

TechTip: Overview of the PLC properties

General

This TechTip helps you with carrying out the property settings at PLC connection points and PLC devices that are required for data exchange with PLC configuration programs in AML 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 which help you in configuring the data exchange were implemented in the PLC field.

Information for reading

Structure of the individual tables:

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

AutomationML GUID

GUIDs are used for identification of the individual objects during data exchange using the AML 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/	
<i>Current Index 1 is used:</i> <ul style="list-style-type: none"> - 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/	
<i>A PLC type designation must be entered for these parts in the parts management to allow export of the accessory parts.</i>	

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".

Settings at PLC connection points (inputs / outputs)

Address	20400
String in accordance with the specification under PLC-specific settings > Addresses	
<p><i>The value must conform to the address format of the PLC configuration program.</i></p> <p><i>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].</i></p> <p><i>AML format: Addresses are always linked with the symbolic address. If no symbolic address is available in the AML file, no address can be imported.</i></p>	

Symbolic address	20404
Any string	
Designation in other PLC configuration programs: Symbol, Variable, Tag	
<p><i>STEP 7 Classic: limited to 24 characters. Quotation marks (") are impermissible.</i></p> <p><i>iQ-Works 3: limited to 256 characters. Blanks and special characters are impermissible.</i></p> <p><i>Rockwell: Blanks are impermissible.</i></p> <p><i>AML format: The assignment list ("TagTable") is only exported under the following conditions at the PLC box that is marked as the CPU:</i></p> <ul style="list-style-type: none"> - <i>The symbolic address is filled.</i> - <i>The corresponding Data type is set.</i> - <i>At the corresponding PLC box, the CPU: Name property is filled correctly.</i> - <i>If multiple connection points with the same channel designation are available, the Symbolic address of the first connection point is exported.</i> 	

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

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

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

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

Channel designation	20428
(Numerical) value equal to or greater than 0	
Is taken from the parts management.	
<i>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.</i>	
<i>STEP 7 Classic: Inputs are specified with "Inx", outputs with "Outx", whereby x is a consecutive value equal to or greater than 0.</i>	

PLC subdevice: Index	20384
Numerical value in the range of 0 to 12	
Is taken from the parts management.	
<i>Specification to which subdevice this PLC connection point belongs.</i>	

The value "0" is to be entered here if master data (for example macros) from versions before 2.7. This has the same meaning as the index "1".

*Also see the notes on the properties **PLC subdevice x** in the section "Settings at PLC devices" later in this document.*

Settings at PLC connection points (bus ports)

Connection point designation	20038
Any string	
Is taken from the parts management.	
<i>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.</i>	

Plug designation	20431								
Any string									
Is taken from the parts management.									
Designation in other PLC configuration programs: Label									
<i>Value has to be filled at bus ports.</i> STEP 7 TIA Portal: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">ASi (single device)</td><td>Depending on the device and bus port. Common values: "AS-i", "ADDR"</td></tr> <tr> <td>ASi (double device)</td><td>ADDR The values "ADDR1" and "ADDR2" are generated during exporting for the two (internal) devices.</td></tr> <tr> <td>Ethernet</td><td>Depending on the device and bus port. Common values: "P1", "P1 R" "P2 R"</td></tr> <tr> <td>Other bus systems</td><td>Depending on the device and bus port. Common values: "X1", "X2" "X3"</td></tr> </table>		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"
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<i>TwinCAT3: Depending on the device and bus port. Common values: "X001", "X1", "X2 OUT"</i>									
<i>Since Version 2.8 the plug designation is identifying together with bus interface name.</i>									

Bus interface: Name	20447
Any string	
<p><i>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. These can be either bus ports of the type "Network / bus cable connection, general" or a "Network / bus cable connection, input" and a "Network / bus cable connection, output".</i></p> <p><i>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.</i></p> <p><i>Since Version 2.8 the plug designation is identifying together with bus interface name.</i></p> <p><i>STEP 7 TIA Portal: Depending on the device and bus port. Common values: "X1", "X2", "X3", "Switch" at so called "unmanaged switches".</i></p> <p><i>TwinCAT3: Depending on the device and bus port. Common values: "EC1", "EC21", "LAN1"</i></p>	

Bus interface: Main bus port	20448
Check box	
<p><i>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).</i></p> <p><i>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".</i></p> <p><i>Recommendation: Identify the first bus port as the main bus port.</i></p>	

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

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

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.	
<i>STEP 7 Classic: A device number is specified at the connected slaves instead of the IP address at the PROFINET bus system.</i>	

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

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

Integrated module	20289
Check box	
<i>Is only used at STEP 7 Classic and identifies an integrated bus interface.</i>	

Logical network: Name	20414
Any string	
<i>Value has to be filled.</i> <i>The name of the logical network has to be unique within a physical network.</i>	

Logical network: Bus port is master	20310
Check box	
<i>If the bus port is a master in this logical network, activate the check box.</i>	

MasterSystemID	20334
Numerical value	
<i>Value corresponds to a network number and has to be specified at the bus port that is a master in the logical network (check box Logical network: Bus port is master).</i> <i>Value must be used for STEP 7 Classic.</i> <i>Value can be used for STEP 7 TIA Portal.</i> <i>Value range:</i> <ul style="list-style-type: none"> - PROFIBUS: 1 to 99 - Ethernet-based bus systems: equal to or greater than 100 	

Configuration project	20161
Any string, a decimal point (".") is not permissible.	
<i>Value has to be filled at all the PLC cards and bus ports. All objects assigned to the same configuration project belong together and represent a bus configuration. The data of the resulting specified devices can be exchanged with the PLC configuration programs of the PLC manufacturers.</i>	

Subnet mask	20446
String in accordance with the rules for subnet masks	
Value can be filled. A filled value is output for Ethernet-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

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	
<p><i>The value has to be filled in at all the PLC cards that represent either a rack or a head station.</i></p> <p><i>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.</i></p> <p><i>If the rack is a head station at the same time, the Bus coupler / head station check box has to be activated additionally for AML format.</i></p> <p><i>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.</i></p> <p><i>iQ Works: maximum value: 7</i></p> <p><i>TwinCAT3: always 0 since there is only one rack per workstation.</i></p>	

PLC card is placed on rack ID	20410
Numerical value equal to or greater than 0	
<p><i>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.</i></p>	

PLC card is placed on head station	20444
Check box	
Is taken from the parts management	
<p><i>AML format: Identifies a PLC card that is placed on the head station or integrated into it and is not adjoined next to the head station.</i></p>	

Position (slot / module)	20411
Numerical value equal to or greater than 0	
Designation in other PLC configuration programs: Slot	
<i>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.</i>	

Device tag	20006
String in accordance with the rules for Device tags	
<i>STEP 7 Classic V5.6: limited to 32 characters</i> <i>STEP 7 TIA-Portal: limited to 32 characters for the higher-level function and to 22 characters for the remaining identifier (location designation and device tag)</i>	

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

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

CPU	20167
Check box	
Is taken from the parts management.	
<i>Every PLC box that represents a CPU is to be identified as a CPU by activating the check box.</i> <i>For a successful data exchange at least one CPU must exist on the main rack within a configuration project.</i>	

AML format: 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.	
<p>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.</p> <p>The correct specification of the CPU name at the PLC box is required so that the assignment list ("TagTable") is exported completely.</p> <p>128 input fields (indices) are available for entering the CPU name. Currently only the first entry is used for data exchange.</p> <p>AML format: The CPU identifier must be an integer equal to or greater than 1.</p> <p>STEP 7 Classic: permitted values for the CPU identifier are 1, 2, 3 or 4</p>	

Function text	20031
Any string, multi-language	
Designation in other PLC configuration programs: Comment	
<p>STEP 7 Classic: limited to 80 characters. Quotation marks (") and line breaks are impermissible.</p> <p>STEP 7 TIA Portal: Line breaks are impermissible.</p>	

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.	
<p><i>Value has to be filled at all the PLC cards and bus ports. All objects assigned to the same configuration project belong together and represent a bus configuration. The data of the resulting specified device can be exchanged with the PLC configuration programs of the PLC manufacturers.</i></p>	

PLC card name	20437								
Any string									
Designation in other PLC configuration programs: Name, module									
<p><i>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.</i></p> <table border="1" data-bbox="225 976 1388 1196"> <thead> <tr> <th>PLC box represents:</th><th>Unique PLC card name required within:</th></tr> </thead> <tbody> <tr> <td>PLC card</td><td>Rack</td></tr> <tr> <td>Rack</td><td>Configuration project</td></tr> <tr> <td>CPU or head station</td><td>Configuration project</td></tr> </tbody> </table> <p><i>STEP 7 Classic: The Object description is used instead of the PLC card name.</i></p> <p><i>iQ-Works 3: limited to 32 characters. For impermissible characters please refer to the corresponding reference manual of the manufacturer.</i></p>		PLC box represents:	Unique PLC card name required within:	PLC card	Rack	Rack	Configuration project	CPU or head station	Configuration project
PLC box represents:	Unique PLC card name required within:								
PLC card	Rack								
Rack	Configuration project								
CPU or head station	Configuration project								

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

PLC station type	20409
String, depending on the target system	
Is taken from the parts management.	
<p><i>The value is specified at PLC boxes that represent a CPU or a head station.</i></p> <p><i>Value must be used for STEP 7 Classic: Valid values are S7300, S7400, S7400H, PC_BASED, HMI_BASED</i></p> <p><i>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</i></p>	

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	
<p><i>The value has to be filled in at all the PLC cards if the Device description: File name is not filled in.</i></p> <p><i>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.</i></p> <p><i>STEP 7 Classic or STEP 7 TIA Portal: For the module the specification with the use of "???" is in part required.</i></p>	

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.	
<p><i>The value has to be filled in at all the PLC cards if the PLC type designation is not filled in.</i></p> <p><i>Is used together with Device description: Index in file.</i></p> <p><i>Is only exported if no PLC type designation is specified.</i></p> <p><i>The specified device description file must be installed in the hardware catalog of the PLC configuration program.</i></p>	

Device description: Index in file	20381
Reference to the device in the file specified by means of <i>device description: File name</i>	
Is taken from the parts management.	
<p><i>Is used together with Device description: File name.</i></p> <p><i>STEP 7 Classic: The Object description is used instead of this property.</i></p> <p><i>Note: The indexes of the device description files additionally serve for the specification of a context in the AML file. This context is automatically detected / supplemented by EPLAN during the import and does not have to be explicitly specified in EPLAN during the configuration:</i></p> <ul style="list-style-type: none"> • /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	
<p><i>Designation of the PLC box.</i></p> <p><i>AML format: Is used at the AML format when the PLC card name is not filled.</i></p> <p><i>STEP 7 Classic: If a device description file is specified, this property is used instead of Device description: Index in file.</i></p>	

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

Address range (SIEMENS STEP 7 Classic), Address range 2 (SIEMENS STEP 7 Classic)	20432, 20299
Numerical value	
Is taken from the parts management.	
<p><i>Address range (SIEMENS STEP 7 Classic): Specification for inputs. Can also be used for outputs if the card only has outputs.</i></p> <p><i>Address range (SIEMENS STEP 7 Classic) 2: Specification for outputs.</i></p> <p><i>Is only used at STEP 7 Classic and, depending on the PLC card, determines the number of input / output bits or bytes.</i></p> <p><i>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.</i></p>	

PLC device: Data length (inputs), PLC device: Data length (outputs)	20548, 20550
Numerical value	
Is taken from the parts management.	
<i>Is currently only used for check runs that reference the address range of PLC cards.</i>	

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

A PLC card can consist of several integrated modules (subdevices) that each have separate [Address ranges](#) and start addresses. Each subdevice is defined by corresponding properties. Up to twelve subdevices can be specified (in the text below x designates the number of the subdevice 1...12).

Subdevices do not have their own **PLC type designation** or specifications on a device description file and are exported when they have at least one start address.

Note: If a PLC card does not have subdevices (meaning that it only consists of one module), the corresponding definitions can be omitted. The value "0" or "1" is entered (both values have the same meaning) at the **PLC subdevice: Index** property at the associated PLC connection points.

Further information on the definition of subdevices is available from your PLC manufacturer.

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)	
<i>Start value for inputs.</i> <i>The property Start address of PLC card is used for Subdevice 1.</i> <i>iQ-Works 3: Values are a multiple of 8 (0, 8, 16, etc.).</i>	

PLC subdevice x: Start address (outputs)	20455 ff., 20478 ff., 20515 ff.
Numerical value (decimal system)	
<i>Start value for outputs.</i> <i>The property Start address 2 of PLC card is used for Subdevice 1.</i> <i>iQ-Works 3: Values are a multiple of 8 (0, 8, 16, etc.).</i>	

PLC subdevice x: Data length (inputs), PLC subdevice x: Data length (outputs)	20547 ff., 20549 ff.
Numerical value	
Is taken from the parts management.	
<i>Is currently only used for check runs that reference the address range of PLC cards.</i>	

Settings at bus-compatible devices

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 following properties are available at bus-compatible devices, details can be found in the section "Settings at PLC devices".

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
20417	Object description
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".

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 AML format.

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 AML format.