

AC500-eCo

Ordering data

Description	Communication type	Type	Order code	Weight (1 pce) kg
Option board for serial communication extension				
RS232 serial adapter isolated, 5 pole spring/cable front terminal 3.50 mm pitch	RS232 isolated	TA5141-RS232I	1SAP187300R0001	0.015
		TA5141-RS232W	1SAP187300R0201	0.015
RS485 serial adapter isolated, 5 pole spring/cable front terminal 3.50 mm pitch	RS485 isolated	TA5142-RS485I	1SAP187300R0002	0.016
		TA5142-RS485IW	1SAP187300R0202	0.016
RS485 serial adapter non-isolated, 5 pole spring/cable front terminal 3.50 mm pitch	RS485 non-isolated	TA5142-RS485	1SAP187300R0003	0.015
		TA5142-RS485W	1SAP187300R0203	0.015
CAN interface serial adapter isolated, 6 pole spring/cable front terminal 3.50 mm pitch	CAN interface isolated	TA5146-CN	1SAP187300R0005	0.016
		TA5146-CNW	1SAP187300R0205	0.016
Option board for communication address setting or real time clock				
KNX address switch option board, 1 push button	-	TA5130-KNXPB	1SAP187200R0001	0.014
		TA5130-KNXPBW	1SAP187200R0201	0.014
Real Time Clock without battery, option board for AC500-eCo Basic CPU only	-	TA5131-RTC	1SAP187200R0002	0.016

The necessary spring terminal blocks are delivered with each option board. Only ABB terminal blocks must be used with AC500-eCo V3.



TA5141-RS232I(W)



TA5142-RS485I(W)



TA5142-RS485(W)



TA5146-CN(W)



TA5130-KNXPB(W)

Description	Type	Order code	Weight (1 pce) kg
Spare parts for option boards (terminal blocks)			
TA5220-SPF5:S500, terminal block, 5 pole, spring front/cable front, pitch 3.5 mm, pack.unit: 6 piece	TA5220-SPF5	1SAP187400R0012	0.015
TA5220-SPF6:S500, terminal block, 6 pole, spring front/cable front, pitch 3.5 mm, pack.unit: 6 piece	TA5220-SPF6	1SAP187400R0013	0.019
TA5220-SPF7:S500, terminal block, 7 pole, spring front/cable front, pitch 3.5 mm, pack.unit: 6 piece	TA5220-SPF7	1SAP187400R0014	0.022
TA5220-SPF8:S500, terminal block, 8 pole, spring front/cable front, pitch 3.5 mm, pack.unit: 6 piece	TA5220-SPF8	1SAP187400R0015	0.170

Only ABB terminal blocks must be used with AC500-eCo V3.



TA5220-SPF5



TA5220-SPF6



TA5220-SPF7



TA5220-SPF8

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Ordering data

S500-eCo I/O modules

- For central extension of the AC500 or AC500-eCo CPUs
- For decentralized extension in combination with communication interface module DC551-CS31, CI52x-MODTCP, PROFINET CI50x modules, CI592-CS31, PROFIBUS modules CI54x, EtherCAT modules CI51x, 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 DI/DO/DC	Input signal	Output type	Output signal	Terminal block required		Type	Order code	Weight (1 pce) kg
				9 poles	11 poles			
8 / - / -	24 V AC / DC	-	-	1	-	DI561	1TNE968902R2101	0.113
16 / - / -	24 V AC / DC	-	-	1	1	DI562	1TNE968902R2102	0.116
8 / - / -	100-240 V AC	-	-	1	1	DI571	1TNE968902R2103	0.129
16 / - / -	100-240 V AC	-	-	1	1	DI572	1SAP230500R0000	0.135
- / 8 / -	-	Transistor	24 V DC, 0.5 A	-	1	DO561	1TNE968902R2201	0.118
- / 16 / -	-	Transistor	24 V DC, 0.5 A	1	1	DO562	1SAP230900R0000	0.160
- / 8 / -	-	Relay	24 V AC / DC, 120 / 240 V AC, 2 A	-	1	DO571	1TNE968902R2202	0.138
- / 8 / -	-	Triac	24 V AC, 100 / 240 V AC, 0.3 A	1	1	DO572	1TNE968902R2203	0.120
- / 16 / -	-	Relay	24 V DC, 120 / 240 V AC, 2 A	1	1	DO573	1SAP231300R0000	0.190
8 / 8 / -	24 V DC	Transistor	24 V DC, 0.5 A	1	1	DX561	1TNE968902R2301	0.120
8 / 8 / -	24 V AC / DC	Relay	24 V AC / DC, 120 / 240 V AC, 2 A	1	1	DX571	1TNE968902R2302	0.140
- / - / 16	24 V DC	Transistor	24 V DC, 0.5 A	1	1	DC562	1SAP231900R0000	0.150

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. The terminal blocks must be ordered separately.

AC500-eCo

Ordering data

Analog I/O

- Each channel can be configured individually
- Resolution:
 - AI561, AI568, AO561, AO562, AO568, AX561: 13 bits including sign
 - AI562, AI563, AI564, AI565: 16 bits including sign

Number of AI/AO	Input signal	Output signal	Terminal block required		Type	Order code	Weight (1 pce) kg
			9 poles	11 poles			
4 / 0	± 2.5 V, ± 5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	–	1	1	AI561	1TNE968902R1101	0.120
2 / 0	PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω , 300 Ω	–	–	1	AI562	1TNE968902R1102	0.121
4 / 0	S, T, R, E, N, K, J, Voltage range: ± 80 mV	–	1	1	AI563	1TNE968902R1103	0.123
8 / 0	S, T, R, E, N, K, J, Voltage range: ± 80 mV	–	1	1	AI564 (1)	1SAP235000R0000	0.126
4 / 0	PT100, PT1000, Ni100, Ni1000, Resistance: 150 Ω , 300 Ω , NTC sensor	–	1	1	AI565 (1)	1SAP235600R0000	0.126
8 / 0	± 2.5 V, ± 5 V, 0...5 V, 0...10 V, ± 10 V, 0...20 mA, 4...20 mA, NTC sensor	–	1	1	AI568	1SAP235200R0000	0.125
0 / 2	–	± 10 V, 0...20 mA, 4...20 mA	–	1	AO561	1TNE968902R1201	0.118
0 / 4	–	0...10 V, ± 10 V, 0...20 mA, 4...20 mA	–	1	AO562	1SAP235300R0000	0.125
0 / 8	–	0...10 V, ± 10 V, 0...20 mA, 4...20 mA	1	1	AO568	1SAP235500R0000	0.125
4 / 2	± 2.5 V, ± 5 V, 0...5 V, 0...10 V, 0...20 mA, 4...20 mA	± 10 V, 0...20 mA, 4...20 mA	1	1	AX561	1TNE968902R1301	0.122

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. The terminal blocks must be ordered separately.

(1) In preparation



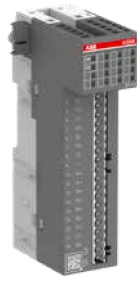
DI561



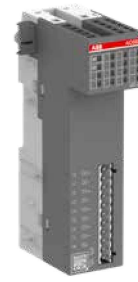
AI562



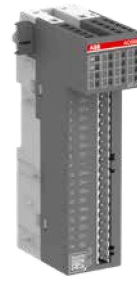
AX561



AI568



AO562



AO568

AC500-eCo

Ordering data

Strain-gauge / load-cell module

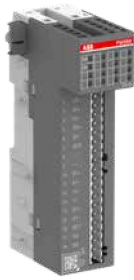
- For central extension of the AC500 V3 or AC500-eCo CPUs V3
- For decentralized extension in combination with communication interface modules CI50X-PNIO, CI51x-ETHCAT, CI52x-MODTCP, CI54x-DP or CI58X-CN.
- Provide 1 or 2 configurable analog strain gauge input channels with each 1 digital output.
- Resolution 23 bits plus sign under normal mode, 25 bits plus sign under oversampling mode.
- Module-wise galvanically isolated.

Number of AI	Input signal	Output signal	Terminal block required		Type	Order code	Weight (1 pce) kg
			9 poles	11 poles			
1	4-wire or 6-wire load-cell / strain gauge input, 24 bits including sign resolution	1 DO 24V DC, 0.25A, High side output	-	1	FM565 (1)	1SAP238000R0001	0.135
2	4-wire or 6-wire load-cell / strain gauge input, 24 bits including sign resolution	2 DO 24V DC, 0.25A, High side output	1	1	FM566 (1)	1SAP238100R0001	0.135

Terminal blocks (9 or 11 poles) are necessary for each S500-eCo I/O. The terminal blocks must be ordered separately.
 (1) In preparation



FM565



FM566

Terminal blocks for S500-eCo I/O modules

Number of poles	Connection type	Cable entry	Type	Order code	Weight (1 pce) kg
9	Screw	Side	TA563-9	1TNE968901R3101	0.018
11	Screw	Side	TA563-11	1TNE968901R3102	0.021
9	Screw	Front	TA564-9	1TNE968901R3103	0.031
11	Screw	Front	TA564-11	1TNE968901R3104	0.036
9	Spring	Front	TA565-9	1TNE968901R3105	0.018
11	Spring	Front	TA565-11	1TNE968901R3106	0.021



Only ABB terminal blocks must be used with AC500-eCo.
 Package unit for these terminal blocks = 6.



TA563-9



TA564-11



TA565-9

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Technical data

AC500-eCo V3 CPUs

Type	PM5012-T-ETH	PM5012-R-ETH	PM5032-T-ETH	PM5032-R-ETH	PM5052-T-ETH	PM5052-R-ETH	PM5072-T-2ETH(W)	PM5082-T-2ETH	PM5092-T-2ETH	
Supply voltage	24 V DC									
Current consumption on 24 V DC										
Min. typ. (module alone)	0.150 A	0.150 A	0.200 A	0.200 A	0.200 A	0.200 A	0.250 A	0.250 A	0.250 A	
Max. typ. (all I/Os)	0.150 A	0.850 A	0.900 A	0.900 A	0.900 A	0.900 A	0.950 A	0.950 A	0.950 A	
Type of processor / Processor clock frequency	TI ARM Cortex-A9 32-bit-RISC / 300 MHz							600 MHz	800 MHz	
Total RAM memory / Total Flash memory	128 MB / 128 MB									
User program memory	1 MB	1 MB	2 MB	2 MB	4 MB	4 MB	8 MB	18 MB	24 MB	
Maximum downloadable application size	1 MB	1 MB	5 MB	5 MB	7 MB	7 MB	9 MB	18 MB	24 MB	
Thereof User program code and data (dynamically allocated) (1)	256 kB	256 kB	512 kB	512 kB	768 kB	768 kB	1 MB	2 MB	3 MB	
Thereof User web server Data max.	–	–	1.5 MB	1.5 MB	3 MB	3 MB	7 MB	16 MB	21 MB	
User data memory saved in FLASH	8 kB	8 kB	32 kB	32 kB	32 kB	32 kB	100 kB	100 kB	100 kB	
Thereof VAR Retain persistent	4 kB	4 kB	16 kB	16 kB	16 kB	16 kB	36 kB	36 kB	36 kB	
Thereof % M memory (e.g. Modbus register)	4 kB	4 kB	16 kB	16 kB	16 kB	16 kB	64 kB	64 kB	64 kB	
User flash disk (Data-storage, programm access or also external with FTP)	–									
Plug-in memory card (onboard micro memory card socket)	● Depending on micro memory card used: use MC5102 preferably									
Data buffering	Flash EPROM memory									
Real-time clock (with Goldcap back-up)	Optional, use option board TA5131-RTC ●									
Cycle time for 1 instruction (minimum)										
Binary / Word / Floating-point	0.02 µs / 0.05 µs / 0.60 µs							0.01 µs / 0.01 µs / 0.01 µs		
Program execution										
Cyclical / Time controlled / multi tasking	● / ● / ●									
User program protection by password	●									
Minimum cycle time configurable for cyclical task	10 ms		5 ms		2 ms		1 ms		0.5 ms	
Min. Onboard EtherCAT Master cycle time	–	–	–	–	–	–	2 ms	1 ms		
Motion control with EtherCAT onboard							4	8	12	
Configuration limits (4): axis / 2 ms										
Performance indication example (5)	–	–	–	–	–	–	4	8	6	
Number of synchr. axis in 1 ms (5)	–	–	–	–	–	–	4	8	12	
Number of synchr. axis in 2 ms (5)	–	–	–	–	–	–	8	16	24	
Number of synchr. axis in 4 ms (5)	–	–	–	–	–	–				
Onboard digital inputs										
Channels	6 (thereof 4 high-speed 5 kHz)		12							
Functionality	up to 6 standard or		up to 12 standard or							
Fast counter	up to 2 (5kHz)		up to 4 (100 kHz)							
A/B Encoder with frequency measurement	up to 1 A/B encoder (5 kHz) without touch/reset input		up to 2 A/B encoder (200 kHz) with without Touch/Reset inputs							
Interrupt inputs with only one common interrupt task (no single task per input)	up to 4		up to 4							
Signal voltage	24 V DC		24 V DC							
Onboard digital outputs										
Channels										
Transistor	4 (thereof 4 high speed 5 kHz)	–	8 (thereof 4 high speed 200 kHz and 4 with 5 kHz)	–	8 (thereof 4 high speed 200 kHz and 4 with 5 kHz)	–	8 (thereof 4 high speed 200 kHz and 4 with 5 kHz)			
Functionality	Up to 4 standard or	–	up to 8 standard or	–	up to 8 standard or	–	up to 8 standard or			
PTO with pulse signal and direction	–	–	up to 4 (200 kHz) (3)	–	up to 4 (200 kHz) (3)	–	up to 4 (200 kHz) (3)			

(1) Memory size of V2 versus V3 CPUs is not comparable. Projects have a different and separate User Program code and Data memory calculation in Automation Builder 2.4.0 version or later. System, configuration and web server parts are not counted anymore. This results in typically about 50 % lower memory usage compared to V2, and even lower memory usage compared to V3 projects compiled in Automation Builder 2.3.0 or before. (2) Maximum downloadable application size: contains user program code, data, web server memory, infrastructure. This is the maximum size of the application which can be downloaded into a CPU with Automation Builder. This value is displayed and splitted into different categories in the resource window of AB SW. (3) Depending on hardware revision (e.g. from Rx17x) (4) PTO, encoder and virtual axis included.

(5) Depending on application complexity the available performance is limited and shared, pure EtherCAT axis may only support a lower real axis count especially at lower cycle time depending on mapped objects: Configuration limits are higher to also count for other mapped axis types (4).

AC500-eCo

Technical data

AC500-eCo V3 CPUs

Type	PM5012-T-ETH	PM5012-R-ETH	PM5032-T-ETH	PM5032-R-ETH	PM5052-T-ETH	PM5052-R-ETH	PM5072-T-2ETH(W)	PM5082-T-2ETH	PM5092-T-2ETH
PTO with CC/CCW pulse outputs	–	–	up to 2 (200 kHz)	–	up to 2 (200 kHz)	–	up to 2 (200 kHz)	–	–
PTO (SW using PWM) pulse and direction	–	–	up to 4 (200 kHz)	–	up to 4 (200 kHz)	–	up to 4 (200 kHz)	–	–
PWM	up to 4 (100 Hz)	–	up to 4 (30 kHz) and up to 4 (100 Hz)	–	up to 4 (30 kHz) and up to 4 (100 Hz)	–	up to 4 (30 kHz) and up to 4 (100 Hz)	–	–
Limit switch	up to 4	–	up to 8	–	up to 8	–	up to 8	up to 8	up to 8
Residual current at signal state 0	< 0.5 mA								
Demagnetization when switching off inductive loads	must be provided externally								
Relay	–	4	–	6	–	6	–	–	–
Functionality	–	Standard output	–	Standard output	–	Standard output	–	–	–
Rated voltage	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	24 V DC	24 V DC
Nominal current per channel	0.5 A resistive	2 A resistive	0.5 A resistive	2 A resistive	0.5 A resistive	2 A resistive	0.5 A resistive	0.5 A resistive	0.5 A resistive
Onboard digital input /output configurable channels									
Channels	–	–	2 digital in/output configurable						
As digital input used	–	–	up to 2						
Signal voltage	–	–	24 V DC						
Functionality	–	–	Standard input						
As digital output transistor used	–	–	up to 2 standard	up to 2 standard or	up to 2 standard	up to 2 standard or	up to 2 standard	up to 2 standard	up to 2 standard
PTO with pulse signal and direction	–	–	–	up to 1 (200 kHz)	–	up to 1 (200 kHz)	–	–	–
PTO with CC/CCW pulse outputs	–	–	–	up to 1 (200 kHz)	–	up to 1 (200 kHz)	–	–	–
PWM	–	–	–	up to 2 (30 kHz)	–	up to 2 (30 kHz)	–	–	–
Limit switch	–	–	–	up to 2	–	up to 2	–	–	–
Rated voltage	–	–	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Nominal current per channel	–	–	0.5 A resistive	0.5 A resistive	0.5 A resistive	0.5 A resistive	0.5 A resistive	0.5 A resistive	0.5 A resistive
Max. number of centralized inputs/outputs									
Max. number of extension modules on I/O bus	–	–	up to max. 10 (S500 and/or S500-eCo I/O modules allowed)						
Maximum size of process image variable on I/O bus		onboard I/O + option board	128 Byte input and 128 Byte output		no limit within 10 I/O modules				
Digital	inputs	only onboard 6 + 1 option board	320 + 12 + max. 2DC as 2DI + opt. boards (2)		320 + 12 + max. 2DC as 2DI + option boards				
	outputs	only onboard 4 + 1 option board	320 + 8/6 + max. 2DC as 2DO + opt. boards (2)		320 + 8/6 + max. 2DC as 2DO + option boards				
Analog	inputs	only 1 option board	max. 64 including option boards (2)		160 + option boards				
	outputs	only 1 option board	max. 64 including option boards (2)		160 + option boards				
Max. number of decentralized inputs/outputs		depends on the used standard fieldbus (1)							
Option board slots for extension		Each slot can be used for all type of existing option boards, same option board for serial interface or digital/analog I/O extension can be used on several slots per CPU							
Max. number of option board slots max.		1	2	3					
Type of option board									
KNX communication address switch		–							TA5130-KNXPB only on 1 slot
Real-time clock (with Goldcap back-up)		TA5131-RTC	–						
Serial interface		TA5141-RS232I, TA5142-RS485/TA5142-RS485I							
CAN Serial interface		TA5146-CN (3)							
Digital in/output channels		TA5101-4DI, TA5105-4DOT, TA5110-2DI2DOT							
Analog in/output channels		TA5120-2AI-UI, TA5122-2AI-TC (1), TA5123-2AI-RTD, TA5126-2AO-UI, TA5128-2AI1AO							

(1) In preparation

(2) Depending on the used S500-eCo or mostly S500 I/O module types, the maximum amount of channel can be lower than these values e.g. using DC532 with high speed counter or AI/AO523 with 16 analog channels. The limit on number of channels is then always given by the maximum size on process image variable within the maximum of 10 I/O modules.

(3) Maximum 2 TA5146-CN are supported by the AC500-eCo CPU V3.

AC500-eCo

Technical data

AC500-eCo V3 CPUs

Type	PM5012-T-ETH	PM5012-R-ETH	PM5032-T-ETH	PM5032-R-ETH	PM5052-T-ETH	PM5052-R-ETH	PM5072-T-2ETH(W)	PM5082-T-2ETH	PM5092-T-2ETH	
Internal interfaces for communication										
COMx	No onboard serial interface, only using additional option boards for serial communication TA5141-RS232I, TA5142-RS485, TA5142-RS485I									
Number of serial interface maximum	1	2	3							
RS232 isolated	● (TA5141-RS232I)									
RS485 non isolated / Isolated	● (TA5142-RS485) / ● (TA5142-RS485I)									
Connection	pluggable spring terminal block delivered with option board									
Modbus RTU Master/Slave, ASCII	●									
Ethernet	1x Ethernet Interface						2x independent Ethernet interfaces for several uses			
Ethernet connection (on the CPU itself)	1x RJ45						2x RJ45 could be used as 2-port switch with 1x interface			
Ethernet functions (1):										
Ethernet Switch on ETH1 / ETH2 with 2x separated interfaces and MAC-Address	-	-	-	-	-	-	●			
Online Access, ICMP (Ping), DHCP	●									
Nb of parallel connections	4	4					6			
IP configuration protocol	●									
UDP data exchange, Network variables	● / ●									
HTTP / HTTPs (integrated Web server)	-	●								
Nb of parallel connections (3)	-	2					4			
Web Visu for data visualisation on web server HTML5	-	●								
NTP (Time synchronization) Server / Client	● / ●									
FTP / FTPs server	-	●								
Nb of parallel connections	-	2								
SNMP (manager and agent)	-	●								
SMTP client	-	●								
Socket programming	●									
Modbus TCP Client / Server	● / ●									
CPU as client can communicate with a max. number of servers (e.g. CI52x) in parallel	8	13	20	30	40	50				
CPU as Server can simultaneously respond to a max. number of clients (e.g. SCADA) in parallel	3	8	10	15	20	25				
IEC 60870-5-104 remote control protocol - Support 2nd connection	-								●	
Nr of free tags	-								1000	
Control Station - Nb connections	-								-	
Sub-Station - Nb connections	-								5	
DNP3 outstation with security (2)	-								●	
Nr of objects	-						400	700		
Nr of master connections	-								8	
OPC UA Server (Micro Embedded Device Server) with security	-	●								
Nr of free tags	-	125	250	1000	3000	5000				
Nr of Connections	-	5					10			
min sampling rate (limit)	-	1000 ms								
OPC DA Server AE	●									
Nr of Connections	4	4					6			

(1) Using parallel protocols on the same and/or different port reduces the bandwidth and the CPU performance. Not all the limits can be achieved at the same time using all the features, it's also depending on the CPU load and the maximum memory size.

(2) Feature is licensed, runtime license per CPU.

(3) Open visualizations from Automation Builder are counted as connections, too.

AC500-eCo

Technical data

AC500-eCo V3 CPUs

Type	PM5012-T-ETH	PM5012-R-ETH	PM5032-T-ETH	PM5032-R-ETH	PM5052-T-ETH	PM5052-R-ETH	PM5072-T-2ETH(W)	PM5082-T-2ETH	PM5092-T-2ETH
Ethernet-based fieldbus protocols (2)	The number of allowed variables is depending on the protocol used								
Downloadable protocols (licensed feature with runtime license per CPU):								available on one Ethernet interface, the other interface can be sometimes used as switch	
Ethernet/IP Scanner communication			● (1)						● (1)
Ethernet/IP Adapter communication			● (1)						● (1)
Maximum allowed number of input/output variables for the onboard fieldbus protocol	-	-	0.5 kB / 0.5 kB				0.5 kB / 0.5 kB		
EtherCAT Master	-	-	-	-	-	-	● (1) (see table page 83)		
PROFINET IO Controller / Device	-	-	-	-	● / ● (1)		● / ● (1)		
IEC 61850 - MMS server Edition 1 / GOOSE communication	-	-	-	-	-	-	● / ● (1)		
Maximum number of allowed data attributes in variables list	-	-	-	-	-	-	1000		
KNX - Building communication	-	-	-	-	-	-	● (1)		
Maximum number of allowed Objects variables on the interface	-	-	-	-	-	-	1000		
BACnet-BC - Infrastructure communication	-	-	● (1)	● (1)	● (1)	● (1)	● (1)		
Maximum number of allowed Objects variables on the interface	-	-	-	-	-	-	1000		
DNP3 outstation with security	-	-	-	-	-	-	● (1)		
Nr of objects	-	-	-	-	-	-	400	700	
Nr of master connections	-	-	-	-	-	-	8		
Diagnostic and function									
RUN/STOP switch	● (Toggle switch)								
LEDs for various status display	●								
Timer/Counter	unlimited/unlimited								
Approvals	See detailed page 262 or new.abb.com/plc								

(1) Feature is licensed, runtime license per CPU.

(2) Using parallel protocols on the same and/or different port reduces the bandwidth and the CPU performance.

Not all the limits can be achieved at the same time using all the features, it's also depending on the CPU load and the maximum memory size.

AC500-eCo

Technical data

Digital I/O option board modules

Type	TA5101-4DI(W)	TA5105-4DOT(W)	TA5110-2DI2DOT(W)
Supply voltage	–	24 V DC	24 V DC
Current consumption on UP			
Max. (without load current)	–	0.002 A	0.002 A
Number of channels per module			
Digital			
inputs	4	–	2
outputs	–	4	2
Configurable as Input or Output DC	–	–	–
Relay / Transistor	–	Transistor	Transistor
Additional configuration of channels as:			
Fast Counter	no	no	no
Digital inputs			
Input signal voltage	24 V DC	–	24 V DC
Input time delay	typically 4...8 ms	–	typically 4...8 ms
Input current per channel			
At Input voltage	24 V DC	typically 5 mA	–
	5 V DC	typically 1 mA	–
	15 V DC	> 2.5 mA	–
	30 V DC	< 7 mA	–
			typically 5 mA
			typically 1 mA
			> 2.5 mA
			< 7 mA
Output current			
Nominal current per channel	–	0.5 A	0.5 A
Maximum (total current of all channels)	–	2 A	1 A
Residual current at signal state 0	–	< 0.5 mA	–
Demagnetization when switching off inductive loads	–	must be provided externally	must be provided externally
Switching frequency			
For resistive load	–	limited by CPU cycle time	limited by CPU cycle time
For inductive load	–	max. 0.5 Hz	max. 0.5 Hz
For lamp load	–	max. 11 Hz at max. 5 W	max. 11 Hz at max. 5 W
Short circuit / overload proofness	–	no	no
Overload indication (I > 0.7 A)	–	no	no
Output current limiting	–	no	no
Resistance against reverse feeding of 24 V signals	–	no	no
Contact rating			
For resistive load, max.	–	–	–
For inductive load, max.	–	–	–
For lamp load	–	–	–
Lifetime (switching cycles)			
Mechanical lifetime	–	–	–
Lifetime under load	–	–	–
Maximum cable length for connected process signals			
Cable			
shielded	500 m	–	–
unshielded	300 m	150 m	150 m
Potential isolation			
Per module	● Use a separated power supply for the process voltage UP/ZP for isolation of the channels against CPU power supply		
Between the channels			
input	per group of 4	–	per group of 2
output	–	per group of 4	per group of 2
Voltage supply for the module's logic	Internal via option board bus partly, mostly by external process supply (UP/ZP), when the supply voltage is not present, the option board doesn't function.		

AC500-eCo

Technical data

Analog I/O option board modules

Type		TA5120-2AI-UI(W)	TA5122-2AI-TC(W) (1)(2)	TA5123-2AI-RTD(W)	TA5126-2AO-UI(W)	TA5128-2AI1AO(W) (1)(2)	
Supply voltage		24 V DC					
Current consumption on UP							
Max. (without load current)		0.050 A	0.050 A	0.050 A	0.070 A	0.070 A	
Number of channels per module							
Analog	inputs	2	2	2	–	2	
	outputs	–	–	–	2	1	
Inputs, individually configurable							
0...10 V	12 bits	●	–	–	–	● (10 bits)	
0...20 mA, 4...20 mA	12 bits	●	–	–	–	● (10 bits)	
RTD	16 bits including sign	–	●	●	–	–	
Pt100	-50...+400 °C (2/3-wire)	–	–	●	–	–	
Pt1000	-50...+400 °C (2/3-wire)	–	–	●	–	–	
Ni100 / Ni1000	-50...+150 °C (2/3-wire)	–	–	●	–	–	
Resistor	0...150 Ω	–	–	●	–	–	
NTC 10K, NTC 20K	-40...+110 °C	–	–	●	–	–	
Thermocouple	Types J, K, T, N, S, E, R	–	●	–	–	–	
Resolution of temperature measurement	0.1 °C	–	–	●	–	–	
Outputs, individually configurable							
0...+10 V	12 bits	–	–	–	●	● (10 bits)	
0...20 mA	12 bits	–	–	–	●	● (10 bits)	
4...20 mA	12 bits	–	–	–	●	● (10 bits)	
Basic error at 25 °C							
Analog input		±0.3 %	±0.3 %	±0.3 %	–	±0.8 %	
Analog output		–	–	–	±0.3 %	±0.8 %	
Maximum error over full temperature range							
Analog input		±0.5 %	±0.3 %	±0.3 %	–	±1.5 %	
Analog output		–	–	–	±0.3 %	±1.5 %	
Per module		● Use a separated power supply for the process voltage UP/ZP for isolation of the channels against CPU power supply					–
Analog	inputs	per group of 2	per group of 2	per group of 2	–	–	
	outputs	–	–	–	per group of 2	–	
Voltage supply for the module's logic		Internal via option board bus partly, mostly by external process supply (UP/ZP), when the supply voltage is not present, the option board doesn't function.					

(1) In preparation

(2) Preliminary information

AC500-eCo

Technical data

Serial interface option board modules

Type	TA5141-RS232I(W)	TA5142-RS485I(W)	TA5142-RS485(W)	TA5146-CN(W)
Supply voltage	–	–	–	–
Current consumption on UP				
Max. (without load current)	–	–	–	–
Number of channels per option board module				
COMx	1	1	1	1
Nb of option board usable on an AC500-eCo V3 CPU	Up to 3 option boards can be used at a same time on a CPU according to their type			
Serial interface				
RS232 isolated	●	–	–	
RS485 isolated	–	●	–	
RS485 non isolated	–	–	●	
Switchable End Of Line termination	–	●	●	
Switchable line polarisation	–	●	●	
CAN interface isolated	–	–	–	●
Programming	–			
Modbus-RTU Master/Slave	●			
ASCII communication	●			
CAN protocol	–	–	–	CANopen Master, CAN 2A/2B, SAE J1939
Terminal block	5 pole spring/cable front terminal 3.50 mm pitch, delivered with the option board			
Maximal cable length for connected interface				
Cable shielded	Information on demand			
Potential isolation				
Per module	●	●	–	
Voltage supply for the module's logic	internal via option board bus			

AC500-eCo

Technical data

Digital S500-eCo I/O modules

Type	DI561	DI562	DI571	DI572	DO561	DO562
Supply voltage	–	–	–	–	24 V DC	24 V DC
Current consumption on UP						
Max. (without load current)	–	–	–	–	0.008 A	0.008 A
Number of channels per module						
Digital						
inputs	8	16	8 (AC)	16 (AC)	–	–
outputs	–	–	–	–	8	16
Configurable as Input or Output DC	–	–	–	–	–	–
Relay / Transistor	–	–	–	–	Transistor	Transistor
Additional configuration of channels as:						
Fast Counter	no				not applicable	
Digital inputs						
Input signal voltage	24 V AC / DC	24 V AC / DC	100-240 V AC	100-240 V AC	–	–
Input time delay	typically 8 ms	typically 8 ms	typically 15 ms / 30 ms	typically 15 ms / 30 ms	–	–
Input current per channel						
At Input voltage	24 V AC / DC	typically 5 mA	typically 5 mA	–	–	–
	5 V AC / DC	typically 1 mA	typically 1 mA	–	–	–
	14 V AC	typically 2.7 mA	typically 2.7 mA	–	–	–
	15 V DC	> 2.5 mA	> 2.5 mA	–	–	–
	27 V AC	typically 5.5 mA	typically 5.5 mA	–	–	–
	30 V DC	< 8 mA	< 8 mA	–	–	–
	40 V AC	–	–	< 3 mA	< 3 mA	–
	164 V AC	–	–	> 6 mA	> 6 mA	–
Output current						
Nominal current per channel	–	–	–	–	0.5 A	–
Maximum (total current of all channels)	–	–	–	–	4 A	8 A
Residual current at signal state 0	–	–	–	–	< 0.5 mA	–
Demagnetization when switching off inductive loads	–	–	–	–	must be provided externally	
Switching frequency						
For resistive load	–	–	–	–	limited by CPU cycle time	
For inductive load	–	–	–	–	max. 0.5 Hz	
For lamp load	–	–	–	–	max. 11 Hz at max. 5 W	
Short circuit / overload proofness	–	–	–	–	no	
Overload indication (I > 0.7 A)	–	–	–	–	no	
Output current limiting	–	–	–	–	no	
Resistance against reverse feeding of 24 V signals	–	–	–	–	no	
Contact rating						
For resistive load, max.	–	–	–	–	–	–
For inductive load, max.	–	–	–	–	–	–
For lamp load	–	–	–	–	–	–
Lifetime (switching cycles)						
Mechanical lifetime	–	–	–	–	–	–
Lifetime under load	–	–	–	–	–	–
Maximum cable length for connected process signals						
Cable	shielded	500 m			150 m	
	unshielded	300 m			–	
Potential isolation						
Per module	●	●	●	●	●	●
Between the channels	input	–	per group of 8	●	per group of 8	–
	output	–	–	–	–	–
Voltage supply for the module's logic	internal via I/O bus					
Fieldbus connection						
Suitable communication interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP					

AC500-eCo

Technical data

Digital S500-eCo I/O modules

Type	D0571	D0572	D0573
Supply voltage	24 V DC		
Current consumption on UP			
Max. (without load current)	0.050 A	–	0.050 A
Number of channels per module			
Digital			
inputs	–	–	–
outputs	8	8	16
Configurable as Input or Output DC	–	–	–
Relay / Transistor	Relay (n.o.)	Triac (AC)	Relay (n.o.)
Process voltage			
DC	24 V	–	–
Digital inputs			
Input signal voltage	–	–	–
Input time delay	–	–	–
Input 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	0.3 A	2 A
Maximum (total current of all channels)	2 x 8 A	2.4 A	max 10 A per group (20 A per module)
Residual current at signal state 0	–	1.1 mA rms at 132 V AC and 1.8 mA rms at 264 V AC	–
Demagnetization when switching off inductive loads	must be performed externally		
Switching frequency			
For resistive load	1 Hz max.	10 Hz max.	1 Hz max.
For inductive load	–	–	–
For lamp load	1 Hz max.	10 Hz max.	1 Hz max.
Short circuit / overload proofness	no		
Overload indication (I > 0.7 A)	no		
Output current limiting	no		
Resistance against reverse feeding of 24 V signals	●	–	●
Output rating for different loads			
For 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
Lifetime (switching cycles)			
Mechanical lifetime	100 000	–	100 000
Lifetime under load	100 000 at rated load	–	100 000 at rated load
Maximum cable length for connected process signals			
Cable			
shielded	500 m		
unshielded	150 m		
Potential isolation			
Per module	between outputs and logic	●	between outputs and logic
Between the channels			
input	–	–	–
output	per group of 4	●	per group of 8
Voltage supply for the module's logic	internal via I/O bus		
Fieldbus connection			
Suitable communication interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP		

AC500-eCo

Technical data

Digital S500-eCo I/O modules

Type		DX561	DX571	DC562
Supply voltage		24 V DC		
Current consumption on UP or L+				
Max. (without load current)		0.005 A	0.050 A	0.090 A
Number of channels per module				
Digital	inputs	8	8	–
	outputs	8	8	–
Configurable as Input or Output DC		–	–	16
Relays / Transistor		Transistor	Relay (n.o.)	Transistor
Process voltage				
DC		24 V	24 V	24 V
Digital inputs				
Input signal voltage		24 V DC	24 V AC / DC	24 V DC
Input time delay		typically 8 ms		typically 8 ms
Input current per channel				
At Input voltage	24 V DC	typically 5 mA	typically 5 mA	typically 5 mA
	24 V AC	–	typically 5 mA	–
	5 V AC	–	typically 1 mA	–
	5 V DC	< 1 mA	< 1 mA	typically 1 mA
	14 V AC	–	typically 2.7 mA	–
	27 V AC	–	typically 5.5 mA	–
	15 V DC	> 2.5 mA	> 2.5 mA	> 2.5 mA
	30 V DC	< 8 mA	< 6.5 mA	< 8 mA
Output current				
Nominal current per channel		0.5 A	2 A	0.5 A
Maximum (total current of all channels)		4 A	2 x 8 A	8 A
Residual current at signal state 0		< 0.5 mA	–	< 0.5 mA
Demagnetization when switching off inductive loads		must be performed externally		
Switching frequency				
For resistive load		Limited by CPU cycle time	1Hz max.	Limited by CPU cycle time
For inductive load		0.5 Hz max.	–	0.5 Hz max.
For lamp load		11 Hz max. at max. 5 W	1 Hz max.	11 Hz max. at max. 5 W
Short circuit / overload proofness		no		
Overload indication (I > 0.7 A)		no		
Output current limiting		no		
Resistance against reverse feeding of 24 V signals		no	yes	no
Output rating for different loads				
For resistive load, max.		–	2 A	–
For inductive load, max.		–	–	–
For lamp load		–	200 W at 230 V AC 30 W at 24 V DC	–
Lifetime (switching cycles)				
Mechanical lifetime		–	100 000	–
Lifetime under load		–	100 000 at rated Load DC-13 according to IEC 60947-5-1	–
Maximum cable length for connected process signals				
Cable	shielded	500 m		
	unshielded	150 m		
Potential isolation				
Per module		●	–	●
Between the channels	input	–	per group of 8	–
	output	–	per group of 4	–
Voltage supply for the module's logic		internal via I/O bus		
Fieldbus connection				
Suitable communication interface module		CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP		

AC500-eCo

Technical data

Analog S500-eCo I/O modules

Type	AI561	AI568	AO561	AO562	AO568	AX561
Supply voltage	24 V DC					
Current consumption on UP or L+						
Max. (without load current)	0.01 A	0.050 A	0.1 A	0.05 A	0.05 A	0.14 A
Number of channels per module						
Analog						
inputs	4	8	–	–	–	4
outputs	–	–	2	4	8	2
Inputs, individually configurable						
-2.5...+2.5 V	13 bits including sign	●	●	–	–	–
-5...+5 V	13 bits including sign	●	●	–	–	–
-10...+10 V	13 bits including sign	–	●	–	–	–
0...5 V	12 bits	●	●	–	–	–
0...10 V	12 bits	●	●	–	–	–
0...20 mA, 4...20 mA	12 bits	●	●	–	–	–
NTC 2-wires sensor		–	●	–	–	–
Outputs, individually configurable						
-10...+10 V	12 bits including sign	–	–	●	●	●
0...10 V		–	–	–	●	●
0...20 mA	12 bits	–	–	●	●	●
4...20 mA	12 bits	–	–	●	●	●
Potential isolation						
Per module	–	●	–	●	●	–
Fieldbus connection						
Suitable communication interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP					

AC500-eCo

Technical data

Analog S500-eCo I/O modules

Type	AI562	AI563	AI564	AI565
Supply voltage	24 V DC			
Current consumption on UP				
Max. (without load current)	0.04 A	0.1 A	0.03 A	0.03 A
Number of channels per module				
Analog				
inputs	2	4	8	4
outputs	-	-	-	-
Inputs, individually configurable				
Temperature internal reference junction	-	-	●	-
Common mode voltage	-	-	●	-
NTC 2-wires sensor	-	-	-	●
RTD	2	-	-	4
Pt100	-50...+400 °C (2/3-wire)			
-50...+400 °C (2/3-wire)	●	-	-	●
Pt1000	-50...+400 °C (2/3-wire)			
-50...+400 °C (2/3-wire)	●	-	-	●
Ni100 / Ni1000	-50...+150 °C (2/3-wire)			
-50...+150 °C (2/3-wire)	●	-	-	●
Resistor	0...150 Ω/0...300 Ω			
0...150 Ω/0...300 Ω	●	-	-	●
Thermocouple	-	4	8	-
Types J, K, T, N, S, E, R	-	●	●	-
Voltage	-80...+80 mV			
-80...+80 mV	-	●	●	-
Resolution of temperature measurement	0.1 °C			
0.1 °C	●	●	●	●
Potential isolation				
Per module	●	●	●	●
Fieldbus connection				
Suitable communication interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP			

S500-eCo I/O function modules

Type	FM565	FM566
Supply voltage	24 V DC	
Current consumption on UP		
Max. (without load current)	0.03 A	0.05 A
Number of channels per module		
Analog		
inputs	1	2
Digital		
outputs	1	2
4/6-wire bridge, Strain gauge inputs, individually configurable		
±1 mV/V...255 mV/V	24 bits including sign	
±1 mV/V...255 mV/V	●	●
Output voltage	24 V DC, Source	
Output current		
Nominal current per channel	0.25 A	
Maximum (total current of all channels)	0.25 A	0.5 A
Residual current at signal state 0	< 0.5 mA	
Demagnetization when switching off inductive loads	must be performed externally	
Potential isolation		
Per module	●	●
Fieldbus connection		
Suitable communication interface module	CI501-PNIO, CI502-PNIO, CI504-PNIO, CI506-PNIO, CI511-ETHCAT, CI512-ETHCAT, CI541-DP, CI542-DP, CI581-CN, CI582-CN, DC551-CS31, CI592-CS31, CI521-MODTCP, CI522-MODTCP	

AC500-eCo

System data

Environmental Conditions

Process and supply voltages

24 V DC	Voltage	24 V (-15 %, +20 %)
	Protection against reverse polarity	yes
100 V...240 V AC Wide Range Supply	Voltage	100...240 V (-15 %, +10 %)
	Frequency	50/60 Hz (-6 %, +4 %)
Allowed interruptions of power supply	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s, PS2
	AC supply	Interruption < 0.5 periods, time between 2 interruptions > 1 s

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

Assembly position

Horizontal	•
Vertical	•

Parameter	Value			
	PM5012-x-ETH	AI561, AI562, AI563, AO561, AX561, DI561, DI562, DI571, DI572, DO561, DO562, DO571, DO572, DO573, DX561, DX571, DC562	PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH, PM5082-T-2ETH, PM5092-T-2ETH, AI564, AI565, AI568, AO568, FM565, FM566	PM5072-T-2ETHW
			All option boards version	All option boards W version except TA5122-2AI-1AOW -40 °C ... +45 °C then derating see documentation

Temperature

Operating				
Horizontal mounting	0 °C ... +55 °C	0 °C ... +60 °C	-20 °C ... +60 °C	-40 °C ... +70 °C
Vertical mounting	0 °C ... +40 °C	0 °C ... +40 °C	-20 °C ... +40 °C	-40 °C ... +40 °C
(output load reduced to 50 % per group)				Between 60 °C ... 70 °C: I/O derating to 75 % Only 75 % of the I/O channels are allowed to be energized simultaneously, e.g., only 6 of 8 output channels.
Storage / Transport	-40 °C ... +70 °C			

Humidity

Operating / Storage	Max 95 % r. H. without condensation
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Air pressure

Operating	-1000 m ... 2000 m (1080 hPa ... 800 hPa)
Storage	<3500 m (>660 hPa)

Electromagnetic Compatibility

Radiated emission (radio disturbances)	Yes, in accordance with CISPR 16-2-3
Conducted emission (radio disturbances)	Yes, in accordance with CISPR 16-2-1, CISPR 16-1-2
Electrostatic discharge (ESD)	Yes, in accordance with IEC 61000-4-2, zone B, criterion B Electrostatic voltage in case of air discharge: 8 kV Electrostatic voltage in case of contact discharge: 6 kV

AC500-eCo

System data

Environmental Conditions

Fast transient interference voltages (burst)	Yes, in accordance with IEC 61000-4-4, zone B, criterion B Supply voltage units (DC): 2 kV Digital inputs/outputs (24 V DC): 1 kV Digital inputs/outputs (100...240 V AC): 2 kV Analog inputs/outputs: 1 kV Communication lines shielded: 1 kV I/O supply (DC-out): 1 kV
High energy transient interference voltages (surge)	Yes, in accordance with IEC 61000-4-5, zone B, criterion B Supply voltage units (DC): 1 kV CM* / 0.5 kV DM* Digital inputs/outputs (24 V DC): 1 kV CM* / 0.5 kV DM* Digital inputs/outputs (100...240 V AC): 2 kV CM* / 1 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* * CM = Common Mode, * DM = Differential Mode
Influence of radiated disturbances	Yes, in accordance with IEC 61000-4-3, zone B, criterion A Test field strength: 10 V/m
Influence of line-conducted interferences	Yes, in accordance with IEC 61000-4-6, zone B, criterion A Test voltage: 10 V
Influence of power frequency magnetic fields	Yes, in accordance with IEC 61000-4-8, zone B, criterion A 30 A/m 50 Hz 30 A/m 60 Hz

WARNING!

Risk of malfunctions and damages to persons!

Unused slots for communication modules are not protected against contact discharge. Dust and Dirt may cause contact problems and malfunctions.

I/O-Bus connectors must not be touched during operation.

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.

Environmental Tests

Storage	IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h IEC 60068-2-2 Test Bb: dry heat withstand test +70 °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., 2 cycles
Vibration resistance	IEC 61131-2 / IEC 60068-2-6: 5 Hz ... 150 Hz, 1 g (with Memory Card inserted)
Shock resistance	IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal

Mechanical Data

Wiring method	Spring terminals / Screw terminals	
Degree of protection	IP 20	
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

Main dimensions mm, inches

