Philips ECU for TSDI / DiTech / Purejet engines

For ASW-NEXT
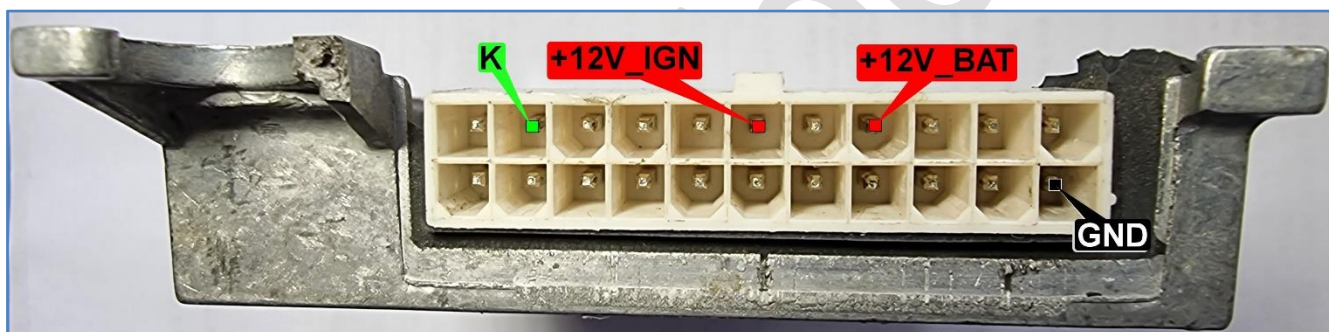
Short User Manual

January 2023

1. How to connect?

2. Software features

- ✓ **Read / Write** internal EEPROM of MC68HC908AZ60.
- ✓ **Read** full internal FLASH of MC68HC908AZ60
- ✓ **Write** software / calibrations area to FLASH. Programable area depend on ECU hardware version (MCU type)
- ✓ **Read / Write** external SPI EEPROM 25160 (if ECU is equipped with SPI EEPROM)
- ✓ **Reset TPS learning**
- ✓ **Read / erase diagnostic trouble codes (DTC)**
- ✓ **Reset ECU to VIRGIN or IMMO-OFF state**

3. Different types of Philips ECU

Philips ECU comes in several hardware versions.

- • **With MCU MC68HC908AZ60 (2J74Y)**
- • **With MCU MC68HC908AZ60A (3K85K)**
- • **With or without external SPI EEPROM 25160 as a storage of calibration maps** (2048 bytes of calibration maps are stored in MCU FLASH (**0E00-15FF**) if ECU is not equipped with an external EEPROM 25160)**.**

All hardware versions listed above are fully supported by software of ASW-NEXT. *MCU type is detected automatically* during FLASH read or reprogramming.

4. Memory programming

Depending on MCU type inside the ECU (2J74Y or 3K85K), different FLASH range is accessible for reprogramming by K-Line:

- ➢ ECU with **MC68HC908AZ60** (2J74Y):
  - ♦ 0450 – 04FF
  - ♦ 0600 – 09FF (internal EEPROM)
  - ♦ 0E00 – BFFF
  - ♦ C000 – FFFF (Bootloader area. Can't be reprogrammed)

- ➢ ECU with **MC68HC908AZ60A** (3K85K):
  - ♦ 0450 – 04FF
  - ♦ 0600 – 09FF (internal EEPROM)
  - ♦ 0E00 – E97F
  - ♦ E980 – FFFF (Bootloader area. Can't be reprogrammed)

> **NOTE:** For safety reason **Bootloader** area can not be erased or reprogrammed by K-Line. This is to prevent ECU to be „bricked" in case of reprogramming failure**.**

❖ **FLASH programming steps**:

1) Load binary file you are going to program. File size must be 64 kB. Every full flash image (0000-FFFF) is accepted here: one that was read previously using ASW-NEXT or using any other programmer.
2) Select „**MCU Full (FLASH + ext. EEPROM)**" from „**Memory Access**" menu. Press „**Write**"
3) Software will check file size. Error message will take place in case the file size is different from **64 kB**.
4) Software will ask you to select programming range:
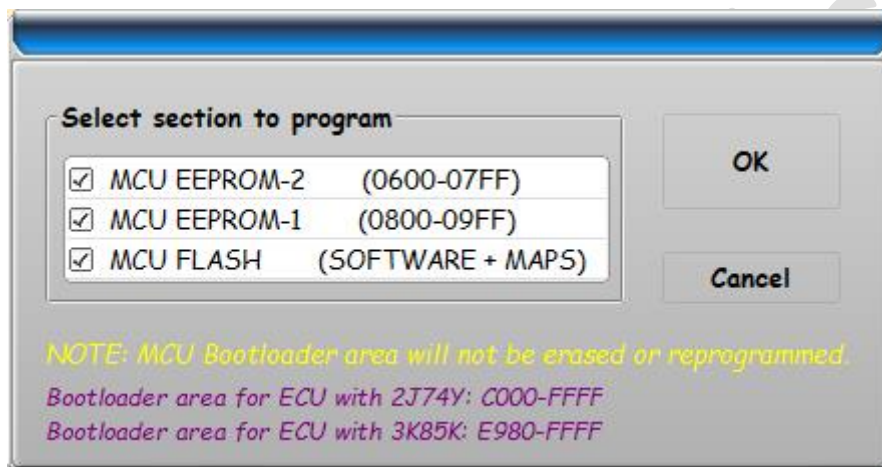
Here you may choose to program both, EEPROM and FLASH, FLASH alone or EEPROM only. For full ECU cloning you should leave all checkboxes selected.

5) Communication with ECU is established and MCU type is read (2J74Y / 3K85K). Now software will check compatibility of loaded file with detected MCU type. Error message will take place in case of mismatch. For example, you can't program flash file from MCU **2J74Y** to ECU, that is based on MCU **3K85K** and vice versa. Flash files for different MCU are strictly incompatible, because MC68HC908AZ60 (2J74Y) and MC68HC908AZ60A (3K85K) have several significant hardware differences.
6) If all previous tests were successful Flash programming starts. It takes about 2,5 min.

❖ **Internal MCU EEPROM programming steps**:

1) Load binary file you are going to program. File size may be 64 kB (full FLASH image) or internal EEPROM file (1024 bytes). Data from area 0600-09FF will be taken for internal EEPROM programming if full FLASH image (0000-FFFF) is loaded.
2) Select „**MCU internal EEPROM**" from „**Memory Access**" menu. Press „**Write**"
3) Internal MCU EEPROM programming starts. It takes about 0,5 min.

❖ **External SPI EEPROM 25160 programming steps**:

1) Load binary file you are going to program. File size must be 2048 bytes.
2) Select „**SPI EEPROM 25C160 (if equipped)**" from „**Memory Access**" menu. Press „**Write**"
3) Communication with ECU is established and test for SPI EEPROM presence starts. <mark>Please note, that depending on hardware version some Philips ECU may not have SPI EEPROM installed</mark>. Error message will take place in case SPI EEPROM is missing in the particular ECU.
4) External SPI EEPROM programming starts. It takes about 0,5 min

> **NOTE:** External SPI EEPROM presence test is not implemented for "Read SPI EEPROM 25C160" procedure.
>
> If ECU is not equipped with external SPI EEPROM, software of ASW-NEXT will read all zeros ("00") from external SPI EEPROM.

## 5. Modification of immobilizer programming in PHILIPS ECU

> **NOTE:** PHILIPS ECU for **Aprilia** is not coded, even if a particular scooter has transponder key operated immobilizer unit incorporated into the instrument cluster.
>
> ASW-NEXT software function for immobilizer status modification apply exceptionally to PHILIPS ECU for **Peugeot** scooters. ECU is coded to immobilizer unit here.

Software of ASW-NEXT is able to:

- ✓ Read current immobilizer status
- ✓ Reset ECU to *VIRGIN*
- ✓ Set ECU to *IMMO-OFF*

This message will be displayed during immobilizer code reset in case when software detects that PHILIPS ECU has no coded immobilizer function:
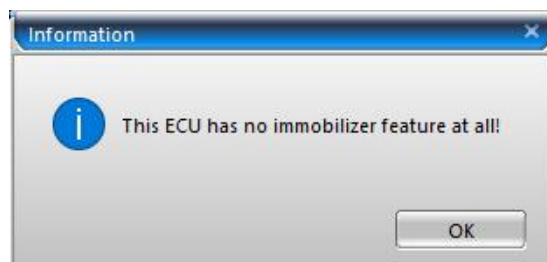
❖ Explanation of statuses:

```
[16:13:04] SOFTWARE   : [ M1EPEECA001 ]
[16:13:04] CALIBRATION: [ JF50A3_1_4 ]
[16:13:04] SERIAL No. : [ 1174861500 ]
[16:13:04] MOTOR HOURS: [ 0.00  h ]
[16:13:05]
[16:13:05] ECU IS VIRGIN: [ NO ]
[16:13:05] STARTING AUTHORIZED: [ NO ]
```
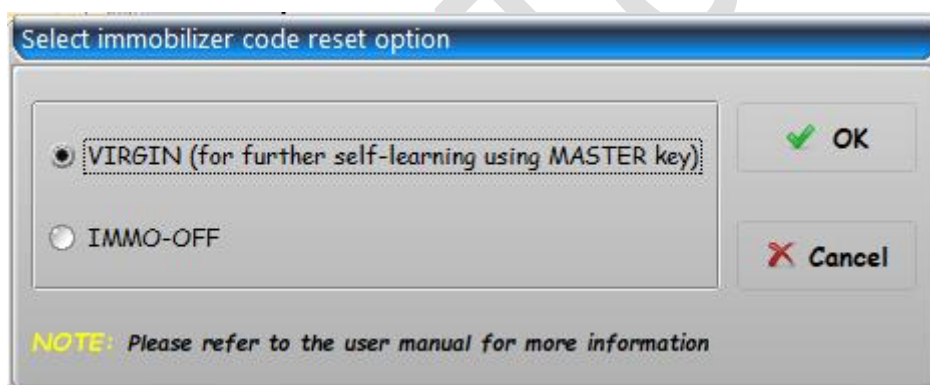
ECU IS VIRGIN

- YES – code programming not done, ECU is blank or without immobilizer function
- NO – code programming done

STARTING AUTHORIZED

- YES – engine start enabled
- NO – engine start disabled

❖ Options for modification of immobilizer feature:

- *VIRGIN*. Immobilizer code is erased from ECU and it is ready to store a new code from immobilizer unit IMM006 or from instrument cluster.
  To learn ECU just turn ignition on with a valid MASTER key. You have 15 attempts to learn it. If ECU will not receive a valid immobilizer code for learning during 15 ignition on/off cycles, it will permanently enter IMMO-OFF mode on 16-th ignition-on and it will stop sending any requests to immobilizer unit. By the way, engine can be started when ECU is VIRGIN, even with immobilizer unit disconnected.

- *IMMO-OFF*. Immobilizer feature is completely disabled in ECU. It does not send requests to immobilizer unit. Engine can be started even with immobilizer unit disconnected or without a valid transponder key.

6. General information

To read DTC or to perform TPS reset by diagnostic connector in **Aprilia** scooter that is equipped with transponder key immobilizer (MATRIX instrument cluster), you should disable instrument cluster communication to ECU. Instrument cluster continuously communicates with engine control unit, requesting various parameters from it (rpm, statuses, etc.). This traffic on K-Line disturbs regular diagnostic connection.

To release K-Line go to menu of the instrument cluster and look for the item <**Diagnostic**>. Instrument cluster will ask you for a service code. This 5-digit code is different for every scotter model and can be found in the service manual for particular scooter or on the Internet. For example for Aprilia SR50 it is **45256**.

When valid service code entered, please select <**Disconnection**>.