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Work-Package 3: “Modelling”

openETCS System Architecture and Design Specification

First Iteration: ETCS Kernel Functions

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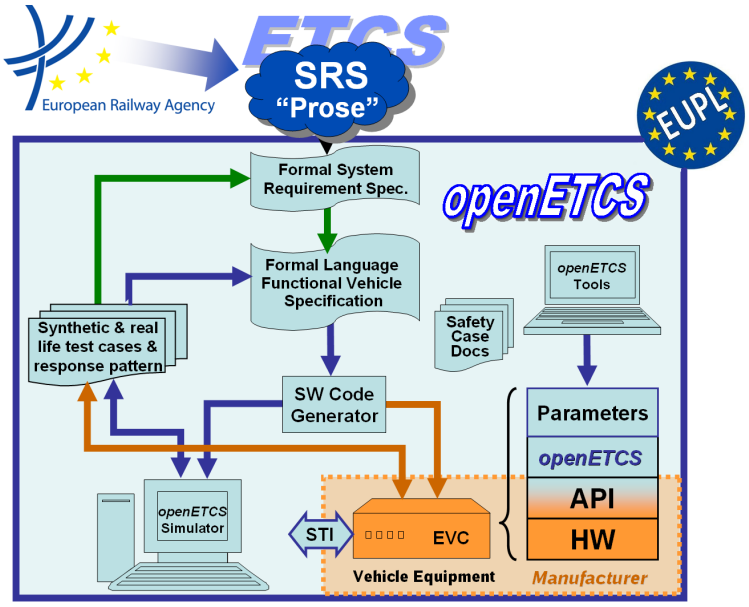

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First Iteration: ETCS Kernel Functions

Document approbation

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Description of work

Prepared for openETCS@ITEA2 Project

Abstract: This document gives an introduction to the architecture of the first openETCS iteration, the openETCS kernel functions. It has to be read as an add-on to the models in SysML, Scade and to additional reading referenced from the document.

Modification History

Version	Section	Modification / Description	Author
0.1	Document	Initial document providing the structure	Bernd Hekele

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1 Introduction

1.1 Motivation

The openETCS work package WP3 aims to provide the architecture and design of the openETCS OBU software as mainly specified in UNISIG Subset_026 version_3.3.0.

The appropriate functionality has been divided into a list of subfunctions of different complexity (see `https://github.com/openETCS/SRS-Analysis/blob/master/SystemAnalysis/List\_Functions.xlsx`).

All these functions are object of the openETCS project and have to be analyzed from their requirements and subsequently modelled and implemented. With limited manpower, a reasonable selection and order of these functions is required for the practical work that allows the distribution of the workload, more openETCS participants to join and leads to an executable– limited – kernel function as soon as possible.

While the first version of this document focuses on the first version of the limited kernel function, it is intended to grow in parallel to the growing openETCS software.

1.2 Objectives

The first objective of WP3 software shall be

- "Make the train run as soon as possible, with a very minimum functionality, and in the form of a rapid prototype."

This does not contradict the openETCS goal to provide conformance to EN50128.

- After a phase of prototyping, the openETCS software shall be implemented compliant to EN50128 for SIL4 systems.

Additional goals for this document are

- Identification of the functions required for a minimum OBU kernel
- Architecture overview regarding the minimum OBU kernel
- Technical approach: Description of the proceeding and methods to be used
- Road map of the minimum OBU kernel functions
- Road map thereafter

Note: This document will be extended according to the progress of WP3.

1.3 History

1.4 Scope

1.5 Glossary and Abbreviations

1.6 References

2 The openETCS Architecture of the initial kernel functions

2.1 The Tools-Chain and its impacts on the actual model

3 Functions of the openETCS Model

3.1 openETCS Data Dictionary

3.2 openETCS Generic API

3.3 openETCS Balise Group

3.3.1 Perform Eurobalise Decoding

3.3.2 Perform Balise Decoding

3.4 openETCS Train Position

/subsubsectionCalculate Train Poition

References

[1] Leslie Lamport, *LaTeX: A Document Preparation System*. Addison Wesley, Massachusetts, 2nd Edition, 1994.