

Main catalog

Industrial Automation & Motion PLCs, HMIs, Drives, Servo Drives, Motion Controllers



Power and productivity for a better world™

# Industrial Automation & Motion PLCs, HMIs, Drives, Servo Drives, Motion Controllers

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# AC500 products family Overview

ABB offers a comprehensive range of scalable PLCs and robust HMI control panels as well as high-availability solutions.

Since its launch in 2006, the AC500 PLC platform has achieved significant industry recognition for delivering high performance, quality and reliability. ABB delivers scalable, flexible and efficient ranges of automation components to fulfill all conceivable automation applications.



Example of connectivity options for AC500



1



# AC500

ABB's powerful flagship PLC offering a wide range of performance levels and scalability within a single, simple concept where most competitors require multiple product ranges to deliver similar functionality. Web server integrated and IEC 60870-5-104 remote control protocol for all Ethernet versions.



# **Drives & Motion control**

Our motion control products and low voltage AC drives include a choice of real-time Ethernet and high-performance multi-axis motion control. A broad selection of capabilities includes communications options, drive-based functional safety features and programming tools to adapt to a wide range of applications.



# AC500-eCo

Meets the cost-effective demands of the small PLC market whilst offering total inter-operability with the core AC500 range. Up to 10 I/O modules connected to the CPU, fast counter onboard CPU up to 50 kHz. Web server, FTP server and Modbus-TCP for all Ethernet versions. A Pulse Train Output module is available for multi axis positioning.



# AC500-S

A PLC based modular automation solution that makes it easier than before to mix and match standard and safety I/O modules to expertly meet your safety requirements in all functional safety applications. "Extreme conditions" version is also offered.



# AC500-XC

"Extreme conditions" modules with extended operating temperature, immunity to vibration and hazardous gases, use at high altitudes, in humid conditions, etc.

It replaces advantageously expensive cabinets by its built-in protection against dirt, water, gases, dust.



# **Control panels**

Our control panels offer a wide range of touchscreen graphical displays from 3.5" up to 15". They are provided with a user friendly configuration software that enables tailor made customized HMI solutions. Rich sets of graphical symbols and the relevant drivers for ABB automation products are provided. Control panels for visualization of AC500 webserver applications are available as well.



### DigiVis 500

DigiVis 500 software is a simple and easily accessible solution in the development of supervision applications. It offers all the functions that are essential to a secure environment, its functional reliability and dual-display mode will simplify all your supervision operations, keeping interruptions to a minimum.



# Programming software

Automation Builder integrates the Engineering and Maintenance for PLC, Drives, Motion, HMI and Robotics.

It complies with the IEC 61131-3 standard

offering all 5 IEC programming languages for PLC and Drive configuration. In addition, it includes continuous function chart, C, extensive function block libraries, and powerful embedded simulation/visualization features. Automation Builder supports a number of languages (English, German, French, Chinese, Spanish) and comes with new libraries, FTP functions, SMTP, SNTP, smart diagnostics and debugging capabilities.

# AC500 products family Automation Builder

1

Automation Builder is ABB's new engineering productivity suite for machine builders and system integrators.



# Discover engineering productivity in engineering your discrete automation solutions.

Automation Builder is ABB's integrated programming and simulation environment for PLCs, safety, robots, motion, drives and control panels.

Automation Builder integrates the proven ABB tools Control Builder Plus, RobotStudio, Drive Manager, Mint WorkBench and Panel Builder.

# Minimize your efforts for managing your project code and data with Automation Builder.

Improve your productivity through seamless engineering – common data storage, single project archive, time saving library blocks for device integration, and a common software installer.

Reduce engineering effort and maintenance cost using easy to use libraries for applications in wind, water, solar, drives, motion, robotics and safety.

Benefit from the simplicity of IEC 61131-3, PLC open, ANSI C and MINT programming languages.

Speed up your project by the bulk data handling capabilities of Automation Builder.

# Reduce downtime by simplified diagnostics and maintenance.

Automation Builder is this single software suite for you to configure and program various ABB controller families in a single project.

Secure and restore your applications in a consistent joint backup.



# AC500 products family At a glance...

# The AC500 Programmable Logic Controllers offers the latest technology enhancements with greater performance in a scalable package.

Standard industrial communications fieldbus, networks and protocols supported by the 'One Platform' solution enable the AC500 to be a very capable automation solution in demanding

environment. The flexible scalable range of superior performance CPUs enables complete control of your application whenever and wherever you need it.



Fieldbus enabled

Ethernet and Fieldbus enabled

\* eXtreme Conditions version available

# AC500 products family At a glance...

	AC500-eCo	AC500	AC500-XC	AC500-S (2)	AC500-S-XC (2
System Configuration and Application pro	ogramming				
Automation Builder (common programming tool)					
Application Features					
Extended temperature range					
Functional safety					
Support of simple motion with FM562 module (1)					
Support of coordinated motion (1)					
Support of High Availability (HA)					
CPU Features	AC500-eCo	AC500	AC500-XC	AC500-S (2)	AC500-S-XC (2
Performance (time per binary instruction)	0.08 µs	0.0020.06 µs	0.0020.06 µs	0.05 µs	0.05 µs
Program memory	128512 kB	1284096 kB	1284096 kB	1024 kB	1024 kB
User data memory	14130 kB	1285632 kB	1285632 kB	1024 kB	1024 kB
Remnent data (= saved)	2 kB	121536 kB	121536 kB	120 kB	120 kB
Serial communication					
RS232					
RS485					
Isolated interface					
Ethernet					
DHCP, FTP server, Web server					
Programming					
Modbus-TCP		_			
IEC 60870-5-104 remote control protocol					
SNTP (Simple Network Time Protocol)					
SMTP (Simple Mail Transfer Protocol)					
Capability to connect Fieldbus Modules		_			
/Os integrated on CPU					
/O Modules Features	S500-eCo	S500	S500-XC	<b>S500-S</b> (2)	S500-S-XC (2)
Analog modules					
Configurable					
Dedicated					
Digital modules					
Configurable					
Dedicated					
Transistor outputs short circuit protected					
Diagnosis for outputs					
Extension with S500-eCo and S500(-XC) I/O modules				(2)	(2)

fully partly

(1) Requires Library PS552-MC-E.

(2) AC500-S and AC500-S-XC are extension CPU modules. They require an AC500 or AC500-XC CPU to operate. The latter support all communication interfaces.

# AC500 products family AC500-eCo



# 1 AC500-eCo Central Processing Unit (CPU)

- Different memory options
- Integrated communication option.

# 2 S500-eCo I/O Modules

- Up to 10 expansions
- Decentralized extension available.

# **3** Terminal blocks

- Three types of pluggable terminal blocks available.

# AC500 products family AC500 and AC500-XC



### **1** Terminal Base

- Same for all AC500 CPU types
- For 1, 2 or 4 communication modules
- With serial interfaces.

## 2 Communication Modules

- For PROFIBUS DP<sup>®</sup>, Ethernet, Modbus TCP, EtherCAT<sup>®</sup> CANopen<sup>®</sup> or PROFINET<sup>®</sup> IO
- Up to 4 pluggable.

### 3 AC500 Central Processing Unit (CPU)

- Different performance, memory, network, operating conditions options
- Integrated communication.

# 4 S500 I/O Modules

- Up to 10 expansions
- Decentralized extension available.

### 5 Terminal units

- Up to 10 terminal units
- Decentralized extension available.

# AC500 products family AC500-eCo system characteristics

AC500-eCo CPUs can be locally expanded with up to 10 I/O modules. New AC500-eCo CPUs for use with pluggable terminal blocks available.



1



 AC500-eCo CPUs can be locally expanded with up to 10 I/O modules (Standard S500 and S500-eCo I/O modules can be mixed).



2 Wall mounting



3 SD-card adapter



4 SD-card



6 Adapter with realtime cloc
6 Adapter with COM2 & realtime clock



7 Adapter with COM2







9 RS485 isolator for COM1



10 COM1 USB11 COM2 USB programming cable

8 Terminal blocks



AC500-eCo Starter kits. More information page 163.

# AC500 products family AC500 system characteristics

1

AC500, superior local extension capabilities for I/O communication and best-in-class CPU functionality and industry leading performance.





AC500 CPUs can be locally expanded with up to 10 I/O modules (Standard S500 and S500-eCo I/O modules can be mixed).



2 Terminal base



5 S500 Terminal unit



8 SD-card



3 Communication module Up to 4 modules in numerous combinations to communicate with nearly everything



6 S500 I/O module



9 Battery





7 S500-eCo I/O module

# AC500 products family Functional Safety

AC500-S Safety PLC is the answer for complex machine safety applications that need the highest level of reliability, efficiency and flexibility.

Hence this safety PLC is aimed at protecting people, machines or processes, environment and investment. An ideal choice of safety PLC that is well suited for wind turbine, crane, hoist and robot applications.







3 Safety terminal unit

### More integration and easier programming

Featuring a consistent look and feel across the entire range, the AC500 is the PLC of choice for applications where uncompromising flexibility, integration and communication are a must. With Automation Builder, you easily integrate your safety application with your ABB PLC, Safety, Drives, Motion, HMI and Robotics. Automation Builder is simple to use through the integrated standard languages like IEC 61131-3, letting you get up and running in no time at all. And not only that: Clear configuration of the overall system with one single tool ensures optimal transparency. With the AC500-S Safety PLC, the latest addition to the AC500 family, ABB takes the stress out of managing even the most complex safety applications. Support for safety-relevant calculations such as COS, SIN, TAN, ASIN, ACOS and LOG makes the AC500-S ideal for applications in fields like crane engineering, wind power generation, robotics and hoist technology. Plus it gives you greater flexibility and simplicity thanks to safety programming under Structured Text (ST) as well as full support for Function Block Diagram (FBD) and Ladder Diagram (LD). Also available in extreme conditions version.

# AC500 products family Extreme conditions

PLC AC500-XC for extreme conditions to be used indoor and outdoor. Ruggedized variants of AC500 for those fighting with the elements.

Hence this PLC AC500-XC is aimed to be reliable, functional and operational even under rough environmental conditions.







1 Extreme conditions communication module



2 Extreme conditions CPU and terminal base



3 Extreme conditions S500 terminal unit



4 Extreme conditions S500 I/O module



# Operating in wet environment

Increased resistance to 100 % humidity with condensation.



# Use at high altitudes

Operating altitude up to 4000 m above sea level.



# Extended immunity to vibration

- 4 g root mean square random vibration up to 500 Hz
- 2 g sinusoidal vibration up to 500 Hz.





# Extended immunity to hazardous gases and salt mist

- -40 °C up to +70 °C operating temperature.

- G3, 3C2 immunity
- Salt mist EN 60068-2-52 / EN 60068-2-11.



# Extended EMC requirements

- EN 61000-4-5 surge immunity test

Extended operating temperature

- EN 61000-4-4 transient / burst immunity test.

# AC500 products family AC500 libraries

1

The AC500 libraries increase stability, while reducing warranty and service efforts. A good investment for System Integrators and end-users. These library packages contain easy to use examples enabling with minimal programming effort to realize also complex and demanding applications quickly.





AC500 libraries especially focus on easy integration of drives, HMI and supervisory systems, enabling your automation solution to be built and commissioned quickly. AC500 solution libraries by ABB are maintained to ensure that your programs can also be used with less risk.

### Motion control library

Library package for decentral, central and coordinated motion following PLCopen<sup>®</sup> standard.

### Solar library

Library package for solar trackers to increase energy efficiency, fast commissioning, excellent positioning accuracy.

### Water library

Library package with functions for energy efficiency and fast commissioning of water applications for example pumping stations and remote communications.

### **Drives integration library**

Library package for fast integration of ABB ACS drives with different field busses. Included free-of-charge in the Automation Builder suite.

# AC500 products family CP600 series

1

ABB control panels can be distinguished from their competitors by their easy yet comprehensive functionality, making clear and easy to understand tailor made operational information for production plants and machines available at a single touch. CP600 control panels make machine operation efficient, predictable and user-friendly.



# Build effective graphic interfaces with Panel Builder 600 - efficient representation of your information







CP600





AC500

without Webserver

Automation Builder programming station

# Save engineering time by using Automation Builder for both your PLC and WebVisu



**Automation Builder** programming station





AC500 with Webserver





CP600-WEB with visualization for AC500 web server

# Connectivity with Drives directly without PLC

Automation Builder programming station





Drives

# Automation products Supervision solution

# DigiVis 500 software is a simple and easily accessible solution in the development of supervision applications.

It offers all the functions that are essential to a secure environment, its functional reliability and dual-display mode will simplify all your supervision operations, keeping interruptions to a minimum. Whether you are an OEM, a machine manufacturer or an integrator, DigiVis 500 will adapt to any application, machine or control room.



### Create your applications quickly and easily

The environment and the development functions have been designed to offer greater accessibility and to be exceptionally user friendly. The management structure allows you to place data in a hierarchy and access the different elements of your project efficiently.

Configuring the supervision applications is easy, whether you create your own or choose to customize or use one of the predefined models from the different libraries.

### Adaptability

A range of options is available to allow you to choose and adjust the maximum number of operational variables per project. Ranging from 50 to an infinite number of variable (OPC signals), you will surely find a size to fit your application needs.

### Save time

DigiVis 500 is easy to connect and put into operation thanks to its interaction with our PLC AC500 solution.

The development functions require no scripting, so you will not waste time with debugging.

What is more, updating your projects on the fly allows you to quickly make any minor changes without rebooting the software.

### Manage your projects efficiently

DigiVis 500 software runs on any Windows XP/7 PC platform. The dual-display mode enhances availability.

The overview offers quick access to all available visualization screens. The "DigiBrowse" option gives you access to all the supervision data outside the software.

### Manage your results

Data processing is optimized from archiving and safeguarding to exporting and making practical use of the data.

### Modularity

Whatever the size of your system, DigiVis 500 will suit your needs. It will also allow you to manage High Availability systems with our turnkey PLC (CI590) supervision solution.

### Reliability and security

The software's reliability and stability ensure a constant flow in the supervision of installations and the recovery of key data, particularly in managing high-availability solutions. The in-built alarm system enables you to ensure the integrity of your installations by customizing the advanced configuration. The "Security lock" option, which controls access, allows you to configure up to 16 profiles for a maximum of 1 000 individual users.

# ABB motion control Capability without complexity

ABB motion control drives offer flexible technologies and high performance motor control to solve a wide variety of applications.



1

For more than 25 years, MINT motion controls have been solving simple and complex motion tasks in the fields of packaging, electronics assembly and test, simple CNC systems and many more. MINT<sup>™</sup> is a high level programming language for simple multi-axis machine control. It combines multitasking efficiency, with event driven responsiveness and a simple plain english language to simplify machine and motion applications. MINT is supported by different platforms, such as intelligent drives, panel-mount analog / stepper, real-time Ethernet motion controllers, and plug-in controllers for drives, providing versatility in tackling a wide variety of applications.



# MINT<sup>™</sup> programmable motion systems

NextMove motion controllers offer high-level machine programming, multiaxis coordinated motion and a choice of technologies form stepper control, analog control and real-time Ethernet. Our intelligent drives are also programmable in the same easy to use MINT language.

### Flexible intelligent drives

MicroFlex e100 and MotiFlex e100 are programmable in MINT Lite and provide solutions to simple motion tasks such as indexing. MINT lite also allows flexible solutions to distributed control from PLCs where the behavior of each axis can be tailored to simplify control schemes.

### Motion control library

This library package for decentral, central and coordinated motion enabling fast and standardized engineering, especially together with ABB's motion control ACS Drives. The development of this library according PLC Open Standard offers a future proof investment.

### Advanced intelligent drives

MicroFlex e150 supports multi-tasking MINT programming with additional support for software CAMs, flying shears offering a single device solution to applications such as cut-tolength and labelling. ACSM1 high power motion drives feature SPC function block programming and a drive to drive (D2D) link for synchronization of multiple axes,

### Multi-axis intelligent drives

A plug-in MINT motion controller option for MotiFlex e100 provides up to five axes of coordinated motion, eliminating the need for an external controller. This high performance solution utilizes Ethernet POWERLINK and reduces cabling and panel space significantly offering a cost advantage.

# Low Voltage AC Drives For premium motor control

You base your business on cost efficiency and performance. We build advanced drive technology that's capable and compatible with your needs, for today and tomorrow. Our low voltage AC drives are flexible for you to optimize your process control, and reliable for high availability. You also get premium service, responsible solutions and expertise at your disposal, anywhere on the globe.



You base your business on cost efficiency and performance. We build advanced drive technology that's capable and compatible with your needs, for today and tomorrow. Our low voltage AC drives are flexible for you to optimize your process 1/26 | ABB Industrial Automation & Motion control, and reliable for high availability. You also get premium service, responsible solutions and expertise at your disposal, anywhere on the globe.



ACS880-01 All-compatible wall-mounted drive with everything built-in.



The flexible workhorse for many high performance applications.



ACS310 Built-in features for pump and fan applications.



ACS550 A wide power range for a broad range of industries.



ACS355 Compact and easy drives to install, set and commission.



ACS850 Flexibility and scalability for machinery applications.



# Automation Builder Integrated engineering suite

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Integrated engineering suite	2/31
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# Automation Builder Key features

Engineer your control and safety functions using IEC 61131-3 languages, CFC or ANSI C

Reduce downtime through Automation Builder's powerful debugging and diagnostics. Configure high performance control panel applications



Program and simulate your robots application in Automation Builder's RobotStudio

Seamlessly integrate and optimize your drives and motion configuration

# Automation Builder Integrated engineering suite



Automation Builder



Solar library



Water library



Motion control library

### Automation Builder Engineering Suite

- For all AC500 CPUs, all programming languages including Continuous Function Chart according to IEC 61131-3
- Contains: 6 programming languages, sampling trace, debugging, offline simulation, integrated visualization, trace recording (multi-channel), recipe management
- Languages: French, English, German, Chinese, Spanish
- Scope of delivery: software, libraries and documentation on USB ROM Single seat license
- Single seat license
- GCC included, Wind River Diab compiler can be integrated by user.

For	Description	Туре	Order code	Price	Weight
				-	(1 pce)
					kg
all AC500 CPUs	Automation Builder Engineering Suite	DM-TOOL	1SAP193000R0001		0.400
	License for runtime visualization package. For installation and visualization of images created with the Automation Builder Engineering Suite (2)	PS541-HMI (1)	1SAP190500R0001		0.300

(1) This package allows granting the license for the software. To install the HMI software, Automation Builder must be purchased separately.

(2) Delivery includes license code and documentation.

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For	Description	Туре	Order code	Price	Weight (1 pce)
					kg
all AC500 CPUs	Solar library (3)	PS562-SOLAR	1SAP195000R0001		0.300
all AC500 CPUs	Water library (3)	PS563-WATER	1SAP195200R0001		0.300
all AC500 CPUs	Motion Control library, Extended (3)	PS552-MC-E	1SAP192100R0002		0.300

(3) Delivery on USB stick that includes: library, single license code and documentation.

### Further application libraries and examples:

Please check and download further libraries and examples from: <u>www.abb.com/plc</u>

Use English language setting, then click on "Applications Libraries" or "Applications Examples".

- Applications Libraries add further functionality to AC500 PLC's. They are well tested library packages with application example(s) and documentation, have limited support and are free of charge.
   FTP-Client, HVAC, ...
- Applications Examples explain functionality by using e.g. standard Automation Builder libraries and functions in examples.
- They are tested in the described example configuration and functionality and also come with documentation and are free of charge.
- KNX, MySQL, Fieldbuses, device connections and many others.

Applications Libraries and Examples help to minimize valuable programming and testing time for specific applications.

# Automation Builder Software features





Technical data	Automation Builder
Description	Engineering Suite. Contains configuration and programming tool for AC500-based automation systems, based on CODESYS Automation Platform technology.
Features	<ul> <li>Common software installer</li> <li>PLC configuration and programming</li> <li>All 5 IEC 61131-5 languages IL, LD, FBD, SFC, ST, plus CFC</li> <li>Extensive PLC programming libraries</li> <li>I/O and communication module setup</li> <li>Protocol settings (UDP, TCP, FTP, SNTP, SMTP, HTTP, PING, Modbus TCP, IEC 60870-5-104)</li> <li>Network device scan: scan function and IP configurator</li> <li>PLC firmware update, download and online change to single or several PLCs</li> <li>Recipe management</li> <li>PLC simulation and debugging</li> <li>Online diagnostics</li> <li>Multiple watch lists</li> <li>Drive Manager – remote drive configuration and diagnostics via PLC tunneling on PROFINET<sup>®</sup> or PROFIBUS<sup>®</sup> connection</li> <li>CP600 project and Pluto safety data in same project file</li> <li>CODESYS visualization for PC</li> <li>Various language support.</li> </ul>
Minimum engineering PC requirements	Windows XP SP3, Windows 7 SP1 32 or 64-bit, 1 GHz, 3 GB RAM, 10 GB free disk space.
Target Systems	<ul> <li>PLC AC500-eCo, AC500, AC500-XC, AC500-S (1), ACS880 (2)</li> <li>Control Panel CP600</li> <li>Robot Controller IRC5</li> <li>Mint motion controllers.</li> </ul>
Supported Devices on PLC fieldbus	<ul> <li>All I/O and fieldbus modules for AC500 family</li> <li>PROFINET®/Profibus® drives ACS355, ACQ810, ACS850, ACS880, ACSM1, MicroFlex e150, IRC5 with PROFINET® slave</li> </ul>
Included components	<ul> <li>Control Builder Plus</li> <li>PS553-DRIVES drive library</li> <li>Drive Manager plug-in</li> <li>Panel Builder 600</li> <li>RobotStudio (Basic license)</li> <li>Mint WorkBench</li> <li>CODESYS tools (OPC server and clients, service tool, PLC gateway, IP configuration)</li> <li>GNU compiler, C programming (3).</li> </ul>
Additional options	<ul> <li>PS501-S safety library</li> <li>PS541-HMI visualization</li> <li>PS552-MC-E PLCopen<sup>®</sup> motion library</li> <li>RobotStudio Premium license</li> <li>ACS880 IEC application programming.</li> </ul>
Comments	<ul><li>(1) requires PS501-S safety library.</li><li>(2) requires ACS880 IEC application programming option.</li><li>(3) for AC500 and AC500-XC targets.</li></ul>







PS552-MC-E	PS562-SOLAR	PS563-WATER
Motion control library	Solar tracker solution library	Water solution library
<ul> <li>Library enabling fast and standardized engineering according to PLCopen® standard when using ABB's AC500 PLC for motion control, especially together with ABB's motion control Drives.</li> <li>Covers different motion control options for single and multiaxis motion control applications: <ul> <li>Drive-Based and PLC-Based motion</li> <li>In PLC based motion, the position control loop could be closed in the PLC or drive (with synchronized network)</li> <li>Single axis, multiaxis and coordinated motion</li> <li>Defined Jerk limitation by polynomial interpolation</li> <li>Spline interpolation or polynomial interpolation for cam curves, position velocity or accelera- tion profiles available</li> <li>Possible to switch over between different movements and cam curves directly</li> <li>latch functionality by utilizing fast drive inputs for ACS350, ACS800, ACSM1</li> <li>Drive based motion: commands from PLC, drives perform interpolation and control loop</li> <li>Supports the new Pulse Train Output module FM562.</li> </ul> </li> <li>PLCopen® functions: <ul> <li>Administrative Function Blocks</li> <li>Single axis Function Blocks</li> <li>Multiple axis Function Blocks</li> <li>Coordinated Motion Function Blocks</li> <li>Additional ABB specific Function Blocks for further simplification.</li> </ul> </li> </ul>	Library for solar tracking applications enabling fast engineering, especially together with ABB's drives and motors Covers different tracker configurations and different algorithms for accuracy needs - Control of trackers in parabolic trough, power tower, PV and CPV applications. Complete library package for different tracking use cases, plug and play: Example program with detailed explanations and visualizations - Control of the tracker adaptable to different needs and conditions, to achieve maximum efficiency of installation - Exact positioning of different axes with the following accuracies: - NOAA algorithm 0.03 Grad - NREL algorithm 0.0003 Grad. Input / sensor adaptation Communication Different actuators / drives control All needed modes for simple commissioning and manual operation: - Fast and simple calibration of the trackers, offering manual repositioning and fine tuning - Safety positions - Back tracking.	<ul> <li>Library supporting the most common functions in many water applications</li> <li>Flexible data logging options: <ul> <li>Especially suited for remote communication like GSM/GPRS</li> <li>Timestamp in logging</li> <li>Integrated variants for simple use with IEC 60870</li> <li>Logging to files: storage capacity only de- pendent on memory availability</li> <li>Flexible log conditions (cyclic, event or tolerance based).</li> </ul> </li> <li>Support for pumping station functions with different operation modes <ul> <li>Standard multidrive functions (PLC based)</li> <li>Advanced functionality together with ABB ACS and ACQ810 drives</li> <li>Detailed diagnosis</li> <li>Energy efficiency functions</li> <li>Multidrive functions</li> <li>Flow estimation.</li> </ul> </li> <li>CP600 support for ACQ810: Fast and simple configuration for pumping stations with re- duced programming effort via pre-built visualization screen templates.</li> <li>Application examples for fast engineering and startup.</li> </ul>
Package with self installing software and license code on USB-stick.	Package with self installing software and license code on USB-stick.	Package with self installing software and license code on USB-stick.
All AC500 CPUs (options and no. of blocks/ functions and performance will depend on CPU size and memory).	NOAA: PM554-XX and above NREL: PM573-ETH and above.	All AC500 CPUs. Logging: PM573 and above.


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Entry level PLC solutions	3/37
Technical data	3/40
System data	3/47

# AC500-eCo Key features

- Up to 10 I/O modules connected to the CPU
- Compatible with all standard I/O modules (S500 and S500-eCo)
- Digital I/O module with configurable I/O available



High performance with large memory variant available

- Three different types of terminal blocks available
- Integrated onboard I/O
- AC versions with integrated power supply

Comprehensive communication options:

- Ethernet for communication and Web server for user defined visualization
- Up to two serial ports for decentralized I/O and communication



PM554



PM556

### AC500-eCo CPUs

- 1 RS485 serial interface (2nd is optional)
- Centrally expandable with up to 10 I/O modules
  - (standard S500 and/or S500-eCo modules can be mixed)
- Optional SD card adapter for data storage and program backup
- Variants with integrated Ethernet (Ethernet includes web server)
- Minimum cycle time per instruction: Bit 0.08  $\mu s,$  Word 0.1  $\mu s,$  Float-point 1.2  $\mu s.$
- Relays up to 2A each or 6A per group (total current) at 120/240 VAC or 24 VDC

Program memory	Onboard I/Os	Relay / Transistor outputs	Integrated communication	Power supply	Туре	Order code	Price	Weight (1 pce)
kB	DI/DO/AI/AO							kg
PM554	: digital I/Os	5						
128	8/6/-/-	Transistor	-	24 V DC	PM554-TP	1SAP120600R0001		0.300
128	8/6/-/-	Relay	-	24 V DC	PM554-RP	1SAP120700R0001		0.400
128	8/6/-/-	Relay	-	100-240 V AC	PM554-RP-AC	1SAP120800R0001		0.400
128	8/6/-/-	Transistor	Ethernet	24 V DC	PM554-TP-ETH	1SAP120600R0071		0.400
PM556	: digital I/Os	s, 512 kB	program me	emory				
512	8/6/-/-	Transistor	Ethernet	24 V DC	PM556-TP-ETH	1SAP121200R0071		0.400
PM564	digital and	analog I	/Os (1)	•			-	
1 10004								
128	6/6/2/1	Transistor	-	24 V DC	PM564-TP	1SAP120900R0001		0.300
	6/6/2/1		-	24 V DC 24 V DC	PM564-TP PM564-RP	1SAP120900R0001 1SAP121000R0001		0.300
128		Transistor	- - -					
128 128	6/6/2/1	Transistor Relay	- - Ethernet	24 V DC	PM564-RP	1SAP121000R0001		0.400
128 128 128	6/6/2/1 6/6/2/1	Transistor Relay Relay	- - Ethernet Ethernet	24 V DC 100-240 V AC	PM564-RP PM564-RP-AC	1SAP121000R0001 1SAP121100R0001		0.400 0.400

Terminal blocks (9 or 11 poles) are necessary for each AC500-eCo I/O. They are delivered separately.

(1) All analog inputs on PM564 can be configured as digital inputs. Analog inputs are 0-10VDC only. 1 Analog output configurable as 0-10 VDC, 0-20mA, or 4-20mA



PM564



DI561



AI562



AX561

### S500-eCo I/O modules

- For central expansion of the AC500 or AC500-eCo CPUs
- For decentralized expansion in combination with communication interface module DC551-CS31, PROFINET® CI50x modules, CI592-CS31, PROFIBUS® modules CI54x, and CANopen® modules CI58x (not usable with DC505-FBP module and CI590-CS31-HA).

### Digital I/O

- DC: Channels can be configured individually as inputs or outputs.

Number of	Input signal	Output type	Output signal	Terminal block required		Туре	Order code	Price	Weight (1 pce)
DI/DO/DC				9 poles	11 poles				kg
8/-/-	24 V DC	-	-	1	-	DI561	1TNE968902R2101		0.12
16/-/-	24 V DC	-	-	1	1	DI562	1TNE968902R2102		0.12
8/-/-	100-240 V AC	-	-	1	1	DI571	1TNE968902R2103		0.15
-/8/-	-	Transistor	24 V DC, 0.5 A	-	1	DO561	1TNE968902R2201		0.12
-/16/-	-	Transistor	24 V DC, 0.5 A	1	1	DO562	1SAP230900R0000		0.16
-/8/-	-	Relay	24 V DC, 120 / 240 V AC, 2 A	-	1	DO571	1TNE968902R2202		0.15
-/8/-	-	Triac	100-240 V AC, 0.3 A	1	1	DO572	1TNE968902R2203		0.12
-/16/-	-	Relay	24 V DC, 120 / 240 V AC, 2 A	1	1	DO573	1SAP231300R0000		0.19
8 / 8/ –	24 V DC	Transistor	24 V DC, 0.5 A	1	1	DX561	1TNE968902R2301		0.12
8 / 8/ –	24 V DC	Relay	24 V DC, 120 / 240 V AC, 2 A	1	1	DX571	1TNE968902R2302		0.15
-/-/16	24 V DC	Transistor	24 V DC, 0.1A	HE10-20	-	DC561	1TNE968902R2001		0.12
-/-/16	24 V DC	Transistor	24 V DC, 0.5 A	1	1	DC562	1SAP231900R0000		0.15

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. They are delivered separately.

### Analog I/O

- Each channel can be configured individually
- Resolution:
- Al561, AO561, AX561: 12 bits/11 bits + sign
- Al562, Al563: 15 bits + sign.

Number of	Input signal	Output signal	Terminal block required		Туре	Order code	Price	Weight (1 pce)
AI/AO			9 poles	11 poles				kg
4 / 0	±2.5 V, ±5 V, 05 V, 010 V, 020 mA, 420 mA	-	1	1	AI561	1TNE968902R1101		0.12
2/0	PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω, 300 Ω	-	-	1	AI562	1TNE968902R1102		0.12
4 / 0	S, T, R, E, N, K, J, Voltage range: ±80 mV	-	1	1	Al563	1TNE968902R1103		0.12
0/2	-	-10+10 V, 020 mA, 420 mA	-	1	AO561	1TNE968902R1201		0.12
4/2		-10+10 V, 020 mA, 420 mA	1	1	AX561	1TNE968902R1301		0.13

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. They are delivered separately.



FM562

### **Positioning module**

- For central expansion of the AC500 or AC500-eCo CPUs
- For decentralized expansion in combination with communication interface modules CI58X-CN, CI50X-PNIO or CI54X-DP
- Not for use in combination with communication interface modules DC551-CS31, DC505-FBP, CI51X or CI59X
- The FM562 module provides Pulse Train Outputs for 2 axes. Profile generator integrated.

Number of axis	Input signal	Output signal	Terminal block required		Туре	Order code	Price	Weight (1 pce)
			9 poles	11 poles				kg
2	4 digital inputs 24 V (2 per axis)	4 pulse outputs RS422 (2 per axis)	1	1	FM562	1SAP233100R0001		0.15

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. They are delivered separately. Library PS552-MC-E is required for programming this module.

Terminal blocks for S500-eCo I/O modules and AC500-eCo CPUs

Cable entry

Side

Side

Front

Front

Front

Front

### Accessories

Number of

poles

9

11

9

11

9

11



TK506



TA561-RTC



TA562-RS-RTC

TA570

TA562-RS



TA565-9



TA564-11

**ARRANAR** 

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Only ABB terminal blocks must be used with AC500-eCo.

TA563-9

Description	Туре	Order code	Price	Weight (1 pce)
				kg
SD Memory Card 2 GB needs the MC503 option	MC502	1SAP180100R0001		0.020
SD Memory Card adapter	MC503	1TNE968901R0100		0.010
Programming cable USB => RS485 Sub-D, 3 m	TK503	1TNE968901R1100		0.400
Programming cable USB => RS485 Terminal block, 3 m	TK504	1TNE968901R2100		0.400
RS485 isolator, Sub-D 9 poles / Terminal 5 poles for COM1	TK506	1SAP186100R0001		0.080
Real time clock option board, battery CR2032 not included	TA561-RTC (1)	1SAP181400R0001		0.007
RS485 serial adapter COM2, pluggable screw terminal block included	TA562-RS	1TNE968901R4300		0.007
Combined Real Time Clock option with RS485 serial adapter COM2, pluggable screw terminal block, included	TA562-RS-RTC (1)	1SAP181500R0001		0.012
Wall Mounting Accessory for AC500-eCo CPU and S500-eCo I/O modules (100 pieces per case)	TA566	1TNE968901R3107		0.450
Set of accessories: 6 x plastic cover for option slot, 6 x 5 pole terminal block, 6 x 5 pole screw terminal block for COM2 serial interface.	TA570	1TNE968901R3203		0.090
Digital input simulator for onboard I/O of CPU, 6 x switch, 24 V DC	TA571-SIM	1TNE968903R0203		0.040

(1) Standard battery CR 2032 has to be purchased separately.

Connection type

Screw

Screw

Screw

Screw

Spring

Spring

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Price

Weight

(1 pce)

kg

0.017

0.020

0.026

0.035

0.016

0.020

Order code

1TNE968901R3101

1TNE968901R3102

1TNE968901R3103

1TNE968901R3104

1TNE968901R3105

1TNE968901R3106

Туре

TA563-9

TA563-11

TA564-9

TA564-11

TA565-9

TA565-11

### AC500-eCo CPUs

Туре		PM554-TP	PM554-RP	PM554-RP-			ETH PM556-TP-ETH
Supply voltage		24 V DC		100-240 V AC		24 V DC	
Current consumption on		24 V DC		100 V AC	240 V AC	24 V DC	
Min. typ. (module alone)		0.06 A	0.08 A	0.02 A	0.012 A	0.07 A	0.07 A
Max. typ. (I/Os)		0.18 A	0.22 A	0.2 A	0.11 A	0.19 A	0.19 A
Program memory		128 kB				••••	512 kB
ntegrated data memory		14 kB thereof 2	kB saved		•••••	••••	130 kB thereof 2 kB save
Web server's data for user RAM	l disk	-	•••••		•••••	512 kB	1024 kB
Data buffering (of saved data)		flash memory		•••••	•••••	····•	······
Real-time clock (option with bat	tery back-up) (1)	•			•••••		
		1					
Program execution							
Cyclical		•		·····			······
Time controlled		•		•••••	····•	•••••	······
Multi tasking			iterrupt task max.	·····		·····	
Interruption		•					·····
User program protection by pas	sword	•					
Cycle time for 1 instruction (min	imum)						
Binary	,	0.08 µs					
Word		0.1 µs	•••••				
Floating		1.2 µs	•••••				
<b>v</b>		1 112 PO					
Onboard digital inputs							
Channels		8					
Signal voltage		24 V DC					
Onboard digital outputs							
Channels		6					
Relay / Transistor		Transistor	Relay	Relay	Relay	Transistor	Transistor
Rated voltage		24 V DC	240 V AC	240 V AC	240 V AC	24 V DC	24 V DC
			· · · · · · · · · · · · · · · · · · ·		· · · · • • • · · · · · · · · · · · · ·		
Nominal current per channel		0.5 A	2 A resistive	2 A resistive	2 A resistive	0.5 A	0.5 A
Onboard analog inputs							
Channels		-					
signal ranges		-		•••••	•••••	••••	
Onboard analog outputs							
Channels		-					
signal ranges		-				••••	
Max. number of centralized input							
Max. number of extension mode			3500 and/or S500-e	Co modules allow	(ed)	····•	
-	nputs	320 + 8					
	outputs	320 + 6					
	nputs	160					
0	outputs	160					
Max. number of decentralized in	nouts/outputs						
	decentralized	on CS31 bust u	p to 31 stations with	up to 120 DI / 13	20 DO each or u	o to 32 AI/32 AO	per station
	2000111/0112/00	0.1 0001 bub. u				5 10 0L / 11/02 AU	
Internal interfaces							
COM1							
RS485		•			·····	····	
Sub-D connection		•					
Programming, Modbus, ASCII, CS	31	•					
COM2 (option) (2)							
RS485		•					
Terminal block		•			•••••	••••	•••••
Programming, Modbus, ASC		•	•••••				••••••
Ethernet		+	•••••		•••••	••••	•••••
RJ45		_				•	
Ethernet functions:		-	•••••		•••••	•	
Programming, Modbus TCP/IP, UI	DP/IP. integrated					-	
Web server, DHCP, FTP server	,						
RUN/STOP switch		•					
	nd error	•	••••••		•••••		
LED display for power, status an Approvals	nd error		erview page 166 or w	www.abb.com/plo			

Real-time clock requires optional TA561-RTC or TA562-RS-RTC.
 COM2 requires TA562-RS-RTC or TA562-RS.

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### AC500-eCo CPUs

Туре		PM564-TP	PM564-RP	PM564-F	RP-AC	PM564-TP-ETH	I PM564-RP-ETH	PM564-F	P-ETH-AC
upply voltage		24 V DC	-	100-240 V	AC	24 V DC	-	100-240 V	AC
Current consumption on	•••••	24 V DC	••••••	100 V AC	240 V AC	24 V DC	•••••••••••••••••••••••••••••••••••••••	100 V AC	240 V AC
Min. typ. (module alor	ie)	0.095 A	0.11 A	0.02 A	0.011 A	0.10 A	0.12 A	0.023 A	0.014 A
Max. typ. (I/Os)	•••••••••••••••••••••••••••••••••••••••	0.21 A	0.24 A	0.21 A	0.125 A	0.22 A	0.25 A	0.22 A	0.13 A
Program memory		128 kB	•••••••••••••••••••••••••••••••••••••••	••••••	÷	÷	···÷·····	÷·····	··· <b>·</b> ······
ntegrated data memory	······	14 kB thereo	f 2 kB saved						•••••••••••••••••••••••••••••••••••••••
Neb server's data for use	er RAM disk	_		••••••	••••••	512 kB	•••••••••••••••••••••••••••••••••••••••		•••••••••••••••••••••••••••••••••••••••
Data buffering (of saved of		flash memory		•••••					•••••
Real-time clock (option w		•	••••••	••••••	******	•••••••••••••••••••••••••••••••••••••••		******	••••
	in battery back-upj (1)	•							
Program execution									
Cyclical		•							
Time controlled		•							
Multi tasking		no, 1 task +	1 interrupt task	max.					
Interruption		•							
User program protection	by password	•		••••••					••••••
Cycle time for 1 instructio	on (minimum)								
Binary		0.08 µs		••••••					••••
Word		0.1 µs	••••••	•••••					
Floating		1.2 µs							
Onboard digital inputs									
Channels		6							
Signal voltage	•••••	24 V DC	•••••	•••••	••••••				••••
		24 000	-						
Onboard digital outputs									
Channels		6							
Relay / Transistor	•••••	Transistor	Relay	Relay		Transistor	Relay	Relay	•••••
Rated voltage	•••••	24 V DC	240 V AC	240 V AC		24 V DC	240 V AC	240 V AC	•••••••••••••••••••••••••••••••••••••••
Nominal current per chan	nel	0.5 A	2 A resistive	2 A resistiv	'e	0.5 A	2 A resistive	2 A resistiv	'e
		1			-				-
Onboard analog inputs									
Channels	·····	2		•••••					
signal ranges		010 V / car	n be configured	as digital in	put 24 V DC				
Onboard analog outputs									
Channels		1							
signal ranges	•••••	0 10 V / 0	20 mA / 420		••••••	•••••••••••••••••••••••••••••••••••••••			•••••••••••••••••••••••••••••••••••••••
		010 07 0	2011/17 420	110 (					
Max. number of centralize	<u> </u>								
Max. number of extension	n modules on I/O bus		0 (S500 and/or	S500-eCo r	nodules allo	wed)			
Digital	inputs	320 + 8							
	outputs	320 + 6	••••••			••••••	••••		•••••
Analog	inputs	160 + 2	••••••••	•••••	******		******		•••••••••••••••••••••••••••••••••••••••
-	outputs	160 + 1	•••••••••••••••••••••••••••••••••••••••	••••••		•••••••••••••••••••••••••••••••••••••••	•••••		•••••••••••••••••••••••••••••••••••••••
Max much as at data at t	· ·	1							
Max. number of decentra		000			100 51				
I/O modules	decentralized	on CS31 bus	: up to 31 statio	ons with up	to 120 DI / -	20 DO each or up	to 32 AI/32 AO per s	station	
Internal interfaces									
COM1									
RS485		•							
Sub-D connection			••••••	••••••			••••	+	•••••••••••••••••••••••••••••••••••••••
			••••••	••••••	•••••••••••••••••••••••••••••••••••••••		••••		•••••
Programming, Modbus, A	5011, 6331			••••••					•••••
COM2 (option) (2)									
RS485	·····	•	••••••						•••••••••••••••••••••••••••••••••••••••
Terminal block		•		<u>.</u>					
Programming, Modbu	s, ASCII	•							
Ethernet									
RJ45		-				•			
Ethernet functions:	••••••	-	••••••	•••••	••••••	•	•••••••••••••••••••••••••••••••••••••••		•••••
Programming, Modbus TC	P/IP, UDP/IP, integrated								
Web, DHCP, FTP	, , <u>g</u>								
RUN/STOP switch	•••••••	•	••••••	•••••			•••••••••••••••••••••••••••••••••••••••		•••••
			. <b>.</b>						
	atus and error				-				
LED display for power, st Approvals	atus and error	see datailed :	overview page -	166 or 140404	abb.com/pl	<u>^</u>			

(1) Real-time clock requires optional TA561-RTC or TA562-RS-RTC.

(2) COM2 requires TA562-RS-RTC or TA562-RS.

### Digital S500-eCo I/O modules

Гуре		DI561	DI562	DI571	DO561	DO562
Supply voltage		-	-	-	24 V DC	24 V DC
Current consumption on UP	••••••			······		·····
Max. typ. (without load current)		-	-	-	0.005 A	0.005 A
Number of channels per module						
Digital input	uts	8	16	8 (AC)	_	-
out	<b>.</b>	_	-	-	8	16
Configurable as Input or Output DC	<b>.</b>	_	-	-	-	-
Relay / Transistor		_	-	_	Transistor	Transistor
	la	1				
Additional configuration of channel	15 85:	no			not applicable	
		110				
Digital inputs						
nput signal voltage		24 V DC		110-240 V AC	-	-
nput time delay		typically 48 ms		typically 15 ms / 30 m	IS —	-
nput current per channel						
At Input voltage	24 V DC	typically 5 mA		-	_	-
	5 V DC	typically 1 mA	•••••	-	-	-
		> 2.5 mA		-	_	-
	30 V DC	< 8 mA		-	_	-
	40 V AC	_		< 3 mA	-	-
	159 V AC	-		> 6 mA	-	-
Output current						
Nominal current per channel		-	-	-	0.5 A at UP = 2	4 V
Maximum (total current of all chann	nels)	-	-	-	4 A	8 A
Residual current at signal state 0		-	-	-	< 0.5 mA	•••••
Demagnetization when switching o	off	-	-	-	must be provide	ed externally
nductive loads					· · ·	
Switching frequency						
For resistive load		_	-	-	limited by CPU	cvcle time
For inductive load		_	-	-	max. 0.5 Hz	-,
For lamp load			-	-	max. 11 Hz at n	nax. 5 W
Short circuit / overload proofness	•••••	†	-	-	no	-
Overload indication (I > 0.7 A)		-	-	-	no	•••••••••••••••••••••••••••••••••••••••
Output current limiting	••••••	-	-	-	no	•••••••••••••••••••••••••••••••••••••••
Proofness against reverse feeding	of 24 V signals	[	-	-	no	
Contact rating	-					
For resistive load, max.		_	-	-	_	
For inductive load, max.		_	-	-	-	
For lamp load		-	-	-	-	
·		1		i	:	
Lifetime (switching cycles)				!	-	
Vechanical lifetime	·····	-	-	-	-	
ifetime under load		-	-	-	-	
Aaximum cable length for connect		1				
	elded	500 m			<u>-</u>	
uns	hielded	300 m			150 m	
Potential isolation						
Per module		•	•	•	•	
Between the channels input	ut	-	per group of 8	•	-	•••••••••••••••••••••••••••••••••••••••
outp	· · · · · · · · · • • · · · · · · · · ·	-	-	-	-	-
oltage supply for the module's lo	<b>.</b>	internal via I/O bi	JS	······		······
Fieldbus connection	-					
	modulo				12-DD CI501 CN (	21582-ON DOSSI 0001
suitable communication interface i	nouule		02-FINIO, 01004-PINIO, 1	JIJUU-FINIO, UID41-DP, UID	42-DF, 01001-0N, (	01002-019, 00001-0601
Suitable communication interface r	module	CI501-PNIO, CI5 CI592-CS31	02-PNIO, CI504-PNIO,	CI506-PNIO, CI541-DP, CI5	42-DP, CI581-CN, (	CI582-CN, DC5

Туре		D0571	DO572	DO573
Supply voltage		24 V DC		
Current consumption on UP	•••••			
Max. typ. (without load curren	nt)	0.050 A	-	0.050 A
lumber of channels per module			*	*
	iputs	_	-	-
	utputs	8	8	
Configurable as Input or Output		-	_	-
Relay / Transistor	20	Relay	triac (AC)	Relay
•				
Process voltage		24 V	······	
		24 V	_	-
Digital inputs				
nput signal voltage				
nput time delay		-	-	-
nput current per channel				
At Input voltage	24 V DC	-	-	-
	5 V DC	-	-	-
	15 V DC	-	-	-
	30 V DC		-	-
Output current			*	
Nominal current per channel		2 A (24 V DC / 120 V AC /	0.3 A at	2 A (24 V DC / 120 V AC /
ioninal current per channel		240 V AC, resistive load)	100240 V AC	240 V AC, resistive load)
Maximum (total current of all cha	annels)	2 x 8 A	2.4 A / 8 x 0.3 A	max 10 A per group
			2	(20 A per module)
Residual current at signal state C	)	_	1.1 mA rms at 132 V AC and 1.8 mA rms at 264 V AC	-
Demagnetization when switching	noff	must be performed externally	<u>i</u> i	<u>i</u>
nductive loads	,			
Switching frequency For resistive load				at the second
	••••••	1 Hz max.	10 Hz max.	1 Hz max.
For inductive load For lamp load	••••••		-	-
Short circuit / overload proofnes	c	1 Hz max. no	10 Hz max.	1 Hz max.
Dverload indication (I > 0.7 A)	5	no		
Dutput current limiting	••••••	no		
Proofness against reverse feedin	a of 24 V signals		_	yes
		yes	<u>i</u>	. 963
Contact rating				
or resistive load, max.	· · · · · · · · · · · · · · · · · · ·	2 A	0.3 A	2 A
For inductive load, max.	· · · · · · · · · · · · · · · · · · ·	-	-	-
For lamp load		200 W at 230 V AC 30 W at 24 V DC	-	200 W at 230 V AC 30 W at 24 V DC
			i	: 00 W at 24 V DO
ifetime (switching cycles)				
Mechanical lifetime		100 000	-	100 000
ifetime under load		100 000 at rated load	-	100 000 at rated load
Aaximum cable length for conne	ected process sig	nals		
	hielded	500 m		
	nshielded	150 m		
Potential isolation				
Per module		between outputs and logic	•	between outputs and logic
	iput		-	
•••	utput	per group of 4	-	– per group of 8
oltage supply for the module's		internal via I/O bus	<u>:</u> •	
Fieldbus connection				
Suitable communication interfac	e module	CI501-PNIO, CI502-PNIO, CI50 CI592-CS31	4-PNIO, CI506-PNIO, CI541-DP, CI542-DF	P, CI581-CN, CI582-CN, DC551-CS31

### Digital S500-eCo I/O modules

Digital S500-eCo I/O module	<u> </u>				
Гуре		DX561	DX571	DC561	DC562
Supply voltage		24 V DC			
Current consumption on UP					•
Max. typ. (without load current)		0.005 A	0.050 A	0.010 A	0.010 A
Number of channels per module					
Digital inputs		8	8	-	-
outputs		8	8	-	-
Configurable as Input or Output DC		-	-	16	16
Relays / Transistor		Transistor	Relay	Transistor	Transistor
Process voltage		·	•		
		24 V	24 V	24 V	24 V
Digital inputs		I	÷	:	i
nput signal voltage		24 V DC	24 V DC	24 V DC	24 V DC
nput time delay		typically 48 ms	24 V DC	24 V DO	typically 8 ms
		typically 4o ms			
nput current per channel					
t Input voltage	24 V DC	typically 5 mA	typically 5 mA	typically 4 mA	typically 5 mA
	5 V DC	< 1 mA	< 1 mA	< 1 mA	typically 1 mA
	15 V DC		> 2.5 mA	> 2.5 mA	> 2.5 mA
	30 V DC	< 6.5 mA	< 6.5 mA	< 6 mA	< 8 mA
Output current					
Iominal current per channel		0.5 A at UP = 24 V DC	2 A (24 V DC / 120 V AC /	0.1 A at UP = 24 V DC	0.5 A at UP = 24 V DC
			240 V AC, resistive load)		
Maximum (total current of all channels)		4 A	2 x 8 A	1.6 A	8 A
Residual current at signal state 0		< 0.5 mA		< 0.5 mA	< 0.5 mA
Demagnetization when switching off		must be performed external	ly		
nductive loads					
Switching frequency			<u>.</u>		
or resistive load		Limited by CPU cycle time	1Hz max.	Limited by CPU cycle time	
or inductive load		0.5 Hz max.		0.5 Hz max.	0.5 Hz max.
or lamp load		11 Hz max. at max. 5 W	1 Hz max.	-	11 Hz max. at max. 5 V
Short circuit / overload proofness		no			
Overload indication (I > 0.7 A)		no			
Dutput current limiting		no			
Proofness against reverse feeding of 24	V signals	no	yes	no	no
Contact rating					
or resistive load, max.		-	2 A	-	-
or inductive load, max.		-	-	_	_
For lamp load		-	200 W at 230 V AC	-	-
•			30 W at 24 V DC		
ifetime (switching cycles)					
Mechanical lifetime		_	100 000	_	-
ifetime under load		_	100 000 at rated load	_	_
				:	
Aximum cable length for connected p Cable shielded	rocess sig				
		500 m			
	eu	150 m			
unshield					
unshield Potential isolation			· ·		
unshield Potential isolation		•	-	•	•
unshield Potential isolation Per module		• -	_ _	• -	-
Unshield Potential isolation Per module Between the channels output		•	– – per group of 4	• - -	- -
Unshield Potential isolation Per module Between the channels output		• - - internal via I/O bus	– – per group of 4	• - -	- -
Potential isolation Per module Between the channels input output Voltage supply for the module's logic		-	– – per group of 4	• - -	-
Unshield Potential isolation Per module Between the channels output	lle	- - internal via I/O bus		-	-

### Analog S500-eCo I/O modules

Туре		AI561	AO561	AX561	AI562	AI563
Supply voltage		24 V DC	· · ·		· · ·	· ·
Current consumption	on UP	t		•		
Max. typ. (without		0.100 A	0.100 A	0.140 A	0.040 A	0.100 A
Number of channels p	er module					
Analog	inputs	4	-	4	2	4
-	outputs	-	2	2	-	-
Inputs, individually co	nfigurable					
-2.5+2.5 V	11 bits + sign	•	-	•	-	-
-5+5 V	11 bits + sign	•	-	•	-	-
-10+10 V	11 bits + sign	_	-	-	-	-
05 V	12 bits	•	-	•	-	-
)10 V	12 bits	•	-	•	-	-
)20 mA, 420 mA	12 bits	•	_	•	-	_
RTD		_	_	_	2	_
Pt100			:			÷
<b>.</b>	-50+400 °C (2/3- wire)	_		-	•	-
Pt1000			:	:	:	;
	-50+400 °C (2/3-wire)		<u> </u>		•	
Ni100 / Ni1000			;	;	1	;
<u> </u>	-50+150 °C (2/3-wire)	_	-	-	•	-
Resistor	0150 Ω/0300 Ω	_	-	-	•	-
Thermocouple	Types J, K, T, N, S, E, R	-	-	-	-	•
Voltage	-80+80 mV	-	-	-	-	•
Outputs, individually o	configurable					
10+10 V		-	•	•	-	-
020 mA		_	•	•	-	-
420 mA		-	•	•	-	-
Potential isolation						
Per module		-	-	-	•	•
Fieldbus connection			·			
Suitable communicati	on interface module	CI501-PNIO C	1502-PNIO CI504-PNIO	CI506-PNIO CI541-DF	CI542-DP CI581-CN	CI582-CN, DC551-CS31
Suituble communicati		CI592-CS31	1002 1 110, 01004-1 110	, 0.000 1 100, 0.041-01	, 010-72 DI , 0100 FON,	01002 014, 00001-0001

### FM562 positioning module

The FM562 module contains Pulse Train Outputs for 2 axes. Profile generator for simple motion control tasks are integrated. The RS422 outputs allow a direct connection to Stepper- or Servo drives. Function blocks in PLCopen<sup>®</sup> motion control style allow the integration of the module in an application. These function blocks are contained in the library PS552-MC-E.

Туре		FM562					
Functionality							
Number of axis		2					
Digital inputs		2 digital inputs per axis Function: for axis enable or limit switch					
Pulse outputs		Modes cw/ccw or pulse/direction Built in profile generators					
Data of the digital inp	outs						
Signal voltage		24 V DC					
Input current at 24 V	DC	typically 5 mA					
Potential isolation		by groups of 2					
Data of pulse outputs	S						
Signal		RS422 (differential)					
Frequency range		0250 kHz					
Potential isolation		RS422 outputs of both axis in one group isolated against the inputs, the process voltage and the PLC CPU logic					
Maximum cable leng	th for digital inputs						
Cable	shielded	500 m					
	unshielded	300 m					
Maximum cable leng	th for pulse outputs						
Cable	shielded	300 m					
	unshielded	30 m					
Process voltage UP							
Nominal voltage		24 V DC					
Current consumption		typically 0.04 A					
Reverse polarity prot	tection	•					
Potential isolation							
Per module		•					
Voltage supply for the	e internal logic	From UP / ZP with isolation					
Fieldbus connection							
Suitable communicat	tion interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI541-DP, CI542-DP, CI581-CN, CI582-CN					

# AC500-eCo System data

### **Environmental conditions**

Process and supply voltage	24 V DC (-15 %, +20 % without ripple)
Absolute limits	19.230 V inclusive ripple
Ripple	< 5 %
Protection against reverse polarity	10 s
Line voltage	120 V AC (-15 %, +10 %)
Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
Line voltage	230 V AC (-15 %, +10 %)
Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
Wide-range supply	
Line voltage	102264 V / 120240 V (-15 %, +10 %)
Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
ply	
Interruption	< 10 ms, time between 2 interruptions > 1 s, PS2
Interruption	< 0.5 periods, time between 2 interruptions > 1 s
	Absolute limits Ripple Protection against reverse polarity Line voltage Frequency Line voltage Frequency Wide-range supply Line voltage Frequency Ply Interruption

Important: Exceeding the maximum power supply voltage (>30 V DC) for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed. The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2. For the supply of the modules, power supply units according to PELV specifications must be used.

Climatic conditions		
Temperature	Operation	060 °C (horizontal mounting of modules)
		040 °C (vertical mounting of modules and output load reduced to 50 % per group)
	Storage	-40+70 °C
umidity r pressure ectromagnetic Compatibility adiated emission (radio distu onducted emission (radio distu	Transport	-40+70 °C
Humidity	Without condensation	Max. 95 %
Air pressure	Operation	> 800 hPa / < 2000 m
	Storage	> 660 hPa / < 3500 m
Electromagnetic Compatibil	lity	
Radiated emission (radio dis	sturbances)	Acc. to IEC61000-6-4
Conducted emission (radio	disturbances)	Acc. to IEC61000-6-4
Electrostatic discharge (ESI	D)	Acc. to EN 61000-4-2, zone B, criterion B
Fast transient interference v	voltages (burst)	Acc. to EN 61000-4-4, zone B, criterion B
High energy transient interfe		Acc. to EN 61000-4-5, zone B, criterion B
Influence of radiated disturt	bances	Acc. to IEC 61000-4-3, zone B, criterion A
Influence of line-conducted	interferences	Acc. to IEC 61000-4-6, zone B, criterion A

In order to prevent operating malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges. The connector of the I/O-Bus must not be touched during operation.

#### Mechanical data

Wiring method	Available types of terminal	Spring terminals, screw terminals
Degree of protection		IP 20 (if all terminal screws are tightened)
Vibration resistance		Acc. to IEC 61131-2
Shock resistance		Acc. to IEC 60068-2-27
Assembly position	Horizontal	no derating
	Vertical	max. ambient temp. 40°C and output load reduced to 50% per group
Assembly on DIN rail		Acc. to IEC 60715
	DIN rail type	35 mm, depth 7.5 mm or 15 mm
Assembly with screws	Screw diameter	4 mm
	Fastening torque	1.2 Nm

#### Main dimensions mm, inches





# AC500-eCo System data

### **Environmental tests**

# Climatic and mechanical tests

Storage	Cold withstand test	IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h
	Dry heat withstand test	IEC 60068-2-2 Test Bb: dry heat withstand test +70 °C / 16 h
Humidity	Damp heat test	IEC 60068-2-30 Test Db: Cyclic (12 h / 12 h)
		Damp-Heat Test 55 °C, 93 % r. H. / 25 °C, 95 % r. H., 2 cycles
Insulation Test		Acc. to IEC 61131-2
Vibration resistance	DIN rail mounting	all three axes
		511.9 Hz, continuous 3.5 mm
		11.9150 Hz, continuous 1 g
	With SD Memory Card inserted	15150 Hz, continuous 1 g
Shock resistance	DIN rail mounting	IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal
EMC immunity tests		
Electrostatic discharge (ESD)	Electrostatic voltage in case of	8 kV
<b>3</b> ( )	air discharge	
	Electrostatic voltage in case of	6 kV
	contact discharge	
Fast transient interference	Supply voltage units (AC, DC)	2 kV
voltages (burst)	Digital inputs/outputs (24 V DC)	2 kV
	Digital inputs/outputs (120/230 V AC)	2 kV
	Analog inputs/outputs	1 kV
	CS31 system bus	2 kV
	Serial RS-485 interfaces (COM)	2 kV
	Ethernet	1 kV
	I/O supply, DC-out	1 kV
High energy transient interference	Power supply AC	2 kV CM (1) / 1 kV DM (2)
voltages (surge)	Power supply DC	1 kV CM (1) / 0.5 kV DM (2)
	DC I/O supply, add. DC-supply-out	0.5 kV CM (1) / 0.5 kV DM (2)
	Buses, shielded	1 kV CM (1)
	AC-I/O unshielded	2 kV CM (1) / 1 kV DM (2)
	I/O analog, I/O DC unshielded	1 kV CM (1) / 0.5 kV DM (2)
Influence of radiated disturbances	Test field strength	10 V/m
Influence of line-conducted interferences	Test voltage	3V zone B, 10 V is also met.

(1) CM = Common Mode.

(2) DM = Differential Mode.





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High performance modular PLC	4/53
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# AC500 Key features

A high performance PLC:

- Highly modular
- From 8 to +80 000 I/Os
- More communications possibilities (Ethernet, Internet, PROFINET<sup>®</sup>, PROFIBUS<sup>®</sup>, Modbus<sup>®</sup>, CANopen<sup>®</sup>, EtherCAT<sup>®</sup>...)



- Seven programming languages available (five IEC 6<sup>1131-3</sup>, CFC and C-code)
- Data logging
- SD card for program back-up
- High Availability (HA) option
- Screw or spring terminal for I/Os
- Extensive programming libraries

Common AC500 line benefits: Automation Builder productivity suite, I/O modules scalable and flexible



PM572



PM592

### AC500 CPUs

- 2 internal serial interfaces, RS232 / RS485 configurable
- Display and 8 function keys for diagnosis and status
- Centrally expandable with up to 10 I/O modules, 320 I/Os (S500 and/or S500-eCo modules allowed)
- Simultaneous operation of up to 4 external communication modules in any desired combination
- Optional SD card for data storage and program backup
- Can also be used as slave on PROFIBUS® DP, DeviceNet or CANopen® via FieldBusPlug, CANopen® also using CM588 slave communication module
- Ethernet version provides web server and IEC 60870-5-104 remote control protocol.

Program memory	Cycle time in µs per instruction min.	Integrated communication	Туре	Order code	Price	Weight (1 pce)
kB	Bit/Word/Float. point					kg
128	0.06 / 0.09 / 0.7	2 x serial	PM572	1SAP130200R0200		0.135
512	0.06 / 0.09 / 0.7	Ethernet (2), 2 x serial	PM573-ETH (1)	1SAP130300R0271		0.150
512	0.05 / 0.06 / 0.5	2 x serial	PM582	1SAP140200R0201		0.135
1024	0.05 / 0.06 / 0.5	Ethernet (2), 2 x serial	PM583-ETH (1)	1SAP140300R0271		0.150
2048	0.002 / 0.004 / 0.004	Ethernet (2), 2 x serial	PM590-ETH (1)	1SAP150000R0271		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (2), 2 x serial	PM591-ETH (1)	1SAP150100R0271		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (2), 2 x serial	PM592-ETH (1)(3)	1SAP150200R0271		0.150

(1) Ethernet communication.

(2) Provides integrated web server and IEC 60870-5-104 remote control protocol.(3) Provides integrated 4 GB flashdisk for user data storage and data logging.



TB511-ETH



TB541-ETH

#### Terminal base

- For mounting and connection of the CPUs and communication modules
- 1 to 4 plug-in communication modules
- Connection for communication coupler integrated in the CPU
- I/O interface for direct connection of up to 10 expansion modules
- Fieldbus-neutral FieldBusPlug-Slave interface
- Connection COM1: 9-pole pluggable terminal block
- Connection COM2: 9-pole Sub-D (socket).

Number of coupler slots	Connection for coupler integrated in the CPU	Туре	Order code	Price	Weight (1 pce)
					kg
1	Ethernet RJ45	TB511-ETH	1SAP111100R0270		0.215
2	Ethernet RJ45	TB521-ETH	1SAP112100R0270		0.215
4	Ethernet RJ45	TB541-ETH	1SAP114100R0270		0.215

Note: These TBs are compatible with previous AC500 CPU versions (R01xx) and new ones (R02xx).



CM572-DP

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CM574-RCOM

### **Communication modules**

Protocol	Connections	Туре	Order code	Price	Weight (1 pce)
					kg
PROFIBUS <sup>®</sup> DP V0/V1 master	Sub-D socket 9 poles	CM572-DP	1SAP170200R0001		0.115
Ethernet	2 x RJ45 - integrated switch	CM577-ETH	1SAP170700R0001		0.115
(TCP/IP, UDP/IP, Modbus® TCP)					
CANopen <sup>®</sup> master	Terminal block 5 poles spring	CM578-CN	1SAP170800R0001		0.115
CANopen <sup>®</sup> slave	Terminal block 2 x 5 poles spring	CM588-CN	1SAP172800R0001		0.115
PROFINET® I/O RT controller	2 x RJ45 - integrated switch	CM579-PNIO	1SAP170901R0001		0.115
EtherCAT <sup>®</sup> master	2 x RJ45	CM579-ETHCAT	1SAP170902R0001		0.115
Serial + co-processor	2 x RS-232/485 on spring terminal blocks	CM574-RS	1SAP170400R0201		0.115
Serial RCOM	2 x RS-232/485 (1 x RCOM/1 x Console)	CM574-RCOM	1SAP170401R0201		0.115

- For decentralized expansion in combination with communication interface modules on CS31, PROFINET®





CM578-CN





DO524



### **Digital I/O**

I/O modules

Number of	Input signal	Output type	Output signal	Terminal units Screw / Spring	Туре	Order code	Price	Weight (1 pce)
DI/DO/DC								kg
32 / – / –	24 V DC	-	-	TU515 / TU516	DI524	1SAP240000R0001		0.200
-/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC522	1SAP240600R0001		0.200
-/-/24	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC523	1SAP240500R0001		0.200
16 / - / 16	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DC532	1SAP240100R0001		0.200
8/8/-	24 V DC	Relay	230 V AC, 3 A (1)	TU531 / TU532	DX522	1SAP245200R0001		0.300
8 / 4 / -	230 V AC	Relay	230 V AC, 3 A (1)	TU531 / TU532	DX531	1SAP245000R0001		0.300
-/32/-	24 V DC	Transistor	24 V DC, 0.5 A	TU515 / TU516	DO524	1SAP240700R0001		0.200

(1) Relay outputs, changeover contacts.

(2) Please refer to the FieldBusPlug catalog for information about FBP. The currently available FBP Fieldbus plugs are listed in the catalog 2CDC190022D0203.

(3) DO524 cannot be used with DC505-FBP and FieldBusPlug.

- For central expansion of the AC500 or AC500-eCo CPUs

IO, PROFIBUS® DP, CANopen® and also DC505-FBP (2)(3) modules - DC: Channels can be configured individually as inputs or outputs - Plug-in electronic modules, terminal unit required (refer to table below).

### Analog I/O



AO523

Number of	Input signal	Output signal	Terminal units Screw / Spring	Туре	Order code	Price	Weight (1 pce)
AI/AO							kg
16 / 0	010 V, ±10 V	-	TU515 / TU516	AI523	1SAP250300R0001		0.200
4 / 4	0/420 mA, PT100,	±10 V	TU515 / TU516	AX521	1SAP250100R0001		0.200
8 / 8 (max. 4 current outputs)	PT1000, Ni1000	0/420 mA	TU515 / TU516	AX522	1SAP250000R0001		0.200
0 / 16 (max. 8 current outputs)	-	-	TU515 / TU516	AO523	1SAP250200R0001		0.200
8/0	05 V, 010 V, ±50 mV, ±500 mV, 1 V, ±5 V, ±10 V, 0/420 mA, ±20 mA, PT100, PT1000, Ni1000, Cu50, 050 kΩ, S, T, N, K, J	: :	TU515 / TU516	AI531	1SAP250600R0001		0.200







DA501

### Analog/digital mixed I/O

Standard I/O module with high functionality:

- 16 digital input channels
- 8 configurable In/Output channels
- first two inputs are also usable as high-speed counter (up to 50 kHz) together with AC500 CPU, CS31 or CI5xx communication interface modules.
- 4 independent analog input channels configurable for voltage, current, 12 bit + sign, 1-2 wire connection
- Galvanic isolation per module
- Compatible with DC505-FBP and all Cl5xx modules.

Number of	Input signal	Output type		Terminal unit Screw / Spring	210 C	Order code	:	Weight (1 pce)
AI/AO/DI/DO/DC			• • •	2 2 2 2 2 2 2				kg
4/2/16/-/8	24 V DC/010 V,	Transistor	24 V DC, 0.5 A/	TU515 / TU516	DA501	1SAP250700R0001		0.200
	-10+10 V,		-10+10 V,	a				
	020 mA,		020 mA,					
	420 mA,		420 mA					
	PT100, PT1000,							
	Ni100, Ni1000							



CD522

### **Multifunctional modules**

Functionality	Number of	Input signal	Output type		Terminal units Screw / Spring	2 M 1	Order code	Price	Weight (1 pce)
	DI/DO/DC	7	7		7 	7			kg
Encoder m	odule							-	
Encoder and PWM module		24 V DC and 2 encoder inputs	2 PWM outputs	- /	TU515 / TU516	CD522	1SAP260300R0001		0.125

Functionality	Number of	• •	Output type	Output signal	Terminal unit	Туре	Order code	Price	Weight (1 pce)
	DI/DO/DC								kg
Interrupt I/	O and fas	t counter r	nodule						
Interrupt I/O		24 V DC	Transistor	24 V DC, 0.5 A	N/A (2)	DC541-CM (1)	1SAP270000R0001		0.100
and fast counter									

Multifunctional module, refer to table on page 69 for details.
 Occupies a communication module slot on the AC500 CPU terminal base, no terminal block required.



DC505-FBP

4



CI541-DP



CI511-ETHCAT



CI501-PNIO



CI504-PNIO

### **Communication interface modules**

Number of	Input signal	Output type	Output signal	Terminal units Screw / Spring	Туре	Order code	Price	Weigh (1 pce
AI/AO/DI/DO/DO	>	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		occorr, oping				kg
Communica	tion interface n	nodule fo	r FieldBusPlu		•			
-/-/8/-/8	24 V DC	Transistor	24 V DC, 0.5 A	TU505-FBP / TU506-FBP	DC505-FBP	1SAP220000R0001		0.200
Communica	tion interface n	nodule fo	r CS31-Bus	•				
-/-/8/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU551-CS31 / TU552-CS31	DC551-CS31	1SAP220500R0001		0.200
-/-/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU551-CS31 / TU552-CS31	CI590-CS31-HA	1SAP221100R0001		0.200
4/2/8/-/8	24 V DC/ 010 V, -10+10 V, 020 mA, 420 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A/ -10+10 V, 020 mA, 420 mA	TU551-CS31 / TU552-CS31	Cl592-CS31	1SAP221200R0001		0.200
Communica	tion interface n			<sup>◎</sup> -DP				
4/2/8/8/-	24 V DC/ 010 V, -10+10 V, 020 mA, 420 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A/ -10+10 V, 020 mA, 420 mA (1)	TU509/TU510/ TU517/TU518	CI541-DP	1SAP224100R0001		0.200
-/-/8/8/8	24 V DC		24 V DC, 0.5 A	TU509/TU510/ TU517/TU518	CI542-DP	1SAP224200R0001		0.200
	tion interface n		· · · · · · · · · · · · · · · · · · ·					•
4/2/8/8/-	24 V DC/ 010 V, -10+10 V, 020 mA, 420 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A/ -10+10 V, 020 mA, 420 mA	TU509/TU510/ TU517/TU518	CI581-CN	1SAP228100R0001		0.200
-/-/8/8/8	24 V DC	Transistor	24 V DC, 0.5 A	TU509/TU510/ TU517/TU518	CI582-CN	1SAP228200R0001		0.200
Communica	tion interface n	nodule fo	r Ethernet ba	sed protoco	- EtherCAT®			
4/2/8/8/-	24 V DC/010 V, -10+10 V, 020 mA, 420 mA, PT100, PT1000, Ni100, Ni1000	Transistor	24 V DC, 0.5 A / -10+10 V, 020 mA, 420 mA	TU507-ETH / TU508-ETH	CI511-ETHCAT	1SAP220900R0001		0.200
-/-/8/8/8	24 V DC	Transistor	24 V DC, 0.5 A	TU507-ETH / TU508-ETH	CI512-ETHCAT	1SAP221000R0001		0.200
Communica	tion interface n	nodule fo	r Ethernet ba	sed protoco	- PROFINET	<sup>®</sup> IO RT		-
4/2/8/8/-	24 V DC/010 V, -10+10 V, 020 mA, 420 mA, PT100, PT1000, Ni100, Ni1000				CI501-PNIO	1SAP220600R0001		0.200
-/-/8/8/8	24 V DC	Transistor	24 V DC, 0.5 A	TU507-ETH / TU508-ETH	CI502-PNIO	1SAP220700R0001		0.200

From	То	Output signal	Terminal units	Туре	Order code	Price	Weight (1 pce) kg
Communica	tion interface module g	ateway on Etl	hernet based	protocol - F	ROFINET® IO RT	•	
PROFINET® I/O	-	3 x RS232/485 ASCII serial interfaces	TU520-ETH	CI504-PNIO	1SAP221300R0001		0.200
PROFINET® I/O		2 x RS232/485 ASCII serial interfaces	TU520-ETH	CI506-PNIO	1SAP221500R0001		0.200



TU515



TU520-ETH



TU510



TU518

### **Terminal units**

For digital and analog expansion modules and interface modules. Please note: for modules with relay outputs, terminal units for 120/230 VAC (TU531 / TU532) are required.

For	Supply	Connection type	Туре	Order code	Price	Weight (1 pce)
			-			kg
FBP interface modules	-	Screw	TU505-FBP	1SAP210200R0001		0.300
		Spring	TU506-FBP	1SAP210000R0001		0.300
Ethernet interface modules	24 V DC	Screw	TU507-ETH	1SAP214200R0001		0.300
		Spring	TU508-ETH	1SAP214000R0001		0.300
Ethernet gateway modules	24 V DC	Spring	TU520-ETH	1SAP214400R0001		0.300
CANopen® / PROFIBUS® DP (1) interface	24 V DC	Screw	TU517	1SAP211400R0001		0.300
modules		Spring	TU518	1SAP211200R0001		0.300
PROFIBUS® DP / CANopen® interface modules	les 24 V DC	Screw	TU509	1SAP211000R0001		0.300
		Spring	TU510	1SAP210800R0001		0.300
I/O modules	24 V DC	Screw	TU515	1SAP212200R0001		0.300
		Spring	TU516	1SAP212000R0001		0.300
I/O modules AC / relay	120/230	Screw	TU531	1SAP217200R0001		0.300
	VAC	Spring	TU532	1SAP217000R0001		0.300
CS31 interface modules	24 V DC	Screw	TU551-CS31	1SAP210600R0001		0.300
		Spring	TU552-CS31	1SAP210400R0001		0.300

(1) TU517/TU518 Terminal units can also be used with PROFIBUS® DP with limited baud rate.



TU508-ETH



MC502



AC500 basic training case CPU, I/Os, HMI

Туре	For I/O modules		For communi	For communication interface modules							
	TU515 TU516	TU531 TU532	TU505-FBP TU506-FBP	TU507-ETH TU508-ETH	TU509 TU510	TU517 TU518	TU520-ETH	TU551-CS3 TU552-CS3			
DA501	•										
DC522	•										
DC523	•										
DC532	•										
DI524	•										
DX522		•									
DX531		•			-						
DO524	•										
CD522	•										
AI523	•										
AI531	•										
AO523	•										
AX521	•				-						
AX522	•										
DC505-FBP			•								
DC551-CS31								•			
CI590-CS31-HA								•			
CI592-CS31								•			
CI501-PNIO				•							
CI502-PNIO				•	-						
CI504-PNIO							•				
CI506-PNIO							•				
CI511-ETHCAT				•							
CI512-ETHCAT				•							
CI541-DP			··· †		•	• (1)					
CI542-DP					•	• (1)					

(1) Can be used with reduced baud rate.

### Accessories for AC500

CI581-CN

CI582-CN

For	Description	Туре	Order code	Price	Weight (1 pce)
					kg
AC500 CPUs COM1	Programming cable Sub-D / terminal block, length 5 m	TK502	1SAP180200R0101		0.400
AC500 CPUs COM2	Programming cable Sub-D / Sub-D, length 5 m	TK501	1SAP180200R0001		0.400
AC500 CPUs	Memory card (2 GB SD card)	MC502	1SAP180100R0001		0.020
	Lithium battery for data buffering	TA521	1SAP180300R0001		0.100
Cable for programming the AC500 via the integrated fieldbus neutral interface	Connection to PC via USB interface. Includes USB extension cable and installation CD	UTF21-FBP	1SAJ929400R0001		-
I/O modules	Pluggable marker holder for I/O modules, packing unit incl. 10 pcs	TA523	1SAP180500R0001		0.300
	White labels, packing unit incl. 10 pcs	TA525	1SAP180700R0001		0.100
Terminal base	Communication module, dummy housing	TA524	1SAP180600R0001		0.120
CPU terminal base	Accessories for wall mounting, packing unit includes 10 pcs	TA526	1SAP180800R0001		0.200
	5-pole power plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit includes 5 pcs	TA527	1SAP181100R0001		0.200
	9-pole COM1 plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit includes 5 pcs	TA528	1SAP181200R0001		0.200
AC500 basic training case CPU, I/Os, HMI	PM583-ETH + CM572 + AX561 + DC551 + Cl542 + CP635 + power supply + cables + simulation stand	TA512-BAS	1SAP182400R0001		7.000
AC500 advanced training case CPU, I/Os, COM, encoder	PM583-ETH + CM574 + CM578 + CM579 + CP635 + CD522 + power supply + cables + simulation stand	TA513-ADV	1SAP182500R0001		8.800

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AC50	)0 C	PUs

AC500 CPUs			,		,		,
Туре	PM572	PM573-ETH	PM582	PM583-ETH	PM590-ETH	PM591-ETH	PM592-ETH
Supply voltage	24 V DC	-	-	-	-	-	-
Current consumption on 24 V DC		•••••••••••••••••••••••••••••••••••••••		•••••••	•••••••••••••••••••••••••••••••••••••••		••••••
Min. typ. (module alone)	0.050 A	0.110 A	0.050 A	0.110 A	0.150 A		
Max. typ. (all couplers and I/Os)	0.750 A	0.810 A	0.750 A	0.810 A	0.850 A	••••••	•••••••
User program memory - Flash EPROM and RAM	128 kB	512 kB	512 kB	1024 kB	2048 kB	4096 kB	•••••••••••••••••••••••••••••••••••••••
Integrated user data memory	128 kB thereof	512 kB thereof	416 kB thereof	1024 kB	3072 kB	5632 kB thereo	of
	12 kB saved	288 kB saved			thereof 536 kB saved	1536 kB saved	
User Flashdisk (Data-storage, programm access or also external with FTP)	-						Yes, 4 GB Flash non removable
Plug-in memory card	Depending on	SD-Card used : r	o SD-HC card a	llowed, use MC5	02 accessorv		. <u>.</u>
Web server's data for user RAM disk	-	1 024 kB	-	4 096 kB	8 MB	••••••	••••••
Cycle time for 1 instruction (minimum)							
Binary	0.06 µs		0.05 µs		0.002 µs		
Word	0.09 µs	•••••	0.06 µs	•••••	0.002 µs		••••••
Floating-point	0.7 µs	•••••••••••••••••••••••••••••••••••••••	0.5 μs	•••••••••••••••••••••••••••••••••••••••	0.004 µs	••••••	•••••••••••••••••••••••••••••••••••••••
	0.7 µ3		<u>.</u> 0.0 μ3		<u>.</u> 0.004 μ3		
Max. number of centralized inputs/outputs Max. number of extension modules on I/O bus	up to may 10	(S500 and/or S50		allowed)			
		(5500 and/or 550	JU-eCo modules	allowed)	•••••••••••••••••••••••••••••••••••••••	•••••••••••••••••••••••••••••••••••••••	•••••••••••••••••••••••••••••••••••••••
Digital inputs	320 320						
outputs		•••••					
Analog inputs	160						
outputs	160	-					
Max. number of decentralized inputs/outputs	depends on the	e used standard I	Fieldbus (1)				
Data buffering	battery						
Real-time clock (with battery back-up)	•						
Program execution							
Cyclical	•						
Time controlled	•	•••••••••••••••••••••••••••••••••••••••		•••••••			••••••
Multi tasking	•	•••••	•••••••••••••••••••••••••••••••••••••••	••••••	•••••••••••••••••••••••••••••••••••••••	••••••	•••••••••••••••••••••••••••••••••••••••
User program protection by password	•						
Internal interfaces							
COM1							
RS232 / RS485 configurable	•						
Connection (on terminal bases)	pluggable sprir	ng terminal block,	use TK502 cabl	e in accessorv	•••••••••••••••••••••••••••••••••••••••	••••••	•••••••••••••••••••••••••••••••••••••••
Programming, Modbus <sup>®</sup> RTU, ASCII, CS31 master	•			· · · · · · · · · · · · · · · · · · ·		•••••	
COM2		•••••	••••••	••••••	•••••••••••••••••••••••••••••••••••••••		••••••
RS232 / RS485 configurable	•						
Connection (on terminal bases)		poles, use TK50	1 cable in acces	sorv	••••••		••••••
Programming, Modbus® RTU, ASCII		20100, 000 11(00	. 54510 11 40065				•••••••••••••••••••••••••••••••••••••••
FieldBusPlug				••••••			••••••
Serial neutral interface	•						
Connection (on terminal bases)	M12 male. 5 p			••••••		•••••••••••••••••••••••••••••••••••••••	
Functions		able UTF-21-FBF	P, slave communi	cation depending	g on FieldBusPlug	g used (PROFIBL	JS® DP,
Ethernet				••••••			
Ethernet connection (on terminal bases) Ethernet functions:	_	RJ45	[-	RJ45			
Programming, TCP/IP, UDP/IP, Modbus® TCP integrated Web server, IEC60870-5-104 remo control protocol, SNTP (simple Network Time Protocol), DHCP, FTP server HTTP, SMTP, PIN	te	•	_	•			
LCD display and 8 function keys	•		. <u>i</u>	. <u>i</u>			
Function	BUN / STOP .	tatus, diagnosis	••••••	••••••	•••••••••••••••••••••••••••••••••••••••		••••••
Timers	unlimited	atao, alayi 10015					
Counters	unlimited			••••••	•••••••••••••••••••••••••••••••••••••••		•••••••••••••••••••••••••••••••••••••••
Approvals						-	
	I See detailed pa	age 166 or www.	abb.com/pic				

(1) e.g. CS31 Fieldbus: up to 31 stations with up to 120 DIs / 120 DOs or up to 32 Als / 32 AOs per station.

### Digital S500 I/O modules

Digital S500 I/O modules		······		
Гуре	DI524	DC522	DC523	DC532
lumber of channels per module				
Digital inputs	32	_	-	16
outputs	-	-	-	-
Configurable channels DC		16	24	16
(configurable as inputs or outputs)				
Additional configuration of channels as	1	*	*	•
Fast counter	oonfiguration of ma	x. 2 channels per module, op	orating mades ass table on	paga 91
Occupies max. 1 DO or DC when used as counter	Configuration of ma			Page of
occupies max. T DO of DC when used as counter	-	•	•	•
Connection via terminal unit	•	•	•	•
		:		
Digital inputs				
nput signal voltage	24 V DC		·····	······
Input characteristic acc. to EN 61132-2		······	·····	••••••
0 signal	-3+5 V DC	·····	·····	·····
Undefined signal state	515 V DC 1530 V DC		·····	
1 signal $(0 > 1 \text{ or } 1 > 0)$		aurable from 0 1 up to 00 m	•	
Input time delay (0 -> 1 or 1 -> 0)	o ms typically, confi	gurable from 0.1 up to 32 ms	8	
Input current per channel				
	5 mA typically			
	> 1 mA			
15 V DC				
30 V DC	< 8 mA			
Digital outputs				
Transistor outputs 24 V DC, 0.5 A	_		•	•
Readback of output	_	•	•	•
Switching of load 24 V	_	•	•	•
Output voltage at signal state 1	-	process voltage UF	P minus 0.8 V	ii
Output current		500 t 110 0		
Nominal current per channel	-	500 mA at UP = 24	1 V	·····
Maximum (total current of all channels)	-	8 A		······
Residual current at signal state 0	-	< 0.5 mA		······
Demagnetization when switching off inductive loads	-	by internal varistors	S	
Switching frequency				
For inductive load		0.5 Hz max.		
For lamp load		11 Hz max. at max	. 5 W	
Short-circuit / overload proofness	-	•	•	•
Quartered indication (L. 0.7.1)		-flor (00		
Overload indication (I > 0.7 A)		after approx. 100 n		·····
Output current limiting	-	yes, with automatic	·····	
Proofness against reverse feeding of 24 V signals	-	•	•	•
Process voltage UP				
Nominal voltage	24 V DC			
Maximum ripple	5 %	••••••	••••••	•
Current consumption on UP				
Min. typ. (module alone)	0.150 A	0.100 A	0.150 A	
Max. typ. (min. + loads)	0.150 A	0.100 A + load	0.150 A + load	•
Reverse polarity protection	•	•	•	•
Fuse for process voltage UP	10 A miniature fuse	•••••	•••••	
Connections for sensor voltage supply. Terminal	-	8	4	-
24 V and 0 V for each connection. Permitted load				
for each group of 4 or 8 connections: 0.5 A				
for each group of 4 or 8 connections: 0.5 A Short-circuit and overload proof 24 VDC sensor	-	•	•	-

### Digital S500 I/O modules

Туре		DI524	DC522	DC523	DC532				
Maximum cable length f	or connected process	signals							
Cable	shielded	1000 m							
	unshielded	600 m		••••••					
Potential isolation									
Per module		•	•	•	•				
Between channels	input	-	-	-	-				
	output	-	-	-	-				
Voltage supply for the m	odule		nsion bus interface (I/O bus)		•				
Fieldbus connection	••••••	via AC500 CPU or all communication interface modules							
Address setting	••••••	automatically (internal)							

### Digital S500 I/O modules

Туре	DX522	DX531	DO524
lumber of channels per module			·
igital inputs	8		
outputs	8 relays	4 relays	32
Configurable channels DC	_		
configurable as inputs or outputs)			
dditional configuration of channels as	•	•	
ast counter	configuration of max. 2 channels	-	-
	per module, operating modes see page 81		
occupies max. 1 DO or DC when used as counter	-	-	-
Connection via terminal unit	•	•	•
igital inputs			
nput signal voltage	24 V DC	230 V AC or 120 V AC	
requency range	-	4763 Hz	_
uput characteristic acc. to EN 61132-2	Туре 1	Type 2	_
signal	-3+5 V DC	040 V AC	_
Indefined signal state	515 V DC	> 40 V AC< 74 V AC	_
signal	1530 V DC	74265 V AC	_
nput time delay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1		
iput and delay (0 -> 1 01 1 -> 0)	up to 32 ms		-
nput current per channel			
t input voltage 24 V DC		-	-
5 V DC	> 1 mA	-	-
15 V DC	> 5 mA	-	-
30 V DC	< 8 mA	-	-
159 V AC	-	> 7 mA	-
40 V AC	_	< 5 mA	-
Digital outputs		:	÷
ransistor outputs 24 V DC, 0.5 A	_	-	•
Readback output	_	-	_
elay outputs, supplied via process voltage UP, hangeover contacts	•	•	-
Switching of load 24 V	•	•	•
230 V	•	•	_
utput voltage at signal state 1	_	-	process voltage UP minus 0.8 V
		:	
Dutput current	1		
lominal current per channel		-	500 mA at UP = 24 V
laximum (total current of all channels)			8 A
esidual current at signal state 0			< 0.5 mA
emagnetization when switching off inductive loads	;   -	-	by internal varistors
witching frequency			0.5.1
or inductive load	2 Hz		0.5 Hz max.
or lamp load	11 Hz max. at max. 5 W		
hort-circuit / overload proofness	by external fuse / circuit breaker. 6 A	A gL/gG per channel	•
overload indication (I > 0.7 A)			after approx. 100 ms
output current limiting	_		yes, with automatic reclosure
roofness against reverse feeding of 24 V signals	-	-	•
Contact rating			
or resistive load, max.	3 A at 230 V AC 2 A at 24 V DC		-
For inductive load max	1.5 A at 230 V AC		_
For inductive load, max.			-
	1.3 A al 24 V DC		
For lamp load	1.5 A at 24 V DC 60 W at 230 V AC	••••	_

Туре		DX522	DX531	DO524				
Lifetime (switching cycle	s)							
Mechanical lifetime		300 000		-				
Lifetime under load	•••••	300 000 at 24 V DC / 2 A		-				
			200 000 at 120 V AC / 2 A					
		100 000 at 230 V AC / 3 A	· · · · · · · · · · · · · · · · · · ·					
Spark suppression for in	ductive AC load	external measure dependir	ng on the switched load	-				
Demagnetization for indu	ictive DC load	external measure:		-				
		free-wheeling diode conne	cted in parallel to the load					
Process voltage UP								
Nominal voltage		24 V DC						
Maximum ripple	••••••	5 %	5 %					
Current consumption on	UP							
Min. typ. (module alo	ne)	0.050 A	0.150 A	0.050 A				
Max. typ. (min. + load	ds)	0.050 A + load	0.150 A + load	0.100 + load				
Reverse polarity protecti	on	•	•	•				
Fuse for process voltage		10 A miniature fuse	10 A miniature fuse					
Maximum cable length fo	or connected process	signals						
Cable	shielded	1000 m	1000 m					
	unshielded	600 m						
Potential isolation								
Per module		•	•	•				
Between the channels	input	-	• (per 2)	-				
	output	•	•	-				
Voltage supply for the mo	odule	internally via extension bus	s interface (I/O bus)					
Fieldbus connection	••••••		via AC500 CPU or all communication interface modules (DO524 not supported by DC505-FBP)					
Address setting	•••••	automatically (internal)	······	······				

### Analog S500 I/O modules

Analog S500 I/O modules	AX521	AX522	AI523	AO523	AI531
	AN021	77,022	71320	70020	
Number of channels per module					
Individual configuration, analog inputs	4	8	16	-	8
outputs	8 4	8	-	16	-
Signal resolution for channel configuration					
-10+10 V	12 bits + sign				15 bits + sign
010 V	12 bits	•••••	•••••	••••••	15 bits
020 mA, 420 mA	12 bits	•			15 bits
Temperature: 0.1 °C	•	•	•	•	•
Monitoring configuration per channel					
Plausibility monitoring	•	•	•	•	•
Wire break & short-circuit monitoring	•	•	•	•	•
Analog Inputs Al	in all in the last				(demending or the second
Signal configuration per Al		er module and with rega ction or differential input		i: Als / Measuring points	s (depending on the use of
010 V	4/4	8 / 8	16 / 16	-	8/8
-10+10 V	4/4	8/8	16 / 16	-	8/8
020 mA	4/4	8/8	16 / 16	-	8/8
420 mA	4/4	8 / 8	16 / 16	-	8/8
Pt100					<u></u>
-50+400 °C (2-wire)	4/4	8/8	16 / 16	-	8/8
-50+400 °C (3-wire), 2 channels	4/2	8 / 4	16 / 8	-	8/8
-50+400 °C (4-wire)	-	-	-	-	8/8
-50+70 °C (2-wire)	4 / 4	8 / 8	16 / 16	-	8/8
-50+70 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
-50+70 °C (4-wire)	-	-	-	-	8/8
Pt1000			······	·····	
-50+400 °C (2-wire)	4 / 4	8/8	16 / 16	-	8/8
-50+400 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
-50+400 °C (4-wire)	-	-	-	-	8/8
Ni1000		······	······	·····	······
-50+150 °C (2-wire)	4 / 4	8/8	16 / 16	-	8/8
-50+150 °C (3-wire), 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
-50+150 °C (4-wire)	-	-	-	-	8/8
Thermocouples of types J, K, T, N, S	-	-	-	-	•
010 V using differential inputs, 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
-10+10 V using differential inputs, 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
Digital signals (digital input)	4 / 4	8 / 8	16 / 16	-	8 / 8
Input resistance per channel	voltage: > 100		•	-	voltage: > 100 kΩ
	current: approx	·····			current: approx. 330 S
Time constant of the input filter	voltage: 100 µs			-	voltage: 100 µs
Conversion avela	current: 100 µs		·····		current: 100 µs
Conversion cycle	2 ms (for 8 Al + 1 s for Pt100/1			-	1 ms (for 8 AI + 8 AO), 1 s for Pt100/1000,
		000, NIT000			Ni1000
Overvoltage protection	•	•	•	-	•
Data when using the AI as digital input	1	•	•	· · ·	÷
Input time delay	8 ms typically, o	configurable		_	8 ms typically,
input une delay	from 0.1 up to 3			-	configurable from 0.1 up to 32 ms
signal voltage	24 V DC	••••••	·····	_	24 V DC
Signal 0	-30+5 V			_	-30+5 V
1	1330 V	•••••	·····	_	1330 V
'	1000 V				1000 V
Analog outputs AO					
Possible configuration per AO		f AOs per module and w	ith regard to the config	<del>.</del>	·····
-10+10 V	4	8 (1)	-	16 (1)	-
020 mA	4	·····		8	-
420 mA	4		:_	8	:

Possible conligurat	ion per AO	Max: number of AOs per module and with regard to the configuration.						
-10+10 V		4 8 (1)	-	16 (1)	-			
020 mA		4	-	8	-			
420 mA		4	-	8	-			
Output	resistance (burden) when used as current output	0500 Ω	-	0500 Ω	-			
		Max. ±10 mA	-	Max. ±10 mA	-			

(1) Half can be used on current (the other half remains available).

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### Analog S500 I/O modules

Туре	AX521	AX522	AI523	AO523	AI531		
Process voltage UP							
Nominal voltage	24 V DC						
Maximum ripple	5 %	•••••	•••••		•		
Current consumption on UP		••••••	••••••		••••••		
Min. typ. (module alone)	0.150 A				0.130 A		
Max. typ. (min. + loads)	0.150 A + load	0.150 A + load	-	0.150 A + load			
Reverse polarity protection	•	•	•	•	•		
Max. line length of the analog lines, conductor cross section > 0.14 mm <sup>2</sup>	100 m						
Conversion error of analog values caused by non-linearity, calibration errors ex works and the resolution in the nominal range	0.5 % typically, 1 9	% max.					
Potential isolation							
Per module	•	•	•	•	-		
Fieldbus connection		all communication inter			••••••		
Voltage supply for the module		Internally via extension bus interface (I/O bus)					

### CD522 encoder module

The CD522 module offers accuracy and dynamic flexibility for a customized solution. It has two independent encoder inputs onboard and is easily configured using the Automation Builder software for 10 different operation modes and for frequencies up to 300 kHz (depending on CPU cycle time). The CD522 module also integrates outputs for pulses and for PWM as well as normal inputs and outputs, depending on selected encoder mode.

Туре		CD522
Functionality		
Digital inputs/outputs		24 V DC, dedicated inputs/outputs can be used for specific counting functions.
<b>3</b>		All unused inputs/outputs can be used as input/output with standard specification.
	Input options	Catch/Touch operation, counter value stored in separate variable on external event (rising or falling)
		Set to preset counter register with predefined value
		Set to reset counter register
	End value output	Output set when predefined value is reached
	Reference point initialization	•
	(RPI) input for relative encoder	
	initialization	
High-speed counter/encoder		
Integrated counters	Counter characteristics	2 counters (24 V DC, 5 V DC, differential and 1 Vpp sinus input)
	Counter mode	one 32 bits or two 16 bits
	Relative position encoder	X1, X2, X3
	Absolute SSI encoder	•
	Time frequency meter	•
	Frequency input	up to 300 kHz
PWM/pulse outputs	·····	
Output mode specification	Number of outputs	2
	Push pull output	24 V DC, 100 mA max
	Current limitation	Thermal and overcurrent
PWM mode specification	Frequency	1100 kHz
	Value	0100 %
Pulse mode specification		115 kHz
	Pulse emission	165535 pulses
	Number of pulses emitted	0100 %
	indicator	
Frequency mode	Frequency output	100 kHz
specification	Duty Cycle	Set to 50 %
Number of channels per mod		
Digital	input	2
	output onfigurable as inputs or outputs)	2
Configurable channels DC (co	onfigurable as inputs or outputs)	8
Additional configuration of ch	annels as	
Fast counter		Integrated 2 counter encoders
Connection via terminal unit		
Digital Inputs		
Input	signal voltage	24 V DC
	time delay	8 ms typically configurable from 0.1 up to 32 ms
Input current per channel		
At input voltage	24 V DC	Typically 5 mA
		> 1 mA
	15 V DC	
	30 V DC	
Distant south at		1
Digital outputs		
Output voltage at signal state	1	UP – 0.8 V
Output current		
Nominal current per channel		0.5 A at UP = 24 V
Maximum (total current of all	channels)	8 A
Residual current at signal sta		<pre></pre> <pre></pre> <pre></pre> <pre></pre>
Demagnetization when switch		By internal varistors
<b>U</b>	<u> </u>	
Switching frequency		
For inductive load		Max. 0.5 Hz
For lamp load		Max. 11 Hz with max. 5 W
Short-circuit / Overload proof	· · · •· · · · · · · · · · · · · · · ·	
Overload indication (I > 0.7 A)	<u> </u>	After approx. 100 ms
Output current limiting		•
Proofness against reverse fee	ding of 24 V signals	

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Туре		CD522
Maximum cable length for	connected process signals	
Cable	shielded	1000 m
Cable	unshielded	
	unshielded	600 m
Potential isolation		
Per module		
Technical data of the high-s	speed inputs	
Number of channels per mo	odule	6
Input type		24 V DC, 5 V DC / Differential / Sinus 1 Vpp
Frequency		300 kHz
Technical data of the fast o	utputs	
Number of channels		2
Indication of the output sig	nals	Brightness of the LED depends on the number of pulses emitted (0 % to 100 %) (pulse output mode only)
Output current		
Rated value, per channel		100 mA at UP = 24 V
Maximum value (all channe	Is together	8A
configurable outputs includ		
Leakage current with signa	· · · · · · · · · · · · · · · · · · ·	< 0.5 mA
Rated protection fuse on U		10 A fast
	luctive loads are switched off	with varistors integrated in the module
Overload message (I > 0.1		Yes, after ca. 100 ms
Output current limitation		Yes, automatic reactivation after short-circuit/overload
Resistance to feedback age	ainst 24 V signals	Yes
Process voltage UP		
Nominal voltage		24 V DC
Maximum ripple	<b>.</b>	5 %
Current consumption on UI	ס	
Min. typ. (module alone		0.070 A
Max. typ. (min. + loads)	<u>.</u>	0.070 A + load
Reverse polarity protection		•
Fuse for process voltage U		10 A miniature fuse

### Analog/digital mixed I/O expansion module

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bit + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits.

Туре	DA501
	DASOT
Number of Channels per Module	
Digital inputs	16
outputs	
Analog inputs	4
outputs	8
Digital configurable channels DC configurable as inputs or outputs)	0
Additional configuration of channels as	
Fast counter	Yes
Occupies max. 1 DO or DC when used as counter Connection via terminal unit TU 5xx	Configuration of max. 2 channels per module. Operating modes see table on page 81
Digital inputs	
nput signal voltage	24 V DC
characteristic acc. to EN 61132-2	Туре 1
) signal	-3+5 V DC
Jndefined signal state	515 V DC
l signal	1530 V DC
Residual ripple, range for 0 signal	-3+5 V DC
1 signal	1530 V DC
nput time delay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms
Digital outputs	
Transistor outputs 24 V DC, 0.5 A	•
Readback of output	•
Outputs, supplied via process voltage UP	•
Switching of 24 V load	•
Output voltage at signal state 1	Process voltage UP - 0.8 V
Output current	
Nominal current per channel	500 mA at UP = 24 V DC
Maximum (total current of all channels)	8 A
Residual current at signal state 0 Demagnetization when switching off inductive loads	< 0.5 mA
Demagnetization when switching on inductive loads	By internal varistors
Analog inputs Al	Max. number per module and with regard to the configuration: Als / Measuring points
Signal configuration per Al	•
010 V / -10 +10 V	4 / 4
020 mA / 420 mA	4 / 4
RTD using 2/3 wire needs 1/2 channel(s)	4 / 2
010 V using differential inputs, needs 2 channels	4 / 2
10+10 V using differential inputs, needs 2 channels	4/2
Digital signals (digital input)	4 / 4
Data when using the AI as digital input	
nput time delay	8 ms typically, configurable from 0.1 up to 32 ms
signal voltage	24 V DC
Outputs, single configurable as	
Possible configuration per AO	
-10+10 V )20 mA / 420 mA	
· · · · · · · · · · · · · · · · · · ·	
Output resistance (load) when used as current output Output loading capability when used as voltage output	0500 Ω ±10 mA max.
Potential isolation	
Per module	•
Process voltage UP	
Nominal voltage	24 V DC
Maximum ripple	5%
Current consumption on UP	
Min. typ. (module alone)	0.070 A
Max. typ. (min. + loads)	0.070 A + load
Reverse polarity protection	•
	10 A miniature fuse
Fuse for process voltage UP Approvals	10 A miniature fuse See detailed page 166 or www.abb.com/plc

### DC541-CM interrupt I/O and fast counter module

In the operating mode counter, the channels can be configured as follows:

Input, Output, 32-bit up/down counter (uses C0...C3) as a 32-bit counter without limit, 32-bit periodic counter as a 32-bit counter with a limit, limiter for a 32-bit counter (limit channel 0), 32-bit up counter (forward counter) with the frequencies 50 kHz, 5 kHz and 2.5 kHz, pulse-width modulation (PWM) with a resolution of 10 kHz, time and frequency measurement, frequency output.

Туре	DC541-CM					
Number of channels per module						
Configurable channels DC	8					
(configurable as inputs or outputs)						
Additional configuration of channels as						
Fast counter	Yes					
Connection via CPU terminal base. Occupies one						
communication module slot						
Digital inputs						
Input signal voltage	24 V DC					
characteristic acc. to EN 61132-2	Type 1					
0 signal	-3+5 V DC					
Undefined signal state	515 V DC					
1 signal	530 V DC					
Input time delay (0 -> 1 or 1 -> 0)	20 µs					
	Clamp to clamp - 300 μs with interrupt task					
Input current per channel						
At input voltage 24 V DC	5 mA typically					
	> 1 mA					
15 V DC						
30 V DC	< 8 mA					
Digital outputs						
Transistor outputs 24 V DC, 0.5 A						
Readback of output						
Switching of 24 V load						
Output voltage at signal state 1	Process voltage UP minus 0.8 V					
Output current						
Nominal current per channel	500 mA at UP = 24 V					
Maximum (total current of all channels)	8 A					
Residual current at signal state 0	< 0.5 mA					
Demagnetization when switching off inductive loads	by internal varistors					
Potential isolation						
Per module						
Voltage supply for the module	Internally via backplane bus					

### Interrupt I/O table

Configuration as		Config	uration f	or chanı	nel no.		Max. no. of channels	Remarks and notes regarding possible alternative	
		Chan. Chan. Chan. Chan. Chan. 0 1 2 3 4-7		for this function	combinations of the remaining channels (a and b)				
Mode 1: Interrupt fur	nctionality							1	
Interrupt	Digital input	1	1	1	1	4	8	Each channel can be configured individually as interrupt	
	Digital output	1	1	1	1	4	8	input or output	
Mode 2: Counting fu	nctionality								
Digital I/Os PWM (1)	Digital input	1	1	1	1	4	8	Usual input	
	Digital output	1	1	1	1	4	8	Usual output	
	PWM, resolution 10 kHz	1	1	1	1	4	8	Outputs and pulsed signal with and adjustable on-off ratio	

(1) Counter and fast counter data available on technical documentation.

### AC500 communication modules

- Up to 4 communications modules can be used on an AC500 CPU

- No external power supply required.

Туре	CM572-DP	CM577-ETH	CM578-CN	CM588-CN	CM579- PNIO	CM579- ETHCAT	CM574-RS	CM574- RCOM
Communication interfa	ces							
RJ45	-	• (x 2) (2)	-	-	• (x 2) (2)	• (x 2)	-	-
RS-232 / 485	-	-	-	-	-	-	• (x 2)	• (x 2)
Terminal blocks (1)	-	-	•	•	-	-	• (x 2)	• (x 2)
Sub-D socket	•	-	-	-	-	-	-	-
Protocols	PROFIBUS® DP Master V0/V1	Ethernet (TCP/IP, UPD/IP, Mod- bus® TCP)	CANopen® master	CANopen <sup>®</sup> slave	PROFINET® IO Controller	EtherCAT®	Serial COM ASCII, Modbus® RTU, CS31	Serial RCOM/ RCOM+
CPU interface	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory
Transfer Rate	9.6 kbit/s to 12 Mbit/s	10 / 100 Mbit/s	10 kbit/s to 1 Mbit/s	10 kbit/s to 1 Mbit/s	10 / 100 Mbit/s	10 / 100 Mbit/s	9.6 kBit/s up to 187.5 kBit/s	2,4 kBit/s to 19.2 kBit/s
Co-processor	Communication processor	Communication processor	Communication processor	Communication processor netX 100	Communication processor netX 100	Communication processor netX 100	Programmable CPU like PM57x with PowerPC 50 MHz processor	PowerPC 50 MHz processor
Memory	-	-	-	-	-	-	256 kB program memory 384 kB data memory	-
Additional features	Multi master functionality Max. Number of subscribers: – 126 (V0) – 32 (V1)	BOOTP DHCP	CAN 2.0A CAN 2.0B CANopen®	NMT Slave PDO SDO server Heartbeat Nodeguard	RTC - Real-time Cyclic Protocol, Class 1 RTA - Real-time Acyclic Protocol DCP Discovery and Configura- tion Protocol CL-RPC - Col CL-RPC - COL CL-RC - CL-RC	CoE (Can over Ethercat) process data (PDO) (cyclic) CoE Mailbox data (SDO) (acyclic) Distributed Clock (32-bit, 64-bit)	<ul> <li>Stand alone</li> <li>Stand alone</li> <li>CPU in coupler</li> <li>module housing</li> <li>allowing to be</li> <li>used as standard</li> <li>serial interface or</li> <li>as free program-</li> <li>mable serial</li> <li>interface coupler.</li> <li>Independant</li> <li>internal CPU</li> <li>programmable for</li> <li>own communica-</li> <li>tion protocol or</li> <li>data processing.</li> <li>2 x CS31</li> <li>master, Modbus®</li> <li>master/slave,</li> <li>free configurable,</li> <li>protocols ASCII.</li> </ul>	-

(1) Plug-in terminal block included.

(2) 10 / 100 Mbit/s, full/half duplex with auto-sensing, 2-port switch integrated.
#### **Communication interface modules**

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bits + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits. Temperature: 0.1 °C.

Туре	DC505-FBP	DC551-CS31	CI590-CS31-HA (1)	CI592-CS31
Communication Interface				
Protocol	According to FieldBusPlug used	Proprietary CS31 b	us protocol on RS485 interface	
	(Fieldbus neutral on module itself)		·	
ID configuration	Per rotary switches on front face fi			
Field bus connection on terminal units	M12 on FieldBusPlug	CS31 field bus, via terr	ninal / redundant for Cl590-CS31-HA on	TU551-CS31 or TU552-CS
Number of Channels per Module				
Digital inputs	8	8	_	8
outputs	-	-	-	-
Analog inputs	-	-	-	4
outputs	-	-	-	2
Digital configurable channels DC (configurable as inputs or outputs)	8	16	16	8
Additional configuration of channels as				•
Fast counter	_	Configuration of ma	x. 2 channels per module	
Occupies max. 1 DO or DC when used as counter	_	•		•
· · ·				
Connection		•		
/ia terminal unit TU5xx	•	•	•	•
Local I/O extension				
Max. number of extension modules	max. 7 x S500 extension modules nb and type (dig./analog) dep. on FBP and protocol used. Note: eCo I/O modules are not allowed to be used	, max. 7 x S500 exte to 120 Dls/120 DO	nsion modules (standard or eCo), u s or up to 32 Als/ 32AOs per station not for S500-eCo I/O modules	1
Digital inputs		•		·
nput signal voltage	24 V DC			
characteristic acc. to EN 61132-2	Type 1	· ••••••••••••••••••••••••••••••••••••		
) signal	-3+5 V DC		·····	
Jndefined signal state	515 V DC		······	
t signal Residual ripple, range for 0 signal	1530 V DC -3+5 V DC			
Residual ripple, range for 0 signal 1 signal	1530 V DC	••••••	·····	
Input time delay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0	1 up to 32 ms		••••
		.1 up to 02 110		
Digital outputs	1 -			
Transistor outputs 24 V DC, 0.5 A	•			
Readback of output	•		·····	
Outputs, supplied via process voltage UP Switching of 24 V load	•			
<u> </u>			·····	
Dutput voltage at signal state 1	Process voltage UP - 0.8 V			
Output current	1			
Nominal current per channel	500 mA at UP = 24 V DC			
Maximum (total current of all channels)	4 A	8 A	<u>8 A</u>	4 A
Residual current at signal state 0	< 0.5 mA			
Demagnetization when switching off inductive loads				
Analog inputs Al	Max. number per module and with	regard to the config	uration: Als / Measuring points	
Signal configuration per Al	-			•
010 V / -10+10 V				4 / 4
)20 mA / 420 mA				4/4
RTD using 2/3 wire needs 1/2 channel(s)			······	4/2
010 V using differential inputs, needs 2 channels			······	4/2
10+10 V using differential inputs, needs	-			4/2
2 channels Digital signals (digital input)				л / л
Digital signals (digital input)				4/4
Data when using the AI as digital input	1			<u>.</u>
Input time delay	-			8 ms typically, con- figurable from 0.1 up to 32 ms
signal voltage				24 V DC
0.9.00.00.0090			ABB Industrial Auto	

(1) Dedicated to High Availability.

#### Communication interface modules

Туре		DC505-FBP	DC551-CS31	CI590-CS31-HA (1)	CI592-CS31	
Outputs, sin	ngle configurable as					
Possible co	nfiguration per AO	-			•	
-10+10 V	······	-			•	
020 mA / 420 mA		-			•	
Output	resistance (load) when used as current output	-			0500 Ω	
	loading capability when used as voltage output	-			±10 mA max.	
Potential iso	blation					
Per module		•	•	•	•	
Between fie module	Idbus interface against the rest of the	•	•	•	•	
Voltage sup	ply for the module	Via FBP By external 24 V DC voltage via terminal UP				
Process vol	tage UP					
Nominal vol	tage	24 V DC				
Maximum ri	pple	5 %			•••••	
Current con	sumption on UP				•••••	
Min. typ	o. (module alone)	0.005 A	0.100 A	0.100 A	0.070 A	
Max. ty	p. (min. + loads)	0.005 A + load	0.100 A + load	0.100 A + load	0.070 A + load	
Reverse pol	larity protection	•				
Fuse for pro	ocess voltage UP	10 A miniature fuse				
Approvals		See detailed page 166 o	r www.abb.com/plc			

(1) Dedicated to High Availability.

#### **PROFIBUS®-DP modules**

PROFIBU	JS <sup>®</sup> -DP modules	1	
Туре		CI541-DP	CI542-DP
Communicat	tion Interface		
Protocol		PROFIBUS® DP (DP-V0 and DP-V1 slave)	
D configura	tion	Per rotary switches on front face from 00h to FFh	
Field bus connection on terminal units		Sub-D 9 poles on TU509, TU510 preferred but TU517	/TU518 can be used with reduced baud rate
lumber of C	hannels per Module		
Digital	inputs	8	8
ngitai	outputs	8	8
Analog	inputs	4	
analog	outputs	2	_
Digital confi	gurable channels DC	_	8
	e as inputs or outputs)		°
	onfiguration of channels as		
	r (onboard I/O)	Configuration of max. 2 DI channels per module	
	ax 1 DO or DC when used as counter		•
		-	
onnection			
ocal I/O ex		Yes	
/lax. numbe	r of extension modules	max. 10 x S500 extension modules (standard or eCo can be also used	modules are allowed), fast counter from digital IO modules
/ia terminal	unit TU5xx		•
			i -
Digital input			
nput	signal voltage	24 V DC	
····:	characteristic acc. to EN 61132-2	Type 1	
signal		-3+5 V DC	
Indefined si	gnal state	515 V DC	
signal		1530 V DC	
lesidual rip	ole, range for 0 signal	-3+5 V DC	
	1 signal	1530 V DC	
nput time d	elay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms	
Digital outpu			
	utputs 24 V DC, 0.5 A	•	
Readback of		-	● (on DC outputs)
	oplied via process voltage UP	•	
Switching of		•	
Output volta	ge at signal state 1	Process voltage UP - 0.8 V	
Dutput curre	ent		
Iominal cur	rent per channel	500 mA at UP = 24 V DC	
Maximum (to	otal current of all channels)	8 A	
Residual cur	rent at signal state 0	< 0.5 mA	
Demagnetiza	ation when switching off inductive loads	s By internal varistors	
Analog Input	ts Al	Max. number per module and with regard to the confi	iguration: Als / Measuring points
	guration per Al	4	
)10 V / -1(			_
20 mA / 4	· · · · · · · · · · · · · · · · · · ·	4/4	-
	/3 wire needs 1/2 channel(s)	4/2	_
	g differential inputs, needs 2 channels	4 / 2	-
	using differential inputs, needs	4/2	-
channels	_ , , , , , , , , , , , , , , , , , , ,		
Digital signa	ls (digital input)	4/4	-
)ata when u	sing the AI as digital input		
nput	Input time delay	8 ms typically, configurable from 0.1 up to 32 ms	_
	signal voltage	24 V DC	-
utouto -!			:
	gle configurable as		
	nfiguration per AO	•	-
10+10V	1 00 4	•	-
)20 mA / 4	· · · · · · •• · · · · · · · · · · · ·	•	-
Dutput	resistance (load) when used as current output	0500 Ω	-
	loading capability when used as	±10 mA max.	
	voltage output		
	V Int	1	

#### **PROFIBUS®-DP modules**

Туре		CI541-DP	CI542-DP	
Potential isolation				
Per module		•	•	
Between fieldbus interface against the rest of the module		•	•	
Between the channels	input	-	-	
	output	-	-	
Voltage supply for the mod	dule	By external 24 V DC voltage via terminal UP		
Process voltage UP				
Nominal voltage		24 V DC		
Maximum ripple	••••••	5 %		
Current consumption on U	P		······	
Min. typ. (module alon	e)	0.260 A		
Max. typ. (min. + load	s)	0.260 A + load		
Reverse polarity protection		•		
Fuse for process voltage UP		10 A miniature fuse		
Approvals	See detailed page 166 or www.abb.com/plc		m/plc	

#### CANopen® modules

CANopen <sup>®</sup> modules			
уре		CI581-CN	CI582-CN
communication interface			
Protocol		CANopen <sup>®</sup> slave, DS401 profile selectable using rot	tarv switches
D configuration		Per rotary switches on front face for CANopen® ID r profile	node from 00h to 7Fh and 80h to FFh for CANopen® DS401
Field bus connection on terminal	units	Terminal blocks on TU517/TU518 or TU509/TU510	
Number of channels per module			
	puts	8	8
•	utputs	8	8
	puts	4	_
•	utputs	2	-
Digital configurable channels DC configurable as inputs or output		-	8
Additional configuration of chan			· ·
Fast counter (onboard I/O)		Configuration of max. 2 DI channels per module	
Occupies max. 1 DO or DC wher	used as counter		•
Connection			
Local I/O extension		•	х II II II
Max. number of extension modu	les	max. 10 x S500 extension modules (standard or eC	
/ia terminal unit TU5xx		•	•
Digital inputs			
Input signal voltage		24 V DC	
	acc. to EN 61132-2	Туре 1	
) signal		-3+5 V DC	
Undefined signal state		515 V DC	
l signal		1530 V DC	
	signal	-3+5 V DC	
	signal	1530 V DC	
nput time delay (0 -> 1 or 1 -> 0)		8 ms typically, configurable from 0.1 up to 32 ms	
Digital outputs			
Transistor outputs 24 V DC, 0.5 A	۱	•	
Readback of output		-	<ul> <li>(on DC outputs)</li> </ul>
Outputs, supplied via process vo	ltage UP	•	
Switching of 24 V load			
Output voltage at signal state 1		Process voltage UP - 0.8 V	
Output current			
Nominal current per channel		500 mA at UP = 24 V DC	
Maximum (total current of all cha		8 A	
Residual current at signal state 0		< 0.5 mA	
Demagnetization when switching	off inductive loads	By internal varistors	
Analog Inputs Al		Max. number per module and with regard to the con	nfiguration: Als / Measuring points
Signal configuration per Al		4	
)10 V / -10+10 V		4 / 4	-
)20 mA / 420 mA		4 / 4	-
RTD using 2/3 wire needs 1/2 ch		4/2	-
010 V using differential inputs,		4/2	
10+10 V using differential inpu	uts, needs	4/2	-
2 channels			
Digital signals (digital input)		4/4	-
Data when using the AI as digital	linput		
nput ti	me delay	8 ms typically, configurable from 0.1 up to 32 ms	-
si	gnal voltage	24 V DC	-
Outputs, single configurable as			
Possible configuration per AO		•	_
-10+10 V		•	-
		•	-
020 mA / 420 mA	N 1 1	0500 Ω	-
	d) when used as	0000 12	
020 mA / 420 mA Output resistance (load current output	d) when used as		
Output resistance (load current output	d) when used as lity when used as	±10 mA max.	-

#### CANopen® modules

Туре		CI581-CN	CI582-CN	
Potential isolation				
Per module		•	•	
Between fieldbus interface module	e against the rest of the	•	•	
Between the channels	input	-	-	
	output	-	-	
Voltage supply for the module		By external 24 V DC voltage via terminal UP		
Process voltage UP				
Nominal voltage		24 V DC		
Maximum ripple	•••••••	5 %		
Current consumption on U	JP			
Min. typ. (module alor	ne)	0.260 A		
Max. typ. (min. + load	ls)	0.260 A + load		
Reverse polarity protection		•		
Fuse for process voltage l	JP	10 A miniature fuse		
Approvals		See detailed page 166 or www.abb.com/p	lc	

#### **PROFINET® IO RT device modules**

Туре	CI501-PNIO	CI502-PNIO	CI504-PNIO	CI506-PNIO
Communication interface				
Ethernet Interface				
Main protocol	PROFINET® IO RT de	vice		
ID Device configuration	By rotary switch on t	ne front side, from 00h to FFr	1	•
Ethernet connection on terminal units	2 x RJ45 with switch	functionality for simple daisy	chain on TU507-ETH or TU508	8-ETH or TU520-ETH
Gateway Interface				
Gateway to	-	-	3 x RS232 / RS422 / R ASCII serial interfaces	S485 CAN / CANopen® Master + 2 x RS232 / RS422 / RS48 ASCII serial interfaces
Fieldbus Protocol used	-	-	-	CAN 2A/2B Master - CANopen <sup>®</sup> Master (1)
CAN physical interface	-	-	-	1 x 10 poles pluggable spring connector
Baudrate	-	-	-	Baudrate up to 1 MBit/s, Support for up to 126 CANopen® Slaves
Serial interface	-	-	3 x RS232 / RS422 or RS485	2 x RS232 / RS422 or RS485
Protocol used	-	-	ASCII	ASCII
Baudrate	-	-	Configurable from 300	bit/s to 115200 bit/s
Fieldbus or serial connection on terminal units	-	-		blocks with spring on TU520-ETH
		÷		
Number of channels per module Digital inputs	8	8		
Digital inputs outputs	8	8	-	
	4	0	-	-
Analog inputs outputs	2	_	-	-
Digital configurable channels DC	Z	8		-
configurable as inputs or outputs)	_	0	_	
Additional configuration of channels as				
Fast counter (onboard I/O)	Configuration of max	. 2 DI channels per module	-	-
Occupies max. 1 DO or DC when used as counter	•		-	-
Connection				
_ocal I/O extension	•		•	•
Max. number of extension modules	max. 10 x S500 exter modules allowed). Fa IO modules can be a	nsion modules (standard or e st counter from digital	Co Valid for Cl501, 502, 50 extension up to 10 mod	04 and 506. All modules can have dules
Via terminal unit TU5xx		•	•	•
Digital inputs		i		;
Digital inputs nput signal voltage	24 V DC			
nput signal voltage characteristic acc. to EN 61132-3		·····	-	-
	-3+5 V DC	······	_	-
) signal Jndefined signal state	515 V DC		-	-
I signal	1530 V DC		_	_
	-3+5 V DC		_	_
	1530 V DC	•••••	_	
1 signal Input time delay (0 -> 1 or 1 -> 0)		urable from 0.1 up to 32 ms	_	_
	1 o mo typiodity, comig	a. a.o. o nom on up to 02 110		
Digital outputs				
Transistor outputs 24 V DC, 0.5 A	•		-	
Readback of output		<ul> <li>(on DC outputs)</li> </ul>	-	-
Outputs, supplied via process voltage UP			-	-
Switching of 24 V load			-	
Output voltage at signal state 1	Process voltage UP -	0.8 V	-	-
Output current				
Nominal current per channel	500 mA at UP = 24 V	' DC	-	-
Maximum (total current of all channels)	8 A	•••••	-	-
Residual current at signal state 0	< 0.5 mA	•	-	-
Demagnetization when switching off inductive load		•••••••••••••••••••••••••••••••••••••••	-	-
	1			

(1) Not simultaneously.

#### **PROFINET® IO RT device modules**

Туре		CI501-PNIO	CI502-PNIO	CI504-PNIO	CI506-PNIO
Analog inputs A	AI	Max. number per module ar	nd with regard to the c	onfiguration: Als / Measuring	points
Signal configur	ation per Al	4	-	-	-
010 V / -10	+10 V	4 / 4	-	-	-
020 mA / 4	20 mA	4/4	-	-	-
RTD using 2/3	wire needs 1/2 channel(s)	4/2	-	-	-
010 V using c	lifferential inputs, needs 2 channels	4/2	-	-	-
2 channels	ng differential inputs, needs	4/2	-	-	-
Digital signals (	digital input)	4 / 4	-	-	-
Data when usin	g the AI as digital input				
Input	time delay	8 ms typically, configurable from 0.1 up to 32 ms	-	-	-
	signal voltage	24 V DC	-	-	-
Outputs, single	configurable as			· ·	· ·
Possible config		•	-	-	-
-10+10 V		•	-	-	-
020 mA / 4	20 mA	•	-	-	-
Output	resistance (load) when used as current output	0500 Ω	-	-	-
	loading capability when used as voltage output	±10 mA max.	-	-	-
Potential isolati	ion	1	·		
Per module		•	•	•	•
Between Etherr module	net interface against the rest of the	•	•	•	•
Voltage supply	for the module	By external 24 V DC voltage	e via terminal UP		
Process voltage	e UP				
Nominal voltage		24 V DC			
Maximum ripple		5 %	•••••••••••••••••••••••••••••••••••••••	••••••	••••••
Current consun	nption on UP			••••••	••••••
	module alone)	0.260 A		0.150 A	
	(min. + loads)	0.260 A + load	••••	0.150 A	
max. typ. (		•	•••••••••••••••••••••••••••••••••••••••		••••••
max. typ. ( Reverse polarit	y protection				
		10 A miniature fuse			

#### EtherCAT<sup>®</sup> modules

EtherCAI <sup>®</sup> mod			
Туре		CI511-ETHCAT	CI512-ETHCAT
	faaa		· · · · · · · · · · · · · · · · · · ·
Communication interf	lace		
Protocol		EtherCAT® slave	
ID Device configuration		Address is defined by position on Ethernet bus	
Field bus connection	on TUs	2 x RJ45 with switch functionality for simple daisy cha	n on 1U507-ETH or TU508-ETH
Number of channels p	per module		
Digital	inputs	8	8
Digital	outputs	8	8
Analog	inputs	4	
Analog	outputs	2	
Digital configurable of	hannels DC (configurable as		-
inputs or outputs)	fiaimeis DC (configurable as	-	8
, ,,			
Additional configurati	ion of channels as		
Fast counter (onboard	d I/O)	-	
Occupies max. 1 DO	or DC when used as counter	-	
Connection			
Local I/O extension			
••••••••••••••••••••••••••••••••••••••		No extension modules possible	
Max. number of exter		-	
Via terminal unit TU5>	KX.		
Digital inputs			
Input signal voltage		24 V DC	
Input characteristic a	cc. to EN 61 132-2	Type 1	
0 signal		-3+5 V DC	
Undefined signal state	e	515 V DC	
1 signal		1530 V DC	
Residual ripple, range	e for 0 signal	-3+5 V DC	
noolada npplo, lange	1 signal	1530 V DC	
Input time delay (0 ->		8 ms typically, configurable from 0.1 up to 32 ms	
Digital outputs			
		-	
Transistor outputs 24	V DC, 0.5 A	•	
Readback of output	•••••	-	● (on DC outputs)
	•••••	• - •	● (on DC outputs)
Readback of output	process voltage UP	-	● (on DC outputs)
Readback of output Outputs, supplied via	process voltage UP d	- • •	● (on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign	process voltage UP d	-	• (on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current	process voltage UP d nal state 1	- ● ● Process voltage UP - 0.8 V	• (on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c	process voltage UP d nal state 1 channel	- ● ● Process voltage UP - 0.8 V 500 mA at UP = 24 V DC	(on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total currer	process voltage UP d nal state 1 channel nt of all channels)	 ● - Process voltage UP - 0.8 V 500 mA at UP = 24 V DC 8 A	(on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign	process voltage UP d nal state 1 channel nt of all channels) gnal state 0	- ● ● Process voltage UP - 0.8 V 500 mA at UP = 24 V DC 8 A < 0.5 mA	(on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign	process voltage UP d nal state 1 channel nt of all channels)	- ● ● Process voltage UP - 0.8 V 500 mA at UP = 24 V DC 8 A < 0.5 mA	(on DC outputs)
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign	process voltage UP d nal state 1 channel nt of all channels) gnal state 0	- ● ● Process voltage UP - 0.8 V 500 mA at UP = 24 V DC 8 A < 0.5 mA	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whe	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads	<ul> <li>-</li> <li>●</li> <li>●</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al	<ul> <li>-</li> <li>●</li> <li>●</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs Al Signal configuration p	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al	<ul> <li>-</li> <li>●</li> <li>● Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al	<ul> <li>-</li> <li>●</li> <li>●</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 4</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sig Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 2</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 4</li> <li>4 / 2</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curre Residual current at si Demagnetization whe Analog inputs Al Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer 2 channels	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads ber AI V V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 2</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whee Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V using differen -10+10 V using differen 2 channels Digital signals (digital	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V using differen -10+10 V using differen 2 channels Digital signals (digital Data when using the J	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 4</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whee Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V using differen -10+10 V using differen 2 channels Digital signals (digital	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads oer AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V using differen -10+10 V using differen 2 channels Digital signals (digital Data when using the J	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 4</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Nominal current Residual current at sig Demagnetization whe Analog inputs Al Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer -10+10 V using differer Digital signals (digital Data when using the / Input	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer -10+10 V using differer 2 channels Digital signals (digital Data when using the / Input	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) Al as digital input time delay signal voltage gurable as:	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> <li>24 V DC</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whee Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer -10+10 V using differer 2 channels Digital signals (digital Data when using the / Input Outputs, single configuration	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads per Al V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) Al as digital input time delay signal voltage gurable as:	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whe Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V using differen -10+10 V using differen Digital signals (digital Data when using the / Input Outputs, single configuration -10+10 V	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads oer AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage gurable as: n per AO	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> <li>24 V DC</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whee Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using different -10+10 V using different -10+10 V using different -10+10 V using different Digital signals (digital Data when using the A Input Outputs, single configuration -10+10 V 020 mA / 420 mA	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads oer AI V eeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage gurable as: n per AO		
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total current Residual current at sign Demagnetization whee Analog inputs AI Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differen -10+10 V Input	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads oer AI V seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage gurable as: n per AO	<ul> <li>-</li> <li>Process voltage UP - 0.8 V</li> <li>500 mA at UP = 24 V DC</li> <li>8 A</li> <li>&lt; 0.5 mA</li> <li>By internal varistors</li> <li>Max. number per module and with regard to the config</li> <li>4</li> <li>4 / 4</li> <li>4 / 4</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 2</li> <li>4 / 4</li> <li>8 ms typically, configurable from 0.1 up to 32 ms</li> <li>24 V DC</li> </ul>	
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sig Demagnetization whe Analog inputs Al Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer -10+10 V using differer 2 channels Digital signals (digital Data when using the / Input Outputs, single config Possible configuration -10+10 V 020 mA / 420 mA Output resistance (load output	process voltage UP d nal state 1 shannel nt of all channels) gnal state 0 en switching off inductive loads oer AI VV seeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage gurable as: n per AO		
Readback of output Outputs, supplied via Switching of 24 V load Output voltage at sign Output voltage at sign Output current Nominal current per c Maximum (total curren Residual current at sig Demagnetization whe Analog inputs Al Signal configuration p 010 V / -10 V +10 020 mA / 420 mA RTD using 2/3 wire ne 010 V using differer -10+10 V using differer -10+10 V using differer 2 channels Digital signals (digital Data when using the / Input Outputs, single config Possible configuration -10+10 V 020 mA / 420 mA Output resistance (load output	process voltage UP d nal state 1 channel nt of all channels) gnal state 0 en switching off inductive loads oer AI V eeds 1/2 channel(s) ntial inputs, needs 2 channels erential inputs, needs input) AI as digital input time delay signal voltage gurable as: n per AO		

#### EtherCAT<sup>®</sup> modules

Туре		CI511-ETHCAT	CI512-ETHCAT	
Potential isolation				
Per module		•	•	
Between Ethernet interfact module	e against the rest of the	•	•	
Between the channels	input	-	-	
	output	-	-	
Voltage supply for the module		By external 24 V DC voltage via terminal UP		
Process voltage UP				
Nominal voltage		24 V DC		
Maximum ripple	•••••	5 %		
Current consumption on U	P			
min. typ. (module alor	ne)	0.260 A		
max. typ. (min. + load		0.260 A + load		
Reverse polarity protection		•		
Fuse for process voltage L		10 A miniature fuse		
Approvals		See detailed page 166 or www.abb.co	pm/plc	

#### **CS31** functionality

	AC500 CPU with integrated CS31 interface	S500 I/O with communication interface DC551-CS31 CI590-CS31-HA CI592-CS31		
Master	Yes, at COM1	-		
Slave	No	Yes / Redundant for Cl590-CS31-HA		
Protocols supported	ABB CS31 protocol			
Diagnosis				
Error indication	On LCD display of the CPU / AC500-eCo error LED	Via module LEDs		
Online diagnosis	Yes			
Error code	Errors are recorded in the diagnosis system of the CPU			
Associated function blocks	Yes			
Physical layer	RS485 / 2 x RS485 for CI590-CS31-HA for redundancy	,		
Connection	Plug at COM1	Screw-type or spring-type terminals		
Baud rate	187.5 kbit/s			
Distance	AC500-eCo: up to 50 m and up to 500 m using the isol	ator TK506 / AC500: up to 500 m; up to 2000 m using a repeater		
Max. number of modules on fieldbus	31 modules max. Please note: The CS31 bus interface occupies one or two module addresses (if counters are configured onboard or if the module is a mixed digital analog module). Depending on the configuration, or if the module contains also mixed digital analog I/O, connected extension modules can occupy further module addresses.			
Configuration	Using configuration tool (included in Automation Builder	software suite)		
Station address configuration	No	Using rotary switches (99 max.)		

#### Digital and mixed signal I/O modules, "Fast Counter" operating modes. Not applicable for DC541 or eCo-I/O modules (1)

Operating mode, configured in the user program of the AC500		Occupied inputs DI or DC	Occupied outputs DO or DC	Maximum counting frequency
				kHz
0	No counter	0	0	-
1	One count-up counter with "end value reached" indication	1	1	50
2	One count-up counter with "enable" input and "end value reached" indication	2	1	50
3	Two up/down counters	2	0	50
4	Two up/down counters with 1 counting input inverted	2	0	50
5	One up/down counter with "dynamic set" input	2	0	50
6	One up/down counter with "dynamic set" input	2	0	50
7	One up/down counter with directional discriminator For synchro transmitters using two counting pulses with an offset of 90° (track A and B)	2	0	50
8	-	0	0	-
9	One up/down counter with directional discriminator and double evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	30
10	One up/down counter with directional discriminator and fourfold evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	15

(1) See technical documentation for details.

# AC500 System data

#### Operating and ambient conditions

Voltages according to EN 61131-2		
24 V DC	Process and supply voltage	24 V DC (-15 %, +20 % without ripple)
	Absolute limits	19.230 V inclusive ripple
	Ripple	< 5 %
	Protection against reverse polarity	10 s
120 V AC	Line voltage	120 V AC (-15 %, +10 %)
	Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
230 V AC	Line voltage	230 V AC (-15 %, +10 %)
	Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
120-240 V AC	Wide-range supply	-
	Line voltage	102264 V / 120240 V (-15 %, +10 %)
	Frequency	4762.4 Hz / 5060 Hz (-6 %, +4 %)
Allowed interruptions of power supply acc.	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s, PS2
to EN 61131-2	AC supply	Interruption < 0.5 periods, time between 2 interruptions > 1 s

upply pr p supply

Temperature	Operation	060 °C (horizontal mounting of modules)
		040 °C (vertical mounting of modules and output load reduced to 50 % per group)
	Storage	-40+70 °C
	Transport	-40+70 °C
Humidity		Max. 95 %, without condensation
Air pressure	Operation	> 800 hPa / < 2000 m
	Storage	> 660 hPa / < 3500 m

#### Creepage distances and clearances

Insulation Test Voltages, Routine Test	t, according to EN 61131-2	High voltage pulse 1.2/50 µs	AC voltage during 2 seconds
Circuits against other circuitry	230 V	2500 V	1350 V
	120 V	1500 V	820 V
	120240 V	2500 V	1350 V
24 V circuits (supply, 24 V inputs/outp against other circuitry	outs), if they are electrically isolated	500 V	350 V
COM interfaces, electrically	isolated	500 V	350 V
	not isolated	not applicable	not applicable
FBP interface		500 V	350 V
Ethernet		500 V	350 V

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

#### Main dimensions mm, inches



Туре	Nr communication	Length L		
	modules	тт	inches	
TB511-ETH	1	95.5	3.76	
TB521-ETH	2	123.5	4.86	
TB541-ETH	4	179.5	7.07	



# AC500 System data

#### Power supply units

For the supply of the modules, power supply units according to PELV specifications must be used.

Electromagnetic Compatibilit	у	
Immunity		
Against electrostatic discharge (ESI	)	According to EN 61000-4-2, zone B, criterion B
Electrostatic voltage in case of	air discharge	8 kV
	contact discharge	4 kV, in a closed switch-gear cabinet 6 kV (1)
ESD with communication connector	rs	In order to prevent operating malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.
ESD with connectors of Terminal Ba	ISES	The connectors between the terminal bases and CPUs or communication modules must not be touched during operation. The same is valid for the I/O-Bus with all modules involved.
Against the influence of radiated (C)	W radiated)	According to EN 61000-4-3, zone B, criterion A
Test field strength		10 V/m
Against transient interference voltage	ges (burst)	According to EN 61000-4-4, zone B, criterion B
Supply voltage units	AC / DC	2 kV
Digital inputs/outputs	24 V DC	2 kV
	120/230 V AC	2 kV
Analog inputs/outputs	-	1 kV
CS31 system bus		2 kV
Serial RS485 interfaces (COM)		2 kV
Serial RS232 interfaces (COM, not fo	or PM55x and PM56x)	1 kV
ARCNET		1 kV
FBP		1 kV
Ethernet	•	1 kV
I/O supply, DC-out		1 kV
Against the influence of line-conduct	cted interferences (CW conducted)	According to EN 61000-4-6, zone B, criterion A
Test voltage		3 V zone B, 10 V is also met
High energy surges		According to EN 61000-4-5, zone B, criterion B
Power supply DC		1 kV CM (2) / 0.5 kV DM (2)
DC I/O supply		0.5 kV CM (2) / 0.5 kV DM (2)
Buses, shielded		1 kV CM (2)
AC-I/O unshielded		2 kV CM (2) / 1 kV DM (2)
I/O analog, I/O DC unshielded		1 kV CM (2) / 0.5 kV DM (2)
Radiation (radio disturbance)		According to EN 55011, group 1, class A

(1) High requirement for shipping classes are achieved with additional specific measures (see specific documentation).
 (2) CM = Common Mode - DM = Differential Mode.

Mechanical Data	
Wiring method / terminals	
Mounting	Horizontal
Degree of protection	IP20 (if all terminal screws are tightened)
Housing	According to UL 94
Vibration resistance acc. to EN 61131-2	all three axes 215 Hz, continuous 3.5 mm 15150 Hz, continuous 1 g (higher values on request)
Vibration resistance with SD Memory Card inserted	15150 Hz, continuous 1 g
Shock resistance	All three axes 15 g, 11 ms, half-sinusoidal
Shipping specific requirements	-
Mounting of the modules	
DIN rail according to DIN EN 50022	35 mm, depth 7.5 mm or 15 mm
Mounting with screws	Screws with a diameter of 4 mm
Fastening torque	1.2 Nm



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### AC500-XC Key features

5

Lower lifetime cost and many of the traditional practices are not required, such as: HVAC for the panel, shock absorbers, door sealing, etc...

### Resistance to:

- High humidity
- Salt mist
- Vibration
- High altitude
- Hazardous gases
- Temperature:
- from -40 to +70 °C



All the benefits from AC500 line: Automation Builder productivity suite, I/O modules, scalable and flexible, same high performance communication, libraries and web services.



PM573-ETH-XC



PM592-ETH-XC

#### AC500 CPUs

- 2 internal serial interfaces, RS232 / RS485 configurable
- Display and 8 function keys for diagnosis and status
- Centrally expandable with up to 10 I/O modules (S500) for a total of 320 Digital I/Os or 160 Analog I/Os
- Simultaneous operation of up to 4 external communication modules in any desired combination
- Optional SD card for data storage and program backup
- Can also be used as slave CANopen® using CM588-CN-XC slave coupler
- Ethernet version provides web server and IEC 60870-5-104 remote control protocol.

Program memory	Cycle time in µs per instruction min.	Integrated communication	Туре	Order code	Price	Weight (1 pce)
kB	Bit/Word/Float. point					kg
512	0.06 / 0.09 / 0.7	Ethernet (2), 2 x serial	PM573-ETH-XC (1)	1SAP330300R0271		0.150
512	0.05 / 0.06 / 0.5	2 x serial	PM582-XC	1SAP340200R0201		0.135
1024	0.05 / 0.06 / 0.5	Ethernet (2), 2 x serial	PM583-ETH-XC (1)	1SAP340300R0271		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (2), 2 x serial	PM591-ETH-XC (1)	1SAP350100R0271		0.150
4096	0.002 / 0.004 / 0.004	Ethernet (2), 2 x serial	PM592-ETH-XC (1)(3)	1SAP350200R0271		0.150

(1) Ethernet communication.

(2) Provides integrated web server and IEC 60870-5-104 remote control protocol.(3) Provides integrated 4 GB flashdisk for user data storage.



TB511-ETH-XC



- For mounting and connection of the CPUs and communication modules
- 1 to 4 plug-in communication modules
- Connection for communication coupler integrated in the CPU
- I/O interface for direct connection of up to 10 expansion modules
- Connection COM1: 9-pole pluggable terminal block
- Connection COM2: 9-pole Sub-D (socket).

Number of coupler slots	Connection for coupler integrated in the CPU	Туре	Order code	Price	Weight (1 pce)
					kg
1	Ethernet RJ45	TB511-ETH-XC	1SAP311100R0270		0.215
2	Ethernet RJ45	TB521-ETH-XC	1SAP312100R0270		0.215
4	Ethernet RJ45	TB421-ETH-XC	1SAP314100R0270		0.215



TB541-ETH-XC





CM572-DP-XC

DI524-XC

DO524-XC

CM579-PNIO-XC



Protocol

### I/O modules

PROFIBUS® DP V0/V1 master

**Communication modules** 

Ethernet (TCP/IP, UDP/IP, Modbus TCP)

- For central expansion of the AC500-XC CPU
- For decentralized expansion in combination with communication interface module (not for DC505-FBP)

Type

CM572-DP-XC

CM577-ETH-XC

CM578-CN-XC

CM588-CN-XC

CM579-PNIO-XC

Price

Order code

1SAP370200R0001

1SAP370700R0001

1SAP370800R0001

1SAP372800R0001

1SAP370901R0001

Weight

(1 pce) kg

0.115

0.115

0.115

0.115

0.115

- DC: channels can be configured individually as inputs or outputs

Connections

Sub-D socket 9 poles

2 x RJ45 - integrated switch

Terminal block 5 poles spring

2 x RJ45 - integrated switch

Terminal block 2 x 5 poles spring

- Terminal unit required (refer to table below).

#### **Digital I/O**

Number of	Input signal	Output type	Output signal	Terminal units	Туре	Order code	Price	Weight (1 pce)
DI/DO/DC							-	kg
32 / - / -	24 V DC	-	-	TU516-XC	DI524-XC	1SAP440000R0001		0.200
-/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU516-XC	DC522-XC	1SAP440600R0001		0.200
- / - / 24	24 V DC	Transistor	24 V DC, 0.5 A	TU516-XC	DC523-XC	1SAP440500R0001		0.200
16 / - / 16	24 V DC	Transistor	24 V DC, 0.5 A	TU516-XC	DC532-XC	1SAP440100R0001		0.200
- / 32 / -	24 V DC	Transistor	24 V DC, 0.5 A	TU516-XC	DO524-XC	1SAP440700R0001		0.200
8/8/-	24 V DC	Relay	230 V AC, 3 A (1)	TU532-XC	DX522-XC	1SAP445200R0001		0.200

(1) Relay outputs, changeover contacts.

#### Analog I/O

Number of	Input signal	Output signal	Terminal units	Туре	Order code	Price	Weight (1 pce)
AI/AO				7			kg
16 / 0	010 V, ±10 V 0/420 mA	-	TU516-XC	AI523-XC	1SAP450300R0001		0.200
4 / 4	PT100, PT1000, Ni1000	±10 V	TU516-XC	AX521-XC	1SAP450100R0001		0.200
8 / 8 (max. 4 current outputs)		0/420 mA	TU516-XC	AX522-XC	1SAP450000R0001		0.200
0 / 16 (max. 8 current outputs)	-		TU516-XC	A0523-XC	1SAP450200R0001		0.200
8/0	05 V, 010 V, ±50 mV, ±500 mV, 1 V, ±5 V, ±10 V, 0/420 mA, ±20 mA PT100, PT1000, Ni1000, Cu50, 050 kΩ, S, T, N, K, J	-	TU516-XC	AI531-XC	1SAP450600R0001		0.200

#### Analog/digital mixed I/O

Standard I/O module with high functionality:

- 16 digital input channels

- 8 configurable In/Output channels
- First two inputs are also usable as high-speed counter (up to 50 kHz) together with AC500-XC CPU, CS31 or CI5xx-XC communication interface modules
- 4 independent analog input channels configurable for voltage, current, 12 bit + sign, 1-2 wire connection
- Galvanic isolation per module
- Usable with all CI5xx modules.

Number of	10 C U U	Output type	Output signal	Terminal unit	Туре	Order code	Price	Weight (1 pce)
AI/AO/DI/DO/DC					- - - -			kg
4/2/16/-/8	24 V DC, 010 V,	Transistor	24 V DC, 0.5 A	TU516-XC	DA501-XC	1SAP450700R0001		0.200
	±10 V, 0/420 mA,		±10 V,					
	PT100, PT1000,		0/420 mA					
	Ni100, Ni1000							







AI531-XC



DA501-XC



CD522-XC

#### **Multifunctional modules**

Functionality	Number of	Input signal	Output type	Output signal	Terminal unit	Туре	Order code	Price	Weight (1 pce)
	DI/DO/DC								kg
Encoder mod	ule								
Encoder and PWM module		24 V DC and 2 encoder inputs	2 PWM outputs	-	TU516-XC	CD522-XC	1SAP460300R0001		0.125

Functionality	Number of	Input signal	Output type	Output signal	Terminal unit	Туре	Order code	Price	Weight (1 pce)
	DI/DO/DC			- - - - -					kg
Interrupt I/O a	and fast cou	inter module				•	•		
Interrupt I/O and fast counter		24 V DC	Transistor	24 V DC, 0.5 A	N/A (2)	DC541-CM-XC (1)	1SAP470000R0001		0.100

Multifunctional module, refer to table on page 101 for details.
 Occupies a communication module slot on the AC500 CPU terminal base, no terminal block required

Number of

AI/AO/DI/DO/DC

Communication interface modules

Communication interface module for CS31-Bus

Output

type

Output signal

Terminal units

Туре

Order code

Price

Weight (1 pce)

kg

0.200 0.200 0.200

0.200

0.200

0.200

0.200

0.200

0.200

Input signal



DC551-CS31-XC



CI541-DP-XC



CI581-CN-XC



CI502-PNIO-XC

1 101 110		e for CS31.	Duo			
-/-/8/-/16	24 V DC	Transistor	24 V DC, 0.5 A	TU552-CS31-XC	DC551-CS31-XC	1SAP420500R0001
/ - / - / - / 16	24 V DC	Transistor	24 V DC, 0.5 A	TU552-CS31-XC	CI590-CS31-HA-XC	1SAP421100R0001
/2/8/-/8	24 V DC /	Transistor	24 V DC, 0.5 A /	TU552-CS31-XC	Cl592-CS31-XC	1SAP421200R0001
	010 V,		-10+10 V,			
	-10+10 V,		020 mA,			
	020 mA,		420 mA			
	420 mA,					
	PT100, PT1000,					
	Ni100, Ni1000			-		
Communicatio	n interface modul	e for PROF	IBUS <sup>®</sup> -DP			
4/2/8/8/-	24 V DC /	Transistor	24 V DC, 0.5 A /	TU510-XC /	CI541-DP-XC	1SAP424100R0001
	010 V,		-10+10 V,	TU518-XC		
	-10+10 V,		020 mA,			
	020 mA,		420 mA			
	420 mA,					
	PT100, PT1000,					
	Ni100, Ni1000					
/ - / 8 / 8 / 8	24 V DC	Transistor	24 V DC, 0.5 A		CI542-DP-XC	1SAP424200R0001
				TU518-XC		
Communicatio	n interface modul	e for CANo	pen®			
4/2/8/8/-	24 V DC /	Transistor	24 V DC, 0.5 A /	TU510-XC /	CI581-CN-XC	1SAP428100R0001
	010 V,		-10+10 V,	TU518-XC		
	-10+10 V,		020 mA,			
	020 mA,		420 mA			
	420 mA,					
	PT100, PT1000,					
	Ni100, Ni1000					
/-/8/8/8	24 V DC	Transistor	24 V DC, 0.5 A		CI582-CN-XC	1SAP428200R0001
				TU518-XC		
	n interface modul					
1/2/8/8/-	24 V DC /	Transistor		TU508-ETH-XC	CI501-PNIO-XC	1SAP420600R0001
	010 V,		-10+10 V,			
	-10+10 V,		020 mA,			
	020 mA,		420 mA			
	420 mA,					
	PT100, PT1000,					
	Ni100, Ni1000					
/-/8/8/8	24 V DC	***	24 V DC, 0.5 A			

From	То	Output signal	Terminal units	Туре	Order code	Weight (1 pce) kg
Communicatio	n interface module	e gateway for Ethernet bas	ed protocol - Pl	ROFINET® IO R	Г	
PROFINET® I/O	1	3 x RS232/485 ASCII serial interfaces	TU520-ETH-XC	CI504-PNIO-XC	1SAP421300R0001	0.200
PROFINET® I/O	1 x CAN 2A/2B or CANopen® Master	2 x RS232/485 ASCII serial interfaces	TU520-ETH-XC	CI506-PNIO-XC	1SAP421500R0001	0.200



CI506-PNIO-XC



TU516-XC

#### **Terminal units**

For digital and analog expansion modules and interface modules. Please note: for modules with relay outputs, terminal units for 230 V AC (TU532-XC) is required.

For	Supply	Connection type	Туре	Order code	Price	Weight (1 pce)
			2 4 4 4			kg
Ethernet interface modules	24 V DC	Spring	TU508-ETH-XC	1SAP414000R0001		0.300
CANopen®/PROFIBUS® DP interface modules	24 V DC	Spring	TU510-XC	1SAP410800R0001		0.300
I/O modules	24 V DC	Spring	TU516-XC	1SAP412000R0001		0.300
CANopen®/PROFIBUS® DP interface modules	24 V DC	Spring	TU518-XC (1)	1SAP411200R0001		0.300
Ethernet gateway modules	24 V DC	Spring	TU520-ETH-XC	1SAP414400R0001		0.300
I/O modules AC / Relay	230 V AC	Spring	TU532-XC	1SAP417000R0001		0.300
CS31 interface modules	24 V DC	Spring	TU552-CS31-XC	1SAP410400R0001		0.300

(1) TU518-XC Terminal units can also be used with PROFIBUS® DP with limited baud rate.



TU520-ETH-XC



TU510-XC

#### Terminal units compatibility

Туре	For I/O modu	les	For communicat	tion interface r	nodules		
	TU516-XC	TU532-XC	TU508-ETH-XC	TU510-XC	TU518-XC	TU520-ETH-XC	TU552-CS31-XC
DA501-XC	•						
DC522-XC	•						
DC523-XC	•						
DC532-XC	•						
DI524-XC	•						
DX522-XC	1	•					
CD522-XC	•						
AI523-XC	•						
AI531-XC	•						
AO523-XC	•						
AX521-XC	•						
AX522-XC	•						
DC551-CS31-XC							•
CI590-CS31-HA-XC							•
CI592-CS31-XC							•
CI501-PNIO-XC	-		•				
CI502-PNIO-XC			•				
CI504-PNIO-XC						•	
CI506-PNIO-XC						•	
CI541-DP-XC				•	• (1)		
CI542-DP-XC				•	• (1)		
CI581-CN-XC					•		
CI582-CN-XC					•		

(1) Can be used with reduced baudrate.



TU508-ETH-XC

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MC502

#### Accessories for AC500-XC

For	Description	Туре	Order code	Price	Weight (1 pce)
				-	kg
AC500 CPUs COM1	Programming cable Sub-D / terminal block, length 5 m	TK502	1SAP180200R0101		0.400
AC500 CPUs COM2	Programming cable Sub-D / Sub-D, length 5 m	TK501	1SAP180200R0001		0.400
AC500 CPUs	Memory card (2 GB SD card)	MC502	1SAP180100R0001		0.020
	Lithium battery for data buffering	TA521	1SAP180300R0001		0.100
I/O modules	Pluggable marker holder for I/O modules, packing unit incl. 10 pcs	TA523	1SAP180500R0001		0.300
	White labels, packing unit incl. 10 pcs	TA525	1SAP180700R0001		0.100
Terminal base	Communication module, dummy housing	TA524	1SAP180600R0001		0.120
CPU terminal base	Accessories for mounting, packing unit includes 10 pcs	TA526	1SAP180800R0001		0.200
	5-pole power plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit includes 5 pcs	TA527	1SAP181100R0001		0.200
	9-pole COM1 plug for AC500. Spare part. Can be plugged to CPU terminal base TB5x1. Packing unit includes 5 pcs	TA528	1SAP181200R0001		0.200
Protective caps for TB, TU and CM	10 x Sub-D plastic caps 20 x RJ45 plastic caps 10 x M12 plastic caps	TA535	1SAP182300R0001		0.300

#### AC500-XC CPUs

PM573-ETH-XC	PM582-XC	PM583-ETH-XC	PM591-ETH-XC	PM592-ETH-XC
24 V DC	:	:		÷
	••••	•••••	•••••	•••••
0 1 1 0 4	0.050 4	0 110 4	0 150 4	
		· · · · · · · · · · · · · · · · · · ·		<b>.</b>
512 kB thereof 288 kB saved	416 kB thereof 288 kB saved	1024 kB thereof 288 kB saved	5632 kB thereof 1536 kB saved	
-	<u>.</u>	<u>i</u>		Yes, 4 GB Flash non removable
depending on SD-Ca	rd used: no SD-HC c	ard allowed, use MC502 a	CCESSORY	·····
	-			•••••
1				
0.06 µs	0.05 µs		0.002 µs	
0.09 µs	0.06 µs	-	0.004 µs	
0.7 us	···· <del>,</del> ································	•	···· <b>;</b> ·······················	•••••
	allowed)			
240	••••			
	••••	•••••	•••••	•••••
	••••		•••••	•••••
100				
depends on the used	standard Fieldbus (1	)		
battery				
•	••••	••••••	•••••	•••••
1				
•			•	
	••••	· · · · · · · · · · · · · · · · · · ·	· · · · <b>·</b> · · · · · · · · · · · · · ·	· · · · <b>·</b> · · · · · · · · · · · · · ·
•				
•	ninal block			
pluggable spring term	ninal block			
•	ninal block			
pluggable spring term	ninal block			
pluggable spring term	ninal block			
pluggable spring term				
pluggable spring term     Sub-D female 9 poles				
pluggable spring term				
pluggable spring term     Sub-D female 9 poles				
pluggable spring term     Sub-D female 9 poles				
pluggable spring term     Sub-D female 9 poles				
pluggable spring term     Sub-D female 9 poles				
pluggable spring term     Sub-D female 9 poles				
		RJ45		
		RJ45		
		RJ45		
	5  	RJ45		
	24 V DC 0.110 A 0.810 A 512 kB 512 kB thereof 288 kB saved - depending on SD-Ca 1 024 kB 0.06 μs 0.09 μs 0.7 μs up to max. 10 (S500 320 240 160 160 depends on the used battery ●	24 V DC         0.110 A       0.050 A         0.810 A       0.750 A         512 kB       512 kB         512 kB thereof       416 kB thereof         288 kB saved       288 kB saved         -       depending on SD-Card used: no SD-HC card         1 024 kB       -         0.06 μs       0.05 μs         0.09 μs       0.06 μs         0.7 μs       0.5 μs         up to max. 10 (S500 allowed)         320         240         160         160         depends on the used standard Fieldbus (1)         battery	24 V DC         0.110 A       0.050 A       0.110 A         0.810 A       0.750 A       0.810 A         512 kB       512 kB       1024 kB         512 kB thereof       216 kB thereof       288 kB saved         288 kB saved       288 kB saved       288 kB saved         -       -       4 096 kB         -       4 096 kB       -         0.06 μs       0.05 μs       0.06 μs         0.7 μs       0.5 μs       0.26 μs         0.7 μs       0.5 μs       0.105 μs         0.7 μs       0.5 μs       0.105 μs         0.7 μs       0.5 μs       0.105 μs         0.7 μs       0.5 μs       -         up to max. 10 (S500 allowed)       320       240         160       -       -         160       -       -         •       •       •	24 V DC         0.110 A         0.050 A         0.110 A         0.150 A           0.810 A         0.750 A         0.810 A         0.850 A         0.850 A           512 kB         512 kB         1024 kB         4096 kB           512 kB thereof         288 kB saved         288 kB saved         5632 kB thereof           288 kB saved         288 kB saved         288 kB saved         1536 kB saved           -         depending on SD-Card used: no SD-HC card allowed, use MC502 accessory         1           1 024 kB         -         4 096 kB         8 MB           0.06 μs         0.05 μs         0.002 μs         0.004 μs           0.7 μs         0.5 μs         0.004 μs         0.004 μs           160         160         160         160         160           160         160         160         160         160

(1) e.g. CS31 Fieldbus: up to 31 stations with up to 120 DIs / 120 DOs or up to 32 Als / 32 AOs per station.

### Digital S500-XC I/O modules

Digital 5500-XC I/O modules							
Гуре		DI524-XC	DC522-XC	DC523-XC	DC532-XC	DO524-XC	DX522-XC
lumber of channels per module							
Digital inputs		32	:		16	_	8
outputs	••••		_	_		32	8 relays
onfigurable channels DC	••••		16	24	16	-	· O Telays
configurable as inputs or outputs)			10	24	10		
Additional configuration of channels as							
ast counter		configuration	of max. 2 channe	els per module, c	perating modes	see table on page	je 112
Occupies max. 1 DO or DC when used a	as counter	-	•	•	•	-	
Connection via terminal unit		•	•	•	•	•	•
Digital inputs							
nput signal voltage		24 V DC				-	24 V DC
nput characteristic acc. to EN 61132-2	••••	Type 1	•••••	••••		-	Type 1
, signal	••••	-3+5 V DC	•••••	••••		-	-3+5 V DC
Indefined signal state	•••••	515 V DC	•••••	••••	••••	-	515 V DC
signal	•••••	1530 V DC	•••••	••••	••••	-	1530 V DC
nput time delay (0 -> 1 or 1 -> 0)	••••	8 ms typically	, configurable fro	m 0.1 up to 32 n	ns	-	8 ms typically, configurable fron
, , ( ,		, ,	,				0.1 up to 32 ms
weiter werden einen alle							•
nput current per channel	04 1/ DC	E ma A de unita III					
t input voltage	24 V DC	5 mA typically	!	····•	····•	-	5 mA typically
	5 V DC	> 1 mA				-	> 1 mA
	15 V DC		·····			-	> 5 mA
	30 V DC	< 8 mA				-	< 8 mA
ligital outputs							
ransistor outputs 24 V DC, 0.5 A		-	•	•	•	•	-
eadback of output	••••	-	•	•	•	-	-
elay outputs, supplied via process vol	age UP,	-	-	-	-	-	•
hangeover contacts	0						
Switching of load 24 V	•••••	_	•	•	•	•	•
230 V	••••	-	-	-	-	-	•
Output voltage at signal state 1	••••	-	process voltage	ge UP minus 0.8	V	····	-
		1					:
Dutput current		1					
lominal current per channel	•••••		500 mA at UP	= 24 V	····	····	
Aaximum (total current of all channels)			8 A				
Residual current at signal state 0			< 0.5 mA		····•	····•	
Demagnetization when switching off		-	by internal var	istors			
nductive loads							
Switching frequency							
or inductive load		-	0.5 Hz max.			0.5 Hz max.	2 Hz
or lamp load	••••	_	11 Hz max. at	max. 5 W	•••••		
hort-circuit / overload proofness	••••	_	•	•	•		by external fuse / circuit breake
siere encare, eveneda procinceo				-		-	6 A gL/gG per channel
Overload indication (I > 0.7 A)	•••••	†	after approx.		<u>:</u>	··· <del>·</del>	
Output current limiting	••••	†	····	matic reclosure		••••	
Proofness against reverse feeding of 24	V signals	_	•	•	•	•	-
·	v orginalo						
Contact rating							
or resistive load, max.		-					3 A at 230 V AC
		L			····•		2 A at 24 V DC
or inductive load, max.		-					1.5 A at 230 V AC
							1.5 A at 24 V DC
For lamp load		-					60 W at 230 V AC
							10 W at 24 V DC
ifetime (switching cycles)							
Aechanical lifetime		_					300 000
ifetime under load	•••••	t	•••••	••••		••••	300 000 at 24 V DC / 2 A
							200 000 at 120 V AC / 2 A
							100 000 at 230 V AC / 2 A
park auppropoian for industing AO Is	4	+	·····	·····	····•		·····
Spark suppression for inductive AC load	1	-					external measure depending on
	·····		•••••	••••		····	the switched load
		-					external measure: free-wheeling
Demagnetization for inductive DC load							
Demagnetization for inductive DC load							diode connected in parallel to the load

### Digital S500-XC I/O modules

Туре		DI524-XC	DC522-XC	DC523-XC	DC532-XC	DO524-XC	DX522-XC		
Process voltage UP									
Nominal voltage		24 V DC							
Maximum ripple		5 %		••••		••••	••••		
Current consumption on	UP		••••	••••	•••••	••••	••••		
Min. typ. (module alone)		0.150 A	0.100 A	0.150 A		0.050 A	0.050 A		
Max. typ. (min. + loads)		0.150 A	0.100 A + load	0.150 A + load		0.100 A + load	0.050 A + load		
Reverse polarity protection		•	•	•	•	•	•		
Fuse for process voltage	UP	10 A miniatur	e fuse	••••	••••	•••••	••••		
Connections for sensor voltage supply. Terminal 24 V and 0 V for each connection. Permitted load for each group of 4 or 8 connections: 0.5 A		-	8	4	-	-	-		
Short-circuit and overloa supply voltage		-	•	•	-	-	-		
Maximum cable length for	or connected process sign	als							
Cable	shielded	1000 m							
	unshielded	600 m							
Potential isolation									
Per module		•	•	•	•	•	•		
Between channels	input	-	-	-	-	-	-		
	output	-	-	-	-	-	•		
Voltage supply for the mo	odule	internally via	extension bus int	erface (I/O bus)	•••••	•			
Fieldbus connection Address setting		via AC500-X0 automatically	· · · · <b>·</b> · · · · · · · · · · · · · ·	munication interfa	ace modules (ex	cept DC505-FBP	Fieldbus Plug module)		

#### Analog S500-XC I/O modules

Туре		AX521-XC	AX522-XC	AI523-XC	AO523-XC	AI531-XC
Number of channels p	er module					
ndividual configuratio		4	8	16	-	8
	outputs	4	8	-	16	-
Signal resolution for c	· · · · · · · · · · · · · · · · · · ·			· ·	· ·	· ·
10+10 V		12 bits + sign				15 bits + sign
)10 V		12 bits + sign		•••••	•••••	15 bits
)20 mA, 420 mA		12 bits		•••••	•••••	15 bits
Temperature: 0.1 °C		•		•		•
		•	•	•	•	•
Monitoring configurati						
Plausibility monitoring		•	•	•	•	•
Wire break & short-cire	cuit monitoring	•	•	•	•	•
Analog Inputs Al						
Signal configuration p	er Al		module and with regard on or differential input)	d to the configuration:	Als / Measuring points (	depending on the use of
)10 V		4/4	8 / 8	16 / 16	_	8/8
10+10 V		4/4	8/8	16 / 16	_	8/8
10+10 v )20 mA	·····	4/4	8/8	16 / 16	_	8/8
20 mA		4/4	8/8	16 / 16	_	8/8
20 mA Pt100		+ / +	0/0	: 10 / 10		: 0 / 0
-50+400 °C (2-	-wire)	4/4	8/8	16 / 16	_	8/8
	wire), 2 channels	4/2	8/4	16/8		8/8
-50+400 °C (3-		+ / <u></u>	-		_	8/8
-50+70 °C (2-w		4 / 4	8/8	- 16 / 16	_	8/8
-50+70 °C (2-v		4/2	8/4	16 / 8		8/8
-50+70 °C (3-v		+ / <u></u>	-	-	_	8/8
-50+70 °C (4-v Pt1000	vii <i>oj</i>		-		-	0/0
-50+400 °C (2-	wiro)	4/4	8/8	16 / 16	1_	8/8
	-wire) -wire), 2 channels	4/2	8/8	16 / 8	-	8/8
			·····•	10 / 0	-	
-50+400 °C (4- Ni1000	-vviie)	-	-	-	-	8/8
	wire)	4.44	0/0	16/10	E	
-50+150 °C (2-		4/4	8/8	16 / 16	-	8/8
	-wire), 2 channels	4 / 2	8 / 4	16 / 8	-	8/8
-50+150 °C (4-		-	-	-	-	8/8
hermocouples of typ		-	-	-	-	•
	tial inputs, 2 channels	4/2	8 / 4	16 / 8	-	8/8
· · · · · · · · · · · · · · · · · · ·	rential inputs, 2 channels	4/2	8 / 4	16 / 8	-	8/8
Digital signals (digital		4/4	8/8	16 / 16	-	8/8
nput resistance per cl	hannel	voltage: > 100 kΩ current: approx. 3			-	voltage: > 100 kΩ current: approx. 330 9
Time constant of the i	nnut filter	voltage: 100 µs		•••••		voltage: 100 µs
ine constant of the l	nput inter	current: 100 µs			-	current: 100 µs
Conversion cycle		2 ms (for 8 Al + 8	AO)		_	1 ms (for 8 Al + 8 AO)
Conversion Cycle		1 s for Pt100/100				1 s for Pt100/1000, Ni1000
Overvoltage protection	n	•	•	•	-	•
		1	:	:	:	
Data when using the A		0 mo tunically	afigurable from 0 to the	0.90 mg		0 mo tunically
nput time dela	ау	o ms typically, col	nfigurable from 0.1 up t	0 32 ms	-	8 ms typically, configurable from 0.1 up to 32 ms
signal vo	oltage	24 V DC	•••••		-	24 V DC
Signal 0	<u></u>	-30+5 V	••••••		-	-30+5 V
	•	1330 V			-	1330 V
		1			:	
nalog outputs AO	nor AO	Mox must	On nor module	h report to the second	ration	
Possible configuration	1 per AU		Os per module and wit	n regara to the config		
-10+10 V		4	8 (1)	-	16 (1)	-
020 mA		4			8	-
420 mA	·····.	4		-	8	-
current o		0500 Ω		-	0500 Ω	-
	capability when used as output	Max. ±10 mA		-	Max. ±10 mA	-

(1) Half can be used on current (the other half remains available).

### Analog S500-XC I/O modules

Туре	AX521-XC	AX522-XC	AI523-XC	AO523-XC	AI531-XC
Process voltage UP					
Nominal voltage	24 V DC				
Maximum ripple	5 %	••••••	•••••	••••••	•••••
Current consumption on UP		••••••	••••••	•	•••••
Min. typ. (module alone)	0.150 A				0.130 A
Max. typ. (min. + loads)	0.150 A + load	0.150 A + load	-	0.150 A + load	
Reverse polarity protection	•	•	•	•	•
Max. line length of the analog lines, conductor cross section > 0.14 mm <sup>2</sup>	100 m				
Conversion error of analog values caused by non-linearity, calibration errors ex works and the resolution in the nominal range	0.5 % typically, 1 9	6 max.			
Potential isolation					
Per module	•	•	•	•	-
Fieldbus connection	Via AC500-XC CPL	J or all communication in	nterface modules (exc	ept DC505-FBP)	••••••
Voltage supply for the module	Internally via exten	sion bus interface (I/O b	us)	•••••••	-

#### CD522-XC encoder module

The CD522-XC module offers accuracy and dynamic flexibility for a customized solution. It has two independent encoder inputs onboard and is easily configured using the Automation Builder software for 10 different operation modes and for frequencies up to 300 kHz (depending on CPU cycle time). The CD522-XC module also integrates outputs for pulses and for PWM as well as normal inputs and outputs, depending on selected encoder mode.

Туре		CD522-XC
Functionality		
Digital inputs/outputs		24 V DC, dedicated inputs/outputs can be used for specific counting functions.
		All unused inputs/outputs can be used as input/output with standard specification.
	Input options	Catch/Touch operation, counter value stored in separate variable on external event (rising or falling)
	le e e e	Set to preset counter register with predefined value
End value output		Set to reset counter register
		Output set when predefined value is reached
	(RPI) input for relative encoder	
	initialization	
ligh-speed counter/encoder		
Integrated counters	Counter characteristics	2 counters (24 V DC, 5 V DC, differential and 1 Vpp sinus input)
integrated obtinters	Counter mode	one 32 bits or two 16 bits
	Relative position encoder	X1, X2, X3
	Absolute SSI encoder	•
	••••••••••••••••••••••••••••••	•
	Time frequency meter	1
	Frequency input	up to 300 kHz
WM/pulse outputs		
Output mode specification		2
	Push pull output	24 V DC, 100 mA max
	Current limitation	Thermal and overcurrent
PWM mode specification	Frequency	1100 kHz
	Value	0100 %
Pulse mode specification	Frequency	115 kHz
	Pulse emission	165535 pulses
	Number of pulses emitted	0100 %
	indicator	
Frequency mode         Frequency output           specification         Duty Cycle		100 kHz
		Set to 50 %
Number of channels per modu	le	
Digital	input	2
5	output	2
Configurable channels DC (co	nfigurable as inputs or outputs)	8
Additional configuration of cha		
Fast counter		Integrated 2 counter encoders
Connection via terminal unit		
Digital Inputs		
	cional valtare	24 V DC
nput	signal voltage	
	time delay	8 ms typically configurable from 0.1 up to 32 ms
	24 V DC	Typically 5 mA
	••••••••••••••••••••••••	Typically 5 mA > 1 mA
	5 V DC	
t input voltage	5 V DC	> 1 mA > 5 mA
ti input voltage	5 V DC 15 V DC 30 V DC	> 1 mA > 5 mA < 8 mA
ti input voltage Digital outputs Dutput voltage at signal state	5 V DC 15 V DC 30 V DC	> 1 mA > 5 mA
ti input voltage Digital outputs Dutput voltage at signal state	5 V DC 15 V DC 30 V DC	> 1 mA > 5 mA < 8 mA
ti input voltage Digital outputs Dutput voltage at signal state Dutput current	5 V DC 15 V DC 30 V DC	> 1 mA > 5 mA < 8 mA
it input voltage Digital outputs Dutput voltage at signal state Dutput current Iominal current per channel	5 V DC 15 V DC 30 V DC 1	> 1 mA > 5 mA < 8 mA UP - 0.8 V
ti input voltage Digital outputs Dutput voltage at signal state Dutput current Iominal current per channel Maximum (total current of all c	5 V DC 15 V DC 30 V DC 1 :hannels)	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V
it input voltage Digital outputs Dutput voltage at signal state Dutput current Iominal current per channel Maximum (total current of all c Residual current at signal state	5 V DC 15 V DC 30 V DC 1 : :hannels) e 0	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A
ti input voltage Digital outputs Dutput voltage at signal state Dutput current Iominal current per channel Maximum (total current of all c Residual current at signal state Demagnetization when switch	5 V DC 15 V DC 30 V DC 1 : :hannels) e 0	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A < 0.5 mA
ti input voltage Digital outputs Dutput voltage at signal state Dutput current Iominal current per channel Maximum (total current of all c Residual current at signal stat Demagnetization when switch Switching frequency	5 V DC 15 V DC 30 V DC 1 : :hannels) e 0	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A < 0.5 mA By internal varistors
At input voltage Digital outputs Dutput voltage at signal state Dutput current Nominal current per channel Maximum (total current of all c Residual current at signal state Demagnetization when switch Switching frequency For inductive load	5 V DC 15 V DC 30 V DC 1 : :hannels) e 0	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A < 0.5 mA By internal varistors Max. 0.5 Hz
nput current per channel At input voltage Digital outputs Dutput voltage at signal state Dutput current Vominal current per channel Maximum (total current of all c Residual current at signal state Demagnetization when switch Switching frequency For inductive load For lamp load	5 V DC 15 V DC 30 V DC 1 1 channels) e 0 ing off inductive loads	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A < 0.5 mA By internal varistors Max. 0.5 Hz Max. 11 Hz with max. 5 W
At input voltage Digital outputs Dutput voltage at signal state Dutput current Nominal current per channel Maximum (total current of all c Residual current at signal state Demagnetization when switch Switching frequency For inductive load For lamp load Short-circuit / Overload proofr	5 V DC 15 V DC 30 V DC 1 1 channels) e 0 ing off inductive loads	> 1 mA > 5 mA < 8 mA           UP - 0.8 V           0.5 A at UP = 24 V           8 A           < 0.5 mA
At input voltage Digital outputs Dutput voltage at signal state Dutput current Nominal current per channel Maximum (total current of all c Residual current at signal state Demagnetization when switch Switching frequency For inductive load For lamp load	5 V DC 15 V DC 30 V DC 1 1 channels) e 0 ing off inductive loads	> 1 mA > 5 mA < 8 mA UP - 0.8 V 0.5 A at UP = 24 V 8 A < 0.5 mA By internal varistors Max. 0.5 Hz Max. 11 Hz with max. 5 W

#### CD522-XC encoder module

Туре		CD522-XC			
Maximum cable length for conne	cted process signals				
Cable sh	ielded	1000 m			
ur	shielded	600 m			
Potential isolation					
Per module		•			
Technical data of the high-speed	inputs				
Number of channels per module		6			
Input type		24 V DC, 5 V DC / Differential / Sinus 1 Vpp			
Frequency		300 kHz			
Technical data of the fast outputs	ì				
Number of channels		2			
Indication of the output signals		Brightness of the LED depends on the number of pulses emitted (0 % to 100 %) (pulse output mode only)			
Output current					
Rated value, per channel		100 mA at UP = 24 V			
Maximum value (all channels togo	ether,	8 A			
configurable outputs included)					
Leakage current with signal 0		< 0.5 mA			
Rated protection fuse on UP		10 A fast			
De-magnetization when inductive	loads are switched off	with varistors integrated in the module			
Overload message (I > 0.1 x A)		Yes, after ca. 100 ms			
Output current limitation		Yes, automatic reactivation after short-circuit/overload			
Resistance to feedback against 2	4 V signals	Yes			
Process voltage UP					
Nominal voltage		24 V DC			
Maximum ripple		5 %			
Current consumption on UP					
Min. typ. (module alone)		0.070 A			
Max. typ. (min. + loads)		0.070 A + load			
Reverse polarity protection		•			
Fuse for process voltage UP		10 A miniature fuse			

#### Analog/digital mixed I/O expansion module

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bit + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits.

Туре	DA501-XC
Number of Channels per Module	
Digital inputs	16
outputs	-
Analog inputs	4
outputs	2
Digital configurable channels DC	8
(configurable as inputs or outputs)	0
Additional configuration of channels as	
Fast counter	Yes
Occupies max. 1 DO or DC when used as counter Connection via terminal unit TU 5xx	Configuration of max. 2 channels per module. Operating modes see table on page 112
Digital inputs	
Input signal voltage	24 V DC
characteristic acc. to EN 61132-2	Type 1
0 signal	-3+5 V DC
Undefined signal state	515 V DC
1 signal	1530 V DC
	-3+5 V DC
	-3+5 V DC 1530 V DC
$\frac{1}{1 \text{ signal}}$	
Input time delay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms
Digital outputs	
Transistor outputs 24 V DC, 0.5 A	•
Readback of output	•
Outputs, supplied via process voltage UP	•
Switching of 24 V load	•
Output voltage at signal state 1	Process voltage UP - 0.8 V
Output current	
Nominal current per channel	500 mA at UP = 24 V DC
Maximum (total current of all channels)	8 A
Residual current at signal state 0	<pre>&lt; 0.5 mA</pre>
Demagnetization when switching off inductive loads	By internal varistors
Analog inputs Al	Max. number per module and with regard to the configuration: Als / Measuring points
Signal configuration per Al	
010 V / -10 +10 V	4/4
020 mA / 420 mA	4/4
	4/2
RTD using 2/3 wire needs 1/2 channel(s)	4/2
010 V using differential inputs, needs 2 channels	
-10+10 V using differential inputs, needs 2 channels	4/2 4/4
Digital signals (digital input)	4/4
Data when using the AI as digital input	9 ma tunically configurable from 0.1 up to 00 ma
Input time delay signal voltage	8 ms typically, configurable from 0.1 up to 32 ms 24 V DC
Outputs, single configurable as	•
Possible configuration per AO	•
-10+10 V	•
020 mA / 420 mA	•
Output resistance (load) when used as current output	0500 Ω
Output loading capability when used as voltage output	±10 mA max.
Potential isolation	T
Per module	•
Process voltage UP	
Nominal voltage	24 V DC
Maximum ripple	5 %
Current consumption on UP	
Min. typ. (module alone)	0.070 A
Max. typ. (min. + loads)	0.070 A + load
Reverse polarity protection	•
	AO A second se
Fuse for process voltage UP	10 A miniature fuse

#### DC541-CM-XC interrupt I/O and fast counter module

In the operating mode counter, the channels can be configured as follows: Input, Output, 32-bit up/down counter (uses C0...C3) as a 32-bit counter without limit, 32-bit periodic counter as a 32-bit counter with a limit, limiter for a 32-bit counter (limit channel 0), 32-bit up counter (forward counter) with the frequencies 50 kHz, 5 kHz and 2.5 kHz, pulse-width modulation (PWM) with a resolution of 10 kHz, time and frequency measurement, frequency output.

Туре	DC541-CM-XC			
Number of channels per module				
Configurable channels DC	8			
(configurable as inputs or outputs)				
Additional configuration of channels as				
Fast counter	Yes			
Connection via CPU terminal base. Occupies one communication module slot	•			
Digital inputs				
Input signal voltage	24 V DC			
characteristic acc. to EN 61132-2	Type 1			
0 signal	-3+5 V DC			
Undefined signal state	515 V DC			
1 signal	530 V DC			
Input time delay (0 -> 1 or 1 -> 0)	20 µs			
	Clamp to clamp - 300 µs with interrupt task			
Input current per channel				
	5 mA typically			
5 V DC	> 1 mA			
	> 5 mA			
30 V DC	< 8 mA			
Digital outputs				
Transistor outputs 24 V DC, 0.5 A	•			
Readback of output	•			
Switching of 24 V load				
Output voltage at signal state 1	Process voltage UP minus 0.8 V			
Output current				
Nominal current per channel	500 mA at UP = 24 V			
Maximum (total current of all channels)	8 A			
Residual current at signal state 0	< 0.5 mA			
Demagnetization when switching off inductive loads	by internal varistors			
Potential isolation				
Per module	•			
Voltage supply for the module	Internally via backplane bus			

#### Interrupt I/O table

Configuration as		Configuration for channel no.					Max. no. of channels	Remarks and notes regarding possible alternative
		Chan.	n. Chan. 1	Chan. 2	-	Chan. 4-7	for this function	combinations of the remaining channels (a and b)
		0						
Mode 1: Interrupt fur	nctionality							
Interrupt	Digital input	1	1	1	1	4	8	Each channel can be configured individually as interrupt
	Digital output	1	1	1	1	4	8	input or output
Mode 2: Counting fu	nctionality							
Digital I/Os PWM (1)	Digital input	1	1	1	1	4	8	Usual input
	Digital output	1	1	1	1	4	8	Usual output
	PWM, resolution 10 kHz	1	1	1	1	4	8	Outputs and pulsed signal with and adjustable on-off ratio

(1) Counter and fast counter data available on technical documentation.

#### AC500-XC communication modules

- Up to 4 communications modules can be used on an AC500-XC CPU

- No external power supply required.

Туре	CM572-DP-XC		CM578-CN-XC	CM588-CN-XC	CM579-PNIO-XC	
Communication interfac	ces					
RJ45	-	• (x2)(1)	-	-	• (x2)(1)	
RS-232 / 485	-	-	-	-	-	
Terminal blocks	-	-	•	•	-	
Sub-D socket	•	-	-	-	-	
Protocols	PROFIBUS® DP master V0/V1	Ethernet (TCP/IP, UPD/IP, Modbus TCP)	CANopen <sup>®</sup> master	CANopen <sup>®</sup> slave	PROFINET® IO controlle	
CPU interface	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	8 kB Dual-port memory	
Transfer Rate	9.6 kbit/s to 12 Mbit/s	10/100 Mbit/s	10 kbit/s to 1 Mbit/s	10 kbit/s to 1 Mbit/s	10/100 Mbit/s	
Co-processor	Communication processor	Communication processor	Communication processor	Communication processor netX 100	Communication processor netX 100	
Additional features	Multi master functionality Max. Number of subscribers: - 126 (V0) - 32 (V1)	BOOTP DHCP	CAN 2.0A CAN 2.0B CANopen®	NMT slave PDO SDO server Heartbeat Nodeguard	RTC - Real-Time Cyclic protocol, Class 1 RTA - Real-Time Acyclic protocol DCP Discovery and Configuration Protocol CL-RPC - Connectionle Remote Procedure Call	

(1) 10/100 Mbit/s, full/half duplex with auto-sensing, 2-port switch integrated.

#### Communication interface modules

For all modules: max cable length for connected process signals is 1000 m for shielded cable and 600 m for unshielded ones. For all Input modules, the signal resolution for channel configuration is: -10...+10 V: 12 bits + sign; 0...10 V, 0...20 mA, 4...20 mA: 12 bits. Temperature: 0.1 °C.

Туре		DC551-CS31-XC	CI590-CS31-HA-XC (1)	CI592-CS31-XC				
Communication Int	terface							
Protocol		Proprietary CS31 bus protoco	l on RS485 interface					
ID configuration		Per rotary switches on front face from 00d to 99d						
Field bus connection	on on TUs	CS31 field bus, via terminal / redundant for Cl590-CS31-HA-XC on TU552-CS31-XC						
Number of Channe		1 -						
Digital	inputs	8	-	8				
•••••••••••••••••••••••••••••••••••••••	outputs		-	-				
Analog	inputs		-	4				
	outputs		<u> </u>	2				
Digital configurable		16	16	8				
(configurable as in	puts or outputs)							
Additional configur	ration of channels as							
Fast counter		Configuration of max. 2 chann	els per module					
Occupies max. 1 D	O or DC when used as counter	•	•	•				
		1		•				
Connection								
Via terminal base T	USXX	•	•	•				
Local I/O extension	ı							
Max. number of ex	tension modules	max. 7 x S500 extension mod	ules, up to 31 stations with up to 120 DIs/	120 DOs or up to				
		32 Als/ 32AOs per station		·				
Digital inputs		,						
<u> </u>		24 V DC						
	nal voltage aracteristic acc. to EN 61132-2	Type 1						
•••••••••••••••••••••••••••••••••••••••		-3+5 V DC	·····					
0 signal Undefined signal s	tata	515 V DC		••••••				
	lale	1530 V DC						
1 signal Residual ripple, rar	and for O signal							
Residual ripple, rar		-3+5 V DC						
	1 signal	1530 V DC						
Input time delay (0	-> 1 or 1 -> 0)	8 ms typically, configurable fro	m 0.1 up to 32 ms					
Digital outputs								
Transistor outputs	24 V DC, 0.5 A	•						
Readback of outpu	ıt	•	•					
Outputs, supplied	via process voltage UP	•						
Switching of 24 V l	oad	•		· · · · · · · · · · · · · · · · · · ·				
Output voltage at s	signal state 1	Process voltage UP - 0.8 V						
Output current								
Nominal current pe	or channel	500 mA at UP = 24 V DC						
		8 A	8 A	1 0				
Residual current at	rrent of all channels)	< 0.5 mA	OA	4 A				
	<u>v</u>	1						
Demagnetization W	hen switching off inductive loads	by internal variators						
Analog inputs Al		Max. number per module and	with regard to the configuration: Als / Mea	asuring points				
Signal configuratio	n per Al	-		•				
010 V / -10+10		[-	·····	4 / 4				
020 mA / 420 r	nA	-		4 / 4				
RTD using 2/3 wire	needs 1/2 channel(s)	-		4 / 2				
	rential inputs, needs 2 channels	-	······	4 / 2				
	lifferential inputs, needs	-		4 / 2				
2 channels	•							
Digital signals (digi	tal input)	-	······	4 / 4				
	ne Al as digital input	1		0 me husiaelly souther that for the				
Input time	e delay	-		8 ms typically, configurable from 0.1 up to 32 ms				
		<u> </u>		······				
	nal voltage	-		24 V DC				

(1) Dedicated to High Availability. Not compatible with S500-eCo I/O modules.

#### Communication interface modules

Туре		DC551-CS31-XC	CI590-CS31-HA-XC (1)	CI592-CS31-XC		
Outputs, sir	ngle configurable as					
Possible co	onfiguration per AO	-		•		
-10+10 V		-		•		
020 mA /	420 mA	-	••••••	•		
Output	resistance (load) when used as current output	-		0500 Ω		
	loading capability when used as voltage output	-		±10 mA max.		
Potential iso	olation					
Per module	1	•	•	•		
Between fieldbus interface against the rest of the module		•	•	•		
Voltage supply for the module		By external 24 V DC voltage via terminal UP				
Process vol	Itage UP					
Nominal vol	Itage	24 V DC				
Maximum ri	ipple	5 %	•••••••	•••••••••••••••••••••••••••••••••••••••		
Current con	sumption on UP		••••••			
Min. typ	o. (module alone)	0.100 A	0.100 A	0.070 A		
Max. typ. (min. + loads)		0.100 A + load	0.100 A + load	0.070 A + load		
Reverse pol	larity protection	•				
Fuse for pro	ocess voltage UP	10 A miniature fuse				
Approvals		See detailed page 166 or www.abb.com/plc				

(1) Dedicated to High Availability.

Tupe	JS <sup>®</sup> -DP modules	CI541 DB XC				
Туре		CI541-DP-XC	CI542-DP-XC			
Communicat	tion Interface					
Protocol		PROFIBUS® DP (DP-V0 and DP-V1 slave)				
ID configurat	tion nnection on terminal units	Per rotary switches on front face from 00h to FFh Sub-D 9 poles on TU510-XC or TU518-XC with limite	d baud rata			
	hannels per Module					
Digital	inputs	8	8			
A	outputs	8	8			
Analog	inputs	4	-			
Digital config	outputs gurable channels DC	<u> </u>	8			
	e as inputs or outputs)		Ť			
Additional co	onfiguration of channels as		· ·			
	(onboard I/O)	Configuration of max. 2 DI channels per module				
	ax 1 DO or DC when used as counter	Ormgulation of max. 2 Di ondrinois por modulo	•			
Connection Local I/O ext	ionsion	•				
	r of extension modules	max. 10 x S500 extension modules, fast counter from	digital IO modules can be also used			
Via terminal I		•				
		1	:			
Digital inputs		24 \/ DC				
Input	signal voltage characteristic acc. to EN 61132-2	24 V DC Type 1				
0 signal		-3+5 V DC				
Undefined si	anal state	515 V DC				
1 signal	gilai stats	1530 V DC				
	ole, range for 0 signal	-3+5 V DC				
	1 signal	1530 V DC				
Input time de	elay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms				
Digital outpu	ts					
	Itputs 24 V DC, 0.5 A	•				
Readback of	outout	-	● (on DC outputs)			
	oplied via process voltage UP	•				
Switching of		•				
Output voltag	ge at signal state 1	Process voltage UP - 0.8 V				
Output curre	nt					
Nominal curr	rent per channel	500 mA at UP = 24 V DC				
	otal current of all channels)	8 A				
	rent at signal state 0	< 0.5 mA				
Demagnetiza	ation when switching off inductive loads	s By internal varistors				
Analog Input	is Al	Max. number per module and with regard to the confi	guration: Als / Measuring points			
	juration per Al	4	_			
010 V / -10		4/4	-			
020 mA / 4		4/4	-			
	/3 wire needs 1/2 channel(s)	4/2	<u>-</u>			
	g differential inputs, needs 2 channels Ising differential inputs, needs	4/2 4/2				
2 channels	ionig amerentiai inputo, needo					
	ls (digital input)	4/4	_			
	sing the AI as digital input	8 ma tunically configurable from 0.1 up to 22 ma	: :			
Input	time delay signal voltage	8 ms typically, configurable from 0.1 up to 32 ms 24 V DC				
			<u>i</u>			
	gle configurable as					
	figuration per AO	•	-			
		•	-			
-10+10V	00 1					
-10+10V 020 mA / 4	·····•	•	-			
	resistance (load) when used as	● 0500 Ω	-			
-10+10V 020 mA / 4	·····•	-	-			

#### PROFIBUS®-DP modules

Туре		CI541-DP-XC	CI542-DP-XC		
Potential isolation					
Per module		•	•		
Between fieldbus interface module	e against the rest of the	•	•		
Between the channels	input	-	-		
	output	-	-		
Voltage supply for the mod	dule	By external 24 V DC voltage via terminal UP			
Process voltage UP					
Nominal voltage		24 V DC			
Maximum ripple	•••••	5 %			
Current consumption on U	P				
Min. typ. (module alon	e)	0.260 A			
Max. typ. (min. + loads)		0.260 A + load			
Reverse polarity protection	n	•			
Fuse for process voltage L	e for process voltage UP 10 A miniature fuse				
Approvals	See detailed page 166 or www.abb.com/plc				
Туре		CI581-CN-XC	CI582-CN-XC		
--------------------------------	--	---	---		
	- intenfere				
Communication Protocol	on interface	CANopen <sup>®</sup> slave, DS401 profile selectable using rota	ry switchos		
ID configuration	n		bde from 00h to 7Fh and 80h to FFh for CANopen <sup>®</sup> DS401		
ID comgutatio		profile			
Field bus con	nection on terminal units	Terminal blocks on TU518-XC			
Number of ch	annels per module				
Digital	inputs	8	8		
0	outputs	8	8		
Analog	inputs	4	-		
	outputs	2			
	urable channels DC	-	8		
	as inputs or outputs)				
	nfiguration of channels as				
Fast counter (		Configuration of max. 2 DI channels per module			
Occupies max	x. 1 DO or DC when used as counter	•	•		
Connection					
Local I/O exte		•			
	of extension modules	max. 10 x S500-XC extension modules	-		
Via terminal u	nit IU5xx	•	•		
Digital inputs					
Input	signal voltage	24 V DC			
	characteristic acc. to EN 61132-2	Туре 1			
0 signal		-3+5 V DC			
Undefined sig	nal state	515 V DC			
1 signal Residual rippl	o renero for	1530 V DC			
nesiduai rippi	e, range for 0 signal 1 signal	-3+5 V DC 1530 V DC			
Input time del	ay (0 -> 1 or 1 -> 0)	8 ms typically, configurable from 0.1 up to 32 ms			
Digital output					
	puts 24 V DC, 0.5 A	•	• (on DC outputo)		
Readback of o	butput blied via process voltage UP	•	• (on DC outputs)		
Switching of 2					
	e at signal state 1	Process voltage UP - 0.8 V			
Output curren	t nt per channel	500 mA at UP = 24 V DC			
	al current of all channels)	8 A			
	ent at signal state 0	< 0.5 mA			
	ion when switching off inductive loads				
Analog Inputs		Max. number per module and with regard to the con	ilguration: Als / Measuring points		
Signal configu 010 V / -10.		4 4 4			
010 v / -10. 020 mA / 4.		4/4			
	wire needs 1/2 channel(s)	4/4			
	differential inputs, needs 2 channels	4/2	-		
	ing differential inputs, needs	4/2	-		
2 channels	G				
Digital signals	(digital input)	4/4			
Data when us	ing the AI as digital input				
Input	time delay	8 ms typically, configurable from 0.1 up to 32 ms	-		
	signal voltage	24 V DC	-		
Outpute eind	e configurable as	,	· ·		
	iguration per AO		_		
-10+10 V			-		
020 mA / 4.	20 mA	•	-		
Output	resistance (load) when used as	0500 Ω			
	current output				
	loading capability when used as	±10 mA max.	-		
	voltage output				
	voltage output		ABB Industrial Automation & Motion		

### CANopen<sup>®</sup> modules

Туре		CI581-CN-XC	CI582-CN-XC		
Potential isolation					
Per module		•	•		
Between fieldbus interface against the rest of the module		•	•		
Between the channels	input	-	-		
	output	-	-		
Voltage supply for the module		By external 24 V DC voltage via terminal UP			
Process voltage UP					
Nominal voltage		24 V DC			
Maximum ripple		5 %			
Current consumption on U	P				
Min. typ. (module alon	e)	0.260 A			
Max. typ. (min. + load		0.260 A + load			
Reverse polarity protection		•			
Fuse for process voltage L	JP	10 A miniature fuse			
Approvals		See detailed page 166 or www.abb.com/plc			

### **PROFINET® IO RT device modules**

Туре	CI501-PNIO-XC	CI502-PNIO-XC	CI504-PNIO-XC	CI506-PNIO-XC				
Communication interface								
Ethernet Interface								
Main protocol	PROFINET® IO BT dev	PROFINET <sup>®</sup> IO RT device						
ID Device configuration	·····	e front side, from 00h to FFh	······	•••••••••••••••••••••••••••••••••••••••				
Ethernet connection on terminal uni			ain on TU508-ETH-XC or TU520-E	TH-XC				
Gateway Interface								
Gateway to	-	-	3 x RS232/RS422/RS485 ASCII serial interfaces	CAN / CANopen <sup>®</sup> Master 2 x RS232/RS422/RS485 ASCII serial interfaces				
Fieldbus Protocol used	-	-	-	CAN 2A/2B Master - CANopen® Master (1)				
CAN physical interface	-	-	-	1 x 10 poles pluggable spring connector				
Baudrate	-	-	-	Baudrate up to 1 MBit/s, Support for up to 126 CANopen <sup>®</sup> Slaves				
Serial interface	-	-	3 x RS232 / RS422 or	2 x RS232 / RS422 or				
			RS485	RS485				
Protocol used	-	-	ASCII	ASCII				
Baudrate	-		Configurable from 300 bit/s					
Fieldbus or serial connection on TU	s –	-	3 x pluggable terminal block	s with spring on TU520-E				
Number of channels per module			•					
Digital inputs	8	8						
outputs	8	8	_	_				
Analog inputs	4	0						
outputs	2	-	-	-				
Digital configurable channels DC		8	-	-				
configurable as inputs or outputs)	_	0	_	-				
Additional configuration of channels as								
Connection via terminal unit TU5xx		-	•	•				
Fast counter (onboard I/O)		2 DI channels per module	-	-				
Occupies max. 1 DO or DC when used a	s counter		-	-				
Connection								
Local I/O extension				•				
Max. number of extension modules	-	tension modules. Fast counter						
viax. number of extension modules		from digital IO modules can be also used.		up to 10 modules				
Digital inputs								
nput signal voltage	24 V DC			-				
characteristic acc. to E			-	-				
) signal	-3+5 V DC		-	-				
Jndefined signal state	515 V DC		-	-				
l signal	1530 V DC		-	-				
Residual ripple, range for 0 signal	-3+5 V DC		-	-				
1 signal	1530 V DC		-	-				
nput time delay (0 -> 1 or 1 -> 0)	8 ms typically, configu	rable from 0.1 up to 32 ms	-	-				
Digital outputs				_				
Transistor outputs 24 V DC, 0.5 A	•			-				
Readback of output	-	<ul> <li>(on DC outputs)</li> </ul>	-	-				
Outputs, supplied via process voltage U	P		-	-				
Switching of 24 V load	•		-	-				
Output voltage at signal state 1	Process voltage UP - (	D.8 V		-				
Output current	· · ·		2					
Nominal current per channel	500 mA at UP = 24 V I	DC		_				
Maximum (total current of all channels)	8 A		_	_				
Residual current at signal state 0		·····		-				
nesioual current at signal state 0	< 0.5 mA	·····	-	; —				
Demagnetization when switching off ind	uctive loads By internal varistors							

(1) Not simultaneously.

Туре	CI501-PNIO-XC	CI502-PNIO-XC	CI504-PNIO-XC	CI506-PNIO-XC
Analog inputs Al	Max. number per module ar	nd with regard to the conf	iguration: Als / Measuring poi	nts
Signal configuration per Al	4	-	-	-
010 V / -10 +10 V	4 / 4	-	-	-
020 mA / 420 mA	4 / 4	-	-	-
RTD using 2/3 wire needs 1/2 channel(s)	4 / 2	-	-	-
10 V using differential inputs, needs 2 channels	4/2	-	-	-
10+10 V using differential inputs, needs 2 channels	4/2	_	-	-
Digital signals (digital input)	4 / 4	-	-	-
Data when using the AI as digital input			·	
nput time delay	8 ms typically, configurable from 0.1 up to 32 ms	-	-	-
signal voltage	24 V DC	-	-	-
Outputs, single configurable as				
Possible configuration per AO	•	-	-	-
10+10 V	•	-	-	-
)20 mA / 420 mA	•	-	-	-
Dutput resistance (load) when used as current output	0500 Ω	-	-	-
loading capability when used as voltage output	±10 mA max.	-	-	-
Potential isolation				
Per module	•	•	•	•
Between Ethernet interface against the rest of the module	•	•	•	•
Voltage supply for the module	By external 24 V DC voltage	e via terminal UP		······
Process voltage UP				
Nominal voltage	24 V DC			
Maximum ripple	5 %			••••••
Current consumption on UP		•••••		••••••
min. typ. (module alone)	0.260 A		0.150 A	
max. typ. (min. + loads)	0.260 A + load		0.150 A + load	••••••
Reverse polarity protection	•	•		
Fuse for process voltage UP	10 A miniature fuse			
Approvals	See detailed page 166 or w			

### CS31 functionality

	AC500-XC CPU with integrated CS31 interface	S500 I/O with communication interface		
		DC551-CS31-XC		
		CI590-CS31-HA-XC		
		CI592-CS31-XC		
Master	Yes, at COM1	-		
Slave	No	Yes / Redundant for CI590-CS31-HA-XC		
Protocols supported	ABB CS31 protocol			
Diagnosis				
Error indication	On LCD display of the CPU	Via module LEDs		
Online diagnosis	Yes			
Error code	Errors are recorded in the diagnosis system of the CPU			
Associated function blocks	Yes			
Physical layer	RS485 / 2 x RS485 for Cl590-CS31-HA-XC for redundance	CY		
Connection	Plug at COM1	Screw-type or spring-type terminals		
Baud rate	187.5 kbit/s			
Distance	AC500-XC: up to 500 m; up to 2000 m using a repeater			
Max. number of modules on fieldbus	31 modules max. Please note: The CS31 bus interface occupies one or two module addresses (if counters are configured onboard or if th module is a mixed digital analog module). Depending on the configuration, or if the module contains also mixed digital analog I/O, connected extension modules can occupy further module addresses.			
Configuration	Using configuration tool (included in Automation Builder se	oftware suite)		
Station address configuration	No	Using rotary switches (99 max.)		

#### Digital I/O modules, "Fast Counter" operating modes. Not applicable for DC541-XC (1)

Operating mode, configured in the user program of the AC500-XC		Occupied inputs DI or DC	Occupied outputs DO or DC	Maximum counting frequency	
				kHz	
0	No counter	0	0	-	
1	One count-up counter with "end value reached" indication	1	1	50	
2	One count-up counter with "enable" input and "end value reached" indication	2	1	50	
3	Two up/down counters	2	0	50	
4	Two up/down counters with 1 counting input inverted	2	0	50	
5	One up/down counter with "dynamic set" input	2	0	50	
6	One up/down counter with "dynamic set" input	2	0	50	
7	One up/down counter with directional discriminator For synchro transmitters using two counting pulses with an offset of 90° (track A and B)	2	0	50	
8	-	0	0	-	
9	One up/down counter with directional discriminator and double evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	30	
10	One up/down counter with directional discriminator and fourfold evaluation For synchro transmitters using two counting pulses with an offset of 90° towards each other (track A and B)	2	0	15	

(1) See technical documentation for details.

### AC500-XC System data

#### **Environmental conditions**

Process and supply voltages		
24 V DC	Process and supply voltage	24 V DC (-25 %, +30 % inclusive ripple)
	Absolute limits	18 31.2 V inclusive ripple
	Ripple	< 10 %
	Protection against reverse polarity	Ves
Allowed interruptions of power supply	DC supply	Interruption < 10 ms, time between 2 interruptions > 1s, PS2
	process or supply voltage (< -35 V DC a	and > + 35 V DC) could lead to unrecoverable damage of the system. For the supply of the
		be used. The creepage distances and clearances meet the requirements of the overvoltage
Temperature		
Operating	-40 +70 °C	
	-4030 °C	Proper start-up of system; technical data not guaranteed
	-40 0 °C	Due to the LCD technology, the display might not be readable
	-40 +40 °C	vertical mounting of modules possible, output load limited to 50% per group
	+60 +70 °C	with the following deratings:
		System is limited to max. 2 Communication Modules per Terminal Base
		Applications certified for cULus up to 60 °C
		Digital inputs: maximum number of simultaneously switched on input channels limited to 75 %
		per group (o.g. 8 chappels $\rightarrow$ 6 chappels)
		Digital outputs: output current maximum value (all channels together) limited to 75 % per group
		(e.g. 8 A => 6 A)
		Analog outputs only if configured as voltage output: maximum total output current per group is
		limited to 75 % (e.g. 40 mA $=>$ 30 mA)
		Analog outputs only if configured as current output: maximum number of simultaneously used
		output channels limited to 75 % per group (e.g. 4 channels => 3 channels)
Storage / Transport	-40 +85 °C	
Humidity		
Operating / Storage		100 % r. H. with condensation
Air pressure		
Operating		-1000 m 4000 m (1080 hPa 620 hPa) >2000 m (<795 hPa): max. operating temperature must be reduced by 10 K (e.g. 70 °C to 60°C
Immunity to corrosive gases		
Operating		Yes, according to: ISA S71.04.1985 Harsh group A, G3/GX
		IEC 60721-3-3 3C2 / 3C3
Immunity to salt mist		
Operating		Yes, horizontal mounting only, according to:
		IEC 60068-2-52 severity level 1
Note: Unused communication socke	ets (RJ45, Sub-D, FBP) must be covered	with TA535 Protective Caps for XC devices in case of salt mist environments.
Electromagnetic Compatibility		
Radiated emission (radio disturba	inces)	Yes, according to: CISPR 16-2-3
Conducted emission (radio distur	bances)	Yes, according to: CISPR 16-2-1, CISPR 16-1-2
Electrostatic discharge (ESD)		Yes, according to: IEC 61000-4-2, zone B, criterion B
Fast transient interference voltage	es (burst)	Yes, according to: IEC 61000-4-4, zone B, criterion B
High energy transient interference	e voltages (surge)	Yes, according to: IEC 61000-4-5, zone B, criterion B
Influence of radiated disturbances	S	Yes, according to: IEC 61000-4-3, zone B, criterion A
Influence of line-conducted interfe	erences	Yes, according to: IEC 61000-4-6, zone B, criterion A
Influence of power frequency mad	matia fielda	Yes, according to:

Note: In order to prevent malfunctions, it is recommended that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges. Unused sockets for Communication Modules on Terminal Bases must be covered with TA524 Dummy Communication Module. I/O-Bus connectors must not be touched during operation.

# AC500-XC System data

Wiring method		Spring terminals			
Degree of protection		IP20			
Vibration resistance	·····	Yes, according to: IEC 61131-2, IEC 60068-2-6, IEC 60068-2-64			
Shock resistance	•	Yes, according to: IEC 60068-2-27			
Assembly position		Horizontal			
		Vertical (no application in salt mist environment)			
Assembly on DIN rail	DIN rail type	According to IEC 60715: 35 mm, depth 7.5 mm or 15 mm			
Assembly with screws Screw diameter		4 mm			
	Fastening torque	1.2 Nm			
Environmental Tests					
Storage	•	IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h			
, to tugo		IEC 60068-2-2 Test Bb: dry heat withstand test +85 °C / 16 h			
Humidity		IEC 60068-2-30 Test Db: Cyclic (12 h / 12 h) Damp-Heat Test 55 °C, 93 % r. H. / 25 °C, 95 % r. H. 6 cycles			
		IEC 60068-2-78, Stationary Humidity Test: 40 °C, 93 % r. H., 240 h			
nsulation Test		IFC 61131-2			
libration resistance		IEC 61131-2 / IEC 60068-26: 5 Hz 500 Hz, 2 g (with SD Memory Card inserted)			
		IEC 60068-2-64: 5 Hz 500 Hz, 4 g rms			
Shock resistance		IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal			
EMC Immunity					
Electrostatic discharge (ESI	))	Electrostatic voltage in case of air discharge: 8 kV			
	-	Electrostatic voltage in case of contact discharge: 6 kV			
ast transient interference v	oltages (burst)	Supply voltage units (DC): 4 kV			
		Digital inputs/outputs (24 V DC): 2 kV			
		Analog inputs/outputs: 2 kV			
		Communication lines shielded: 2 kV			
		I/O supply (DC-out): 2 kV			
ligh energy transient interfe	erence voltages (surge) (1)	Supply voltage units (DC): 1 kV CM / 0.5 kV DM			
		Digital inputs/outputs (24 V DC): 1 kV CM / 0.5 kV DM			
		Analog inputs/outputs: 1 kV CM / 0.5 kV DM			
		Communication lines shielded: 1 kV CM			
		I/O supply (DC-out): 0,5 kV CM / 0.5 kV DM			
nfluence of radiated disturb	oances	Test field strength: 10 V/m			
nfluence of line-conducted	interferences	Test voltage: 10 V			
Power frequency		30 A/m 50 Hz			
Magnetic fields		30 A/m 60 Hz			

(1) CM = Common Mode, DM = Differential Mode.





# AC500-S Functional Safety PLC

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### AC500-S Key features

Easy integration: Simple expansion of a non-safety ABB PLC with safety functions. One common diagnostic system for safety and non-safety CPUs. eXtreme Conditions (-XC) version is available.

PROFINET®/PROFIsafe® interface for decentralized safety I/Os, safe position and speed monitoring as well as triggering of safety drive functions. PWR DIAGO RUN HERR D E-ERR D DIAGO RUN HERR DIAG

Easy implementation of flexible configuration concept (one safety program for various machine types). Safety CPU can be configured to work even if non-safety CPU is in STOP mode.

Automation Builder productivity suite providing integrated support of ST, Ladder (LD) and Function Block Diagram (FBD) programming. Trigonometric functions are supported for easy implementation of complex kinematic tasks.

# AC500-S Functional Safety PLC from ABB



SM560-S



DI581-S



TU582-S

### Safety CPU

Description	User program memory	Туре	Order code	Weight
				(1 pce)
	MB			kg
Safety CPU module	1	SM560-S	1SAP280000R0001	0.100

### S500 Safety I/O

Description	Input signal		Output signal	Туре	Order code	Weight (1 pce)
	SIL2	SIL3	SIL3			kg
Safety digital input module	16	8	-	DI581-S	1SAP284000R0001	0.130
Safety digital input / output module	8	4	8	DX581-S	1SAP284100R0001	0.130
Safety analog input module	4	2	-	Al581-S	1SAP282000R0001	0.130

escription	Туре	Order code	Weight
			(1 pce)
			kg
Spring terminal unit for safety I/O modules	TU582-S	1SAP281200R0001	0.200

#### Software

Description	Туре	Order code	Weight
			(1 pce)
			kg
Licence enabling package for AC500-S Safety PLC programming	PS501-S	1SAP198000R0001	0.100

# AC500-S-XC Functional Safety and extreme conditions PLC from ABB



SM560-S-XC



DI581-S-XC



Safety XC CPU

Description	User program memory	Туре	Order code	Weight
				(1 pce)
	MB			kg
Safety CPU module	1	SM560-S-XC	1SAP380000R0001	0.100

### S500-XC Safety I/O

Description	Input signa	l	Output signal	Туре	Order code	Weight (1 pce)
	SIL2	SIL3	SIL3			kg
Safety digital input module	16	8	-	DI581-S-XC	1SAP484000R0001	0.130
Safety digital input / output module	8	4	8	DX581-S-XC	1SAP484100R0001	0.130
Safety analog input module	4	2	-	AI581-S-XC	1SAP482000R0001	0.130

S500-XC	Safety	terminal	unit

Description	Туре	Order code	Weight
			(1 pce)
			kg
Spring terminal unit for safety I/O modules	TU582-S-XC	1SAP481200R0001	0.200



TU582-S-XC

# AC500-S and AC500-S-XC Technical data

Safety	V CP	Us

21		SM560-S / SM560-S-XC			
Performance level		PL e (ISO 13849)			
Safety	integrity level	SIL3 (IEC 61508: 2010, IEC 62061)			
	protocol	PROFIsafe® V2 via PROFINET®			
Program memory flash EPROM and RAM		1 MB			
Integrated data memory		1 MB thereof 120 KB saved			
Cycle time for 1 inst	ruction				
Binary		0.05 µs			
Word	•	0.06 µs			
Floating point		0.5 µs			
Max. number of cen	tralized inputs/outputs				
Max. nb. of safety e	xtension modules on I/O bus	up to max. 10			
Digital	inputs	160 (SIL2) / 80 (SIL3)			
	outputs	80 (SIL3)			
Analog	inputs	40 (SIL2) / 20 (SIL3)			
Max. number of dec	entralized inputs/outputs	On PROFINET®: up to 128 stations with up to 10 safety extension modules			
Program execution					
Cyclical		•			
User program prote	ction by password	•			
Interfaces					
Ethernet		Via AC500 CPU or PROFINET® coupler			
COM		Via AC500 CPU			
Programming		Via AC500 CPU			
Approvals		CE, cUL, UL, C-Tick			

# AC500-S and AC500-S-XC Technical data

#### S500 and S500-XC Safety I/O

Туре	DI581-S / DI581-S-XC	DX581-S / DX581-S-XC	AI581-S / AI581-S-XC
Performance Level	PL e (ISO 13849)	· · ·	· ·
Safety Integrity Level	SIL3		
Safety protocol	PROFIsafe® V2 via PROFINET® (I	EC 61508: 2010, IEC 62061)	
Digital inputs			
Number of channels per module	16 (SIL2) / 8 (SIL3)	8 (SIL2) /4 (SIL3)	-
nput signal voltage	24 V DC	24 V DC	-
Frequency range	65 Hz	65 Hz	-
nput characteristic acc. to EN61131-2	Type 1	Type 1	-
) signal	-3+5 V DC	-3+5 V DC	-
Undefined signal state	515 V DC	515 V DC	-
1 signal	1530 V DC	1530 V DC	-
Input time delay (0 -> 1 or 1 -> 0)	Input filter configurable	Input filter configurable	-
	from 1, 2, 5500 ms	from 1, 2, 5500 ms	
Test pulse outputs	8	4	-
Input current per channel			
At input voltage	24 V DC / 7 mA typically	24 V DC / 7 mA typically	-
	5 V DC / < 1 mA	5 V DC / < 1 mA	-
	15 V DC / > 4 mA	15 V DC / > 4 mA	-
	30 V DC / < 8 mA	30 V DC / < 8 mA	-
Digital outputs		·	
Number of channels per module	-	8 (SIL3)	-
Transistor outputs 24 V DC, 0.5 A	-	•	-
Switching of 24 V load	-	•	-
Output current		· · · ·	
Nominal current per channel	-	500 mA at UP = 24 V	-
Maximum (total current of all channels)	-	4 Amp. / 500 mA / channel	-
Residual current at signal state 0	-	< 0.5 mA	-
Demagnetization when switching off	-	By internal suppressor diodes	-
inductive loads			
Switching frequency			
Short-circuit / overload proofness	-	•	-
For inductive load	-	On request	-
For lamp load	-	On request	-
Proofness against reverse feeding of 24 V signals	-	•	-

# AC500-S and AC500-S-XC Technical data

Туре	DI581-S / DI581-S-XC	DX581-S / DX581-S-XC	AI581-S / AI581-S-XC
Analog inputs			
Number of channels per module	-	-	4 (SIL2) / 2 (SIL3)
Input resistance per channel	-	-	125 Ohm
Time constant of the input filter	-	-	10 ms
Conversion cycle	-	-	0.33 ms
Overvoltage protection	-	-	-
Signal resolution for channel configuration	·		·
020 mA, 420 mA	-	-	14 bits
Process voltage UP			*
Nominal voltage	24 V DC		
Maximum ripple	5 %		
Reverse polarity protection	•		
Fuse for process voltage UP	10 A miniature fuse		
Connections for sensor voltage supply	•		
Terminal 24 V and 0 V			
Conversion error of analog values caused by	-	-	±1.5 %
non-linearity, calibration errors ex and			
the resolution in the nominal range			
Maximum cable length for connected process	signals		
Shielded cable	1000 m	1000 m	-
Unshielded cable	600 m	600 m	-
Max. line length of the analog lines,	-	-	100 m
conductor cross section > 0.14 mm <sup>2</sup>			
Potential isolation			
Per module	•		
Fieldbus connection	Via AC500 CPU or PROFINET® c		
Voltage supply for the module	Internally via extension bus interf	ace (I/O bus)	

# AC500-S System data

### **Operating and ambient conditions**

Voltages according to EN 61131-2				
24 V DC	Process and supply voltage	24 V DC (-15 %, +20 % without ripple)		
	Absolute limits	19.230 V inclusive ripple		
	Ripple	< 5 %		
	Protection against reverse polarity	Yes		
Allowed interruptions of power supply acc. to EN 61131-2	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s		
		upply voltages could lead to unrecoverable damage of the system. The system could be destroyed		
Important: Exceeding the maximum power s Temperature	upply voltage (> 30 V DC) for process or si Operation	060 °C (horizontal mounting of modules)		
	Operation	060 °C (horizontal mounting of modules) 040 °C (vertical mounting of modules and output load reduced to 50 % per group)		
Temperature	Operation Storage	060 °C (horizontal mounting of modules) 040 °C (vertical mounting of modules and output load reduced to 50 % per group) -40+70 °C		
	Operation Storage	060 °C (horizontal mounting of modules) 040 °C (vertical mounting of modules and output load reduced to 50 % per group) -40+70 °C -40+70 °C		

### Creepage distances and clearances

Insulation Test Voltages, Routine Test, according to EN 61131-2	AC voltage during 2 seconds
24 V circuits (supply, 24 V inputs/outputs), if they are electrically isolated	350 V
against other circuitry	

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

# AC500-S System data

### Power supply units

For the supply of the modules, power supply units according to PELV specifications must be used.

### **Electromagnetic Compatibility**

Immunity			
Against electrostatic discharge (ESD)		According to EN 61000-4-2, zone B, criterion B	
Electrostatic voltage in case of	air discharge	±8 kV	
	contact discharge	±4 KV	
ESD with communication connectors		In order to prevent operating malfunctions, it is recommended, that the operating personnel dis- charge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.	
ESD with connectors of Terminal Bas	ses	The connectors between the Terminal Bases and CPUs or Communication Modules must not be touched during operation. The same is valid for the I/O-Bus with all modules involved.	
Against the influence of radiated (CW	/ radiated)	According to EN 61000-4-3, zone B, criterion A	
Test field strength		10 V/m	
Against transient interference voltage	es (burst)	According to EN 61000-4-4, zone B, criterion B	
Supply voltage units	DC	2 KV	
Digital inputs/outputs	24 V DC	2 KV	
Analog inputs		1 KV	
Against the influence of line-conduct (CW conducted)	ed interferences	According to EN 61000-4-6, zone B, criterion A	
Test voltage	•••••	10 V zone B	
High energy surges		According to EN 61000-4-5, zone B, criterion B	
Power supply	DC	1 kV CM (1) / 0.5 kV DM (2)	
DC I/O supply, add. DC-supply-out	•••••	0.5 kV CM (2) / 0.5 kV DM (2)	
I/O analog, I/O DC unshielded	•••••	1 kV CM (2) / 0.5 kV DM (2)	
Radiation (radio disturbance)		According to EN 55011, group 1, class A	

(1) High requirement for shipping classes is achieved with additional specific measures (see specific documentation).
 (2) CM = Common Mode; DM = Differential Mode.

#### **Mechanical Data**

Wiring method / terminals	
Mounting	Horizontal (DIN rail mounting)
Degree of protection	IP20
Housing	According to UL 94
Vibration resistance acc. to EN 61131-2	all three axes (DIN rail mounting) 511.9 Hz, continuous 3.5 mm 11.9150 Hz, continuous 1 g
Shock resistance	All three axes 15 g, 11 ms, half-sinusoidal
Mounting of the modules	
DIN rail according to DIN EN 50022	35 mm, depth 7.5 mm or 15 mm
Mounting with screws	Screws with a diameter of 4 mm
Fastening torque	1.2 Nm

# AC500-S-XC System data

### **Operating and ambient conditions**

Voltages according to EN 61131-2		
24 V DC	Process and supply voltage	24 V DC (-25 %, +30 % without ripple)
	Absolute limits	1831.2 V inclusive ripple
	Ripple	< 10 %
	Protection against reverse polarity	Yes
Allowed interruptions of power supply acc. to EN 61131-2	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s
	upply voltage (> 30 V DC) for process or se	upply voltages could lead to unrecoverable damage of the system. The system could be destroyed
		upply voltages could lead to unrecoverable damage of the system. The system could be destroyed -40+70 °C (horizontal mounting of modules) -40+40 °C (vertical mounting of modules and output load reduced to 50 % per group)
· · · ·		-40+70 °C (horizontal mounting of modules)
· · · ·	Operation	-40+70 °C (horizontal mounting of modules) -40+40 °C (vertical mounting of modules and output load reduced to 50 % per group)
Temperature	Operation Storage	<ul> <li>-40+70 °C (horizontal mounting of modules)</li> <li>-40+40 °C (vertical mounting of modules and output load reduced to 50 % per group)</li> <li>-40+85 °C</li> </ul>
Temperature	Operation Storage	<ul> <li>-40+70 °C (horizontal mounting of modules)</li> <li>-40+40 °C (vertical mounting of modules and output load reduced to 50 % per group)</li> <li>-40+85 °C</li> <li>-40+85 °C</li> </ul>
Important: Exceeding the maximum power s Temperature Humidity Air pressure	Operation Storage Transport	<ul> <li>-40+70 °C (horizontal mounting of modules)</li> <li>-40+40 °C (vertical mounting of modules and output load reduced to 50 % per group)</li> <li>-40+85 °C</li> <li>-40+85 °C</li> <li>Max. 100 %, with condensation</li> </ul>

### Creepage distances and clearances

Insulation Test Voltages, Routine Test, according to EN 61131-2	AC voltage during 2 seconds
24 V circuits (supply, 24 V inputs/outputs), if they are electrically isolated	350 V
against other circuitry	

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

## AC500-S-XC System data

### Power supply units

For the supply of the modules, power supply units according to PELV specifications must be used.

### **Electromagnetic Compatibility**

Immunity				
Against electrostatic discharge (ESD)		According to EN 61000-4-2, zone B, criterion B		
Electrostatic voltage in case of	air discharge	±8 kV		
	contact discharge	±4 kV		
ESD with communication connectors		In order to prevent operating malfunctions, it is recommended, that the operating personnel dis- charge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.		
ESD with connectors of Terminal Base	es	The connectors between the Terminal Bases and CPUs or Communication Modules must not be touched during operation. The same is valid for the I/O-Bus with all modules involved.		
Against the influence of radiated (CW	radiated)	According to EN 61000-4-3, zone B, criterion A		
Test field strength		10 V/m		
Against transient interference voltages (burst)		According to EN 61000-4-4, zone B, criterion B		
Supply voltage units	DC	2 kV		
Digital inputs/outputs	24 V DC	2 kV		
Analog inputs	•	1 kV		
Against the influence of line-conducte (CW conducted)	d interferences	According to EN 61000-4-6, zone B, criterion A		
Test voltage		10 V zone B		
High energy surges		According to EN 61000-4-5, zone B, criterion B		
Power supply	DC	1 kV CM (1) / 0.5 kV DM (2)		
DC I/O supply, add. DC-supply-ou	t	0.5 kV CM (2) / 0.5 kV DM (2)		
I/O analog, I/O DC unshielded	•	1 kV CM (2) / 0.5 kV DM (2)		
Radiation (radio disturbance)		According to EN 55011, group 1, class A		

(1) High requirement for shipping classes is achieved with additional specific measures (see specific documentation).
 (2) CM = Common Mode; DM = Differential Mode.

#### **Mechanical Data**

Wiring method / terminals	
Mounting	Horizontal (DIN rail mounting)
Degree of protection	IP20
Housing	According to UL 94
Vibration resistance acc. to EN 61131-2	all three axes (DIN rail mounting) 511.9 Hz, continuous 3.5 mm 11.9150 Hz, continuous 1 g
Shock resistance	All three axes 15 g, 11 ms, half-sinusoidal
Mounting of the modules	
DIN rail according to DIN EN 50022	35 mm, depth 7.5 mm or 15 mm
Mounting with screws	Screws with a diameter of 4 mm
Fastening torque	1.2 Nm



### CP600 and CP400 series HMI and control panels

Key features	7/130
CP600 series and CP400 series	
HMI panels	<b>7</b> /131
Control panels	7/131
Technical data	
CP600	7/132
CP400	<b>7</b> /133

### HMI and control panels Key features

- Aluminium housing
- Front protection IP66
- Engineering software integrated in Automation Builder



- Brilliant colored display
- Free reusable graphic elements (Widgets)
- Import tags from PLC configuration within Automation Builder

- Improved flexibility and integration
- Two versions available:
  - CP600: Configuration with PB610 Panel Builder 600 for clear tailor made visualization.
  - CP600-WEB: visualization of AC500 web server without engineering software

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### CP600 series and CP400 series HMI panels and control panels



CP650

Resolution	Display size	Туре	Order code	Price	Weight (1 pce)
pixels		Ī			kg
480 x 272	4.3"	CP620	1SAP520100R0001		0.950
320 x 240	5.7"	CP630	1SAP530100R0001		1.150
800 x 480	7.0"	CP635	1SAP535100R0001		1.100
800 x 600	10.4"	CP650	1SAP550100R0001		2.100
800 x 600	12.1"	CP660	1SAP560100R0001		2.900
1024 x 768	15.0"	CP675	1SAP575100R0001		3.800
480 x 272	4.3"	CP620-WEB	1SAP520200R0001		0.950
320 x 240	5.7"	CP630-WEB	1SAP530200R0001		1.150
800 x 480	7.0"	CP635-WEB	1SAP535200R0001		1.100
800 x 600	10.4"	CP650-WEB	1SAP550200R0001		2.100
800 x 600	12.1"	CP660-WEB	1SAP560200R0001		2.900
1024 x 768	15.0"	CP675-WEB	1SAP575200R0001		3.800

### Communication cables (connection control panel <-> PLC)

Description	Туре	Order code	Price	Weight
	- - - -	-		(1 pce)
				kg
Communication cable RS232: CP600-AC500	TK681	1SAP500981R0001		0.130
Communication cable RS485: CP600-AC500-eCo	TK682	1SAP500982R0001		0.130

### **Programming software**

Description	Туре	Order code	Price	Weight
	- - - -	-	-	(1 pce)
				kg
Panel Builder 600 (1)	PB610	1SAP500900R0001		0.150
(included in Automation Builder software suite)				

(1) Delivery includes the programming software and corresponding documentation for software and control panels on USB-ROM.



**Control panels** 

Resolution	Display	Туре	Order code	Price	Weight
pixels					(1 pce) kg
240 x 240	3.5", 16 grey levels	CP415M	1SBP260191R1001	•	0.230
320 x 240	5.7", 16 blue levels	CP430B	1SBP260183R1001		0.810

#### **Programming cables**

-	0 Description	Туре	Order code	Price	Weight
side					(1 pce)
Sub-D 9	Connection to COM1. Length: 4 m	TK401	1SBN260216R1001		0.180
Sub-D 25	Connection to COM2. Length: 4 m	TK402	1SBN260217R1001		0.230

### Communication cables (connection control panel <-> PLC)

Plug on PLC side	PLC	Туре	Order code	Price	Weight (1 pce)
SILLE					kg
Sub-D 9	AC500	TK405	1SBN260221R1001		0.130
Sub-D 9	AC500-eCo	TK406	1SBN260224R1001		0.130

# **Programming software**

Description	Туре	Order code	Price Weight
		ABB Industrial Autor	<mark>(1 pce)</mark> nation & Moti <mark>ky</mark> n   <b>7</b> /131
Programming software for CP400 (1)	CP400Soft	1SBS260284R1001	0.100

(1) Delivery includes the programming software and corresponding documentation on CD-ROM.

# CP600 series Technical data

Туре	CP620	CP630	CP635	CP650	CP660	CP675
	CP620-WEB	CP630-WEB	CP635-WEB	CP650-WEB	CP660-WEB	CP675-WEB
Display						
xact display size diameter	4.3" widescreen	5.7"	7" widescreen	10.4"	12.1"	15"
esolution	480 x 272 pixels	320 x 240 pixels	800 x 480 pixels	800 x 600 pixels		1024 x 768 pixe
isplay type	TFT color					
ouch screen material	glass covered by	plastic film	•••••	•••••	•	•••••
ouch screen type	analog resistive		••••	•••••	•••••	••••••
olors	64 k	••••	••••	•••••	•••••	•••••
acklight type	LED	•	••••	• • • • • • • • • • • • • • • • • • • •	CCFL	•••••
acklight life	40 000 h typ at 2	5 °C	••••	50 000 h typ at 25		•••••
rightness	150 cd/m <sup>2</sup>	200 cd/m <sup>2</sup>	300 cd/m <sup>2</sup>	: 00 000 m typ at 20		•••••
	150 Cu/III-	200 00/11-	300 cu/m-			
ousing	1200					
rotection class front	IP66			•••••		
rotection class rear	IP20			····· •	·····	
ront side material	Zamak			Aluminium		
everse side material	Zamak	Aluminium				
ystem resources						
rocessor type	ARM Cortex A8: 6	300 MHz		MIPS + FPU: 600	MHz	
perating system, version	Microsoft Window	/s CE 6.0	••••	<u>i</u>	•••••	••••••
MI software			nanels (not CP6yy-	WER) PR610 is includ	led in Automation Buil	dor
isualization of AC500 web server	ves, with CP6xx-V				iou in Automation Duil	
				•••••	•••••	
lser memory type, capacity	Flash Disk, 128 M	IB		····· •	•••••	••••••
AM type, capacity	256 MB DDR					
iterfaces						
thernet ports number, type	2 - 10/100 Mbit (v	with integrated Swi	itch function)	1 - 10/100 Mbit		
SB ports number, type	1 - host interface	2 - host interface	е,	1 - host interface,	•	••••••
	version 2.0	1 ver. 2.0, 1 ver.	2.0 and 1.1	version 2.0		
erial ports number, type	1 - RS-232, RS-4	85, RS-422, softw	are configurable	2 - RS-232, RS-48	35, RS-422, software of	configurable
dditional ports number, type		t 2 - Expansion sl		1 - Aux. port for fu	· · · · · · • · · · · · · · · · · · · ·	
		s for future module				
ard slot number, type	1 - SD card slot	. <u>.</u>			•••••	•••••
ower supply voltage nominal	24 V DC					
tolerance	1830 V DC					
		074		101		
current consumption	0.4 A	0.7 A		1.0 A	1.1 A	1.2 A
attery type		nium battery, not us				
Veight	0.95 kg	1.15 kg	1.1 kg	2.1 kg	2.9 kg	3.8 kg
aceplate (L x H)	149 x 109 mm	187 x 147 mm		287 x 232 mm	337 x 267 mm	392 x 307 mm
utout (L x H)	136 x 96 mm	176 x 136 mm		276 x 221 mm	326 x 256 mm	381 x 296 mm
nvironmental conditions				·	•	
Operating temperature range	050 °C					
perating humidity range	585 % relative h	numidity, non-cond	lensina	•••••	•••••	•••••
storage temperature range	-20+70 °C		ionioni g	•••••	•••••	•••••
torage humidity range		numidity, non-cond	lonoing	•••••	•••••	•••••
		iumiuny, non-conu	lensing			
or the entire range (CP6xx with PB610 from	n <b>V1.</b> 90)					
ector graphics	•					
bject dynamics (types)	•					
rue type fonts	•	•••••	•••••	•••••	•••••	••••••
Iultiple driver communication	4	•••••	•••••	•••••	•••••	•••••
nicode capability (1)	•	••••		••••		
Iultilanguage capability		••••	••••	·····	•••••	·····
				•••••	•••••	·····
untime language switching				•••••		
ecipes (capacity)		brage limited only b	y available memory			·····
larms	•					•••••
ata acquisition + capacity	Flash memory sto	rage limited only b	y available memory			
rend presentation + capacity	Flash memory sto	orage limited only b	y available memory			
istorical event list	•			•••••	•••••	•••••
sers/passwords	•	•••••	••••	•••••	•••••	••••••
ardware realtime clock, battery back-up	•	••••	••••	•••••	•••••	•••••
creen saver	•	••••	••••	•••••	•••••	
		····	••••	····· •	·····	·····
ntegration within Automation Builder	•			•••••		
anort printing via LICD printara				····· •	·····	·····
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Off-line and on-line simulation	•					·····
ff-line and on-line simulation emote access via	•					
off-line and on-line simulation lemote access via Vindows Client or VNC server	• • RoHS, cUL, DNV,	C-Tick , KCC				
Report printing via USB-printers Off-line and on-line simulation Remote access via Windows Client or VNC server Approvals 1) Including Chinese character sets.	•	C-Tick , KCC				

(1) Including Chinese character sets.7/132 | ABB Industrial Automation & Motion

# CP400 series Technical data

Туре	CP415M	CP430B
Display size	3.5"	5.7"
Resolution	240 x 240 pixels	320 x 240 pixels
Display type	Touch Mono FSTN 16 grey	Touch 16 blue, STN
Brightness	90 cd/m <sup>2</sup>	110 cd/m <sup>2</sup>
Contrast adjustment	Via touch panel	Via touch panel
Back-light type	LED	CCFL
Back-light life	40 000 h	50 000 h
Touch screen (number of times)	> 1 million	> 1 million
Function keys / other keys	-	5 keys + 1 key menu
Application flash prom	4 MB	4 MB
RTC (rechargeable lithium battery)	•	•
Ethernet	-	-
Alarm management	•	•
Recipe management	-	-
Data/Recipe	-	-
Trends	•	•
Data storage (CF card)	-	-
Communication interface	1	2
USB 2.0	-	-
Printer port	-	-
Consumption	< 330 mA	< 840 mA
Dimensions L x H x W (external)	96 x 96 x 40.6 mm	195 x 145 x 60 mm
Weight	0.23 kg	0.81 kg
For the entire range		
RISC CPU	32 bit	
Graphics and text	•	
Macro and Ladder	•	
On-line and off-line simulation	•	
Real time clock	•	
Password protection	•	
Supply voltage	24 V DC ±15 %	
Class protection	IP65	
Approvals	RoHS, cUL	



# DigiVis 500 Supervision software

Key features	8/136
Your supervision software from ABB	
Ordering details	<b>8</b> /137
Technical data	<b>8</b> /137

### DigiVis 500 Key features



Interacts easily with AC500 PLC via

Dual-display enhanced mode and "DigiBrowse" options offer availability and easy access to data outside the software

- Adaptable from 50 to an unlimited number of variables
- Flexible license scheme so customers can easily extend based on demand

### DigiVis 500 Your supervision software from ABB



DigiVis 500 USB, software and documentation

Description		Туре	Order code	Price	Weight (1 pce) kg
Operations licer	ises				
OPC signals	50	DV500-OP50	1SAP501800R0021		0.050
	100	DV500-OP100	1SAP501800R0031		0.050
	250	DV500-OP250	1SAP501800R0041		0.050
	500	DV500-OP500	1SAP501800R0051		0.050
	1000	DV500-OP1000	1SAP501800R0061		0.050
	2000	DV500-OP2000	1SAP501800R0071		0.050
	unlimited	DV500-OPUNL	1SAP501800R0081		0.050
Operation expan	nsion licenses				
OPC signals	50100	DV500-EXP100	1SAP501800R0091		0.050
	100250	DV500-EXP250	1SAP501800R0101		0.050
	250500	DV500-EXP500	1SAP501800R0111		0.050
	5001000	DV500-EXP1000	1SAP501800R0121		0.050
	10002000	DV500-EXP2000	1SAP501800R0131		0.050
	unlimited	DV500-EXPUNL	1SAP501800R0141		0.050
Software					
USB dongle		DV500-USB	1SBN260318R1001		0.100
Software and Docume	entation CD	DV500-CD	1SAP501900R0001		0.150
Software option	s				
Graphics Builder		DV500-GBUILDER	1SAP501800R0011		0.050
USB dongle replacem	ent license	DV500-USB-R	1SAP501800R0151		0.050
WEB Display runtime	•••••••••••••••••••••••••••••••••••••••	DV500-WEBDIS	1SAP501800R0161		0.050
Dual monitor Support	·····	DV500-DUALMON	1SAP501800R0171		0.050
	•••••••••••••••••••••••••••••••••••••••	DV500-DIGIB	1SAP501800R0181		0.050
DigiBrowse		E DVSUU-DIGID	13AF301000h0101	1	0.000

# DigiVis 500 Your supervision software from ABB

Туре	DigiVis 500			
Description	Creation and operation of windows-based supervision of AC500 based automation systems via OPC			
Features	– User interface/system supervision design for PC without need for scripting			
	- Clear information hierarchy			
	- Optional user authorization control and security lock, up to 16 user profiles with up to 1 000 users			
	– Multi-monitor screens			
	- Rich choice of displays, images and log functions			
	– Graphics editor and macros			
	– Trending and archiving			
	– Acoustic alarms			
	– OPC configuration			
	– Commissioning & debugging			
	- Automatic code documentation			
	– DigiBrowse – standalone archive viewer			
	- Operation mode			
	- Report generation			
	– Audit trails/user action logging			
	- On-the-fly software updating without restarting the application			
	– Languages: English.			
Minimum engineering PC requirements	Windows XP Professional SP3 or Windows 7 Professional SP1, 32 or 64-bit, 2 GHz, 1 GB RAM, 10 GB free disk space.			
Target Systems	PC with Windows XP Professional SP3 or Windows 7 Professional SP1, 32-bit, 2 GHz, 3 GB RAM, 2 GB free disk space			
	(≥80 GB for archiving).			
Components and options	– DigiVis 500 Graphics Builder			
	– DigiVis 500 operations			
	– ABB OPC tunnel			
	– AC500 standard tag type library			
	– Web display runtime			
	– Dual monitor support			
	– DigiBrowse			
	– Security lock.			





# Low voltage drives

ACS880 series, all compatible ABB industrial drives	9/142
ABB general purpose drives offer ease-of-use	9/143
ABB machinery drives for flexible needs	9/144
ABB motion control drives ACSM1	9/145

### ACS880 series all-compatible ABB industrial drives

The ACS880 series drives introduce a new generation of industrial drives. These drives are easily adaptable to suit different customer needs and integrate into various industry solutions. The drives are part of ABB's new all-compatible drives portfolio that is designed to provide customers across industries and applications with unprecedented levels of compatibility, flexibility and ease of use. The new ACS880 industrial drives are compatible with virtually all types of processes, automation systems, user groups and business requirements. Yet, despite the drives' wide-ranging capabilities, they are remarkably easy to use and integrate.

The ACS880 drives offering will grow alongside with the ACS800 drives. They are available as single drives, multidrives and drive modules.

#### ACS880-01, wall-mounted drives highlights

- Compact wall-mounted drives with all important features built-in the drive, saving installation space and time
- Premium motor control with direct torque control (DTC) for virtually any type of AC motor, including permanent magnet motors
- A broad range of options offer flexibility and universal connectivity
- Built on ABB's all-compatible drives architecture providing unprecedented levels of compatibility, flexibility and easeof-use.

### All-compatible wall-mounted drive with everything built-in



#### Features

- Power range 0.55...250 kW (208...690 V)
- IP21 as standard (UL type 1), IP55 as option (UL type 12)
- Integrated safety including safe torque-off (STO) as standard with several safety functions as options
- Intuitive control panel with USB connection and support up to 20 languages
- Common PC tool, Drive composer, for commissioning and configuration
- Drive-to-drive link for fast communication between drives including master-follower configurations without any additional software
- Removable memory unit for easy setup and maintenance
- Drive's energy efficiency information and the energy optimizer feature help to improve process efficiency

- Options include:
  - I/O extension modules
  - Fieldbus adapter modules
  - Safety functions module
  - Speed feedback interfaces
  - EMC filter, braking chopper.
### ABB general purpose drives offer ease-of-use

ABB general purpose drives are designed to control a wide range of applications such as pumps, fans, conveyors and mixers, as well as process control in industries including material handling, food and beverage, chemical, rubber and plastics, textile and printing. The drives are easy to select, install, configure and use, saving considerable time as most features are built-in as standard.

### Built-in features for pump and fan applications



A wide power range for a broad range of industries



### ACS310 highlights

- Designed for pump and fan applications, such as booster pumps and process ventilation
- Compact dimensions with unified height and depth save space and facilitate cabinet installations
- Equipped with pump and fan control (PFC), PID control with booster functionality and pump protection function to optimize pump or fan flow, to cut maintenance costs and to save energy.

### Features

- Power range 0.37...2.2 kW (1-phase 200...240 V), 0.37...11 kW (3-phase 200...240 V)
- Power range 0.37...22 kW (3-phase 380...480 V)
- IP20 enclosure, optional NEMA 1 kit
- Built-in pump and fan features such as multi-pump control, pipe clean and fill functions
- Embedded Modbus® EIA-485
- Options
  - Basic and assistant control panels
  - Input and output chokes
  - Relay output extension module
  - External EMC filter for 1st environment
  - FlashDrop tool for unpowered drive configuration in 2 seconds.

### ACS550 highlights

- Wide power range and vector control for variable and constant torque applications from pumps and fans to conveyors and mixers
- Many built-in features including an EMC filter for 1<sup>st</sup> environment, a Modbus<sup>®</sup> interface and a swinging choke enhance drive performance and help reduce the space needed for installation
- Intuitive control panel and assistant functionality for fast set up and commissioning.

### Features

- Power range 0.75...355 kW (3-phase 208...240 V, 380...480 V)
- Wall-mounted drives, IP21 as standard (UL type 1), IP54 as option (UL type 12 in frame sizes R1-R6)
- Vector control
- Built-in EMC filter and Modbus® fieldbus interface
- Swinging choke for superior harmonic reduction
- Options
  - Basic control and assistant control panel
  - Plug-in fieldbus adapters, panel mounting kits, relay output extension module
  - Output chokes
  - Brake units and choppers
  - FlashDrop tool for unpowered drive configuration in 2 seconds.

### ABB machinery drives for flexible needs

ABB machinery drives are designed to meet the production and performance needs of machine builders, system integrators, panel builders and end users in a broad range of applications. The drives can be flexibly programmed to meet the demands of different machine solutions. A wide range of features and options provide optimal solutions.

Compact and easy drives to install, set and commission



Flexibility and scalability for machinery applications



### ACS355 highlights

- A compact drive with a wide range of built-in features including safety functionality
- Sequence programming provides an easy way to implement drive's control logic
- A wide range of options for enhanced performance and flexible connectivity to different processes
- Compact dimensions with unified height and depth save space and facilitate cabinet installations.

### **Features**

- Power range 0.37...2.2 kW (1-phase 200...240 V), 0.37...11 kW (3-phase 200...240 V)
- Power range 0.37...22 kW (3-phase 380...480 V)
- IP20 enclosure, optional NEMA 1 kit
- IP66, IP67 or IP69K as optional variant up to 7.5 kW
- Scalar control, open and closed loop vector control
- Advanced functionality with sequence programming
- Induction and permanent magnet motor control
- Built-in brake chopper and EMC filter for 2nd environment
- Integrated safe torque-off (STO) as standard
- Options
  - Basic and assistant control panels
  - Potentiometer, plug-in fieldbus adapters, encoder interface, relay output extension module, input and output chokes
  - External EMC filter for 1st environment
  - FlashDrop tool for unpowered drive configuration in 2 seconds.

### ACS850 highlights

- Covers a wide power and voltage range, and provides a variety of standard and optional features making adaptation to different applications easy
- The standard control program can be easily modified to meet specific application needs and function block programming provides additional flexibility
- Equipped with direct torque control (DTC) providing highly accurate open and closed loop control for different types of motors.

### Features

- Power range 0.37...560 kW (380...500 V)
- IP20 as standard
- Compact size and side-by-side mounting save space in cabinets
- Built-in input chokes for harmonic filtering
- Built-in braking chopper up to 45 kW as standard
- Induction, permanent magnet and synchronous reluctance motor control
- Extensive input and output connectivity as standard
- Integrated safe torque-off (STO) as standard
- Removable memory unit for easy drive management
- Options
  - Fieldbus adapter, I/O extension and feedback interface modules
  - PC tools: DriveStudio for startup, tuning and programming, DriveSPC for modifying and extending functionality
  - Synchronous reluctance motor and drive packages
  - Crane control program for stand-alone cranes
  - EMC filters, braking options, du/dt filters.

### ABB motion control drives ACSM1

ABB motion control drives offer flexible technologies and high performance motor control to solve a wide variety of applications. The range includes powers from less than 1 kW to more than 100 kW. The drives enable operation with single and three-phase supplies for global markets, and have open communication options as well as real-time Ethernet technologies such as EtherCAT<sup>®</sup> and PowerLink. Our intelligent motion drives include programming options for single and multi-axis control applications or can be combined with our multi-axis motion controllers and PLC products for system solutions.

#### ACSM1 highlights

- Wide power range, different product variants and programming flexibility ensure an optimum solution for both single and multi-axis systems.
- Control of synchronous and asynchronous motors with direct torque control (DTC) in open or closed loop
- Regenerative supply for applications with high braking power duty cycles.

The flexible workhorse for many high performance applications



#### **Features**

- Three-phase operation 230...500 V AC
- 3...635 A rms, power range 0.75...355 kW
- IP20 enclosure for cabinet installation (UL open)
- Suitable for single drive and multidrive configurations
- Speed, torque and motion control
- Controls synchronous and induction motors
- Integrated safe torque-off (STO) as standard
- Innovative memory unit for easy drive management.

#### - Options:

- Various control options for encoder feedback and communication with master and I/O extension
- Cooling variants: air, cold-plate, push-through
- Winder control program
- Regenerative supply
- Drive variant for lift application.



## Motion control

Servo drives	10/148
AC motion control drives	10/150
Motion controllers	10/152

### Servo drives Analog, PTO, POWERLINK and EtherCAT<sup>®</sup> options

### MicroFlex Analog

- Compact motion control drive for single and three-phase operation
- ±10 V analog speed / torque demand or Pulse + Direction inputs
- Choice of resolver feedback or incremental encoder / SSI
- Pulse Train control inputs compatible to Pulse Train Output (PTO) module FM562 for AC500 and AC500-eCo.

### MicroFlex e100

- Compact motion control drive for single and three-phase operation
- Ethernet PowerLink technology for real-time motion control
- MINT programming for multitasking control of communications, logic, motion and HMI interaction in simple motion applications.



Compact motion control drive for simple analog or PTO control



Compact motion control drive with real time Ethernet POWERLINK technology

### Series MicroFlex Analog

- 1 or 3-phase operation 105...250 V AC
- 3, 6 and 9 Arms
- IP20 enclosure for cabinet installation (UL open)
- Auto-tuning and anti-resonance digital filters
- Suitable for single drive and multi-axis systems
- Controls rotary and linear AC servo motors
- Options
  - Space saving footprint EMC filter
  - Brake units.

For further information, see flyer "ABB motion control drives, MicroFlex brushless AC servo drives", code: 3AUA0000123110 EN.

### Series MicroFlex e100

- 1 or 3-phase operation 105...250 V AC
- 3, 6 and 9 Arms
- IP20 enclosure for cabinet installation (UL open)
- Real-time Ethernet operation with PowerLink
- Suitable for single drive and multi-axis systems
- Controls rotary and linear AC servo motors
- Options
  - Space saving footprint EMC filter
  - Brake units.

For further information, see flyer "ABB motion control products, MicroFlex e100 servo drives", code: 3AUA0000116018 EN.

10

### MicroFlex e150

- Compact motion control drive with embedded safety for single and three-phase operation
- Ethernet technology including EtherCAT<sup>®</sup> for real-time motion control
- Advanced MINT programming for multitasking control of communications, logic, motion and HMI interaction in high performance motion applications.

### MotiFlex e100

- Wide voltage range, DC bus capability and three-phase operation for a broad range of applications
- Ethernet PowerLink technology for real-time motion control
- MINT programming for multitasking control of communications, logic, motion and HMI interaction, plus a multi-axis plug-in motion option.



Intelligent motion control drive with embedded safety and EtherCAT<sup>®</sup> technology



Versatile motion control drive with integrated realtime Ethernet POWERLINK technology

### Series MicroFlex e150

- 1 or 3-phase operation 105...250 V AC
- 3, 6 and 9 Arms
- IP20 enclosure for cabinet installation (UL open)
- Embedded real-time Ethernet including EtherCAT<sup>®</sup>, Modbus<sup>®</sup> TCP and Ethernet/IP<sup>™</sup>
- Suitable for single drive and multi-axis systems
- Controls rotary and linear AC servo motors
- Safe torque-off feature as standard
- Options
- MINT Motion programming
- Space-saving footprint EMC filter
- Resolver adapter
- Dual encoder splitter
- Brake units.

For further information, see flyer "ABB motion control products, MicroFlex e150 servo drives", code: 3AUA0000097609 EN.

### Series MotiFlex e100

- Three-phase operation 180...528 V AC
- 1.5...65 Arms in three frame sizes
- IP20 enclosure for cabinet installation (UL open)
- Real time Ethernet operation with PowerLink
- Suitable for single drive and multi-axis systems
- Controls rotary and linear AC servo motors
- Integrated DC bus for energy sharing capability
- Options
  - Plug-in motion controller for up to five axes
  - Fieldbus options
  - Plug-in IO options (digital or analog)
  - Secondary feedback options, resolver or encoder
- Filters, brake resistors, chokes and DC bus bars. For further information, see flyer "ABB motion control products, MotiFlex e100 servo drives",

code: 3AUA0000116019 EN.

### AC motion control drives MicroFlex series



MicroFlex e150



- Compact EtherCAT<sup>®</sup> motion control drive
- Simple to advanced motion technology fully integrated
- Powerful PC tool for commissioning and auto-tuning
- Precise control of rotary and linear motors
- Embedded EtherCAT®, Ethernet/IPTM, Modbus® TCP/IP
- Standard I/O: (10) inputs + (7) outputs
- Universal and Dual Encoder function
- Safe Torque Off (STO) SIL3 PLe
- USB, RS485 serial and 7-segment display communications.

Input voltage	Bus voltage	Output current		Order code	Price
		Continuous	Peak (3 s)		
	V DC	Arms	Arms		
1/3 phase 105-250 V AC	160-320	3	6	E152A03EIOA	
1/3 phase 105-250 V AC	160-320	6	12	E152A06EIOA	
1/3 phase 105-250 V AC	160-320	9	18	E152A09EIOA	

#### EtherCAT<sup>®</sup> slave device drive (non-programmable)

1/3 phase 105-250 V AC	160-320	3	6	E152A03EINA	
1/3 phase 105-250 V AC	160-320	6	12	E152A06EINA	
1/3 phase 105-250 V AC	160-320	9	18	E152A09EINA	

Note: Will accept either incremental or absolute encoder feedback (BiSS, EnDat, SSI, SmartAbs®). Dual encoder mode and resolver supported via option.

#### MicroFlex e100 (Ethernet POWERLINK)

- Compact Ethernet Powerlink motion control drive
- Simple motion programming with MINT Lite software and auto-tuning
- Ethernet Powerlink , Modbus® TCP and TCP/IP
- Universal encoder
- CANopen<sup>®</sup> port for simple expansion
- USB and RS485 serial communications
- LEDs: Drive status, CANopen®, Ethernet Powerlink.

1/3 phase 105-250 V AC	160-320	3	6	MFE230A003BW	
1/3 phase 105-250 V AC	160-320	6	12	MFE230A006BW	
1/3 phase 105-250 V AC	160-320	9	18	MFE230A009BW	

Note: Will accept either incremental or absolute encoder feedback (BiSS, EnDat, SSI, SmartAbs®).

#### **MicroFlex analog**

- Compact analog motion control drive
- Encoder/resolver feedback and simulated encoder output
- RS232/422 serial communications for PC tools
- Analog or pulse and direction control e.g. for motion control applications using AC500 or AC500-eCo CPUs with the Pulse Train Output module FM562.

Input voltage	Bus voltage	Output currer	nt	Order code		Price
		Continuous	Peak (3 s)	RS232 version	RS485 version	
	V DC	Arms	Arms			
Encoder/SSi feedba	ack					•
1/3 phase 105-250 V AC	160-320	3	6	FMH2A03TR-EN23W	FMH2A03TR-EN43W	
1/3 phase 105-250 V AC	160-320	6	12	FMH2A06TR-EN23W	FMH2A06TR-EN43W	
1/3 phase 105-250 V AC	160-320	9	18	FMH2A09TR-EN23W	FMH2A09TR-EN43W	
Resolver feedback						
1/3 phase 105-250 V AC	160-320	3	6	FMH2A03TR-RN23W	FMH2A03TR-RN43W	
1/3 phase 105-250 V AC	160-320	6	12	FMH2A06TR-RN23W	FMH2A06TR-RN43W	
1/3 phase 105-250 V AC	160-320	9	18	FMH2A09TR-RN23W	FMH2A09TR-RN43W	



10



MicroFlex analog

### AC motion control drives MotiFlex e100



MotiFlex e100 Size A (1.5 A - 16 A)



MotiFlex e100 Size B (21 A - 33.5 A)



MotiFlex e100 Size C (48 A - 65 A)

### MotiFlex e100

- Advanced servo drive/motion controller
- Simple motion programming with MINT Lite software, auto-tuning and plug-in motion controller option
- Universal encoder function and optional resolver interface
- Ethernet Powerlink interface (real time)
- CANopen DSP 401 network manager for expansion
- DC bus operation with simple link system
- 2 x expansion card slots for secondary feedback, MINT programmable options, fieldbus and I/O expansion
- Servo control, closed loop AC vector and Scalar modes.

Size	Input voltage	Bus voltage	Output currer operation 200		Order code	Price
			Continuous Peak	Peak		
		V DC	Arms	Arms		
4	3 phases 180-560 V AC	325-650	1.5	3	MFE460A001BW	
			3	6	MFE460A003BW	
			6	12	MFE460A006BW	
			10.5	21	MFE460A010BW	
			16	32	MFE460A016BW	
3	3 phases 180-560 V AC	325-650	21	40	MFE460A021BW	
			26	54	MFE460A026BW	
			33.5	68	MFE460A033BW	
)	3 phases 180-560 V AC	325-650	48	96	MFE460A048BW	
			65	130	MFE460A065BW	

### Accessories for MotiFlex e100

Description	Order code	Price
AC power and motor power brackets	OPT-CM-001	
Signal and feedback cable bracket size A	OPT-CM-002	
Signal and feedback cable bracket size B / C	OPT-CM-003	
DC bus bars for A size drive x 2	OPT-MF-DC-A	
DC bus bars for B size drive x 2	OPT-MF-DC-B	
DC bus bars for C size drive - 160mm x 2	OPT-MF-DC-C	
DC bus bars for C size drive - 212mm x 2	OPT-MF-DC-D	
Spare connector kit for 1 - 16A	OPT-MF-CN-A	
Spare connector kit for 21 - 33.5A	OPT-MF-CN-B	
Spare connector kit for 48 - 65A	OPT-MF-CN-C	
USB signal isolator	OPT-CNV-003	

#### AC line reactors for use with MotiFlex e100

Size	Control current rating	Order code	Price
	Α		
A	1 - 6	LRAC02502	
А	10 - 16	LRAC03502	
В	21 - 33.5	LRAC05502	
С	48 - 65	LRAC130ACB2	

### Plug in option cards for use with MotiFlex e100

Description	Order code	Price
Single axis MINT motion option (plug-in)	OPT-MF-100	
Multi-axis MINT motion option (plug-in)	OPT-MF-101	
Analog I/O 16 bit 4 off inputs and 4 off outputs differential +/-10 V DC	OPT-MF-001	
Digital I/O card 6 off digital inputs (AC optos), 4 off digital output	OPT-MF-005	
Incremental encoder + halls with simulated encoder out option	OPT-MF-011	
Resolver with simulated encoder out option card	OPT-MF-013	
Fieldbus options		
Fieldbus carrier option (required for ALL fieldbus cards)	OPT-MF-030	
DeviceNet® fieldbus option	OPT-FB-001	
Profibus® fieldbus option	OPT-FB-002	
Ethernet/IP fieldbus option	OPT-FB-004	
Modbus® TCP fieldbus option	OPT-FB-005	
Profinet® I/O fieldbus option	OPT-FB-006	

## Motion controllers MINT programmable, analog, PTO, CANopen and POWERLINK NextMove ESB-2 NextMove e100

- Compact panel mount motion controller
- Up to 8 axes of coordinated motion
- Stepper and analog axis control
- CANopen manager for system expansion
- MINT programming for multitasking control of communications, logic, motion and HMI interaction in simple motion applications.
- Compact panel mount motion controller
- Ethernet PowerLink technology for real-time motion control
- Stepper and analog axis control
- CANopen manager for system expansion
- MINT programming for multitasking control of communications, logic, motion and HMI interaction in simple motion applications.



Compact motion controller for analog and stepper control



Compact motion controller with real-time Ethernet POWERLINK technology

### Series NextMove ESB-2

- Up to 8 axes of coordinated motion
- 4 x PTO (Stepper) axes
- 3 or 4 x analog controlled axes with encoder feedback
- Maximum of 8 axes of control
- Digital and analog I/O including 4 x high speed registration latches
- Options
  - RS232 or RS485 serial option
  - Differential / single-ended stepper interfaces
  - 7 axis or 8 axis variants.

### Series NextMove e100

- 1 to 16 axes interpolated axes via POWERLINK
- Additional CN profiled POWERLINK axes
- 4 x PTO (stepper) axes
- 3 x analog controlled axes with encoder feedback
- Maximum of 30 axes of control
- Digital and analog I/O including 4 x high speed registration latches
- Options
  - Differential / single-ended stepper interfaces
  - 8, 12 or 16 axes of interpolated motion.

## Motion controllers NextMove



NextMove e100



NextMove ESB-2



- Compact, high performance motion controller
- Real-time Ethernet Powerlink and Modbus® TCP/IP
- 8, 12 or 16 axes of interpolated motion
- (16 MN + 14 CN) profiled axes = max. 30 Powerlink axes
- 4 stepper axes / 3 analog axes
- CANopen® network manager
- RS232/422 and USB communications
- Advanced multitasking MINT programming
- ActiveX<sup>®</sup> controls
- Integrated digital/analog I/O including high speed registration inputs.

Number of axes	Order code		Price
	Differential stepper	Single ended stepper	
8	NXE100-1608DBW	NXE100-1608SBW (1)	
12	NXE100-1612DBW	NXE100-1612SBW (1)	
16	NXE100-1616DBW	NXE100-1616SBW (1)	

(1) For use with DSMS stepper/driver.

### NextMove ESB-2

- Compact, panel mount motion controller
- Economical and simple to install
- Powerful multitasking MINT programming
- 4 axes of closed loop control
- 4 axes of open loop control (step/direction outputs)
- Max. 8 axes
- USB, serial and CANopen® provide flexible communications to PLC, distributed I/O and other devices
- Integrated digital/analog I/O including high speed registration inputs
- Firmware variant allows the controller to operate as a CANopen® DS402 master and control up to 64 axes.

Number of axes	Serial port	Order code		Price
		Differential stepper	Single ended stepper	
7	RS232 / USB	NSB202-501W	NSB203-501W	
7	RS485 / USB	NSB202-502W	NSB203-502W	
8	RS232 / USB	NSB204-501W	NSB205-501W	
8	RS485 / USB	NSB204-502W	NSB205-502W	

#### NextMove PCI-2

- Compact, high performance PCI-bus motion controller
- 4 stepper axes + 4 analog axes = max. 8 axes
- Onboard digital and analog I/O
- CANopen<sup>®</sup> for distributed control
- High speed PCI bus interface
- Advanced multitasking MINT or ActiveX® programming
- Firmware variant allows the controller to operate as a CANopen® DS402 master and control up to 64 axes.

Number of axes	Order code		Price
	PNP outputs	NPN outputs	
1 (2)	PCI201-501	PCI201-511	
2 (2)	PCI201-502	PCI201-512	
3 (2)	PCI201-503	PCI201-513	
4 (2)	PCI201-504	PCI201-514	
8 (3)	PCI201-508	PCI201-518	

(2) User configurable for servo or stepper. (3) 4-axis servo control and 4-axis stepper.

#### Plug in option cards for use with MotiFlex e100

- Plug-in motion controller
- 4 POWERLINK axes + 1 analog axes = max. 5 axes
- Onboard digital and analog I/O
- Encoder input for electronic gearing functions
- CANopen® manager for I/O expansion (via host drive)
- Add CP600 HMI via RS485 Modbus® RTU
- Fully utilize drive I/O and interfaces including additional option cards.

Description	Order code	Price
Single axis MINT motion option (plug-in)	OPT-MF-100	
Multi-axis MINT motion option (plug-in)	OPT-MF-101	





MotiFlex e100 connection panel



# Application descriptions and additional information

### Application descriptions

AC500 website - Online tools

Order and delivery

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## Application descriptions Network architecture

### Communication with AC500 - always the right solution

Flexibility, real-time capability and the highest possible data transmission speed are just some of the communication demands made on automation systems. With its AC500 control system, ABB developed a communication platform offering customer oriented solutions for the most varied communication tasks. Simple network configuration and diagnostic options using the Automation Builder enables fast planning, implementation and commissioning, thus helping save engineering time and project costs. Among others, ABB's AC500 supports the following communication protocols:

### **PROFINET**®

PROFINET<sup>®</sup> I/O meets the sophisticated demands placed on real time Ethernet protocols in the world of automation. Very fast data transmission, integrated and standardized network structures from the control to the field level as well as flexible network management support users in the implementation of their automation solutions.

### **PROFIBUS DP®**

PROFIBUS DP<sup>®</sup> enables flexible configuration by means of a mono and multi-master systems structure. Data rates of up to 12 Mbit/s on twisted pair cables and/or optical fiber, as well as the option to connect up to 126 devices (master/slave) to one bus segment enable simple and robust communication solutions.

### **CANopen**<sup>®</sup>

CANopen<sup>®</sup> offers fast data transmission and high immunity in Master/Slave network topologies, with up to 127 participants and transmission speeds of 10 kbit/s up to 1 Mbit/s depending on bus length.

### CS31-Bus

CS31-Bus is a high-performance, proprietary ABB communication standard enabling transmission speeds of up to 187.5 kbit/s. Up to 31 bus participants can communicate via RS485, simple telephone cable or optical fiber lines.



### Modbus® TCP & RTU

Modbus<sup>®</sup> RTU is an open serial data protocol for the implementation of master/slave network configurations with up to 31 network partners. Different bus lengths depending on the serial communication interface enable data transmission speeds of up to 115.2 Kbit/s. Modbus<sup>®</sup> TCP is a common Ethernet based networking protocol.

#### RCOM

RCOM is a proprietary ABB bus protocol for master/slave communication via RS232/485. Based on expandability up to 254 RCOM Slaves and the most varied diagnostic options, this protocol is ideal for applications in the water and waste water industry.

#### **Ethernet and Internet**

Integrated communications, high data transmission rates and the use of existing data networks enable simple, customer specific solutions. Supported protocols are:

 HTTP for web server. Visualization for remote operations and maintenance

- FTP for file data-transfer
- SNTP, simple network time protocol. The PLC time can be synchronized using internet-hosted time services
- SMTP, to send e-mails with attachments
- TCP and UDP sockets can be programmed for project specific protocols. Library functions are available
- IEC60870-5-104 Telecontrol, mainly used for long distances as like pipe-lines, water and waste-water. The configuration of protocols is done with the Automation Builder software suite.

#### **EtherCAT®**

EtherCAT<sup>®</sup> is an open Industrial Ethernet standard regulated in the international standards IEC 61158 and IEC 61784 as well as in ISO 15745-4. Because of its extremely high data transmission speeds, EtherCAT<sup>®</sup> is suitable as a real time Ethernet protocol for time critical applications within the area of motion control technology. Whether in "cam switch" functionalities or the most varied master/slave network configurations, AC500 delivers the right solution for your application.



## Application descriptions AC500 High Availability

### Performance is the key

Most downtime is caused by either human error or device malfunction which could be avoided with the AC500 high availability. Utilizing dual CPUs and dual distributed I/O Bus help reduce any risk of total system failure thus enhancing system availability.

If the retention of critical data and the avoidance of downtime are important to your application then ABB AC500 high availability with dedicated large data storage solution is the ideal solution.

What benefits can you expect from our AC500 high availability solution?

- Greater resource usage with no downtime in hardware/ software failure with the dual CPUs and dual communication fieldbus CS31-Bus
- Cost efficiency and easy system maintenance through the use of standard hardware
- Only standard CPUs required, choose from PM573-ETH to PM592-ETH to achieve high availability
- 3 cycles or 50 ms changeover time (no cycle synchronized Hot-Standby)
- Up to 8 additional redundant IO-Bus lines via CM574 possible (1).
- (1) available after Q2/2014.





### Application descriptions Real-time Ethernet products



### **RT-Ethernet modules**

The modules are available on two different communication protocols on Ethernet basis (PROFINET<sup>®</sup> I/O, EtherCAT<sup>®</sup>). Master couplers provide the connection of the AC500 CPUs to the remote I/O modules. Various interface modules offer the possibility to connect I/O modules decentralized to the real-time Ethernet networks.

#### **Cam-switch functionality**

Modules based on decentralized real-time EtherCAT<sup>®</sup> interface technology extended with integrated I/Os and programmed thanks to PLCopen<sup>®</sup> function blocks.



### Application descriptions MINT motion solutions – Real-time Ethernet systems

#### Advanced multi-axis machine controller

Machine control systems, requiring up to 16 axes of interpolation, can be implemented using the NextMove e100 family of motion controllers. NextMove e100 can coordinate 16 axes of interpolated motion in a single or multiple coordinate groups and command additional DSP 402 positioning drives via Powerlink, up to 24 axes in total. On-board communications include, RS232/485 (selectable), USB, CANopen<sup>®</sup> and Ethernet Powerlink or TCP/IP.

#### Mixed technology motion control

In addition to Powerlink axes, NextMove e100 supports 3 axes of analog control with incremental encoder feedback and 4 stepper axes, providing a mixed technology platform. Analog axes can be servo, vector, inverter or servo - hydraulic valves for example. Encoder inputs can be used as line-shaft inputs and all analog outputs can be used for general purpose functions.





### PLC Trainer AC500 Training packages with didactic models, software, teachware for schools and universities

# Teach IEC61131-3 programming based on CoDeSys with ABB AC500 PLCs

The ABB PLC Trainer AC500 addresses learners and students starting from the basic logic programming over motivating exercises up to Ethernet communication tasks and visualization with an integrated web server.

The included exercises range from the basic logical functions to practical samples like hot water heating using solar panels, parking bay monitoring or controlling gates with IR-remote.

Expansion possibilities like Motor or Traffic Light plug-on module and the Solar Tracking module will increase the motivation of the learners.

These training packages are built in cooperation with IKH Didactic Systems.

### PLC Trainer AC500 basic package

Description:

- 1 PLC Trainer ABB AC500 with AC500-eCo CPU
- 1 Power supply 230 V AC / 24 V DC
- 1 IR-remote control without batteries
- 45 Learning cards 110 x 81 mm laminated in transparent storage box
- Programming software and 45 practical exercises and solutions on USB stick
- 1 Programming cable.



ABB PLC trainer AC500

ABB PLC trainer AC500 with plug-on motor module

### AC500-eCo Starter kits Getting started is as easy as 1, 2, 3 More functionality and enhanced scalability

### AC500-eCo Starter kits

The AC500-eCo Starter kits help you to get familiar with ABB AC500 PLC offerings and the engineering tool within a very short time. Learn how to connect and setup the components provided in the starter kit and how to program the PLC by means of several simple example applications. All starter kits come with CPU, programming cable, digital input simulator, PS501 Control Builder Plus engineering tool and getting started handbook. The four variants differ from the CPU included – AC or DC power supply input, relay or transistor type output, with or without Ethernet interface.

#### Easy to use

The AC500-eCo from ABB is a range of uniquely scalable PLCs offering you unrivalled cost effectiveness for modern industrial automation applications. The AC500-eCo integrates perfectly into the AC500 family - this provides you with the option to build customized solutions based on the standard S500 and S500-eCo I/O range.

### Easy to learn

Offering all of the advantages you would expect from the AC500 family of devices, the AC500-eCo delivers an impressive set of powerful programming features. In addition, thanks to the fact that ABB uses a common CoDeSys-based programming system for the entire AC500 family, it is a snap to learn and configure.

### **Ordering details**

Each kit contains a CPU, programming cable, digital input simulator, PS501 full functional version without update and "Getting started" handbook.

	Programming cable (included)	Туре	Order code	Weight (1 pce)
	7 1 1 1	2 4 8 8 8	2	kg
PM564-R-AC	TK503 (USB/Serial)	TA574-A-R-AC	1SAP186200R0001	1.400
PM564-R	TK503	TA574-A-R	1SAP186200R0002	1.400
PM564-T	TK503	TA574-A-T	1SAP186200R0003	1.400
PM554-T-ETH	Ethernet	TA574-D-T-ETH	1SAP186200R0004	1.400



### Additional information Life cycle management for maximum return on investment

ABB's automation products business follows two main structures to ensure its customer's installations remain healthy:

1. ABB's product life cycle management model assures availability of services and support throughout the life cycle and a smooth transition to new technology at the end of the life cycle. 2. ABB's service offering follows a logical flow that spans the entire asset life cycle, from the moment a customer makes the first enquiry through to disposal and recycling of the product. At the heart of ABB's services is its product life cycle management model. All services and support available for ABB products are planned according to this model. Product specific life cycle plans are available for customers to help with maintenance planning and when deciding about upgrades, retrofits and replacements.

### Product life cycle management model



The life cycle management model divides a product's life cycle into four phases: active, classic, limited and obsolete. Each phase has different implications for the end user in terms of services and support provided.

In the "active" phase the end user benefits from warranty options and a full range of life cycle services, spare parts and maintenance materials. This phase ends when the volume production of a particular product ends and the "classic" phase starts. In addition to offerings available in "active" phase, end users may migrate to new technology by using upgrade and retrofit solutions providing improved performance and extension of the life cycle.

After the "classic" phase products enter the "limited" phase and end users are recommended to start planning a transfer to new technology before product support ceases.

Spare part services continue as long as components and materials are available, and throughout the course of time the use of reconditioned parts increases. A product is transferred to the "obsolete" phase when it is no longer possible to provide life cycle services within reasonable cost, or when ABB can no longer support the product technically, or the old technology is no longer available.

### Benefits of product life cycle management

Product life cycle management maximizes the value of equipment and maintenance investments by:

- Ensuring spare part and competence availability throughout the life cycle
- Enabling efficient product support & maintenance for improved reliability
- Adding functionality to the initial product by following the upgrade path
- Providing a smooth transition to new technology at the end of a product's lifecycle
- Helping the end user to decide when an upgrade, retrofit or replacement is required.

Pre-purchase

Order and delivery Installation and commissioning Operation and maintenance Upgrade and retrofit Replacement and recycling

The services offered by ABB's automation products span the entire asset lifetime, from the moment a customer makes the first enquiry to disposal and recycling of the product. Throughout the lifetime of an asset, ABB provides training, technical support and customized contracts. All of this is supported by one of the most extensive global sales and service networks.

### **Pre-purchase**

ABB provides a range of services and support that help guide the customers to the right products for their applications.

### Order and delivery

Orders can be placed through any ABB office or through ABB's channel partners. In some countries, ABB also offers a global online ordering and tracking system. ABB's sales and service network offers timely deliveries including express delivery.

### Installation and commissioning

While many customers have the resource to undertake installation and commissioning on their own, ABB and its channel partners offer professional installation and start up services.

### Operation and maintenance

From maintenance assessments, preventive maintenance and reconditioning to spare parts and repairs on-site or within its workshops, ABB has all the options covered to keep its customer's processes operational.

#### Upgrade and retrofit

ABB products can often be upgraded to the latest software or hardware to improve the performance of the application. Existing processes can be economically modernized by retrofitting the latest technology.

#### **Replacement and recycling**

ABB can advise on the best replacement products while ensuring that the products are disposed of in a way that meets all local environmental regulations.

## Additional information Approvals and certifications

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CM578-CN-XC						•		-								
CM579-ETHCAT		N.N.				•					•					
CM579-PNIO		N.N.														
CM579-PNIO-XC						•	•				•					
CM588-CN																
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DA501			•							•						
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# Additional information Approvals and certifications

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# Additional information Approvals and certifications

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A521	N.A.				•		N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.	•	
A523	N.A.						N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.		
A524	N.A.						N.A.	N.A.		N.A.	N.A.		N.A.	N.A.		N.A
A525	N.A.						N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.		N.A
A526	N.A.			NI A			N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.		N.A
A527	N.A.		N.A.	N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
A528	N.A.		N.A.	N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A
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A563-11	N.N.				-			-								
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A564-11	N.N.					-				-		-		_	_	-
A564-9	N.N.									-						
A565-11	N.N.															
A565-9	N.N.															
A566	N.N.															
A570	N.N.					•										•
A571-SIM			N.N.	N.N.	N.N.		N.N.	N.N.	N.N.	N.N.	N.N.	N.N.	N.N.	N.N.	N.N.	
B511-ETH-XC																
B521-ETH						•										
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B541-ETH																
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K501	N.A.						N.A.	N.A.		N.A.	N.A.	N.A.	N.A.			
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### Additional information AC500 website - Online tools

The www.abb.com/plc website is a mine of information on our products and documentation.



FAQ of PLC and automation products

Success stories

More info links

11

### Additional information Motion website - Online tools

The www.abbmotion.com website is a mine of information on our products and documentation.



Motion Products

Solutions

SupportMe links

### Additional information Order and delivery

#### Automation products

With more than 100 manufacturing sites in 50 countries (see image below), the Automation Products Division of ABB is able to deliver one million products per day through sales activities in more than 200 countries. ABB often gets the reaction from its customers, "Do you really do all that?",

when they take a first glance at ABB's Automation Products catalog. With a range of more than 170,000 products, ABB supplies just about every type of electronic equipment; from standard components to the latest control technology, to meet all customer's need, whether a standalone product or a completely integrated system.



O Business unit sales offices

Through its global logistics network, ABB offers genuine factory certified spare parts and related services tailored to customer's needs. A wide range of parts is available within a short time, often in 24 hours direct to site. ABB spare parts and services can be purchased from more than 1400 companies located throughout the world and is able to serve customers locally, often in their own language. These companies include ABB's own offices and authorized channel partners.

In many countries, ABB and its channel partners, stock products and spare parts locally, providing high availability and, often, same day delivery. To minimize its customer's costly downtime, ABB's logistics network, in many countries, operate 24 hours a day, seven days a week, using air freight and express courier services.





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A0523         1SAP250200R0001         4/54           A0523-XC         1SAP450200R0001         5/88           A0561         1TNE968902R1201         3/38           AX521         1SAP250100R0001         4/54           AX521         1SAP250100R0001         5/88           AX522         1SAP250000R0001         4/54           AX522-XC         1SAP460300R0001         5/88           AX561         1TNE968902R1301         3/38           CD522         1SAP260300R0001         4/56           CD522-XC         1SAP460300R0001         5/90           CI501-PNIO         1SAP220600R0001         5/90           CI502-PNIO         1SAP21300R0001         4/56           CI502-PNIO         1SAP21300R0001         5/90           CI504-PNIO-XC         1SAP421300R0001         5/90           CI504-PNIO-XC         1SAP221000R0001         4/56           CI504-PNIO-XC         1SAP221000R0001         4/56           CI512-ETHCAT         1SAP22000R0001         4/56           CI512-ETHCAT         1SAP22400R0001         5/90           CI512-CN         1SAP42400R0001         5/90           CI522-DP         1SAP22800R0001         4/56           CI520-CNXC	AI581-S	1SAP282000R0001	<b>6</b> /119
AO523-XC         1SAP450200R0001         5/88           AO561         1TNE968902R1201         3/38           AX521         1SAP250100R0001         4/54           AX521-XC         1SAP450100R0001         5/88           AX522         1SAP250000R0001         4/54           AX522         1SAP450000R0001         5/88           AX561         1TNE968902R1301         3/38           CD522         1SAP460300R0001         5/89           CI501-PNIO         1SAP20600R0001         5/90           CI502-PNIO         1SAP420700R0001         5/90           CI502-PNIO         1SAP421300R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP22100R0001         4/56           CI504-PNIO         1SAP22100R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP22100R0001         4/56           CI542-DP         1SAP22100R0001         5/90           CI542-DP         1SAP424100R0001         5/90           CI542-DP <t< td=""><td>AI581-S-XC</td><td>1SAP482000R0001</td><td><b>6</b>/120</td></t<>	AI581-S-XC	1SAP482000R0001	<b>6</b> /120
AO661         ITNE968902R1201         3/38           AX521         ISAP250100R0001         4/54           AX521-XC         ISAP450100R0001         5/88           AX522         ISAP250000R0001         5/88           AX522         ISAP450000R0001         5/88           AX561         ITNE968902R1301         3/38           CD522         ISAP260300R0001         5/89           CI501-PNIO         ISAP20600R0001         5/90           CI502-PNIO         ISAP20700R0001         5/90           CI502-PNIO         ISAP20700R0001         5/90           CI504-PNIO         ISAP21300R0001         5/90           CI504-PNIO         ISAP221300R0001         4/56           CI504-PNIO         ISAP221300R0001         4/56           CI504-PNIO         ISAP221000R0001         4/56           CI511-ETHCAT         ISAP221000R0001         4/56           CI512-ETHCAT         ISAP221000R0001         4/56           CI514-DP         ISAP221000R0001         4/56           CI542-DP-XC         ISAP424100R0001         5/90           CI541-DF         ISAP22400R0001         5/90           CI522-CN         ISAP428200R0001         5/90           CI522-CN	AO523	1SAP250200R0001	<b>4</b> /54
AX521         1SAP250100R0001         4/54           AX521-XC         1SAP450100R0001         5/88           AX522         1SAP25000R0001         4/54           AX522         1SAP450000R0001         5/88           AX561         1TNE968902R1301         3/38           CD522         1SAP260300R0001         4/55           CD522-XC         1SAP460300R0001         5/89           CI501-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP221300R0001         5/90           CI502-PNIO         1SAP221300R0001         5/90           CI504-PNIO         1SAP221300R0001         5/90           CI506-PNIO         1SAP221500R0001         4/56           CI504-PNIO-XC         1SAP421300R0001         5/90           CI504-PNIO         1SAP221000R0001         4/56           CI504-PNIO         1SAP22100R0001         4/56           CI511-ETHCAT         1SAP22100R0001         4/56           CI541-DP         1SAP22100R0001         4/56           CI542-DP         1SAP424100R0001         5/90           CI582-CN         1SAP428200R0001         4/56           CI582-CN-XC         1SAP428200R0001         5/90           CI582-CN-XC	AO523-XC	1SAP450200R0001	<b>5</b> /88
AX521-XC         ISAP450100R0001         5/88           AX522         ISAP250000R0001         4/54           AX522-XC         ISAP450000R0001         5/88           AX561         ITNE968902R1301         3/38           CD522         ISAP260300R0001         4/55           CD522-XC         ISAP460300R0001         5/89           CI501-PNIO         ISAP20600R0001         5/90           CI502-PNIO         ISAP420700R0001         5/90           CI502-PNIO         ISAP421300R0001         5/90           CI502-PNIO         ISAP421300R0001         5/90           CI504-PNIO         ISAP421300R0001         5/90           CI506-PNIO         ISAP221500R0001         4/56           CI506-PNIO         ISAP22100R0001         4/56           CI511-ETHCAT         ISAP22100R0001         4/56           CI512-ETHCAT         ISAP224100R0001         5/90           CI542-DP         ISAP424200R0001         5/90           CI542-DP         ISAP428200R0001         4/56           CI581-CN         ISAP228200R0001         5/90           CI582-CN-XC         ISAP428200R0001         5/90           CI582-CN-XC         ISAP428200R0001         5/90           CI582-C	AO561	1TNE968902R1201	<b>3</b> /38
AX522         ISAP250000R0001         4/54           AX522-XC         ISAP450000R0001         5/88           AX561         1TNE968902R1301         3/38           CD522         ISAP260300R0001         4/55           CD522-XC         ISAP460300R0001         5/89           CI501-PNIO         ISAP220600R0001         4/56           CI502-PNIO         ISAP220700R0001         4/56           CI502-PNIO         ISAP220700R0001         5/90           CI504-PNIO         ISAP221300R0001         5/90           CI504-PNIO         ISAP221300R0001         4/56           CI504-PNIO         ISAP221500R0001         4/56           CI504-PNIO         ISAP22100R0001         4/56           CI512-ETHCAT         ISAP22100R0001         4/56           CI512-ETHCAT         ISAP22100R0001         4/56           CI542-DP         ISAP224200R0001         5/90           CI542-DP         ISAP424200R0001         5/90           CI542-DP         ISAP224200R0001         5/90           CI582-CN         ISAP428200R0001         5/90           CI582-CN         ISAP428200R0001         5/90           CI590-CS31-HA         ISAP22100R0001         5/90           CI590-CS3	AX521	1SAP250100R0001	<b>4</b> /54
AX522-XC         ISAP450000R0001         5/88           AX561         ITNE968902R1301         3/38           CD522         ISAP260300R0001         4/55           CD522-XC         ISAP460300R0001         5/89           CI501-PNIO         ISAP20600R0001         4/56           CI502-PNIO         ISAP420700R0001         5/90           CI502-PNIO         ISAP421300R0001         5/90           CI502-PNIO         ISAP421300R0001         5/90           CI504-PNIO         ISAP421300R0001         5/90           CI504-PNIO         ISAP421300R0001         5/90           CI506-PNIO         ISAP221500R0001         4/56           CI504-PNIO         ISAP22100R0001         4/56           CI512-ETHCAT         ISAP221000R0001         4/56           CI542-DP         ISAP22400R0001         5/90           CI542-DP         ISAP424200R0001         5/90           CI581-CN         ISAP428100R0001         5/90           CI582-CN         ISAP428200R0001         5/90           CI590-CS31-HA         ISAP221100R0001         5/90           CI592-CS31         ISAP421200R0001         5/90           CI592-CS31-HA-XC         ISAP421200R0001         5/90           <	AX521-XC	1SAP450100R0001	<b>5</b> /88
AX561         ITNE968902R1301         3/38           CD522         1SAP260300R0001         4/55           CD522-XC         1SAP460300R0001         5/89           CI501-PNIO         1SAP220600R0001         4/56           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221000R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI542-DP         1SAP224100R0001         4/56           CI542-DP-XC         1SAP424100R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI582-CN         1SAP428100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI590-CS31-HA         1SAP22800R0001         5/90           CI590-CS31-HA-XC         ISAP428100R0001         5/90           CI592-CS31         1SAP170200R0001         4/56	AX522	1SAP250000R0001	<b>4</b> /54
CD522         1SAP260300R0001         4/55           CD522-XC         1SAP460300R0001         5/89           CI501-PNIO         1SAP220600R0001         4/56           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221300R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI542-DP         1SAP224200R0001         4/56           CI581-CN         1SAP22800R0001         5/90           CI582-CN         1SAP22800R0001         5/90           CI582-CN         1SAP22100R0001         4/56           CI590-CS31-HA         1SAP22100R0001         5/90           CI592-CS31         1SAP22100R0001         5/90           CI592-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31-HA-XC         ISAP42100R0001         5/90	AX522-XC	1SAP450000R0001	<b>5</b> /88
CD522-XC         1SAP460300R0001         5/89           CI501-PNIO         1SAP220600R0001         4/56           CI501-PNIO-XC         1SAP420600R0001         5/90           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO         1SAP420700R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221000R0001         4/56           CI511-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI542-DP         1SAP424100R0001         5/90           CI542-DP         1SAP428100R0001         4/56           CI581-CN         1SAP428100R0001         5/90           CI582-CN         1SAP42800R0001         5/90           CI582-CN-XC         1SAP42800R0001         5/90           CI592-CS31-HA         1SAP22100R0001         4/56           CI592-CS31-HA         1SAP22100R0001         4/56           CI592-CS31         ISAP421200R0001         5/90	AX561	1TNE968902R1301	<b>3</b> /38
CI501-PNIO         1SAP220600R0001         4/56           CI501-PNIO-XC         1SAP420600R0001         5/90           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO-XC         1SAP420700R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP22400R0001         4/56           CI542-DP         1SAP24200R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428200R0001         5/90           CI582-CN-XC         1SAP428200R0001         5/90           CI590-CS31-HA         1SAP22100R0001         4/56           CI590-CS31-HA         1SAP22100R0001         5/90           CI592-CS31         1SAP170200R0001         4/54           CM572-DP         1SAP170200R0001         4/54 <tr< td=""><td>CD522</td><td>1SAP260300R0001</td><td><b>4</b>/55</td></tr<>	CD522	1SAP260300R0001	<b>4</b> /55
CI501-PNIO-XC         1SAP420600R0001         5/90           CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO-XC         1SAP420700R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221500R0001         5/90           CI506-PNIO         1SAP221500R0001         5/90           CI506-PNIO-XC         1SAP421500R0001         5/90           CI511-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP22400R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI592-CS31         ISAP421200R0001         5/90           CM572-DP         ISAP170200R0001         4/54           CM572-DP-XC         ISAP370200R0001         5/88           CM572-DP-XC         ISAP170401R0201         4/54      <	CD522-XC	1SAP460300R0001	<b>5</b> /89
CI502-PNIO         1SAP220700R0001         4/56           CI502-PNIO-XC         1SAP420700R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP221500R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP224200R0001         5/90           CI581-CN         1SAP228100R0001         5/90           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI582-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI582-CN         1SAP42100R0001         5/90           CI590-CS31-HA         1SAP22100R0001         5/90           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         ISAP170200R0001         4/54           CM572-DP         SAP170401R0201         4/54	CI501-PNIO	1SAP220600R0001	4/56
CI502-PNIO-XC         1SAP420700R0001         5/90           CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO         1SAP421300R0001         5/90           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO         1SAP421500R0001         5/90           CI512-ETHCAT         1SAP220900R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP2424100R0001         5/90           CI542-DP         1SAP242400R0001         5/90           CI542-DP         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI592-CS31         1SAP221200R0001         5/90           CI592-CS31-XC         1SAP421100R0001         5/90           CI592-CS31-XC         1SAP370200R0001         4/54           CM572-DP         1SAP170401R0201         4/54           CM574-RC         1SAP370200R0001         5/88           CM574-RS         1SAP170400R0201         4/54	CI501-PNIO-XC	1SAP420600R0001	<b>5</b> /90
CI504-PNIO         1SAP221300R0001         4/56           CI504-PNIO-XC         1SAP421300R0001         5/90           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO-XC         1SAP421500R0001         5/90           CI511-ETHCAT         1SAP220900R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP224200R0001         4/56           CI542-DP         1SAP224100R0001         5/90           CI542-DP         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI592-CS31-HA         1SAP22800R0001         5/90           CI592-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31-HA         1SAP221200R0001         4/56           CI592-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31-HA-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP         1SAP170401R0201         4/54           CM574-RCOM         1SAP170400R0201         4/54 <td>CI502-PNIO</td> <td>1SAP220700R0001</td> <td>4/56</td>	CI502-PNIO	1SAP220700R0001	4/56
CI504-PNIO-XC         1SAP421300R0001         5/90           CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO-XC         1SAP421500R0001         5/90           CI511-ETHCAT         1SAP220900R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP424100R0001         5/90           CI542-DP         1SAP424200R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP22800R0001         5/90           CI592-CS31-HA         1SAP22800R0001         5/90           CI592-CS31         1SAP221100R0001         4/56           CI592-CS31         1SAP421100R0001         5/90           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP470200R0001         4/54           CM572-DP         1SAP170200R0001         4/54           CM574-RS         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0001         5/88           CM578-CN         ISAP370700R0001         5/88	CI502-PNIO-XC	1SAP420700R0001	<b>5</b> /90
CI506-PNIO         1SAP221500R0001         4/56           CI506-PNIO-XC         1SAP421500R0001         5/90           CI511-ETHCAT         1SAP220900R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI542-DP         1SAP224200R0001         4/56           CI542-DP         1SAP228100R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI581-CN         1SAP228100R0001         5/90           CI582-CN         1SAP428100R0001         5/90           CI592-CS31-HA         1SAP22800R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI592-CS31         1SAP221200R0001         5/90           CI592-CS31         1SAP421100R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170400R0201         4/54           CM574-RCOM         1SAP170400R0201         4/54           CM577-ETH         1SAP170800R0001         5/88	CI504-PNIO	1SAP221300R0001	4/56
CI506-PNIO-XC         ISAP421500R0001         5/90           CI511-ETHCAT         ISAP220900R0001         4/56           CI512-ETHCAT         ISAP221000R0001         4/56           CI512-ETHCAT         ISAP224100R0001         4/56           CI541-DP         ISAP224100R0001         5/90           CI542-DP         ISAP224200R0001         5/90           CI542-DP-XC         ISAP228100R0001         5/90           CI581-CN         ISAP228100R0001         5/90           CI582-CN         ISAP22800R0001         5/90           CI582-CN         ISAP428100R0001         5/90           CI582-CN         ISAP428200R0001         5/90           CI582-CN         ISAP428100R0001         5/90           CI582-CN-XC         ISAP428100R0001         5/90           CI582-CN         ISAP42100R0001         5/90           CI590-CS31-HA         ISAP421100R0001         5/90           CI592-CS31-XC         ISAP421200R0001         5/90           CM572-DP         ISAP170200R0001         4/54           CM572-DP-XC         ISAP370200R0001         5/88           CM574-RCM         ISAP170401R0201         4/54           CM578-CN         ISAP170400R0001         4/54	CI504-PNIO-XC	1SAP421300R0001	<b>5</b> /90
CI511-ETHCAT         1SAP220900R0001         4/56           CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         4/56           CI541-DP         1SAP2424100R0001         5/90           CI542-DP         1SAP24200R0001         4/56           CI542-DP         1SAP24200R0001         4/56           CI542-DP-XC         1SAP424200R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI581-CN-XC         1SAP428100R0001         5/90           CI582-CN         1SAP22800R0001         4/56           CI590-CS31-HA         1SAP221100R0001         5/90           CI592-CS31         1SAP221200R0001         5/90           CI592-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         ISAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM574-RS         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM578-CN         1SAP170800R0001         5/88           CM578-CN         1SAP170800R0001         4/54	CI506-PNIO	1SAP221500R0001	4/56
CI512-ETHCAT         1SAP221000R0001         4/56           CI541-DP         1SAP224100R0001         5/90           CI541-DP-XC         1SAP424100R0001         5/90           CI542-DP         1SAP224200R0001         4/56           CI542-DP-XC         1SAP424200R0001         5/90           CI542-DP-XC         1SAP424200R0001         5/90           CI581-CN         1SAP228100R0001         4/56           CI582-CN         1SAP428100R0001         5/90           CI582-CN-XC         1SAP428200R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI590-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31         1SAP221200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM572-DP-XC         1SAP170401R0201         4/54           CM574-RS         1SAP17000R0001         5/88           CM577-ETH-XC         1SAP370700R0001         4/54           CM578-CN         1SAP170800R0001         5/88           CM578-CN-XC         1SAP170902R001         4/54 <td>CI506-PNIO-XC</td> <td>1SAP421500R0001</td> <td><b>5</b>/90</td>	CI506-PNIO-XC	1SAP421500R0001	<b>5</b> /90
Cl541-DP         1SAP224100R0001         4/56           Cl541-DP-XC         1SAP424100R0001         5/90           Cl542-DP         1SAP224200R0001         4/56           Cl542-DP-XC         1SAP424200R0001         5/90           Cl581-CN         1SAP228100R0001         4/56           Cl581-CN         1SAP228100R0001         5/90           Cl582-CN         1SAP428100R0001         5/90           Cl582-CN         1SAP228200R0001         4/56           Cl590-CS31-HA         1SAP221100R0001         5/90           Cl592-CS31         1SAP221200R0001         4/56           Cl592-CS31         1SAP421200R0001         5/90           Cl592-CS31         1SAP421200R0001         5/90           CM572-DP         1SAP421200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM572-DP-XC         1SAP170401R0201         4/54           CM574-RCOM         1SAP170400R0201         4/54           CM574-RCOM         1SAP17000R0001         5/88           CM577-ETH         1SAP170800R0001         4/54           CM578-CN         1SAP170800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54	CI511-ETHCAT	1SAP220900R0001	<b>4</b> /56
Cl541-DP-XC         1SAP424100R0001         5/90           Cl542-DP         1SAP224200R0001         4/56           Cl542-DP         1SAP424200R0001         5/90           Cl542-DP-XC         1SAP424200R0001         4/56           Cl581-CN         1SAP228100R0001         4/56           Cl581-CN-XC         1SAP428100R0001         5/90           Cl582-CN         1SAP428200R0001         5/90           Cl592-CS31-HA         1SAP221100R0001         4/56           Cl592-CS31-HA         1SAP221200R0001         5/90           Cl592-CS31-HA         1SAP421200R0001         5/90           Cl592-CS31-HA         1SAP421200R0001         5/90           Cl592-CS31-HA         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP370700R0001         5/88           CM578-CN         1SAP370800R0001         5/88           CM578-CN-XC         1SAP370800R0001         5/88           CM579-PNIO         1SAP170901R0001         4/54	CI512-ETHCAT	1SAP221000R0001	<b>4</b> /56
Cl542-DP         1SAP224200R0001         4/56           Cl542-DP-XC         1SAP424200R0001         5/90           Cl581-CN         1SAP228100R0001         4/56           Cl581-CN         1SAP228100R0001         5/90           Cl581-CN-XC         1SAP228200R0001         4/56           Cl582-CN         1SAP228200R0001         5/90           Cl582-CN-XC         1SAP428200R0001         5/90           Cl590-CS31-HA         1SAP221100R0001         4/56           Cl592-CS31         1SAP221200R0001         5/90           Cl592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP         1SAP170401R0201         4/54           CM574-RCOM         1SAP170400R0201         4/54           CM577-ETH         1SAP17000R0001         4/54           CM577-ETH         1SAP17000R0001         4/54           CM578-CN         1SAP370800R0001         5/88           CM578-CN         1SAP170902R001         4/54           CM579-PNIO         1SAP170902R001         4/54           CM579-PNIO         1SAP170902R001         4/54           CM579-PNIO         1SAP170902R001         4/54 <t< td=""><td>CI541-DP</td><td>1SAP224100R0001</td><td><b>4</b>/56</td></t<>	CI541-DP	1SAP224100R0001	<b>4</b> /56
Cl542-DP-XC         1SAP424200R0001         5/90           Cl581-CN         1SAP228100R0001         4/56           Cl581-CN-XC         1SAP428100R0001         5/90           Cl582-CN         1SAP428200R0001         4/56           Cl582-CN         1SAP428200R0001         4/56           Cl582-CN-XC         1SAP428200R0001         5/90           Cl590-CS31-HA         1SAP221100R0001         4/56           Cl592-CS31         1SAP421100R0001         5/90           Cl592-CS31-XC         1SAP421200R0001         5/90           Cl592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM574-RS         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP170900R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88      <	CI541-DP-XC	1SAP424100R0001	<b>5</b> /90
CI581-CN         1SAP228100R0001         4/56           CI581-CN-XC         1SAP428100R0001         5/90           CI582-CN         1SAP228200R0001         4/56           CI582-CN         1SAP428100R0001         5/90           CI582-CN-XC         1SAP428200R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI592-CS31         1SAP421100R0001         5/90           CI592-CS31         1SAP421200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP17000R0001         4/54           CM577-ETH         1SAP17000R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP170800R0001         4/54           CM579-ETH-CAT         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88 <t< td=""><td>CI542-DP</td><td>1SAP224200R0001</td><td>4/56</td></t<>	CI542-DP	1SAP224200R0001	4/56
Cl581-CN-XC         1SAP428100R0001         5/90           Cl582-CN         1SAP228200R0001         4/56           Cl582-CN-XC         1SAP428200R0001         5/90           Cl590-CS31-HA         1SAP221100R0001         4/56           Cl590-CS31-HA         1SAP221100R0001         4/56           Cl590-CS31-HA-XC         1SAP421100R0001         5/90           Cl592-CS31         1SAP221200R0001         4/56           Cl592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170700R0001         4/54           CM577-ETH         1SAP17000R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO-XC         1SAP370901R0001         5/88	CI542-DP-XC	1SAP424200R0001	<b>5</b> /90
CI582-CN         1SAP228200R0001         4/56           CI582-CN-XC         1SAP428200R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI590-CS31-HA         1SAP421100R0001         5/90           CI590-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31         1SAP221200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP17000R0001         5/88           CM578-CN         1SAP370700R0001         5/88           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO         1SAP170800R0001         4/54           CM579-PNIO-XC         1SAP370901R0001         5/88	CI581-CN	1SAP228100R0001	4/56
CI582-CN-XC         1SAP428200R0001         5/90           CI590-CS31-HA         1SAP221100R0001         4/56           CI590-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31         1SAP221200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP         1SAP170200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM577-ETH         1SAP17000R0001         5/88           CM578-CN         1SAP370200R0001         5/88           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170800R0001         5/88           CM588-CN         1SAP372800R0001         5/88           CM588-CN-XC         1SAP372800R0001         5/88 <td>CI581-CN-XC</td> <td>1SAP428100R0001</td> <td><b>5</b>/90</td>	CI581-CN-XC	1SAP428100R0001	<b>5</b> /90
CI590-CS31-HA         1SAP221100R0001         4/56           CI590-CS31-HA-XC         1SAP421100R0001         5/90           CI592-CS31         1SAP221200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         4/54           CM574-RCOM         1SAP170401R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM578-CN         1SAP17000R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM579-ETH-XC         1SAP170800R0001         4/54           CM578-CN         1SAP170900R0001         4/54           CM578-CN-XC         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM579-PNIO-XC         1SAP370901R0001         4/54           CM588-CN         1SAP172800R0001         5/88	CI582-CN	1SAP228200R0001	4/56
Cl590-CS31-HA-XC         ISAP421100R0001         5/90           Cl592-CS31         ISAP221200R0001         4/56           Cl592-CS31-XC         ISAP421200R0001         5/90           CM572-DP         ISAP170200R0001         4/54           CM572-DP         ISAP370200R0001         4/54           CM572-DP-XC         ISAP370200R0001         5/88           CM574-RCOM         ISAP170401R0201         4/54           CM574-RS         ISAP170700R0001         4/54           CM577-ETH         ISAP170700R0001         4/54           CM578-CN         ISAP170800R0001         5/88           CM578-CN-XC         ISAP370800R0001         5/88           CM579-ETH-CAT         ISAP170902R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM578-CN         ISAP170901R0001         4/54           CM579-PNIO         ISAP170800R0001         4/54           CM578-CN         ISAP172800R0001         4/54           CM578-CN         ISAP172800R0001         5/88      <	CI582-CN-XC	1SAP428200R0001	5/90
CI592-CS31         1SAP221200R0001         4/56           CI592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM577-ETH         1SAP170400R0201         4/54           CM578-CN         1SAP170700R0001         4/54           CM578-CN         1SAP170800R0001         4/54           CM579-ETH-XC         1SAP370700R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM588-CN         1SAP370800R0001         5/88           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131		1SAP221100R0001	4/56
Cl592-CS31-XC         1SAP421200R0001         5/90           CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM578-CN         1SAP170800R0001         5/88           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM578-CN         1SAP170902R0001         4/54           CM579-PNIO         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM588-CN         1SAP370901R0001         4/54           CM588-CN-XC         1SAP372800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	CI590-CS31-HA-XC	1SAP421100R0001	5/90
CM572-DP         1SAP170200R0001         4/54           CM572-DP-XC         1SAP370200R0001         5/88           CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM578-CN         1SAP170700R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM579-ETH-XC         1SAP370800R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM588-CN         1SAP172800R0001         5/88           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	•••••••••••••••••••••••••••••••••••••••		••••••
CM572-DP-XC         ISAP370200R0001         5/88           CM574-RCOM         ISAP170401R0201         4/54           CM574-RS         ISAP170400R0201         4/54           CM577-ETH         ISAP170700R0001         4/54           CM578-CN         ISAP170800R0001         5/88           CM578-CN         ISAP170800R0001         4/54           CM578-CN-XC         ISAP370800R0001         5/88           CM579-ETH-CAT         ISAP170902R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM578-CN         ISAP170902R0001         4/54           CM579-PNIO         ISAP170901R0001         4/54           CM578-CN         ISAP370901R0001         4/54           CM578-NIC         ISAP370901R0001         5/88           CM578-NIC         ISAP372800R0001         5/88           CM588-CN         ISAP372800R0001         5/88           CP400Soft         ISBS260284R1001         7/131	CI592-CS31-XC		
CM574-RCOM         1SAP170401R0201         4/54           CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM577-ETH         1SAP370700R0001         5/88           CM578-CN         1SAP370800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP370901R0001         5/88           CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131			
CM574-RS         1SAP170400R0201         4/54           CM577-ETH         1SAP170700R0001         4/54           CM577-ETH-XC         1SAP370700R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETH-CAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM588-CN         1SAP172800R0001         5/88           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	CM572-DP-XC	1SAP370200R0001	<b>5</b> /88
CM577-ETH         1SAP170700R0001         4/54           CM577-ETH-XC         1SAP370700R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETH-CAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP370901R0001         4/54           CM588-CN         1SAP370901R0001         5/88           CM588-CN         1SAP372800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131		1SAP170401R0201	
CM577-ETH         1SAP170700R0001         4/54           CM577-ETH-XC         1SAP370700R0001         5/88           CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETH-CAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP370901R0001         4/54           CM588-CN         1SAP370901R0001         5/88           CM588-CN         1SAP372800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131	CM574-RS	1SAP170400R0201	<b>4</b> /54
CM578-CN         1SAP170800R0001         4/54           CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP170901R0001         5/88           CM588-CN         1SAP172800R0001         5/88           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	CM577-ETH	1SAP170700R0001	<b>4</b> /54
CM578-CN-XC         1SAP370800R0001         5/88           CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP370901R0001         5/88           CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131	CM577-ETH-XC	1SAP370700R0001	<b>5</b> /88
CM579-ETHCAT         1SAP170902R0001         4/54           CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO         1SAP370901R0001         5/88           CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131	CM578-CN	1SAP170800R0001	<b>4</b> /54
CM579-PNIO         1SAP170901R0001         4/54           CM579-PNIO-XC         1SAP370901R0001         5/88           CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SB260284R1001         7/131		1SAP370800R0001	<b>5</b> /88
CM579-PNIO-XC         1SAP370901R0001         5/88           CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	CM579-ETHCAT		••••••
CM588-CN         1SAP172800R0001         4/54           CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131			
CM588-CN-XC         1SAP372800R0001         5/88           CP400Soft         1SBS260284R1001         7/131	CM579-PNIO-XC		••••••
CP400Soft 1SBS260284R1001 7/131	CM588-CN		••••••
	CM588-CN-XC		
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### Notes

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