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 application version: 03.240531

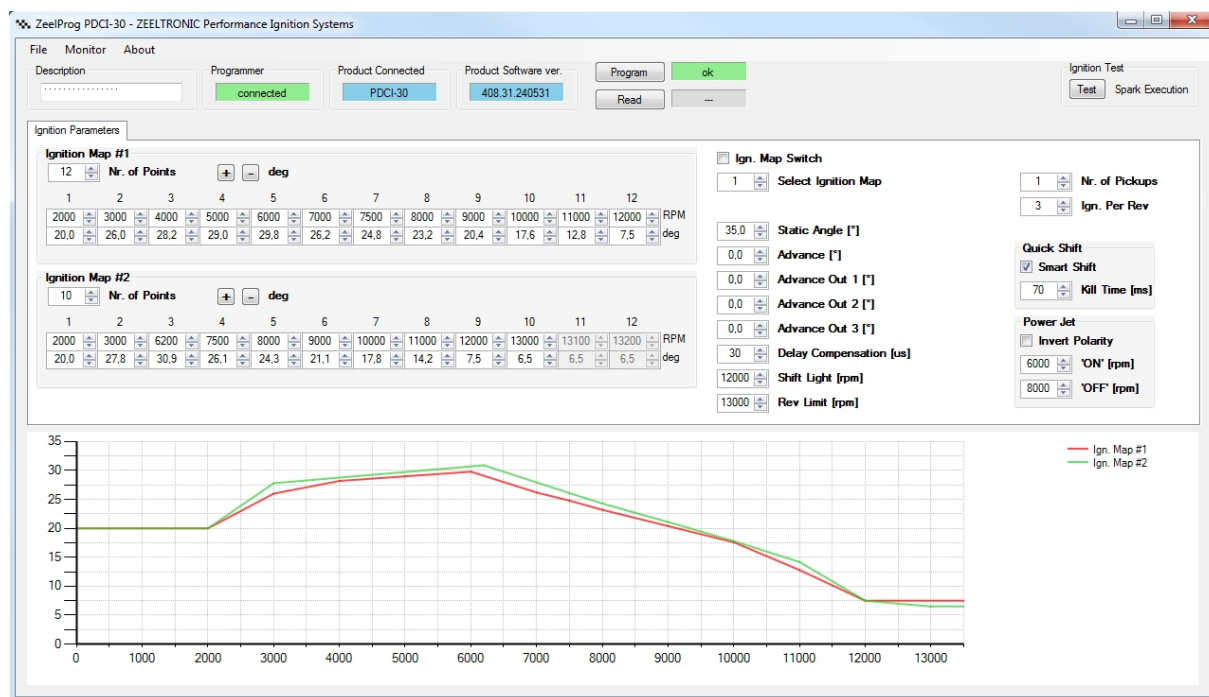
PROGRAMMING MANUAL ZeelProg PDCI-30

Supported control units: **PDCI-30**

PDC-30 is three channel DC-CDI with 2 switchable ignition maps, shift light, quick shift and output for rev counter.

ZeelProg is PC application for programming ZEELTRONIC engine *control units*. For programming special PC-USB programmer is needed.

- **ZeelProg** automatically detects PC-USB programmer connection and enables all functions (without PC-USB programmer, **ZeelProg** application is locked).
- **ZeelProg** automatically detects type of engine *control unit* connected to PC-USB programmer.



Limit values:

- minimum revs	200 RPM
- maximum revs	20000 RPM
- minimum supply voltage	7 Volts
- maximum supply voltage	17 Volts
- recommended power supply voltage	12÷15 Volts
- stand-by current draw	< 0.05 Amp
- current draw at 1300 RPM	< 0.4 Amp
- current draw at 12000 RPM	< 2.4 Amp
- maximum continuous current for shift light and power jet output	1 Amp
- peak current for shift light and power jet output	5 Amp
- constant spark energy from idle to 14000 RPM	>35mJ

Features:

- fast power-up
- full power starting spark energy already at 7 Volts power supply
- 3 isolated inputs for pickups
- 3 independent ignition coil outputs
- individual advance/retard of each output
- store and load function for two ignition maps
- external switch for changing ignition map while riding
- shift light output
- power jet output
- quick shift (shift kill)
- soft rev limit (three stage rev limit)
- tachometer output
- easy and fast programming on the field, via hand held programmer
- PC-USB programming
- programming while machine running - you can immediately see effects
- each curve can be set in 4 to 12 curve points
- signal delay compensation
- instant monitoring of rev's and angle, via hand held programmer and PC
- timing calculation for every 1 RPM change (1000, 1002, .. , 9805, 9806, ...)

Very important!

Resistor spark plugs must be used, because they produce less electromagnetic disturbances.

Very important!

CDI is protected against static discharge, but too high static charge can damage CDI. Be careful when using programmer on the dyno, because static charge can build up on the bike and static discharge can damage CDI unit, or programmer. Make ground connection between dyno and bike frame to prevent static discharge through programmer and CDI.

Danger of electric shock!

Avoid connecting PDCI to 12V power supply, before connecting it to ignition coil. High voltage is generated and touching free wires can cause electric shock, or damage the unit.

For manuals, wiring diagrams and programming software visit our web site:

www.zeeltronic.com

ZeelProg SOFTWARE

Software can be downloaded from web site:
<http://www.zeeltronic.com/page/zeelprog.php>

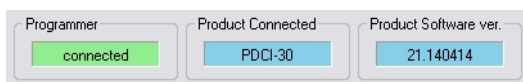
ZeelProg application can be installed on Windows XP/Vista/7/8/10/11.

ZeelProg USER INTERFACE

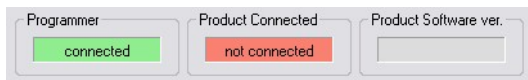
Auto detection

Zeelprog automatically detects USB-Programmer and type of *control unit*.

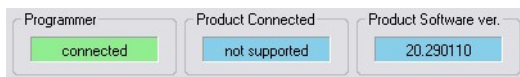
⇒ Programmer connected, product (*control unit*) connected:



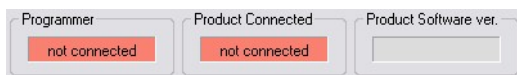
⇒ Programmer connected, product (*control unit*) not connected:



⇒ Programmer connected, product (*control unit*) not supported:



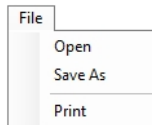
⇒ Programmer not connected, product (*control unit*) not connected:



Menu structure

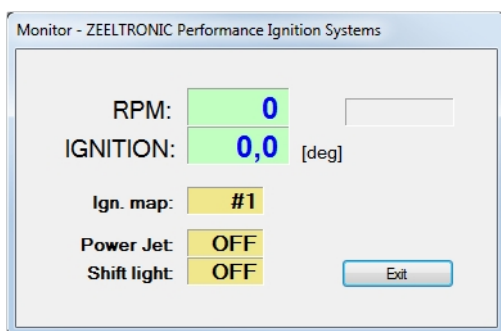


⇒ **File** menu is active when PC-USB programmer is connected



- Open** → Open an existing *.zee file
- Save As** → Save all parameters to *.zee file
- Print** → Print ZeelProg screen with all parameters and charts

⇒ **Monitor** is active when *control unit* is connected to PC-USB programmer.
Clicking on the **Monitor** opens Monitor window.



⇒ Clicking on **About** opens About window and show some basic information about **ZeelProg** application.



Ignition Parameters

The screenshot displays the 'Ignition Parameters' configuration window. It is divided into two main sections for 'Ignition Map #1' and 'Ignition Map #2'. Each map section includes a 'Nr. of Points' dropdown (set to 12) and a table of 12 points. Each point is defined by its RPM value and its corresponding advance in degrees. For example, in Map #1, the first point is at 2000 RPM with 20.0 degrees advance, and the last point is at 12000 RPM with 7.5 degrees advance. To the right of the maps are various global settings: 'Ign. Map Switch' (checked), 'Select Ignition Map' (set to 1), 'Nr. of Pickups' (set to 3), 'Ign. Per Rev' (set to 3), 'Static Angle' (35.0), 'Advance' (0.0), 'Advance Out 1' (0.0), 'Advance Out 2' (0.0), 'Advance Out 3' (0.0), 'Delay Compensation' (30), 'Shift Light' (12000), 'Rev Limit' (13000), 'Quick Shift' (checked), 'Smart Shift' (checked), 'Kill Time' (70), 'Power Jet' (unchecked), 'Invert Polarity' (unchecked), 'Power Jet ON' (6000), and 'Power Jet OFF' (8000).

- ⇒ **Nr. of Points** for each ignition map can be set from 4 to 12.
- ⇒ **RPM** of each ignition point can be set from 100rpm to 20000rpm in 100rpm steps.
- ⇒ **deg**...advance of each ignition point can be set from 0deg to 85deg in 0,1deg steps
- ⇒ **Ignition Map Switch**...enables, or disables ignition map switch. Ignition map can be selected with switch, when function is enabled.
- ⇒ **Select Ignition Map**...selection is active only when **Ignition Map Switch** is not enabled.
- ⇒ **Nr. of Pickups**... **PDCI** can run with 1, or 3 pickups. When using one pickup, then all 3 ignition coils fire at the same time.
- ⇒ **Ign. Per Rev**... number of ignitions per revolution can be set only when number of pickups is set to 1. When using one pickup then all 3 ignition coils fire at the same time, but they can fire every 360 deg (setting 1, one lobe at trigger rotor), 180 deg (setting 2, two lobes at trigger rotor) and 120 deg (setting 3, three lobes at trigger rotor).
- ⇒ **Static Angle** is pickup advance position from TDC (Top Dead Centre)
- ⇒ **Advance**...advances, or retards whole ignition map from -10deg to 10deg in 0,1deg steps. Positive value advances and negative value retards.
- ⇒ **Advance out 1**...advances, or retards ignition output 1 for -10deg to 10deg in 0,1deg steps. Positive value advances and negative value retards.
- ⇒ **Advance out 2**...advances, or retards ignition output 2 for -10deg to 10deg in 0,1deg steps. Positive value advances and negative value retards.
- ⇒ **Advance out 3**...advances, or retards ignition output 3 for -10deg to 10deg in 0,1deg steps. Positive value advances and negative value retards.
- ⇒ **Delay Compensation**...ensure correct ignition angle through whole revs. Default value is 30us.
- ⇒ **Rev limit**...limits maximum revolutions. Set to maximum 20000rpm in 100rpm steps.
- ⇒ **Shift light**...activate shift light output above programmed revs. Set to maximum 20000rpm in 100rpm steps.
- ⇒ **Smart Shift**... enable, or disable Smart Shift. Smart shift function automatically adjusts kill time for different revs. Shift kill time must be always set, as basic kill time.
- ⇒ **Kill Time**... for shifting without using clutch - shift sensor is required. Function is disabled with setting to 0ms.
- ⇒ **Power Jet 'ON' rpm**... revs for activating Power Jet
- ⇒ **Power Jet 'OFF' rpm**... revs for deactivating Power Jet
- ⇒ **Invert Polarity of Power Jets**... when checked, operation of power jets is inverted.

Example:

Power jet ON (RPM) = 8000rpm

Power jet OFF (RPM) = 10000rpm

Power jet is switched on when revs are between 8000-10000rpm, otherwise power jet is switched off.

PROGRAMMING AND SETTING NEW PARAMETERS

- ⇒ While programming or reading, *control unit* does not need to be connected to power supply, because it is supplied through PC-USB programmer.

Changing control unit parameters

- ① Read parameters from connected *control unit*, by pressing **Read** button.



Progress bar indicate read and verify process.

Successful reading is indicated as:



Error while reading is indicated as:



If error occurs, then repeat reading.

- ② Change parameters

- ③ Program parameters to connected *control unit*, by pressing **Program** button.



Progress bar indicate program and verify process.

Successful programming is indicated as:



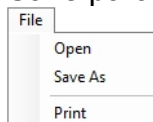
Error while programming is indicated as:



If error occurs, then repeat programming.

Make new *.zee file without connecting control unit

- ① Connect PC-USB programmer to PC.
② Set parameters
③ Save parameters by clicking **Save As** from **File menu**.

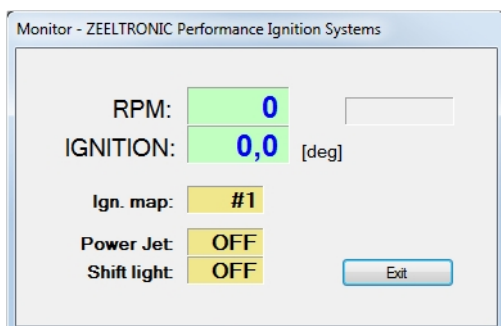


MONITOR FUNCTION

- ⇒ **Monitor** function is active when *control unit* is connected to PC-USB programmer.



Clicking on **Monitor** opens Monitor window.



- ⇒ Monitor shows engine revolution, ignition advance angle, selected ignition map, shift light operation, rev limit operation, power jet operation.

MEASURING STATIC ANGLE

Measuring correct static angle is very important. Wrong static angle will cause inaccurate ignition advance. If static angle is programmed larger than mechanical static angle ignition advance will be smaller than programmed, or vice versa. The most accurate procedure of measuring static angle is with dial gauge and strobe light.

Procedure applies to single and multiple cylinder engines. If you have a multi cylinder engine with multiple pickups it is recommended (but not required) that you perform this procedure on each cylinder/pickup pair for most accurate timing.

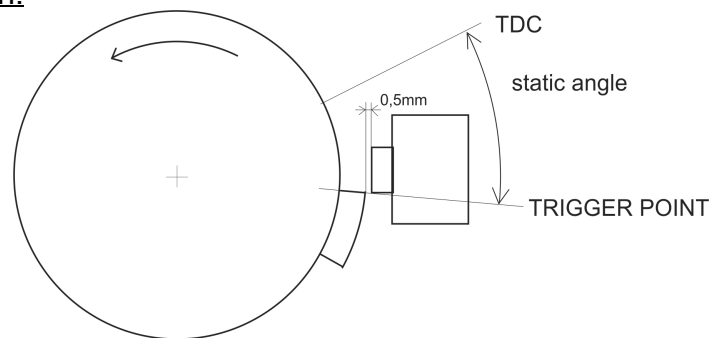
Necessary tools:

- strobe light
- dial gauge

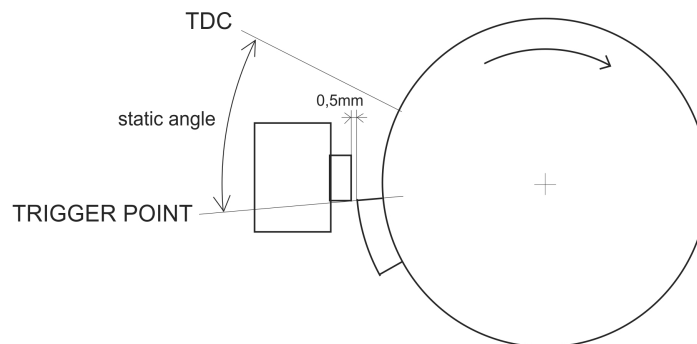
Follow the procedure:

Measure approximate static angle with a degree wheel, just to have starting point...look at the drawing below.

Counterclockwise rotation:



Clockwise rotation:



- program CDI with measured approximate static angle
- program CDI with flat ignition curve...16deg advance is suitable for most engines.
- find information about engine stroke and conrod length
- convert programmed flat ignition advance angle to millimetres

Example:

$\alpha = 16\text{deg}$ (ignition advance)

$L = 110\text{mm}$ (conrod length)

$R = 54/2 = 27\text{mm}$ (engine stroke divided by 2)

$T = 1,3\text{mm}$ (calculated ignition advance in mm)

Equation for calculating from degrees to millimetres:

α = ignition advance in degrees

T = ignition advance in mm

R = engine stroke divided by 2 in mm

L = conrod length in mm

$$T = L + R \cdot (1 - \cos \alpha) - \sqrt{L^2 - (R \cdot \sin \alpha)^2}$$

Downloadable spreadsheet is available on request.

- remove sparkplug from cylinder head and mount dial gauge in cylinder.
- find TDC (Top Dead Centre)
- rotate engine backwards (opposite from running engine rotation) to calculated advance
in millimetres (in example above it is 1,3mm) and make marks on rotor and stator
- remove dial gauge and install sparkplug back in cylinder head
- start engine and run at constant speed of 3000rpm to 4000rpm
- use a strobe light to check alignment of marks on rotor and stator
- adjust static angle with programmer to align marks on the rotor and stator

Result of above procedure is very accurate static angle.

Important!

- Static angle is reference point for CDI to calculate delay for programmed ignition advance.
- Static angle has to be greater than maximum ignition advance!
- Example - If maximum advance in ignition map is 30deg, then static angle has to be at least 31deg.
- Very large static angles are not a good solution, because it decreases electronic ignition advance stability (do not use static angle greater than 45deg if not necessary).

If you find when testing with your strobe light that your timing marks are off by 10 or more degrees it may be necessary to reverse the wiring from the reluctor pickup to the ignition and test again. Reluctor pickups have polarity but it is rarely marked on the pickups so must be determined by the trial and error method. Incorrect wiring polarity will cause the reluctor pickup to send the trigger signal on the trailing edge of the rotor instead of the required leading edge of the rotor.