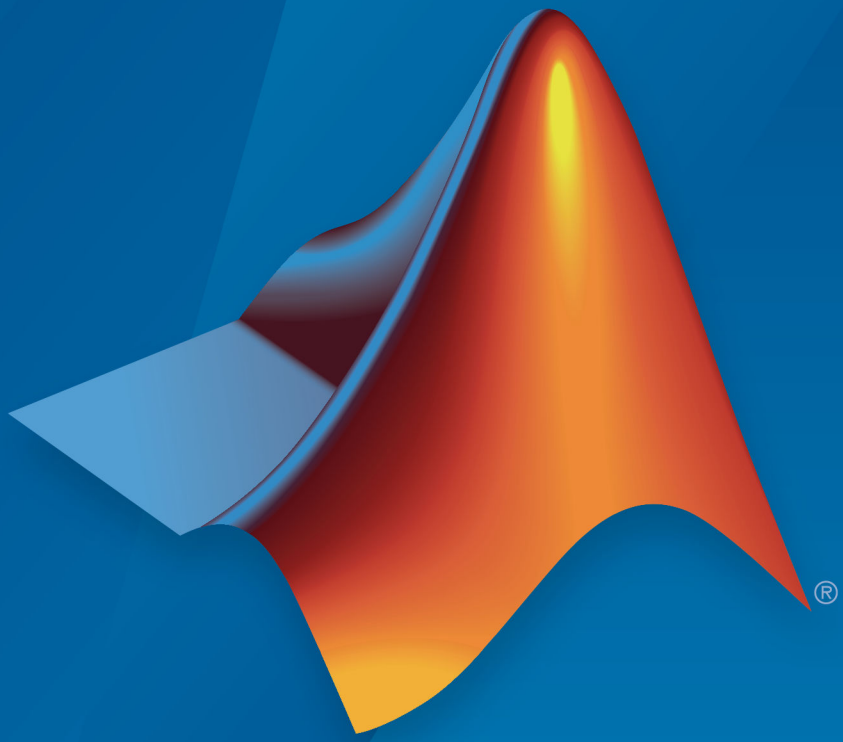
Vehicle Network Toolbox™ Release Notes



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Vehicle Network Toolbox™ Release Notes

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R2017b

Version: 3.4

New Features

Bug Fixes

Compatibility Considerations

CAN FD Protocol: Send and receive messages with MATLAB using the CAN FD protocol

Vehicle Network Toolbox now supports the ISO CAN FD protocol in MATLAB for all vendors, including MathWorks virtual channels, for raw messages and message definitions from DBC files.

The following functions are updated to accommodate the new `ProtocolMode` property with its `'CAN FD'` value, and the bus timing configuration necessary for CAN FD. See each function reference page for more information and examples.

```
canfdch = canChannel('Vector','Virtual 1',1,'ProtocolMode','CAN FD');
canfdmsg = canMessage(1000,false,64,'ProtocolMode','CAN FD')
configBusSpeed(canfdch,arbbusspeed,databusspeed)
```

Note The Vehicle CAN Bus Monitor does not support the CAN FD protocol.

MDF Datastore: Work with large MDF file collections that might not fit in memory

Vehicle Network Toolbox allows you to create a datastore from multiple MDF files. For more information, see “Measurement Data Format (MDF)”.

Simulink Bus Objects: Simplify Simulink block diagrams by choosing Simulink Bus Signals when configuring CAN blocks

The blocks provided in the CAN Communication block library of Vehicle Network Toolbox now support the use of Simulink® bus objects.

Among these blocks, the CAN Pack, CAN Receive, and CAN Replay block parameters have a new **Output as bus** option, to output a native Simulink bus signal.

For more information on Simulink bus objects, see “Composite Signals” (Simulink).

Hardware Support: Connect to additional National Instruments USB CAN interface devices

This release offers support for the USB-8502 National Instruments® USB CAN interface device.

For a list of other supported devices, see Supported Hardware.

canChannelList: List CAN devices and channels in MATLAB table

The new function `canChannelList` generates a MATLAB table that contains information about the available vendors, devices, and channels. For more information and examples, see the `canChannelList` reference page.

Compatibility Considerations

Because the new function provides similar information, the following functions will be removed in a future release.

```
canHWInfo
CAN.VendorInfo
CAN.ChannelInfo
```

MDF File Access: Improved performance

This release offers improved speeds for MDF file access with the MDF `read` function.

A2L File Access: Improved performance

This release offers improved speeds for A2L file access. For information on XCP communication with A2L files, see “A2L File Management”.

Hardware Support: Kvaser Smartcraft Diagnostic Interface

This release offers support for the Kvaser Smartcraft Diagnostic Interface.

Functionality being removed or changed

Functionality	Result	Use Instead	Compatibility Considerations
`canHWInfo`	Still works	`canChannelList`	Replace instances of `canHWInfo` with `canChannelList`.
`CAN.VendorInfo`	Still works	`canChannelList`	Replace instances of `CAN.VendorInfo` with `canChannelList`, and index into the resulting table.
`CAN.ChannelInfo`	Still works	`canChannelList`	Replace instances of `CAN.ChannelInfo` with `canChannelList`, and index into the resulting table.

R2017a

Version: 3.3

New Features

Bug Fixes

Compatibility Considerations

Virtual Channels: Emulate CAN bus communication without hardware

This release of Vehicle Network Toolbox includes MATLAB® and Simulink support for a MathWorks® virtual CAN device with two channels. You can view the device and channels in MATLAB with the `canHWInfo` function.

```
info = canHWInfo
```

```
info =

CAN Devices Detected

    Vendor     |   Device    | Channel | Serial Number |              Constructor
  ------------ | ----------- | ------- | ------------- | ------------------------------------
  MathWorks    | Virtual 1   | 1       | 0             | canChannel('MathWorks','Virtual 1',1)
  MathWorks    | Virtual 1   | 2       | 0             | canChannel('MathWorks','Virtual 1',2)
```

Many examples throughout the documentation show how to use these virtual channels, so that you can run them on your own system. For example, see Transmit and Receive CAN Messages.

Timetable Formatted CAN Messages and Signals: Receive and import data in timetables, and convert existing message objects to timetables

When dealing with CAN messages and signals, the use of timetables instead of arrays of objects can offer significant performance and display improvements. For general information on timetables, see Timetables.

The following functions are enhanced with the option to return timetables of CAN messages. See their reference pages for more information and examples.

Function	Purpose
`receive`	Receive messages from CAN bus
`canMessageImport`	Import CAN message log file from third-party tool

The following new functions create CAN message and signal timetables from existing messages.

Function	Purpose
`canMessageTimetable`	Convert CAN messages into timetable

Function	Purpose
`canSignalTimetable`	Create CAN signal timetables from CAN message timetable

Other functions support CAN messages as timetables without any modification to their syntax. These include `transmit`, `replay`, `save`, and `load`.

J1939 Parameter Group and CAN Signal Import Functions: Import third-party log files directly into J1939 parameter groups and CAN signal timetables

The following new functions support the ability to import log files into J1939 parameter groups and CAN signal timetables. See their reference pages for more information and examples.

Function	Purpose
`canSignalImport`	Import CAN log file into decoded signal timetables
`j1939ParameterGroupImport`	Import J1939 log file

canMessageReplayBlockStruct Function: Convert CAN messages for CAN Replay block

The new function `canMessageReplayBlockStruct` formats CAN messages for use with the CAN Replay block. For more information, see the `canMessageReplayBlockStruct` reference page.

J1939 and CAN Signal Values No Longer Clipped by Database Limits

When encoding or decoding signals to or from messages on the CAN bus, MATLAB and Simulink no longer clip the signal values at the minimum and maximum defined in the database file. This updated behavior is now consistent with the J1939 protocol.

Compatibility Considerations

In past releases, the signal values were clipped to fall within the range defined by the database file minimum and maximum. Signals are no longer automatically clipped in this way.

R2016b

Version: 3.2

New Features

Bug Fixes

Measurement Data Format (MDF) File Support: Import data and attachments stored in MDF files

Vehicle Network Toolbox supports reading data and saving attachments from Measurement Data Format (MDF) files. The following new functions provide these capabilities.

```
mdf
read
saveAttachment
```

For more information and examples, see Measurement Data Format (MDF).

Vehicle CAN Bus Monitor: Monitor CAN bus traffic with improved app performance

The Vehicle CAN Bus Monitor performance is improved in this release. Open the app with the `canTool` function.

R2016a

Version: 3.1

New Features

Bug Fixes

Compatibility Considerations

64-bit Hardware Support: Access and analyze data acquired from National Instruments NI-XNET hardware using 64-bit MATLAB

Vehicle Network Toolbox now supports analysis of CAN data from National Instruments NI-XNET hardware.

InitialTimestamp Property: Easily compute the absolute time of your CAN messages with the new property available on a CAN channel object

The new `InitialTimestamp` property of the CAN channel object enables you to compute the absolute time of CAN message data and signal values.

Synchronization and Triggering: Start National Instruments NI-XNET CAN channels via external triggers, and synchronize with National Instruments DAQ devices

Vehicle Network Toolbox now supports hardware triggering from National Instruments NI-XNET devices and National Instruments DAQ devices.

You can now trigger the start of an NI-XNET CAN device channel, and synchronize the start with an NI DAQ device.

You can configure synchronization and triggering with the `StartTriggerTerminal` property on the NI-XNET CAN channel object. This property string value configures a synchronization-trigger connection to start the NI-XNET CAN channel on the connected source terminal.

New properties of National Instruments XI-NET CAN channel objects

The following properties of NI-XNET CAN channel objects are now supported:

- `BusStatus` — Protocol level status of the network indicating potential error or bus off states
- `ReceiveErrorCount` — Number of receive error events detected by the device at the protocol level

- `TransmitErrorCount` — Number of transmit error events detected by the device at the protocol level
- `OnboardTermination` — Configure the on-board termination of the NI-XNET device that controls bus termination

Discontinued support for NI-CAN devices

Beginning in this release, Vehicle Network Toolbox no longer supports National Instruments NI-CAN devices.

Compatibility Considerations

This release does not support NI-CAN devices. To continue using NI-CAN devices, use an earlier version of Vehicle Network Toolbox. Alternatively, consider using a device supported in this release. For more information, see CAN Bus Support from Vehicle Network Toolbox.

R2015b

Version: 3.0

New Features

Bug Fixes

Support for J1939 protocol

This release of Vehicle Network Toolbox supports the SAE J1939 vehicle bus. This support includes:

- A command-line set of operations for access to J1939 channels and parameter groups. For more information on these, use the following MATLAB command:

  ```
  help vnt
  ```

- A J1939 Communication block library, available in the Simulink Library Browser, under the Vehicle Network Toolbox node.

Support for reading additional information from CANdb database files

For a full listing, see the `CAN database operation` category in the output from the MATLAB command:

```
help vnt
```

Support for additional Kvaser hardware

This release offers expanded support for Kvaser devices for the Memorator, PCIEcan, Leaf, USBcan, and BlackBird families; and added support for Ethercan devices.

R2015a

Version: 2.4

New Features

Bug Fixes

Significant decrease in memory usage for CAN messages

CAN messages in the MATLAB workspace use significantly less memory.

CAN message import speed doubled

You can now import CAN messages faster.

R2014b

Version: 2.3

New Features

Bug Fixes

Four times faster execution time for canMessageImport function

You can import messages into Vehicle Network Toolbox four times faster than before using the `canMessageImport`.

Optimized code generation for CAN blocks

CAN Simulink blocks are now optimized for code generation. Improvements include:

- Generated code is optimized and no longer contains mismatched data type comparisons.
- Improved MISRA compliance.
- Optimized constraint checks to avoid unnecessary saturation of code.
- Easier integration of custom transmit and receive blocks into existing applications.

R2014a

Version: 2.2

New Features

Bug Fixes

Support for Kvaser, National Instruments, PEAK-System, and Vector CAN interface devices via Support Package Installer

You can now install these supported CAN devices via the Support Package Installer

- Kvaser
- NI-CAN
- NI-XNET
- PEAK-System
- Vector

Support for Additional Vector Devices

You can now use Vehicle Network Toolbox with Vector VN8900 interface family devices.

R2013b

Version: 2.1

New Features

Support for additional National Instruments CAN devices that use NI-XNET driver

You can now use Vehicle Network Toolbox with NI CAN devices that use the NI-XNET driver including NI PCI-8511, NI PCI-8512, NI PCI-8513, NI PXI-8511, NI PXI-8512, and NI PXI-8513.

Support for PEAK-System CAN interface devices

You can now use Vehicle Network Toolbox with PEAK-System devices including PCAN-USB, PCAN-USB PRO, PCAN-ExpressCard, PCAN-PCI, PCAN-PCI Express, and PCAN-cPCI families.

Support for additional Kvaser devices

You can now use Vehicle Network Toolbox with Kvaser Blackbird V2, Kvaser Leaf Light V2, and Kvaser Mini PCI Express devices.

Support for additional Vector devices

You can now use Vehicle Network Toolbox Vector VN7600 device.

R2013a

Version: 2.0

New Features

Bug Fixes

XCP on CAN protocol support

You can now use XCP over CAN to communicate with your vehicle network.

MATLAB functions for transmitting and receiving XCP messages

You can now use new MATLAB functions to transmit and receive messages on your vehicle network using XCP.

Simulink XCP blocks for connecting a model to a CAN bus or ECU

You can now use new Simulink XCP blocks to build a model that communicates with a CAN bus or an ECU.

XCP MATLAB functions and Simulink blocks for reading and writing dynamic DAQ and STIM lists

You can now use new MATLAB functions and Simulink XCP blocks to read data acquisition lists and write data stimulation lists to an XCP channel.

XCP seed and key support for controlling access to a secured ECU

You can now use seed and key security to control access to your ECU using XCP over CAN.

A2L description file support

You can parse an A2L file and also use it to create XCP channels connected to a CAN device.

R2012b

Version: 1.7

Bug Fixes

Compatibility Considerations

Old Message Filtering Functions Removed

The following filtering functions have been removed:

- `filterAcceptRange`
- `filterBlockRange`
- `filterReset`
- `filterSet`

Use these new message filtering functions instead:

- `filterAllowAll`
- `filterAllowOnly`
- `filterBlockAll`

Compatibility Considerations

You cannot access any of the old message filtering functions. Replace all instances of the old functions with the new functions.

Support for Vector VN1600 series CAN interface devices

You can now use the VN1600 series devices for CAN communication using the Vehicle Network Toolbox.

R2012a

Version: 1.6

New Features

Bug Fixes

Compatibility Considerations

New UserData Property

You can now attach custom information to a CAN channel, message, or database using the new `UserData` property.

New discard Function

You can now use the `discard` function to clear all available messages on a CAN channel without restarting the channel.

Enhanced Sampling Time Field in Vehicle Network Toolbox Simulink Blocks

You can now use MATLAB variables to represent sampling time in Vehicle Network Toolbox Simulink blocks.

receiveRaw Function No Longer Available

You can no longer access `receiveRaw` and `canMessageCompatibilityMode` functions in the MATLAB workspace.

Compatibility Considerations

You cannot access direct signal properties as of R2012a of Vehicle Network Toolbox. Update your code to access physical signal values through the `Signals` property of message objects.

New Hardware Support for Kvaser Devices

New hardware support was added for Kvaser Memorator R SemiPro, USBcan R, and Eagle devices.

R2011b

Version: 1.5

New Features

Bug Fixes

Compatibility Considerations

New CAN Message Replay and Logging Simulink Blocks

You can now log and replay CAN messages from your Simulink Model using the CAN Log and CAN Replay blocks.

New CAN Message Filtering Functions

You can use these functions to filter standard and extended CAN messages:

- `filterAllowAll`
- `filterAllowOnly`
- `filterBlockAll`

Compatibility Considerations

The following message filtering functions will be removed in a future release:

- `filterAcceptRange`
- `filterBlockRange`
- `filterReset`
- `filterSet`

You will see a warning when you use these functions. Use these new filtering functions on page 13-2 instead.

New Platform Support for 64-bit Windows for Vector and Kvaser Devices

You can now use Vector and Kvaser CAN devices with Vehicle Network Toolbox on a 64-bit Windows® system.

Support Added for Custom Receive and Transmit Blocks

You can now create your own Receive and Transmit blocks that communicate with unsupported hardware. You can use these custom blocks with the available Vehicle Network Toolbox Simulink blocks.

Enhanced canMessageImport Function

The `canMessageImport` function now import messages faster from Vector and Kvaser log files.

R2011a

Version: 1.4

New Features

Bug Fixes

Compatibility Considerations

New Hardware Support for National Instruments CAN Devices

Vehicle Network Toolbox supports NI CAN devices. You can use these devices for CAN communication in the toolbox and with CAN blocks in Simulink.

Note For a complete list of supported hardware, visit the Vehicle Network Toolbox product page at the MathWorks Web site `Supported Hardware` page.

Message Filtering Option in the CAN Tool

You now have the option to filter incoming messages in the CAN Tool and display only the messages you want to see, using message IDs. See Monitoring CAN Message Traffic for more information.

Deployable Code Generation in the CAN Blocks

You can now generate code from Simulink blocks in Vehicle Network Toolbox. Models containing the CAN Receive, CAN Transmit, and CAN Configuration blocks run successfully in Accelerator, Rapid Accelerator, External, and Deployed Modes. These blocks also now support using the Simulink Coder™ `packNGo` function.

receiveRaw function Removed

The `receiveRaw` function no longer works in the current release of Vehicle Network Toolbox.

Compatibility Considerations

You cannot access direct signal properties or use the `canMessageCompatibilityMode` function to restore access to direct signal properties starting with the current release of Vehicle Network Toolbox. Update your code to access physical signal values through the `Signals` property of message objects.

R2010b

Version: 1.3

New Features

Bug Fixes

New canMessageImport Function

The new `canMessageImport` function allows you to import CAN messages from Vector or Kvaser CAN log files.

Enhanced CAN Tool

The CAN Tool includes many enhancements such as:

- A redesigned, flexible interface
- Ability to decode messages attached to CAN database files

Enhanced CAN Channel for Event-Based Message Transmission

Use the `transmitEvent` function in MATLAB to enable messages for event-based transmission.

Enhanced CAN Channel for Periodic Message Transmission

Use the `transmitPeriodic` function in MATLAB to enable messages for periodic transmit. You can also configure the CAN Transmit block to send messages periodically.

New Hardware Support for Kvaser Devices

Vehicle Network Toolbox supports the following additional Kvaser CAN devices:

- PCIEcan HS/HS
- PCIEcan HS

R2010a

Version: 1.2

New Features

Bug Fixes

Compatibility Considerations

New Hardware Support for Kvaser Devices

Vehicle Network Toolbox supports Kvaser CAN devices, including these products:

BlackBird	PC104
LAPcan	PC104+
LAPcan II	PCcan
Leaf	PCIcan
Leaf Light	PCIcanx
Leaf Light Rugged	PCIcan II
Leaf Professional	PCIcanx II
Leaf SemiPro	USBcan
Memorator	USBcan II
Memorator II	USBcan Rugged
Memorator Professional	USBcan Professional

You can use these devices with the Vehicle Network Toolboxtm_vehiclenetworktoolbox; and the CAN block library.

For a complete list of devices, see the Supported Hardware page at the MathWorks Web site.

Enhanced Toolbox and Block Library Performance

The toolbox now transmits, receives, and processes messages at a faster rate. The Transmit and Receive blocks transmit and receive messages at a faster rate.

Removal of the receiveRaw Function

The `receiveRaw` function will be removed in a future release. In earlier software versions, the `receiveRaw` function expedited receive capability with minimal processing time and maximized message throughput. With enhanced toolbox performance this capability is no longer required. Performance of the standard `receive` function is significantly increased and you can use it to receive all messages.

Compatibility Considerations

The `receiveRaw` function will be removed in a future release. You will see a warning when you use this function. Use the `receive` function instead.

New Signals Property for CAN Message Functions

The `Signals` property displays each physical signal as defined for a CAN message in the CAN database. The `Signals` property is not applicable if you are not using a CAN database.

Signals displayed by the `Signals` property replaces access to direct signal property display of CAN messages. It has also increased the toolbox performance and the throughput of the message receive and transmit functions.

Compatibility Considerations

Direct signal properties will no longer appear in a message output. Use the new `Signals` property to access physical signal values. Update your code if you are using a CAN database and direct signal properties. Refer to the `Signals` property for more information. It is recommended that you update your code and use the new `Signals` property because all access to direct signal properties will be removed in a future release. If you cannot update your code at this time, you can use the `canMessageCompatibilityMode` function to restore access to direct signal properties.

New BusLoad Property

The `BusLoad` property displays the load on the CAN bus associated with the CAN message traffic on Kvaser devices.

Enhanced filterSet Function

The `filterSet` function now automatically calculates and applies the best case filter settings from an array of `CAN` IDs.

Enhanced replay Function

The `replay` function now replays messages from MATLAB to Simulink with their original timestamps without blocking Simulink operation.

R2009b

Version: 1.1

New Features

Bug Fixes

New Hardware Support for the Vector Informatik Device

Additional CAN hardware support is added for the CANcardXLe device.

R2009a

Version: 1.0

New Features

Bug Fixes

CAN Connectivity from MATLAB

You connect to a CAN network from the MATLAB interface with R2009a.

Vector CAN Database Support

Version 1.0 of the Vehicle Network Toolbox supports the Vector CAN database.

CAN Message Encoding and Decoding

You can encode and decode CAN traffic messages with Version 1.0 of the Vehicle Network Toolbox.

CAN Message Filtering

Version 1.0 of Vehicle Network Toolbox allows you to filter CAN messages by message ID.

CAN Message Logging and Replay

With Version 1.0 of Vehicle Network Toolbox you can log and replay CAN messages.

CAN Block Library

Version 1.0 of Vehicle Network Toolbox comes with a Simulink CAN block library that you can use to simulate CAN network models.

CAN Message Traffic GUI

Version 1.0 of Vehicle Network Toolbox provides a simple GUI that allows you to monitor CAN message traffic.

MATLAB Compiler Support

Version 1.0 of Vehicle Network Toolbox supports the MATLAB Compiler™. With this capability, you can use the MATLAB Compiler to take MATLAB files as input and

generate redistributed, standalone applications that include Vehicle Network Toolbox functionality.