User Manual

Diagnostics on FlexRay

Installation and usage in DENoe.FlexRay

Version 1.1

Englisch

Imprint

Vector Informatik GmbH
Ingersheimer Straße 24
D-70499 Stuttgart

Table of contents

1 Introduction

In this chapter you find the following information:

1.1 Overview: Diagnostics on FlexRay in DENoe

Available features

With DENoe.FlexRay 7.0 SP4, diagnostics on FlexRay networks is supported:

- FlexRay interfaces defined in diagnostics descriptions are recognized. It is possible to see and configure protocol parameters.
- The FlexRay slot definitions in the FIBEX database are used for the configuration of the network layer. If PDUs are defined, these can also be used.
- The Diagnostics Console Window and the Fault Memory Window can be used on FlexRay.
- Several FlexRay transport protocol variants are supported.
- Test modules as diagnostics clients can communicate with diagnostics servers (ECUs) on FlexRay – **without** any changes to the CAPL code if the standard CANdela communication channel is used.
- A DENoe simulation node can be configured to emulate an ECUs diagnostics functionality.

With DENoe.FlexRay 7.1 some additional diagnostics/TP features are supported:

- The FlexRay diagnostics/TP observer for the Trace window is available.
- The ISO 10681-2 TP for FlexRay is supported.

1.2 About this user manual

1.2.1 Access helps and conventions

To find information quickly

The user manual provides you the following access helps:

- At the beginning of each chapter you will find a summary of the contents,
- In the header you can see in which chapter and paragraph you are ((situated)),
- In the footer you can see to which version the user manual replies,
- At the end of the user manual you will find an index, with whose help you will quickly find information.

Conventions

In the two following charts you will find the conventions used in the user manual regarding utilized spellings and symbols.

Style	Utilization
bold	Blocks, surface elements, window- and dialog names of the software. Accentuation of warnings and advices. **[OK]** Push buttons in brackets **File** | **Save** Notation for menus and menu entries
CANoe	Legally protected proper names and side notes.
`Source code`	File name and source code.
Hyperlink	Hyperlinks and references.
<STRG>+<S>	Notation for shortcuts.

Symbol	Utilization
	Here you can obtain supplemental information.
	This symbol calls your attention to warnings.
	Here you can find additional information.
	Here is an example that has been prepared for you.
	Step-by-step instructions provide assistance at these points.
	Instructions on editing files are found at these points.
	This symbol warns you not to edit the specified file.

1.2.2 Certification

Certified Quality Management System

Vector Informatik GmbH has ISO 9001:2000-12 certification. The ISO standard is a globally recognized quality standard.

1.2.3 Warranty

Restriction of warranty

We reserve the right to change the contents of the documentation and the software without notice. Vector Informatik GmbH assumes no liability for correct contents or damages which are resulted from the usage of the user manual. We are grateful for references to mistakes or for suggestions for improvement to be able to offer you even more efficient products in the future.

1.2.4 Support

You need support?

You can get through to our hotline at the phone number

+49 (711) 80670-200

or you send a problem report to the CANoe-Support.

1.2.5 Registered trademarks

Registered trademarks

All trademarks mentioned in this user manual and if necessary third party registered are absolutely subject to the conditions of each valid label right and the rights of particular registered proprietor. All trademarks, trade names or company names are or can be trademarks or registered trademarks of their particular proprietors. All rights which are not expressly allowed, are reserved. If an explicit label of trademarks, which are used in this user manual, fails, should not mean that a name is free of third party rights.

➔ Outlook, Windows, Windows XP, Windows 2000, Vista are trademarks of the Microsoft Corporation.

2 Installation and configuration

In this chapter you find the following information:

2.1 Prerequisites

DENoe.FlexRay

Version 7.0 SP4 or later must be installed (which requires an additionally installed add-on package) or version 7.1 or later must be installed (which already supports the ISO FlexRay TP and another TP can optionally be installed).

FlexRay Package

One of the following FlexRay add-on packages has to be (optionally) installed:

- AUTOSAR FlexRay add-on package V1.5.0
- OEM FlexRay TP add-on package

Please contact the Vector Informatik support to receive a specific add-on package (distribution restrictions may apply).

If the protocol variant you intend to use is not yet available in an add-on package, contact Vector Informatik for more information please.

2.2 FIBEX database definitions

FlexRay frame type

The FIBEX database must define slots (or PDUs) for the transfer of diagnostics or transport protocol data, i.e. their type must be one of the following:

- Diagnostics state
- Diagnostics request
- Diagnostics response
- Transport Protocol Layer

Sender/receiver relation

The sender of a slot (or PDU) has to be defined since DENoe will only offer possible slots for selection.

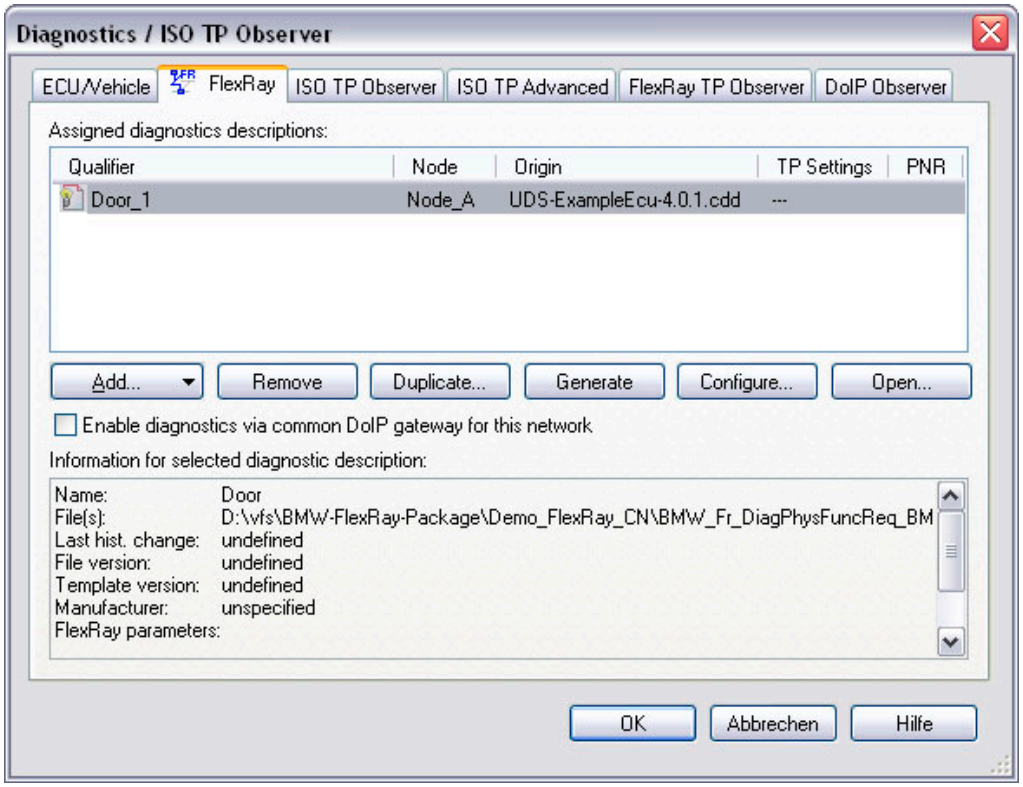
Frames vs. PDUs

The underlying FlexRay transport protocols for AUTOSAR and from the ISO can work with frames (FIBEX version ≤ 2.1) or with PDUs (FIBEX+ or FIBEX 3.0). The assigned FIBEX version determines if FlexRay frames or PDUs are used for the service data units of the network layer.

2.3 Configuration

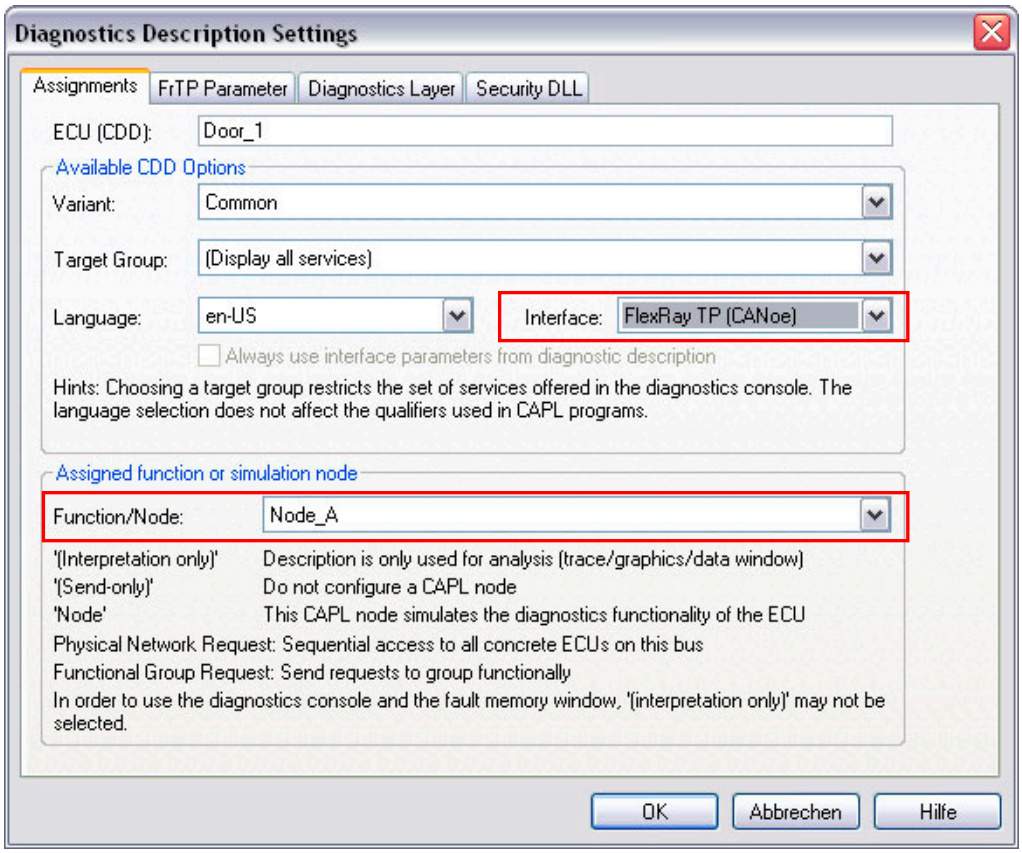
Add a diagnostics description

If the prerequisites (cf. 2.1) are met, it is possible to add a diagnostics description (CDD or ODX) to a FlexRay network on the **Diagnostics/ISO TP Observer configuration** dialog:



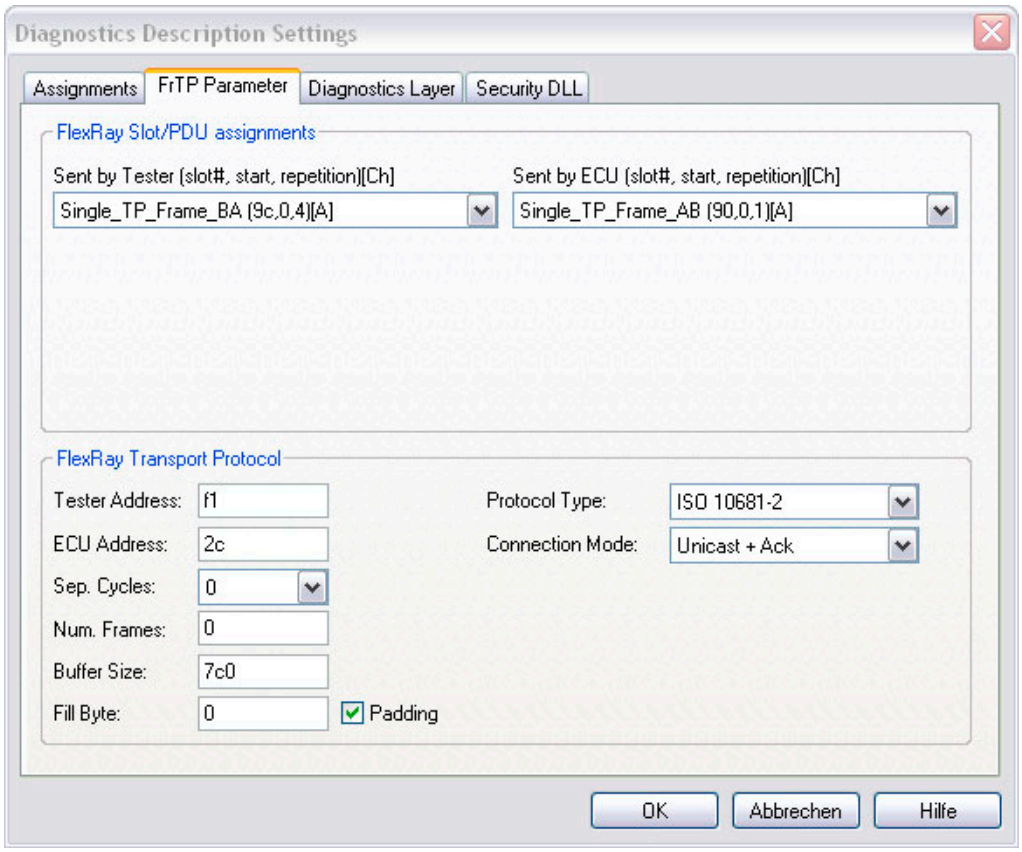
Assign the FIBEX database node

If a diagnostics description is added to a FlexRay bus, then you must configure the description. First you have to assign the FIBEX database node, which is target for the diagnostics requests (see Function/Node field in the **Diagnostics Description Settings** dialog). Optionally you can select the TP parameters to be loaded from the appropriate FlexRay interface of the diagnostics description or DENoe's parameters of the "FrTP Parameter" page are used:



Configure FrTP Parameter

The following dialog allows changing the FlexRay parameters of one description.



General dialog fields

Field name	Description
Sent by Tester/ECU	The available slots (PDUs) that are defined in the FIBEX database (cf. 2.2) are displayed here. It is necessary to select one slot/PDU for each direction. Select the appropriate target ECU in the 'Assignments' page of the **Diagnostics Description Settings** dialog!
(slot#, start, repetition)[Ch]	For slots, additional information about their location in the FlexRay cycle is displayed.
Tester/ECU address	The transport protocol identifies nodes using an address.
Protocol type	The available protocols are listed here. One of them has to be selected.
Fill Byte	Determines the fill byte that is used to fill the un-used bytes in the message. (Only available for DENoe.FlexRay ≥ 7.1)
Padding	Only if enabled, filling will be applied (except for TP PDU with odd length in FlexRay frames (that have even length). (Only available for DENoe.FlexRay ≥ 7.1)

AUTOSAR FlexRay TP fields

Address format	Defines whether addresses use 1 byte (values 0-255) or 2 bytes (values 0-65535).
Connection Mode Message Length, STmin [ms], Block Size	AUTOSAR FlexRay TP protocol parameters. Please refer to the protocol's specification for details.

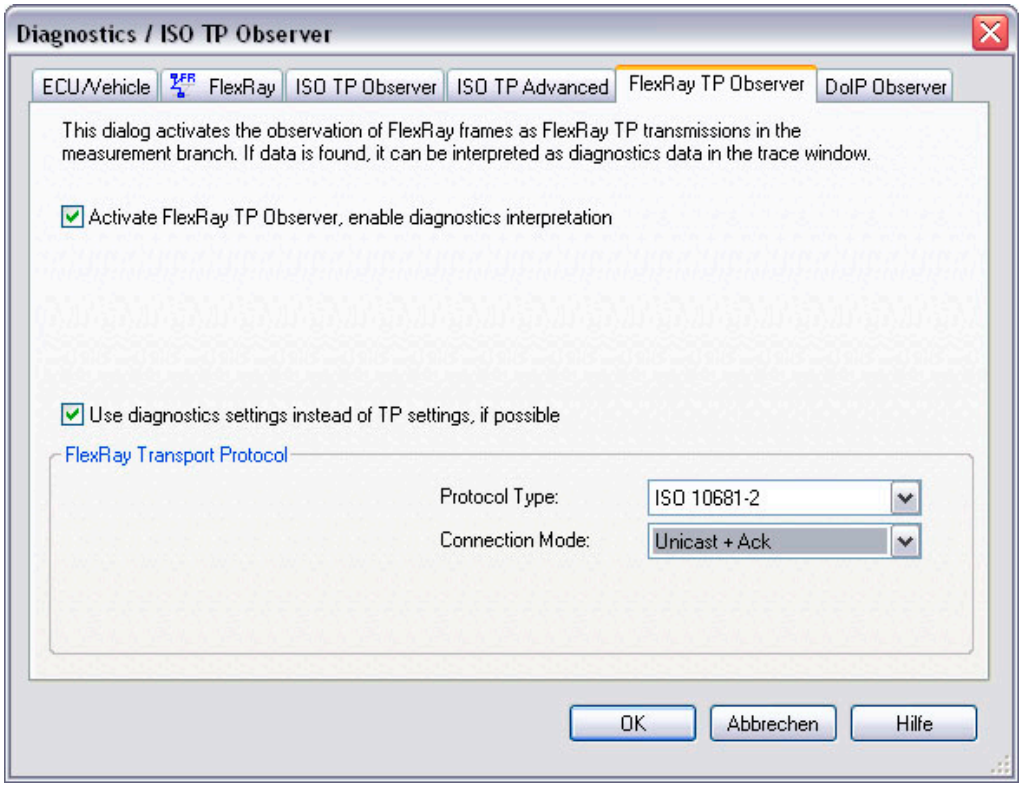
Field name	Description
Bandwidth Control, Sep. Cycles, Max. Frames Per Cycle, Block Size, Receiver Type	OEM-specific FlexRay TP protocol parameters. Please refer to the protocol's specification for details.
Connection Mode, Sep. Cycles, Max. Frames Per Cycle, Buffer Size	ISO FlexRay TP protocol parameters. Please refer to the protocol's specification for details.

OEM1-specific fields

ISO 10681-2 TP fields

Configure the FlexRay Diagnostics/TP Observer

The following page on the **Diagnostics/ISO TP Observer configuration** dialog allows to activate and configure the FlexRay Diagnostics/TP Observer for the Trace window (only available for DENoe.FlexRay ≥ 7.1):



3 Usage

In this chapter you find the following information:

3.1 CAPL

Test modules

In a test module, no special configuration has to be performed to communicate with an ECU, as long as the CANdela communication channel (always available for the Diagnostics Console Window and the Fault Memory Window) is used.

ECU simulations

It is possible to create ECU simulations for the diagnostics functionality of ECUs accessible via FlexRay. For details regarding the “CAPL Callback Interface (CCI) for diagnostics” refer to the sample implementation in the examples provided with the add-on packages or DENoe.FlexRay (version ≥ 7.1).

3.2 Examples

Sample configuration

The add-on packages or DENoe.FlexRay (version ≥ 7.1) will install some sample configurations. These “UDSSim…” sample configurations show an ECU simulation and allow accessing its diagnostics functionality from the Diagnostics Console Window and the Fault Memory Window.

In addition, in some examples a test module is provided that communicates with the ECU using diagnostics services on FlexRay.

3.3 Help

Refer also to the online help of DENoe.FlexRay for more information.

4 Appendix A: Address table

Vector Informatik GmbH

Vector Informatik GmbH
Ingersheimer Str. 24
D-70499 Stuttgart
Phone: +49 (711) 80670-0
Fax: +49 (711) 80670-111
mailto:info@vector-informatik.de
http://www.vector-informatik.com/

Vector CANtech, Inc.

Vector CANtech, Inc.
Suite 550
39500 Orchard Hill Place
USA-Novi, Mi 48375
Phone: +1 (248) 449 9290
Fax: +1 (248) 449 9704
mailto:info@vector-cantech.com
http://www.vector-cantech.com/

Vector France SAS

Vector France SAS
168, Boulevard Camélinat
F-92240 Malakoff
Phone: +33 (1) 4231 4000
Fax: +33 (1) 4231 4009
mailto:information@vector-france.com
http://www.vector-france.com/

Vector GB Ltd.

Vector GB Ltd.
Rhodium
Central Boulevard
Blythe Valley Park
Solihull, Birmingham
West Midlands B90 8AS, UK
mailto:info@vector-gb.co.uk
http://www.vector-gb.co.uk

Vector Japan Co., Ltd.

Vector Japan Co., Ltd.
Seafort Square Center Bld. 18F
2-3-12, Higashi-shinagawa, Shinagawa-ku
J-140-0002 Tokyo
Phone: +81 3 (5769) 7800
Fax: +81 3 (5769) 6975
mailto:info@vector-japan.co.jp
http://www.vector-japan.co.jp/

Vector Korea IT Inc.

Vector Korea IT Inc.
Daeryung Post Tower III, 508
Guro-dong, Guro-gu, 182-4
Seoul, 152-790
Republic of Korea
Phone: +82(0)2 2028 0600
Fax: +82(0)2 2028 0604
mailto:info@vector-korea.com
http://www.vector-korea.com/

VecScan AB

VecScan AB
Lindholmspiren 5
SE-417 56 Göteborg
Phone: +46 (31) 76476-00
Fax: +46 (31) 76476-19
mailto:info@vecscan.com
http://www.vecscan.com/

5 Index

Get more Information!

Visit our Website for:

> News

> Products

> Demo Software

> Support

> Training Classes

> Addresses

www.vector-worldwide.com