Correction of use of wide band Lambda Innovate

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Skynam Machine management

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IMPORTANT PRELIMINARY

This documentation has been specially updated for the firmware versions of the Challenger ECUs:
- Challenger5 version 2.90 and newer
- Challenger6 version 2.70 and newer
- Challenger7 version 1.50 and newer
- Challenger8 version 1.50 and newer

The document 'Use of Lambda sensor' provided by the installation of these ECUs gave incorrect information on the programming of Innovate modules.
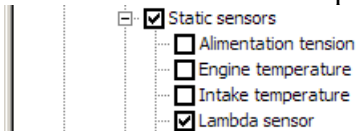The previous version V1.00 of this present document still gave errors.

The present document corrects a new time these errors. These corrections are marked in red.

USE OF INNOVATE LAMBDA MODULES

From the new firmware versions of the Challenger given above, it is also possible to use the Innovate modules, but these must be specifically programmed to be adapted to the characteristics of the Sybele ECUs.

I) LINEARISATION MAP OF THE LAMBDA SENSOR:

Go to the Lambda sensor page of the Winjall software ECU tuning:

☐ ☑ Static sensors
    ☐ Alimentation tension
    ☐ Engine temperature
    ☐ Intake temperature
    ☑ Lambda sensor

And set the conversion map in this way:

ECU DISPLAY IN RICHNESS
Here is the (new correction) linearization map of the Lambda sensor to set in the ECU:

Lambda conversion	Innovate-MTX				
LINE SCALE	Not defined			Standard interpolation	
COLUMN SCALE	Lambda sensor input level		0	Standard interpolation	
Richness	**200**	2500	4800		
0	1333	1000	667		

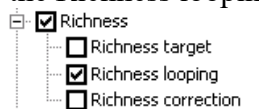**ECU DISPLAY IN LAMBDA**
Here is the (new correction) linearization map of the Lambda sensor to set in the ECU:

Lambda conversion	Innovate-MTX				
LINE SCALE	Not defined			Standard interpolation	
COLUMN SCALE	Lambda sensor input level		0	Standard interpolation	
Lambda	**200**	2500	4800		
0	0.750	1.000	1.499		

II) MAP OF HEATING TIME OF THE LAMBDA SENSOR:

And go the Richness looping page of the Winjall software:

☐ ☑ Richness
    ☐ Richness target
    ☑ Richness looping
    ☐ Richness correction

And set the map of Max waiting time before start in this way:

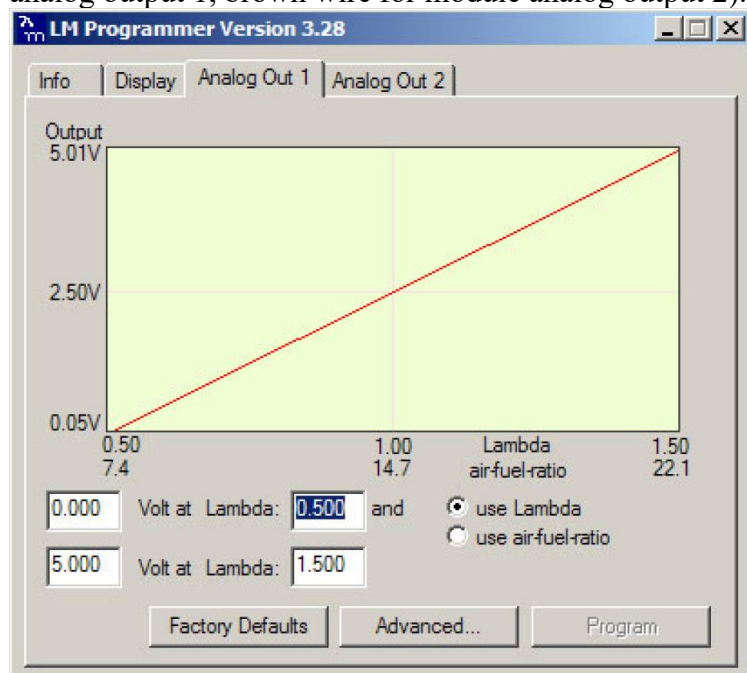| Max waiting time before Lambda start correction	Maximum waiting time at engine start in milliseconds				
LINE SCALE	Not defined			Standard int	
COLUMN SCALE	Engine temperature (°C)		-273	Standard int	
	−40	**+40**	**+60**	**+80**	
1000	65535	45000	45000	40000	

Indeed, the Innovate modules have very long sensor warm-up times and if we do not correctly position the waiting time in this map, the ECU will start using the sensor while it is not yet working, and the richness correction will be bad.

III) PROGRAMMATION OF INNOVATE MODULE WITH THE INNOVATE SOFTWARE:

See the User's manual of your Innovate

ANALOG OUTPUT PROGRAMMING
Select the tab corresponding with the output that you have wired to the ECU (yellow wire for module analog output 1, brown wire for module analog output 2).
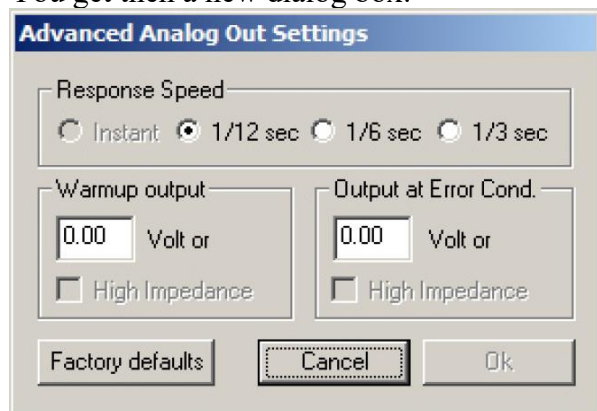

(image of Innovate software)

1) Check 'Use Lambda'.

2) Then, whether you have programmed Winjall to work in richness or in Lambda,
- On the first line, fill **0.200** Volts at Lambda **0.750** (new correction)
- On the second line, fill **4.800** Volts at Lambda **1.500** (new correction)

3) Click on the button [Program] to record these tunings in the module Innovate

ADVANCED PROGRAMMING OF ANALOG OUTPUT
In the setup page of the output, click on the button [Advanced]
You get then a new dialog box:

(image of Innovate software)

1) Check "Response speed" 1/12 sec or faster if it exists
2) In the value "Warmup output" (value while heating), set **2.50** Volts
3) In the value "Output at Error Cond" (value on error), set **0.00** Volts
4) Click on the button [OK] to record these tunings in the module Innovate

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These values will allow the ECU to accurately find the Lambda errors and to help waiting the Lambda sensor heating before use it.