



Data Sheet

## b-HiL

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### ADAS HiL Raw Data Injection System

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#### Compact HiL Raw Data Injection System for ADAS ECUs up to SAE-Level 3

The b-HiL platform delivers the ideal solution for Hardware-in-the-Loop tests. It works as a raw data re-injection system, featuring a scalable FPGA/SoC concept.

Your control units are electrically and mechanically connected to the b-HiL via a Sensor Connector Board (SCB) or via cable.

The size of the b-HiL allows it to be used not only in the test bench but also directly at the developer's workstation.

There are 10 Gigabit Ethernet interfaces which are ideal for a high bandwidth raw data transfer, especially necessary for high-resolution camera based ADAS ECU's.

The b-HiL creates best preconditions for open-loop test runs with its features and interfaces.

## Highlights

- Scalable processing power
- Various automotive bus interfaces onboard CAN, CAN-FD, 100BASE-T1, 1000BASE-T1
- Replay of recorded data
- 10GBaseT interface for raw data transfer
- Provides a wide range of embedded sensor raw data interfaces e.g. CSI2 or ZipWire (please contact us for more information)
- Dual core ARM processor
- Scalable as a cluster (crosslinking of e.g., two b-HiL systems for higher demands)
- Sync- and trigger-I/Os
- Powerful FPGA family
- Data integrity observation
- Option for time synchronization
- Optimized for multi-gigabit raw data replay
- Optimized for ADAS development tasks directly at the developer's workstation
- Highly adaptable to a wide range of integrable ECUs thanks to custom sensor connector board



## Features

### Functional details

- Linux based system
- Standalone-operation possible
- Interfaces for CAN, Ethernet, and ADAS sensors (e.g., CSI-2)
- Programmable status LED
- Transfer of data per Ethernet interface connection possible
- Sustainable through possible update solutions and expandability
- GPIO for trigger signals
- Enhancement of ECU software predevelopment
- Replacement of error prone Monitor HiL-Systems → cost reduction
- Reduced workspace requirements – ideal for developer workstation
- Cooling with fan, ECU power demand at up to 36 W possible
- Device monitoring system included (e.g., temperature)
- Option for clustering, ideal for the requirements of e.g., sensor fusion (HW stackable)
- SW-API for Windows and Linux available

## Specifications

### Logic & Processing System

- bHiL45 – 350k logic cells
- Dual ARM Cortex-A9 MPCore
- 1 GByte DDR3 SDRAM

### Dimensions

- 250 mm (L) x 175 mm (W) x 95 mm (H)
- Rugged metal case

### Interfaces

- CAN, CAN FD, 100BaseT1, 1000BaseT1, 10GBaseT, GPIO

### Available SCB based interfaces

- 2x H-MTD GMSL 2 Twisted Pair
- 4x miniSAS CSI2
- 4x Fakra GMSL2 Coax
- 4x Fakra FPDLink 3

### Supply Voltage

- 12 V DC

### Accreditation

Project definition

## Concept of SCB

## Customer-specific Adaptable



*b-HiL with open SCB case*

### Sensor Connector Board (SCB)

For the ECUs/sensor, a custom Sensor Connector Board (SCB) is necessary. The ECUs differ from customer to customer. The SCB enables simple, customer-specific integration of the customer ECU into the b-HiL system.

Here an example configuration is shown. If there would be, e.g., an ECU interface change in a follow-up project, it is possible to exchange only the SCB and reuse the baseboard.

### Need for adaptability / project diversity

- Possible connection of sensors / ECUs with different interfaces and use cases for the customer (e.g., CSI-2, ZipWire, ...)
- Variable for sensors (imager, radar, ...)
- Emulation of sensor parts possible
- Replay of synthetic generated image data
- Customer-specific imager-initialization (e.g., with I<sup>2</sup>C)

