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updated 12.06.2024
program version: 31.240531

USER MANUAL
PDCI-30 PROGRAMMABLE CDI IGNITION

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	>35 mJ

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

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

Danger of electric shock!
Avoid connecting PDCI to 12 V 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

PDCI does not need to be connected to power supply when battery is installed in to the handheld programmer. Connect **programmer** to **PDCI** and wait few seconds for activation of **programmer** and then press ENTER. Move through menu with pressing +, or - and choose with pressing ENTER.
Exit menu with choosing ***Exit.***

2. MENU ORGANISATION

Load Ign. Map	- load (select) ignition map (from #1 to #2)
Save Ign. Map	- save new ignition map (from #1 to #2)
Set Ignition Map	- ignition map parameters submenu
Advance	- advance/retard whole ignition map on both ignition coil outputs
Advance 1	- advance/retard ignition coil output 1
Advance 2	- advance/retard ignition coil output 2
Advance 3	- advance/retard ignition coil output 3
Gear Shift Light	- shift light
Quick Shift	- quick shift settings
Rev Limit	- rev limit
Static Angle	- static angle (stator position)
Compensation	- signal delay compensation (from pickup to spark plug)
Power Jet 1	- power jet 1
Ign. Map SW	- activating/deactivating external switch for selecting ignition map
Nr. of Pickups	- number of connected pickups
Ign. Per Rev	- number of ignitions per revolution
Ignition Test	- test ignition spark
Exit	

3. LOAD IGN. MAP

Enter ***Set Ign.*** menu and move to ***Load Ign. Map*** with pressing +, or - and then press ENTER.
Select number of previously saved ignition map, with pressing +, or - and then press ENTER.

4. SAVE IGN. MAP

Enter ***Set Ign.*** menu and move to ***Save Ign. Map*** with pressing + , or - and then press ENTER . Select number to which you want to save your ignition map, with pressing + , or - and then press ENTER .

5. Change IGNITION MAP *(if TPS disabled)*

Enter ***Set Ign.*** menu and move to ***Set Ignition Map*** with pressing + , or - and then press ENTER . You are in submenu for setting ignition map.

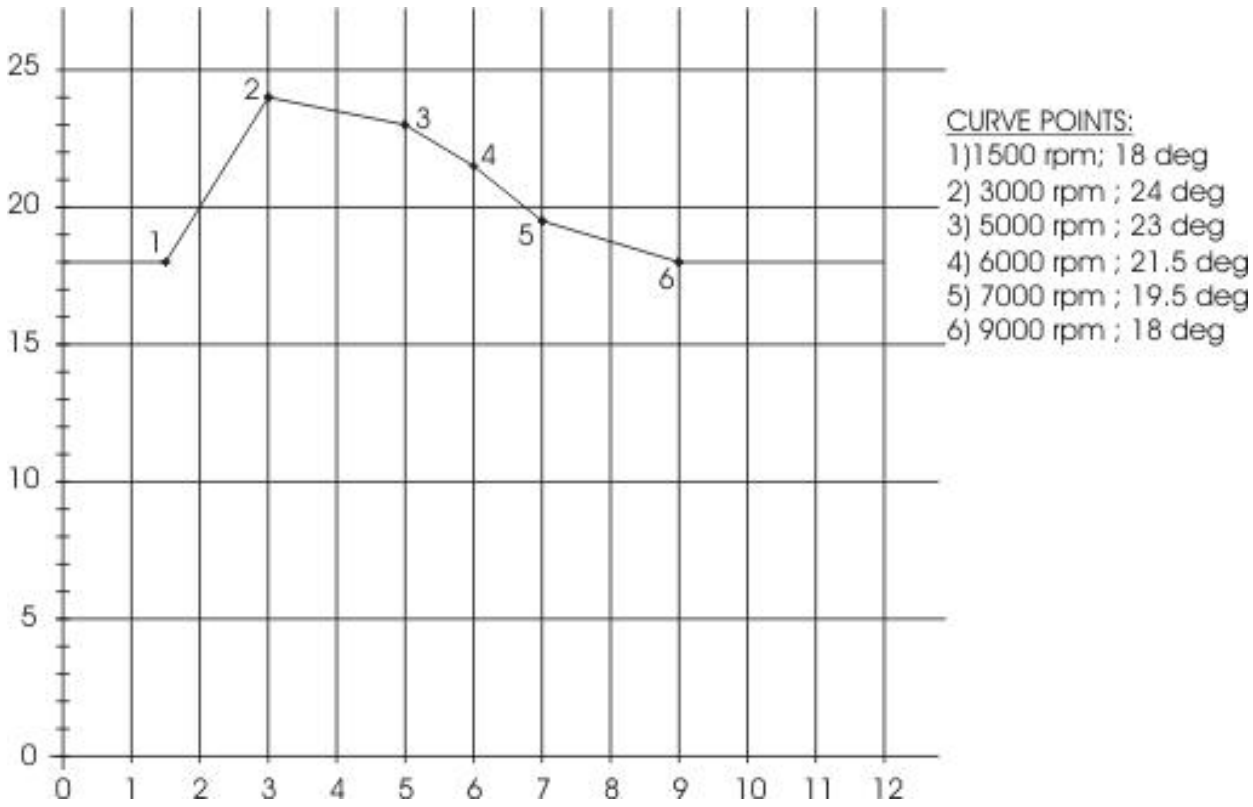
Submenu organisation:

Nr. of Points	- number of ignition map points (from 4 to 12)
1)	- first ignition map point
2)	- second ignition map point
...	...
...	...
Exit	- exit submenu

Important!

To avoid wrong processing, don't make unreasonable map course.
Every time you make any changes to ignition map, it is automatically saved to position #0. Later you can save it to any other position number #1 or #2.

Ignition map example with six curve points:



5.1. Change NUMBER OF IGNITION CURVE POINTS

Move to ***Nr. of Points*** with pressing + , or - and press ENTER .
Select number of ignition points, with pressing + , or - and press ENTER .

5.2. Change PARAMETERS OF IGNITION CURVE POINT

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

6. 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.

Enter ***Set Ign.*** menu and move to ***Advance*** with pressing + , or - and press ENTER .
Set advance with pressing + , or - (in 0.1deg steps) and then press ENTER .

7. ADVANCE 1

With this setting is possible to advance, or retard ignition map only on ignition coil output 1. When setting is positive, then ignition curve is advanced and when setting is negative than ignition curve is retarded.

Enter ***Set Ign.*** menu and move to ***Advance 1*** with pressing + , or - and press ENTER .
Set advance with pressing + , or - (in 0.1deg steps) and then press ENTER .

8. ADVANCE 2

With this setting is possible to advance, or retard ignition map only on ignition coil output 2. When setting is positive, then ignition curve is advanced and when setting is negative than ignition curve is retarded.

Enter ***Set Ign.*** menu and move to ***Advance 2*** with pressing + , or - and press ENTER .
Set advance with pressing + , or - (in 0.1deg steps) and then press ENTER .

9. ADVANCE 3

With this setting is possible to advance, or retard ignition map only on ignition coil output 3. When setting is positive, then ignition curve is advanced and when setting is negative than ignition curve is retarded.

Enter ***Set Ign.*** menu and move to ***Advance 3*** with pressing + , or - and press ENTER .
Set advance with pressing + , or - (in 0.1deg steps) and then press ENTER .

10. GEAR SHIFT LIGHT

Enter ***Set Ign.*** menu and move to ***Set Ign.*** menu and move to ***Gear Shift Light*** with pressing + , or - and press ENTER .
Change rev point with pressing + , or - (in 100 rpm steps) and then press ENTER .

11. QUICK SHIFT

Enter ***Set Ign.*** menu and move to ***Quick Shift*** with pressing + , or - and press ENTER .
...you entered submenu for quick shift settings.

Submenu organisation:
Shift Kill Time - basic kill time
Smart Shift - activating/deactivating automatic kill time for different revs
Exit - exit submenu

11.1. SHIFT KILL TIME

Enter ***Set Ign.*** menu and move to ***Quich Shift*** menu and move to ***Shift Kill Time*** with pressing + , or - and press ENTER .
Change kill time with pressing + , or - (in 10 ms steps) and then press ENTER .

11.2. SMART SHIFT

Smart shift function automatically adjusts kill time for different revs. Shift kill time must be always set, as basic kill time.
Enter ***Set Ign.*** menu and move to ***Quich Shift*** menu and move to ***Smart Shift*** with pressing + , or - and press ENTER .
Enable, or disable function with pressing + , or - and press ENTER .

12. REV LIMIT

Enter ***Set Ign.*** menu and move to ***Rev Limit*** with pressing + , or - and press ENTER .
Change rev limit with pressing + , or - (in 100 rpm steps) and then press ENTER .

13. STATIC ANGLE

Enter ***Set Ign.*** menu and move to ***Static Angle*** with pressing + , or - and then press ENTER .
Set static angle with pressing + , or - (in 0.1deg steps) and then press ENTER .

14. 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. Compensation helps that advance angles in ignition map are accurate.
How to check, if compensation is correct?
First you have to set flat ignition curve. Then measure with stroboscope lamp, if mark at flywheel moves when changing revs. If mark moves, then compensation delay must be changed.
Default value is 30 us and is correct for most applications.

Change Compensation:
Enter ***Set Ign.*** and move to ***Compensation*** with pressing + , or - and press ENTER .
Change compensation delay with pressing + , or - and press ENTER .

15. POWER JET 1

Enter ***Set Ign.*** menu and move to ***Power Jet 1*** with pressing + , or - and press ENTER .
...you entered submenu for ***Power Jet 1***.

Submenu organisation:

Invert Polarity	- enable/disable invert operation of power jet 1
Power Jet 1 ON RPM	- revs for activating power jet 1
Power Jet 1 OFF RPM	- revs for deactivating power jet 1
Exit	- exit submenu

Example:
Power jet 1 ON (RPM) = 8000rpm
Power jet 1 OFF (RPM) = 10000rpm

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

16. IGN. MAP SW

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

Enter ***Set Ign.*** menu and move to ***Ign. Map SW*** with pressing + , or - and press ENTER .
Enable, or disable external switch with pressing + , or - and press ENTER .

17. NUMBER OF PICKUPS

PDCI can run with 1, or 3 pickups.
When using one pickup, then all 3 ignition coils fire at the same time.

Enter menu and move to ***Nr. of Pickups*** with pressing + , or - and press ENTER .
Change nr. of pickups with pressing + , or - and press ENTER .

18. IGNITIONS PER REVOLUTION

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).

Enter menu and move to ***Ign. Per Rev*** with pressing + , or - and press ENTER .
Change setting with pressing + , or - and press ENTER .

18. 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 sparks will occur, for about 1s at each output channel.

19. MECHANICAL SETTINGS (Static Angle)

Static Angle is ignition advance angle, set with stator (generator).
Measure this angle with dial gauge. This measured **Static Angle** is your maximum advance angle you can set with **PDCI**.

Calculating mm to deg or vice versa:

α = ignition advance in degrees
T = ignition advance in mm
R = engine stroke divided by 2 in mm
L = conrod length in mm

$$P = R + L - T$$

$$\alpha = \cos^{-1}\left(\frac{P^2 + R^2 - L^2}{2 \cdot P \cdot R}\right)$$

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

20. MONITORING

Connect **programmer** to **PDCI** 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, TPS position...depends on setting in the menu.

Information!
You can connect or disconnect **PDCI** 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!