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USER MANUAL
PDCIS-02T PROGRAMMABLE DC-CDI IGNITION

PDCIS-02T is single channel DC-CDI with 2 switchable ignition maps, latching stop and automatic power down with extremely low current. It can be programmed with handheld programmer, or PC.

TECHNICAL DATA

Limit values:
- minimum revs	200 RPM
- maximum revs	20000 RPM
- minimum supply voltage	9 Volts
- maximum supply voltage	17 Volts
- recommended power supply voltage	12÷15 Volts
- automatic power down current	0,5 mAmp
- max idle current draw	0,15 Amp
- constant output energy from idle to 12500 RPM	>55mJ
- output energy at 15000 RPM	>45mJ
- output energy at 20000 RPM	>33mJ
- max current	1,2 Amp

Circuit is protected against reverse supply voltage (wrong connection).

Features:
- fast power-up (also starts only with condenser)
- full power starting spark energy already at 8Volts power supply
- one isolated input for magnetic pickup
- store and load function for two ignition curves
- external switch for changing ignition map while riding
- soft rev limit (three stage rev limit)
- easy and fast programming on the field, via hand held programmer and PC
- programming while machine running - you can immediately see effects
- each curve can be set in 4 to 12 curve points
- signal delay compensation
- latching stop
- automatic power down
- instant monitoring of rev's and angle, via LCD(hand held programmer)
- fast processing for high accuracy - delays from 1us
- timing calculation for every 1 RPM change (1000, 1002, .. , 9805, 9806, ...)

<u>Very important!</u>
Resistor spark plugs must be used, because they produce less electromagnetic disturbances.

<u>Danger of electric shock!</u>
Avoid connecting PDCI to 12V power supply, before connecting to ignition coil. High voltage is generated and touching free wires can cause electric shock, or damage the unit.

1.   HOW TO ENTER MENU

PDCIS must be connected to power supply. Connect **programmer** to **PDCIS** and wait few seconds for activation of **programmer** and then press enter. With pressing + or - you can move through menu and with pressing enter you can choose.
You can exit menu with choosing *Exit.*

2.   MENU ORGANISATION

Load Ign. Curve	- load previously saved ignition map (from #1 to #2)
Save Ign. Curve	- save new ignition map (from #1 to #2)
Set Ignition Curve	- ignition curve parameters
Advance	- advance/retard whole ignition map
Rev Limit	- rev limit
Static Angle	- static angle (pickup sensor position)
Compensation	- signal delay compensation (from pickup to spark plug)
Ign. Map SW	- enable/disable external switch for changing ignition map
Pulses Per Rev	- number pulses per revolution from pickup
Trigger Mode	- trigger mode
Ignition Test	- spark execution test without running engine
Stop SW Mode	- stop switch mode
Latching Stop	- enable/disable latching stop
Exit	

3.   LOAD IGN. CURVE

Enter menu and move to *Load Ign. Curve* with pressing + , or - and then press enter .
Now you can select position number of previously saved ignition curve, with pressing + , or - and then press enter .

4.   SAVE IGN. CURVE

Enter menu and move to *Save Ign. Curve* with pressing + , or - and then press enter .
Now you can select position number to which you want to save your ignition curve set, with pressing + , or - and then press enter .

5.   Change IGNITION CURVE

Enter menu and move to *Set Ignition Curve* with pressing + , or - and then press enter .
Now you are in submenu for setting ignition curve.

Submenu organisation:
Nr. of Points   - number of ignition curve points (from 4 to 12)
1)   - first ignition curve point
2)   - second ignition curve point
...   ...
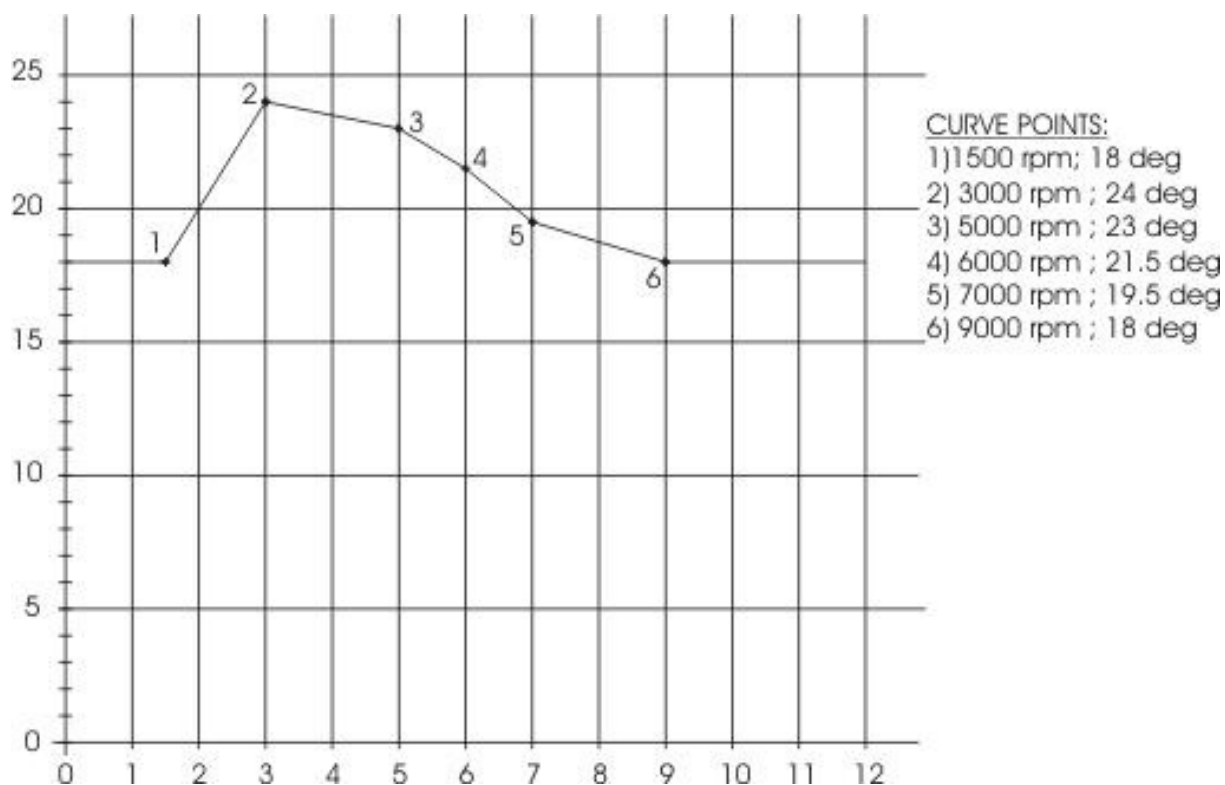*Exit Curve*   - exit submenu
Important!
To avoid wrong processing, don't make unreasonable curve course.
Every time you make any changes to ignition curve, it is automatically saved to #0 position.
Then you can save it to any other position number from #1 to #2.

Curve Example with six curve points:

CURVE POINTS:
1) 1500 rpm; 18 deg
2) 3000 rpm ; 24 deg
3) 5000 rpm ; 23 deg
4) 6000 rpm ; 21.5 deg
5) 7000 rpm ; 19.5 deg
6) 9000 rpm ; 18 deg

5.1.   Change NUMBER OF IGNITION CURVE POINTS

Move to *Nr. of Points* with pressing + , or - and then press enter .
Now you can select number of ignition points, with pressing + , or - and then press enter .

5.2.   Change PARAMETERS OF IGNITION CURVE POINT

Move to point you want to change, with pressing + , or - and then press enter .
Now you can change rev point with pressing + , or - (in 100 rpm steps) and then press enter .
Now you can change advance angle with pressing + , or - (in 0.1deg steps) and then press enter .

6.   Set ADVANCE

With this setting is possible to advance or retard whole ignition curve. When setting is positive then ignition curve is advanced and when setting is negative than ignition curve is retarded. With *Advance 0.0deg*, ignition curve is unchanged.
Enter menu and move to *Advance* with pressing + , or - and then press enter .
Now you can set advance with pressing + , or - (in 0.1deg steps) and then press enter .

7.   Set REV LIMIT

Enter menu and move to *Rev Limit* with pressing + , or - and then press enter .
Now you can change rev limit with pressing + , or - (in 100 rpm steps) and then press enter .

8.   Set STATIC ANGLE

Enter menu and move to *Static Angle* with pressing + , or - and then press enter .
Now you can set static angle with pressing + , or - (in 0.1deg steps) and then press enter .

More information's about static angle you can find in section 15.

9.   COMPENSATION

It is compensation of signal delay from pickup to spark plugs. You can check this delay with stroboscope lamp. Without this compensation, ignition advance angle decreasing with rising revs.
This compensation helps that advance angles in ignition curve are real (more accurate).

How to check, if compensation is correct:
First you must set flat ignition curve. Then measure with stroboscope lamp, if mark at flywheel moving when changing revs. If mark moving then you must change compensation delay.

Change Compensation:
Enter menu and move to *Compensation* with pressing + , or - and then press enter .
Now you can change compensation delay with pressing + , or - and then press enter .

10. IGNITION MAP SWITCH

Enabling, or disabling ignition map switch for changing ignition curves while riding.

Enter menu and move to *Ign. Map SW* with pressing + , or - and then press enter .
Now you can enable, or disable external switch with pressing + , or - and then press enter .

11. Set PULSES PER REV

It is number of pulses per rev from pickup coil and is important for correct rev reading. Set 1 for single cylinder engines. Set 2 for all twins with wasted spark ignition system.
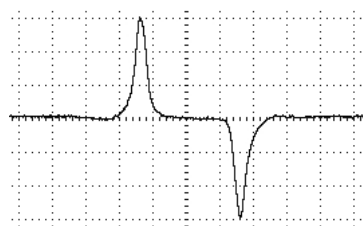Enter *Set Ign.* menu and move to *Pulses Per Rev* with pressing + , or - and then press enter.
Change nr. of pulses per rev with pressing + , or -   and then press enter .

12. Set TRIGGER MODE

Enter *Set Ign.* menu and move to *Trigger Mode* with pressing + , or - and then press enter.
Change *Trigger Mode* with pressing + , or -   and then press enter .

Trigger signal from pickup consist of positive and negative pulse. Positive pulse must be first and is generated by leading edge of trigger bar...negative pulse must be second and is generated by trailing edge of trigger bar.
If trigger signal is opposite (first negative and second positive), then wires from the pickup need to be switched...that changes polarity of signal from pickup.
Positive pulse defines static angle position and negative pulse defines idle running timing position.
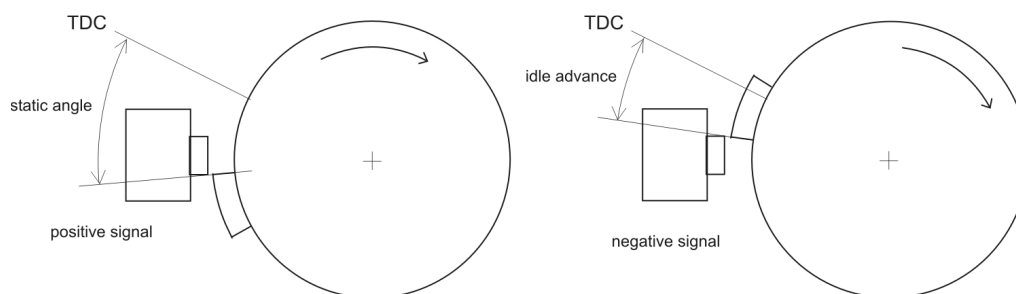
When **"only [+] signal"** is selected, then only positive signal is detected and ignition timing is calculated for all revs as programmed with ignition map.

When **"[+] and [-] signal"** is selected, then both signals are detected. Revs of first ignition point define switching point between, programmed ignition map and idle running timing position.

- Ignition timing is defined with trailing edge of trigger bar, at revs lower then first ignition point (idle advance...look at drawing above).

- Ignition timing is defined with programmed map, at revs higher then first ignition point.

<u>Example:</u> if first ignition point is programmed at 1500rpm, then below 1500rpm, ignition timing is defined with trailing edge of trigger bar (idle advance...look at drawing above) and above 1500rmp, ignition timing is defined by programmed ignition map.

Set **"only [+] signal"** when using custom, or modified trigger rotor, or upgrade from static ignition timing CDI.

Set **"[+] and [-] signal"** when using original trigger rotors, or flywheels. First ignition point should be programmed somewhere between 1000-2000rpm.

13. IGNITION TEST

Spark execution test without running engine. Spark can be optically checked, with removed spark plug connected to plug cup and to the ground.

Enter menu and move to *Ignition Test* with pressing + , or - . With pressing enter multiple spark will occur, for about 1s.

14. Set STOP SWITCH MODE

It defines stop switch position for engine stop.

"**Low Level Stop**" ... engine stops when low level signal (when stop switch connected to the ground).

"**High Level Stop**" ... engine stops when high level signal (when stop switch is opened).

Enter menu and move to *Stop SW Mode* with pressing + , or - and press enter. Change *Stop SW Mode* with pressing + , or - and then press enter .

15. LATCHING STOP

When "**Latching Stop**" enabled then engine stops with short push on stop switch.

Enter menu and move to *Latching Stop* with pressing + , or - and press enter. Enable, or disable *Latching Stop* with pressing + , or - and then press enter .

16. MECHANICAL SETTINGS (Static Angle)

Static Angle is ignition advance angle, set with pickup sensor position.

Measure this angle with dial gauge. This measured **Static Angle** is your maximum advance angle you can set with **PDCIS**.

Calculating mm to deg or vice versa:

$$\alpha = \text{ignition advance in degrees}$$
$$T = \text{ignition advance in mm}$$
$$R = \text{engine stroke divided by 2 in mm}$$
$$L = \text{conrod length in mm}$$
$$P = R + L - T$$
$$\alpha = \cos^{-1}\left(\frac{P^2 + R^2 - L^2}{2 \cdot P \cdot R}\right)$$
$$T = L + R \cdot (1 - \cos\alpha) - \sqrt{L^2 - (R \cdot \sin\alpha)^2}$$

17. MONITORING

Connect **programmer** to **PDCIS** and wait few seconds for activation of **programmer.** Fist information displayed on the **programmer** is software version.

With **programmer** you can watch revs, calculated advance ignition angle, selected ignition curve, TPS position...depends on setting in the menu.

Information!
You can connect or disconnect **PDCIS** unit from **programmer** any time you want, without any harm. It is not important, if motor running or not and if power supply is connected or not.

Important!
Do not use too much force when connecting or disconnecting **programmer** unit!