Association for Standardisation of
Automation and Measuring Systems

ASAM AE XIL

Generic Simulator Interface

Part 1 of 4

Programmers Guide

Version 2.1.0

Date: 2017-06-19

Base Standard

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Foreword

ASAM developed HIL API as a standard for the communication between test automation software and hardware-in-the-loop (HIL) testbenches. HIL API enables users to choose products freely according to their requirements, independent of the vendor. Several implementations of the latest version of the standard, HIL API 1.0.2, are available on the market now. This new version 2.0 of the API contains broadly extended functionality and enhanced applicability. It will support testbenches at all stages of the function software development process – MIL[1], SIL[2], HIL[3], etc. As a result, the ASAM standardization workgroup has decided to change the name to XIL API – Generic Simulator Interface with release version 2.0. After all, XIL API allows engineers to reuse their existing tests and enables a better know-how transfer from one testbench to the other, resulting in reduced training costs for employees as well.

Some areas of the XIL API standard are not HIL-specific. The MAPort, for example, can also be used to adapt simulation tools. This allows engineers to develop test cases in very early stages and in different domains in order to reuse them in later stages at a real HIL Simulator using XIL API. The Functional Mock-up Interfaces (FMI) initiative has cooperated with the XIL API Project 2.0. As a result of the ITEA2-funded project Modelisar, standardized interfaces for model exchange and co-simulation of subsystems from different domains have been developed. These “functional mock-up interfaces” will support simulation system setup at all stages of function software development (MIL, SIL, HIL, etc.).

Thus, a subset of XIL API 2.0 mainly dealing with the MAPort and simulator control as “Functional Mock-up Interface for Applications” has been released separately. This means that tests written in those early simulation environments can be directly reused in real HIL environments at a later stage.

The standard consists of different parts:

- one part for the base standard specification (programmers guide)
- one part for the mapping rules of each technology reference and
- one part for the XIL support library documentation

The base standard contains the major parts

- *Framework*, which is completely new and contains broadly extended functionality such as variable measuring and mapping as well as managing of ports already known from HIL API 1.0.2. The *Framework* chapter deals with functionality, that is based on the
- *Testbench*, which comprises the ports, known from HIL API 1.0.2. The ports were extended slightly with respect to missing functionality in the previous standard version, such as configuration and initialization. In order to give test developers standardized access to CAN busses, the Network Port was completely new designed and added to the port family.

[1] Model-in-the-Loop
[2] Software-in-the-Loop
[3] Hardware-in-the-Loop

The XIL support library contains open source software, which can be used by test case developers and framework vendors to realize vendor independent common tasks. Such tasks are

- for framework and test case
  - Unit Converter
  - Data type converter
- for Framework
  - Mapping reader (which generates a memory image from mapping file information with access possibility)
  - Creation of Framework variables (ready for usage) based on mapping information's
- for Test case
  - Realization of Framework mapping Info API
  - Mathematical operations

Factories are distributed for the generic instantiation of the framework and one or more testbenches from different vendors.