

# Simulink<sup>®</sup> Real-Time<sup>™</sup> Release Notes



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*Simulink<sup>®</sup> Real-Time<sup>™</sup> Release Notes*

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# R2015b

**Version: 6.3**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Performance Advisor: Optimize real-time applications**

To optimize your Simulink® model for real-time execution, run performance checks on your model. You can improve task execution time for models that include Simscape™ and other physical modeling toolboxes.

## **Precision Time Protocol Support: Synchronize clocks for networked measurements**

To align measurement data across distributed sensors with timestamps read from synchronized clocks, use IEEE® 1588-2008, the Precision Time Protocol. You can share a clock across multiple Speedgoat target computers so that measurement data timestamps have the same time base.

## **Signal and Parameter Internationalization: Observe signals and parameters with Unicode characters**

Signal and parameter names that include Unicode® characters are displayed as expected in Simulink Real-Time™ Explorer and at the MATLAB® command line.

## **Binary and Hexadecimal Signal Formats: Display monitored signals in binary and hexadecimal formats**

You can now display monitored signals in binary and hexadecimal formats within Simulink Real-Time Explorer signal groups.

## **Speedgoat Target Computer and I/O Hardware**

Now available from [www.speedgoat.ch](http://www.speedgoat.ch) are these target computers, I/O modules, and driver block libraries:

- Ruggedized, expandable, fanless, and portable target computer for mobile, in-vehicle, and small deployment field use. This updated Mobile real-time target machine includes multicore Intel® Core™ i7 CPU, up to 12 I/O modules, and optional Xilinx® FPGA subsystems.
- Hilscher netX-chip based I/O modules and driver block libraries for these industrial automation and machinery protocols: PROFINET master/slave, Modbus TCP master/slave, and POWERLINK master/slave.

- Fault and signal insertion I/O modules and driver block libraries supporting up to four fault buses and 75 channels for HIL applications.

## Functionality being removed or changed

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
In R2016a, the API for COM will be removed.	In R2015b, you can build and run existing programs that use the API for COM.  In R2016a, you cannot build existing programs that use the API for COM.	API for .NET.	To allow existing programs to build and run, replace COM interface calls with .NET API calls.
<code>slrtbench</code> will be removed in a future release.	Continues to work.	Performance Advisor.	
In Simulink external mode, the Simulink Scope now allows you to set the range of the time axis while the scope is running.	As a consequence of changing the time axis, gaps in acquired data can appear in the display. The execution of the real-time application is unaffected.	Use a host scope in Simulink Real-Time Explorer.	The Scope display can appear different from previous releases.



# R2015a

**Version: 6.2**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Export of standalone instrument panels from Simulink Real-Time Explorer

You can export a Simulink Real-Time Explorer configuration as a standalone executable and deploy it upon a Windows<sup>®</sup>-compatible computer. From the deployment computer, you can control a real-time application running on a target computer, even if MATLAB is not installed on the deployment computer.

## Function execution time profiling

To turn on function profiling for the real-time application, open the Configuration Parameters dialog box, select **Code Generation > Verification**, and then select the **Measure function execution time** check box.

## Digital I/O support with Speedgoat IO331-6

The Simulink Real-Time Speedgoat IO331-6 A/D and D/A Converter supports digital I/O on pins DI0 to DI015 inclusive. Each digital I/O pin can be configured as either input or output, but not as both at the same time.

## Speedgoat IO682 ARINC (GE RCEI-830A) support

Simulink Real-Time supports the Speedgoat IO682 ARINC board (GE<sup>®</sup> RCEI-830A) in 2, 4, 8, and 16 channel variants.

## Ethernet cards for communicating between development and target computers

For communicating between development and target computers, Simulink Real-Time supports additional Ethernet cards using the R8168 and I8254x chip sets. For more information, see <https://www.mathworks.com/products/simulink-real-time/supported/xpc-target-supported-ethernet-chipsets.pdf>.

## Functionality being removed or changed

The following functionality is being removed or changed.



Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
The Microsoft® COMAPI is being removed from Simulink Real-Time.	Existing programs that use the COM API no longer build.	Microsoft .NET Framework API	Update existing programs to use the .NET Framework API.
The <b>Build COM objects from tagged signals/parameters</b> parameter (xpcObjCom) is being removed from the <b>Simulink Real-Time Options</b> dialog box.	MATLAB parameter does nothing.	None	No equivalent exists that uses the .NET Framework API.
The <b>Include model hierarchy on the target application</b> parameter (xPCGenerateXML) is being removed from the <b>Simulink Real-Time Options</b> dialog box.	Existing programs still run.	None	None
The <b>Workspace variable</b> parameter (CodeExecutionProfile) is being hidden in the <b>Verification</b> dialog box for Simulink Real-Time models.	Existing programs still run.	None	None
The <b>Save options</b> parameter (CodeProfilingSaveOptions) is being removed from the <b>Verification</b> dialog box for Simulink Real-Time models.	The profiler unconditionally generates the profiling display.	None	None

## **Blocks no longer recommended for use**

The following blocks are no longer recommended for use. For a complete list, see [Library of Drivers No Longer Recommended for Use](#).

- UDP Pack
- UDP Unpack

## **Compatibility Considerations**

Existing models that use the UDP Pack and UDP Unpack blocks still work. However, these driver blocks might not be supported in future releases. Do not use these blocks in new models.

# R2014b

**Version: 6.1**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Video display on target computer monitor

Simulink Real-Time displays video data on the target computer monitor using a Video Display block.

To collapse a video display into an icon, at the target computer command line, type `hide Video video_number`. To expand a collapsed video display from an icon, type `show Video video_number`.

There can be no more than two Video Display blocks in a model. The combined number of Video Display blocks and target scopes cannot exceed nine.

## Drag-and-drop association of parameters and signals in Simulink Real-Time Explorer

Simulink Real-Time Explorer supports drag-and-drop of signals on scopes and signal groups. It supports drag-and-drop of parameters on parameter groups.

## Support for multiple network cards for real-time UDP

Simulink Real-Time supports sending and receiving UDP packages using up to eight network cards on the same target computer.

- Real-Time Ethernet Configuration combines the functionality of the Ethernet Init and Buffer Mgmt blocks. Models containing Ethernet Init and Buffer Mgmt blocks still function.
- Real-Time UDP Configuration replaces the Network Configuration block. When you open a model containing a Network Configuration block, Simulink replaces it with a Real-Time UDP Configuration block.

## FlexRay PDU support

To pack, transmit, receive, and unpack protocol data units (PDUs), Simulink Real-Time provides the following driver blocks:

- FlexRay Pack PDU
- FlexRay Write PDU
- FlexRay Commit Frame
- FlexRay Read PDU

- 
- FlexRay Unpack PDU

## **Sample time specification for FlexRay driver blocks**

FlexRay™ blocks include a **Sample time** parameter.

## **Support for HUMUSOFT MF634 board**

Simulink Real-Time supports the Humusoft MF634 board with A/D, D/A, digital I/O, PWM, counter, and encoder blocks.

## **Support for Microsoft Visual C++ 2013 compiler**

Support for the Microsoft Visual C++® 2013 compiler has been added. For a complete list of supported compilers, see Supported and Compatible Compilers.

## **SimulinkRealTime.target.getPCIInfo returns Ethernet controller information**

When called with the parameter 'ethernet', `SimulinkRealTime.target.getPCIInfo` returns information for the Ethernet controllers supported by Simulink Real-Time that are installed on the target computer. When called with the parameters 'supported' and 'ethernet', `SimulinkRealTime.target.getPCIInfo` returns information for all of the Ethernet controllers supported by Simulink Real-Time.

## **Real-Time Scope block usable in referenced model**

The Simulink Real-Time Scope block functions correctly when you place it in a referenced model.

## **Updated signal display format for target scopes**

For signals in model reference blocks, the full block path is displayed on the target monitor in the format `signal_number: submodel_name/signal_name`.

## **Control of target scope visibility from target computer command line**

To collapse a target scope into an icon, at the target computer command line, type `hide Scope scope_number`. To expand a collapsed scope from an icon, type `show Scope scope_number`.

## Blocks no longer recommended for use

The following blocks are no longer recommended for use. For a complete list, see Library of Drivers No Longer Recommended for Use.

- Measurement Computing PCI-DAS1002 Analog Input (A/D)
- Measurement Computing PCI-DAS1002 Analog Output (D/A)
- Measurement Computing PCI-DAS1002 Digital Input
- Measurement Computing PCI-DAS1002 Digital Output
- Measurement Computing PCI-DAS1200 Analog Input (A/D)
- Measurement Computing PCI-DAS1200 Analog Output (D/A)
- Measurement Computing PCI-DAS1200 Digital Input
- Measurement Computing PCI-DAS1200 Digital Output
- Measurement Computing PCI-DAS1200/JR Analog Input (A/D)
- Measurement Computing PCI-DAS1200/JR Digital Input
- Measurement Computing PCI-DAS1200/JR Digital Output
- Measurement Computing PCI-DAS1602/12 Analog Input (A/D)
- Measurement Computing PCI-DAS1602/12 Analog Output (D/A)
- Measurement Computing PCI-DAS 1602/12 Digital Input
- Measurement Computing PCI-DAS1602/12 Digital Output
- Measurement Computing PCI-DAS1602/16 Analog Input (A/D)
- Measurement Computing PCI-DAS1602/16 Analog Output (D/A)
- Measurement Computing PCI-DAS 1602/16 Digital Input
- Measurement Computing PCI-DAS1602/16 Digital Output
- Real Time Devices DM7420 Analog Input (A/D)
- Real Time Devices DM7420 Digital Input
- Real Time Devices DM7420 Digital Output
- SBS FLEX/104A
- SBS IP-16ADC Analog Input (A/D)
- SBS IP-16DAC Analog Output (D/A)
- SBS IP-HiADC Analog Input (A/D)

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- SBS IP-Synchro
  - National Instruments PCI-6030E Analog Input (A/D) (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6030E Analog Output (D/A) (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6030E Digital Input (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6030E Digital Output (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6030E Pulse Generation (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6030E Pulse Width/Period Measurement (formerly PCI-MIO-16XE-10)
  - National Instruments PCI-6031E Analog Input (A/D)
  - National Instruments PCI-6031E Analog Output (D/A)
  - National Instruments PCI-6031E Digital Input
  - National Instruments PCI-6031E Digital Output
  - National Instruments PCI-6031E Pulse Generation
  - National Instruments PCI-6031E Pulse Width/Period Measurement

## **Compatibility Considerations**

Existing models that use these driver blocks still work. However, these blocks will not be supported in future releases. Do not use these driver blocks in new models.

## **Blocks removed from product**

The following blocks have been removed from the product:

- ADDI-DATA APCI-1710
- ADDI-DATA PA1700 Incremental Encoder
- Adlink PCI-8133 3-Phase PWM
- Burr-Brown PCI-20003M Analog Output (D/A)
- Burr-Brown PCI-20019M Analog Input (A/D)
- Burr-Brown PCI-20023M Analog Input (A/D)
- Burr-Brown PCI-20041C Digital Input
- Burr-Brown PCI-20041C Digital Output
- Burr-Brown PCI-20098C Analog Input (A/D)

- Burr-Brown PCI-20098C Digital Input
- Burr-Brown PCI-20098C Digital Output
- CANDBC translator
- Data Translation DT2821 Analog Input (A/D)
- Data Translation DT2821 Analog Output (D/A)
- Data Translation DT2821 Digital Input
- Data Translation DT2821 Digital Output
- Data Translation DT2821-F-16SE Analog Input (A/D)
- Data Translation DT2821-F-16SE Analog Output (D/A)
- Data Translation DT2821-F-16SE Digital Input
- Data Translation DT2821-F-16SE Digital Output
- Data Translation DT2821-F-8DI Analog Input (A/D)
- Data Translation DT2821-F-8DI Analog Output(D/A)
- Data Translation DT2821-F-8DI Digital Input
- Data Translation DT2821-F-8DI Digital Output
- Data Translation DT2821-G-16SE Analog Input (A/D)
- Data Translation DT2821-G-16SE Analog Output (D/A)
- Data Translation DT2821-G-16SE Digital Input
- Data Translation DT2821-G-16SE Digital Output
- Data Translation DT2821-G-8DI Analog Input(A/D)
- Data Translation DT2821-G-8DI Analog Output (D/A)
- Data Translation DT2823 Analog Input (A/D)
- Data Translation DT2823 Analog Output (D/A)
- Data Translation DT2823 Digital Input
- Data Translation DT2823 Digital Output
- Data Translation DT2824-PGH Analog Input (A/D)
- Data Translation DT2824-PGH Digital Input
- Data Translation DT2824-PGH Digital Output
- Data Translation DT2824-PGL Analog Input (A/D)
- Data Translation DT2824-PGL Digital Input



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- Data Translation DT2824-PGL Digital Output
  - Data Translation DT2825 Analog Input (A/D)
  - Data Translation DT2825 Analog Output (D/A)
  - Data Translation DT2825 Digital Input
  - Data Translation DT2825 Digital Output
  - Data Translation DT2827 Analog Input (A/D)
  - Data Translation DT2827 Analog Output (D/A)
  - Data Translation DT2827 Digital Input
  - Data Translation DT2827 Digital Output
  - Data Translation DT2828 Analog Input (A/D)
  - Data Translation DT2828 Analog Output (D/A)
  - Data Translation DT2828 Digital Input
  - Data Translation DT2828 Digital Output
  - FIFO Mode CAN Message
  - Gespac GESADA-1 Analog Input (A/D)
  - Gespac GESADA-1 Analog Output (D/A)
  - Gespac GESPIA-2A Digital Input
  - Gespac GESPIA-2A Digital Output
  - GPIB-232CT-A Send/Receive Block
  - GPIB-232CT-A Setup Block
  - Measurement Computing CIO-DIO24 Signal Conditioning
  - Measurement Computing CIO-QUAD02 Incremental Encoder
  - Measurement Computing CIO-QUAD04 Incremental Encoder
  - Measurement Computing PCI-DIO24 Signal Conditioning
  - NAI PC-12SD (PC-77SD1) Synchro/Resolver
  - National Instruments AT-A0-10 Analog Output (D/A)
  - National Instruments AT-A0-6 Analog Output (D/A)
  - National Instruments PC-DIO-24 Digital Input
  - National Instruments PC-DIO-24 Digital Output
  - National Instruments PC-TIO10 Counter FM & ARM

- National Instruments PC-TIO-10 Counter FM
- National Instruments PC-TIO-10 Counter PWM & ARM
- National Instruments PC-TIO-10 Counter PWM
- National Instruments PC-TIO-10 Digital Input
- National Instruments PC-TIO-10 Digital Output
- National Instruments PC-TIO10 FM Capture
- National Instruments PC-TIO10 PWM Capture
- National Instruments PC-TIO-10xx
- Object Mode CAN Message
- RS-232 Binary Pack
- RS-232 Binary Receive
- RS-232 Binary Send
- RS-232 Binary Unpack
- RS-232 Mainboard Receive (Asynchronous)
- RS-232 Mainboard Send (Asynchronous)
- RS-232 Mainboard Send/Receive (Synchronous)
- RS-232 Mainboard Setup
- Sensoray 626 Analog Input
- Sensoray 626 Analog Output
- Sensoray 626 Digital Input
- Sensoray 626 Digital Output
- Sensoray 626 Encoder
- Sensoray 626 Initialize
- Sensoray 626 PWM Capture
- Softing CAN-AC2-ISA with Intel 82527 Receive
- Softing CAN-AC2-ISA with Intel 82527 Send
- Softing CAN-AC2-ISA with Intel 82527 Setup
- Softing CAN-AC2-ISA with Philips PCA 82C200 Receive
- Softing CAN-AC2-ISA with Philips PCA 82C200 Send
- Softing CAN-AC2-ISA with Philips PCA 82C200 Setup

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## **Compatibility Considerations**

Existing models that use these blocks no longer work. You should substitute equivalent models from the Simulink Real-Time block library.



# R2014a

**Version: 6.0**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## New product that combines the functionality of xPC Target and xPC Target Embedded Option

xPC Target™ has been updated and renamed to Simulink Real-Time. Changes include:

- The xPC Target Embedded Option™ product ships bundled with the Simulink Real-Time license.
- The Simulink Real-Time class interface replaces the xPC Target class interface:
  - Package `xpctarget` ⇒ package `SimulinkRealTime`
  - `xpctarget.env` ⇒ `SimulinkRealTime.targetSettings`
  - `xpctarget.fs` ⇒ `SimulinkRealTime.fileSystem`

Class `xpctarget.ftp` is being merged into `SimulinkRealTime.fileSystem`.

Class `xpctarget.fsbase` is becoming private.

- `xpctarget.xpc` ⇒ `SimulinkRealTime.target`
- Class `xpctarget.targets` is being removed.
- `xpctarget.xpcf` ⇒ `SimulinkRealTime.fileScope`
- `xpctarget.xpcschost` ⇒ `SimulinkRealTime.hostScope`

Class `xpctarget.xpcsc` is becoming private.

- `xpctarget.xpcsc` ⇒ `SimulinkRealTime.targetScope`
- A new package has been added, `SimulinkRealTime.utils`.
- Some of xPC Target class methods are renamed within the Simulink Real-Time class methods:
  - `xpctarget.ftp.get (ftp)` ⇒ `SimulinkRealTime.copyFileToHost`
  - `xpctarget.ftp.put` ⇒ `SimulinkRealTime.copyFileToTarget`
  - `xpctarget.targets.Add` ⇒ `SimulinkRealTime.addTarget`
  - `xpctarget.targets.Item` ⇒ `SimulinkRealTime.getTargetSettings`
  - `xpctarget.targets.makeDefault` ⇒ `SimulinkRealTime.targetSettings.setAsDefaultTarget`
  - `xpctarget.targets.Remove` ⇒ `SimulinkRealTime.removeTarget`

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The remaining xPC Target class methods have the same name within the Simulink Real-Time class interface.

- The following xPC Target functions are replaced by `SimulinkRealTime` methods and, in some cases, equivalent Simulink Real-Time functions:
  - `getxpcenv` ⇒ `SimulinkRealTime.getTargetSettings`
  - `getxpcinfo` ⇒ `SimulinkRealTime.getSupportInfo`
  - `getxpcpci` ⇒ `SimulinkRealTime.target.getPCIInfo`
  - `readxpcfile` ⇒ `SimulinkRealTime.utils.getFileScopeData`

This method reads data from a file on the host computer.

- `setxpcenv` ⇒ `SimulinkRealTime.targetSettings.set`.
  - `xpcbootdisk` ⇒ `SimulinkRealTime.createBootImage`
  - `xpcbytes2file` ⇒ `SimulinkRealTime.utils.bytes2File`
  - `xpcgetCC` ⇒ `slrtgetCC`
  - `xpcnetboot` ⇒ `SimulinkRealTime.createBootImage`
  - `xpcsetCC` ⇒ `slrtsetCC`
  - `xpcsliface` ⇒ `SimulinkRealTime.utils.createInstrumentationModel`
  - `xpctargetping` ⇒ `SimulinkRealTime.target.ping`, `SimulinkRealTime.pingTarget` and `slrtpingtarget`
  - `xpctargetspy` ⇒ `SimulinkRealTime.target.viewTargetScreen`
  - `xpctest` ⇒ `slrttest`
- The xPC Target class properties have the same name within the Simulink Real-Time class interface. The property `SimulinkRealTime.target.Settings` has been added.
- The following xPC Target functions are replaced by Simulink Real-Time functions:
  - `xpcbench` ⇒ `slrtbench`
  - `xpcdrivertool` ⇒ `slrtdrivertool`
  - `xpcexplr` ⇒ `slrtexplr`
- Library `slrtlib` replaces library `xplib`.
- The libraries `LVDT` and `Synchro Resolver` libraries have become sublibraries of library `LVDT` and `Synchro Resolver`.

- The libraries `Audio` and `Video` libraries have become sublibraries of library `Audio` and `Video`.
- Library `Misc` has been split into libraries `Target Management` and `Displays and Logging`. Sublibrary `Target Management` is divided into two sublibraries, `Target Information` and `Execution Parameters`.
- Blocks from the old `Misc` library have been moved and some have been renamed to remove the xPC Target product name:
  - `Misc./From File` ⇒ `Target Management/From File`
  - `Misc./xPC Target Time` ⇒ `Target Management/Target Information/Session Time`
  - `Misc./Software Reboot` ⇒ `Target Management/Software Reboot`
  - `Misc./Time Stamp Counter` ⇒ `Target Management/Target Information/Time Stamp Counter`
  - `Misc./Time Stamp Delta` ⇒ `Target Management/Target Information/Time Stamp Delta`
  - `Misc./xPC Target Get Free Stack Size` ⇒ `Target Management/Execution Parameters/Current Available Stack Size`
  - `Misc./xPC Target Get Minimal Free Stack Size` ⇒ `Target Management/Execution Parameters/Minimum Available Stack Size`
  - `Misc./xPC Target Set Overload Counter` ⇒ `Target Management/Execution Parameters/Set Overload Counter`
  - `Misc./xPC Target Get Overload Counter` ⇒ `Target Management/Execution Parameters/Get Overload Counter`
  - `Misc./xPC Target TET` ⇒ `Target Management/Execution Parameters/Task Execution Time`
  - `Misc./XCP Server` ⇒ `Target Management/Displays and Logging/XCP Server`
  - `Misc./Scope (xPC)` ⇒ `Target Management/Displays and Logging/Scope`
  - `Misc./To xPC Target` ⇒ `Target Management/Displays and Logging/To Target`
  - `Misc./From xPC Target` ⇒ `Target Management/Displays and Logging/From Target`



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- In the **Code Generation** pane of the Configuration Parameters dialog box, the **System target file** setting `xpctarget.tlc` becomes `slrt.tlc` and `xpctargetert.tlc` becomes `slrtert.tlc`.

## Compatibility Considerations

- The existing MATLAB language interface still works, but is no longer being enhanced. You should use the updated and renamed MATLAB language interface.
- When you open an existing model, the Simulink Editor replaces blocks that use the xPC Target name with the equivalent new blocks. The appearance of your model will not change. The upgrade becomes permanent when you save the model.
- If you open a model that was originally saved with **System target file** set to `xpctarget.tlc`, the software will automatically update the setting to `slrt.tlc`, and likewise with `xpctargetert.tlc` and `slrtert.tlc`. To retain the updated setting, you must save the updated model.

## Graphical controls and displays in Simulink Real-Time Explorer to design and run instrument panels

Simulink Real-Time Explorer supports a set of graphical instruments that you can use to build custom instrument panels and target application interfaces.

## High-resolution real-time target display

The target computer display has been updated and now supports higher-resolution graphics.

## Tunable parameters for referenced models

Block parameters in referenced models can be changed without rebuilding the model.

## Single-model workflow for processor and FPGA targeting

Using Simulink Real-Time and HDL Coder™, you can build applications targeted to both a target computer processor and to an FPGA from the same model.

## FlexRay time-triggered protocol support

Simulink Real-Time supports the FlexRay network standard.

## EtherNet/IP protocol support

Speedgoat now supports EtherNet/IP™ protocol hardware.

## XCP master over UDP support

Simulink Real-Time can function as an XCP master when communicating over UDP.

The following XCP blocks are no longer in use:

- XCP DAQSTIM
- XCP Protocol Stack

The following blocks have been added:

- XCP UDP Transport Layer
- XCP CAN Transport Layer
- XCP Configuration
- XCP Data Stimulation
- XCP Data Acquisition

## EtherCAT improvements

- The blocks EtherCAT Async SDO Upload and EtherCAT Async SDO Download have been added.
- The EtherCAT Init block includes a new check box, **Enable Log and Debugging**, that when selected makes visible EtherCAT® debug and logging options.
- The following EtherCAT blocks have been renamed:
  - EtherCAT Rx Var ⇒ EtherCAT PDO Receive
  - EtherCAT Tx Var ⇒ EtherCAT PDO Transmit
  - EtherCAT COE Read ⇒ EtherCAT Sync SDO Upload
  - EtherCAT COE Write ⇒ EtherCAT Sync SDO Download
- The EtherCAT Rx Frames and EtherCAT Update blocks have been merged into the EtherCAT Init block.

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## Compatibility Considerations

- The functionality of the EtherCAT Init block has changed significantly. You must replace it with the new block.
- Enabling the EtherCAT Init logging options may result in CPU overloads. Use them only to provide data for MathWorks® technical support.
- The EtherCAT Rx Var, EtherCAT Tx Var, EtherCAT COE Read, and EtherCAT COE Write blocks no longer exist in the `slrtlib` library. You must replace them with the new blocks.
- The EtherCAT Rx Frames and EtherCAT Update blocks no longer exist in the `slrtlib` library. You must remove them from the model.

## Blocks no longer in use

The following blocks are no longer in use. For a complete list, see Simulink Real-Time Library of Drivers No Longer in Use.

- BittWare Audio-PMC+ Analog Input
- BittWare Audio-PMC+ Analog Output
- IO Port Read
- IO Port Write
- LED
- Measurement Computing PCI-DIO24 Signal Conditioning
- TI DM642 Init
- TI DM642 RX
- TI DM642 TX
- Watchdog Timer

## Compatibility Considerations

Existing models that use obsolete driver blocks still work. However, they might not be supported in future releases. Do not use these driver blocks in new models.

## Tunable parameters mapping behavior change

Starting in R2014a, for models configured with **InlineParameters** set to 'off', the handling of block parameters has changed in the generated code. For more information,

see the R2014a Simulink Coder™ Release Notes, “Simpler behavior for tuning all parameters and support for referenced models”.

## Compatibility Considerations

The Simulink Coder change in mapping behavior can have an impact on existing MATLAB, C, or .NET code written to interface to models through the Simulink Real-Time API.

- If you use a workspace variable in a parameter expression in the dialog box field of a tunable Simulink block parameter, the generated code now maps those variables as tunable model parameters. In previous releases, the generated code mapped all tunable parameters as block parameters, even if you used an expression containing a variable in the dialog box field.
- If you use a mask parameter in the dialog box field of a tunable block parameter under the masked block, the generated code now maps the mask parameter as a tunable block parameter of the masked block. In previous releases, the generated code ignored mask parameters and mapped all tunable parameters of the blocks under the mask as block parameters.
- You cannot use the Simulink Real-Time software to observe model parameters that are structures or members of structures.

In any of these situations, existing code no longer works as it did in R2013b or before if the code queries or modifies block parameters. You must modify your code to replace the old mappings with the new mappings.

## Functionality being removed or changed

The following functionality is being removed or changed.

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
xpcwwenable will be removed in a future release.	Still works	SimulinkRealTime.target	Update existing programs to close the connection using SimulinkRealTime.target.close.

# R2013b

**Version: 5.5**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **xPC Target Explorer Save and Restore Layout**

To save and restore the xPC Target Explorer window layout, use **File > Save Layout** and **Load Layout**.

## **Support for Microsoft Visual Studio 2012 compiler**

Support for Microsoft Visual Studio® 2012 compiler has been added. For a complete list of supported compilers, see Supported and Compatible Compilers.

## **Support for Condor QPCX-1553 boards (MIL-STD-1553 protocol)**

You can now model Condor® QPCX-1553 boards using the QPCX-1553 block set.

## **Support for Condor RCEI-530 and CEI-830 boards (ARINC 429 protocol)**

You can now model Condor RCEI-530 and CEI-830 boards using the CEI-x30 block set.

## **Speedgoat IO331 with AXM-A75 A/D and D/A converter**

The Speedgoat IO331 FPGA supports the AXM-A75 A/D and D/A converter subsystem board under the Speedgoat IO331-6 configuration. HDL Coder HDL Workflow Advisor automatically adds the Speedgoat IO331-6 A/D Range block to the model.

## **xPC Target Support Package for USB Video Hardware**

The USB Video hardware driver no longer ships with the base product. It must be downloaded as an xPC Target support package.

## **Compatibility Considerations**

The first time you attempt to use a USB Video block, Simulink displays a dialog box asking you to install the support package. From the **HOME** tab on the ribbon, click **Add-Ons > Get Hardware Support Packages**.

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## **mex -setup command sets default target compiler**

The `mex -setup` command sets the default compiler for xPC Target builds, provided that the MEX compiler is a supported Microsoft compiler. Use `xpcsetCC -setup` only if you must specify different compilers for MEX and xPC Target.

## **getxpcpci returns additional information**

The `getxpcpci` function returns a MATLAB struct that, in addition to the existing fields, contains the `ADChan`, `DACHan`, `DIOChan`, `Release`, and `Notes` fields.

## **Blocks Renamed**

The following blocks have been renamed:

- Speedgoat IO325 PCI Setup ⇒ Speedgoat IO321 PCI Setup
- Speedgoat IO325 A/D Calibration ⇒ Speedgoat IO321-5 A/D Calibration
- Speedgoat IO325 PCI Read ⇒ Speedgoat IO321 PCI Read
- Speedgoat IO325 PCI Write ⇒ Speedgoat IO321 PCI Write

## **Compatibility Considerations**

FPGA models generated using the previous version of HDL Coder HDL Model Advisor accessed these blocks under their old names. Because these blocks no longer exist under those names in the xPC Target library, such models no longer run. To access these blocks under their new names, you must regenerate the FPGA model using the current version of HDL Coder HDL Model Advisor .

## **Blocks Designated Obsolete**

The following blocks have been designated as obsolete.

For a complete list of obsolete blocks, see Simulink Real-Time Library of Obsolete Drivers.

- ACCES I/O WDG-CSM
- ACCES I/O WDG-CSM Watchdog Timer
- ADDI-DATA APCI-1710

- ADDI-DATA APCI-1710 Incremental Encoder
- ADDI-DATA PA-1700
- ADDI-DATA PA-1700 Incremental Encoder
- Adlink PCI-8133
- Adlink PCI-8133 3-Phase PWM
- Advantech PCL-1800
- Advantech PCL-1800 Analog Input (A/D)
- Advantech PCL-1800 Analog Output (D/A)
- Advantech PCL-1800 Digital Input
- Advantech PCL-1800 Digital Output
- Advantech PCL-711B
- Advantech PCL-711B Analog Input (A/D)
- Advantech PCL-711B Analog Output (D/A)
- Advantech PCL-711B Digital Input
- Advantech PCL-711B Digital Output
- Advantech PCL-726
- Advantech PCL-726 Analog Output (D/A)
- Advantech PCL-726 Digital Input
- Advantech PCL-726 Digital Output
- Advantech PCL-727
- Advantech PCL-727 Analog Output (D/A)
- Advantech PCL-727 Digital Input
- Advantech PCL-727 Digital Output
- Advantech PCL-728
- Advantech PCL-728 Analog Output (D/A)
- Advantech PCL-812
- Advantech PCL-812 Analog Input (A/D)
- Advantech PCL-812 Analog Output (D/A)
- Advantech PCL-812 Digital Input
- Advantech PCL-812 Digital Output



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- Advantech PCL-812PG
  - Advantech PCL-812PG Analog Input (A/D)
  - Advantech PCL-812PG Analog Output (D/A)
  - Advantech PCL-812PG Digital Input
  - Advantech PCL-812PG Digital Output
  - Advantech PCL-818
  - Advantech PCL-818 Analog Input (A/D)
  - Advantech PCL-818 Analog Output (D/A)
  - Advantech PCL-818 Digital Input
  - Advantech PCL-818 Digital Output
  - Advantech PCL-818H
  - Advantech PCL-818H Analog Input (A/D)
  - Advantech PCL-818H Analog Output (D/A)
  - Advantech PCL-818H Digital Input
  - Advantech PCL-818H Digital Output
  - Advantech PCL-818HD
  - Advantech PCL-818HD Analog Input (A/D)
  - Advantech PCL-818HD Analog Output (D/A)
  - Advantech PCL-818HD Digital Input
  - Advantech PCL-818HD Digital Output
  - Advantech PCL-818HG
  - Advantech PCL-818HG Analog Input (A/D)
  - Advantech PCL-818HG Analog Output (D/A)
  - Advantech PCL-818HG Digital Input
  - Advantech PCL-818HG Digital Output
  - Advantech PCL-818L
  - Advantech PCL-818L Analog Input (A/D)
  - Advantech PCL-818L Analog Output (D/A)
  - Advantech PCL-818L Digital Input
  - Advantech PCL-818L Digital Output

- Analogic AIM
- Analogic AIM12 Analog Input (A/D)
- Analogic AIM12 Digital Input
- Analogic AIM12 Digital Output
- Analogic AIM16
- Analogic AIM16 Analog Input (A/D)
- Analogic AIM16 Digital Input
- Analogic AIM16 Digital Output
- Data Translation DT2821
- Data Translation DT2821 Analog Input (A/D)
- Data Translation DT2821 Analog Output (D/A)
- Data Translation DT2821 Digital Input
- Data Translation DT2821 Digital Output
- Data Translation DT2821-F-8DI
- Data Translation DT2821-F-8DI Analog Input (A/D)
- Data Translation DT2821-F-8DI Analog Output (D/A)
- Data Translation DT2821-F-8DI Digital Input
- Data Translation DT2821-F-8DI Digital Output
- Data Translation DT2821-G-8DI
- Data Translation DT2821-G-8DI Analog Input (A/D)
- Data Translation DT2821-G-8DI Analog Output (D/A)
- Data Translation DT2821-G-8DI Digital Input
- Data Translation DT2821-G-8DI Digital Output
- Data Translation DT2821-F-16SE
- Data Translation DT2821-F-16SE Analog Input (A/D)
- Data Translation DT2821-F-16SE Analog Output (D/A)
- Data Translation DT2821-F-16SE Digital Input
- Data Translation DT2821-F-16SE Digital Output
- Data Translation DT2821-G-16SE
- Data Translation DT2821-G-16SE Analog Input (A/D)

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- Data Translation DT2821-G-16SE Analog Output (D/A)
  - Data Translation DT2821-G-16SE Digital Input
  - Data Translation DT2821-G-16SE Digital Output
  - Data Translation DT2823
  - Data Translation DT2823 Analog Input (A/D)
  - Data Translation DT2823 Analog Output (D/A)
  - Data Translation DT2823 Digital Input
  - Data Translation DT2823 Digital Output
  - Data Translation DT2824-PGH
  - Data Translation DT2824-PGH Analog Input (A/D)
  - Data Translation DT2824-PGH Digital Input
  - Data Translation DT2824-PGH Digital Output
  - Data Translation DT2824-PGL
  - Data Translation DT2824-PGL Analog Input (A/D)
  - Data Translation DT2824-PGL Digital Input
  - Data Translation DT2824-PGL Digital Output
  - Data Translation DT2825
  - Data Translation DT2825 Analog Input (A/D)
  - Data Translation DT2825 Analog Output (D/A)
  - Data Translation DT2825 Digital Input
  - Data Translation DT2825 Digital Output
  - Data Translation DT2827
  - Data Translation DT2827 Analog Input (A/D)
  - Data Translation DT2827 Analog Output (D/A)
  - Data Translation DT2827 Digital Input
  - Data Translation DT2827 Digital Output
  - Data Translation DT2828
  - Data Translation DT2828 Analog Input (A/D)
  - Data Translation DT2828 Analog Output (D/A)
  - Data Translation DT2828 Digital Input

- Data Translation DT2828 Digital Output
- GPIB-232CT-A
- GPIB-232CT-A Send/Receive Block
- GPIB-232CT-A Setup Block
- Humusoft AD 512
- Humusoft AD 512 Analog Input (A/D)
- Humusoft AD 512 Analog Output (D/A)
- Humusoft AD 512 Digital Input
- Humusoft AD 512 Digital Output
- Keithley DAS-1800HR
- Keithley DAS-1800HR Analog Input (A/D)
- Keithley DAS-1800HR Digital Input
- Keithley DAS-1800HR Digital Output
- Keithley KCPI-1801HC
- Keithley KPCI-1801HC Analog Input (A/D)
- Keithley KPCI-1801HC Analog Output (D/A)
- Keithley KPCI-1801HC Digital Input
- Keithley KPCI-1801HC Digital Output
- Keithley KPCI-1802HC
- Keithley KPCI-1802HC Analog Input (A/D)
- Keithley KPCI-1802HC Analog Output (D/A)
- Keithley KPCI-1802HC Digital Input
- Keithley KPCI-1802HC Digital Output
- Measurement Computing CIO-DAC08 (/12)
- Measurement Computing CIO-DAC08 (/12) Analog Output (D/A)
- Measurement Computing CIO-DAC08/16
- Measurement Computing CIO-DAC08/16 Analog Output (D/A)
- Measurement Computing CIO-DAC16 (/12)
- Measurement Computing CIO-DAC16 Analog Output (D/A)
- Measurement Computing CIO-DAC16/16

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- Measurement Computing CIO-DAC16/16 Analog Output (D/A)
  - Measurement Computing CIO-DAS16/JR (/12)
  - Measurement Computing CIO-DAS16/JR Analog Input (A/D)
  - Measurement Computing CIO-DAS16/JR (/12) Analog Input (A/D) with EXP
  - Measurement Computing CIO-DAS16/330
  - Measurement Computing CIO-DAS16/330 Analog Input (A/D)
  - Measurement Computing CIO-DAS16JR/16
  - Measurement Computing CIO-DAS16JR/16 Analog Input (A/D)
  - Measurement Computing CIO-DAS1601/12
  - Measurement Computing CIO-DAS1601/12 Analog Input (A/D)
  - Measurement Computing CIO-DAS1601/12 Analog Output (D/A)
  - Measurement Computing CIO-DAS1601/12 Digital Input
  - Measurement Computing CIO-DAS1601/12 Digital Output
  - Measurement Computing CIO-DAS1602/12
  - Measurement Computing CIO-DAS1602/12 Analog Input (A/D)
  - Measurement Computing CIO-DAS1602/12 Analog Output (D/A)
  - Measurement Computing CIO-DAS1602/12 Digital Input
  - Measurement Computing CIO-DAS1602/12 Digital Output
  - Measurement Computing CIO-DAS1602/16
  - Measurement Computing CIO-DAS1602/16 Analog Input (A/D)
  - Measurement Computing CIO-DAS1602/16 Analog Output (D/A)
  - Measurement Computing CIO-DAS 1602/16 Digital Input
  - Measurement Computing CIO DAS1602/16 Digital Output
  - Measurement Computing CIO-DDA06 (/12)
  - Measurement Computing CIO-DDA06 (/12) Analog Output (D/A)
  - Measurement Computing CIO-DDA06 (/12) Digital Input
  - Measurement Computing CIO-DDA06 (/12) Digital Output
  - Measurement Computing CIO-DDA06/16
  - Measurement Computing CIO-DDA06/16 Analog Output (D/A)
  - Measurement Computing CIO-DDA06/16 Digital Input

- Measurement Computing CIO-DDA06/16 Digital Output
- Measurement Computing CIO-DIO24
- Measurement Computing CIO-DIO24 Digital Input
- Measurement Computing CIO-DIO24 Digital Output
- Measurement Computing CIO-DIO24 Signal Conditioning
- Measurement Computing CIO-DIO24H
- Measurement Computing CIO-DIO24H Digital Input
- Measurement Computing CIO-DIO24H Digital Output
- Measurement Computing CIO-DIO48
- Measurement Computing CIO-DIO48 Digital Input
- Measurement Computing CIO-DIO48 Digital Output
- Measurement Computing CIO-DIO48H
- Measurement Computing CIO-DIO48H Digital Input
- Measurement Computing CIO-DIO48H Digital Output
- Measurement Computing CIO-DIO96
- Measurement Computing CIO-DIO96 Digital Input
- Measurement Computing CIO-DIO96 Digital Output
- Measurement Computing CIO-DIO192
- Measurement Computing CIO-DIO192 Digital Input
- Measurement Computing CIO-DIO192 Digital Output
- Measurement Computing CIO-DO24DD
- Measurement Computing CIO-DO24DD Digital Output
- Measurement Computing CIO-PDISO16
- Measurement Computing CIO-PDISO16 Digital Input
- Measurement Computing CIO-PDISO16 Digital Output
- Measurement Computing CIO-QUAD02
- Measurement Computing CIO-QUAD02 Incremental Encoder
- Measurement Computing CIO-QUAD04
- Measurement Computing CIO-QUAD04 Incremental Encoder
- National Instruments AT-AO-6

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- National Instruments AT-AO-6 Analog Output (D/A)
  - National Instruments AT-AO-10
  - National Instruments AT-AO-10 Analog Output (D/A)
  - National Instruments PC-DIO-24
  - National Instruments PC-DIO-24 Digital Input
  - National Instruments PC-DIO-24 Digital Output
  - National Instruments PC-TIO-10 Digital Input
  - National Instruments PC-TIO-10 Digital Output
  - NAII PC-12SD (PC-77SD1)
  - NAII PC-12SD (PC-77SD1) Synchro/Resolver
  - RS-232 Binary Pack
  - RS-232 Binary Receive
  - RS-232 Binary Send
  - RS-232 Binary Unpack Block
  - RS-232 Mainboard Receive (Asynchronous)
  - RS-232 Mainboard Send (Asynchronous)
  - RS-232 Mainboard Send/Receive (Synchronous)
  - RS-232 Mainboard Setup
  - Softing CAN-AC2-ISA with Philips PCA 82C200 Setup
  - Softing CAN-AC2-ISA with Philips PCA 82C200 Send
  - Softing CAN-AC2-ISA with Philips PCA 82C200 Receive
  - Softing CAN-AC2-ISA with Intel 82527 Setup
  - Softing CAN-AC2-ISA with Intel 82527 Send
  - Softing CAN-AC2-ISA with Intel 82527 Receive
  - Digital I/O Bit-Packing
  - Digital I/O Bit-Unpacking

## **Compatibility Considerations**

Existing models that use obsolete driver blocks still work. However, they might not be supported in future releases. Do not use these driver blocks in new models.

## Functionality being removed or changed

The following functionality is being removed or changed.

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
xPCGetScope will be removed in a future release.	Still works	xPCScGetScopeProperty functions	Update existing programs to use the xPCScGetScopeProperty to access property values.
xPCSetScope will be removed in a future release.	Still works	xPCScSetScopeProperty functions	Update existing programs to use the xPCScSetScopeProperty to access property values.
<b>Profiling enabled</b> check box removed from <b>xPC Target options</b> pane of Configuration Parameters dialog box.	N/A	<b>Measure task execution time</b> check box in <b>Verification</b> pane of Configuration Parameters dialog box	Existing models with <b>Profiling enabled</b> set continue to work.  The configuration process has changed. The output format has changed.
<b>TLC Options</b> text box removed from <b>xPC Target options</b> pane of Configuration Parameters dialog box.	N/A	MATLAB setparam command and 'TLCOptions' property	To change the 'TLCOptions' property setting in an existing model, use the MATLAB setparam command.



# R2013a

**Version: 5.4**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **xPC Target Support Package for BitFlow Neon CLB Camera Link hardware**

The BitFlow™ Neon CLB Camera Link® hardware driver is no longer shipped with the base product. It must be downloaded as an xPC Target support package.

### **Compatibility Considerations**

The first time you attempt to use a BitFlow Neon CLB Camera Link block, Simulink displays a dialog box asking you to install the support package. Use the Simulink menu item **Tools > Run on Target Hardware > Install/Update Support Package** or the `targetinstaller` command to install the support package.

### **Support for Speedgoat IO331 I/O module with Spartan 6 FPGA**

You can now use HDL Coder to program the Speedgoat IO331 I/O module supporting the Spartan 6 FPGA.

### **Coprocessor mode communication between CPU and FPGA**

xPC Target supports the following FPGA operation modes: `Free running` (default), `Coprocessing – blocking`, and `Coprocessing – nonblocking with delay`. For more information, see `FPGA Synchronization Modes`.

### **Add signal port to connect a signal trigger source**

For a `Scope (xPC)` block in `Signal triggering` mode, you can use the **Add signal port to connect a signal trigger source** check box to add the port `Trigger signal` to the scope block. You can connect this port to an arbitrary signal and use it to trigger the scope, even if the signal was not previously added to the scope.

### **Parameter tuning in Stateflow blocks using names derived from parameter names**

In previous releases, Stateflow® parameters in the generated code were not derived from the parameter names. In R2013a, parameter names appear unchanged in the code, which provides better traceability between the chart and the generated code.

---

## Compatibility Considerations

When tuning parameters in the target application running on the target computer, you must use a name of the form `sfunctionname_parametername` instead of a name of the form `SFunction_p1_k`, `SFunction_p2_k`, and so on.

For example, suppose model `myTestModel` contains a Stateflow block named `myStateflowChart` with a Stateflow parameter named `myParam`. In the generated code, this parameter is represented by the name `myTestModel.myStateFlowChart_myParam`.

## Functionality being removed or changed

The following functionality is being removed or changed.

Functionality	What Happens When You Use This Functionality?	Use This Instead	Compatibility Considerations
The xPC Target Microsoft COM interface is no longer being enhanced.	Still works	xPC Target Microsoft .NET Framework interface	Replace calls to the COM interface with calls to the .NET interface.
<b>Bus type</b> ISA will be removed in a future release.  This change affects only ISA Ethernet adapters used for host-target communication.	Still works	<b>Bus type</b> PCI or USB	Update your target computer hardware to be compatible with <b>Bus type</b> PCI or USB.
MATLAB property <code>TcpIpTargetBusType</code> value 'ISA' will be removed in a future release.  This change affects only ISA Ethernet	Still works	Property <code>TcpIpTargetBusType</code> values 'PCI' or 'USB'	Update your target computer hardware to be compatible with <code>TcpIpTargetBusType</code> 'PCI' or 'USB'.

<b>Functionality</b>	<b>What Happens When You Use This Functionality?</b>	<b>Use This Instead</b>	<b>Compatibility Considerations</b>
adapters used for host-target communication.			

# R2012b

**Version: 5.3**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## **Redesign of xPC Target Explorer for 32-bit and 64-bit MATLAB, including signal and parameter groups**

xPC Target Explorer has been redesigned for both 32-bit and 64-bit MATLAB. You can control your real-time application, view signals, and tune parameters. You can also create signal and parameter groups, providing custom views of system and subsystem elements.

## **Intel Gigabit support for EtherCAT and real-time Ethernet**

xPC Target supports Intel Gigabit Ethernet adapters for:

- Real-time Ethernet
- EtherCAT

## **ShowHardware kernel environment property**

xPC Target includes a new environment property, `ShowHardware`, with values `'off'` and `'on'` (by default, `'off'`). If you create a target boot kernel when `ShowHardware` is `'on'` and boot the target computer with it, the kernel displays on the target monitor the index, bus, slot, function, and target driver for each Ethernet card.

## **xPC Target compiler support**

The xPC Target compiler support has changed as follows:

- Removed support for Microsoft Visual Studio 2005 SP1 (8.0) on 32-bit and 64-bit Windows platforms.
- Removed support for Open WATCOM compilers.

See [Supported and Compatible Compilers](#) for a complete list of supported compilers.

## **Functionality being removed or changed**

The following functionality is being removed or changed:

<b>Functionality</b>	<b>What Happens When You Use This Functionality?</b>	<b>Use This Instead</b>	<b>Compatibility Considerations</b>
MATLAB property value <code>Watcom</code> has been removed.	The <code>set</code> and <code>get</code> commands using this property run, but the target application build fails.	Use the <code>xpcgetCC</code> function to configure the Microsoft Visual C++ compiler.	Use the <code>xpcgetCC</code> function to configure the Microsoft Visual C++ compiler.
MATLAB properties <code>CCompiler</code> and <code>CompilerPath</code> are no longer supported.	The <code>set</code> and <code>get</code> commands using these properties still run.	Use the <code>xpcgetCC</code> function to configure the Microsoft Visual C++ compiler.	Use the <code>xpcgetCC</code> function to configure the Microsoft Visual C++ compiler.
EtherCAT tasks doing multirate data transfers run at the greatest common divisor of the task rates in the model.	EtherCAT data transfers happen at a slightly different rate from in previous releases.	N/A	Previously, tasks ran at the rate of the first task, which had to run at the fastest rate.





# R2012a

**Version: 5.2**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Board and Block Support

xPC Target supports the following new boards and blocks:

- Speedgoat IO312
- Speedgoat IO314

## New FPGA Functionality

xPC Target supports the following new FPGA functionality:

- Vector signals for FPGAs
- DMA for FPGA data transfers

## xPC Target Compiler Support

The xPC Target compiler support has changed as follows:

- Removed support for Microsoft Visual Studio 2010 Express on win32,win64

See Supported and Compatible Compilers for a complete list of supported compilers.

## xPC Target Examples

This release contains the following new or updated examples:

- **Demo: Audio Processing** — This model demonstrates audio input, output and display with xPC Target using the General Standards 24DSI12 and 16AO16 boards.
- **Demo: Audio Power Spectrum** — This model demonstrates how to use xPC Target to compute the power spectrum of an audio signal input from the General Standards 24DSI12 board.
- **Demo: Audio Tone Control using General Standards Boards** — This model demonstrates tone control audio processing using General Standards I/O boards.

## Functionality Being Removed or Changed

Functionality	What Happens When You Use This Functionality?	Use This Instead	Compatibility Considerations
The <b>Allow tasks to execute concurrently</b> check box in the <b>Simulation &gt; Configuration Parameters &gt; Code Generation &gt; xPC Target options</b> node has been removed.		<b>Solver &gt; Enable concurrent tasking</b> in a configuration for concurrent execution	Set <b>Solver &gt; Enable concurrent tasking</b> in a configuration for concurrent execution.
xPC Target Explorer <b>Host target communication</b> mode RS-232 will be removed in a future release.	xPC Target Explorer <b>Create Boot Disk</b> and <b>Create DOS Loader</b> still run, with warning.	<b>Host target communication</b> mode TCP/IP	Set xPC Target Explorer <b>Host target communication</b> mode to TCP/IP
MATLAB property <b>HostTargetComm</b> value RS232 will be removed in a future release.	xpcbootdisk command still runs, with warning.	MATLAB property <b>HostTargetComm</b> value TcpIp	Set <b>HostTargetComm</b> value to TcpIp
xPC Target Explorer <b>Select C Compiler</b> value Watcom will be removed in a future release.	xPC Target Explorer <b>Create Boot Disk</b> and <b>Create DOS Loader</b> still run.	<b>Select C Compiler</b> value Watcom	Set xPC Target Explorer <b>Select C Compiler</b> value to Watcom
MATLAB property <b>CCompiler</b> value Watcom will be removed in a future release.	xpcbootdisk command still runs.	MATLAB property <b>CCompiler</b> value VisualC	Set <b>CCompiler</b> value to VisualC
xpcexplr command in a 64-bit installation.	In a 64-bit installation, the xpcexplr	In a 64-bit installation, use the MATLAB	To see the xPC Target Explorer window,

Functionality	What Happens When You Use This Functionality?	Use This Instead	Compatibility Considerations
	command brings up a window instead of printing an error message.	command-line interface. (See <i>Configuring Environment From the MATLAB Command Line.</i> )	run the <code>xpcexplr</code> command in a 32-bit installation.

---

**Tip** To create a configuration for concurrent execution, select **Configuration > Add Configuration for concurrent execution** in the **Model Hierarchy** pane of Simulink Model Explorer.

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# R2011b

**Version: 5.1**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Signal Upload Inside Reference Models in Simulink External Mode

In Simulink External Mode, xPC Target supports uploading non-bus signal information from models referenced inside a top model. Uploading information from buses and virtual signals inside a reference model generates a warning.

## Hard Drive Bootdisk

You can create an xPC Target “bootdisk” using CompactFlash and removable hard drives as well as floppy disk and CD-ROM. This disk boots the xPC Target kernel without requiring DOS, as with DOSLoader.

## Multicore Support

### Distributed Target Execution Using Multicore Processors

In addition to supporting preemptive rate monotonic scheduling for single-core processors, the xPC Target software supports distributing a target application built from a Simulink model as concurrent tasks across processors in a multicore machine.

### Multicore Mode Target Execution Using Intel Core i5 and Intel Core i7 Processors

The xPC Target kernel supports distributing a target execution in multicore mode using the Intel Core i5 and Intel Core i7 processors.

### Legacy MPFPS Enabled by Environment Property

As part of its support for multiple processors, the xPC Target software uses the Advanced Configuration and Power Interface (ACPI) to discover ACPI-compliant hardware in the target computer and creates a MultiProcessor Floating Pointer Structure (MPFPS) representing it. If the hardware is not entirely ACPI compliant, you can use the following xPC Target environment property to access the legacy MPFPS in the computer BIOS:

```
setxpcenv('LegacyMultiCoreConfig', 'on')
```

---

**Note:** To display the allowed values of xPC Target environment properties, type `setxpcenv` without arguments. To display their current values, type `getxpcenv` without arguments.

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## USB Support

### Data Storage and Transfer Using USB Drives and Sticks

The xPC Target kernel supports data storage and transfer using 1 LUN (logical unit) USB drives, 2 LUN USB drives, and 4-LUN card readers.

### Host-Target Communication Using USB Ethernet Adapters

The xPC Target kernel allow the host and target computers to communicate using USB Ethernet adapters. In xPC Target Explorer, do the following:

- Set TCP/IP target bus to USB.
- Set TCP/IP target driver to USBAX772, USBAX172, or Auto.

From the MATLAB command line, do the following:

- `setxpcenv('TcpIpTargetBusType','USB')`
- `setxpcenv('TcpIpTargetDriver','USBAX772')`, or  
`setxpcenv('TcpIpTargetDriver','USBAX172')`, or  
`setxpcenv('TcpIpTargetDriver','Auto')`

If you set the target driver to Auto, the software defaults the target driver to USBAX772, the driver most commonly used.

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**Note:** To display the allowed values of xPC Target environment properties, type `setxpcenv` without arguments. To display their current values, type `getxpcenv` without arguments.

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## Board and Block Support

### Triggering and Region of Interest Support in Camera Link Interface Standard Blocks

The xPC Target software supports multiple triggering modes and extracting a region of interest using the NEON BitFlow Image Input block. See Acquiring Images from Camera Link Cameras.

### **IsValid Output Port on From File Block**

The From File IsValid port outputs 1 if the file read succeeds and 0 if it fails. Select the **Show IsValid port** check box on the From File Source Block Parameters dialog to make it visible in the model.

### **CAN Remote Frame Support**

The xPC Target kernel supports the CAN protocol with remote frame transmission.

### **I/O Pin Mapping for National Instruments 6221/37 M-Series Board**

xPC Target supports the default I/O pin map for the 37-pin variant of the NI 6221 M-Series board, as shown in the M-Series User Manual from National Instruments®.

### **Direct Frequency Measurement Using National Instruments PCI-6601 and PCI-6602 Boards**

The xPC Target driver supports direct frequency measurement (pulse counting) using the capabilities of the NI PCI-6601 and PCI-6602 boards.

### **Speedgoat FPGA Support**

The software supports the following additional Speedgoat boards and functionality:

- Speedgoat IO302 board
- A/D input port on Speedgoat IO325 board. HDL Workflow Advisor will automatically add the A/D input port calibration block to the model.
- Differential ports on Speedgoat IO303/IO325 board.
- Digital Clock Manager (DCM) configuration on Speedgoat FPGA boards.
- The xPC Target computer can synchronize target application execution to interrupts produced by supported FPGA boards.

## **Compatibility Considerations**

The Watcom 1.8 compiler cannot compile an IO325 model. Use a Microsoft compiler instead.

### **TLC Option `-axPCModelStackSizeKB` Added to Adjust Stack Size**

You can change the stack size of the real-time threads by setting a TLC option in the Configuration Parameters dialog, Code Generation node, section Build Process. For example, to set the stack size to 256 kBytes, type the following in the TLC option box:



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-axPCModelStackSizeKB=256

## xPC Target Compiler Support

The xPC Target compiler support has changed as follows:

- Added Intel Visual Fortran Composer XE 2011 on win32 and win64.
- Added Windows SDK 7.1 on win32 and win64.

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**Note:** To access Windows SDK 7.1, type `xpcsetCC('setup')` at the MATLAB prompt and select Microsoft Visual Studio 10.0.

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- Removed Microsoft Visual Studio 2005 SP1 (8.0) on win32 and win64.

See Supported and Compatible Compilers for a complete list of supported compilers.

## xPC Target Demos

This release contains the following new demos:

- **Concurrent Execution on xPC Target** — This demo demonstrates how to realize concurrent execution of a model on xPC Target, illustrating the execution of each model thread using the xPC Target profiling tool.



# R2011a

**Version: 5.0**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## New Profiling Capability

You can now profile an application running on a target PC. This capability enables you to determine:

- Whether your target PC is taking advantage of its multiple cores
- The execution sequence of the target application
- The task execution time (TET) of the target application for the active rate groups

See Multicore Processor Configuration in the xPC Target User's Guide.

In support of this new capability, the following configuration parameters are new in the **Configuration Parameters > Code Generation > xPC Target options** node:

- Enable profiling
- Number of events (each uses 20 bytes)

To help you build, download, and display the profile data, a script is available in *matlabroot\toolbox\rtw\targets\xpc\xpcdemos\profile\_xpc\_demo.m*. This script uses an example model, *matlabroot\toolbox\rtw\targets\xpc\xpcdemos\xpcprofdemo*.

## Support for FPGA Applications

With the HDL Coder software, you can now implement Simulink algorithms. You can also configure I/O functionality on select FPGA I/O boards that xPC Target supports. The HDL Workflow Advisor streamlines and automates the entire process.

The software supports the following Speedgoat FPGA boards:

- Speedgoat IO301
- Speedgoat IO303
- Speedgoat IO311
- Speedgoat IO313
- Speedgoat IO325

See Speedgoat in the xPC Target I/O Reference for information on the blocks the software uses to program and communicate with the FPGA boards.

---

For more information on how to use the HDL Workflow Advisor with xPC Target, see FPGA Models in the xPC Target User's Guide.

## Support for Real-Time UDP Applications

The xPC Target software now supports real-time UDP applications with the following blocks:

- Network Configuration
- Receive
- Send

For more information, see Real-Time UDP Communication Support in the xPC Target I/O Reference.

The following core Internet Protocol (IP) blocks were also added to support the real-time UDP blocks. In general, you do not need to access these blocks directly.

- UDP Consume
- UDP Produce
- UDP Rx
- UDP Tx

For more information, see IP Library for Real-Time UDP Communication Support in the xPC Target I/O Reference.

## Support for Image Processing Applications

The xPC Target software now supports images and video frames from the following devices:

Device	Description
USB webcams	Supported by the From USB Video Device and USB Video Device List blocks
Cameras that support the Automated Imaging Association's Camera Link interface standard	Supported by the NEON BitFlow Image Input block

To support these capabilities, the Video Utilities library provides the following blocks:

- Image Receive
- Image Transmit
- Jpeg Compression
- Jpeg Decompression

For more information, see Video Image Processing and BitFlow in the xPC Target I/O Reference.

## **xPC Target Demos**

This release contains the following new demos:

- FPGA demos
  - **Servo Control with the Speedgoat IO301 FPGA Board** — Demonstrates programming and configuring the Speedgoat IO301 board with a simple PWM servo controller, hardware counter, and digital I/O.
  - **Digital I/O with the Speedgoat IO303 FPGA Board** — Demonstrates programming and configuring the Speedgoat IO303 board for digital I/O.
- xPC Target API for Microsoft .NET Framework demos
  - **Simple Client Application with the .NET API** — Demonstrates the use of the xPC Target API for Microsoft .NET Framework to create a client human machine interface (HMI) for your target application.
- Camera Link demos
  - **Edge Detection with Camera Link and Bitflow Neon-CLB Frame Grabber** — Demonstrates processing (Sobel edge detection) of video images captured with a Camera Link camera connected to the BitFlow Neon-CLB board.
  - **Image Capture with Camera Link and Bitflow Neon-CLB Frame Grabber** — Demonstrates a method to capture and view video images from a Camera Link camera attached to the BitFlow Neon-CLB board.

## **Microsoft Windows 64-Bit Support**

The xPC Target software now supports Microsoft Windows 64-bit systems from the MATLAB command line.

---

xPC Target Explorer does not run on 64-bit systems. It continues to run on 32-bit systems. You can install the 32-bit version of MATLAB products on your 64-bit system.

If you install the 64-bit version of MATLAB products on your 64-bit system, use the command-line interface to set up xPC Target systems (see *Configuring Environment From the MATLAB Command Line* in the xPC Target User's Guide).

## I/O Driver Support

### Threshold for Ethernet Library Buffer Block

The Buffer block in the xPC Target library for Ethernet now has a minimum threshold parameter so that you can specify when the block begins to output buffers.

## Additional Ethernet Card Support

Support for a number of Ethernet cards has been added. For the most current list of supported cards, see [http://www.mathworks.com/products/xpctarget/-supported-hardware/xPC\\_Target\\_Supported\\_Ethernet\\_Chipsets.pdf](http://www.mathworks.com/products/xpctarget/-supported-hardware/xPC_Target_Supported_Ethernet_Chipsets.pdf).

## xPC Target Compiler Support Changes

The xPC Target software now supports the following compilers:

- Microsoft Visual Studio 2010 (10.0) Professional and Express, 32-bit and 64-bit

---

**Note:** The Express edition must be the most recent version of the compiler. If you have an earlier Express edition installed, uninstall it and install the latest version from the Microsoft site.

---

The xPC Target software no longer supports the Microsoft Visual Studio 2009 (9.0) Express compiler.

## New Commands to Support Compiler Configuration

Use the `xpcgetCC` and `xpcsetCC` functions to configure the compiler. Use these commands instead of the `CCompiler` and `CompilerPath` properties. For more information, see *Functions and Function Elements Being Removed*.

## Enhanced readxpcfile

The structure returned by the `xpctarget.fs.readxpcfile` function contains a new field, `signalNames`. This field is a cell array of the signal names acquired by the file scope.

## Functions and Function Elements Being Removed

Function or Function Element Name	What Happens When You Use the Function or Element?	Use This Instead	Compatibility Considerations
<code>xpctarget.xpc.set</code> (target application object) <code>target scope Mode</code> property	Still works	<code>DisplayMode</code>	Replace the existing instances of <code>Mode</code> with <code>DisplayMode</code> .
<code>xpctarget.xpc.set</code> (target application object) <code>file scope Mode</code> property	Still works	<code>WriteMode</code>	Replace the existing instances of <code>Mode</code> with <code>WriteMode</code> .
xPC Target COM API	Still works	xPC Target API for Microsoft .NET Framework	Create custom applications using xPC Target API for Microsoft .NET Framework instead of xPC Target COM API. Existing custom application executables should continue to work on 32-bit host PCs.
<code>CCompiler</code> and <code>CompilerPath</code>	Still works. Warns.	<code>xpcsetCC</code> and <code>xpcgetCC</code>	Configure your compiler using the new functions.

## xPC Target Product Now in Simulink Start, Help, and Demos Category

The Simulink category now contains the xPC Target software product.



---

## Compatibility Considerations

This change impacts you in the following ways:

- Finding and viewing this product through the MATLAB Desktop **Start** button and in the Help browser **Contents** and **Demos** panes.
- Using the demo command to access the product demos.

## xPC Target Upgrade Requirements

### Compatibility Considerations

If you upgrade your xPC Target software from a previous version, you must recreate the target PC boot image and you must rebuild your xPC Target applications. See Target Boot Method in the xPC Target Getting Started Guide.



# R2010b

**Version: 4.4**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## xPC Target — A Complete Real-Time Testing Solution for Simulink

xPC Target Turnkey is a complete, fully assembled, real-time testing solution that combines the xPC Target software with a variety of high-performance real-time target machines and I/O modules. Your real-time target machine will be assembled based on your requirements and be ready to use when you receive it.

### Multicore Support for Multirate Models

The xPC Target software now allows you to run multirate target applications on multiple cores on your target PC. You can use this capability if your target PC has a multicore processor and you want to take advantage of them for multirate models.

This is a model-level feature that you can access from the Simulink model editor. In the Simulink model editor, see the **Allow tasks to execute concurrently** check box in the **Simulation > Configuration Parameters > Code Generation > xPC Target options** node.

These models must use the Rate Transition block to transition between rates. If the model uses other blocks for rate transitions, you cannot build the model using this feature.

### Compatibility Considerations

Support to take advantage of multicore processors was added in xPC Target version 4.2 (R2009b). That feature required you to select the **Multicore CPU support** check box in the xPC Target Explorer Settings node.

The new multirate feature takes advantage of the multicore processor feature to generate xPC Target code for multirate models. It requires you to select both the target PC **Multicore CPU support** check box in the xPC Target Explorer and the model **Allow tasks to execute concurrently** check box in the Simulink model editor configurations parameters.

However, if the following is true:

- You built and downloaded a model from an earlier release using just the **Multicore CPU support** check box.
- You now want to rebuild and download that same model using the **Allow tasks to execute concurrently**.

---

Be aware that the data results might numerically differ slightly between these releases, and might also numerically differ slightly from run to run. If you want the same results as from earlier releases, clear the model-specific **Allow tasks to execute concurrently** check box.

## **xPC Target Support for EtherCAT Networks**

To support EtherCAT networks (open and real-time Ethernet networks), the xPC Target library provides the blocks described in Model-Based EtherCAT Communications Support, in the xPC Target I/O Reference.

## **Support for an XCP Client on a CAN Network**

Blocks have been added to support the use of Universal Measurement and Calibration Protocol (XCP) clients on a CAN network. Use these blocks to take advantage of the XCP features, synchronous data stimulation (STIM), and synchronous data acquisition (DAQ). See XCP Over CAN Support in the xPC Target I/O Reference.

## **Support for Parallel Model Reference Builds**

The xPC Target software now supports the ability to build models that contain referenced models in parallel when possible. This capability enables you to more quickly build and download xPC Target applications to the target PC. For more information, see Reduce Build Time for Referenced Models in the *Real-Time Workshop® User's Guide*. This capability requires the Parallel Computing Toolbox product.

If you want to build models that contain referenced models on multiple remote PCs, you must also install the MATLAB Distributed Computing Server™ product. See Building Referenced Models in Parallel in the xPC Target User's Guide.

## **Compiling Model Reference Models with Open Watcom Compiler**

The xPC Target software now supports the ability to build models that contain referenced models with the supported Open Watcom compiler.

## **Improved Support for Stateflow Charts**

The xPC Target software now supports, with Simulink external mode, the ability to:

- Animate Stateflow charts.
- Use Simulink floating scopes and the Signal & Scope Manager to display Stateflow states for which you have set test points.

For more information, see *Monitoring Stateflow States* in the xPC Target User's Guide.

## Support for BLAS Library

The xPC Target software now supports the Basic Linear Algebra Subprograms (BLAS) library. This library speeds up large matrices (16 x 16) operations in the target application. You do not need to do anything to access this capability.

---

**Note:** Your model accesses this library if you build your model with a Microsoft Visual C/C++ compiler. If you build your model with the Open Watcom compiler, the xPC Target software does not use the BLAS library. Behavior remains as in previous releases.

---

## I/O Driver Support

### New Blocks for HUMUSOFT AD622 and MF624 Boards

Blocks have been added to support the HUMUSOFT<sup>®</sup> AD622 and MF624 boards. See H in the xPC Target I/O Reference for more information.

## Non-Inlined S-Functions in Referenced Models

The Real-Time Workshop product supports the building of models containing referenced models that have noninlined S-functions. This capability is not supported when building models containing referenced models that have xPC Target I/O blocks and xPC Target scopes.

## xPC Target Upgrade Requirements

### Compatibility Considerations

If you upgrade your xPC Target software from a previous version, you must recreate the target PC boot image and you must rebuild your xPC Target applications. See *Target Boot Method* in the xPC Target Getting Started Guide.

# R2010a

**Version: 4.3**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Updated Ethernet Rx Block

The Ethernet Rx block has been updated to allow the filtering of Ethernet packets. This change enables to use multiple Ethernet Rx blocks with the same device ID. However, you must configure each block to filter a unique set of packets.

The block dialog box now contains the tabs **Rx** and **Filter**. **Rx** contains the original block parameters. **Filter** contains the filter characteristics you choose for the received Ethernet frames.

## Support for Bus-off Failure Recovery in CAN Systems

The following CAN setup blocks have been updated to support the ability to recover from CAN bus failures.

- Softing CAN-AC2-PCI with SJA1000 Setup
- Softing CAN-AC2-104 with SJA1000 Setup
- Softing CAN-AC2-PCI with Philips SJA1000 FIFO Setup
- Softing CAN-AC2-104 with Philips SJA1000 FIFO Setup

Each block now has two additional parameters: **Show bus-off status output** and **Bus-off recovery**.

## Support for Diamond Systems Athena II Board

The Diamond Systems Athena II board is now supported. Use the Prometheus/Athena blocks to access this board. For further information, see Diamond Prometheus, Athena, and Athena II in the xPC Target I/O Reference.

## New setxpcenv Property

The target application setxpcenv function has a new property, **EthernetIndex**. Use this property to specify the index number of a particular Ethernet card. Otherwise, the software assumes that there is only one Ethernet card available, and uses the first Ethernet card found.

## .NET API xPC Target Framework Updates

The .NET API xPC Target Framework has the following updates:



- 
- `MinimumTet` and `MaximumTet` property added to the `xPCApplication` class
  - `SaveParameterSet` and `LoadParameterSet` methods added to the `xPCParameters` class
  - `TriggerSlope` property added to the `xPCScope` class

## New MPL PATI EEPROM Write Block

The new MPL PATI EEPROM Write block writes MPL boot code on the EEPROM. Use this block before running a model that contains MPL blocks. See the xPC Target MPL PATI EEPROM Write block for more information.

## xPC Target Demos

This release contains the following new and changed demos:

- The .NET API xPC Target Framework has a new demo, located in `matlabroot\toolbox\rtw\targets\xpc\api\xPCFrameworkSamples\FileSystemBrowser`  
  
This is a C# application project developed with the Microsoft Visual Studio 2008 IDE. It illustrates how to build a standalone Windows executable to connect to target PC and a host PC. See the `Readme.txt` file in the demo directory for instructions.
- The series of CAN I/O and CAN I/O FIFO demos using `CAN_MESSAGE` and standard data types have been reorganized:
  - CAN (`CAN_MESSAGE` Data Types) — Contains demos that use `CAN_MESSAGE` data types. Many of these demos are updated from previous releases to use `CAN_MESSAGE` data types instead of the standard data types. See xPC Target CAN Library in the xPC Target I/O Reference.
  - CAN Legacy (Standard Data Types) — Contains demos that use standard data types. These are the legacy demos from previous releases. See xPC Target CAN FIFO Demonstrations for CAN-AC2-PCI and CAN-AC2-104 Boards in the xPC Target I/O Reference.
- New Ethernet Rx block demo, `Ethernet Rx Block Filtering`.

## Simulink SimState Support

The Simulink product supports the ability to save complete model simulation state (see `Saving and Restoring the Complete SimState` in the Simulink Release Notes). The xPC

Target software now supports this behavior when simulating, on a host PC, a Simulink model that contains some xPC Target blocks. The software does not support this behavior when executing such a model on the target PC. If an xPC Target block does not support the SimState behavior, the software generates a message. For example, you might get a message like the following:

```
Simulink is unable to access the simulation state...
```

To prevent warning or error messages from blocks that do not support the SimState behavior, clear the **Save complete SimState in final state** check box in the **Configuration Parameters Data Import/Export** node for your model. See xPC Target Support and SimState in the xPC Target I/O Reference for a list of blocks that do not support SimState behavior.

## xPC Target Compiler Support Changes

The xPC Target software now supports the following compilers:

- Intel Visual Fortran 11.0 compiler
- Open Watcom 1.8

xPC Target software no longer supports the following compilers:

- Intel Visual Fortran 10.1 compiler
- Open Watcom 1.7
- Microsoft Visual Studio 7.1

## Multiple Ethernet Cards of the Same Type

If your target PC has multiple Ethernet cards of the same type, your target PC might have communication issues. Situations that might cause these issues include:

- The presence of more than one Ethernet card on the target PC
- Updated xPC Target releases

Changes to the xPC Target kernel might cause these issues.

See *Are Multiple Ethernet Cards in the Target Computer Causing Communication Problems During Download?* in the xPC Target User's Guide for details on how to resolve this issue.

---

## **Compatibility Considerations**

If you have an updated xPC Target releases, you might have this communication issue. See [Are Multiple Ethernet Cards in the Target Computer Causing Communication Problems During Download?](#) in the xPC Target User's Guide for details on how to resolve this issue.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target PC boot image and you must rebuild your xPC Target applications. See [Target Boot Method](#) in the xPC Target Getting Started Guide.



# R2009bSP1

Version: 4.2.1

Bug Fixes



# R2009b

**Version: 4.2**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Changed CAN Block Messaging

You can use the new CAN Pack and CAN Unpack blocks that are available with your xPC Target license to perform message packing and message unpacking functions. Refer to the chapter "Mapping Obsolete CAN Blocks to New Host-side CAN Blocks" for more information. These new blocks add the following functionality:

- Consolidate multiple blocks to handle basic and advanced pack and unpack functions, which include manually specified signals and CANdb file-specified signals.
- Improved compatibility with Vector Informatik CANdb files.

The message handling capability of the xPC Target CAN block library has changed. These blocks now use the CAN\_MESSAGE data type. In previous releases, these blocks transferred data as 8 bytes in a double.

The Send and Receive blocks (including FIFO Write and Read blocks) for the Softing CAN-AC2-PCI with Philips SJA1000 CAN Controller and CAN-AC2-104 (PC/104) with Philips SJA1000 CAN Controller boards support the new message handling capability. The Send and Receive blocks for the Softing CAN-AC2 (ISA) with Philips PCA 82C200 CAN Controller and CAN-AC2 (ISA) with Intel 82527 CAN Controller support only the old message handling capability.

## Compatibility Considerations

If you have models that use old CANDBC blocks from the xPC Target block library (available by typing `xpcobsoletelib`), you will see an obsolescence warning message. (In the previous release, you saw this message when typing `xpclib`; this message now appears only when typing `xpcobsoletelib`.) These models will continue to work as before. You should update your models to use the new CAN Pack and the CAN Unpack blocks available from the xPC Target block library, as the old CAN Message blocks might be removed from a future release of the xPC Target product.

For information on how you can identify obsolete blocks and transition to the new blocks, see chapter "Mapping Obsolete CAN Blocks to New Host-side CAN Blocks".

The following blocks have been moved to the xPC Target library of obsolete drivers:

- CAN Message Packing
- CAN Message Packing (CANdb)
- CAN Message Filter
- CAN Message Unpacking



- 
- CAN Message Unpacking (CANdb)
  - CANDBC Translator
  - FIFO Mode CAN Message
  - Object Mode CAN Message

You can still access these driver blocks by typing the command `xpcobsoletelib` at the MATLAB Command Window. Existing models that use these drivers will still work. However, they may not be supported in future releases. Do not use these driver blocks in new models. Instead, use the corresponding blocks contained in the CAN Message Handling blocks library.

## **CAN Message Warning Message Does Not Appear**

In xPC Target Version 4.1 (R2009a), typing `xpclib` in the MATLAB Command Window caused a `CAN_MESSAGE` warning. This warning now appears only when you type `.xpcobsoletelib`.

## **New .NET API xPC Target Framework Enables Users to Create Applications that Interface with a Target PC**

The xPC Target environment now provides a .NET API for the Microsoft .NET Framework. You can use this xPC Target API framework in an integrated development environment (IDE) that also supports the Microsoft .NET Framework environment. Use this API framework to create custom standalone applications (for example, Windows Forms applications running on a host PC that communicates with your target application running on a target PC). See xPC Target API Reference for Microsoft .NET Framework in the xPC Target API Guide.

To access the types available from the xPC Target environment, reference this namespace in your application:

```
using MathWorks.xPCTarget.FrameWork;
```

The primary object is `xPCTargetPC`.

## **Enhanced UDP Send and Receive Block Allows Sending Variable Length Packets**

The UDP library has been enhanced to support variable length packets. The following blocks are updated:

- UDP Receive
- UDP Send

The default behavior of these blocks remains the same as before. Your existing UDP models will continue to work without modification.

## Enhanced J1939 Support for Address Claiming

The J1939 library has been enhanced to support address claiming. See SAE J1939 in the xPC Target I/O Reference.

The following block is new:

- J1939 Controller Application

The following blocks have changed to take into account the capabilities of the new J1939 Controller Application block:

- J1939 Protocol Stack — See the reference for the updated block parameters. The following parameters have been removed: **TX CAN Board**, **RX CAN Board**, **TX CAN Port**, **RX CAN Port**, **Transport Protocol Enabled**, **Transport Protocol Max Send (# of Fragments)**, **Transport Protocol Max Receive (# of Fragments)**.

The following parameters are new: **Max CAN Message Receive (Per Sample Time)**, **Max CAN Message Transmit (Per Sample Time)**, **Enable Transport Protocol**, **Maximum Concurrent Sessions**, **Enable Address Claiming**.

- J1939 Receive Message — See the reference for the updated block parameters. The following parameters have been removed: **J1939 Protocol Stack Id**, **Node Address (0–255)**.

The following parameter is new: **CA ID**.

- J1939 Transmit Message — See the reference for the updated block parameters. The following parameters have been removed: **J1939 Protocol Stack Id**, **Node Address (0–255)**.

The following parameter is new: **CA ID**.

---

## Compatibility Considerations

If you have existing models that use the updated J1939 blocks, note that you must now add the J1939 Controller Application block to your model. You must then configure the J1939 Protocol Stack, J1939 Receive Message, and J1939 Transmit Message blocks to reference the controller application.

## National Instruments PCI-6225 Support

xPC Target 4.2 now supports National Instruments PCI-6225 as part of its support for the National Instruments M series data acquisition boards.

## Enhanced File Scopes

xPC Target file scopes now support dynamic naming and multiple files. For further information, see:

- Acquiring Signal Data into Multiple, Dynamically Named Files with File Scopes in the xPC Target User's Guide.
- See the `DynamicFileName`, `FileName`, and `MaxWriteFileSize` properties in the `xpctarget.xpcsc.set` (scope object) method.
- See Acquiring Signal Data into Multiple, Dynamically Named Files on the Target Computer in the xPC Target User's Guide.

## Support to Load Parameter Sets from Target PC File System

The xPC Target software now enables you to load parameter sets from the target PC file system. The **Configuration Parameters** dialog box has the following changes for xPC Target models. In the **Application tunable parameter options** section of the **xPC Target options** node, the following parameters are new:

- **Load a parameter set from a file on the target file system**
- **File name**

See xPC Target Options Configuration Parameter in the xPC Target User's Guide.

## New Property for Target Application Object set Method

The target application `xpctarget.xpc.set` (target application object) method has a new property, `CommunicationTimeout`. Use this property to increase the timeout value for the communication between the target and host PC.

## New xPC Target Support for Multicore Processors

If your target PC has multicore processors, the xPC Target software can now take advantage of these processors for background tasks.

To enable this feature, do one of the following. By default, this feature is off.

- At the MATLAB Command Window, type:  

```
setxpcenv('MulticoreSupport','on')
```
- In the xPC Target Explorer Settings node, select the **Multicore CPU support** check box.

If you use polling mode, enabling the multicore processor feature also removes the following restrictions. Other restrictions still apply. (See *Introducing Execution Modes in the xPC Target User's Guide* for further details on these restrictions.)

- Host-target communication is now available during the execution of the target application.
- Target screen now updates during the execution of the target application.
- External interrupts are now allowed during the execution of the real-time model. This does not mean that you can trigger your model with an external interrupt.
- File scopes can now log data into a file on the target PC.

## xPC Target Compiler Support

The xPC Target software now supports the Intel Visual Fortran 10.1 compiler.

The xPC Target software no longer supports the Intel Visual Fortran 9.1 compiler.

## xPC Target Demos

This release contains the following new demos:

- 
- UDP demos
    - Target to Host Transmission using UDP — Demonstrates how to use UDP blocks to send data from a target PC to a host PC.
    - Target to Target Transmission using UDP — Demonstrates how to use UDP blocks to send data between two target PCs.
  - CAN I/O and CAN I/O FIFO demos using CAN\_MESSAGE data type
    - CAN I/O - Simple Use Case (with CAN\_MESSAGE) — Demonstrates simple CAN I/O communication using the Softing<sup>®</sup> CAN-AC2-PCI board.
    - CAN I/O FIFO Mode - Simple Use Case (with CAN\_MESSAGE) — Demonstrates CAN I/O communication using the First In First Out (FIFO) mode of the Softing CAN-AC2-PCI board.
    - CAN I/O FIFO Mode - Simple Use Case (with CAN\_MESSAGE and Function Call Output) — Demonstrates CAN I/O communication using the First In First Out (FIFO) mode of the Softing CAN-AC2-PCI board. The FIFO Read block uses a function call output format.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target PC boot image and you must rebuild your xPC Target applications. See Target Boot Method in the xPC Target Getting Started Guide.



# R2009a

**Version: 4.1**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Target PC Boot CD/DVD Creation Tool

xPC Target Explorer now enables you to create a target PC boot CD or DVD directly from the CD boot image file. In the previous release, you used third-party CD writing software to write ISO image files. See Booting Target Computers from CD or DVD in the xPC Target Getting Started Guide.

## New Function Summarizing Diagnostic Information for Target PC

A new function, `getxpcinfo`, has been added to help you capture diagnostic information for your xPC Target configuration. This function stores this information in a text file. You can send this text file to MathWorks Technical Support if you encounter host PC/target PC configuration problems.

## J1939 Library Enhanced to Support Transport Protocol

The J1939 library has been enhanced to support transport protocol. See SAE J1939 in the xPC Target I/O Reference.

The following block is new:

- J1939 Protocol Stack

The following blocks and their names have been updated.

- J1939 Database (CANdb) Setup
- J1939 Message Trigger
- J1939 Receive Message
- J1939 Transmit Message

## Compatibility Considerations

This release updates the following J1939 blocks. The previous versions of these blocks are available by typing the command `xpcobsolete1ib` in the MATLAB Command Window. If you have existing models that contain these blocks, they will continue to work. You should update your models with the new blocks and use them going forward.

- J1939 Database (CANdb) Setup
- J1939 Message Trigger



- 
- J1939 Receive Message
  - J1939 Transmit Message

In addition, the following blocks are obsolete:

- J1939 Pack
- J1939 Unpack

The J1939 Receive Message and J1939 Transmit Message now contain the functionality from these blocks.

## **Support for the GE Fanuc PCI-5565PIORC Shared/Reflective Memory Board**

Support for the GE Fanuc PCI-5565PIORC shared/reflective memory board has been added. See GE Fanuc Embedded Systems Shared Memory in the xPC Target I/O Reference.

## **Support for Counters and Incremental Encoders for National Instruments M Series Boards**

Pulse generation, pulse width measurement, and incremental encoder blocks have been added for the following National Instruments boards:

- National Instruments PCI-6221
- National Instruments PCI-6229
- National Instruments PCI-6251
- National Instruments PCI-6259
- National Instruments PCI-6280
- National Instruments PCI-6281
- National Instruments PCI-6289

## **Enhanced Floating-Point Operations**

The SSE2 (Intel Streaming SIMD Extensions 2) is now supported. It provides enhanced performance for certain floating-point operations.

## xPC Target Demos

This release contains the following new demos:

- Distributed Closed-Loop Control with GE Fanuc Embedded Systems PCI-5565 Boards — Demonstrates closed-loop control using two xPC Target models communicating over shared memory.
- J1939 I/O Using Transport Protocol — Demonstrates the transmission and reception of J1939 data through a loopback connection of two CAN ports in a single target PC.
- Audio Tone Control Using General Standards Boards — Demonstrates tone control audio processing using General Standards I/O boards.

## xPC Target Compiler Support

The xPC Target software now supports the Microsoft Visual Studio C/C++ 2008 SP1 and Express Edition compilers.

The xPC Target software no longer supports the Microsoft Visual Studio C/C++ 2005 Express Edition compiler.

## Compatibility Considerations

For a complete list of the xPC Target supported and compatible compilers, see:

[http://www.mathworks.com/support/compilers/current\\_release/](http://www.mathworks.com/support/compilers/current_release/)

## CANdb Blocks

The CANdb message block documentation, accessible by clicking the **Help** button on a block, has the string **Obsolete** in the reference page titles. This string indicates that the blocks might be removed from a future release.

For this release, you can continue to use the CANdb blocks as usual. In addition, existing models will continue to work as expected.

If you type `xpc1ib` in the MATLAB Command Window, the following message appears. This string indicates that the CAN Message blocks might be removed from a future release. xPC Target users can ignore this warning and continue to use the CANdb blocks as usual.

---

Warning: The CAN Message blocks are obsolete and may be removed from the product at a future date. If your model uses these blocks, refer to the CAN blocks transition page and update your model accordingly.

## **Save complete SimState in final state Check Box**

The Simulink product now supports the ability to save complete model simulation state (see Saving and Restoring the Complete SimState in the Simulink Release Notes). This capability is not supported when simulating a Simulink model that contains xPC Target blocks. Doing so might generate warning or error messages. To prevent these messages, clear the **Save complete SimState in final state** check box in the **Configuration Parameters Data Import/Export** node for your model.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications. See Booting Target Computers from Removable Boot Drives in the xPC Target Getting Started Guide.



# R2008b

**Version: 4.0**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## Enhanced Support for Booting Target PCs Within Dedicated Network

The ability to boot target PCs within dedicated networks has been enhanced in this release. These enhancements include:

- Full integration into the xPC Target Explorer environment.
- Multitarget support in a dedicated network environment with network booting.

In the previous release, you manually started the network boot server process, and the capability was limited to one target PC within the dedicated network group. In this release, the xPC Target Explorer environment now fully integrates this feature and supports multiple target PCs.

See *Booting Target Computers Within a Dedicated Network* in the *Installation and Configuration* chapter of the *xPC Target Getting Started Guide*. You can continue to use the manual procedure as described in *xPC Target Version 3.4*, or use the method integrated into xPC Target Explorer.

## Support for Booting from CDs

The xPC Target software now supports target boot CDs. See *Booting Target Computers from CD or DVD* in the *Installation and Configuration* chapter of the *xPC Target Getting Started Guide*.

## Changes to xpcbootdisk Function

The xpcbootdisk function has been updated to allow for the creation of CD boot images. As a result, this function can now create 3.5-inch boot disks, CD boot images, and DOSLoader files. In previous releases, this function could create 3.5-inch boot disks and DOSLoader files.

## Configuration Parameter Dialog Box Update

The **Configuration Parameters** dialog box has the following change for xPC Target models. In the **Execution options** section of the **xPC Target options** node, the **PCI slot/ISA base address** parameter has been changed to **PCI slot (-1: autosearch) or ISA base address**. Its purpose and use remains the same.

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## Automatic IRQ Selection

The **Configuration Parameters** dialog box has the following change for xPC Target models. In the **Execution options** section of the **xPC Target options** node, the **Real-time interrupt source** parameter now has an **Auto (PCI only)** option. This option enables the xPC Target software to automatically determine and use the IRQ number that the BIOS assigned. In previous releases, you had to manually choose an IRQ number for the real-time interrupt source. See *Setting Configuration Parameters* in the xPC Target Reference.

## CPU Overload Management

The xPC Target software now supports the management of CPU overloads. See *Can I Allow CPU Overloads?* in the xPC Target User's Guide.

## Enhanced Scopes

The following enhancements have been made for scopes.

- Number of scopes of type host is now limited only by available resources.
- Number of signals that scopes of type host and file can log is now limited only by available resources.

Note, the number of allowed scopes of type target and the number of signals that scopes of type target can log remain 10. The number of scopes of type file remains eight.

## Exporting Data from Scopes of Type File to MATLAB Workspace

From xPC Target Explorer, you can now export data from target PC files to the MATLAB workspace. In previous releases, you had to use the file system objects to transfer data from the target PC to the host PC.

## Support for Model-Based Ethernet Communications

Support for model-based Ethernet communications. See *Model-Based Ethernet Communications Support* in the xPC Target I/O Reference.

## Enhancements to xPC Target C API

The following enhancements have been made to the xPC Target C API:

- xPC Target C API can be invoked by multiple threads at the same time.
- The following functions and structures are new:
  - fileinfo
  - xPCGetNumScopes
  - xPCScGetNumSignals
  - xPCGetScopeList
  - xPCScGetSignalList
  - xPCGetSessionTime
  - xPCFSFileInfo

See Functions, Properties, and Arguments Being Removed for additional notes.

## Support for Serial ATA (SATA) Drives

Target PCs with serial ATA (SATA) drives are now supported. In previous releases, only IDE or parallel ATA (PATA) drives were supported. Your target PC must have a PATA or SATA drive to log data to the target PC file system. See Logging Signal Data with FTP and File System Objects in the xPC Target User's Guide.

## I/O Driver Support

Support for the following National Instruments M series data acquisition boards. See National Instruments in the xPC Target I/O Reference.

- National Instruments PCI-6221
- National Instruments PCI-6229
- National Instruments PCI-6251
- National Instruments PCI-6259
- National Instruments PCI-6280
- National Instruments PCI-6281
- National Instruments PCI-6289

## Changes to xPC Target Library

When you double-click the xPC Target Driver Demos block, the Demos tab in the MATLAB Help Navigator now opens, displaying the xPC Target demos. In previous



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releases, double-clicking this block opened a sublibrary that displayed a list of xPC Target driver demos.

## **Target PC Monitor Update**

The target PC monitor display has been updated to reflect the PCI bus and slot number of the Ethernet card in the target PC used for host PC-target PC communications. In previous releases, the display showed the memory base address and IRQ of the Ethernet card.

## **xPC Target Demos**

This release contains the following new demos:

- Data Logging With a File Scope — Illustrates data logging to scopes of type file.
- Real-Time Transmit and Receive over Ethernet — Demonstrates how to perform real-time communications over the Ethernet protocol.
- Filtering on MAC Address — Demonstrates how to filter Ethernet packets based on MAC addresses.
- Filtering on EtherType — Demonstrates how to filter Ethernet packets based on EtherTypes.
- IO Test with Diamond Systems MM-32-AT Board — Demonstrates a simple analog and digital I/O loopback test using the Diamond Systems MM-32-AT (PC/104) board.
- IO Test with General Standards PMC-ADADIO Board — Demonstrates a simple analog I/O loopback test using the General Standards PMC-ADADIO board.
- IO Test with National Instruments PCI-6070E Board — Demonstrates a simple analog and digital I/O loopback test using the National Instruments PCI-6070E (E Series) board.
- IO Test with National Instruments PCI-6289 Board — Demonstrates a simple analog and digital I/O loopback test using the National Instruments PCI-6289 (M Series) board.
- Master/Slave Synchronization with the GE Fanuc Embedded Systems PCI-5565 — Demonstrates how to synchronize two xPC Target models with shared memory interrupts.

## **Compilers**

The xPC Target product now supports the following additional compilers:

- Microsoft Visual C/C++ compiler Version 9.0
- Open Watcom C/C++ compiler Version 1.7

## Compatibility Considerations

The xPC Target product no longer supports the Open Watcom C/C++ compiler Version 1.3.

## Functions, Properties, and Arguments Being Removed

The following changes affect the xPC Target C API.

Function Name	What Happens When you use Function	Use This Instead	Compatibility Considerations
xPCGetScopes	Still runs	xPCGetScopeList	The xPCGetScopes function continues to run. However, use xPCGetScopeList instead.
xPCScGetSignals	Still runs	xPCScGetSignalList	The xPCScGetSignals function continues to run. However, use xPCScGetSignalList instead.

## Recreate Target Boot Disk and Rebuild Applications

### Compatibility Considerations

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications. See Booting Target Computers from Removable Boot Drives in xPC Target Getting Started Guide.

# R2008a

**Version: 3.4**

**New Features**

**Bug Fixes**

**Compatibility Considerations**

## xPC Target Now Supports Booting Target PCs Within a Dedicated Network

You can now boot a target PC from a host PC within a dedicated network. In previous releases, you could only boot a target PC with a target boot disk. See Target Boot Method in the xPC Target Getting Started Guide.

Associated with this feature, the `xpcnetboot` function was added. This function creates the xPC Target kernel to boot target PC over dedicated network.

## xPC Target Explorer Enhancements

xPC Target Explorer has the following enhancements:

- You can now drag a prebuilt target application, DLM, to a target PC icon. If a connection does not already exist, xPC Target Explorer prompts you to create a connection to that target PC. See Downloading and Running Target Applications on a Target PC in the xPC Target Getting Started Guide.
- You can now start xPC Target Explorer from the Simulink model window (**Tools > Code Generation > xPC Target Explorer**).
- If a scope does not exist, you can now drag a signal to a Host Scope, Target Scope, or File Scope icon to create a scope of that type in xPC Target Explorer. See Adding Signals to Scopes in the xPC Target User's Guide.
- You can now change the refresh rate of xPC Target Explorer. See Menus, Toolbars, and Shortcut Keys in the xPC Target User's Guide.
- The xPC Target Explorer PCI Devices node now displays the subsystem vendor and device IDs. In previous releases, this node displayed only system vendor and device IDs.

## Changes in xPC Target Configuration Parameters

The following are changes to the xPC Target options pane of the Simulink Configuration Parameters dialog box.

- New check box, **Use default communication timeout**, and a new associated text entry field, **Specify the communication timeout in seconds**. See Setting Configuration Parameters in the xPC Target Reference.

- 
- New IRQ options 3 and 4 available for the **Real-time interrupt source** parameter.

## **xPC Target Software Support for Vector CANape TCP Layer**

The interface between the xPC Target software and Vector CANape<sup>®</sup> software has been enhanced to support the Vector CANape TCP communication layer. This enhancement enables xPC Target to acquire signal data at the base sample rate of the model. If you have existing models that use earlier Vector CANape solutions, they should continue to be valid. See Vector CANape Support in the xPC Target User's Guide.

## **xPC Target Now Supports Multidimensional Signals and Parameters**

xPC Target now supports the logging and monitoring of multidimensional signals and the tuning of multidimensional parameters. In previous releases, the xPC Target software ignored multidimensional signals and parameters. If a target application contains a multidimensional signal or parameter:

The xPC Target Explorer Model Hierarchy now displays signals and parameters in column-major format. See Signals and Parameters in the xPC Target User's Guide.

## **xPC Target Driver Authoring Tool**

The xPC Target Driver Authoring Tool has been added to help with the creation of custom xPC Target device drivers. See Using the xPC Target Driver Authoring Tool in the xPC Target Device Drivers Guide.

## **Changes to Simulink External Mode**

The following limitations no longer apply to Simulink external mode:

- You can now add scopes of type host to the system. In previous releases, you could add scopes of only type target or file to the system when updating data to Simulink external mode.
- xPC Target can now upload data to more than 10 Simulink scopes. In previous releases, xPC Target could upload up to 10 Simulink scopes.
- Each Simulink scope can now upload more than the first 10 input signals from the target PC. In previous releases, each Simulink scope could upload only the first 10 input signals from the target PC.

## Arbitrarily Sized Target Application (DLM) Files

Arbitrarily-sized target application (DLM) files can now be loaded in BootFloppy and DOSLoader modes. These modes ignore the `MaxModelSize` setting.

## Compatibility Considerations

For StandAlone mode, you still must specify the target application size.

## getxpcpci Function Has New verbose Option

The `xpctarget.xpc.getxpcpci` function has a new `verbose` option. This option includes the base address register information in the PCI device display. This information is useful if you to want to use a PCI-based parallel port.

## Intel Visual Fortran 9.1 Support

The xPC Target product now supports the Intel Visual Fortran 9.1 compiler for the incorporation of Fortran code into Simulink models. See Incorporating Fortran S-Functions in the xPC Target User's Guide for details.

## Compatibility Considerations

The xPC Target product no longer supports the Intel Visual Fortran 9.0 and Compaq<sup>®</sup> Visual Fortran Compiler Version 6.5 or later compilers.

## xPC Target Product Does Not Support Open Watcom 1.7

xPC Target product does not support Open Watcom 1.7. Open Watcom 1.3 continues to be supported.

## xPC Target Mouse

The xPC Target software no longer supports the use of a mouse on the target PC. The **Target mouse** field has been removed from the xPC Target Explorer **Appearance Component** pane.

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## I/O Blocks

### Updated Condor Engineering ARINC blocks

The block mask and documentation have been updated for the following Condor Engineering ARINC blocks:

- Condor Encode ARINC 429 Words for Send
- Condor Decode ARINC 429 Words from Receive

## Compatibility Considerations

If you have existing models that contain these blocks, you should reevaluate the configuration parameters with regard to the way the blocks work with binary data.

### New ASCII Decode Block for Serial Communication

The ASCII Decode V2 block has been added to the RS232 library to provide improved performance over the ASCII Decode block. The original ASCII Decode block will continue to be available.

### Changes to the RS232 Library

The xPC Target RS232 library has been reorganized as follows:

- The drivers in `Conventional drivers (Obsolete)` have been moved to the `Obsolete` category.
- The drivers in `V1.0 compatible` have been moved to the `Obsolete V 1.0` category.

### Obsolete I/O Blocks

## Compatibility Considerations

xPC Target has obsoleted the counter blocks for the following boards. The xPC Target block library continues to support the noncounter blocks for these boards.

- Diamond Quartz-MM-5
- Diamond Quartz-MM-10
- Measurement Computing CIO-CTR05
- Measurement Computing PCI-CTR05

- National Instruments PC-TIO-10
- Real Time Devices DM6804

You can still access these driver blocks by typing the command `xpcobsoletelib` at the MATLAB Command Window. Existing models that use these drivers will still work. However, they may not be supported in future releases. Do not use these driver blocks in new models. Instead, consider the following alternative boards:

- National Instruments PCI-6601
- National Instruments PCI/PXI-6602
- MPL PATI

## **xPC Target Demos**

The following demos were updated in this release to use parallel ports, instead of Measurement Computing PCI-CTR05 boards, as interrupt sources.

- `xpcasynctrans`
- `xpcasynbuffer`

The following demos were updated in this release to improve clarity:

- `xpcserialbaseboardbinarysplit`
- `xpcserialbaseboardbinarytest`
- `xpcserialbinarysplit`
- `xpcserialbinarytest`

## **xPC Target Device Drivers Guide**

The xPC Target Device Drivers Guide is now part of the xPC Target documentation set in the MATLAB Help browser.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications. See *Booting Target Computers from Removable Boot Drives* in *xPC Target Getting Started Guide*.



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## “What's This?” Context-Sensitive Help Available for Simulink Configuration Parameters Dialog

R2008a introduces “What's This?” context-sensitive help for parameters that appear in the Simulink Configuration Parameters dialog. This feature provides quick access to a detailed description of the parameters, saving you the time it would take to find the information in the Help browser.

To use the “What's This?” help, do the following:

- 1 Place your cursor over the label of a parameter.
- 2 Right-click. A **What's This?** context menu appears.

For example, the following figure shows the **What's This?** context menu appearing after a right-click on the **Start time** parameter in the **Solver** pane.



- 3 Click **What's This?** A context-sensitive help window appears showing a description of the parameter.



# R2007b

**Version: 3.3**

**New Features**

**Compatibility Considerations**

## **J1939 Support**

To support SAE J1939, an automotive CAN protocol, xPC Target provides the blocks described in SAE J1939, in the xPC Target I/O Reference.

## **Shared Interrupts**

xPC Target now supports shared interrupts to allow multiple boards to have the same interrupt numbers. See Setting Configuration Parameters in the xPC Target Reference.

## **I/O Driver Support**

xPC Target 3.3 has new driver blocks, including support for the following boards:

- General Standards 24DSI12 (see General Standards 24DSI12 Analog Input)
- General Standards PMC66-16AO16 (see General Standards 16AO16 Analog Output)

Both are described in the xPC Target I/O Reference.

## **Communication Timeout Applies to xPC Target API Functions**

The communication timeout of the xPCSetLoadTimeOut and xPCGetLoadTimeOut functions now apply to all communications between the target PC and the host PC. In previous releases, the communication timeout applied only to the initialization and loading of applications.

## **Support for Working with Referenced Model Signals**

xPC Target now supports the monitoring and logging of signals from referenced models. See Monitoring Signals from Referenced Models in the xPC Target User's Guide.

## **DOSLoader Mode**

You no longer need xPC Target Embedded Option to use DOSLoader Mode. See DOS Loader Boot Method and Embedded Target Boot Method in the xPC Target User's Guide.

## **Compatibility Considerations**

In previous releases, xPC TargetBox<sup>®</sup>, which uses xPC Target software, was able to use StandAlone Mode without xPC Target Embedded Option. Starting with this release, this

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is no longer possible. xPC TargetBox users must have xPC Target Embedded Option to use StandAlone Mode.

## CANdb Enhancements

The FIFO Mode CAN Message and Object Mode CAN Message blocks capture the data received by the xPC Target CAN receive blocks for translation into CANdb format (see Accessing CANdb DBC Format Databases from the xPC Target Environment in the xPC Target I/O Reference).

## xPC Target Demos

This release contains the following new demos:

- `xpccandb` — Illustrates how to access CANdb DBC format databases from xPC Target.
- `j1939example` — Illustrates how to access use the J1939 blocks from xPC Target.

## Link and Target Products Regrouped in New Start, Help, and Demos Category

A new product category, Links and Targets, now contains the MathWorks software products that link, target, or cosimulate code.

## Compatibility Considerations

This change impacts you in the following ways:

- Finding and viewing these products through the MATLAB Desktop **Start** button and in the Help browser **Contents** and **Demos** panes.
- Using the demo command to access the product demos.

For more about this new product category, see Demos and Help Browser Contents Now Include New Category for Links and Targets, in the *MATLAB Release Notes*.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications. See *Booting Target Computers from Removable Boot Drives* in *xPC Target Getting Started Guide*.

# **R2007a**

**Version: 3.2**

**New Features**

**Compatibility Considerations**

## CANdb Blocks

xPC Target now supports the encoding and decoding of messages specified via a CANdb file (see Accessing CANdb DBC Format Databases from the xPC Target Environment in the xPC Target I/O Reference). The CANDBC library (available from within the CAN library) includes blocks for the decoding and formatting of these messages. The CAN library also includes a CANDBC Translator block, which translates the CANdb message to one that xPC Target can write into the transmit FIFO with a FIFO mode Write block.

The new `xpccandbcfifo` model illustrates how to read the CANdb messages contained in `matlabroot\toolbox\rtw\targets\xpc\xpcdemos\demo.dbc`.

## Selecting Signals Using Signal Labels Now Supported

xPC Target now supports the selection of signals using signal labels (see the **Signal name** parameter of the Signal Properties Dialog Box in the Simulink documentation) in addition to block paths. This is supported for target application objects, C and COM API, and xPC Target Explorer.

### Target Application Object Methods

xPC Target has the following new target application object functions:

- `xpctarget.xpc.getsignallabel`
- `xpctarget.xpc.getsignalidsfromlabel`

### API

xPC Target has the following new C API functions:

- `xPCGetSigIdxfromLabel`
- `xPCGetSigLabelWidth`
- `xPCGetSignalLabel`

xPC Target has the following new COM API functions:

- `xPCTarget.GetSignalidsfromLabel`
- `xPCTarget.GetSignalLabel`



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## xPC Target Explorer

xPC Target Explorer can now display signals by their label instead of by block path. You can view signals by their labels by right-clicking the Model Hierarchy node and selecting **View Only Labeled Signals**. To view signals by their block paths, right-click the Model Hierarchy node and select **View All Signals**. Hovering over the signal label or block path displays the signal block path or signal label, respectively. For details, see *Signal Monitoring with xPC Target Explorer* in the *xPC Target User's Guide*.

## Folder Contents Display

xPC Target has new API functions and structures to display the contents of a folder.

The new C API structure is `dirStruct`. The new C API functions are:

- `xPCFSDirItems`
- `xPCFSDirStructSize`
- `xPCFSDirSize`

The new COM API structures are `FSDir` and `FSDiskInfo`. The new COM API functions are:

- `xPCFileSystem.DirList`
- `xPCFileSystem.GetDiskInfo`

## From xPC Target Block Now Accepts Cell Array of Signals

The `From xPC Target` block now allows you to manually enter a cell array of signals (**Signal name** parameter) to read. Using a cell array of signal names, the `From xPC Target` block will output a vector of signal values. This can improve the performance of the application. In previous releases, this parameter accepted only one signal.

## Target Application Versions Now Checked

You cannot download a target application that was built from a different version of xPC Target than the xPC Target kernel on the target PC. Attempts to download such a target application generates an error message on the target PC monitor:

```
Mismatch between model and kernel versions
```

In previous releases, downloading a mismatched target application causes the target PC to crash.

## Discrete States Logging Now Supported

xPC Target now supports the logging and monitoring of discrete states in a model. In previous releases, you could not log and monitor discrete states (see Signal Logging in the xPC Target User's Guide).

## Microsoft Visual C++ 2005 Express Edition Compiler Now Supported

xPC Target now supports the Microsoft Visual C++ 2005 Express Edition compiler. See Host Computer Configuration in the xPC Target Getting Started Guide for details.

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**Note:** If you use Microsoft Visual C++ 2005 Express Edition, xPC Target does not support the generation of COM objects from the xPC Target model.

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## Parallel Ports Now Supported

xPC Target now supports the parallel ports of your target PC (see Parallel Ports in the xPC Target I/O Reference). This feature also enables you to generate interrupts using parallel ports.

## I/O Driver Support

xPC Target 3.2 has new driver blocks, including support for the following boards:

- Commtech Fastcom 422/2-PCI-335 board (see xPC Target RS-232 and 422/485 Drivers (Composite) in the xPC Target I/O Reference)
- Measurement Computing™ PCI-DAS1002 and PCI-DAC6703 (see Measurement Computing PCI-DAS1002 and Measurement Computing PCI-DAC6703 in the xPC Target I/O Reference)
- Quanser Q4 (see Quanser Q4 in the xPC Target I/O Reference)
- National Instruments PCI-6528 (see National Instruments PCI-6528 in the xPC Target I/O Reference)

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## **Writing Device Drivers for xPC Target**

xPC Target now enables you to write your own custom device drivers for xPC Target. This documentation is only available for download as a PDF file. See <http://www.mathworks.com/products/xpctarget/> for details on how to access this file.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.



# R2006b

**Version: 3.1**

**New Features**

**Compatibility Considerations**

## Ethernet Chip Support

In addition to the existing list of Ethernet chip families, xPC Target now also supports the Intel I8254X fast Gigabit Ethernet chip family.

## xpctarget.targets Enhancement

The `xpctarget.targets` has a new property, `FloppyDrive`. This property allows you to set the 3.5-inch drive letter to the one designated by your target PC, for example `a:` or `b:`.

## Simulink External Mode

The xPC Target Simulink external mode is now enabled by default. In previous releases, you had to type the `xpcextmodeenable` command to access this feature.

## Microsoft Visual C++ Compiler Version 8.0

xPC Target now supports Microsoft Visual C++ Professional Edition Version 8.0.

## I/O Driver Support

xPC Target has new driver blocks to support the Texas Instruments™ DM642 EVM with Target for TI C6000™. This enables you to build and download an xPC Target application to a target PC that contains a DM642 EVM board. This application can then communicate and exchange data with the DM642 EVM through an Target for TI C6000 model that contains blocks that enable communication with xPC Target.

To access these blocks, type `xpctexasinstrumentslib` at the MATLAB Command Window.

## Obsolete Driver Blocks

## Compatibility Considerations

xPC Target has obsoleted the driver blocks for the Sensoray 626 board. You can still access these driver blocks by typing the command `xpcobsoletelib` at the MATLAB

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Command Window. Existing models that use these drivers will still work. However, they may not be supported in future releases. Do not use these driver blocks in new models.

## **xPC Target Demos**

The xPC Target demo, Exchanging Data with the TI DM642 EVM (TI`dm642xPC`), has been added to the `xpcdemos` folder. With its Target for TI C6000 counterpart, Using the PCI Bus to Exchange Data with xPC (`c6000pci.xpc`), this demo illustrates how xPC Target can exchange data with the DM642 EVM through an Target for TI C6000 model.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.





# R2006a+

**Version: 3.0**

**New Features**

**Compatibility Considerations**

## Ethernet Card Support

In addition to the existing list of Ethernet cards, xPC Target now also supports

- National Semiconductor DP83815
- 3Com 3C90x

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**Note:** xPC Target does not support the 3C905-TX board (PCI device ID 0x9050).

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- Realtek RTL8139, RTL8139C, RTL8139C+ (tested and verified for Zonet ZEN3200 and AOpen AON-325)

## Intel Visual Fortran 9.0 Support

xPC Target now supports the Intel Visual Fortran 9.0 compiler for the incorporation of Fortran code into Simulink models. See Incorporating Fortran S-Functions in the xPC Target User's Guide for details.

## To/From Blocks and Target PCs

The To/From xPC Target blocks now support multiple target PCs with the following additional parameters:

- **Use default target PC**

Selecting this option directs the To xPC Target block to communicate to the default target PC.

- **Specify target name**

If you deselect the **Use default target PC** check box, this field is displayed. Enter the name of the configured target PC.

## Compatibility Considerations

In earlier releases, to run a model that contained From or To xPC Target blocks in a multiple target PC environment, you had to configure your model with the **Simulation > Configuration Parameters** menu (see To xPC Target and From xPC Target Blocks). You can now configure the blocks directly for this behavior; you do not have to configure the model that contains these blocks.

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## xpctarget.fs Method Enhancements

The xpctarget.fs.fopen method now supports the following operations:

Option	Description
'a'	Open the file for appending to the file.
'r+'	Open the file for reading and writing.
'w+'	Open the file for reading and writing.
'a+'	Open the file for reading and appending to the file.

## Numerical Formats for xPC Target Scope Blocks

In previous releases, the format string for numerical format entries of scopes of type target had a limit of 100 characters for all the signals combined. You can now have 100 characters per signal in a format string (see Entering Parameters for an xPC Target Scope Block in the xPC Target Getting Started Guide).

## Simulink External Mode and Tuning Parameters

In previous releases, the act of tuning target application parameters in Simulink external mode displayed messages on the target PC monitor. These messages are no longer displayed when you tune parameters in Simulink external mode.

## xPC Target Explorer

xPC Target Explorer has a new check box in the **Settings** node, **Target PC is a 386/486**. You must select this check box if your target PC has a 386 or 486 compatible processor. If your target PC has a higher version of the Pentium chip or compatible processor, selecting this check box will slow the execution of your target PC.

## I/O Device Driver Support

### New Board Support

xPC Target 3.0 has new driver blocks, including support for the following boards:

- SBS

- SBS IP-UD-IHV-16I80
- SBS IP-UD-IHV-8I160
- SBS PCI-40B
- MPL PATI (PowerPC<sup>®</sup> controlled Analog and Timing I/O Intelligence)
  - MPL PATI Digital Input
  - MPL PATI Digital Output
  - MPL PATI Incremental Encoder
  - MPL PATI Timebase Setup

## Compatibility Considerations

The previous xPC Target release introduced the MPL PATI PWM measure and MPL PATI PWM generate blocks. The time base for these blocks was hard coded to 20 MHz.

In xPC Target Version 3.0, you must use the new MPL PATI Timebase Setup block with these blocks to select the 20 MHz frequency for the time base. If you do not use the MPL PATI Timebase Setup block with the MPL PATI PWM measure or MPL PATI PWM generate blocks, the TCR1 time base defaults to 1.25 MHz.

## Updated Driver Support

The drivers for the following blocks have been added or updated:

Manufacturer	Change
MPL	<ul style="list-style-type: none"> <li>• The MPL PATI PWM generate block has been updated to support armed input.</li> </ul>
National Instruments	<p>The following blocks were added:</p> <ul style="list-style-type: none"> <li>• National Instruments PCI/PXI-6711 Pulse Generation</li> <li>• National Instruments PCI/PXI-6711 Pulse Width/Period Measurement</li> <li>• National Instruments PCI/PXI-6713 Pulse Generation</li> <li>• National Instruments PCI/PXI-6713 Pulse Width/Period Measurement</li> </ul>

Manufacturer	Change
	<ul style="list-style-type: none"> <li>• National Instruments PCI/PXI-6731 Pulse Generation</li> <li>• National Instruments PCI/PXI-6731 Pulse Width/Period Measurement</li> <li>• National Instruments PCI/PXI-6733 Pulse Generation</li> <li>• National Instruments PCI/PXI-6733 Pulse Width/Period Measurement</li> </ul>

### Utilities Library

The xPC Target library has a new sublibrary, Utilities. It contains blocks that provide generic functions. The following blocks were added to the Utilities sublibrary.

- Byte Packing
- Byte Unpacking
- Bit Packing
- Bit Unpacking

### Miscellaneous Library

The following blocks were added to the Miscellaneous library. These blocks provide counter and delta blocks for the Pentium chip.

- Pentium Time Stamp Counter
- Time Stamp Delta

## xPC Target Mouse

### Limitation

The mouse does not work on the target PC. Setting **Target mouse** to a setting on the xPC Target Explorer **Configuration > Appearance** node has no affect.

## xPC Target Demos

The VMIC5565 demo has been added to the `xpcdemos` folder. This demo illustrates sending and receiving data over the VMIC shared memory.

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.

# R2006a

**Version: 2.9**

**New Features**

**Compatibility Considerations**

## xPC Target Explorer

xPC Target Explorer has the following enhancements:

- The ability to save an xPC Target application session, including scope and target PC settings, to a standard MATLAB MAT-file on the host PC (see Saving and Reloading xPC Target Application Sessions in the xPC Target User's Guide)
- The ability to copy (with drag and drop) a signal from one scope to another
- The ability to remember resized and relocated xPC Target Explorer windows
- Enhanced file system support manipulation

## xPC Target Options Pane

The xPC Target Options pane (see Setting Configuration Parameters in the xPC Target Reference) has a new check box, **Include model hierarchy on the target application**. Selecting this check box includes the model hierarchy as part of the target application.

## Simulink External Mode

xPC Target support for Simulink external mode has the following enhancement and change:

- xPC Target now supports uploading real-time data to Simulink scopes when using Simulink external mode (see Signal Tracing with Simulink External Mode in the xPC Target User's Guide).
- xPC Target now supports Simulink external mode for all target PCs you have set up, not just the default one.

## MATLAB Compiler Support

xPC Target now supports the MATLAB Compiler. With this capability, you can use the MATLAB Compiler to take M-files as input and generate redistributable, standalone applications that include xPC Target functionality.

## Open Watcom Compiler Support

xPC Target now supports Open Watcom C/C++ Version 1.3. It no longer supports Watcom compiler C/C++ Version 11.0.



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## xPC Target C API

To better support target PC file systems, the xPC Target C API has been enhanced:

- The `xpctarget.fs.diskinfo` data structure was added. It contains information, such as FAT type and number of clusters, for target PC file system disks.
- The `xPCFSDiskInfo` function was added. It returns information, such as FAT type and number of clusters, for target PC file system disks.

## Support for Model Referencing

If you download a target application to a target PC, and that target application was built from a model that contains referenced models, you can now tune the parameters of the top level of the model. The referenced models themselves must have Inline Parameters on, as in previous releases.

## I/O Device Driver Support

### New Board Support

xPC Target 2.9 has new driver blocks, including support for the following boards:

- Contec
  - PIO-32/32F(PCI)
  - PIO-32/32L(PCI)H
  - PI-64L(PCI)H
  - PO-64L(PCI)H
  - CNT32-8M(PCI)
- MPL PATI (PowerPC controlled Analog and Timing I/O Intelligence)

### Updated Driver Support

The drivers for the following have been updated:

Manufacturer	Change
Diamond Systems	<ul style="list-style-type: none"><li>• The Diamond Prometheus driver has been updated to also support the Diamond Athena board.</li></ul>

Manufacturer	Change
	<ul style="list-style-type: none"> <li>The Emerald-MM block now lists the baud rates with an HS label to indicate the rate if the board contains the high-speed crystal option.</li> </ul>
National Instruments	The PCI-MIO-16XE-50 blocks have been renamed to PCI-6911E.
United Electronic Industries (UEI)	The PD2-MF and PDX1-MF 12-bit series blocks have been enhanced to support 3 MHz in addition to 1.25 MHz.

### Utility Sublibraries

xPC Target has added the following utility sublibraries:

Sublibrary	Description
Digital Input/Utilities, Digital Output/Utilities	Contains the following new blocks: <ul style="list-style-type: none"> <li>Digital IO bit-packing — Constructs data frames for digital I/O blocks</li> <li>Digital IO bit-unpacking — Extracts data frames for digital I/O blocks</li> </ul>
Incremental Encoder/Utilities/ Rollover	Contains the following new blocks: <ul style="list-style-type: none"> <li>Rollover Counter — Sample rollover counter block</li> <li>Extended Counter — Sample extended counter block</li> </ul>

## Recreate Target Boot Disk and Rebuild Applications

### Compatibility Considerations

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.

# R14SP3

**Version: 2.8**

**New Features**

**Compatibility Considerations**

## xPC Target Explorer

The xPC Target Explorer has the following enhancements:

- **Apply** and **Revert** buttons have been added to the bottom of many panes.
  - **Apply** — Click this button to apply changes.
  - **Revert** — Use the **Revert** button to retrieve old values.
- Target PC nodes now have a PCI Devices node. This lists the PCI devices detected on the target PC.

## Fixed-Point Support

xPC Target now supports Simulink fixed-point data. This enables you to

- Monitor and log signals of fixed-point data types
- Tune parameters of fixed-point data types

## Target PC Environments

This release now allows you to set up multiple target PCs from the command line. See the Target Environment Command-Line Interface in the xPC Target User's Guide for details.

## New Supplied Ethernet Card

xPC Target now ships with the Intel PRO/100 M card.

## I/O Device Driver Support

xPC Target 2.8 has new driver blocks, including support for the following boards:

- Condor QPCI/PCI-1553 to support the MIL-STD-1553 military avionics databus protocol
- National Instruments
  - PCI/PXI-6731, PCI/PXI-6711
  - PCI/PXI-6733, PCI/PXI-6713

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## **Compatibility Considerations**

The xPC Target MIL-STD-1553 drivers have the following limitations:

- Condor PCI/QPCI-1553 RT Initialize block — You cannot change the values of the following parameters at run-time:
  - Initial status
  - Initial BIT word
  - Inhibit terminal flag

## **Recreate Target Boot Disk and Rebuild Applications**

### **Compatibility Considerations**

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.



# R14SP2

**Version: 2.7.2**

**New Features**

**Compatibility Considerations**

## xPC Target Explorer

xPC Target Explorer has been enhanced and now fully supports the following:

- Inlined parameters
- Monitoring of test-pointed Stateflow states

## I/O Device Driver Support

xPC Target 2.7.2 has new driver blocks, including support for the following board:

<b>Manufacturer</b>	<b>Board</b>
National Instruments	PXI-6052E

The drivers for the following boards have been updated:

<b>Manufacturer</b>	<b>Board</b>
Contec	Contec DA12-16(PCI)
Measurement Computing	CIO-DAS16JR/16

## Recreate Target Boot Disk and Rebuild Applications

### Compatibility Considerations

If you upgrade your xPC Target software from a previous version, you must recreate the target boot disk and you must rebuild your xPC Target applications.