RTI CAN Blockset XCP-Option

Manual

Release 2021-A – May 2021

dSPACE

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How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

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You can also use the support request form: http://www.dspace.com/go/supportrequest. If you are logged on to mydSPACE, you are automatically identified and do not need to add your contact details manually.

If possible, always provide the relevant dSPACE License ID or the serial number of the CmContainer in your support request.

Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit http://www.dspace.com/go/patches for software updates and patches.

Important Notice

Contents

About This Document

Content

This document provides access to the information you need to implement the XCP Real-Time Service (RTI CAN Blockset XCP-Option) in a real-time application for dSPACE hardware and to generate ASAP2 files from a Simulink model.

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazard that, if not avoided, could result in property damage.
Note	Indicates important information that you should take into account to avoid malfunctions.
Tip	Indicates tips that can make your work easier.
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.

Naming conventions

dSPACE user documentation uses the following naming conventions:

%name% Names enclosed in percent signs refer to environment variables for file and path names.

< > Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

Special folders

Some software products use the following special folders:

Common Program Data folder A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\<InstallationGUID>\<ProductName>`

or

`%PROGRAMDATA%\dSPACE\<ProductName>\<VersionNumber>`

Documents folder A standard folder for user-specific documents.

`%USERPROFILE%\Documents\dSPACE\<ProductName>\<VersionNumber>`

Local Program Data folder A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\<InstallationGUID>\<ProductName>`

Accessing dSPACE Help and PDF Files

After you install and decrypt dSPACE software, the documentation for the installed products is available in dSPACE Help and as PDF files.

dSPACE Help (local) You can open your local installation of dSPACE Help:

- On its home page via Windows Start Menu
- On specific content using context-sensitive help via **F1**

dSPACE Help (Web) You can access the Web version of dSPACE Help at www.dspace.com.

To access the Web version, you must have a *mydSPACE* account.

PDF files You can access PDF files via the icon in dSPACE Help. The PDF opens on the first page.

Introduction to the XCP on CAN Real-Time Service

Where to go from here

Information in this section

Basics on the XCP on CAN Real-Time Service

ASAM MCD standard

The ASAM MCD standard defines interfaces and data formats for communication with and diagnosis of automotive electronic control units. ASAM stands for the *Association for Standardization of Automation and Measuring Systems*. MCD stands for the *Measurement, Calibration and Diagnosis* section of the ASAM.

For information on these standards, refer to http://www.asam.net.

Controller development and calibration

Principle The RTI CAN Blockset XCP-Option lets you interface dSPACE real-time hardware via measurement and calibration systems.

The measurement and calibration system reads the A2L file that was generated for your specific dSPACE real-time system and configures the XCP on CAN Real-Time Service to acquire data from the memory of the dSPACE hardware. The data is then sent to the measurement and calibration system via its CAN interface. By implementing the XCP on CAN Real-Time Service in an application

and generating an A2L file, you can perform calibration tasks while the controller is still under development.

A2L file generation The A2L file that is required by the measurement and calibration system is generated during the build process. For details, refer to the Simulink Model A2L File Generation Manual 🕮.

System architecture

A system for simultaneous controller development and calibration mainly consists of the following components:

- A host PC
- dSPACE real-time hardware (refer to System Requirements and System Setup on page 8)
- A measurement and calibration system supporting XCP connected to the dSPACE real-time hardware via CAN. Typically, the measurement and calibration system is installed on the host PC.

Communication between the dSPACE real-time hardware and the measurement and calibration system is performed via the Universal Measurement and Calibration Protocol (XCP).

Demo model

The software includes the demo model `xcp_demo.slx`, which is available via the XCP block library. Refer to How to Prepare the Demo Model on page 9.

Related topics

HowTos

How to Prepare the Demo Model 9

System Requirements and System Setup

Introduction

To use the XCP on CAN Real-Time Service, you have to check the hardware and software requirements.

Hardware requirements

The following hardware is required:

- One of the following dSPACE real-time hardware platforms:
  - DS1401 (MicroAutoBox II)
- You must establish a connection between the dSPACE real-time hardware and the host PC with your measurement and calibration system via an XCP-compatible CAN interface.

For information on how to install and configure dSPACE real-time hardware, refer to the following documentation:

- MicroAutoBox II Hardware Installation and Configuration 🕮

Related topics

Basics

Introduction to the XCP on CAN Real-Time Service 7

How to Prepare the Demo Model

Objective

The software includes the `xcp_demo.slx` demo model, which is available via the XCP block library. When you open the demo model, it is automatically configured for your current default board. The following boards are supported:

- MicroAutoBox II

Method

To prepare the demo model

1. Open MATLAB.
2. Type `rtican` at the MATLAB command prompt.
   The RTI CAN Blockset opens.
3. Double-click the Library Extensions button.
   The RTICAN Extensions library opens.
4. Double-click the XCP Library button.
   The XCP Library opens.
5. Double-click the Demo button.
   The demo model opens.
6. Press `Ctrl` + `B` to build the real-time application.
   During the build process, an A2L file named `xcp_demo.a2l` is generated in the demo folder. In addition, the code for the XCP on CAN Real-Time Service is integrated into the real-time application. For further information on the build process, refer to Building and Downloading the Model (RTI and RTI-MP Implementation Guide 🕮).
7. Connect the dSPACE real-time hardware to the host PC.
8. Load the application to the flash memory of your dSPACE real-time hardware. For details, refer to Handling an Application for the Flash Memory on page 28.

Result

The demo model is prepared for use with an measurement and calibration system. In your measurement and calibration system, you can load the generated A2L file and access the real-time application for measurement and calibration purposes.

Related topics

Basics

Implementing the XCP on CAN Real-Time Service

Where to go from here

Information in this section

Basics on Implementing the XCP on CAN Real-Time Service

Introduction

The XCP on CAN Real-Time Service provides access to the dSPACE real-time hardware for measurement and calibration systems to make variables – parameters and signals – that are running on the dSPACE platform available to an measurement and calibration system. The XCP on CAN Real-Time Service, which is based on the Universal Measurement and Calibration Protocol (XCP), is implemented in the application running on your dSPACE real-time hardware.

Features of the service

The XCP on CAN Real-Time Service provides the following features:

- Implementation of XCP version 1.0
- Measurement and calibration of the variables of the real-time application running on the dSPACE hardware
- Acquisition of data in polling and event-triggered mode (refer to Basics on Data Acquisition with the XCP on CAN Real-Time Service on page 12)
- Compliance with the ASAP1a standard defined by the *Arbeitskreis zur Standardisierung von Applikationssystemen (ASAP)*.

Related topics

Basics

Basics on Data Acquisition with the XCP on CAN Real-Time Service....12
Implementing the XCP on CAN Real-Time Service....11

HowTos

How to Configure Data Acquisition....17
How to Implement the XCP on CAN Real-Time Service....15

References

XCP Page (RTICAN CONTROLLER SETUP)....23

Basics on Data Acquisition with the XCP on CAN Real-Time Service

Introduction

A measurement and calibration system can acquire data from the dSPACE real-time hardware either in *polling mode* or in *data acquisition mode*.

Polling mode

In polling mode, the measurement and calibration system sends a CTO command packet (CMD) on the MASTER CAN identifier at a specific rate. The XCP on CAN Real-Time Service implemented on the dSPACE real-time hardware receives and acknowledges it, and sends the requested information back to the measurement and calibration system.

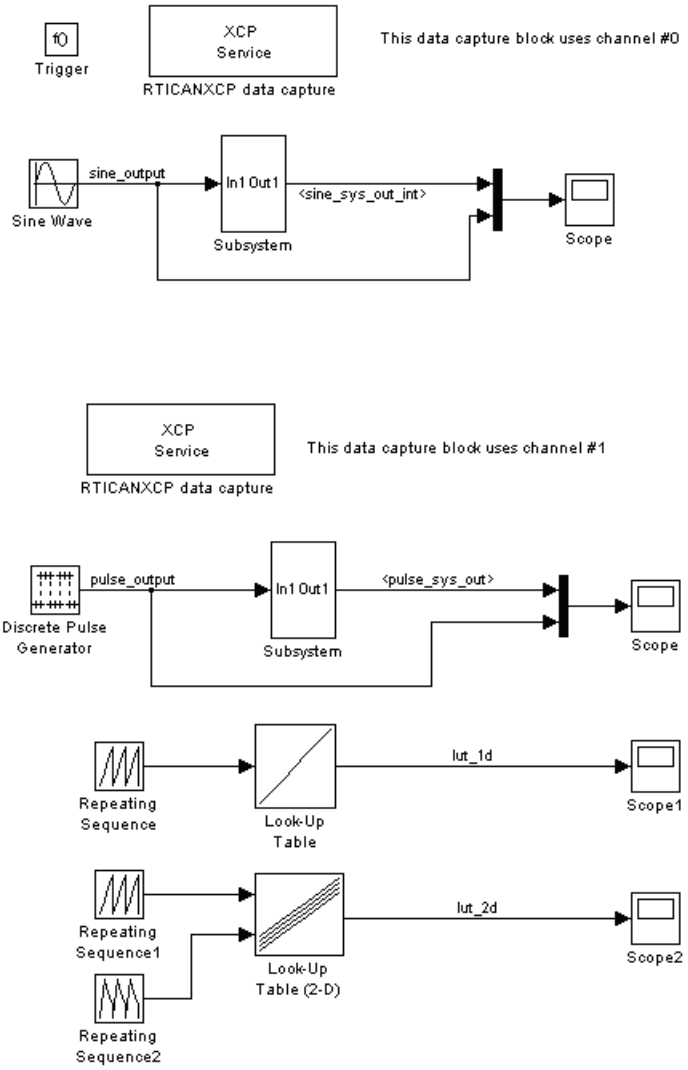
The service accepts only CAN messages from the measurement and calibration system that have a CMD identfier and the MASTER CAN identifier – either the standard (STD) or the extended (XTD) CAN ID.

Handshake protocol A handshake protocol is used to initiate a connection between the measurement and calibration system and the dSPACE real-time hardware, configure the XCP on CAN Real-Time Service, and acquire data in polling mode.

Whenever a CAN message with the MASTER CAN ID is received, the command interpreter of the XCP Real-Time Service is called. The message is decoded and a command response object (RES) is sent back to the measurement and calibration system on the SLAVE CAN ID to acknowledge the command.

Event-triggered acquisition mode

In event-triggered mode, the dSPACE real-time hardware is configured to acquire and send the requested data without interaction from the measurement and calibration system. Data acquisition is triggered by one or more RTICANXCP Data Capture blocks, which you can place in any subsystem of your Simulink model.



Event channels In your measurement and calibration system, you can assign variables to an event channel. To acquire these variables from the dSPACE real-time hardware, you have to set up the event channels in the RTICANXCP Data Capture blocks of your Simulink model. Each RTICANXCP Data Capture block corresponds to one event channel identified by a unique event channel number. The variables assigned to a specific event channel are then acquired

with the sample time given in the corresponding RTICANXCP Data Capture block. The data is sent later, which minimizes the effect on the model's execution time.

Sample time You can specify a different sample time for each RTICANXCP Data Capture block in your model – either a multiple of the model's sample time or -1. If you specify -1, the sample time of the event channel is inherited from the subsystem in which the RTICANXCP Data Capture block resides. Data is sampled at the end of the subsystem. Therefore, the results of the current sampling step can be observed.

Note

The sample time must be a multiple of one millisecond.

Data acquisition lists Information on the variables to be acquired is stored in data acquisition (DAQ) lists. Several DAQ lists can be assigned to one event channel and sampled at the same rate.

Two types of data acquisition lists are supported:

- Static DAQ lists with PID off
- Dynamic DAQ lists with PID on

In case of static DAQ lists with PID off, each DAQ list consists of 1 object descriptor table (ODT) containing 8 data bytes, which are sampled and put together in one DTO.

For static DAQ lists with PID off each DAQ list is transmitted using a unique CAN identifier. The CAN identifier used is calculated:

CAN ID DAQ list N = CAN ID MASTER + 1 + N

As an example, the DAQ list number 2 is transmitted on CAN ID 100 + 1 + 2 = 103, if the MASTER CAN ID is 100. In case of dynamic DAQ lists with PID on, the size of the DAQ lists is configurable by the tool. All the DAQ lists are transmitted using the CAN ID SLAVE identifier.

Data transmission is triggered by an interrupt that occurs if the previous CAN message was sent successfully. A callback function then checks if there are unsent messages in the queue and sends the next message.

Avoiding overruns The send queue is 250 messages long to avoid overruns when a lot of data is sampled within a short time. If the queue is full, the whole DAQ list is dropped. The queue is checked again for the remaining DAQ lists assigned to the current event channel. This means that the remaining data is sent if the queue is no longer full. To avoid overruns, increase the sample time of the event channels or reduce the number of variables to be sampled.

Related topics

HowTos

References

How to Implement the XCP on CAN Real-Time Service

Objective

Implementing the XCP on CAN Real-Time Service in a real-time application lets measurement and calibration systems access the variables of the application.

Specifying the priority for the XCP on CAN Real-Time Service

Since communication with the measurement and calibration system is interrupt-triggered, a priority can be assigned to the XCP on CAN Real-Time Service's send function and receive function.

If you specify no priorities for the XCP on CAN Real-Time Service, the following default values are used:

- 125 for the send function
- 126 for the receive function

Note

If you increase the priority of the XCP on CAN Real-Time Service's send and receive functions above the lowest priority of other tasks in the Simulink model, the timing of the real-time application changes. For details, see Priorities and Task-Switching Time (RTI and RTI-MP Implementation Guide 🕮).

Restrictions

Only one instance of the XCP on CAN Real-Time Service can run on a dSPACE platform at the same time. For example, if your system contains a DS2210 and two DS4302s connected to a dSPACE processor board, only one instance can run on the dSPACE processor board.

Methods

- For instructions on enabling and configuring the XCP on CAN Real-Time Service, refer to Method 1.
- For instructions on specifying the priority for the XCP on CAN Real-Time Service, refer to Method 2.

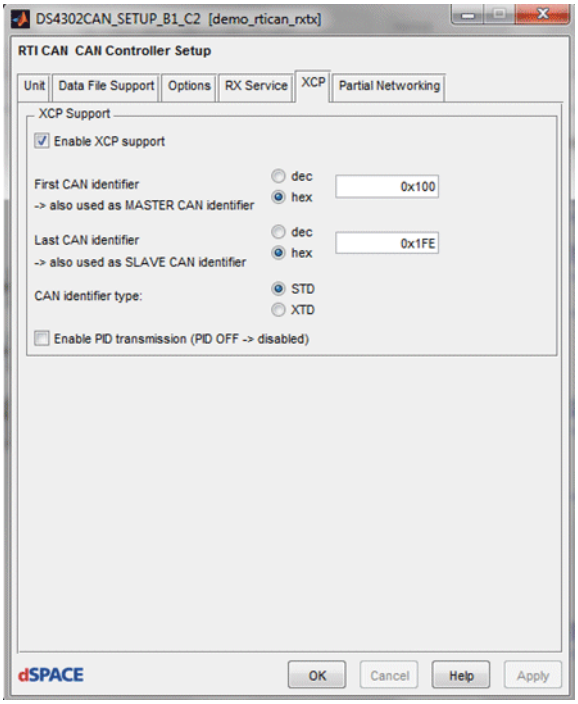
Method 1

To enable and configure the XCP on CAN Real-Time Service

1 In the Simulink model, double-click the RTICAN CONTROLLER SETUP block.
The RTICAN CONTROLLER SETUP block dialog opens.

2 Select the XCP Page (RTICAN CONTROLLER SETUP).

3 Select the Enable XCP support checkbox.



4 Specify the desired first and last free CAN identifier to be used for XCP.

5 Specify whether the CAN identifier type is either a standard (STD) or an extended (XTD) identifier.

6 Specify to use static DAQ lists with PID Off or dynamic DAQ lists with PID On.

Note

ControlDesk supports only static DAQ lists with PID Off. Clear the Enable PID transmission (PID OFF -> disabled) checkbox.

Method 2

To specify the priority for the XCP on CAN Real-Time Service

1 In the Simulink model, press **Ctrl** + **E** to open the Configuration Parameters dialog.

2 Open the Code Generation node and select the RTI simulation options node.

3 Click the Task Configuration button.
This opens the RTI Task Configuration Dialog.

4 Rearrange the tasks in the **Tasks with configurable priority** list to meet your requirements.

Result

You have implemented the XCP on CAN Real-Time Service in your real-time application.

Related topics

Basics

Implementing the XCP on CAN Real-Time Service 11

HowTos

How to Configure Data Acquisition 17

References

Code Generation Dialog (Model Configuration Parameters Dialogs) (RTI and RTI-MP Implementation Reference 🕮)
XCP Page (RTICAN CONTROLLER SETUP) 23

How to Configure Data Acquisition

Objective

To trigger data acquisition, you have to implement RTICANXCP Data Capture blocks in the application of the dSPACE real-time hardware.

Basics

You can place **RTICANXCP Data Capture** blocks in any subsystem of your Simulink model.

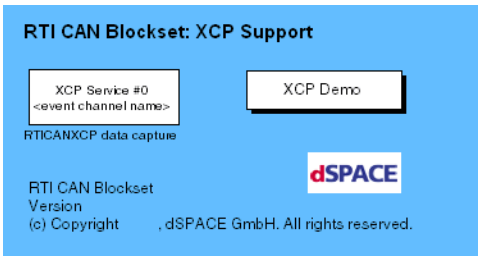
Via this block, you can specify the event channel number and the sample time for each event channel individually.

Method

To configure data acquisition

1 In the MATLAB Command Window, enter `rticanxcp`.

The Library: rticanxcp opens.

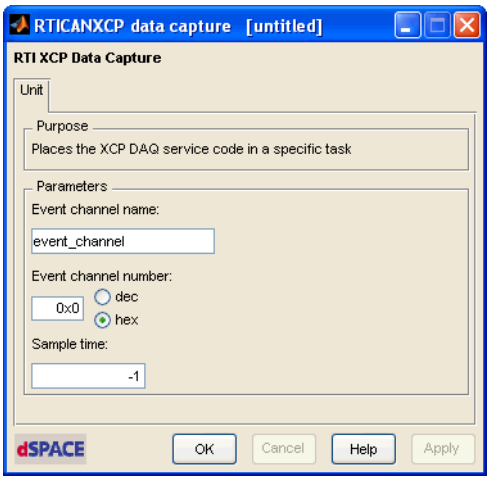


2 From the library, drag the RTICANXCP Data Capture block into the subsystem of your model it is to be executed in.

3 Double-click the RTICANXCP Data Capture block.

This opens the corresponding block dialog.

4 In the RTICANXCP Data Capture block dialog, specify the event channel number and the sample time.



Result

You have configured data acquisition.

Related topics

Basics

Basics on Data Acquisition with the XCP on CAN Real-Time Service..... 12

HowTos

How to Implement the XCP on CAN Real-Time Service..... 15

References

RTICANXCP Data Capture..... 25

RTI CAN Blockset XCP-Option

RTI block support

The following RTI blocks are part of the RTI CAN Blockset XCP-Option.

To implement the XCP Real-Time Service in a real-time application

- Use RTICAN CONTROLLER SETUP on page 22.

To configure data acquisition via the XCP Real-Time Service

- Use RTICANXCP Data Capture on page 25.

Where to go from here

Information in this section

Information in other sections

RTI CAN Blockset Reference
Provides reference information for the RTI CAN Blockset.

RTICAN CONTROLLER SETUP

Purpose

To define the global settings that apply to the CAN hardware, i.e., the module or board type, board/module number, controller, baud rate, transceiver, termination and bit timing parameters.

Where to go from here

Information in this section

Block Description (RTICAN CONTROLLER SETUP)

Illustration

Purpose

To define the global settings that apply to the CAN hardware, i.e., the module or board type, board/module number, controller, baud rate, transceiver, termination and bit timing parameters.

You can use either the standard configuration or the advanced configuration options.

Note

- One RTICAN CONTROLLER SETUP block must always be in your model if you want to use any of the other RTICAN blocks.
- If your dSPACE CAN board contains more than one CAN controller, each controller must be specified by a separate RTICAN CONTROLLER SETUP block in the model.

Dialog pages

The following pages and dialogs are available:

- Unit Page (RTICAN CONTROLLER SETUP)
- Options Page (RTICAN CONTROLLER SETUP)
- Advanced Configuration Dialog (RTICAN CONTROLLER SETUP)
- XCP Page (RTICAN CONTROLLER SETUP) (see below)

Related topics

References

Advanced Configuration Dialog (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)
Options Page (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)
Unit Page (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)
XCP Page (RTICAN CONTROLLER SETUP)..... 23

XCP Page (RTICAN CONTROLLER SETUP)

Purpose

To implement the XCP Real-Time Service in a real-time application.

Description

The XCP Real-Time Service must be implemented in your application if you want to make the variables of the application accessible to an measurement and calibration system.

Commands from the measurement and calibration system are accepted by the dSPACE real-time hardware only if they have the *MASTER CAN ID identifier*. To send CAN messages from the dSPACE real-time hardware to the measurement and calibration system, the *SLAVE CAN ID identifiers* are used.

Tip

For details on the other pages and dialogs of the RTICAN CONTROLLER SETUP block dialog, refer to the *RTI Reference* of your specific dSPACE platform.

Dialog settings

Enable XCP support Implements the XCP Real-Time Service in your real-time application.

Note

Only one instance of the XCP Real-Time Service can run on a dSPACE platform at the same time. For example, if your system contains a DS2210 and two DS4302s connected to a dSPACE processor board, only one instance can run on the dSPACE processor board.

First XCP identifier Specifies the first identifier, which can be used for XCP.

Last XCP identifier Specifies the last identifier, which can be used for XCP.

STD/EXT The identifiers used for XCP can be either a standard (STD) or an extended (XTD) identifier. It can be a decimal or hexadecimal number.

Note

Do not use any identifier from the first XCP identifier to the last XCP identifier for purposes other than XCP.

Enable PID transmission (PID OFF -> disabled) Specifies to use static DAQ lists with PID Off (checkbox cleared) or dynamic DAQ lists with PID On (checkbox selected).

Related topics

Basics

Basics on Implementing the XCP on CAN Real-Time Service 11

HowTos

How to Implement the XCP on CAN Real-Time Service 15

References

Advanced Configuration Dialog (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)
Options Page (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)
Unit Page (RTICAN CONTROLLER SETUP) (RTI CAN Blockset Reference 🕮)

RTICANXCP Data Capture

Purpose

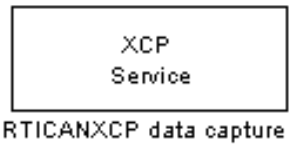
To place the service code for data acquisition via the XCP on CAN Real-Time Service in a specific task, and to specify the corresponding event channel number and sample time.

Where to go from here

Information in this section

Block Description (RTICANXCP Data Capture)

Illustration



Access

This block is located in the *Library: rticanxcp*, which opens after you enter rticanxcp in the MATLAB Command Window.

Purpose

To place the service code for data acquisition via the XCP on CAN Real-Time Service in a specific task, and to specify the corresponding event channel number and sample time.

Description

Data acquisition is triggered by one or more RTICANXCP Data Capture blocks, which you can place in any subsystem of your Simulink model. Each RTICANXCP Data Capture block defines an event channel identified by a unique event channel number. The service code needed by the XCP on CAN Real-Time Service is executed in the real-time application. This code samples one set of data for each sampling step at the end of the subsystem.

Dialog pages

The following dialog page is available:

- Dialog Settings (RTICANXCP Data Capture) on page 26

Related topics

HowTos

How to Implement the XCP on CAN Real-Time Service 15

Dialog Settings (RTICANXCP Data Capture)

Purpose

To place the service code for data acquisition via the XCP on CAN Real-Time Service in a specific task, and to specify the corresponding event channel name and number, and the sample time.

Dialog settings

Event Channel Name Lets you enter a user-defined name for the event channel defined by this RTICANXCP Data Capture block. The name is displayed in the block mask.

Event Channel Number Lets you enter a unique number for the event channel defined by this RTICANXCP Data Capture block. You must use consecutive event channel numbers starting at 0, in either a decimal or hexadecimal format. The number is displayed in the block mask.

Sample time Lets you enter the sample time at which the service code for the XCP on CAN Real-Time Service is to be executed. Choose "–1" to inherit the sample time – this is the default setting – or any multiple of the "Fixed step size" chosen for the model.

Note

The sample time must be a multiple of one millisecond. The maximum sample time is about 65 seconds.

Related topics

HowTos

How to Configure Data Acquisition 17
How to Implement the XCP on CAN Real-Time Service 15

Appendix

Where to go from here

Information in this section

Handling an Application for the Flash Memory

Introduction

To load a real-time application automatically after power-up, it must be downloaded to the flash memory of the hardware.

Where to go from here

Information in this section

Basics of the Flash Memory.....29
The supported dSPACE boards are equipped with a flash memory for real-time applications. A flash memory is used to load a real-time application automatically after power-up.

Information in other sections

Handling Applications via Command Line (ControlDesk Platform Management 🕮)
You can download and start applications on dSPACE platforms via the `cmdloader` command line tool. The tool runs in the command shell of the operating system, so you can use it in batch files or makefiles.

Down1401.exe (MicroAutoBox II RTLib Reference 🕮)
To compile, link, and download applications.

How to Clear an Application from the Flash Memory (DS100x, DS110x, MicroAutoBox II, MicroLabBox – Software Getting Started 🕮)
If an application is loaded to the flash memory, the dSPACE board starts the application automatically after reboot. If you want to avoid this, you have to clear the flash memory.

How to Download an Application to the Flash Memory and Start the Real-Time Processor (DS100x, DS110x, MicroAutoBox II, MicroLabBox – Software Getting Started 🕮)
Some dSPACE boards have a flash memory. This allows them to be used as a stand-alone system without a connection to the host PC.

How to Load an Application to the Flash Memory of dSPACE Real-Time Hardware (ControlDesk Platform Management 🕮)
Various dSPACE real-time hardware contains flash memory. Loading an application to the flash memory allows you to use dSPACE real-time hardware as a stand-alone system without a connection to the host PC.

How to Clear an Application from the Flash Memory of dSPACE Real-Time Hardware (ControlDesk Platform Management 🕮)
You can clear an application that is currently in the flash memory. This prevents the dSPACE real-time hardware from booting a flash application.

Basics of the Flash Memory

Introduction

The supported dSPACE boards are equipped with a flash memory for real-time applications. A flash memory is used to load a real-time application automatically after power-up.

Power-up

On power-up, the dSPACE board always starts executing the bootstrap loader contained in the flash memory. The loader checks for an application program currently stored in the flash memory. If it finds one, the application is started. If it does not detect an application in the flash memory, the loader enters the idle state and waits for commands from the connected host PC.

Note

- After power-up, the bootstrap loader never executes an application that was previously loaded to global memory.
- If power is turned off, an application that was previously loaded to global memory is lost.
- To prevent the dSPACE board executing an application stored in the flash memory after power-up, the flash memory must be cleared (see How to Clear an Application from the Flash Memory (DS100x, DS110x, MicroAutoBox II, MicroLabBox – Software Getting Started 🕮)).

Downloading an application to the flash memory

You can download an application to the flash memory via

- Down tool (only if you work with MicroAutoBox II, see Down1401.exe (MicroAutoBox II RTLib Reference 🕮)).
- DOS window (see Handling Applications via Command Line (ControlDesk Platform Management 🕮)).
- ControlDesk (see How to Load an Application to the Flash Memory of dSPACE Real-Time Hardware (ControlDesk Platform Management 🕮)).

Clearing an application from the flash memory

You can clear an application from the flash memory via

- ControlDesk (see How to Clear an Application from the Flash Memory (DS100x, DS110x, MicroAutoBox II, MicroLabBox – Software Getting Started 🕮)).

Related topics

Basics

Handling Applications via Command Line (ControlDesk Platform Management 🕮)

HowTos

How to Clear an Application from the Flash Memory (DS100x, DS110x, MicroAutoBox II, MicroLabBox – Software Getting Started 🕮)
How to Load an Application to the Flash Memory of dSPACE Real-Time Hardware (ControlDesk Platform Management 🕮)

Abbreviations

Abbreviations

Abbreviation overview

The following abbreviations are used in this document:

Abbreviation	Description
ASAP1a	Software interface for connecting a measurement and calibration system to an ECU; this part describes the interface in the ECU.
A2L	File format for variable description files of ECUs. An A2L file contains information about the interface to be used and all accessible variables.
DAQ	Data acquisition
ECU	Electronic control unit
ID	Identifier
MC	Measurement and calibration
ODT	Object descriptor table
RTI	Real-Time Interface
XCP	Universal Measurement and Calibration Protocol

Limitations

Limitations

Introduction

The following limitations and workarounds apply:

Limitations of the XCP on CAN Real-Time Service

The XCP on CAN Real-Time Service has the following limitations:

- Only one instance of the XCP on CAN Real-Time Service can run on a dSPACE platform at the same time. For example, if your system contains a DS2210 and two DS4302s connected to a dSPACE processor board, only one instance can run on the dSPACE processor board.
- The variable description (TRC and SDF) file generated by RTI contains only the variables that are prepared for use with the XCP on CAN Real-Time Service. Only these variables are accessible in an experiment of ControlDesk.

Limitations for using the Signal Generator block

Using the Signal Generator block might cause problems when you download calibration parameters to the hardware. For this reason, some limitations apply to the Signal Generator block.

Workaround If you use the Signal Generator block, select **Use external signal** for the **Time (t)** value. Then connect a Clock block to the inport of the Signal Generator block. As a limitation, you cannot change the frequency of the Signal Generator block's signal during run time.

Problems while downloading an application to the flash memory without ControlDesk

If you encounter problems while downloading an application to the flash memory without ControlDesk, you can reset the device driver of your dSPACE hardware using the `dcont -r` command.

Note

- If you use the `dcont -r` command, not only the device driver of one dSPACE hardware component, for example, MicroAutoBox II, will be reset but all the device drivers of all the dSPACE hardware components connected to your PC.
- Do not use the `dcont -r` command if you have ControlDesk installed. Using the `dcont -r` command may prevent multiprocessor systems from being recognized by ControlDesk.
  If you have ControlDesk installed, use the Refresh Interface Connections (ControlDesk Platform Management 🕮) command.

Related topics

Basics

Introduction to the XCP on CAN Real-Time Service..... 7

References

Refresh Interface Connections (ControlDesk Platform Management 🕮)