

case study

► Softing with Continental:

Flash programming by
ASAM MCD means

”ASAM MCD-2 D (ODX) and ASAM MCD-3 provide a good backbone for a standardized flash process with automated reprogramming loops.“

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SUMMARY

Continental and Softing implemented a new automatized flash process that is based on ASAM MCD-2 D (ODX) for flash data description and ASAM MCD-3 for the flash programming sequence.

The automatic generation of all relevant ODX files significantly reduces the risk of inconsistent tool configurations. The end user only needs to import the PDX file into his reprogramming tool and gets - depending on his skills - either a simple one-button user interface or a five-button user interface allowing him preconfigured user interaction.

SITUATION

The reprogramming of the flash memory is a recurring task throughout the ECU’s lifecycle. During the development phase, reprogramming of new software versions or application data is an on-going process for both the ECU supplier and the vehicle manufacturer. Even in the field, software updates are occasionally necessary. Finally, the return analysis departments of ECU suppliers need to reprogram ECUs for analysis purposes.

SUCCESS STRATEGY

Continental was looking for a new ECU reprogramming process that covers not only the pure data download but also the necessary pre- and post processing, such as security access. The target was to

- Automatically generate flash ODX files during the software development process in order to reduce manual and thus error prone configuration work.

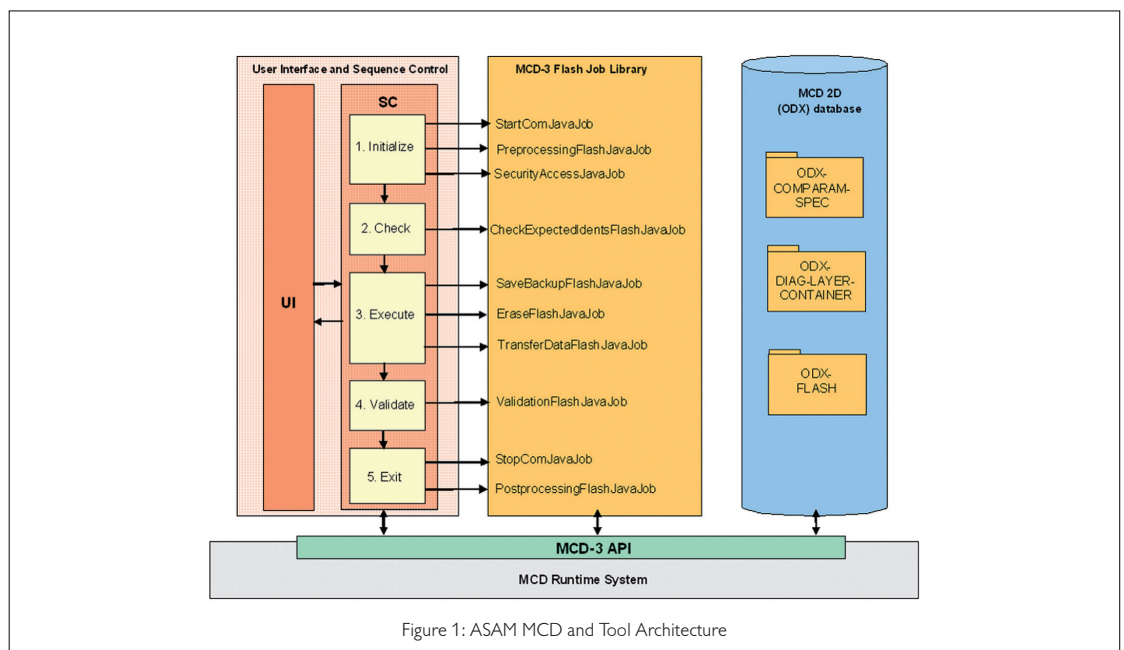


Figure 1: ASAM MCD and Tool Architecture

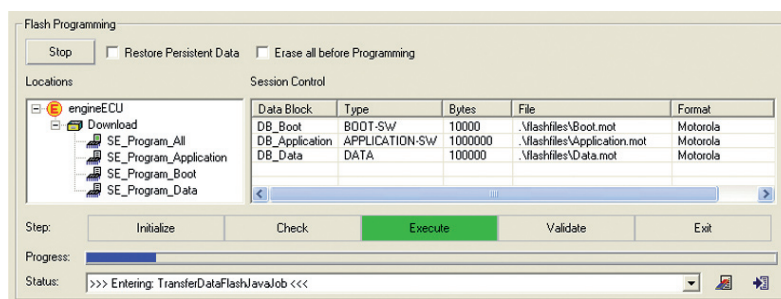


Figure 2: Reprogramming with user interaction

- Add coherence checks before and consistency checks after the programming in order to have a safe flash process.
- Allow programming of an ECU in almost any initial condition (robust flash process).
- Provide an easy-to-use reprogramming tool with a simple user interface.
- Use existing standards (ASAM MCD-2 D and ASAM MCD-3).

The Diagnostic Tool Set (DTS V7) of the tool supplier Softing AG provides the required flexibility in order to implement all pre-and post processing steps. Figure 1 illustrates the architecture of the system. Figure 1 shows that the proprietary user interface (UI) and the session control (SC) allow launching several standardized ASAM MCD-3 Java jobs in a sequence. These jobs have access to the ODX data via the MCD-3 API. A return code and error handling mechanism allows for some user interaction in between the JAVA jobs (see Figure 2). Besides the files that contain the binary data to be programmed, an ASAM based flash process requires ODX objects. Examples include:

- The ODX-FLASH object contains detailed information about physical and logical flash memory layout, memory mapping, flash files,

checksum etc.

- The ODX-DIAG-LAYER-CONTAINER contains the description of the diagnostic protocol used for the flash process, e.g. UDS on CAN.
- The ODX-COMPARAM-SPEC describes all bus parameters required to enter into communication with the ECU (addresses, baud rate, etc.).
- A library of ASAM MCD-3 flash jobs that contains the flash sequence, including pre-and post processing. All these objects are contained in different files that are collected in a PDX file (packaged ODX). The PDX files are generated automatically with each software build process for a new version.

BUSINESS BENEFITS

The automatic generation of the ODX/PDX files removes the risk of inconsistent tool configurations. The end user imports the PDX file into his reprogramming tool and gets an easy-to-use user interface. The complexity of the flash process is covered within the ASAM MCD-3 flash jobs (Java jobs). Due to the reduction of the development efforts, these improvements significantly reduce expenses in terms of time and money.