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IR IGBT TC3300 Software Release Notes



WAP7



WAG9/WAG9H



WAP5

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1. Introduction

1.1 Abstract

This document contains the release note for software's delivered by Bombardier for IR WAG9/WAG9H/WAP locomotives with IGBT TC3300 AC product. Describes Software version number involved in 320T01BT-220T01BT software Package.

1.2 Abbreviations and Definitions

Abbreviation	Description
AP	Application
BL	Bootloader
BUR	Auxiliary Converter
Cfg	Configuration
CLW	Chittaranjan Locomotive Works
CON	Traction converter
DCU	Drive control unit
FW	Firmware
IR	Indian Railways
MAPP	Address plug programming tool for TCMS & converter control equipment
MCE	Micas-S2 Control Electronics, retained control equipment for the IR GP140 locomotive
MOBAD	Mode – Battery – Address Unit
MTVD	Download and version control tool for TCMS & converter control equipment
OS	Operating system
RDSO	Research Designs & Standard Organization
SPIF	Standard Propulsion Interface – central IGBT traction converter controller
TCMS	Train Control and Management System
VCI	Vehicle Control – Converter – Interface, additionally introduced TCMS equipment for the IR GP140 IGBT locomotive
VCU	Vehicle control unit

Table 1-1: Abbreviations and Definitions

References

Ref.	Document	Revision	Identification
[1]	IR IGBT TC3300 Software Release Notes	—	3EYP601332--0101

Table 1-2: References

2 Delivery

The software release delivered as a package (320T01BT-220T01BT for WAG9, WAP7 type of locomotive) file and Compatible with the previous release 318T01BT/218T01BT. The MCE software is now part of CLW, hence details regarding MCE is removed in present release notes.

320T01BT - 220T01BT Software Package includes in the folders the following files:

Folder	Filenames	Description
320T01BT- 220T01BT/ VCI	VCI_Common_Release_1251_14112019_1551.7z	Download container for VCI-VCU-C MTVD software download for WAP7i Locomotives. Download container for VCI MTVD OS + BL Cfg download
	VCI1.S19 VCI2.S19	Configuration files for VCI1 MOBAD Configuration files for VCI2 MOBAD Note: These file are only required in case of replacement of defective controller devices. Please ask Bombardier maintenance staff for details.
320T01BT- 220T01BT/ CCON	CCON_SW_1.2.1.4.mcp.7z	Download container for Converter Control Application MTVD. Including application software +OS + BL Cfg
	SPIF1_MTPE3_10er.s19 SPIF2_MTPE3_10er.s19	Configuration files for SPIF 1 MOBAD Configuration files for SPIF 2 MOBAD Note: These file are only required in case of replacement of defective controller devices. Please ask Bombardier maintenance staff for details.
Documentation	3EYP600299-9001_en_SW	Release notes of this software release (this document)

Table 2-1: Details of Software package 320T01BT 220T01BT Delivery

3 Installation

3.1 Tools

To install this software release the following tools are required.
The tool revision shall at least be as specified or higher (not for the TDS Uploader).

Toolname	Revision	Identification
MTVD Version Control and Download	2.13.0.0	3EGM081360E0301
MAPP Address Plug Programming Tool	2.6.0.0	3EGM050810E0260
DCUTERM	4.0.0.0	

Table 3-1: IR / RDSO / CLW Staff Tool list

3.2 Installation instruction

Preconditions

- Before starting installation, the tools have to be installed on the PC according to the installation instructions provided with the tools.
- The Ethernet configuration of the PC has to be set in the following way:
IP address range: 10.0.0.202 to 10.0.15.254
Subnet mask:: 255.255.240.0
- Ethernet service cable RJ45 connector to M12 connector

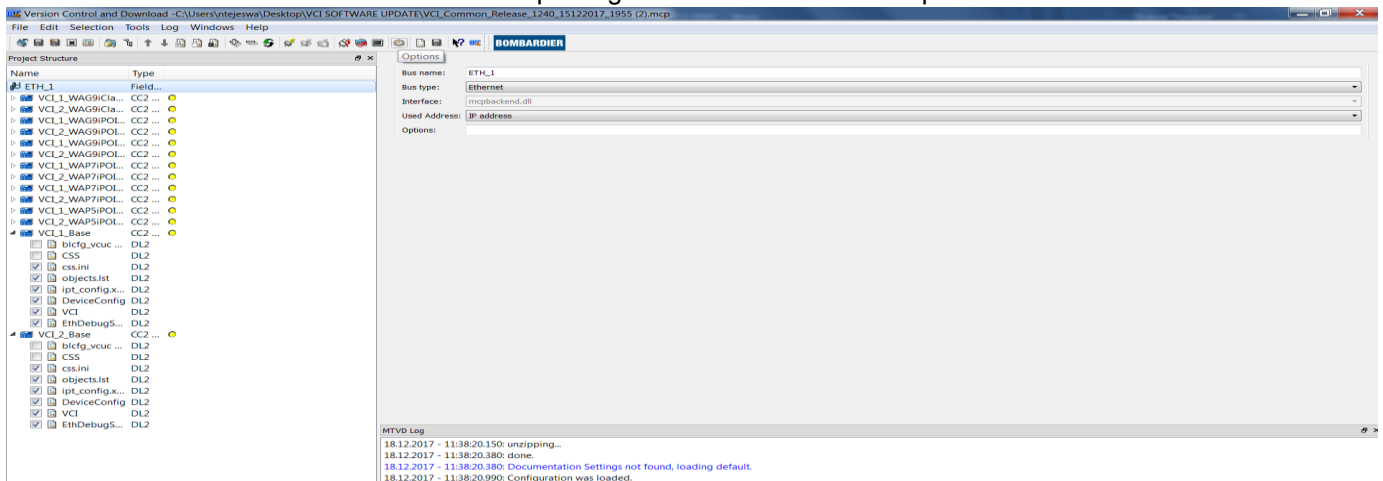
Step1: Vehicle and PC preparation

- Check for good charged vehicle battery before starting installation or use the direct 110V DC power set.
- Bring vehicle to a safe state by applying brake, switching off MCB and lower pantographs.
- Connect the PC by Ethernet to the Ethernet connector in cab 2 for Converter or VCI download.
- Extract the Release Zip file on the PC and the included zip files as well.

Step2: Download Base software from PC to VCI

Open download configuration VCI_Common_Release_1251_14112019_1551.mcp

- Start connection check to VCI1 and VCI2
- Select VCI1 and VCI2 Base Software package to download with description as below



- If connection is successfully established (green bullet) start download by Menu "Tools/Download selected".

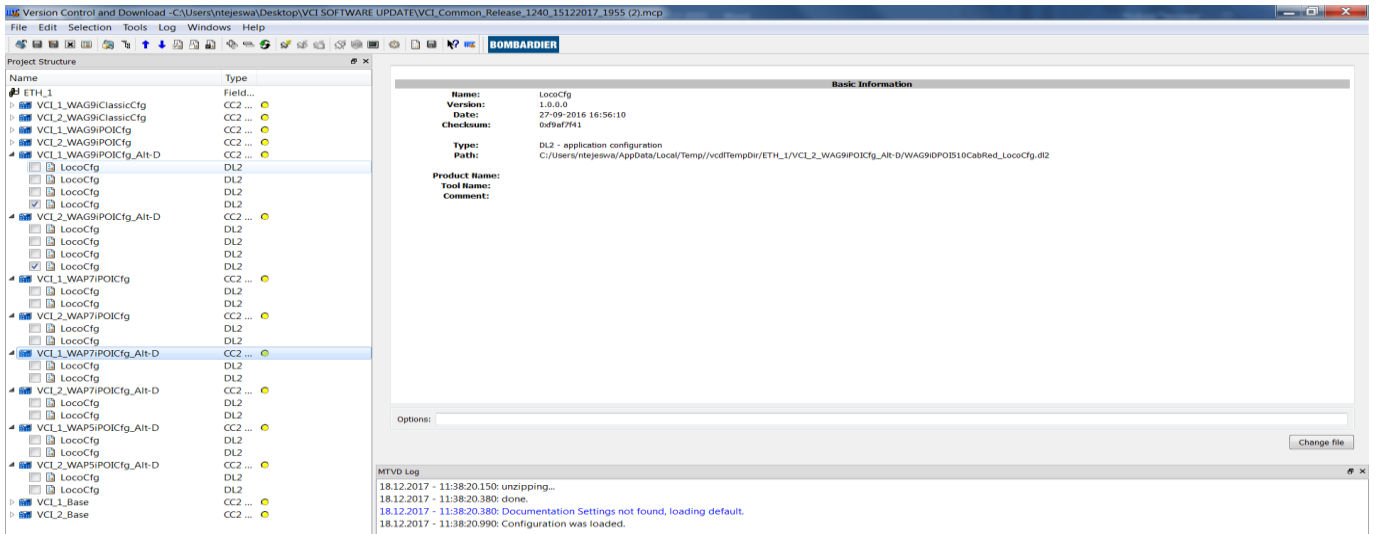
Step3: Download LocoCfg file from PC to VCI

- Start connection check to VCI1 and VCI2
- Check Locomotive type and Traction Converter type to select correct Locomotive configuration as per below table and select correct LocoCfg for VCI1 and VCI2 from MTVD Project Tree.

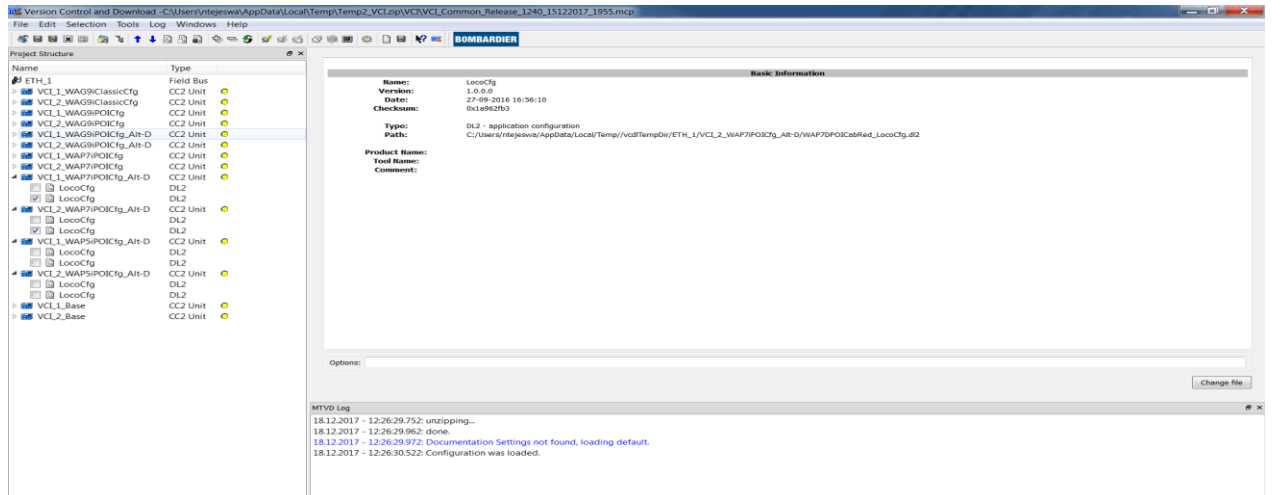
Locomotive Type	IGBT Traction Converter Type	Heavy Configuration (TE _{Max} = 510 KN)	CAB Redundancy	LocoCfg name
WAG9	Classic	NO	NO	WAG9iClassic460CabNRed_LocoCfg
		NO	Yes	WAG9iClassic460CabRed_LocoCfg
		Yes	NO	WAG9iClassic510CabNRed_LocoCfg
		Yes	Yes	WAG9iClassic510CabRed_LocoCfg
	DCUM Power of Isolation	NO	NO	WAG9iPOI460CabNRed_LocoCfg
		NO	Yes	WAG9iPOI460CabRed_LocoCfg
		Yes	NO	WAG9iPOI510CabNRed_LocoCfg
		Yes	Yes	WAG9iPOI510CabRed_LocoCfg
	DCUM Power of Isolation + Standard Interfaces	NO	NO	WAG9iDPOI460CabNRed_LocoCfg
		NO	Yes	WAG9iDPOI460CabNRed_LocoCfg
		Yes	NO	WAG9iDPOI510CabNRed_LocoCfg
		Yes	Yes	WAG9iDPOI510CabNRed_LocoCfg
WAP7	DCUM Power of Isolation	Not Applicable	NO	WAP7POICabNRed_LocoCfg
		Not Applicable	Yes	WAP7POICabRed_LocoCfg
	DCUM Power of Isolation + Standard Interfaces	Not Applicable	NO	WAP7DPOICabNRed_LocoCfg
		Not Applicable	Yes	WAP7DPOICabRed_LocoCfg
WAP5	DCUM Power of Isolation + Standard Interfaces	Not Applicable	NO	WAP5DPOICabNRed_LocoCfg
		Not Applicable	Yes	WAP5DPOICabRed_LocoCfg

Table 3-2: Details of LocoCfg for VCI1 and VCI2

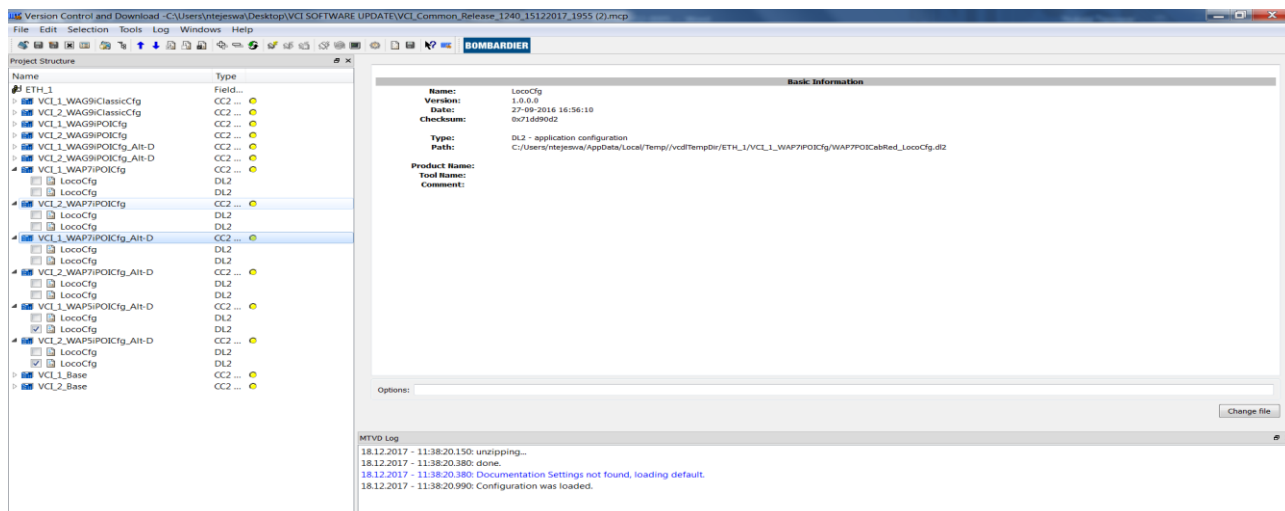
- Example: WAG9H Locomotive with DCUM Power of Isolation and Cab redundancy following VCI1 and VCI2 LocoCfg to be selected for downloading



Example: WAP7 Locomotive with DCUM Power of Isolation and Cab redundancy following VCI1 and VCI2 LocoCf to be selected for downloading






- Example: WAP5 Locomotive with DCUM Power of Isolation and Cab redundancy following VCI1 and VCI2 LocoCf to be selected for downloading



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Step 4: Check correct software update

- Check if the software versions of all devices are correct by Menu "Tools/ Retrieve all versions"
-> all devices that are not correctly updated are marked with a  sign.
- If there are devices marked with , repeat the download procedure (Step2 and Step3)
- If no device is marked with  continue with step5

Step 5: Download new software from PC to CON

- Open download configuration CCON_SW_1.2.1.5.mcp for WAG9i and WAP7i locomotives with POI or CON_v1_16_10 for WAG9i locomotives without POI
- Start connection check to all configured devices
- If connection is successfully established (green bullet) start download by Menu "Tools/Download selected" for all configured devices

Step 6: Restart control electronics

- Power off control electronics by moving key switch "BL" to "C" position.
- Power on control electronics and occupy cab by moving key switch "BL" to "D" position.

Step7: Documentation of actual software state

- Create documentation of VCI and CCON software state by selecting MTVD menu "Documentation/PDF (actual state)" -> VCDL Documenter: Documentation -> mention vehicle number in file name -> OK
- close MTVD tool
- Check Software versions on DDA screen

Step8: Restore vehicle to operational state

- Startup locomotive.
- Start MicWDiag or TDS Uploader and select WAG9i project
- Connect to DIA1.
- Set vehicle name (e.g. GP140-31215 or GP140-31424)
-> System information -> Set Vehicle Name
- Perform the Condition Data Download.
-> restore the last uploaded condition data on DIA1
- Set locomotive number (e.g. 31215 or 31424)
-> Process ID 20 and 32 -> Parameter ID 1
- Check if locomotive is running well.
- Perform the Event Data Upload
- Close communication to DIA1.
- Terminate MicWDiag or TDS Uploader Tool.
- Check Event Data Upload files for failures.

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4 Changes

4.1 New or enhanced functions

- VCI:
 - o During neutral section negotiation, ramp up of demanded tractive effort takes with ramp up of Auxiliary Converter.
- CON:
 - o DC-link Over voltage while braking mode of locomotive
 - o OVC Resistor high temperature while braking mode of locomotive
 - o Line side converter control parameters are fine tuned for reduction of IGBT failures.

4.2 Adaptations and corrected errors

- VCI:
 - o None.
- CON:
 - o None.

4.3 Known problems

- VCI:
 - o none
- CON:
 - o None

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5 Dependencies

5.1 Compatibility to earlier software releases

There are no incompatibilities to previous versions for normal locomotive operation, but nevertheless ensure that the complete software for CON, VCI is downloaded.
Please note that the VCI SW supports all type of locomotives (WAG9, WAG9H, WAP7 and WAP5). The configuration of the locomotive type is now part of the commission (together with the locomotive configuration) as defined in Table 3-2: Details of LocoCfg for VCI1 and VCI2.

5.2 Hardware dependencies

The VCI software release can be used on all WAG9 and WAP7 locomotives with Bombardier Traction Converter without and with power supply off isolation for motor DCUs.

The Current software 320T01BT-220T02BT is foreseen to be used on all WAG9i and WAP7i locomotives with Bombardier Traction Converter with power supply off isolation (POI) of motor DCUs.

There is special CCON Software version for Converters on locomotives 31215, 31234, 31380, 31381 and 31414.

There are no other known hardware dependencies.

6 High Level summary for versions

Device	Released Versions		
	Previous		Current
	318T01BT	218T01BT	320T01BT – 220T01BT
VCI	1.2.4.8	1.2.4.8	1.2.5.1
SPIF	1.2.0.7	1.2.0.7	1.2.1.5
DCUL	1.2.0.7	1.2.0.7	1.2.1.5
DCUM	1.2.0.7	1.2.0.7	1.2.1.5

7 Version information for WAG9 Locomotive Software Package version 320T01BT – 220T01BT

7.1 Vehicle control software

The software version screen on the drivers display shows the version of the FLG1, FLG2, STB1, STB2, HBB1, HBB2, DDA1, DDA2, DIA1, BUR1, BUR2, BUR3, FBV1, FBV2, ZBV1, VCI1 and VCI2.

Device name	Device ID	Built in cubicle	Device type	IP-address	MVB
VCI1		TC1	VCU-C	10.0.0.44	44
VCI2		TC2	VCU-C	10.0.0.46	46
VCI Base Software package					
Used on Device	Application type	Application name	Version	changed	
VCI \ln	BL	U-Boot vcuc 2-3-0	2.3.0.0	no	
VCI \ln	Cfg	Boot-Config_10_VCUC-HPP_V0201	0.2.0.1	no	
VCI \ln	OS	CSS 3.12.2.0	3.12.2.0	no	
VCI \ln	FW	ETHDebugService	1.7.99.1	no	
VCI \ln	Cfg	css.ini	1.2.5.1	yes	
VCI \ln	Cfg	objects.lst	1.2.5.1	yes	
VCI \ln	Cfg	lpt_config.xml	1.2.5.1	yes	
VCI \ln	Cfg	DeviceConfig	1.2.5.1	yes	
VCI \ln	AP	VCI	1.2.5.1	yes	

Table 7-1: VCI Base Software Package

VCI LocoCfg					
Used on Device	Application type	Application name	Version	changed	
VCI \ln	LocoCfg	WAG9iClassic460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iClassic460CabRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iClassic510CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iClassic510CabRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iPOI460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iPOI460CabRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iPOI510CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iPOI510CabRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iDPOI460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iDPOI460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iDPOI460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAG9iDPOI460CabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAP7POICabNRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAP7POICabRed_LocoCfg	1.0.0.0	no	
VCI \ln	LocoCfg	WAP7DPOICabNRed_LocoCfg	1.0.0.0	no	

VCI LocoCfg				
Used on Device	Application type	Application name	Version	changed
VCIn	LocoCfg	WAP7DPOICabRed_LocoCfg	1.0.0.0	no
VCIn	LocoCfg	WAP5DPOICabNRed_LocoCfg	1.0.0.0	no
VCIn	LocoCfg	WAP5DPOICabRed_LocoCfg	1.0.0.0	no

Table 7-2: VCI Loco Configuration details

7.2 Converter control software

Device name	Device ID	Built in cubicle	Device type	IP-address	MVB
VCUC_SPIF1		TC1	VCU-C	10.0.0.64	64
DCU2LH1_1		TC1	DCU-2	10.0.0.160	128 (MVB2)
DCU2MH1_1		TC1	DCU-2	10.0.0.161	129 (MVB2)
DCU2MH2_1		TC1	DCU-2	10.0.0.162	130 (MVB2)
DCU2MH3_1		TC1	DCU-2	10.0.0.167	135 (MVB2)
VCUC_SPIF2		TC2	VCU-C	10.0.0.68	68
DCU2LH1_2		TC2	DCU-2	10.0.0.176	128 (MVB3)
DCU2MH1_2		TC2	DCU-2	10.0.0.177	129 (MVB3)
DCU2MH2_2		TC2	DCU-2	10.0.0.178	130 (MVB3)
DCU2MH3_2		TC2	DCU-2	10.0.0.183	135 (MVB3)

Table 7-3: CON Control Device IP Addresses

Used on Device	Application type	File name	Version
VCUC_SPIF n	BL	bl_VCUC_2-3-0.dl2	2.3.0.0
VCUC_SPIF n	Cfg	Boot-Config_10_VCUC-HPP_V0205_IMG.dl2	0.2.0.5
VCUC_SPIF n	OS	vx+css_vcuc-3_11_3_0.dl2	3.11.3.0
VCUC_SPIF n	FW	EthDebugService_1822.dl2	1.8.2.2
VCUC_SPIF n	Cfg	css_ini.dl2	1.2.1.5
VCUC_SPIF n	FW	FW_ODBS_1700_PPC.dl2	1.7.0.0
VCUC_SPIF n	Cfg	IPTCom-3.6.4.0.dl2	3.6.4.0
VCUC_SPIF n	Cfg	objects.dl2	1.2.1.5
VCUC_SPIF n	Cfg	ODBSCFG_01706.dl2	0.17.0.6
VCUC_SPIF n	Cfg	VCUC1_1_2_0_0.dl2	1.2.1.5
VCUC_SPIF n	AP	SPIFH_1_2_0_0.dl2	1.2.1.5
VCUC_SPIF n	Cfg	ipt_config.dl2	1.2.1.5
DCU2MH n _m DCU2LH n _m	BL	bl_DCU2_2-3-0.dl2	2.3.0.0
DCU2MH n _m DCU2LH n _m	Cfg	Boot-Config_10-DCU2-HPP_V0208_IMG.dl2	0.2.0.8
DCU2MH n _m DCU2LH n _m	OS	vx+css_dcu2-3_11_3_0.dl2	3.11.3.0
DCU2MH n _m DCU2LH n _m	FW	EthDebugService_1822.dl2	1.8.2.2
DCU2MH n _m	Cfg	css_INI.dl2	1.2.1.5
DCU2LH n _m DCU2MH n _m DCU2LH n _m	Cfg	Objects.dl2	1.2.1.5

Used on Device	Application type	File name	Version
DCU2MHn_m	Cfg	DCU2MH_1_2_0_0.dl2	1.2.1.5
DCU2LHn_m	Cfg	DCU2LH_1_2_0_0.dl2	1.2.1.5
DCU2MHn_m	AP	MCU2MH_1_2_0_0.dl2	1.2.1.5
DCU2LHn_m	AP	MCU2LH_1_2_0_0.dl2	1.2.1.5
DCU2MHn_m	Cfg	Load_INF.dl2	3.11.0.16
DCU2LHn_m	Cfg	Load_INF.dl2	1.0.0.99
DCU2LHn_m	AP	FPGALA_1_0_10_0_BIN.dl2	1.0.10.0
DCU2LHn_m	AP	DSP4QC_1_4_6_12_BIN.dl2	1.4.6.12
DCU2MHn_m	AP	FPGA2MH_1_0_8_0_BIN.dl2	1.0.8.0
DCU2MHn_m	AP	dsp2m_h_1_0_7_101_0_BIN.dl2	1.0.7.101
DCU2MHn_m	AP	dsp2m_h_1_0_7_101_0_SYM.dl2	1.0.7.101
VCUC_SPIFn	BL	bl_VCUC_2-3-0.dl2	2.3.0.0

Table 7-4: CON processors application versions

8 Revision History

Rev.	Edited	Checked	Approved	Remark
—	2020-08-28 Tejeswar Nukala	2020-08-28 Ketan Shah	2020-08-28 Kalpesh Devariya	Release Note