User's Manual

AUTOSAR MCAL R4.0.3

User's Manual

WDG Driver Component Ver.1.0.5

Generation Tool User's Manual

Target Device:
RH850/P1x

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Abbreviations and Acronyms

Abbreviation / Acronym	Description
API	Application Programming Interface
AUTOSAR	AUTomotive Open System ARchitecture
BSWMDT	Basic Software Module Description Template
DEM	Diagnostic Event Manager
ECU	Electronic Control Unit
ID/Id	Identifier
MCAL	MicroController Abstraction Layer
MCU	MicroController Unit
WDG/Wdg	Watchdog Driver
WDTA	Window Watchdog Timer A
XML	Extensible Mark-up Language

Definitions

Terminology	Description
BSWMDT File	This file contains Common Published Information of WDG driver.
ECU Configuration Description File	Input file to WDG Driver Generation Tool. It is generated by ECU Configuration Editor.
Sl.No.	Serial Number
Translation XML File	This file contains the translation and device specific header file path.

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Chapter 1 Introduction

The Watchdog Driver provides services for initialization, changing the operation mode and triggering the Watchdog.

The WDG Driver module comprises of two sections as Embedded Software and the Generation Tool to achieve scalability and configurability.

The document describes the features of the WDG Driver Generation Tool. WDG Driver Generation Tool is a command line tool that extracts information from ECU Configuration Description File and BSWMDT File and generates WDG Driver C Source and C Header files (Wdg_59_DriverA_Cfg.h, Wdg_59_DriverA_PBcfg.c and Wdg_59_DriverA_Cbk.h).

This document contains information on the options, input and output files of the WDG Driver Generation Tool. In addition, this manual covers a step-by-step procedure for the usage of tool. ECU Configuration Description File contains information about WDG configuration.

Remark Based on the value for the parameter 'VendorApiInfix', WDG Generation Tool generates Wdg_59_DriverA_Cfg.h, Wdg_59_DriverA_PBcfg.c and Wdg_59_DriverA_Cbk.h files. Hence in this document 'Wdg_59_DriverA_Cfg.h, Wdg_59 _DriverA_PBcfg.c and Wdg_59_DriverA_Cbk.h' terms are used.

1.1 Document Overview

This user manual is organized as given in the table below:

Section	Contents
Section 1 (Introduction)	Provides an introduction to the document and explains how information is organized in this manual.
Section 2 (Reference)	Provides a list of documents referred while developing this document.
Section 3 (WDG Driver Generation Tool Overview)	Provides the WDG Driver Generation Tool Overview.
Section 4 (Input Files)	Provides information about ECU Configuration Description File.
Section 5 (Output Files)	Explains the output files that are generated by the WDG Driver Generation Tool.
Section 6 (Precautions)	Contains precautions to be taken during configuration of ECU Configuration Description File.
Section 7 (User Configuration Validation)	Describes about user configuration validation done by the WDG Driver Generation Tool.
Section 8 (Messages)	Describes all the Error/Warning/Information messages of R4.0.3 which helps the user to understand the probable reason for the same.
Section 9 (Notes)	Provides notes to help the user to understand this document better.

Chapter 2 Reference

2.1 Reference Documents

The following table lists the documents referred to create this document:

Sl. No	Title	Version
1.	**Autosar R4.0** AUTOSAR_SWS_WatchdogDriver.pdf	2.5.0
2.	**P1x Parameter Definition File** R403_WDG_P1M_04_05_10_to_15_18_to_23.arxml	1.0.4

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Chapter 3 WDG Driver Generation Tool Overview

WDG Driver Generation Tool overview is shown below.

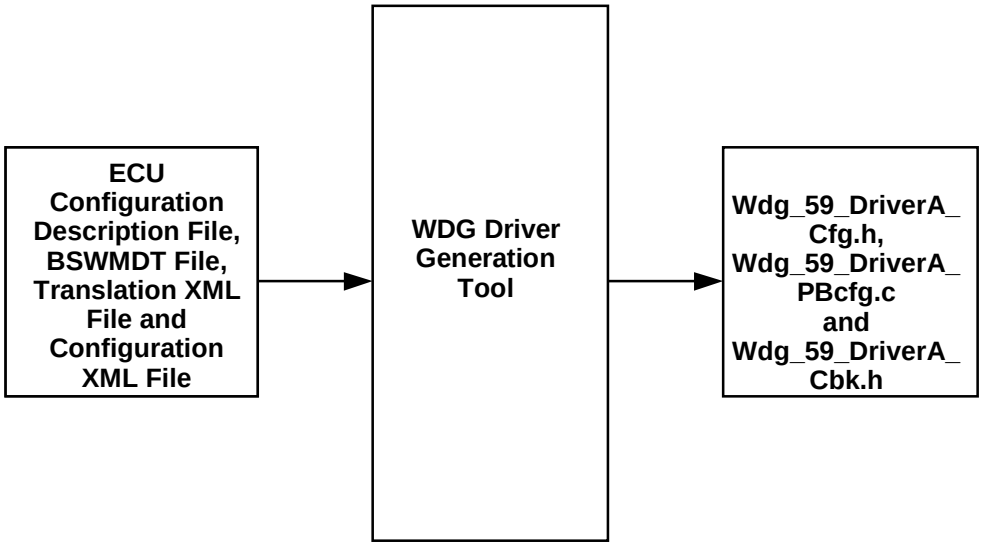

Figure 3-1 Overview of WDG Driver Generation Tool

WDG Driver Generation Tool is a command line tool that extracts, analyzes the configuration details provided in the input file and validates correctness of the data and provides scalability and configurability for WDG Driver module. It accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input and displays appropriate context sensitive error messages for wrong input and exits. Tool creates the Log file (Wdg.log) that contains the list of Error/Warning/Information messages in the output directory.

For the error free input file, the tool generates the following output files: Wdg_59_DriverA_Cfg.h, Wdg_59_DriverA_PBcfg.c and Wdg_59_DriverA_Cbk.h

Wdg_59_DriverA_Cfg.h and Wdg_59_DriverA_Cbk.h will be compiled and linked with WDG Driver Component. Wdg_59_DriverA_PBcfg.c will be compiled and linked separately from the other C Source files and placed in flash.

Remark

- In case of errors the generation tool returns a 1, in case of no errors the generation tool returns a 0.
- WDG Driver Generation Tool uses “Common Published Information” from WDG module specific BSWMDT File. WDG module specific BSWMDT File should not be updated manually since it is “Static Configuration” file.

Chapter 4 Input Files

WDG Driver Generation Tool accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input. WDG Driver Generation Tool needs information about WDG Driver module. Hence ECU Configuration Description File should contain configuration of WDG Driver module. Generation Tool ignores any other AUTOSAR component configured in the ECU Configuration Description File. ECU Configuration Description File can be generated using configuration editor.

ECU Configuration Description File must comply with AUTOSAR standard ECU Configuration Description File format.

Remark The detailed explanation about the parameters and containers are found in Parameter Definition File mentioned in the Reference Documents section.

Chapter 5 Output Files

WDG Driver Generation Tool generates configuration details in C Header and C Source files (Wdg_59_DriverA_Cfg.h, Wdg_59_DriverA_PBcfg.c and Wdg_59_DriverA_Cbk.h).

The content of each output file is given in the table below:

Table 5-1 Output Files Description

Output File	Details
Wdg_59_DriverA_Cfg.h	This file contains pre-compile time parameters. This file also contains the macro definitions for development error detect, version info API, compile switch to allow/ forbid disabling Watchdog Driver during runtime and Watchdog Driver Id. This file also contains information for maximum Watchdog Timer timeout, Minimum Watchdog Timer timeout, configuration set handles, resolution of Watchdog time out period and Watchdog trigger mode.
Wdg_59_DriverA_PBcfg.c	This file contains post-build configuration data.
Wdg_59_DriverA_Cbk.h	This file contains Prototype Declarations for WDG callback Notification Functions.

Remark Output files generated by WDG Driver Generation Tool should not be modified or edited manually.

Chapter 6 Precautions

- ECU Configuration Description File and BSWMDT File must comply with AUTOSAR standard for R4.0.3 ECU Configuration Description File and BSWMDT File respectively.
- The input file must contain WDG Driver, MCU Driver and DEM component related configuration.
- Default Translation XML File (Wdg_X1x.trxml) should be present in same location of Wdg_X1x.dll when the variant specific trxml file is not given as input in command line.
- Default Configuration XML File (Wdg_X1x.cfgxml) must be present in same location of Wdg_X1x.dll.
- If Translation XML File is not provided on the command line, Wdg_X1x.trxml which is present in same location of Wdg_X1x.dll is considered as ‘default’ Translation XML File.
- If Configuration XML File is not provided on the command line, Wdg_X1x.cfgxml which is present in same location of Wdg_X1x.dll is considered as ‘default’ Configuration XML File.
- Translation XML File should contain the file extension ‘.trxml’.
- Configuration XML File should contain the file extension ‘.cfgxml’.
- All the function names and the string values configured should follow C syntax for variables. It can only contain alphanumeric characters and “_”. It should start with an alphabet.
- If the output files generated by WDG Driver Generation Tool are modified externally, then they may not produce the expected results or may lead to error/warning/Information messages.
- Short Name for a container should be unique within a name space.
- C Source and C Header files will be generated by the Watchdog Driver Generation Tool based on the configuration of the parameters ‘VENDOR-ID’ and ‘VENDOR-API-INFIX’ in the WDG Driver specific BSWMDT File.
- An error free ECU Configuration Description File generated from configuration editor has to be provided as input to the WDG Driver Generation Tool. Otherwise Tool may not produce the expected results or may lead to errors/warnings/information.
- User has to make sure that the respective device specific configuration file is used, otherwise Tool may not produce the expected results or may lead to errors/warnings/information messages.
- The description file should always be generated using AUTOSAR specified configuration editor and it should not be edited manually.

Remark Please refer the WDG Component User Manual for deviations from AUTOSAR specifications, if any.

Chapter 7 User Configuration Validation

This section provides help to analyze the error, warning and information messages displayed during the execution of WDG Driver Generation Tool. It ensures conformance of input files with syntax and semantics. It also performs validation on the input file for correctness of the data.

For more details on list of Error/Warning/Information messages that are displayed as a result of input file validation, refer Chapter 8 “*Messages*”.

The Generation Tool displays errors or warning or information when the user has configured incorrect inputs. The format of Error/Warning/Information message is as shown below.

- ERR/WRN/INF<mid><xxx>: <Error/Warning/Information Message>.

  where,
  <mid>: 102 - WDG Driver Module Id (102) for user configuration checks.
  000 - for command line checks.
  <xxx>: 001-999 - Message Id.
- File Name: Name of the file in which the error has occurred.
- Path: Absolute Path of the container in which the parameter is present.

‘File Name’ and ‘Path’ need not be present for all Error/Warning/Information messages.

Chapter 8 Messages

The messages help to identify the syntax or semantic errors in the ECU Configuration Description File. Hence it ensures validity and correctness of the information available in the ECU Configuration Description File.

The following section gives the list of error, warning and information messages displayed by the Generation Tool.

8.1 Error Messages

ERR102001: Number of fields is not same for the entity 'Structure Name'.

This error occurs, if the number of fields is not same in the structure that is to be generated in the output file.

ERR102002: Field 'Field Name' is empty in the entity 'Structure Name'.

This error occurs, if the structure fields that are to be generated in the output file are empty.

ERR102003: 'WDG Driver' Component is not present in the input file(s).

This error occurs, if WDG Driver Component is not present in the input ECU Configuration Description File(s).

ERR102004: The parameter 'parameter name' in the container 'container name' should be configured.

This error occurs, if any of the mandatory configuration parameter(s) mentioned below is (are) not configured in ECU Configuration Description File.

The list of mandatory parameters with respect to container is listed below:

Table 8-1 Parameters and Container related to error ERR102004

Parameter Name	Container Name
WdgDevErrorDetect	WdgGeneral
WdgDisableAllowed	
WdgIndex	
WdgVersionInfoApi	
WdgVaryingActivationCodeMode	
WdgTriggerLocation	
WdgDeviceName	
WdgInitialTimeout	
WdgRunArea	

Parameter Name	Container Name
WdgMaxTimeout	
WdgCriticalSectionProtection	
WdgVersionCheckExternalModules	
WdgClockRef	
WdgWriteVerify	
WdgUseWriteVerifyErrorInterface	
WdgInterruptConsistencyCheck	
WdgTriggerMode	WdgPublishedInformation
WdgClkSettingsFast	WdgSettingsFast
WdgClkSettingsSlow	WdgSettingsSlow
-	WdgSettingsOff
WdgDefaultMode	WdgSettingsConfig

ERR102005: The reference path <path> provided for the parameter 'Parameter Name' within the container 'Container Name' is incorrect.

This error occurs, if path provided for the reference parameters mentioned in the below table are incorrect:

Table 8-2 Parameters and Container related to error ERR102005

Parameter Name	Container Name
WdgClockRef	WdgGeneral
WDG_E_DISABLE_REJECTED	WdgDemEventParameterRefs
WDG_E_MODE_FAILED	
WDG_E_REG_WRITE_VERIFY	
WDG_E_INT_INCONSISTENT	

ERR102006: The value configured for the parameter 'WdgClkSettingsFast' in the container 'WdgSettingsFast' and value of the parameter 'WdgClkSettingsSlow' in the container 'WdgSettingsSlow' are same.

This error occurs, if the value configured for the parameter WdgClkSettingsFast in the container WdgSettingsFast and value of the parameter WdgClkSettingsSlow in the container WdgSettingsSlow are same.

ERR102007: The value configured for the parameter 'WdgClkSettingsSlow' in the container 'WdgSettingsSlow' is faster (valid configuration should be WdgClkSettingsSlow > WdgSettingsFast) than the value of the parameter 'WdgClkSettingsFast' in the container 'WdgSettingsFast'.

This error occurs, if the value configured for the parameter WdgClkSettingsSlow in the container WdgSettingsSlow is faster than the value of the parameter WdgClkSettingsFast in the container WdgSettingsFast.

ERR102008: The value of the parameter 'WdgInitialTimeout' is greater than the value of the parameter 'WdgMaxTimeout'.

This error occurs, if the value of the parameter WdgInitialTimeout is greater than the value of the parameter WdgMaxTimeout.

ERR102010: The total instances of 'WdgSettingsConfig' container per WDTA instance is more than <1>.

This error occurs, if the total instance of WdgSettingsConfig container per WDTA instance is more than 1.

ERR102011: The macro definition <Macro name> is not found in <Translation Header File name> translation C Header File. The macro label format should be 'Macro format'.

This error occurs, if the macro definitions "RENESAS_ICWDTA<WDG instance>NMI_IMR" and "RENESAS_ICWDTA<WDG instance>_IMR" are not present in Translation Header File.

ERR102012: "DriverA" WDG instance is not present in input BSWMDT File. "VENDOR-API-INFIX" tag in WDG specific BSWMDT File should contain DriverA".

This error occurs, if "DriverA" WDG instance is not present in BSWMDT file.

ERR102014: The reference to BSWMDT file 'MODULE-DESCRIPTION-REF' should not refer to the same 'VendorApiInfix' for two different WDG drivers. 'VendorApiInfix' should be unique for each hardware driver.

This error occurs, if the value of 'VendorApiInfix' is not unique for each hardware driver.

ERR102015: The value configured for the parameter 'WdgIndex' is same for all the configured WDG drivers. The value of WdgIndex should be unique for each hardware driver.

This error occurs, if the value configured for the parameter WdgIndex is same for all the configured WDG drivers.

ERR102016: The short name of the container 'WdgSettingsConfig' should be unique across the Drivers.

This error occurs, if the short name of WdgSettingsConfig container is not same across the Drivers.

ERR102018: The minimum and maximum values for slow_time_value should be 0 and 196.608.

This error will occur, if the slow_time_value is less than 0 or exceeds 196.608.

ERR102019: The minimum and maximum values for fast_time_value should be 0 and 196.608.

This error will occur, if the fast_time_value is less than 0 or exceeds 196.608.

ERR102020: The parameter 'WDG_E_REG_WRITE_VERIFY' in the

container ' WdgDemEventParameterRefs' should be configured since parameter 'WdgWriteVerify'in container 'WdgGeneral' is not configured as 'WV_DISABLE'.

This error will occur, if parameter 'WDG_E_REG_WRITE_VERIFY' is not configured while parameter 'WdgWriteVerify' is configured other than 'WV_DISABLE'.

ERR102021: WdgWriteVerifyErrorInterface parameter should have a value when the parameter WdgUseWriteVerifyErrorInterface is configured as true.

This error will occur, if WdgUseWriteVerifyErrorInterface is configured as true and WdgWriteVerifyErrorInterface parameter is set as NULL.

ERR102022: The parameter 'WDG_E_INT_INCONSISTENT' in the container ' WdgDemEventParameterRefs' should be configured since the parameter 'WdgInterruptConsistencyCheck' in container 'WdgGeneral' is configured as true.

This error will occur, if the parameter 'WDG_E_INT_INCONSISTENT' is not configured while parameter 'WdgInterruptConsistencyCheck' in container 'WdgGeneral' is configured as true.

8.2 Warning Messages

WRN102001: The value of the parameter 'WdgInitialTimeout' is configured as <0> and 'WdgDefaultMode' is not configured as <WDGIF_OFF_MODE>. Hence, Watchdog hardware will be enabled directly after Wdg Module initialization and WDG counter will expire after <calculated_value in msec>.

This warning occurs, if WdgInitialTimeout parameter is configured as 0 and WdgDefaultMode is not configured as WDGIF_OFF_MODE.

WRN102002: The window open period when a WDTA trigger is valid is not set to 25%.

This warning occurs if the generated value for WDG Mode register has Window open period set other than 25%.

8.3 Information Messages

INF102001: The duration of 75% of one WDG trigger cycle for slow mode is <slow_time_value msec>.

This information occurs to provide 75% interrupt time for slow mode. In this information message 'slow_time_value' will be evaluated as follows:

slow_value = Power factor from WdgClkSettingsSlow
slow_time_value = ((0.75 * (2 ** $slow_value / $clock)) * 1000)

INF102002: The duration of 75% of one WDG trigger cycle for fast mode is <fast_time_value msec>.

This information occurs to provide 75% interrupt time for fast mode. In this information message ‘fast_time_value’ will be evaluated as follows:

fast_value = Power factor from WdgClkSettings
Fast fast_time_value = ((0.75 * (2 ** $fast_value / $clock)) * 1000)

INF102003: WdgUseWriteVerifyErrorInterface functionality has no effect when WdgWriteVerify parameter is DISABLED.

This information occurs if WdgWriteVerify parameter is DISABLED and WdgUseWriteVerifyErrorInterface is configured TRUE.

INF102004: Reference path is not provided for the parameter <dem parameter> and hence error shall not be reported.

This information occurs if either of WDG_E_DISABLE_REJECTED or WDG_E_MODE_FAILED parameter is not provided reference path.

Chapter 9 Notes

“Generation Tool” and “Tool” terminologies are used interchangeably to refer WDG Driver Generation Tool.

Revision History

Sl.No.	Description	Version	Date
1.	Initial Version	1.0.0	18-Oct-2013
2.	Following changes are made: 1. Chapter 2 is updated for addition of PDF reference. 2. WdgRegReadBackEnable parameter is added in ERR102004 error message table. 3. A note is added for ERR102012 error message. 4. WdgDemEventParameterRefs container and its parameters are added in the table of error message ERR102005. 5. Error message ERR102017 is added newly. 6. Error messages ERR102015 and ERR102016 are rephrased. 7. Chapter 6 Precautions is updated.	1.0.1	26-Sep-2014
3.	Following change is made: 1. Updated Chapter 2 to add PDF reference.	1.0.2	28-Apr-2015
4.	Following change is made: 1.Updated Chapter 8.1 to add error messages ERR102018 and ERR102019 2. Added R-Number.	1.0.3	29-Mar-2016
5.	Following changes are made: 1. Chapters 1,3 and 5 are updated to add new output file Wdg_59_DriverA_Cbk.h 2. Updated Chapter 8.1, error message ERR102005 for new Dem parameters and removed ERR102009. 3. ERR102004 is updated to add new parameters under container WdgGeneral. 4. ERR102012 error message is updated, ERR102017 is deleted as READBACK feature is no longer supported. 5. Added new error IDs ERR102020, ERR102021 and ERR102022. 6. Chapter 8.3 is updated to add information messages INF102003 and INF102004. 7. Updated Chapter 2 to add PDF version.	1.0.4	13-Jul-2016
6.	Following changes are made: 1. Section 8.2 is updated to add new warning message WRN102002. 2. Table headers adder for Table 8.1 and Table 8.2	1.0.5	21-Oct-2016

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