

PRODUCT PORTFOLIO

# ABB Ability™

## Control Technologies



# Freelance DCS

The power and reliability of a Distributed Control System (DCS) in a user- friendly, easy to install, engineer, operate and maintain making the system cost effective and robust solution, ideal for all process industries. All the capability of a DCS at the size and price of a PLC /SCADA

## AC 900F – Controller

Following years of experience in automation and control products. ABB is proud to introduce its latest Freelance controller – the AC 900F. This controller truly extends the hardware portfolio of Freelance distributed control system.

- SD card support
- Typically around 1,500 I/Os supported
- G3 compliant as standard
- Redundancy option for high availability
- Four (4) built-in Ethernet ports supporting Modbus TCP/IP or 60870-5-104 telecontrol protocol
- Two (2) serial ports supporting Modbus RTU/ASCII or IEC 60870-5-101 telecontrol protocol
- Optional PROFIBUS master modules (up to two) providing integrated line redundancy
- Direct connection of I/O modules (up to 10), including modules combining inputs and outputs in just one module can reduce footprint and costs.
- I/O modules can also be connected remotely via PROFIBUS

## AC 800F – Controller

- The outstanding feature is it can be equipped with a set of fieldbus modules, covering all major fieldbuses used in process automation.
- Option to run controllers either redundantly (CPU redundancy, fieldbus module redundancy) or non-redundantly
- Fieldbus-compliant components such as remote I/O, field devices, and network components can be used.
- Optional G3-compliant
- A single controller can typically support around 1,000 I/Os

## AC 700F- Controller

- Typically supports around 300 I/Os signals per AC 700F controller.
- This PLC-like controller comes with a very small footprint. Up to eight (8) S700 direct I/O modules can be plugged to the right of the controller module.
- The connection to the Freelance control network is via Ethernet as for all other controllers. As an alternative to remote I/Os, AC 700F can be placed directly in the field, offering a very flexible and cost- effective solution for an “intelligent” I/O station.
- I/O modules can also be connected remotely via PROFIBUS. This allows for high flexibility in installation.
- SD card support.

## S700 - I/O

- Can be used as direct I/O for AC 700F and AC 900F Freelance controllers.
- Can be used as PROFIBUS remote I/O with AC 700F, AC 800F, AC 900F or other PROFIBUS masters.
- Small footprint – the modules are featured with a high packing density, several modules are available with inputs and outputs mixed in one module. Fourteen (14) different module types are currently available, covering a wide variety of applications and giving maximum flexibility.

## AC 800 – I/O

- A comprehensive, distributed and modular process I/O system that communicates with controllers via PROFIBUS. Installation in the field as remote I/O, close to sensors and actuators, greatly reduces the installation cost by reducing the cost of cabling. Ability to exchange modules and rel/ configure the system during operation.
- Redundancy options in all areas allow a high degree of availability
- For harsh environments, the I/O modules are compliant to G3 severity level of ISA-S71.04, Environmental Conditions for Process Measurement and Control Systems.
- A pass-through feature makes it possible to configure and examine all HART-compliant field devices directly from the control systems engineering tool.

## AC800L - I/O

S800L I/O modules are both cost-effective and space-saving. They connect to any PLC or controller via Profibus. The S800L I/O is also fully integrated with the AC800M advanced process controller. In addition, the modules can be freely combined with high performance S800 I/O modules to bring advanced field interface functionality into any S800L configuration. Its cost-effective design at an installation depth of 59mm makes it economic and space saving choice for PLC applications in the process industry.



# Freelance DCS Operations

Freelance Operations supports dual-monitor operation, which offers the benefit to stay continuously tuned with essential information like the alarm list, while simultaneously inspecting, for example, the progress of a sequential function chart, trend archives, or plant graphics. Several Freelance Operator Workplaces can work seamlessly together.

## The Freelance Operations interface

Freelance Operations meets all standard process control requirements with regard to operation and observation at an attractive price. Amongst other things, Freelance Operations offers the following visualization features:

- Clearly structured faceplates for operator interventions which can also be combined as required in group displays
- Trend displays including historical data and long-term Archiving
- Alarm pages for specific plant areas, sequence control displays, shift logs, event logs and data archiving
- Standardized system display for system hardware diagnostics
- Free graphic displays with standard graphic elements which are also supported by bitmaps and a 3D macro library
- Dual monitor operation
- Control aspect for interlocking displays



## Freelance Formulation

The new offering is a preferred solution for common sequencing applications, like continuous process startup / shutdown, equipment sequencing, or cleaning skid control. With these applications, you have repeatable execution of activities and can make use of parameters. That means, instead of pure Sequential Function Charts (SFC), Freelance Formulation's flexible parameter management and traceability allows for shorter changeover times from one recipe to another.

## Freelance Formulation's Key Functions

- Integrated in Freelance Operations
- ISA88 terms are used so that batch experts do not need
- Supports automatic batch reporting
- Supports logging of operator actions
- User administration with Security Lock
- Lifecycle concept with workflow procedure for recipe levels
- Support configuration and operator mode similar to Freelance Engineering
- Parameter sets are managed as Control Recipes
- Flexible capacity calculation for a parameter values included
- Recipes are executed on SFC



# Compact Product Suite

A comprehensive suite of flexible and scalable control products for a diverse range of customers, such as Systems Integrators, Original Equipment Manufacturers (OEMs), end users who engineer their own systems, or stand-alone solutions that meet their specific automation needs. These systems can include Process Controllers with superior analog control capability, Panel 800 process panels and Compact HMI; an Object-based SCADA System for small to mid-size applications in varied industries and applications.

## AC800M - Process Controller

The AC800M is a Programmable Application Controller, designed to achieve high availability for control applications in the process industry. The rich function block library includes several types of control loops, including advanced control and auto-tune capabilities, as well as integration for ABB drives and motors. The controller communication by means of Ethernet includes on-board RNRP redundancy along with a broad set of communication modules to connect to third party devices. A superior redundancy concept allows for fast switchover times and topologically separated CPU-modules. Several CPU modules are available, varying in terms of processing power, memory size and redundancy support. Priority controlled, time-based tasks allow the highest stability in even complex control tasks.

Supporting standard IEC 61131-3 programming languages, Compact Control Builder is the tool for engineering the control code and the hardware layout of AC 800M. It creates logic, sequential and analog control-intensive automation solutions for all existing controllers in the automation system to be handled in one database. The flash memory card allows loading applications without the need to utilize the engineering tool to support OEM and remote solutions.



AC800M



S800-S800L



S700



S900

## S800-I/O

The S800 I/O is a distributed, highly modularized and flexible I/O system with an efficient design, providing easy installation of the I/O modules, process cabling and connection to drives systems. It provides high precision and comfort for process automation tasks. A tight integration into AC800M and Freelance Engineering tool provide extra benefit to the user over standard Profibus I/O. Redundancy can be reached on all levels and the modules can easily be exchanged and reconfigured while under operation. S800 offers highest accuracy analog modules.

## S800L- I/O

S800L I/O modules are both cost-effective and space-saving. They connect to any PLC or controller via Profibus. The S800L I/O is also fully integrated with the AC 800M advanced process controller. In addition, its modules can be freely combined with high-performance S800 I/O modules to bring advanced field interface functionality into any S800L configuration. Its cost-effective design at an installation depth of 59 mm makes an economic and space saving choice for PLC applications in the process industry.

## S700 -I/O

The S700 I/O is meant for applications where PLC I/Os have been traditionally used. The small footprint and flexible functionality per module allows for a cost-efficient automation solution. S700 I/O can be used as direct I/O together with the AC700F controller, as well as remote I/O to any PLC with a Profibus master module.

## S900- I/O

The S900 remote I/O system is designed for applications in the chemical, pharmaceutical and oil and gas industries. It can be mounted directly in process areas classified explosion hazard zone 1 (ATEX), significantly reducing installation costs. It communicates with controllers by a redundant power supply. Further savings can be achieved through S900's extended diagnostics and the use of HART®- compliant field devices. A field mounted IP66 variant with temperature range-20 to 60°C is available.

# Compact Product Suite

## Human Machine Interface (HMI)

### Compact HMI

The SCADA system lets you use the latest ergonomic design to take full control of your process. Based on the premium technology of ABB's system 800xA, it can economically scale from applications with just 50 signals and one operator workplace to applications with up to ten workplaces and 10,000 signals. Compact HMI runs on a Microsoft Windows PC or Server. A High Performance Graphics library and options for alarm management, text messaging and read-only remote access via ABB's Smart Client technology complete the offering.



Compact HMI

### Panel 800 Version 5

Panel 800 5.1 is one of the fastest, most powerful operator panels on the market. Equipped with a high-performance Intel XScale processor, 32 MB of Intel StrataFlash and 64 MB RAM, the Panel 800 is designed to handle large volumes of data and graphics rapidly and efficiently. Additional compact flash slots enable users to expand memory for exceptionally demanding applications. Panel 800 uses the Windows CE.Net version operating system - a reliable and proven processing platform used in many industrial applications. File safety and data integrity are ensured by the Intel Persistent Storage Manager, which gives rapid access to files and data protects them from corruption even during power failures.

### Panel 800 Version 6

Panel 800 Version 6 is a user-friendly, intuitive and ergonomic operator panel that combines slim, space-saving dimensions with a comprehensive range of advanced functions. Explore modern controlling using scroll and swipe gestures to make your application intuitive and more efficient to navigate.

On top of the standard panels PP871, PP874 and PP877, Panel 800 has two high-performance panels: PP882 and PP885, offering more power functionality and flexibility. The panel supports online language switch and includes simplified traditional Chinese. The communication includes protocol conversion and secure separation of Ethernet networks.

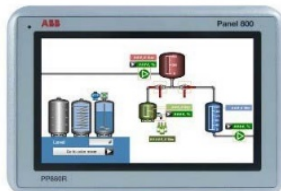
Additionally, Rugged and Marine rated panels round out the diverse and capable Panel 800 family, providing robust operator panels certified for operation in extreme environments, as well as for use in maritime applications.



Standard Panels



High Performance Panels



Rugged Panels



Marine Panels

# Factory Automation

## Programmable Logic Controller (PLC)

ABB's AC500 Factory Automation products deliver solutions with high performance and flexibility to be effectively deployed within diverse industries and applications including water, building infrastructure, data centers, renewable energy, machinery automation, material handling, marine and more.

The AC500 platform comprises of a series of PLCs such as AC500, AC500-eCo, AC500-S and AC500- XC.

These scalable PLC ranges provide solutions for small, middle and high-end PLC applications. These products are the ideal choice for PLC applications needing high performance level, extreme environment operability, or machine safety solutions.

### AC500- PLC

The AC500 is a powerful flagship PLC with a wide range of performance, communications and I/O capabilities for industrial applications. The ideal choice for complex high speed machinery and networking solutions.

### AC500-eCo - PLC

This compact PLC offers flexible and economical configurations for your modern control system. The ideal choice for smaller applications.

### AC500-XC - PLC

Extreme Condition PLC variant of the AC500 platform with extended operating temperature, immunity to vibration and hazardous gases, use at high altitudes and in humid conditions.

### S500 & S500-eCo – I/O

The S500 I/O enables simple expansion or adding of field devices. The S500 I/O platform has been developed with multifunctional and software configurable I/O modules with different channels, signal voltage, and fieldbus connections. The I/O can be configured as Central I/O using the local I/O bus of the CPU module, allowing up to ten I/O modules to be directly connected. The I/Os can also be configured as decentralized periphery via fieldbus between CPU module and remote I/O modules. The system's multifunctional approach provides features that enables us to cover a broad range of requirements; for example, DA501 with six different I/O types in one module (AI, AO, DI, DO, RTD, Counter).



AC500



AC500-eCo



AC500-S



AC500-XC

# Factory Automation Control Panels

## Factory Automation Control Panels

The CP600 control panels offer a wide range of features and functionalities for maximum operability. The Control Panels Human Machine Interfaces (HMI) provides human control and operation of machines and processes with a wide range of communication protocols, making these control panels the ideal complement to ABB PLCs, Drives and Robots. The control panel series CP600 provides color touch screens sized from 4.3" to 15". A complete engineering software solution offers a great variety of HMI capabilities. A set of CP600 WEB panels displays the visualization of the ABB PLC's web server by means of a web browser.

### CP600

The CP600 range is dedicated for machines and systems requiring visualization performance or representative design. The CP600 range provides seven TFT 65,536 color touch screens sized from 4.3" to 15". The panels enable the use of 3D Scalable Vector Graphics (SVG) and provides free graphic widgets in a large gallery. The system also connects to ABB drivers for effortless integration with ABB AC500 PLC platform, ABB Drives, ABB motion controllers, ABB Robots IRCS, ABB Pluto. Along with many standard protocols such as Modbus TCP and Modbus RTU, the control panels also provide internet remote access via FTP, SNTP, RSS. The panels can also function as a data transfer gateway by converting between protocols and interfaces. Additional features such as Web cam and video playback for CP651, CP661, CP665 and CP676 are also included.

### CP600- WEB

The CP600-WEB range offers the same robustness and design of the CP600, while utilizing from the web server of the AC500 PLC platform. The CP600-WEB range provides seven TFT 65,536 color touch screens from 4.3" to 15". The panels connect to PLCs via intranet or internet for remote connection, running HTTP protocol on Ethernet interface. The panels web visualization designed with Automation Builder and can be created during development and system integration phases making CP600-WEB ideal for projects with a few identical machines.

### Common features CP600 and CP600-WEB

- Connects to PLC via intranet or internet for remote connection, running HTTP protocol on Ethernet interface.
- Web visualization is designed with Automation Builder
- Visualization can be created during development and system integration phases
- Visualization becomes part of the PLC binary. This single binary helps to make software distribution and version management more comfortable
- Variables of controller and visualization are within the same project
- To control details of the visualization, IEC61131-3 languages can be used instead of JavaScript
- When integration is finished, the visualization screens can be easily reused for GUIs of operations
- CP600-WEB is ideal for projects with a few identical machines



CP600 & CP600-WEB

# Recorders & Controllers

ABB has developed a comprehensive family of process control instrumentation that provides high quality process indications, controls and data recording.

## SM500F

The SM500F is probably the world's first field-mountable paperless data recorder. Featuring seven process inputs, second recording channels, and is available with wall, panel and pipe mounting options. It's fully sealed IP66 and NEMA 4X enclosure means it is ideal for use in even the most hostile environments, including hose down and dusty applications.

## RVG200

The RVG200 recorder takes the established operating and security benefits of the ScreenMaster range one step further. Features include, touchscreen 'swipe' operation, front and rear USB ports for connecting peripheral devices, including a barcode scanner and keyboard, and Ethernet and RS485 communications.

## SM3000

Using the SM3000, up to 36 channels can be recorded, with data arranged in a variety of views to provide users with a tailored view of their process. Six process groups are provided, allowing channels to be grouped together and individual displays created for different processes.

## DataManager Pro

This PC-based analysis of software provides the complete data collection, analysis and storage solutions for data recorded by a ScreenMaster recorder. Via Ethernet communications, DataManager Pro can be integrated with any number of ScreenMaster recorders to create a fully automatic data gathering and storage system.

## Commander Circular Chart Recorders: C1300, C1900-R, C1900, C1900-RC, C1909, C1950 and C1960

With over 100 years of experience in the industry, ABB's circular chart recorder offering is world class. Our range is extremely easy to use, offers up to four pens, NEMA 4X and IP66 environmental protection, integrated PID control and data logging.

- C1901: Basic functionality single pen circular chart recorder
- C1900: 1 to 4 pen general purpose circular chart recorder with integrated PID control
- C1900R: 1 to 4 pen general purpose circular chart recorder
- C1950: Circular chart recorder/controller for pasteurization applications
- C1300: 1 to 4 pen advanced circular chart recorder

## ControlMaster CM15

This panel-mount indicator is a feature-packed 1/8 DIN universal process indicator. A crystal-clear, full-color, TFT display shows operators exactly the information they need, full text, making the CM15 intuitive to use and very quick to install and commission.

Available as a basic indication-only model, or enhanced through plug and play function keys and I/O modules, the CM15 offers totalization, level, math, logic, counter and alarm functions, making it extremely flexible and able to solve many tricky application requirements. Modbus and Ethernet communication options ensure easy integration and connectivity supervisory or control systems.

## ControlMaster CMF310 / CMF160

The all new, NEMA4X / IP66 field mount offers environmental protection for the most demanding of process needs. Panel mount, pipe mount or wall mount, you choose how to set it up. Each instrument provides a comprehensive display of process status using crystal clear, full color, TFT Technology, the finest available. The easy to use user interface delivers clear text prompts that make installation, commissioning and operation quick and simple.



ControlMaster CM15

ControlMaster CMF310

SM500

RVG200

Circular Chart Recorder

SM3000



# Process Safety

Process Safety - ABB's Independent High Integrity Safety System is TUV Certified for Safety Integrity Level (SIL) 3 applications, where deep stand-alone Process Safety is needed.

## AC800M

The AC800M HI offers a SIL3 TUV certified control environment for combining safety and business critical process control in one controller without sacrificing safety integrity. The AC800M High Integrity controller is achieved by combining the processor module (PM865) with the safety module (SM811). When configured as a SIL1-2 system, the AC800M HI is realized in a 1oo1D structure by combining application execution in the PM865 with diagnostic and monitoring functions in the SM811 / SM810. As a SIL3 system, it is achieved in a 1oo2D structure in both PM865 and SM811.

## S800-High Integrity I/O

S800 I/O a distributed, highly modularized and flexible I/O system, providing easy installation of I/O modules and process cabling. S800 I/O modules and its termination units can be mounted and combined in many different configurations to fit any space requirements or meet any application needs. A comprehensive assortment of I/O modules and accessories are available for safety critical and non-critical use. Within the S800 I/O family, there are SIL3 compliant modules that can be used for safety critical applications.

The High Integrity I/O is certified for IEC61508- SIL3, DINV 19250 / DINVVDE0801-AK6 and EN954-1 Category 4. The High Integrity I/O are used together with a certified controller to comply with the standards. The three modules that belong to the High Integrity I/O family, that are certified for these standards, are the AI880 / AI880A, DI880, and DO880. The modules are supported by the AC800M controller PM865 only and have to use the optical ModuleBus modem TB840, adding optical clusters.

## Control Safe Engineering

Control Safe Engineering is a TUV-certified engineering tool for the programming of SIL applications; including certified libraries, IEC61131-3 programming languages, access and override (force) control, and difference reports. The object oriented engineering environment with SIL compliant function libraries efficiently supports the entire safety lifecycle. The engineering environment includes safeguards against non-SIL compliant configurations. The engineering system will automatically limit user configuration choices.

# Machine Safety

Machine Safety - AC500-S Safety PLC for Machine Safety applications, offers the unique CPU module SM560-S which is optimally designed with extensive diagnostic functionality as per the safety norms to meet SIL3 (IEC 61508, IEC 62061) & PL e (ISO 13849-1) standard of functional safety application.

## AC500-S PLC

AC500-S Safety PLC offers the unique CPU module SM560-S which is optimally designed with extensive diagnostic functionality as per the safety norms to meet SIL3 (IEC 61508, IEC 62061) & PL e (ISO 13849-1) standard of functional safety application. The AC500-S system supports flexible configuration concept in machine building due to configuration switch. The AC500-S components are also available as XC (extreme conditions) for harsh environmental conditions.

## S500-S I/O Modules

All S500 I/O modules supports SIL3 (IEC 61508, IEC 62061) and PL e (ISO 13849-1) functional safety standards with approvals from CE, cUL, UL and C-Tick. These modules could be placed in the I/O Bus (local rack) as well as in the remote rack via PROFINET network using PROFIsafe protocol. The I/O modules has built-in process power supply checking implementation.

There are three different types of S500-S I/O Modules:

- Digital Input Module DI581-S with 16 safety digital input channels up to SIL2 or PL d OR 8 channels up to SIL3 or PL e with 8 test pulse outputs.
- Digital Input/Output Module DX581-S with 8 safety digital output channels up to SIL3 or PL e and 8 safety digital input channels up to SIL2 or PL d OR 4 channels up to SIL3 or PL e with 4 test pulse outputs
- Analog Input Module AI581-S with 4 safety current input channels up to SIL2 or PL d OR 2 safety current input channels up to SIL3 or PL e and Terminal Unit TU582.



AC800 HI & S880 I/O



AC500-S & S500-S I/O

# Summary

Scalable for projects of any size, the Control Technologies product group is comprised of: Freelance DCS, Compact Product Suite, and the AC500 PLC product family. Independent High Integrity Safety, Machine Safety, PLC Automation, and Recorders and Controllers are each made available in the Compact Product Suite. All product groups carry ABB's sterling global reputation in Industrial Automation.

## Contact Us

ABB Inc.  
Industrial Automation Control Technologies  
Wickliffe, Ohio  
Phone: +1 440 585 8500

Sam Petty  
Director, Channel Partners - North America  
Phone: +1 440 585 6750  
Email: sam.r.petty@us.abb.com

Eltony Hayes  
Regional Channel Manager - Gulf  
Phone: +1 281 467 7602  
Email: eltony.o.hayes@us.abb.com

Dan Rapp  
Regional Channel Manager - Special Accounts  
Phone: + 1 512 705 6078  
Email: daniel.j.rapp@us.abb.com

Steve Walker  
Regional Channel Manager - Northeast  
Phone: + 1 330 357 9041  
Email: steve.walker@us.abb.com

[www.abb.com/controlsystems](http://www.abb.com/controlsystems)  
[www.abb.com/freelance](http://www.abb.com/freelance)  
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