

TechTip: Configuring PLC devices with device description files

Identification of the PLC devices for the PLC data exchange is carried out both in EPLAN and in the PLC configuration program and is effected either by means of the PLC type designation or by specifying a device description file (GSD / GSDML / EDS file). A device description file contains device information that is not contained in the default hardware catalog of a manufacturer.

Often PLC devices contain integrated modules. This means that for the description by means of a device description file such a PLC device is combined from two or more modules with their own indexes in the device description file.

This TechTip helps you in configuring PLC devices of this type in EPLAN to be able to perform a PLC bus data exchange.

How do I recognize a PLC device with integrated modules?

EPLAN does not evaluate the content of device description files and can therefore not recognize the PLC devices mentioned above.

What can help us are the manufacturers of such devices, often also the PLC configuration programs as is shown below using the examples of AML data that were exported from SIEMENS TIA Portal.

Configuration suggestion in EPLAN

A PLC configuration program cannot recognize on the basis of the structure of the device description file that it is a single device. For this reason two (apparently) independent devices are exported.

EPLAN cannot detect that the devices are related during the data import from the AML file. Since Version 2.9 this relation can be stored in the parts management. You can also find a description in the TechTip "**TechTip-Preparation-of-master-data-for-PLC-data-exchange**".

Previously both devices were configured independently in EPLAN. Thus structure data could be stored at the integrated module, amongst others:

- **PLC card is placed on rack ID**
- **Position (slot / module)**
- **Device description: File name** and **Device description: Index in file**

The disadvantage here is that the integrated modules have their own DT even though they are not real devices.

Since EPLAN Version 2.9 it is possible to combine the apparently independent devices via the parts management as one device with PLC subdevices. To do this all other integrated modules are entered as PLC subdevices at the part of the main device. You can also find the details in the TechTip "**TechTip-Preparation-of-master-data-for-PLC-data-exchange**".

Advantages:

- The integrated modules do not require their own DT.
- The parts data and the configuration in the schematic correspond with the real devices.

Disadvantage:

- An import in EPLAN requires corresponding parts data.

Important:

If no parts data is available, the relation of the devices cannot be detected during importing. Therefore the integrated modules are imported as separate devices!

Note on the examples:

The indexes of the device description files additionally have the specification of a preceding context in the AML file (for example M/1000). This context is automatically detected / supplemented by EPLAN at the main device during the import and export and does not have to be explicitly specified in EPLAN during the configuration.

For PLC subdevices this information **must** be available:

- D/ (Device)
- R/ (Rack)
- DAP/ (Device Access Point)
- M/ (Module)

Example 1: X67 PROFINET field bus coupler of B&R

The device is modeled in SIEMENS TIA Portal by means of the device description file and is exported into an AML file.

Afterwards the specification <GSD> stands for the used device description file "GSD:GSDML-V2.25-BR-X67BCE321.L12-20160415.XML".

Structure of the AML file:

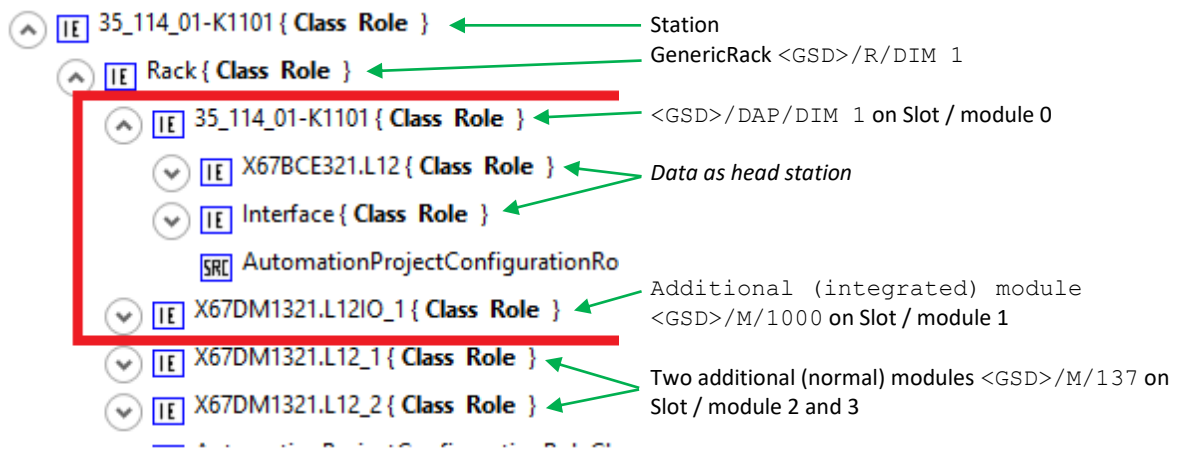


Table view of the PLC data in the AML file:

Row			Slot / module	Typenidentifier		
1	Station			<GSD>/D		
2		Rack		<GSD>/R/DIM 1		
3			Head module	0	<GSD>/DAP/DIM 1	→ This is a PLC device
7			Module L12IO_1	1	<GSD>/M/1000	
8			Module L12_1	2	<GSD>/M/137	
9			Module L12_2	3	<GSD>/M/137	

The following exist here:

- A head station (Head Module) [Row 3]
- The integrated module [Row 7]
- Two additional modules [Row 8 and 9]

The following data has to be entered at the individual PLC boxes according to the configuration suggestion:

Row	Rack	Is placed on the rack	Position (slot / module)	Device description: Index in file	Bus coupler / head station
3	0			DIM 1	<input checked="" type="checkbox"/>
8		0	2	137	<input type="checkbox"/>
9		0	3	137	<input type="checkbox"/>

Data of the main device (Row 3) in the parts management:

Tab Function templates:

Function definition	Bus system	Plug designation	PLC subdevice: Index
PLC box	Other bus systems		
Network / bus cable connection point, general	Ethernet	P1	
Network / bus cable connection point, general	Ethernet	P2	
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1
PLC connection point, multi-function			1

For the bus ports the **Bus interface: Name** property has to be specified during the configuration (for example x1). The first bus port is also to be identified as **Bus interface: Main bus port**: This bus port has all relevant bus data (for example **Physical network: Bus ID / item number**).

For the PLC I/O connection points the connection point designations and channel designations should be specified so that the assignment to the connection points in the project is unique.

Tab Properties:

Property	Value
Device description: File name	GSDML-V2.25-BR-X67BCE321.L12-20160415.XML
Device description: Index in file	DIM 1
Object description	BCE321.L12
PLC station type	X67
Bus coupler / head station	<input checked="" type="checkbox"/>
PLC subdevice 1: Name	IO module
PLC subdevice 1: Position	1
PLC subdevice 1: Device description: Index in file	DAP/DIM 1#BUILTIN

Note:

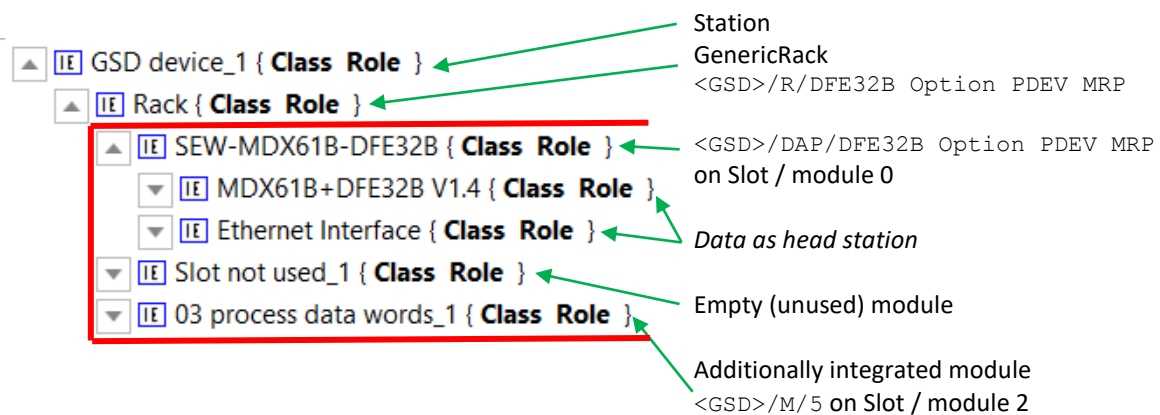
For the respective PLC subdevice, the index including context **must** be specified.

Example 2: Frequency inverter of SEW

The device is modeled in SIEMENS TIA Portal by means of the device description file and is exported into an AML file.

Afterwards the specification <GSD> stands for the used device description file "GSD:GSDML-V2.25-DFE-DFS-2Ports-20150902.XML".

Structure of the AML file:



Tabular view of the PLC data of the AML file:

Row			Slot / module	TypenIdentifier	
1	Station			<GSD>/D	
2		Rack		<GSD>/R/DFE32B Option PDEV MRP	
3		Head module	0	<GSD>/DAP/DFE32B Option PDEV MRP	→ This is a PLC device
6		Slot not used	1		
7		PD Channel	2	<GSD>/M/5	

PD Channel is the module here for transferring the **Process Data**, the index (here: 5) depends on the used module.

The following exist here:

- A head station (Head Module) [Row 3]
- The integrated module [Row 7]
- An unused (empty) module [line 6]

The following data has to be entered at the individual PLC boxes according to the configuration suggestion:

Row	Rack	Is placed on the rack	Position (slot / module)	Device description: Index in file	Bus coupler / head station
3	0		0	DFE32B Option PDEV MRP	<input checked="" type="checkbox"/>

Data of the main device (Row 3) in the parts management:

Tab Function templates:

Function definition	Bus system	Plug designation
PLC box	Other bus systems	
Network / bus cable connection point, general	Ethernet	P1 R
Network / bus cable connection point, general	Ethernet	P2 R

For the bus ports the **Bus interface: Name** property has to be specified during the configuration (for example x1). The first bus port is also to be identified as **Bus interface: Main bus port**: This bus port has all relevant bus data (for example **Physical network: Bus ID / item number**).

Tab Properties:

Property	Value
Device description: File name	GSDML-V2.25-DFE-DFS-2Ports-20150902.XML
Device description: Index in file	DFE32B Option PDEV MRP
Object description	Frequency inverter SEW
PLC station type	SEW
Bus coupler / head station	<input checked="" type="checkbox"/>
PLC subdevice 1: Name	Slot not used
PLC subdevice 1: Position	1
PLC subdevice 1: Device description: Index in file	DAP/DFE32B Option PDEV MRP#BUILTIN
PLC subdevice 2: Name	03 process data words
PLC subdevice 2: Position	2
PLC subdevice 2: Device description: Index in file	M/5



Depending on the process data module (PD Channel) used the associated index is specified in the device description file for PLC subdevice 2.

Note:

For the respective PLC subdevice, the index including context **must** be specified.