



Control and Automation

AC500 - your PLC for solar systems

Change for more energy efficiency

Photovoltaic and thermosolar systems

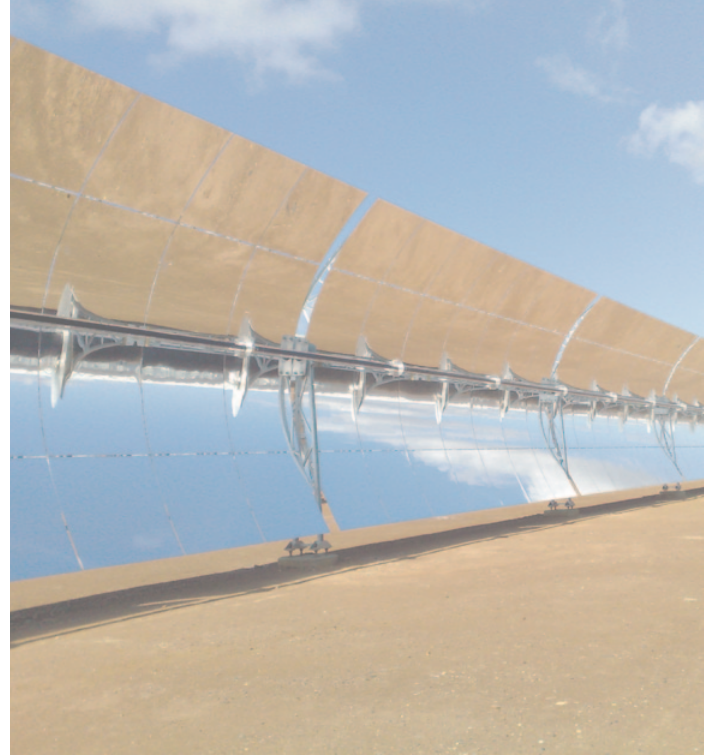
Those who are close to the sun are **more** successful

Today, the role of renewable energy sources is increasingly important given the growing scarcity of fossil fuel deposits and the pressing need to cut or eliminate CO₂ emissions. Over the next decade, renewables will be expected to meet more than 20% of the world's energy needs.



There is an increasing demand for photovoltaic systems

The use of PV systems to produce energy is spreading world-wide. Solar systems are easy to install, not very difficult to operate and useable almost anywhere that gets sunlight. Applications vary greatly: from small fixed systems for domestic use to solar parks with modules that follow the sun's path. Technological developments have kept pace with the growing demand for PV systems. Thanks to its wide range of products, ABB plays an effective and sustainable part in this phenomenon. The efficiency of solar-tracking PV systems makes them stand out particularly. Solar modules are mounted on a frame which moves in either one direction (horizontally) or two directions (horizontally and vertically).



Increased number of thermosolar plants in areas directly exposed to sunlight

Some governments have taken steps to boost the development of renewables including the promotion of thermosolar plants. This technology has shown that it can guarantee a high output and efficiency compared to traditional solutions, thereby resulting in growing interest from other countries. One of the basic requirements of a thermosolar plant is its ability to follow the position of the sun accurately, which is reflected in the plant's output. ABB solutions take all needs into account to offer their clients products and systems which are suited to their requirements.

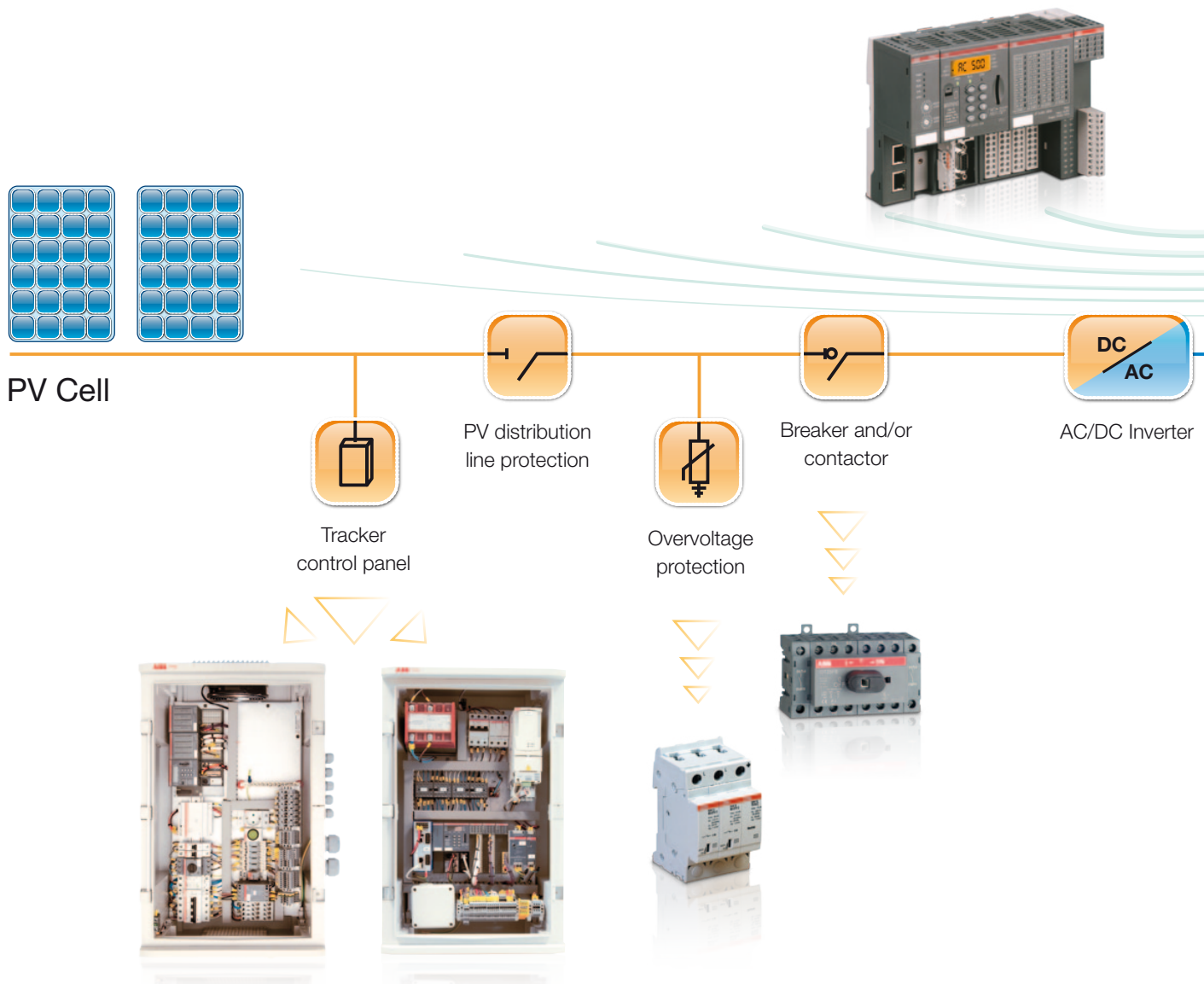
The AC500 sets the trend: ABB guarantees that the use of suitable automation components, such as the scalable PLC AC500, maximizes the effective use of sunlight. Depending on the location and design of the solar-tracking PV system, up to 35% more energy can be obtained than with a fixed system.



Photovoltaic and thermosolar systems

Save **MORE** energy from a single source

ABB's product range comprises, from start to finish, all of the components that are needed for the seamless operating of a solar-tracking PV system regardless of its size



Always the right solution

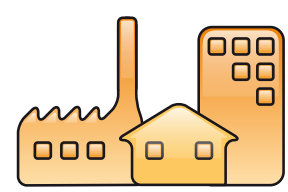
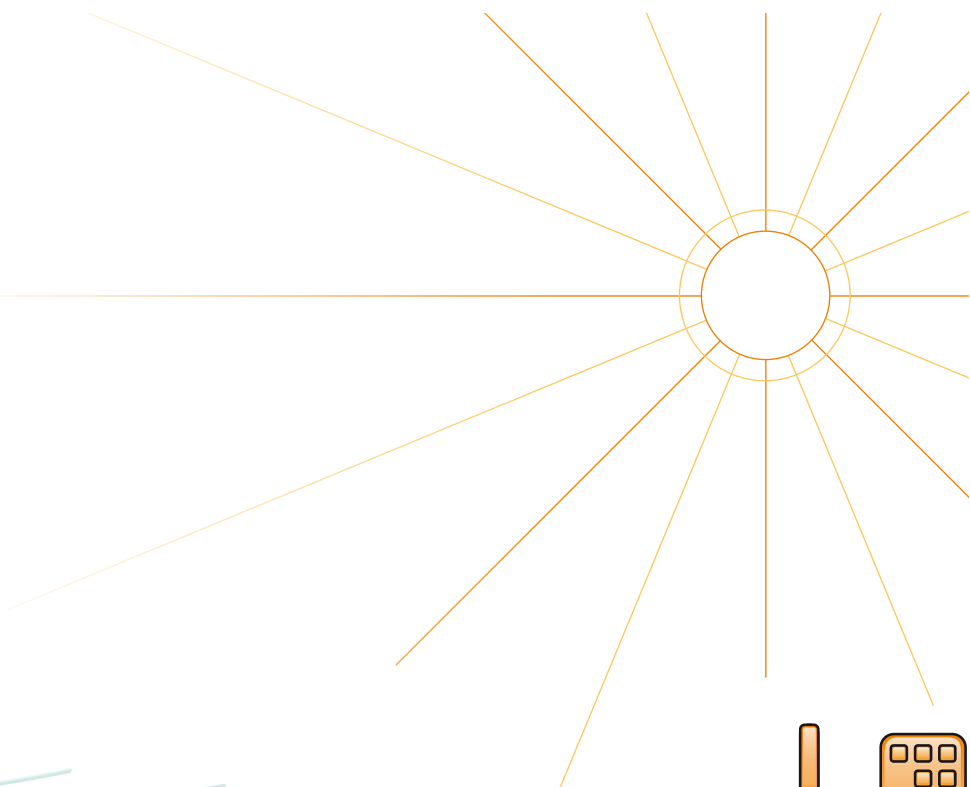
So that the solar modules can adjust to the position of the sun when it is windy or even snowing, a small, resistant and strong automation and converter system is needed.

Change-over components

In addition to the scalable AC500 control unit, ABB has other change-over components such as connectors, interrupters, cut-outs, power switches, relays, motor-protection switches, operator panels and high performance automatic circuitbreakers

The control system

ABB always has suitable automation solutions thanks to the scalable PLC AC500, which is based on a modular design that incorporates a CPU, communication modules and I/O modules. Furthermore, the system can be easily expanded when required. The function blocks and standard programming ensure that the user can gain instant control, which is especially useful after changes to the system have been made.



Switch



Overvoltage protection



Breaker and RCD protection



Communication

Solar panels can be incorporated into an existing automation environment thanks to a wide range of communication and field bus modules.

The operator panel

ABB has a wide selection of operator panels in many different sizes and designs from text to touch screen panels which are simple to use and reliable.

Converter technology

ABB is a leader in the global converter technology market. In this sector, we have a wide range of frequency converters, power converters and motors.

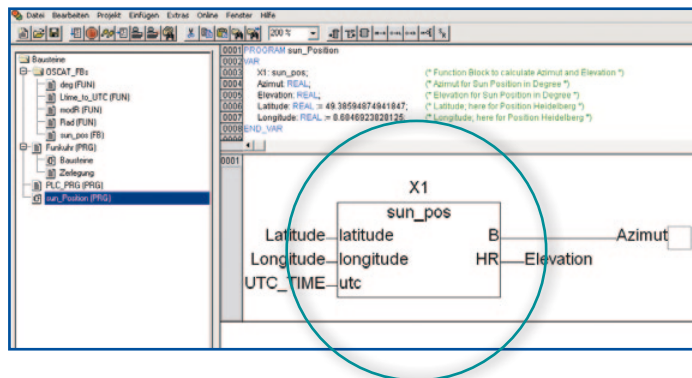
Wherever you need us

The services and technical assistance provided by ABB worldwide make it a reliable partner for manufacturers and users who can rest assured that their investments are protected over the long-term.

ABB runs seminars and special training courses on many of its products and systems, including automation systems.

Photovoltaic and thermosolar systems

Get MORE with the scalable PLC AC500



Suited to your needs

High resolution solar algorithms which are uploaded directly into the software guarantee that the solar panels or mirrors are aligned with the sun. This function - together with the unique scalability of the AC500 - means that it can be very easily adjusted to the different requirements of the various solar-tracking systems.

Different types of CPU for each solar-tracking system. All CPU types are programmed in the same way and have either one or two integrated serial interfaces and an optional SD card (to save data, for example).

Coprocessors to complement the main CPU for a user program that may require more services in the future. The AC500 platform allows for up to four simultaneous and independent processors in addition to the main CPU.

Communication modules which can be added in any combination (up to four for each CPU). The following alternatives are available : Ethernet (Modbus TCP, with integrated switch), CANopen, DeviceNet, Profibus DP and Modbus RTU, as well as ProfiNet and EtherCAT.

Configurable I/O modules (digital and analog) to reduce the number of different modules and thereby make maintenance much cheaper.

Various solar-tracking **function blocks** are available to program the solar panels or mirrors. For the most basic version of solar panels, the function block calculates all of the values needed to control the panels or mirrors by processing the local coordinates, date and time of the day. If you wish to calculate more complex values (for example, for thermosolar systems) for which additional information has to be considered (local temperature, atmospheric refraction and pressure, etc.), there are other function blocks with more complex services based on the NREL algorithm.

Ideal for solar-tracking PV systems and thermosolar systems

The AC500 takes care of all of the tasks linked to controlling the open and closed loops and monitoring the tracking of the sun. This includes options such as :

- Calculating the path of the sun
- Registering and assessing the sensors connected (e.g. airspeed indicators)
- Placing the panels in a safe position if weather conditions deteriorate (e.g. during storms or when it snows)
- «Manual positioning» mode
- Specification of the initial adjustments to the converters
- Capacity to save important incidents and operating states (data storage)
- Remote data transmission
- ...

Designed to be 100% reliable

Other advantages that come with the AC500 and that you can enjoy from the outset:

- Homogenous programming in compliance with standard IEC61 131-3 available in five languages
- Ease of use with an LCD screen, keyboard, slot for SD cards and two integrated serial interfaces
- Worldwide supply
- Global assistance and services
- Wide range of certificates
- Standard automation on a futuristic platform by an acknowledged expert in the fields of automation and energy technology.

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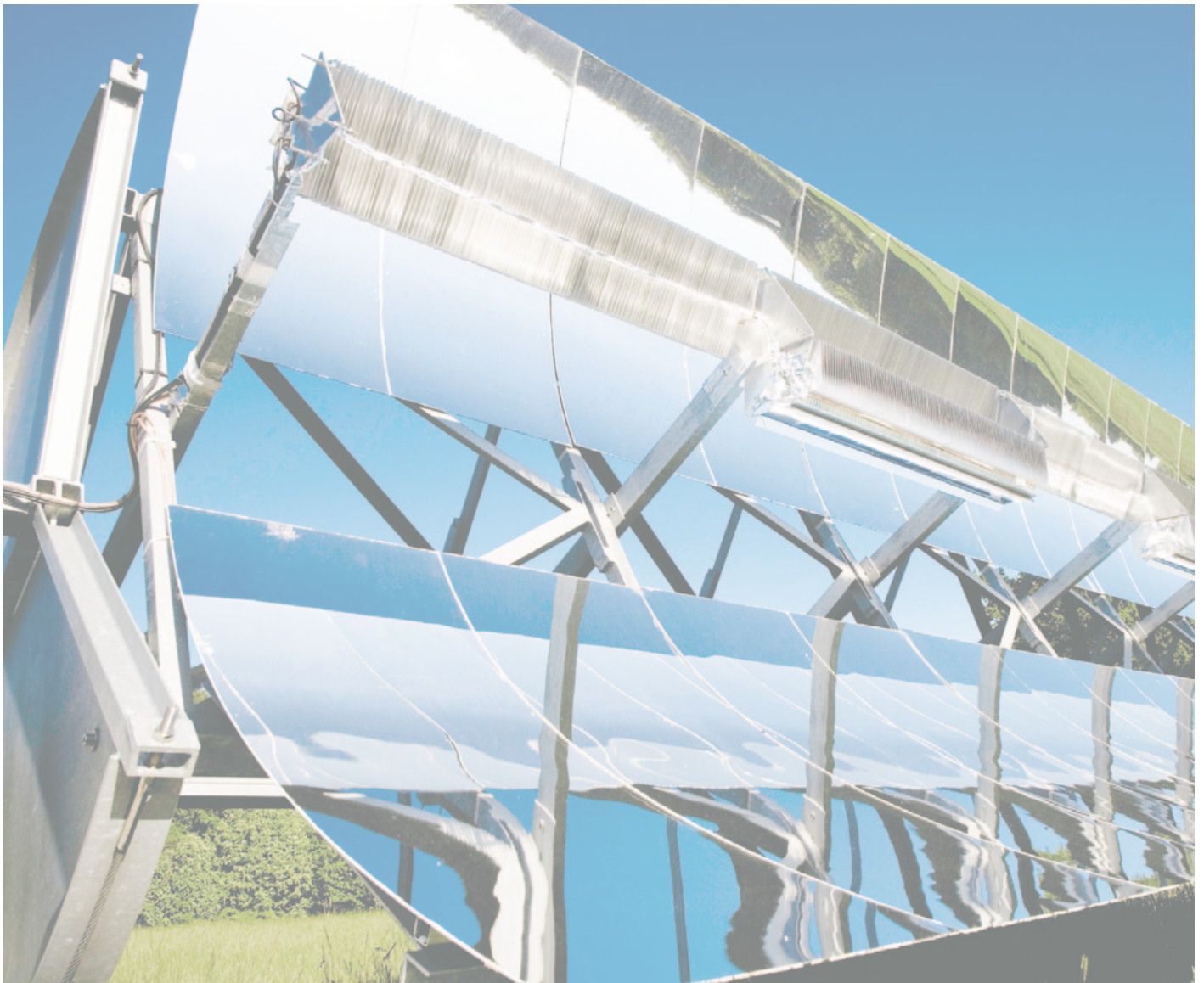
Choose systems that generate **MORE** energy

The PLC AC500 guarantees that the requirements of your automation technology are met despite ever-changing conditions and regardless of the location and of the solar-tracking concepts used

The key to success

The AC500 is currently used in solar-tracking PV systems and in thermosolar plants of all sizes. For example, large solar parks with over 1000 solar-trackers have the same number of AC500 control units at their service whose job is to place the reflectors in the best position in relation to the sun. ABB technology is used in solar systems worldwide and often in extreme weather conditions.

Furthermore, ABB places at your disposal highly qualified personnel anywhere in the world thanks to its global network of branches, distributors and specialized system integrators which represent ABB at a local level. We can guarantee that you will enjoy a comprehensive service from project planning to commissioning and maintenance.



Contact us

ABB STOTZ-KONTAKT GmbH

Eppelheimer Strasse 82
69123 Heidelberg, Germany
Phone: +49 (0) 6221 701-1444
Fax: +49 (0) 6221 701-1382
E-Mail : info.desto@de.abb.com

www.abb.com/plc

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