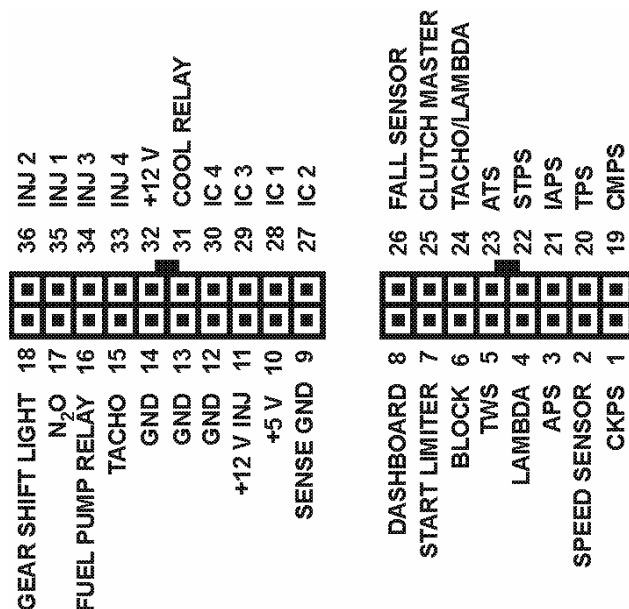


IGNIJET MAX POWER 04

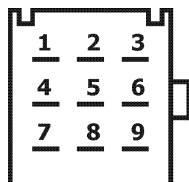
Detailed description

1. Hardware

Wiring of the main connector (IGNIJET 04 unit view):



Wiring of the secondary connector (on the conductor bundle):



1	GEAR SHIFT LIGHT	6	CLUTCH MASTER
2	N ₂ O	7	TACHO/LAMBDA
3	START LIMITER	8	LAMBDA
4	COOL RELAY (does not apply for basic layout)	9	SENSE GND
5	ACTIVATE N ₂ O		

Water temperature sensor TWS.

An input is ready for standard thermo sensors used on motorbikes. The chart of sensor resistance as a function of temperature is provided for checking purpose:

TW [°C]	R [kΩ]
-10	10,8
20	2,48
50	0,81
80	0,32
110	0,14

One outlet of the TWS should be connected to connector (pin 5) and the other one should be connected to SENSE GND (pin 9) following the chart.

Air temperature sensor ATS.

An input is ready for standard thermo sensors used on motorbikes. Resistance/temperature function is the same as with water temperature sensors.

One outlet of the ATS should be connected to connector (pin 23) and the other one should be connected to SENSE GND (pin 9) following the chart.

Warning!!! Kawasaki ZX12R uses different sucked-air temperature sensor – it is necessary to replace it with another one (from different type of motorbike) or not to use it (to disconnect it from the connector).

Throttle position sensor TPS.

An input is ready for standard TPS sensors used on motorbikes. It is designed to bear voltage up to 5 V. Particular sensor settings for individual motorbike types are included in IGNIJET 04.EXE software.

TPS is powered by referential voltage + 5 V (10) and SENSE GND (9). Sensor outlet will be connected to connector (20).

Servo position sensor STPS.

There is a servo drive on some bikes. It mostly propels the exhaust valve. Further there is a secondary suction valve on some bikes. These devices are not usually used for racing purposes (racing exhaust systems do not contain such valve at all).

However servo drive can be used well for example as electronic adjustment device for length of suction tubes depending on rpm.

An input is ready for sensors used in standard servos on motorbikes. It is designed to bear voltage up to 5 V. Servo settings are included in IGNIJET 04.EXE software.

TPS is powered by referential voltage + 5 V (10) and SENSE GND (9). Sensor outlet will be connected to connector (22).

Separate 2-pin connector in standard version connects servo motor wires. In unit version with an original connector the servomotor wires are connected to this connector (if there is original servo on the bike).

Only the bikes with standard servo drive will be equipped with servo controller, it is possible to make special order.

LAMBDA.

An input is ready for standard lambda sensors used in cars and bikes (voltage for stechiometric air-gasoline mixture is 0.4 to 0.8 V). It is designed to bear voltage up to 5 V. Lambda sensor voltage is not used for lambda air-gasoline mixture regulation, but for displaying lambda sensor voltage on a screen by IGNIJET 04.EXE software using the tachometer.

LAMBDA sensor should be connected to connector (pin 4) and the other one should be connected to SENSE GND (pin 9).

Air pressure sensor APS.

An input is ready for various APS sensor types used on motorbikes. It is designed to bear voltage up to 5 V. We provide the chart of sensor dependency for various motorbike types:

HONDA Motorbikes:

AP [kPa]	U [V]
110	3,15
100	2,87
90	2,60
80	2,33
70	2,05
60	1,78
50	1,51

YAMAHA Motorbikes:

AP [kPa]	U [V]
110	4,36
100	3,96
90	3,56
80	3,16
70	2,76
60	2,36
50	1,96

Other motorbikes:

AP [kPa]	U [V]
110	3,90
100	3,61
90	3,32
80	3,03
70	2,74
60	2,45
50	2,16

Sensor selection is based on motorbike type selection within IGNIJET 04.EXE software.

APS is powered by referential voltage + 5 V (10) and SENSE GND (9). Sensor outlet will be connected to connector (3).

If there is no APS in the bike system the air pressure sensor feature will be provided by IAPS (measures AP at switching on. In case there is neither APS nor IAPS the unit will adjust air pressure to 100 kPa.

Induction air pressure sensor IAPS.

The sensors are the same as APS, but they measure induction manifold pressure instead of atmospheric pressure. The value is needed to determine fuel dosage in cases when TPS < 5 % or there is no TPS in the system (is malfunctioning). In case there is no IAPS in the system, the unit determines the dosage using TPS only.

IAPS is powered by referential voltage + 5 V (10) and SENSE GND (9). Sensor outlet will be connected to connector (21).

Crankshaft position sensor CKPS.

An input is ready for standard pickup sensors used on motorbikes as CKPS.

One outlet of the CKPS should be connected to connector (1) and the other one should be connected to SENSE GND (pin 9) following the chart.

Camshaft position sensor CMPS.

An input is ready for standard pickup sensors used on motorbikes as CMPS.

One outlet of the CMPS should be connected to connector (pin 19) and the other one should be connected to SENSE GND (pin 9) following the chart.

Motorbikes Yamaha R1 and R6 use Hall sensor type as CMPS, IGNIJET 04 unit adjustment is solved by connection bundle YAMAHA R6, R1.

DASHBOARD.

Connection of serial communication with the dashboard. Information on the engine temperature (all SUZUKI and YAMAHA bikes) and speed (YAMAHA) is sent via serial communication to the dashboard, where it is displayed. To ensure proper display function the immobilizer should be disabled.

DASHBOARD (pin 8) output should be connected following the chart.

Injectors INJ 1, INJ 2, INJ 3, INJ 4.

Injector outputs are ready for standard injector types used on motorbikes (coil resistance approx. 13 Ohm).

One outlet of injectors should be connected to key switched + 12 V and the other one should be connected to corresponding connector pin INJ 1 to pin 35, INJ 2 to pin 36, INJ 3 to pin 34, INJ 4 to pin 33.

In line engine configuration applies only to motors with cylinders order 4, 3, 1, 2. For two-cylinder motors INJ 1 and INJ 4 represent the front cylinder and INJ 2 and INJ 3 the back cylinder.

Units can be optionally equipped with another four injectors for Honda CBR600RR 03 bike (top injectors). These outputs are of different color (1- white, 2 - orange, 3 – gray, 4 – brown). These outputs are mounted on special request only.

GEAR SHIFT LIGHT indicator.

The indicators maximum output current is 5 A (bulb up to 50 W). Gearshift indicator revolution is set within IGNIJET 04.EXE software.

One Gearshift indicator outlet should be connected to connector (pin 18) and the other one should be connected to key switched + 12V.

N₂O injection output.

Maximum Injection valve output current is 10 A (just for a short period of time - about 30 s). The N₂O is injected only if "N₂O enable" in program IGNIJET 04.EXE is checked, TPS > 85 %, start limiter isn't active and revolution is greater than 2000 rpm. N₂O injection settings as well as delay after ignition are adjusted within IGNIJET 04.EXE software. Together with N₂O supply so-called RETARD is activated – advance reduction. RETARD and its delay settings after ignition are adjusted within IGNIJET 04.EXE software. One N₂O injection valve outlet should be connected to connector (pin 17) and the other one should be connected to key switched + 12V.

Revolution indicator output TACHO.

The revolution indicator output is compatible with major part of board devices used on motorbikes. Pulse number for one revolution is set within IGNIJET 04.EXE software.

TACHO is supplied by 12V voltage GND. TACHO output should be connected to connector (pin 15).

When TACHO/LAMBDA switch is activated LAMBDA sensor voltage is displayed on the tachometer.

FUEL PUMP RELAY output.

Fuel relay activates for about 4 s after the unit is switched on and remains active while the motor is running. One fuel pump relay outlet should be connected to connector (pin 16) and the other one should be connected to key switched + 12V. Connect the switched fuel pump relay circuit following the diagram. !!!BE AWARE OF THE FUEL PUMP POLARITY!!!

FALL SENSOR.

One outlet of FALL SENSOR should be connected to connector (pin 26) and the other one should be connected to SENSE GND (pin 9) or GND (12, 13, 14). If FALL SENSOR switch is activated, the unit blocks ignition. Reverse polarity of the fall sensor can be configured within IGNIJET 04.EXE software. Honda motorbikes have the fall sensor included in the unit power supply.

Inhibit input BLOCK.

One outlet of BLOCK (e.g. from stand switch) should be connected to (6) and the other one should be connected to SENSE GND (pin 9) or GND (12, 13, 14). If BLOCK switch is activated, the unit blocks ignition.

START LIMITER input.

One outlet of START LIMITER switch should be connected to connector (pin 7) and the other one should be connected to SENSE GND (pin 9) or GND (12, 13, 14). If START LIMITER switch is activated, the unit adjusts limiter and after deactivation START LIMITER initiates N₂O injection delay. Reverse polarity of the START LIMITER switch can be configured within IGNIJET 04.EXE software.

CLUTCH MASTER input.

One outlet of CLUTCH MASTER switch should be connected to connector (pin 25) and the other one should be connected to SENSE GND (pin 9) or GND (12, 13, 14). If CLUTCH MASTER switch is activated, the unit blocks ignition for a defined period of time. This provides for higher gearshift without clutch and gas shut-off, thus minimizing the time losses during gear shifting. Blocking time can be adjusted within IGNIJET 04.EXE software. Reverse polarity of the CLUTCH MASTER switch can be configured within IGNIJET 04.EXE software.

TACHO/LAMBDA switch input.

One TACHO/LAMBDA outlet of should be connected to connector (pin 24) and the other one should be connected to SENSE GND (pin 9) or GND (12, 13, 14). If TACHO/LAMBDA switch is activated, the unit displays lambda sensor voltage on the tachometer (instead of revolution) Displayed sensitivity: $0.4 \div 0.9$ V as $0 \div 12000$ rpm. Reverse polarity of the switch can be configured within IGNIJET 04.EXE software.

Induction coils IC 1, IC 2, IC 3, IC 4.

Induction coils outputs are ready for standard types, designed for inductive ignition and used on injection-type motorbikes (primary coil resistance approx. 1 to 2 Ohm).

One outlet of induction coils should be connected to key switched + 12 V and the other one should be connected to corresponding connector pin IC 1 (28), IC 2 (27), IC 3 (29), IC 4 (30).

In line engine configuration applies only to motors with cylinders order 4, 3, 1, 2. For two-cylinder motors IC 1 and IC 4 represent the front cylinder and IC 2 and IC 3 the back cylinder.

Supply voltage +12 V.

Nominal Supply voltage is 14 V. It must be within 8 – 16 V range. In this range the unit is able to provide optimal control of all the processes. Supply voltage is connected by positive outlet to +12 V (pin 32) and by negative outlet to GND (pin 12,13,14 – connect these together).

SENSE GND.

SENSE GROUND (pin9) is used for connection and supply of sensors.

Reference voltage + 5 V.

Reference voltage +5V (pin 10) is used for the power supply of sensors.

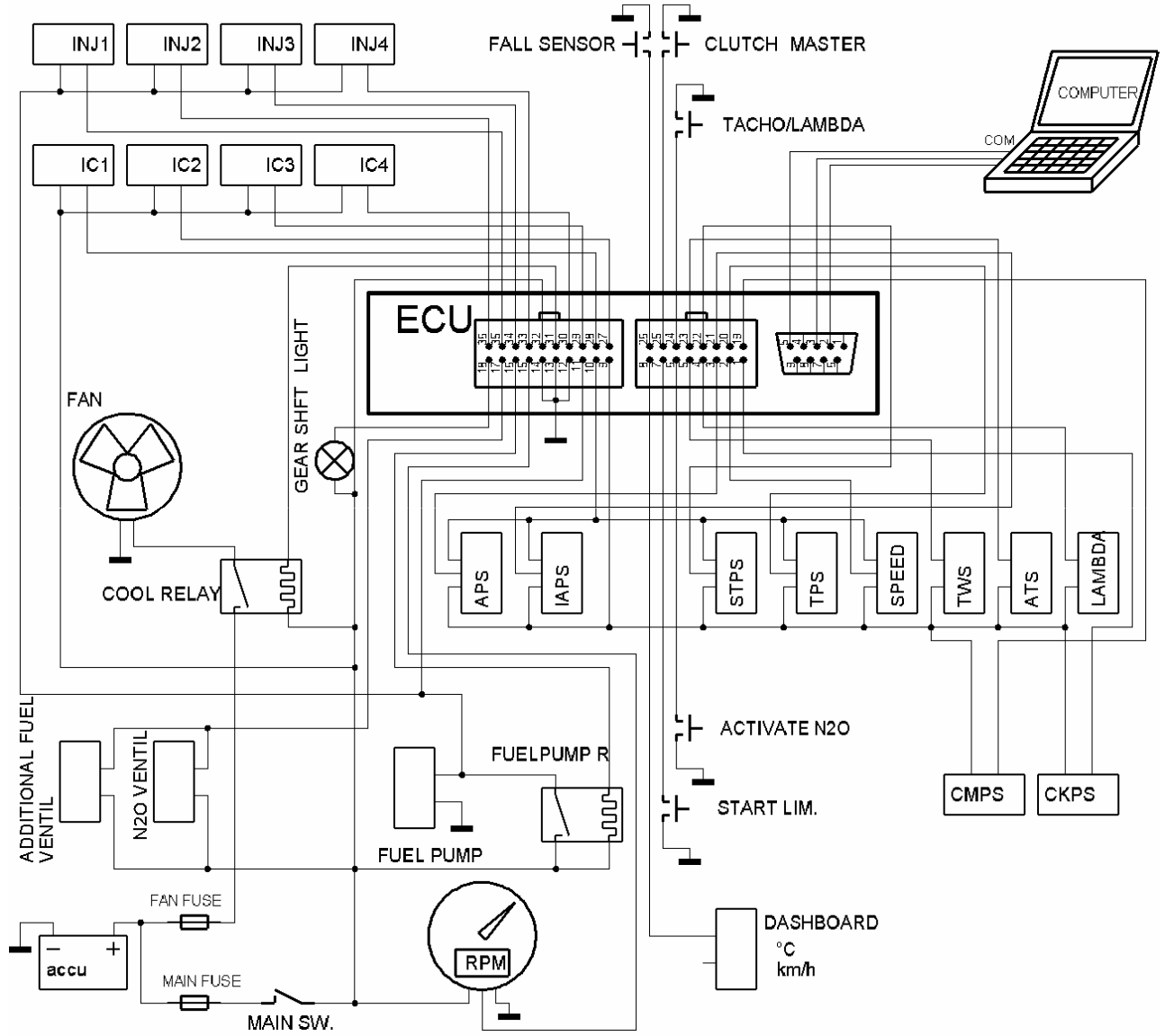
Injection supply voltage measuring +12 V INJ.

As the characteristics of injectors depend on supply voltage to great extent it is necessary to connect the supply voltage to +12 V input (pin 11). The unit will measure it and adjust automatically. In case the unit detects lower than 7 V or higher than 18 V voltage it will lock up.

COOL RELAY switch output.

The cooling relay should be connected following the wiring diagram. One relay outlet should be connected to cooling output COOL RELAY (pin 31) and the other one should be connected to key switched + 12V. Connect the switched relay circuit following the diagram. When the unit is switched on this output will switch for about 1 s and make the fan turn. This serves the purpose of fan function check.

Standard wiring of injection system using IGNIJET 04 unit:



2. IGNIJET 04 Software

Pull down menus

File – includes items

New	- default settings (serial adjustment)
Open	- opens data file
Save	- saves data file
Print	- prints the current settings
Exit	- exits the program

Warning!!! Clicking **New** results in automatic default settings of all parameters (serial adjustment) for the motorbike.

Port – includes items **Com1 to Com10** - selection of communication line

Device – includes items

Read	- reads data from the unit
Verify	- compares data in PC with data in the unit
Program	- sends data to the unit and conducts verification

TP map mode – includes options of TP maps control settings mode

- **Separate** (separate map control)
- **Interlocked** (online map control)
- **14->23** (map 14 only)
- **23->14** (map 23 only)

Language – language settings: **English, Czech, and German**

Help – includes items

Help	- opens assembly guide (this file)
About the program	- data on the software (version, date)

Icons menus



- default settings of the motorbike (serial adjustment)

Warning!!! Clicking this icon results in automatic default settings of all parameters (serial adjustment) for the motorbike.



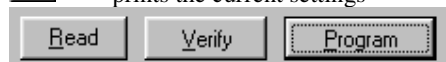
- opens data file



- saves data file



- prints the current settings



- see pull down menu **Device**

Ignition tab sheet

Motorbike selection - the unit is designed to operate on these motorbikes:

APRILIA	RSV MILLE	98' - 02'
DUCATI	996	
HD	V-rod	
HONDA	CBR600F	01' - 02'
	CBR600RR	03'
	CBR900RR	02'
	VTR1000 SP1	00' - 01'
KAWASAKI	ZX6R PCE	ZX6R 02' injection adjustment – send questions to pce.cz@worldonline.cz
	ZX6RR	03'
	ZX6RR	04'
	ZX10R	04'
	ZX12R	00' - 02'
	ZX12R	03'
MZ	MZ125	MZ125 02' injection adjustment – send questions to pce.cz@worldonline.cz
SUZUKI	GSX600R	01' - 03'
	GSX750R	00' - 03'

	GSX1000R	01´ - 02´
	GSX1000R	03´
	GSX1300	
	TL1000	98´
YAMAHA	R6	03´
	R1	02´

Warning!!! Selecting new bike type results in automatic default settings of all parameters (serial adjustment) for the motorbike.

10 couples of edit boxes for setting advance as function of RPM

Curve of 10 couples for setting advance as function of RPM Collective adjustment of the whole advance curve can be done by collective change tool (+ and – buttons with selection **All**)

When the motor is running current segment is highlighted in the advance curve. Use of collective change tool + and – button without selection **All** just the current segment will be changed.

Starting limiter	- sets revolution of starting limiter
Limiter	- sets revolution of classic starting limiter
Clutch master	- sets ignition switch off period during gear shift
Gearshift light	- sets revolution of gearshift light
Tachometer 2x	- tachometer output settings
Switch activation	- input logic settings (if the box is checked the function is activated by switch on input)
Programming after a change	- automatic programming settings (after every change)
No reading	- reading is not allowed (after programming with this option data cannot be retrieved from the unit)

IAP map tab sheet

IAP -> TPS value (0 ÷ 100 %) sets TP position at which IAP map transfers to TP map.

IAP map provides for fuel dosage settings in the range 0 ÷ **IAP -> TPS** [% TP] (in case the TPS is not connected in the range of 0 ÷ 100 % TP). Standard **IAP -> TPS** value is 5%. This means idle motor run in fact. Idle motor run setting by IAP map displays more stable parameters than setting by TP map.

IAP map includes 10 adjustable revolution options x 10 options for induction underpressure (100% means serial adjustment).

Collective setting of the whole column is possible using the arrows under columns. Collective adjustment of the whole map can be done by collective change tool (+ and – buttons with selection **All**)

When the motor is running and PC connected with the unit current segment in the fuel map is highlighted. Use of collective change tool + and – button without selection **All** - just the current segment will be changed.

TP map 14 and TP map 23 tab sheets

IAP map provides for fuel dosage settings in the range **IAP -> TPS** ÷ 100 [% TP] (in case the IAPS is not connected in the range of 0 ÷ 100 %). Standard **IAP -> TPS** value is 5%. This is basically range over idle run – effective motor performance area. Setting this range by TP map displays more stable parameters than setting by IAP map.

TP map includes 10 adjustable revolution options x 10 options for throttle position (100% means serial adjustment).

Collective setting of the whole column is possible using the arrows under columns. Collective adjustment of the whole map can be done by collective change tool (+ and – buttons with selection **All**)

When the motor is running and PC connected with the unit current segment in the fuel map is highlighted. Use of collective change tool + and – button without selection **All** - just the current segment will be changed.

TP map 14 is designed for fuel dosage of 1.4 cylinders. **TP map 23** is designed for fuel dosage of 2.3 cylinders (option **Separate**).

Both maps can be interlocked – i.e. both can be used at the same time from TP map 14 (option **Coupled**)

Warning!!! Maps cannot be interlocked if the revolution columns are not equal!!!

It is also possible to use one map for all the cylinders – either TP map 14 (option **14->23**) or TP map 23 (option **23->14**)

Tab sheet Miscellaneous

Starting plus-injection Asynchronous injection in all the cylinders at the ignition (for motor temperature 80°C – the period is adequately extended for lower temperatures). At the same time under lower motor temperature the injection time will be increased during first 30 s of motor run.

Cooling - motor temperature at which the fan switch is activated can be adjusted here

Acceleration plus-injection - asynchronous plus-injection in all the cylinders when acceleration is needed (acceleration pump).
Threshold - minimum throttle movement speed needed to activate acceleration plus-injection
Size - intervals of separate acceleration plus-injections (10 ms period)

Temperature corrections

Coolant - correction curve of the water temperature (100% means serial adjustment for 80°C)

Inlet air - correction curve of the air temperature (100% means serial adjustment for 50°C)

TPS - limit TPS voltage values can be set here [mV]



- measures and sets 0% TPS (supply on, unit connected with PC, no gas)



- measures and sets 100% TPS (supply on, unit connected with PC, full gas)

N₂O tab sheet

N₂O allowed - software activation of N₂O dosage controller

N₂O
N₂O 1 - initial N₂O injection
N₂O 2 - final N₂O injection
Build-up time - period between initial and final gas injection
Delay - delay period after starting limiter activation

Retard Retard 1 - initial RETARD
Retard 2 - final RETARD
Build-up time - period between initial and final advance reduction
Delay - delay period after starting limiter activation

Tab sheet Servo

Servo allowed - software activation of servo controller

10 adjustable options for revolution/required voltage of servo position sensor

Collective adjustment of the whole servo curve can be done by collective change tool (+ and – buttons with selection **All**)
 When the motor is running current segment is highlighted in the servo curve. Use of collective change tool + and – button without selection **All** - just the current segment will be changed.

Hysteresis – fineness of servo driver steps can be set here

!!!Warning!!! - in case you set too low value there is a risk of servo oscillation

Monitor

Monitor is located on the right and lower side of the screen – sensor values and motor operational characteristics can be observed here. Should there be **NO CONNECTION** prompt displayed in the upper right corner, the unit is not connected.

Extended monitor - monitor extended mode activation Monitor will display voltage of separate sensors and other parameters in this mode.

RPM - motor revolution [1/min]
TP - Throttle position [%]
TW - temperature of motor [°C]
AT - Induction air temperature [°C]
AP - atmospheric pressure [kPa]
IAP - induction tube air pressure [% AP]
U - Supply voltage of injectors [V]
Inj. Time 14 - Time of injection for 1.4 cylinders (front cylinder for two-cylinder motors) [µs]
Inj. Time 23 - Time of injection for 2.3 cylinders (front cylinder for two-cylinder motors) [µs]
Inj. Time 14 H - Time of injection for 1.4 cylinders top injectors (for bikes equipped with top injectors) [µs]
Inj. Time 23 H - Time of injection for 2.3 cylinders top injectors (for bikes equipped with top injectors) [µs]

Advance	- Ignition advance [°]
LAMBDA	- Lambda sensor voltage measured [mV]
Fall sensor	- Fall sensor activation signal
Blocking	- Blocking activation signal
Clutch master	- Clutch master activation signal
Start limiter	- Start limiter activation signal
Tacho/Lambda	- Display of lambda sensor voltage using tachometer activation signal
Activate N₂O	- Hardware activation of N ₂ O controller signal (works only after software N ₂ O activation)
Servo required	- Required value of servo position sensor
Servo measured	- Measured value of servo position sensor
Number of programming	- Number of times the unit has been programmed (applies only for Extended monitor option)

3. Connection for individual motorbikes

IGNIJET 04 unit is produced in several versions for individual bike types:

- 1) Standard version – uses MULTILOCK 20 + 16 pins connector. Cable reductions are made for individual bikes used between IGNIJET 04 unit and motorbike cable bundle connector.
- 2) Original connector version – for some bikes the unit is equipped with original connector directly (Yamaha R6). Inputs and outputs are aside the cable bundle from the unit.

IGNIJET 04 unit is produced in two software versions:

- A) FULL VERSION - contains all function described in this document.
- B) BASIC VERSION - contains no additional racing function (CLUCH MASTER, START LIMITER, TACHO/LAMBDA, GEAR SHIFT LIGHT, N2O). Limiter cannot be adjust above to value of original unit.

BASIC VERSION is possible to upgrade to FULL VERSION (for additional payment).

Additional information on assembly to various bike types:

Immobilizer has to be disconnected when using IGNIJET 04 unit on YAMAHA R6 and R1 bikes in order to ensure functional display of motor temperature and bike speed.

For bikes equipped with induction secondary throttle (such as Suzuki GSX, Kawasaki ZX6RR, Kawasaki ZX10R) it is necessary to disable it (adjust 100% open). There are no circuits to control this throttle in the IGNIJET 04 unit.