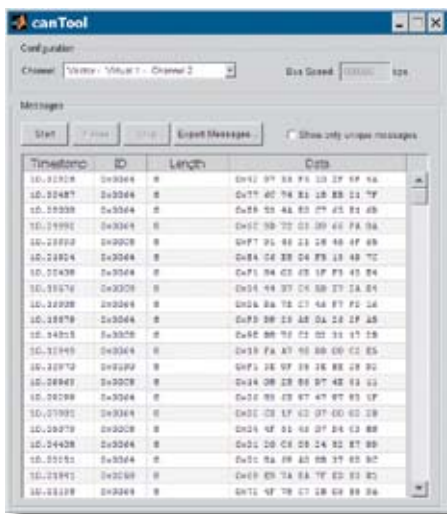


Configuring CAN Channels

CAN channel functions in MATLAB and CAN configuration blocks in Simulink enable you to define a connection to Vector CAN interface hardware that establishes a physical connection with the CAN bus. The toolbox provides CAN channel functions to query and configure CAN interface hardware settings, such as bus speed and transceiver settings. You can also verify other CAN channel properties, such as the number of messages available and the number of messages received or transmitted on the channel. By attaching Vector CAN database files to CAN channels, incoming messages are automatically presented using information stored in the database. After defining a CAN channel, you can send and receive CAN messages on the channel.

Sending and Receiving CAN Packets

CAN messages contain properties for storing the CAN message identifier (standard 11-bit or extended 29-bit), the time stamp, and up to 8 bytes of CAN data. Transmit and receive functions and blocks in the toolbox enable the sending and receiving of CAN messages over CAN channels. For large data sets, you can log CAN messages for offline analysis.



TimeStamp	ID	Length	Data
10.10108	0x0000	8	0x12 0F 0A 0F 03 0F 0F 0A
10.10487	0x0004	8	0x77 40 76 81 28 88 21 7F
10.10538	0x0004	8	0x78 53 48 83 07 05 01 0B
10.10992	0x0004	8	0x1C 5B 7D 03 00 4C 7A 5A
10.10993	0x0008	8	0x77 31 88 23 28 48 4F 89
10.10924	0x0004	8	0x84 5E 38 04 78 18 48 7C
10.10438	0x0004	8	0x71 94 03 05 1F 73 43 84
10.10576	0x0008	8	0x51 44 37 04 5B 73 2A 04
10.10008	0x0004	8	0x5A 8A 78 07 4A 87 72 2A
10.10878	0x0004	8	0x7D 39 23 48 0A 2A 2F 45
10.14018	0x0008	8	0x6C 88 7D 7D 02 31 17 18
10.10148	0x0004	8	0x19 FA 87 90 88 00 02 85
10.10972	0x0008	8	0x71 2E 0F 09 2E 88 2E 92
10.10848	0x0008	8	0x24 08 28 88 07 4E 03 21
10.10298	0x0004	8	0x2C 81 03 87 47 87 83 1F
10.10982	0x0004	8	0x1C 03 1F 03 07 00 02 18
10.10979	0x0008	8	0x24 4F 31 6A 0F 0A 03 88
10.10438	0x0004	8	0x24 20 0E 28 24 82 87 89
10.10012	0x0004	8	0x1C 8A 88 4D 88 1F 83 8C
10.10942	0x0008	8	0x1C 85 7A 8A 7F 8C 03 8C
10.10118	0x0004	8	0x1C 4F 78 07 28 0A 88 8A

Building and Extracting Signals from CAN Messages

Vehicle Network Toolbox provides functions and blocks for encoding and decoding CAN messages. CAN message data may contain data representing multiple signals. Unpack functions and blocks let the user specify start bit, signal length, data type, and byte ordering. Pack functions and blocks provide the same options for building up data for CAN message transmission.

Visualizing CAN Traffic and Handling CAN Messages

The toolbox provides a graphical user interface (GUI) for visualizing active traffic on a particular CAN channel. You can run the canTool GUI while performing other tasks in MATLAB or Simulink.

When traffic on the network contains more information than needed for your application, you can limit the number of CAN messages received by a CAN channel to a defined range of CAN message identifiers. Using filter functions and mask settings in the toolbox, you receive only the messages needed for your application.

Working with Vector CAN Database Files

In MATLAB or Simulink, you can associate a Vector CAN database file with a CAN channel or message, enabling you to encode and decode CAN messages using application-specific message and signal names, such as EngineMsg and EngineRPM, as well as scaled engineering units. The ability to work with industry-standard database files simplifies the interaction with the CAN bus because the database not only specifies the message list and component signals, but also provides the bit packing and unpacking rules for the

Live CAN bus traffic on the network displayed by canTool, a graphical user interface for visualizing data in Vehicle Network Toolbox.

associated signals. Because signal data type, start bit, length, and byte order are all pre-defined for the messages in the database, you can focus on analyzing your signals rather than on defining them.

Required Products

MATLAB®

Related Products

Simulink®

Data Acquisition Toolbox™

Target Support Package™ FM5

(for Freescale™ MPC5xx)

Target Support Package™ IC1

(for Infineon® C166)

Target Support Package™ TC2

(for TI's C2000™ DSP)

Platform and System Requirements

For platform and system requirements, visit www.mathworks.com/products/vehicle-network. ■

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