

Readme for PROFINET Tests

The goal of this test bundle is to have all the necessary documents and test systems for RT and IRT, device and controller and Security Level 1 (Net Load) combined in one bundle with all the electronic test cases to be performed during a certification test.

The specification and test tool for GSDML, the ART tester, test description and tester for net load / security level 1 and also the PI Guidelines shall be used for all versions of the test.

The name of the folder in which the test case specification can be found shall be interpreted in the following way.

- **automated:** here the tests are described that are fully automated within the test system.
- **not automated:** here the test case specifications can be found that have to be executed and checked manually. These manual tests shall be done in the following way:
you use the log file or the network recordings and check it according to the standard, the TCS, the relevant guidelines and the GSD entries.
- **future:** here the test case specifications can be found that will get automated in a future test system and needs not to be tested with this version of the test system.

Certification test in a PITL shall be done with an official released version of the test bundle (see file "Versions for Certification"). If there is found a problem in the test system and a Beta or a weekly build has solved this problem, you do the (re-)test of the **affected test cases (and only the affected ones!)** with the new Beta or weekly build.

This Test Bundle V2.41.0 Release shall be used for certification test of a device and/or a controller of Conformance Classes A and B and a device of Conformance Class C. Actual it is not intended to use it for a device or a controller of Conformance Class D.

This bundle is intended to be used for development support. It does not substitute a certification test and a certificate!

Important Hints:

For preparation of a certification test please read the document "How to get a PN certificate".

The usage of software and/or documentation of this bundle implies the agreement to the license conditions (see "Disclaimer PN Test Bundle.pdf").

Support and Bug Report:

If you have any question, please contact the test lab (PITL) where you intend to perform the certification test or the supplier of the PROFINET ASIC/stack you are using. If you are still faced with severe problems of the installation and execution of the test tools out of the test system, please send an e-mail to:

PN-TS-Support@oth-aw.de

How to apply for the Certification Test:

Please read the test specification for applying a certification test.

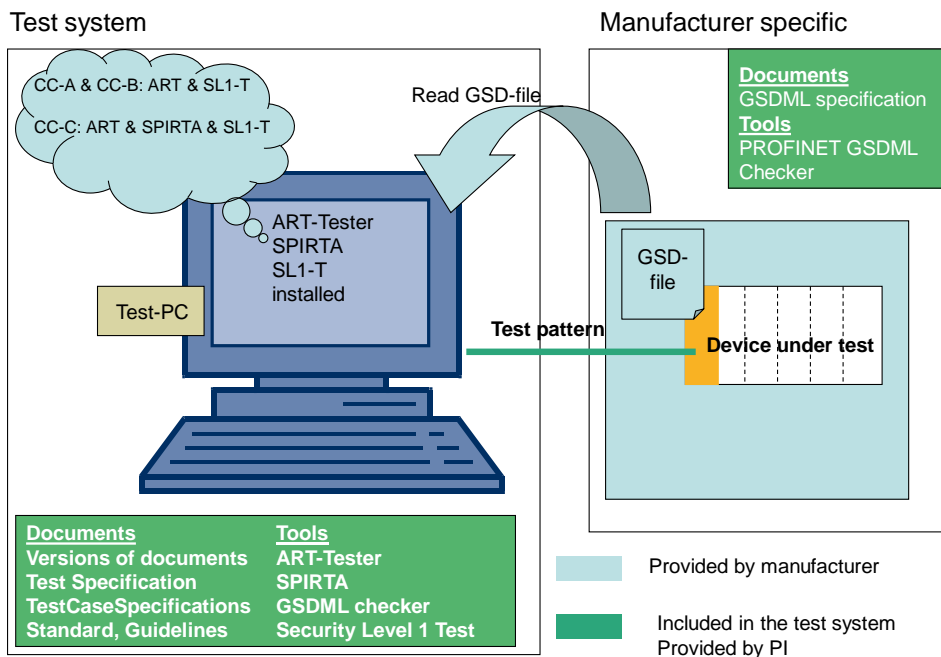
To obtain an application contract please contact the test lab (PITL). The actual list of PITLs with the internet addresses is available on

www.profinet.com

Versions for Certification

RT Tests, IRT Tests, device & controller									
Version standard (PNO/PI)	Version Testspec	Version Testcases	Tester electronic TCs	tested functionality	Status	BOT (first day for "application for certification test")	EOT (last day for "application for certification test")	EOT + 6 month (real stop for certification)	GSD-Version
V2.4	V2.4a Mar. 2019	included in Test bundle July 2019	ART V2.4.1.3 Spirta V2.4.1.0001	PNIO_Version V2.34, V2.35, V2.4 CC-D & RSI not tested , no IRT controller tests	mostly automated, some manual tests	2019-07-23	2020-08-31	2021-02-28	V2.34 / V2.35 / V2.4
V2.4 MU1	V2.41 Jan. 2020	included in Test bundle May 2020	ART V2.41.0.2 and Spirta V2.41.0.0002 included in PNTB	PNIO_Version V2.35, V2.4, V2.41 CC-D & RSI not tested , no IRT controller tests		2020-05-13	2021-08-31	2022-02-28	V2.35 / V2.4 / V2.41
PROFinergy Test									
Version Guideline (PNO/PI)	Version Testspec	Version Testcases	Tester electronic TCs	tested functionality	Status	BOT (first day for "application for certification test")	EOT (last day for "application for certification test")	EOT + 6 month (real stop for certification)	
V1.2 Apr. 2016	V2.4a Mar. 2019	included in Test bundle July 2019	integrated in PNTB (ART tester)	PROFinergy V 1.1, V 1.2	some manual checks necessary	2019-07-23	2020-08-31	2021-02-28	
V1.3 Sep. 2019	V2.41 Jan. 2020	included in Test bundle May 2020				2020-05-13	2021-08-31	2022-02-28	
Net Load Tests / SL 1 T									
Version Guideline (PNO/PI)	Version Testspec	Version Testcases	Tester electronic TCs	tested functionality	Status	BOT (first day for "application for certification test")	EOT (last day for "application for certification test")	EOT + 6 month (real stop for certification)	
Security Level 1 V1.2.1.1 Feb. 2017	V2.4a Mar. 2019	included in Test bundle May 2020	Installer test system V2.41.0.1 and TIA V15 / V15.1 engineering	NetLoadClass I, II and III	mostly automated, some manual tests	2019-07-23	2020-08-31	2021-02-28	
	V2.41 Jan. 2020					2020-05-13	2021-08-31	2022-02-28	

Overview test strategy:



Log of the test bundle (to last official release):

Version / Name of main folder	Information
V 2.4.2 2019-09-04	internal version new or updated files and documents: Updated controller-TCS_00004104_RPC_IP_UDP_EPM Updated manual_TCS_overview Updated document TFPC Updated CDML specification Updated CDML example Updated GSDML specification Updated GSDML Upgrade tool Updated GSDML checker Updated Spirta Updated AutomatedRtTester (ART) Updated Synaccess dll Added new folder with add TCs removed files and documents -no-
2019-10-09	new or updated files and documents: Updated AutomatedRtTester (ART) Updated Synaccess dll Updated add TCs removed files and documents -no-
V 2.4.3 2019-11-26	internal version new or updated files and documents: Renaming of folders and adaption of folder structure Added engineering and GSDML for controller test Updated Testspec (Review-Version d 2.41.1)

	<p>Updated Guideline PN-Cabling-Guide_2252 Updated Guideline PROFIenergy Updated GSDML Spec. Updated GSDML Upgrade Tool Updated TCS_00000001_DiffAccessWays Updated TCS_00000001_DiffAccessWays-SysRed-addOn Updated TCS_00000005_Pdev_Check_onePort Updated TCS_00000006_Diagnosis Updated TCS_00000012_Alarms_SysRed_AddOn Updated TCS_00000013_Interop Updated TCS_00000013_Interop_SysRed_AddOn Updated TCS_00000015_Interop-Controller Updated TCS_00000015_Interop-Controller_SysRed_AddOn Updated TCS_00000018_Pdev_Records Updated TCS_00000019_AR-ASE_SysRed_AddOn Updated TCS_00000026_MRP_Pdev Updated TCS_00000026_MRP_Pdev-SysRed-addOn Updated TCS_00000027_SysRed Updated TCS_4200_Devicelist Updated Test_Execution_Reference_Guide Updated Spirta Updated AutomatedRtTester (ART) Updated Synaccess dll Updated add TCs</p> <p>removed files and documents CRs for TS (TS updated with these CRs) manual_TCS_overview (not needed anymore)</p>
2020-01-14	<p>new or updated files and documents: Added TCS_00000120_PS Updated Versions for Certification Updated Testspec (preliminary) Updated TCS_00004101_Read_Write Updated TCS_00004104_RPC_IP_UDP_EPM Updated ART-C_TFPC Updated SL1-T Updated SPIRTA Updated AutomatedRtTester (ART) Updated Synaccess dll Updated add TCs</p> <p>removed files and documents -no-</p>
V 2.41.0	<p>Official release version</p>
2020-03-13	<p>new or updated files and documents: Updated "Versions for certification" Updated Testspec. and actual available CRs Updated TCS_00000001_DiffAccessWays Updated TCS_00000016_DCP Updated TCS_00000019_AR-ASE Updated TCS_00000020_IP_UDP_RPC_I&M_EPM Updated TCS_00000110_SL1 Updated TCS_00002048_TEDcheck Updated TCS_00004103_Alarm_Handling Updated TCS_00004104_RPC_IP_UDP_EPM Updated TCS_00004116_DCP-Ctrl New description of SR engineering New TCS_00000201_RSI New TCS_00004201_RSI-Ctrl New TCS_00008192_Addresssing_Mapping_PA</p>

	<p>New TCS_00008193_Parameter_Attributes_PA New TCS_00008195_Startup_PA New TCS_00008196_Physical_Block_PA Updated SPIRTA Updated AutomatedRtTester (ART) Updated Synaccess dll Updated add TCs Updated SL1-T including documents</p> <p>removed files and documents TCS_00000001_DiffAccessWays_PA_AddOn (replaced by PA; CR #3590) TCS_00000029_MCR (according to TSDG decision) TCS_00000030_AutoConfig (according to TSDG decision) TCS_00000031_ManSpecBlocks (according to TSDG decision) TCS_00003073_SyncSlave (according to TSDG decision)</p>
2020-05-07	<p>new or updated files and documents: Updated "Versions for certification" Updated actual available CRs for TS Updated TCS_00000001_DiffAccessWays Updated TCS_00000020_IP_UDP_RPC_I&M_EPM Updated TCS_00000110_SL1 Updated TCS_00000120_PS Updated TCS_00002048_TEDcheck Updated TCS_00004096_Interop_Ctrl Updated TCS_00004100_GSD_Handling Updated TCS_00004200_Devicelist Updated PNIO_Test_Execution_Reference_Guide Updated "How to install and to run the security level 1 tester" Updated standard documents including MIB description Updated CDML specification Updated CDML example Updated controller engineerings and ART GSDML Updated Guideline "PN-High-Availability" Updated Guideline "PN-Diagnosis" Updated spirta Updated AutomatedRtTester (ART) Updated Synaccess dll Updated add TCs New Test GSDML V3.9 for controller tests</p> <p>removed files and documents All TCS files regarding PA</p>

File Structure of the actual Bundle:

Main Folder: 2020-05-07_PN-test

File: Disclaimer PN Test Bundle.pdf

File: Framework-for-testing_2912_V25_Jun19.pdf

File: How-to-get-PN-certificate_2922n_V18_Jun19.pdf

File: Readme_V2.41.0.pdf (this file)

File: Testspec-PN_2572_V241_Jan20.pdf

File: TS-CRs_2020-04-27.pdf

File: V2.41.0 - PN_Versions_for_certifications.pdf

Folder: Guidelines

Folder: PN-Media-Red

File: IEC-62439-2-MGMT-MIB-20140509.mib

File: IEC-62439-2-MON-MIB-20140509.mib

File: PN-Media-Red-7212-V103-Apr18.pdf

File: IsoM_7192_v10_Jun16.pdf

File: PE_3802_V13_Sep19.pdf

File: PN-Cabling-Guide_2252_V411_Oct19.pdf

File: PN-Diagnosis_7142_V15_Feb20.pdf

File: PN-High-Availability-7242-V12-Feb20.pdf

File: PN-IRT-Engineering_7172_V135_Feb17.pdf

File: PN-SoE_7222_v10_Sep17.pdf

File: PN-Topology-7182-V20-Jul17.pdf

File: PNIO-Security-Level-1-Guideline_7302_V1211_Feb17.pdf

File: Profile-Guideline-I_M_3502_V21_May16.pdf

File: Profile-PA-Devices_3042_V40_May18.pdf

File: PROFINET_Field_Devices_eng_2018.pdf

File: PROFIsafe_3192_V26MU1_Aug18.pdf

Folder: CDML

File: CDML_2.41.0_example.xml

File: CDML-Spec_V.2.41.0.00002.pdf

Folder: GSDML

File: GSDML_2354_V2.4.zip

File: PROFINET_GSD_Checker_2.35.zip

File: UpgradeGSDML_V2.4.zip

Folder: PN-Spec

File: IEC-62439-2-MGMT-MIB-20140509.mib

File: IEC-62439-2-MON-MIB-20140509.mib

File: LLDP-EXT-IEC61158-TYPE10-MIB.mib

File: Overview-for-PI-specs_2702_V23_Oct10.pdf

File: PN-AL-protocol_2722_V24MU1_Mar20.pdf

File: PN-AL-services_2712_V24MU1_Mar20.pdf

File: PN-Profiles_2742_V24MU1_Mar20.pdf

Folder: PN-Test

Folder: engineering

Folder: controller_test

File: 2020-04-06_Siemens_Controller Test_V15.1.1.7z

File: 2020-04-15_BoschRexroth_Controller Test.xiwp

File: 2020-04-15_Phoenix_Controller Test.pcwex

File: GSDML-V2.35-CT-Device-20191118.xml

File: GSDML-V2.4-CT-Device-20200325.xml
File: GSDML-V3.9-CT-EngineeringTest-20200511.xml

Folder: device_test
File: Description_of_SR_Project.pdf
File: SR_Project.zip
File: StandardTestSetupFO_V15.zap15
File: TestProject_V15_IRT.zap15
File: TestProject_V15_manual_MAUType.zap15
File: TestProject_V15_MRP.zap15
File: TestProject_V15_RT.zap15

Folder: add_on_power-outlet
File: NP05B.cs
File: README.txt
File: synaccess.dll

Folder: add_on_Testcases
File: readme.txt
File: ReadOutInformation.cs
File: ReadOutInformation.dll

File: AutomatedRtTester_v2.41.0.2.zip
File: Spirta_V2_41_0_0002.zip

Folder: Security Level 1 Test
Folder: PLC_application
File: normal_d_V2.40.0.zap15
File: normal_d_V2.40.0_V15.1.zap15_1
File: TIA example program for Net Load Test V2.40.0.pdf

Folder: tester
File: How to install and to run the security level 1 tester V2.41.0.1_V1.0.pdf
File: pinetload_2.41.0.1_all.deb

Folder: TestCaseSpec
Folder: common
Folder: automated
File: TCS_00000110_SL1_V2.41.0.2.pdf
File: TCS_00002048_TEDcheck_V2.41.0.00001.pdf

Folder: not_automated
File: TCS_00000100_Hardware_V2.33.2.pdf
File: TCS_00004200_Devicelist_V2.41.0.1.pdf

Folder: future
File: TCS_00000017_DHCP_V2.35.2.pdf

Folder: controller
Folder: automated
File: ART-C_TFPC_V2.35b.pdf
File: Concept_Controller_Test_V2.35.pdf
File: TCS_00004101_Read_Write_V2.4.3.pdf
File: TCS_00004102_RTC_Ctrl_V_2.35.2.pdf
File: TCS_00004103_Alarm_Handling_V2.41.0.pdf
File: TCS_00004104_RPC_IP_UDP_EPM_V2.41.0.pdf
File: TCS_00004116_DCP-Ctrl_V2.41.0.pdf

Folder: not_automated
File: TCS_00004096_Interop_Ctrl_V2.41.0.pdf

File: TCS_V2.33_00004097_DHT_Ctrl_V_01.00.pdf
File: TCS_00004098_Behavior_Ctrl_V2.35.0.pdf
File: TCS_00004099_Error_Checks_V2.33.3.pdf
File: TCS_00004100_GSD_Handling_V2.41.0.1.pdf
File: TCS_00004103_Alarm_Handling_V2.34.0.pdf
File: TCS_V2.33_00004105_Legacy_Ctrl_V_02.00.pdf
File: TCS_V2.33_00004106_Topology_Read_V_01.00.pdf
File: TCS_V2.33_00004107_FSU_Ctrl_V_01_00.pdf
File: TCS_V2.33_00004108_IRT_Ctrl_V_01_00.pdf
File: TCS_00004109_MRP_Ctrl_V2.35.0.pdf

Folder: future

File: TCS_00004097_DHT_Ctrl_V2.35.3.pdf
File: TCS_00004098_Behavior_Ctrl_V2.35.3.pdf
File: TCS_00004099_Error_Checks_V2.35.3.pdf
File: TCS_00004106_Topology_Read_V2.35.3.pdf
File: TCS_00004107_FSU_Ctrl_V2.35.3.pdf
File: TCS_00004201_RSI-Ctrl_V2.41.0.pdf

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File: TCS_00001024_CMDEV_V2.33.3.1.pdf
File: TCS_00001025_CMDEV_Legacy_V2.33.3.1.pdf
File: TCS_00001026_COD_CYCLIC_V2.33.3.1.pdf
File: TCS_00001027_COD_LLDP_V2.33.3.1.pdf
File: TCS_00001028_COD_PTCP_V2.33.3.1.pdf
File: TCS_00001029_COD_RPC_V2.33.3.1.pdf
File: TCS_00001030_CPM_V2.33.3.1.pdf
File: TCS_00001031_Delay01_V2.33.3.1.pdf
File: TCS_00001032_Delay02_V2.33.3.1.pdf
File: TCS_00001033_Delay03_V2.33.3.1.pdf
File: TCS_00001034_DHT_V2.33.3.1.pdf
File: TCS_00001035_RedRelay01_V2.33.3.1.pdf
File: TCS_00001036_MUXDEMUXScheduler01_V2.33.3.1.pdf
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File: TCS_00001039_RedRelay02_V2.33.3.1.pdf
File: TCS_00001040_RedRelay03_V2.33.3.1.pdf
File: TCS_00001041_RedRelay04_V2.33.3.1.pdf
File: TCS_00001042_RTC3PSM_V2.35.2.pdf
File: TCS_00001043_Syncslave01_V2.33.3.1.pdf
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File: TCS_00001045_Syncslave03_V2.33.3.1.pdf
File: TCS_00001046_Syncslave04_V2.33.3.1.pdf
File: TCS_00001047_Syncslave05_V2.33.3.1.pdf
File: TCS_00001048_Syncslave06_V2.33.3.1.pdf
File: TCS_00001049_PerformanceIndicatorCheck01_V2.33.3.1.pdf
File: TCS_00001050_PerformanceIndicatorCheck02_V2.33.3.1.pdf
File: TCS_00001051_PerformanceIndicatorCheck03_V2.33.3.1.pdf
File: TCS_00001052_NRTFramePrioritization_V2.33.3.1.pdf
File: TCS_00001053_NRTStorageCapacity_V2.33.3.1.pdf

File: TCS_00001054_PermanentData_V2.33.3.1.pdf
File: TCS_00001055_PPM_V2.33.3.1.pdf
File: TCS_00001056_PTCTimeoutFactor_V2.33.3.1.pdf
File: TCS_00001057_ReductionRatio_V2.33.3.1.pdf
File: TCS_00001058_MRPD01_V2.33.3.1.pdf
File: TCS_00001059_MRPD02_V2.33.3.1.pdf
File: TCS_00001060_MRPD03_PerformanceClient_V2.33.3.1.pdf
File: TCS_00001061_MRPD03_PerformanceManager_V2.33.3.1.pdf
File: TCS_00001062_MRPD04_V2.33.3.1.pdf
File: TCS_00001063_MRPD05_V2.33.3.1.pdf
File: TCS_00001064_Fragmentation01_V2.33.3.1.pdf
File: TCS_00001065_Fragmentation02_V2.33.3.1.pdf
File: TCS_00001066_Fragmentation03_V2.33.3.1.pdf
File: TCS_00001067_FastForwarding_V2.33.3.1.pdf
File: TCS_00001068_PreambleShortening_V2.33.3.1.pdf
File: TCS_00001069_DFP_NonShortening_V2.33.3.1.pdf
File: TCS_00001070_DFP_Shortening_V2.33.3.1.pdf
File: TCS_00001071_ShortCycles_V2.33.3.1.pdf
File: TCS_00001072_SyncSignalCheck_V2.33.3.1.pdf
File: TCS_00001524_IRT_General_V2.35.2.pdf

Folder: device_RT

Folder: automated

File: TCS_00000001_DiffAccessWays_V2.41.0.2.pdf
File: TCS_00000001_DiffAccessWays-SysRed-addOn_V2.4.3.pdf
File: TCS_00000005_Pdev_Check_onePort_V2.4.3.pdf
File: TCS_00000006_Diagnosis_V2.4.3.pdf
File: TCS_00000012_Alarm_V2.34.2.pdf
File: TCS_00000012_Alarms_SysRed_AddOn_V2.4.3.pdf
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File: TCS_00000101_PE_V2.35.0.pdf

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File: TCS_00000028_FO-Diag_V2.34.0.pdf
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File: PNIO_Test_Execution_Reference_Guide_V2_41_0.xlsx

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File: TCS_00000032_ReportingSystem_V2.34.2.pdf

File: TCS_00000201_RSI_V2.41.0.pdf

Folder: PROFIsafe

Folder: automated

File: TCS_00000120_PS_V2.41.0.pdf

Helpful Tools:

PRONETA you can download at: <http://support.automation.siemens.com/WW/view/en/67460624>

Use of the PROFINET trademark, test and certification

PNO is entitled to grant licenses in respect of the trademark "PROFINET" (word formation trademark) applied for in the Federal Republic of Germany and in respect of all corresponding applications and/or registrations outside Germany (referred to hereinafter collectively as "TRADEMARK").

The Member is entitled, following certification of its equipment by PNO, to use the TRADEMARK on such certified equipment, relevant documentation, promotional material etc.

In order to obtain such a certificate, the Member must have its equipment put through a certification test at a test laboratory accredited by PNO.

Once the certification test has been passed to the satisfaction of PNO, PNO shall issue certification to the Member.

The Member shall not in any country initiate any applications in respect of the TRADEMARK or any other trademarks that might be mistaken for it.

If the Member is intending to sell his certified products in countries in which PNO has no trademark application or registration, the parties shall agree upon which party shall bear the costs arising from such applications.

It is understood that this agreement does not provide the Member with any right in respect of the Trademark other than that of using the TRADEMARK in accordance with the provisions of this agreement, and that the Member shall not, out of use of the TRADEMARK, derive any claims against PNO.

PN Versions for certifications

This document is now part of this Readme file and gives you an overview about the current test possibilities. Please read first!

How to get a PN certificate and Framework-for-testing

These documents give you an overview about the certification process.

GSDML Specification

In this area you can find a description how to write the GSDML file for your device. Here also are attached examples and style sheets.

PROFINET GSD Checker

With the help of this software you can check the correctness of GSDML files.
Minimum requirements see included text file

GSDML Upgrade Tool

Here an upgrade tool for GSDML to the latest version is placed.

ControllerDescription

This file shall be used to specify the behavior of a controller for testing. The manufacturer of the controller DUT shall fill out this file so that the PITL has got a reference regarding the test of IOC. For an IOC this file correlates to the GSD file of an IOD. The description of this file is available as CDML-Spec within this test bundle.

PROFINET test

For the requirements please see the manuals and the Test Specification document. The test setups are described in the Test Specification document.

Test Specification for PROFINET

This document describes which tests have to be done in an authorized PROFINET test laboratory to get a PROFINET certificate for a new developed PROFINET device.

Net Load test / Security Level 1 test

For the simple execution of the security level 1 (Net Load) test according to the guidelines the PNO offers a test environment.

For the Minimum System Requirements, installing and test preparation please read the document "How to install and to run the security level 1 tester".

Guidelines

The actual valid PI Guidelines describing the requirements, handling and usage of:

- diagnosis
- Topology discovery
- IRT engineering
- High Availability
- I&M
- profile PROFlenergy
- profile PROFIsafe
- Cabling and Interconnection Technology
- Isochronous Mode
- PROFINET Field Devices, Recommendations for Design and Implementation
- Sequence of Events (SoE)
- Media Redundancy
- Security Level 1 / Net Load

Test Case Specifications

These are the actual valid Test Case Specifications that extend the file "Test Specification PROFINET devices". The documents valid for the particular tests are mentioned in the Test Specification. The numbering within the document name roughly is:

00000001 to 00001023 for RT device testing and common testing, including PE and PS Profile tests.

00001024 to 00002047 for IRT device testing.

00002048 to 00003071 for Topology check.

00003072 to 00004095 for TSN testing.

00004096 to 00005119 for RT controller testing.

00005120 to 00006143 for IRT controller testing.

00006144 to 00007167 for Topology controller testing.

00007168 to 00008191 for TSN controller testing.

00008192 to 00009215 for PA profile testing.

00009216 to 00010239 for additional PA profile testing.

00010240 to 00065535 for later use.