Software for electrical and photovoltaic engineering

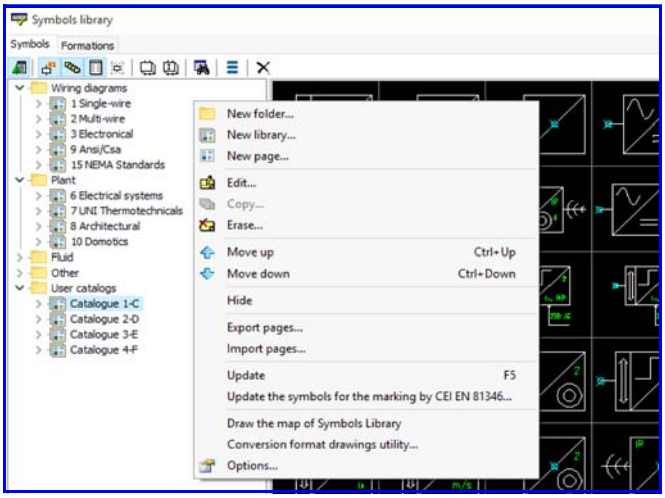
CADelet, iDEA, Eplus - Electrical CAD

CADelet now supports AutoCAD 2019

CADelet line software is now compatible with AutoCAD from 2007 to 2019 at 32-bit or 64-bit.

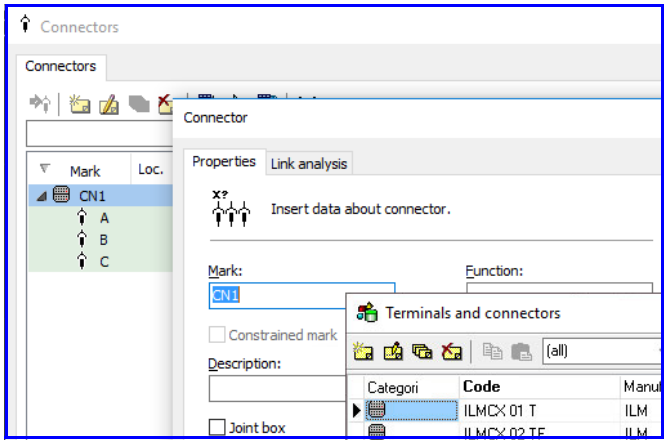
New features in the management of symbol library and catalogs

In the Symbol Library you can now create folders with other folders inside, without limits, to organize the default and personal catalogs.
Within each catalog you can create new library pages where you can save symbols, as in previous versions, but now it is easier to edit the information, move and sort through drag & drop to organize the catalogs as you prefer.



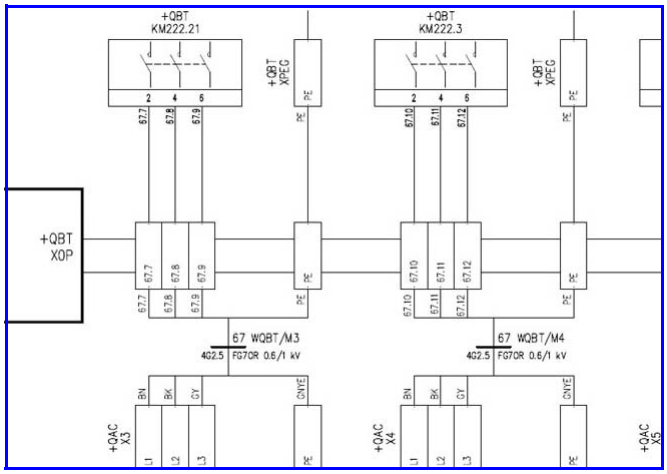
Management of modular connectors, with case and inserts

The modular connectors are a type of electrical connection elements made available by some manufacturers that allow assembling inside a container, said frame, a set of appropriate connectors or plugs.
The management of connectors in the electrical CAD and in Cablo now allows to define the modular connectors as multiple connectors assembled to a frame, of which they assume the initials, location and function. After tracing in the project, their aggregation is displayed in the Connector Detail Tables and the Connector List Table.



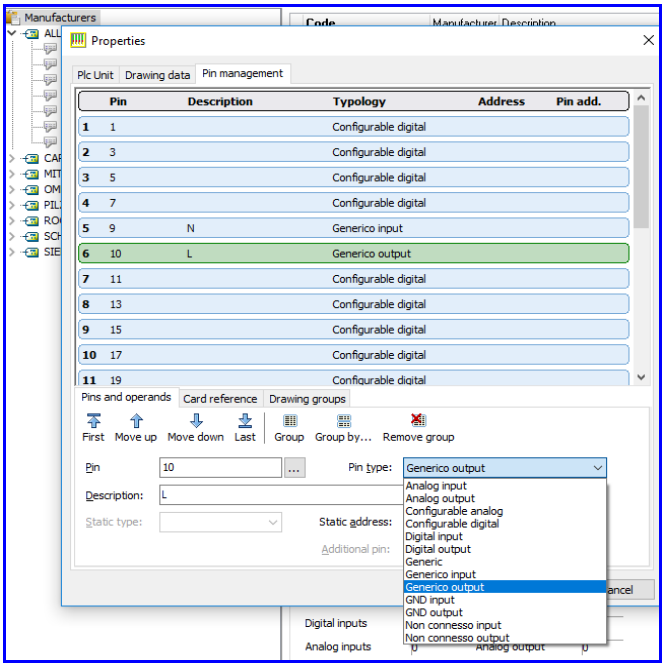
Representation of the connection between terminal blocks and individual components or other terminal blocks, on several levels

The connection diagram of the terminal board (or connector) is a new representation of the upstream and downstream connections of a terminal board and the underlying levels; it can be traced automatically in the wiring diagram via the interface of Cablo 2019.



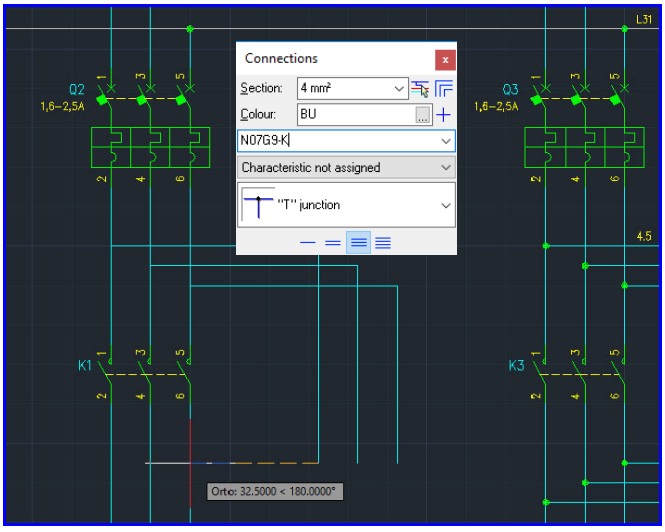
Management of PLC cards with types of operands that can be defined when inserted into the drawing

In the new Plc slots database it is now possible to define new types of Plc cards with operands that allow to be configured as input or output at the moment of insertion into the project.
Only when the board is assigned to a Plc project, in the presence of new types of pin (digital configurable and analog configurable), is asked to define their final type. The cards can therefore be represented in the wiring diagram in their concentrated graphic form.



Improvements on wire drawing functions with automatic coupling to existing wires

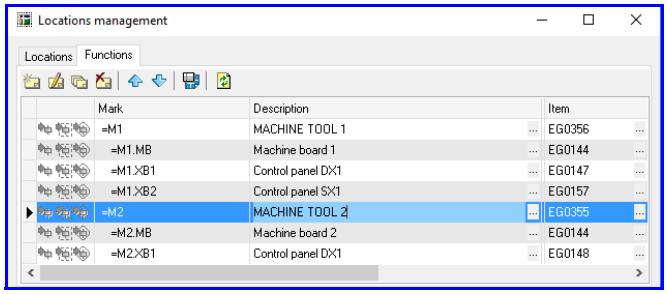
With the new Wire command, drawing one-to-four-phase power lines, if you select a point near an already drawn wire, the line tracing ends by hooking up according to the desired type of connection (node, serial or parallel branch).



If the number of phases drawn is greater than one, the other lines will automatically identify the corresponding phases on which to connect.

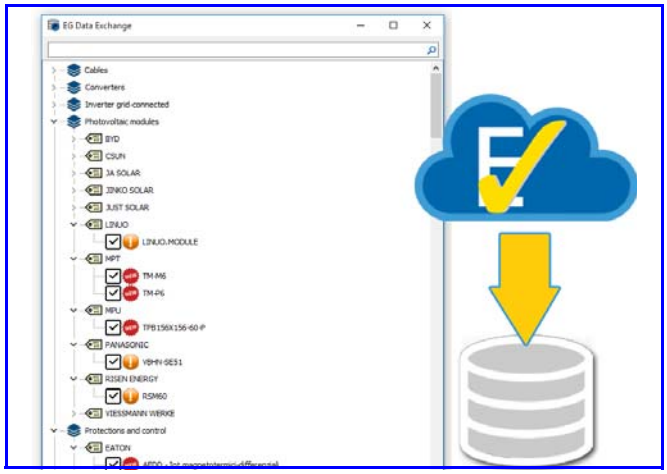
Assignment of plant and machine information to functional groups, with relative typical coding

In the 2019 Series new functions of coding of the elements of the electric scheme are proposed, to meet the need that arises in some companies, to organize the materials used in a hierarchical structure codified and pyramidal.
It is now possible to create a free pyramidal structure of the Project Functions to represent the functional areas of a plant. Each defined function can be assigned an item code that represents the functional group within the company management system.
Even a group of sheets referring to a certain process, saved in the Sheet Library, can be coded with a single material code.
At the end of the drawing, the bill of materials of the scheme can therefore be optionally displayed as a list of unique codes for each machining or functional group as an alternative to the material codes of the individual components.



New EGData Exchange for downloading data packages, classified by manufacturer and series, containing the complete set of electrical device data (product, technical, schematic, dimensional, images and documentation)

Electro Graphics Data Exchange is the new tool for downloading update packages and integration of all Electro Graphics software database.



Installation in the database of data downloaded by EGData Exchange

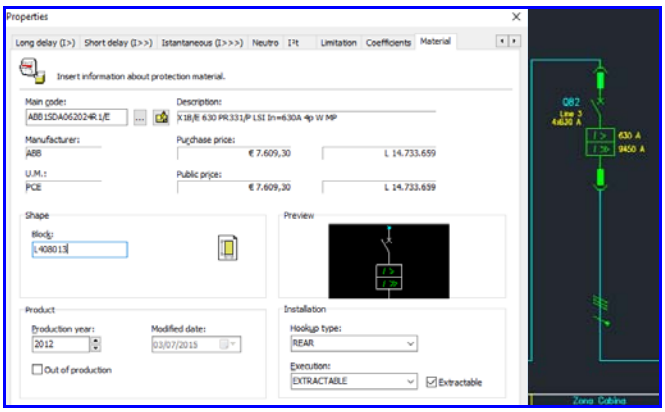
EGData Exchange simplifies the search and installation of technical data useful for the design, reduces the time of distribution of database updates, centralizing the different types of product categories in a simple structure that communicates with the Electro Graphics server and real-time notification of the presence of new database packages.
Cables, connectors, protections, relays, families of symbols and many other types of data can transit through this system and be easily imported into the data files used by the Electro Graphics software, whether they are local or shared on the network.

Importing information of electrical devices from other formats

The new version of the Insert Eplan macro function, in addition to importing the .ema and .ems files, also allows importing .edz files. EDZ files, in addition to the elementary graphics of the block, can also contain the technical information of one or more material articles. The merchandise data are saved in the article archive including code, description of the article and any images, technical data sheets and representation blocks on the wiring diagram and layout layout.

Reporting of accessory information on the protections on a single-line diagram

The Extractable type protection devices are now highlighted in the automatic single-line diagram with the appropriate symbology that identifies the extractability of the device. The drawing characteristic is based on a specific property present in the appliance data in the Protections database.



Recognition of equipment on a single-line diagram for multi-line point-to-point connections

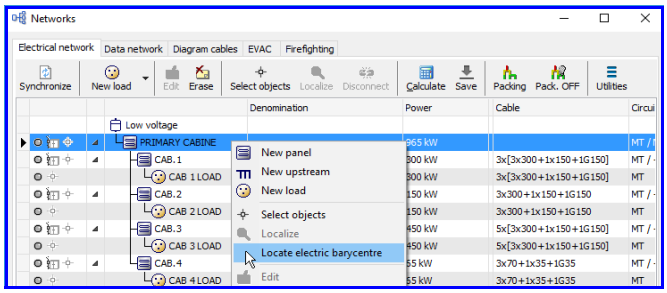
The specification of multiple connection data within the pin of the devices inserted in a single-line diagram now allows to determine the individual point-to-point links in order to obtain the data for the connection and the marking of the wires in Cablo and the export of the plates for wires and terminals.

Representation of the connection diagram of the distribution panels in the plant electrical network

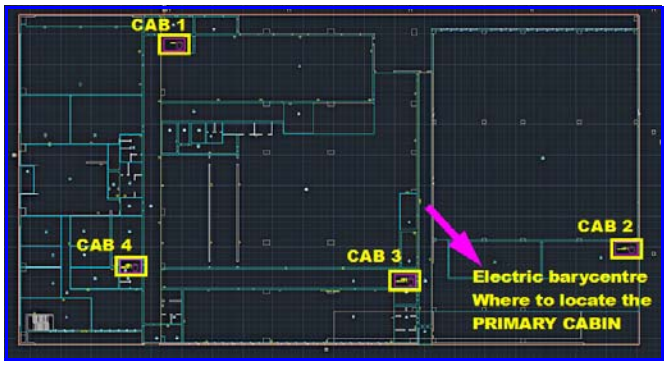
The synoptic management of the plant has been enhanced with a new function that allows to automatically draw the diagram of the frames defined in the utilities project elaborated in the Electro Graphics Ampère calculation software.

Determination of the electric barycentre of the loads defined on the planimetry, to optimize the positioning of the electrical panels

The electric barycentre of the loads defined on a planimetry is the point where the power absorbed by the entire plant can be supposed to be concentrated.
Positioning MV/LV cabins or points of electric supply near the electric barycentre, allows to obtain the best solution against voltage drops, power losses, cable length.



In Network Management, a function has been introduced that facilitates the identification of the electric barycentre of a booth or panel. The Locate electric barycentre command can be started from the context menu and can be executed after having placed booths, panels or loads in the floor plan immediately downstream of the cab to be positioned. An arrow-shaped indicator will indicate the optimal calculated position based on the powers and utilization coefficients involved.



Additional functionality in the management of networks for EVAC and fire fighting (point editing, loop closure and more)

The new Firefight and Sound diffusion EVAC use destinations for cable ducts and compartments have been

introduced. The routing of the cables for these types of networks requires the correct setting of the new destinations in the data of the ducts of the design and in the relevant compartments. To this end, the new destinations of use are available in the tracing window of a conduit. Furthermore, in the editing window of a conduit, the software performs a consistency check on the use of the sub-funds in relation to what is defined in the predefined sub-sections in the Preferences.
Within the Networks interface, for EVAC and Firefighting networks, where the definition of serial chains of equipment is frequent, an element can now be moved upstream or downstream. The command is present in the context menu of the list after clicking with the right mouse button on an element.
The multiple editing of the elements for the Zone, Panel and Unit Type data was also enhanced.
Introduced the summary tables for EVAC and Firefighting networks. In all the Cables tables the Panel and Destination area information can now also be printed.

Panel layout with combined equipment such as circuit-breakers with releases and other accessories

When drawing combined equipment such as circuit-breakers with releases or other accessories, positioning on a DIN rail in the layout of the panel automatically considers the appropriate positioning direction.

Extension and updating of the formations, PLC, carpentry and devices database

All the database used by the Electro Graphics 2019 Series software have been reviewed, updated and integrated; in particular the Cables, Formations, PLCs, Carpentries archives and all the types of the family of the devices archives: Protections, surge protectors and overvoltage limiters SPD, UPS, Busbar trunking, Transformers, AC / AC inverter for motor starting, Inverter for photovoltaic systems connected in network, DC / AC inverter, Charge regulators, Optimizers for photovoltaic systems, Batteries, Photovoltaic modules.

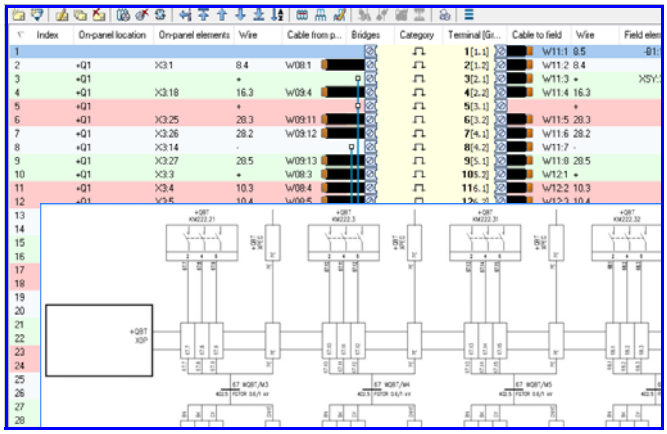
Sharing of database packages

A new feature was created to allow the sharing of technical information of materials between stations or Electro Graphics products of different versions.
The Electro Graphics EGZ database package (file with .egz extension) contains material data and technical data specific to the type of material, which may include electrical data, shapes, images, associated documents. EGZ packages will be published by Electro Graphics and made available for installation using the new EG Data Exchange tool. An EGZ package can also be exported from your Material database using the Export database package function, available in the materials archive window. And new EGZ packages can be imported directly into your Maerial database using the Import database package function.

Cablo - Wiring harness

Multi-level connection diagram between terminal blocks and devices

The connection diagram of the terminal board (or connector) is a new level representation of the connections upstream and downstream of a terminal board; it can be drawn automatically in the wiring diagram in CADelet, Smart, and iDEA through the interface of Cablo 2019.
Each connection level represents the connections between a terminal board and the connected components. If one or more of these components are terminal blocks or connectors, a new level is added to the representation in accordance with the connecting direction from the main terminal board.
If cables are connected to the connections, they are shown on the diagram, with the cable identification data and the wiring data of the conductors.



Starting from a selected sheet, the software will make the drawing in the necessary sheets. The diagram shows all the connection levels from the selected terminal block that can be represented in the space available in the sheet. The design order of the terminals of the main terminal board is determined by the index of the terminal board that can be set in Cablo. The terminal block connection diagram is updated automatically using the Update tables function.

Extraction of wire plates and components according to KMI and Script@MI standards

In Cablo 2019 it is possible to export the list of connections in the compatible format for the KM Corporate automatic machines with the configuration of the exportable data set.
It is also possible to generate a csv format file, for the Script@MI label printing system by MORSETTITALIA.

Deploying and updating cable database

For all items types present in the database, new series were introduced.

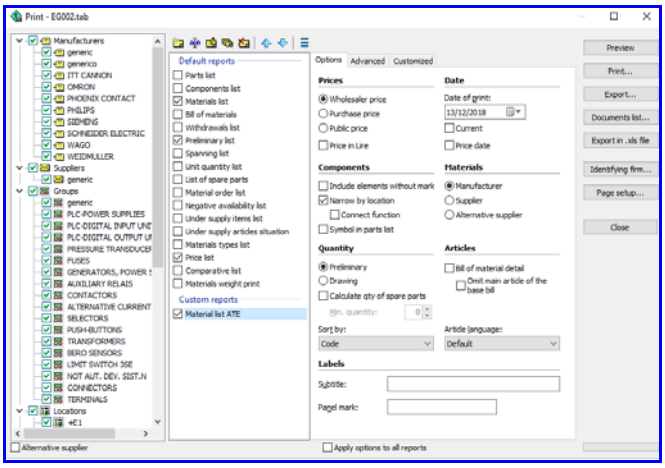
Tabula - Materials list

Management of the plant, machine and functional group level for the purpose of preliminary estimation

Using the new coding of electrical diagram elements functions, now available in CADelet, Smart, iDEA, Eplus, in Tabula 2019 you can so obtain a bill of materials with a coded and hierarchical structure.
As an alternative to the list of material codes about the all components, it is possibile to display an estimate material list made up of the codes of each machine or functional group. That is a material list more oriented to the commercial or administrative network.

General revision of print menu with addition of spare parts management

The Print window interface has been completely redesigned to facilitate the management of standard and customized printing profiles and the many options available. All printing features are visible in a single page divided into three sections, where you can choose which materials to print, what kind of document to print and set all preferences.



The Parts list is the list of materials in the plant, for which a certain number of spare parts is required. For each item in the bill of materials, the spare parts quantity can be now shown as a percentage. The quantity of spare parts is calculated by applying the percentage parts quantity to the value of the Preliminary quantity or Drawing quantity, based on the option selected in the article database.

Acquisition of metric and modular data of cable-holder systems

The extraction of the BOM data from the drawing can now also include the cable-conduits elements drawn with the Draw conduit function.
The amount of materials associated with cable conduits and related accessories depends on the properties set in the Cable conduit database and on methods for exporting quantities set. The cable conduits can therefore be counted according to the length in the drawing, or the number of pieces calculated based on the length measured in the drawing, the length of a single piece and the number of conduit in parallel.

Deploying and updating database

For all device types present in the database, new series were introduced.

Ampère line - Electric grid calculation

Update to the new edition of IEC 60909-0: 2016 regarding the calculation of fault currents on electrical networks

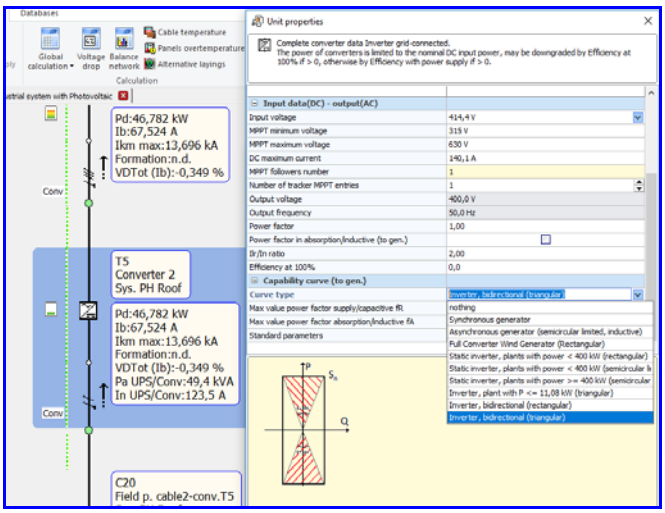
Ampère 2019 incorporates the new edition of the standard for the calculation of short-circuit currents in AC three-phase systems. The main changes introduced at the calculation level concern the adjustment of some calculation factors.

- Voltage factor c for LV networks.
- Direct, inverse and homopolar impedance correction factor for calculation of the maximum short-circuit currents for two-winding transformers (*IEC 60909-0 para 6.3.3*) and generators (*IEC 60909-0 section 6.6.1*).
- Impedance correction factor for the calculation of initial maximum currents in systems supplied directly from generators without intermediate transformers *(IEC 60909-0 para 6.3.3*) and generators (*IEC 60909-0 para 6.6.1*).
- Factor for correcting the overall high impedance of the transformer to calculate the initial maximum short-circuit currents in the production groups WITH automatic voltage regulation of the transformer (*IEC 60909-0 section 6.7.1*).
- Factor for correcting the overall high impedance of the transformer to calculate the initial maximum short-circuit currents in the production groups WITHOUT automatic regulation of the transformer voltage (*IEC 60909-0 section 6.7.2*).

Management of the new triangular and rectangular capability curves for the inverters

Ampère 2019 enhances the definition of capability curves, also called Performance curves, and integrates new types of curves for inverters.

- Inverter in systems with P <= 11.08 kW (triangular);
- Bidirectional inverter (rectangular);
- Bidirectional inverter (triangular);



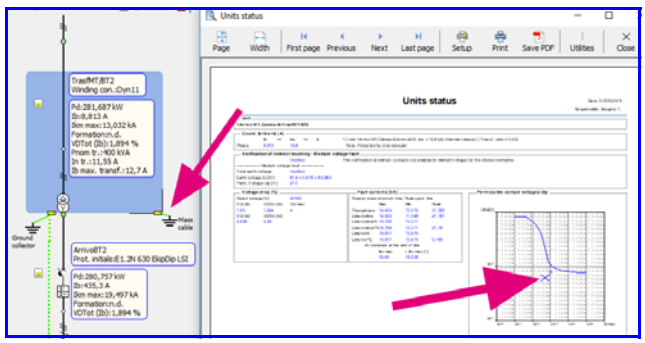
New interface for the verification of selectivity between multi-level protections with in-line update of the selectivity curve according to the modified settings

All the controls for adjusting the protection settings are now also available in the useful Advanced Curves panel, always open at the side of the mesh. This avoids the need to call up the Selectivity window for each protection and maintain full visibility on the electrical network, highlighting the protections in question. The new Curves panel shows the preview of the intervention curves for the selected utilities and the direct access to the settings in the Calibration window.

Calculation of the total earth voltage UE on the primary of MV transformers in fault conditions

For transformers with primary side in MT it is now possible to define also the cabin mass earth collector, ie the connection of the carcass to the ground; this new feature allows to refine the calculation of the total earth voltage UE and verify the fault with respect to the UTP contact voltage.

The total earth voltage UE of an electrical system with respect to a sink is the voltage value that is established in case of phase-ground contact between the earthquake itself and the points of the ground sufficiently distant to be considered potential-free.

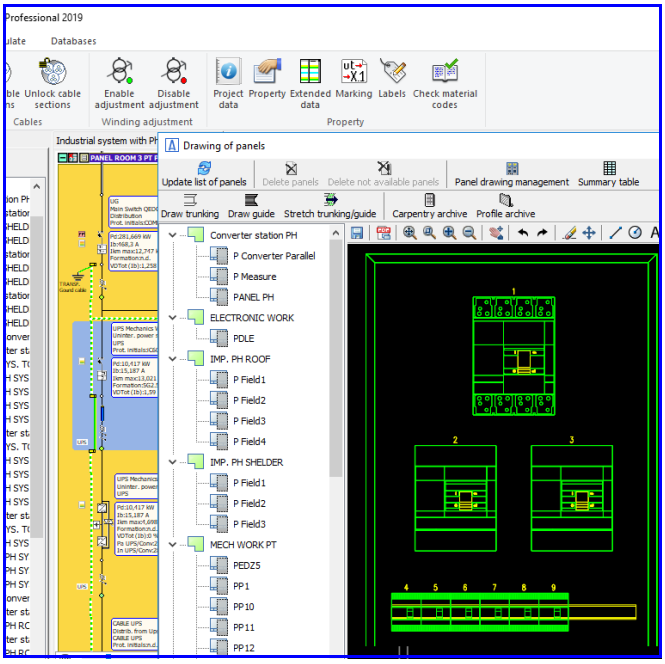


For the verification of the primary side fault of a medium voltage transformer, Ampère calculates the values of the total earth voltage in the user in question given by all the earth fault current that passes on the user's sink, as in the case of cabins powered by overhead lines without a grounded guard line.

The new Unit status window in Ampère 2019 displays the contact voltage provided by the IEC 61936-1 standard, ie the curve that indicates the voltage limit that an average person can withstand over time, and facilitates the graphic check of the total voltage UE ground in transformers: if it is lower than the UTP contact voltage, then the system is also protected for step voltages.

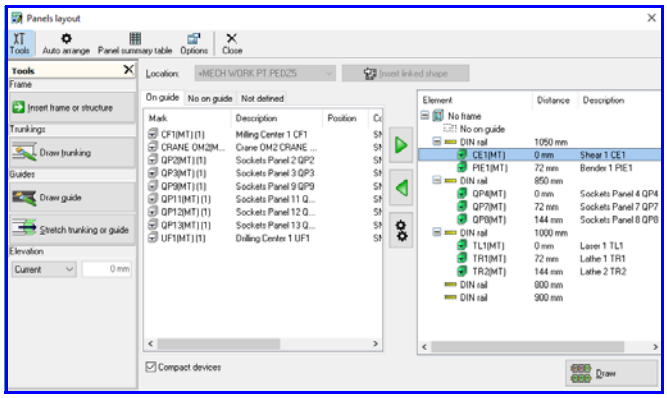
New EGCAD manager, to draw the framework carpentries, with the placement of devices (boxed or modular), without the need for external CAD resources, and save on .dwg file

The new instrument allows the representation of the frame fronts referring to the electrical grid frames calculated in Ampère. All operations take place in an interface within Ampère where a multi-sheet diagram and the tools of a dedicated CAD environment are available.
The built multi-sheet is standard Electro Graphics type, and it can be elaborated in CADelet, Smart, Eplus, iDEA; you can choose the configuration set that determines the sheet title block and squaring block.
The drawing window presents the list of the panels defined in the Ampère project's electricity grid, divided by area: each one panel refers to one sheet in which to draw the panel carpentry and other elements.



All the necessary tools for the drawing of the panel are available: with the choice in the Carpentry archive of the structure or frame of the cabinet or cabinet, the block of the frame and of the other elements that make up the wardrobe or cabinet is proposed (door , panels, accessories, ...) according to the pre-established compatibility in the database. Also for the drawing of guides and the trunkings, simply select the model from the databse and quickly place the pieces on the carpentry.

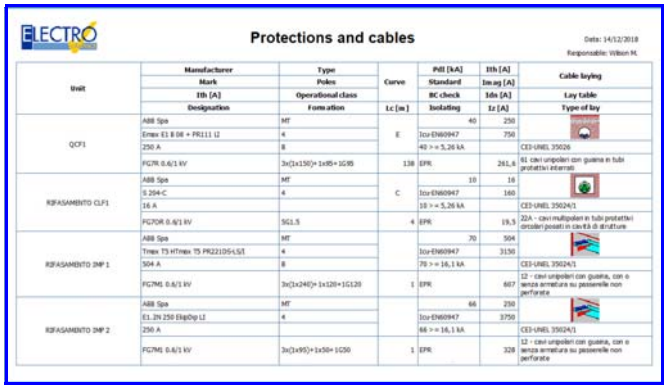
The modular devices are automatically arranged on the DIN guides according to the assisted composition of the panel. Others devices can be placed directly on the panel frame carpentry.



A summary table of the inserted devices can finally be attached to the layout drawing.
The drawing is saved as AutoCAD® drawing file (DWG format) and can be published in PDF format.

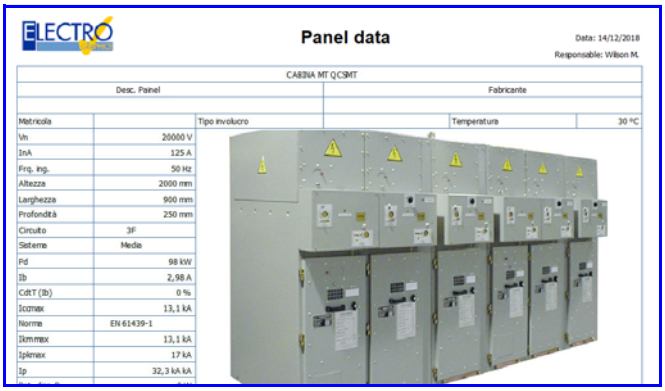
New tool for printing technical attachments, with customizable templates

The tool for the composition of the printouts of technical documents has been deeply updated and improved introducing the possibility to customize the printing models or to create new ones.
The customization of the models is probably the most interesting news, as well as the possibility to print multiple documents queued, to improve the selection of units to be included in prints with multiple filters by Zone and Panel. The setup of preferences is now simplified and configurations are automaticaly saved for each type of document.



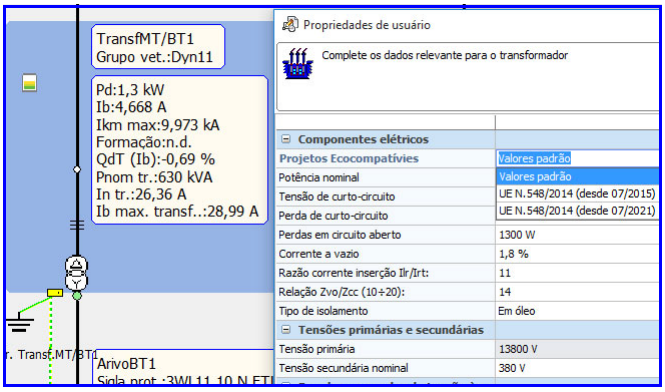
Template customization is a powerful tool for quickly creating printouts with the information and graphic features you need. For the creation or modification of an Ampère document template, you can use any spreadsheet editor that saves files in .XLS format (Excel file version 97-2003). The spreadsheet, widely known as a working tool, allows a total customization of the prints.

The arrangement of labels in the cells will result in a totally customizable print layout.



Environmentally friendly transformers, according to EU regulation n.548 / 2014

The EU Regulation N.548 / 2014 establishes the (mandatory) requirements for eco-design for electrical transformers with a minimum power of 1 kVA used in electricity transmission and distribution networks. It indicates the maximum load and empty losses that must be respected by the various types of transformers. The regulation provides constructive constraints for builders allowing a progressive path, with two steps depending on the time (July 2015 and July 2021) with decreasing dissipated power values.



The choice of transformers can now be guided by Ampère just defining which family the transformer belongs to. In addition to the 'standard' type, others transformers can now be configured to meet the new eco-compatible requirements according to EU Regulation N.548/2014. In the machine data it is now possible to specify the nominal power and dissipated power values according to EU N.548/2014 with specification 07/2015 and 07/2021.

Management of units with single-pole device combinations for the protection of single-phase lines, realized with the sharing of three-phase and PE common conduit

You can now assign 1P unipolar devices to 3F+N or 2F+N units, and manage multiphase systems with neutral pole with independent device.

During the selection of protection, Ampère accepts a unipolar protection and automatically assigns one item to each phase. The neutral is not protected, while the correct counting of the devices is carried out for printing and data exports.

Increase of calculation speed in network processing, with improvements of up to 200% in the calculation of faults

It is now possible to set the Ampère calculation mode to take advantage of the increased CPU speed when available. With the new Multi Thread option the calculation program exploits the processors by making them work in parallel, increasing the calculation performance. In particular, optimization takes place in the calculation of short-circuit failures, faults in indirect contacts, voltage drops.
The 2019 version sees increased speed also for access to the database, from which it derives a further increase in the speed of use of Ampère in the modification of data, the calculation and verification of the electricity grid. The increase in speed can be noticed particularly by using the shared files on the network with access from multiple locations.

The value of Delta Ib can be set for each individual unit

The Delta Ib value, percentage increase in the operating current for the nominal current calculation, can now be set for each unit. In the Properties window, on the Rules and global constants tab, you must enable the For each user option, positioned after the Global percentage increase value. In the unit data editing window, you will find the Electrical details tab, in which you can set the desired value.

New graphics signals according to the voltage drop and the overload currents with respect to Iz or In

The connection points between units now are green, olive, yellow, orange or red, depending on the voltage drop Cdt Ib Total.
To the left of the distribution type units, an icon represents bands of green, olive, yellow, orange, red, the overload with respect to the cable Iz or to the protection In, considering the heaviest of the two.
These signals can be enabled or disables on the Display options in the Ampère Properties window.

Extension and updating of the device databse

New series for all types of devices have been added to the Ampère database.

ABB
- Series MO 132
- Series Tmax XT, Tmax XT1, Tmax XT2

ASHIDA ELECTRONICS
- Series ADR

BTICINO
- Series BTDIN
- Series BTDIN D

- Series BTDIN 100, BTDIN 60, BTDIN RS

EATON
- All series LV

HAGER
- All series LV

LEGRAND
- Series C, NH
- Series C/CT, C/CTX, SP
- Series MPX3 32H, MPX3 32S

ITALWEBER
- Series FMT

SAREL
- Series IM6P, IM6P-TF, IM6S, IM6S-TD, IM6S-TF, WL

SCHNEIDER ELECTRIC
- Series MTZ1, MTZ2, MTZ3
- Series MICROLOGIXC X
- Series IM, IMB,IMC,IMP

SIEMENS
- Series 5TT3-0Y

EGlink - BIM data exchange

Compatibility with Revit 2019

EGlink 2019 is now compatible with Revit MEP 2016/ 2017, Revit 2018 and Revit 2019.

Compact representation of cable units with the possibility of distinguishing between concentrated, barycentric and distributed loads

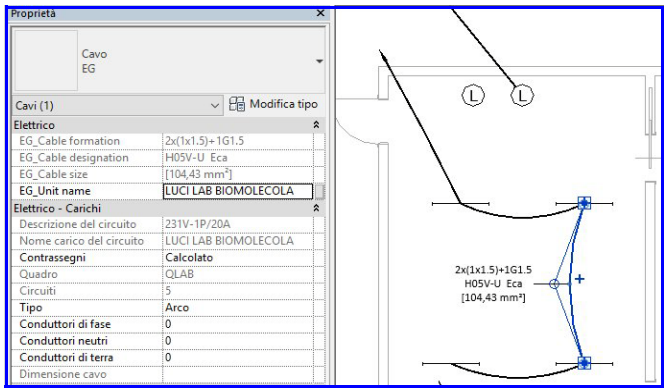
EGlink 2019 allows you to choose between two possible ways of representing electrical power circuits: compact and extended. This option determines the way in which the electrical power circuits detected in the Revit project are interpreted and represented in the Revit user tree first and in the related Ampère files then.
In the extended representation mode each terminal element (load) detected is represented as a single user, ie there is always a one-to-one correspondence between the single Revit element and the related Ampère user; this mode is suitable for detailed but not very extensive electricity networks.
For projects of considerable size, with a particularly extensive mesh, it is useful to apply a compact representation mode, in which for circuits with terminal loads connected downstream it is possible to choose between the following options:

- Circuit with concentrated load
- Circuit with distributed load
- Circuit with barycentric load

The representation of the distribution circuits, in both modes, can be of the normal type or upright.

Estimated cable size starting from Ampère data and saving in Revit model

EGlink 2019 provides an estimate of cable size starting from Ampere user data related to the Revit type of circuit type. This data can be displayed directly in the Revit model in the parameters related to the project cables (user name, training, designation and cable size).
It is also possible to create customized labels and display the estimate of the hollow space in the project annotations.



Definition of functions and functional areas for the division of Revit model elements into multiple work files

In projects of considerable size, it may be necessary to distinguish several functional zones within the Ampère file itself and to organize the Revit model users in several project files.
As a solution to this requirement, EGlink 2019 introduces the concept of function and functional zone. The function represents the aggregation criterion of a certain number of electrical elements that will be processed and dimensioned within the same Ampère project file.
Within the same project file, the designer can also define multiple functional zones.
The definition of functions and zones allows the operator to filter the elements of the Revit project by function and functional area.

Management of several Ampère project files related to the Revit project with management possibilities in multi-project mode in Ampère

EGlink 2019 allows you to manage multiple Ampère project files related to the same Revit project by defining multiple functions, one for each related Ampère file. After selecting the Ampère project, you can take advantage of all the EGlink features to edit, update, rework the related projects and maintain bidirectional synchronization between the Revit project and all associated Ampère project files. The Functions drop-down list on the toolbar allows you to quickly switch from one project file to another.

Introduced search filters in the Revit units tree by name, panel and areas

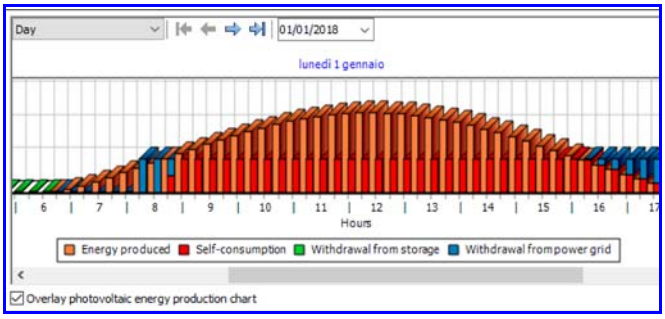
To simplify the work in the EGlink interface, there are now useful filters for name, panel and area that allow users to quickly find the units.

Solergo - Photovoltaic engineering

Energy analysis of the system at 15 minute intervals with possible use of consumption data provided by distributors on .xls file

Solergo 2019 introduces the possibility to set the accuracy of the analysis calculations of the production of the planned photovoltaic plant, of the consumption of the system and the relative economic evaluation.
By default Solergo calculates electricity flows with hourly accuracy, but now a more detailed calculation can be triggered which analyzes the values at 15-minute intervals.
The energy and economic analysis performed with quarter-hour precision can be more precise in the following conditions:

- presence of electrical loads defined with precision in the quarter of an hour, such as consumption profiles supplied directly by the electric distributors;
- use of small storage systems. In this case, short discharge / charge cycles can be simulated more precisely by this time of analysis.



Like the print reports, the daily chart of the energy analysis with precision in the quarter of an hour shows the trend of the energy produced, absorbed and self-consumed, detailing four values for each hour.

Further development of optimizers for parallel module management

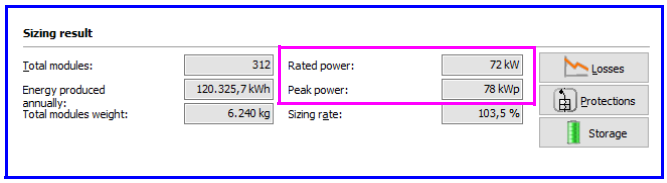
Solergo 2019 allows to check further configurations of connection to power optimizers:

- one optimizer for photovoltaic module;
- one optimizer every two modules in series;
- one optimizer every two modules in parallel (versions with double input for parallel connection of two modules).

In the process of configuring a photovoltaic system with Solergo, it is possible to choose the use of power optimizers in the Components page, after choosing the photovoltaic module. The configurations that meet the electrical checks are proposed in the drop-down list that is activated after selecting the Use power optimizer check box.

Updates according to new standards

The nominal power of the system is now considered equal to the maximum active power that can be supplied; so, it is limited by the nominal power of the inverter if it is lower than the sum of the STC power of the modules.
With reference to this, the nominal power and peak power are now specified.



Importing monthly loads profile in the Bi-Time or Tri-Time mode

With the Import monthly / diary load profile function it is possible to set the consumption of each month of a standard year, detailing the components in the bands defined by the tariff applied to the system (Bi-Time or Tri-Time mode).

Calculation of the total weight of the modules

The calculation of the total weight of the modules it is now available on the components sizing results. A special label can be used to report the data also in custom reports.

More details on string junction boxes in the single wire diagram

Each line exiting the string junction boxes present in the plant layout is represented by a separate single-line connection.

Automatic insertion of markers for microinverters in plant layout

In case of use of microinverters it is possible to insert the inverter markers automatically, in correspondence to the modules or strings in the layout of the plant.

Special configurations for systems with microinverters

In systems with microinverters, cable calculation, device estimation and connection diagram design can be verified by defining the number of inverters to be connected in parallel, rather than deducing the connection situation data present in the layout of the plant.

Bank financing with pre-amortization

In the case of a bank financing, it is possible to set a number of pre-amortization installments included in the duration of the loan. The fixed installments will be calculated over the period of the loan, after deducting the installments of the pre-amortization period.

Sharing of database packages

A new feature allows sharing technical information of materials between pc stations or Electro Graphics products of different versions.

A Electro Graphics EGZ database package (file with .egz extension) contains material data and technical data specific to the type of material, which may include electrical data, shapes, images, associated documents. EGZ packages will be published by Electro Graphics and made available for installation using the new EG Data Exchange tool. An EGZ package can also be exported from your Material database using the Export database package function, available in the materials archive window. And new EGZ packages can be imported directly into your Maerial database using the Import database package function.

Extension and updating of the module and inverter databases

For all the types of devices that can be used in a photovoltaic system, new series have been integrated into the Solergo database.

Photovoltaic module

A2PEAK
- Series PEAK ON P3-235-60, PEAK ON P230-60, PEAK ON P130-36

ALEO SOLAR
- Series P18 250-265W, P19 290-300W, S18 250-265W, S25 235-245W, S59 HE 300-310W, S75 230-240W,
S79 HE 295-305W, S79 sol 290-300W, Elegante 190W

ALFASOLAR
- Series ASE36M, ASE48M, ASE60M, ASE72M, ASE36P, ASE60P

ALTIUS PHOTOVOLTAIC
- Series AFM-60-260, AFM-72-310, AFP-60-250, AFP-72-300

PERLIGHT SOLAR
- Series PLM-150M-36, PLM-150P-36, PLM-200M-72, PLM-250M-54, PLM-250M-60, PLM-250MA-60, PLM-250MB-60, PLM-260P-60, PLM-260P-60DG, PLM-260PB-60, PLM-270M-96, PLM-285P-66, PLM-310M-72, PLM-310P-72, PLM-350M-84, PLM-350P-84

REC SOLAR AS
- Series Peak Energy, Peak Energy 72, Twinpeak, TwinPeak 2, TwinPeak 2 BLK2, TwinPeak 2S 72, TwinPeak 72

MERLIN SOLAR
- Series BR72, FX24L, FX36L, FX36S, GX36S

SUNPOWER
- Series P17

Inverter

ATERSA
- Series BCR

B&B POWER
- Series Solar Hybrid, Solar Off-Grid

KACO ENERGY
- Series Blueplanet

MORNINGSTAR
- Series SunSine

OUTBACK POWER SYSTEM
- Series GFX, OBX,FXR,VFXR

PHOCOS
- Series SI

STECA
- Series AJ, PLI, Solarix PI, Solarix PLI,Xtender

VICTRON ENERGY
- Series Multiplus, Phoenix

Charge regulator

B&B POWER
- Series Solar Charger

EPSOLAR
- Series EPIPDB-COM, eTRACER AD, eTRACER BND, iTRACER AD, LandStar, LandStar BPD, LandStar EPD, TRACER BN, TRACER BP, TRACER CN, LS-BP, LS-E, LS-EU, ViewStar AU

PHOCOS
- Series CIS-MPPT, CIS-N-LED Seriess, CMLmppt, CMLsolid, CMLup, CXNsolid, CXNup 2B, CXup Seriess, ECO, Ecoterm, ECO-T-MPPT, MPPT 100-40, MPPTsolid

STECA
- Series Solarix PLI

VICTRON ENERGY
- Series BlueSolar Charge Controller, BlueSolar PWM-DUO, BlueSolar PWM-Light, PWM-PRO, SmartSolar Charge Controller

WESTERN
- Series DUAL B, MPPT, PWM, SBP-S, SPC

OUTBACK POWER SYSTEM
- Series FLEXmax, FLEXmax Extreme

Optimizers for photovoltaic systems

HUAWEI
- Series SUN2000P

SOLAREDGE
- Series P370, P505, P600, P700, P800s, P800p