TechTip: Overview of the PLC properties

Contents

1. Use

This TechTip helps you to carry out the property settings at PLC connection points and PLC devices that are required for PLC data exchange with PLC configuration programs in AutomationML format.

For the fundamental description of a property please refer to the current EPLAN help:

- Terminals, Cables, Plugs, and PLC Information > PLC > Basics
- EPLAN Properties: Overview

This TechTip provides supplementary information about the properties.

With Version 2.7 of EPLAN Electric P8 numerous new check runs were implemented in the PLC field which help you in configuring the PLC data exchange.

Information for reading

Structure of the individual tables:

Property	**<ID>**
Input format	
Notes (for example from parts management, designation in other PLC configuration programs)	
Particular aspects for PLC data exchange	

2. AutomationML GUID

GUIDs are used for identification of the individual objects during data exchange using the AutomationML format. These GUIDs are generated as required before a data export (the project must therefore be writeable for a data export) and should no longer be modified by the user:

AutomationML GUID	**25030**
In accordance with AutomationML specification. https://www.automationml.org/	

AutomationML GUID 2	**25031 [1...12]**
In accordance with AutomationML specification. https://www.automationml.org/	
Current Index 1 is used: - *At PLC connection points (input or output)* - *At PLC cards*	

AutomationML GUID (accessories)	**20399 [1...50]**
In accordance with AutomationML specification. https://www.automationml.org/	
A PLC type designation must be entered for these parts in the parts management to allow export of the accessory parts.	

An AutomationML GUID has the format "xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx", with "x" standing for one of the characters "0 1 2 3 4 5 6 7 8 9 a b c d e f A B C D E F".

3. Settings at PLC devices

PLC devices are always to be configured as PLC boxes. This includes devices with I/O connection points or devices that require further PLC settings (PLC structure data).

Tip: Use the "Edit in table" function to achieve effective editing of the data.

Rack	**20427**
Numerical value equal to or greater than 0	
Designation in other PLC configuration programs: Rack	
The value has to be filled in at all the PLC cards that represent either a rack or a head station. *Numbering of the racks begins with the value 0 ("Main rack") at each station. Numbering is carried out without gaps and has to be unique within a station. Extension racks therefore have values greater than 0.* *If the rack is a head station at the same time, the* Bus coupler / head station *check box has to be activated additionally for the AutomationML format.* *Racks without specification of a PLC type designation or of a device description file with specification of an index in the GSD file are handled during importing in EPLAN as virtual racks, meaning that a separate PLC box is not created to this purpose.* *iQ Works: maximum value: 7* *TwinCAT3: always 0 since there is only one rack per workstation.*	

PLC card is placed on rack ID	**20410**
Numerical value equal to or greater than 0	
The value has to be filled in at all the PLC cards that are mounted on a rack or are adjoined at a head station.	

PLC card is placed on head station	**20444**
Check box	
Is taken from the parts management	
AutomationML: Identifies a PLC card that is placed on the head station or integrated into it and is not adjoined next to the head station, for example a bus adapter.	

Position (slot / module)	**20411**
Numerical value equal to or greater than 0	
Designation in other PLC configuration programs: Slot	
The value has to be filled in at all the PLC cards that are mounted on a rack or are adjoined at a head station.	

Drive	**20576 [1…10]**
Any string	
Specifies the association of a device to a drive. *A device (for example, power converter) can belong to several drives, a motor usually only belongs to one drive.*	

Drive: Device type	**20577**
Any string	
The specification of this value takes place in the part reference data. For devices that are assigned to a drive you specify the type of device, for example "Synchronous motor", "Inverter", "Encoder" ,etc. more exactly.	

Device tag	**20006**
String in accordance with the rules for Device tags	
STEP 7 Classic V5.6: limited to 32 characters *STEP 7 TIA Portal:* *- AML version 1.0.0: limited to 32 characters for the higher-level function and to 22 characters for the remaining identifier (location designation and device tag).* *- AML-Version 1.1.0: limited to 32 characters for the higher-level function, 22 characters for the location designation and to 54 characters for the device tag.*	

Bus coupler / head station	**20164**
Check box	
Is taken from the parts management.	
AutomationML: Identifies a head station that is a rack at the same time. *STEP 7 Classic: not used.*	

Bus distribution device	**20189**
Check box	
Is taken from the parts management.	
Is not used for: AutomationML, STEP 7 Classic *PLC cards identified as bus distribution devices are not taken into consideration in the check runs 4035, 4037 and 4072.*	

CPU	**20167**
Check box	
Is taken from the parts management.	
Every PLC box that represents a CPU is to be identified as a CPU by activating the check box. *For a successful data exchange at least one CPU must exist on the main rack within a configuration project.* *AutomationML: The assignment list ("TagTable") is only exported at those PLC cards that are identified as a CPU by the check box.*	

CPU: Name	**20253 [1...128]**
Any string	
Value has to be filled. *The CPU: Name is specified in all modules as a complete name in the form [Configuration project].[Station ID].[CPU identifier], for example* `Siemens SIMATIC S7.Station 300.1`*. The CPU name has to be unique within the EPLAN project.* *The correct specification of the CPU name at the PLC box is required so that the assignment list ("TagTable") is exported completely.* *128 input fields (indices) are available for entering the CPU name. Currently only the first entry is used for data exchange.* *AutomationML: The CPU identifier must be an integer equal to or greater than 1.* *STEP 7 Classic: permitted values for the CPU identifier are 1, 2, 3 or 4*	

Function text	**20031**
Any string, multi-language	
Designation in other PLC configuration programs: Comment	
STEP 7 Classic: limited to 80 characters. Quotation marks (") and line breaks are impermissible. *STEP 7 TIA Portal: Line breaks are impermissible.* *AutomationML: The function text is always output in all languages defined in the function text.*	

Integrated module	**20289**
Check box	
Identifies an integrated module, the PLC box in this case often has no own PLC type designation.	

Configuration project	**20161**
Any string, a decimal point (".") is not permissible.	
The value has to be filled at all the PLC cards. *All* objects *assigned to the same configuration project belong together and represent a PLC configuration. The data of the devices specified in this manner can be exchanged with the PLC configuration programs of the PLC manufacturers.*	

Safety address	**20439**
Numerical value, range 1 to 65535	
Safety address at safety modules (for example F-address for PROFIsafe). *Exchange as of AML version 1.1.0.*	

PLC card name	**20437**
Any string	
Designation in other PLC configuration programs: Name, module	
The value must be filled and contains the designation of the PLC box. Depending on whether the PLC box represents a PLC card, a rack or a CPU, the PLC card name must be unique within a rack, a station or a configuration project.	

PLC box represents:	*Unique PLC card name required within:*
PLC card	*Rack*
Rack	*Configuration project*
CPU or head station	*Configuration project*

STEP 7 Classic: The Object description *is used instead of the* PLC card name*.*

iQ-Works 3: limited to 32 characters. For impermissible characters please refer to the corresponding reference manual of the manufacturer.

PLC station ID	**20408**
Any string, a decimal point (".") is not permissible.	
Value has to be filled at all the PLC cards and specifies the association of the PLC card to a station. *iQ-Works 3: limited to 32 characters. For impermissible characters please refer to the corresponding reference manual of the manufacturer.*	

PLC station type	**20409**
String, depending on the target system	
Is taken from the parts management.	
The value is specified at PLC boxes that represent a CPU or a head station. *Value must be used for STEP 7 Classic: Valid values are* S7300, S7400, S7400H, PC_BASED, HMI_BASED *Value is to be used for STEP 7 TIA Portal : Valid values are amongst others* S7300, S7400, S71200, S71500, ET200AL, PC, ET200ecoPN, ET200SP, ET200ISP, ET200M, ET200S, ET200Pro, ASi, S7mEC, SCALANCE/X200IRT	

Detailed information about using **PLC type designation**, **Device description: File name** and **Device description: Index in file** is available in the EPLAN help system in the section "Data exchange of PLC configuration files" under the keyword "Device identification".

PLC type designation	**20416**
String	
Is taken from the parts management. Designation in other PLC configuration programs: Order number, Catalog number	
The value has to be filled in at all the PLC cards if the Device description: File name *is not filled in.* *As a rule the original order number under observance of any blanks and separators is to be specified. Every PLC card can only have* ***one*** *PLC type designation. A combination of several parts by entering several PLC type designations is not supported.* *STEP 7 Classic or STEP 7 TIA Portal: For the module the specification with the use of "???" is in part required.*	

Device description: File name	**20415**
File name of the device description file with file name extension and without file path specification	
Is taken from the parts management.	
The value has to be filled in at all the PLC cards if the PLC type designation *is not filled in.* *Is used together with* Device description: Index in file*.* *Is only exported if no* PLC type designation *is specified.* *The specified device description file must be installed in the hardware catalog of the PLC configuration program.*	

Device description: Index in file	**20381**
Reference to the device in the file specified by means of *device description: File name*	
Is taken from the parts management.	
Is used together with Device description: File name*.* *STEP 7 Classic: The* Object description *is used instead of this property.* *Note: 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 during the import and does not have to be explicitly specified in EPLAN during the configuration:* • *D/ (Device)* • *R/ (Rack)* • *DAP/ (Device Access Point)* • *M/ (Module)*	

Object description	**20417**
Any string	
Is taken from the parts management. Designation in other PLC configuration programs: Module, DP identifier	
Designation of the PLC box. *AutomationML: Is used when the* PLC card name *is not filled.* *STEP 7 Classic: If a device description file is specified, this property is used instead of* Device description: Index in file*.*	

Start address of PLC card, Start address 2 of PLC card	**20419, 20255**
Numerical value (decimal system)	
Start value for the address range of an input or output card. *Start address of PLC card: Start value for the address range of the inputs.* *Can also be used for outputs if the card only has outputs.* *Start address 2 of PLC card: Start value for the address range of the outputs.* *iQ-Works 3: Values are a multiple of 8 (0, 8, 16, etc.).*	

Address range (SIEMENS STEP 7 Classic), **Address range 2 (SIEMENS STEP 7 Classic)**	**20432,** **20299**
Numerical value	
Is taken from the parts management.	
Address range (SIEMENS STEP 7 Classic): Specification for inputs. *Can also be used for outputs if the card only has outputs.* *Address range (SIEMENS STEP 7 Classic) 2: Specification for outputs.* *Is only used at STEP 7 Classic and, depending on the PLC card, determines the number of input / output bits or bytes.* *If the* address range *is not specified for STEP 7 Classic or is specified incorrectly, the* Start address *is not taken into consideration during data import in STEP 7 Classic.*	

PLC device: Data length (inputs), **PLC device: Data length (outputs)**	**20548,** **20550**
Numerical value	
Is taken from the parts management.	

Version	**20418**
Any string	
Is taken from the parts management. Designation in other PLC configuration programs: Firmware	
STEP 7 Classic: if "Latest" is specified, the most recent firmware version is used. *STEP 7 TIA Portal: If nothing is specified, the most recent version is used.*	

Specific PLC devices consist of several integrated modules (PLC subdevices) that each have their own Address ranges and start addresses. Such a device can consist, for example, of an internal CPU module, an internal input / output module as well as internal counter module - however with only one part number. In order to map such logical function units within a PLC device, up to twelve PLC subdevices are available to you. Each PLC subdevice is defined by the corresponding properties (x in the following describes the number of PLC subdevice 1…12). You can find further information in the TechTip "**TechTip-Preparation-of-master-data-for-PLC-data-exchange**" in the chapter "PLC devices with subdevices".

PLC subdevices are exported if they have at least one start address or one bus port or one I/O connection point or one Device identification.

Note:

If a PLC card has no PLC subdevices (meaning that it only consists of one module), definitions for these can be omitted. The value "0" is entered at the **PLC subdevice: Index** property at the associated PLC connection points.

You can obtain further information on the definition of subdevices from the manufacturer of the PLC device or in the TechTip "**TechTip-Configuring-PLC-devices-with-device-description-files**".

PLC subdevice x: Position (slot / module)	**20533 ff.**
Numerical value	
Is taken from the parts management.	

PLC subdevice x: Name	**20521 ff.**
Any string	
Is taken from the parts management.	

PLC subdevice x: Start address (inputs)	**20454, 20382, 20392 ff., 20452 ff.**
Numerical value (decimal system)	
Start value for inputs. *iQ-Works 3: Values are a multiple of 8 (0, 8, 16, etc.).*	

PLC subdevice x: Start address (outputs)	**20455 ff., 20478 ff.,20515 ff.**
Numerical value (decimal system)	
Start value for outputs. *iQ-Works 3: Values are a multiple of 8 (0, 8, 16, etc.).*	

PLC subdevice x: Data length (inputs), **PLC subdevice x: Data length (outputs)**	**20547 ff.,** **20549 ff.**
Numerical value	
Is taken from the parts management.	

PLC subdevice x: PLC type designation	**22365, 22341 ff.**
Any string	
Is taken from the parts management.	
This property has to be filled for PLC subdevices if these are expected as independent devices in the PLC configuration program. *As a rule the original order number under observance of any blanks and separators is to be specified. Every PLC subdevice can only have **one** PLC type designation. A combination of several parts by entering several PLC type designations is not supported.*	

PLC subdevice x: Device description: Index in file	**22366, 22352 ff.**
Reference to the device in the device description file that is entered at the PLC box (main device) in the property **Device description: File name**.	
This property has to be filled for PLC subdevices if these are expected as independent devices in the PLC configuration program and are identified via a device description file and the associated index. *Notes: The device description file is specified at the PLC box (main device). The indexes of the device description files additionally have the specification of a preceding context in the AML file (for example `M/1000`). For a PLC subdevice this context **must** always be specified during the configuration:* • *D/ (Device)* • *R/ (Rack)* • *DAP/ (Device Access Point)* • *M/ (Module)*	

4. Settings at PLC connection points (inputs / outputs)

Address	**20400**
String in accordance with the specification under PLC-specific settings > Addresses	
The value must conform to the address format of the PLC configuration program. *The address must be unique within a CPU. In this context the CPU is identified by means of the full CPU name in the form [Configuration project].[Station ID].[CPU identifier].* *AutomationML format: Addresses are always linked with the symbolic address. If no symbolic address is available in the AML file, no address can be imported.*	

Symbolic address	**20404**
Any string	
Designation in other PLC configuration programs: Symbol, Variable, Tag	
STEP 7 Classic: limited to 24 characters. Quotation marks (") are impermissible. *iQ-Works 3: limited to 256 characters. Blanks and special characters are impermissible.* *Rockwell: In accordance with IEC61131-3 blanks are impermissible.* *PLCNext Engineer: In accordance with IEC61131-3 blanks are impermissible.* *AutomationML: The assignment list ("TagTable") is only exported under the following conditions at the PLC box that is marked as the* **CPU***:* - *The symbolic address is filled.* - *The corresponding* **Data type** *is set.* - *At the corresponding PLC box, the* CPU: Name *property is filled correctly.* - *If multiple connection points with the same channel designation are available, the* **Symbolic address** *of the first connection point is exported.*	

Connection point description	**20039**
Any string	
Is taken from the parts management.	
The connection point description has to be unique within a PLC box. *The connection point description may occur several times at card power supplies.*	

Connection point designation	**20038**
Any string	
Is taken from the parts management.	
The connection point designation has to be unique within a PLC box.	

Data type	**20405**
String in accordance with the selection list under PLC-specific settings > Addresses	
Value has to be filled. *Permissible values: BOOL, BYTE, WORD, DWORD, LWORD, INT, DINT, LINT.*	

Function text	**20031**
Any string, multi-language	
Designation in other PLC configuration programs: Remark, Comment	
STEP 7 Classic: limited to 80 characters. Quotation marks (") and line breaks are impermissible. *STEP 7 TIA Portal: Line breaks are impermissible.* *AutomationML: The function text is always output in all languages defined in the function text.*	

Channel designation	**20428**
(Numerical) value equal to or greater than 0	
Is taken from the parts management.	
The value has to be filled and has to be in accordance with the method of counting and the number system of the PLC configuration program. *STEP 7 Classic:* Inputs are specified with "Inx", outputs with "Outx", whereby x is a consecutive value equal to or greater than *0*.	

PLC subdevice: Index	**20384**
Numerical value in the range of 0 to 12	
Is taken from the parts management.	
Specification to which PLC subdevice this PLC connection point belongs. *The value "0" is to be entered here if master data (for example macros) from versions before 2.7.* *Also see the notes on the properties* **PLC subdevice x** *in the section "Settings at PLC devices" later in this document.*	

5. Settings at PLC connection points (bus ports)

Connection point designation	**20038**
Any string	
Is taken from the parts management.	
The connection point designation is not filled at single-line bus ports! *Leave these empty also at the function templates in the parts management.* *Use the plug designation instead.*	

Plug designation	**20431**
Any string	
Is taken from the parts management. Designation in other PLC configuration programs: Label	
Value has to be filled at bus ports. *STEP 7 TIA Portal:*	

ASi (single device)	*Depending on the device and bus port.* *Common values: "AS-i", "ADDR"*
ASi (double device)	*ADDR* *The values "ADDR1" and "ADDR2" are generated during exporting for the two (internal) devices.*
Ethernet	*Depending on the device and bus port.* *Common values: "P1", "P1 R" "P2 R"*
Other bus systems	*Depending on the device and bus port.* *Common values: "X1", "X2" "X3"*

TwinCAT3: Depending on the device and bus port. Common values: "X001", "X1", "X2 OUT"

Since Version 2.8 the plug designation is identifying together with the bus interface name.

Bus interface: Name	**20447**
Any string	
Serves to group bus ports for the export of Ethernet-based bus systems. Associated bus ports are combined into a logical unit via this name. To do this use the bus ports of the type "Network / bus cable connection point, general". *Value has to be filled at Ethernet-based bus ports as well as for DRIVE-CLiQ bus ports in accordance with the hardware specifications of the PLC manufacturer.* *Since Version 2.8 the plug designation is identifying together with the bus interface name.* *STEP 7 TIA Portal: Depending on the device and bus port. Common values: "X1", "X2", "X3", "Switch" at so called "unmanaged switches".* *TwinCAT3: Depending on the device and bus port. Common values: "EC1", "EC21", "LAN1"*	

Bus interface: Main bus port	**20448**
Check box	
Identifies a bus port within a bus interface as the main bus port. This bus port represents the bus interface and bears the data relevant for the data exchange (among others Physical network: Bus ID / item number, MasterSystemId). *Exactly one main bus port must exist within an interface. This is either the bus port "Network / bus cable connection point, input" or one of the bus ports of the type "Network / bus cable connection point, general".* *Recommendation: Identify the first bus port as the main bus port.*	

Bus system	**20308**
Selection list	
The following bus systems are currently supported: *STEP 7 Classic:* MPI Bus, PROFIBUS, PROFINET *STEP 7 TIA Portal:* MPI Bus, PROFIBUS, Ethernet, ASi *TwinCAT3:* EtherCAT *Interconnection of extension racks:* Local-Bus: Extension	

Physical network: Name	**20413**
Any string	
Value has to be filled. *The name of the physical network has to be unique within the configuration project. Only one bus system can exist within a physical network.*	

Physical network: Bus ID / item number	**20311**
Any string. Depending on the bus system, the value is a simple number, an IP address or a combination of letters and numbers.	
STEP 7 Classic: A device number is specified at the connected slaves instead of the IP address at the PROFINET bus system.	

Physical network: Bus ID / item number 2	**20386**
Any string	
Second bus address, currently for ASi devices.	

Data transfer rate	**20313**
String	
Is only used at STEP 7 Classic. Specification is effected as a numerical value with unit (bps, Kbps, Mbps or Gbps).	

Integrated module	**20289**
Check box	
Is only used at STEP 7 Classic and identifies an integrated bus interface.	

Configuration project	**20161**
Any string, a decimal point (".") is not permissible.	
The value can be filled at bus ports during the export into the AutomationML format. If the value is empty, the configuration project from the associated PLC box is used. *The value must be filled for export into all other formats.* *All* objects *assigned to the same configuration project belong together and represent a PLC configuration. The data of the devices specified in this manner can be exchanged with the PLC configuration programs of the PLC manufacturers.*	

Logical network: Name	**20414**
Any string	
The name of the logical network has to be unique within a physical network. *STEP 7 Classic: Name of the IO controller for the IO system or of the DP master for the DP master system* *AutomationML: Value can be used as with STEP 7 Classic* *Schneider Unity Pro: Topology address for the bus port* *For the case of PLC data exchange for IO systems all the PLC boxes with the same logical network name belong to one IO system. The IO system specifies which station (in TIA Portal "IO-Device") is controlled by which IO controller. This is comparable to the specification of the CPU association: While the CPU association is PLC card-oriented, the IO system is station-oriented.* *Within an IO system, there is always a master that is designated through the check box* Logical network: Bus port is master*.* *When the "PROFIBUS" bus system is used, the "IO system" is similar to the "DP master system", the "IO controller" is similar to the "DP master" and the "IO device" is similar to the "DP slave".*	

Logical network: Bus port is master	**20310**
Check box	
If the bus port is a master in this logical network, activate the check box. *Is used for: AutomationML, STEP 7 Classic, TwinCAT2 and RSLogixArchitect* *Within an IO system (for Ethernet-based bus systems) or a DP master system (for PROFIBUS), that bus port must always be designated that is master for the assignment.*	

MasterSystemID	**20334**
Numerical value	
*Value corresponds to the network number of an IO system (for Ethernet-based bus systems) or DP master systems (for PROFIBUS) and is specified at that bus port that is a master in this logical network (check box*Logical network: Bus port is master*).* *Value must be used for STEP 7 Classic.* *Value can be used for STEP 7 TIA Portal.* *Value range:* - *PROFIBUS: 1 to 99* - *Ethernet-based bus systems: equal to or greater than 100*	

PLC subdevice: Index	**20384**
Numerical value in the range of 0 to 12	
Is taken from the parts management.	
Specification to which PLC subdevice this PLC connection point belongs. *The value "0" is to be entered here if master data (for example macros) from versions before 2.7.* *Also see the notes on the properties* **PLC subdevice x** *in the section "Settings at PLC devices" later in this document.*	

Subnet mask	**20446**
String in accordance with the rules for subnet masks	
Value can be filled. *A filled value is output forEthernet-based bus systems.*	

Subslot	**20312**
Numerical value	
Value has to be filled. *STEP 7 TIA Portal:*	

ASi (single device)	*0*
ASi (double device)	*0* *The values "1" and "2" are generated during exporting for the two (internal) devices.*
Ethernet	*Depending on the device and bus port.* *Common values: 0 to 3*
Other bus systems	*Depending on the device and bus port.* *Common values: 0 to 3*

6. Settings at bus-compatible devices and devices that are assigned to a drive

In addition to the PLC devices, bus-capable devices and devices that are assigned to a drive, are exchanged during the PLC data exchange.

Bus-capable devices are converters, motors, valve terminals, etc. that, in addition to the actual function, have one or more bus ports, but no I/O connection points. Such devices can be defined via the common DT or be configured as a black box.

The specification of the configuration project is required for the PLC data exchange. The **Drive** (ID: 20576 [1…10]) must also be assigned for devices that are assigned to a drive.

The following properties are available for these devices, details can be found in the section "Settings at PLC devices".

20576 [1...10]	**Drive**
20006	**Device tag**
20164	**Bus coupler / head station**
20189	**Bus distribution device**
20031	**Function text**
20415	**Device description: File name**
20381	**Device description: Index in file**
20577	**Device type**
20161	**Configuration project**
20417	**Object description**
20408	**PLC station ID**
20409	**PLC station type**
20416	**PLC type designation**
20418	**Version**

If you require further PLC settings (PLC structure data), the devices (for example CPU, network devices, I/O cards, communication modules, switches and others) have to be configured as a PLC box. These settings are described in the section "Settings at PLC devices".

7. Specification of bus data at the PLC box

You have the possibility at the PLC box to also specify bus data on the **PLC structure data** tab:

20308	**Bus system**
20311	**Physical network: Bus ID / item number**
20386	**Physical network: Bus ID / item number 2**
20413	**Physical network: Name**
20446	**Subnet mask**

The specification of bus data at PLC boxes is only required for special export formats.

Data entered here is currently not evaluated in the AutomationML format.

8. Further specification on the rack layout at the PLC box

You have the possibility at the PLC box to specify further data about the rack layout on the **PLC structure data** tab:

20259	**Number of positions in the rack**
20260	**Number of positions in the rack (to the left)**
20258	**Sort code (for position in rack)**

The specification of this data is only required for special export formats.

Data entered here is currently not evaluated in the AutomationML format.