

## ❖ IMAGE



## ❖ INTRODUCTION

- MOTOSCAN is a small motorcycle & Scooter scanner. It researched and manufactured by DTDAuto Technology Team, Institute of Physics, Vietnam Academy of Science and Technology since 2013.

- MOTOSCAN used for motorbike repair workshops and motorbike technical vocational training to determine fault and repair electronic & electrical system for most motorbikes and scooters in Asia market and some other market with electronic control system for starting, fuel injection, ignition, ABS, Smart key, ODO, ECU...

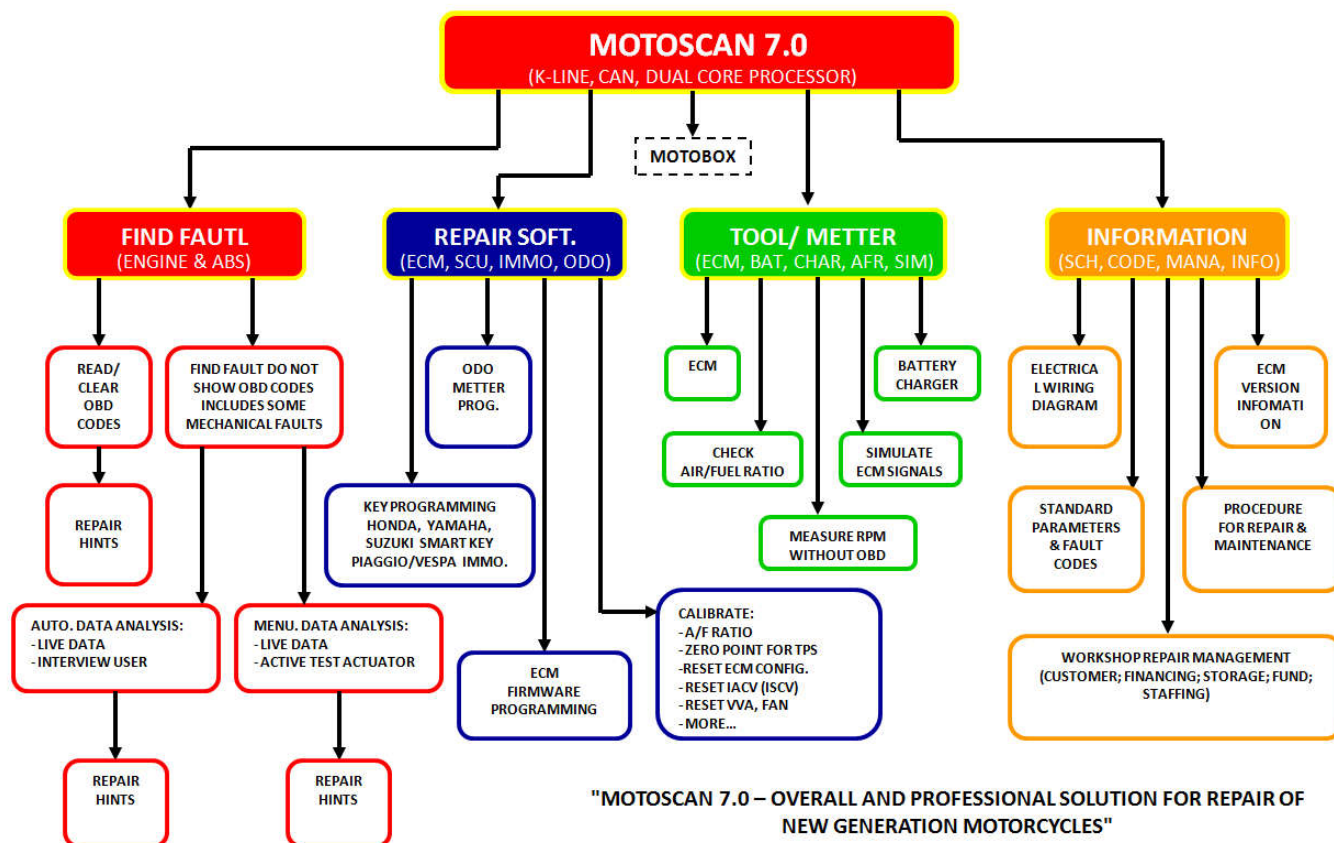
- MOTOSCAN is used for diagnosing fault, repair fault for Engine & ABS system; automatic programming smart key system; automatic test ECU inside, automatic engine technical analyzing, intelligent diagnosing without OBD fault code , ODO value correction, ECU signal simulating, programming and upgrading standard software of manufacturer inside ECM, SCU... and many special measurement functions, full-featured for professional motorbike repair workshop.

Since 2020, MOTOSCAN has supported advanced function that communicate with SCU system (Smart key Control Unit) to solve requirements of automatic smart key programming in case of registration a new key, lost of the keys, replacing SCU, replacing ECM, copy, restoring and editing SCU data.

- In particular, with MOTOBX advance accessory, MOTOSCAN can correct true odometer value, reprogram ECM, simulate ECU signals, test fault inside ECU (ECU tester) ... to repair advanced problems in electronic systems of a new generation motorbikes/scooters.

- MOTOSCAN has supported advanced functions that used diagnosis solution by analyzing auto data. It can find hard faults that MIL lamp does not indicate such as: Idling Stop mode trouble, down power when accelerate, over idle speed, more fuel consumption, weak engine, hard start and mechanical faults that common diagnostic tools cannot execute.
- Support programming, adjusting and setting parameters in ECU as electronic key programming, zero point programming of TPS, and air/fuel ratio programming, idle speed and pulse bandwidth adjustment to control fuel injection vv...
- A gift MOTODATA software for 01 year (you need pay renewal fee for the next years) that used to lookup motorbike repair data for PIAGGIO, HONDA, YAMAHA, SUZUKI, SYM, KYMCO. MOTODATA supports Android, iOS, and Windows devices as smart phone, Tablet, computer, laptop. In particular, it integrated workshop management function that helps you manage orders, customers, inventory, financial...
- Equipment designed as the handheld, good quality, low cost and suitable for small and medium repair workshop.

❖ **FUNCTION**



**A. FUNCTION 1: FIND MALFUNCTION**

**1.1. Read, clear fault codes stored in ECUs of engine system and ABS system**

**1.2. Find complex faults that MIL lamp does not indicate include such as:**

- Diagnose faults by the automatic data analyzing and interviewing the technicians
  - + Can't start engine
  - + Down power when accelerate

- + Idling stop fault
- + Fuel consumption
- + Starter is not work
- + Random acceleration
- + Constant acceleration
- + Idling not work
- + Hard to start engine
- + Weak engine
- + Injector mechanical fault
- + Dirty Air filter\*
- + Exhaust pipe block\*
- + Air hole dirty/block of MAP sensor/Throttle\*
- + Intake manifold leak\*
- Diagnose faults by analyzing the engine live data and activate the actuators
  - + Voltage and open angle of throttle position sensor (TPS)
  - + Voltage and value of intake air temperature sensor (IAT)
  - + Voltage and value of manifold air pressure sensor (MAP)
  - + Voltage and value of engine temperature sensor (ECT)
  - + Voltage and value of oxygen sensor (O2S)
  - + Value of atmospheric pressure sensor
  - + Engine speed (CKP/ NE)
  - + Vehicle speed (VSS)
  - + Front/rear wheel speed (with ABS system)
  - + Status of fuel pump
  - + Ignition timing advance (ISA)
  - + Fuel injection time (Ti)
  - + Starter signal (STP)
  - + Status signal of side stand switch (SSTAND-SW)
  - + Status Hall sensor
  - + Evaporative purge cut solenoid valve output signal (PCS)
  - + Output signal active starter relay (ON/OFF)
  - + Output signal active PCV
  - + Output signal active IACV
  - + Output signal active MIL
  - + SCS input signal status (service check signal)
  - + Open state of step motor (IACV)
  - + State of heater of O2 sensor
  - + State of brake switch
  - + State of Start & Stop indicate lamp
  - + State of Start & Stop mode button
  - + State of start button
  - + State of pre-positioning
  - + Status of direction sensor
  - + Status of oil minimum pressure sensor
  - + Engine stop command from DSP
  - + Battery voltage (BATT)

- + Battery current
- + Short term fuel trim in closed loop
- + Environmental revision coefficient in closed loop
- + Fault code and total fault codes
- + And other parameters vv...
- Activate and reset the actuators: Fuel pump, injector, ignition coil, IACV (ISCV), O2 heater, pump, blower, head lamp, MIL warning lamp, ABS warning lamp, Immobilizer lamp, Start&Stop lamp, engine oil pressure warning lamp, VVA valve, reset pre-positioning of crankshaft ...

## **B. FUNCTION 2: REPAIR FAULT**

### **2.1. Automatically program smart key for HONDA, YAMAHA, SUZUKI:**

- Read all KEYID# and ECMID from vehicle SCU
- Program smart key directly with vehicle or without vehicle (SCU is not installed on vehicle) for cases:
  - + Register more FOB# for all of cases
  - + Register FOB# when lost all of the FOB#
  - + Delete KEYID in SCU memory
  - + Synchronize SCU & ECM for all of cases
  - + Inactivate FOB# code in SCU when lost FOB#
  - + Check FOB# & SCU
  - + Display status of KEY (ON/OFF)
  - + Display SCU information
- Restore SCU data from sample data for HONDA (this function used to repair software inside SCU when SCU data is fault)
- Copy data from source SCU to destination SCU for all motorbikes that have Smart key system: HONDA, YAMAHA, SUZUKI (This function used to repair, swap SCU when have SCU hardware/software fault)
- Quick sync SCU & ECM (without FOB) for HONDA: SH, PCX, X-ADV... and equivalent vehicles List of vehicle as below (include other models which use similar ECMS):
  - HONDA: SH 125/150/125D/150D/SM, SH 300i ABS, PCX, SH MODE , LEAD, AIR BLADE, VISION, X-ADV, FORZA, SUPER CUB, SCOOPY ESP, X-ADV, CLICK, VARIO
  - YAMAHA: JANUS 125, NVX 125, NVX 155 Camo, NVX 155 ABS, AEROX, LEXI S, NMX, NMAX, SMAX, TMAX, QBIX 125, QBIX 125 S, QBIX 125 ABS
  - SUZUKI: GSX R150

**2.2. Programming key immobilizer and get out immobilizer ID code for PIAGGIO/VESPA** (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs) that ECM types: ACII, AC2I, AC5I, AC8I, AC13I, AC13I, AC19I, AC19I, AC20I, AC21I, AC23I, AC24I, AC25I, AC27I, AC32I, AC5I, AC8I, ACI600, AC601, ACI602, ACI603, ACI604, ACI605, ACI606, ACII, MIU1, MIU2, MIU G3/RIU1, MIU4, PGN04/PGS02/PGT01, PGU09\*, PGT10\* and PGQ16\*

Reset immobilizer, register new key when lost all of the keys, register additional keys ... by many methods (KEY to IMMO. or IMMO. to KEY)

*Note: The advanced functions with an asterisk (\*) will appear on the next version*

### **2.3. Correct and adjust value of digital odometer (use with MOTOBX)**

- HONDA: AIR BLADE (2013-2019), AIR BLADE 2020, CBR 250, FUTURE NEO Fi, FUTURE X Fi, LEAD (2013-2019), LEAD 2020, PCX (2008-2013), PCX (2014-2017), PCX 2018, PCX HYBRID, SH 300i, SH MODE (2013-2019), SH 125/150/125D/150D/SM (2013-2017), SH 125/150/125D/150D/SM (2018-2019), SH 125/150/125D/150D/SM (2020), SCOOPY, MSX, VARIO 150, WINNER, WINNER X, X-ADV, DYLAN, ZOOMER X (2013-2017), ZOOMER X (2018-2020), SONIC, WAVE 125 (Thái Lan), CLICK (2012-2014), CLICK (2014-2017) CLICK (2018-2020), VARIO (2014-2017), VARIO (2018-2020)
- YAMAHA: AEROX, LEXI S, LATTE, FREGO, NVX, NMAX, NMX, JANUS, TFX, EXCITER (2014-2018), EXCITER (2019-2020), ACRUZO, , FZ 150, FZ 150i, GRANDE, NOUVO SX, NOUVO LX, YZF-R3, R15
- PIAGGIO: Medly 125, Medly 150, Medly 125 ABS, Medly 150 ABS, Liberty ABS, Liberty 125 3V PGN04, Liberty 150 3V PGN04, Liberty 125 3V PGT01, Liberty 150 3V PGT01, Liberty 125 3V PGS02, Liberty 150 3V PGS02, Liberty ABS PGS06
- VESPA: Primave 125 PGN04, Primave 150 PGN04, Sprint 125 3V PGN04, Sprint 150 3V PGN04, Sprint 125 3V PGT01, Sprint 150 3V PGT01, Sprint 125 3V PGS02, Sprint 150 3V PGS02

#### **2.4. Reprogram and upgrade ECM firmware (firmware) (use with MOTOBOX) for:**

- HONDA: AIR BLADE 125, LEAD 125, SH MODE, VISION 110, VISION ESP\*
- PIAGGIO/VESPA (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs): ECM types are AC19I/AC20I/AC24I/AC25I/ AC27I/AC32I, MIU G3/RIU1 and ECM PGN04/PGS02/PGT01 and PGQ16\*
- YAMAHA: NVX\*

Initialize and repair data errors, upgrade the versions of MCU, EEPROM

*Note: The advanced functions with an asterisk (\*) will appear on the next version*

#### **2.5. Calibrate and set control parameters in the ECM:**

- Calibrate air/fuel ratio (AFR): YAMAHA, PIAGGIO/VESPA (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs), SYM
- Reset to manufacturer value of ECM: HONDA, YAMAHA, PIAGGIO/VESPA (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs)
- Offset zero point value and set range of throttle position sensor for PIAGGIO/VESPA (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs)
- Reset IACV: HONDA, YAMAHA, PIAGGIO/VESPA (it also support GILERA, APRILIA, DERBI, PEUGEOT, which use similar ECMs), KYMCO
- Adjust pulse band width to control fuel injectors (Ti) and idle speed: YAMAHA, SYM
- Create new and repair data errors, upgrade the version MCU, EEPROM
- Set altitude mode for some models of YAMAHA

#### **2.6 Check component fault inside ECM (this is optional and use with MOTOBOX)**

Test quantity of ECMs for HONDA, YAMAHA, PIAGGIO/VESPA according to the order

#### **2.7 Simulate Input/Output signal of ECU to support diagnosing fault and repair ECU hardware (use with MOTOBOX)**

### **C. FUNCTION 3: SPECIALIZED MEASURE TOOL**

3.1 Fast measure and assess capacity, quality of battery

3.2 Reviewed charging status and rated the quality of the generator, regulator

- 3.3 Measure the air/fuel ratio (A/F) to assess the instantaneous fuel consumption
- 3.4 Measure engine speed (RPM) for all carburetor and PGM-FI/FI with DIY ECU motorbikes
- 3.5 Emulate the signals on motorbike for fault diagnosis, ECU hardware repair\*\*

#### **D. FUNCTION 4: INFORMATION**

- 4.1 Show the current firmware version of ECM and ACU
- 4.2 Look up the acronym, position of signal pins for systems: ECM, SCU, ACU, ODO, IMMO, SMART KEY
- 4.3 Look up electrical wiring diagram: principle diagram, schematic assembly and specified conditions
- 4.4 Look up the process assembly, repair, maintenance mechanic, oil warning lamp reset
- 4.5 Manage repair workshop: customer, financial, store, treasury, employees
- 4.6 Update version of data software and firmware via Internet

#### **NOTES:**

- *The advanced functions with an asterisk (\*) will appear on the next version*
- *The advanced functions with an asterisk (\*\*), you must purchase additional **MOTOBOX***

#### **❖ ADDRESS & APPLICATION RANGE**

- It is diagnostic tool in motorcycle/ Scooter workshops and equipment for technical training.
- A semi-finished products connect to trainer for electronic injection & ignition system of PGM-FI motorcycles.
- A safety check equipment of the motorcycles before it is running on the road and in motorcycle club.

- **PIAGGIO/VESPA:** BEVERLY 125/300/350 MIUG3, FLY 125/150 MIUG3, FLY 125 3V MIUG3, FLY 125 AC19I/20I/191/201, FLY 150 3V MIUG3, FLY 150 AC19I/20I/191/201, LIBERTY 125 3V PNG04/PGS02/PGT01, LIBERTY 125 AC19I/20I/191/201, LIBERTY 150 3V MIUG3, LIBERTY 150 3V PGN04/PGS02/PGT01, LIBERTY 150 AC19I/201, LIBERTY ABS PGS06, X10 125/350 MIUG3, MEDLEY 125/150 PGQ16, VESPA 946 125/150 MIUG3, GTS 125/150 MIUG3, LXV 125 3V MIUG3, GTS 125/300 ABS MIUG3, LT 125/150 3V MIUG3, LX 125 MIUG3, LX 125 AC19I/20I/191/201, LX 150 MIUG3, LX 150 AC19I/20I/191/201, LX 125/150 3V MIUG3, LX 125 3V PGN04/PGS02/PGT01, LX150 3V PGN04, LXV125 2V MIUG3, LXV125/150 3V MIUG3, PRIMAVE 125/150 MIUG3, PRIMAVE 125/150 PGN04/PGS02/PGT01, PRIMAVERA ABS, S125/150 MIUG3, S125/150 3V MIUG3, SPRINT 125/150 3V PGN04/PGS02/PGT01, SPRINT ABS ...
- **HONDA:** LEAD 110, LEAD 125, AIR BLADE FI, FUTURE NEO FI, FUTURE X FI, FUTURE 125 FI, PCX, PCX HYBRID, VISION, WAVE RSX FI AT, WINNER, WINNER X, SH 125i, SH 150i, SH125 ESP, SH150 ESP, SH MODE, SH 300I, SCR, SONIC 150, PS, SCOOPY-I, SUPER CUP C125, WAVE RSX FI, MSX 125, WAVE 110-I, WAVE 125-I, CLICK-I, VARIO 150, ZOOMER-X vv...
- **YAMAHA:** ACZURO, CUXI, EXCITER FI, JUPITER FI GRAVITA, JUPITER FI GRAVITA GREEN, JUPITER FI RC, LATTE, LUVIAS GTX FI, LUVIAS FI, NOZZA, NOZZA LIMITED, NOUVO LX, NOUVO SX RC, NOUVO SX STD, NOUVO SX GP, NM-X, NVX 155, NVX 155 ABS, SIRIUS FI, YZF, FREEGO, FREEGO S, FZ-S FI, YZF R6, FZ1 FAZER, YBR vv...
- **SUZUKI:** ADDRESS, HAYATE 125 SS, UA125-T, RAIDER 150, VIVA 115, GSX R150, GZ150-A, EN150-A, THUNDER150/150S, IMPLUSE, STAR RS 125 EFI, STAR SR 170 ABS vv...

- **SYM** : ATTILA-V SMART IDLE, ELIZABETH SMART IDLE, ELIZABETH, JOYRIDE, SHARK 125, SHARK 125 CBS, SHARK MINI 125, PASSING EFI ...
- **KYMCO** : PEOPLE S FI, PEOPLE 16 FI, MANY MACAROL FI, MANY FI, LIKE FI, JOCKEY FI ...

**❖ PACKAGE**

- 01 Handheld with LCD and function control buttons
- 01 Data cable used to determine faults (K-line communication protocol)
- 01 Data cable for YAMAHA (CAN Bus communication protocol)
- 01 Cable receiver signal and optical sensor
- 01 Cable check battery and generator
- 03 Cables program HONDA, YAMAHA, SUZUKI smart key
- 01 12V/DC Power cable
- 01 220V/AC to 12V/DC power converter
- 01 Extendable cable for Yamaha
- 01 MOTOBOX electrical accessory (an optional only and isn't included of standard pack)
- 01 RPM cable used to measure engine speed (RPM) without OBD (an optional only and isn't included of standard pack)
- 01 MT0006 LINK - data cable (an optional only and isn't included of standard pack)
- 01 Accessory measure exhaust (an optional only and isn't included of standard pack)
- 01 Update cable
- 01 CD video use guide and free MOTODATA
- 01 Guide book
- 01 Hand cloth bag

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