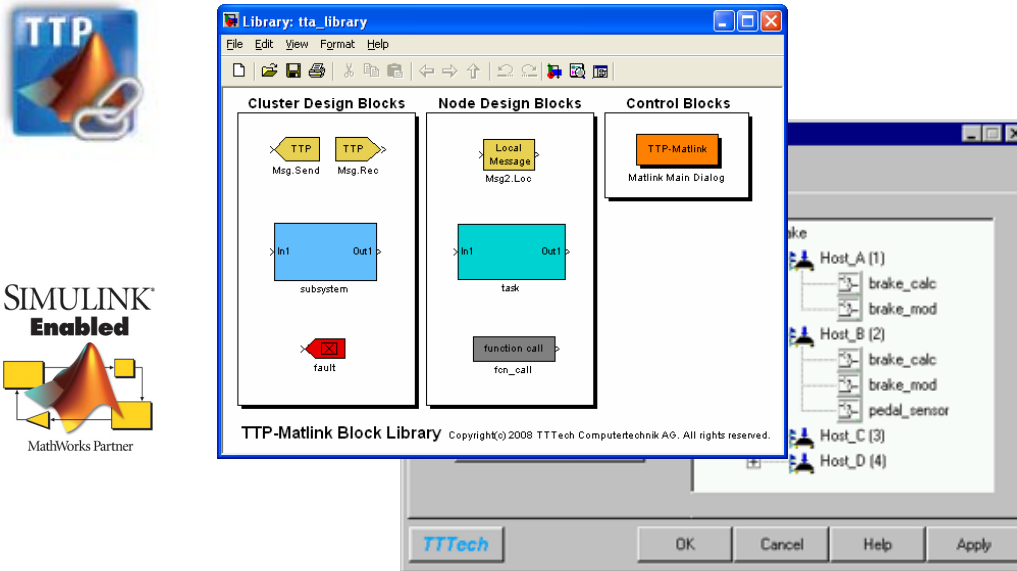


Modeling, Simulation and Code Generation



TTP Matlink – The TTP Simulation and Design Tool

TTP Matlink is a rapid prototyping platform for TTP applications. It handles all steps of an application development, including simulation, visualization and code generation. TTP Matlink provides seamless integration of TTTech's TTP Tools software development suite with MATLAB®, Simulink®, Stateflow®, Real-Time Workshop® Embedded Coder from The MathWorks as well as TargetLink® from dSpace.

With TTP Matlink, developers can design control systems, from analysis of algorithms to modeling and simulation, rapid prototyping, and code generation. Finally TTP Matlink provides object programs that are ready to be downloaded and run on the hardware target. It improves the development process for TTP systems, shortening its duration and increasing its quality.

Design of Distributed Systems

The TTP Matlink blockset facilitates the design and development of distributed real-time systems. The graphical user interface allows the user to intuitively map functionality onto the cluster's node. By setting different viewing points of the built-in browser, the user can immediately get condensed information about the distributed system.

Data Exchange with TTP Plan and TTP Build

In the next step TTP Matlink interacts with the TTP Tools components TTP Plan and TTP Build, the TTP cluster and node design tools from TTTech. The interaction with these tools results in the automatic generation of a complete fault-tolerant communication net as well as the configuration of the TTP OS operating system.

Simulation Capabilities

The ability to simulate a TTP system precisely enables designers to develop highly optimized control algorithms. Applications that are designed with MATLAB, Simulink, and Stateflow can be simulated as distributed systems. Sampling effects due to latencies introduced by the TTP bus can be simulated as accurately as effects of faults introduced by loss of sensors or whole nodes.

Code Generation for Distributed Systems

The automatic code generation features of ^{TTP}Matlink support rapid prototyping and production code generation for distributed fault-tolerant real-time systems. Real-Time Workshop Embedded Coder or TargetLink configure together with ^{TTP}Build the fault-tolerant communication layer ^{TTP}FT-COM for each of the nodes defined in the Simulink model. Moreover, these tools generate the functional code according to the simulation results.

Fully Automated Make Procedure

In a final step the C-code is compiled and linked automatically. This make procedure can be launched directly from the main dialog. The resulting machine code is then ready to be downloaded into the distributed system via ^{TTP}Load.

Functionality

- Simulink blockset for TTP communication
- Simulation of sampling effect of TTP schedule
- Modeling of message timing according to generated communication code
- Easy handling of subsystem replication
- Multiple views for better overview of distributed subsystems and nodes
- Simulation of message and subsystem loss
- Very efficient high-level simulation engine
- Transparent data exchange with ^{TTP}Plan and ^{TTP}Build
- Automatic generation of configuration data (MEDLs – message descriptor lists)
- Automatic generation of fault-tolerant communication layer (^{TTP}FT-COM)
- Transparent integration of Real-Time Workshop Embedded Coder
- Code generation from multiple subsystems for distributed systems
- Fully automated generation of download images
- Support for austriamicrosystems AS8202NF TTP communication controller
- Context-sensitive help

System Requirements

- Operating system: MS Windows 2000 or Windows XP
- Processor: 1.5 GHz or above recommended
- Disk space: 30 MB
- RAM: 512 Mbit (minimum), 1Gbit (recommended)
- Graphics: 1024x768 16-bit colors (minimum), 1280x1024 32-bit colors (recommended)
- ^{TTP}Plan (needed for TTP schedule generation and checking)
- ^{TTP}Build (needed for ^{TTP}FT-COM code and operating system configuration)
- MATLAB/Simulink from The MathWorks, Inc.
- Real-Time Workshop Embedded Coder from The MathWorks, Inc.
- TargetLink from dSpace GmbH
- Wind River Diab[®] C/C++ Compiler
- CD-ROM drive, Aobe Acrobat Reader 4.0 or above

Subject to changes and corrections.

For further information, including price and availability, contact products@tttech.com.

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