



PLEASE READ THIS BEFORE STARTING THE INSTALLATION; IT IS NOT ABOUT THE TYPICAL BLA-BLA-BLA, BUT VITAL INFORMATION FOR THE FUNCTIONING OF YOUR IGNITION.

The electronic ignition you just purchased can provide you with years of great services, but it requires a proper and respectful installation with the recommended connections. Failure to proceed as indicated in the manual is possible to damage the electronic control unit, voiding the warranty of the product as the failure is due to incorrect handling and not to any manufacturing defect.

On the last page of the manual there is a typical connection diagram. In case of any doubt you can contact us through www.rmlightning.com where we will gladly answer any questions you wish to ask us.

Thank you for purchasing our RMLightning - RAL Digital

Welcome to RM Lightning. We hope that our ignition will meet your expectations and provide years of good service. For this we put at your disposal this manual, with which we try to clarify some key ideas for its correct installation and good use.

1. What is it?

It is a module that provides variable timing to the old electronic Motoplat ignitions and can provide a double ignition curve, depending on versions. It is designed to operate by condenser discharge (CDI technology in current slang), and can be fitted on almost any classic motorcycle equipped with Motoplat electronic igniters, usually installed as standard equipment in brands such as Montesa, Ossa, Puch, Fantic, Husqvarna, KTM, Maico, etc.

2. How does the CDI Motoplat ignition work?

The spark energy comes from the 2 microfarad capacitor integrated in the high Motoplat coil, previously charged to about 200V from a magneto winding, and ground by a diode incorporated in the electronic coil.

A thyristor, also integrated into the coil, abruptly discharges the capacitor onto the high coil the moment it receives the signal from a magnetic pick-up integrated into the stator.

3. What change does the digital RAL bring?

The pick-up signal does not immediately cause the spark, but it is governed by applying a variable delay to it. The delay is calculated round-trip by a programmable digital microprocessor to achieve at each speed the optimum timing with a precision of $\frac{1}{2}$ degree, according to a curve of configurable timing between 300 and 12800 RPM, in sections of 100 RPM.

Usually a CDI spark accompanied by a variable timing greatly improves the maximum power of the 2-stroke engine. In our bench tests, depending on the timing setting, constant increases in torque and improvements in maximum power are observed.

4. How is the timing modified?

The digital RAL, instead of advancing the ignition at high speed, starting from a small static advance, delays the ignition at low speeds starting from a maximum nominal advance, which never exceeds.

5. Can different ignition curves be programmed?

No, the Digital RAL has one or two timing curves pre-set at the factory. For a fully programmable ignition, visit the RMLightning website (www.rmlightning.com or www.avancevariable.com) for information on our latest models.

6. What advantages can be perceived with a variable timing?

Start without recoil, stable idle, and smoothness at low speed without sacrificing maximum power. It also incorporates a programmable ignition cut-off in the event of an excess of revolutions. The pick-up detector built into the digital RAL has better sensitivity than the original system, so it operates from lower speeds, making it easier to start..

7. Is it easy to install?

The installation of the RAL Digital is very simple, since it is enough to intercalate it in the original electric system of the motorcycle. Setting up requires the disassembly of the magnetic flywheel to set the desired new advance.

The adjusted advance must be at least 3° higher than the desired maximum advance. It is typically set to 4mm before the PMS for a variable timing between 0 and 3.5mm.

8. Is it compatible with all Motoplat electronic ignitions?

Some special models may require adding a load resistor between the feed and pick-up wires from the magnet. Specifically, the ignitions for motorbikes without light installation require the addition of a 100 ohm resistor for good performance. In this case, the sensitivity improvement described in point 6 is not obtained.

9. What tools do I need?

In addition to a set of socket wrenches, you need a specific steering wheel extractor for your motorcycle, steering wheel jaw, torque wrench and a screwdriver. The jaw is not necessary if a pneumatic impact gun is available.

10. How to check and adjust the ignition timing?

In the usual way in Motoplat electronic igniters: with a 2 mm rod to fix the moment of the maximum advance and the aid of a device of measurement of the advance or a gauge introduced by the hollow of the candle. Ideally it should then be checked in operation with a strobe gun.

In Montesa and Ossa ignitions (located to the right of the motorcycle and with a right turn) the plate should be moved to the left. On motorcycles with the left-hand ignition flywheel would proceed in reverse.

Installation Manual

A.- Description of the CDI module

The RAL Digital module is presented in a metal box with a fixing screw at the top that provides ground to the circuits in case of being screwed to the frame, an identification label at the bottom where you'll find your serial number and factory programmed curve.

It has at its two ends two groups of cables. The input consists of blue, black, and yellow (optional) cables. The output has white, black and green / yellow cables.

B.- Wiring

To work comfortably, it is normal to disassemble the necessary accessories to have access to all the points of the motorcycle where there are electrical connections. Especially, to the high coil area and the connections that get to the main switch..

Once the access is cleared, we connect the CDI module as follows:

1. The cables of the input group are connected as follows:
 - a. The black cable of the CDI input with the black cable coming from the stator.
 - b. The blue cable of the CDI input with the blue cable coming from the stator.
 - c. If present, the yellow cable of the CDI input is connected to a switch that allows it to be grounded to activate the second programmed curve.
2. The output group cables are connected as follows:
 - a. Black output wire from the CDI to the small input of the high coil. It provides the "trigger signal" to the coil.
 - b. White CDI wire to high input of high winding and motorcycle stop button. Provides high coil power.
 - c. Green / yellow ground wire. It can be connected to the screws that support the high coil in the frame.

C.- Timing

Each RAL Digital unit specifies the programmed curve and static timing to be adjusted.

But if you decide to adjust the timing with more or less advance, you will get an identical curve but displaced these same degrees in all the revs scale.

Usually a 4 mm timing is specified to obtain 3.5 mm of maximum timing.

In some cases an adjustment to 5 mm is specified, in order to obtain an timing of up to 4.5 mm.

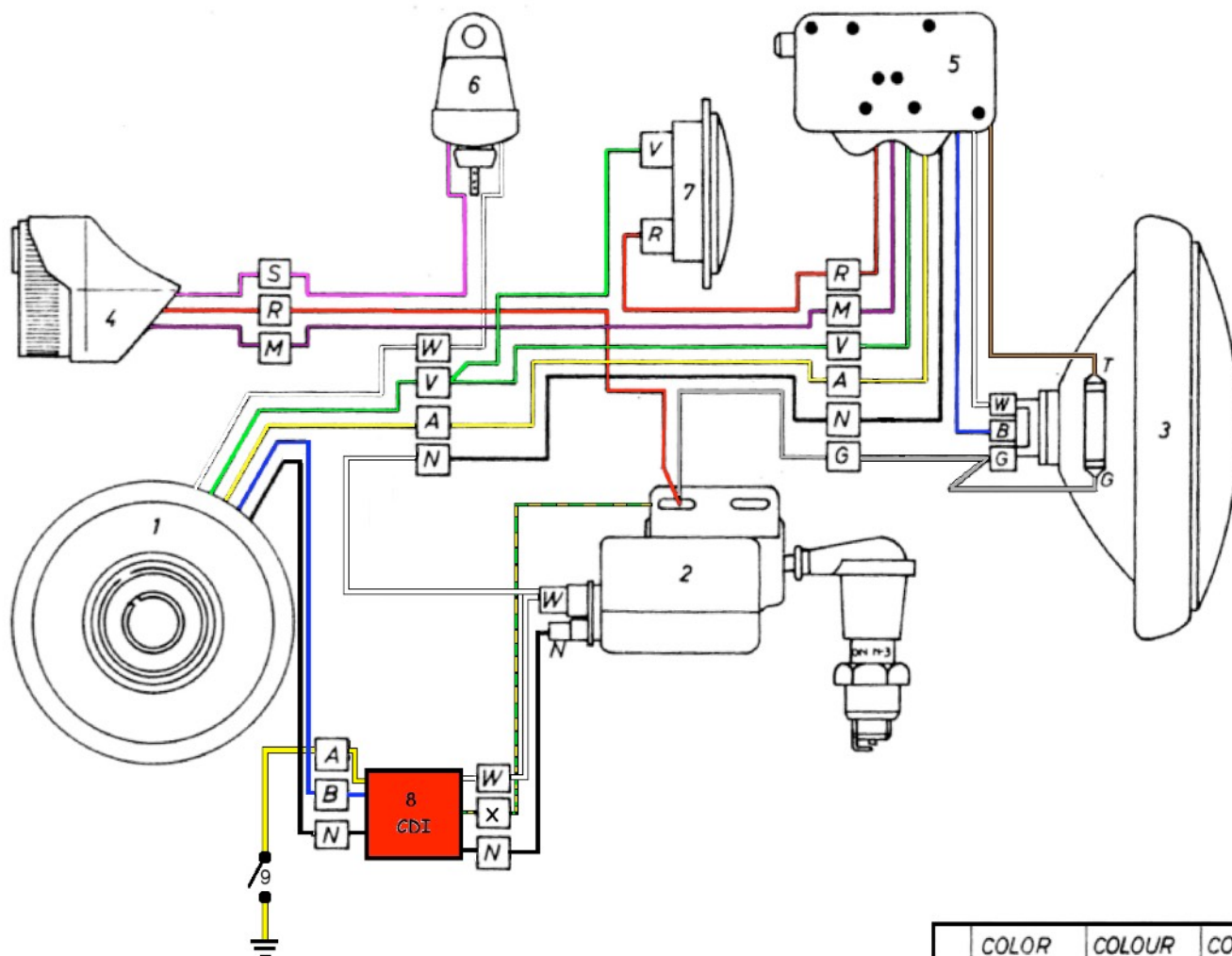
To set the timing, proceed as usual in the electronic ignites Motoplat:

1. Remove, if necessary, the shift and kickstart levers to release the ignition cover.
2. Remove the spark plug and replace it with a dial indicator or a gauge that allows us to measure the top dead center by moving the flywheel.

3. Turn the flywheel counterclockwise (left on Ossa or Montesa engines with ignition on the right) until you find the 4 or 5 mm timing mentioned above.
4. Make a mark on the crankcase and another on the flywheel aligned in the desired position before removing the flywheel.
5. To remove it, if you do not have an impact gun to loosen the locking nut, it must be immobilized to perform the operation with a socket wrench. For this there are several options, like the use of a false spark plug as a stop, or use a jaw around the steering wheel.
6. Loosen the flywheel nut by turning it clockwise in the case of Montesa engines derived from the Impala.
7. Insert the extractor with the pusher fully unscrewed. Screw to the bottom. Apply oil if necessary.
8. Screw on the plunger until resistance is felt. If the flywheel does not come off, lightly tap the plunger head with a nylon hammer. Screw it in until the flywheel separates from the conical shaft.
9. Remove the flywheel.
10. Loosen the three screws that secure the stator to the engine and present the flywheel again, aligning the marks previously made.
11. Turn the flywheel to the right for about 30 °.
12. Insert a 2mm diameter rod through the set-up hole and turn the flywheel gently by pressing the rod until it has been inserted into the set-up hole of the stator.
13. Turn to the left (in Montesa or Ossa engines with right hand drive) the flywheel until aligning the mark previously made in the crankcase. With this, the ignition is regulated to the new maximum timing that we have decided to use.
14. Remove the flywheel again and tighten the three fixing screws of the stator.
15. Tighten the flywheel locking nut to the maximum torque specified by the motorcycle manufacturer.
16. If you have a stroboscopic gun, it would be good to check with it the set-up obtained..

WIRING DIAGRAM FOR A MONTESA ENDURO

INSTALACION ELECTRICA—WIRING DIAGRAM—PLAN DE CABLAGE



1	Volante magnético	Magneto flywheel	Volant magnétique		M	Morado	Purple	Violet
2	Bobina A.T.	Ignition coil	Bobine d'allumage		N	Negro	Black	Noir
3	Faro delantero	Head lamp	Phare	Lamp. 6V.25/25W-6V.4W	R	Rojo	Red	Rouge
4	Faro piloto	Tail light	Lanterne arrière	Lamp. 6V.18/5W (stop)	S	Rosa	Pink	Rosè
5	Conmut. s/manillar	Handle switch	Interrupteur		T	Marrón	Brown	Marron
6	"Stop"	"Stop"	"Stop"		V	Verde	Green	Vert
7	Avisador acústico	Horn	Avertisseur		W	Blanco	White	Blanc
8	Módulo CDI	CDI	CDI		X	Verde / Amarillo	Green / Yellow	Vert / Jaune
9	Conmutador de curvas	Ignition map switch	Commutateur de double courbe allumage					