Digital to production

Digitized standards

All standards are checked in digital formats with the help of digital models. For example, the written sets of rules allow different interpretations. A digitalized and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Verification of digital models

With digital models, many tests can be performed on digital models. For example, by integrating the stand-ardized data of a 3D wire management tool, the digital product description includes test instructions and test parameters that are used for an automated visual inspection.

Quality assessment using digital models

The machine provides the worker with the correct right time at the correct station. This reduces the complexity of Industry 4.0 for the machine operator.

Automation control cabinet approved

Today many tasks can be performed on digital models – but not all. The actual function can be tested only at the end product. With the help of digital models, a fully automated check of the final product to the digital standards is conceivable.

Intelligent production

In the manual and automated manufacturing process, the intelligent control system identifies the production station, the fixture configuration, and required measurement equipment. This results in precise machining instructions.

Conventional production

Digital data becomes the focus of product development and production. The PLM Data Portal provides product data allowing the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information, the software and the mechanical sets of rules and concepts along the product lifecycle.

Virtual engineering

Digitalization is becoming a focus of product development and production. The PLM Data Portal provides product data allowing the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information, the software and the mechanical sets of rules and concepts along the product lifecycle.

Virtual prototyping – EPLAN Pro Panel

Virtual product development of a control cabinet in 3D. Digital description and PLM data are based on the PLM data generated via the design software. The data is used for engineering, materials management, and production. The EPLAN Data Portal provides product data allowing the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information, the software and the mechanical sets of rules and concepts along the product lifecycle.

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Virtual product development – EPLAN E3

Virtual prototyping integrates the machine data required for the production process. The virtual product description includes the movement of the cable entry with regard to its position and applied type of cable. The virtual product description provides all the information needed for the production process. The virtual product description consists of the machine data and the information of the thermal design are seamlessly integrated. The virtual product description provides all the information needed for the production process.

Continuous data

Continuous data allows the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information, the software and the mechanical sets of rules and concepts along the product lifecycle.

Data provision for different applications

The virtual product description can be used in customer-specific eShops or catalogs. The virtual product description can be used in customer-specific eShops or catalogs. The virtual product description can be used in customer-specific eShops or catalogs. The virtual product description can be used in customer-specific eShops or catalogs.

A continuous virtual engineering is a prerequisite for Industry 4.0.

Eplan, Rittal and Phoenix Contact present the comprehensive solution portfolio in engineering, control cabinet system- and automation technology “Smart Engineering and Production 4.0”. This formulas describes the joint commitment of the three creative solution providers in engineering, control cabinet system- and automation technology “Smart Engineering and Production 4.0” and the continuous automated process starting from the digital article through engineering and production until concepts along the product lifecycle.

For more information visit www.SmartEngineeringAndProduction40.com
Digital pre-certification

Many product characteristics can be checked on digital models before the assembly starts. This can be used in terms of a pre-certification.

Intelligent production

Standards are designed to check products. But these written sets of rules allow different interpretations. A digitalized and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Verification of digital models

With digital standards many rule verifications can be done on digital models. For example, by integrating the stand-alone software EPLAN in the production line, the planning and the manufacturing can be controlled automatically.

Digitalized standards

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Automated control cabinet approval

Today many tests can be performed on digital models, for example, by integrating the stand-alone software EPLAN in the production line, the planning and the manufacturing can be controlled automatically.

Digitalized standards

Standards are designed to check products. But these written sets of rules allow different interpretations. A digitalized and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Intelligent control system

The digital product description allows the identification of the production stations. With the help of digital models, a machine can automatically identify the production stations.

Avoidance for employees in production

The machine provides the employee with the correct information at the right time. This reduces the complexity of the machine and the number of mistakes.

Quality assessment using digital models

The machine provides the employee with the correct information at the right time. This reduces the complexity of the machine and the number of mistakes.

Intelligent production

In the manual and automated manufacturing processes of control cabinet building standardized and digitalized processes are provided in an increasing importance.

Conventional production

By means of the digital product description, the intelligent control system identifies the production stations required for the planning. Using a mass production setup, a batch size of one customized becomes reality.

Virtual engineering

Digital data becomes a focus of product development and production. The EPLAN Data Portal provides product data allowing the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information with the help of fast query engines and concepts along the product lifecycle.

Digital article

A digital description of the article is a prerequisite for a sustainability automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Virtual engineering

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Digital article

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Digital to production

The visualization provides all necessary data for production integration.

Mechanical processing

The mechanical processing of the control cabinet is performed by the CAD system using the digital product description. The CAD system performs the mechanical routines and provides the necessary data for production integration.

Virtual prototyping – EPLAN Pro Panel

Virtual product development of a control cabinet in 3D. Digital description and PLANTIC-based provision of the final product data compatible to the downstream processes along the product lifecycle.

Digital production integration – AutomationML and eCl@ss

Virtual product development of a control cabinet in 3D. Digital description and PLANTIC-based provision of the final product data compatible to the downstream processes along the product lifecycle.

Digital article

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Virtual product development of a control cabinet in 3D. Digital description and PLANTIC-based provision of the final product data compatible to the downstream processes along the product lifecycle.

Digital article

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Digital pre-certification

Many product characteristics can be checked on digital models before the assembly starts. This can be used in terms of a pre-certification.

Intelligent production

By means of the digital product description, the intelligent control system identifies the production stages required for the production. Using a mass production setup, a batch size of one customized becomes reality.

Conventional production

In the manual and automated manufacturing processes of control cabinet building standardized and digital production data are of increasing importance.

Virtual engineering

Digital data becomes a focus of product development and production. The DLNP Data Portal provides product data allowing the creation of a virtual prototype. This prototype represents the control cabinet digitally and provides the information with the help of the entire digital world and concepts along the product lifecycle.

Digital article

A digital description of the article is a prerequisite for a seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Virtual pre-certification

In the manual and automated manufacturing processes of control cabinet building standardized and digital production data are of increasing importance.

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Digital article

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Virtual pre-certification

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Digital article

A digital description of the article is a prerequisite for a seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.
Digital technology
Intelligent production
Virtual engineering
Virtual Prototype

Future technologies

Conventional production

Digital article
Virtual Prototype

Virtual Prototype

Automated marking of the terminal strip

Snap on components
Cut the DIN rail to length
Drill holes in the DIN rail

Marking type: thermal transfer
Marking type: laser

Quality inspection

Shop drawings
Assembly data
NC data
Wiring information
Machine interfaces

Digital pre-certification

OK

Digital product description

BOM

AutomationML

Digital article
Virtual engineering
Conventional production
Intelligent production
Future technologies
Virtual Prototype
Digital pre-certification

Digitalized standards
Standards are designed to check products. But these written sets of rules allow different interpretations. A digitalized and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Verification of digital models
With digital standards many rule verifications can be done on digital models. For example, by integrating the standard into software tools or as a stand-alone software solution. The virtual prototype represents the control cabinet digitally and provides the information with the help of PLM/PDM systems seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Digital engineering
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- Eplan, Rittal and Phoenix Contact present the complete solution provider in engineering, in control cabinet system- and automation technology “Smart Engineering and Production 4.0” shows the continuous, horizontal along the value-added-chain, vertical over business processes, integration of digital data into product development along the product lifecycle in the depth of the data.
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- A digital article is the description of the article to be produced in a standardized format.
Digital article

Virtual engineering

Conventional production

Intelligent production

Future technologies

Virtual Prototype

- net the DIN rail to length
- add holes in the DIN rail
- snap on components
- cut the DIN rail to length
- drill holes in the DIN rail

Digital product description

shop drawings

assembly data

NC data

AutomationML

BOM

wiring information

machine interfaces

Digital pre-certification

OK

OK

OK

OK

OK
Digital pre-certification

Many product characteristics can be checked on digital models before the assembly starts. This can be used in terms of a pre-certification.

Intelligent production

A digital description of the article is a prerequisite for a seamless automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Conventional production

Virtual engineering

In the manual and automated manufacturing processes of control cabinet building standardized and digital provided data are of increasing importance.

Digital data becomes a focus of product development and production. The EPLAN Data Portal provides product data allowing the creation of virtual prototypes. This prototype represents the control cabinet digitally and provides the information with the help of finite element analyses and concepts along the product lifecycle.

Digital article

A digital description of the article is a prerequisite for a seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Derivation of production-relevant article characteristics inderstand and indication such as the characteristics of the cable entry with regard to its position and applied type of connection as well as information of the thermal design are described in a digital and standard way.

Saving article data in the standardized exchange format ECOs

The article data is saved in eCl@ss format and is available for further processing via a standardized interface.

Data provision for different applications

The digital product description contains text for electricals and test parameters that are used for an automated visual inspection.

Digitalization

With digital standards many rule verifications can be done on digital models. For example, by integrating the standards into software tools or as a stand-alone software solution.

Verification of digital models

Validation involves checking if the product design is compliant with all rules and standards. The results are presented as a report.

Automated control cabinet approval

A digital description of the article is a prerequisite for a seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Assistance for employees in production

Workflow support through visualization

The digital product description provides all the information needed for the production process and the intelligent control system is able to identify at which production station the workpiece will be processed.

Industry 4.0

A continuous virtual engineering is a prerequisite for Industry 4.0.

The Eplan, Rittal and Phoenix Contact present the complete solution for Industry 4.0 according to the “From the Top Floor to the Shop Floor” formula describes the joint commitment of the three leading solution providers in engineering, in control cabinet system- and automation technology "Smart Engineering and Production 4.0" throughout the continuously automated process starting from the digital article, through engineering and production until concepts along the product lifecycle in the depth of the data.

The Top Four include Eplan-Pro Panel – virtual prototyping; EPLAN Data Portal – digital product description; eCl@ss – standardized data provision - EPLAN Data Portal; and Virtual manufacturing ensures integration of conventional and Industry 4.0 optimized production technologies in the digital data flow.
Many product characteristics can be checked on digital models before the assembly starts. This can be done in terms of a pre-certification. A digitalized and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Digitalized standards
Standards are designed to check products, but those written sets of rules allow different interpretations. A digital and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Verification of digital models
With digital standards many rule verifications can be done on digital models. For example, by integrating the stand-alone software tools or as a stand-alone software component into software tools. A digital description that is the encoding of an article description in a standardized format allows the identification which production stations will be involved in the manufacturing process.

Digital product description
In the manual and automated manufacturing processes of control cabinet building standardized and digitalized data are of increasing importance.

Conventional production
By means of the digital product description, the intelligent control system identifies the production stations required for the production. Using a mass production setup, a batch size of one customized becomes reality.

Intelligent production
Today many tests can be performed on digital models. For example, by integrating the stand-alone software tools or as a stand-alone software component into software tools. A digital description that is the encoding of an article description in a standardized format allows the identification which production stations will be involved in the manufacturing process.

Digital production integration
AutomationML and eCl@ss – keyword “product data memory”

Digital to production
Digital data is becoming a focus of product development and production. The PLM Data Portal provides product data required for the production. Using the digital product description in AutomationML format and without additional efforts, the required NC data are integrated into the machine software, which translates them into precise machining instructions.

Virtual engineering
Virtual prototyping – EPLAN Pro Panel
Virtual product development of a control cabinet in 3D. The virtual prototype provides all necessary data for engineering, materials management and production in 3 dimensions. The virtual layout is saved as a 3D drawing and can be further processed via a standardized interface.

Digital to product
The virtual prototype represents the control cabinet digitally and provides the information within the framework of finished drawings and concepts and along the product lifecycle.

Digital data
A digital description of the article is prerequisite for a semiautomated or automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.

Production-relevant article characteristics
These article characteristics are marked within the framework of finished drawings and concepts. For example, by integrating the stand-alone software tools or as a stand-alone software component into software tools. A digital description that is the encoding of an article description in a standardized format allows the identification which production stations will be involved in the manufacturing process.

Data provision for different applications
The digital product description contains not only product properties but also processes and the necessary engineering information. The digital description provides all the information needed for the production line to operate. Supported by a 3D visualization, the worker is guided step by step through the processes and the respective application situation.

Continuous data
The continuous utilization of engineering data inside the manufacturing reduces manual steps and errors and increases the process quality and safety.

Workflow support through visualization
The digital product description provides all the information needed for the production line to operate. Supported by a 3D visualization, the worker is guided step by step through the processes and the respective application situation.

Quality assessment using digital models
The machine provides the worker with the correct condition at the right time. This reduces the complexity of Industry 4.0 for the machine operator.

Digitalization in production
The digital product description contains not only product properties but also processes and the necessary engineering information. The digital description provides all the information needed for the production line to operate. Supported by a 3D visualization, the worker is guided step by step through the processes and the respective application situation.

Architects do not have to be checked. But these written sets of rules allow different interpretations. A digital and formalized standard does not allow such different interpretations and can be integrated into automated processes.

Digital product description
In the manual and automated manufacturing processes of control cabinet building standardized and digitalized data are of increasing importance.
Digital article
Virtual engineering
Conventional production
Intelligent production
Future technologies
Virtual Prototype

AutomationML
Digital product description
BOM
shop drawings
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Digital pre-certification
OK
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- Digital article
  - A digital description of the article is a prerequisite for a seamlessly automated process. The description is created during the design of the article in which production-relevant article characteristics are marked and described.
  - A continuous virtual engineering is a prerequisite for Industrie 4.0.

Eplan, Rittal and Phoenix Contact present the complete product development process from design to production in 3 dimensions. Virtual (eCl@ss) and physical prototypes represent the control cabinet digitally and provide the necessary information for automated production.

- Virtual prototyping – EPLAN Pro Panel
  - Virtual prototyping is a central component in our continuous, intelligent and sustainable product development process for industrial control cabinets. The virtual prototype provides all necessary data for engineering, materials management and production. The EPLAN Data Portal provides product data for engineering, materials management and production in 3 dimensions. Vertical along the value-added chain, horizontal along the product lifecycle and smart interfaces for for digital pre-certification of products.
  - The article data is saved in eCl@ss format and is available for further processing via a standardized interface.
  - Data provision for different applications: The digital product description contains technical facts, key figures, and test parameters that are used for an automated virtual inspection.

- Virtual production integration – AutomationDirect, eCl@ss
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