

Software for electrical and photovoltaic engineering

CADelet, iDEA, Eplus - Electrical CAD

Compatibility with AutoCAD

The CADelet line products are now compatible with AutoCAD products from version 2010 to 2021 at 32 bit or 64 bit.

iDEA and Eplus with AutoCAD OEM 2020 engine

Among the main innovations of the 2021 version of iDEA and Eplus 64-bit is the transition from the 2018 to 2020 version of the Autodesk AutoCAD® OEM engine which the two electrical CADs are based on.



Save project WorkSet

For the needs of using PDM software it is now possible to manage the electrical automation project, as a single document file, which can be included in the backup managed by a server and can be opened with the classic double click, monitoring the time of use by an operator.

QR code in drawing and documents

The QR code of the company associated with the project, or the materials used, can be inserted in the drawing and in material lists.



Power flow analysis on the wiring diagram

The analysis of the power flows is a function of CADelet / iDEA / Eplus software which allows to determine the power and current values required in certain points of the wiring diagram in order to allow the correct sizing of disconnecting and protection elements, power supply groups, generators, transformers and converters. The analysis is aimed at two functions.

- Calculate the electrical power (active and apparent) absorbed by the loads connected to a component in the wiring diagram. The value of the absorbed power is acquired from the technical data of the material item assigned to the symbol in the wiring diagram.
- Calculate the current values on the component output lines. This second analysis depends on the definition of the phases on the symbol pins.

Component	Link	Phases	Voltage[V]	Power[kW]	Power[kVA]	I1[A]	I2[A]	I3[A]
QA12	2F	L2,L3	400	1	1,25	-	3,1	3,1
QA12	2F	L1,L2	400	1	1,25	3,1	3,1	-
TA1	3F+N	L1,L2,L3,N	400	1	1,25	1,8	1,8	1,8
TA1	F+N	L1,N	231	1	1,25	5,4	-	-
TA2	[N.D.]		231	0,93				
TB1	Continua		24	0,93	0,93	38,8	-	-

Component	Link	Phases	Voltage[V]	Power[kW]	Power[kVA]	I1[A]	I2[A]	I3[A]
MA7	F+N	L1,N	231	1	1,25	5,4	-	-
MAB	F+N	L1,N	400					

Message
 Voltage not correct in MAB: 400/231 V

Multilanguage Pdf

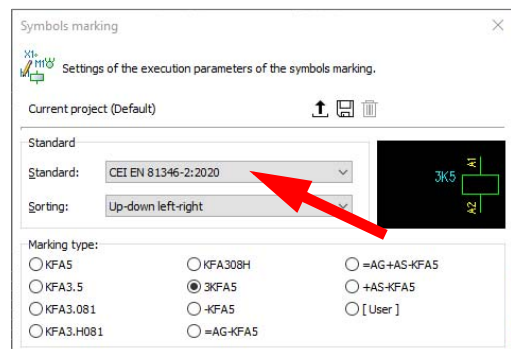
The Save multi-sheet to PDF function allows you to obtain the PDF file of the multi-sheet wiring diagram with different customizations given by the many options and preferences available.



With the new version, in particular, it is possible to generate a PDF with texts in multiple languages. In order to take advantage of this functionality it is necessary to have translated the diagram in Multilayer mode.

Marking of symbols according to EN 81346-2:2020

It is now possible to specify, for each symbol in the library, the marking family according to CEI EN 81346-2: 2020 in force from 01/01/2020, in addition to the previous CEI EN 81346-2: 2012.



The new standard, in addition to modifying or replacing some definition classes provided by the previous ver-

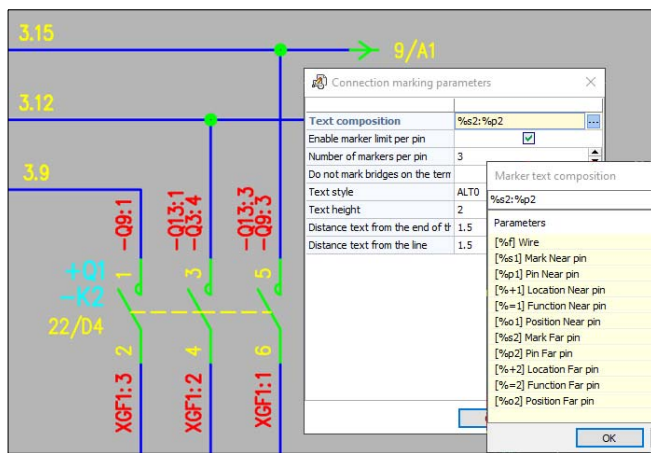
sion, provides for a third subclass level, with three characters, further detailing the identification of symbols in the wiring diagram.

To set the family, similar to the previous standard, access the symbol setup window in the Symbols library and select the family corresponding to the "Family (CEI EN 81346-2: 2020)" value.

Connection marking

The new Marking Connected Wires feature allows you to write a variety of connection information near the symbol pins.

The information shown can be chosen, among those available, using the Connection marking parameters function, where it is also possible to modify the graphic properties of the marking.



Wires marking

The new function Insert wire markers allows you to insert in any point of a wire, an attribute block showing the information of the wire at the insertion point. The wire information that is drawn in the presence of the relative attributes are: Wire code, Section, Color, Designation, List of connections crossing the selected point.

New features in Plc management

- Rack duplication with the copy of the boards connected to it.
- Shift descriptions, with choice of which data to move between Description 1, Description 2, Notes, User field 1, User field 2, Wire.
- Automatic choice of the operand block, in distributed mode tracking.
- The numbering of the operands can now be customized for each card defined in the Plc Archive.

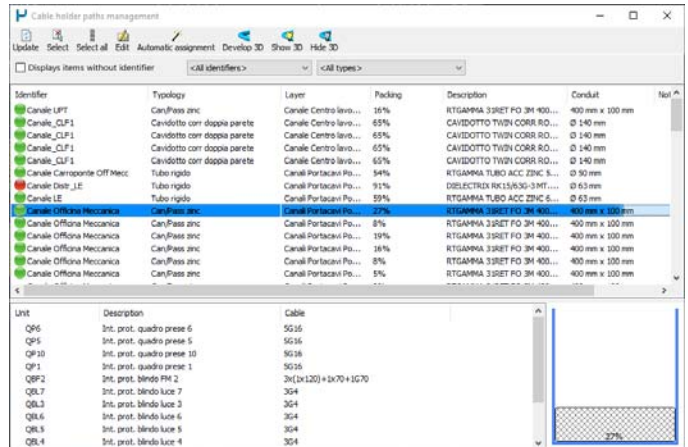
Management of cable holder path

The new management window for cable holder path allows you to obtain an overview of the status of the conduits of a planimetric drawing.

Management of cable holder path is the tool to be used after the drawing of the conduits and the insertion of the units cables processed with the electrical grid calculation tools.

The assignment of automatic sections guides the designer in selecting the appropriate cable holder based on the situation. It is also possible:

- check the filling status of the sections of the conduits;
- modify the information assigned to the conduits on all the straight elements of the selected sections;
- start the 3D development of the conduits and the rendering view.

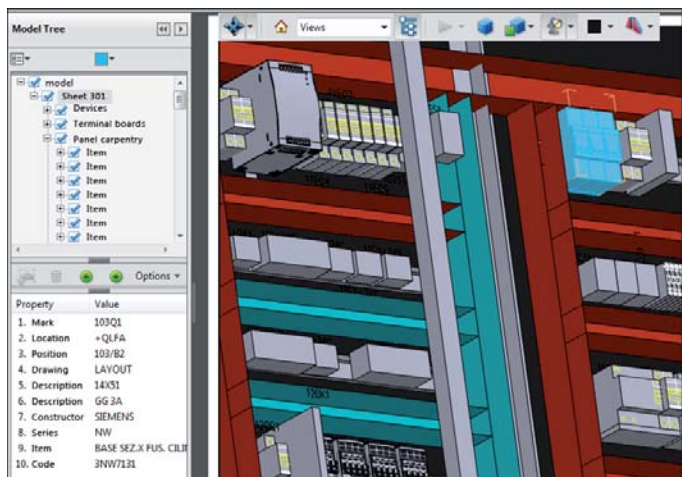


PDF 3D

A 3D PDF is a pdf file that incorporates one or more solid graphics templates that can be viewed with the Adobe PDF Reader © application. The 3D model represents, within the pdf, an active content as it is possible to zoom, pan, rotate, change views and visual styles.

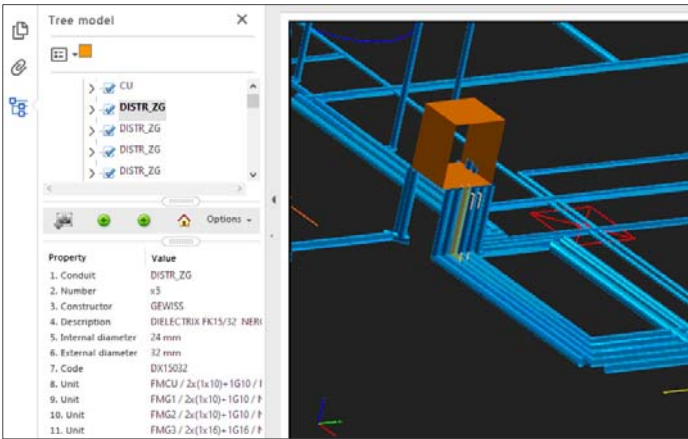
3D PDF for the representation of the panels layout

It is possible to produce a pdf file containing the 3D model of one or more sheets with panel layout. The exported 3D model represents all the objects that build the switchboard such as devices, terminal blocks, carpentry elements, including the identification and descriptive data of the material, where available.



3D PDF of the planimetric drawing

The Save 3D PDF function of the floor plan produces a PDF file with a 3D model of the drawing, with particular attention to the representation of the ducts in three-dimensional format. The published objects are grouped in the model tree, in nodes corresponding to the layer they belong to in the drawing.



Compositions of elements in fruit boxes

The Align boxes with the same elevation option is now also available; it is useful for compositions of several boxes arranged side by side. If the option is active, when a composition is inserted in the floor plan, the boxes that have the same elevation value are drawn side by side.



Insertion of units in the pre-established conduits

The insertion of the user cables in the conduits drawn in the plan is done with the electrical network management tools.

A new option allows to obtain detailed routing, specifying which cable holder sections to consider for the cables of certain units. For this purpose it is necessary to draw the conduits on distinct layers and specify the right layer in the units data.

New symbols legend

The new symbol legend shows the configuration window used for other tables, with the columns that can be sorted, deactivated, size and column settings and profiling.

Cablo - Wiring harness

Automatic panel routing

New options have been introduced to refine the resolution of routing in a panel layout, generated by the wiring diagram.

- 3D Routing (Consider Z elevation): allows you to consider any equipment not mounted on a DIN rail, whose pinout is located more back in the panel, than other elements.

- Consider passage on the edges: makes sure that the algorithm for resolving the wire passage mesh (routing) does not consider only the central axis of the cable trunking, but adds two passage axes near the edges to privilege the connection of the modules side by side, compared to modules on opposite sides of a cable trunking.

MOLEX connectors

It is now also possible to manage cable lugs and terminal contacts that can be specified with the MOLEX connectors type.

Tabula - Bill of materials

Printouts with QR codes

The printouts of the Tabula materials may contain the QR code deriving from the Web field compiled in the technical data sheet of the material item, which may represent the link to an online document containing technical or maintenance information for the item.

The new QR code label can be used in the customization of all printout templates. The new QR Code list printout is a new default template with the list of materials also identified by QR code.

QR code	Mark	Article description	Picture
[QR]	-51	PULSE MUSHROOM BUTTON RED	[Pic]
[QR]	-52	PULSE MUSHROOM BUTTON RED	[Pic]
[QR]	-58	PULSE FERRULE WIRE BUTTON BLACK	[Pic]
[QR]	-53	PULSE MUSHROOM BUTTON RED	[Pic]
[QR]	-55	PULSE FERRULE WIRE BUTTON BLACK	[Pic]
[QR]	-518	PULSE FERRULE WIRE BUTTON BLACK	[Pic]
[QR]	-519	PULSE FERRULE WIRE BUTTON BLACK	[Pic]

Documents assigned to material items

With the new version, further properties have been introduced.

- Article language: the descriptions of the articles in the list will be those assigned to the material items in the Articles archive according to the chosen language.
- Type of document: classification of the document based on use such as EMC Certificate, RoHS Certificate, Declaration of Conformity, Manual / Datasheet, or other.

Ampère line - Electrical grid calculation

VFD inverter start-up

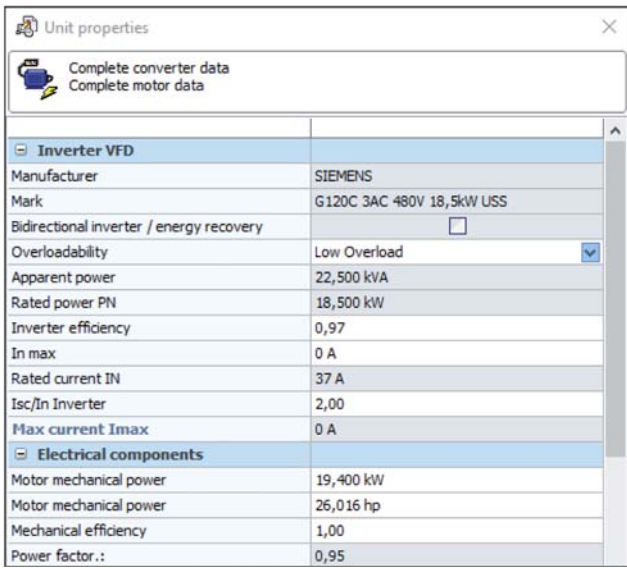
Inverters, also called frequency converters, are used where high performance is required for starting and controlling the speed of motors such as:

- applications with a high starting torque;

- speed control and system efficiency at reduced speeds in run mode;
- possibility of keeping the rotor at zero speed;
- continuous feedback for critical position control.

In Ampère, the starter is inserted in the same user as the motor, together with the general protection and the pipeline. The start-up is a software-managed AC/AC converter, defined as VFD inverter for motors, with properties dedicated to motor control.

By choosing a start-up from the Devices archive, Ampère detects any installation information: on the panel or on the machine.



Unit properties	
Complete converter data Complete motor data	
Inverter VFD	
Manufacturer	SIEMENS
Mark	G120C 3AC 480V 18,5kW USS
Bidirectional inverter / energy recovery	<input type="checkbox"/>
Overloadability	Low Overload
Apparent power	22,500 kVA
Rated power PN	18,500 kW
Inverter efficiency	0,97
In max	0 A
Rated current IN	37 A
Isc/In Inverter	2,00
Max current Imax	0 A
Electrical components	
Motor mechanical power	19,400 kW
Motor mechanical power	26,016 hp
Mechanical efficiency	1,00
Power factor.:	0,95

Laying tables IEC 61892-4 and IEC 60502-2

The second edition of the installation table IEC 61892-4 of 2019 is now available. Standard for fixed and mobile offshore installations, in low and medium voltage up to 30kV.

HEPR cables have been added to the IEC 60502-2 routing tables, which behave like EPRs.

Transformer with connection Dzn and Yzn11

For two-winding transformers, the vector groups Dzn and Yzn11 are now also available.

Once you have inserted a transformer unit with "3F" electrical circuit, in the unit Properties window, you can select the new types of connection.

Two-phase-Single-phase Transformer

They are single-phase transformers whose primary is connected to a 2F electrical circuit. The secondary must be set single-phase, to connect units with F + N circuit downstream.

Two-phase-Single-phase grid-connected inverter

The grid-connected converters can be connected to the line voltage, and have a 2F output circuit and an F+N input circuit.

Two-phase-Single-phase UPS

Double conversion UPSs can be connected to the phase-to-phase voltage, and have a 2F input electrical circuit and an F+N output electrical circuit.

The UPS Line Interactive can also be connected to two phases, but the output circuit must continue to be 2F. In general they must have the same input and output, so F+N / F+N or 2F / 2F.

Printouts

Ampère proposes new printing models for project documentation.

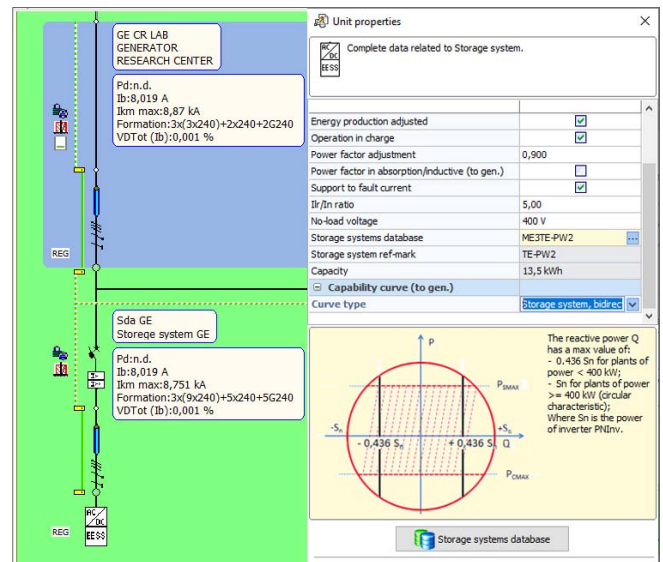
- Protections (curve) and Protections (manufacturer, curve): list of users with protection data and trip curve.
- Motors - Direct and Star / Delta.
- Motors - Soft starter.
- Motors - VFD Inverter.

Accumulation system (Ampère Pro)

These devices, normally present in parallel with photovoltaic or wind generators, can be inserted to compensate for periods of lack of energy production. However, they can be used as a normal reserve, increasing network security by being able to cope with energy gaps, similar to the UPSs seen previously.

The electrical model used by the program relates to electrochemical storage systems, having a capability given by the combination of the inverter curve (PNINV power circular) with that of the battery (defined as a rectangle with a height between PCMAX and PSMAX and a width equal to a -Qi + Qi of the inverter).

They can be connected both in alternating and direct current networks.

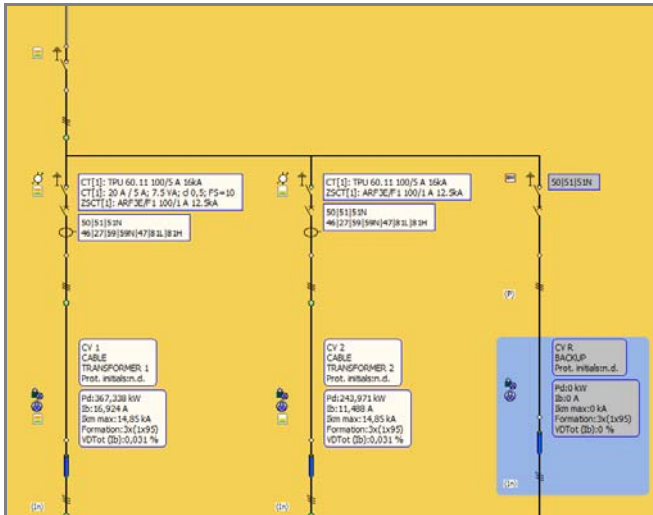


Unit properties	
Complete data related to Storage system.	
Energy production adjusted	<input checked="" type="checkbox"/>
Operation in charge	<input checked="" type="checkbox"/>
Power factor adjustment	0,900
Power factor in absorption/Inductive (to gen.)	<input type="checkbox"/>
Support to fault current	<input checked="" type="checkbox"/>
I _r /I _n ratio	5,00
No-load voltage	400 V
Storage systems database	ME3TE-PW2
Storage system ref-mark	TE-PW2
Capacity	13,5 kWh
Capability curve (to gen.)	Storage system_bidrec
Curve type	

The reactive power Q has a max value of: - 0,436 Sn for plants of power < 400 kW; - Sn for plants of power >= 400 kW (circular characteristic); Where Sn is the power of inverter PNInv.

MV/HV cells (Ampère Pro)

The MV / HV cells are switchboards containing the typical disconnection and protection devices of medium voltage systems. They have very standard configura-



tions and in limited numbers, with some peculiarities typical of medium voltage.

Ampère Professional proposes / filters these protections to facilitate their insertion and provide a dedicated graphic representation.

The choice of MV / HV cell also affects the method of choosing the protections: circuit-breakers with relays can only be inserted with the Insert circuit-breaker and Release relay commands.

The drawing of the single-line diagram has been updated with the blocks relating to the medium voltage cells. Therefore, the representation enriched with the symbology of the switch disconnectors, the symbology of the releases and also a title block dedicated to medium voltage users.

Protections according to Codes ANSI/IEEE C37.2

The relay type medium voltage electrical protections now allow the management of additional ANSI functions. These relays, used in the most important points of an electrical system, such as generators, transformers, substations, etc., possess controls and functions to protect and control the network. We can find controls for voltage, frequency, power, synchronism of the motors and more, named by a common coding that originates from the ANSI / IEEE C37.2 document.

These characteristics will be shown in the protections printouts, and in particular in the Calibrations printout, which is important for the final adjustment of the protections.

Neutral forming transformer

Now it is possible to insert the so-called "zigzag reactors", which provide an earth connection to the fault currents. In applications where neutral grounding is required (directly or through impedance), and the star point of the power transformer is not available for a connection, then the neutral forming transformer is used.

Extension of verifications to measurement CTs

The saturation checks have also been extended to the measurement CTs. Unlike what happens for protection CTs, saturation of the measuring transformer core is recommended in the case of high currents, in order to ensure the integrity of the instrumentation connected to the secondary.

Batteries, energy regulation

A new battery-related feature is Regulated Energy Production. If the battery is inserted in a grid with no power constraints, that is, it is not supplying any isolated loads, then it will supply the rated current of the battery, calculated with the formula:

$$I_n = k_u \cdot \frac{C_{10}}{10}$$

where the capacity at 10 hours and the utilization coefficient are important for fine-tuning the current fed into the grid.

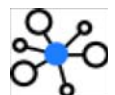
Multiproject calculation - Quick method

Ampère updates the entire Multiproject by calculating all the individual files in order in order to ensure the Load Flow of the power and the analysis of faults. The iterative method allows to reach an excellent final approximation of the electrical variables and to handle the resolution of grid with a large number of units.

It is recommended to use this option for projects that exceed a total number of 2000 users, divided into rows of approximately 1000 users each.

EGlink - Compatibility with Revit 2021

EGlink is now compatible with **Autodesk Revit MEP 2017** and **Autodesk Revit 2018, 2019, 2020, 2021**.



EGlink - New annotative labels

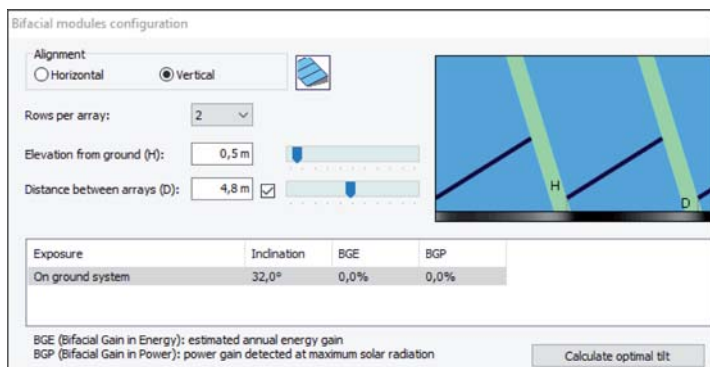
In order to report in the annotative labels on cable conduits and pipes more information about the routed units, the information Description and Panel have been added.

Solergo - Photovoltaic engineering

Management of bifacial photovoltaic modules

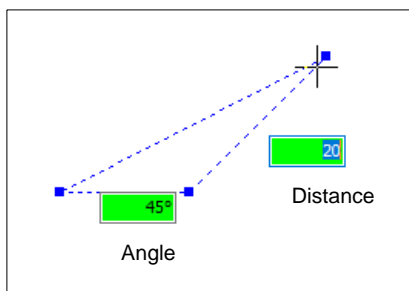
The bifacial or double-sided photovoltaic module is a particular type of panel that manages to generate energy from both sides of the photovoltaic cell, thus increasing energy production compared to a standard photovoltaic module.

To proceed with the sizing of a photovoltaic system with bifacial modules, it is necessary to estimate the double-sided gain of the system in advance, intended as an increase in the producibility of the modules due to solar radiation from the rear side. This value depends on several factors; the main ones are soil albedo, installation height, row spacing.



Drawing with dynamic input

In the design area of the plant layout, when it is required to specify a point or a distance, it is possible to enter from the keyboard, the distance and angle (polar offset) of the required point referred to the previous point.



Compare projects

Solergo simplifies the comparison of the economic return values calculated in different plant projects, and the reuse of the results.

Solergo generates an xls spreadsheet with all the amounts calculated, at the analysis end date, for several plant projects examined.

Projects comparison

Add Erase Create Close

Projects

	A	B	C
1		PV plant project A	PV plant project B
2		Hybrid system for Delimart shoppi	Hybrid system for Delimart shoppi
3		Analysis start date: 01/01/2018	Analysis start date: 01/01/2018
4		End of analysis date: 31/12/2037	End of analysis date: 31/12/2037
5	Energy produced:	2.225.152,2 kWh	1.478.855,9 kWh
6	Consumption savings:	2.690.966,15 €	2.606.036,06 €
7	Incentive:	0 €	0 €
8	Energy sale:	0 €	0 €
9	Active interest and other entries:	2.437.440,20 €	2.318.126,05 €
10	Expenses:	966.922,93 €	967.449,45 €
11	Cash flow:	4.161.483,42 €	3.956.712,66 €
12	Own amount:	185.138,22 €	185.138,22 €
13	Cumulative cash flow:	3.976.345,20 €	3.771.574,44 €
14	NPV:	850.657,69 €	799.902,64 €
15	Compound return rate:	16,84 %	16,55 %
16	IRR:	34,95 %	33,89 %
17	Repayment period (years):	4	5
18			

Print summary in documents

In a printout document, the table of contents shows the list of paragraphs with indication of the page number.

Customization of table of contents, header and footer in document templates

To change the insertion position, you can edit the desired document template.

Extension and updating of modules and inverters databases

The archives of photovoltaic modules and inverters have been expanded with thousands of new items.

System requirements

Operating system 32 or 64 bit required: Windows 7 SP1, Windows 8.1 or Windows 10.

CADelet is compatible with AutoCAD versions from 2010 to 2021.

Eplus and iDEA use the new 64-bit AutoCAD OEM 2020 engine and 32-bit AutoCAD OEM 2018.

For interface purposes between Ampère Professional and Revit, ELink is compatible with Revit versions 2017 to 2021.