

# Flash Bootloader

Flashing via CAN, LIN and FlexRay

## Advantages

- > Large number of supported microcontroller platforms
- > Dedicated support for several OEMs
- > Low memory requirement
- > Extensive tool chain

The Vector Flash Bootloader is a universal and compact solution for fast, efficient and secure reprogramming of ECUs on various bus systems such as CAN, LIN, FlexRay and others. It is an established solution that is practice-proven over many years of use.

The Flash Bootloader fulfils the specifications of different automotive OEMs.

## Application areas

The Vector Flash Bootloader reprograms ECU software on an in-vehicle network. This simplifies the transfer of ECU software in development, during production and in service.

## Properties and advantages

The Flash Bootloader consists of these components: bootloader, flash driver (flash algorithms) and a PC-based flash tool.

The GENy configuration tool is used to flexibly configure the Flash Bootloader, adapting it to individual requirements. Moreover, the interfaces enable ECU-specific adaptations.

The compact architecture of the Flash Bootloader even supports microcontroller platforms with limited resources.

For the flash process, the user only needs a connection to the bus system, where the ECU is connected to a PC. The flash tool is then used to program new ECU software.

## Functions

As the first software instance after the ECU reset, the Flash Bootloader is started during the boot phase. It checks to see if valid executable ECU software exists, and starts this software as necessary.

In the reprogramming process, first the Flash Bootloader loads the flash driver into the ECU's RAM via the available bus system. Then the ECU software is erased and is reprogrammed by the Flash Bootloader.

## Architecture

Besides containing the OEM Download Manager, the Flash Bootloader also contains the appropriate CAN, LIN or FlexRay driver, a transport protocol and a diagnostic layer (KWP2000 or UDS). These components are specially adapted to the requirements of the Flash Bootloader and therefore require very little memory.

The OEM Download Manager contains the OEM-specific flash routine based on KWP 2000 or UDS diagnostic services.



Flashing via CAN, LIN or FlexRay

The Flash Bootloader is usually loaded in the ECU together with the ECU-specific software, and it is stored in a protected memory area.

Due to the modular architecture of the Flash Bootloader, reprogramming also supports multiprocessor systems and different memory types in one ECU.

A security module is also available for ECUs with security needs. The security module utilizes cryptographic methods to prevent programming of ECU software that does not originate from a trustworthy source.

To reduce data transmission time in ECU programming, Vector also offers a data compression module for the Flash Bootloader.

Details on the security module and data compression are described in a separate datasheet.

#### **Hardware interfaces**

Except for a PC or laptop with CAN interface (e.g. CANcardXL, CANboardXL or CANcaseXL) or FlexRay interface (e.g. FlexCard, VN3300, VN3600 or VN7600), no additional interface or hardware is needed.

#### **Included in the delivery**

- > Flash Bootloader as configurable C source code
- > Flash driver
- > Flash scripts for controlling the download process