BMW GROUP

Rolls-Royce Motor Cars Limited

User Guide Vin

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1 Overview

1.1 Purpose

The Vin module is used to request the VIN over the bus, set the qualifier and hand it over to application software components.

The Vin module is modeled as an AUTOSAR software component (SWC) residing above the RTE.

2 Acronyms and Abbreviations

A&S	Authentication and Signature (Grundschutzmechanismen)
AllgGB	Allgemeine Gültigkeitsbedingung
AN	Applikationsnummer
API	Application Programming Interface
AppGB	Applikationsspezifische Gültigkeitsbedingung
AUTOSAR	Automotive Open System Architecture
CA	Certification Authority
CAL	Cryptographic Abstraction Layer
CAS	Car Access System (Steuergerät)
CCC	Car Communication Computer
CKD	Completely Knocked Down. A BMW plant that is not connected to the central BMW IT.
CSM	Client Security Module
CRL	Certificate Revocation List
DEK	Data Encryption Key
DER	Distinguished Encoding Rules (As described by ASN.1)
DES	Data Encryption Standard
DN	Distinguished Name
DTC	Diagnostic Trouble Code -> Fehlercode des Fehlerspeichereintrages
ECU	Electronic Control Unit
FAT	Flash-Absicherungs-Tool
FSC	Freischaltcode
FSCS	Freischaltcode-Stelle
FZG	Fahrzeug
FZG-R	BMW Fahrzeug-Root-CA
GB	Gültigkeitsbedingung
GG	Gültigkeitsgruppe
GMT	Greenwich Mean Time
HO	Handelsorganisation (BMW)
HW	Hardware

M-FSCS	Master-Freischaltcodestelle
OS	Operating System
PKI	Public Key Infrastrucutre
RCn	Routine Control Option n / Exit Result n
RI	Routine Identifier
RSA	Asymmetric Cryptoalgorithm by Rivest, Shamir und Adleman
RTE	Runtime Environment
SG	Steuergerät
SGID	Steuergeräte-ID, Diagnoseadresse, Steuergeräte-Adresse
SID	Service Identifier
SigS	SW-Signatur-Stelle
SW	Software
SW-C	Software Component
SWID	Software-ID consisting of application number and upgrade index
SWT	SWEEPING Technologies (SoftWare Enabled Electronic Platform for Innovative Next Generation Technologies)
UDS	Universal Diagnostic Services
UI	Upgrade Index
UTC	Coordinated Universal Time
VCM	Vehicle Configuration Management
VIN	Vehicle Identification Number
VIN7	The last 7 digits of the 17-digit VIN

All abbreviations used throughout this document -- except the ones listed here -- can be found in the official AUTOSAR glossary [1].

3 Related documentation

3.1 BMW Specifications

3.2 AUTOSAR Specifications

[1] Glossary
AUTOSAR_TR_Glossary

4 Usage

This section describes all functional Vin features to be used by an application.

4.1 Receiving the VIN and Qualifier

```
Vin_VinType           ExternalVIN;

if( E_OK == Rte_Read_Vin_Vin_Vin(&ExternalVIN))
{
   /* ExternalVIN.Vin contains the VIN,
      ExternalVIN.Qualifier contains the corresponding qualifier */
}
```

4.2 Evaluating the Qualifier

There is a macro to easily evaluate the qualifier in `Vin_Helper.h`. The check, whether an external VIN has been received at all, use the following code snipped:

```
#include "Vin_Helper.h"

if (VIN_CHECKQUALIFIER(ExternalVIN.Qualifier, VIN_CQ_VIN_RECEIVED))
{
   /* An external VIN has been received */
}
```

To check for a verified secure VIN, use

```
#include "Vin_Helper.h"

if (VIN_CHECKQUALIFIER(ExternalVIN.Qualifier, VIN_CQ_VIN_SECURE))
{
   /* An external secured VIN has been received and verified */
}
```

For a plain VIN in an unsafe environment, use the same with `VIN_CQ_VIN_UNSAFE`.

4.3 Getting Notified about a Changed VIN

If a received VIN is different from the last received VIN, the mode `VinChangeIndicator` is switched to `VIN_CI_CHANGED`.

The mode will stay in `VIN_CI_CHANGED` until shutdown of the ECU. On the next start-up, the mode will switch to `VIN_CI_NOCHANGE` if the same VIN is received.

Hint: If you need to trigger a long-running operation on a VIN change, you should write a flag into NVM in your `ON-ENTER` Runnable and then trigger the operation. So if the ECU shuts down

before the long-running operation has finished, you can restart it in the next life cycle according to the flag.