Common development in PG Switchgear

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Subject: Rules for global parts database of Switchgears in PPMV

1 Scope

Document defines rules for ABB global master data creation, as well as rules for storage this master data on the Master Data server.

2 References

[1]	MVE specification	Specification of the application MVE in its latest version
[2]	3WYR000001	Classification of secondary material for Eplan Projects in BU PPMV
[3]	2NBA000001	Reference Designation of objects for electrical documents in BU PPMV
[4]	2NDA000001	Rules for documents of electrical engineering in Eplan projects
[5]	3WYR000001_Tabs	List of required data for component data tabs according to ABB class

3 Definitions

eCAD	Electrical CAD (Computer-Aided Design) refers to software packages that allow an electrical engineer to create and manage electrical schematics. Advanced packages do not only manage electrical schematics, but also integrate functionalities such as cabinet and panel lay-out planning, terminal management and so on.
Eplan	Eplan Electric P8 (EPLAN Software & Service – FRIEDHELM LOH-GROUP) is a process-oriented, integrated and automated eCAD system.
MD	Master data includes, for example, symbol libraries, plot frames, forms, macros, project templates and part.
MVE	ABB Medium Voltage Engineer tool with the following main functions: - Import of tendering data - Editing and completion of project data - Validation of project data - Generation of drawings - Ordering of material - Enhancing data with information from Eplan - Export of project data to other applications, …
Pro Panel	Add-on to Eplan Electric P8 for the 3D the layout planning of panels and doors

4 Application

Application of rules given in this document is mandatory for the creation of master data that is stored on central master data server or global parts database of the BU PPMV.

5 Symbols and Symbol libraries

5.1 IEC standard

Symbol libraries are used to collect symbols in the Eplan P8 environment.

The following libraries shall be used for ABB usage

IEC_symbol.sdb (as basic library for multiline schemes)
ABB_IEC_symbol.sdb (symbol library with additional symbols for multiline schemes)
ABB_GRAPHICS.sdb
ABB_REPORT.sdb (for z-page reports)
ABB_IEC_ED.sdb (for single line diagrams)

All the mentioned libraries contain symbols according to IEC60617 standard. Connection points and insertion point of symbols have to be placed in the grid with step 4 mm (def. C). It is recommended to use an existing symbol as basis for a new symbol during symbol creation process. It is recommended to follow the logic of symbols which is set by default symbols of Eplan:

- insertion of symbols into the correct Function Definition
- using of variants
- using of layers
- default displayed properties

It is necessary to check the symbol before saving (Utilities\Check Symbol).

Below mentioned rules are related to symbols, which will be used in macros, which will be consecutively placed in MD server:

- add new symbols into this library only in exceptional cases
- newly created symbols has to correspond to IEC60617 standard or newer, in addition wherever applicable the IEC81714-2 shall be followed
- also the new symbol shall comply with the Eplan standards. In order to follow this standard, it is easiest to copy an existing part from the Eplan standard libraries and to modify it.
- ask the ABB global administrator for the number of symbol, before its creation
- choose suitable name for new symbol and add symbol description (English language)
- send the exported symbol and created macro together after creation to global administrator, who will place them to the server.

Note: The libraries for ABB shall be used in addition to the Eplan standard libraries. Only symbols that cannot be found in the standard library shall be created in the ABB library. The Eplan standard library shall not be changed.

5.2 ANSI (NFPA) standard

For ANSI (NFPA) master data checking and downloading to MD server an ABBLM (Lake Mary, FL, USA) local administrator is responsible. ABB_NFPA_symbol.sdb library contains symbols according to ANSI standard. Connection points and insertion point of symbols has to be placed in the grid with step 0.125" (def. C). It is recommended to use some existing symbol as a basis for a new symbol during symbol creating process. It is recommended to follow the logic of symbols which is set by default symbols of Eplan:

- insertion of symbols into the correct Function Definition
- using of variants
- using of layers
- default displayed properties

It is necessary to check the symbol before saving (Utilities\Check Symbol).

Below mentioned rules are related to symbols, which will be used in macros, which will be consecutively placed in MD server:

- add new symbols into this library only in exceptional cases
- newly created symbols has to correspond to actual ANSI standard
- ask the ABBLM local administrator for the number of symbol, before its creation
- choose suitable name for new symbol and add symbol description (English)
- send the exported symbol and created macro together after creation to ABBLM local administrator, who will place them to the server.

Note: The library ABB_NFPA_symbol.sdb shall be used in addition to the Eplan standard library MFPA_symbol.sdb. Only symbols that cannot be found in this library shall be created in the ABB library. The Eplan standard library shall not be changed.

6 Macros

6.1 Creation of Multiline Macros

The given instructions in this chapter refer to page macros as well as window/symbol macros. Instructions which only apply for page macros e.g. mounting locations and locations boxes have to be disregarded for page/symbol macros.

For the creation of macros, only symbols from IEC_symbol.sdb library, resp. NFPA_symbol.sdb shall be used. If a required symbol cannot be found in these standard libraries, a new symbol can be created in the ABB_IEC_symbol.sdb or ABB_NFPA_symbol.sdb library as described in chapter 5.

During creation of macros the logic of Eplan has to be respected:

- one DT = one apparatus = one main function
- specify the symbols used in a black box as Representation type = Graphics
- draw the connections between single symbols inside the black boxes (location boxes) with a line with layer definition: EPLAN300, Symbol graphic. General
- for the text information use respective Properties of black box (Technical characteristics, Function text, Remark,…)
- texts within symbols which are used for DTs or technical characteristics shall be set as "do not translate automatically". This will prevent errors when the project is translated.
- connections and handle point of macros has to lie in the grid with a step 4 mm / 0.125" (def. C)
- connection points are placed inside of black boxes and touch the border

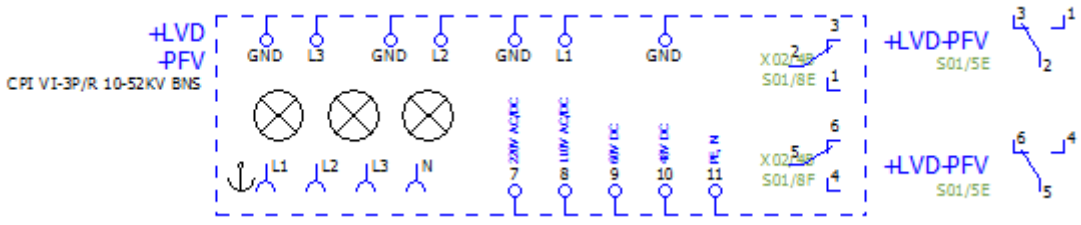


Figure 1: Example of multi-line macro

- size of page-macros has to be chosen according to size of ABB standard plotframe (see chapter 8), resp. standard ANSI title block
- the devices shown within a macro shall be grouped for easier handling
- mounting locations / Mounting Site (describing) used for macros:
  - devices usually placed inside LV compartment – without mounting location specifications, or placed in mounting location LV
  - devices usually placed on LV compartment doors – placed in mounting location LVD
  - other devices - placed in mounting location MV
  - attribute used for EPLAN – MVE export; it determines zone name in MVE; if missing in EPLAN, MVE creates a zone with a name “*New Zone”
  - naming convection for zones depends on local customization

  - *note*: function “Assign zone names” can be used for automatic update of zone names
- all the text descriptions has to be written at least in English = language en_US (English (USA)), multilingual option must be entered correctly
- handle point (insertion point) of macro is left top corner of black box. Alternatively, the top left connection point can be used as insertion point of the macro.
- every developed macro must be checked against errors – Eplan Message Management
- there must be no Errors (recommended also no Warnings and Notices) after using Eplan default offline check
- when possible, follow Eplan standard displayed properties layout
- all objects graphical properties, exclude exception listed above should stay as Eplan default values = From layer (text size, line thickness, color, style, object visibility, etc.)
- when any object is imported from .dwg/.dxf file, then Autocad layers must be changed to Eplan layers for graphics (Eplan102 – Eplan108)
- data imported from .dwg/.dxf file must compound from as less objects (lines, rectangles, circles, etc.) as possible, because a lot of objects cause Eplan to slow down. This is especially important when imported drawings are data exported from Solid Works

Macro description has to contain:

- name of device with possible necessary identification entries
- manufacturer
- manufacturers ordering code (optional)
- other (supplementary) detailed technical parameters
- revision of macro
- name of author and creation date

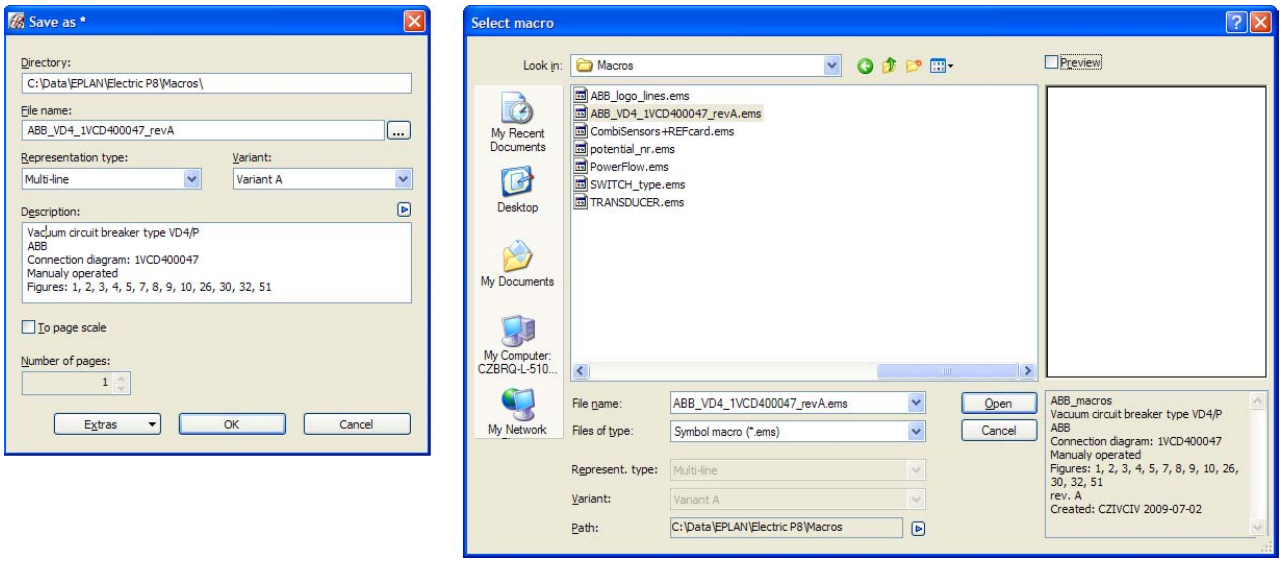


Figure 2: Example of macro naming and describing

6.2 Creation of 2D Panel and Door Layout Macros

Layout macros database (LMD) contains necessary objects for panel and door layout drawings in EPLAN and for generating of drawing for LV doors cut-out. The basic principles for the creation of macros as defined in chapter 6.1 shall also applied to the layout macros. Deviations are defined in this chapter.
The macros are stored in the folder defined in chapter 9.1.The name of macros should follow approved rules: _(-)manufacturer_type_dimensions. Macros are assigned to relevant parts in parts database. The prefix differs according to the macro placement:

1. **_manufacturer_type_dimensions** – macro for door layout
2. **-manufacturer_type_dimensions** – macro for LV compartment

Example:

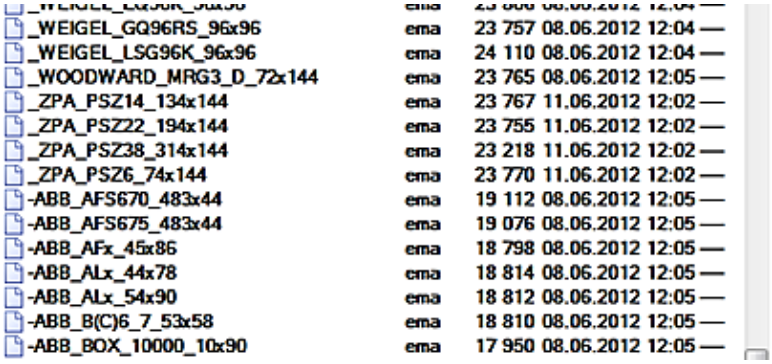


Figure 3: Example of macro naming

Object description for door placement

Each object contains several parts:

- Graphical elements are defined in different layers. They shall be used to distinguish data for certain tasks. Also it is possible to draw special data for factories (e.g. label below device) on different layers, which can be turned off by users of a factory where they are unimportant. The following list of standard layers can be enhanced when necessary:
  - **20, ABB.DESIGN LAYERS** – cut-out layer which is necessary for correct door cut-out. It has to be accurate according to a data-sheet.
  - **6,6** – outside dimensions of a device. It is used like information about overall dimension on doors only.
  - **2, ABB.DESIGN LAYERS** – axes of a device, they are useful for precise positioning. The color of axes can be different and it can be indicated if an assembly zone is clear for a device. If they are **green** the assembly zone around a device **is clear**. If they are **yellow** the assembly zone around a device **is NOT clear** because of less experience with real mounting.
  - **Part placement (invisible)** – defines a zone around a device (grey solid line) where no other device can be placed (labels are exception).

Figure 4 shows two devices with different color of axes. If the assembly zone around a device is clear, axes are green. If the assembly zone is not approved by mechanical engineer axes are yellow and the assembly zone overlaps outside dimensions of a device by 10 cm. The coloring of axes is optional. By default the color defined in the layer should be used.

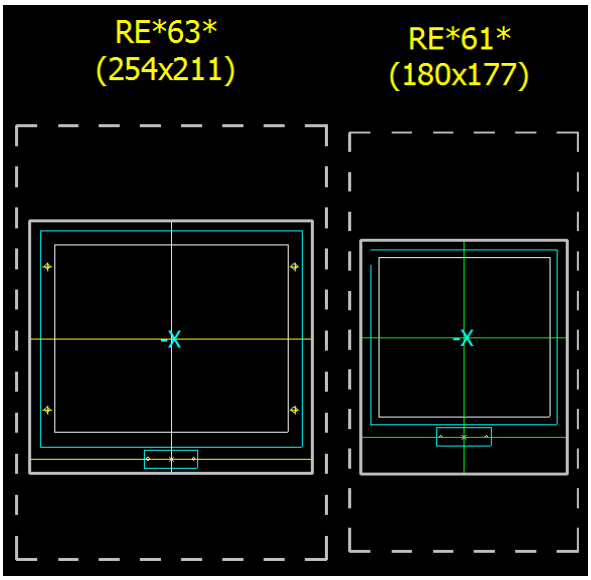


Figure 4: Example of macros mounted on doors

- Macrobox (dashed line) contains basic information in Description field (type, manufacturer, revision and creator). Macros are generated to the default folder defined in chapter 9.1 and assigned to parts in part database.
- Handle point – **in the middle of a label** because of easier positioning.

Object description for LV compartment (LVC) placement

Macros for most devices placed into LVC do not have to be prepared individually. If dimensions of a part are defined in parts database (Mounting data Tab) then EPLAN creates rectangle with the same dimensions automatically during inserting a part from 2D panel layout navigator.
Macros for LVC are prepared for devices where an assembly zone has to be taken under consideration. See Figure 5 – grey solid rectangle (invisible) shows a zone where cables are usually connected and no device can be places inside this zone.

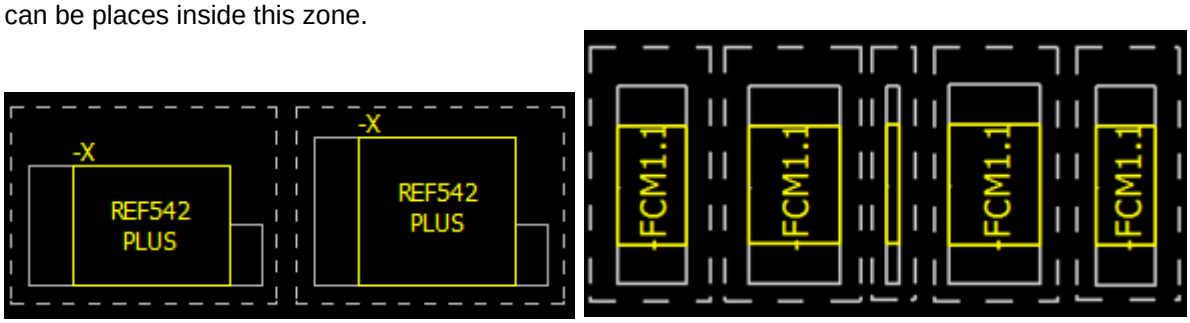


Figure 5: Example of macros mounted in LV compartment

Handle point – **in the middle of left side** because devices are usually placed on central axis of a DIN rail. Handle point on left side respects principle of placing devices from left side (exception are terminals for voltage and current circuits usually placed on right side of a DIN rail). Middle position of handle point allows covering both, axis of a device and axis of the DIN rail. Exceptions are devices which cover more than one DIN rail.

Macro data should include 3D and 2D layout

The 3D and 2D layout of a device should be stored in the same macro file. Through this, the two layout types of the macro (2D and 3D) can be used independently by selection of the macro type in the mounting tab.
It is aimed to store both data types in one macro file in order to prevent too many macro data files. If only the 2D or 3D data type shall be used, it is possible to create later a tool for data separation.

6.3 Macro files naming

The file names for a page macro or a window/symbol macro shall comply with the rules given below. The aim of a universal file naming convention for macros is to have unique filenames on one hand and easy access of the files on the other hand.

Electrical devices

File name of saved macro shall be in format:

***producer_device name_global part number*.ems (or .ema or .emp)**

Producer name – according to catalogue
Device name – explicit define device
Global part number – number from Global parts database of first created device it was used for

Note: The information “Macro revision – inform about current revision of macro. Revisioning starts from ’A’” is no longer possible due to incompatibility with the Global Parts Server function of MVE 2.1.

Complex electrical devices (as in appendix C)

File name of saved macro shall be in format:

***producer_device name_designation_function_consecutiv number_global part number*.ems**

Producer name – according to catalogue
Device name – explicit define device
Designation – designation of the subsection of the complex device (if applicable)

Function – for contacts function 'NO' or 'NC' (if applicable)
Consecutive number – in order to distinguish identical subsections of a complex device (if applicable)
Global part number – number from Global parts database of first created device it was used for

Note: The additional information in the macro name for the complex devices are necessary due to the fact that usually multiple macros are created which contain different subsections of the device.

Subfolders for complex electrical devices (as in appendix C)

Subfolders shall be used for structuring macros of complex devices. The name shall be in format:

producer_device name

Producer name – according to catalogue
Device name – explicit define device or a group of devices of same class

Note: Additional subfolders are possible and shall follow the same rules for naming.

Non-electrical drawings

File name of saved macro shall be in format:

***Switchgear_Voltage_Unit_Document_Width_Height_Depth_Other.*ems (or .ema or .emp)**

Type of switchgear

- Switchgear = type of Switchgear
  - UGZS1 = UniGear ZS1
  - UGDBU = UniGear ZS1 Double Busbar
  - UGDLE = UniGear ZS1 Double Level
  - UGBTB = UniGear ZS1 Back to Back
  - UGZS2 = UniGear ZS2
  - UGZS3 = UniGear ZS3.1
  - UNZVC = UniGear ZVC
  - UG500 = UniGear 500R
  - UG550 = UniGear 550
  - UGMCC = UniGear MCC (new)
  - UNSEC = UniSec
  - ZS8 = ZS8.4
  - ZX0 = ZX0
  - ZX02 = ZX0.2
  - ZX1 = ZX1.2
  - ZX2 = ZX2
  - ZX2DB = ZX2 Double Busbar
  - ZX22 = ZX2.2
  - …

- Voltage = rated voltage [kV]
  (only if necessary: e.g. with Front = yes, with Foundations = no)
  - 07 = 7.2 kV
  - 12 = 12 kV
  - 17 = 17.5 kV
  - 24 = 24 kV
  - 36 = 36 kV
  - …
  - 00 = no relation with kV

- Unit = type of typical unit, according to catalogue
  - BT = Bus-tie (UniGear)
  - DF = Switch-disconnector feeder (UniGear)
  - IF = Incoming/outgoing feeder (UniGear)
  - IFD = Direct incoming/outgoing feeder (UniGear)
  - IFDM = Direct incoming/outgoing feeder with measurements (UniGear)
  - M = Measurements (UniGear)
  - R = Riser (UniGear)
  - RM = Riser with measurements (UniGear)

- BRC = Bushing riser with cable (UniSec)
- BRM = Bushing for Sectionalising and busbar Measuring (UniSec)
- BRS = Bushing riser for sectionalising (UniSec)
- BRV = Bushing for busbar Measuring (UniSec)
- DRC = Direct Riser with Cable (UniSec)
- DRS = Direct Riser for Sectionalising (UniSec)
- SBC = Switch Disconnector with Circuit-breaker (UniSec)
- SBM = Switch Disconnector with Circuit-breaker for Measuring (UniSec)
- SBR = Reverse Circuit-breaker (UniSec)
- SBS = Switch Disconnector with Circuit-breaker for Sectionalising (UniSec)
- SDC = Switch Disconnector with Cable (UniSec)
- SDM = Switch Disconnector for Measuring (UniSec)
- SDS = Switch Disconnector for Sectionalising (UniSec)
- SFC = Switch Fuse with Cable (UniSec)
- SFS = Switch Fuse for Sectionalising (UniSec)
- SFV = Switch Fuse for Measuring (UniSec)
- BAR = Bars without cable entry (general)
- CAB = cable entry (general)
- CAD = Cable Duct (general)
- CDG = Cable Duct with Gas duct (general)
- END = End cover (general)
- EPL = End Panel Left (general)
- GAS = Gas duct (general)
- LVC = LV Compartment (general)
- …

o Document = type of document
- DF = Door Frame
- FD = Foundation Detail (with detailed dimensions)
- FF = Foundation Frame (to compose the switchgear)
- FV = Front View
- SV = Section View
- …

o Width = width of Unit [mm]
(only if necessary: e.g. with Front view = yes, with Foundation frames view = yes)
- W0375 = 375 mm
- W0500 = 500 mm
- W0550 = 550 mm
- W0650 = 650 mm
- W0800 = 800 mm
- W1000 = 1000 mm
- W0027 = 27 mm
- …

o Height = height of Unit [mm]
(only if necessary: e.g. with Front view = yes, with Foundation frames view = no)
- H1700 = 1700 mm
- H2000 = 2000 mm
- H2100 = 2100 mm
- H2200 = 2200 mm
- H2595 = 2595 mm
- H0280 = 280 mm
- …

o Depth = depth of Unit [mm]
(only if necessary: e.g. with Front view = no, with Foundation frames view = yes)

  - D1070 = 1070 mm
  - D1186 = 1186.7 mm
  - D1198 = 1198.5 mm
  - D1340 = 1340 mm
  - D1390 = 1390 mm
  - …

- Other = further special details
  (only if necessary: following example are necessary for UniSec)
  - R = Right side (used in macro rules)
  - L = Left side (used in macro rules)
  - S = bars from down to top (like a "S")
  - Z = bars from top to down (like a "Z")

- Revision = inform about current revision of macro. Revisioning starts from 'A'

Note: Not necessary information can be left blank as defined above.
The information "Macro revision – inform about current revision of macro. Revisioning starts from 'A'" is no longer possible due to incompatibility with the Global Parts Server function of MVE 2.1.

6.4 Creation of 3D macros

The Eplan eCAD software add-on Pro Panel provides the option to use 3D data for the layout planning of panels and doors. The data handled in this add-on correspond to the data in 2D in many ways. This chapter defines additional data which need to be entered in the parts database.

The scope of handling 3D data in PPMV is to provide means to plan the placement of components in the LV compartment of MV switchgears and for door cut-out planning. Therefore, a simplified part representation on cuboids is sufficient. This is a standard function in Pro Panel based on the dimensions entered in the parts database. Only in exceptional cases, where a detailed representation within the panel is necessary for the engineering or production process, 3D macros can be used. An exceptional case is defined through proven cost savings in the involved processes or through the need to resolve an existing quality issue in production. However, for the door layout design 3D macros are mandatory in order to provide door front view diagrams for customer documentation.

6.4.1 General requirements on 3D data

In order to ensure efficient work with 3D data also when handling bigger eCAD projects, the following requirements on the used 3D data shall be observed:

- Select simplified 3D raw data: The data exported from a mechanical CAD system shall be on a low resolution and free of unnecessary information. Only features which help to identify the part or its features, shall remain. Unnecessary are small details, embossed text, screws or internal structures of the part. Roundings and facets shall be avoided as far as possible.
- Use low resolution during import to Eplan: The setting for the resolution of 3D imports shall remain to the default value which is low.
- Delete unnecessary data from the object: Some 3D models contain additional information such like supporting DIN rails or screws; these can be deleted after import.
- Unify 3D models: 3D models which consist of different parts but form one device that is not changed in its structure shall be unified through the Eplan command.

6.4.2 Formatting of 3D parts macros

Parts macros which contain 3D data shall follow these requirements:

- Macro file naming shall be in accordance with chapter 6.3.
- Comments within the macro files shall comply with the definition stated in chapter 6.1.
- The handle point of devices placed on a DIN rail shall be in the center of the left side of the area to be place on the DIN rail (placemen area).

- The handle point of parts placed at the door shall be on the center of the area which corresponds to the door surface.
- The handle point of parts mounted on mounting surfaces shall be on the center of the top left fixing screw.
- Mounting points or base points shall be labeled with a meaningful name which allows an easy identification for the placement of connected parts.

6.4.3 Formatting of 3D enclosure macros

Enclosure macros which are used for the documentation of the low voltage compartment will not be handled commonly on the global parts database. However, the following recommendations shall be observed during the creation for local databases.

- Applicable requirements stated in chapter 6.4.1 shall be followed.
- The handle point of the enclosure shall be at the bottom rear left corner.
- Base points shall be used if possible instead of mounting points. Base points can be addressed during configuration of enclosures through accessory selection.
- Enclosures shall use accessories and accessory lists for configuration of the LV compartment. This is in order to avoid drawing each option individually.
- Main enclosure macro should contain parts similar for every enclosure type. Variable part as doors, side panels, rear panels, etc. shall be created as an accessory.
- Standard DIN rails, wiring profiles, ducts or routing paths shall be placed in the enclosure or defined as an accessory if there are more variants for the same enclosure.
- Accessories such like door locks, hinges and wiring tubes for the door connection shall be represented only simplified.

6.4.4 Creation of cut-out drawings

Cut-out drawings are prepared for creation of drilling patterns in the parts database. The graphical elements in the drawings are in layer EPLAN805, Graphic.Drilling pattern generation. The cut-out drawings require drilling pattern frames for generation. The frame should contain

- Name of the cut-out drawing
- Description
- Subdirectory for outline generation
- Point of origin

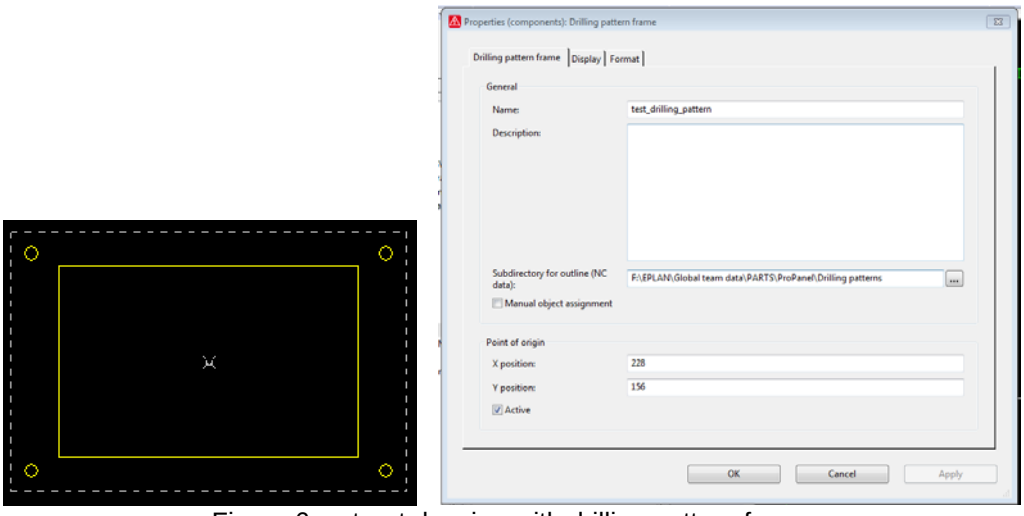
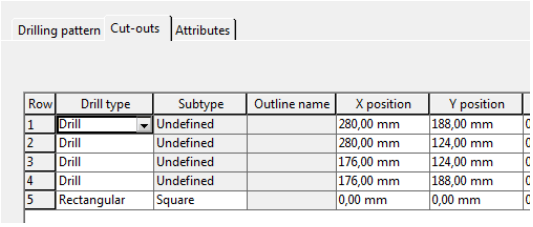


Figure 6: cut-out drawing with drilling pattern frame

Drilling patterns are generated directly to the parts database from the cut-out drawing by transforming the graphical elements inside the drilling pattern frame into cut-outs or outlines. If the drilling pattern frame

contains a graphical element with a special shape, it will be exported to an outline file. The name of the drilling pattern is taken from the name of the drilling pattern frame.



Row	Drill type	Subtype	Outline name	X position	Y position
1	Drill	Undefined		280,00 mm	188,00 mm
2	Drill	Undefined		280,00 mm	124,00 mm
3	Drill	Undefined		176,00 mm	124,00 mm
4	Drill	Undefined		176,00 mm	188,00 mm
5	Rectangular	Square		0,00 mm	0,00 mm

Figure 7: cut-outs generated from the drawings

Outlines

Outlines are used for defining mounting rails in the parts database without 3D macro or for defining special cut-out shapes for drilling patterns.

- Outline (extrusion) – used for creation of mounting rail profiles. The file should be stored in folder ...\Eplan\Outlines\. The naming of the file shall follow as far as possible the naming convention for macros as described in chapter 6.3.
- Outline (NC) – since this outline does not allow to draw more than one cut-out in the outline drawing, it is recommended to create cut-out drawings as described in the chapter 6.4.4.

6.4.5 Creation of connection point pattern

Connection point pattern have to be created globally in the parts database, because they are need for the MVE function “Low cost materials calculation”. 3D macros and connection point patterns are created for following groups of parts:

1. Parts that have no graphical representation (test probes, accessories, etc.) – will not have 3D representation and no connection point pattern.
2. Parts with function definitions only (MCB, aux. relays, etc.) - The 3D object will be automatically created in Pro Panel based on the dimensions in parts database and connection point pattern defined in the database.
3. Parts with black boxes (transducers, simple protection relays, etc.) - The 3D object will be automatically created in Pro Panel based on the dimensions in parts database and connection point pattern defined in the database.
4. Complex parts (IED, CB, isolators, ESW, etc.) - The 3D object will be automatically created in Pro Panel based on the dimensions in parts database as preferred option. In case more details are required for engineering or production process, the 3D macro will be created as a detailed cubicle with necessary accessories (BIO cards) and connection point pattern defined in the database.

7 Global parts database

7.1 Global parts attributes for electrical components

This chapter defines globally attributes and locally maintained attributes. Each attribute that is global can be either mandatory or not mandatory. If they are not mandatory, it is not required to fill a value in. However, the responsibility is still at the global parts team for this attribute. For local attributes, the local parts administrator has to decide if a value is entered. Attributes that are not mentioned in descriptions below are not taken in consideration.

Page: General

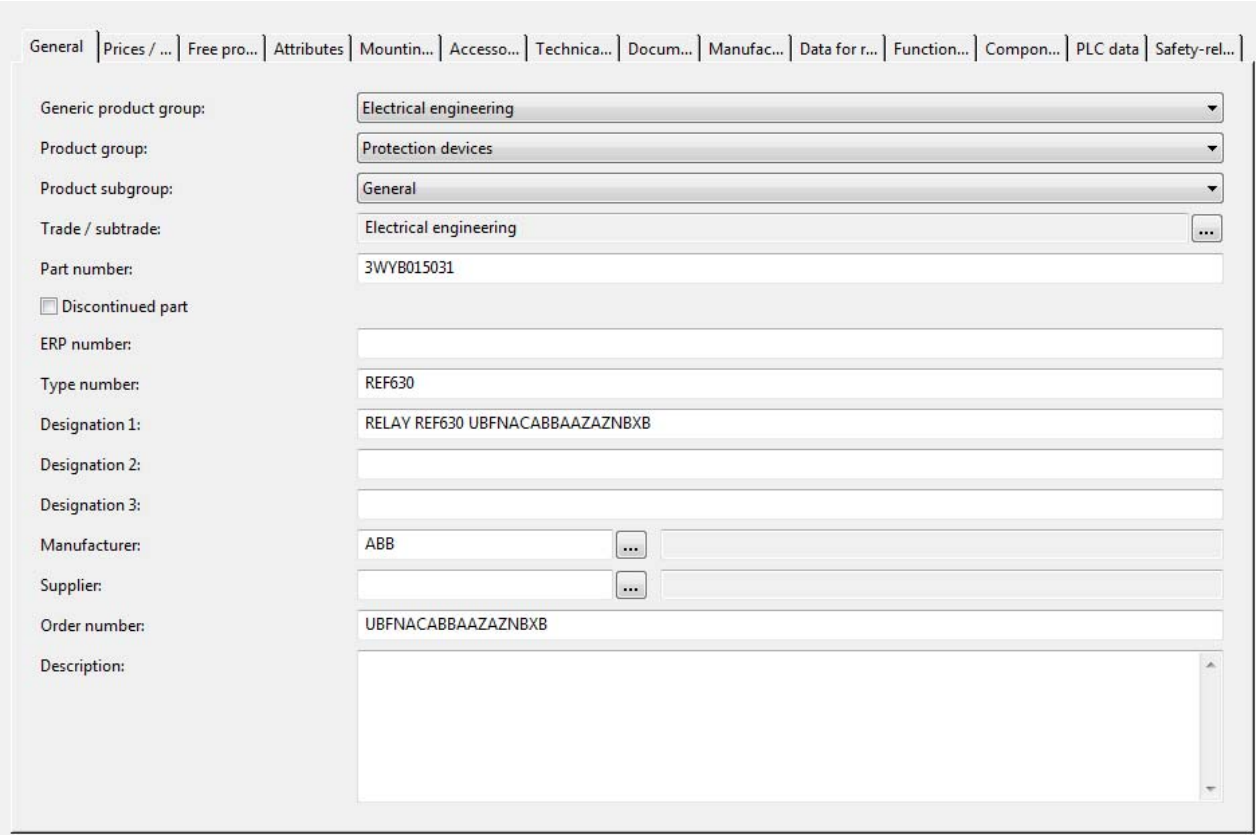


Figure 6: Parts management: General

Attribute	Global	Mandat.	Description	Notes
Generic product group	Yes	Yes	Eplan Generic product group	Value: “Electrical engineering”
Product group	Yes	Yes	Eplan Product group	According to 3WYR000001
Product subgroup	Yes	Yes	Eplan Product subgroup	According to 3WYR000001
Part number	Yes	Yes	Database key, unique syntax	Unique number from ABB PPMV global numbering system i.e. 3WYxxxxxxx, according to 3WYR000001 chapter 7
Discontinued part	Yes	No	Mark if a part is obsolete	Replace Free Properties [78] from MVE 2.5 version
ERP number	No	--	Local ERP system order number	Local SAP code
Type number	Yes	Yes	Manufacturer type number	If manufacturer does not provide type number, enter order number.
Designation 1	Yes	Yes	Short ERP description in English language	The amount of used characters in this field should not exceed 40 characters. The syntax of the entry is defined in the document [5] “3WYR000001_Tabs” in respect of the ABB classification. Additional languages can be added in accordance with Eplan multilingual settings syntax. These languages are for local use only. The format is as follows: “Short description of part group” “full type of part” e.g.

				“MCB S282UC-K1.6”
Designation 2	Yes	No	Empty, booked for future use	No value
Designation 3	No	--	For local use	
Manufacturer	Yes	Yes	Name of Manufacturer	If manufacturer of a part is changed, this field will also be changed, but macro name will remain with old manufacturer name due to compatibility with MVE functions
Supplier	No	--	Name of Supplier	It can differ from Manufacturer
Order number	Yes	No	Manufacturers order number	Only enter if the order number is globally identical for the whole ABB factories.
Description	Yes	No	Long ERP description in English language (optional)	The information stated in the field “Description” shall be used for the following purposes: • Priority 1: Detailed information for selection of component by engineer • Priority 2: Support of ordering process • Priority 3: Information on reports Minimum data in this field shall be as per document “3WYR000001_Tabs - List of required data for component data tabs according to ABB class” regarding the component data in clear text. Additional data shall be added on demand by the requestor of the part. The text in this field shall be all capital letters except for units. Additional languages are added in accordance with Eplan multilingual settings syntax. These languages are for local use only.

Page: Prices/other

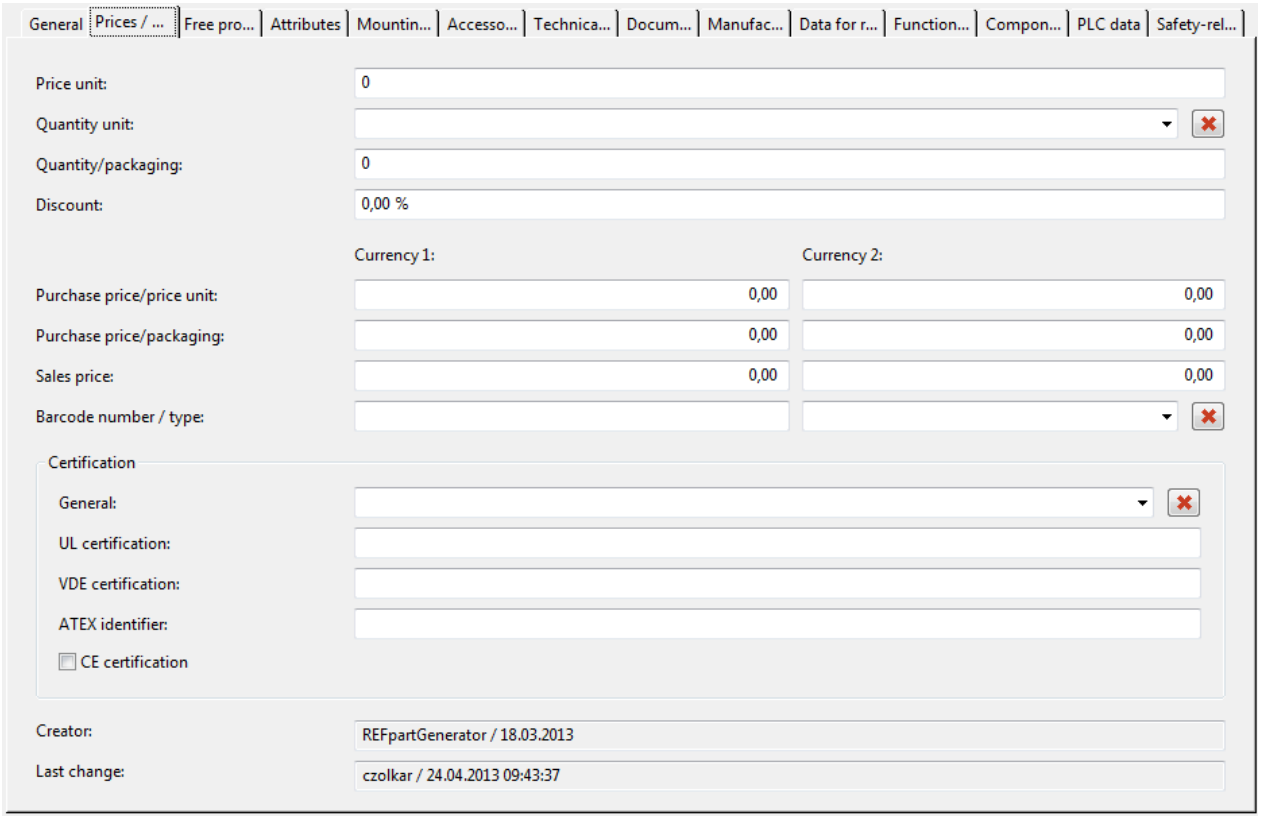


Figure 7: Parts management: Prices / other

Attribute	Global	Mandat.	Description	Notes
Certification	No	--	For local use	
Other attributes	No	--	Not considered for ABB purpose	

Page: Free properties

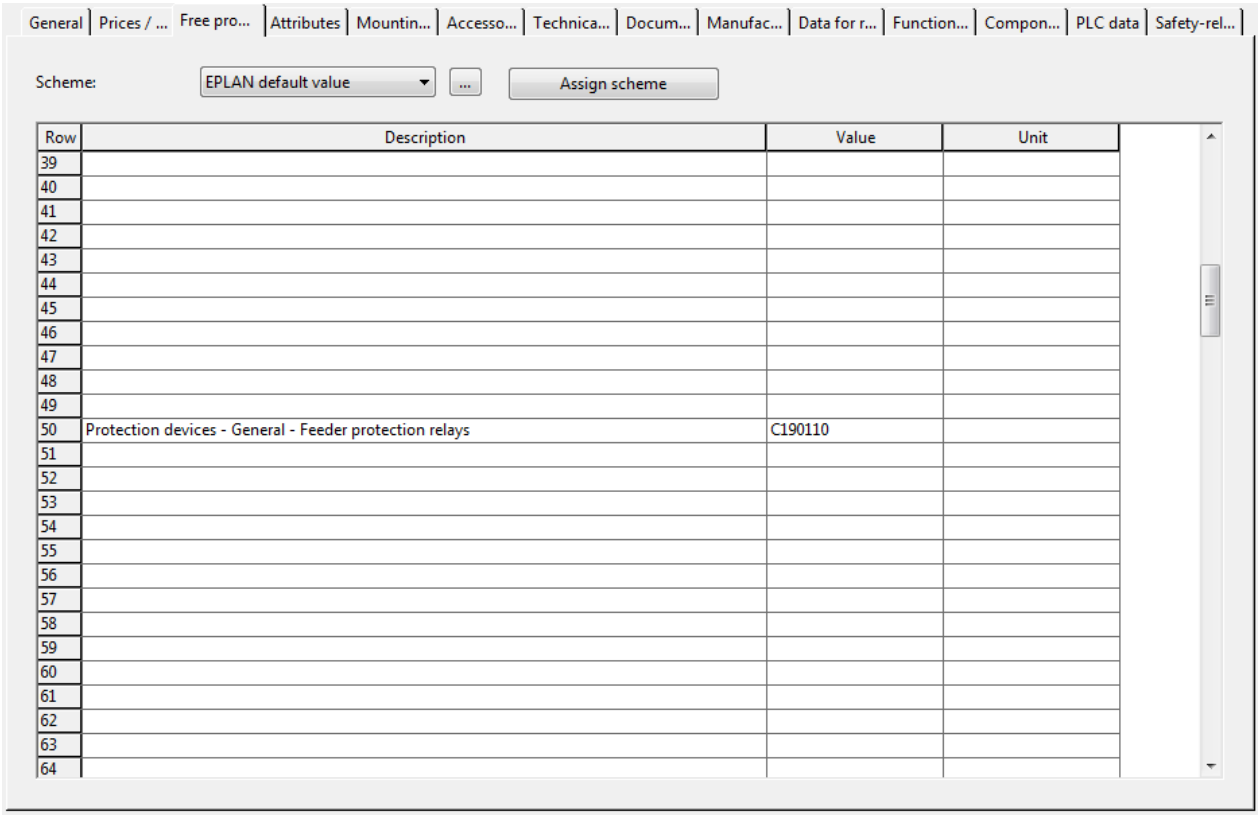


Figure 8: Parts management: Free properties

Attribute	Global	Mandat.	Description	Notes
Free Properties [1] to [49]	No	--	Free for local usage	
Free Properties [50]	Yes	Yes	ABB classification of part	According to 3WYR000001: - Description = Classification for ABB - Value = Short Classification Note: the correct language setting of the fields has to be used (normally en_US)
Free Properties [51]	No	--	Saves information from ERP system if material is on stock	
Free Properties [52] to [76]	No	--	Attributes of part transported from ERP system	Text can be multi lingual as defined in ERP import specification
Free Properties [77]	No	--	Part is marked as long term delivery item	
Free Properties [78]	Yes	No	Part is marked as obsolete item	Obsolescence of material is defined locally
Free Properties [79]	No	--	Part is marked for not to be used in PLD page	
Free Properties [80]	No	--	Part is marked as not to be ordered	
Free Properties [81]	No	--	Label material in case of terminal	Used for export to Modernotechnica (Brady)
Free Properties [82]	No	--	Low cost material	
Free Properties [83]	No	--		
Free Properties [84]	No	--	For selection of Wiring Category	According to 3WYR000001: Device Tags

Free Properties [85]	No	--	STIC zone and sequence information	
Free Properties [86]	No	--	Sequence of devices per default sorting	Used for Generic Marking
Free Properties [87] to [100]	No	--	Reserved for global usage	

Page: Attributes

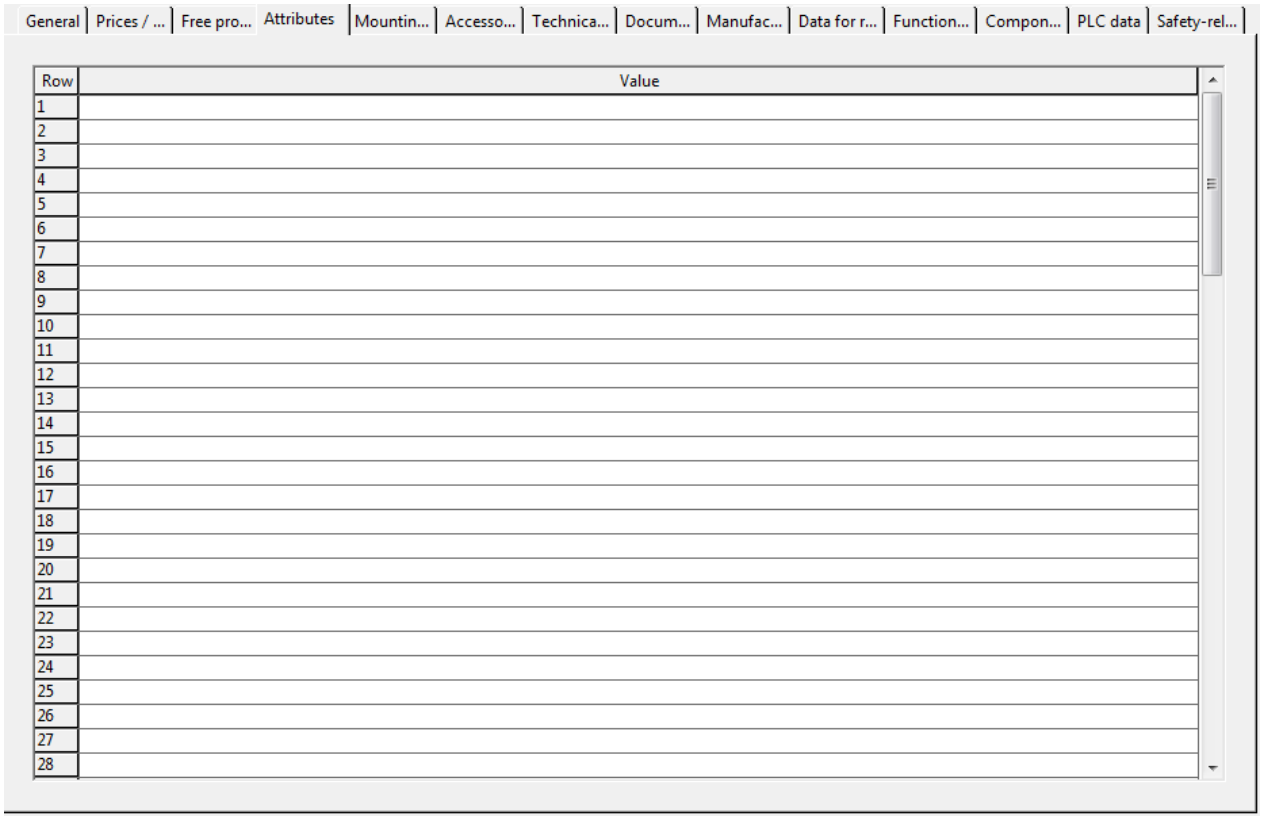


Figure 9: Parts management: Attributes

Attribute	Global	Mandat.	Description	Notes
Attribute [1] to [49]	No	--	Free for local usage	
Attribute [50]	Yes	No	Part has no function templates	Allowed text: 'No function templates' or empty
Attribute [78]	Yes	No	Reason why a part is obsolete (discontinued)	Short description why parts is obsolete
Attribute [51] to [100]	Yes	No	Reserved for global usage	

Page: Mounting data

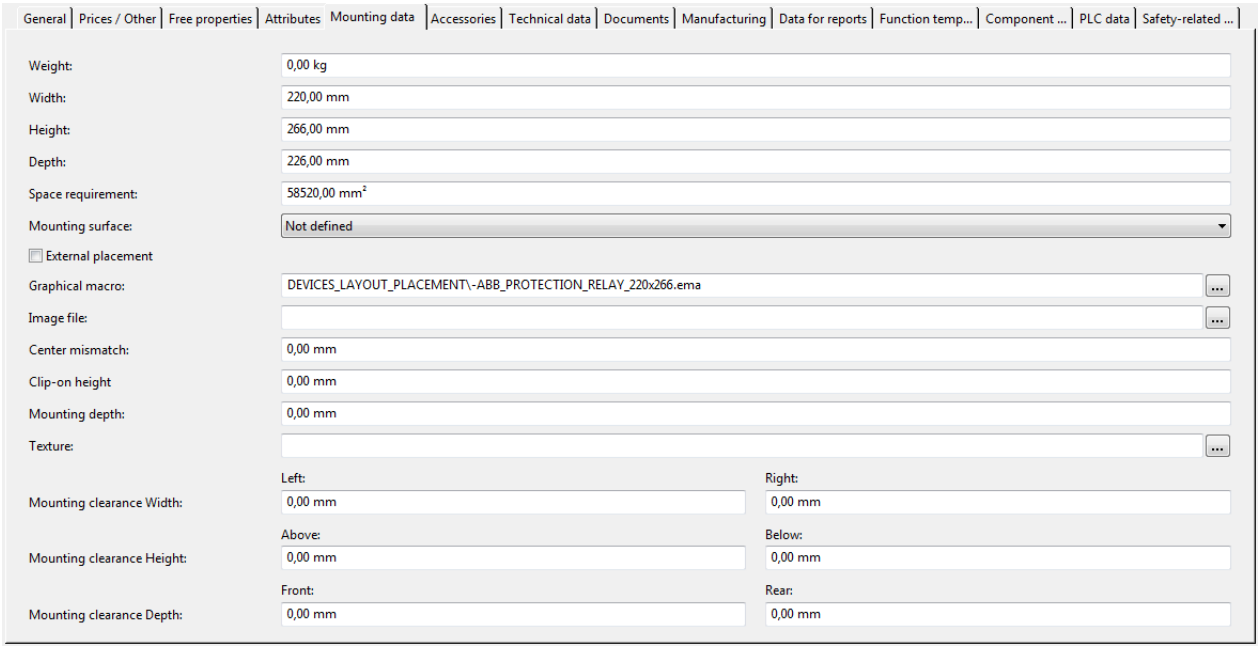


Figure 10: Parts management: Mounting data

Attribute	Global	Mandat.	Description	Notes
Weight	No	--	Weight of Material	According to catalogue value
Width	Yes	Yes	Width of Material	According to catalogue value. If no value is stated in the catalogue, 0,1 mm has to be entered.
Height	Yes	Yes	Height of Material	According to catalogue value. If no value is stated in the catalogue, 0,1 mm has to be entered.
Depth	Yes	Yes	Depth of Material	According to catalogue value. If no value is stated in the catalogue, 0,1 mm has to be entered.
Space requirement	Yes	Yes	Space required by mounting	Automatically calculated (based on Width and Height) If no value is stated in the catalogue for width and height, the value has to be 0,01 mm.
Mounting surface	No	--	Optional	
Graphical macro	Yes	No	Eplan panel layout macro (.ema) for creating panel layout drawings	Only for devices where a macro is needed for correct design of PLD and DLD
Image file	No	--	Not considered for ABB purpose	
Center mismatch	Yes	Yes	Center mismatch of the device	Gives information about the center mismatch of the macro
Clip-on height	Yes	Yes	The height between the mounting rail and the macro.	The height can be positive or negative in the direction.
Mounting depth	Yes	Yes	The value specifies how far an item projects into a door.	Only applicable for parts mounted into a door.
Texture	No	--	Not considered for ABB purpose	
Mounting clearance Width / Height / Depth	Yes	Yes	Entry of the device-specific mounting clearances in mm. If wiring systems (e.g. Lütze) are	The values in this field cause an increase of the space requirement of the part.

			used, the specified dimensions should correspond to the punched rail, the wiring cradle, or the perforation strip.	

Page: Accessories

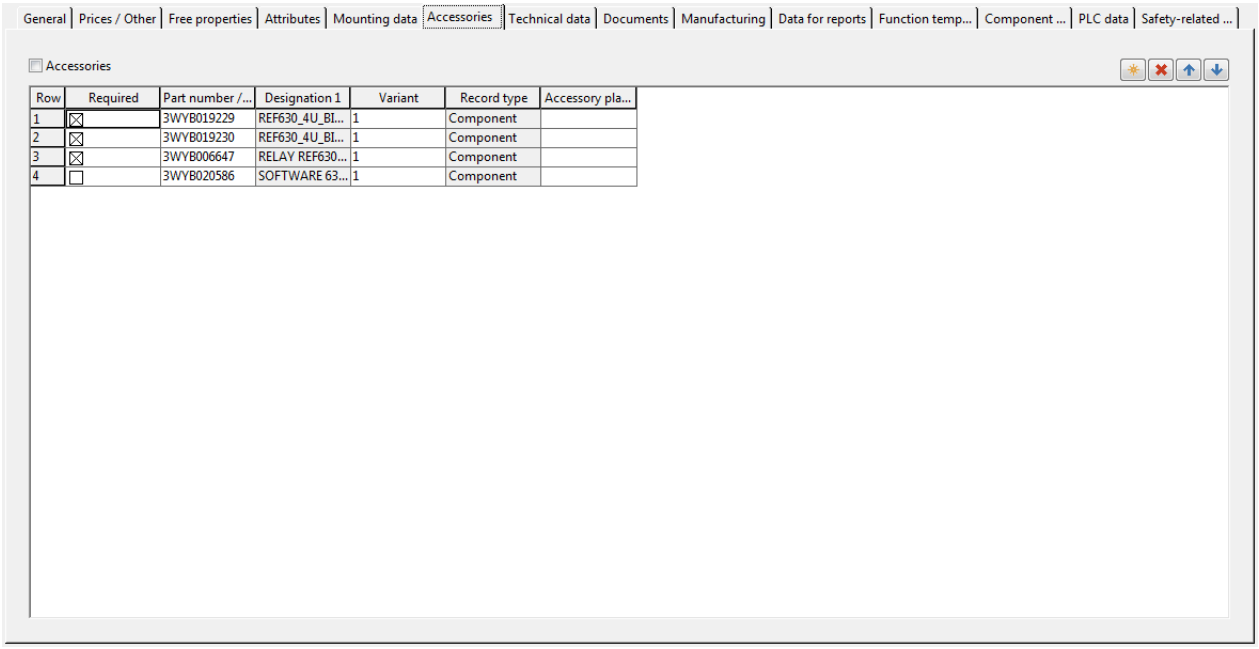


Figure 11: Parts management: Accessories

Attribute	Global	Mandat.	Description	Notes
Accessories checkbox	Yes	Yes	Material is marked as accessory for other material(s)	Needed for dynamic assemblies
Accessories table	Yes	Yes	List of accessories material belonging to the current material	Needed for dynamic assemblies

Note: The definition for accessory lists are described at the end of this chapter.

Page: Technical data

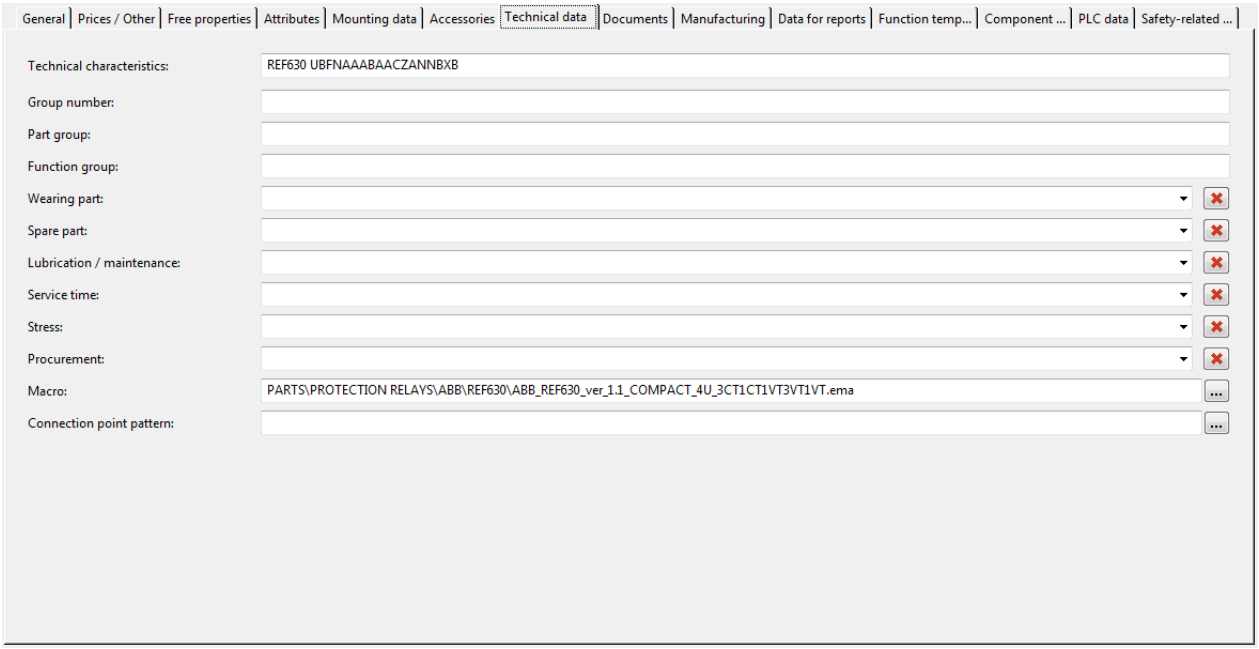


Figure 12: Parts management: Technical data

Attribute	Global	Mandat.	Description	Notes
Identifier	No	--	IEC device tag code	According to 2NBA000001 "Reference Designation of objects for electrical documents"
Macro	Yes	No	Eplan multiline macro	Only for devices where a macro is needed due to complexity of device (e.g. black box) The path of the macro file shall be relative to the Eplan standard directory for macros (setting for directories).
Connection point pattern	Yes	No	In the generic product group Connection point pattern, one can define names for an arrangement (i.e., a group) of connection points, and enter information about the spatial arrangement of the connection points.	To assign these properties to certain parts, then, click [...] in this field and select the desired record in this selection dialog.
Other attributes	No	--	Not considered for ABB purpose	

Page: Documents

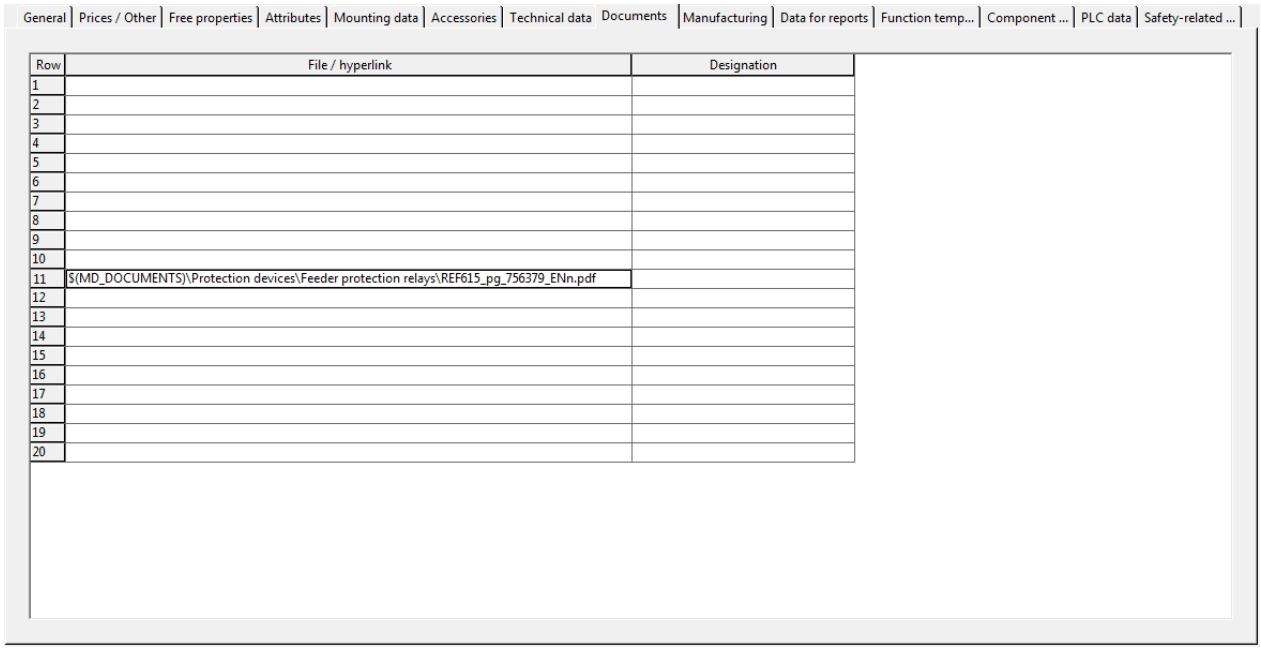


Figure 13: Parts management: Documents

Attribute	Global	Mandat.	Description	Notes
Attribute [1] to [10]	No	--	Free for local usage	
Attribute [11] to [20]	Yes	No	Filename and description of documentation of part.	If a local parts administrator requests a part and provides a catalogue page or datasheet with significant data in English language, it will be entered by the global parts administrator. The document will be stored in the documents-directory on the global server. The path shall be defined through the path variable "$(MD_DOCUMENTS)". The file will be part of the synchronization function and thus be automatically updated if the part is changed. The file will be given a meaningful name which's structure orientates on the macro name. It is not the responsibility of the global parts administrator to search for this kind of documentation. Instead it has to be provided by the requester. Also, there will be no responsibility to keep these data up-to-date. Other languages can be added if English is not available or not too detailed enough.

Page: Data for reports

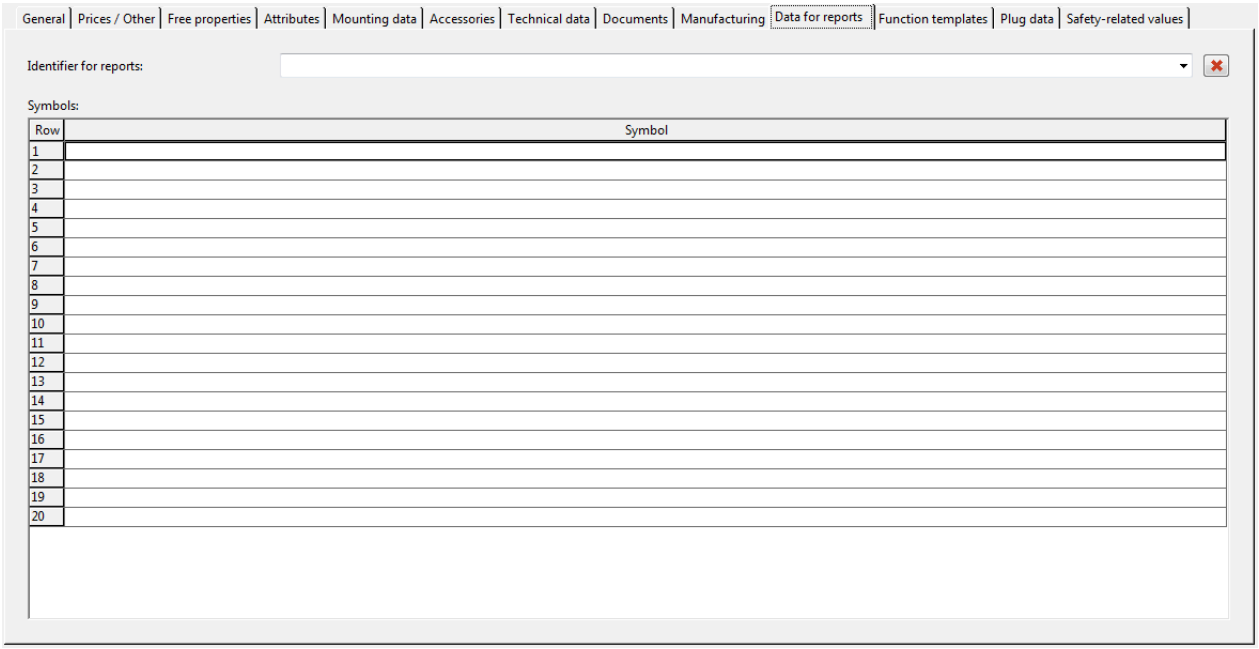
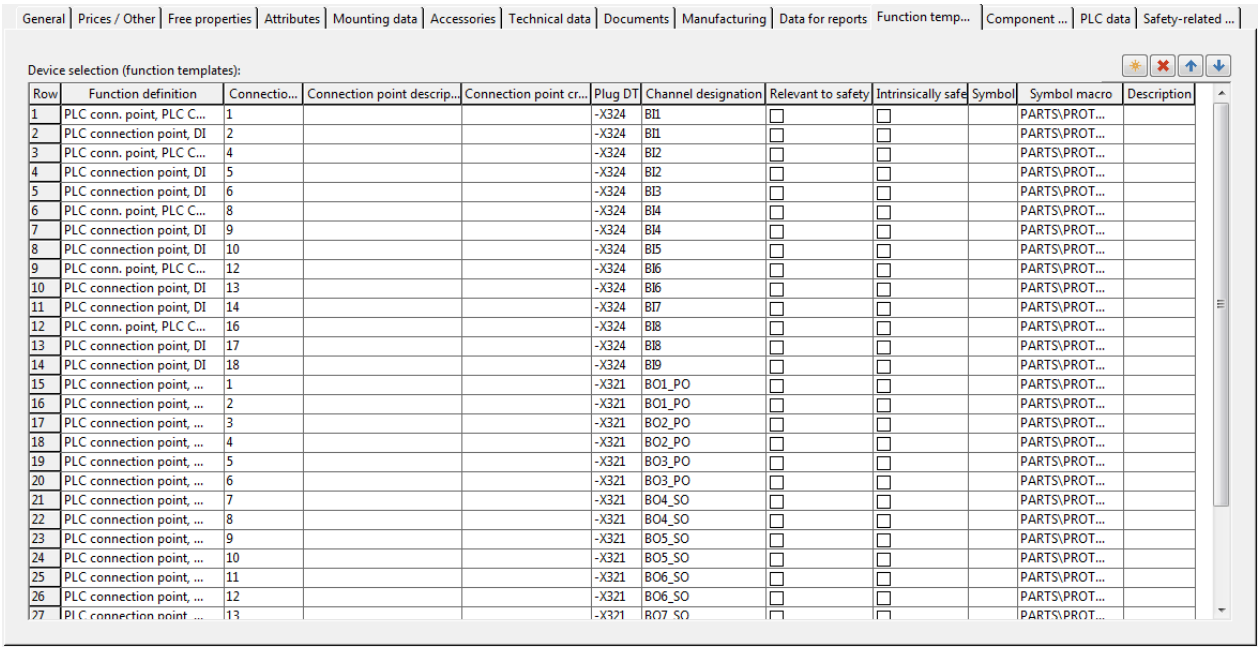


Figure 14: Parts management: Data for reports

Attribute	Global	Mandat.	Description	Notes
All attributes	No	--	For future/local purpose	Needed for graphical bill of material

Page: Function templates



Row	Function definition	Connectio...	Connection point descrip...	Connection point cr...	Plug DT	Channel designation	Relevant to safety	Intrinsically safe	Symbol	Symbol macro	Description
1	PLC conn. point, PLC C...	1			-X324	BI1	☐	☐		PARTS\PROT...	
2	PLC connection point, DI	2			-X324	BI1	☐	☐		PARTS\PROT...	
3	PLC conn. point, PLC C...	4			-X324	BI2	☐	☐		PARTS\PROT...	
4	PLC connection point, DI	5			-X324	BI2	☐	☐		PARTS\PROT...	
5	PLC connection point, DI	6			-X324	BI3	☐	☐		PARTS\PROT...	
6	PLC conn. point, PLC C...	8			-X324	BI4	☐	☐		PARTS\PROT...	
7	PLC connection point, DI	9			-X324	BI4	☐	☐		PARTS\PROT...	
8	PLC connection point, DI	10			-X324	BI5	☐	☐		PARTS\PROT...	
9	PLC conn. point, PLC C...	12			-X324	BI6	☐	☐		PARTS\PROT...	
10	PLC connection point, DI	13			-X324	BI6	☐	☐		PARTS\PROT...	
11	PLC connection point, DI	14			-X324	BI7	☐	☐		PARTS\PROT...	
12	PLC conn. point, PLC C...	16			-X324	BI8	☐	☐		PARTS\PROT...	
13	PLC connection point, DI	17			-X324	BI8	☐	☐		PARTS\PROT...	
14	PLC connection point, DI	18			-X324	BI9	☐	☐		PARTS\PROT...	
15	PLC connection point, ...	1			-X321	BO1_PO	☐	☐		PARTS\PROT...	
16	PLC connection point, ...	2			-X321	BO1_PO	☐	☐		PARTS\PROT...	
17	PLC connection point, ...	3			-X321	BO2_PO	☐	☐		PARTS\PROT...	
18	PLC connection point, ...	4			-X321	BO2_PO	☐	☐		PARTS\PROT...	
19	PLC connection point, ...	5			-X321	BO3_PO	☐	☐		PARTS\PROT...	
20	PLC connection point, ...	6			-X321	BO3_PO	☐	☐		PARTS\PROT...	
21	PLC connection point, ...	7			-X321	BO4_SO	☐	☐		PARTS\PROT...	
22	PLC connection point, ...	8			-X321	BO4_SO	☐	☐		PARTS\PROT...	
23	PLC connection point, ...	9			-X321	BO5_SO	☐	☐		PARTS\PROT...	
24	PLC connection point, ...	10			-X321	BO5_SO	☐	☐		PARTS\PROT...	
25	PLC connection point, ...	11			-X321	BO6_SO	☐	☐		PARTS\PROT...	
26	PLC connection point, ...	12			-X321	BO6_SO	☐	☐		PARTS\PROT...	
27	PLC connection point, ...	13			-X321	BO7_SO	☐	☐		PARTS\PROT...	

Figure 15: Parts management: Function templates

Attribute	Global	Mandat.	Description	Notes
Device selection	Yes	No	List all connection points of all equipments (terminals excluded)	Required for Wiring categories tab and other check functions. The entry of function templates is only necessary for parts of category 2., 3. and 4. as defined in chapter 7.60

Page: Component data

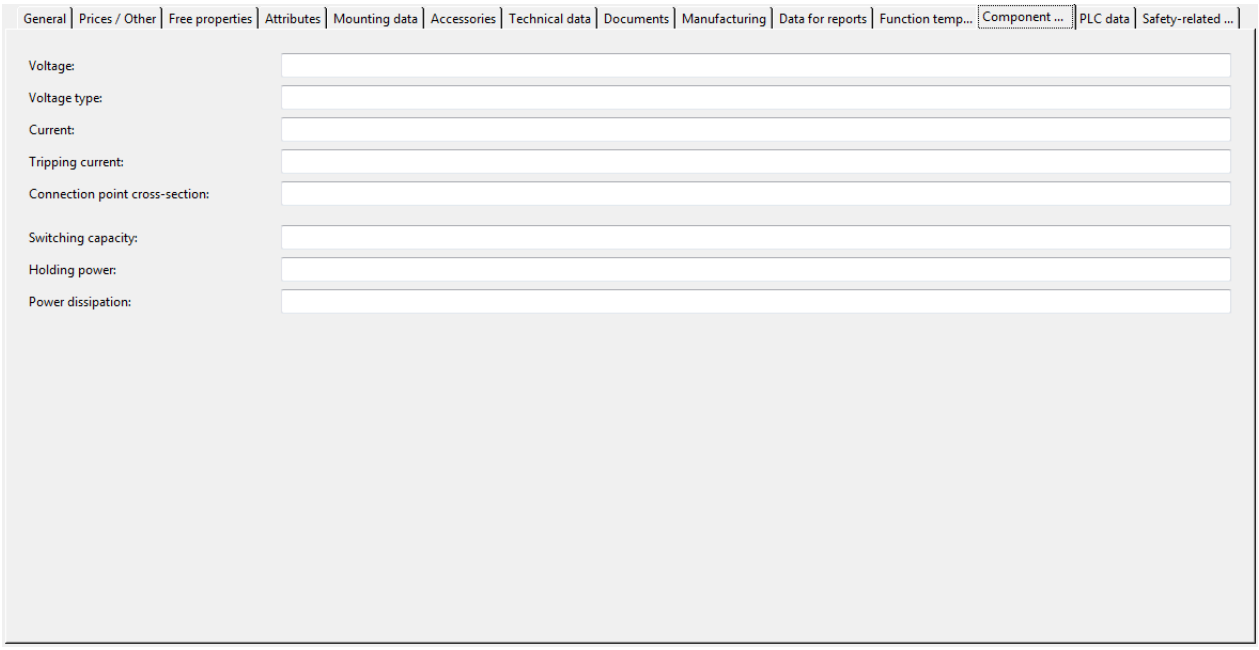


Figure 16: Parts management: Component data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for general devices	It can be used for reports, filtering and other Eplan functions. The format has to comply with the rules stated in chapter 7.10. Remark: The power attributes has to be stated in 'kW'. The power dissipation has to be stated in 'mW'.

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] "3WYR000001_Tabs" in respect of their ABB classification.

Page: Connection data

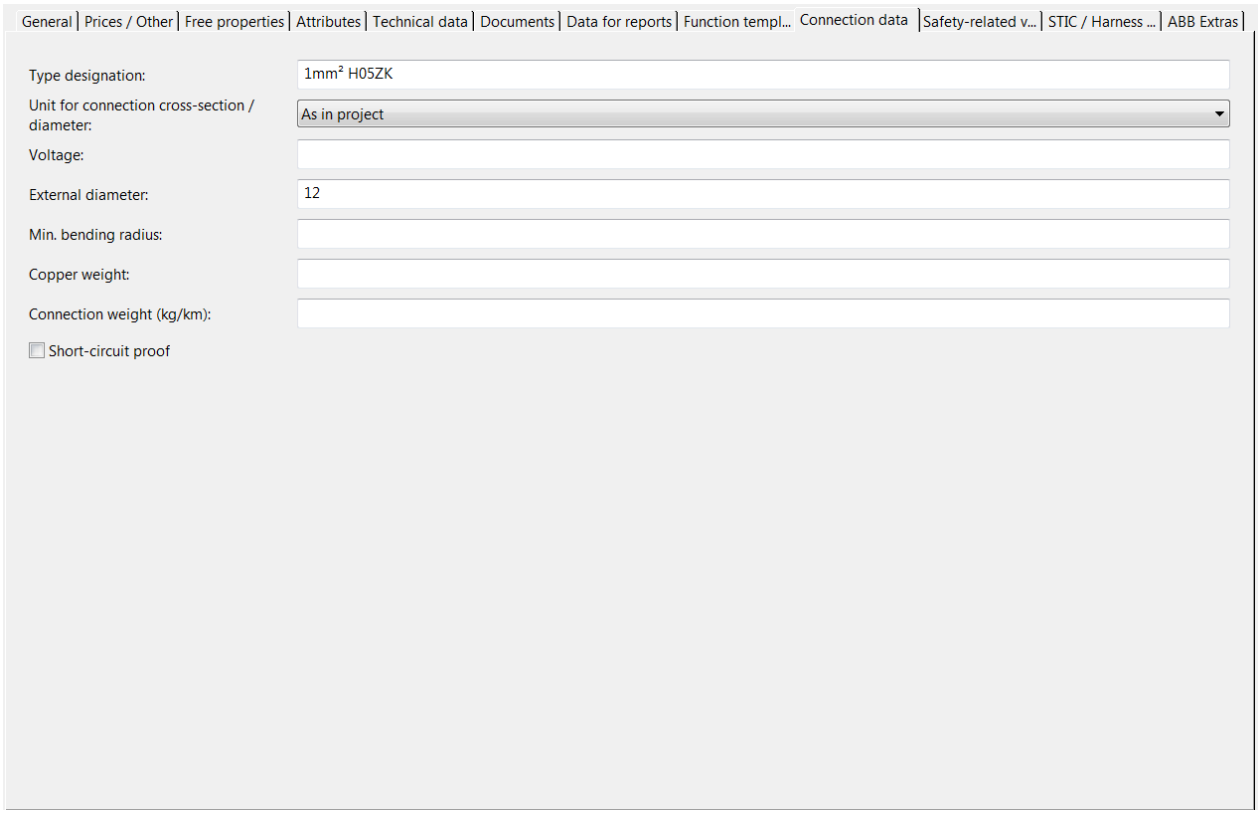


Figure 17: Parts management: Connection data

Attribute	Global	Mandat.	Description	Notes
Type designation	Yes	No	Full type definition of wire	To be shown on reports
External diameter	Yes	No	Defines the diameter of the connector including insulation in mm.	Necessary for 3D layout calculation
Other attributes	Yes	No	Additional information for connections e.g. wires	It can be used for reports, filtering and other Eplan functions

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] “3WYR000001_Tabs” in respect of their ABB classification.

Page: Contactor data

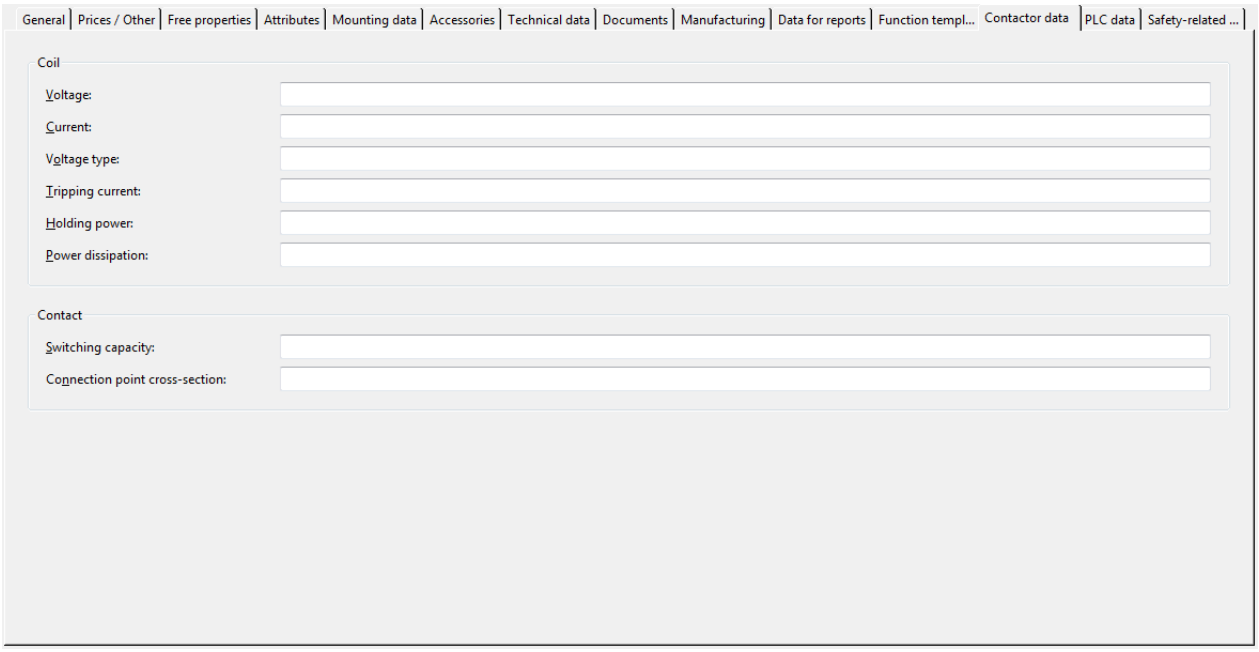


Figure 18: Parts management: Contactor data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for contactors (e.g. relays)	It can be used for reports, filtering and other Eplan functions Remark: The power attributes has to be stated in 'kW'. The power dissipation has to be stated in 'mW'.

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] "3WYR000001_Tabs" in respect of their ABB classification.

Page: Terminal data

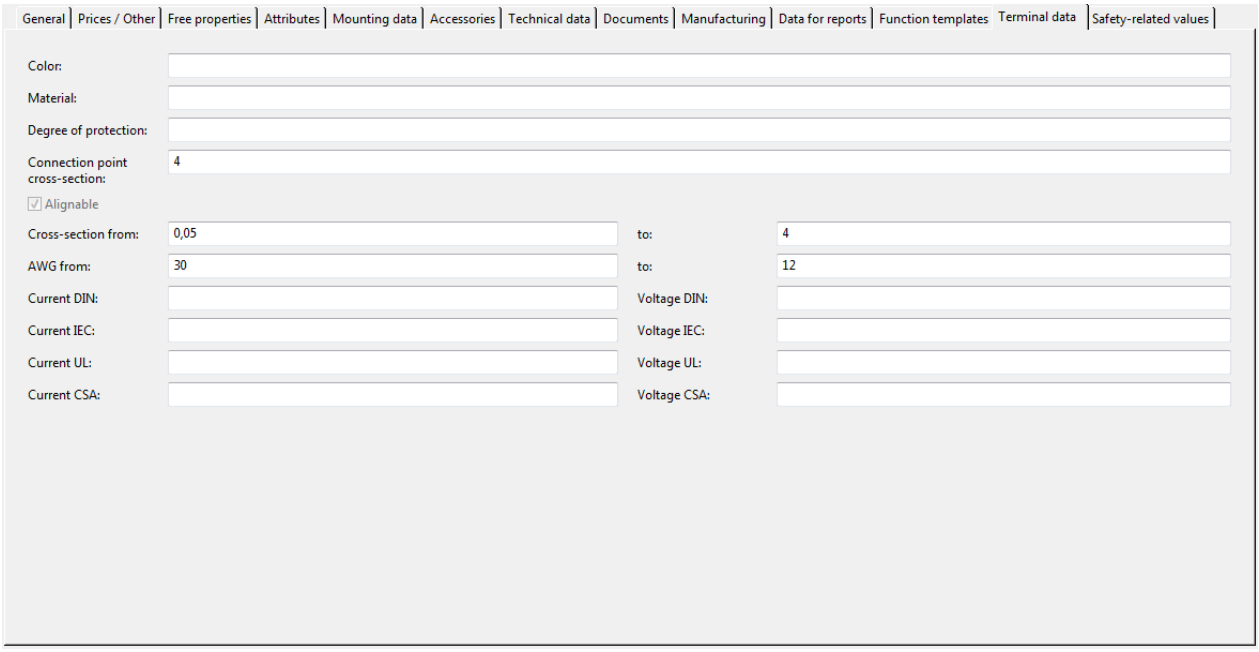


Figure 19: Parts management: Terminal data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for terminals and terminal accessories	It can be used for reports, filtering and other Eplan functions Remark: The connection point cross-section shall be used for the maximum cross-section in mm².

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] “3WYR000001_Tabs” in respect of their ABB classification.

Page: Plug data

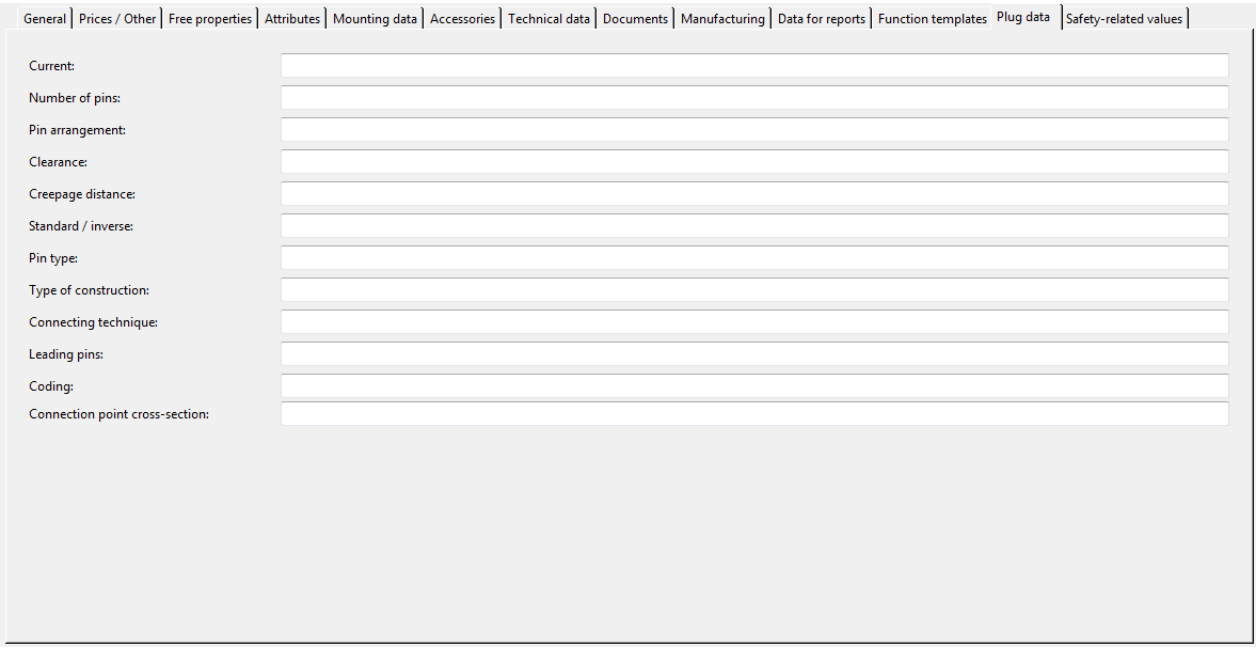


Figure 20: Parts management: Plug data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for plugs	It can be used for reports, filtering and other Eplan functions

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] “3WYR000001_Tabs” in respect of their ABB classification.

Page: Cable data

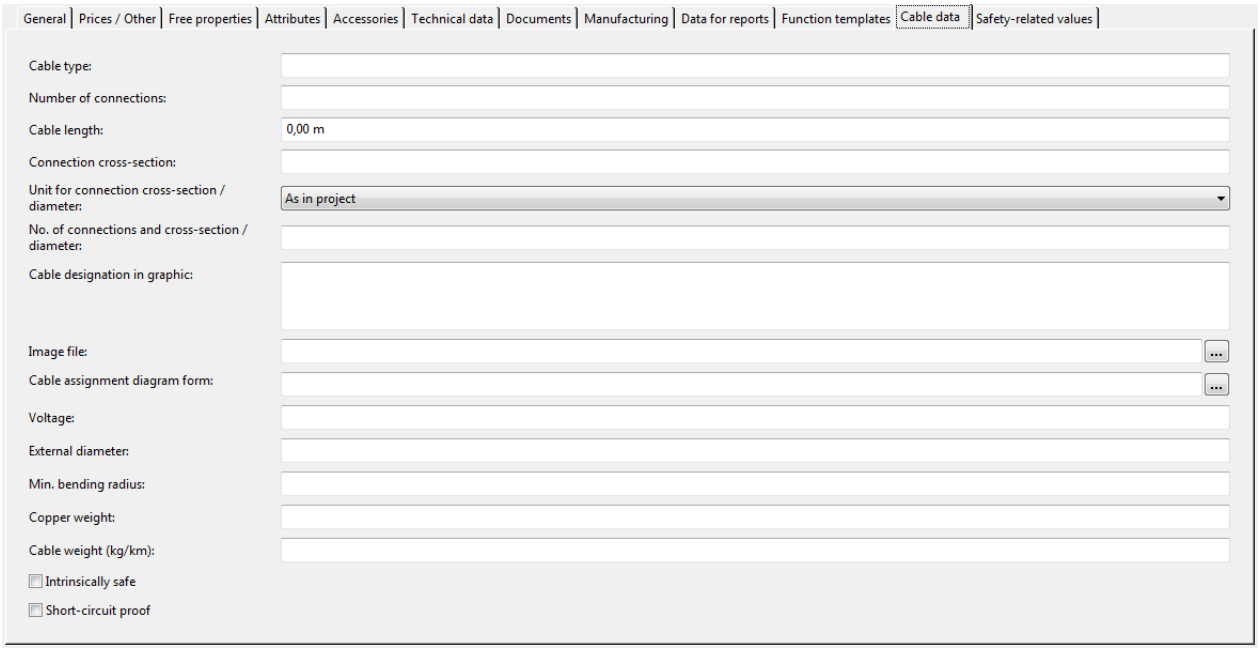


Figure 21: Parts management: Cable data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for cables	It can be used for reports, filtering and other Eplan functions

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] “3WYR000001_Tabs” in respect of their ABB classification.

Page: PLC data

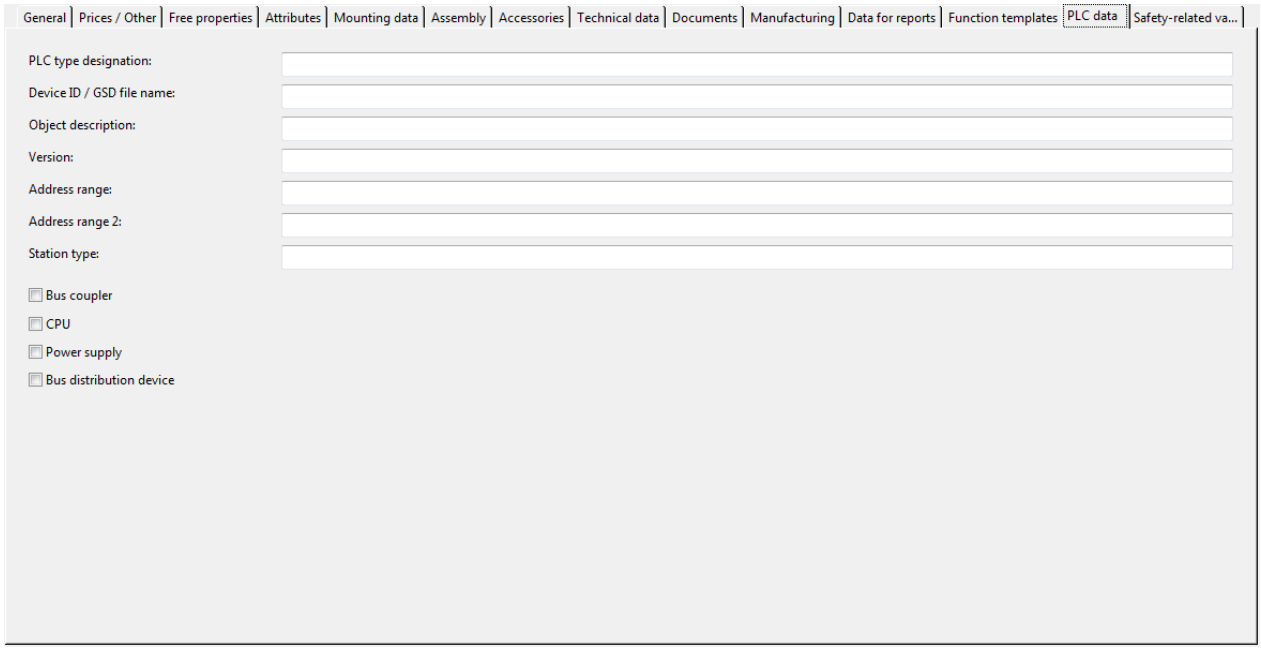


Figure 22: Parts management: PLC data

Attribute	Global	Mandat.	Description	Notes
All attributes	Yes	No	Additional information for PLC devices, in BU PPMV it shall be used for multifunction protection devices / IED	It can be used for reports, filtering and other Eplan functions Remark: The power attributes has to be stated in 'kW'. The power dissipation has to be stated in 'mW'.

Note: The component data have to be entered according to the type of device. The required component data are listed in the document [5] "3WYR000001_Tabs" in respect of their ABB classification.

Page: ABB Extras

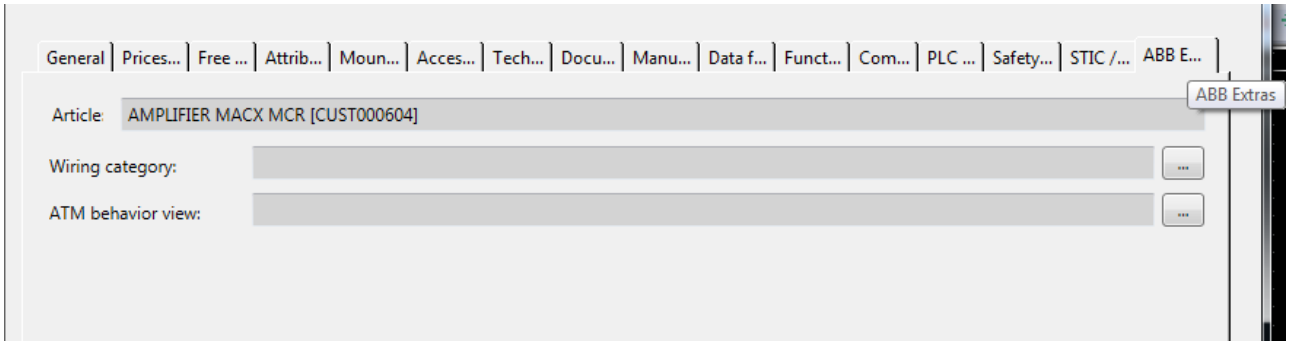


Figure 23: Parts management: ABB Extras

Attribute	Global	Mandat.	Description	Notes
Wiring category	No	--	Data for Wiring categories	
ATM behavior view	No	--	Data for ATM behavior views	

7.2 Global parts attributes for mechanical components

The all applicable data defined for electrical components shall also be followed for mechanical components. In addition the data defined in this chapter shall be entered.

Page: Function definition

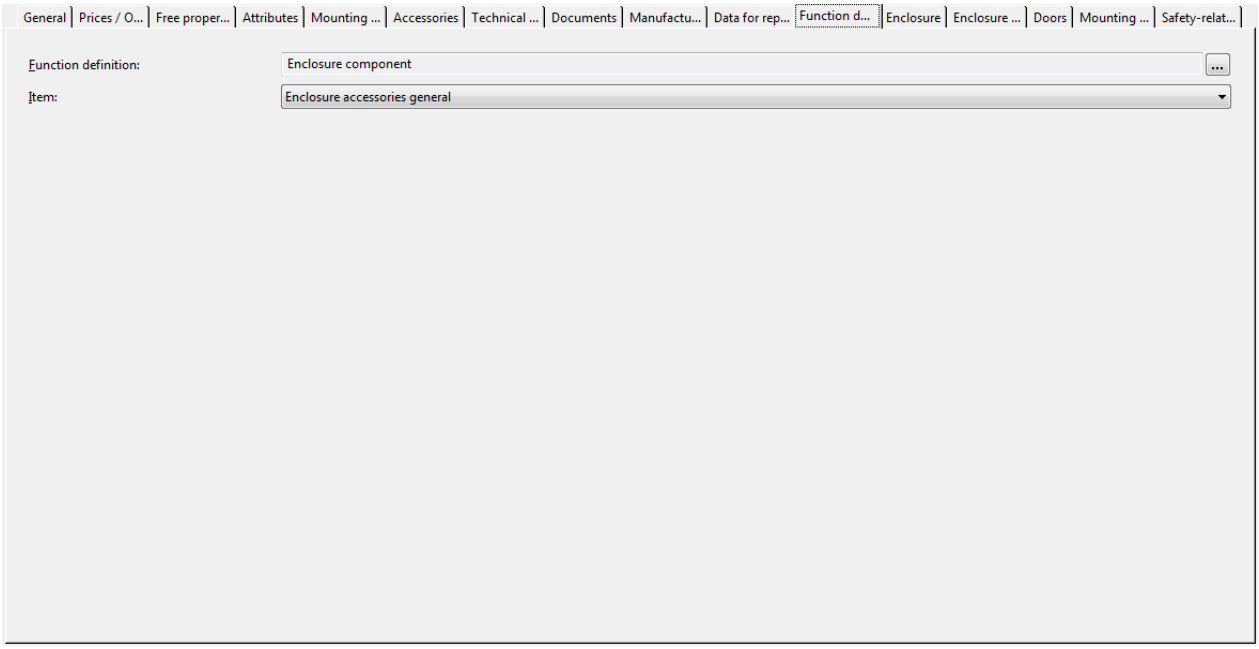


Figure 24: Parts management: Function definition

Attribute	Global	Mandat.	Description	Notes
Function definition	Yes	Yes	Selection of the enclosure system (e.g. body, enclosure, profile).	
Item	Yes	Yes	Choose the master component enclosure	

Page: Enclosure

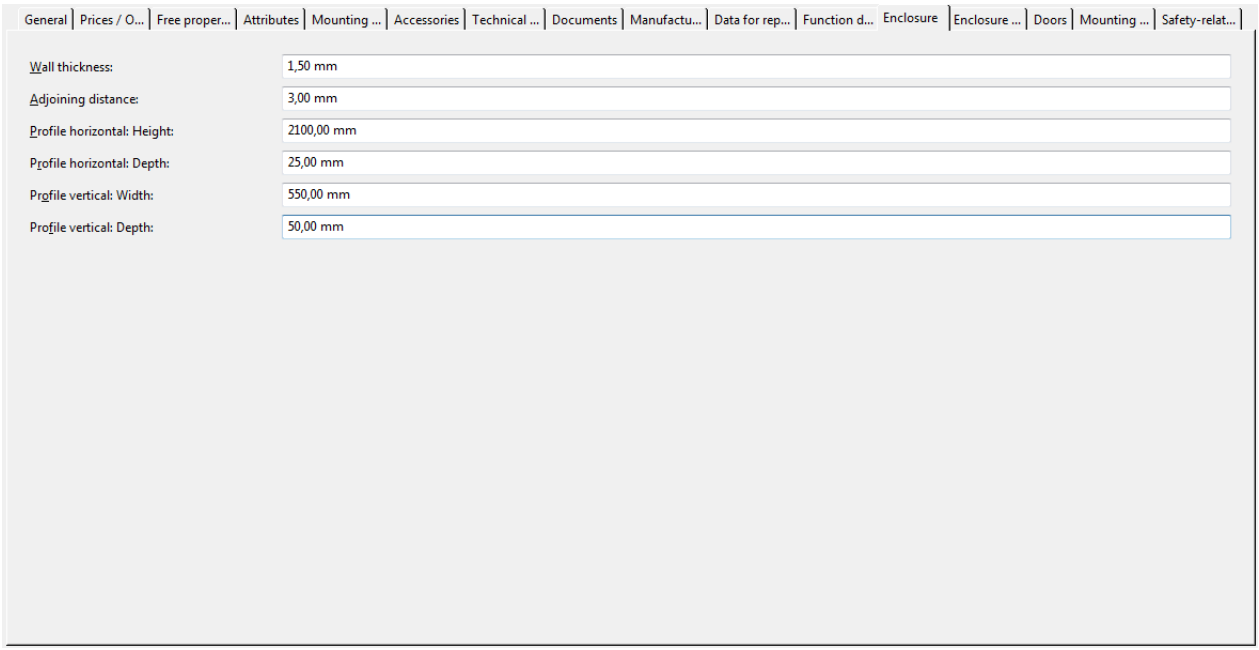


Figure 25: Parts management: Enclosure

Attribute	Global	Mandat.	Description	Notes
Wall thickness	Yes	No	Selection of the wall thickness of the enclosure.	Input is only required, if the component is selected.
Adjoining distance	Yes	No	Distance between the enclosures.	Input is only required, if the component is selected.
Profile horizontal: Height:	Yes	No	Measurement of the height of the profile in horizontal position.	Input is only required, if the component is selected.
Profile horizontal: Depth:	Yes	No	Measurement of the depth of the profile in horizontal position.	Input is only required, if the component is selected.
Profile vertical: Width:	Yes	No	Measurement of the width of the profile in vertical position.	Input is only required, if the component is selected.
Profile vertical: Depth:	Yes	No	Measurement of the depth of the profile in vertical position.	Input is only required, if the component is selected.

Page: Enclosure body

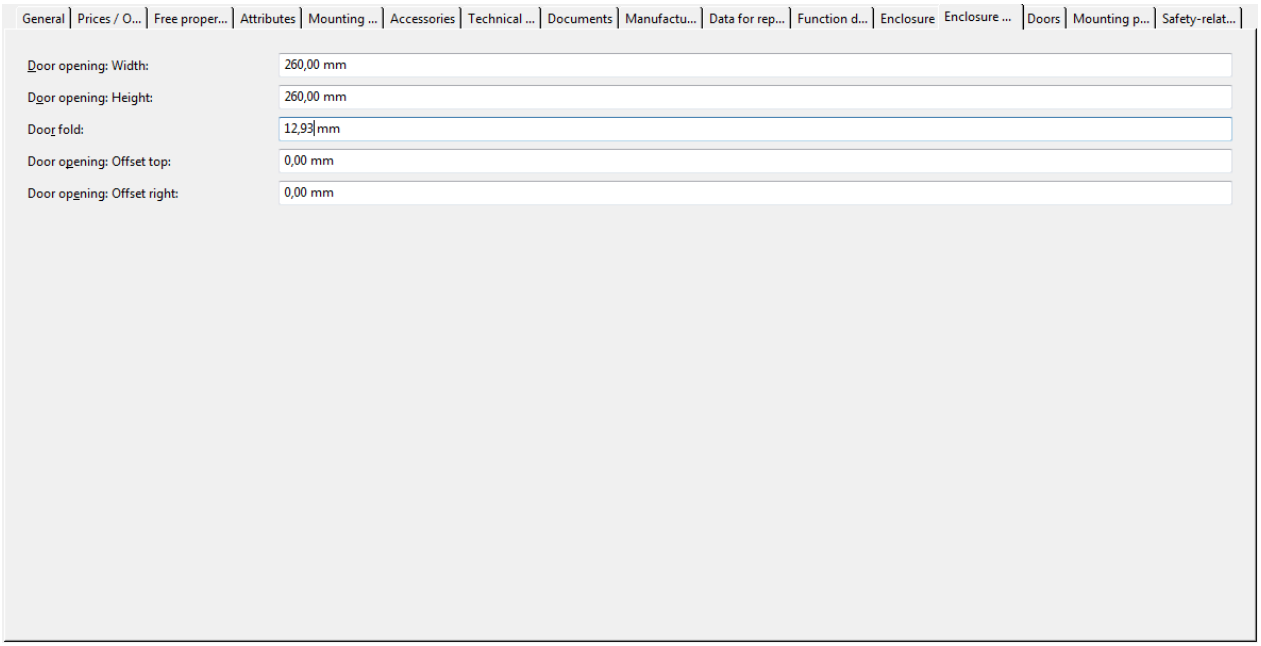


Figure 26: Parts management: Enclosure body

Attribute	Global	Mandat.	Description	Notes
Door opening: Width:	Yes	Yes	Enter the value for the width of the door opening for the enclosure body here.	Values are designated in mm.
Door opening: Height:	Yes	Yes	Enter the value for the height of the door opening for the enclosure body here.	Values are designated in mm.
Door fold:	Yes	No	Enter the value for the door fold here.	The formation of the edge of a door leaf has to take in consideration.
Door opening: Offset top:	Yes	No	Enter the value for the upper offset of the door opening for the enclosure body here.	Values are designated in mm.
Door opening: Offset right:	Yes	No	Enter the value for the right offset of the door opening for the enclosure body here.	Values are designated in mm.

Page: Enclosure component

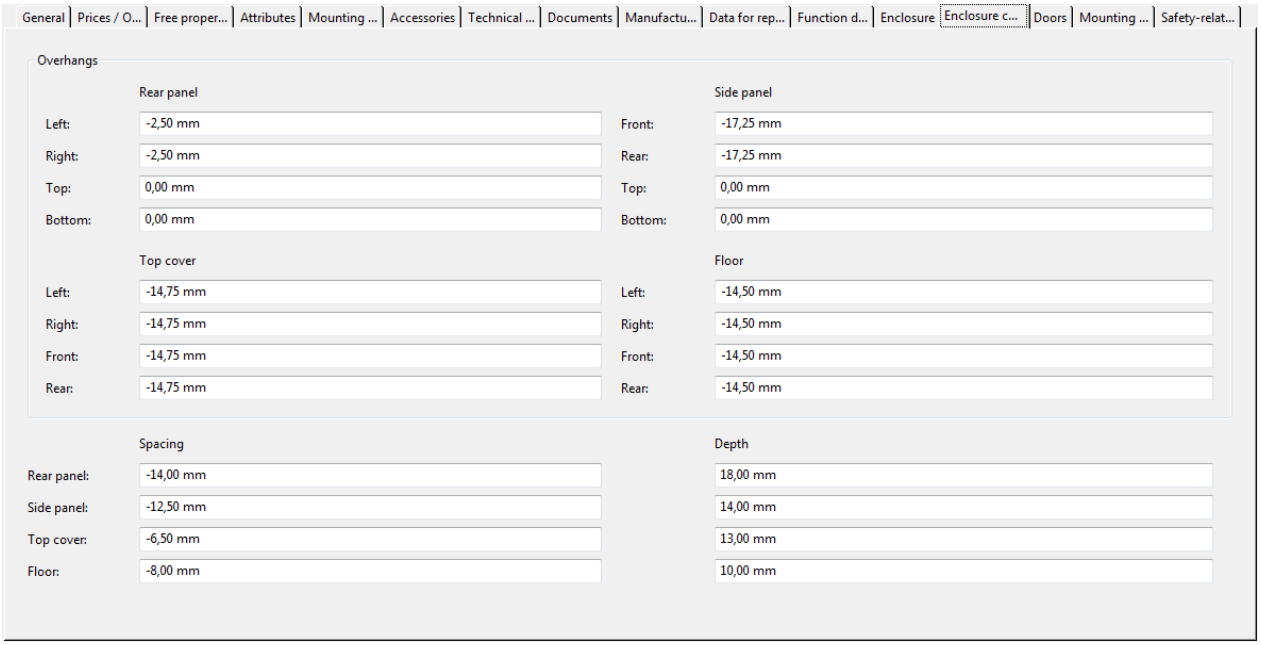


Figure 27: Parts management: Enclosure component

Attribute	Global	Mandat.	Description	Notes
Overhangs	Yes	No	The individual entered values define the overhang of the item (= rear wall, side panel, top cover, floor) to the outer edge of the respective profile.	The prefix +/- gives the overhang a direction.
Spacing	Yes	No	Enter the spacing of the outer edge of the item (the end of the seam) to the respective profile edge here.	The prefix +/- gives the spacing a direction.
Depth	Yes	No	Enter the depths for the rear panel, side panels, top cover, and floor here. The depth of the item, incl. seam, is meant here, i.e. not the material thickness.	

Page: Doors

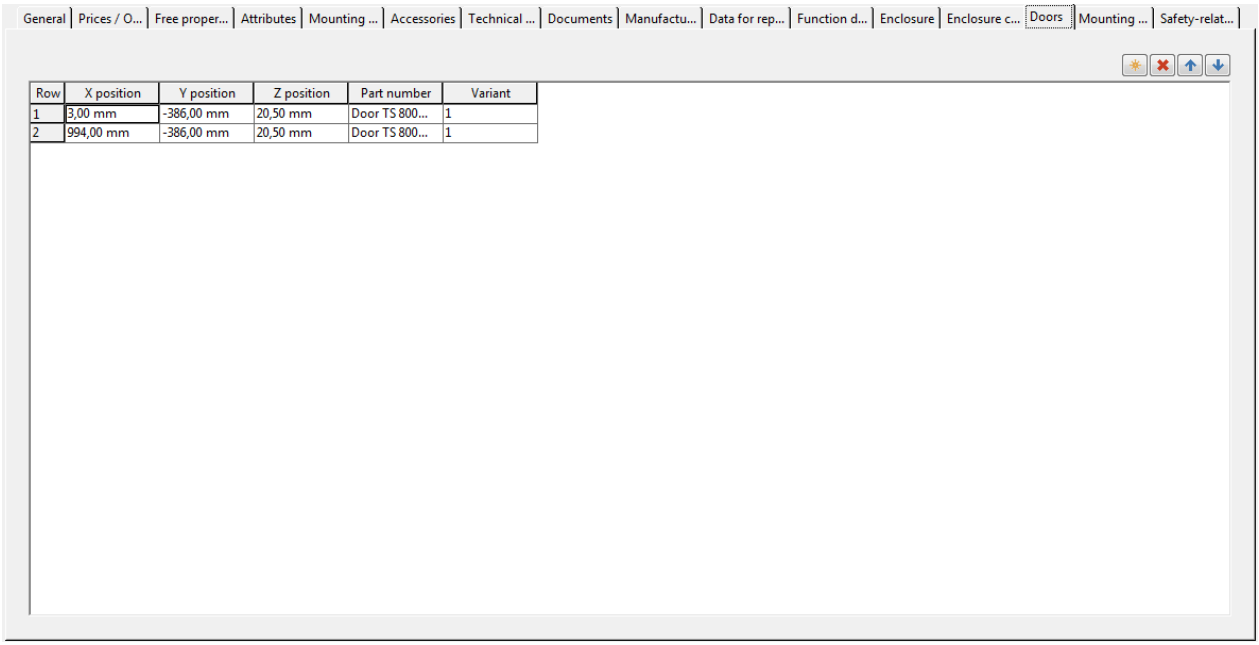


Figure 28: Parts management: Doors

Attribute	Global	Mandat.	Description	Notes
X position Y position Z position	Yes	No	Define here the positions of the doors by entering the appropriate values into the cells.	Values are designated in mm.
Part number	Yes	No	Select a part or part variant from the part selection within the drop-down list.	A multiple selection is not possible here.
Variant	Yes	No	If a part variant in the Part number field is selected, the appropriate variant number is displayed here.	It is possible to overwrite the entry if necessary.

Page: Mounting panels

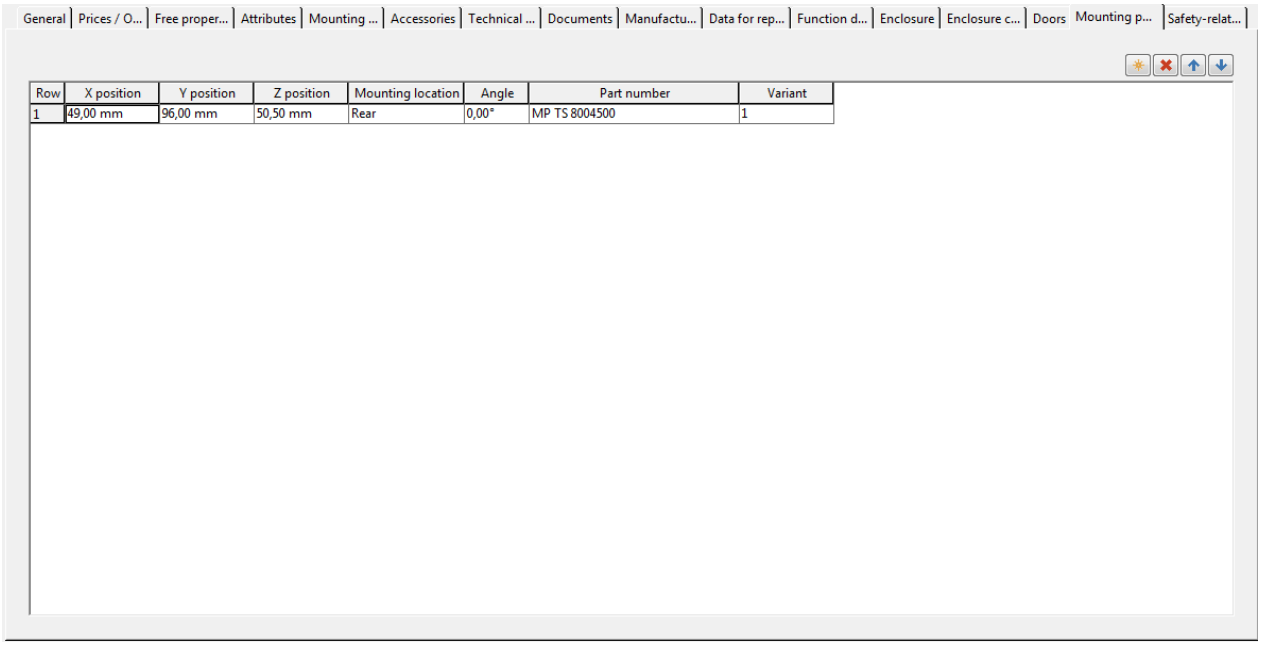


Figure 29: Parts management: Mounting panels

Attribute	Global	Mandat.	Description	Notes
X position Y position Z position	Yes	No	Define here the position of the mounting panels by entering the appropriate values into the cells.	Values are designated in mm.
Mounting location	Yes	No	Selection of the possible entries "Rear", "Left", or "Right" from the drop-down list.	A multiple selection is not possible at this point.
Angle	Yes	No	Enter the angle for the mounting panel here.	
Part Number	Yes	No	Select a part or part variant from the drop-down list.	A multiple selection is not possible here.
Variant	Yes	No	If a part variant in the Part number field is selected, the appropriate variant number is displayed here.	It is possible to overwrite this entry if required.

Page: Housing data

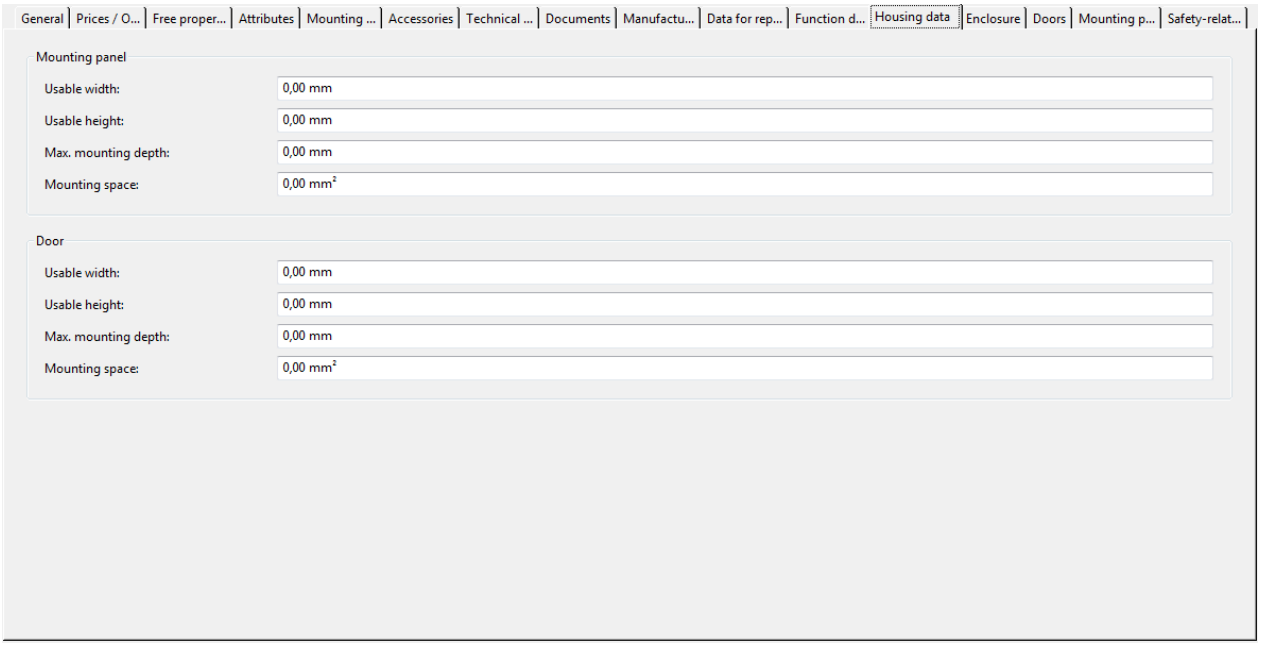


Figure 30: Parts management: Housing data

Attribute	Global	Mandat.	Description	Notes
All attributes	No	No	Additional information. Not for ABB purpose.	

Page: Locked areas

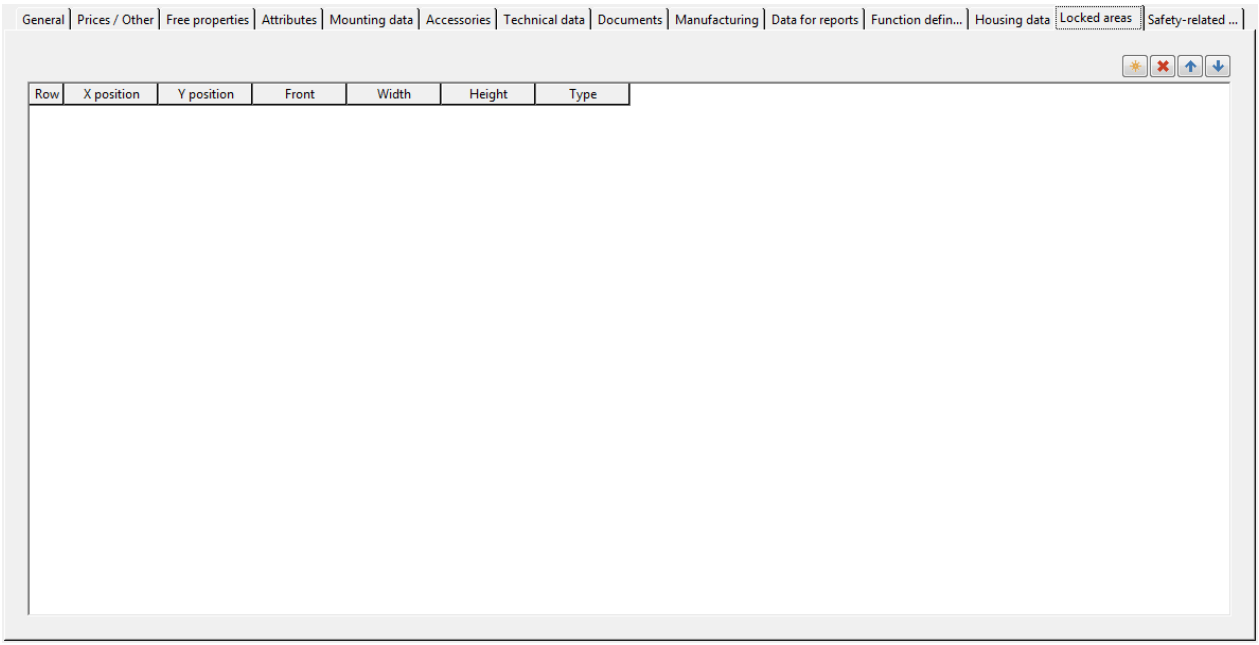


Figure 31: Parts management: Locked areas

Attribute	Global	Mandat.	Description	Notes
All attributes	No	No	Additional information. Not for ABB purpose.	

7.3 Global parts attributes for accessory lists

Page: Accessory list

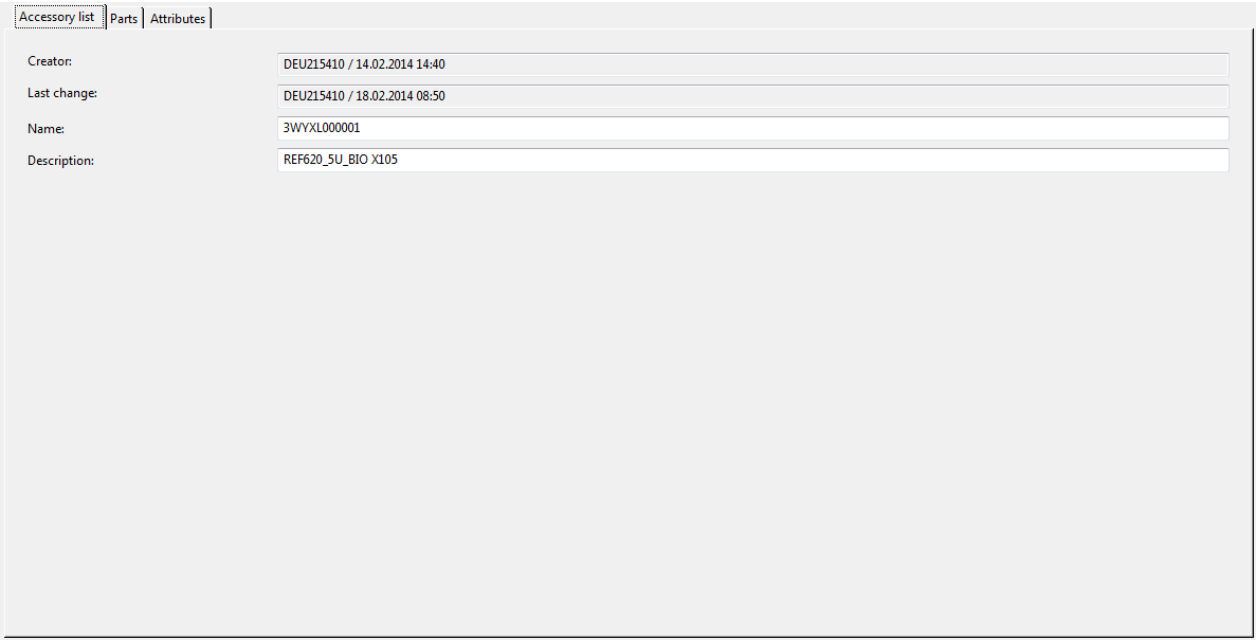


Figure 32: Parts management: Accessories - Accessory list

Attribute	Global	Mandat.	Description	Notes
Name	Yes	Yes	Database key, unique syntax	Name should be similar to Designation 1 field of related part. Do not follow PPMV global numbering system according to 3WYR000001.
All attributes	Yes	Yes	Short description in English language which shall reference to the main device	Additional languages are added in accordance with Eplan multilingual settings syntax. Multilingual entries are within one database entry (parametric translator).

Page: Parts (Accessory list)

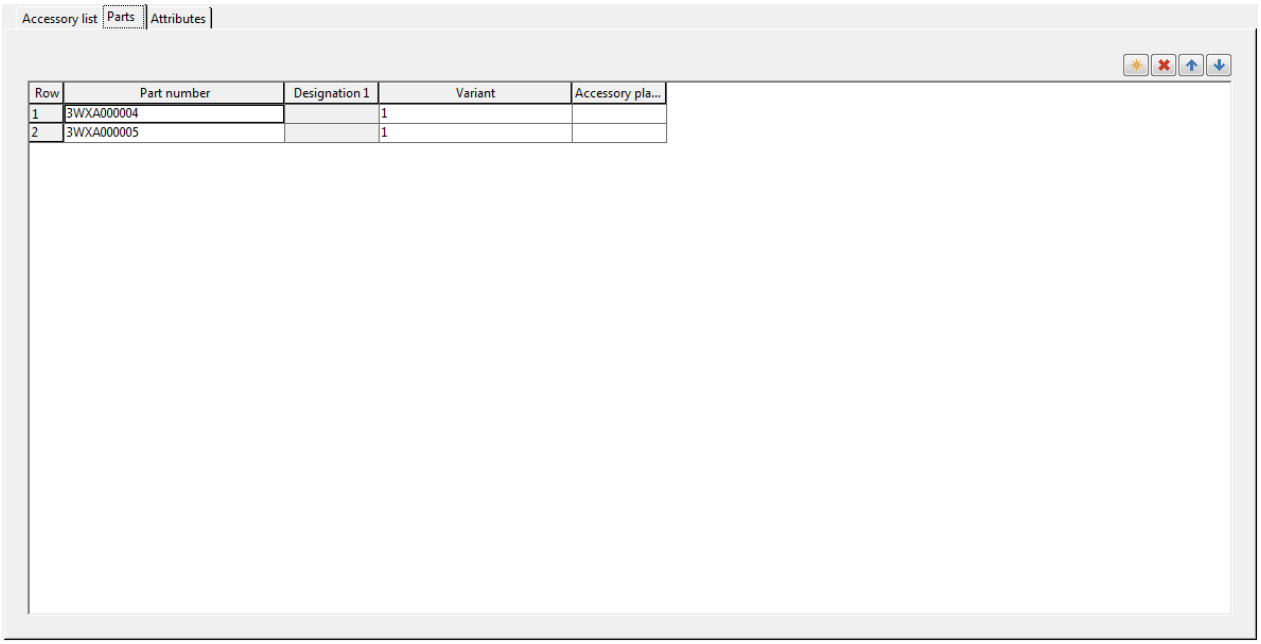


Figure 33: Parts management: Accessories – Parts

Attribute	Global	Mandat.	Description	Notes
Part number	Yes	Yes	Unique number for part	It can be selected through dialog.
Variant	Yes	Yes	Number of variant	Normally ‘1’
Accessory placement	No	--	Information about placement	

Page: Attributes (Accessory list)

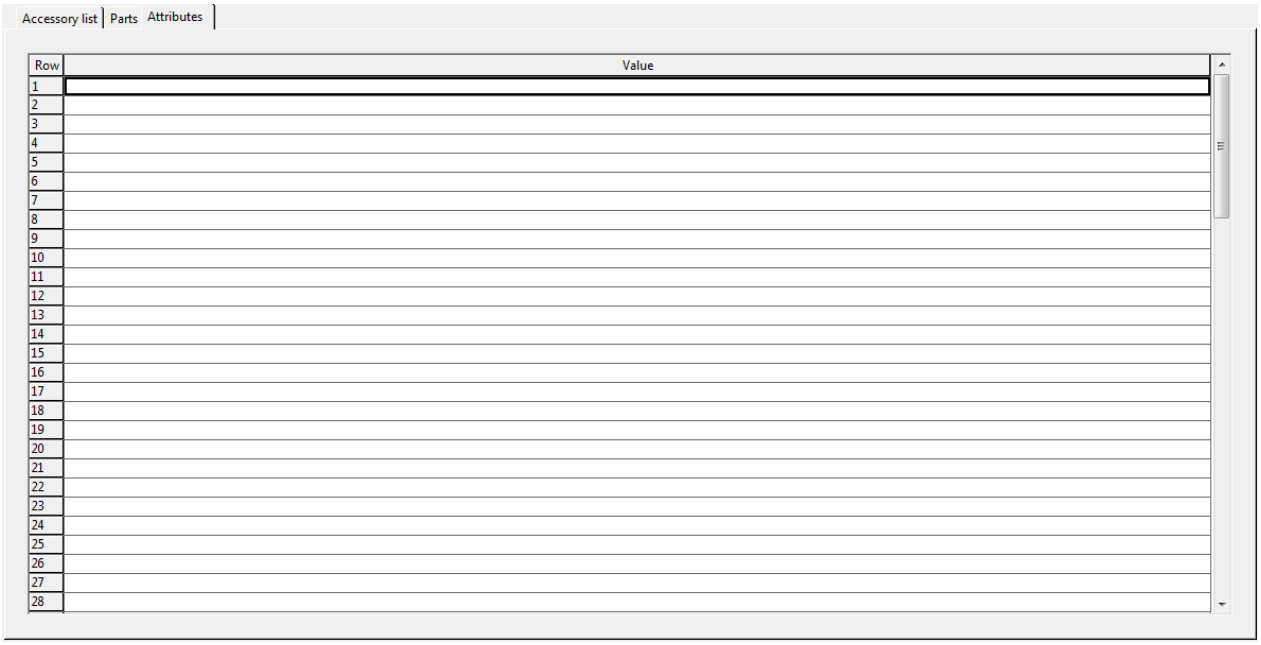


Figure 34: Parts management: Accessories – Attributes

Attribute	Global	Mandat.	Description	Notes
Attribute [1] to [49]	No	--	Free for local usage	
Attribute [50] to [100]	Yes	No	Reserved for global usage	

7.4 Global parts attributes for connection point pattern

This chapter defines globally connection point pattern attributes and locally maintained connection point pattern attributes. Each attribute that is global can be either mandatory or optional. If they are optional, it is not required to fill a value in. However, the responsibility is still at the global parts team for this attribute. For local attributes, the local parts administrator has to decide if a value is entered. Attributes that are not mentioned in descriptions below are not taken in consideration.

Page: Connection point pattern

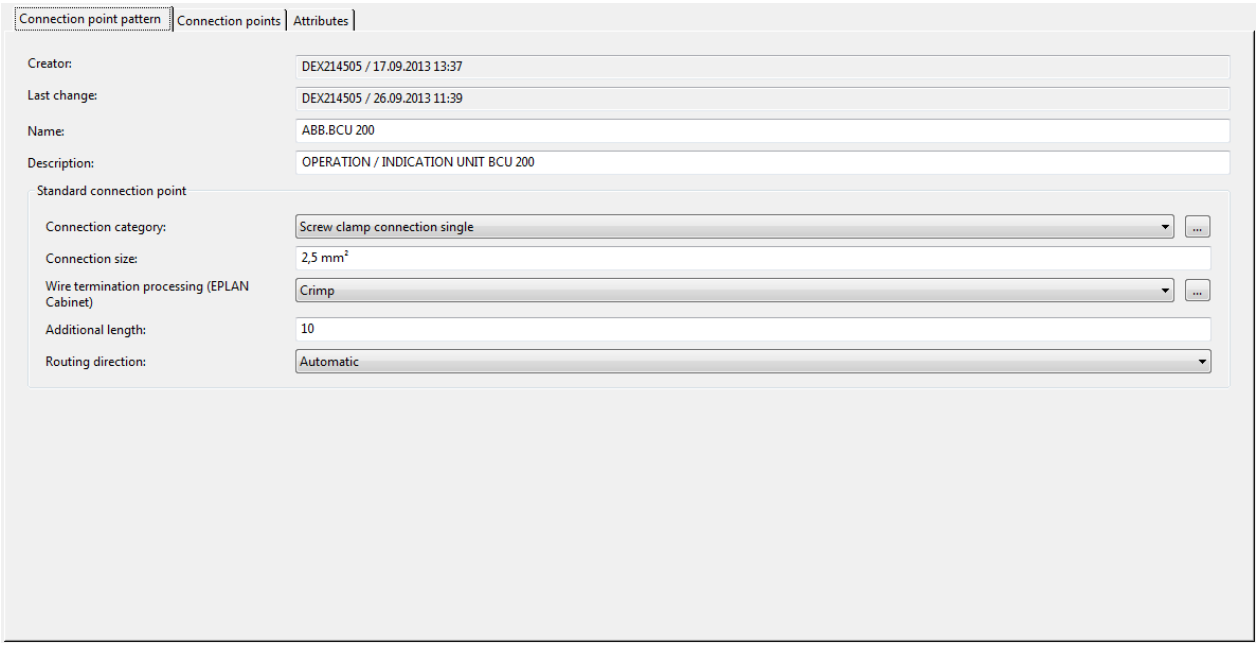
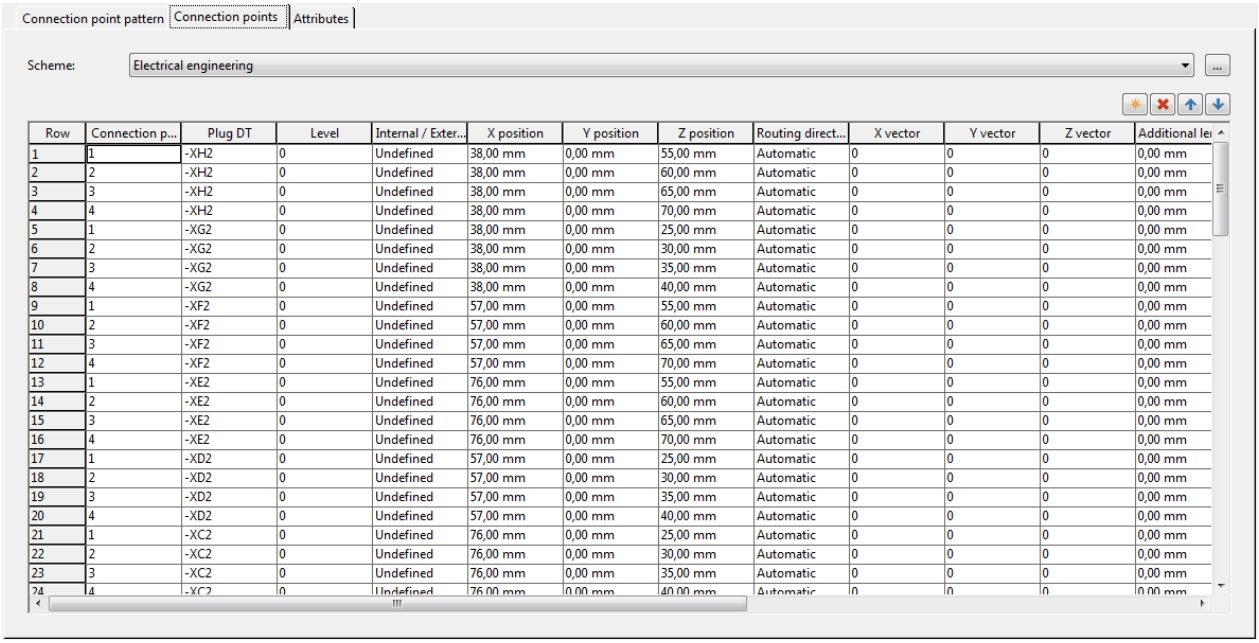


Figure 35: Parts management: Connection point pattern - Connection point pattern

Attribute	Global	Mandat.	Description	Notes
Name	Yes	Yes	When selecting a connection point pattern in the Technical data tab of a part, this name will be shown in the selection dialog.	Name should be similar to Designation 1 field of related part. Not follow PPMV global numbering system according to 3WYR000001.
Description	Yes	No	This will also be shown in the Technical data tab of a part in the selection dialog.	Additional information of the part.
Connection category	Yes	Yes	Select the default value from drop-down list to specify the connection point type	Description of the Connection point type.
Connection size	Yes	Yes	Enter a default value for a screw (e.g., "M6") or of the lug (e.g. "4.8 x 0.5") for screw connections, threads, nipples, and plug-in connections. In the tab one can also define other values for individual connection points.	
Wire termination processing	No	--	This property is only required due to compatibility with EPLAN Cabinet. Select the default value for the end of the connections, e.g., "Strip" or "Crimp", from this drop-	

			down list or define the desired values in the subsequent dialog and write them to the database.	
Additional length	Yes	Yes	Enter the value for the additional length of the connection point connection. In the Connection point pattern tab one can define default values of the additional length.	
Connection point direction	No	--	Select default connection point direction from this drop-down list. In the Connection points tab it is possible to define other values for individual connection points.	

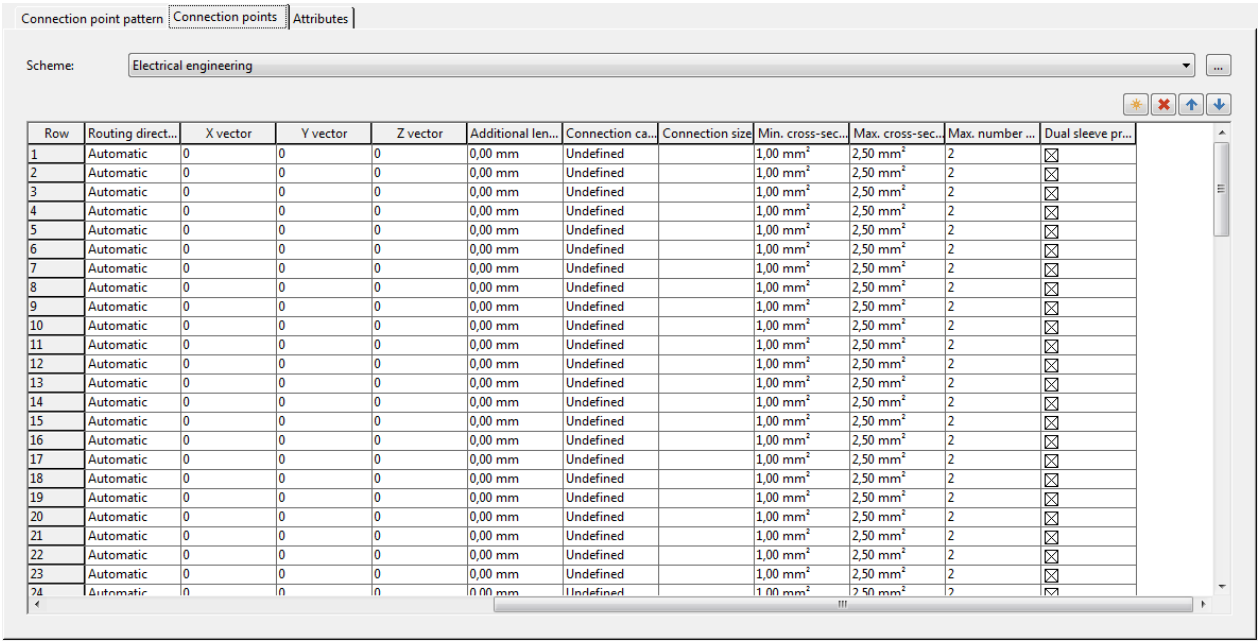
Page: Connection points (1/2)



Row	Connection p...	Plug DT	Level	Internal / Exter...	X position	Y position	Z position	Routing direct...	X vector	Y vector	Z vector	Additional le
1	1	-XH2	0	Undefined	38,00 mm	0,00 mm	55,00 mm	Automatic	0	0	0	0,00 mm
2	2	-XH2	0	Undefined	38,00 mm	0,00 mm	60,00 mm	Automatic	0	0	0	0,00 mm
3	3	-XH2	0	Undefined	38,00 mm	0,00 mm	65,00 mm	Automatic	0	0	0	0,00 mm
4	4	-XH2	0	Undefined	38,00 mm	0,00 mm	70,00 mm	Automatic	0	0	0	0,00 mm
5	1	-XG2	0	Undefined	38,00 mm	0,00 mm	25,00 mm	Automatic	0	0	0	0,00 mm
6	2	-XG2	0	Undefined	38,00 mm	0,00 mm	30,00 mm	Automatic	0	0	0	0,00 mm
7	3	-XG2	0	Undefined	38,00 mm	0,00 mm	35,00 mm	Automatic	0	0	0	0,00 mm
8	4	-XG2	0	Undefined	38,00 mm	0,00 mm	40,00 mm	Automatic	0	0	0	0,00 mm
9	1	-XF2	0	Undefined	57,00 mm	0,00 mm	55,00 mm	Automatic	0	0	0	0,00 mm
10	2	-XF2	0	Undefined	57,00 mm	0,00 mm	60,00 mm	Automatic	0	0	0	0,00 mm
11	3	-XF2	0	Undefined	57,00 mm	0,00 mm	65,00 mm	Automatic	0	0	0	0,00 mm
12	4	-XF2	0	Undefined	57,00 mm	0,00 mm	70,00 mm	Automatic	0	0	0	0,00 mm
13	1	-XE2	0	Undefined	76,00 mm	0,00 mm	55,00 mm	Automatic	0	0	0	0,00 mm
14	2	-XE2	0	Undefined	76,00 mm	0,00 mm	60,00 mm	Automatic	0	0	0	0,00 mm
15	3	-XE2	0	Undefined	76,00 mm	0,00 mm	65,00 mm	Automatic	0	0	0	0,00 mm
16	4	-XE2	0	Undefined	76,00 mm	0,00 mm	70,00 mm	Automatic	0	0	0	0,00 mm
17	1	-XD2	0	Undefined	57,00 mm	0,00 mm	25,00 mm	Automatic	0	0	0	0,00 mm
18	2	-XD2	0	Undefined	57,00 mm	0,00 mm	30,00 mm	Automatic	0	0	0	0,00 mm
19	3	-XD2	0	Undefined	57,00 mm	0,00 mm	35,00 mm	Automatic	0	0	0	0,00 mm
20	4	-XD2	0	Undefined	57,00 mm	0,00 mm	40,00 mm	Automatic	0	0	0	0,00 mm
21	1	-XC2	0	Undefined	76,00 mm	0,00 mm	25,00 mm	Automatic	0	0	0	0,00 mm
22	2	-XC2	0	Undefined	76,00 mm	0,00 mm	30,00 mm	Automatic	0	0	0	0,00 mm
23	3	-XC2	0	Undefined	76,00 mm	0,00 mm	35,00 mm	Automatic	0	0	0	0,00 mm
24	4	-XC2	0	Undefined	76,00 mm	0,00 mm	40,00 mm	Automatic	0	0	0	0,00 mm

Figure 36: Parts management: Connection points - Connection point pattern

Page: Connection points (2/2)



Row	Routing direct...	X vector	Y vector	Z vector	Additional len...	Connection ca...	Connection size	Min. cross-sec...	Max. cross-sec...	Max. number ...	Dual sleeve pr...
1	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
2	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
3	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
4	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
5	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
6	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
7	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
8	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
9	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
10	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
11	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
12	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
13	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
14	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
15	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
16	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
17	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
18	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
19	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
20	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
21	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
22	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
23	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒
24	Automatic	0	0	0	0,00 mm	Undefined		1,00 mm²	2,50 mm²	2	☒

Figure 37: Parts management: Connection points - Connection point pattern

Attribute	Global	Mandat.	Description	Notes
Connection point designation	Yes	Yes	Specify the number of the connection point.	Description of the Connection point number.
Plug DT	Yes	No	Additional information of the part.	Enter the DT of the plug used to connect the connection point.
Level	Yes	No	If the connection point is a multi-level terminal, enter the level here.	

Internal / External index	No	--	Defines for a connection point in the connection point pattern the number of the internal or external connection point that this connection point represents.	
X / Y / Z position	Yes	Yes	Enter the position of the connection point in these fields. The length is given in mm and is dimensioned starting from the zero point of the model.	Information about the placement of the connection point.
Connection point direction	No	--	Select one of the possible connection point directions "Automatic", "Up", "Down" "Left" or "Right" from this drop-down list.	
Additional length	Yes	No	Enter the value for the additional wire length of the individual connection point position.	One can also handle the values in the connection point pattern tab.
Connection category	Yes	Yes	Select the value that specifies the connection type of the connection point.	Select from the drop-down list in this field on the right side (e.g. screw clamp connection, cage clamp connection etc.) or embed an individually connection category.
Connection size	Yes	Yes	Enter the connections dimensions of a screw (e.g. M6) or lug (e.g. 4,8 x 0,5)for screw connection, nipple, and plug-in connections.	There is no input requested, when it is a wire connection.
Min. wire cross-section	Yes	Yes	Enter the value of the min. wire cross-section of the connection point.	
Max. wire cross-section	Yes	Yes	Enter the value of the max. wire cross-section of the connection point.	
Max. number of wires	Yes	Yes	Defines the max. number of wires.	
Dual sleeve prescription	Yes	Yes	Tick the check box use duel sleeves for the connection point when two connections lead to this connection point.	
Wire termination processing	Yes	Yes	Assignment of wire termination processing to the actual equipment of wire ends by the fabrication machine (stripping, crimping, sleeves). For this purpose, machine commands should listen for the used machine.	Select from drop-down list on the right side in this bar and choose a wire termination. One also can generate a new wire termination in the previous tab connection point pattern wire termination.

Page: Attributes

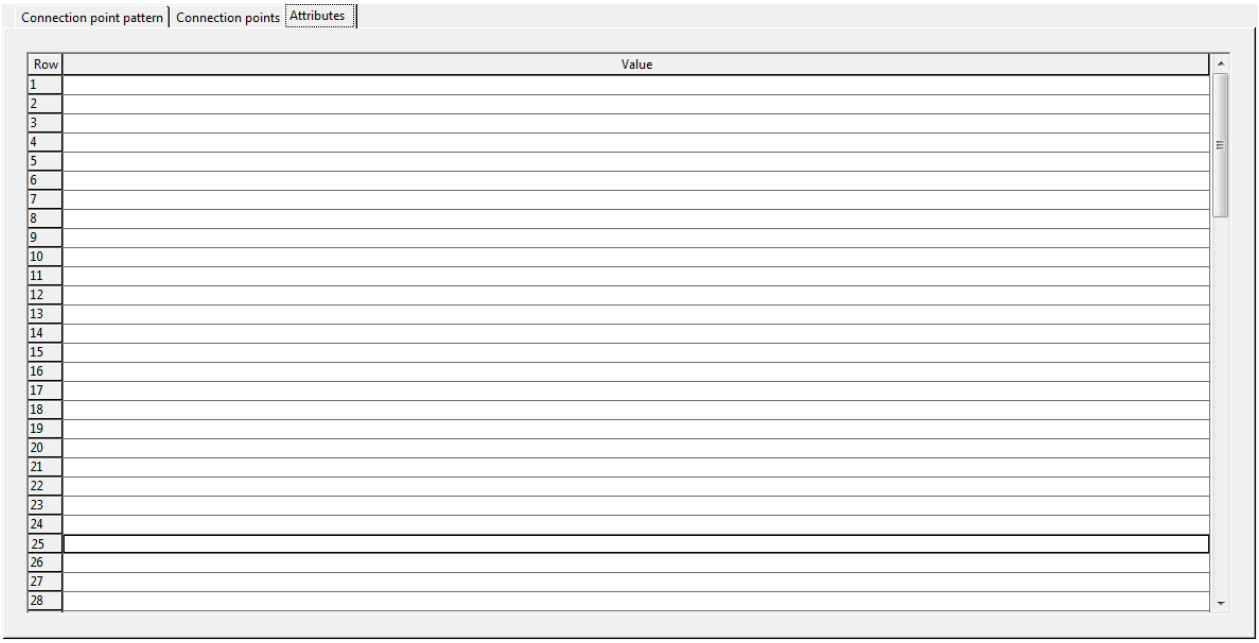


Figure 38: Parts management: Attributes - Connection point pattern

Attribute	Global	Mandat.	Description	Notes
Attribute [1] to [49]	No	--	Free for local usage	
Attribute [50] to [100]	Yes	No	Reserved for global usage	

7.5 Global parts attributes for drilling pattern

This chapter defines globally drilling pattern attributes and locally maintained drilling pattern attributes. Each attribute that is global can be either mandatory or optional. If they are optional, it is not required to fill a value in. However, the responsibility is still at the global parts team for this attribute. For local attributes, the local parts administrator has to decide if a value is entered. Attributes that are not mentioned in descriptions below are not taken in consideration.

Page: Drilling Pattern

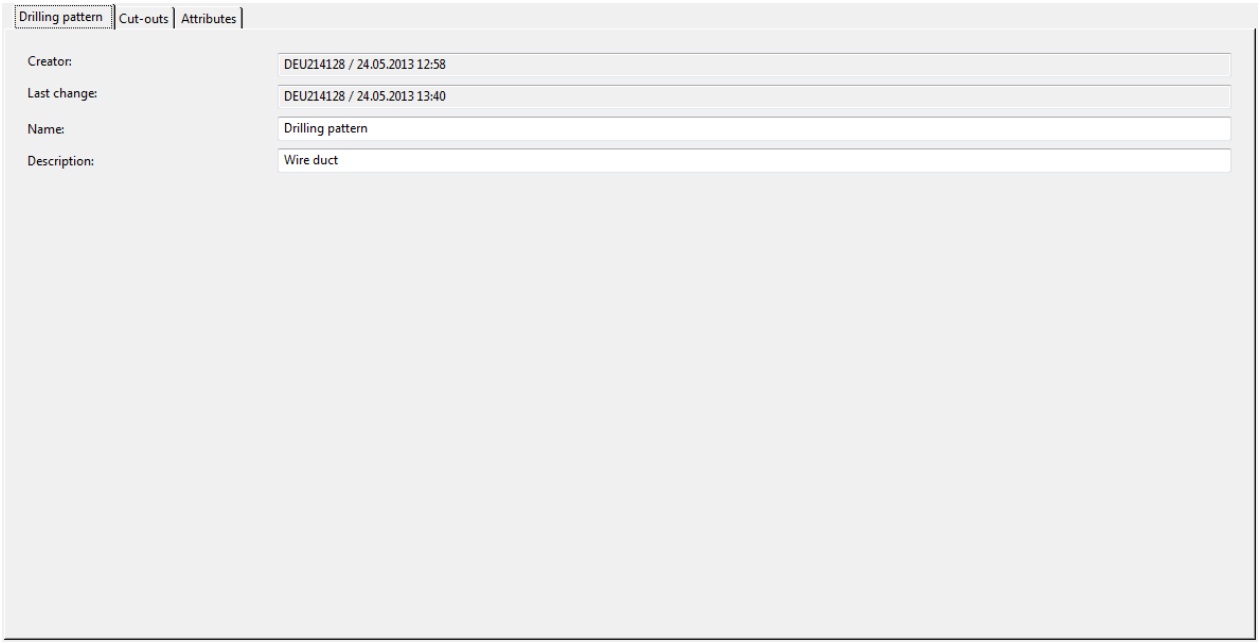


Figure 39: Parts management: Drilling pattern - Drilling pattern

Attribute	Global	Mandat.	Description	Notes
Creator	Yes	Yes	EPLAN automatically fills in this field with the username of the user who created the record, as well as the date and time of the creation of the record, in which the contents can't therefore be edited.	No input possible in this field.
Last change	Yes	Yes	EPLAN automatically fills in this field with the username of the user who created the record, as well as the date and time of the creation of the record, in which the contents can't therefore be edited.	No input possible in this field.
Name	Yes	Yes	Enter the name of the drilling pattern here; when selecting drilling patterns in the Manufacturing tab of a part, this name will be shown in the selection dialog.	Name should be similar to Designation 1 field of related part. Not follow PPMV global numbering system according to 3WYR000001.

Description	Yes	No	Enter the description of the drilling pattern here; this will also be shown in the Manufacturing tab of a part in the selection dialog.	

Page: Cut-outs (1/2)

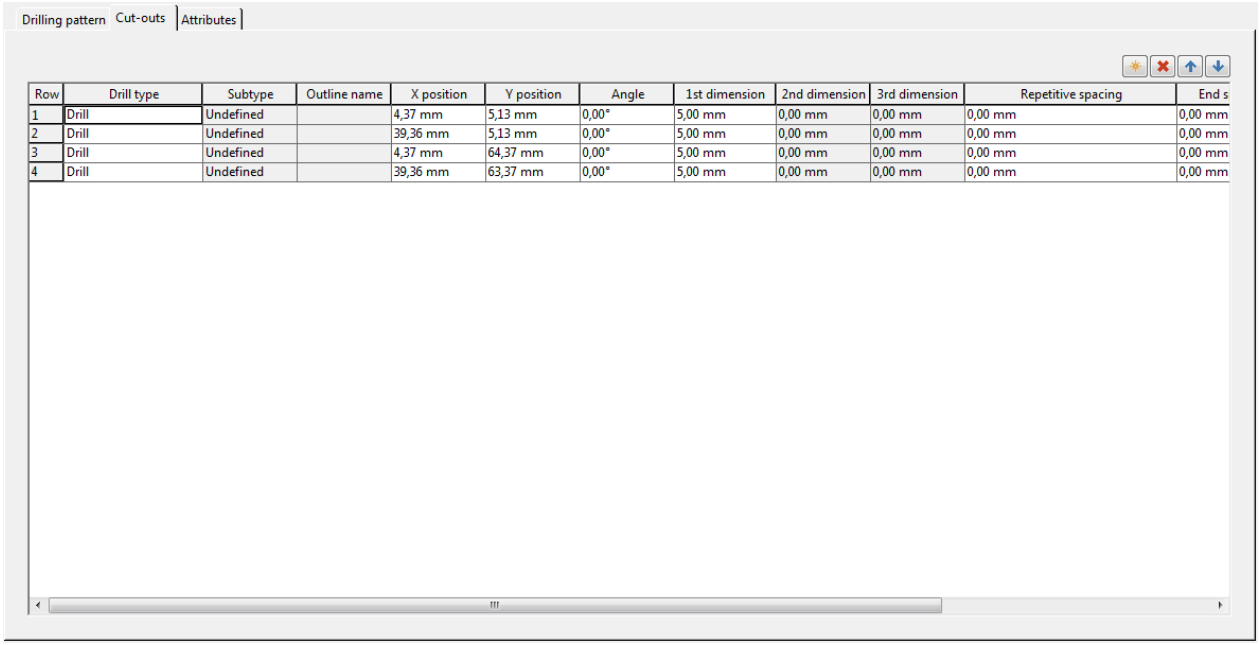


Figure 40: Parts management: Cut-outs - Drilling pattern

Page: Cut-outs (2/2)

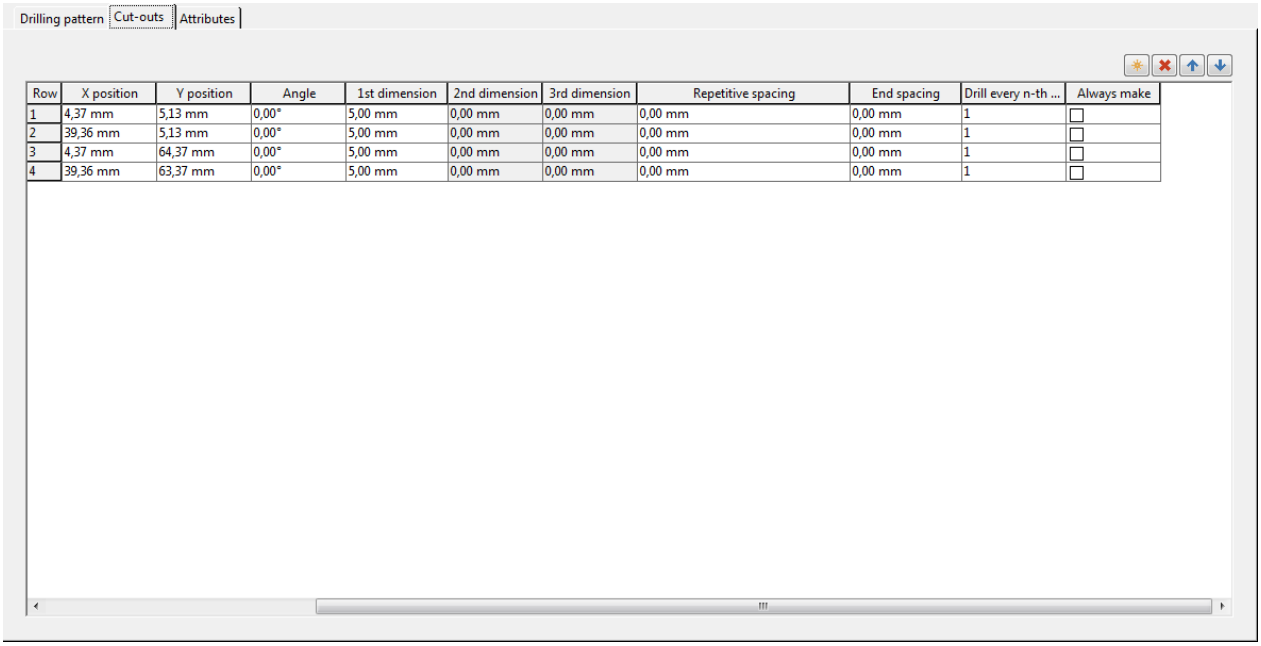


Figure 41: Parts management: Cut-outs - Drilling pattern

Attribute	Global	Mandat.	Description	Notes
Drill type	Yes	Yes	Select one of the possible drill types from this drop-down list, if available.	Choose one of the given drill types of this list, or generate a new drill type.

Subtype	No	No	Select one of the possible subtypes from this drop-down list, if available.	Choose one of the given subtypes of this list, or generate a new subtype.
Outline name	No	No	If the "User-defined outline" drill type was chosen, then enter a designation for the outline here.	
X-position / Y-position	Yes	Yes	Enter the correct position of the hole into these fields. The origin, with respect to the coordinates entered here, lies at the lower left corner of the item.	
Angle	Yes	Yes	Specify the angle of the hole here.	If no angle of the drilling hole is requested set the angle to 0,00°.
1st dimension / 2nd dimension / 3rd dimension	Yes	Yes	Enter the desired dimensions for particular drill types into these fields.	1st dimension must set to a value for a round hole. It is possible to set the other two dimensions for slots, rectangles etc.
Repetitive spacing	Yes	Yes	Enter the distance in this field, which all additional boring holes should have from one to another.	
End spacing	No	No	In this field, enter the minimum clearance of the last hole to the right edge of the object, i.e. no hole will be placed closer to the edge of the object than the value specified here.	For (e.g.) cable ducts can use this setting to define how far away the hole is from the edge of the cable duct, so that no problems occur when screwing it tight.
Drill every n-th hole	Yes	Yes	Determines which holes should be drilled.	For instance, if entered "4" then only every fourth hole is drilled.
Always make	No	No	If this check box is activated, the machining (drill hole, thread, rectangular, etc.) defined in the Drill type field is always executed, even if the affected part has not been placed directly on a NC-relevant mounting surface. This is the case when the part has been placed on a mounting rail. The system always searches the structure automatically for the next mounting surface to be fabricated, and outputs the drilling data to this mounting surface.	If the check box is deactivated (default setting), the drill hole will be manufactured only if it has been placed on a NC-relevant mounting surface.

Page: Attribute

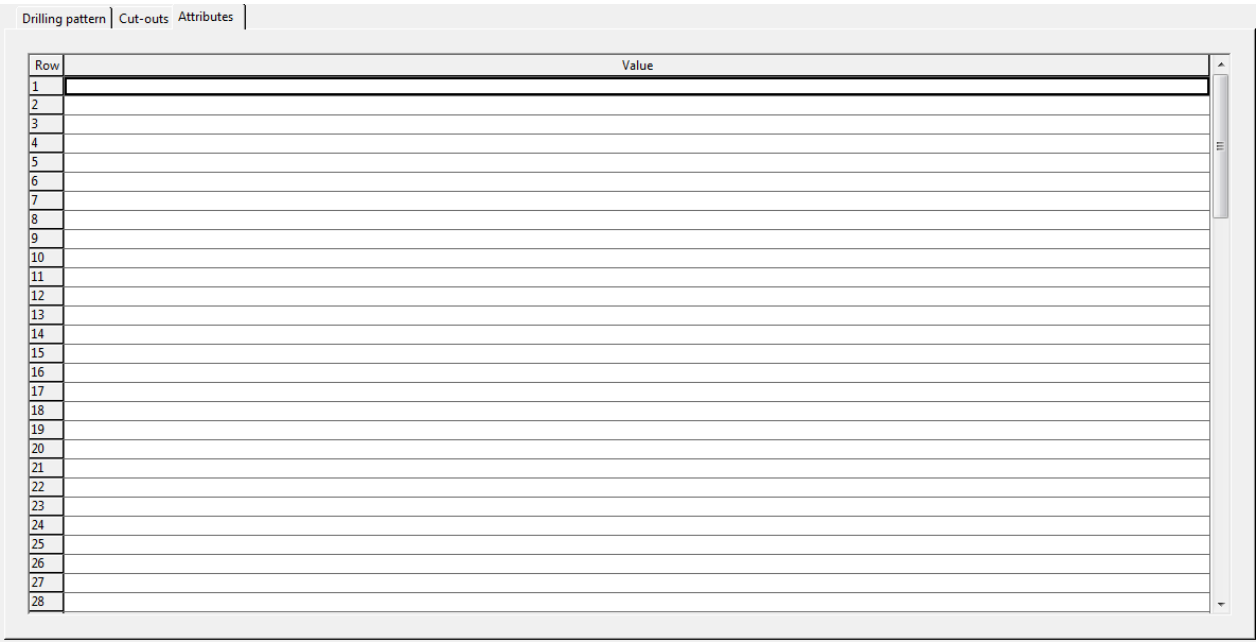


Figure 42: parts management: Attributes - Drilling pattern

Attribute	Global	Mandat.	Description	Notes
Attribute [1] to [49]	No	--	Free for local usage	
Attribute [50] to [100]	Yes	No	Reserved for global usage	

7.6 Parts creation for the global parts database

The process for the parts creation for the global parts database has to follow the rules given in this chapter as well as the technical requirements given thought EPLAN P8.

Parts which are stored on the global parts database have different levels of complexity:

1. parts that have no graphical representation (test probes, accessories, etc.)
2. parts with function definitions only (MCB, aux. relays, etc.),
3. parts with black boxes (transducers, simple protection relays, etc.),
4. complex parts (IED, CB, isolators, ESW, etc.)

Parts which belong to level 1. shall not have a function definition entered in the tab 'Function templates'. For these parts a flag shall be set in the tab 'Attributes' instead. The Attribute No. 50 shall be filled with the string 'No function templates', when it no function templates are used for this part. It shall remain empty, when function templates are use.

Parts which belong to levels 3. or 4. need to be created according to the procedure described in appendix A and C.

Note: All parts which are complex i.e. use (variable) device connection points shall be created according to the process as described in appendix A. However, for these devices one should use variable device connection points whenever feasible as described in appendix C.

The quality of parts data on the global parts server is of high importance. Therefore, different categories for the quality were defined.

Stage 1: Only commercial (textual) data are entered in the data base. User can generate a BOM based on these data.
Stage 2: In addition to stage 1 data also function definitions are available.
Stage 3: In addition to stage 2 data also macros for multi-lines are available
Stage 4: In addition to stage 3 data also macros for DLD and PLD are available
Stage 5: In addition to stage 4 data also ATM data and wiring categories are available
Stage 6: In addition to stage 5 data also 3D data are available for Pro Panel

Parts which are placed on the global parts data server have at least to belong to stage 4. In order to check the quality, each newly created part has to be placed in a schematic project. No errors shall occur.

The function of variants[1] for parts on the parts database of EPLAN P8 shall not be used for parts which are stored on the global server. This is due to the fact that MVE in its current version 2.1 and before does not support this function.

7.7 Process of parts creation

This chapter describes the process of parts creation for the global parts database by the global parts team. The work of the global parts team is explained through their communication ways on the one hand and on the data exchange on the other. Additionally the overall process for parts request and creation is explained.

In the picture below the roles for the global parts creation are defined. In detail this is:

- *Local EPLAN users* utilize EPLAN parts in schematics
- *Local parts administrators* care about the local parts database and collect requests for new parts
- *Global parts team* communicates with local administrators. They create new parts that are distributed to locations.

Also the sever structure for the data exchange is stated in below picture. In detail this is:

- Each location has a *local parts database* which consists of a SQL server and a file server
- The *global parts database* is located in a data centre of IBM e.g. Ehningen.

[1] A variant is a set of technical properties of a part. A part can have different technical variants. For each implementation there is a variant managed via a unique designation.

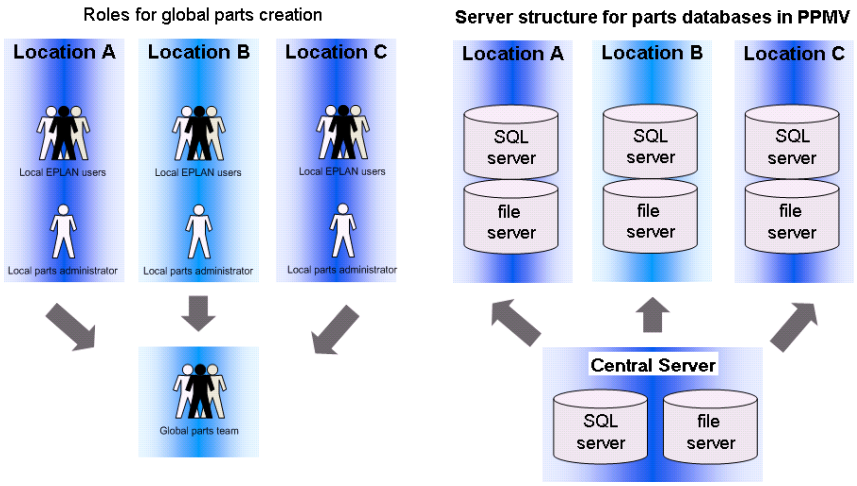


Figure 43: Sever structure for the data exchange

The process for parts data request and parts creation is shown in below picture.

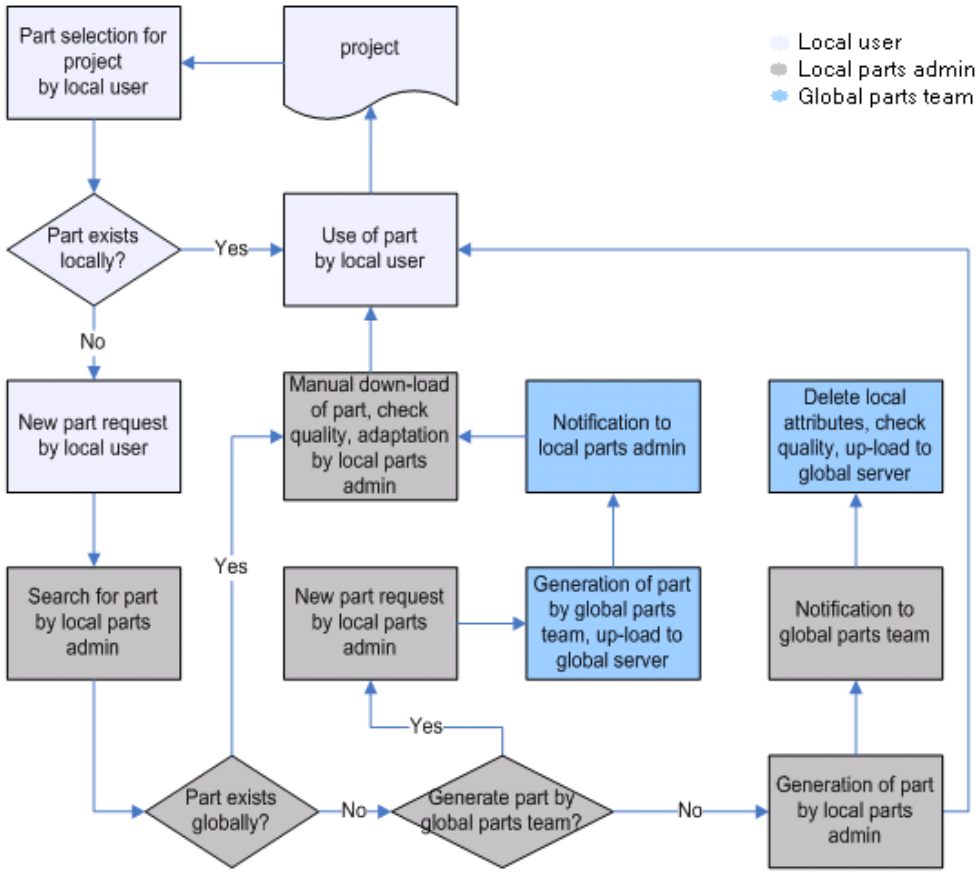


Figure 44: Process for parts data request

The following objectives shall be achieved through this process:

- Central generation of parts for all locations, thus always same quality and double check through local admin
- Team of expert has good knowledge, substitute scheme is possible
- No double creation of technical identical parts for PPMV
- Common look and feel for parts macro and technical data for PPMV

Process for local part request:

1) If a designer does not find required part on local parts database, he creates a parts request to the local parts admin *or* he changes in MVE settings the parts database from local to global and try to

find the part there. If the part exists in global database, then the designer creates a local part request with reference to a global part number.
If part does not exist in global parts database or the designer has no access rights, then the designer adds a new part request into local part request database. Local admin has to decide if the part is created locally or globally.

Process steps for local parts creation:

1) New part creation request is put into local MVE new part request database on SQL server by designer.
2) Local admin or designer adds a flag on part in part request database if part should be put on global server after creation.
3) Local admin creates part on local server according to rules defined in this document.
4) Global admin receives an email with description of the part request and with the locally created part (in edz-format). (Option: Alternatively, the global admin checks manually on regular base local part request databases or there is a global part request database on SQL server which is online fetching flagged parts from local part requests databases).
5) Quality of global part entries is checked by global admin (quality = part is completed (finished/approved) locally, all global attributes are filled in with proper syntax). If necessary, local attributes are deleted.

Process steps for global parts creation:

1) New part creation request is put into local MVE new part request database on SQL server by designer.
2) Local admin or designer adds a flag on part in part request database if part should be put on global server after creation.
3) Local admin decides to ask global parts team for creation of part on global server according to rules defined in this document.
4) Global admin receives an email with description of the part request.
5) Global parts team creates part and sends notification to local admin.
6) Quality of global part entries is checked by local admin (quality = part is completed (finished/approved), all global attributes are filled in and with proper syntax). If necessary, local attributes are added.

Process steps for downloading global parts:

1) Local admin defines which global parts have to be synchronized to local database.
2) Parts to be synchronized between Global and Local are defined by parts including in local part database (local parts and their global attributes are updated only). The settings necessary for automatic synchronization are defined in the MVE 2.1 specification.
3) Automatic import global parts database to local database:
   - Keep existing languages
   - Keep local attributes
   - Transport external files.

Further points to consider:

1) Local standard issue (IEC, GOST, ANSI, BS, etc.) – separate subfolders for macros for different standards saved on global server. Subfolder is addressed in respective Eplan installation.
2) Change process (not fully defined yet):
   - Additional languages (There can be used Eplan translation database also for parts database translations. The question is how global admin would be informed about need of translations synchronization)
   - Additional standards (IEC, GOST, ANSI, BS, etc.) – different macros for different standards
   - Changed attributes
   - Changed macros
   - Changed external docs
   - Changed functional definitions.

The parts request process will be supported through an on-line database. The local parts administrators will have access to it which allows them to generate new part requests as well as track the status of the parts creation.

7.8 Parts database administration

The following points shall be followed for parts database administration.

- Global parts database should be placed on common Master data server (maintained by IBM). It would require global admin who maintains global database if needed.
- Global parts database consists of parts and all items (macros, functional templates, etc.) relevant to it.
- Creation of parts, macros and functional templates for all ABB products shall be done globally (inc. global attributes only). Creation of parts, macros and functional templates for other parts may be done locally (inc. global and local attributes).
- Parts which couldn't be obviously used globally are not supposed to be submitted into global parts database.
- Deletion of certain parts in global parts database is not allowed due to compatibility. Instead of deletion, the respective part will be marked as 'obsolete' within the part's free properties.
- There is not allowed to change part number once it is created.
- Obsolete parts are locally maintained. A part in the global database can be marked as an „obsolete" part only if it is marked as „obsolete" in all local parts databases.
- Dynamical assemblies' creation process is the same as for parts.
- Mandatory language for attributes is English (en_US). Local language can be added by local admin.

7.9 Global classification of parts

For parts classification in material database will be used **Eplan standard 3-level classification**:

- Generic product group
- Product group
- Product subgroup
- extended by **Free properties [50]**, where ABB classification will be stored.

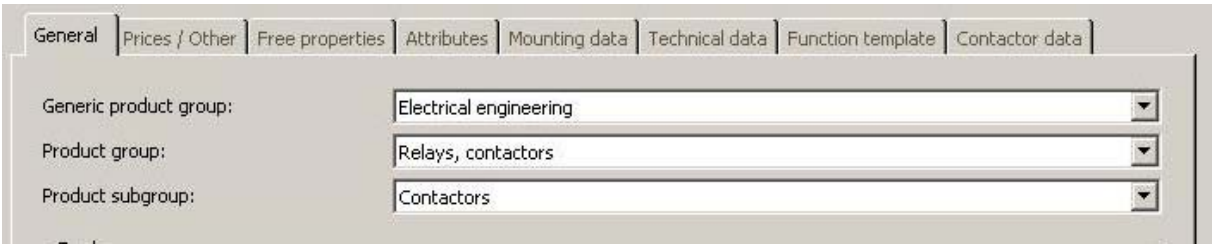


Figure 45: Parts management: General – parts classification

For improved retrieval of parts in the database, the tree configuration of the P8 parts data base can be changed as follows:

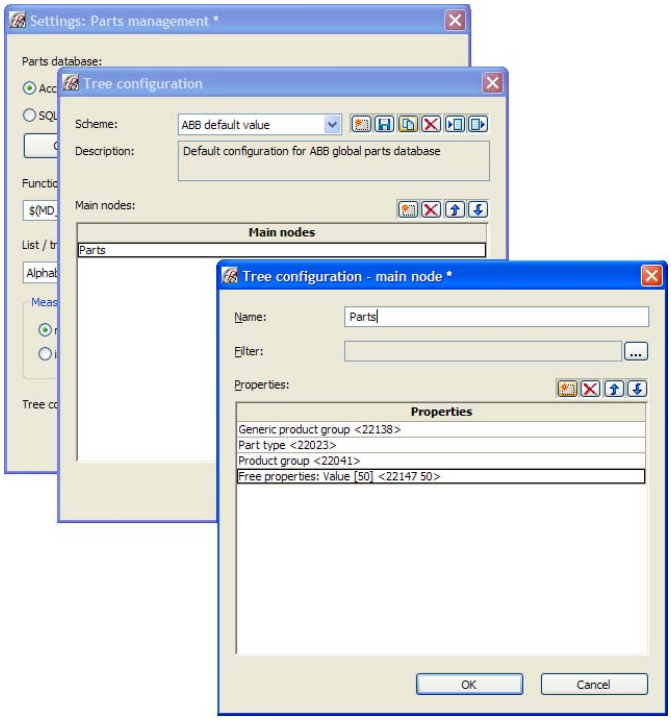


Figure 46: Parts management: Tree configuration

Classification based on ABB definition is described in document 3WYR000001 "Classification of parts for Eplan Projects" which can be found in the ABB library.

7.10 Format of technical characteristics

Technical characteristics are electrical ratings and dimensions of a device. The format of technical characteristics shall comply with IEC regulations (e.g. IEC 61293, IEC 61082-4, IEC 600027-1). The table below lists the types and format of technical characteristics entered in parts of the global parts database.

Type	Format	Example
Single value	Each rating indication shall consist of a single numerical value and a unit symbol.	60 kV
Two and more values	Each rating indication shall consist of numerical values separated by a solidus (/) in a consistent sequential order and a unit symbol.	60/110/220 V
Range of values	Each rating indication shall consist of the end values separated by three dots (…) and a unit symbol.	60…220 V

Figure 47: Format of technical characteristics

Note: There shall be a space between the value and the unit.

Note: It must be use the symbol '…' (Unicode 2026 or Alt+Crl+.) instead of three dots. This is useful if the text field only allows few characters.

8 Plot frames

IEC standard plot frames (title blocks) must correspond with rules given by document 2NDA000001"Rules for electrical documents.pdf" [4] in its latest revision.
The document can be found within the ABB library. The plot frame can be found in the following place:
ftp://eplanro:KuG1lTDpUr@10.51.31.23/EPLAN/IEC_STANDARD/PlotFrames/2NDA000001_B.fn1

9 Master data server

This chapter describes the technical as well administrative aspects of the Master data (MD) server.

9.1 Server structure

Files on MD server are stored in the following directory structure. The basic structure is taken over from the EPLAN standard directory structure. Further subdirectories were added in respect to the requirements form PPMV. Some subdirectories might not be filled with data. They shall remain as placeholders for future enhancements.

Any macro which is referenced to in the fields ‘Macro’ or ‘Symbol macro’ of the parts database shall be stored in the directory ‘Macros\PARTS’. The folder structure for these macros is stated in Appendix D. It can be enhanced by additional folders in future. Any newly created folder should comply with the defined names for ABB classes as in document [5] “3WYR000001_Tabs”. A macro shall be stored in the directory ‘Macros\DEVICES_LAYOUT_PLACEMENT’ if it is referenced in the field ‘Graphical macro’ in the parts database.\ROOT

- **\IEC_STANDARD**
  - \Administration
  - \Documents
  - \Dxf_Dwg
  - \Forms
  - \FunctionDefinition
  - \Images
  - \Macros
    - \DEVICES_LAYOUT_PLACEMENT (2D Panel and Door Layout Macros)
    - \DEVICES_LAYOUT_PLACEMENT_3D (3D Panel and Door Layout Macros, 2D optional)
      - \DLD (3D Door macros, subfolders for groups optional)
      - \PLD (3D Panel macros, subfolders for groups optional)
    - \DLD (Door layout drawing)
      - \LV DOOR
      - \MIMIC
    - \FDD (Fixing details drawing)
    - \FFD (Foundation frames drawing)
    - \FFDD (Foundation frames details drawing)
    - \FVD (Front view drawing)
    - \ICD (Interconnections drawing)
    - \MLD (Multiline drawing)
    - \PARTS (Parts macros, see Appendix D)
    - \PLD (Panel layout drawing)
      - \LV BACKPANEL
    - \SLD (Singleline drawing)
    - \SVD (Section view drawing)
  - \Mechanical models
  - \Outlines
    - \DEVICES_LAYOUT_PLACEMENT_3D
  - \Parts
  - \PlotFrames
  - \PPE
  - \Projects
  - \Schemes
  - \Scripts
  - \Symbols
  - \Templates
  - \Translation
  - \Xml
- **\ANSI_STANDARD**
  - \Product group 1
    - \Producer 1
      - \macro1.em*

…

In order to use the automatic synchronizer function as part of the MVE 2.1 version, the global server structure has to be mapped to the local server structure. It is recommended to set up the same structure locally as on the global server.

9.2 Using data from MD server

The Master data server was designed as a library. It is not allowed to use MD server as an online MD directory for work in Eplan Electric. Each LBU has rights to download data from global MD server to their server and to use these data for work in Eplan or MVE.

9.3 Server administration

All registered local administrators have read/only access to content of global MD server. Only elected administrators (one for IEC type of MD and one for ANSI type of MD) and their deputy have read/write access. Only these administrators are allowed to add new data to MD server. Deputy is set because of substitutability, for the case of non-availability of MD server administrator and for MD server technical administration and support.
Each user of Eplan is allowed to create macros and other content of MD (objects) for the MD server. It is recommended to set stable persons, who will do this work. Local administrator will send these object after its creation to MD server administrator (or his deputy), who will check it and place it into the applicable structure of server.
MD server administrators will check each new object according to the rules given by this document, pertinently according to the functionality and application in Eplan. Creator of the object (or global administrator of the LBU, where the object was created) is responsible of the content (electrical scheme, description, etc.)
MD server administrators will send after the placement of new object to MD server an informative email to all local administrators, who will be registered for receiving these emails. The email will incorporate this:

Subj.: New MD object on ABB MD server - %date

Body:
New Master data object was uploaded on MD server:
\path\filename

If a user finds whichever mistake during using of Eplan, he will contact local administrator, who will send the correct object to MD server administrator after its correction. The revised object will be marked with new revision on MD server.

10 Appendix A - How to generate parts for the global parts database

1. Set-up a macro project for the creation of the parts (Project>Properties, then Type of project <10902> = Macro project). Define the hierarchy and output folders for this project in the settings (User – Management - Directories).

2. Each part will be drawn on a separate page. On the first page the part is drawn completely with all function definitions and internal graphics if it is a black box. The part has to be placed within a macro box. The macro name and settings have to comply with ABB PPMV's standards for global parts creation. It is not necessary to define the complete path of the macro file. Instead the default setting from the settings will be automatically used.

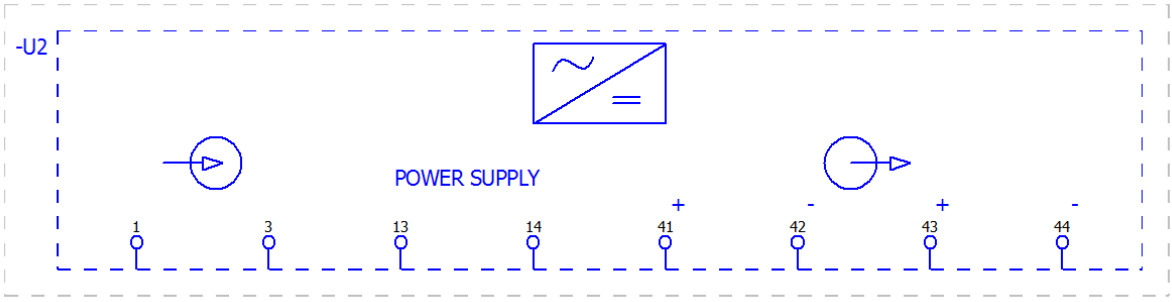


Figure 48: Example of macro for parts generation

3. On the second page further macros of the same part can be generated e.g. when the part is split for display on different pages of schematics. These further macros are stored on other variants (B, C, D …) of the original macro.

4. On the third page the macro for panel layout or door layout diagram is drawn. This page has to be of type Panel layout

5. A forth page can be created for the creation an overview for the part. This page will be stored as a page macro. The page name usually starts with a ZZ.

6. Generate the macros of this new device either by manual generation of individual macros or by automatic function for generation of all macros of the project (Utilities>Generate macros>Automatically from macro project).

7. Define a part number in the ‘Parts’-tap of the main function of the device (first page). The part number must be a number from the global part numbers. This number will be assigned to the new part in the parts database. After the generation (next step) it should be deleted.

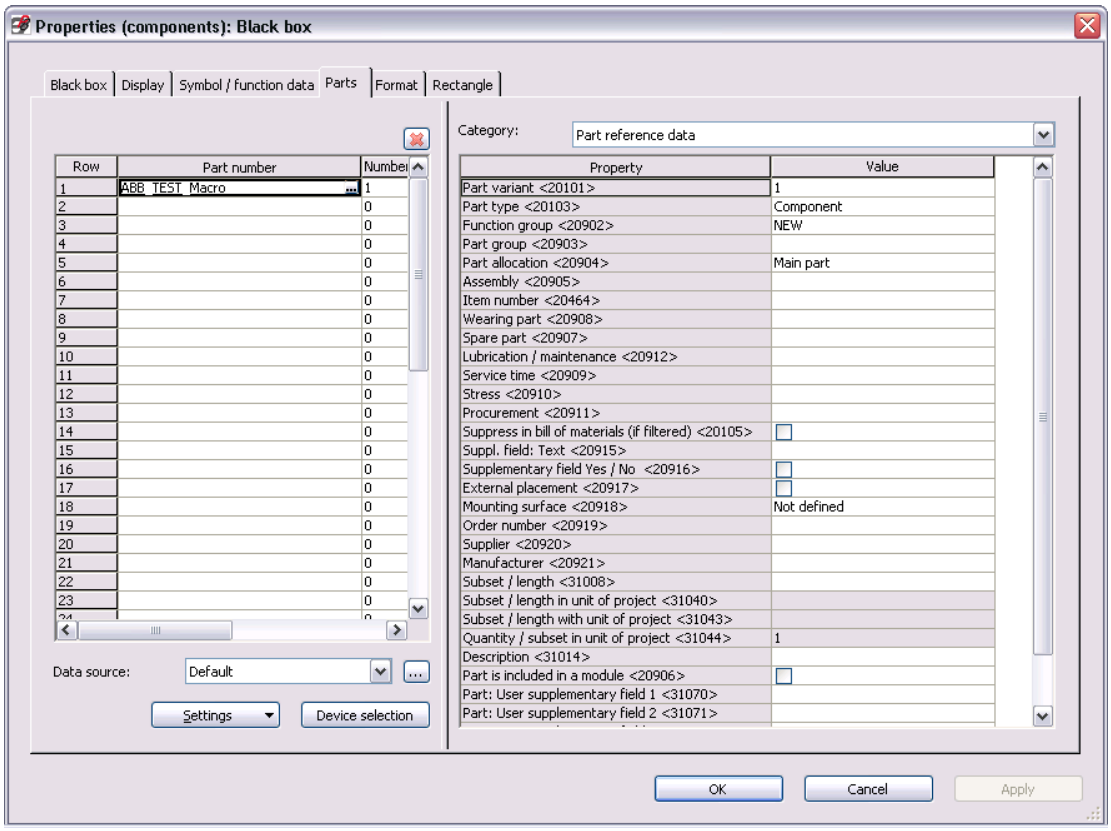


Figure 49: Example of macro generation – non-existing part number has to be filled in

8. Make a right mouse click on the main function of the device. Select ‘Generate part’ from the context menu. If the part number does not exist in the part database, a new part will be created.

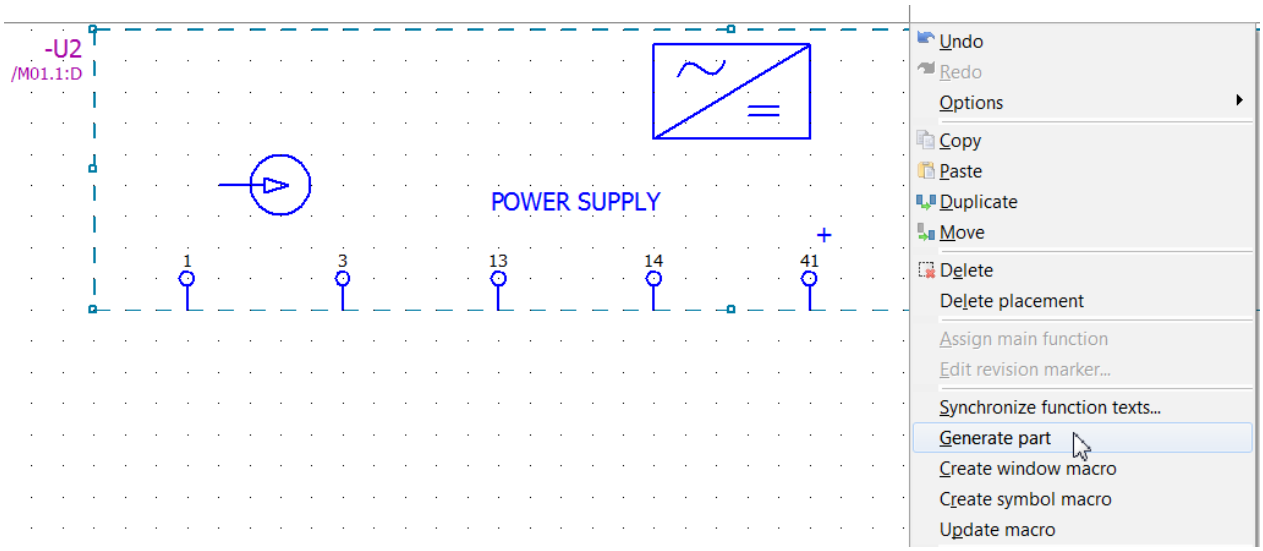


Figure 50: Example for macro generation

9. The new part was created in the parts database. In this step all textual information can be added. Also the macros must be assigned to the part.

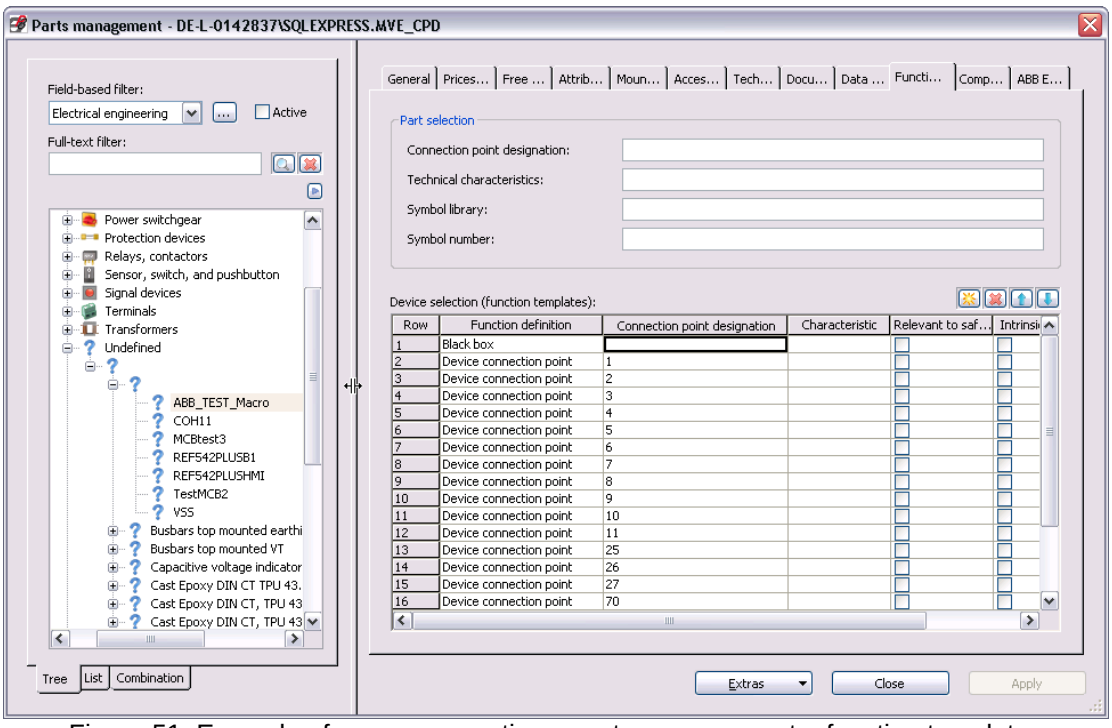


Figure 51: Example of macro generation – parts management – function templates

10. Check the part and the macro by placing it into another schematic project. Check for error messages and warnings in the message board.

Note: It seems useful to draw this new part in a macro project due to the following reasons. The project is a central place to generate parts. Modification and re-usage are easy and well documented. Also in the same step as the generation of the part, a macro for the same can be generated.

11 Appendix B - How to generate data for graphical overview pages (z-pages)

1. There are three categories of parts that will cause a different behaviour of the z-pages report.

2. Parts that are built out of up to 10 symbols (e.g. a simple relay) do not require any special work on the z-pages. For these the default form can be used.

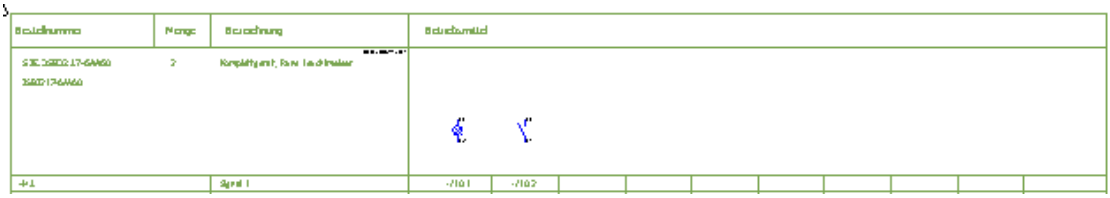


Figure 52: Z-page showing a part up to 10 symbols

3. Parts that are built out of a black box with device connection points need to be handled differently. For these parts special symbols need to be created. See next chapter

4. Parts that are out of a black box and many connection points (e.g. REF, CB) will reference to an overview page (zz-page). The symbol that is shown here is only doing this reference to the overview page.

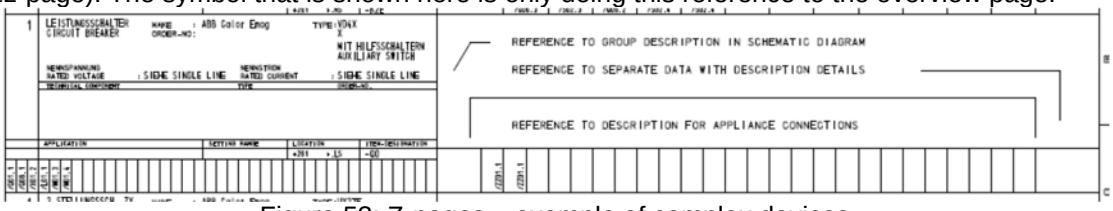


Figure 53: Z-pages – example of complex devices

Generation of Symbols for z-pages for parts based on black boxes

In order to display the details that are usually displayed within the black box as graphic, it is necessary to generate symbols which are called during report generation. Note: If no symbol is defined, the report will place the device connection points only.

In the report for z-pages a strip with references is displayed under the symbol. This strip has a certain raster. The connection points of the symbol shall correspond with the references within the raster.

Also it is important that the height of the symbol fits to the report form. A raster has to be defined and kept for the height too.

The symbols have to be stored in a special database. The reference to the symbol and to the report form and reference strip has to be defined in the part database.

The following items have to be created.

Reference strips

1. horizontal reference strip
2. vertical reference strip
3. vertical reference strip with a pattern

Report form

1. standard height
2. 1.5 height of standard
3. double height of standard
4. whole page (?)

Frame for symbol

This frame shall show the left bottom corner which is the insertion point of the symbol. The standard length to the right has to be shown as well as the possible heights of the symbol (standard 1,5 and double). Below the symbol max. dimension one or more raster shall be shown that indicate the possible raster of the reference strip.

12 Appendix C – How to handle complex devices with variable device connection points

EPLAN P8 provides a new function for the handling of complex devices such as circuit breakers. It is available since version 2.0.
Complex devices often consist of many device connection points that need to be defined in the function template of a part e.g. for auxiliary contacts. When such a device is placed in the device navigator, either manually or through the MVE drawing generator, the user only sees the device connection point with the plug number and the connection number. It is not possible to identify the other connection point(s) that also belong to this function. For example an auxiliary contact has usually two connection points that are displayed together.

Creation
The new function “Device connection point, variable” provides now the possibility to combine device connection points, which belong together, into a logical entity.

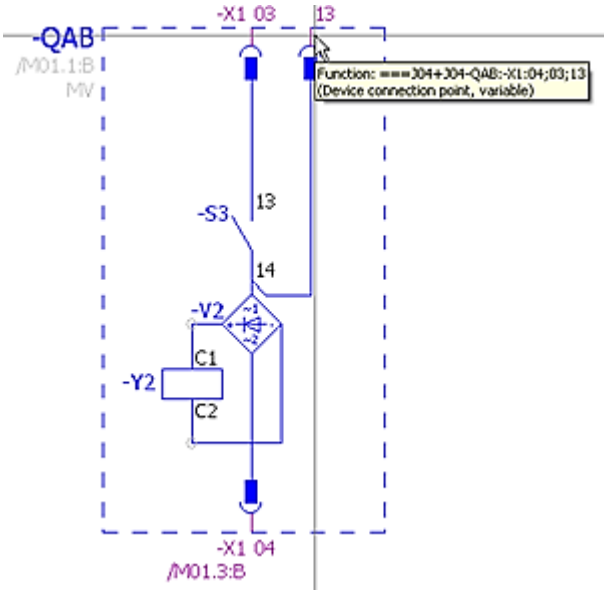


Figure 54: Example of device connection point

The function “Device connection point, variable” can be found in the function library in different versions. During parts creation the user selects a “Device connection point, variable”, which fits best to the technical function, in the tab Function template. In the last column of this tab, the user has to define a symbol macro. This symbol macro can be later placed by drag and drop directly from the device navigator to the multiline page.

The part that is using “Device connection point, variable” has to fulfill the following requirements:

1. Each function of type “Device connection point, variable” should have defined a matching symbol macro in the tab Function template.
2. The device should have a single line macro if it shall be displayed in the single line diagram. The SLD macro is defined as type single line. The macro is referenced to the part through the field Macro on the tab Technical data.
3. The device should have an overview macro if it is of level four of complexity (see chapter **Error! Reference source not found.**). The macro has to be defined of type overview. It is referenced to the part through the field Macro on the tab Technical data. The SLD macro and the overview macro must be combined in one file.
4. The part can contain accessories. The reference to accessory parts is made on tab Accessories. Also accessory parts can contain variable device connection points.

The macros should be handled in a macro project as described in appendix 10.

Placement in a project
When the part shall be placed manually in a project, the following steps must be followed.[2]

1. Open a page of type SLD in the page navigator.
2. Press “New device…” in the device navigator. Select a part from the parts database. This device will be now created as unplaced device in the project. The functions are created according to the function template of the parts definition in the database.

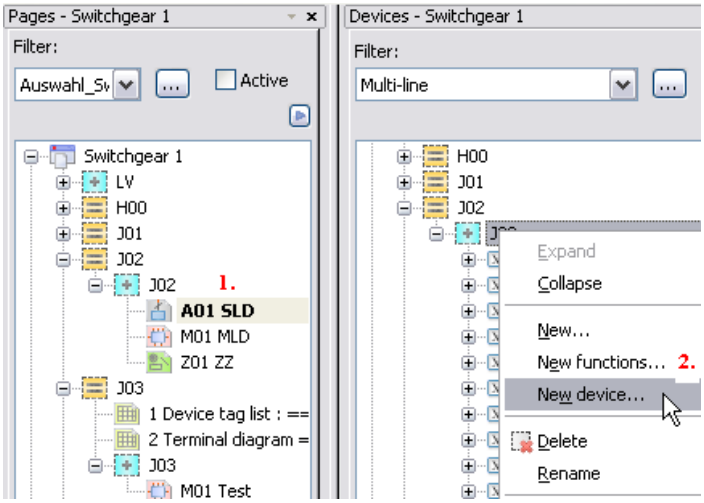


Figure 55: Handling complex macros – inserting SLD symbol

3. The SLD macro can now be placed by drag and drop to the SLD page. Alternatively, one can use the context menu to Place the macro as Single line.

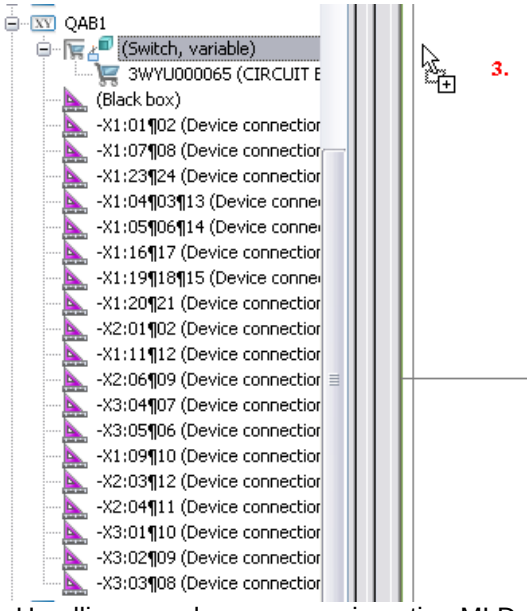


Figure 56: Handling complex macros – inserting MLD macros

4. The same function as in step 3. can be applied to the multiline macros on multiline pages. If a part is placed, it is booked off in the device navigator.

[2] This applies to EPLAN Electric P8 version 2.1. In later versions, other workflows have to be followed.

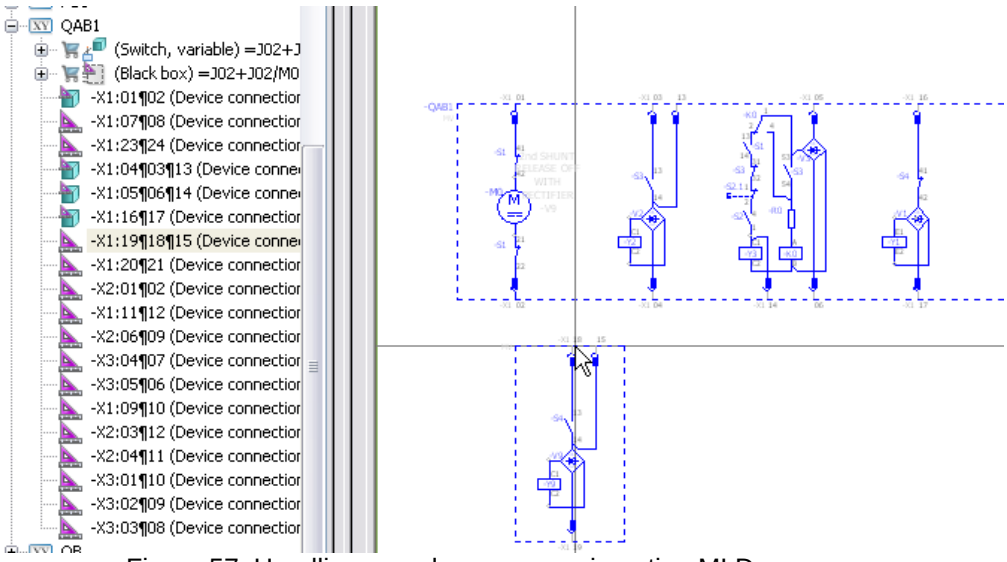


Figure 57: Handling complex macros – inserting MLD macros

5. In a final step the overview macro can be placed on a page type overview. Use the context menu to Place the macro as Overview. All referenced functions are marked also in the device navigator with a red frame.

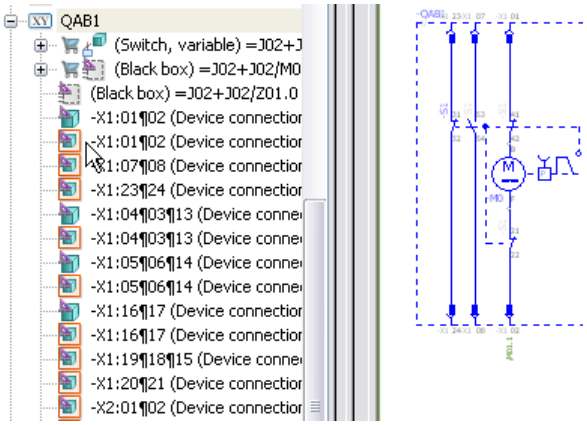


Figure 58: Handling complex macros – inserting overview

Handling of required and optional accessories

For complex parts it is possible to define accessories. Accessories are parts in the parts library which are marked as such on the tab ‘Accessories’. These accessories are parts in its own right and thus can contain function templates and additional information (e.g. dimensions).

An accessory must only be used with a main part. The function templates of the main part and the accessories are displayed combined in the device navigator. A user can use the device selection dialog for easy choice of a main part and its accessories.

If a complex device has required and optional function templates, the optional function templates must be generated within an accessory part. The required function templates should be placed in the main part unless the generation into a required accessory gives advantages for the reduction of the amount of parts and macros. It is possible to set a flag ‘Required’ in the tab ‘Accessories’ for an accessory.

Important icons in the device navigator

Unplaced	Placed	Description
		Multi-line **main function**, representation type "Multi-line" (symbol library symbols, busbar connection point, PLC connection point, mounting panel...)
		Single-line main function, "Single-line" representation type
		Multi-line **auxiliary function** (symbol library symbols, busbar connection point, PLC connection point, mounting panel...)
		Single-line auxiliary function, "Single-line" representation type
-		Auxiliary function, overview positioning, "Overview" representation type
-		Main function, overview positioning, "Overview" representation type
		Overlaid main function
		Superimposed function
	-	Function template
		Black box, PLC box (main function)
		Superimposed black box, PLC box (main function)
		Black box, PLC box (auxiliary function)
		Function contains inconsistent or incomplete data.

13 Appendix D – Folder structure for the directory Macros\Parts on the master data server

The following folder structure shall be used for the easy structuring of the macros for parts. The folder names comply with the first and second level of the ABB classes as defined in [2].

Macros\PARTS
- \AMPLIFIERS
- \BRAKE
- \CABLES
- \CAPACITORS
- \CONVERTERS
  - \ACTIVE ENERGY CONVERTERS
  - \ACTIVE POWER CONVERTERS
  - \APPARENT POWER CONVERTERS
  - \CURRENT CONVERTERS
  - \FREQUENCY CONVERTERS
  - \MULTIFUNCTION MEASURING CONVERTERS
  - \POWER-FACTOR CONVERTERS
  - \REACTIVE ENERGY CONVERTERS
  - \REACTIVE POWER CONVERTERS
  - \TEMPERATURE CONVERTERS
  - \VOLTAGE CONVERTERS
- \COUPLINGS
- \FIELD DISTRIBUTION DEVICES
  - \ACCESSORIES
  - \DNP 3.0
  - \IEC61850
  - \LONBUS
  - \MODBUS
  - \MODULES
  - \PROFIBUS
  - \SIGNAL CONVERTERS
  - \SIGNAL INTERCONNECTORS
  - \SPABUS
  - \STATION AUTOMATION
- \GENERAL
- \HEATING
- \INDICTORS
- \LIGHT
- \LOGIC ITEM
- \MEASURING INSTRUMENTS_TEST DEVICES
  - \ACCESSORIES
  - \AMMETERS
  - \DIGITAL INDICATOR INSTRUMENTS
  - \ENERGY COUNTERS
  - \ENERGY METERS
  - \FREQUENCYMETER
  - \HOURMETERS
  - \MULTIFUNCTION INSTRUMENTS
  - \OTHER COUNTERS
  - \POWER-FACTOR METERS
  - \RECORDING INSTRUMENTS
  - \SEQUENCIMETERS
  - \SYNCHRONIZING GROUPS
  - \SYNCHRONOSCOPE
  - \TEST BLOCKS
  - \VARMETERS

\VOLTMETERS
\WATTMETERS
\MISCELLANEOUS
\HYGROSTATS
\INSULATION MONITORING DEVICES
\LOCKING COILS
\MOTOR CONTROL UNITS
\THERMOMETRIC UNITS
\THERMOSTATS
\MODULATORS
\MOTORS
\MOUNTING PANELS
\PLC
\PLUGS
\POWER SWITCHGEAR
\3 POSITION DISCONNECTORS_EARHING SWITCHES
\3 POSITION SWITCH-DISCONNECTORS_EARHING SWITCHES
\ACCESSORIES
\CIRCUIT-BREAKERS
\CIRCUIT-BREAKERS eVD4
\CIRCUIT-BREAKERS eVM1
\CIRCUIT-BREAKERS HD4
\CIRCUIT-BREAKERS HVD4
\CIRCUIT-BREAKERS VD4
\CIRCUIT-BREAKERS VM1
\CIRCUIT-BREAKERS Vmax
\CONTACTORS
\DISCONNECTORS
\EARTHING SWITCHES
\SHARED_PARTS
\SWITCH-DISCONNECTORS
\TRUCKS
\PROTECTION DEVICES
\RECTIFIER
\RELAYS
\ACCESSORIES
\AUX_BISTABLE RELAYS
\AUX_CONTACTORS
\AUX_RELAYS
\AUX_TIME-DELAYING RELAYS
\CONTACTORS
\MULTIFUNCTION RELAYS
\RELAYS
\RESTART RELAYS
\SPECIAL PURPOSE RELAYS
\RESISTORS
\SEMICONDUCTORS
\SENSOR_SWITCH_PUSHBUTTON
\CONTROL SWITCHES
\CURRENT SWITCHES
\ON_OFF SWITCHES
\PRESSURE SWITCHES
\PUSHBUTTONS
\SELECTOR SWITCHES
\STEP SWITCHES
\VOLTAGE SWITCHES
\SHARED_PARTS
\SIGNAL DEVICES
\ALARM UNIT
\FLAG RELAYS

\INDICATORS
\MULTIFUNCTION SIGNAL UNITS
\POSITION INDICATORS
\SIGNAL AND CONTROL UNITS
\SIGNALING LAMPS
\SIRENS_HORNS
\VOLTAGE INDICATORS
\TERMINALS
\TRANSFORMERS
\3-PHASE M.V. CURRENT TRANSFORMERS
\BUSHING CURRENT SENSORS
\COMBINED CURRENT AND VOLTAGE SENSORS
\CURRENT SENSORS
\DUMMY CURRENT TRANSFORMERS
\HYBRID CURRENT SENSORS
\L.V. CURRENT TRANSFORMERS
\L.V. INSULATING CURRENT TRANSFORMERS
\L.V. VOLTAGE TRANSFORMERS
\M.V. CURRENT TRANSFORMERS
\M.V. VOLTAGE TRANSFORMERS
\NEUTRAL RING CURRENT TRANSFORMERS
\PHASE RING CURRENT TRANSFORMERS
\VOLTAGE SENSORS
\VOLTAGE SOURCE AND GENERATOR

14 Appendix E – How to create 3D enclosure and accessory macros

14.1 Creation of 3D macros

3D macros can be imported from STEP model to macro project and then generated automatically from a macro project as other 2D, MLD,… macros.

Create 3D macro from an imported 3D graphic

3D graphic files can be imported in STEP format. One can generate files of this type with a 3D CAD system, or obtain them from manufacturers. The original position of the graphic can be influenced after importing by defining and rotating a placement area so the desired areas are always rotated to the correct placement position when the macro is placed as a window macro or as a device.
Depending on the quality of the source data the 3D graphic should be edited before it can be saved as a 3D macro. In order to achieve uniform behavior when placing a macro that contains rotated graphics one must select the menu *Edit* > *Device logic* > *Placement area* > *Define and Edit* > *Device logic* > *Placement area* > *Rotate*.
One can also use *Edit* > *Graphic* > *Unite* to combine all the items of the layout space so that a 3D macro is handled like one item when used.

14.2 Creation of 3D enclosures

The files store on the global parts server for 3D macros and graphical macros shall comply with the rules given in this document. The enclosure macros are not a part of Global parts database and should be stored in the folder structure Macros\MECHANICAL MODELS\ENCLOSURES-ACCESSORIES only in local database.

The first step is to import a STEP-model in to the layout space and remove all unnecessary parts of the imported model (enclosure). It is recommended to correct macro in 3D CAD system before importing to EPLAN Pro Panel. In Figure 59 shows the imported enclosure with placement errors. There is no description of any part in the layout space tree on the left side. All undefined parts are declared as “Logic item”.

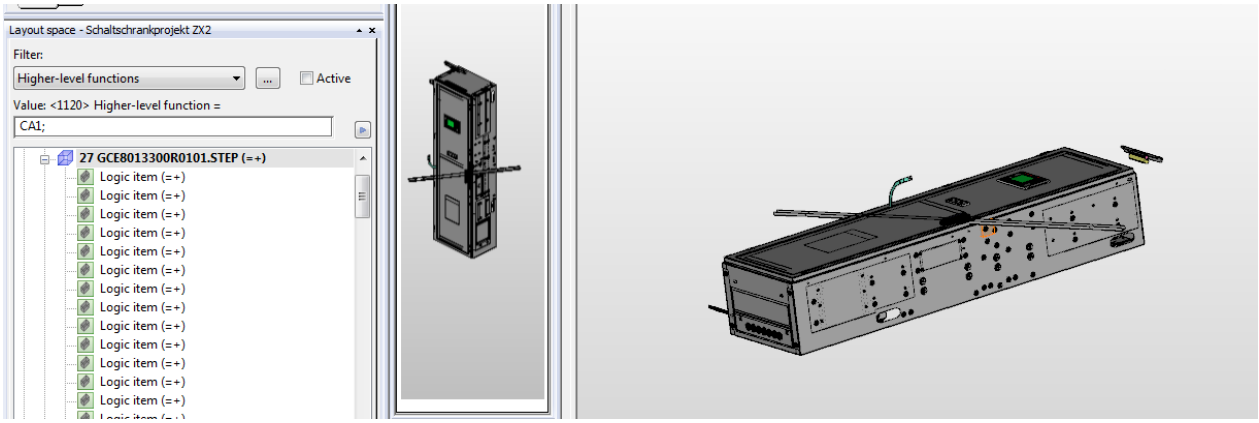


Figure 59: Import of extracted enclosure

The imported STEP-data in the layout space should include necessary items of the enclosure. Necessary items of the enclosures shall be created as a main part. Figure 60: Full enclosure with accessories shows full enclosure with accessories included in macro.

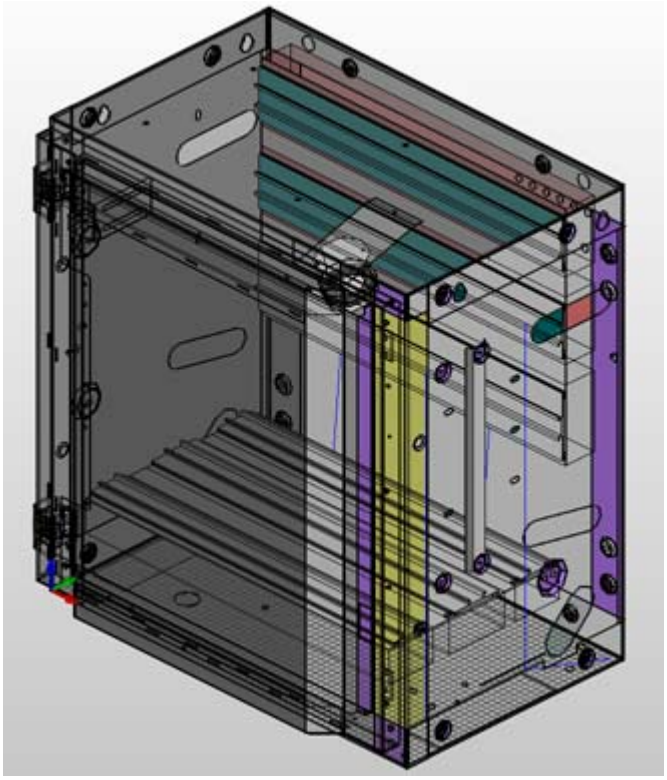


Figure 60: Full enclosure with accessories included in macro

In order to decrease complexity, some items can be created as accessories if the main part contains similar items for each enclosure and variable items (doors, hinges, DIN rails,..). Figure 61: Basic enclosure without accessories shows main part of enclosure and Figure 62: Full enclosure without accessories shows accessories defined in parts database.

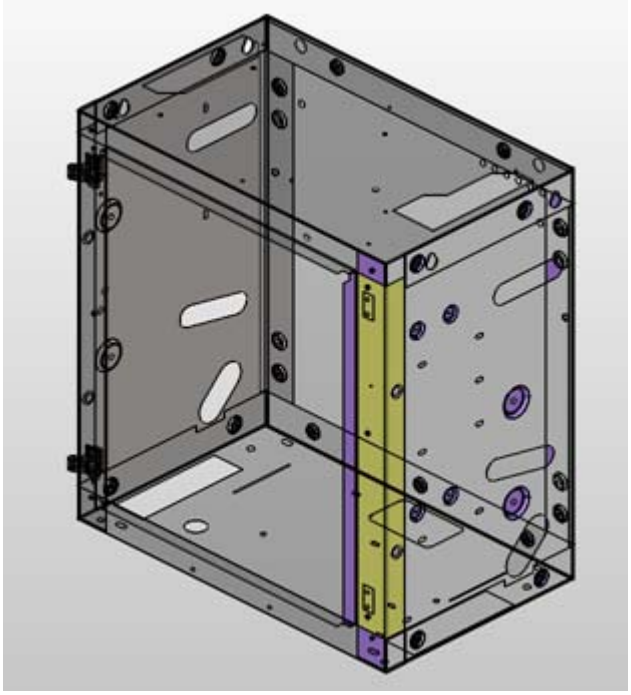


Figure 61: Basic enclosure without accessories

Accessory selection LVC (650x705) *

Accessories:

Required <19...	Part number /...	Accessory typ...	Selection	Variant selecti...	Part: Designati...	Accessory placement <...	Installation va...
☑	DOOR (650x705)	Accessory list	DOOR_STANDARD (650...	1		DOOR	1
☐	PLUG_Cover	Component	PLUG_Cover	1	PLG	PLUG_cover	1
☑	LIGHTNING	Accessory list	Lightning_NEW	1	LIGHT	LIGHTNING NEW	1
☐	Holder	Component	Holder	1	Holder LVL	HOLDER LVL	MIDDLE
☐	Weidmuler LVR	Component	Weidmuler LVR	1	Mouting Rail	RAIL LVR	1
☑	MP (650x705)	Accessory list	Lutze (650x705)	1		Mouting Panel (Lutze)	1

Figure 62: Full enclosure without accessories

Furthermore define a placement area on the outer floor plate of the enclosure and define a handle point.

Some parts consist of several elements, so that it makes sense to combine these component parts to one unit (e.g. hinges, door handles, stiffening profiles, etc.). This will simplify the handling for the user.
One should select there a suitable function definition for the selected item. It means a door must be defined as a door in the function definition tree. Function definition can be assigned also automatically.

Figure 63 represents the fully defined enclosure after the interpretation process. Main components should be equipped with mounting surfaces, e.g. door, mounting panel, mounting plates, stiffening profile and perhaps the enclosure side walls, too. It is important to define the mounting surfaces on the area of the part where a device should be placed in future, especially at the doors and mounting panels. At other parts it is not necessary to generate mounting surfaces, if it is not intended to place there any devices.
The mounting surfaces stay in the hierarchy under the described part. Further it is recommended to describe the mounting surface and give them a name in the properties.

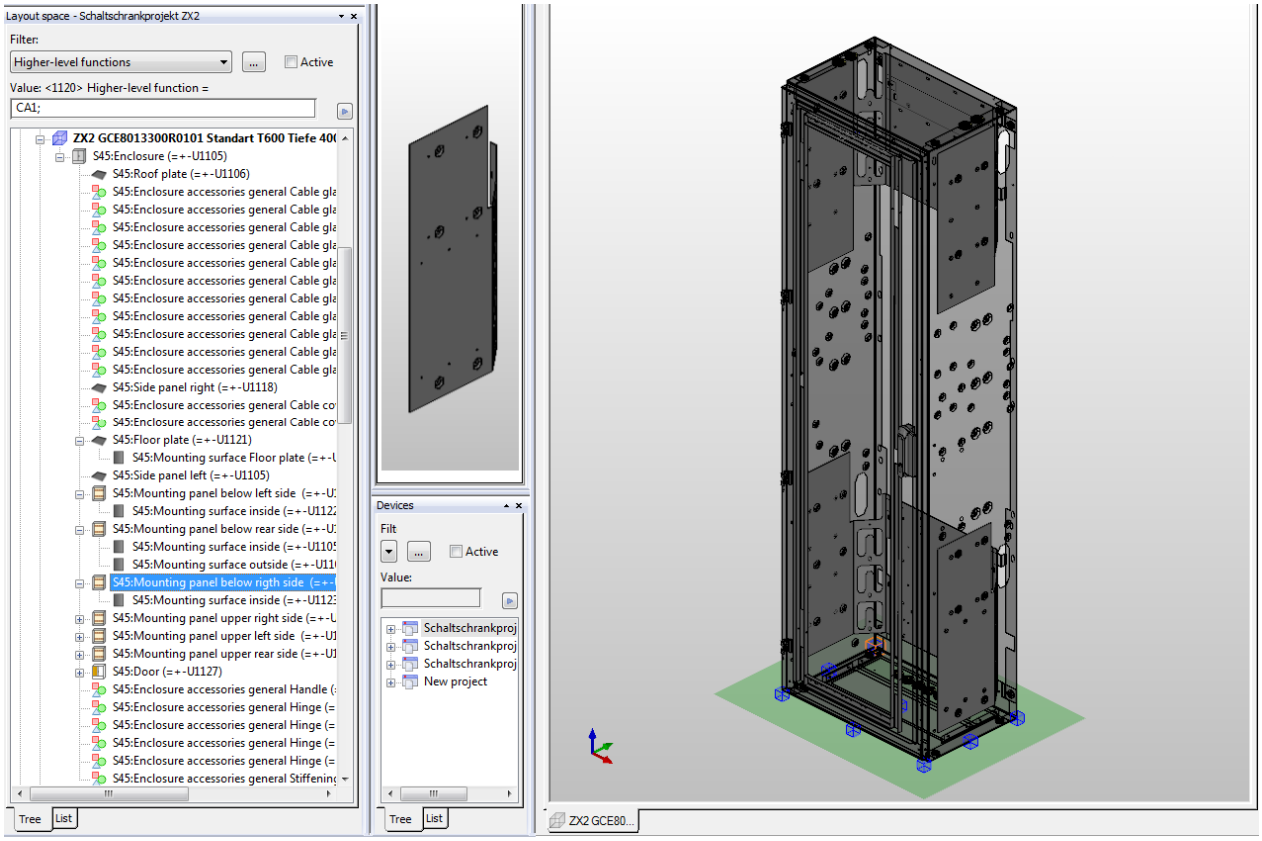


Figure 63: Full defined enclosure after manual or automatic interpretation

The hierarchy level of all components is one level below the enclosure level. This is important for using of filters and schemes in future. All components of the enclosure should have the format style taken from layer.

In the format tab belonging to the properties there is one option to select a layer for the part. Useful layers are the EPLAN layer560 for enclosure components, the layer561 is used for mounting panels and the layer562 for devices. The default settings of the format for color and transparency of the enclosure components are given from the layer, there is no input required.

Figure 64 represents the enclosure sidewall description through the selection of a function definition and the selection of an Item in the part placement. In this way the description of the functionality of enclosure walls is done.

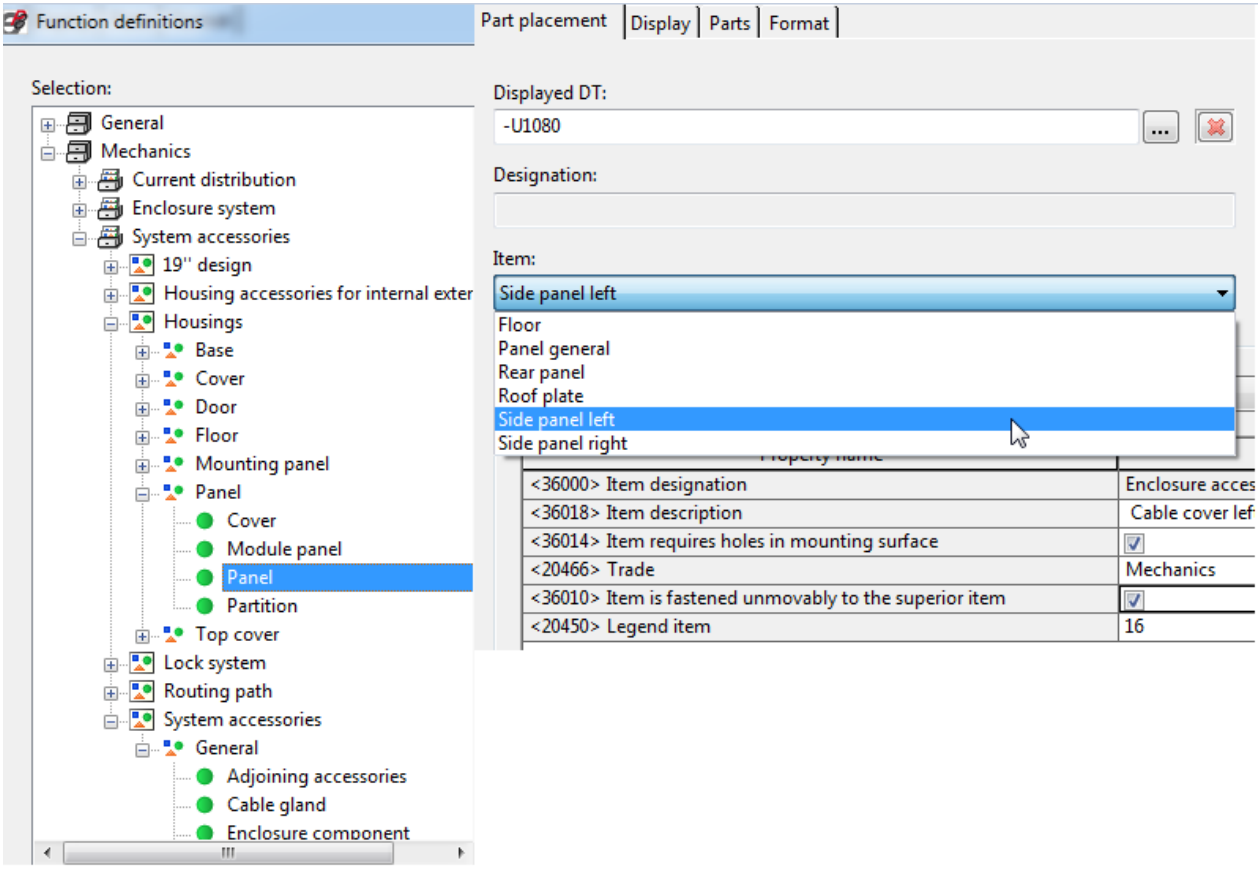


Figure 64: Description of an enclosure wall

Furthermore it is requested to activate the item “Item is fastened unmovable to the superior item”, so that no unintentional placement change of the enclosure components can occur. In order to use the automatic 3D generation function as part of the MVE 2.4 version.

Long descriptions of the parts are undesired in the layout space. Ensure that there are no entries in the property arrangement at the display tab. In the display is no entry requested, so in the property arrangement can select a default filter, or generate a new filter with the required settings. Routing ranges and routing paths are exceptions, where DT or other object-specific property can be filled in according to requirements.

After all the descriptions of the parts were entered, the macro can be generated. However, it is not possible to set the enclosure level in the hierarchy. It is automatically created in the macro, if the enclosure is inserted manually from the parts DB in a project. If the enclosure level is needed in the macro, at first the macro has to be assigned to the enclosure in the parts DB, then inserted again from the parts DB into the same layout in the macro project.
Note: The storage location is defined in the folder structuring in chapter 9.1 in this document.