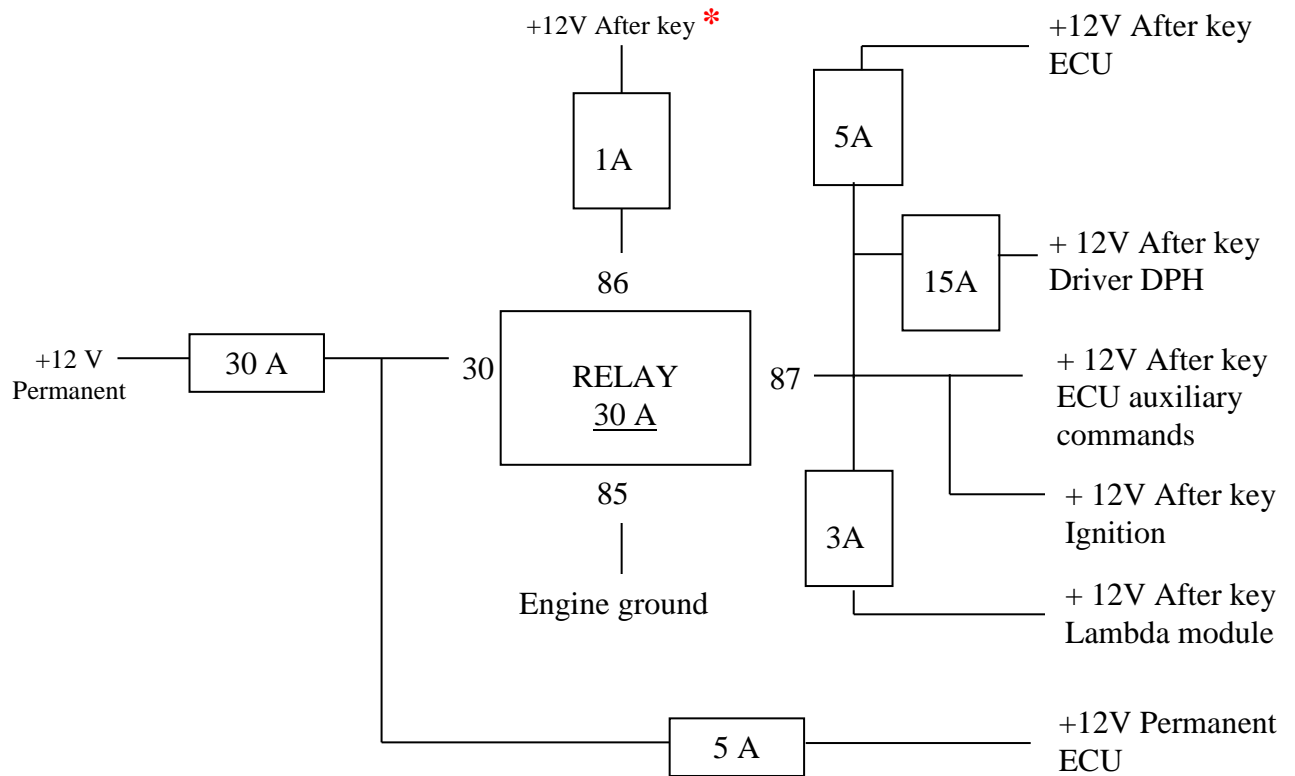The power ground of the driver is wire at the same place than the engine management ECU one, on the engine block.

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

+12V After key *****

+12V After key
ECU

1A

5A

+ 12V After key
Driver DPH

86

15A

+12 V Permanent — 30 A — 30 — RELAY 30 A — 87

+ 12V After key
ECU auxiliary
commands

85

+ 12V After key
Ignition

3A

Engine ground

+ 12V After key
Lambda module

5 A

+12V Permanent
ECU

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

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* 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.

DPH DRIVERS CONFIGURATION

I) WNJDPH SOFTWARE LAUNCHING:

Before launching the WnjDPH software

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

SPECIAL DPH OPERATION FOR THE CONFIGURATION
During all the configuration, The DPH should not receive a command signal on its trigger inputs (the DPH trigger signal inputs must remain at rest) because it does not communicate while it is performing commands.
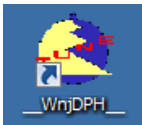
When the configuration will be completed, you can immediately make it work.

POWER THE DPH
Switch on ignition to start the DPH.

RUN THE WNJDPH SOFTWARE
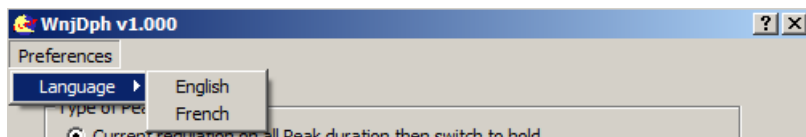Launch the software by double clicking on its icon on the computer desktop.

II) LANGUAGE SELECTION:

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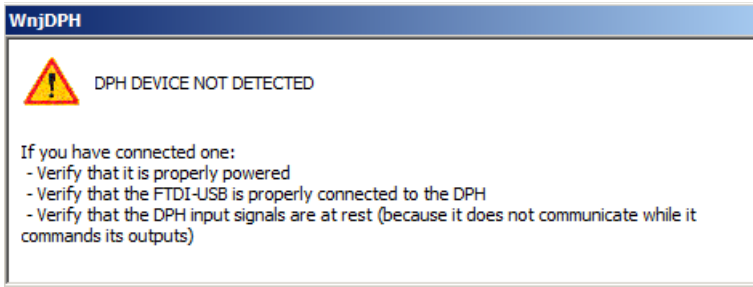Two languages can be dynamically selected by the 'Preferences' menu, English and French.

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

III) MAIN WINDOW OF WNJDPH :

The window in which runs WnjDPH only makes settings available when the program sees a DPH driver connected, that is, the DPH is properly connected to the PC, it is powered and it does not command its outputs.
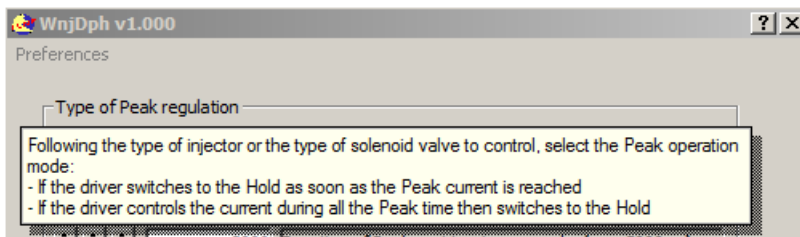Otherwise, a window asking to connect the DPH appears.

WnjDPH

⚠ DPH DEVICE NOT DETECTED

If you have connected one:
 - Verify that it is properly powered
 - Verify that the FTDI-USB is properly connected to the DPH
 - Verify that the DPH input signals are at rest (because it does not communicate while it commands its outputs)

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 type of Peak regulation:

WnjDph v1.000   ? ✕

Preferences

Type of Peak regulation

Following the type of injector or the type of solenoid valve to control, select the Peak operation mode:
 - If the driver switches to the Hold as soon as the Peak current is reached
 - If the driver controls the current during all the Peak time then switches to the Hold

CURRENT COMMAND CONFIGURATION

I) PEAK REGULATION:

TYPE OF REGULATION
Two types of Peak command are selectable:
- the driver switches to the Hold as soon as the Peak current is reached.
- the driver controls the current during all the Peak time then switches to the Hold.

PEAK DURATION
Following the requested type of Peak, the driver uses the Peak time in two different ways:
- If the driver must switch to the Hold as soon as the Peak current is reached, the Peak time is the maximum duration before the driver switches to Hold, in the case where the Peak does not reach the desired current
- If the driver must control the current on all the Peak duration, it is the Peak control time before the diver switches to the Hold

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 go from 0.5 to 8.0 Amperes by 0.5 Amperes steps

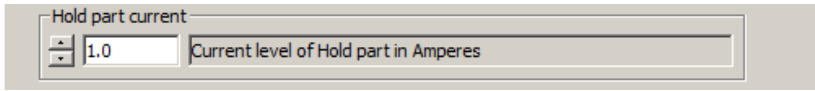## II) HOLD REGULATION:

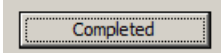**HOLD CURRENT**
Can go from 0.5 to 8.0 Amperes by 0.5 Amperes steps

III) VALIDATION OF THE CONFIGURATION :

When you have configured the command, to send this configuration to the DPH device, click on the [Apply] button.
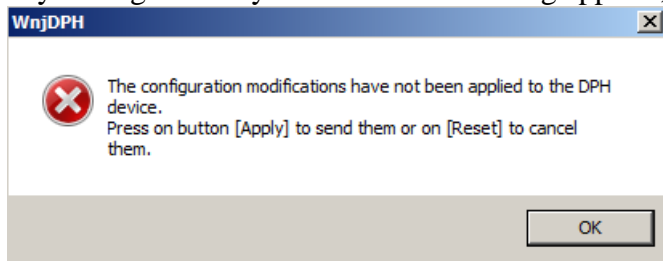To come back to the last applied configuration, click on the [Rest] button

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

If you forget and try to exit without having applied, or reset, you will receive an error message:
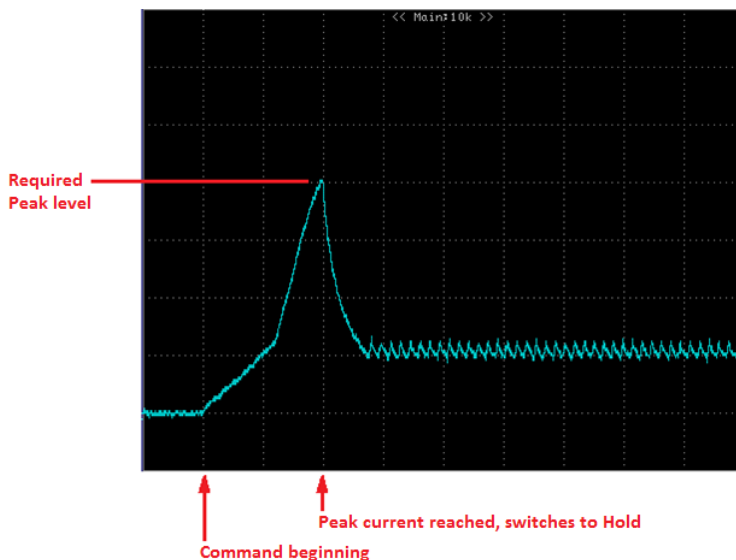

IV) EXAMPLES OF REGULATION:

PEAK SWITCHES TO HOLD AS SOON AS ITS CURRENT IS REACH

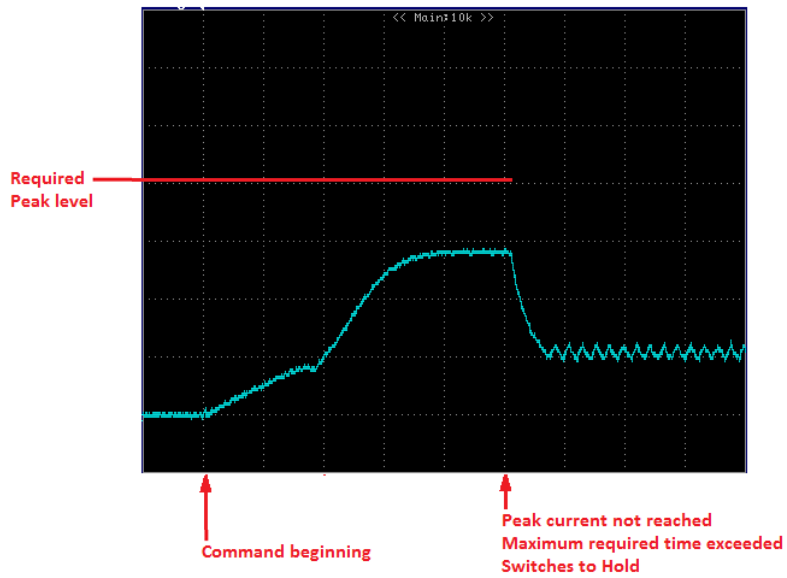Example 1:
The current reaches the required level

Example 2:
The current does not reach the required level, the Peak lasts the allowed maximum time

Configuration of WnjDPH

Required Peak level

<< Main:10k >>

Command beginning

Peak current not reached Maximum required time exceeded Switches to Hold

PEAK CONTROLS THE CURRENT DURING THE REQUIRED TIME THEN SWITCHED TO HOLD

Required Peak level

<< Main:10k >>

Command beginning

Peak time completed, switches to Hold