



Importing project files defined in CAD, with acquisition of units data.

### Harmonic profile (\*)

Setup of harmonic profile on load, UPS and inverter.

Transfer down-up of the harmonic content, considering the effect of transformer and UPS. Calculation of the distortion factor THD. Check lines, protection and panels according to the harmonic profile.

### Grid setup

Management of lines, or parts of the grid, in parallel (\*). Ring grid.

Busbars or cables shared by more units.

Mesh of grid by drag & drop units.

Inserting parts of grid, previously meshed in CAD.

Copy-paste of one or more unit or whole panels or zones.

Importing networks already processed as previous projects.

Management of blocked and unmodifiable panels. Calculation of current and power of the grid according to the vector method.

Automatic propagation of power at various levels of the distribution boards, use and transfer of the units or downstream panels.

"Multiproject" mode to share a job with other operators or for complex grid (\*).

Highlight of the grounding line grid.

### Grid currents balancing

Routine to solve the grid currents balancing problem.

Automatic setting of single-phase and two-phases load connections in order to obtain a minimum neutral currents overall the power grid.

Panels and sub-panels can be balanced one by one or all together; a result printout lists all the phases to be changed in the project.

### Power factor correction

Automatic power factor correction of the grid in order to obtain the required cos-φ, in global mode, for single loads or for a single distribution board.

The software calculates the required capacitor and let the operator to choose it from the Capacitors database.

Determination of the right protection to install in the compensation unit.

### LV cable sizing

Automatic section calculation for neutral and protective conductors and section reduction according to the chosen standard.

Sizing of protective conductor performed according to IEC 60909.

Compliance with EU regulation no. 305/11 for the use of construction products (CPR cables). Cables with flow rate stored in the archive.

Possibility to set and lock section and formation of any cable in the system.

Calculation of current eligible, Joule integral, working temperature, impedance and voltage drop lines.

Optimization of power failures in order not to exceed the maximum expected load drop com-

### Generality

Job order management, network projects sharing, backup and recovery.

EG Cloud is a service for saving and sharing projects efficiently and securely.

Management of user profiles for conditional access to the common database and library.

Management of interface styles (dark theme) and HDPI screens.

### Power supply

Power supply LV without power limit.

Definition of supply points with the electrical parameters of the cutting section.

Power supply HV or MV with isolated, compensated or on the grounded neutral conductor (\*).

Use of HV/MV and MV/LV transformers with definable data. Transformers can be connected in parallel in any number (\*).

Management of TN, TT and IT electrical system.

### Generators and UPS (\*)

Insertion of synchronous or asynchronous generators and UPS. They can be located in any point of the grid, with different operating state (stand-by or running).

It is possible to set the nominal values of a device or to choose a device marked from a large archive available in the Devices database.

Capability curve for generator, inverter or for the system.

### Grounding system

Definition of the grounding system with ground rod, collectors, impedances and connection elements. Choosing the type of terrain and calculation of earth resistance.

Setup of the ground collectors in the grid.

### Panels setup

Wizard for panel setup with assignment of protections, carpentry and data for the panel over-

temperature check-up.

Drawing of panels blocks diagram.

Setup and calculation of bars inside the switchboard according to CEI UNEL 01433.

### Units setup

Unit denomination and assignment of zone and panel. Automatic marking of units according to customizable profiles.

Assigning units characteristics: power consumption, cos-φ, length, proximity and laying conditions, ambient temperature, maximum voltage drop and type of conduit.

Management of transformer LV/LV.

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

Use of connectors between any transformers.

Setup of cable lines, busbars or lines with known impedance. Setup of the maximum operating temperature on cables.

Methods of distribution and connection of the protective conductor.

Management of the neutral conductor and PE common to more units.

Method of laying in accordance with tables reported in CEI-UNEL 35024/1 - 35024/2 - 35026, IEC 364 (1983), IEC 60364-5-52, IEC 448 and IEC 61892-4.

Management of more laying for each units.

Various types of loads are handled: generic, lighting, motor, capacitive.

Synchronous or asynchronous motor with startup mode setup: direct, star-delta or with soft starter or inverter.

Setup of loads distributed on power uprights (such as lines for public lighting).

Setup of preferential loads (\*).

Setup of generic auxiliary units.

Setup of accessory elements and related functional diagrams.

Management of a typical user profile archive.

Tabular multiple editing of units.

### Integrations

CADElet Impianti, Eplus: electrical system engineering.

CADElet Schemi, iDEA: wiring diagrams for industrial automation.

CADElet Professional: electrical system and wiring diagrams engineering.



pared to the supply point. Optimization of voltage drops in order not to exceed the maximum expected drop on the load. Check of neutral currents on three-phase grid in result of unbalanced loads.

### Dimensioning of busbars

Customizable busbar database with more than 1.800 bars by leading manufacturers (Graziadio, Moeller Electric, Pogliano, Siemens, Telemecanique and Zucchini) already available and extendable by the designer.

Check of overload, short circuit and short-time pulse current.

### Power loss in the grid

Optimization of the cable operating temperature. Calculation of the thermal dissipation of the grid and related operating costs.

### Protection devices

Protections devices with all the electrical, thermal and size characteristics; action chart, limitation and temperature derating in temperature and frequency chart are included.

Management of regulation steps on currents and times with relative tolerances.

More than 93,000 devices made by the leading manufacturers on the market: ABB, AEG, BTicino, Chint, Dossena, Eaton, General Electric, Gewiss, Hager Lume, Italweber, Legrand, Moeller Electric, Sarel, Schneider Electric, Siemens and Thytronic.

Selectivity and backup tables allows to set the coordination between protections (\*).

For electric motor protection a database with specifically coordinated devices, taken from manufacturers specification, is available (\*). Database of coordinated devices and soft starter or inverter VFD for motor driving.

Management of coupled protection, motor starter, fuse holder, switch disconnector and switch disconnector with fuse. Management of switches with electronic disconnector (\*).

Time-current characteristic curve (to checking selectivity) and let-through Joule energy curve (for checking short circuit fault currents) are provided for each device.

New devices can be defined by the operator inserting the required electric values and the protection curves acquired from bitmap image.

Combined protections with circuit-breaker plus releaser (\*).

Association of CT with definition of the insertion point of indirect CT. (\*)

### Lines and protections check

Management of coordination between conductors and protection devices.

Protection device assignment guided by the software that filters the protection database in order to propose the best solution for every unit. Automatic protection assignment according to profiles set by the operator, that includes nominal current ranges, manufacturer, series, intervention curve, switching power (according to EN 60947 or EN 60898 standard), price range. Verification of the maximum voltage drop on motor start.

Coordination of the magnetic characteristics

with the inrush current of a motor.

Setup of motor coordination and its starting system (\*).

Selectivity check on several levels by comparing the action curves of the protections or by the manufacturer's selectivity tables.

Adjustment of the protections according to customizable steps, with representation of the release bands (\*).

### Fault conditions

Calculation of faults by sequential phase analysis according to IEC 60909 and Cenelec R064 standards, with fault model near (\*) or far from the generator, in a permanent and transitory state. Calculation of symmetrical and homopolar short circuit currents, short circuit impedances and fault ring impedances, considering the contribution of motors and generators. Calculation of faults according to IEC 61363-1 for naval plants.

Calculation of short-circuit impedance  $Z_k$  and  $Z_o'$  for TT, TN or IT systems, and impedance on fault loop for TN or IT systems, at any point in the system.

Verification of breaking and closing capacity and protection against indirect contact and short-circuit.

Comparison between the let-through Joule energy curve of the protection and the Joule integral of the cable for phase, neutral or ground conductor.

### Electrical panels

Calculation of panel overtemperature according to CEI 17-43 and CEI 23-51 standards.

Arc Flash analysis according to IEEE 1584-2018 standard and printing of electric arc risk labels.

Drawing of the panel layout, with placement of the carpentries and used devices (boxed or modular), without the need for external CAD resources, and saving on .dwg files (\*).

### Calculation reports

Introductory report with standard reference and method of calculation.

Table report about cables and busbars sizing, protections choices, fault conditions in different points of the grid, presence of motors and power supply conditions.

Customization of the printing model for the tabular documents.

Extended report for each units that fully documents all load characteristics, cables sizing, parameters of fault-line and the chosen protection device.

Chart of the let-through energy curve of protec-

State	Manufacturer	Mark	Typology	Mode	Poles	Rated current	Rated voltage	Reg.Ter.	Reg.M.	Reg.Dif.
	ABB	Emax E2 8 MS			3	1.600 A	690 V			
	ABB	Emax E2 8 MS			3	2.000 A	690 V			
	ABB	Emax E2 8 MS			4	1.600 A	690 V			
	ABB	Emax E2 8 MS			4	2.000 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			3	320 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			3	400 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			3	800 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			3	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			4	250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			4	400 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			4	800 A	690 V			
	ABB	Emax E2 L 12 + PR111 LI			4	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LSI			3	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LSI			4	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LSI			4	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR111 LSI			4	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR112 LSI			3	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR112 LSI			4	1.250 A	690 V			
	ABB	Emax E2 L 12 + PR112 LSI			4	1.250 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			3	400 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			3	800 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			3	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			4	400 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			4	800 A	690 V			
	ABB	Emax E2 L 16 + PR111 LI			4	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR111 LSI			3	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR111 LSI			4	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR111 LSI			4	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR112 LSI			3	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR112 LSI			4	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR112 LSI			4	1.600 A	690 V			
	ABB	Emax E2 L 16 + PR112 LSI			4	1.600 A	690 V			
	ABB	Emax E2 N 12 + PR111 LI			3	250 A	690 V			
	ABB	Emax E2 N 12 + PR111 LI			3	400 A	690 V			
	ABB	Emax E2 N 12 + PR111 LI			3	800 A	690 V			
	ABB	Emax E2 N 12 + PR111 LI			3	1.250 A	690 V			
	ABB	Emax E2 N 12 + PR111 LI			4	250 A	690 V			

tion related with the Joule integral of cable. Chart of the comparative curves of selectivity and protection calibration data (\*).

### Wiring diagrams

Automatic generation of single-line and multi-line diagrams as DWG and PDF.

Functional diagrams related to auxiliary elements of the devices can be included, also.

Produced DWG is compatible with CAdelet, Eplus and iDEA.

### Printouts

All reports can be printed or saved inside the project folder.

Generation or concatenation of all reports in a single PDF file in order to obtain the general document report of the project.

Saving reports as XLS, RTF, TXT, WMF, HTML and CSV.

### Ampère Mobile

Application for iOS or Android smartphone or tablet to view, edit and add note on the grid project.

Interactive exchange of project files with Ampère via email.

### Interoperability

Data exchange for the automatic drawing of the single-line diagram or the distribution panels radial scheme and their layout in CAdelet, Eplus and iDEA.

Export estimation data to Sigma (optional module, Italian only).

Parametric exportation of project data to Microsoft EXCEL and importation.

(\*) not available on Ampere Light



**System requirements:** Computer with 3 GHz or higher processor. At least 8 GB RAM. Hard disk with at least 6 GB free space. 1024x768 screen resolution. USB port, mouse, printer or plotter. 64-bit O.S. Windows 10 or 11.