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USER MANUAL
PDCI-12 PROGRAMMABLE CDI IGNITION

TECHNICAL DATA

Limit values:

- minimum revs	200 RPM
- maximum revs	20000 RPM
- minimum supply voltage	9 Volts
- maximum supply voltage	18 Volts
- max idle current draw	60 mAmp
- 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 13000 RPM	>35mJ

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

Features:
- one channel isolated input (pickup)
- store and load function for two ignition curves
- RAVE output (Aprilia RS125 exhaust valve)
- TPS input (Throttle Position Sensor)
- shift light output
- power jet output
- quick shift (shift kill)
- soft rev limit (three stage rev limit)
- external switch for changing ignition map while riding
- tachometer output
- easy and fast programming on the field, via hand held programmer
- programming while machine running - you can immediately see effects
- each curve can be set in 4 to 12 curve points
- 3D interpolated ignition map, if TPS selected
- signal delay compensation
- 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, ...)

Very important!
Resistor spark plugs, or resistor spark plug caps must be used, because they produce less electromagnetic disturbances.

1. HOW TO ENTER MENU

PDCI must be connected to power supply. Connect **programmer** to **PDCI** 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 curve set (from #1 to #2)
Save Ign. Curve	- save new ignition curve set (from #1 to #2)
Set Ignition Curve	- ignition curve parameters
RAVE open	- RAVE solenoid (Aprilia exhaust valve)
Advance	- advance/retard whole ignition curve
Gear Shift Light	- shift light
Shift Kill Time	- shift kill time
Rev Limit	- rev limit
Static Angle	- static angle (stator position)
Compensation	- signal delay compensation (from pickup to spark plug)
Power Jet	- power jet
TPS	- enable/disable Throttle Position Sensor
TPS close [0%]	- calibrating TPS close position (only if TPS enabled)
TPS open [100%]	- calibrating TPS open position (only if TPS enabled)
Remote SW	- enable/disable external switch for changing ignition map
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 set, 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 *(if TPS disabled)*

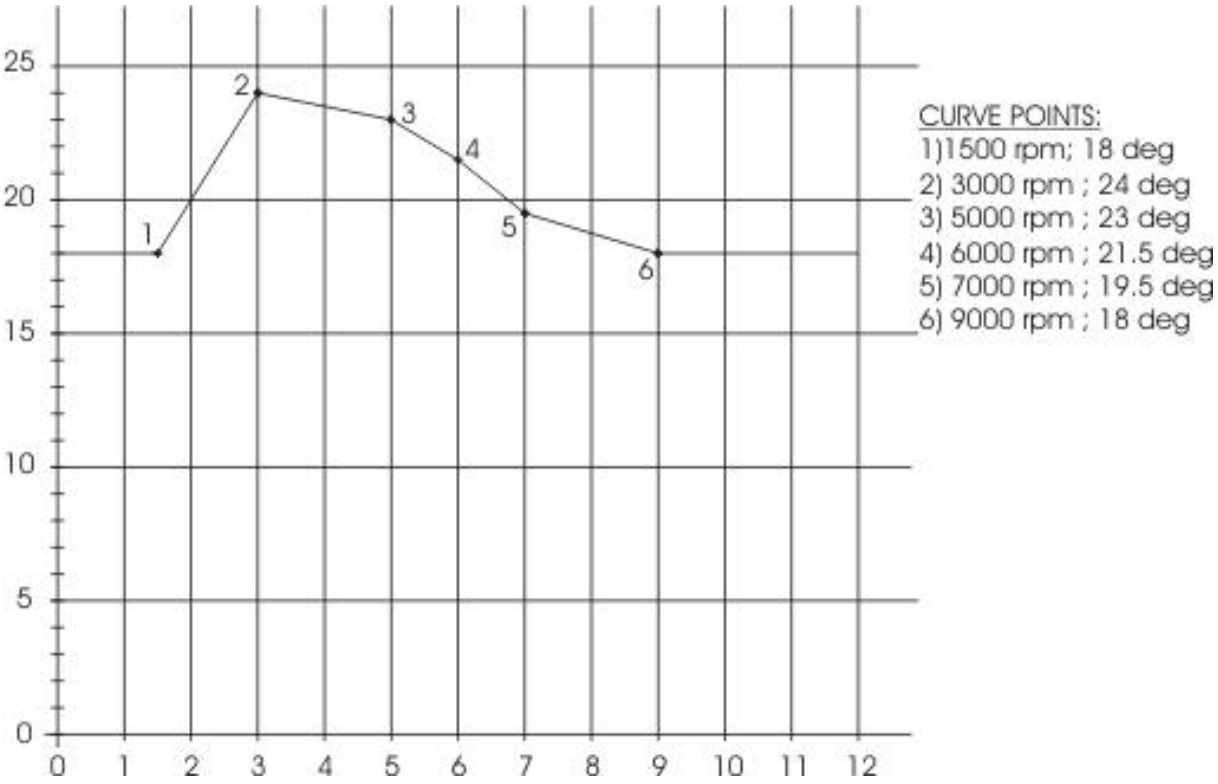
Enter menu and move to ***Set Ignition Curve*** with pressing [+] or [-] and then press [enter] .
Now you are in submenu for setting ignition curve.

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:



5.1. Set IGNITION CURVE *(if TPS enabled)*

Three ignition curves must be programmed for different TPS positions. **PDCI** does not only switch between ignition curves, but also calculate timing between programmed curves for all TPS positions above 33%. From 0% to 33% TPS is used only one ignition curve.

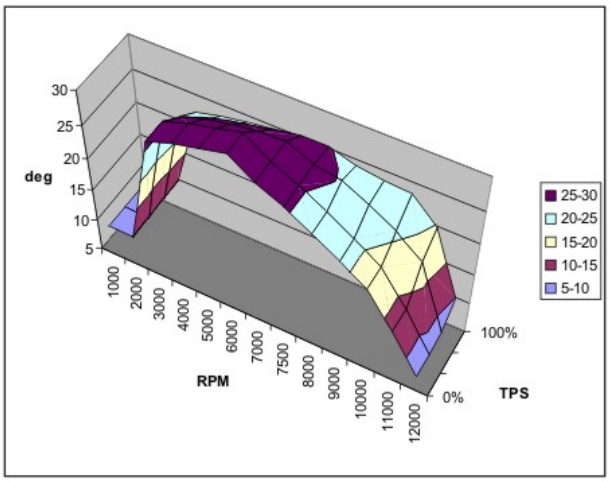
Enter menu and move to ***Ignition Curve*** with pressing [+] or [-] and then press [enter] .
Now you are in submenu for selecting ignition curve.

Submenu organisation:

Nr. of Points	- number of ignition curve points (from 4 to 10)
Curve 0-33%	- ignition curve from 0 to 33% TPS
Curve 66%	- ignition curve for 66% TPS
Curve 100%	- ignition curve for 100% TPS
Exit	- 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:



5.2. 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] .

5.3. 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 RAVE open

Enter menu and move to ***RAVE open*** with pressing [+] or [-] and then press [enter] .
Now you can change rev point with pressing [+] or [-] (in 100 rpm steps) and then press [enter] .

7. 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] .

8. Set GEAR SHIFT LIGHT

Enter menu and move to ***Gear Shift Light*** with pressing [+] or [-] and then press [enter] .
Now you can change rev point with pressing [+] or [-] (in 100 rpm steps) and then press [enter] .

9. Set SHIFT KILL TIME

Enter menu and move to ***Shift Kill Time*** with pressing [+] or [-] and then press [enter] .
Now you can change kill time with pressing [+] or [-] (in 10 ms steps) and then press [enter] .

10. 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] .

11. 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.

12. Set 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] .

13. Set POWER JET parameters

Enter menu and move to ***Power Jet*** with pressing [+] or [-] and then press [enter] .
Now you are in submenu for selecting ***Power Jet*** parameters.

Submenu organisation:

Power Jet ON RPM	- revs for activating power jet
Power Jet OFF RPM	- revs for deactivating power jet
Power Jet ON TPS	- throttle position for activating power jet
Exit	- exit submenu

Example:
Power jet ON (RPM) = 8000rpm
Power jet OFF (RPM) = 10000rpm
Power jet ON (TPS) = 90%TPS

Power jet is switched on, when revs are above 8000rpm and throttle position above 90%TPS.
Power jet is switched off, when revs are above 10000rpm or throttle position is below 90%TPS.

13.1. Set POWER JET ON RPM

Enter menu and move to ***Power Jet 1 ON RPM*** with pressing [+] or [-] and then press [enter] .
Now you can change rev limit with pressing [+] or [-] (in 100 rpm steps) and then press [enter] .

13.2. Set POWER JET OFF RPM

Enter menu and move to ***Power Jet OFF RPM*** with pressing [+] or [-] and then press [enter] .
Now you can change rev limit with pressing [+] or [-] (in 100 rpm steps) and then press [enter] .

13.3. Set POWER JET ON TPS

Enter menu and move to ***Power Jet ON TPS*** with pressing [+] or [-] and then press [enter] .
Now you can change TPS position with pressing [+] or [-] (in 1%TPS steps) and then press [enter] .

14. Set TPS

Enabling or disabling Throttle Position Sensor.

Enter menu and move to ***TPS*** with pressing [+] or [-] and then press [enter] .
Now you can enable or disable TPS with pressing [+] or [-] and then press [enter] .

15. Set TPS close [0%] *(if TPS enabled)*

For correct operation, TPS close position must be calibrated!
Enter menu and move to ***TPS close [0%]*** with pressing [+] or [-] and then press [enter] .
Leave throttle at close position and confirm calibrating with pressing [enter] , or exit calibration with pressing [-]. Displayed number should be between 0 and 500.

16. Set TPS open [100%] *(if TPS enabled)*

For correct operation, TPS open position must be calibrated!
Enter menu and move to ***TPS open [100%]*** with pressing [+] or [-] and then press [enter] .
Move throttle to maximum open position and confirm calibrating with pressing [enter] , or exit calibration with pressing [-]. Displayed number should be between 500 and 1010.

17. Set REMOTE SW

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

Enter menu and move to ***Remote SW*** with pressing [+] or [-] and then press [enter] .
Now you can enable or disable external switch with pressing [+] or [-] and then press [enter] .

18. 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

$$P = R + L - T$$

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

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

19. 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, selected ignition curve, 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!