SIMATIC 505

General

Application
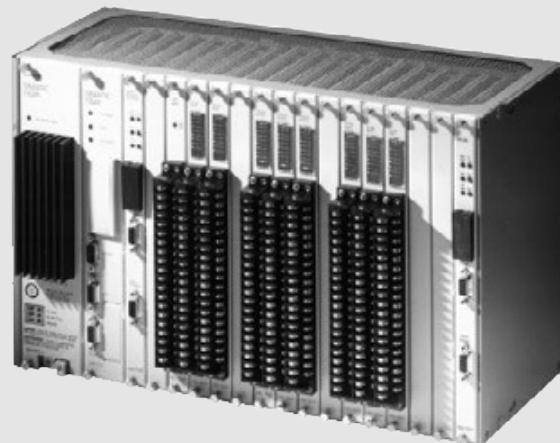
Fig. 5/1   SIMATIC 505 programmable controllers

The SIMATIC 505 programmable controllers provide a special combination of open-loop control tasks, closed-loop control tasks and complex mathematical functions for a large variety of applications in process engineering.

Design

Compactness

The SIMATIC 505 programmable controllers have an extremely compact design corresponding to the state-of-the-art of integrated circuits (ASICs). The latest design technology ensures low space requirements with high performance. System costs and space requirements decrease at the same time as system reliability increases.

Intelligent I/O modules

The SIMATIC 505 programmable controllers have different digital, analog and intelligent I/O modules as well as communications processors available. There are digital module versions with 8, 16, 32 inputs/outputs, and relay module versions with 8, 16, 32 outputs. Analog input/output modules acquire signals from thermocouples and RTD inputs. In addition, there are AT-compatible PC modules and different communications processors (for example, with RS 232 interfaces) available.

Distributed control

The SIMATIC 505 programmable controllers let you take a truly distribued approach to your plant control. First of all they are designed to meet the latest IEC safety and reliability standards to withstand the toughest industrial environments so that they can be placed wherever they are needed. Secondly, a powerful, remote I/O capability enables I/O modules and subracks to be placed as far as 1000 m/3280 ft from the controller itself, thus eliminating the need for long, multiple cable runs to remote sensors and actuators.

Design (continued)

Redundant systems

For critical process applications, the SIMATIC 560T/TI565T systems can be combined with the TI505 I/O modules to form a redundant system. The redundant design reduces any possible down time to a minimum.

Hot backup with single-channel I/O design

The hot backup system consists of a redundant configuration of the CPUs.

The active PLC and the standby PLC are each equipped with a hot backup card.

A fiber-optic connection between the active and the standby PLC executes self monitoring and synchronization of the programs up to four times per cycle.

The active PLC updates the standby PLC automatically and hands over control as soon as a serious fault occurs.

The hot backup system requires no additional programming by the user.
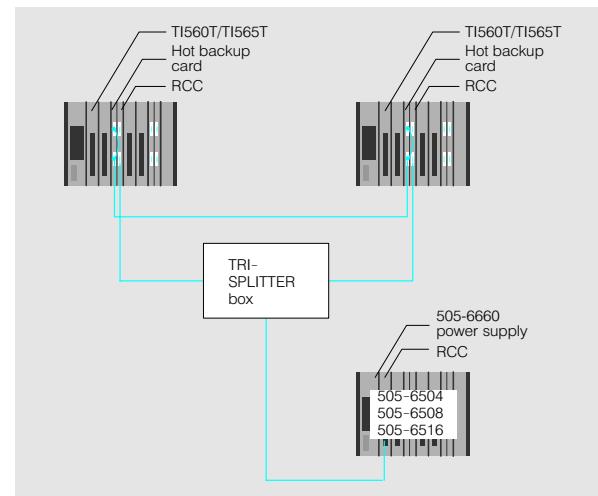
Fig. 5/2   Hot backup with single-channel I/O

It guarantees the integrity of both PLCs even during on-line program edits.

Hot backup with two-channel I/O design

The TI505 I/O system can also operate redundantly.

For this purpose, a special power supply module and the RBC (remote base controller) are installed redundantly (double) in a special redundantly designed mounting rack. The RF-RBC is an intelligent interface between the RCC (remote channel controller) and the redundant mounting rack.

The redundant mounting rack, equipped with 11 slots, contains two power supply modules (110/220 V AC or 24 V DC) and two RBCs. In addition, each redundant mounting rack has two cables so that if one line fails an automatic switch can be made to the other.
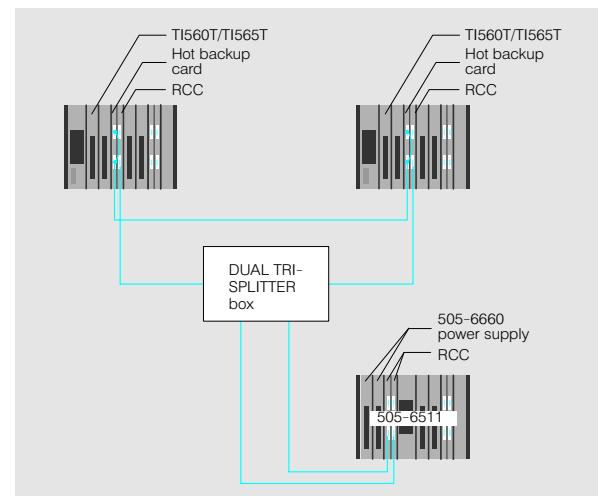

Fig. 5/3   Hot backup with two-channel I/O

In normal mode, one of the redundant RCBs is active and the other is in standby. If an fatal fault occurs in the active RCB, communications are automatically switched to the redundant standby RCB. This takes place within one PLC cycle.

SIMATIC 505
General, Ordering Data

Programming

Ease of use means different things to different people. That's why a choice of different development tools is offered.

The SIMATIC TISOFT package is available for programming the PLC. For those with previous knowledge of process automation, there is SIMATIC APT.

SIMATIC APT uses CASE (computer-aided software engineering) technology which provides for a structured approach to programming while simultaneously enabling mastery of sequential control processes and continuous closed-loop control functions.

APT ensures that the programs are well structured and documented. The data coherence check reduces programming errors to a minimum.

General technical specifications

Safety and reliability
SIMATIC 505 corresponds to the IEC 65A and DIN 41 494 standards for industrial and process control systems.

Insulation group
In accordance with IEC 801, Part 2, Paragraph 4.
Protection against static electrical discharge to 15 kV.

Temperature range
In accordance with IEC 68-2-14 NB.
Fault-free operation at temperatures fluctuating between 0 to 60 °C.

Humidity
In accordance with IEC 68-2-3 Ca.
Fault-free operation under environmental conditions up to 95% humidity at 60 °C.

Mechanical shock test
In accordance with IEC 68-2-21 EA test.
No detrimental effect in the case of non-repetitive shocks.

See Section 1 for further technical specifications

Ordering data TI525 to TI565

	Order No.		Order No.
Mounting racks		**CPUs** (continued)	
for TI505		**Firmware upgrade kit**	
4 slots	PPX:505-6504	for TI545-1101 Version 2.1.1	PPX:2601099-8005
8 slots	PPX:505-6508	for TI545-1102 Version 3.1	PPX:2601099-8006
11 slots, redundant	PPX:505-6511		
16 slots	PPX:505-6516	**TI555**	
Power supply units		8192 digital/8192 analog inputs/outputs,	
1 required per mounting rack		memory 384 KB,	PPX:555-1101
2 per redundant mounting rack		memory 1920 KB	PPX:555-1102
110/220 V AC, single	PPX:505-6660		
110/220 V AC, single or redundant	PPX:505-6660-A	**TI560T** (with power supply)	
24 V DC, single or redundant	PPX:505-6663	for twisted-pair cable	
CPUs		• 110 V AC, RS 485, RCC	PPX:560T1KM-1101
TI525	PPX:525-1102	• 24 V DC, RS 485, RCC	PPX:560T1KM-1102
Memory 10 KB,		for coaxial cable connection	
512 digital/128 analog inputs/outputs		• 110 V AC, RCC	PPX:560T4KM-1101
		• 24 V DC, RCC	PPX:560T4KM-1102
TI535			
Memory 40 KB,	PPX:535-1212	**TI565T** (with power supply)	
1024 digital/1024 analog inputs/outputs		for twisted-pair cable	
		• 110 V AC, RS 485, RCC	PPX:565T1KM-1101
		• 24 V DC, RS 485, RCC	PPX:565T1KM-1102
TI545		for coaxial cable connection	
Memory 192 KB,	PPX:545-1102	• 110 V AC, RCC	PPX:565T4KM-1101
2048 digital/1024 analog inputs/outputs, 64 controllers		• 24 V DC, RCC	PPX:565T4KM-1102
TI545			
Memory 96 KB,	PPX:545-1103		
1024 digital/1024 analog inputs/outputs, 16 controllers			

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Ordering data TI525 to TI565	Order No.		Order No.

CPUs (continued)

Programming manual for TI505
German	**PPX:505-8104D**
English	**PPX:505-8104-5**
Italian	**PPX:505-8104I**

Technical product description for TI525/TI535
English	**PPX:505-8103**

System manual for TI525, TI535
English	**PPX:505-8106**
German[1]	**PPX:505-8106D**
French[1]	**PPX:505-8106F**

Technical product description for TI545/TI555
CPU 1101
English	**PPX:545-8101-4**
German	**PPX:545-8101D**
French	**PPX:545-8101F**
Italian	**PPX:545-8101I**

System manuals for TI545/TI555
CPU 1102, English	**PPX:545-555-8101-2**
Documentation set TI545 (hardware, design, I/O programming), English	**PPX:545-8102**

Technical product description for TI545
English	**PPX:545-8103-3**
German	**PPX:545-8103-3D**
French	**PPX:545-8103-3F**
Italian	**PPX:545-8103-3I**

System manual for TI555, CPU
English	**PPX:555-8101-2**
German	**PPX:555-8101-1D**
französich	**PPX:555-8101-1F**
Italian	**PPX:555-8101-1I**

System manual for TI560T/TI565T, English **PPX:560-65-8109**

Programming manual for TI560T/TI565T
English	**PPX:560-65-8102**
German[1]	**PPX:560-65-8102D**
French[1]	**PPX:560-65-8102F**
Italian[1]	**PPX:560-65-8102I**

Product description for TI560T/TI565T
English	**PPX:560-65-8107**
French	**PPX:560-65-8107F**
Italian	**PPX:560-65-8107I**

User manual **PPX:560-65-8108**
for redundant I/O, English

Controllers

Controllers for expansion units
• I/O channel controller (IOCC) for TI535[2]	**PPX:505-6830**
• Distributed base controller (DBC) for TI535[3]	**PPX:505-6840**
• Remote channel controller (RCC), coaxial	**PPX:560-2126-B**
• Remote channel controller (RCC), RS 485 interface	**PPX:560-2127-B**
• Remote base controller (RBC), coaxial FM mode[4]	**PPX:505-6850-A**
• Remote base controller (RBC), RS 485 interface[4]	**PPX:505-6851-A**
• Remote base controller (RBC) for TI560T/565T, max. 4 km, coaxial	**PPX:500-2114-A**
• Remote base controller (RBC), for TI560T/565T, max. 1 km, RS 485	**PPX:500-5114-A**
• 505/6MT controller	**PPX:505-5190**
• 505/7MT controller	**PPX:505-7190**

Manuals
• 7 MT interface adapter	**PPX:505-8115-2**
• 6 MT interface adapter	on request

Communications modules
Peerlink module,
Point-to-point link between 2 to 16 modules, mixed link between TI500 and TI505, with manual
• for TI505, 2 redundant channels	**PPX:505-7354**
• for TI500, 1 channel	**PPX:500-5053**
• for TI500, 2 redundant channels	**PPX:500-5054**

TIWAY communications processor NIM
with manual
• 2 redundant interfaces (local line) for TI505	**PPX:505-7339**
• 2 redundant interfaces (RS232) for TI505	**PPX:505-7340**
• 2 redundant interfaces (local line) for TI500	**PPX:500-5039**
• 2 redundant interfaces (RS232) for TI500	**PPX:500-5040**

UNLINK host adapter
with manual and PIM
• 115 V AC, local line/local line TI-WAY interfaces, computer interfaces RS232C/423	**PPX:505-7111**
• 115 V AC, RS232C/RS232C TI-WAY interfaces, computer interfaces RS232C/423	**PPX:505-7112**
• 220 V AC, local line/local line TI-WAY interfaces, computer interfaces RS232C/423	**PPX:505-7113**
• 220 V AC, RS232C/RS232C TI-WAY interfaces, computer interfaces RS232C/423	**PPX:505-7114**

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1) Available in Europe only.
2) TI535: additional IOCC in basic mounting rack.
3) TI535: DBC as interface in each expansion rack.
4) RBC as interface between CPU and RCC in expansion racks for 560T/565T.

SIMATIC 505
Ordering data

Ordering data 525 to 565	Order No.		Order No.
Communications modules (continued)		**I/O modules** (continued)	
		Digital input modules (cont.)	
FIM fieldbus interface module, (with manual) Connection with USS protocol (for SIMOVERT/SIMOREG drives), Profibus link (e.g. ET 200, S5-95U, drives), connection as for expansion rack (remote base)	PPX:505-7202	• 48/24 V DC, 16 inputs	PPX:505-4316-A
		• 24 V AC, 8 inputs	PPX:505-4008-A
		• 24 V AC, 16 inputs	PPX:505-4016-A
		• 24 V AC, 32 inputs	PPX:505-4032-A
		• 110 V AC, 8 inputs	PPX:505-4208-A
		• 110 V AC, 16 inputs	PPX:505-4216-A
		• 110 V AC, 32 inputs	PPX:505-4232-A
		• 220 V AC, 8 inputs	PPX:505-4408-A
Industrial Ethernet module (NIM/Ethernet) Point-to-point link via Layer 4, connection via TF functionality Layer 7, with manual	PPX:505-CP1434TF	• 220 V AC, 16 inputs	PPX:505-4416-A
		• 220 V AC, 32 inputs	PPX:505-4432-A
		• 24 V DC isolated, 16/8 interrupt inputs	PPX:505-4317
MODBUS NIM 2 redundant interfaces, slave stations, with manual (English) and software	PPX:505-5184	• 48 V DC, isolated interrupts, 16 inputs/outputs	PPX:505-4318
		• 125 V DC, isolated interrupts, 16 inputs/outputs	PPX:505-4319
RS485 coaxial converter for connecting coaxial I/O to TI545/555/575	PPX:505-6860	• Simulation modules, 32 inputs	PPX:505-6010
		Digital output modules	
		• 24 V DC, 0.5 A, 8 source-only outputs	PPX:505-4508
TIWAY TAP Distributor terminal for bus cable	PPX:2703770-8001	• 24 V DC, 0.5 A, 8 sink-only outputs	PPX:505-3508
500 and 505 manual	PPX:500-8115	• 24 V DC, 0.5 A, 16 source-only outputs	PPX:505-4516
Manuals for TIWAY modules		• 24 V DC, 0.5 A, 16 sink-only outputs	PPX:505-3516
• TI505 user description, English	PPX:TIWAY-8124	• 24 V DC, 0.5 A, 32 source-only outputs	PPX:505-4532
• TI500 user description, English	PPX:TIWAY-8110		
• TI500 technical description, English	PPX:TIWAY-8119	• 24 V DC, 0.5 A, 32 sink-only outputs	PPX:505-3532
Manuals for UNILINK host adapter		• 24 V DC, 2 A, 8 source-only outputs	PPX:505-4708
• Installation manual, English	PPX:TIWAY-8106	• 24 V DC, 2 A, 8 sink-only outputs	PPX:505-3708
• User manual, English	PPX:TIWAY-8121		
• TIWAY system, English	PPX:TIWAY-8101	• 24 V DC, 2 A, 16 source-only outputs	PPX:505-4716
User for FIM,		• 24 V DC, 2 A, 16 sink-only outputs	PPX:505-3716
German	PPX:505-8124-2D		
English	PPX:505-8124-3	• 24 V DC, 2 A, 32 source-only outputs	PPX:505-4732
French	PPX:505-8124-2F		
Italian	PPX:505-8124-2I	• 24 V DC, 2 A, 32 sink-only outputs	PPX:505-3732
User for Industrial Ethernet,		• 115 V AC/DC, 4 A, 16 relay outputs	PPX:505-5417
German	PPX:505-8126-1D	• 24/110 V AC, 0.5 A, 8 outputs	PPX:505-4608
English	PPX:505-8126-2	• 24/110 V AC, 0.5 A, 16 outputs	PPX:505-4616
French	PPX:505-8126-1F	• 24/110 V AC, 0.5 A, 32 outputs	PPX:505-4632
Italian	PPX:505-8126-1I	• 110/220 V AC, 1 A, 8 outputs	PPX:505-4808
MODBUS NIM, English	PPX:505-8122-1	• 110/220 V AC, 1 A, 16 outputs	PPX:505-4816
I/O modules		• 110/220 V AC, 1 A, 32 outputs	PPX:505-4832
Digital input modules		• 220 V AC, 24 V DC, 2 A, 8 relay outputs	PPX:505-4908
• 4 to 15 V DC, 8-point source/sink inputs	PPX:505-4108	• 220 V AC, 24 V DC, 2 A, 16 relay outputs	PPX:505-4916-A
• 4 to 15 V DC, 16-point source/sink inputs	PPX:505-4116	• 220 V AC, 24 V DC, 2 A, 32 relay outputs	PPX:505-4932
• 4 to 15 V DC, 32-point source/sink inputs	PPX:505-4132	• 220 V AC, 24 V DC, 5 A/3 A, 16 relay outputs	PPX:505-5518
• 24 V DC, 8-point source/sink inputs	PPX:505-4308	• Simulation modules, 32 outputs	PPX:505-6011
• 24 V DC, 32-point source/sink inputs	PPX:505-4332		

Ordering data 525 to 565	Order No.		Order No.
I/O modules (continued)		**Special modules** (continued)	
Analog input module	PPX:505-6108-A	**Manual for counter module**	
8-channel, 12 bits (0-5 V DC/± 5V)		with 2 counters, English	PPX:505-8113-2
		with 6 counters, English	PPX:505-8127-1
Analog output module	PPX:505-6208-A	**Basic module**	PPX:505-7101
8-channel, 12 bits (0-10 V DC/0-20 mA)		2 (RS232C/423) interfaces, memory 28 KB, transmission rate 110-19200 bps	
Analog input/output modules		**Backup battery for basic module**	PPX:2587678-8010
• 8x15 bit input/4x12 bit output (mixed ranges)	PPX:505-7012		
• 8x13 bit input/4x12 bit high-speed output (mixed ranges)	PPX:505-7016	**EEPROM for basic program**	PPX:2587681-8028
Parallel input/output modules		**Manual**	PPX:505-8101-2
• 8-channel, multiplex TTL, 16-bit word inputs	PPX:505-6308	(supplied with module)	
• 8-channel, multiplex TTL, 16-bit word inputs	PPX:505-6408	**386/ATM module**	PPX:505-ATM-4120
User manual for digital I/O modules	PPX:505-8105-2	with CPU 30C286SX, RAM 4 MB, hard disk 120 MB, clock frequency 8 or 16 MHz, MS-DOS manual (English) and software	
Manual for 505-4317 interrupt module	PPX:505-8123-1	**Manual**	PPX:505-ATM-MANL-3
Manual for analog I/O		(supplied with module)	
English	PPX:505-8110-2	**Turbo plastic module**	PPX:505-5100
German	PPX:505-8110-2D	5 analog inputs	
French	PPX:505-8110-2F	0 to +5/0 to +10V DC	
Italian	PPX:505-8110-2I	4 analog outputs, −10 to +10 V DC	
Special modules		4 digital outputs, 15 to 24 V DC	
Thermocouple/RTD modules		**Turbo parison module**	PPX:505-5103
(with manual)		4 digital inputs/5 analog inputs	
• 8 inputs, -50 to +50 mV, thermo-couples	PPX:505-7028	4 digital inputs/4 analog inputs	
• 8 inputs, -50 to +50 mV, RTD	PPX:505-7038	**Hot backup system**	
• Calibration connector for RTD module	PPX:2587705-8009	**560T hot backup system**	
		with 560/565T hot backup card, upgrade kit (PPX:560-2129-A) and:	
User manual for thermocouple module		• 2 560T CPU	PPX:560H1KM-1101
English	PPX:505-8111-3	(PPX:560T1KM-1101)	
German	PPX:505-8111-2D	• 2 560T CPU	PPX:560H1KM-1102
French	PPX:505-8111-2F	(PPX:560T1KM-1102)	
Italian	PPX:505-8111-2I	• 2 560T CPU	PPX:560H4KM-1101
User manual for RTD module		(PPX:560T4KM-1101)	
English	PPX:505-8114	• 2 560T CPU	PPX:560H4KM-1102
German	PPX:505-8114-2D	(PPX:560T4KM-1102)	
French	PPX:505-8114-2F	• 2 565T CPU	PPX:565H1KM-1101
Italian	PPX:505-8114-2I	(PPX:565T1KM-1101)	
High-speed counter and encoding module	PPX:505-7002	• 2 565T CPU	PPX:565H1KM-1102
2 counters, 4 inputs,		(PPX:565T1KM-1102)	
4 outputs, counter speed 50 kHz,		• 2 565T CPU	PPX:565H4KM-1101
5 to 24 V DC,		(PPX:565T4KM-1101)	
with manual		• 2 565T CPU	PPX:565H4KM-1102
		(PPX:565T4KM-1102)	
High-speed counter and encoding module	PPX:505-7003	**Manuals**	
6 counters, 8 inputs,		• Hot backup installation instructions, English	PPX:560-65-8103-2
8 outputs, counter speed 100 kHz, 5 to 24 V DC,		• TI505 redundant I/O, English	PPX:505-8125-2
with manual			

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SIMATIC 505
Ordering data

Ordering data 525 to 565	Order No.		Order No.
Spares for TI525 to TI555		**Spares for 525 to 555** (continued)	
• Connector: Side access (qty 1)	**PPX:2587705-8010**	**Fuses**	
• Connector: Front access (qty 1)	**PPX:2587705-8011**	• Set, 3 A/125 V, pack of 5, for 505-45xx	**PPX:2587679-8012**
• dummy plate (pack of 5)	**PPX:2587705-8003**		
• Fuse holder for power supply (pack of 4)	**PPX:2587704-8001**	• Set, 3 A/250 V, pack of 5, for 505-48xx	**PPX:2587679-8013**
• Screws for dummy plate (pack of 10)	**PPX:2587705-8001**	• Set, 3 A/250 V, pack of 5, for 505-46xx	**PPX:2587679-8014**
• 505 RTD calibration connector	**PPX:2587705-8009**	• Set, 3 A/250 V, pack of 5, for 505-6660	**PPX:2587679-8015**
• EEPROM			
for 525/535	**PPX:2587681-8020**	**Spares for TI560/565**	
for 545/555, 128 KB	**PPX:2587681-8022**	• 560T digital CPU	**PPX:560-2820**
for 555, 256 KB	**PPX:2587681-8031**	• 565T special function CPU	**PPX:565-2820**
• EPROM		• 560T/565T power supply module, 110/220 V AC	**PPX:560-2122**
for 525/535	**PPX:2587681-8012**		
for CPU 545/555, 128 KB	on request	• 560T/565T power supply module, 24 V DC	**PPX:560-2123**
for 555, 256 KB	**PPX:2587681-8030**	• Remote channel controller (RCC) (FM)	**PPX:560-2126-B**
• Backup battery for 525/535/545/650T/656T	**PPX:2587678-8005**	• Remote channel controller (RCC) (RS 485)	**PPX:560-2127-B**
• Programming cable for 545	**PPX:2601094-8001**	• Hot backup card	**PPX:560-2128-A**
• Memory expansion for 545-1101, 256 KB	**PPX:545-1111**	• Hot backup upgrade kit (2 modules + cable)	**PPX:560-2129-A**
• Relay, 5 A, pack of 5	**PPX:2587704-8002**	• Memory expansion module 64 K words	**PPX:560-2130**
		• Memory expansion module 256 K words	**PPX:560-2136**
		• Distributor box for 565T hot backup, tri splitter	**PPX:2587755-8001**
		• Fiber- optic cable for 565 HBU	**PPX:2587693-8010**

Ordering data 575	Order No.		Order No.
575 CPU 832 KB	**PPX:575-2103**	**Accessories**	
		• Connecting cable with RS232 interface (for connecting programming devices)	**PPX:VPU200-3605**
System manual for 575	**PPX:575-8101-4**		
575 user manual	**PPX:575-8104-1**	• dummy plate 1" for 575-2124 (9 slots)	**PPX:2589739-8003**
Power supply modules (VME)		• dummy plate 0.2" for 575-2124 (9 slots) or for 575-2128 (14 slots)	**PPX:2589739-8004**
• 115 V AC, 185 watts	**PPX:575-6660**		
• 115/230 V AC, 300 watts	**PPX:575-6663**	• dummy plate 0.4" for 575-2124 (9 slots) or for 575-2128 (14 slots)	**PPX:2589739-8005**
Interface for expansion unit (RCC) Plug-in card in CPU 575	**PPX:575-2126**	• dummy plate 0.6" for 575-2130 (16 slots)	**PPX:2589739-8014**
Digital input module (VME) with 32 inputs, 110 V AC	**PPX:575-4232**	• dummy plate 0.8" for 575-2130 (16 slots)	**PPX:2589739-8015**
Digital output module (VME) with 16 outputs, 110 V AC	**PPX:575-4616**	• Mounting rail for 575-2124 (9 slots)	**PPX:2589739-8001**
Digital input/output module (VME) with 16 I/O, 24 V DC	**PPX:575-4366**	• Mounting rail for 575-2128 (14 slots)	**PPX:2589739-8002**
		• Mounting rail for 575-2130 (16 slots)	**PPX:2589739-8016**
Mounting rack (VME) 1.0"		• Ventilator set for 575-2130, 115/230 V AC	**PPX:575-2131**
• with 9 slots	**PPX:575-2124**		
• with 14 slots	**PPX:575-2128**	• J2 backplane bus connector for power supply, 1 slot for all devices (optional)	**PPX:2589739-8012**
• with 16 slots	**PPX:575-2130**		
Coprocessor (optional, Motorola 68882)	**PPX:2589739-8010**	• Daisy chain bridging connector for 575-2124 or for 575-2128	**PPX:2589739-8011**
		• Spare I/O connector	**PPX:2589739-8007**
		• Spare battery, 4 V, 5 Ah	**PPX:2589739-8006**
		• Spare fuse for 575-6660, 8 A	**PPX:2589739-8008**