ETAS RTA-FBL GM V1.3.2

Release Notes

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1. Introduction

This document contains the release notes for RTA-FBL GM V1.3.2 developed by ETAS.

1.1. Definitions and Abbreviations

Term/Abbreviation	Definition
ADC	Analogue to Digital Convertor
Application Software	This is the software that executes the control logic of the ECU
AR	AUTOSAR
AUTOSAR	AUTomotive Open System Architecture
BLSM	Bootloader State Manager
BSW	Basic Software
CAN	Controller Area Network
CAN FD	CAN Flexible Datarate
Dcm	Diagnostic Communication Manager
DiD	Data iDentifier
ECU	Electronic Control Unit
FBL	Flash Bootloader
Fee	Flash EEPROM Emulation
GM	General Motors
HW	Hardware
KIR	**K**nown **I**ssue **R**eport – For severe Problem Reports which occur after a release, ETAS has introduced the Known Issue Report to inform affected customer immediately. The current Known Issues of former versions can be found on the ETAS website: www.etas.com/kir
OEM	Original Equipment Manufacturer
PR	Problem Report
SP	Security Peripheral
SW	Software

1.2. References

Ref.	Description	Version
[1]	GB6000 Unified Diagnostic Services Specification	v2.2 (March 17, 2017)
[2]	GB6001 Diagnostic Infrastructure Specification	MY22 Version: Version: 4.1 (02/06/2019)
[3]	GB6002 Bootloader Specification	Version 2.0 Jan-13-2021

1.3. User Documentation

The RTA-FBL GM user’s documentation in PDF format can be found as part of the Documentation folder of this product after installation.

2. Product Definition

2.1. Functions at a glance

This RTA-FBL GM port implements features of the GM Bootloader specification given in [3] with the following exceptions noted:

- Bit-difference library: This optional feature is not supported.
- LZMA compression: This feature is not supported. Note that GM do not require this feature to be supported if the download time requirements are met. If downloads do not meet these requirements, consider using ARLE compression which is supported in this port.
- Multiple processors: Only one processor is supported in this version. Therefore, only one application and its association calibration modules will be accepted for download by the bootloader. This also limits the maximum number of calibration partitions to 14 and the maximum number of calibration modules to 19 (calibration module Ids 2 through to 20).
- The optional integrity check validation of the bootloader during initialization is not supported.
- ECU Regionalization: This feature is not currently supported.
- Bootloader Secure Parameters: This feature is not currently supported.
- Security Peripheral Update: While this feature is supported, a dedicated memory area for storing the downloaded update package is required. You cannot use an application or calibration space to store the SP update package.

The integrator should also note the following:

- Bootloader update is not required in [3]. Although bootloader update is not natively supported in the port, support may have been implemented for your chosen target. Please see your GM FBL Target Guide for additional information on whether bootloader update is supported for your target.
- The block size set in the configuration of the bootloader as described in the RTA-FBL GM user manual must be respected for all blocks sent from the tester except for the last block that can be smaller than the configured block size.
- As result of a limitation in the types of frames supported by RTA-BSW, functional addresses should only be used for single-frame communication when using CAN. All multi-frame communication should be done using physical Can Ids for CAN communication. See Section 3.6 for further information on other limitations of this release.

2.2. Intended Use

The scope of the project is to implement a Flash Bootloader for GM OEM. A Flash Bootloader is a piece of software that resides in a permanent partition of the ECU's flash memory. The purpose of Flash Bootloader is to establish the ECU entry point upon power up or power on reset and to enable flash programming of application software and calibration data via a diagnostic protocol on some physical channel. The Flash Bootloader implements the startup sequence when the ECU is powered up or after power on reset. Flash programming of the ECU is required when application software or calibration data is missing or an update to these is required.

2.3. Safety-Relevance

The bootloader delivered in this release has been developed to a Quality-Management (QM) level. Therefore, the bootloader software is not certified to any safety level (including any ASIL-x level) and should not be used with any safety-relevant applications.

2.4. General Description

2.4.1. System Prerequisites

The following minimum system prerequisites have to be met:

Required Hardware	1,0 GHz PC 1 GB RAM Network adapter Graphics with a resolution of at least 1024 x 768, 32 MB RAM
Required Operating System	Windows® 10
Required Free Disk Space	500 MB (not including the size for application data)

The following system prerequisites are recommended:

Required Hardware	2,0 GHz Dual-Core PC or equivalent 2 GB RAM Network adapter Graphics with a resolution of 1280 x 1024, 128 MB RAM
Required Operating System	Windows® 10
Required Free Disk Space	>2,0 GB

2.4.2. Software Prerequisites

Software Name	Version	Description
Microsoft Windows®	10	Software has been fully tested, including the provided GUI configuration tool in this version of Windows
ETAS ISOLAR-AB	9.1.0	RTA-FBL Configurator tool
.NET Framework	3.5	This is required by the ETAS license management. In most cases, you will already have this installed on your machine.

2.4.3. Hardware Target System and Components

This software delivery is target-independent. The dummy target provided with the software installation cannot be built. You can only use the generated code as a reference to explore how different parameters change the generated FBL instance.

2.4.4. Compiler/Build Tools

Your RTA-FBL GM Target Guide will provide information on how to build an instance of the bootloader for your real target.

2.4.5. Integration Notes

Refer to the User Manual for instructions on integration with application software. Your RTA-FBL GM Target Guide may also provide additional integration information for your target.

2.5. Delivery

The software is delivered with an installer. All software documentation is available in the Portable Document Format (PDF), which requires Adobe® Reader®. You will find the installation link in the Documentation directory on the installation. This document provides information relevant to installation and licensing of this product.

The installer contains the following items:

Directory	Meaning / Explanation
RTA_FBL_1.3.2_GM.exe	Installation program for ETAS RTA-FBL GM
Documents\ETAS_Safety_Advice.pdf	Safety Advice
Documents\RTA-FBL_GM_EULA.pdf	End User Level Agreement
Documents\RTA-FBL_GM_OSS_Attribution_Document.pdf	Open Source Attribution Document
Documents\RTA-FBL_GM_Release_Notes.pdf	Release Notes (this document)
Documents\RTA-FBL_GM_User_Manual.pdf	User Manual

2.6. Installation

The detailed installation instructions are available in the Installation chapter of the RTA-FBL GM User Manual that can be found in the Documentation folder of this product.

2.7. Licensing

The use of ETAS RTA-FBL GM is protected by electronic licensing. Valid licenses are necessary to install ETAS RTA-FBL GM and its add-ons. The use of unlicensed ETAS software is prohibited. The required licenses are not included in this delivery.

When you purchase ETAS RTA-FBL GM licenses, you receive a separate entitlement certificate which

contains an activation ID needed to acquire the license. Please refer to the Licensing chapter in the RTA-FBL GM User Manual for more detailed information.

For further assistance, please consult the manual available under “help” on the start page of the ETAS self-service portal (http://www.etas.com/support/licensing) or see the ETAS licensing FAQ: https://www.etas.com/en/downloadcenter/37717.php.

3. Changes

This chapter describes changes with respect to the previous version of RTA-FBL GM.

3.1. What's New

The delivery fixes a number of minor issues for which workaround patches had been provided in the previous version (V1.3.1). These issues are related in a large part to the responses to DIDs 0xF181 and 0xF0F0.

3.2. Compatibility to Earlier Releases

This version (V1.3.2) supersedes V1.3.1. The FBL configuration created using the previous RTA-FBL GM versions are not compatible with this version.

3.3. Fixed Problems

This section describes the set of fixed problems of the released version of RTA-FBL GM.

Customer Ticket (where reported)	ETAS Tracking No.	Issue Name	Description
N/A	RTAFBL-4565	FBL not recoverable after TestCase_GM_RC033	An issue was identified whereby if an application erase operation fails during programming, and the final sector is not erased, then the ECU is bricked. This issue can happen accidentally if power is lost during the erase operation, which usually lasts under 1 second. If the erase fails due to a memory issue in the program flash, then the ECU would in any case not be recoverable. Therefore, while this issue could lead to a bricked ECU during programming a healthy ECU, it is unlikely to happen in practice as it requires a loss of power during the short time window where application erase has started (through RID 0xFF00) but not yet completed.
RHGM-1947	RTAFBL-4364	Bug fix for optimisation that results in HSM update failing.	The shared RAM variable between FBL and HSM was being optimised away in some compilers. This variable is now tagged as volatile to ensure the compiler does not optimise it away.
RHU-2001 RHU-3560	RTAFBL-4268	Bug fix DIDs 0xF181 and 0xF0F0	DIDs 0xF181 and 0xF0F0 returned wrong values for the HSM partition and

Customer Ticket (where reported)	ETAS Tracking No.	Issue Name	Description
			module Ids; 0xF181 also returned the wrong DLS
RHU-1795	RTAFBL-4365	NRCs for RIDs cannot return NRC 24	The response for some services returned a MessageOutOfSequence NRC that is not allowed by ISO14229
RHU-3637	RTAFBL-4366	Reading HSM PSI after HSM update fails	After a successful HSM update, reading the PSI returned an invalid state of the HSM until a reset is issued
RHGM-1976	RTAFBL-4391	Missing memmaped items	Some variables were not enclosed in memmap #includes that allows them to be proper located by the linker
N/A	RTAFBL-4392	Mini-FBL needs a watchdog call	Before starting an HSM update, the integrator might need to disable the watchdog because the Mini-FBL executes in a non-interruptible loop

3.4. Known Issue Reports

If a product issue develops, ETAS will prepare a Known Issue Report (KIR) and post it on the internet. The report includes information regarding the technical impact and status of the solution. Therefore, you must check the KIR applicable to this ETAS product version and follow the relevant instructions prior to operation of the product.

The Known Issue Report (KIR) can be found here: www.etas.com/kir

3.5. Known Issues

This section describes the set of known problems of the released version of RTA-FBL GM.

Issue Tracking No.	Issue Name	Description and Workarounds
RTAFBL-1287	Incorrect NRC and PEC on calibration request download without erase and after app download.	A bug exists whereby an incorrect NRC is returned and the PEC is set incorrectly when a successful application download is followed by a request download service request for a calibration module when that calibration module's partition is not first erased. The expected behavior in this case is that the NRC response is set to 0x24 (sequence error) and the PEC is set to 0x001D (MsgOutOfSequence). Instead, the NRC returned to the request download service request is 0x31 (request out of range) and the PEC is set to 0x0005 (GetAppInfo). The workaround is to make sure that, as required in [3], you follow the correct sequence in your tester

Issue Tracking No.	Issue Name	Description and Workarounds
		download script and always remember to erase the calibration partition first before attempting to program it. If you do get the aforementioned incorrect NRC and PEC values on a request download request of a calibration module, consider that this may be because you have forgotten to erase the calibration module's partition first, rather than there was an error reading the application info.
RTAFBL-2590	Communication Control $28 without required services before, the FBL returns positive response	Service $28 should be issued following the GM-specified download sequence. An NRC should be returned by the FBL if this sequence is not followed.
RTAFBL-1985	Failed download with wrong cal values in App SW Info, ECU is blocked after erase of cal	The FBL will fail and cause a reset if the app info is invalid. The ECU is not bricked and download is still possible.
RTAFBL-1986	FBL returns PEC 0x030C when HSM update length exceeds host boundaries	The PEC returned is Err_HSM_LengthExceeded (0x030C) rather than the expected Err_HSM_HostMemory (0x037) when HSM update length exceeds host boundaries.
RTAFBL-2344	Configuration order dependence of ARXML	The configuration of external memory results in an error if parameter values are not given in strict order with start module address appearing first and end module address appearing second. Reordering the .arxml configuration in a text editor is the proposed workaround.

3.6. Known Limitations

This section describes the set of known limitations of the released version of RTA-FBL GM.

Limitation Tracking No.	Limitation Name	Description and Workarounds
RTAFBL-1323	Testing of 11-bit CAN Ids	Available test tooling (including GM's DPS) could not support 11-bit CAN Ids that return a flow control frame with a different CAN Id to the response message (see [1]). Some testing of the 11-bit CAN Ids has been carried out to provide confidence that this will work on a tester that supports this configuration. However, the full test suite was only run using 29-bit Ids. It is unlikely that any failures will occur when using 11-bit CAN Ids that would not have been caught in the 29-bit extensive tests that have been carried out. If you encounter any problems

Limitation Tracking No.	Limitation Name	Description and Workarounds
		when using 11-but CAN Ids, please contact ETAS using the contact information provided in Section 4.
RTAFBL-1326	Suppressed responses persists across UDS requests	A known issue in RTA-BSW results in no response being received to UDS requests with no subfunction if a previously sent request with a subfunction was sent with the suppression bit set on. For example, if a tester present request is sent was the response suppressed, then no response will be received for a subsequent read DID request. The workaround for this issue is to always send a UDS request without response suppression before making any requests with no subfunction. This issue may be resolved in a future version of RTA-BSW, but will remain a limitation of the FBL until then.
RTAFBL-1332	Single Frame functional requests	As result of a limitation in the types of frames supported by RTA-BSW, functional addresses should only be used for single-frame communication. All multi-frame communication should be done using physical Can Ids.
RTAFBL-1333	Request download addressAndLength-FormatIdentifier	As required in [1], this parameter of the request download request must equal to 0x44. Due to a limitation of the BSW, values less than 0x44 but greater than 0x00 do not return a correct NRC. The workaround is to ensure that your tester uses only 0x44 as the addressAndLengthFormatIdentifier as required in the GM Specification [1].
RTAFBL-1530	String input cannot be padded with spaces	If a string input parameter ends with spaces, the spaces are truncated during FBL generation.
RTAFBL-1951 RTAFBL-1952	On Ethernet network, FBL does not respond to PDU with wrong payload	A known issue in RTA-BSW results in no response being received to UDS requests sent over Ethernet when the wrong payload (either smaller or bigger) is sent to the FBL. The expected behaviour in this case is to receive an NRC 0x13.
RTAFBL-1861	On Ethernet network, FBL does not respond to Write SBA Ticket Request	A known issue in RTA-BSW results in no response being received to UDS requests sent over Ethernet made up of multiple frames The expected behaviour when writing DID $F0F4 is to receive NRC 0x31 (Request Out Of Range), since the DID is not supported. Instead, the FBL does not respond.
RTAFBL-2046	If SP programming Routine fails, FBL returns NRC when trying to read the Routine result	A known issue in RTA-BSW results in a wrong NRC after the Start Routine Request has failed. As a result, it is not possible to retrieve the 0x3C2 Routine Result when the SP programming update has failed and the FBL has returned NRC 0x72.

Limitation Tracking No.	Limitation Name	Description and Workarounds
RTAFBL-1953	ECU responds only to one tester after entering extended session	The correct behaviour should be that limiting response to one tester should only happen after entering the programming session.
RTAFBL-3980	If App/Cal includes the last memory module sector, service 0x34 returns NRC 0x31	If the size of the memory block that is downloaded includes the last memory sector, service 0x34 returns NRC 0x31, due to a limitation of the check of stardAddress + memorySize.
RTAFBL-3992	Limitation of functional Address for services 0x27, 0x34 and 0x37	Services 0x37 and 0x34 reply to functional addresses and they should not, service 0x27 does not reply to functional addresses due to previous limitation RTAFBL-1332.
RTAFBL-4454	TCP Checksum in ethernet frames	The checksum in internet frames is checked in the FBL as per RFCs 1071, RFC1141. The result of this checksum may be 0xffff for some frames. Some testers do not follow these RFCs and will send a checksum of 0x0000, which results in the frame being discarded. It is known that GM internal tools do not have this problem, but some Windows and Linux PCs do. Your test tools should be updated to ensure checksum 0x0000 is never sent to the ECU under test.
RTAFBL-4303, RHGM-1962	Jumping to boot with a CAN message when CAN-FD is enabled in FBL	When CAN-FD is enabled in the FBL, then the jump to boot from the application needs to be done via a 10 02 message sent over a CAN-FD channel.

4. Contact Information

4.1. Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the website: www.etas.com/hotlines

4.2. ETAS Headquarters

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