



Integrating the FL SWITCH 2000 series PROFINET switches into PLCnext Engineer

Quick start guide



Quick start guide

Integrating the FL SWITCH 2000 series PROFINET switches into PLCnext Engineer

UM EN QS FL SWITCH 2000 PLCNEXT ENGINEER, Revision 00

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This user manual is valid for:

Designation	Order No.	Designation	Order No.
FL NAT 2208	2702882	FL SWITCH 2308 PN	1009220
FL NAT 2304-2GC-2SFP	2702981	FL SWITCH 2312-2GC-2SFP	2702910
FL SWITCH 2116	2702908	FL SWITCH 2314-2SFP	1006191
FL SWITCH 2204-2TC-2SFX	2702334	FL SWITCH 2314-2SFP PN	1031683
FL SWITCH 2206-2FX	2702330	FL SWITCH 2316	2702909
FL SWITCH 2206-2FX SM	2702331	FL SWITCH 2316 PN	1031673
FL SWITCH 2206-2FX SM ST	2702333	FL SWITCH 2404-2TC-2SFX	1088853
FL SWITCH 2206-2FX ST	2702332	FL SWITCH 2406-2SFX	1043414
FL SWITCH 2206-2SFX	2702969	FL SWITCH 2406-2SFX PN	1089126
FL SWITCH 2206-2SFX PN	1044028	FL SWITCH 2408	1043412
FL SWITCH 2206C-2FX	1095628	FL SWITCH 2408 PN	1089133
FL SWITCH 2207-FX	2702328	FL SWITCH 2412-2TC-2SFX	1088875
FL SWITCH 2207-FX SM	2702329	FL SWITCH 2414-2SFX	1043423
FL SWITCH 2208 PN	1044024	FL SWITCH 2414-2SFX PN	1089139
FL SWITCH 2208C	1095627	FL SWITCH 2416	1043416
FL SWITCH 2212-2TC-2SFX	2702907	FL SWITCH 2416 PN	1089150
FL SWITCH 2214-2FX	2702905	FL SWITCH 2504-2GC-2SFP	1088872
FL SWITCH 2214-2FX SM	2702906	FL SWITCH 2506-2SFP	1043491
FL SWITCH 2214-2SFX	1006188	FL SWITCH 2506-2SFP PN	1089135
FL SWITCH 2214-2SFX PN	1044030	FL SWITCH 2508	1043484
FL SWITCH 2216	2702904	FL SWITCH 2508 PN	1089134
FL SWITCH 2216 PN	1044029	FL SWITCH 2512-2GC-2SFP	1088856
FL SWITCH 2304-2GC-2SFP	2702653	FL SWITCH 2514-2SFP	1043499
FL SWITCH 2306-2SFP	2702970	FL SWITCH 2514-2SFP PN	1089154
FL SWITCH 2306-2SFP PN	1009222	FL SWITCH 2516	1043496
FL SWITCH 2308	2702652	FL SWITCH 2516 PN	1089205

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1 Integrating the 2000 series switches into PLCnext Engineer

This quick start guide describes how to integrate a 2000 series Managed Switch from Phoenix Contact into a PROFINET environment. It also gives an overview of the options for configuring the startup parameters.

This quick start guide applies to switches from the 2000 or higher series (FL SWITCH 2...). Switches from this series with "PN" in their product name (FL SWITCH 2... PN...) are preset to PROFINET.

You need to switch switches without "PN" in the product name to the PROFINET mode. You can set the PROFINET mode via the web interface or via the "Mode" button.

You also need to switch the FL NAT... switches to the PROFINET mode. For FL NAT... devices, the PROFINET function is only available in the LAN 1.

Example project

The example project uses the following components:

- **Industrial Ethernet Switch** from Phoenix Contact:
FL SWITCH 2207-FX SM, 2702329
Managed Switch 2000
- **Controller** from Phoenix Contact
AXC F 2152, 2404267
PLCnext Control to directly control Axioline F I/Os
- **Software** PLCnext Engineer from Phoenix Contact, version 2020.0 or later
PLCNEXT ENGINEER, 1046008
Engineering software platform for Phoenix Contact automation controllers

Prerequisite

- The PLCnext Engineer software is installed.
- In PLCnext Engineer, a project has been created into which the AXC F 2152 controller is integrated.
- The FL SWITCH 2207-FX SM switch is set to PROFINET mode.

More information

In addition to this quick start guide, you'll find an overview of the PROFINET functions of the 2000 series switches in the following user manual:

- User manual, German, Konfiguration der FL SWITCH 2000 und FL NAT 2000 Produktfamilie, UM DE SW FL SWITCH 2000 Konfiguration
- User manual, English, configuration of the FL SWITCH 2000 and FL NAT 2000 product family, UM EN SW FL SWITCH 2000 configuration

The user manual can be downloaded at: phoenixcontact.net/qr/2702329

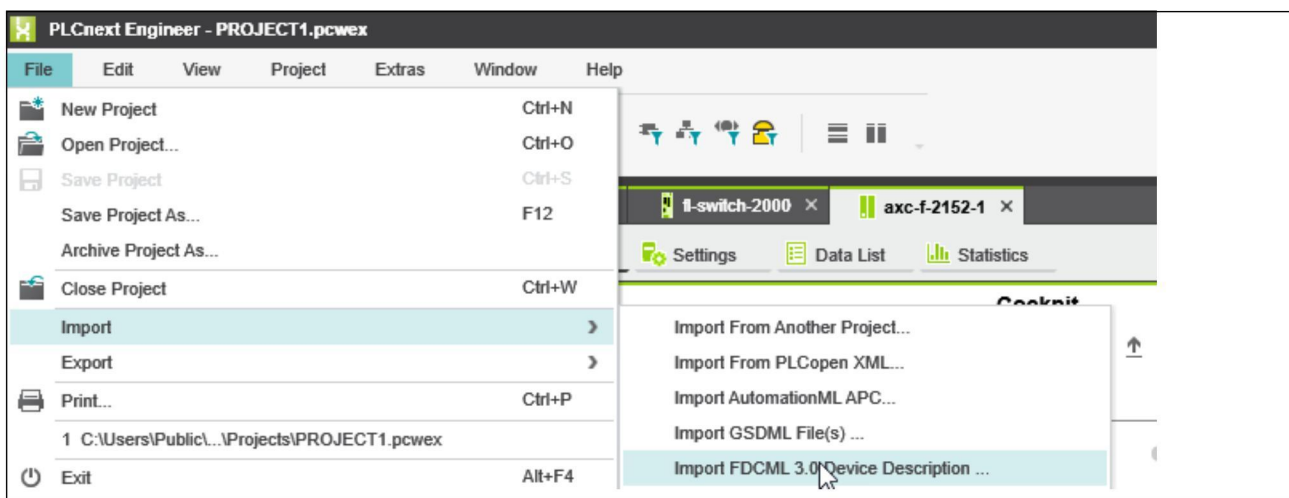
1.1 Integrating the proper FDCML file

To begin the project, you need to import the device description of the switch into PLCnext Engineer.

The FDCML file is available in the download area of the switch in question. To download the FDCML file, select the package that matches your firmware. Besides the firmware and the release notes, the package also contains the FDCML and GSDML files.

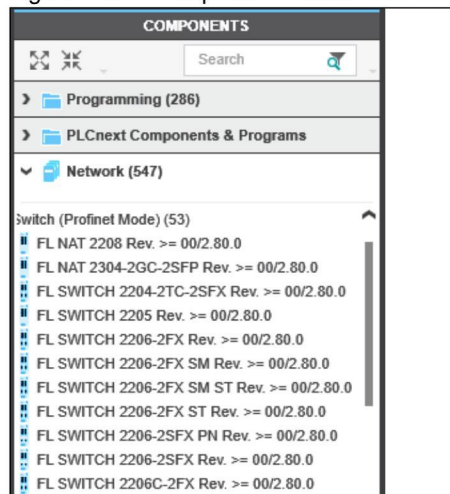
- To integrate the FDCML file, choose “File, Import, Import FDCML 3.0 Device Description ...”.
 - Select the FDCML 3.0 file you need.
- ⇒ After it has been selected, the device description is integrated into the project.

Figure 1-1 Importing the FDCML file



You can look at and choose the device descriptions in the components area.

Figure 1-2 Imported FDCML files in the component area

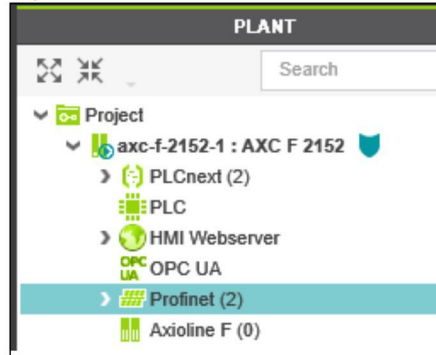


1.2 Scanning the PROFINET network

After you have imported the device description of the switch, scan the PROFINET network for connected devices.

- On the left side of the “PLANT” area, double-click “Profinet” to open the “Profinet” tab.

Figure 1-3 PLANT



- On the “Profinet” tab, under “Online Devices”, you’ll find a button for searching for devices in the PROFINET network.
All found PROFINET devices will be listed in a table.
All PROFINET devices automatically receive an IP address via DCP. There is a defined IP address range for each project.

Figure 1-4 Scan results

The screenshot shows the 'Online Devices' window. At the top, it displays the network interface 'Ethernet Intel(R) Ethernet Connection I217-LM' and a search bar. Below the search bar, it indicates 'Last scan on 02.04.2020 11:30:3'. The main content is a table with the following data:

Name of station (Online)	Function	Location	IP address	Subnet mask	Default gateway	Type
fl-switch-2000			192.168.1.2	255.255.255.0	192.168.1.2	FL SWITCH 2207-FX SM
axc-f-2152-1	Not supported	Not supported	192.168.1.10	255.255.255.0		AXC F 2152

1.3 Adding the found switches

- Select the switch and open the context menu to add it to the project.
- ⇒ The switch is now part of the project. You can configure the switch for startup in the “PLANT” window, under PROFINET.

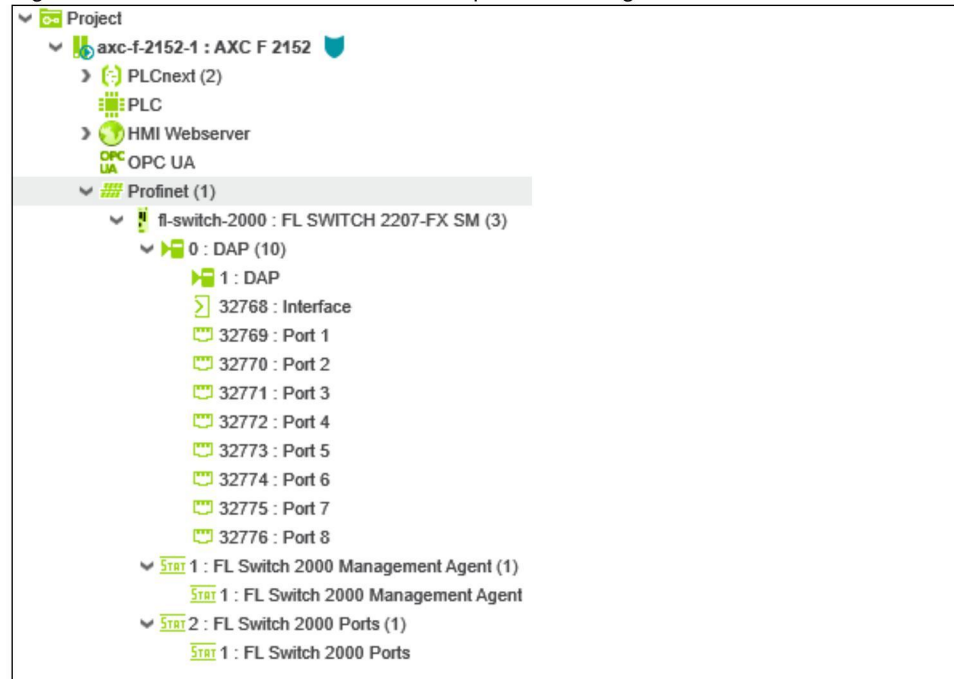
Figure 1-5 Adding devices to the PROFINET project

Subnet mask	Default gateway	Type	Revision	Status	Name of station (Online)	Function	Location
255.255.255.0	192.168.1.2	FL SWITCH 2207-FX SM	0/N2.80.0	✓	fl-switch-2000		
				⚙️	axc-f-2152-1	Not supported	Not su

1.4 Setting the startup parameters

Configuring the startup parameters will make it possible to use the switch with the proper parameter record. This parameter record is transmitted from the controller to the switch when the application starts up. The configurations are linked to the various PROFINET nodes. This section describes the possible configuration objects and where to find them.

Figure 1-6 Overview of the PROFINET parameter ranges



“DAP, Interface” node

- Under “Profinet”, open the “DAP, Interface” node.

On the DAP node, you can configure PROFINET-specific time values such as cycle time and monitor time. The general MRP parameters for the switch are also set on this node.

Figure 1-7 Setting options in the “DAP, Interface” category

The screenshot shows a software interface titled "Settings" with a sidebar on the left containing navigation options: "All", "Identity", "Profinet interface sub module", and "MRP 1". The main area is titled "Profinet interface sub module" and contains the following configuration fields:

Profinet interface sub module	
Subslot number:	32768
Node ID: ⓘ	2
RT Class:	RT
Reduction ratio: ⓘ	512
Update time: ⓘ	512
Monitor factor: ⓘ	3
Monitor time: ⓘ	1536
MRP 1	
Role:	Manager
Domain UUID:	ffff - ff - ff - ff - ffffff
Domain:	PLCNext-Engineer-MRP-Default
Prio:	0
TOPchgT:	1
TOPNRmax:	3
TSTshortT:	10

“DAP, Port” node

- Under “Profinet”, open the “DAP, Port” node.

Under Port 1 to Port 8 in the DAP, you can enter parameters related to the network structure, such as function or location, and make MRP settings for the individual ports.

Figure 1-8 Setting options in the “DAP, Port” category

Settings

Identity

Product name: Port 1

Article number: none

Version:

Function: ①

Location: ①

Profinet port sub module

Subslot number: 32769

Node ID: ① 3

Ring port configuration

Supports ring port configuration:

Is default ring port:

MRP domain UUID: ffffffff - ffff - ffff - ffff - ffffffff

Selected ring port: Yes

“Management Agent” node

- Under “Profinet”, open the “Management Agent” node.

In the “Management Agent” area, you can make settings for the general PROFINET alarm behavior of the switch:

Figure 1-9 Setting options in the “Management Agent” category

Parameters	
Profinet alarm parameter	
Alarm Power Supply:	no change
Alarm MRP Ring Fail:	no change
Alarm PlugMem missing:	no change

You can also make the following settings:

- RSTP (Rapid Spanning Tree Protocol)
- Additional PROFINET alarms
- Password, time, and user interface settings

Figure 1-10 Setting options in the “Management Agent” category

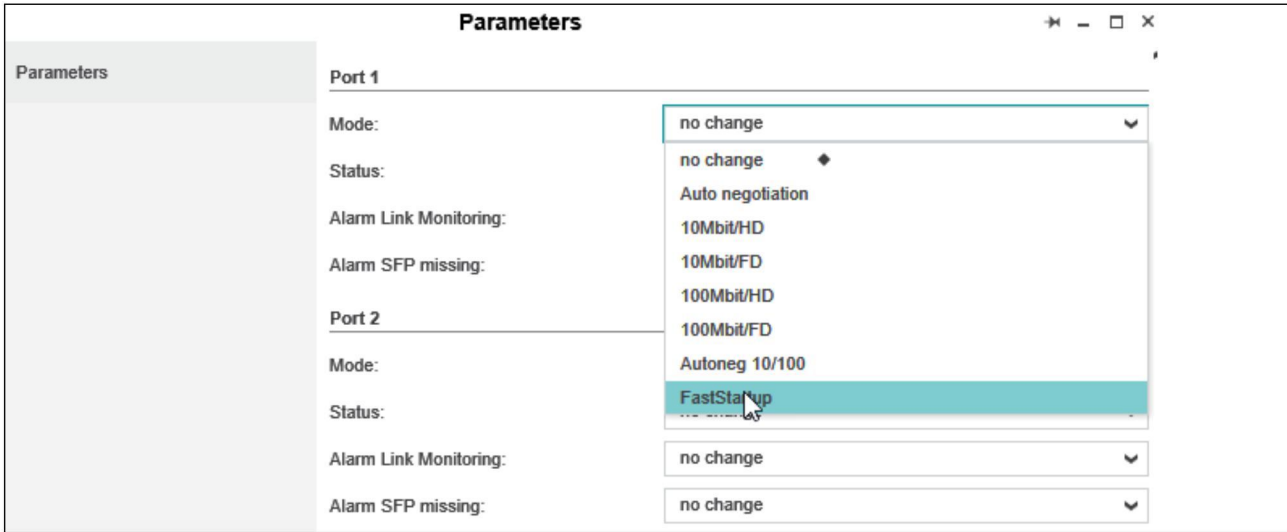
Parameters	
Device configuration parameter	
RSTP Mode:	RSTP
RSTP Priority:	0
Web Server:	HTTPS
SNMP Agent:	SNMPv3
CLI service:	SSH
CLI network scripting:	disable
Alarm output for power supply:	enable
Alarm output for link monitoring:	disable
Alarm output for MRP failure:	enable
Alarm output for plugable memory missing:	no change
Current admin password:	
Set admin password:	
SNTP Mode:	UNICAST
SNTP UTC offset:	-8h (Los Angeles)
SNTP Server IP:	192.168.1.202

“FL Switch 2000 Ports” node

- Under “Profinet”, open the “FL Switch 2000 Ports” node.

Here you’ll find the usual port parameters of a switch, such as the mode, the status, and the port-specific alarms.

Figure 1-11 Setting options in the “FL Switch 2000 Ports” category



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Flachsmarktstraße 8
32825 Blomberg
GERMANY

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See the product details here

PHOENIX CONTACT GmbH & Co. KG
Flachmarktstraße 8
32825 Blomberg, Germany
Phone: +49 5235 3-00
Fax: +49 5235 3-41200
E-mail: info@phoenixcontact.com
phoenixcontact.com

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