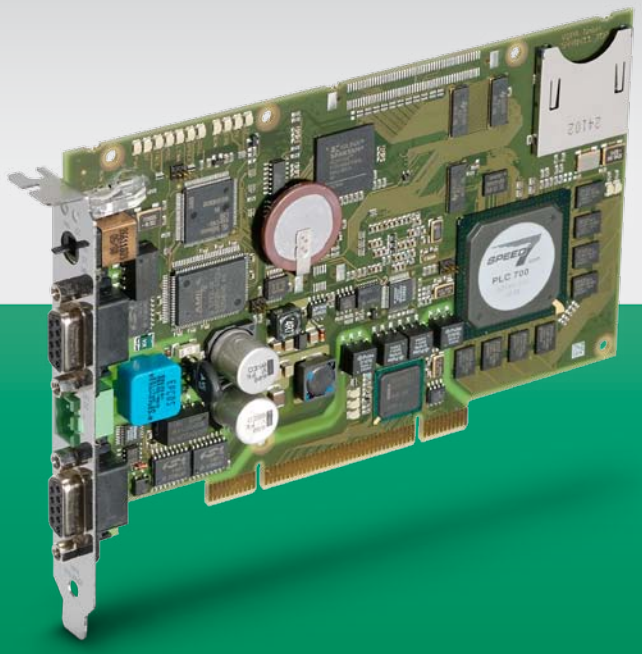


500S

System description 500S

Structure and Concept

The Slot PLC, based on the SPEED7 technology is designed for use within the core of a PC with a PCI interface.

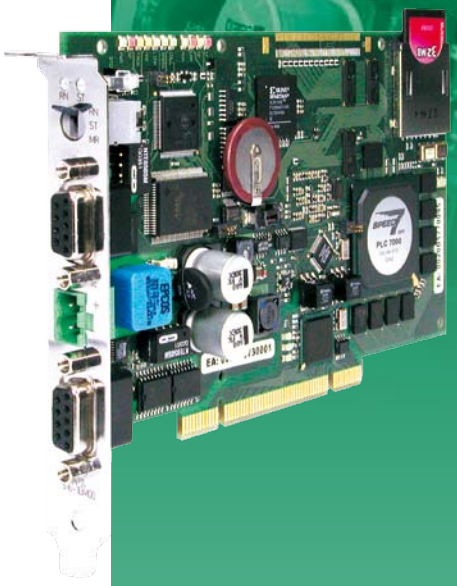
500S can be extended with up to 124 PROFIBUS-DP slave stations. Thereby all systems from VIPA can be used with PROFIBUS-DP slave peripherals.

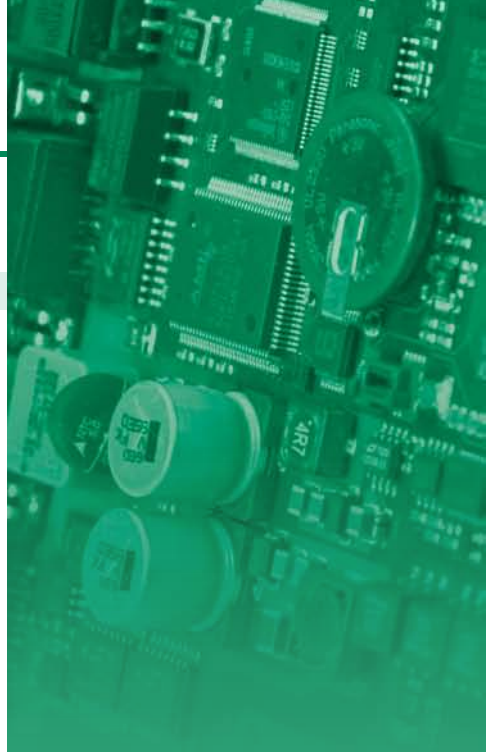
The CPU is supplied with power externally, for example with an interconnected UPS, thereby autarchic operation is possible and the operation of the CPU is also secured during a power outage.

Operation and monitoring of the CPU are supported by the program "PLCTool". The tool provides schematic representation of a CPU from 300S with all status LEDs on the PC monitor.

An OPC server for communication between the CPU and PC is included in the delivery.

Due to the module size, the CPUs fit into any standard desktop PC.





Performance and Application

500S is designed for centralized automation tasks for application within a PC with a PCI interface. It covers all requirements in the manufacturing and process industries up to the highest power range. With 500S CPU integrated SPEED7 ASIC the system is among the fastest automation systems worldwide.

Programming

500S is programmed with VIPA WinPLC7 or with STEP7 from Siemens in LAD, FBD and STL.

Memory

The CPUs in 500S have the work and load memory already integrated. Depending on the CPU-memory variant of the different users are available. The work and load memory can be adapted to the needs of memory card by plugging in an MCC memory expansion card. To back up program and data MMC cards are also supported.

Functions

Signal, communication and function modules, and devices with PROFIBUS-DP slave interfaces are connected via the integrated PROFIBUS-DP master interface.

Communication

An Ethernet programming interface is integrated on all CPUs in 500S. The integrated Ethernet communication processor CP 543 or a network card integrated in the PC link 500S horizontally and vertically into network structures. Therefore, all relevant data is made available to the connected host systems. The CPUs in 500S already have a PROFIBUS-DP master interface integrated, therefore the system can act, manufacturer-independent, as master control.

CPUs

CPUs-Central Modules

System 500S CPU SPEED7 represents a full PLC CPU in the form of a PCI bus card for PC-based applications. Windows operating systems 98, ME, NT4, 2000, XP and W7-32bit are supported.

The scope of performance corresponds to that of a SPEED7 CPU from System 300S. Programming is done using the standard programming tools VIPA WinPLC7 or Siemens STEP7.

For the connection to the process level, an MPI and a PROFIBUS-DP master interface are available. In addition, depending on the CPU type, a CP 543 for communication tasks is integrated. The scope of supply includes the OPC Server.

After the hardware installation, the plug-in card from the PC is connected as "Intel Ethernet integrated interface". To operate the card independent from of the PC, it will be supplied externally with DC 24 V.

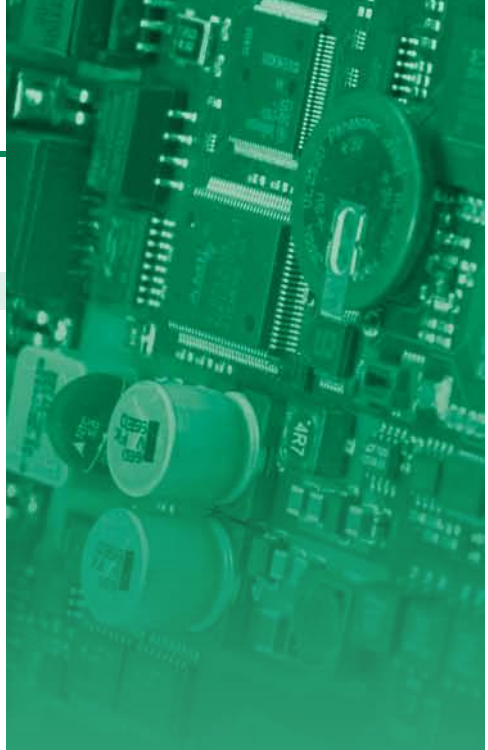
In the CPUs of System 500S memory for code and data is already integrated. It can be expanded by inserting a MCC memory card into the MMC slot. To back up program and data MMC cards are also supported.

Due to the high performance and scalable memory, the CPUs of System 500S are especially suitable for complex control tasks.

Operation Safety

- External power supply for the CPU (autarchic operation)
- ESD / Burst 61000-4-2/IEC in accordance with IEC 61000-4-4 (up to level 3)
- Shock resistance in accordance with IEC 60068-2-6 / IEC 60068-2-27 (1G/12G)

Overview



Order no.	Name/Description	Page
CPUs		
515-2AJ02	**CPU 515S/DPM - SPEED7 technology** › SPEED7 technology › 1 MB work memory › Memory extension (max. 2 MB) › PROFIBUS-DP master	**558**
517-2AJ02	**CPU 517S/DPM - SPEED7 technology** › SPEED7 technology › 2 MB work memory › Memory extension (max. 8 MB) › PROFIBUS-DP master	**558**
517-4NE02	**CPU 517SN/NET - SPEED7 technology** › SPEED7 technology › 2 MB work memory › Memory extension (max. 8 MB) › PROFIBUS-DP master and CP 543	**558**

CPUs

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

Order number	515-2AJ02	517-2AJ02	517-4NE02	
Figure				
Type	CPU 515S/DPM	CPU 517S/DPM	CPU 517SN/NET	
General information				
Note	-	-	-	
Features	› SPEED7 technology › 1 MB work memory › Memory extension (max. 2 MB) › PROFIBUS-DP master	› SPEED7 technology › 2 MB work memory › Memory extension (max. 8 MB) › PROFIBUS-DP master	› SPEED7 technology › 2 MB work memory › Memory extension (max. 8 MB) › PROFIBUS-DP master and CP 543	
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	
Reverse polarity protection	✓	✓	✓	
Current consumption (no-load operation)	250 mA	250 mA	300 mA	
Current consumption (rated value)	1 A	1 A	1.2 A	
Inrush current	5 A	5 A	5 A	
I^2t	0.5 A^2s	0.5 A^2s	0.5 A^2s	
Max. current drain at backplane bus	-	-	-	
Power loss	5 W	5 W	6.5 W	
Load and working memory				
Load memory, integrated	2 MB	8 MB	8 MB	
Load memory, maximum	2 MB	8 MB	8 MB	
Work memory, integrated	1 MB	2 MB	2 MB	
Work memory, maximal	2 MB	8 MB	8 MB	
Memory divided in 50% program / 50% data	✓	✓	✓	
Memory card slot	MMC-Card with max. 1 GB	MMC-Card with max. 1 GB	MMC-Card with max. 1 GB	
Hardware configuration				
Racks, max.	-	-	-	
Modules per rack, max.	-	-	-	
Number of integrated DP master	1	1	1	
Number of DP master via CP	-	-	-	
Operable function modules	-	-	-	
Operable communication modules PtP	-	-	-	
Operable communication modules LAN	-	-	-	
Command processing times				
Bit instructions, min.	0.01 µs	0.01 µs	0.01 µs	
Word instruction, min.	0.01 µs	0.01 µs	0.01 µs	
Double integer arithmetic, min.	0.01 µs	0.01 µs	0.01 µs	
Floating-point arithmetic, min.	0.06 µs	0.06 µs	0.06 µs	

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

Order number	515-2AJ02	517-2AJ02	517-4NE02	
Timers/Counters and their retentive characteristics				
Number of S7 counters	512	2048	2048	
S7 counter remanence	adjustable 0 up to 512	adjustable 0 up to 2048	adjustable 0 up to 2048	
S7 counter remanence adjustable	C0 .. C7	C0 .. C7	C0 .. C7	
Number of S7 times	512	2048	2048	
S7 times remanence	adjustable 0 up to 512	adjustable 0 up to 2048	adjustable 0 up to 2048	
S7 times remanence adjustable	not retentive	not retentive	not retentive	
Data range and retentive characteristic				
Number of flags	8192 Byte	16384 Byte	16384 Byte	
Bit memories retentive characteristic adjustable	adjustable 0 up to 8192	adjustable 0 up to 16384	adjustable 0 up to 16384	
Bit memories retentive characteristic preset	MB0 .. MB15	MB0 .. MB15	MB0 .. MB15	
Number of data blocks	4095	8190	8190	
Max. data blocks size	64 KB	64 KB	64 KB	
Number range DBs	1 ... 4095	1 ... 8190	1 ... 8190	
Max. local data size per execution level	510 Byte	510 Byte	510 Byte	
Max. local data size per block	-	-	-	
Blocks				
Number of OBs	24	24	24	
Maximum OB size	64 KB	64 KB	64 KB	
Totalnumber DBs, FBs, FCs	-	-	-	
Number of FBs	2048	8191	8191	
Maximum FB size	64 KB	64 KB	64 KB	
Number range FBs	0 ... 2047	0 ... 8190	0 ... 8190	
Number of FCs	2048	8191	8191	
Maximum FC size	64 KB	64 KB	64 KB	
Number range FC2	0 ... 2047	0 ... 8190	0 ... 8190	
Maximum nesting depth per priority class	8	8	8	
Maximum nesting depth additional within an error OB	4	4	4	
Time				
Real-time clock buffered	✓	✓	✓	
Clock buffered period (min.)	6 w	6 w	6 w	
Type ofbuffering	-	-	-	
Load time for 50% buffering period	20 h	20 h	20 h	
Load time for 100% buffering period	48 h	48 h	48 h	
Accuracy (max. deviation per day)	10 s	10 s	10 s	
Number of operating hours counter	8	8	8	
Clock synchronization	✓	✓	✓	
Synchronization via MPI	Master/Slave	Master/Slave	Master/Slave	
Synchronization via Ethernet (NTP)	no	no	Slave	
Address areas (I/O)				
Input I/O address area	8192 Byte	8192 Byte	8192 Byte	
Output I/O address area	8192 Byte	8192 Byte	8192 Byte	
Process image adjustable	✓	✓	✓	

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

Order number	515-2AJ02	517-2AJ02	517-4NE02	
Input process image preset	256 Byte	256 Byte	256 Byte	
Output process image preset	256 Byte	256 Byte	256 Byte	
Input process image maximal	2048 Byte	8192 Byte	8192 Byte	
Output process image maximal	2048 Byte	8192 Byte	8192 Byte	
Digital inputs	65536	65536	65536	
Digital outputs	65536	65536	65536	
Digital inputs central	-	-	-	
Digital outputs central	-	-	-	
Integrated digital inputs	-	-	-	
Integrated digital outputs	-	-	-	
Analog inputs	4096	4096	4096	
Analog outputs	4096	4096	4096	
Analog inputs, central	-	-	-	
Analog outputs, central	-	-	-	
Integrated analog inputs	-	-	-	
Integrated analog outputs	-	-	-	
Communication functions				
PG/OP channel	✓	✓	✓	
Global data communication	✓	✓	✓	
Number of GD circuits, max.	16	16	16	
Size of GD packets, max.	54 Byte	54 Byte	54 Byte	
S7 basic communication	✓	✓	✓	
S7 basic communication, user data per job	76 Byte	76 Byte	76 Byte	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
S7 communication, user data per job	160 Byte	160 Byte	160 Byte	
Number of connections, max.	32	32	32	
Functionality Sub-D interfaces				
Type	X2	X2	X2	
Type of interface	RS485	RS485	RS485	
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	
Electrically isolated	✓	✓	✓	
MPI	✓	✓	✓	
MP²I (MPI/RS232)	-	-	-	
DP master	-	-	-	
DP slave	-	-	-	
Point-to-point interface	-	-	-	
Type	X3	X3	X3	
Type of interface	RS485	RS485	RS485	
Connector	Sub-D, 9-pin, female	Sub-D, 9-pin, female	Sub-D, 9-pin, female	
Electrically isolated	✓	✓	✓	
MPI	-	-	-	
MP²I (MPI/RS232)	-	-	-	

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

Order number	515-2AJ02	517-2AJ02	517-4NE02	
DP master	yes	yes	yes	
DP slave	yes	yes	yes	
Point-to-point interface	-	-	-	
Functionality MPI				
Number of connections, max.	32	32	32	
PG/OP channel	✓	✓	✓	
Routing	✓	✓	✓	
Global data communication	✓	✓	✓	
S7 basic communication	✓	✓	✓	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
Transmission speed, min.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s	
Transmission speed, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	
Functionality PROFIBUS master				
PG/OP channel	✓	✓	✓	
Routing	✓	✓	✓	
S7 basic communication	✓	✓	✓	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
Activation/deactivation of DP slaves	✓	✓	✓	
Direct data exchange (slave-to-slave communication)	-	-	-	
DPV1	✓	✓	✓	
Transmission speed, min.	9.6 kbit/s	9.6 kbit/s	9.6 kbit/s	
Transmission speed, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	
Number of DP slaves, max.	32	32	32	
Address range inputs, max.	1 KB	1 KB	1 KB	
Address range outputs, max.	1 KB	1 KB	1 KB	
User data inputs per slave, max.	244 Byte	244 Byte	244 Byte	
User data outputs per slave, max.	244 Byte	244 Byte	244 Byte	
Functionality PROFIBUS slave				
PG/OP channel	✓	✓	✓	
Routing	✓	✓	✓	
S7 communication	✓	✓	✓	
S7 communication as server	✓	✓	✓	
S7 communication as client	-	-	-	
Direct data exchange (slave-to-slave communication)	-	-	-	
DPV1	✓	✓	✓	
Transmission speed, min.	9.6 kbit/s	9.6 kbit/s	9.6 kbit/s	
Transmission speed, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	
Automatic detection of transmission speed	-	-	-	
Transfer memory inputs, max.	244 Byte	244 Byte	244 Byte	
Transfer memory outputs, max.	244 Byte	244 Byte	244 Byte	

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

Order number	515-2AJ02	517-2AJ02	517-4NE02	
Address areas, max.	32	32	32	
User data per address area, max.	32 Byte	32 Byte	32 Byte	
Functionality RJ45 interfaces				
Type	n/d	n/d	n/d	
Type of interface	Ethernet 10/100 MBit	Ethernet 10/100 MBit	Ethernet 10/100 MBit	
Connector	PCI bus	PCI bus	PCI bus	
Electrically isolated	✓	✓	-	
PG/OP channel	✓	✓	✓	
Number of connections, max.	4	4	4	
Productive connections	-	-	-	
Type	-	-	X4	
Type of interface	-	-	Ethernet 10/100 MBit	
Connector	-	-	RJ45	
Electrically isolated	-	-	✓	
PG/OP channel	-	-	✓	
Number of connections, max.	-	-	32	
Productive connections	-	-	✓	
Ethernet communication CP				
Number of productive connections, max.	-	-	64	
Number of productive connections by Siemens NetPro, max.	-	-	16	
S7 connections	-	-	USEND, URCV, BSEND, BRCV, GET, PUT, Connection of active and passive data handling	
User data per S7 connection, max.	-	-	32 KB	
TCP-connections	-	-	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling	
User data per TCP connection, max.	-	-	64 KB	
ISO-connections	-	-	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling	
User data per ISO connection, max.	-	-	8 KB	
ISO on TCP connections (RFC 1006)	-	-	SEND, RECEIVE, FETCH PASSIV, WRITE PASSIV, Connection of active and passive data handling	
User data per ISO on TCP connection, max.	-	-	32 KB	
UDP-connections	-	-	SEND and RECEIVE	
User data per UDP connection, max.	-	-	2 KB	
UDP-multicast-connections	-	-	SEND and RECEIVE (max. 16 Multicast groups)	
UDP-broadcast-connections	-	-	SEND	

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

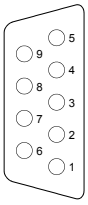
Order number	515-2AJ02	517-2AJ02	517-4NE02	
Ethernet open communication				
Number of connections, max.	-	-	8	
User data per ISO on TCP connection, max.	-	-	8 KB	
User data per native TCP connection, max.	-	-	8 KB	
User data per ad hoc TCP connection, max.	-	-	1460 Byte	
User data per UDP connection, max.	-	-	1472 Byte	
Housing				
Material	-	-	-	
Mounting	-	-	-	
Mechanical data				
Dimensions (WxHxD)	20 mm x 106 mm x 174 mm	20 mm x 106 mm x 174 mm	40 mm x 106 mm x 174 mm	
Weight	280 g	290 g	390 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	in preparation	in preparation	in preparation	

Connections, Interfaces

CPUs | CPUs						
515-2AJ02 517-2AJ02 517-4NE02						

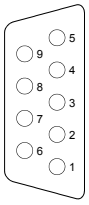
515-2AJ02

DP master



① shield
② M24V
③ RxD/TxD-P (line B)
④ RTS
⑤ M5V
⑥ P5V
⑦ P24V
⑧ RxD/TxD-N (line A)
⑨ n.c.

MPI

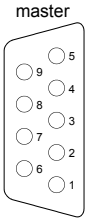


① reserved
② M24V
③ RxD/TxD-P (line B)
④ RTS
⑤ M5V
⑥ P5V
⑦ P24V
⑧ RxD/TxD-N (line A)
⑨ n.c.

① DC 24 V
② DC 24 V

517-2AJ02

DP master



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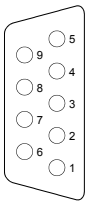
⑧ RxD/TxD-N (line A)
⑨ n.c.

MPI



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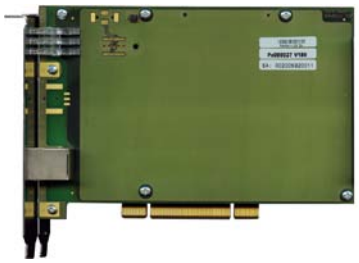
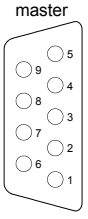
④ RTS
⑤ M5V
⑥ P5V
⑦ P24V
⑧ RxD/TxD-N (line A)
⑨ n.c.

① DC 24 V
② DC 24 V

517-4NE02



DP master



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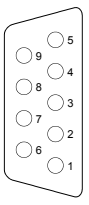
MPI



① reserved
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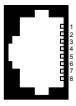
⑨ n.c.

① DC 24 V
② DC 24 V

CP 543 RJ45



① Transmit +
② Transmit -
③ Receive +
④ -
⑤ -
⑥ Receive -
⑦ -
⑧ -

500S accessories

Structure and Function

System accessories enable and expand the use of the system and facilitate starting.

Memory Expansion

MMC cards can be used for storing programs and data. By inserting a VIPA-MCC card the work memory is expanded without exchanging the CPU.

Each CPU has an integrated work memory. During the program flow, 50% of the work memory is used for the program code and 50% for data.

Manuals

The technical documentation of the respective modules encompasses various manuals with the necessary hardware and programming information, detailed descriptions of each module, and instructions for structure and assembly.

Memory extensions

Order number	Type	Description	Note
953-0KX10	MMC - MultiMediaCard	Extension memory for VIPA CPUs 11x, 21x, 24x, 31x, 51x, and 208-1DP01, CC 03 (for load memory not necessary)	
953-1LE00	Memory Configuration Card (MCC) 32kByte	for SPEED7 CPUs, 16kByte program/16kByte data	
953-1LF00	Memory Configuration Card (MCC) 64kByte	for SPEED7 CPUs, 32kByte program/32kByte data	
953-1LG00	Memory Configuration Card (MCC) 128kByte	for SPEED7 CPUs, 64kByte program/64kByte data	
953-1LH00	Memory Configuration Card (MCC) 256kByte	for SPEED7 CPUs, 128kByte program/128kByte data	
953-1LJ00	Memory Configuration Card (MCC) 512kByte	for SPEED7 CPUs, 256kByte program/256kByte data	
953-1LK00	Memory Configuration Card (MCC) 1MByte	for SPEED7 CPUs, 512kByte program/512kByte data	
953-1LL00	Memory Configuration Card (MCC) 2MByte	for SPEED7 CPUs, 1MByte program/1MByte data	
953-1LM00	Memory Configuration Card (MCC) 4MByte	for SPEED7 CPUs, 2MByte program/2MByte data	
953-1LP00	Memory Configuration Card (MCC) 8MByte	for SPEED7 CPUs, 4MByte program/4MByte data	

Manuals

Order number	Title	Contents	Language
HB145D_CPU	Manual System 500S - SPEED7, German	PCI CPU 51xS, incl. operations list	DE
HB145E_CPU	Manual System 500S - SPEED7, English	PCI CPU 51xS, incl. operations list	EN