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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 distributed 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.

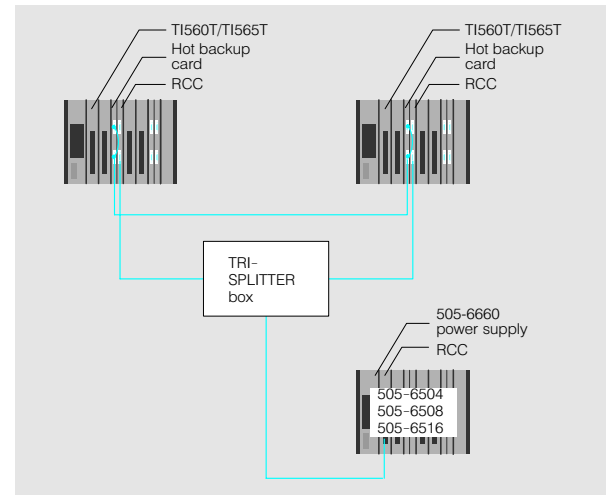


Fig. 5/2 Hot backup with single-channel I/O

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.

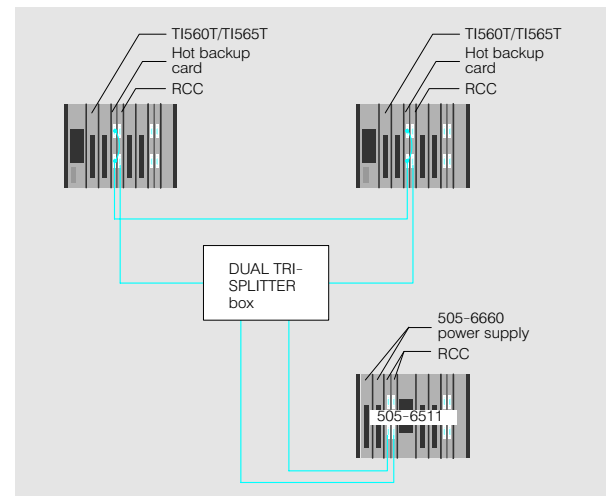


Fig. 5/3 Hot backup with two-channel I/O

In normal mode, one of the redundant RCBs is active and the other is in standby. If a 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

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Ordering data TI525 to TI565

Order No.

Order No.

Mounting racks

for TI505

4 slots
8 slots
11 slots, redundant
16 slots

PPX:505-6504
PPX:505-6508
PPX:505-6511
PPX:505-6516

Power supply units

1 required per mounting rack
2 per redundant mounting rack
110/220 V AC, single
110/220 V AC, single or redundant
24 V DC, single or redundant

PPX:505-6660
PPX:505-6660-A
PPX:505-6663

CPUs

TI525

Memory 10 KB,
512 digital/128 analog inputs/outputs

PPX:525-1102

TI535

Memory 40 KB,
1024 digital/1024 analog
inputs/outputs

PPX:535-1212

TI545

Memory 192 KB,
2048 digital/1024 analog inputs/
outputs, 64 controllers

PPX:545-1102

TI545

Memory 96 KB,
1024 digital/1024 analog inputs/
outputs, 16 controllers

PPX:545-1103

CPUs (continued)

Firmware upgrade kit

for TI545-1101 Version 2.1.1
for TI545-1102 Version 3.1

PPX:2601099-8005
PPX:2601099-8006

TI555

8192 digital/8192 analog inputs/
outputs,
memory 384 KB,
memory 1920 KB

PPX:555-1101
PPX:555-1102

TI560T (with power supply)

for twisted-pair cable
• 110 V AC, RS 485, RCC
• 24 V DC, RS 485, RCC
for coaxial cable connection
• 110 V AC, RCC
• 24 V DC, RCC

PPX:560T1KM-1101
PPX:560T1KM-1102

TI565T (with power supply)

for twisted-pair cable
• 110 V AC, RS 485, RCC
• 24 V DC, RS 485, RCC
for coaxial cable connection
• 110 V AC, RCC
• 24 V DC, RCC

PPX:560T4KM-1101
PPX:560T4KM-1102

PPX:565T1KM-1101
PPX:565T1KM-1102

PPX:565T4KM-1101
PPX:565T4KM-1102

Ordering data TI525 to TI565	Order No.	Ordering data TI525 to TI565	Order No.
CPUs (continued)		Controllers	
Programming manual for TI505		Controllers for expansion units	
German	PPX:505-8104D	• I/O channel controller (IOCC) for TI535 ²⁾	PPX:505-6830
English	PPX:505-8104-5	• Distributed base controller (DBC) for TI535 ³⁾	PPX:505-6840
Italian	PPX:505-8104I	• Remote channel controller (RCC), coaxial	PPX:560-2126-B
Technical product description for TI525/TI535		• Remote channel controller (RCC), RS 485 interface	PPX:560-2127-B
English	PPX:505-8103	• Remote base controller (RBC), coaxial FM mode ⁴⁾	PPX:505-6850-A
System manual for TI525, TI535		• Remote base controller (RBC), RS 485 interface ⁴⁾	PPX:505-6851-A
English	PPX:505-8106	• Remote base controller (RBC) for TI560T/565T, max. 4 km, coaxial	PPX:500-2114-A
German ¹⁾	PPX:505-8106D	• Remote base controller (RBC), for TI560T/565T, max. 1 km, RS 485	PPX:500-5114-A
French ¹⁾	PPX:505-8106F	• 505/6MT controller	PPX:505-5190
Technical product description for TI545/TI555		• 505/7MT controller	PPX:505-7190
CPU 1101		Manuels	
English	PPX:545-8101-4	• 7 MT interface adapter	PPX:505-8115-2
German	PPX:545-8101D	• 6 MT interface adapter	on request
French	PPX:545-8101F	Communications modules	
Italian	PPX:545-8101I	Peerlink module,	
System manuals for TI545/TI555		Point-to-point link between 2 to 16 modules, mixed link between TI500 and TI505, with manual	
CPU 1102, English	PPX:545-555-8101-2	• for TI505, 2 redundant channels	PPX:505-7354
Documentation set TI545 (hardware, design, I/O programming), English	PPX:545-8102	• for TI500, 1 channel	PPX:500-5053
Technical product description for TI545		• for TI500, 2 redundant channels	PPX:500-5054
English	PPX:545-8103-3	TIWAY communications processor NIM	
German	PPX:545-8103-3D	with manual	
French	PPX:545-8103-3F	• 2 redundant interfaces (local line) for TI505	PPX:505-7339
Italian	PPX:545-8103-3I	• 2 redundant interfaces (RS232) for TI505	PPX:505-7340
System manual for TI555, CPU		• 2 redundant interfaces (local line) for TI500	PPX:500-5039
English	PPX:555-8101-2	• 2 redundant interfaces (RS232) for TI500	PPX:500-5040
German	PPX:555-8101-1D	UNLINK host adapter	
französisch	PPX:555-8101-1F	with manual and PIM	
Italian	PPX:555-8101-1I	• 115 V AC, local line/local line TIWAY interfaces, computer interfaces RS232C/423	PPX:505-7111
System manual for TI560T/TI565T, English	PPX:560-65-8109	• 115 V AC, RS232C/RS232C TIWAY interfaces, computer interfaces RS232C/423	PPX:505-7112
Programming manual for TI560T/TI565T		• 220 V AC, local line/local line TIWAY interfaces, computer interfaces RS232C/423	PPX:505-7113
English	PPX:560-65-8102	• 220 V AC, RS232C/RS232C TIWAY interfaces, computer interfaces RS232C/423	PPX:505-7114
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			
for redundant I/O, English	PPX:560-65-8108		

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.

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Ordering data

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

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

SIMATIC 505

Ordering data

Ordering data 525 to 565	Order No.	Order No.	
Spares for TI525 to TI555 <ul style="list-style-type: none"> Connector: Side access (qty 1) Connector: Front access (qty 1) dummy plate (pack of 5) Fuse holder for power supply (pack of 4) Screws for dummy plate (pack of 10) 505 RTD calibration connector EEPROM <ul style="list-style-type: none"> for 525/535 for 545/555, 128 KB for 555, 256 KB EPROM <ul style="list-style-type: none"> for 525/535 for CPU 545/555, 128 KB for 555, 256 KB Backup battery for 525/535/545/650T/656T Programming cable for 545 Memory expansion for 545-1101, 256 KB Relay, 5 A, pack of 5 	PPX:2587705-8010 PPX:2587705-8011 PPX:2587705-8003 PPX:2587704-8001 PPX:2587705-8001 PPX:2587705-8009 PPX:2587681-8020 PPX:2587681-8022 PPX:2587681-8031 PPX:2587681-8012 on request PPX:2587681-8030 PPX:2587678-8005 PPX:2601094-8001 PPX:545-1111 PPX:2587704-8002	Spares for 525 to 555 (continued) <p>Fuses</p> <ul style="list-style-type: none"> Set, 3 A/125 V, pack of 5, for 505-45xx Set, 3 A/250 V, pack of 5, for 505-48xx Set, 3 A/250 V, pack of 5, for 505-46xx Set, 3 A/250 V, pack of 5, for 505-6660 <p>Spares for TI560/565</p> <ul style="list-style-type: none"> 560T digital CPU 565T special function CPU 560T/565T power supply module, 110/220 V AC 560T/565T power supply module, 24 V DC Remote channel controller (RCC) (FM) Remote channel controller (RCC) (RS 485) Hot backup card Hot backup upgrade kit (2 modules + cable) Memory expansion module 64 K words Memory expansion module 256 K words Distributor box for 565T hot backup, tri splitter Fiber-optic cable for 565 HBU 	PPX:2587679-8012 PPX:2587679-8013 PPX:2587679-8014 PPX:2587679-8015 PPX:560-2820 PPX:565-2820 PPX:560-2122 PPX:560-2123 PPX:560-2126-B PPX:560-2127-B PPX:560-2128-A PPX:560-2129-A PPX:560-2130 PPX:560-2136 PPX:2587755-8001 PPX:2587693-8010

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Ordering data 575	Order No.	Order No.	
575 CPU 832 KB System manual for 575 575 user manual Power supply modules (VME) <ul style="list-style-type: none"> 115 V AC, 185 watts 115/230 V AC, 300 watts Interface for expansion unit (RCC) Plug-in card in CPU 575 Digital input module (VME) with 32 inputs, 110 V AC Digital output module (VME) with 16 outputs, 110 V AC Digital input/output module (VME) with 16 I/O, 24 V DC Mounting rack (VME) 1.0" <ul style="list-style-type: none"> with 9 slots with 14 slots with 16 slots Coprocessor (optional, Motorola 68882)	PPX:575-2103 PPX:575-8101-4 PPX:575-8104-1 PPX:575-6660 PPX:575-6663 PPX:575-2126 PPX:575-4232 PPX:575-4616 PPX:575-4366 PPX:575-2124 PPX:575-2128 PPX:575-2130 PPX:2589739-8010	<p>Accessories</p> <ul style="list-style-type: none"> Connecting cable with RS232 interface (for connecting programming devices) dummy plate 1" for 575-2124 (9 slots) dummy plate 0.2" for 575-2124 (9 slots) or for 575-2128 (14 slots) dummy plate 0.4" for 575-2124 (9 slots) or for 575-2128 (14 slots) dummy plate 0.6" for 575-2130 (16 slots) dummy plate 0.8" for 575-2130 (16 slots) Mounting rail for 575-2124 (9 slots) Mounting rail for 575-2128 (14 slots) Mounting rail for 575-2130 (16 slots) Ventilator set for 575-2130, 115/230 V AC J2 backplane bus connector for power supply, 1 slot for all devices (optional) Daisy chain bridging connector for 575-2124 or for 575-2128 Spare I/O connector Spare battery, 4 V, 5 Ah Spare fuse for 575-6660, 8 A 	PPX:VPU200-3605 PPX:2589739-8003 PPX:2589739-8004 PPX:2589739-8005 PPX:2589739-8014 PPX:2589739-8015 PPX:2589739-8001 PPX:2589739-8002 PPX:2589739-8016 PPX:575-2131 PPX:2589739-8012 PPX:2589739-8011 PPX:2589739-8007 PPX:2589739-8006 PPX:2589739-8008