



Topic Controller and plant on real time target.

Hardware-in-the-Loop (HIL) Testing

- Test and verify embedded controllers with a digital or a hybrid physical and digital power HIL twin of your plant.
- Run complex Simulink plant models on powerful multi-core CPUs and FPGAs
- Automate testing by defining and running test cases with [Simulink Test or XIL-enabled test automation platforms](#)
- Include virtual ECUs with restbus simulation and insert faults

Rapid Control Prototyping (RCP)

- Expedite control design development by using the test system as a powerful and flexible prototype of your controller in R&D.
- Connect the test system with the same I/O ultimately provided by your future embedded controller to connect with your physical plant.
- Use MATLAB & Simulink to design your controls, and use Simulink Real-Time to deploy the real-time application to the test system. Iterate through designs and monitor their performance. Automate the testing process.
- Evolve your control designs while keeping core parts running on the embedded controller using bypassing. The embedded controller remains part of the test setup while new features are executed on the real-time test system, all perfectly connected and synced.
 - **I/O Expansion and Access**
 - This test system is frequently used to control and simulate highly complex setups such as complete vehicles and aircrafts, which is why the Performance real-time target machine offers large I/O expansion flexibility: The base unit offers seven or eleven I/O slots, depending on your choice. Plus you can connect up to two expansion units, enabling installation of over forty I/O modules. And should you require to scale even further, [multiple target machine can be interconnected and synchronized](#) such as with low latency shared memory links.
 - I/O modules can either be accessed at the front or at the rear.

SNS COLLEGE OF TECHNOLOGY, COIMBATORE-35

DEPARTMENT OF MECHANICAL ENGINEERING

19MEZ404-Connected and Automated Vehicles

UNIT V REALTIME SIMULATION OF AUTOMOTIVE SYSTEMS

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I/O expansion units

Expansion unit are connected with a high-bandwidth, low-latency InfiniBand (IB) link, resulting in small additional latencies only. Latency sensitive I/O modules for high sample rate application components are typically installed into the base unit.