

HILS-200

HARDWARE-IN-THE-LOOP SYSTEM

The Hardware-in-the-Loop System (HILS) is a high-performance, real-time testing and validation platform for embedded systems, control algorithms, sensor and actuator interfaces, and complex cyber-physical systems. Deterministic real-time execution, industrial-grade computing and a wide range of communication interfaces let engineers evaluate system behavior under realistic, repeatable and fully controlled test conditions – emulating sensors, actuators and environmental dynamics while real embedded software or hardware runs in a closed loop.



HILS-200

SOFTWARE SUPPORT	MATLAB® / Simulink® · LUSI
PROCESSOR	Intel® Core™ i7-12700 · 12 cores, up to 4.7 GHz · 35 W TDP
MEMORY / STORAGE	8 GB DDR5 · 2 TB SSD (560/530 MB/s)
OPERATING SYSTEM	Linux 22.04 · hard real-time execution
ETHERNET	4× RJ45 GbE (Intel® I210-AT)
CAN BUS	4× DB9 dual-isolated CAN 2.0B / J1939
SERIAL	5× RS-485/422/232/SDLC
MIL-STD-1553	Dual-channel MIL-STD-1553
DIGITAL I/O	16× optically isolated DIO (8 in / 8 out)

MATLAB® & LUSI INTEGRATION

HILS provides native MATLAB® compatibility for Model-Based Design workflows, and connects to LUSI – ATEŞ Labs’ physics-based digital twin and scenario generator – for high-fidelity, simulation-driven hardware testing of autonomous, defense and safety-critical systems.

MATLAB® INTEGRATION

Simulink® models as real-time plant/environment · controller validation · closed-loop testing with real ECUs, avionics units and embedded boards · analysis with MATLAB toolboxes · data logging & post-processing in MATLAB

LUSI INTEGRATION

Real-time connection to physics-based environment simulations · sensor-level data exchange for IMU, GNSS, radar, LiDAR, EO and IR cameras · multi-sensor fusion testing under configurable dynamic scenarios

VALIDATION SCOPE

Hardware-in-the-loop validation of autonomy, navigation, guidance and control algorithms · scenario-based testing with repeatable environmental conditions and fault injection

MODEL-BASED DESIGN

Seamless transition from Simulink simulation to real-time HIL validation

DIGITAL TWIN

LUSI generates the world; HILS runs the real hardware in the loop

FAULT INJECTION

Repeatable scenarios with controlled faults for safety-critical verification

VALIDATE BEFORE YOU FLY

Tell us your controllers and sensors – we’ll configure the HILS-200 test bench around them.