



# Performance Description

Contents: EPLAN Engineering Configuration 2022  
Status: 01/2022



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# Introduction

EPLAN offers Engineering software and service in the fields of electrical engineering, automation and mechatronics. The company develops one of the world's leading software solutions for engineering, plant engineering and enclosure design. EPLAN is also the ideal partner for simplifying challenging engineering processes.

Standardized and individual ERP and PLM/PDM interfaces ensure consistent data along the entire value chain. Working with EPLAN means unrestricted communication across all engineering disciplines. Whether small or large companies: Customers can use their expertise more efficiently. EPLAN aims to keep growing with its customers and partners and furthers integration and automation in engineering. "Efficient Engineering" is our motto.

EPLAN was founded in 1984 and is part of the Friedhelm Loh Group.

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## All from one provider: EPLAN Solutions



EPLAN supports you with establishing your engineering across multiple disciplines. The basis is formed by the EPLAN platform that interconnects our software solutions. For you this means a clear increase in efficiency when it comes to working on your EPLAN project. Since your digital data flow seamlessly from solution to solution and are enriched further in every process step. The Cloud products of EPLAN offer added values for collaboration in teams - in particular for tasks across all your locations.

Together the EPLAN Platform and the supplementary Cloud applications form EPLAN Solutions - or, in other words: the key for your future-oriented engineering.

EPLAN offers a comprehensive framework for your daily work. This way interfaces allow the bidirectional exchange with ERP and PDM systems. With the connection to mechatronic processes you expand your view to a mechatronic engineering perspective. With neutral interfaces you can transfer the EPLAN project data into other software environments and continue working on them.

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## **Extensions and modules for all cases**

No matter to what extent you are already working with EPLAN solutions in your company and which requirements have to be fulfilled in the future: Extensions in all directions can be implemented easily thanks to the add-on concept of EPLAN - flexibly and individually for your tasks.

To this purpose EPLAN offers comprehensive extension options through extension modules and in the form of service packages - the "Elements".

You can find a comprehensive overview of the current extension modules in the licensing overview. Should you have any further questions on this topic, please do not hesitate to ask your EPLAN contact person.

## **EPLAN Electric P8**

With EPLAN Electric P8 you configure your electrical design for machines and plants in an engineering system consistently, coherently and quickly. The software supports diverse engineering methods: from manual creation to standardized and template-based work. EPLAN Electric P8 automatically creates detailed reports for you as an integral part of the project documentation - if desired continuously or bundled after project completion. This way you supply the downstream process steps with all required information from the engineering process.

## **EPLAN Fluid**

EPLAN Fluid is your engineering tool, especially for the configuration and automated documentation of circuits of fluid-power plants in the fields of hydraulics, pneumatics, cooling and lubrication.



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### **EPLAN Preplanning**

EPLAN Preplanning allows you to already acquire engineering data in the pre-planning phase. This, for example, includes the actuators and sensors of a plant, machine or a building. You can import data both from external tabular sources as well as plant and machine overviews and furthermore graphically acquire process and instrumentation diagrams. You can also access data that have been collected and enriched in EPLAN Preplanning for downstream planning phases in the engineering.

### **EPLAN Pro Panel**

With EPLAN Pro Panel Professional you conceive and design control system enclosures, switchgear and power distribution systems for the energy supply in 3D. This way you can solve diverse engineering tasks in one software: from the electrical schematic creation through the planning of the mounting layout in 3D to the virtual routing of connections. A variety of data and information for the manufacturing are provided in an automated way - from the component labeling to the support of manual wiring processes.

### **EPLAN Smart Wiring**

EPLAN Smart Wiring is your virtual assistant for manual wiring in the enclosure production. From the connecting point to the exact routing track, the software provides you - as the wirer - with all the required information in digital form - if necessary, also in 3D. You can note the status of the wiring with the traffic light principle. If you need to reassure yourself, you can call up the electrical schematic and counter-check it - on the basis of each individual connection. The provision of the project data on a central server makes it possible to manufacture many identical enclosures in parallel or work together with several wirers.

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### **EPLAN Harness proD**

Use EPLAN Harness proD for the efficient design and documentation of cables and wire harnesses. With the software you digitize the typical work processes in cable and wire harness design: From the importing of the connection information as well as the 3D panel layout from the EPLAN Platform through the intuitive routing up to the creation of manufacturing documentation. The software is open for MCAD systems and can in this way be seamlessly integrated into existing system landscapes.

### **EPLAN Cogineer**

With EPLAN Cogineer you gain the full potential from your engineering in a short time as well as increase the quality of your electrical and fluid-power documentation. You use the switching templates you have already created to structure a macro library and with EPLAN Cogineer realize the automatic schematic creation at the push of a button. Profit from the innovative methods with added value in engineering without long implementation - in all industries and in companies of all sizes.

### **EPLAN Engineering Configuration (EEC)**

With EPLAN Engineering Configuration (EEC) you illustrate your product portfolio in a modular system with interdisciplinary function units. On this stable basis, EEC becomes your tool for the design and application of configuration user interfaces as well as the automated creation of documentations. The interdisciplinary working method integrates sales, order processing, mechanical engineering, electrical engineering and control technology as well as production and documentation.

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### **EPLAN ERP/PDM Integration Suite**

Continuous data flows ensure transparency in the product development process. Through the EPLAN Integration Suite, EPLAN manages the integration into existing ERP, PDM and PLM system landscapes. You can optimize your work processes from the schematic through to the master data. The quick and individual provision of the data takes place in bidirectional exchange with the systems, without you having to leave the work environment within the EPLAN platform.

### **EPLAN eVIEW Free**

EPLAN eVIEW Free lets you implement engineering review processes digitally. This free software allows structured collaboration with co-workers, customers and service providers. It enables you to view and comment on changes to a project through redlining workflows by using a browser and irrespective of your location.

### **EPLAN eBUILD Free**

New methodology for your engineering process: With EPLAN eBUILD Free you have the possibility to compile schematics from template libraries with a few clicks. Registered users have this application automatically available as a free service. eBUILD Free offers you predefined libraries and a configurator that allows you to create parts of schematic projects in EPLAN practically at the click of a button.

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### **EPLAN eBUILD**

With EPLAN eBUILD you create your own template libraries which can be re-used by employees and colleagues within the EPLAN Cloud environment. This way you can automatically create schematics in EPLAN across the company. eBUILD is composed of two functional areas which are available to you completely in the full version: In Designer experienced users create their own template libraries on the basis of the EPLAN macro technology. In Project Builder they can then be used repeatedly at any time to compile elements of schematics which are frequently used in day-to-day work with a few clicks.

### **EPLAN Data Portal**

With the EPLAN Data Portal you have direct online access to high-quality product catalogs from a continuously growing pool of notable component manufacturers. All the solutions anchored in the EPLAN platform access this Web service equally. Simple transfer of the offered components into the EPLAN documentation reduces the required configuration work and increases the quality of the machine and plant documentation. With its Data Standard based on ECLASS Advanced, EPLAN Data Portal provides a systematic framework for device attributes.

### **EPLAN eMANAGE Free**

EPLAN eMANAGE Free is your Cloud application for collaborations across all your projects and locations with colleagues, partners, suppliers and clients. eMANAGE enables you to share EPLAN projects with selected project partners across all teams and across the company in a protected Cloud environment. The solution enables simple uploading of projects from the EPLAN Platform or via web browser.

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## EPLAN eMANAGE

Beyond the functions of the free version, the full version of EPLAN eMANAGE offers you practical, functional extensions as well as additional storage for your data. Share project data via eMANAGE at an extended scope - with familiar access control and the same ease of use. Make your master data available with eMANAGE from the EPLAN Platform 2022 and thus make their usage easier for other users. With a click you make current EPLAN projects available in earlier Platform versions as well. This way you allow project partners who do not yet use the current EPLAN version access to the project data you provided in the Cloud.



### **Note:**

The properties and functionalities specified in this performance description are based on the maximum scope of performance of the product including all extension modules, Elements and add-ons. Extension modules, Elements and add-ons are available optionally and separately and as a rule cost an additional fee. For further details of the available product variants please refer to the "Licensing Overview" chapter.



## **EPLAN Electric P8 - Innovative and Flexible**

EPLAN Electric P8 offers innovative possibilities for designing, documenting and managing electrical-engineering automation projects. With optionally graphical- or device-oriented editing and a consistent platform technology, the high-end system sets standards in the future of electrical engineering. Interdisciplinary working becomes reality thanks to its scope of functionalities and the direct interlinking of all trades.

The working methods in electrical design are as manifold as the tasks at hand. Each procedure in the planning process has its advantages in specific project phases – whether while generating first graphical machine / plant overviews, creating schematics or including project information in the database, independently of the graphics. Ideal if an engineering system supports these different planning approaches on a par and parallel. You decide which working method is the most efficient for you, and EPLAN ensures complete consistency in project data irrespective of your approach.

Once recorded in the schematic, the project data form the basis for almost automatic completion of the machine and plant documentation. Through extensive and individually configurable check runs you check the documentation against quality requirements defined by you at the click of a button. EPLAN supports rapid revision and corrections through central recording of the check results in the message management. EPLAN automatically creates detailed reports as an integral component of the comprehensive documentation during the project course or in concentrated form at the project completion. This way all the required information is supplied from the engineering phase to the downstream process phases – from the consistent product development process through to manufacturing, mounting, commissioning, maintenance and servicing.



# General Information about EPLAN Engineering Configuration

The optimal and consistent application of EPLAN Engineering Configuration (EEC) in the complete product creation process is based in a modular structure of the products or systems that are to be configured through EEC. EEC supports the user in the following process steps:

- Development of a modular system in which the product architecture is mapped in interdisciplinary modules, rule sets and documentation.
- Configuration of products and systems, whereby the documentation for the various phases of an order process (sales, engineering, commissioning, etc.) is generated automatically.

The development of the modular system and the generation of the documentation is realized via software modules that are available to the customer in addition to the basic functionalities of EEC. The extents of the basic functionalities as well as the supplementary modules are described below.

The objective of EEC is the interdisciplinary configuration throughout the entire order process on the basis of a standardized modular system. This makes the repeated use of modules as well as their documentation possible. Through the uniform data basis documents can be generated automatically from the configuration and thus a consistent description of the products in the connected disciplines derived. This documentation can be customized to the order-specific requirements with the corresponding (engineering) tools.

A wide variety of different products and systems can be configured with EEC. The spectrum of the products or systems to be configured can range from a serial product with many variations through to complex production systems plants or special machines.

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# Used third-party software

EPLAN Engineering Configuration contains components of third-party providers. The complete list of the third-party software used by EPLAN Engineering Configuration can be called up in the following file:

<Installation directory>\license\3rd-party.txt

The use of third-party software is subject to the licenses defined through this. In the following file you can call up the license terms and copyright notices for the third-party software used by EPLAN Engineering Configuration:

<Installation directory>\license\license.txt





# Development of a Modular System with EPLAN Engineering Configuration

The aim of the development of a modular system with EEC is to map a modular product architecture in such a manner that a configuration of the product or system is possible. In the process products are divided into small standardized units (components). These units contain information from one or more disciplines as well as an object dependency for the future structure of the product. During the configuration of a new product or system the units are used again and combined into a job-specific combination on the basis of the object dependency.

During the development of the modular system and also during the configuration described later the user is supported by several software modules that can be licensed individually. The EEC BASIC module is a part of every installation and encompasses the basic functionalities for the development of mechatronic modular systems (modeling of the object dependency through forms, design of the configurations user interface, etc.). It can be extended by the following modules:

- ECAD
- PLC
- Word
- Pro Panel
- Scripting
- SAP
- Job Server

This allows the scope of performance of EEC to be customized to the requirements of the utilizing company, but also for EEC to be introduced step-by-step. In addition the knowledge about the units in the form of data can be stored through modularization in the modular system and be used again after the configuration and automatic generation. The resulting documentation can be customized to the order-specific requirements through (engineering) tools that are used in the product creation process of machine and plant engineering (CAX systems, MS Office products, programming systems, etc.).



## **EPLAN Engineering Configuration BASIC**

The EEC BASIC module provides the basic functionalities for developing a modular system that is described in more detail below.

### **Modular development**

During the development of a modular system the function-oriented and the resource-oriented procedures can be differentiated. These differ as described below in the sequence of the steps to be carried out.

#### **Function-oriented procedure:**

- Division of the products or systems into mechatronic units that fulfill a function, as well as the creation of the required parameters in order to map various variants, etc. of the components (for example a unit fulfills the "Feed" function in a machine tool).
- Preparation and modularization of the required resources based on this functional, interdisciplinary plant model (for example division of the schematic into modules fulfilling functions – i.e. for a feed axis).
- Assignment of the modular resources to the mechatronic units (for example feed axis with interdisciplinary documentation (Word, ECAD, PLC, etc.)).

This procedure is also called "top-down" development of the modular system.

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### Resource-oriented procedure:

- Creating or making available of the resources (for example a schematic for an industrial robot).
- Creating of the discipline-specific units and parameters as well as assigning of resources (for example electrical engineering documentation for an industrial robot).
- Creating of the interdisciplinary units and parameters as well as assigning of discipline-specific resources (for example mechatronic documentation for an industrial robot).

This procedure is also called "bottom-up" development of the modular system.

The modular system development can be tested by means of a mechatronic configuration. To this purpose the individual parameters are specified and a discipline-specific structure is generated. From this the documentation can in turn be generated.

### Formula mechanism and set of rules

A formula language is integrated in EPLAN Engineering Configuration with which it is possible to describe the object dependency between the units through mathematic operations and interactions between individual disciplines. Through this formula language the knowledge is managed centrally in libraries.

The formula editor is used to create the formulas. The formula editor makes a formula wizard and syntax highlighting available for efficient creation of the formulas. Formula results can be checked with the formula inspector.

### Form-UI

With the Form-UI module it is possible to configure customer-specific user interfaces with which the data of the underlying EEC model can be displayed and modified. The user interfaces are described in an XML format. Various control elements used for the display and modification of data, for example labels, text boxes, selection boxes and tables are available for the creation of the user interfaces.

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## Graph2D

With the Graph2D module it is possible to create customer-specific 2D diagrams with which the data of the underlying EEC model can be displayed and modified.

The 2D diagrams are described in an XML format. The XML description of the 2D diagrams can be stored in the form of diagram objects in libraries of the EEC model. The diagram objects can be inserted into libraries or projects.

## User management

Groups as well as individual users can be created through the user management. The rights can be assigned rule-based. Individual processing functions such as "Edit library" can also be specifically blocked. In this way, the system only offers users those actions they need to perform their tasks. The distribution of editing tasks is different in every company and is oriented according to working methods, project and knowledge level of the user. The users receive their rights by belonging to one (or more) group(s). The permitted editing rights can be assigned to the user groups by the administrator. The groups give their assigned rights to all users in the group.

## I/O Generator

EPLAN Engineering Configuration disposes of the functionality of field bus linking. This term is used for the automatic I/O address assignment of the complete plant. Through this all I/Os, also distributed I/Os, have concrete values assigned to them in accordance with the stored rules.



## **Text Module**

The Text module is always part of each Basic EEC license. With this module a structured text can be automatically generated on the basis of text fragments in connection with rules and parameters.

This structured text output can also be compared, for example, to a structured XML output format, whereby the XML format is not mandatory.

Thus this module can be used in manifold ways for the creation of documentations as well as for the output of logical information for further processing in other author, product management, automation and manufacturing systems.

## **ECAD Module**

The ECAD module allows the mapping of modularized electrical engineering and fluid power schematics in a modular system. The module supports the systems EPLAN Electric P8 and EPLAN Fluid.

Basis for the modularization of schematics is the macro technique that are implemented in the ECAD systems. In the ECAD system schematics are structured in page macros and window macros. In EEC window macros are processed as created as a page or fragment in the modular system. This makes it possible to adapt a schematic page with fixed graphic that was created as a page in EEC by means of parameters. Alternatively a schematic page can, however, contain the fundamental graphic and be completed by inserting fragments. Parameterizing of the schematic page is also possible here. Typical parameters are, for example, the device tags (DT), parts data, technical data, page number and page description).



## **PLC Module**

The PLC module allows product-specific PLC software codes to be mapped in modularized form in EPLAN Engineering Configuration. The PLC module covers the following languages:

- Step7
- CoDeSys
- AutomationWorX

The method of functioning of the modularization of the data is basically similar to that of the text discipline. Differences result from the specific characteristics of the documents used (hardware configuration, symbol lists and program code). The modules support the discipline-specific structures of the listed languages. Enriching the individual PLC software code fragments with parameters as well as constructs for conditions, loops and evaluations of formulas are also supported.

## **Office Word module**

The Office module supports the mapping of modularized Microsoft Office documents in the modular system and exclusively supports the file format of Microsoft Word. To this purpose an existing Word document is modularized into a main document and fragments. A main document serves as the basis for the desired target document. It defines the fundamental structure and contains the basic part of the target document. Fragments, on the other hand, contain individual sentences, paragraphs, table rows or chapters.

## **Pro Panel Module**

The Pro Panel module allows the user to create enclosures or parts of them, equipped with devices and components – for example from EPLAN Data Portal – that underlie the functional structure of the EEC model.



## **Scripting Module**

The functionality of EEC can be extended through scripts. Scripts can be created in the languages Java and BeanShell Java. Scripts are stored in the methods of the library objects. Examples for the use of scripts are the importing of customer-specific data and extension of the formula mechanism by customer-specific methods.

## **SAP Module**

The SAP module provides a generic SAP interface through which data can be transferred bidirectionally between SAP and EEC. The generic interface allows accessing of the processes and data in a SAP system via the well-defined interface, the Business Application Programming Interface (BAPI). The Business APIs contained in the SAP standard or specifically programmed can be addressed and used.

## **Module Job Server / Job Server Worker**

The Job Server add-on generates new projects on the basis of a modular system. The tasks to be automated, in the form of EEC actions to be performed, are recorded in job definitions. Working through the actions recorded in a job definition always takes place on at least one Job Server Worker signed in to the Job Server. Starting of the automation processes can be triggered from an existing system by generating a file or via a web callup.

The goal is to automatically generate the target data with existing data from existing systems, for example EPLAN Electric P8 schematics.

Important licensing note:

Parallel operation of EEC configuration instances, meaning as a Job Server Worker or at an EEC instance signed into a Job Server on a PC system or a virtual machine requires a separate ECC configuration license respectively! Any other usage legally contradicts the licensing model!



# Configuration with EPLAN Engineering Configuration

The configuration is available to the users on the basis of the generated modular system through defined input masks. A difference is made whether the configuration is carried out using third-party systems or own user interfaces.

The aim of the configuration is to obtain a complete description of the products with functional mechatronic or discipline-specific components from the modular system. Throughout the order workflow process individual users in the various phases can carry out partial configurations and generate the respective documents automatically.

During the configuration the components of the modular system have references to the different discipline objects. The respective structures of the project documents are built up from the mechatronic configuration.

Through the so-called plug-socket concept it is possible to structure the discipline structures in accordance with criteria deviating from the mechatronic structure. For example, the mechatronic structure is usually structured from a functional point of view, whereas the bill of materials structure of the mechanics is often structured from a mounting-oriented point of view.

To create a project the user initially selects mechatronic components of the modular system that are to be used in the project (configuration). Subsequently the mechatronic components are parameterized. Through the parameterization the concrete variant used of the component is defined, this means that the mechatronic and discipline-specific components can be disabled depending on the parameterization or extended through newly added components. Components installed in mechatronic components have a disabler for disabling - and an extension point formula for the extension.



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When using the disabler, the maximum version of a component is specified first. The underlying concept is called the maximum concept. Through the maximum concept the number of variants of a mechatronic component to be managed in the libraries can be reduced.

The user is supported in the process by several software module that can be licensed individually.

## Basic Module

With the Basic module the objects from the modular system can be combined into a project. A project can be set up by direct usage of the components from the libraries as well as the created classic (Form-UI) or graphical (Graph2D) configuration user interfaces. The generated configuration user interfaces allow the representation of a user-controlled configuration for the respective application. The configuration is supported through the stored set of rules.

Any extensions via scripts can be executed during the configuration either automatically or at a defined action.

The module text contained in the module basis allows the combining and thus automatic generation of the text documents on the basis of the evaluation of the templates and their constructs. The document structure is created in the first step. In a second step the document is generated depending on the respective standard program stored in Windows.

The SAP Module allows the data exchange to a SAP system via the generic SAP Interface during the configuration.

## ECAD Module

Through the ECAD basic module the user is able to automatically generate an electrical engineering or fluid power schematic from the configuration. In the process a discipline-specific structure of the configurations is generated from the functional structure. The graphical representation is effected by means of a system generator in the EPLAN system.



## PLC Module

From the functional mechatronic plant structure the discipline-specific structure is first created during generation, meaning that all the components of the selected PLC discipline are combined in accordance with the rules of the discipline. In a second step the code for the target system is generated from this discipline-specific structure. For example it is possible that the code is imported automatically into the target system SIMATIC Step 7, and if appropriate automatically compiled with the PLC / STEP 7 basic module.

## Word module

The Word module can be used to generate documents in DOCX format from the functional structure of the modular system. By means of the plug-socket concept it is possible to generate free document structures from the discipline elements "main document" and "fragment". The references within the generated Word documents can be updated by means of a command. In addition, the generated Word documents can be converted into the PDF format by means of a command.

## Pro Panel Module

From the functional structure of the modular system a discipline-specific structure is created in the project by using parameterized handles and mounting points as well as the plug-socket concept. The discipline-specific structure consists of 3D graphical macros. The Pro Panel project is generated from the discipline-specific structure by means of a system generator.



# Hardware Requirements

## Workstation

The computer platform is a PC with an Intel Core i5, i7, i9 or compatible processor. Rather select a high-speed computer with less CPU cores than a slower computer with more CPU cores.

## Recommended Workstation Configuration

Processor:	Multicore CPU, not older than three years
RAM:	16 GB
Hard disk:	500 GB
Monitor / graphics resolution:	2-screen solution with a resolution of at least 1280 x 1024 recommended 1920 x 1080
3D display:	Graphics card from ATI or Nvidia with the latest OpenGL driver

## Network

We recommend using a Microsoft Windows network.

Net transfer rate of the server:	1 Gbits/s
Net transfer rate of the client computer:	100 Mbits/s
Recommended latency	< 1 ms

## Multi-user

With regard to minimum requirements for multi-user operation, please contact EPLAN Support. We can advise you specifically according to your individual requirements.



# Software Approvals

In the current Version 2022 the programs of the EPLAN platform are available as a 64-bit version.

## Operating Systems

The EPLAN Platform supports the 64-bit variants of the Microsoft operating systems Windows 10.

The EPLAN user interface language installed must be supported by the operating system.

The Microsoft .NET framework 4.7.2 is required to operate the EPLAN platform.

The program is identified by EPLAN as compatible in accordance with the requirements specified in this performance description on the following operating systems:

### Workstation

- Microsoft Windows 10 (64-bit) Pro, Enterprise  
Version 1809, 1903, 1909, 2004, 20H2

### Server

- Microsoft Windows Server 2012 R2 (64 bit)
- Microsoft Windows Server 2016 (64 bit)
- Microsoft Windows Server 2019 (64 bit)

### Citrix-Server

- Terminal-Server with Citrix XenApp 7.15 and Citrix Desktop 7.15

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## Microsoft Office Products

Prerequisite for the creation of Microsoft Office file formats from EPLAN is that an executable MS Office version that is identified by EPLAN as compatible in accordance with the requirements specified in this performance description is installed on the computer.

- Microsoft Office 2016 (64 bit)\*
- Microsoft Office 2019 (64 bit)\*

\*Please observe the notes in the information portal ([www.eplan.help](http://www.eplan.help)).

## SQL Server (64-bit)

- Microsoft SQL Server 2016
- Microsoft SQL Server 2017
- Microsoft SQL Server 2019

## PDF Redlining

- Adobe Reader Version XI
- Adobe Acrobat Version XI Standard / Pro
- Adobe Reader Version DC
- Adobe Acrobat Version DC Standard / Pro

## PLC Products

The version statuses of the third-party systems are to be inquired in as far as they are not stated.

- SIMATIC Manager
- Codesys

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## Java

Java is required in the following version for the installation variant Web EEC and the SCRIPTING module.

- Java Version 8 (64-bit)  
Usage of the Java runtime environment (JRE) supplied with the EEC is recommended.

## Apache Tomcat Server

The installation of Apache Tomcat Server is required in the following version for the installation variant Web EEC.

- Apache Tomcat 9.0.48

## Data Sources

### Continuous queries via DataSource object

CSV, Microsoft SQL, JDBC-capable data sources (Java 8)

### One-time Imports via Wizard or Commands

Microsoft Excel, CSV, XML (IMX or other formats via XSL transformation in IMX)

(Errors and changes reserved.)