

xPC Target 4.3

Perform real-time rapid control prototyping and hardware-in-the-loop simulation

xPC Target™ enables you to execute Simulink® and Stateflow® models on a target computer for rapid control prototyping, hardware-in-the-loop (HIL) simulation, and other real-time testing applications. It provides a library of drivers, a real-time kernel, and a host-target interface for real-time monitoring, parameter tuning, and data logging.

For a complete, fully assembled, real-time testing solution, [xPC Target Turnkey](#) combines xPC Target with a variety of high-performance real-time target computers.

Using [xPC Target Embedded Option™](#), you can run a Simulink and Stateflow model on the target computer in standalone mode, without requiring the target computer to be connected to your host computer.

Key Features

- Real-time execution of Simulink and Stateflow models on a target computer via an optimized real-time kernel
- Support for target computer hardware, including PMC, PCI, PCIe, cPCI, and PC104 form factors
- Support for numerous I/O modules, including analog I/O, digital I/O, pulse train generation and capture, and shared memory
- Support for communication protocols and data buses, including serial, UDP/IP, CAN, J1939, ARINC 429, and MIL-STD-1553
- Tools for real-time monitoring, parameter tuning, and data logging
- Standalone operation using xPC Target Embedded Option
- Open APIs (Visual Basic, C/C++, Java, and .NET) for programmatically developing user interfaces



xPC Target Turnkey real-time testing solution. Once you connect to hardware under test, you can run your Simulink and Stateflow models in real time and verify your designs.

Working with xPC Target

You create a real-time testing environment for Simulink models by connecting a host computer, a target computer, and your hardware under test. You connect the host computer running xPC Target, Simulink,



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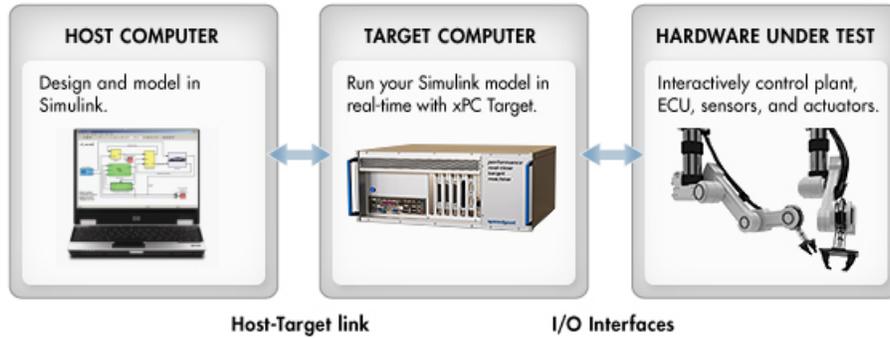
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Real-Time Workshop®, and a C compiler to the target computer via a single TCP/IP or RS-232 communications link. You then connect the target computer to your hardware under test and download code generated by Real-Time Workshop from a Simulink model to the target computer via the communications link.

Once you make the connections, you can:

- Access and interactively control the target computer and xPC Target application
- Tune parameters before, during, and after real-time execution
- Acquire, view, and log signal data



Components of an xPC Target real-time testing environment.

Interfacing with Target Computer Hardware

Using xPC Target in a real-time testing environment requires a target computer with I/O modules or protocol support. [xPC Target Turnkey](#) provides ready-to-use configurations, from which you can select a real-time target machine that meets the performance requirements of your real-time testing application. xPC Target Turnkey offers a variety of form factors and I/O modules that are suitable for desktop, laboratory, or in-vehicle real-time testing solutions.

xPC Target also includes I/O drivers and functions that support additional target computer hardware and I/O boards that you specify and purchase directly from the hardware manufacturer. Learn more about additional supported [hardware drivers](#) for xPC Target.



Ready-to-use xPC Target Turnkey real-time target machines in a variety of form factors that are suitable for desktop, lab, or in-vehicle environments.

Accessing and Controlling an xPC Target Application

You create an xPC Target application using xPC Target with Real-Time Workshop to automatically generate and compile a C/C++ code representation of a Simulink model. You then download the target application via a LAN (Ethernet) connection from the host computer to the target computer.

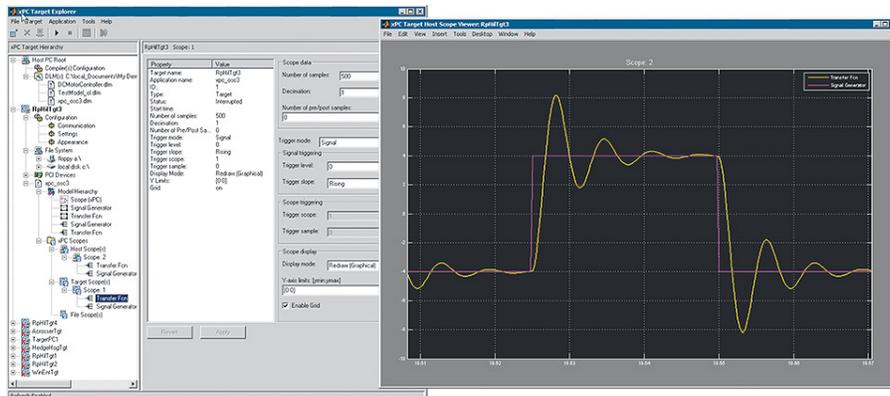
xPC Target enables you to access the target application and control it directly from the host computer using either xPC Target Explorer, a graphical user interface, or the MATLAB® command line. You can download your target application, start and stop real-time test execution, change the sample time, stop time, and modify other target application properties.

xPC Target also provides flexible APIs for MATLAB, .NET, C, and COM that let you programmatically control the target application running on the target computer.

Once you have a working xPC Target application, you can run the application in standalone mode using xPC Target Embedded Option. In standalone mode, xPC Target application automatically starts and executes on the target computer without requiring a host computer.

Tuning Parameters, Monitoring Signals, and Acquiring Data

xPC Target lets you tune and optimize parameter values before, during, and after real-time execution of models on the target computer using xPC Target Explorer, the MATLAB command-line interface, or Simulink external mode.



xPC Target Explorer window (left) and xPC Target Host Scope Viewer (right). xPC Target Explorer runs on the host and interactively monitors and controls xPC Target applications.

To monitor and acquire data, xPC Target includes scopes for both the host and target computers. Scopes support several trigger modes that you can use to control the acquisition, timing, and duration of data collection. You can also display multiple signals in a single scope and attach multiple scopes to a single model.

Signal monitoring enables you to view signal values at the current sample rate. Signal tracing lets you capture, store, and display bursts of data, similar to the behavior of a digital oscilloscope. Signal logging lets you acquire and store signals during the entire test execution. You can then upload the logged data to the host computer for signal display, analysis, or archiving.

Resources

Product Details, Demos, and System Requirements

www.mathworks.com/products/xpctarget

Trial Software

www.mathworks.com/trialrequest

Sales

www.mathworks.com/contactsales

Technical Support

www.mathworks.com/support

Online User Community

www.mathworks.com/matlabcentral

Training Services

www.mathworks.com/training

Third-Party Products and Services

www.mathworks.com/connections

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