Control^{IT}
AC 800C Controller

the compact and cost-effective process controller

Industrial^{IT}
Solutions
from ABB

ABB
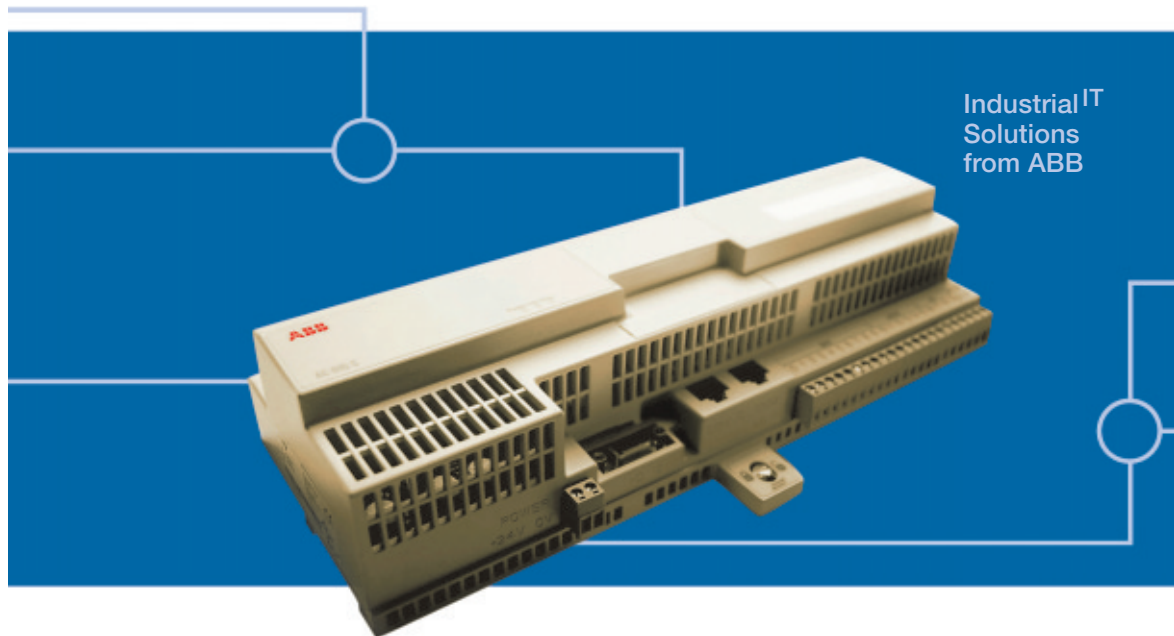
AC 800C is a small, cost-effective controller belonging to the AC 800 family. It is configured and programmed with Control Builder M, a Windows 2000® application.

AC 800C has ten digital inputs and six digital outputs on board. Depending on the acquired license, up to 36 external digital and/or analog I/O units can also be connected.
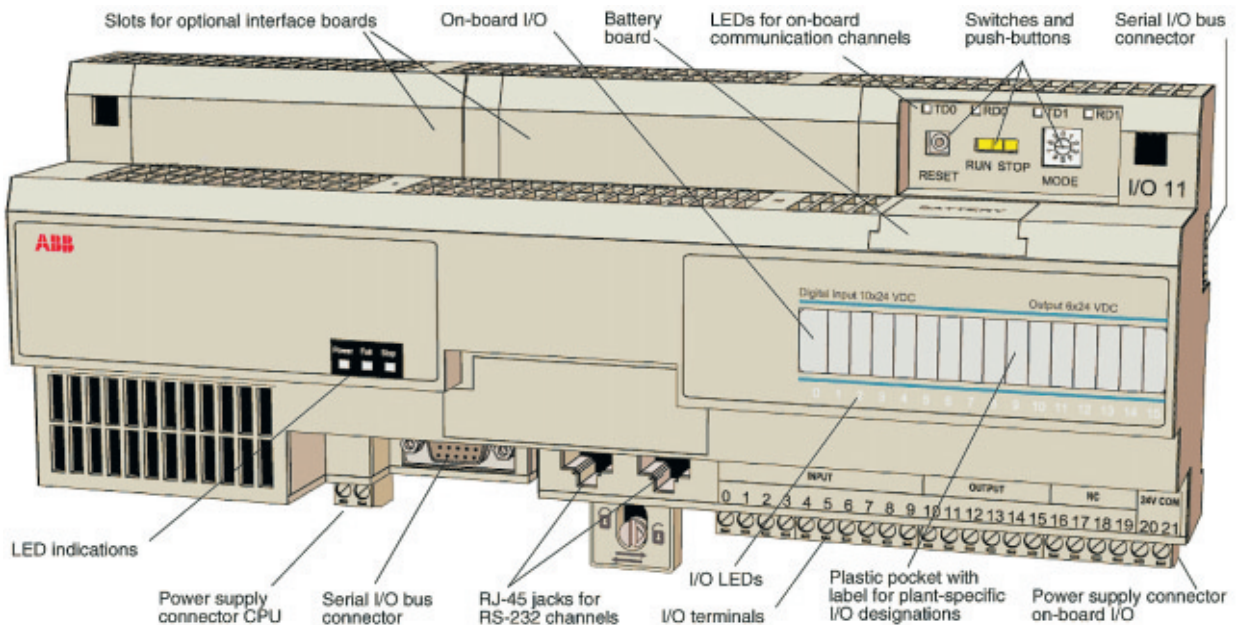
The controller has two on-board RJ-45 jacks for RS-232 channels. An optional battery board with a real-time clock and two optional communication plug-in boards can be installed.
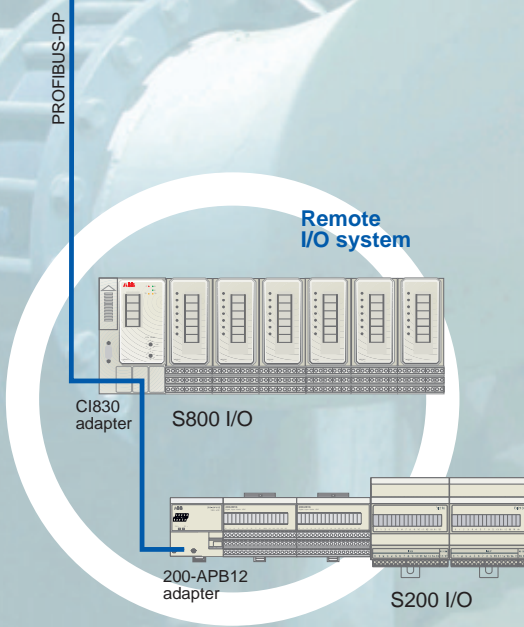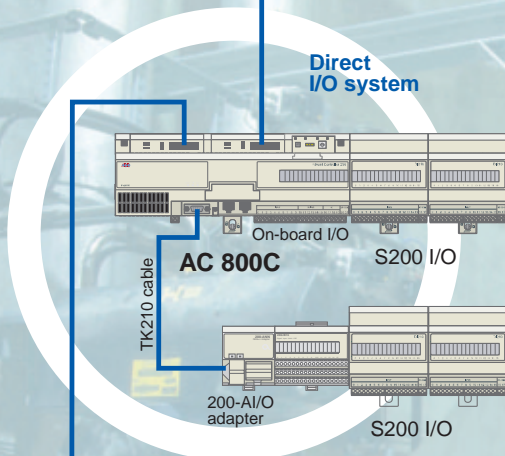
Features:

◆ Compact design

◆ DIN rail mounting

◆ Digital on-board I/O

◆ Detachable screw terminal blocks for power supply and I/O connections

◆ A range of licenses permitting different I/O and functional capabilities

◆ I/O support of S200 I/O and S200L I/O centrally via the serial I/O bus

◆ I/O support of S200 I/O, S200L I/O, S800 I/O and S800L I/O remotely via PROFIBUS-DP (option)

◆ Communication with other systems by RS-232 and Ethernet (option)

◆ Battery/real-time clock board (option)

◆ Powerful Windows 2000-based configuration and programming tools

◆ Carries CE and UL approvals

The AC 800C controller

Slots for optional interface boards · On-board I/O · Battery board · LEDs for on-board communication channels · Switches and push-buttons · Serial I/O bus connector

LED indications

Power supply connector CPU · Serial I/O bus connector · RJ-45 jacks for RS-232 channels · I/O LEDs · I/O terminals · Plastic pocket with label for plant-specific I/O designations · Power supply connector on-board I/O

Operator workplace

Engineering workplace

Ethernet LAN

PROFIBUS-DP

Direct I/O system

On-board I/O

S200 I/O

TK210 cable

AC 800C

200-AI/O adapter

S200 I/O

Remote I/O system

CI830 adapter

S800 I/O

200-APB12 adapter

S200 I/O

Example of I/O configuration.

Hardware

AC 800C offers hardware functions and features such as:

✔ On-board I/O.

✔ Two on-board RS-232C channels for communication with programming stations and other systems.

✔ LEDs indicating status of power supply, application program(s) and on-board I/O.

✔ Two slots for optional communication boards such as CI271 (RS-232C), CI272 (Ethernet) and/or CI274 (PROFIBUS-DP).

✔ One slot for an optional battery/real-time clock board (SB210).

✔ Serial bus connectors for local I/O expansion.

Direct I/O system

The on-board I/O system has ten digital inputs and six digital outputs for 24 V DC. All I/O signals are galvanically isolated by optocouplers and share a common ground connection. The outputs are short-circuit proof.

The I/O system has a separate two-pole plug-in screw connector for the external +24 V DC power supply. The unit is not damaged if the polarity is reversed.

The status of each signal is indicated by a yellow LED on the front of the unit. A plastic pocket above each LED can be fitted with a label for plant-specific I/O designations.

Outputs can be connected in parallel to increase output current, restricted only by the maximum total output current per unit.

The inputs have a second-order, low-pass hardware filter and a digital filter with individual time constants 0.5 to 32 ms.

In addition to the on-board I/O, the direct I/O system supports S200 I/O. Up to eight external I/O units can be directly plugged onto the controller and installed on the same DIN rail, and another eight I/O units can be connected via a TK210 cable (length 0.5, 1.0, or 2.5 m) and a 200-AIO adapter. A row of I/O units can be split in two by using a 200-CE1 or a 200-CE3 cable, 0.3 and 0.9 m respectively (cannot be combined with the 2.5 m TK210 cable). Note that a TK210 cable longer than 0.9 m is not allowed in hazardous locations according to UL1604.

Remote I/O – PROFIBUS-DP

The CI274 board is an optional interface for the PROFIBUS-DP field bus and used for remote connection of S800 I/O, S800L I/O, S200 I/O, S200L I/O and third-party units over a maximum length of 100 to 1200 m, depending on baud rate.

S800 I/O units are connected to one or more I/O adapters, CI830. Additional units can be connected to the CI830 adapter via optical cables and optical interface units, TB820.

S200 I/O units are connected to one or more I/O adapters, 200-APB12, with a maximum of eight I/O units per adapter.

The CI274 board serves as bus master and handles cyclic reads and writes from/to the slaves. The cycle time depends on the baud rate and the number of slaves attached.

A maximum of two such boards can be installed in AC 800C.

On-board communication channels

AC 800C has two on-board RJ-45 jacks for RS-232 channels, one with full modem support. Each channel has LEDs indicating the status of transmit and receive activities.

The RJ-45 jacks have metallized grounded housings. A shielded cable should be used, with the shield connected to the metallized housing of the connector.

RS-232 communication board

The CI271 board is an optional interface with two RJ-45 jacks for RS-232 channels, each with a full set of modem control signals. Two CI271 boards can be installed in AC 800C.

Ethernet communication board

The CI272 board is an optional interface with one RJ-45 jack for Ethernet 10Base-T (twisted pair, max. cable length 100 m). The IP address is entered via Control Builder M. Two CI272 boards can be installed in AC 800C. Redundant network routing is possible.

Battery/real-time clock board

SB210 is an optional board for AC 800C which contains a lithium battery and a real-time clock.

The battery supplies the real-time clock with power and preserves the contents of the RAM for at least one year. The real-time clock (RTC) keeps track of the duration of a power failure.

Without SB210, the RAM contents may be lost after about 20 minutes of power failure. The battery should be replaced at least once a year, or when low battery voltage is indicated by a flashing PWR indication. The battery can be replaced during operation.
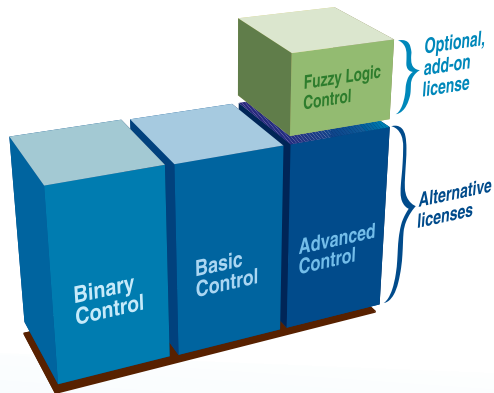
AC 800C runs ABB's Control Software, thereby providing a vast range of control and communication functionality.

Software

AC 800C runs ABB's Control Software, thereby providing a vast range of control and communication functionality. These capabilities are divided into different library licences as follows:

The ***Binary control license*** includes all the basic data types and functions, e.g. type conversions, math, logic gates, flip-flops, timers and counters as specified by the IEC 61131-3 standard.

The license also enables an AC 800C controller to work in a Control Network environment as server, thereby communicating with other system stations, e.g. other controllers, OPC servers or Control Builders by RS-232C or Ethernet.

The ***Basic control license*** includes all the above plus extended functionality in:

❖ *communications*, enabling AC 800C also to act as client on Control Networks and also to communicate with external system stations by a number of well-known protocols on either Ethernet or RS-232C,

❖ *process object handling*, offering ready-to use function blocks for frequently occurring plant devices such as motors and valves. This approach offers great benefits to both control engineers and plant operators,

❖ *regulatory control*, offering ready-to use function blocks for single and cascaded PID control loops, with digital or analog output and an impressive set of functional options – including autotuning.

❖ *batch control* to the industry standards.

The ***Advanced process control license*** includes all the above plus:

❖ *advanced PID control* and adaptive regulatory control,

❖ *advanced object-oriented process control* by means of a construct called Control Modules.

❖ *integration with Operate^{TT} Process Portal,* ABB's production supervision software.

Fuzzy logic control is available as an option.

The unit is configured, programmed and handled with Control Builder M, fully Windows 2000-integrated software, supporting all five of the programming languages specified by the IEC 61131-3 standard.

As part of its Industrial[IT] activities ABB has developed a long-term strategy of offering a comprehensive range of products and systems for industrial applications. At the heart of this strategy is the Aspect Objects™ concept which allows users access to all control and information systems within the enterprise and to assemble the information they require in a format best suited to their needs. Users are able to extend, modify and migrate their systems without difficulty.

ABB has developed a suite of human-system interfaces which combines comprehensive process know-how and experience with advanced software functionality. Based on the Windows® platform, these user interfaces provide a consistent method for accessing enterprise-wide systems and for launching multiple applications from any connected workstation in a plant or office.

Automation Technology Products within ABB offers a complete range of Industrial IT products, from individual programmable controllers to complete control systems for complex plants. These products are sold and supported by the worldwide network of ABB. If you would like to know more about the products please contact your local office or visit our website at www.abb.com/processautomation.

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