

AN417 – Re-flashing Firmware on CANopen Axiomatic Devices

Introduction

This application note highlights the procedure for re-flashing CANopen application firmware for Axiomatic devices in the field.

Prerequisites

1. A Personal Computer with a USB port, running on a Windows operating system.
2. An application firmware flash file for the Axiomatic device, with the following name:

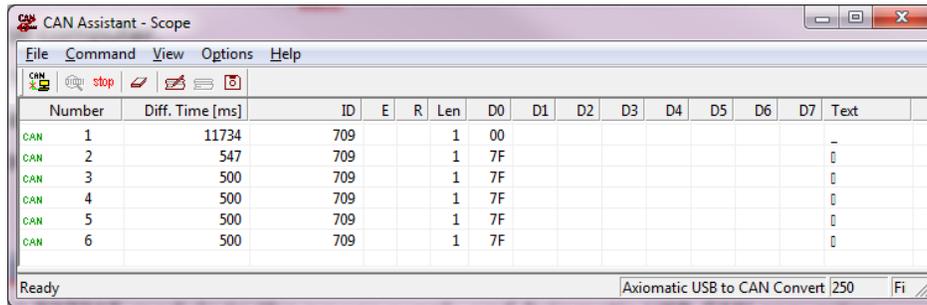
AF-nnnnn-x.xx-sss.bin

Where:

- a) 'nnnnn' represent the specific project number,
 - b) 'x.xx' is the firmware version number
 - c) 'sss' are file comments for information purposes.
3. The Axiomatic Electronic Assistant (EA) software (p/n AX070500).
 4. The Axiomatic CAN Assistant – Scope software (p/n AX070501SCO).
 5. An Axiomatic USB-CAN Converter (p/n AX070501) connected to the USB port of the PC.
 6. A power supply to power the controllers.
 7. Wire harness to connect the controllers to the power supply and the CAN port of the Axiomatic USB-CAN converter with proper network termination resistance.

Starting Bootloader on Device

1. Connect an Axiomatic controller to the power supply and Axiomatic USB-CAN converter.
2. Open the CAN port and start monitoring the CAN bus in 'CAN Assistant – Scope'. Ensure the baud rate is set equal to the baud rate configured in the CANopen Axiomatic device.
3. Power-up the controller. A single message should be sent from the unit, followed by heartbeat messages (if configured):

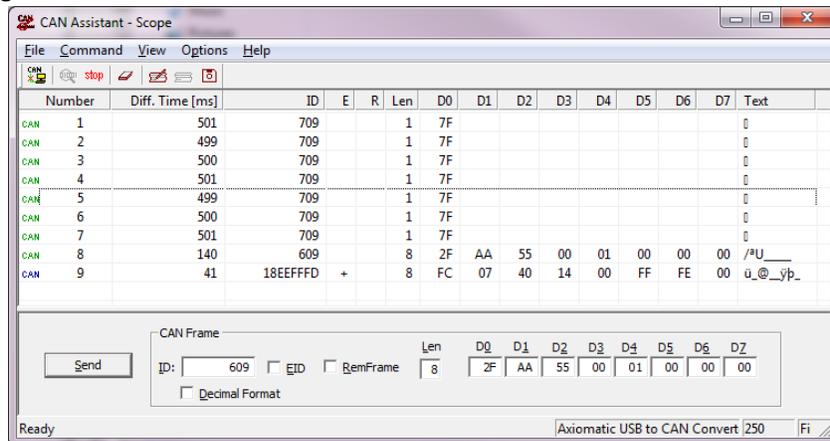


- Set the CANopen object 0x55AA to 1 using SDO protocol. To do so, send the following message using 'CAN Assistant – Scope':

ID	Len	D0	D1	D2	D3	D4	D5	D6	D7
609	8	2F	AA	55	00	01	00	00	00

Note: The device in this document has a Node ID of 0x09; SDO messages to the Axiomatic device will have ID with this structure: $0x600 + NodeID (0x09)$, which results in an ID of 0x609.

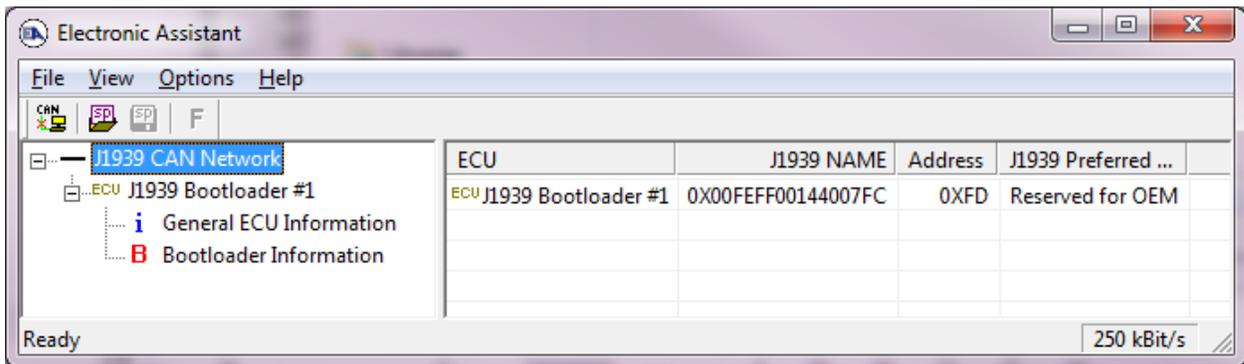
If everything is correct, the controller will acknowledge the writing operation and activate software reset after the message is sent.



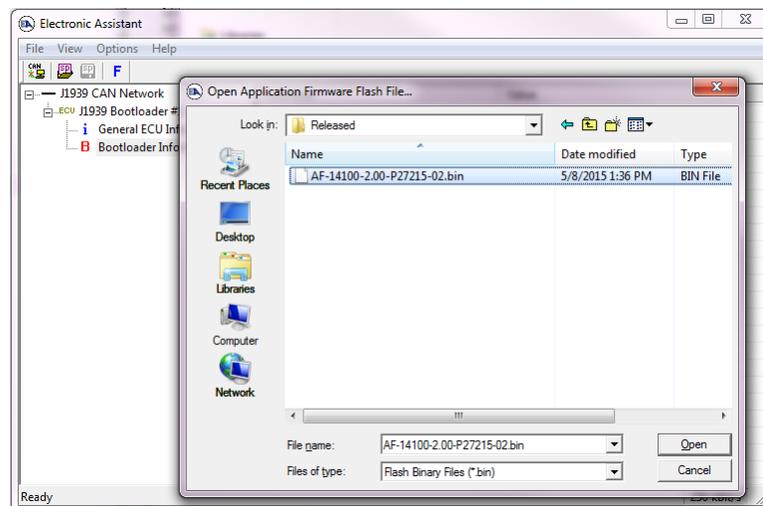
The last message with extended ID is the address claimed message of the J1939 bootloader.

Re-flashing Firmware

- Run the Electronic Assistant (EA) software and connect to the CAN port. The following screen should pop-up:



- Click on the Bootloader Information group in the left pane and then on the F button in the EA toolbar.
Select the flash file in the format: **AF-nnnnn-x.xx-sss.bin**



- Open the flash file and begin the flashing operation by pressing the Flash ECU button.

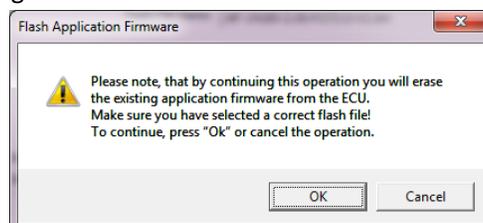
After reading and confirming the recommendations of **Note 1** and **Note 2**, check 'Erase All ECU Flash Memory'.

Note 1: Contact Axiomatic Customer Service prior to checking 'Erase All ECU Flash Memory'. This is because for some units, checking this field may erase calibration data, which would in turn require the unit to be returned to Axiomatic for calibration.

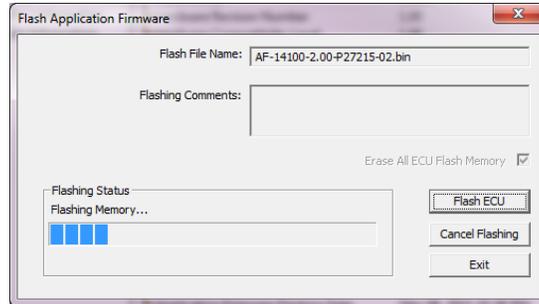
Note 2: Saving setpoints before flashing the firmware is highly recommended to avoid errors.

Users have the option to write their comments in the Flashing Comments field.

- Confirm this warning message from EA.

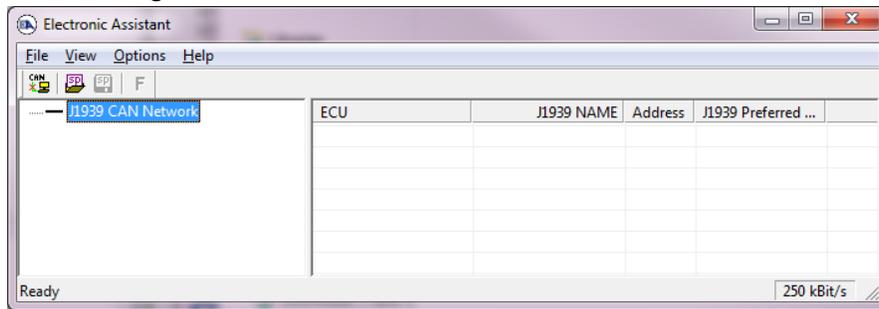


After confirming the flashing, users will see the flashing operation on the EA screen.

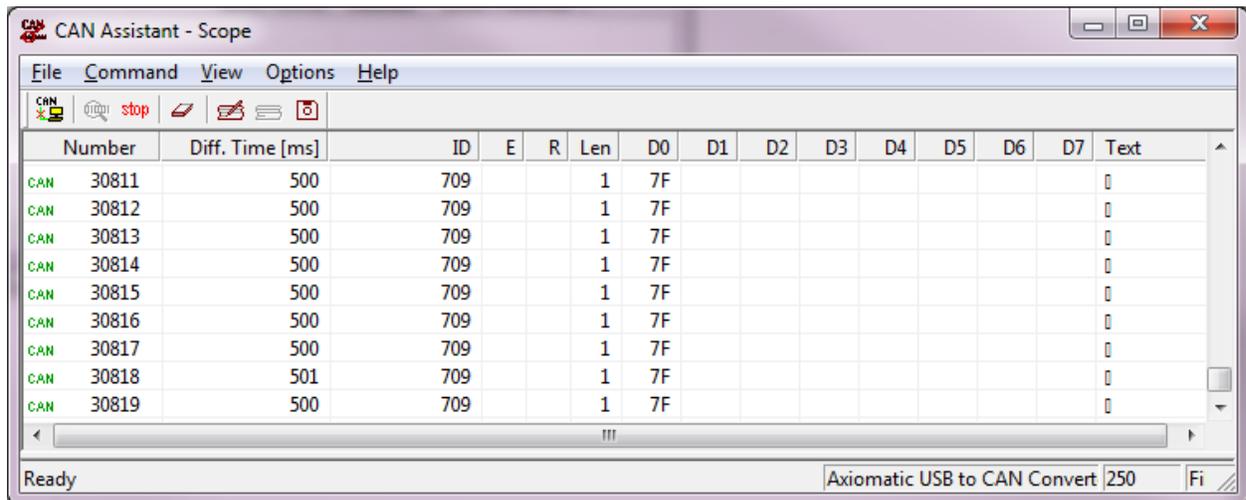


5. When the flashing is done, reset the ECU.

After the ECU is reset, the J1939 bootloader will no longer be active, and the new CANopen application firmware should be running.



6. Check the new application firmware. Cycle power to the controller. In the 'CAN Assistant – Scope' users should see a single message from the new application firmware reporting that the unit is in its pre-operational state:



Version	Date	Author	Comments
1.00	August 20, 2021	Gustavo Del Valle/Sue Thomas / Kiril Mojsov	Initial release
1.00	Feb. 22, 2022	Amanda Wilkins	CANopen