



Data Sheet CODESYS PROFINET Device SL

The CODESYS PROFINET Device enables a CODESYS PLC to act as a PROFINET Device that is programmable with the CODESYS Development System.

Product description

PROFINET (Process Field Network) is an open standard for realtime industrial Ethernet systems in automation technology. It is promoted by the user organization PI (PROFIBUS & PROFINET International as an umbrella group of the PROFIBUS user organization PNO) and is regarded as the successor of PROFIBUS. PROFINET uses UDP/IP and IEEE 802.3 (Standard Ethernet) for acyclic services and/or I/O communication

The fully integrated CODESYS PROFINET Device Solution provides a uniform configurator for different variants of underlying PROFINET Device communication stacks:

- CODESYS PROFINET Device (IEC)
Protocol stack in the form of a CODESYS library (in IEC 61131-3 code), operates on standard network interface cards.
The Ethernet adapter is not used exclusively, it's still available for all other applications using TCP/IP on this adapter (e.g. CODESYS Visualization, Web Browser).

CODESYS PROFINET Device Configurator

- Configurator for settings of PROFINET Device
- Sample GSDML file included in scope of delivery
- Configuration of module's in- and output-mapping
- Status page with detailed view of currently pending diagnostics

Profinet-Stack (IEC)

CODESYS PROFINET Device Stack in principle can run on any standard Ethernet adapter hardware (see requirements and restrictions). This Ethernet adapter is still be used for other services like CODESYS Communication (with IDE), Web-Server, or other CODESYS Fieldbuses (except EtherCAT). The CODESYS Runtime and the operating system (e.g. firewall) have to be configured correctly. For details, see CODESYS Online Help / Fieldbus Support (<https://help.codesys.com/>)

Feature	CODESYS PROFINET Device (IEC)
PROFINET Specification	V2.42
Conformance Class	B
Max. IO-Data	1440 input and 1440 byte output
Max. acyclic data	16 KB

Platforms / OS (see restrictions)	Windows, Linux, VxWorks
CPU	32/64 Bit Little-/Big-Endian
Provider-/Consumer-Status	yes
Shared Device	no
Device Access AR	no
Dual Port	see below
MRP	Client, see Dual Port

CODESYS PROFINET Device (IEC) and Dual-Port Interface:

With standard Ethernet Adapter hardware only single port devices are possible, i.e. each PROFINET Device can handle just one port. (The system itself may have more than one Ethernet adapter, maybe running a PROFINET Controller on it).

A Dual-Port Device (e.g. for MRP support or a 'daisy-chain') may be implemented with special dual-port Ethernet chipsets, but this requires some runtime adaptations by the OEM.

Programming Interface (API for IEC application)

The PROFINET Device provides an API for Profinet related functions and utilities that can be used by the application at runtime.

Function	Description
Generic access on device- and module-configuration	Function Block ProfinetCommon.DeviceIterator and SubmoduleIterator Generic API for iterating Slave- or Module Configuration and Status
Add/Remove Diagnosis Entries	Function Block ProfinetCommon.UpdateDiagnosisEntry Update the device's local Diagnosis Database, send diagnosis-alarm
Send Alarms	Function Block CommFB.SALARM
Acyclic Services	Function Block CommFB.PRIVREC / RCVREC e.g. Receive Parameters from PROFINET Controller
Connection Establishment	Function Block ProfinetCommon.DeviceAR A Profinet Device application uses this function block for controlling all phases of the connection establishment.
Reconfigure	Function Block DED.Reconfigure Enable/Disable modules or the complete PROFINET stack
Programmatic Configuration	Alternatively to the usual configuration with a declaration via the device tree, the

Function	Description
	<hr/> <p>PROFINET Device can also be configured purely programmatic.</p> <p>The library ProfinetDeviceConfig provides a programming interface which does not require instances of device objects.</p> <hr/>

Screenshots

The screenshot shows the CODESYS IDE interface for a project named 'PN_Device_Raspi'. The 'Devices' tree on the left shows a 'PN_Device (CODESYS Profnet Device)' connected to an 'Ethernet (Ethernet)'. The main window displays the 'General' tab for the 'PN_Device [Device: Ethernet]' with the following diagnostic information:

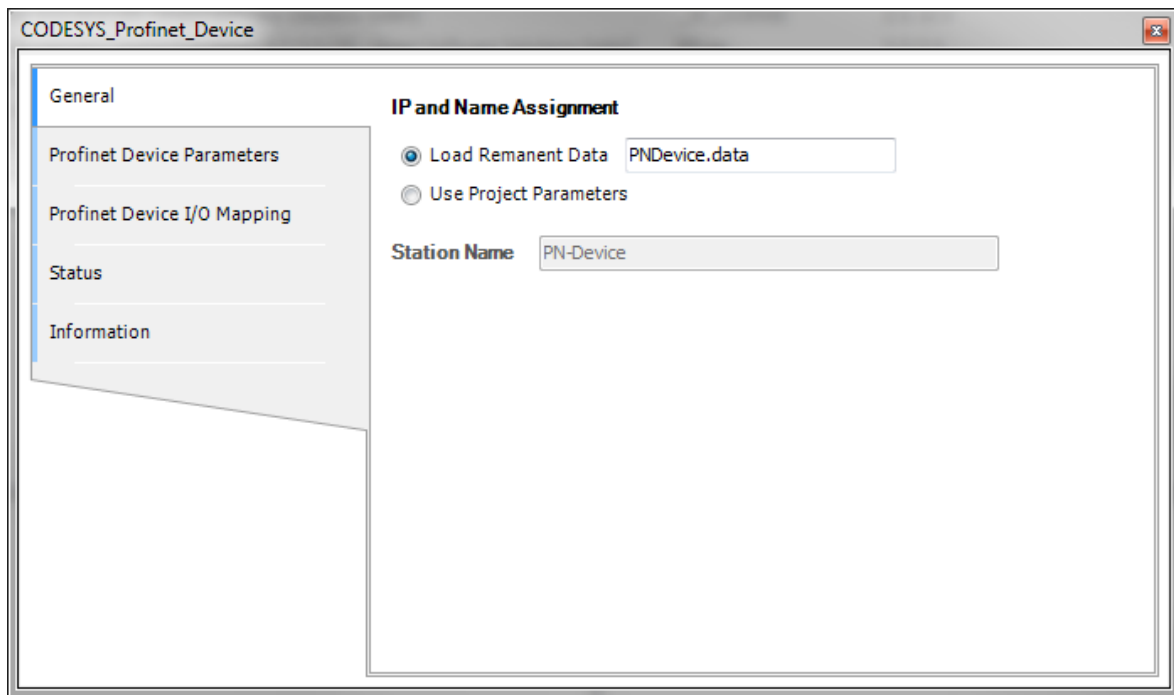
Driver Diag	Profnet IO Device Driver diagnostic information
PN-Device Status	Open
Connections	0
Online	TRUE
IP Active	FALSE
Stationname	'pn-device'
IPParameter	currently active IP-Settings
Ethernet Statistic	
Link Status	Up
MALType	100BASE-TX full duplex mode

The 'Last Diagnostic Message' section is empty. The 'Breakpoints' window at the bottom shows a table with columns: POU, Location, Instance path, Tasks, Condition, Hit count condition, Current hit count, and Watched values last updated. The status bar at the bottom indicates 'Precompile: ✓', 'RUN', and 'Program loaded'.

The screenshot shows the CODESYS IDE interface for a project named 'Unit8 project'. The 'Devices' tree on the left shows a 'PN_Device (PN-Device)' with 'Input_structured' and 'Output_structured' modules. The main window displays the 'General' tab for the 'Input_structured' module with the following I/O mapping table:

Variable	Mapping	Channel	Address	Type	Unit	Description
PN20Dev-Module Parameters		Outputs	%D11			Output from controller to device
PN20Dev-Module I/O Mapping		Inputs	%I11			Input from device to controller

The status bar at the bottom indicates 'Precompile: ✓' and 'Current user: (nobody)'.



General information

Supplier:

CODESYS GmbH
 Memminger Strasse 151
 87439 Kempten
 Germany

Support:

Technical support is not included with this product. To receive technical support, please purchase a CODESYS Support Ticket.

<https://support.codesys.com>

Item:

CODESYS PROFINET Device SL

Item number:

2303000021

Sales / Source of supply:

CODESYS Store
<https://store.codesys.com>

Included in delivery:

- License key

System requirements and restrictions

Programming System	CODESYS Development System V3.5.17.0 or higher
Runtime System	CODESYS Control V3.5.17.0 or higher CODESYS Control V3.5.17.30 or higher required for certification
Supported Platforms/ Devices	CODESYS runtime system with these components * SysEthernet * SysSocket Note: Use the project <i>Device Reader</i> to find out the supported features of your device. <i>Device Reader</i> is available for free in the CODESYS Store.
Additional Requirements	Technical requirements * Ethernet Adapter (for Control RTE with Intel or Realtek chip)

Legal requirements

A certification by a PI Test Lab is mandatory for every PROFINET Controller or Device that is sold to end-users.

Details on certification can be found here:

www.profibus.com/products/product-certification/

Restrictions

Certification is currently possible for

* Control RTE > V3.5.18.30

* Linux based runtimes > V3.5.17.30

Licensing



DEVICE

Single Device License: The license can be used on the target device/PLC on which the CODESYS Runtime System is installed.

Licenses are activated on a software-based license container (soft container), which is permanently connected to the controller. Alternatively the license can be stored on a CODESYS Key (USB-Dongle). By replugging the CODESYS Key, the license can be used on any other controller

Required Accessories

Optional: CODESYS Key

Note: Not all CODESYS features are available in all territories. For more information on geographic restrictions, please contact sales@codesys.com.

Note: Technical specifications are subject to change. Errors and omissions excepted. The content of the current online version of this document applies.