b - plus

PIONEERING
NEW MOBILITY

Our Hardware in the Loop Solutions

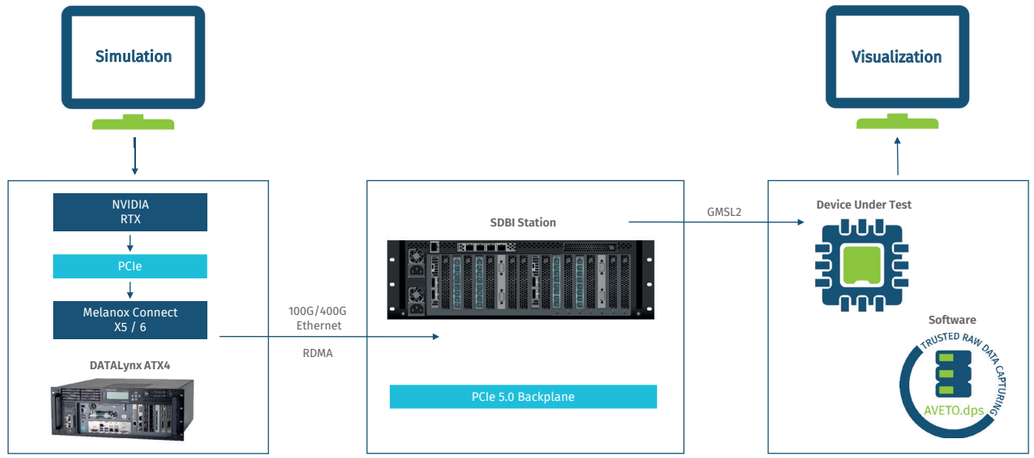
For Open & Closed Loop Validation
Specialist for Raw Data Replay & Simulation

Enhance your Vehicle System Testing with our HiL Solutions

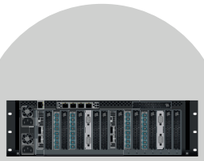
Our HiL solutions includes high-performance replay software designed for accurate real-time replay of high-bandwidth data such as radar, lidar and video streams.

Key Benefits

- Industry-proven replay software for accurate playback of complex data sets
- Reliable 24/7 performance in demanding environments
- Low latency, perfect for real-time simulation and precision testing
- Rapid validation, accelerate development with HiL integration



Our Flexible and Scalable HiL Solutions



SDBI Station

Is designed to **reuse (already existing) simulation HW/SW setups** to validate your models / functionality with pyhsical ECUs across multiple projects.

CONiX HiL Integrator

Provides a compact **19“ rack-based** development environment with powerful hardware, integrated raw data interface, flexible integration options, configurable workflows, and support for various protocol stacks to adapt to ECU characteristics or cloud/data center platforms.

CONiX HiL Racksystem

A **highly scalable** and automated 19“ rack solution that minimizes maintenance, ensures 24/7 high data rate performance, and offers optional packages, making it ideal for sensor and ECU validation applications.

- Scene origin is usually a recording of a testdrive
- Device under test (DUT) has very limited influence on the reproduced scenes
- Time exactness is the most important thing whereas latency doesn‘t really matter

OPEN LOOP

&

CLOSED LOOP

- Latency is one of the key figures
- Data/scene is generated with your simulation tool
- DUT influences the scene generator (e.g. speed, brakes, steering angle)

+ Our Software Building Blocks

ReproUnit Manager

Efficient management of the individual ReproUnits is the core element for maximum utilization of the individual HiL stations. This flexible module ensures optimal processes throughout the entire workflow, both on the ReproUnit and on the management interface.

HiL Player

The HiL Player plays a central role in complex HiL systems. It controls the playback of recordings, receives the signals and forwards the correct data to the control unit.

ECU/DUT Handling

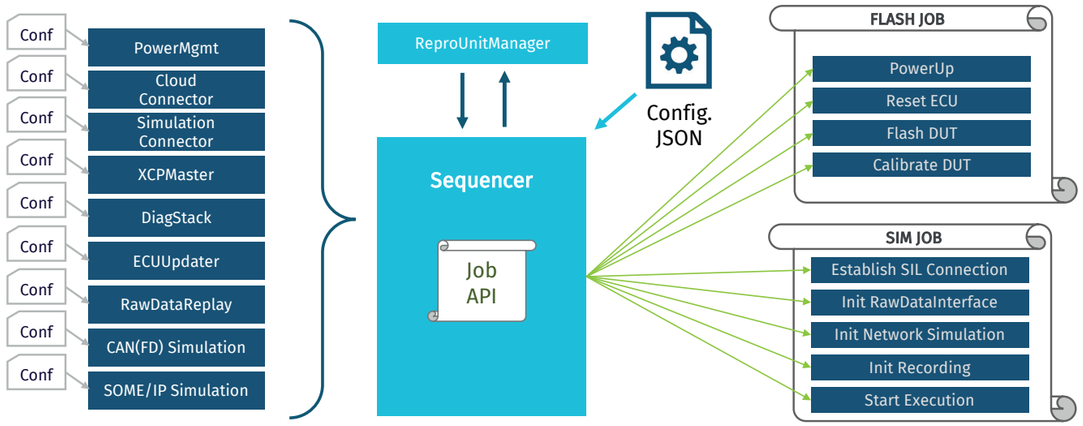
With the Building Blocks around the DUT, such as XCP, DoIP, ECU Updater or various residual bus simulators, we can react quickly and comprehensively to new requirements in the projects.

Time Synchronization

With the help of our TSN stacks, e.g., according to the IEEE 802.1AS profile, our solution ensures correct time bases and synchronous playback.

Integration

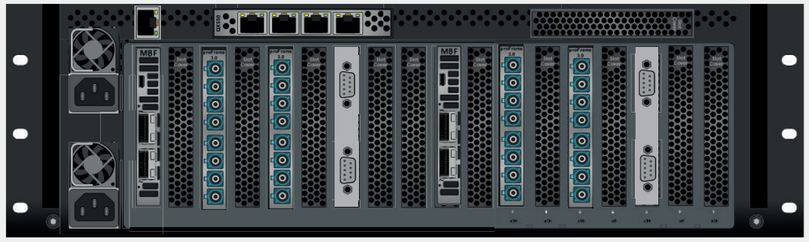
Connection to existing simulation software, use of 3rd party hardware and integration into existing HiL systems are the most important aspects of our Solutions.



+ Characteristics & Benefits of our HiL Solutions

Scalability	+ Supports both simple and complex test configurations + Adapts to changing needs and technological advances
High speed and efficiency	+ Enables efficient sequential and parallel test runs in real-time + Enhances throughput and accelerates the testing process
Flexibility	+ Supports configurable open-loop and closed-loop tests + Accommodates different hardware components and sensor models
Integration	+ Integration with existing development and test environments + Compatibility with other tools and systems
Hardware	+ Out-of-the-box inject hardware + Raw data interfaces: CSI-2, GMSL2, FPD-Link III + Suitable for high-performance AD platforms
Connectivity	+ Remote access capabilities + Support for automotive communication protocols and standards + Our HiL solution interfaces with various protocols
High data throughput	+ Robust support for high data rates + Essential for ADAS/AD simulations + Seamless handling of substantial data volumes
Compatibility & interoperability	+ Seamless compatibility with range of data center HW and SW + Efforless interoperability with external systems
Access to latest technologies	+ Take advantage of data center technology innovations + Provides interaction with cutting-edge simulation capabilities + Open or expandable hardware setup
Expert teams	+ Minimization of project escalation and validation costs + Achieving quality through a team of highly skilled engineers + Time savings due to perfected technology right from the start

+ Our Hardware Building Blocks



Real-Time Testing & Simulation

+ SDBI Station (Simulation Data Bridge and Inject Station)

Our advanced HiL system provides a robust solution for real-time test & injection, ideal for use in complex engineering environments.

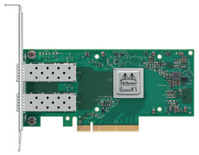
Key Features

+ Project agnostic and modular HW platform
+ Lowest latency by using RDMA
+ Highest bandwidth up to 4x200Gbit/s per unit
+ Data Center Technology based on PCIe 5
+ 24/7 usage for highest availability
+ Our SmartNIC-based solution system allows you to book datacenter GPU instances to inject simulation data into your ECU

Data Center Quality Replay Platforms

+ DATALynx ATX4
+ BRICK

For a holistic infrastructure, you need high-performance HiL players to buffer and deliver the continuous stream of data consistently and without interruption. This is where our proven DATALynx and BRICK platforms come in.



Data Distribution

+ EDSwitch

To distribute the data efficiently in a time-synchronized network, we offer EDSwitch of the 100G Ethernet class with integrated XTSS TimeSync Stack for a low latency network.

+ 100G Connectivity

Additionally, we offer the full package of connectivity cables including 100G Smart NICs and Connectivity Cables.

+ Focus on the Development of your ADAS/AD Functions

Raw data interfaces: **GMSL2/3, FPDLink-3/4**

Seamless integration into customer processes

Synchronous playback of raw sensor data, vehicle bus and network information

Hardware is suitable for **powerful AD platforms**

Supports common sensor technologies (radar, lidar and camera)

PIONEERING
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