PM5012, PM5032, PM5052, PM5072

Processor Module

1 Ordering data

Table 1: Processor modules for AC500-eCo V3

Part no.	Description	Product life cycle phase *)
1SAP 122 600 R0072	PM5012-T-ETH, AC500-eCo V3 processor module, programmable logic controller 1 MB, 6DI/4DO-Transistor, Ethernet, 24 V DC, option slot	Active
1SAP 122 700 R0072	PM5012-R-ETH, AC500-eCo V3 processor module, programmable logic controller 1 MB, 6DI/4DO-Relay, Ethernet, 24 V DC, option slot	Active
1SAP 123 400 R0072	PM5032-T-ETH, AC500-eCo V3 processor module, programmable logic controller 2 MB, 12DI/8DO-Transistor/2DC, Ethernet, 24 V DC, 2 option slots	Active
1SAP 123 500 R0072	PM5032-R-ETH, AC500-eCo V3 processor module, programmable logic controller 2 MB, 12DI/6DO-Relay/2DC, Ethernet, 24 V DC, 2x option slots	Active
1SAP 124 000 R0072	PM5052-T-ETH, AC500-eCo V3 processor module, programmable logic controller 4 MB, 12DI/8DO-Transistor/2DC, Ethernet, 24 V DC, 3 option slots	Active

Part no.	Description	Product life cycle phase *)
1SAP 124 100 R0072	PM5052-R-ETH, AC500-eCo V3 processor module, programmable logic controller 4 MB, 12DI/6DO-Relay/2DC, Ethernet, 24 V DC, 3 option slots	Active
1SAP 124 500 R0073	PM5072-T-2ETH, AC500-eCo V3 processor module, programmable logic controller 8 MB, 12DI/8DO-Transistor/2DC, 2x Ethernet, 24 V DC, 3 option slots	Active
1SAP 124 400 R0073	PM5072-T-2ETHW, AC500-eCo V3 processor module, programmable logic controller 8 MB, 12DI/8DO-Transistor/2DC, 2x Ethernet, 24 V DC, 3 option slots, wide temperature	Active

> *) Modules in lifecycle Classic are available from stock but not recommended for planning and commissioning of new installations.

1.1 Dimensions
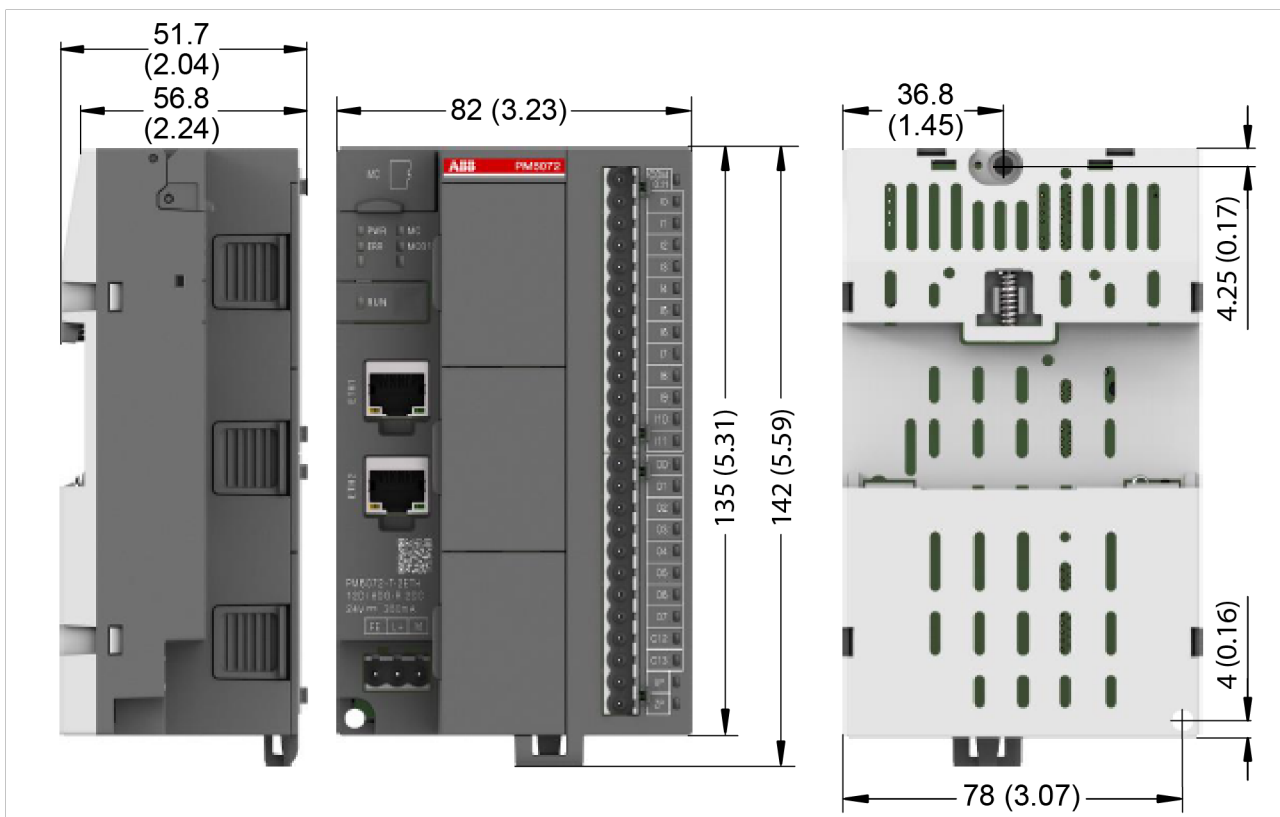
> The dimensions are in mm and in brackets in inch.

2 Technical data

The system data of AC500-eCo V3 apply ♨ *Chapter 3 "System data AC500-eCo V3" on page 6*

Only additional details are therefore documented below.

General data

Parameter	Value			
	PM5012	**PM5032**	**PM5052**	**PM5072**
Power supply	24 V DC			
Connection of power supply	Via removable 3-pin terminal			
Current consumption from power supply (max.)				
Transistor version	200 mA	340 mA	400 mA	420 mA
Relay version	200 mA	340 mA	400 mA	-
Inrush current at nominal voltage	On request			
Required fuse	On request			
Max. power dissipation within the processor module				
Transistor version	On request	On request	On request	On request
Relay version	On request	On request	On request	-
Processor module interfaces	RS485/RS232 (optional), Ethernet			
	-	I/O bus		
Weight				
Transistor version	280 g	300 g		360 g
Relay version	330 g	350 g		-
Mounting position	Horizontal or vertical			

Detailed data

Parameter	Value			
	PM5012	**PM5032**	**PM5052**	**PM5072**
Global user program memory for (PROG/DATA/WEB)	1 MB	2 MB	4 MB	8 MB
Thereof user program code / data memory dynamically allocated	256 kB	512 kB	768 kB	1 MB
Thereof user web server memory for web visualization max.	no web	1.5 MB	3.2 MB	7 MB
User data memory saved in FLASH	8 kB	32 kB		100 kB
VAR_RETAIN persistent	4 kB	16 kB		36 kB
%MB data	4 kB	16 kB		64 kB
Data buffering	FRAM memory without battery			
Real-time clock (RTC) (no battery, supercap)	Optional with TA5131-RTC	Built in		
Min. retention time for RTC / accuracy in s/day	On request	On request	On request	On request

Parameter	Value			
	PM5012	**PM5032**	**PM5052**	**PM5072**
Programming languages	● Instruction List (IL) ● Function Block Diagram (FBD) ● Ladder Diagram (LD) ● Sequential Function Chart (SFC) ● Structured Text (ST) ● Continuous Function Chart (CFC)			
Cycle time per instructions (minimum)	PM5012	PM5032	PM5052	PM5072
Binary	20 ns			
Word	50 ns			
Floating point	600 ns			
Program execution	PM5012	PM5032	PM5052	PM5072
Cyclic min. configurable	10 ms	5 ms	2 ms	1 ms
Time-controlled	Yes			
Multitasking	Yes			
Interruption	Yes			
LEDs	Power, Error, Run, MC, MOD1, States of I/Os			
RUN/STOP button	Yes			
Protection of the user program by password	On request			
Usable accessories	On request			

Data of I/Os	**PM5012-x-ETH**	**PM5032-x-ETH**	**PM5052-x-ETH**	**PM5072-T-2ETH**
Onboard digital inputs				
Channels	6 (incl. 2 counter inputs 5 kHz and 4 interrupts)	12 (incl. 4 fast counter/encoder inputs (100 kHz), 4 counter inputs (5 kHz), 4 standard inputs)		
Signal voltage	24 V DC type 1			
Onboard digital outputs				
Type of digital outputs	PM5012-T-ETH: Transistor	PM5032-T-ETH: Transistor	PM5052-T-ETH: Transistor	PM5072-T-2ETH: Transistor
	PM5012-R-ETH: Relay	PM5032-R-ETH: Relay	PM5052-R-ETH: Relay	-
Channels for transistor version	4 (5 kHz standard and PWM)	8 (incl. 4 fast outputs for standard or 4 PWM/2 PTO (100 kHz), 4 standard outputs (5 kHz))		

Data of I/Os	PM5012-x-ETH	PM5032-x-ETH	PM5052-x-ETH	PM5072-T-2ETH
Channels digital input/output configurable (valid for both PLC version relais or transistor)	-	2 Relay version: The DC channels can be used as 1 PTO/2 PWM (100 kHz) or standard digital inputs/outputs Transistor version: The DC channels can only be used as standard digital inputs/outputs		2 Transistor version: The DC channels can only be used as standard digital inputs/outputs
Rated voltage transistor	24 V DC			
Nominal current per transistor channel	0.5 A resistive			
Channels for relay version	4	6		-
Rated voltage relay	240 V AC			-
Nominal current per relay channel	2 A resistive			-
Analog inputs	Optional			
Analog outputs	Optional			
Number of option board slots	1	2	3	3
Usage of option board	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 slot per CPU. Note: RTC option board is only for PM5012 possible.			
KNX address switch	No			TA5130-KNXPB only on 1 slot
Real-time clock (RTC)	TA5131-RTC	No		
Serial interface	TA5141-RS232I, TA5142-RS485/TA5142-RS485I			
Digital in/out channels	TA5101-4DI, TA5105-4DOT, TA5110-2DI2DOT			
Analog in/out channels	TA5120-2AI-UI, TA5122-2AI-TC, TA5123-2AI-RTD, TA5126-2AO-UI			
Max. number of I/O modules on I/O bus	0	10		
Digital inputs	Onboard I/O only	128 B	1 kB	
Digital outputs		128 B	1 kB	
Number of decentralized inputs and outputs	Depending on the fieldbus used			
Internal interfaces				
Serial COMx	Optional, use a dedicated serial interface option board (up to 1)	Optional, use a dedicated serial interface option board (up to 2)	Optional, use a dedicated serial interface option board (up to 3)	

Data of I/Os	PM5012-x-ETH	PM5032-x-ETH	PM5052-x-ETH	PM5072-T-2ETH
	Modbus RTU Master/Slave, ASCII			
Ethernet interface RJ45	1			2 Independent with switch functionality
Ethernet functions	Programming, TCP/IP, UDP/IP, DHCP, PING, network variables, and other listed below			
Modbus TCP/IP client/server	Yes 8 / 3	Yes 13 / 8	Yes 20 / 10	Yes 30 / 15
SNTP client/server	No	Yes		
HTTPs and Web-Visu number of connections	No	Yes 1	Yes 2	Yes 4
FTPs number of connections	No	Yes 1	Yes 2	
OPC UA server number of free tags	No	Yes 125	Yes 250	Yes 1000
MQTT and JSON library	No	Yes		
OPC DA server	Yes			
IEC 60870-5-104 telecontrol protocol	No			Yes Substation only, 5 connections max., only 1x Ethernet supported
Licensed protocols (runtime protocol per CPU)				
BACnet IP B-BC	No			Yes (max. 1000 object variables)
KNXIP	No			Yes (max. 1000 object variables)
IEC 61850 MMS server/goose pub/sub	No			Yes (max. 1000 data attributes)
EthernetIP adapter/scanner	No	Yes (in preparation)		

3 System data AC500-eCo V3

3.1 Environmental conditions

Table 2: Process and supply voltage

Parameter	Value
Voltage	24 V (-15 %, +20 %)
Protection against reverse polarity	Yes

Parameter	Value
Allowed interruptions of power supply, according to EN 61131-2	
DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s, PS2

> **!** **NOTICE!**
> Exceeding the maximum power supply voltage (> 30 VDC) for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.

Parameter	Value			
	PM5012	PM5032	PM5052	PM5072
Temperature				
Operating				
Horizontal mounting				
Standard temperature range	0 °C...+55 °C	0 °C...+60 °C		
Wide temperature range	-			-20 °C...+70 °C
Vertical mounting (output load reduced to 50 % per group)				
Standard temperature range	0 °C...+40 °C			
Wide temperature range	-			-20 °C...+40 °C
Storage	-40 °C...+70 °C			
Transport	-40 °C...+70 °C			
Humidity	Max. 95 %, without condensation			
Air pressure				
Operating	> 800 hPa / < 2000 m			
Storage	> 660 hPa / < 3500 m			

3.2 Creepage distances and clearances

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

3.3 Insulation test voltages, routine test

According to EN 61131-2

Parameter	Value	
Relay circuit against other circuitry	1350 V	AC 2 s or
	1900 V	DC 2 s
24 V circuits against other circuitry	350 V	AC 2 s or

Parameter	Value	
	500 V	DC 2s
COM interfaces, electrically isolated	350 V	AC 2 s or
	500 V	DC 2s
Ethernet	350 V	AC 2 s or
	500 V	DC 2s

3.4 Power supply units

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

3.5 Electromagnetic compatibility

Electromagnetic Compatibility	
Device suitable for:	
Industrial applications	Yes
Domestic applications	No
Immunity against electrostatic discharge (ESD):	According to IEC 61000-4-2, zone B, criterion A
Electrostatic voltage in case of air discharge	8 kV
Electrostatic voltage in case of contact discharge	6 kV
ESD with communication connectors	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.
Immunity against the influence of radiated (CW radiated):	According to IEC 61000-4-3, zone B, criterion A
Test field strength	10 V/m
Immunity against transient interference voltages (burst):	According to IEC 61000-4-4, zone B, criterion B
Supply voltage units (DC)	2 kV
Digital inputs/outputs (24 VDC)	1 kV
Digital inputs/outputs (120 VAC...240 VAC)	Relay 2 kV
Ethernet	1 kV
Immunity against the influence of line-conducted interferences (CW conducted):	According to IEC 61000-4-6, zone B, criterion A
Test voltage	20 V pass A
High energy surges	According to IEC 61000-4-5, zone B, criterion B
Power supply DC	1 kV CM / 0.5 kV DM [1])

Electromagnetic Compatibility	
DC I/O supply	1 kV CM / 0.5 kV DM [1]
Buses, shielded	ETH
AC I/O unshielded [2]	1 kV DM [1]
I/O analog, I/O DC unshielded [2]	1 kV CM [1]
Radiation (radio disturbance)	According to IEC 55011, group 1, class A

[1] CM = Common Mode, DM = Differential Mode

[2] When DC I/O inputs are used with AC voltage, external filters limiting high energy surges to 1 kV CM / 0.5 DM are required to meet requirements according IEC 61131-2.

3.6 Mechanical data

Parameter	Value
Mounting	Horizontal
Degree of protection	IP 20 (if all terminal screws are tightened)
Housing	Classification V0 according to UL 94
Vibration resistance acc. to EN 61131-2	all three axes (DIN rail mounting) 5 Hz...8.4 Hz, continuous 3.5 mm 8.4 Hz...150 Hz, continuous 1 g
Shock test	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

3.7 Approvals and certifications

Information on approvals and certificates can be found in the corresponding chapter of the *Main catalog, PLC Automation*.