Performance Description

Contents: EPLAN Cogineer 2022
Status: 01/2022

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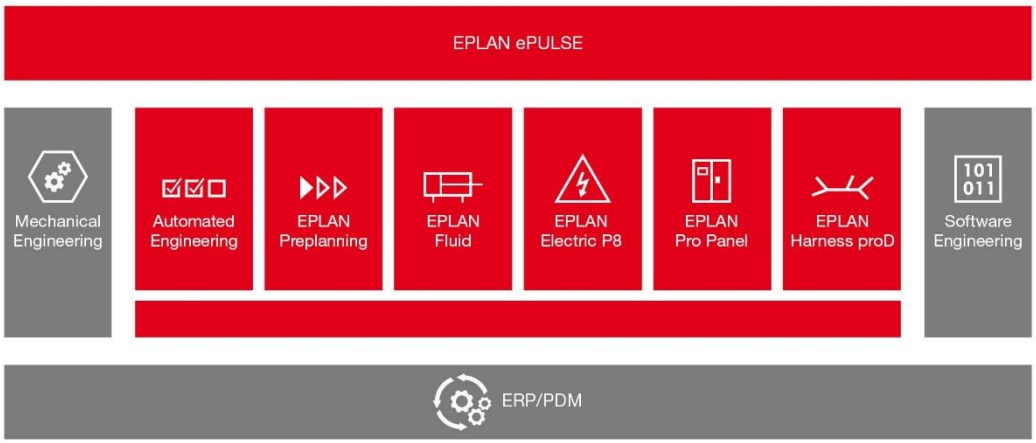
Introduction

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.

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 mechatronical engineering perspective. With neutral interfaces you can transfer the EPLAN project data into other software environments and continue working on them.

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.

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.

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.

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.

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.

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 Cogineer – Automatic Schematic Generation at the Click of a Button

EPLAN Cogineer opens up completely new possibilities to automatically generate schematics or partial circuits for electrical engineering and / or fluid power at the click of a button and is a universal tool for the users of EPLAN Electric P8, EPLAN Fluid or EPLAN Pro Panel Stand-alone.

The utilization of EPLAN Cogineer completely changes the way of working in electrical engineering: Instead of copying and inserting project pages, macros or symbols from template or sample projects, EPLAN Cogineer makes declarative user interfaces available with which complete projects or partial circuits of a project are configured in a clear structure and generated at the click of a button. The result is always a native EPLAN project that can subsequently be edited further with all the functionalities available in the EPLAN platform. Through the generation of schematics and partial circuits errors are avoided that may otherwise have arisen through the copying of possibly incorrect templates or required customizing after inserting. In addition to the increase in quality of the project planning result, EPLAN Cogineer automatically saves a lot of engineering time, quasi as a side effect.

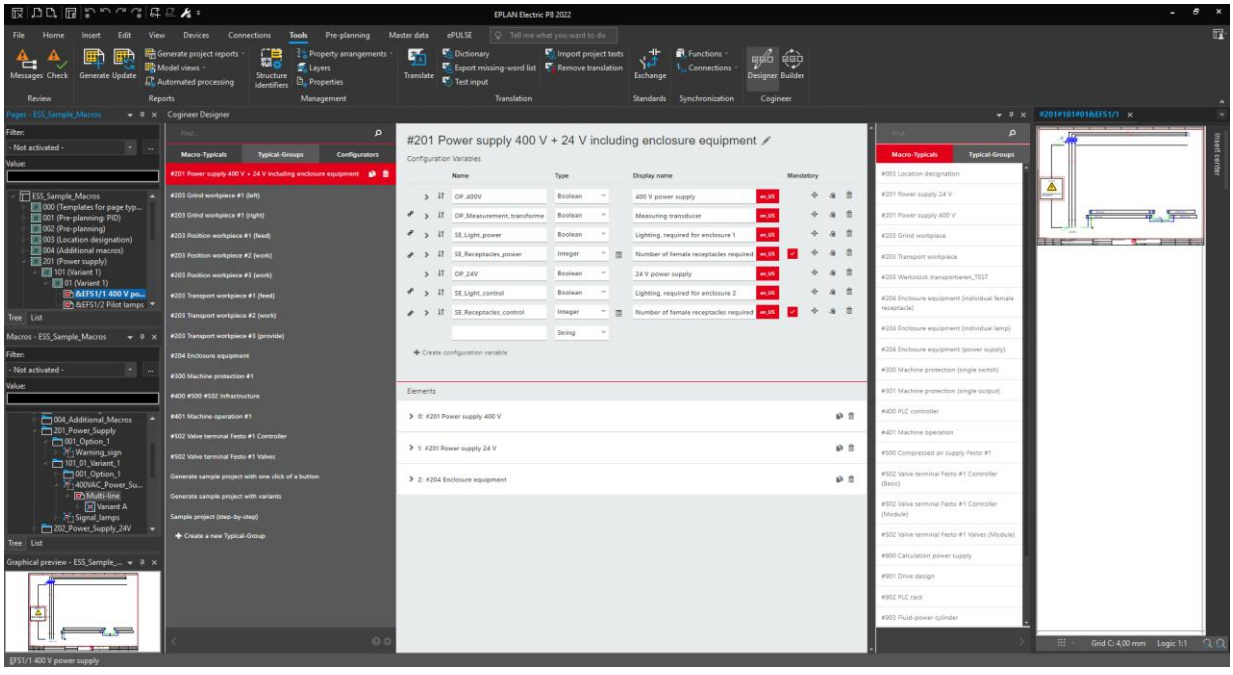
Through EPLAN Cogineer automatic schematic generation and manual "classic" project engineering are now available to the user in parallel – also in one and the same project. EPLAN Cogineer bases directly on existing EPLAN macro libraries and apart from a basic knowledge of the EPLAN macro technology and of the handling of value set tables in EPLAN macros does not require any special knowledge of a high-level programming language or other expert knowledge in the fields of modeling and configuration from the user.

Thanks to the diverse possible applications – irrespective of whether projects are structured hierarchically by functional aspect or from a production-oriented point of view – EPLAN Cogineer is suitable for use in almost all industries, for virtually all company sizes as well as for new planning and modification in equal measure.

User Interface

Look & Feel

EPLAN Cogineer is integrated directly in the EPLAN platform and provides a transparent, intuitive and thus very simple and structured user interface. The user interface is therefore suitable for new users, occasional users and experienced EPLAN users. EPLAN Cogineer is divided into two workspaces: The Cogineer Designer and the Cogineer Project Builder.



Users can easily adapt the entire interface including window arrangement and toolbars to their needs and wishes. The settings can be saved and retrieved as workspaces as needed.

The mouse wheel can be used to scroll upward and downward as usual in the windows. When the [Ctrl] key is pressed, the mouse wheel is used to scale the window contents of Cogineer Designer and Cogineer Project Builder.

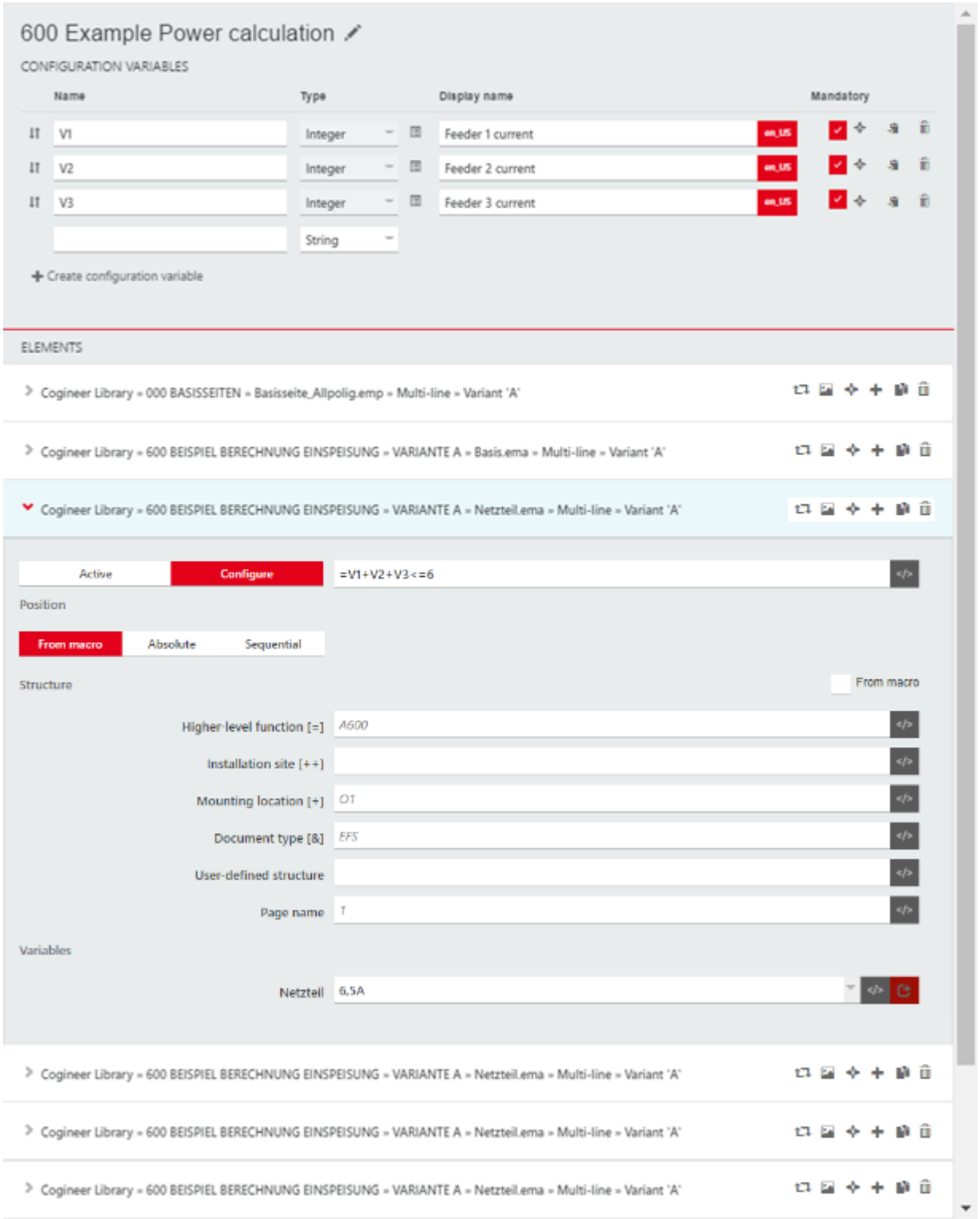
Workflow & Integration

Cogineer Designer and Cogineer Project Builder

EPLAN Cogineer consists of the two workspaces Cogineer Designer and Cogineer Project Builder. As is usual in the EPLAN platform, the windows of these workspaces can be customized individually and optionally also be displayed parallel to each other.

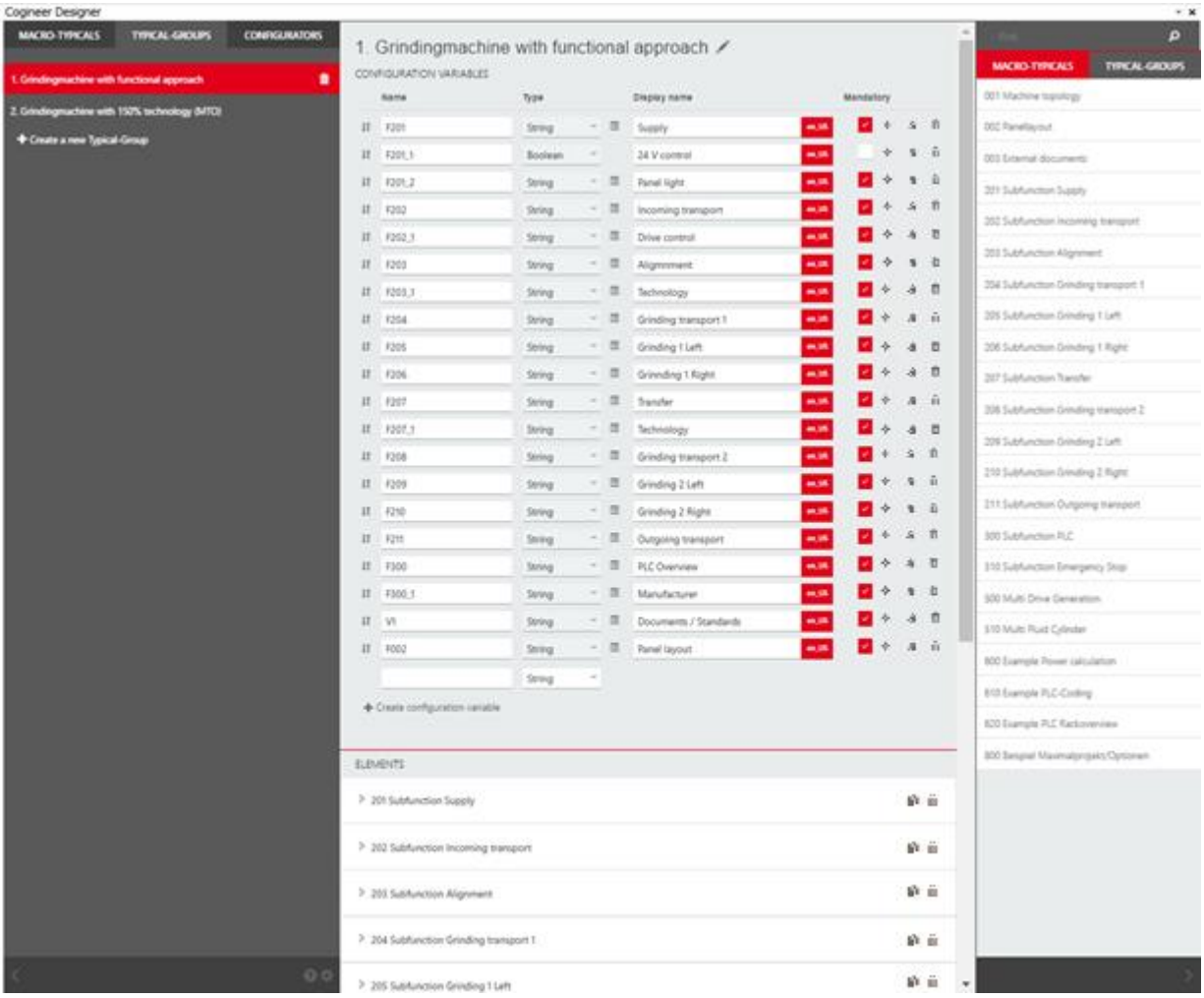
In the Cogineer Designer the organizational structure of Macro-Typicals is created on the basis of macros. Macro-Typicals are (partial) functions or partial circuits of a machine or plant. Together with configuration variables definable in Macro-Typicals, that at the same time also form the basis for the declarative user interface in the Project Builder, rules and selection criteria for specific variants of the respective (partial) functions or partial circuits are defined in a Macro-Typical. Configuration variables can be of the type String, Boolean, Integer and Double. A country-specific displayed name is assigned to the configuration variables for the Project Builder and they can be structured with mathematical basic operators and logical operations into the set of rules of the respective Macro-Typical. To this purpose no special knowledge of a high-level programming language or other expert knowledge in the fields of configuration or variant management is required.

Example for the structure and contents of a Macro-Typical using a load calculation for a power supply:


600 Example Power calculation
CONFIGURATION VARIABLES
Name
Type
Display name
Mandatory
V1
Integer
Feeder 1 current
en_US
V2
Integer
Feeder 2 current
en_US
V3
Integer
Feeder 3 current
en_US
String
Create configuration variable
ELEMENTS
Cogineer Library » 000 BASISSEITEN » Basisseite_Allpolig.emp » Multi-line » Variant 'A'
Cogineer Library » 600 BEISPIEL BERECHNUNG EINSPEISUNG » VARIANTE A » Basis.ema » Multi-line » Variant 'A'
Cogineer Library » 600 BEISPIEL BERECHNUNG EINSPEISUNG » VARIANTE A » Netzteil.ema » Multi-line » Variant 'A'
Active
Configure
=V1+V2+V3<=6
Position
From macro
Absolute
Sequential
Structure
From macro
Higher-level function [=]
A600
Installation site [++]
Mounting location [+]
O1
Document type [&]
EFS
User-defined structure
Page name
1
Variables
Netzteil
6,5A
Cogineer Library » 600 BEISPIEL BERECHNUNG EINSPEISUNG » VARIANTE A » Netzteil.ema » Multi-line » Variant 'A'
Cogineer Library » 600 BEISPIEL BERECHNUNG EINSPEISUNG » VARIANTE A » Netzteil.ema » Multi-line » Variant 'A'
Cogineer Library » 600 BEISPIEL BERECHNUNG EINSPEISUNG » VARIANTE A » Netzteil.ema » Multi-line » Variant 'A'

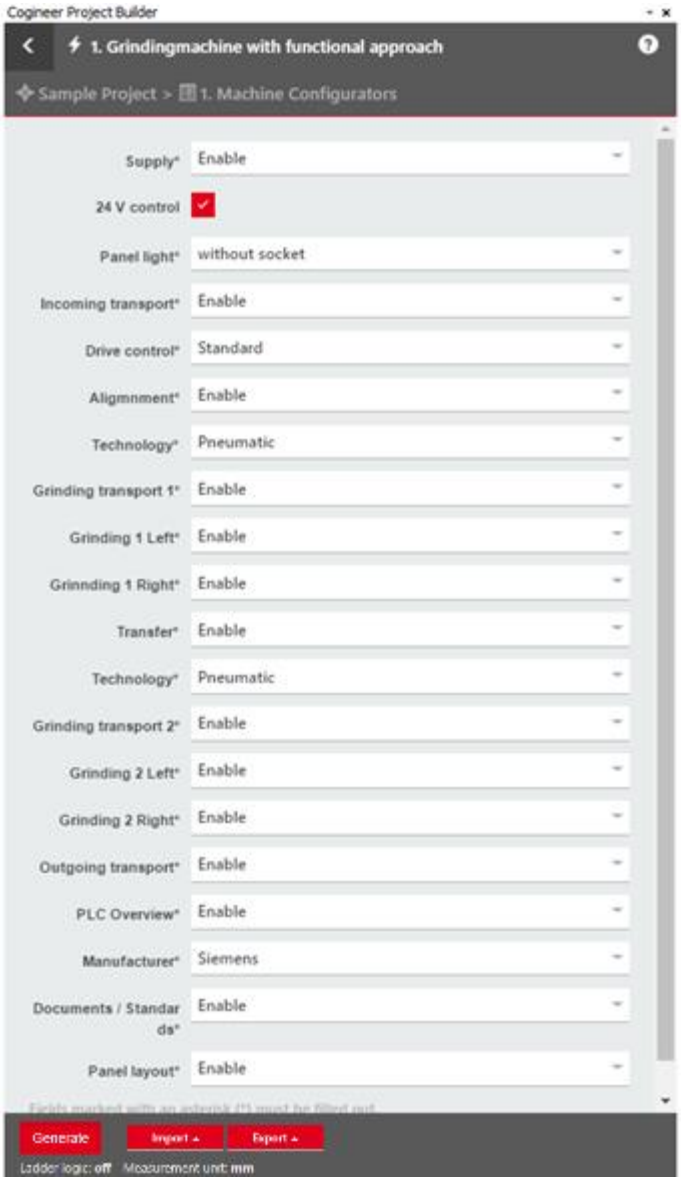
In Designer, Macro-Typicals can be combined into a next-higher organizational structure, the so-called Typical-Groups. This allows function levels to be nested to almost any depth with each other. Typical-Groups in turn have their own configuration variables, that apply for all the elements of the respective Typical-Group.

Example for the structure and content of a Typical-Group:



The third organizations structure in Cogineer Designer is formed by the so-called configurators. They consist of Macro-Typicals and / or Typical-Groups and are exactly the objects that are available in the Project Builder for the generation of schematics and partial circuits.

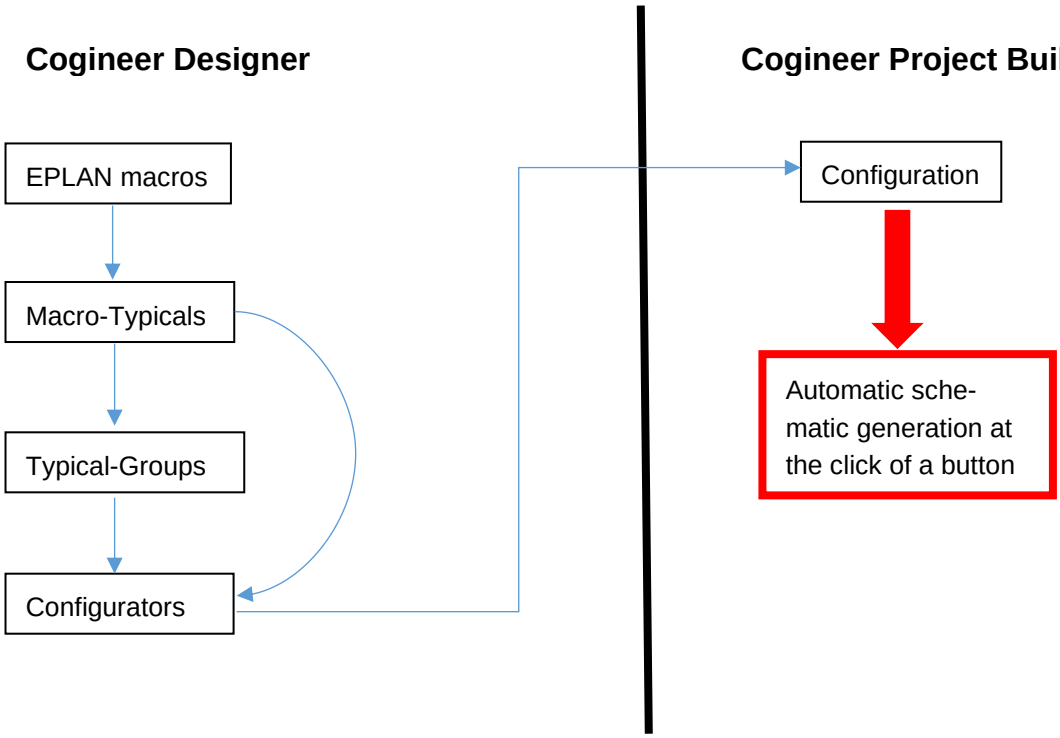
On the basis of the configuration variables of the Macro-Typicals and / or Typical-Groups, that are made available in the form of configurators from the Cogineer Designer, the Cogineer Project Builder makes declarative user interfaces available for the configuration and automatic generation of schematics and partial circuits.



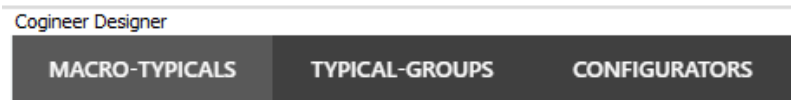
These configuration user interfaces are generated automatically and are always consistent with the definitions of the configuration variables in the respective Macro-Typicals or Typical-Groups. Changes in the configuration variables in Cogineer Designer are automatically visible immediately in the Cogineer Project Builder without special programming or another action of the user being required.

Methods and Functionality

The structure as well as the methodology of the working methods of EPLAN Cogineer are displayed in the following figure:



In Cogineer Designer the objects Macro-Typicals, Typical-Groups and configurators can be called via corresponding tabulators:



Configuration Variables

Configuration variables are superior variables that apply for all the subelements of the respective organizational structure for which they are defined. This means that all the configuration variables of a Macro-Typical apply for all the elements of this Macro-Typical (meaning the contained macros), and all the configuration variables of a Typical-Group apply for all the elements of this Typical-Group (meaning the contained Macro-Typicals and their macros).

The referencing of configuration variables to macro variables is effected on the basis of simple formulas. With this method it is possible to define manifold and extensive dependencies by simple means. To this purpose the set of rules / model for the future configuration is structured in Project Builder. The display name assigned for a configuration variable is displayed instead of the variable name in Project Builder. The following variable types are available:

Variable type	Meaning	Example
Integer	Integer value	1, 2, 3, …
Double	Floating-point value	2.786
String	String	Mounting location
Boolean	Two possible states	0 or 1

Variables of the type "Boolean" are displayed in the configuration user interface of the Project Builders as a check box.

The following operators are permitted for the structuring of formulas in connection with the above variable types:

Operators	Meaning	Applicable for	Example
+, -, *, /	Arithmetic calculation	Integer, Double	=V1+V2
'…'	Literal	String	='EPLAN'
+	Linking of drawing chains	String	='EPLAN'+'efficient engineering'

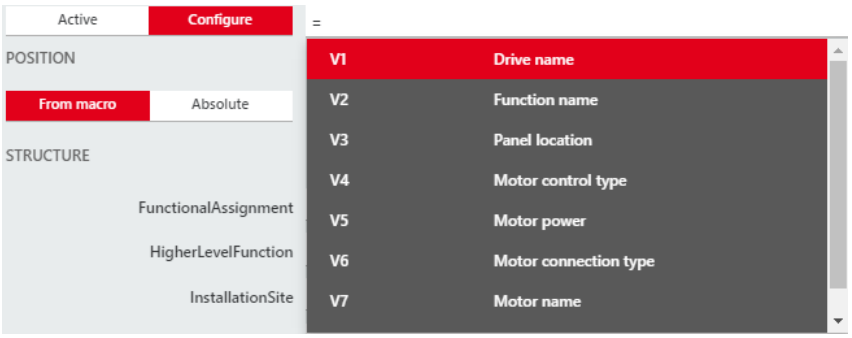
Operators	Meaning	Applicable for	Example
==, !=, <, <=, >, >=	Comparison operators	Integer, Double	=V1<=V2
If Condition **then** Value1 **else** Value2 **endif** or Condition? Value1 : Value2	Conditional values	All	=if V1==0 then V2 else V3 endif or =V1==0?V2:V3

When creating the set of rules for formula creation, the aim should always be to keep the number of operands and nested elements as low as possible. This procedure generally leads to a structured formula which can be maintained and edited well. We also recommend viewing and checking the formula, modularizing it if possible and structuring it into smaller parts from time to time. These measures further the advantages in maintenance and system performance listed above.

Code Completion

During the entry of a formula the EPLAN Cogineer user is supported by a functionality called "Code Completion". As soon as an 'equals' sign "=" is entered during the formula definition, all the available designations of configuration variables are displayed in a drop-down list. The list is filtered automatically during the input.

Example:



Multi-user

Simultaneous usage of Cogineer macro libraries in the Project Builder by different users is possible. You can use a user-individual project as a target project (no simultaneous generation in an identical target project through different users).

Simultaneous editing of a Cogineer macro library via the Designer is not supported.

Please contact EPLAN Support with regard to the hardware requirements for multi-user operation. We can advise you specifically according to your individual requirements.

Multilingual Capabilities

The user interface of EPLAN Cogineer is currently available in the following languages:

- cs-CZ
- da_DK
- de_DE
- en_US
- es_ES
- fr_FR
- hu_HU
- it_IT
- ja_JP
- ko_KR
- nl_NL
- pl_PL
- pt_BR
- pt_PT
- ro_RO
- ru_RU
- sv_SE
- tr_TR
- zh_CN

Displayed names of Cogineer components (Macro-Typicals, Typical-Groups, configuration variables, etc.) can be displayed in further languages in addition to the source language set, irrespectively of the interface languages of Cogineer:

The initial language set in the options of the platform is displayed respectively in Project Builder.

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

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).

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

Licensing Overview

EPLAN Cogineer is available as an add-on in the module packages "Cogineer" and "Cogineer Advanced" for the following EPLAN products:

- EPLAN Electric P8 as of the module package Select
- EPLAN Fluid
- EPLAN Pro Panel Professional
- EPLAN Preplanning Professional

(Creation of schematics in 2D. The creation of 3D representations is not supported.)

Errors and changes reserved.

✓ Standard functionality O Optional − Not available

Variant **Feature**	Cogineer	Cogineer Advanced	Cogineer Advanced Project Builder
Structure identifier definition in library settings	✓	✓	
Usage of ladder logic (US standard)	✓	✓	✓
Specification of the library unit system (mm / inch)	✓	✓	
Creation of functions and partial functions in the form of Macro-Typicals	✓	✓	
Creation of several function units (such as machine type structuring) in the form of Typical-Groups	✓	✓	
Creation of configuration variables	✓	✓	
Definition of monolingual selection lists at configuration variables	✓	✓	
Duplication of Macro-Typicals and Typical-Groups	✓	✓	

Variant / Feature	Cogineer	Cogineer Advanced	Cogineer Advanced Project Builder
Duplication of configuration variables	✓	✓	
Comments in the formula editor	✓	✓	
Code Completion in the formula editor	✓	✓	
Macro exchange in existing Macro-Typicals incl. maintenance of set of rules		✓	
Graphical macro preview in Macro-Typicals	✓	✓	
References / indication of points of usage	✓	✓	
Searching for element names	✓	✓	
Translation function by means of the EPLAN dictionary*	✓	✓	
Generating of 2D schematics for electrical engineering and fluid power	✓	✓	✓
Automatic creation of configuration user interfaces (declarative configuration user interfaces)	✓	✓	✓
Wizard for the graphical definition of rules of visibility of configuration variables and active / inactive controlling of elements		✓	
XML export of Configurator structures		✓	
XML / XLSX export of configured configurations		✓	✓
XML / XLSX import of configured configurations (repeated usage)		✓	✓

Variant / Feature	Cogineer	Cogineer Advanced	Cogineer Advanced Project Builder
Placement of (partial) functions in the form of Macro Typicals and Typical groups		✓	✓
SilentMode (fully automatic generation)		✓	✓
Schematic generation directly on the basis of an XLSX file**		✓	✓

** The functionality depends on the licensed add-ons of the EPLAN Platform product used*

*** The functionality requires the implementation of a complemented available add-on.*