



AUCOTEC
Create Synergy – Connect Processes

Engineering Base

New Features in Version 6.6.1

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1 Common Update Notes

1.1 Migration of Data from Previous Versions

To migrate data from previous Engineering Base versions, you must update the database with the database manager.

How to update a database:

1. Open the **database manager** via the Windows **Start menu**.
2. Select the tab **SQL Server Instance** and click on **Update Databases**.

The dialog now shows a list of not yet updated databases. Mark the databases you wish to update and start updating.



You can access databases from previous Engineering Base versions with **Engineering Base** only if they have been updated. Databases not matching the installed Engineering Base version are not displayed in the **Open Database** selection dialog.

2 Data Exchange and Integration of External Systems

2.1 EB Setup with Integrated Configuration of the "Web Communication Server" (EB 6.6.1)

The **Web Communication Server** is a "Windows Communications Foundation Utility" that allows the user to access and manipulate data from an **Engineering Base** database. For this purpose you can call and change data of individual objects or dictionaries. To use it you need a **Web Communication Server** License (1172).

Within the **Engineering Base** setup, you can use the dialog **Web Communication Server: Configuration** to specify settings for the connection of the **Web Communication Server** with the **Engineering Base** database. The following specifications are possible:

1. Application Server: (default setting: "localhost")
2. SQL Server: (default setting: "localhost")
3. SQL Instance: (default setting: "EB120")

You can also activate or deactivate the **Web Communication Server** in the extended setup dialog as subfeature of the feature "Server". The default setting is "Activated".

3 EB Solution Packages

3.1 "Minerals Processing" Content (EB 6.6.1)

For the business solution **Minerals Processing**, the required content is still supplied in the form of a separate **Engineering Base** database. This contains all relevant data:

- Sample projects
- Dictionaries
- Specification catalogs
- Stencils
- Attributes
- Type definitions
- Macros

Moreover the following macros of the **Minerals Processing** business solution have been adopted into the **Engineering Base** standard:

Macro	Description
ATEX markings	Wizard for highlighting (plant) sections in drawings that are assigned to certain categories (e.g. ATEX zones).
Change Function Code	Wizard for switchover between the designation systems of the client and the supplier.
Break up Component (hitherto: Break up Component)	Wizard for restructuring plant sections in the structure tree.
Standard Design Criteria	Wizard for displaying design specifications in the project.

If you use the **Engineering Base Database Manager** to activate the business solution **Minerals Processing** in a database, then these macros are automatically updated by **AUCOTEC** via database update.

To use the macros, you need one of the following licenses:

- EB Plant Design
- EB Instrumentation Basic
- EB Instrumentation Detail
- EB Instrumentation Pro

4 Redesign and Extension of Wizards

4.1 Extensions of the Macro "Extended CAD Import" (EB 6.6.1)

You need one of the licenses listed below:	No license required
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid Automotive Harness Design Power Transmission and Distribution

4.1.1 Import of "Free" Texts not Assigned to a DWG Block

You can use the variables "AbsoluteX" and "AbsoluteY" to read out free texts from the source drawing and assign them to Engineering Base attributes via their positions. The "AbsoluteX" and "AbsoluteY" values refer to the 0 coordinates in the DWG drawing.

4.1.2 Automatic Creation of Process Connections during Import of P&I Sheets

Up to now only electrical connections were created during the **Extended CAD Import**. During **Layer mapping**, you can now use the **Options** of the wizard to assign **Pin types** to the layers of the DWG input. When importing DWG data of a layer, e.g. the layer "CONNECTION", then not only is the created data stored in the assigned Visio layer but also pins of the desired type, e.g. **Process/Fluid** are automatically created.

4.1.3 Taking into Account the DWG Text Parameter "Width Factor".

The **Extended CAD Import** converts the DWG parameters "Width factor" for texts to Visio "Distance attributes".

4.1.4 Import of User-Defined SHX Fonts

To correctly display user-defined SHX fonts in Visio, you can use the mapping settings for fonts to specify a horizontal correction factor for text positioning.

4.1.5 Changes in the "Attribute Mapping" Dialog

An "Autofill" functionality for comfortable assignment of column contents is now available. After entering data in a cell, you can transfer their contents to subsequently selected cells of the column.

The header line for sorting and filtering is no longer moved when scrolling in the table but remains always visible.

4.2 Extended Bridge Concept in the "Terminal Block Designer" (EB 6.6.1)

In the **Terminal Block Designer**, you can define connections between terminals as insertion bridge, wire jumper, mixed wire jumper, material bridge or fixed jumper.

Up to now insertion bridges and fixed jumpers were stored in "Bridge" folders underneath the terminal blocks. Now bridges are stored as sub-devices (of the type bridge) at the terminal with the highest position number (successor terminal). At these bridge sub-devices, the association with the unspecified wire or bridge (for insertion bridges) is shown.

The following attributes are available for bridge objects:

Jumper Type, Jumper Length, Jumper Specification, Suppress Bridge in Terminal Block Diagram, Master Shape for Terminal Block Diagram

With these attributes you can store all properties relevant for copying the various jumper types between different projects. Thus you can use the **Terminal Block Designer** to reconstruct all accessory and jumper properties of the copied terminal blocks. You can find and restore the wire associations via the jumper type and jumper length information.

4.3 Extensions in Terminal Diagrams (EB 6.6.1)

<p>You need one of the licenses listed below:</p>	<p>EB Evaluation Version EB View EB Electrical EB Electrical Pro EB Instrumentation Detail EB Instrumentation Pro EB Cable EB Cable Logic VOBES EB Power EB Explorer</p>
<p>Contained in the following business solutions:</p>	<p>Electrical / Instrumentation Detail Engineering International Standards System Engineering Harness Design Electrical USA Standards Power Transmission and Distribution</p>

4.3.1 Extended Bridge Concept

The extensions described in the chapter "Extended Bridge Concept in the Terminal Block Designer" concerning available attributes and generated data structures are also taken into account for generating terminal diagrams.

4.3.2 Attribute "Suppress Bridge in Terminal Diagram"

With the **Terminal Block Designer** you can set the Boolean attribute **Suppress Bridge in Terminal Diagram** for devices of the type **Bridge**. In the context menu for bridges, depending on the status of the attribute the **Terminal Block Designer** offers the menu items **Suppress Bridge** or **Show Bridge**.

When generating terminal diagrams, the display of the bridges is controlled by the attribute.

4.3.3 Representation of Fixed Jumpers

The portrayal of fixed jumpers not represented by a shape is configurable. You can choose between a representation with or without end points.

For this purpose start the macro **Terminal Diagram/Configuration** to specify the representation of your choice:

- `<BridgeOptions>0</BridgeOptions>` for a representation with end points (default).
- `<BridgeOptions>2</BridgeOptions>` for a representation without end points.

4.3.4 Distinction Between Cable and Wiring Material Cores

By configuring the terminal diagram template, you can generate terminal diagrams showing different attribute contents for cables and wiring material cores in the column areas "Cable/Wire". The cable and core designations for cable cores can be displayed. However, for cores not belonging to a cable (single wires) the "Cable/Wire" columns show the contents of the core attributes specified in the terminal diagram template.

1		2		3	
Montage / Hinweise				Leitungs Material	
				Standard	
				H07V-K	1,5mm ² GY
Rück-Verweis	Ltg Kabel	Ader	Ziel Bezeichnung extern		
S01.2C	-W1	BK	=E01 +E01	-T1L1	2
S01.3C	-W1	RD	=E01 +E01	-T1L2	2
S01.6C	H07V-K	GY 1,5mm ²	=E01 +S2	-X2	1
S01.6C	H07V-K	GY 1,5mm ²	=E01 +S2	-X2	2

4.3.5 "Start Sheet" and "Title" Attributes for Terminal Blocks

Using terminal block attributes, you can predefine attributes for the terminal diagram that are used during the start or the creation of the terminal diagram.

Here you can specify data for captions that are adopted into the terminal diagram frame during the generation of the terminal diagram. The sheet where the terminal report is stored gets the content of the attribute **First Sheet** as sheet designation.

If the structure of the drawings in the **Documents** folder corresponds to that of **Part of** in the terminal block, then the generated terminal diagram is stored with this hierarchy.

4.4 Extended Functionality of the Potential Wiring Editor (EB 6.6.1)

<p>You need one of the licenses listed below:</p>	<p>EB Cable Pro EB Cable Logic EB Cable Harness Design EB Cable Logic VOBES Cable Manufacturing</p>
<p>Contained in the following business solutions:</p>	<p>Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid Automotive Harness Design Power Transmission and Distribution</p>

The **Potential Wiring Editor** offers the option to create and edit the wiring of a plant alphanumerically. For this purpose the functions and potentials required from a functional point of view are specified and are then used to derive the circuit wiring. With the aid of the associated modules of the wizard, you can newly create, edit or delete inline connection points, terminal blocks and cables. In this context the following extensions were implemented:

4.4.1 Macro Settings for Displaying "Material Information" and "Wire Material"

1. Material information

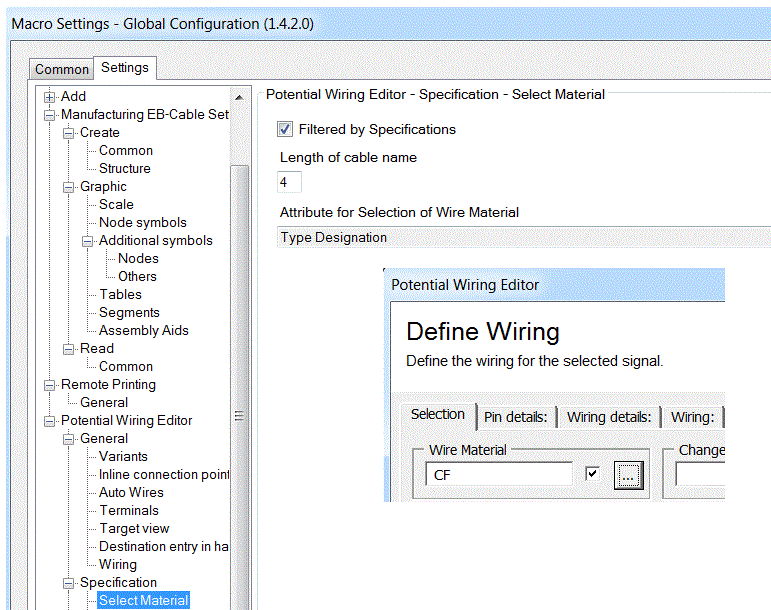
For wires, the **Target View** now contains in addition to the columns **Material** and **Voltage Level** the configurable column **Material Information** for displaying further wire attributes.

Using the wizard **Macro Settings – Configuration**, you can specify the IDs of attributes to be displayed either project-specific or for the complete database.

2. Wire material

In the tabs **Selection**, **Pin Details**, **Wiring Details** and **Wiring**, you can use the area **Wire Material** to select the wire material for subsequent editing from the catalogs. In the associated text field, an attribute of the selected material is shown; in the following example this is the **Type Designation**.

Using the wizard **Macro Settings – Configuration**, you can specify the attributes to be displayed either project-specific or for the complete database.



In all dialogs of the Potential Wiring Editor, e.g. **Target View**, **Edit Inline Connection Point** and **Edit Terminal Block**, the columns with wiring information now have the identical designation **Wire Material**.

4.4.2 Extensions for Editing Inline Connection Points with Assigned Material

The dialog **Edit Inline Connection Point** offers the function **Remove Material** for inline connection points, their connectors and mating connectors and the assigned materials. Upon confirming a message dialog, the material entries are removed, and the inline connection points become "dynamic inline connection points". At the inline connection points, the Boolean attribute **Automatic Terminals and Pins** is then set to "True".

Since for an inline connection point with existing material it cannot be defined whether the material is to be accepted for both plug-in connectors, the material entries must be deleted before you can **split** the inline connection point.

4.4.3 Display of Split Inline Connection Points

By moving connector parts, you can store parts of an inline connection point in different units. This situation is correctly represented both in the graphic control and the tabular representation.

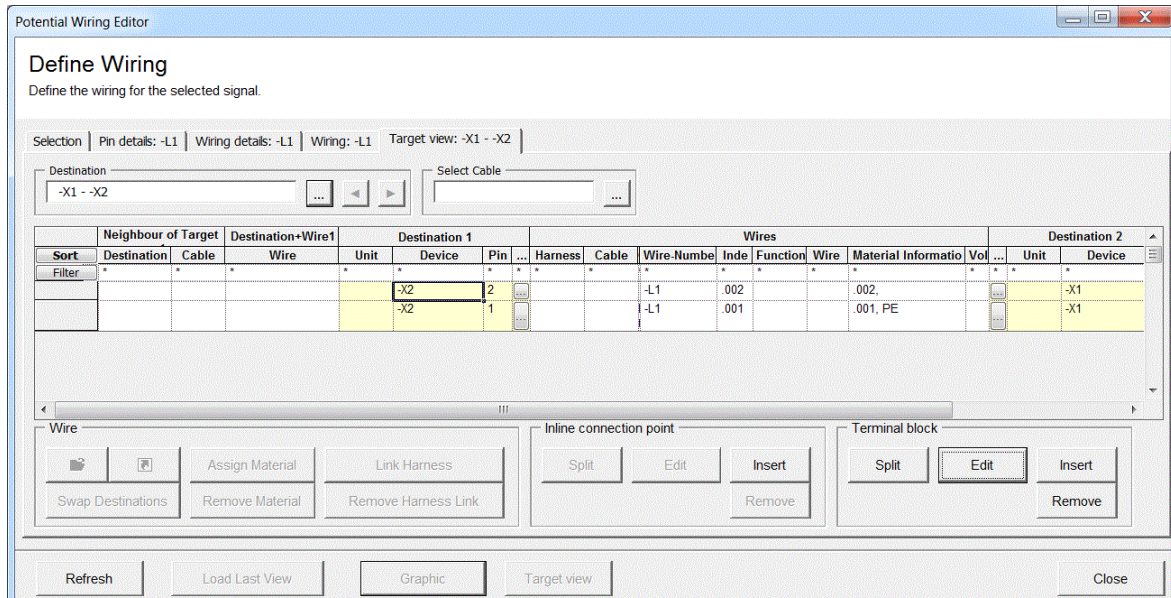
For split inline connection points, the inline connection point designations of the connector parts are to be visible only for connectors not located in the same unit as the inline connection point.

You can achieve this with the option **Inline Connection Point Name Invisible**. Using the wizard **Macro Settings – Configuration**, you can activate the option either project-specific or for the complete database.

4.4.4 "Terminal Block Designer" Can be Started from Terminal Blocks

In the dialog **Define Wiring** of the **Target View**, you can now start the **Terminal Block Designer** by clicking on **Edit** for terminal blocks.

With the wizard **Macro Settings – Configuration**, you can activate the checkbox **Terminal Block Designer for Editing Terminal Blocks** in the tab **Potential Wiring Editor – General - Terminals**, either throughout the database or specifically for the project. If the Terminal Block Designer is deactivated, then the still available edit function of the Potential Wiring Editor is started with the dialog **Edit Terminal Blocks**.



You can make the changes made with the **Terminal Block Designer** retroactively visible with a click on **Refresh** in the **Potential Wiring Editor**.

4.4.5 Removing Inline Connection Points and Terminal Blocks from Wire/Cable Chains

In the **Target View**, you can mark and then delete wires, inline connection points, their connectors and terminal blocks or terminals by clicking on **Remove**. The associated wiring is completely updated in this case.



If during a deletion process a wire assigned to a wire harness is to be deleted, then the inline connection point or terminal block cannot be deleted.

In principle, terminals, inline connection points and wires are deleted only if all associated wires can be deleted. In particular, the following procedure is kept:

- The explicitly selected single wires are deleted. The wires connected to the other side of the terminal or inline connection point are connected to the corresponding targets of the deleted wires.
- As soon as all single wires of the cable have been taken into account by selecting the objects to be edited, the cable is completely deleted. Should a core of cable remain connected, then the cable in its entirety is not deleted, and a corresponding program message is displayed.
- If an inline connection point is to be deleted, then all pins of the inline connection point must be marked for deletion.
- If a terminal block is to be deleted, then all pins of the terminal block must be marked for deletion.

4.5 Extensions of the "Typical Manager" (EB 6.6.0/EB 6.6.1)

<p>For the Typical Manager, you need one of the licenses listed below:</p>	<p>EB Evaluation Version EB Electrical EB Electrical Pro EB Plant Design EB Instrumentation Basic EB Instrumentation Detail EB Instrumentation Pro EB Power</p>
<p>For the Advanced Typical Manager you need in addition the following license:</p>	<p>Advanced Typical Manager (1166)</p>
<p>Contained in the following business solutions:</p>	<p>Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering Electrical USA Standards Power Transmission and Distribution</p>

In the last few versions, the **Typical Manager** has been comprehensively extended:

4.5.1 Dimensioning (EB 6.6.0)

With **Dimensioning**, you can assign certain materials to devices of a function of the typical project. Thus you can copy **variants** with variable device combinations into the target project. This functionality is available only with the **Advanced Typical Manager**. You specify the designs at the typical using the Typical Manager module **Configure Dimensioning**. The user must assign a **Dimensioning Index** per design that is unambiguous for the typical.

4.5.2 Taking into Account the Logical Function Assignment and the Parent Structures while Copying (EB 6.6.1)

When merging the equipment in the target project, in addition to the associations with locations and units the associated functions are now also taken into account. In particular, the merging is carried out in the following steps:

1. First of all all slave objects of a typical function are compared level by level with the target function. If a match is detected, the functions are merged, otherwise the typical function is copied into the target project.
2. Equipment associated with the typical function is compared to the equipment of the target function. If there is an unambiguous match, the data is merged, otherwise the equipment is copied into the target project. When the equipment is copied, the entire structure is inserted. When the option „Add the structure of the Typical to the merge objects and linked Typical Units“ is activated, also the objects located between the object to be merged and the „Typical Unit“ are transferred.

3. Equipment that is contained in typical sheets but is not part of the typical function is compared to the equipment of the target project. If a match is found, only the associations are copied. If there is no match, the equipment is copied. In the process, the entire structure is always copied.
4. Finally the associated typical locations are compared to those of the target project. If there is a match, the associations are transferred to the locations of the target project. There is no merging! If there is no match, the typical location is copied.
5. A typical function can contain sheets on which objects are represented which do not belong to the typical function. These objects are copied into the destination project together with the entire parent structures to avoid inconsistent sheets in the target project.



4.5.3 Availability for all Function Types (EB 6.6.1)

The **Typical Manager** and the **Advanced Typical Manager** can be started in the target project for all defined function types via macro selection and the associated context menus.

In the **Options**, the list **Visible Functions** relevant for the option **Only Load Selected Functions** contains all available function types. Moreover you can here set the **Number of Units per Typical**, and in the appropriately configured projects also the **Number of Locations per Typical**, to the maximum of "10".

4.5.4 Flexible Use of Typical Units and Typical Locations

Instead of the fixed names "Typical Unit 1-10" and "Typical Location 1-10", you can now store objects in the typical project with the new types **Typical Unit** and **Typical Location** using freely selectable, individual names. The new typical object types have an attribute **Typical Indenture Number** whose value corresponds to the hitherto used numerical name part "1-10".

Piktogramm	Object type
	Typical Location
	Typical Unit

The Typical Manager determines the units and the locations to be handled via the typical object types and the indenture numbers. If the search is unsuccessful, then it is carried out via the former method using fixed names.



The typical units and typical locations do not have to be located in the root folder any more.

4.6 Extensions of the "Automotive Contact Selection" (EB 6.6.1)

You need one of the licenses listed below:	EB Cable Pro EB Cable Logic EB Cable Harness Design EB Cable Logic VOBES Cable Manufacturing
Contained in the following business solutions:	Automotive Harness Design

The macro **Automotive Contact Manager** is used to create contacts, seals and blind seals for the individual cavities of a connector. Based on the attribute contents present at the cavities and the connected wires, the macro uses a special set of rules to calculate the results for the individual cavities.

4.6.1 Optional Material Number Check

In **Automotive Contact Selection**, cables (multi-core wires) are also checked for material numbers. Since as a matter of course cables and multi-core wires do not have material numbers at their single wires, you can optionally switch off this check when selecting contacts.

4.6.2 Optional Taking into Account of Wire Attributes

Moreover you can use the macro settings to activate the consideration of the outer diameters of wires and of their wire types. When activating this option, then in the dialog **Solve Conflict** the filters for the columns **Diameter (minimum)**, **Diameter (maximum)** and **Wire Type** are assigned the value "All" in the selection lists for contacts and seals.

4.6.3 Taking into Account Several Seal and Terminal Types

For cavity types, you can now specify a list of types separated by "," for the attributes **Blind Seal Type**, **Seal Type** and **Terminal Type**. In the **Automotive Contact Selection** for a cavity you can then select all blind seals, seals and terminals whose types are contained in the type list of the cavity.

4.7 The Accessory Wizard Takes into Account Preferred and Additional Catalogs (EB 6.6.1)

<p>You need one of the licenses listed below:</p>	<p>EB Evaluation Version EB Electrical EB Electrical Pro EB Plant Design EB Instrumentation Basic EB Instrumentation Detail EB Instrumentation Pro EB Cable EB Cable Pro EB Cable Logic EB Cable Harness Design EB Cable Logic VOBES EB Power EB Fluid EB Explorer</p>
<p>Contained in the following business solutions:</p>	<p>Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid Automotive Harness Design</p>

The accessory wizard supports the linkage of devices, cables and wires with accessories.

- For one thing, it offers the functionality to use catalogs for defining mounting forms with mounting positions and their accessories and to assign devices to them.
- If not yet present, you can then assign mounting forms to devices in projects. From the accessories of these mounting forms you can then select add-on components for the mounting position.

For device editing in projects, the **Preferred Catalog** and all **Additional Catalogs** are taken into account.

4.8 Wizard "Terminal Connection" with Revised Destination Reference Display (EB 6.6.1)

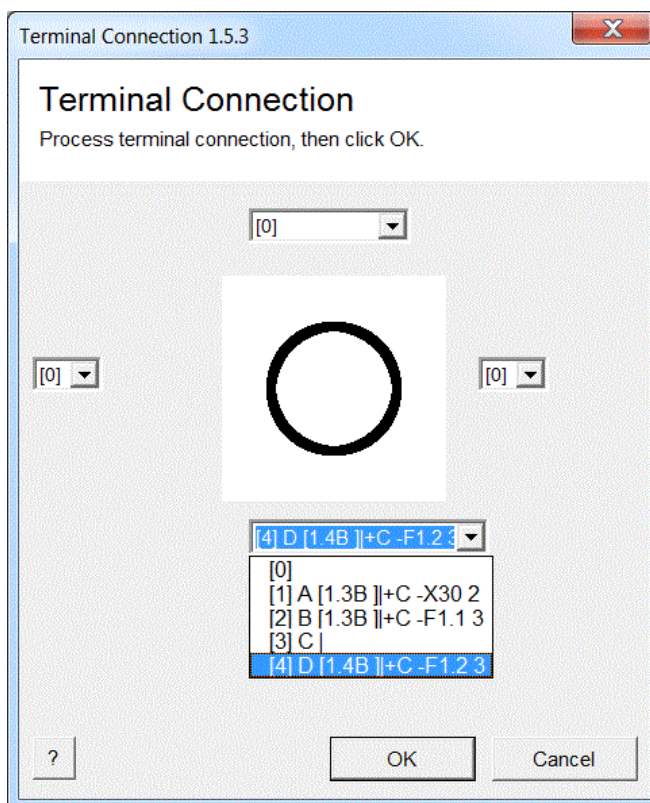
You need one of the licenses listed below:	No license required
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards Power Transmission and Distribution

With the **Terminal Connection Wizard**, you can edit the connector configuration of pins, particularly in cases of distributed representation.

The selection lists with connection information that are opened when editing the pins now contain extended pin and destination information:

["pin position"] " pin designation"[cross-reference to the pin display in the diagram"]
"designation of the target connector"

e.g. "[4]D[1.4B]]+C -F1.2 3"



4.9 "Import of E-CAD Master Data" Supports the Import of ".edz" Files (EB 6.6.1)

You need one of the licenses listed below:	Data Service
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid Automotive Harness Design Power Transmission and Distribution Minerals Processing

In the file selection dialog of the wizard **Import of E-CAD Master Data**, you can select the entry "EDZ Files (.edz) (*.EDZ)" from the list of permissible file types.

The ".edz" files are zipped archives containing in addition to parts data also associated macros, documents and image files. When importing these files, then in addition to a catalog with the included parts data, **Engineering Base** dictionaries and stencils with master shapes are also generated.

4.10 "RemotePrint" with "SmartPDF" Output (EB 6.6.1)

You need one of the licenses listed below:	No license required
Contained in the following business solutions:	

In the printer selection list, the macro **RemotePrint** also offers the output format "Smart PDF".

The folder where the resulting files are stored is specified as "Smart PDF Folder" with the wizard **Macro Settings** either for a certain project or globally for the database.

4.11 Start Objects of the "CNC Machine Control Tool" (EB 6.6.1)

You need one of the licenses listed below:	No license required
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid Automotive Harness Design Power Transmission and Distribution Minerals Processing

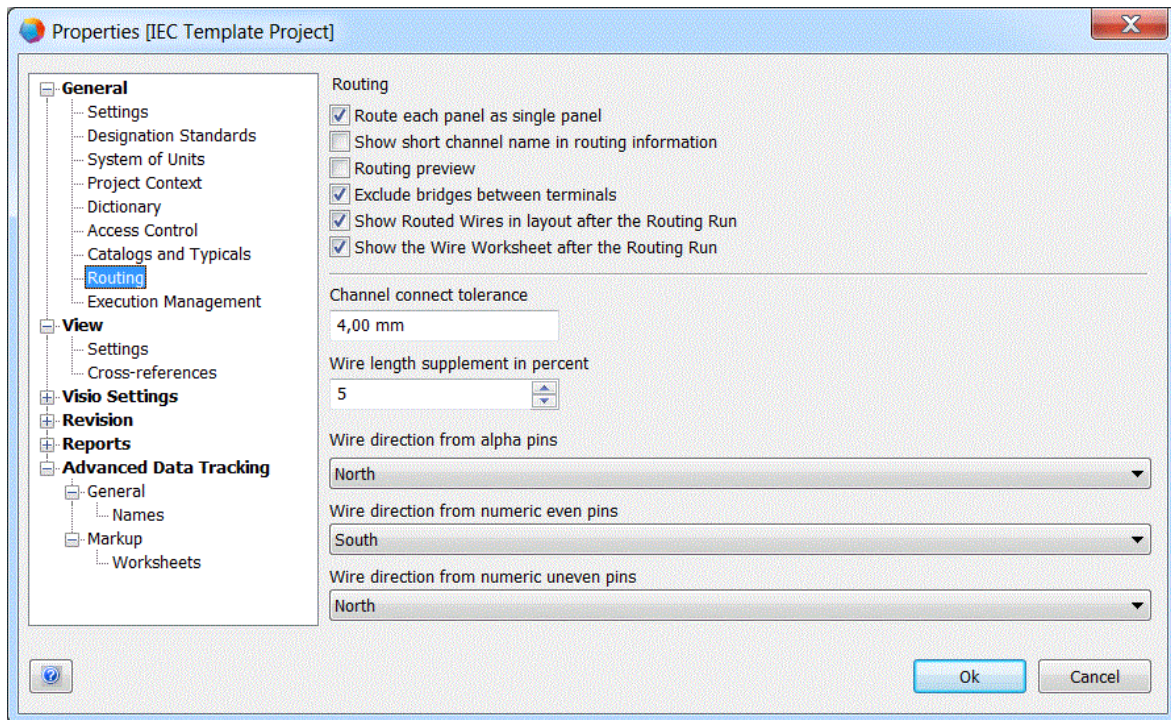
The **CNC Machine Control Tool** can now be started from objects of the type **Sheet**, **Assembly** or **Cabinet**.

4.12 Extensions of the Macro "Routing" (EB 6.6.1)

You need one of the licenses listed below:	Routing
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards System Engineering Harness Design Electrical USA Standards Power Transmission and Distribution

The primary revision concerned the treatment of the "Wire Direction of Pins".

Moreover the project properties offer additional options for configuring the **Routing** functionality.



4.12.1 Configurable Display of the Routed Wires

In the project properties, you can use the **Routing** tab and there the checkbox **Show Routed Wires in Layout Diagram after the Routing Run** to switch the final display on or off. The default for the checkbox is "Activated" in order not to automatically change the former sequence.

4.12.2 Optional Display of the Worksheet with the Wires of the Project

In the project properties, you can use the **Routing** tab and there the checkbox **Show the Wire Worksheet after the Routing Run** to switch on or off the final display of a worksheet with all wires of a project. The default for the checkbox is "Activated" in order not to automatically change the former sequence. If there are any errors during routing, then independent of the setting of the checkbox a worksheet with warnings and error messages is displayed.

4.12.3 Support of Additional Wiring Directions

For selecting the **Wiring Direction**, pins now offer "East" and "West" in addition to "North" and "South".

4.12.4 Extensions for Dealing with Wiring Directions

For some applications, when selecting the wiring direction the user must for technical reasons deviate from the direction suggested by the position of the pin. For example a pin in the upper area of a device is wired not to "North" but instead to "South". With this change of pin direction only the length of the wire changes, not the position of the pin at the device.

To be able to deal with such cases, the attribute combination **Wiring Direction**, **Reference Point** and **Position X/Y** was introduced into Engineering Base. The first two attributes get their permissible values in the **Modify** dialog for pins using the macro **Select Value**.

1. The **Wiring Direction** ("North", "South", "East" or "West") specifies from which direction the wiring is to occur.
2. The **Reference Point** ("Top", "Left", "Bottom", "Left") determines, in combination with the values of the attributes **Position X (Dimensioning)** and **Position Y (Dimensioning)**, the absolute position of a pin at a device.
3. If no values are specified for **Position X/Y**, then it is assumed that the pins are located at the outer edges that correspond to the wiring directions ("North" = top, "South" = bottom, "West" = left, "East" = right). This then holds independent of the specification of a reference point.



The attribute configurations of existing **Engineering Base** databases are not automatically modified. You must manually adjust the selection values for the attributes **Wiring Direction** and **Reference Point**. For this purpose you must use the following text entries:

Texts for wiring direction	
<10:10433>	"North"
<10:10434>	"South"
<10:10435>	"West"
<10:10436>	"East"
Texts for the reference point	
<10:10503>	"Top/left"
<10:10504>	"Bottom/left"

In newly created databases the attribute configurations are already adapted.

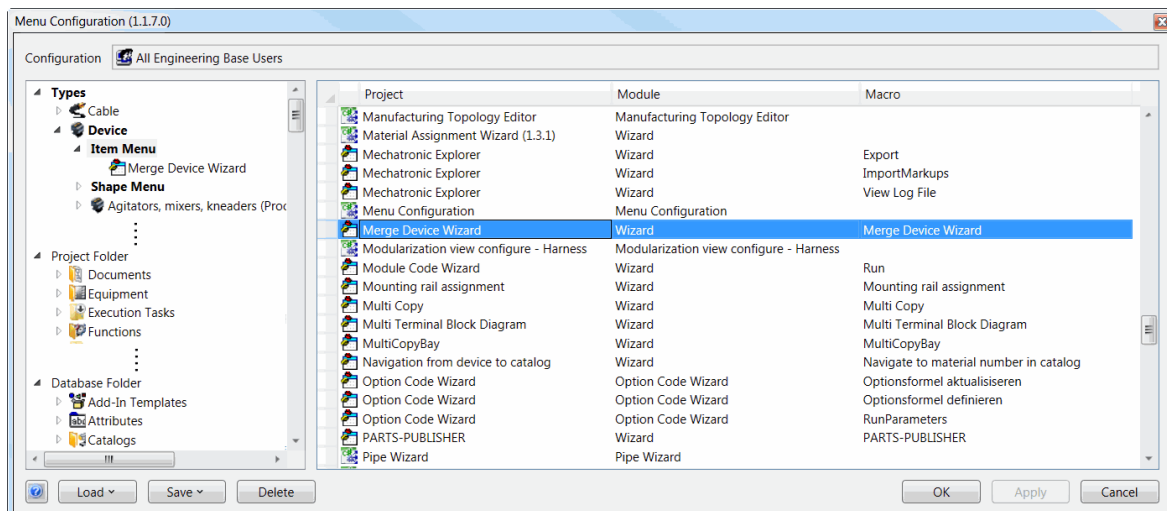
4.13 Menu Configuration (EB 6.6.1)

You need one of the licenses listed below:	No license required
Contained in the following business solutions:	Electrical / Instrumentation Detail Engineering International Standards Instrumentation Basic Engineering System Engineering Harness Design Electrical USA Standards Fluid

Using the macro **Menu Configuration**, you can make the contents of context menus and the display of macros in the tab **Extras** for various objects more flexible; to do this, specify which wizards are to be started for these objects. Thus to start a wizard you do no longer have to call the **Macro Selection** followed by selecting your macro with **Run**.

The configuration of context menus is not user-related but is carried out for "Engineering Base user groups". You can store the configurations in the **Configurations** of the database in the system folder **Templates**. From there you can export them into the file system or load them for configuring context menus of a user group.

The left-hand area of the dialog **Menu Configuration** shows all objects for which a configuration is possible. The right-hand area shows the list of available macros known from the **Macro Selection** that can be dragged onto the desired menu of an object.



4.14 Ex Calculation for Several Measuring Circuits per Tag (EB 6.6.1)

You need one of the licenses listed below:	Ex-i Calculation
Contained in the following business solutions:	Instrumentation Basic Engineering

In the **Engineering Base** projects, the measuring circuits and control loops for the Ex area are covered. Using the **Ex-i Calculation Wizard** you can calculate the intrinsic safety of functions in the Ex area and automatically create the required documents.

The wizard offers the following functionality:

1. The calculation of the intrinsic safety of all functions present in a project is made on the basis of the respective parts master data the project data taking into account up to 5 measuring circuits.
2. For each calculation, a calculation sheet, i.e. a document in the form of a report, is created, where the result of the calculation as well as the original data are shown. To generate the report, you XLS templates and configuration files can be stored in the project, which are available in the start dialog for the calculation.
3. The calculation of the function includes the characteristic values of the active and passive devices as well as those of the cable lengths.
4. For all relevant tag elements of the function, you can see the **EC Type Examination Certificate** in the form of the ATEX certificate number.



The reports thus created have no active association with the objects of the project. If the object data is changed, then recalculations are required, and you must create new reports.

You can start the wizard from a project or the objects it contains. After the start of the calculation, all **Functions** under the starting point are determined for which the Ex-i attribute **Proof of Intrinsic Safety** is set. By means of the alphanumeric wiring, the devices and cables associated underneath are then determined. These can be assigned to a maximum of 5 measuring circuits. A measuring circuit here consists of an active power supply device, any number of passive power-consuming devices and any number of cables. The active devices are identified via a positive value to the Ex-i attribute **Maximum Output Power Po**. The association of objects with a measuring circuit is specified via the content of the Ex-i attribute **Measuring Circuit**.

After determination of all objects of a measuring circuit, the existence and consistency of the associated data is checked. The calculation is carried out only if all object data relevant for the calculation is present and the reports are also generated only then. The Ex-i data thus created is stored at the functions.

4.15 PTD Cable List with Extended FROM/TO Destination Information (EB 6.6.1)

You need one of the licenses listed below:	No license required
Contained in the following business solutions:	

Since a cable with its cores can be split between several terminal blocks, the **Cable List** lists the terminal blocks as "FROM" and "TO" destinations. For this purpose circuit diagrams and cable overviews are evaluated.

The **Cable Overview Diagram** contains information about superordinate from/to destinations e.g. for units or cabinets. This information must be adopted for the cable objects. The **Cable List** uses the cores in the circuit diagram to determine the connected terminal blocks and devices. The FROM-TO destination information is then determined via the cables and their destinations according to the **Cable Overview**.

4.16 Extensions of the Module Matrix Wizard (EB 6.6.1)

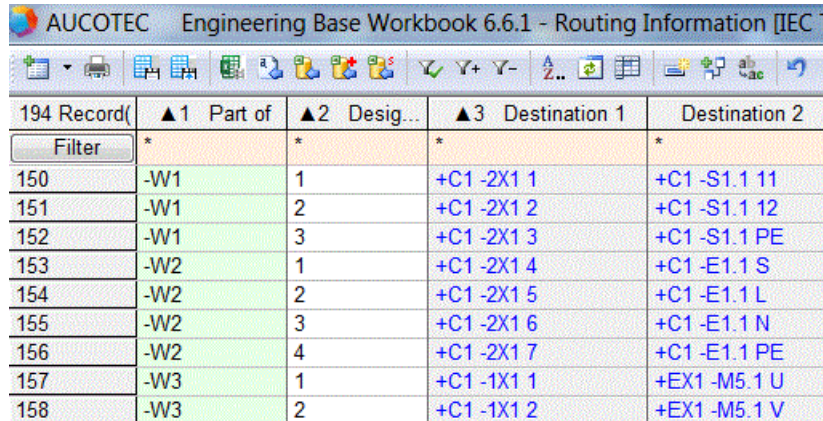
You need one of the licenses listed below:	EB Cable Logic EB Cable Harness Design EB Cable Logic VOBES Cable Manufacturing
Contained in the following business solutions:	Automotive Harness Design

Modules of the same module family were previously considered incompatible by the **Module Matrix Wizard**. Using an option of the wizard, you can switch off this behavior for cases where modules of the same module family do not mutually exclude each other.

5 Extensions for Worksheets

5.1 Macro "Find and Replace" Can Be Started via the Toolbar (EB 6.6.1)

All workbooks have in their toolbars a button  for starting the macro **Find and Replace**.



194 Record(▲1 Part of	▲2 Desig...	▲3 Destination 1	Destination 2
Filter	*	*	*	*
150	-W1	1	+C1 -2X1 1	+C1 -S1.1 11
151	-W1	2	+C1 -2X1 2	+C1 -S1.1 12
152	-W1	3	+C1 -2X1 3	+C1 -S1.1 PE
153	-W2	1	+C1 -2X1 4	+C1 -E1.1 S
154	-W2	2	+C1 -2X1 5	+C1 -E1.1 L
155	-W2	3	+C1 -2X1 6	+C1 -E1.1 N
156	-W2	4	+C1 -2X1 7	+C1 -E1.1 PE
157	-W3	1	+C1 -1X1 1	+EX1 -M5.1 U
158	-W3	2	+C1 -1X1 2	+EX1 -M5.1 V



The button for starting the macro is disabled if the summation (**Count**) function is activated for the column of a worksheet.

5.2 Filter with Selection Lists (EB 6.6.1)

When entering filtering terms for column contents, you can select the desired term from a list showing the entries in the column. For dictionary texts, the list does not show the text reference but the text for the currently specified language. If the dictionary contains a comment for the respective dictionary text, then this is shown in the selection list as tool tip. When storing the filters, dictionary references are taken into account so that upon re-opening the worksheet the filter contains the correct contents even if the language settings have meanwhile been changed.

If the filtering is to be applied to several column contents, then you can as before add more filter rows and assign the desired terms to them.

5.3 Configurable Column Display for Summation (EB 6.6.1)

To be able to display parts lists in a more compact form, the entries in device worksheets with summation are combined on the basis of their material numbers. With this summation, up to now the other columns were reduced to the entry of the first object.

Now you can activate an extended display in the **Properties** of each column of a worksheet. In particular the columns may contain the following entries:

- For the summary, all elements are listed separated by ", " ("100, 101, 102, 103, K1, K2, K3, k4")
- Consecutive values in the list may be shortened ("100...103, K1...3, K4")
- Instead of a one-line list separated by ", " you can also activate a multi-line list by selecting a line break.



When using formula attributes "[Associated Function][Associated Location][Complete Path]", the column contents for more complex or complete object designations ("=F1 +L1 -K1...4") are also displayed accordingly.

6 Extension of the Revision Functionality

6.1 Revision Management with Multiple Selection in the List of Changed Sheets (EB 6.6.1)

In the worksheet **Revision for Documents**, following multiple selection of cells in a worksheet column you can change the cell contents of all selected cells with a text entry. Following multiple selection, you can likewise jointly activate or deactivate the checkboxes for all selected cells of a column.

7 Releases

7.1 Release for Windows 10 (EB 6.6.1)

From the Engineering Base Version 6.6.1 on, Windows 10 is supported.

7.2 Release for Visio 2013 (EB 6.6.1)

From the Engineering Base Version 6.6.1 on, Visio 2013 is supported.

Important note: When using Visio 2010, comments can be placed at any position on the sheet with the menu item "Review" and the command "New Comment". In contrast, when using Visio 2013, comments are always assigned to the selected shapes. All comments placed in Visio 2010 are therefore shifted to the upper left corner automatically when opening existing drawings with comments in Visio 2013.

8 Miscellaneous

8.1 Device Wiring Diagram (EB 6.6.0)

The **Device Wiring Diagram** is used to create a report in which all connectors are evaluated for each device in the item tree. Terminals/terminal blocks and cables are considered only as destinations here.

For the use of this functionality, the license **Engineering Base Power Add-On** (1046) is required.

The report may be started on the equipment folder, a unit, a folder, or on a device.

The following information is shown for each pin of a device, if available:

- Pin designation
- Complete Destination designation incl. pin (here the same shortening rules as in the circuit diagram apply). If the destination of the device is a terminal, it is noted at the pin, if the connection is entered on the internal or external side of the terminal diagram.
- Wiring material (material, wire size, and color)
- Core (cable designation and core number)
- Potential
- Back reference to the representation in the diagram.

The template of the device wiring diagram is included in the EB Power Content. The configuration may be edited using the macro **Device Wiring Diagram**.

1	2	3	4	5	6	7	8			
Device	Pin	Destination designation	Pin	Mat.	Ø (mm²)	Color	Cable	Wire	Potential	Destination reference
-F1.1	1									
	2	-K1	1							
	3									
	4	-K1	3							
	5									
	6	-K1	5							
-F1.2	1									
	2	-K2	1							
	3									
	4	-K2	3							
	5									
	6	-K2	5							
-K1	13									
	14									
	A1									
	A2									
	1	-F1.1	2						Pot1	1.2C
	2	-X1	1a3							1.2C
-K2	1									
	2	-F1.1	4						Pot1	1.2C
	3	-X1	2a3							1.2C
	4	-F1.1	8						Pot2	1.2C
	5	-X1	3a3							1.2C
	6	-X1							Pot3	1.2C
-M1.1	A1									
	A2									
	1	-F1.2	2							1.4C
	2	-X2	1							1.4C
	3	-F1.2	4							1.4C
	4	-X2	2							1.4C
-M1.2	1									
	2	-F1.2	6							1.4C
	3	-X2	3							1.4C
	PE									
	U	-X1	1c3	MAT1	1.5 mm	BK	-F1	1	Pot1	1.2E
	V	-X1	2c3				-F1	2	Pot2	1.2E
-X0	1									
	2									
	3									
	4									
	PE									
	U	-X2	1				-F2	1	Pot1	1.4E
-W	1									
	2									
	3									
	4									
	PE									
	U	-X2	2				-F2	2	Pot2	1.4E
-X0	1									
	2									
	3									
	4									
	PE									
	U	-X2	3				-F2	3	Pot3	1.4E

8.2 Extensions for Attributes with Units (EB 6.6.1)

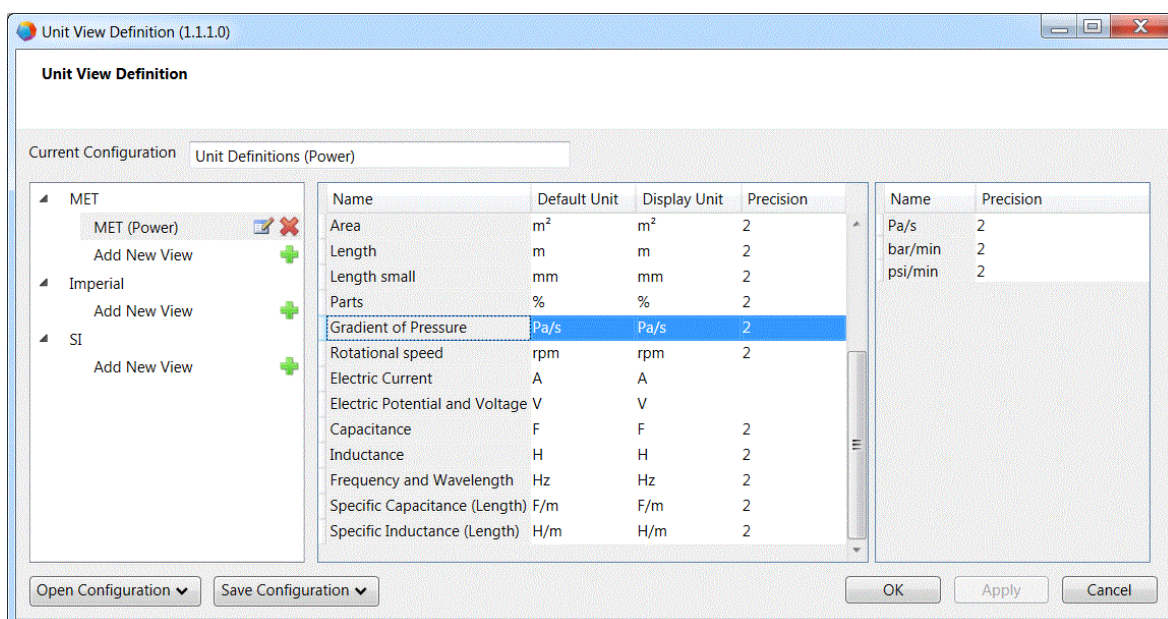
8.2.1 Setting the Accuracy on the Database Level

You can specify the decimal places and thus the accuracy of the units on the database level using the macro the **Unit View Definition**. You can use the macro explicitly via the macro selection or implicitly via the tab **Unit View Configuration** in the properties of the database.



The decimal places can only be edited for systems of units created by the customer, the systems predefined in **Engineering Base** are not editable.

By editing the respective **Decimal Places** cell, you can set the decimal places both for a group of units and for individual units.



When you select a group of units, a list of the respective units with the decimal places is shown. The entry of the decimal places for a group of units is automatically transferred to all units of the group.

If units of a group have individual values for the decimal places, then no value is shown for the group of units.

8.2.2 "Modify" Dialog with Pre-Allocation of the Default Units

In the **Modify** dialog, empty input cells for **Attributes with Units** are initialized with their respective predefined unit. This predefined unit is shown in a gray text. As soon as these cells are edited, the contents is shown in a black text. If upon exiting a cell contains a correct value and unit input, the text remains black.

Attribute	Value
Output Power	
Voltage	
Current	
Frequency	
RPM	
Rated Torque	
Protection Classification (IP)	
Mounting Form	
Weight	
Width	200,00 mm
Height	... in
Depth	... in
Length	... ft
Milling Start X	... in
Belt -Ultimate tensile force [kN]	
Remarks	
Occupied mounting positions	
Accessory available	<input type="checkbox"/>

For worksheets, reports and **Visio** list panes this function is not available.

8.3 .Net Version of the Database Manager (EB 6.6.1)

With the Engineering Base version 6.6.1, a .NET version of the database manager based on "SQL Server Management Objects" is available. This version offers you the already available functionality in an updated user interface. It also has an additional function for matching user and AUCOTEC attributes.

8.3.1 Matching User and AUCOTEC Attributes Using Mapping Tables

With the function **Attribute Mapping**, the database manager offers the possibility to replace user attributes in a database with the AUCOTEC attributes (AID in the 10000 – 99999 range) of this database. With the mapping you can ensure that databases use AUCOTEC attributes instead of local user attributes; AUCOTEC attributes are also available in other databases and especially in centrally maintained ones.

The user attributes are replaced in all dialogs, type definitions, formula attributes, worksheets and reports, and their contents are adopted into the target attributes. This also holds for attributes in text blocks of shapes and master shapes. Finally the replaced user attributes are removed from the database.



All objects are also correspondingly updated in the recycle bins. By contrast the user attributes are not exchanged in existing revisions or worksheets of the **Extended Data Tracking** to avoid that a "Change Management" erroneously assumes a changed data stock.

The user attributes to be replaced by which AUCOTEC attributes are passed to the **Attribute Mapping** in the form of XML configuration files that contain pairs of user attributes and the intended AUCOTEC target attributes. Here the following conditions must be met:

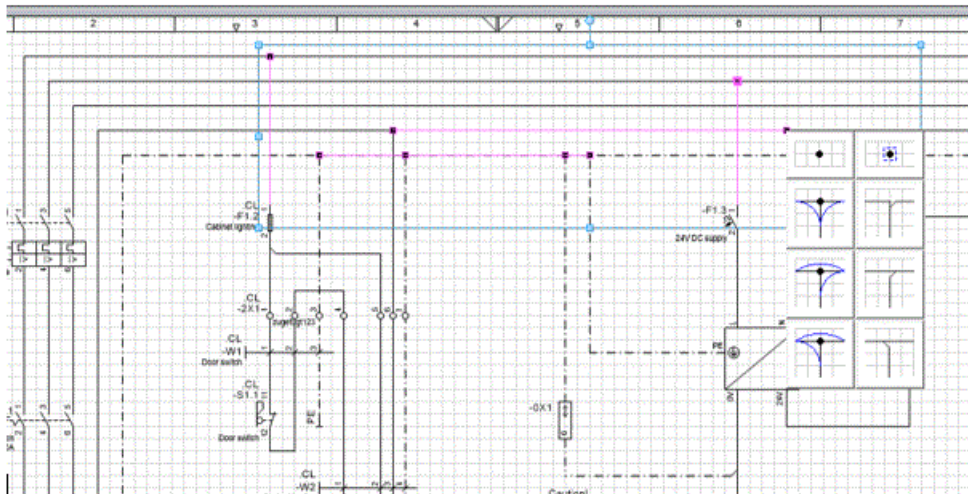
1. Both the user and the AUCOTEC attribute must be of the same type.
2. The attribute ID of the user attribute must be ≥ 100000 .
3. The attribute ID of the AUCOTEC attribute must lie in the range [10000,99999].

8.4 "User List" in the Context Menu of Sheets (EB 6.6.1)

The context menu for sheets now also contains the function **List Users** already previously available under **Extras**.

8.5 Forced Wiring for Multiple Selection (EB 6.6.1)

You can now specify the wiring for a multiple selection of connection nodes in a single step; to do this, open the context menu and then click on a connection node type.



8.6 Attribute "Protected" for Message Objects Supplemented (EB 6.6.1)

For all objects in the system folder **Messages**, folders and message objects, you can now use the attribute **Protected** to individually specify whether or not they may be deleted.

8.7 Cable List: Cables with Several Destinations may be Written One below the Other (EB 6.6.1)

As an alternative to representing the cable destinations side by side, the cable destinations in cable lists can be written one below the other. For this purpose activate the **Wrap Text** for the **Text Control** in the column Cable Destinations via the property **Worksheet Configuration** under **Column Settings - Format**.

This functionality is available only in worksheets and reports. In particular it is not available in **Modify** dialogs and **Visio** list panes. Moreover in worksheets for revisions and the **Advanced Data Tracking**, data for multi-target destinations are not wrapped independent of the **Wrap Text** settings to keep their change status unchanged. The wrap text setting of the columns remains unchanged, however.

8.8 Pins with Consideration of Device Structures (EB 6.6.1)

Complex devices such as power circuit breakers or protection devices are designed with a hierarchy of subdevices. A connector aggregated under a complex device then has its individual pins with pin designations. A complex device may have several connectors. The pin designations at the individual connectors may be identical.

For an overall display of the inner circuits of a complex device including connectors (e.g. in the equipment diagram), it is not possible to determine the peer references via the pin designations alone. In order to get unambiguous results, you can set the new attribute **Substructure Identifier**.

In particular the following extensions for "non-electrical", i.e. Layout, Single Line and Equipment shapes have been introduced:

- For the symbol design of non-electrical master shapes, the stencil **Passive Pins** offers the masters "P_005" and "P_012" with the attributes **Pin Designation** and **Substructure Identifier**.
 - P_005: Pin with text blocks for designators, wiring destinations and potential/substance designations
 - P_012: Pin with text blocks and reference to identical ones
- The two attributes are assigned at the placed pin master shapes, and in this manner the starting point for the peer determination in the device structure is specified.
 - The pin to be used is determined via the **Pin Designation**.
 - The levels from the subdevice to the main device are listed in the attribute **Substructure Identifier**, separated by "|". (e.g. "-B1|-K11|-M2")
- For unassociated shapes, you can activate the **Assignment of Passive Pins** in the Properties dialog. When this property is activated, then the contents of the **Substructure Identifier** attributes are used to determine the peer references for all passive pins. To change the property at an associated shape, you must first remove the association.

Changes become visible in the graphic upon closing and reopening the respective sheet or by carrying out updating actions such as **Calculate Automatic Wires**.

8.9 Line Breaks in Cross-References (EB 6.6.1)

In the Project Properties, tab **View – Cross-References**, you can define cross-reference and cutting rules. You can here specify the setup of cross-references with attributes and arbitrary separators, among other things line breaks, for the complete project.

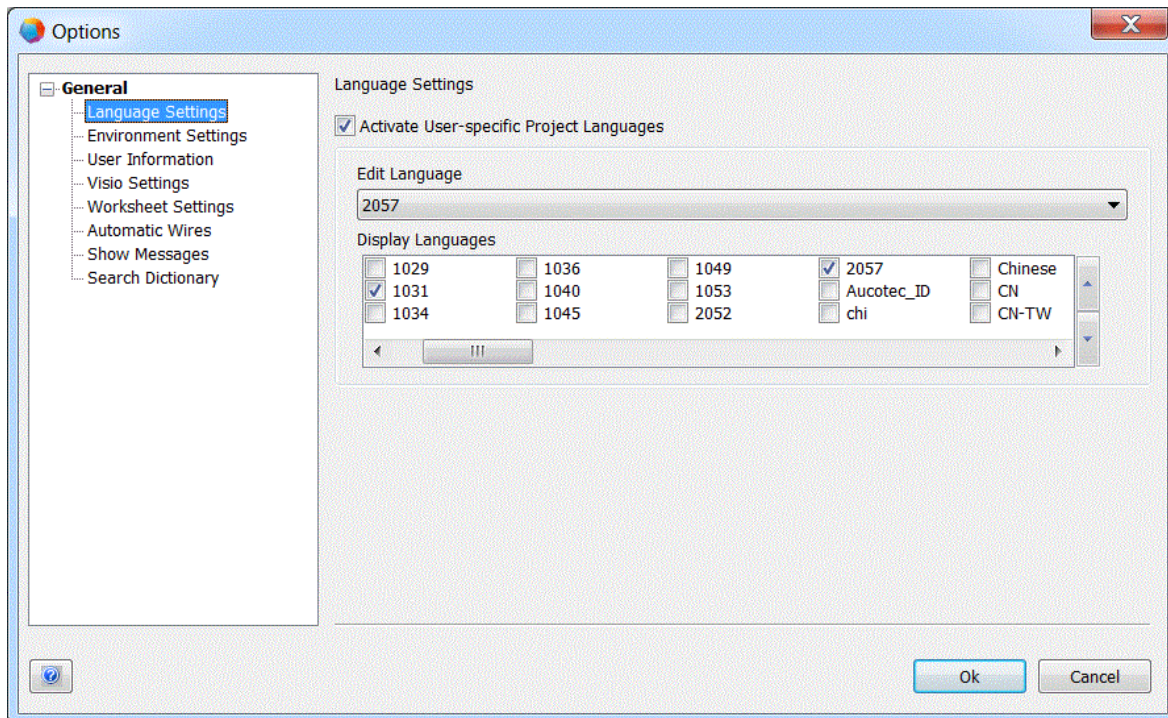
In the graphic editing of a sheet, using the **Properties** of the shape you can for each shape activate or deactivate the checkbox **No Line Break in Cross-References**. Thus you can control the display of line breaks in cross-references individually at the shapes. This setting also influences cross-references shown at frames or in the display of structured devices. To make changes in the graphic visible, you can update the display of the cross-references with **F5**.



You can activate or deactivate the checkbox **No Line Break in Cross-References** also in the graphic editing of master shapes. After placing the master shapes, the shapes in the sheets then have the control settings of the master shape.

8.10 User-Specific Project Languages (EB 6.6.1)

As presently in the project settings, each user can select an editing language and several display languages on the database level (in the **Options** under **Language Settings**). These settings are valid individually for a user and can be switched on or off via the checkbox **Activate User-Specific Project Languages**. After confirmation of the dialog they are immediately visible in the project data, especially in the documents, and are again active after an **Engineering Base** restart.



If you activate user-specific project languages, then the language settings made in the projects are ignored, and the project data is shown with these user-specific settings. If a user wants to output the documentation in a special language, he must only change his own display language. The project language settings remain unchanged, especially for other users.



If a dictionary specified in a database or a project does not contain the selected language, then the text reference "#Reference[...]" is shown instead of the text.

8.11 Use of Connectors with Slots (EB 6.6.1)

Connectors with slots can now be managed in the catalog. When using these connectors in the project as inline connection point connectors, then you can select the slots according to the definitions in the catalog. Moreover a number of wizards were extended to include the use of connectors with slots.

For this purpose the catalogs contain the following data:

1. Module Connector Assembly

In the catalog, a housing connector with the following additional attributes is created:

- **Slot Type** – Describes the slot connector assembly families.
- **Number of Slots**
- **Mating Connector**
- **Module Connector Assembly** – This Boolean attribute is used to identify module connector assemblies.

2. Slot Connector Assembly

The slots in the catalog are defined like normal connectors with cavities and contain the following additional information:

- **Slot Type** – Describes the slot connector assembly families.
- **Mating Connector** – Specification of the mating connector is mandatory.

Connectors with slots are taken into account by the following wizards:

Wizard	Extension/Functionality
Device manager	For module connector assemblies (type connector) you can define the number of slots (type slot).
Inline connection point manager	With the choice of the slot connector assemblies after selecting module connector assemblies.
Potential wiring manager	In the case of module connector assemblies, you can edit several connector/mating connector pairs under an inline connection point.

8.12 User Interface with New View "Associated Documents" (EB 6.6.1)

In addition to the two views **List Pane** and **Associated Equipment** (formerly **Associated Objects**), with the view **Associated Documents** Engineering Base offers the option to show all documents associated with a start object. This enables a quick and efficient search for documents.

Functions of the tree "Associated Documents":

- Display of all documents associated with the start object.
- Display of the associated documents in the hierarchic structure of the document folder. Higher-order and sibling objects are shown in gray.
- Possible start objects are the **Equipment, Function, Location** and **Document** folders and objects in these folders.

8.13 Extensions in the Stencils (EB 6.6.1)

8.13.1 Individual Assignment of Access Rights for Individual Stencils

The access rights for "Change" and "User Management" can be given individually at the respective stencil. This is not possible for stencils in symbol design, however.

The access rights specified for the folder **Stencils** are passed on to all stencils. Newly created stencils adopt these rights, and changes in the folder **Stencils** are adopted by all stencils for which no individual access rights have been assigned. Moreover individually assigned access rights can only be modified at the stencils.



Read access to a stencil may not be denied to any user.

8.13.2 More Detailed Preview of Master Shapes

When editing master shapes, you can activate or deactivate the option **Show in Preview** in the properties of the placed text shapes. You can also set the option for text shapes used in symbol design for dynamic areas.

Upon storing the master shapes, the master preview then shows the texts activated for the preview.



The option is available for text shapes for displaying designators, technical data and cross-references but not for pin texts.

8.14 Alignment of AutoSegmentTags Parallel to Connections and Segments (EB 6.6.1)

AutoSegmentTags, i.e. segment designations, can be placed automatically while drawing or changing connections in topology networks. You can activate this functionality in the project properties and specify different SegmentTag master shapes for labeling horizontal and vertical connections. After selecting **Align Tag Parallel to Connection**, only the master for labeling horizontal connections is placed and aligned parallel to connections and segments.

8.15 Uniform Behavior of all Frame Types (EB 6.6.1)

The relevant aspects of a plant are also mirrored in the existing frame objects. For the product view there are equipment frames. These may be unit, device or cable frames where newly created objects are aggregated. On the other hand there are function and location frames where newly created objects are associated.

The standardization was made in view of the following functionality:

- The frame and if applicable also the form deliver the default for **Part of** or **Associated Function / Associated Location** when creating a new element whose shape was placed within the frame or in the sheet.
- The creation can also be effected by copying. An automatic aggregation or association is then made during copying.
- Frames may be graphically nested. If equipment (unit, device, cable) frames and function or location frames are nested, then both pieces of information are used as default values for the creation. If several equipment frames are nested, then the first frame as viewed from the shape specifies the default equipment. The function and location frames behave identically.
- Graphic movement of shapes into or out of any frame does not influence the aggregation or association of the displayed element. Only the designation is shortened according to the project settings. By contrast elements under the target frame are aggregated and associated with functions and locations if the movement was made with the M key pressed simultaneously.
- Likewise associating or dissociating frames does not change association or aggregation of the elements in the frame.