The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

Table 13: AC500-eCo processor modules with their most important properties

Processor modules	Total maximum downloadable application size	Configurable input/output	Digital inputs	Digital outputs	Power supply	Ethernet interfaces	Option board slots
Basic CPUs							
PM5012-T-ETH	1 MB thereof 256 kB for user program code and data dynamically allocated	-	6	4 (Transistor)	24 V DC	1	1
PM5012-R-ETH	1 MB thereof 256 kB for user program code and data dynamically allocated	-	6	4 (Relay)	24 V DC	1	1
Standard CPUs							
PM5032-T-ETH	5 MB thereof 512 kB for user program code and data dynamically allocated	2 (Transistor)	12	8 (Transistor)	24 V DC	1	2

Processor modules	Total maximum downloadable application size	Configurable input/output	Digital inputs	Digital outputs	Power supply	Ethernet interfaces	Option board slots
PM5082-T-2ETH	9 MB thereof 1 MB for user program code and data dynamically allocated	2 (Transistor)	12	8 (Transistor)	24 V DC	2	3
PM5092-T-2ETH	9 MB thereof 2 MB for user program code and data dynamically allocated	2 (Transistor)	12	8 (Transistor)	24 V DC	2	3

*) W = wide temperature range

5.1.1.1.1 Short description

The processor modules are the central units of the PLC.

The main characteristics of the processor modules:

- Power supply 24 V DC
- I/O bus (not for PM5012-x-ETH)
- Real-time clock (PM5012-x-ETH needs additional RTC option board)
- Option board slots for extension on the CPU (1 for PM5012-x-ETH, 2 for PM5032-x-ETH, 3 for PM5052-x-ETH and PM50x2-T-2ETH)
- 6 digital inputs (PM5012-x-ETH), 12 digital inputs (PM5032-x-ETH, PM5052-x-ETH, PM50x2-T-2ETH)
- 4 transistor outputs (PM5012-T-ETH), 8 transistor outputs (PM5032-T-ETH, PM5052-T-ETH, PM50x2-T-2ETH)
- 4 relay outputs (PM5012-R-ETH), 6 relay outputs (PM5032-R-ETH, PM5052-R-ETH)
- 2 configurable digital inputs/outputs (not for PM5012-x-ETH)

The various processor module variants differ in the following characteristics:

- Type of the digital outputs (transistor or relays)
- Ethernet interface one or two independent interfaces

All processor module variants include a micro memory card slot.

Details and technical data are provided in the technical data section *Chapter 5.1.1.1.7 “Technical data” on page 62*.

5.1.1.1.2 Assortment

Detailed data

Parameter	Value					
	PM5012	PM5032	PM5052	PM5072	PM5082	PM5092
EtherCAT Master	No			Yes max. 512 byte in / 512 byte out data for adapter		
DNP3 Outstation	NO			Yes (max. 400 tags, 8 client sessions)	Yes (max. 700 tags, 8 client sessions)	Yes (max. 700 tags, 8 client sessions)
Remarks: * Depending an application complexity the available performance is limited and shared. 1) The values are for information only and cannot be fulfilled altogether. The available resources are limited at the end by the maximal downloadable application size for each CPU.						

5.1.1.1.3 Connections and interfaces

General

I/O bus

> *The I/O bus is not available for PM5012-T-ETH and PM5012-R-ETH. I/O channel extension using option board slot only.*

The I/O bus is the I/O data bus for the I/O modules. Through this bus, I/O and diagnosis data are transferred between the processor module and the I/O modules. Up to 10 I/O modules for PM5032-x-ETH (but with a limit of 128 Bytes input/ 128 Bytes output variables) and 10 I/O modules for PM5052-x-ETH and PM50x2-T-2ETH can be added.

Option board slot interface

Depending on the processor module variants, an additional option board can be connected to the option board slot to extend the feature of the processor module.

↳ *Chapter 5.1.1.3 “Option boards” on page 92*

Serial interface

RS-232 communication interface is available by using the following option board:

- TA5141-RS232I (isolated)
  ↳ *Chapter 5.1.1.3.11 “TA5141-RS232I - Option board for COMx serial communication” on page 185*

RS-485 communication interface is available by using the following option boards:

- TA5142-RS485I (isolated)
  ↳ *Chapter 5.1.1.3.12 “TA5142-RS485I - Option board for COMx serial communication” on page 189*
- TA5142-RS485 (non isolated)
  ↳ *Chapter 5.1.1.3.13 “TA5142-RS485 - Option board for COMx serial communication” on page 197*

CAN communication interface is available by using the following option board:

- TA5146-CN (non isolated)
  ↳ *Chapter 5.1.1.3.14 “TA5146-CN - Option board for CAN communication” on page 204*

5.1.1.1.7 Technical data

The system data apply.

Chapter 4.1 “System data AC500-eCo” on page 26

Only additional details are therefore documented below.

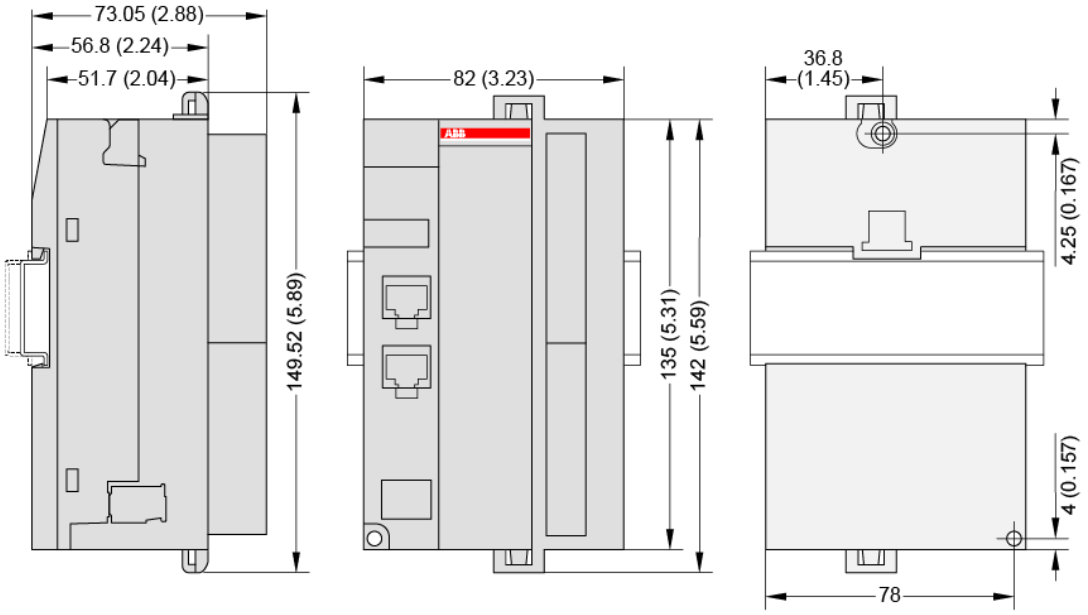
General data

Parameter		Value					
		PM5012	**PM5032**	**PM5052**	**PM5072**	**PM5082**	**PM5092**
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	420 mA	420 mA
	Relay version	200 mA	340 mA	400 mA	-	-	-
Melting integral of a fuse at 24 V DC		0.9 A^2s					
Peak inrush current from 24 V DC		65 A					
Max. power dissipation within the processor module							
	Transistor version	5.7 W	8.1 W	9.0 W	9.2 W	9.2 W	9.2 W
	Relay version	5.9 W	8.3 W	9.2 W	-	-	-
Processor module interfaces		RS485/RS232 (optional), Ethernet					
		-	I/O bus				
Weight							
	Transistor version	225 g	253 g	257 g	265 g	265 g	265 g
	Relay version	235 g	268 g	273 g	-	-	-
Mounting position		Horizontal or vertical					

Detailed data

Parameter		Value					
		PM5012	**PM5032**	**PM5052**	**PM5072**	**PM5082**	**PM5092**
DRAM memory (HW installed)		128 MB	128 MB	128 MB	128 MB	256 MB	256 MB
Total maximum downloadable application size [1]		1 MB	5 MB	7 MB	9 MB	18 MB	24 MB
	Thereof user program code / data memory dynamically allocated	256 KB	512 KB	768 KB	1 MB	2 MB	3 MB
	Thereof user web server memory for web visualization max.	no web	1.5 MB	3.2 MB	7 MB	16 MB	21 MB
Flash memory for user data							
	Flash memory EMMc (HW installed)	128 MB	128 MB	128 MB	128 MB	512 MB	512 MB

5.1.1.1.8 Dimensions



The dimensions are in mm and in brackets in inch.

5.1.1.1.9 Ordering Data

Processor modules

To enable better product availability into the production and to provide some new features, a revision 1 of the existing AC500-eCo processor modules was necessary. Processor modules with rubric R0**0**7x is replaced by compatible new processor modules revision 1 with rubric R0**1**7x. Revision 1 devices have more and improved functions and features compared to devices without revision.

For example: The processor module revision **1** PM5012-T-ETH (1SAP122 600 **R0172**) replaces the existing processor module without revision PM5012-T-ETH (1SAP 122 600 **R0072**).

Following points must be considered with the processor module revision 1:

Aspects to be considered with revision 1:

- *The processor module revision 1 (R017x) requires a new BootFW / CPUFW from V3.6.x and higher.*
- ***It cannot be downgraded** and used with lower firmware versions than V3.6.0.*
- *The processor module revision 1 (R017x) provides the same features as the processor module (R007x) existing today and is fully compatible.*
- *An existing application using a processor module (R007x) built with Automation Builder < 2.6 can run on a processor module revision 1 (R017x) but the application **must be upgraded** to at least Automation Builder 2.6.0 or higher.*

What must be done using a new processor module revision 1 (R017x)?

- On a new application?
  - Just use the processor module revision 1 (R017x)
  - Use the latest Automation Builder software from 2.6.0 or higher.
- On an existing application using an Automation Builder software version smaller than 2.6.0?
  - To use a processor module revision 1 in an existing application (e.g., replacement of the processor module), the application must be upgraded to at least Automation Builder 2.6.0 or higher.
  - If several processor module (revision 1 and revision 0) are used within the same project, all the processor modules used in the same application must be upgraded to the firmware version V3.6.x and higher.

Table 18: AC500-eCo processor modules

Part no.	Description	Product life cycle phase *)
1SAP 122 600 R0072 (processor module revision 0)	Basic CPU PM5012-T-ETH, AC500-eCo processor module, programmable logic controller 1 MB, 6DI/4DO-Transistor, Ethernet, 24 V DC, 1 option board slot	Limited (replaced by processor module revision 1)
1SAP 122 600 **R0172** (processor module revision 1)	Basic CPU PM5012-T-ETH, AC500-eCo processor module, programmable logic controller 1 MB, 6DI/4DO-Transistor, Ethernet, 24 V DC, 1 option board slot	Active
1SAP 122 700 R0072 (processor module revision 0)	Basic CPU PM5012-R-ETH, AC500-eCo processor module, programmable logic controller 1 MB, 6DI/4DO-Relay, Ethernet, 24 V DC, 1 option board slot	Limited (replaced by processor module revision 1)
1SAP 122 700 **R0172** (processor module revision 1)	Basic CPU PM5012-R-ETH, AC500-eCo processor module, programmable logic controller 1 MB, 6DI/4DO-Relay, Ethernet, 24 V DC, 1 option board slot	Active
1SAP 123 400 R0072 (processor module revision 0)	Standard CPU PM5032-T-ETH, AC500-eCo processor module, programmable logic controller 2 MB, 12DI/8DO-Transistor/2DC, Ethernet, 24 V DC, 2 option board slots	Limited (replaced by processor module revision 1)
1SAP 123 400 **R0172** (processor module revision 1)	Standard CPU PM5032-T-ETH, AC500-eCo processor module, programmable logic controller 2 MB, 12DI/8DO-Transistor/2DC, Ethernet, 24 V DC, 2 option board slots	Active
1SAP 123 500 R0072 (processor module revision 0)	Standard CPU PM5032-R-ETH, AC500-eCo processor module, programmable logic controller 2 MB, 12DI/6DO-Relay/2DC, Ethernet, 24 V DC, 2 option board slots	Limited (replaced by processor module revision 1)
1SAP 123 500 **R0172** (processor module revision 1)	Standard CPU PM5032-R-ETH, AC500-eCo processor module, programmable logic controller 2 MB, 12DI/6DO-Relay/2DC, Ethernet, 24 V DC, 2 option board slots	Active

<table>
<tr><th rowspan="2">Parameter</th><th colspan="4">Value</th></tr>
<tr><th>PM5012-T-ETH</th><th>PM5012-R-ETH</th><th>PM5032-T-ETH
PM5052-T-ETH
PM5072-T-2ETH(W)
PM5082-T-2ETH
PM5092-T-2ETH</th><th>PM5032-R-ETH
PM5052-R-ETH</th></tr>
<tr><td>Digital inputs</td><td colspan="2">6</td><td colspan="2">12</td></tr>
<tr><td>Functionality of digital inputs
(encoder, fast counter, counter, interrupt)</td><td colspan="2" rowspan="3">6 DI fast input 24 V DC (max. 5 kHz)
The digital inputs are usable as the following:
● 6 DI 24 V DC standard.
● 2 channel 5 kHz encoder with frequency measurement.
● 2 channel 5 kHz encoder with frequency measurement and with touch/reset using standard DI.
● 2 fast counter (5 kHz).
● 4 DI as interrupt input with 1 dedicated interrupt task and input information.</td><td colspan="2">4 DI fast input 24 V DC (max. 200 kHz)
The digital inputs are usable as the following:
● 4 DI 24 V DC standard.
● 4 fast counter (100 kHz).
● 2 A/B encoder (200 kHz) with frequency measurement.
● 2 full A/B encoders 0 and 1 (200 kHz) with frequency measurement and with touch/reset using standard highspeed (5 kHz) DI.
● 1 full A/B encoder 0 (200 kHz) with frequency measurement and optional with touch/reset using 2 touch/sync inputs with A/B encoder 0.</td></tr>
<tr><td colspan="2">4 DI fast input 24 V DC (5 kHz)
The digital inputs are usable as the following:
● 4 DI 24 V DC standard.
● 4 DI as interrupt input with 1 dedicated interrupt task and input information.
● 4 touch/sync inputs with A/B encoder 0 or 1.</td></tr>
<tr><td colspan="2">4 standard DI 24 V DC</td></tr>
<tr><td>Digital outputs</td><td colspan="2">4</td><td>8</td><td>6</td></tr>
</table>

Parameter	Value			
	PM5012-T-ETH	**PM5012-R-ETH**	**PM5032-T-ETH** **PM5052-T-ETH** **PM5072-T-2ETH(W)** **PM5082-T-2ETH** **PM5092-T-2ETH**	**PM5032-R-ETH** **PM5052-R-ETH**
Functionality of digital outputs	**4 fast output DO-T** 24 V DC/0.5 A (max. 5 kHz) The digital outputs are usable as the following: ● 4 DO-T 24 V DC/0.5 A. ● 4 PWM. Note: The speed must be limited below 100 Hz. The low speed PWM can be used for heating control. ● 4 limit switch.	**4 DO-R** 24 V DC / 120/240 V AC 2A in 2 groups	**4 fast output DO-T** 24 V DC (100 kHz) The digital outputs are usable as the following: ● 4 DO-T 24 V DC/0.5 A. ● 4 limit/ switch outputs for encoder/ counter. ● 4 PWM (30 kHz, 2 µs accuracy and maximum duty 95 %). ● 2 PTO (200 kHz) CW/CCW or Pulse/Direction. ● 4 PTO (PWM) 100...200 kHz Pulse/Direction using standard output.	**6 DO-R** 24 V DC / 120/240 V AC 2A in 2 groups

Parameter	Value			
	PM5012-T-ETH	**PM5012-R-ETH**	**PM5032-T-ETH** **PM5052-T-ETH** **PM5072-T-2ETH(W)** **PM5082-T-2ETH** **PM5092-T-2ETH**	**PM5032-R-ETH** **PM5052-R-ETH**
			4 fast output DO-T 24 V DC/0.5 A (5 kHz) (max. 5 kHz) The digital outputs are usable as the following: ● 4 DO-T 24 V DC/0.5 A. ● 4 limit/ switch outputs for encoder/ counter. ● 4 PWM. Note: The speed must be limited below 100 Hz. The low speed PWM can be used for heating control. ● 4 direction outputs together with 4 high speed pulses for up to 4 PTO Pulse/Direction outputs up to 200 kHz.	
Digital inputs/ outputs, configurable	-	-	2	2

Terminal	Signal	Description
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

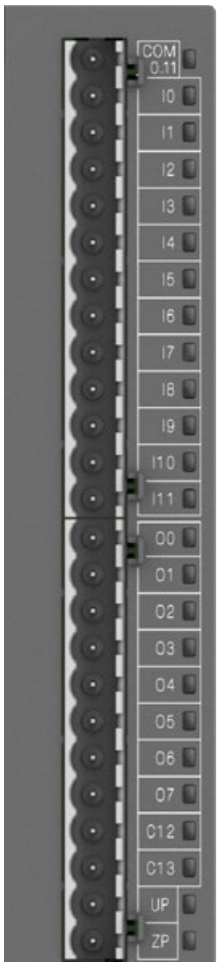


Table 22: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13

Parameter		Value
	With inductive loads	On request
Short-circuit-proof / Overload-proof		No
Overload message		No
Output current limitation		No
Resistance to feedback against 24 V DC		No
Connection of 2 outputs in parallel		Not possible
Max. cable length *)		
	Shielded	500 m
	Unshielded	150 m

*) For PWM and PTO outputs, a shielded cable must be used.

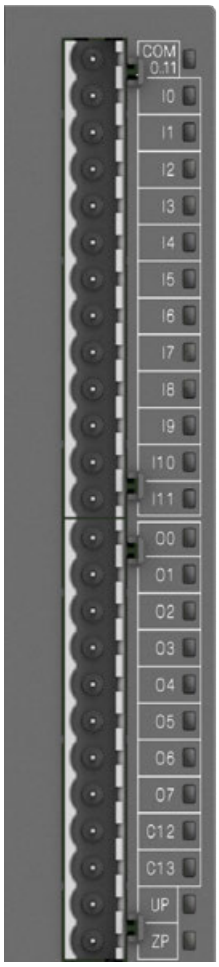


Table 30: PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETHand PM5092-T-2ETH

Parameter		Value
Number of channels per module		8
Distribution of the channels into groups		1 group of 8 channels
Galvanic isolation		Yes, per group
Connection of the channels O0 to O7		Terminals 14 to 21
Common power supply voltage		Terminals 24 (+24 V DC, signal name UP)
Reference potential for the channels O0 to O7		Terminal 25 (0 V DC, negative pole of the process voltage, signal name ZP)
Indication of the output signals		1 yellow LED per channel; the LED is on when the output signal is high (signal 1)
Way of operation		Non-latching type
Min. output voltage at signal 1		UP - 0.1 V
Output delay (max. at rated load)		
	0 to 1	On request
	1 to 0	On request
Rated protection fuse (per channel)		2 A fast
Output current		
	Rated current per channel (max.)	0.5 A at UP 24 V DC (resistance, general use and pilot duty)
	Rated current per group (max.)	4 A
	Rated current (all channels together, max.)	4 A
Max. leakage current with signal 0		0.5 mA
Demagnetization when inductive loads are switched off		Must be performed externally according to driven load specification
Switching Frequencies		
	With inductive loads	On request
Short-circuit-proof / Overload-proof		No
Overload message		No
Output current limitation		No
Resistance to feedback against 24 V DC		No