ALFA ROMEO 939 SERIES OIL TEMPERATURE SENSOR – SOFTWARE UPDATE GUIDE

VERSION 2.0

14/06/24

Document Information

Revision Information

Date	Version	Document Changes
20/01/21	1.0	Initial Draft
30/01/21	1.1	Update following USB driver requirement
14/06/24	2.0	Second release – Product photos updated

Product Information

Premise

This manual gives detail as to how to update the software on the WorkingDesign Alfa Romeo 939 Series Oil Temperature Sensor for the JTS engines. Whilst every endeavour has been made to ensure that the following guide covers all aspects of software update, there may be some minor differences, therefore it is important to note all steps of the manual are for guidance only. The control PCB acts similarly to a PLC as such it is easily configurable and expandable to match any hardware changes. Once loaded with software it will loop until the power supply is interrupted.

Testing cycles are performed on both test benches as well as on a 939 Series vehicle to discover any software bugs or possible feature improvements. New software revisions are made to match all PCB variants and be forwards-compatible, however it is not always possible to discover new software bugs during day-to-day testing because of this approach.

Assumptions

- The user installing the product has access to basic hand tools and basic technical knowledge.
- The control PCB has been removed from the vehicle.
- The .hex file has been downloaded in preparation for software updates.
- The software 'XLoader' has been downloaded and uncompressed.
- The user has an available USB port on their computer.
- The user has a USB-A to Mini USB lead.

If the above are true then updating the software should take approximately 5 minutes.

Setup

Software Tools Required

The required tools to update the software on the control PCB are as follows:

- XLoader
- Windows 7, Windows 8/8.1, Windows 10
- Windows Explorer
  - Other .zip folder decompressors can be used
- Device Manager
- CH340/341 USB Drivers

It is recommended to have administrative permissions on the computer you are using to update the control PCB, however not necessary.

CH340/341 USB Driver

The PCB communicates to the host computer using a USB serial interface, because of this an external USB driver is required for the communication protocol to be interpreted correctly to/from the computer. The CH34x driver set is a common interface for communicating to microprocessors, and as such is a trusted and reliable driver set that has been used for many USB TTL applications. Installation for the CH34x drivers is very simple. Use the **following download link to download the CH34x drivers**, and the below instructions for installing them for use.

After downloading the executable file, launch it and you will be shown the ensuing popup:
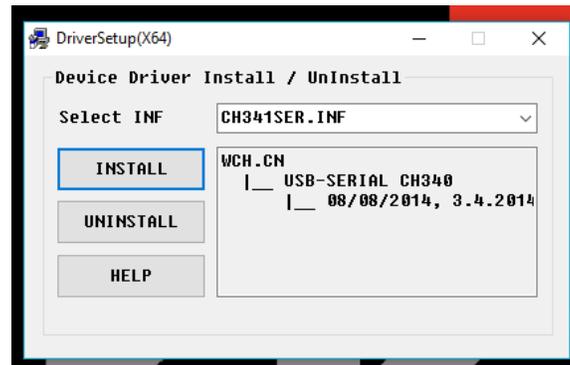
Figure 1: CH34x Driver Install

Install the drivers by pressing the 'Uninstall' button, followed then by the 'Install' button – it does not take long to install.

Connections

Connecting To A Computer

Remove the control PCB from the case, with the wires removed from the terminal blocks the terminal block end of the PCB tilts up to be on it's end. A small ridge is designed in the case to prevent the PCB coming loose depending on the location installed in the car. The microcontroller-end of the PCB fits under this ridge to secure it in-place.

After removing the PCB from the case, connect a USB-A to Mini USB lead to the computer you are using and plug the Mini USB connector into the Mini USB receiver on the PCB – the PCB should light up and flash approximately once every second-and-a-half.

Figure 2: USB-A to Mini USB

Figure 3: Terminal Blocks Lifted From Case

Uploading New Firmware

Setting Communication Values

After extracting the XLoader compressed folder to a known location, launch the executable file named 'XLoader'. The following menu should appear after a short pause:
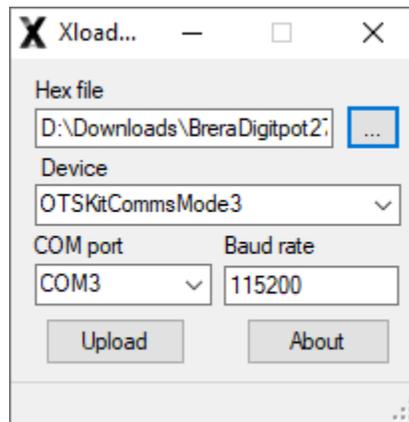
Figure 4: XLoader menu options

- Hex File
  - o The 'Hex File' location will change depending on where the .hex file downloaded from https://working-design.co.uk/software/ was saved on your computer; typically the downloads folder unless otherwise specified.
- Device
  - o Depending on the software version currently installed on the OTS PCB, you will need to try each of the OTSKitCommsMode options in the drop-down box.
- COM Port
  - o The COM Port the PCB is connected to changes on a computer-by-computer basis. This can easily be found by launching 'Device Manager' on your computer, going to the Ports (COM & LPT) expand menu and finding the COM Port number assigned to 'USB Serial CH340'. In this example it is assigned to COM Port 3 (COM3).

Figure 5: PCB COM Port Number (Highlighted)

- Baud Rate
  - This is the speed that the computer communicates to the PCB at. Depending on the drop-down 'Devices' option the baud rate will change between 57600, 19200, or 115200.

Uploading

After ensuring all of the communication values are correct, check that the .hex file is the right one you intend to upload to the PCB. The process of updating the PCB with the .hex file rewrites the memory of the controller and uploading incorrect files to it can cause issues.

Click the 'Upload' button, and after a brief pause the LEDs on the PCB should begin to flash rapidly to confirm new data is being written – this process should take no more than 10 seconds if the correct drop-down has been selected in the 'Device' tab. Once the LEDs stop rapidly flashing and the PCB returns to its normal state of lighting the LED once every second-and-a-half, confirm XLoader has uploaded the new software to the device. This will be presented to you by '*xyz* Bytes Uploaded' as in the screenshot below. The PCB can now be disconnected from the computer and returned to the vehicle.
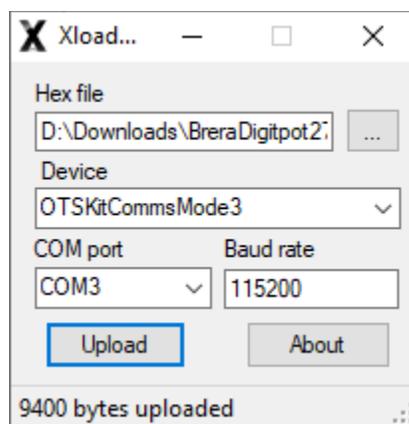
Figure 6: Bytes Uploaded Confirmation

If the devices' LEDs do not flash rapidly, and the XLoader software freezes/locks up for more than 20 seconds after pressing the 'Upload' button, then you will need to try a different option in the 'Device' drop-down and try to upload the firmware again.

This completes the update procedure. Reconnect the PCB to the vehicle and confirm functionality.

Help & Support

For help or support please contact george@working-design.co.uk stating your order number and query.