

# Minimag Co. Digital Ignition Systems

Norton Commander model TT1 Firmware version 81/TH\_628 Rev 5 June 2013

The TT1 unit is a fully digital replacement for the original equipment ignition box as used on the Norton Commander motorcycle. Through the use of modern components and manufacturing techniques, it offers enhanced reliability and additional features.

## Installation

The unit should be located away from sources of extreme heat. The ideal place is inside the R/H fairing compartment or alternatively fasten with cable ties as per the original equipment unit. Cool running promotes reliability.

The unit is fitted with AMP "Universal Mate 'n Lock" crimp connectors and is supplied with the mating parts and crimp inserts to be fitted to your wiring loom. The original AMP nylon connector housings and 3mm crimp terminals are now obsolete and unobtainable. You can, of course, fit your own connector system if preferred.

Please note some machines have been found with reversed pickup wiring. Determine polarity by a *brief* trial start-up before fitting the plastic shell. If the connections are reversed, the engine will refuse to start, but fuel vapour will build up in the silencers very quickly and is liable to ignite with an extremely loud report.

## Connection summary (Original / loom colours in brackets)

	Wire size/length	Loom	Function
RED	16/0.2 700mm	(RED / YELLOW)	Timing Pickup 1
YELLOW	16/0.2 700mm	(YELLOW)	Timing Pickup 2
BROWN	24/0.2 400mm	(BROWN / WHITE)	Coils Common
YELLOW	24/0.2 400mm	(BLACK / YELLOW)	Coil 1
WHITE	24/0.2 400mm	(BLACK / WHITE)	Coil 2
WHITE	24/0.2 320mm	(WHITE)	Battery Positive
GREY	24/0.2 320mm	(BLACK)	Chassis 0V
ORANGE	24/0.2 320mm	(ORANGE)	Starter relay - cranking boost
RED	16/0.2 320mm	(RED)	Side Stand – switches to chassis when stand down.
2x BLUE	16/0.2 400mm	(BLUE)	Thermistor

The unit is fitted with two LEDs for diagnostic purposes. They are visible through a small window.

## LED indicator function

RED	Side stand is down (Engine will turn over but not fire)
RED flashing	Ignition ON, engine stationary, side stand is up.
RED and GREEN steady	Engine warm-up
After warm-up:	
None	Engine idling
GREEN	Engine speed 1000-2000 RPM (advance curve)
RED	Revolution Limiter 9500RPM

## Coils

The unit is compatible with the original coils and ballast resistor setup. Do not attempt to run with coils specifically designed for CDI ignition as their primary resistance is too low. You will get a very weak spark and risk overheating the coils and possible damage to the unit.

# Operation

## Cold Start

Ignition timing is locked on full advance and engine temperature is constantly monitored by way of the thermistor input. The machine may be ridden off immediately after a cold start if so desired, although it is good practice to warm-up for a short period. When approximately 90C is reached, the advance lock is removed. If the engine should be idling at this point, the RPM will drop noticeably and the engine will smooth out. If the machine is cruising, then the rider will notice no change.

## Warm start

On initial cranking, the unit sets full advance for twenty-five revolutions then reverts to normal operation. This action has been found to promote easy starting.

When running between 1000 and 2000 RPM, the unit calculates required spark advance each revolution. Above 2000RPM, advance is locked full.

A revolution limiter will operate if engine RPM exceeds 9500RPM. The limiter works by introducing full retard until engine speed drops back to a safe level.

## Running without a thermistor

Connect the two blue leads together. The unit will now think that the engine is always warm. A bi-metallic thermal switch may be substituted for the thermistor.

## Specifications

Case sealing	IP56
Absolute max ambient temperature	70 degrees Celsius
Advance curve	Linear
Advance commences	1000RPM
Advance ends	2000RPM
Revolution limiter	9500RPM
Maximum coil current	8A continuous, each channel
Thermistor trip-point	approx. 6000 ohms -> 90 degrees Celsius
Supply voltage	5 to 20V, reverse polarity protected.
Setpoint accuracy	+ / - 2%

**In the interests of product improvement, specifications and features may change without notice.**

