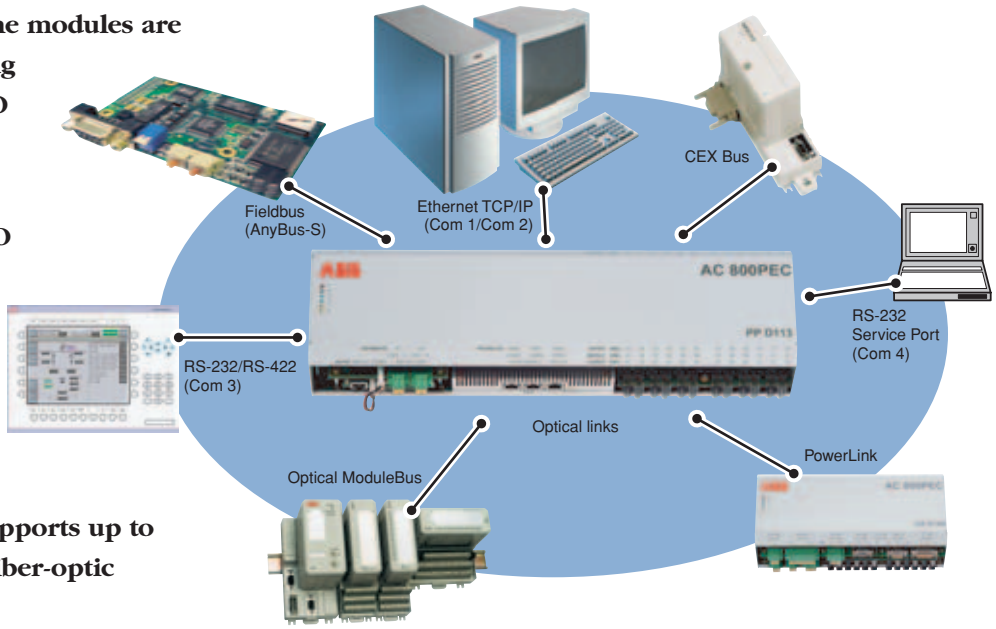
Key benefits

The AC 800PEC is a modular high-speed control system. The modules are arranged according to the required I/O configuration and the process.

The AC 800PEC I/O modules are connected via optional high-speed point-to-point connections.

The AC 800PEC supports up to 36 bi-directional fiber-optic PowerLinks.



Performance

The AC 800PEC excels with a very high processing speed. It provides

- Very fast analog and digital process I/Os with a typical cycle time of 25 µs
- Fast closed-loop control and regular process logic implemented in one controller
- Low-speed I/Os with a typical cycle time of 10 ms
- Very fast analog/digital conversion and nominal/actual value comparison, directly on the peripheral I/O module.

Connectivity

The AC 800PEC features outstanding ability to communicate with other control devices:

- Two Ethernet ports for connection to a plant control network, other processor modules, the Control Builder M programming tool and to the PECView service tool
- RS-232 / RS-422 serial ports for a local process panel and/or service terminal
- Up to two on-board AnyIO ports for ABB Communications Expansion bus (CEX) and AnyBus®-S modules for all common fieldbus types
- Up to 36 terminals for optical PowerLinks and ABB S800 optical ModuleBus for cost-effective, noise-immune connections to I/O systems and power converters.

Modular configuration

The modular-design AC 800PEC comes with:

- Units mounted onto a DIN rail or equipped for direct wall mounting

- Hardware and communication modules according to process needs
- Any combination of fast and slow I/Os, large and small topologies, installed locally and remotely.

Hardware

AC 800PEC hardware is optimized for power electronics control:

- Optical connection between controller and process I/O
- Fast peripheral I/O devices for control and measurement
- Program and data stored in Flash memory, no battery backup needed
- Compatible with standard ABB S800 I/O devices
- Suitable for field installation.

Software

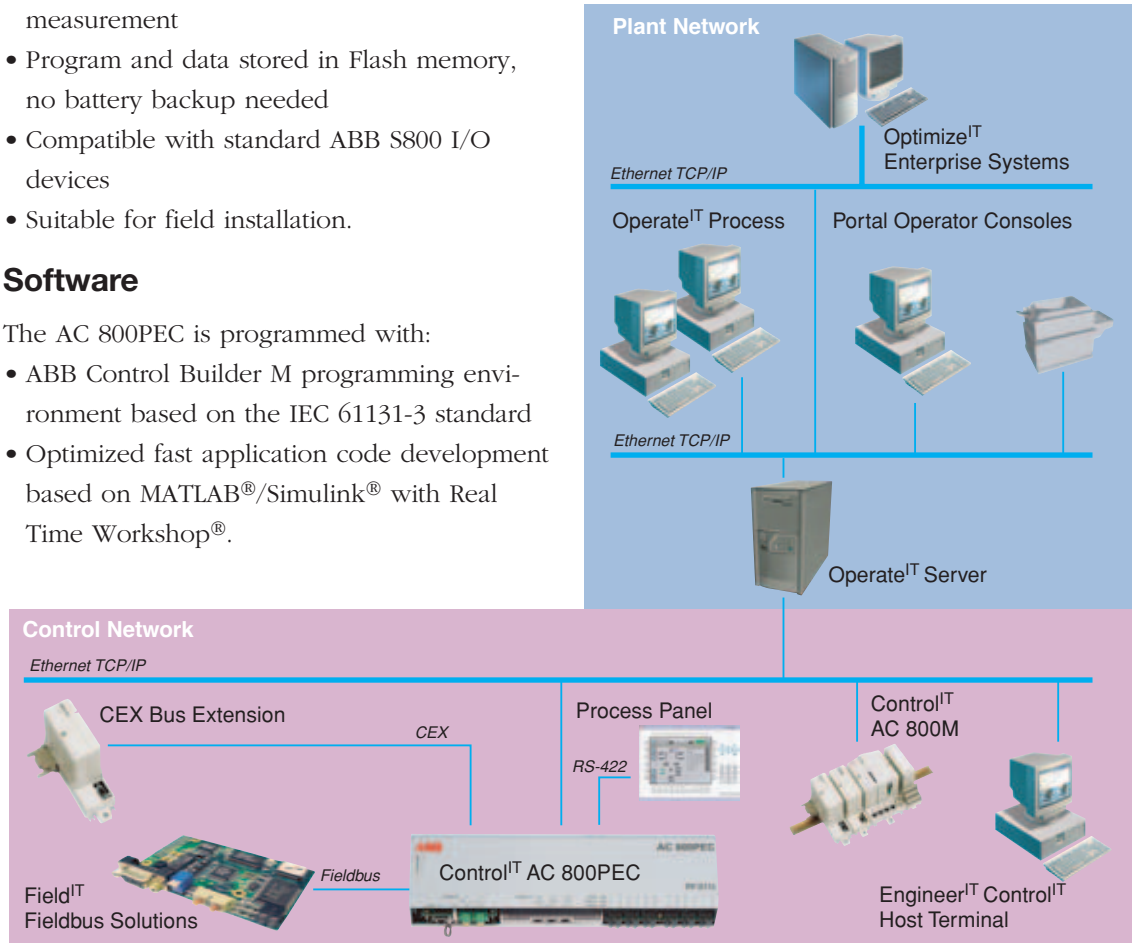
The AC 800PEC is programmed with:

- ABB Control Builder M programming environment based on the IEC 61131-3 standard
- Optimized fast application code development based on MATLAB®/Simulink® with Real Time Workshop®.

Industrial^{IT} integration

The AC 800PEC is fully integrated into ABB's Control^{IT} software environment.

Industrial^{IT} Enabled products from ABB will set the standard for productivity and profits in future power, automation and information solutions.



The AC 800PEC hardware

The AC 800PEC system incorporates equipment that meets the most challenging – and also contradictory – requirements in process control. It includes a wide range of I/O modules to cover all power electronics control requirements.

The different I/O modules can be connected to the AC 800PEC controller to cover most automation requirements in:

- Process industry
- Power generation and distribution
- Transportation and traction.

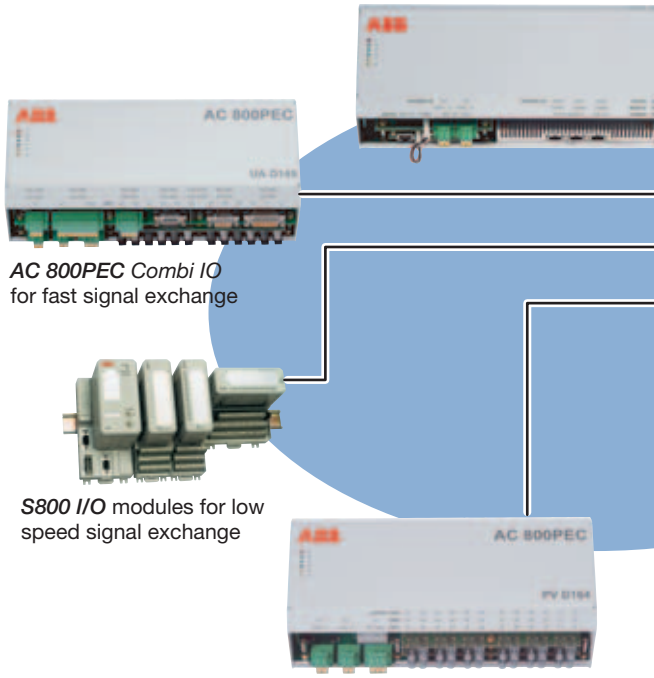
The modular, energy-efficient design of the AC 800PEC allows operation without forced cooling.

The modules are mounted on standard DIN rails and can easily be installed in distributed processes.

The number of directly connectable I/O systems is limited only by the maximum available fiber-optic links to the processor (36 bidirectional links).

Depending on the required performance, single, multiple or redundant bidirectional links are used between modules.

Each module comprises a mechanical carrier, a base module and a configurable set of submodules which provide the required I/O terminals or communication interfaces.



AC 800PEC Combi IO for fast signal exchange

S800 I/O modules for low speed signal exchange

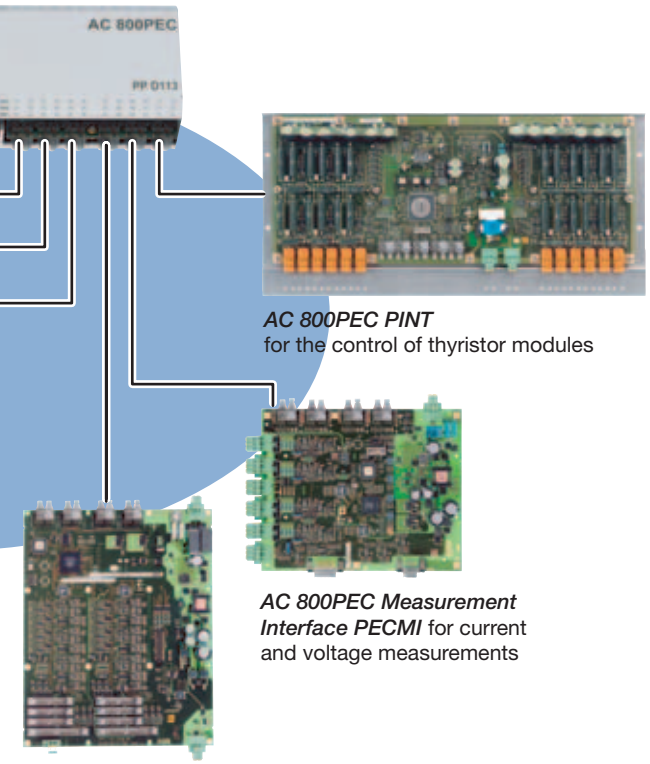
AC 800PEC INT interface system for direct IGCT converter contol

AC 800PEC Controller PP D113

The controller comprises a low power circuit with high reliability. The hardware can be configured freely, depending on the process requirements and the selected communication with the upper control.

The AC 800PEC controller module contains the processor, the optical interfaces to the peripheral I/O, the fieldbus, and interfaces to the upper control:

- **Base unit AC 800PEC BP** (backplane with slots for mounting the processor, the power supply, and the optical and communication modules)
- **Processor module AC 800PEC CPU** mounted on the AC 800PEC BP. The CPU is a fully-featured 600 MHz RISC processor with a 64-bit IEEE Floating-Point-Unit (FPU). It is optimized for applications with very fast control cycles
- Two **AnyIO interfaces,** each consisting of
  – an AnyBus®-S slot
  – an additional AnyIO extension slot for an AC 800PEC CEX interface or special applications
- Up to 6 **AC 800PEC optical modules** for fiber-optic links to various I/O modules.

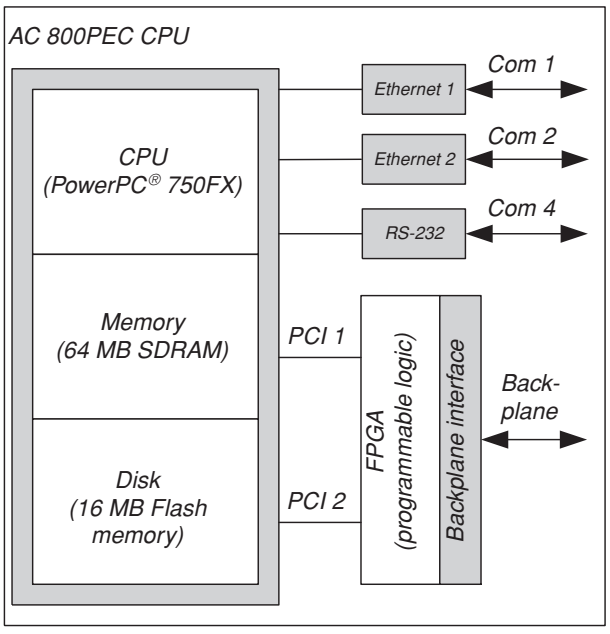


AC 800PEC PINT
for the control of thyristor modules

AC 800PEC Measurement Interface PECMI for current and voltage measurements

AC 800PEC PEBB
Interface board for direct IGBT converter control

Programs and data are stored in a robust solid-state 16 MB Flash memory, which is formatted as a file disk. Active programs are operating out of the cached 64 MB SDRAM.



Communication modules

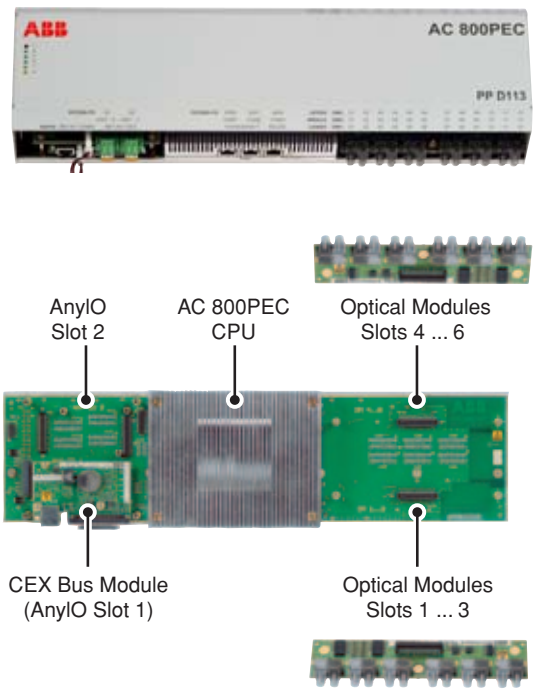
Communication with external systems (i.e. the upper control via fieldbus) is via CEX or AnyBus®-S fieldbus interface module, or via Ethernet ports on the processor module.

The CEX interface provides optimum connectivity with the complete ABB AC 800 CEX program, such as:

- MB300
- Profibus master
- Ethernet

The supported AnyBus®-S fieldbus types are:

- Profibus slave
- Lon Works slave
- Modbus slave
- CANopen slave
- Interbus slave
- etc.



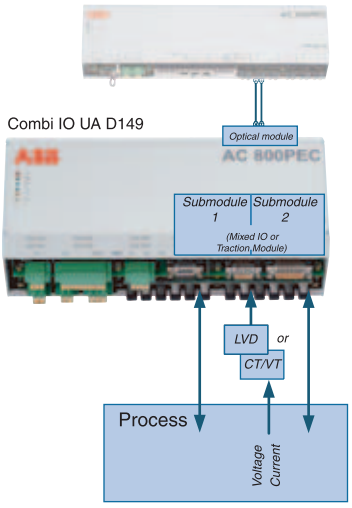
I/O modules

The combination of a huge variety of I/O modules is another specific advantage of the AC 800PEC.

The AC 800PEC is an open system that provides standard interfaces even for modules with customized design and functionality.

All internal communication between the controller and I/O modules is achieved entirely by means of optical links.

There are no electric connections between the controller and any I/O device.



AC 800PEC Combi IO UA D149

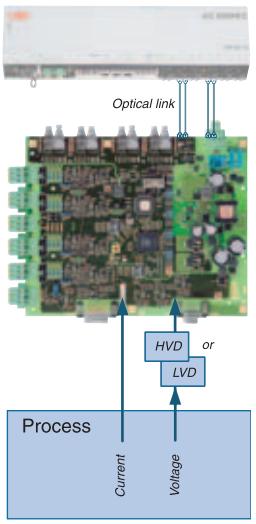
The Combi IO UA D149 is a universal, remote I/O device for high-speed applications, and is part of the AC 800PEC control system. It is mainly used for sensing actual values in fast closed-loop control and protection circuits.

The Combi IO comprises the basic module UA D141, which can be equipped with stackable I/O boards such as:

- Up to 2 Mixed IO boards UA D142, each providing
  - 16 fast digital inputs / 8 fast digital outputs
  - 6 fast analog inputs
  - 2 fast analog outputs.
- Alternatively: 1 Traction Module DA D143, providing
  - 13 analog inputs with various predetermined characteristics
  - 18 digital inputs allocated to specific monitoring tasks.

In order to adapt to various voltage and current levels, the Combi IO can be combined with low voltage divider boards (up to 1000 V_{rms}) and CT/VT sub-boards.

AC 800PEC Measuring Interface PECMI UA D140



The Measuring Interface PECMI provides a high-speed current- and voltage-measurement device which supplements the Combi IO module.

- Active scalable inputs for up to 4 current sensors (e.g. LEM) are provided
- Inputs for voltage divider boards and CT/VT sub-boards are available.
  In order to adapt to various voltage and current levels, the PECMI can be combined with voltage divider boards:
  - Voltages up to 1000 V_{rms} require a Low Voltage Divider (LVD)
  - Higher voltages up to 6000 V_{rms} require the High Voltage Divider (HVD).