

# KMS

## FA23 Wiring

Part nr: 01-01-03-0003



**Kronenburg Management Systems**

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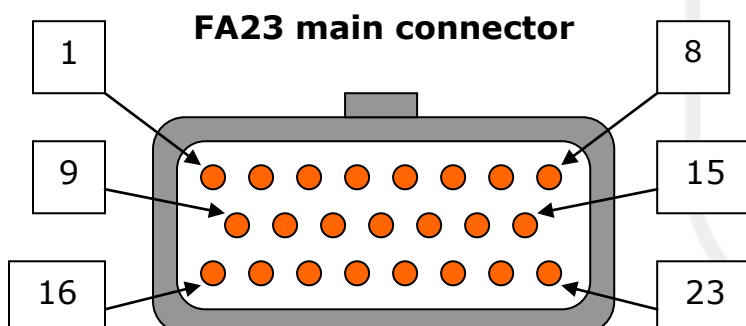
This document contains detailed information on how to connect the KMS FA23 ECU for multiple applications. Additional information, user manuals and software can be found on our website: <http://kms.vankronenburg.nl> or on the software CD included with the ECU.

## 1 Pin output

The main connector of the FA23 consists out of 23 pins. Each pin has its own function which can be seen in the overview below including wire colours and thickness.

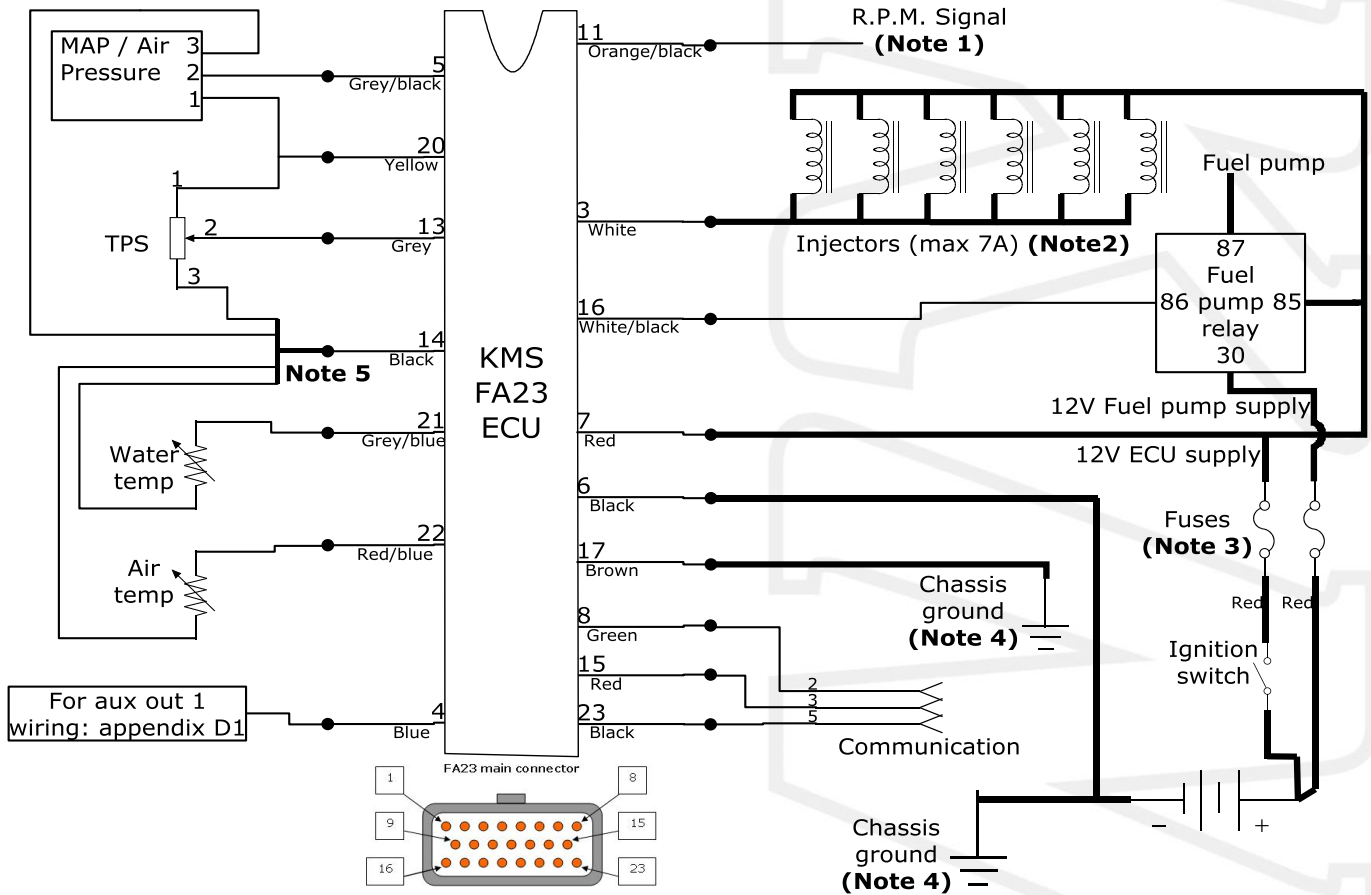
Pin nr.	Colour	Wire thickness	Function
1			
2			
3	white	0,75mm <sup>2</sup>	Injector driver output
4	blue	0,5mm <sup>2</sup>	Aux out 1
5	grey/black	0,5mm <sup>2</sup>	Load signal MAP
6	black	0,75mm <sup>2</sup>	ECU ground
7	red	0,75mm <sup>2</sup>	12V ECU supply
8	green	0,5mm <sup>2</sup>	Communication
9			
10			
11	orange/black	0,5mm <sup>2</sup>	Coil / hall signal
12			
13	grey	0,5mm <sup>2</sup>	Load signal TPS
14	black	0,75mm <sup>2</sup>	Sensor ground
15	red	0,5mm <sup>2</sup>	Communication
16	white/black	0,5mm <sup>2</sup>	Fuel pump relay
17	brown	0,75mm <sup>2</sup>	Ground
18			
19			
20	yellow	0,5mm <sup>2</sup>	5V Load sensor supply
21	grey/blue	0,5mm <sup>2</sup>	Water temperature signal
22	red/blue	0,5mm <sup>2</sup>	Air temperature signal
23	black	0,5mm <sup>2</sup>	Communication

The pin numbers can be read on the back of the main connector of the FA23. These numbers can also be seen in the following drawing, seen from the back of the main connector or front of the FA23 ECU.



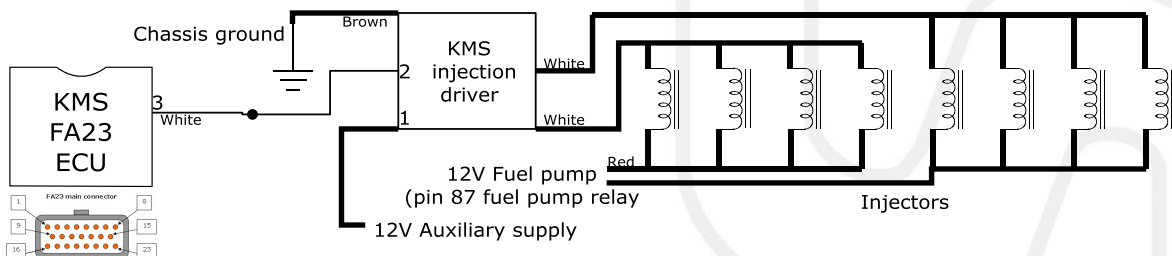
## 2 Main wiring

Below a wiring diagram is shown on how to connect the FA23 ECU to different sensors and actuators. This is a universal diagram which can be used for any type of engine. Wire colours are mentioned for each pin of the FA23 ECU and can also be seen on page 3, together with the wire thickness.



**Note 1:** The FA23 ECU has the possibility to use either a hall sensor (maximum of 5 pulses / revolution) or tachometer signal as RPM signal. It's also possible to use a RPM pickup direct from - coil, but this is not recommended. Selecting the applied sensor in the software can be done under 'Options (F4)' → 'RPM pickup'.

**Note 2:** The injector output can deliver a maximum current of 7A. This means that a maximum of 6 high impedance ( $\geq 12$  Ohm) injectors can be used on one injector output (pin 11). When using low impedance injectors ( $< 12$  Ohm) or more than 6 high impedance injectors on one injector output, an external KMS injection driver needs to be used. KMS injection drivers can take up to a maximum of 10A per output. For connection of the injection driver, see detailed drawing below. See also chapter 2.1 'Specification'.



**Note 3:** The value/capacity of the fuse is dependent on the total maximum current of the electrical components connected. See chapter 2.1 'Specification' for deterring the fuse values.

**Note 4:** Preferably put all ground connections (**except fuelpump ground!**) on the same chassis point, to prevent a difference in potential between the grounds. Place the fuelpump ground on a separate point on the chassis, to prevent interference with the other electrical components.

**Note 5:** All sensor grounds must be soldered together at one point as close as possible to the main connector. The connecting point should then be connected to the main connector by one single wire.

## 2.1 Specification

### 2.1.1 Fuses

As described before, the value/capacity of the fuse for each voltage supply is dependent on the total maximum current of the electrical components connected. The following steps need to be taken to determine the capacity/value of the fuse for each 12V supply:

1. Calculate the maximum current by adding the currents below for the applications in use.

**Application:**

ECU (including all sensors and inputs)  
Aux out 1  
Fuel pump

**Current:**

1A  
1A  
Depending on fuel pump being used, use manufacturers recommendations.  
1A/injector  
When using low impedance injectors or more then 6 high impedance injectors on one injector output, measure the resistance over the injectors to determine the current.

2. After calculating the current, multiply this value by 1,2. The result is the **minimum** value/capacity of the fuse. The applied fuse should be the subsequent standard fuse value. (Standard fuse values: 2.5, 5, 7.5, 10, 15, 20, 25)

**For example:**

12V ECU fuse:  $ECU + Aux\ out\ 1 + 8\ high\ impedance\ injectors = 10A * 1,2 = 12A$ : minimum fuse value, so use in this case a 15A fuse for the 12V ECU.

12V Fuel pump supply: fuel pump = 20A (according to manufacturer).

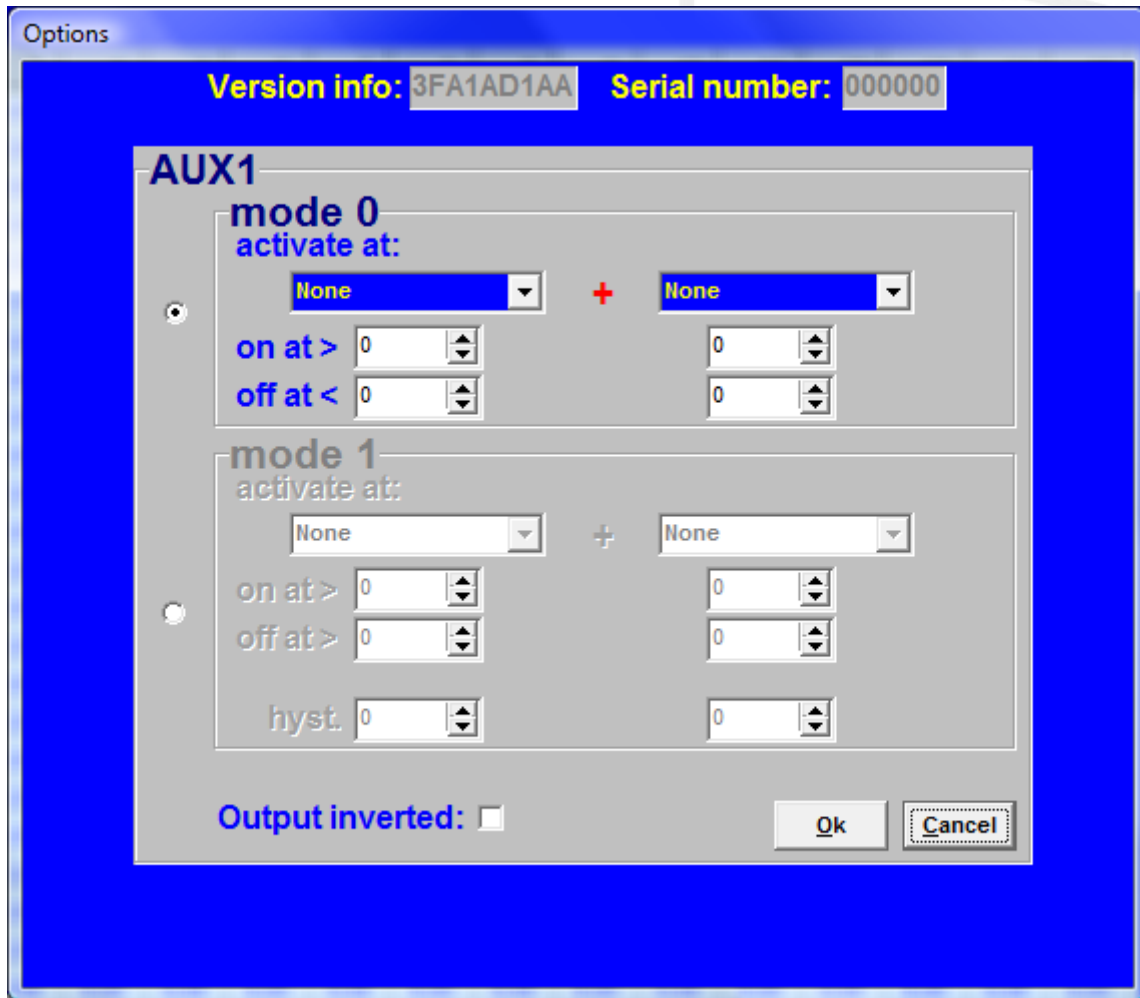
### 2.1.2 Wire thickness

The following wire thicknesses should be maintained for the maximum continuous currents through the wires:

Maximum current:	Wire thickness:
3A	0,5 mm <sup>2</sup>
7,5A	0,75 mm <sup>2</sup>
15A	1 mm <sup>2</sup>
25A	1,5 mm <sup>2</sup>

### 3 Appendix D1: Auxiliary (aux) output wiring

The aux output 1 can be used for different functions. The chosen functions must be set correctly in the software for each application. When you are in the main screen of the software program, go to 'options (F4)' and then 'AUX 1'. The following screen will appear.



Here the function for aux output 1 can be defined, depending on the way the output is connected/wired. The aux output can be used to direct many different applications such as NOS, cooling fan, shiftlight, variabel inlet systems, cam control, water injection, etc. The following diagram describes the general wiring of these systems, however some applications may deviate from this diagram.

**Warning:** Maximum current: 1A!!! If a higher current is needed, a relay should be used.

