## SIEMENS

## Data sheet

## 6ES7416-3FS07-0AB0



SIMATIC S7-400, CPU416F-3 PN/DP Central processing unit with: Work memory 16 MB, (8 MB code, 8 MB data), interfaces 1st interface MPI/DP 12 Mbit/s, (X1), 2nd interface Ethernet/PROFINET (X5) 3rd interface IF 964-DP plug-in (IF1)

General information	
Product type designation	CPU 416F-3 PN/DP
HW functional status	01
Firmware version	V7.0
Engineering with	
<ul> <li>Programming package</li> </ul>	STEP 7 V5.5 or higher with HSP 262
CiR – Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	10 µs
Supply voltage	
Rated value (DC)	
• 24 V DC	No; Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.3 A
from backplane bus 5 V DC, max.	1.6 A
from backplane bus 24 V DC, max.	300 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface

Power loss	
Power loss, typ.	6.5 W
Power loss, max.	8 W
Memory	
Type of memory	RAM
Work memory	
● integrated	16 Mbyte
<ul> <li>integrated (for program)</li> </ul>	8 Mbyte
<ul> <li>integrated (for data)</li> </ul>	8 Mbyte
• expandable	No
Load memory	
expandable FEPROM	Yes; with Memory Card (FLASH)
<ul> <li>expandable FEPROM, max.</li> </ul>	64 Mbyte
<ul> <li>integrated RAM, max.</li> </ul>	1 Mbyte
• expandable RAM	Yes; with Memory Card (RAM)
• expandable RAM, max.	64 Mbyte
Backup	
● present	Yes
• with battery	Yes; all data
• without battery	No
Battery	
Backup battery	180 uA: up to 40 °C
Backup current, typ.	180 μA; up to 40 °C
Backup current, max.	
<ul> <li>Backup time, max.</li> </ul>	Dealt with in the module data manual with the secondary conditions and the factors of influence
<ul> <li>Feeding of external backup voltage to CPU</li> </ul>	5 V DC to 15 V DC
CPU processing times	
for bit operations, typ.	12.5 ns
for word operations, typ.	12.5 ns
for fixed point arithmetic, typ.	12.5 ns
for floating point arithmetic, typ.	25 ns
CPU-blocks	
DB	
• Number, max.	10 000; Number range: 1 to 16000
	64 kbyte
• Size, max.	
• Size, max. FB	
	5 000; Number range: 0 to 7999
FB	
FB ● Number, max.	5 000; Number range: 0 to 7999
FB • Number, max. • Size, max.	5 000; Number range: 0 to 7999

<ul> <li>Size, max.</li> </ul>	64 kbyte
OB	
• Number, max.	see instruction list
• Size, max.	64 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul> <li>Number of time alarm OBs</li> </ul>	8; OB 10-17
<ul> <li>Number of delay alarm OBs</li> </ul>	4; OB 20-23
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	9; OB 30-38 (shortest cycle that can be set = 500 $\mu$ s)
<ul> <li>Number of process alarm OBs</li> </ul>	8; OB 40-47
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55-57
<ul> <li>Number of isochronous mode OBs</li> </ul>	4; OB 61-64
<ul> <li>Number of multicomputing OBs</li> </ul>	1; OB 60
<ul> <li>Number of background OBs</li> </ul>	1; OB 90
Number of startup OBs	2; OB 100, 102
<ul> <li>Number of asynchronous error OBs</li> </ul>	9; OB 80-88
<ul> <li>Number of synchronous error OBs</li> </ul>	2; OB 121, 122
Nesting depth	
<ul> <li>per priority class</li> </ul>	24
<ul> <li>additional within an error OB</li> </ul>	2
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
— upper limit	Yes
<ul> <li>upper limit</li> <li>IEC counter</li> <li>present</li> <li>Type</li> </ul>	Yes SFB
<ul> <li>upper limit</li> <li>IEC counter</li> <li>present</li> <li>Type</li> <li>Number</li> </ul>	Yes
upper limit IEC counter • present • Type • Number S7 times	Yes SFB Unlimited (limited only by RAM capacity)
upper limit IEC counter • present • Type • Number S7 times • Number	Yes SFB
upper limit IEC counter • present • Type • Number S7 times • Number Retentivity	Yes SFB Unlimited (limited only by RAM capacity) 2 048
upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable	Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes
upper limit IEC counter • present • Type • Number S7 times • Number Retentivity	Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes 0
upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable	Yes SFB Unlimited (limited only by RAM capacity) 2 048 Yes

Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Туре	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	Total working and load memory (with backup battery)
Flag	
• Number, max.	16 kbyte; Size of bit memory address area
<ul> <li>Retentivity available</li> </ul>	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; in 1 memory byte
Local data	
• adjustable, max.	32 kbyte
• preset	16 kbyte
Address area	
I/O address area	
Inputs	16 kbyte
Outputs	16 kbyte
of which distributed	
— MPI/DP interface, inputs	2 kbyte
— MPI/DP interface, outputs	2 kbyte
— DP interface, inputs	8 kbyte
— DP interface, outputs	8 kbyte
— PROFINET interface, inputs	8 kbyte
— PROFINET interface, outputs	8 kbyte
Process image	
<ul> <li>Inputs, adjustable</li> </ul>	16 kbyte
• Outputs, adjustable	16 kbyte
<ul> <li>Inputs, default</li> </ul>	512 byte
• Outputs, default	512 byte
• consistent data, max.	244 byte
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	15
Digital channels	
• Inputs	131 072
— of which central	131 072
Outputs	131 072

— of which central	131 072
Analog channels	
Inputs	8 192
— of which central	8 192
Outputs	8 192
— of which central	8 192
Hardware configuration	
Number of expansion units, max.	21
connectable OPs	95
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
Interface modules	
<ul> <li>Number of connectable IMs (total), max.</li> </ul>	6
<ul> <li>Number of connectable IM 460s, max.</li> </ul>	6
<ul> <li>Number of connectable IM 463s, max.</li> </ul>	4; IM 463-2
Number of DP masters	
<ul> <li>integrated</li> </ul>	1
• via CP	10; CP 443-5 Extended
● via IM 467	4
<ul> <li>Mixed mode IM + CP permitted</li> </ul>	No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode
• via interface module	1; IF 964-DP
<ul> <li>Number of pluggable S5 modules (via adapter capsule in central device), max.</li> </ul>	6
Number of IO Controllers	
● integrated	1
● via CP	4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode
Number of operable FMs and CPs (recommended)	
● FM	Limited by number of slots or number of connections
• CP, PtP	CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections
<ul> <li>PROFIBUS and Ethernet CPs</li> </ul>	14; In total max. 10 CPs as DP master and PROFINET controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller
Slots	
<ul> <li>required slots</li> </ul>	2
Time of day	
Clock	
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
<ul> <li>retentive and synchronizable</li> </ul>	Yes
Resolution	1 ms
• Deviation per day (buffered), max.	1.7 s; Power off

Operating hours counter         16           • Number/Number range         0 to 15           • Range of values         SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2*31 - 1 hours           • Granularity         1 h           • etentive         Yes           Clock synchronization         Yes           • upopted         Yes           • to MPI, master         Yes           • to MPI, slave         Yes           • to MPI, slave         Yes           • to DP, slave         Yes           • naks, slave         Yes           Interfaces/bu	<ul> <li>Deviation per day (unbuffered), max.</li> </ul>	8.6 s; For power On
Number Number range0 to 15Range of valuesSFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2*31 - 1 hoursGranularity1 h• retentiveYes• retentiveYesClock synchronizationYes• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, slaveYes• to DP, slaveYes• to DP, slaveYes• to DP, slaveYes. As client• to IP slaveYes. As client• to IF 964 DPYes. As client• to IF 964 DPYesTime difference in system when synchronizing via10 ms• therfaces/bus type1 x MPU/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of other interfaces1 : Combined MPI / PROFIBUS DPNumber of other interfaces1 : Combined MPI / PROFIBUS DPInterfaces/bus type1 : RegratedPhysicsRS 485 / PROFIBUS DPNumber of other interfaces1 SO mANumber of other interfaces100 msIsolatedYes• Prooreadom100 msNumber of connection resources100 msNumber of connection resources100 ms• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• PROFIBUS DP	Operating hours counter	
Range of valuesSFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2/31 - 1 hoursGranularity1 h• Granularity1 h• retentiveYesClock synchronizationYes• supportedYes• supportedYes• to MPI, masterYes• to MPI, masterYes• to MPI, slaveYes• to DP, slaveYes• to DP, slaveYes• to LP, slaveYes• on Ethernet via NTPYes. As client• on Ethernet max.10 ms• MPI, max.200 msInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1, Combined MPI / PROFIBUS DPNumber of other interfaces1, Combined MPI / PROFIBUS DPNumber of connection resourcesMPIPower supply to interface (15 to 30 VDC), max.MPI 32ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP shareYes• PROFIBUS DP shareYes• PROFIBUS DP shareYes• PROFIBUS DP shareYes• Number of connection resourcesMPI 44, DP: 32• ProtocolsYes• PROFIBUS DP shareYes• P	• Number	16
• Granularity1 h• retentiveYesClock synchronizationYes• to MPI, masterYes• to MPI, masterYes• to DP, slaveYes• to DP, slaveYes• to DP, slaveYes• to DP, slaveYes• to AS, slaveYes• on Ethernet via NTPYes, As client• to IF 964 DPYes• to IF 964 DPYes• the Hernet via NTPYes, As client• to IF 964 DPYes• thereful via NTPYes, As client• to IF 964 DPYes• to IF 964 DPYes• thereful via NTPYes, As client• to IF 964 DPYes• thereful max.10 ms• DTmee difference in system when synchronizing via• Ethernet, max.10 ms• DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6587964-22AA04-0AB0)• Dever supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32• PROFIBUS DP master • PROFIBUS DP masterYes• MPIYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIServices on the line is reduced by 1 1 diagnostics repeater is used on the line,	Number/Number range	0 to 15
interfaceYesClock synchronizationYes• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes• to DP, masterYes• to DP, slaveYes• to DP, slaveYes• in AS, masterYes• on Ethernet via NTPYes• MPI, max.200 msInterfaces1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of other interfaces1 ; Combined MPI / PROFIBUS DPNumber of other interfaces1 ; Combined MPI / PROFIBUS DPInterfaceIntegratedPhysicsRS 485 / PROFIBUS P MPIIsolatedYes• MPIYes• MPIYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes	<ul> <li>Range of values</li> </ul>	SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^31 - 1 hours
Clock synchronization         Stream           • supported         Yes           • to MPI, master         Yes           • to MPI, slave         Yes           • to MP, slave         Yes           • to DP, master         Yes           • to DP, master         Yes           • to DP, slave         Yes           • to IP 964 DP         Yes           • to IF 964 DP         Yes           • thernet, max.         200 ms           • therdaces/bus type         1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (polyain option; MLFB: 6ES7964-2AA04-0AB0)           • Dreface         Integrated           Physics         Yes           • ProoFIBUS DP master         Yes           • PROFIBUS DP master         Yes           • PROFIBUS DP master         Yes           • PROFIBUS DP m	Granularity	1 h
• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes• to DP, slaveYes• to DP, slaveYes• in AS, masterYes• in AS, masterYes• on Ethernet via NTPYes, As client• to IF 964 DPYes• on Ethernet, max.10 ms• Ethernet, max.10 ms• MPI, max.200 msInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 465 interfaces1; Combined MPI / PROFIBUS DPNumber of ther interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0ABO)Eleface typeIntegratedPhysicsRS 485 / PROFIBUS PInverter of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIYes• Transmission rate, max.12 Mbit/s	retentive	Yes
to MPI, masterYesto MPI, masterYesto DP, masterYesto DP, masterYesto DP, slaveYesto DP, slaveYesin AS, masterYeson Ethernet via NTPYes, As clientto IF 964 DPYesTime difference in system when synchronizing viaEthernet, max.10 mseEthernet, max.200 msMPI, max.200 msInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1, PROFIBUS DP, 1 x PROFIBUS DPNumber of other interfaces1, PROFIBUS PMPIIsolatedYesProver supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI• PROFIBUS DP masterYes• PRO	Clock synchronization	
to MPI, slaveYesto DP, masterYesto DP, slaveYesto DP, slaveYesin AS, masterYesin AS, slaveYeson Ethernet via NTPYes, Sa clientto IF 964 DPYesTime difference in system when synchronizing via10 msethernet, max.10 msof HPI, max.200 msInterfaces/bus type1 trefaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; Combined MPI / PROFIBUS DPNumber of other interfacesRS 485 / PROFIBUS DPInterface typeIntegratedProtecolsYesPower supply to interface (15 to 30 V DC), max.160 mANumber of connection resources48 / Pro 32ProtecolsYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYesMPIYes• PROFIBUS DP slaveYes• PROFIBUS DP slaveYes <t< td=""><td>• supported</td><td>Yes</td></t<>	• supported	Yes
to DP, masterYesto DP, slaveYesto DP, slaveYesin AS, masterYesin AS, slaveYeson Ethernet via NTPYes, As clientto IF 964 DPYesTime difference in system when synchronizing via10 msEthernet, max.10 msof PMP, max.200 msInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: e6S7964-2AA0-0AB0)InterfaceIntegratedInterface typeIntegratedPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesYesProtocolsYeseNPIYeseNPIBUS DP masterYeseNPOFIBUS DP masterYeseNPIFIBUS DP masterYeseNPIFIBUS DP masterYeseNPIFIBUS DP masterYeseNPIFIBUS DP slaveYesMPIYeseNPIFIBUS DP slaveYesMPIYeseNumber of connection resources on the line, the number of connection resources on the line is reduced by 1 connection resources on the line is reduced by 1 enditication resou	• to MPI, master	Yes
to DP, slaveYesin AS, masterYesin AS, masterYesin AS, slaveYeson Ethernet via NTPYes; As clientto IF 964 DPYesTime difference in system when synchronizing via10 msethernet, max.10 msMPI, max.200 msInterfaces/bus typeInterfaces/bus type1 × MPI/PROFIBUS DP, 1 × PROFINET (2 ports), 1 × PROFIBUS DPNumber of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)InterfaceIntegratedPower supply to interface (15 to 30 V DC), max.180 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Transmission rate, max.12 Mbit/sServicesYes	● to MPI, slave	Yes
in AS, masterYesin AS, slaveYesin AS, slaveYesin AS, slaveYesin Ethernet via NTPYes, As clientit o IF 964 DPYesTime difference in system when synchronizing via10 msEthernet, max.10 msit MPI, max.200 msInterfaces/bus typeInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)IsolatedYesPower supply to interface (15 to 30 V DC), max.MPI 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPI• Transmission rate, max.12 Mbit/sServicesYes	● to DP, master	Yes
Inite, metalInterfacein AS, slaveYeson Elbernet via NTPYes; As clientto IF 964 DPYesTime difference in system when synchronizing via10 msEthernet, max.10 msMPI, max.200 msInterfaces/bus typeInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1; Combined MP1 / PROFIBUS DPNumber of ther interfaces1; Combined MP1 / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: dES7964-2AA04-0AB0)fetface1Interface150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; if a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1• Transmission rate, max.12 Mbit/sServicesServices	● to DP, slave	Yes
InterfaceYes: As client• on Ethernet via NTPYes: As client• to IF 964 DPYesTime difference in system when synchronizing via10 ms• Ethernet, max.10 ms• MPI, max.200 msInterfaces/Interfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0ABO)Interface1Interface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP plaveYesMPIYes• Number of connections44; if a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1• Transmission rate, max.12 Mbit/s	● in AS, master	Yes
to IF 964 DPYesTime difference in system when synchronizing via10 ms• Ethernet, max.200 ms• MPI, max.200 msInterfaces1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DPNumber of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)InterfaceIntegratedInterface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 connection resources on the line is reduced	● in AS, slave	Yes
Time difference in system when synchronizing via• Ethernet, max.10 ms 200 ms• MPI, max.200 msInterfacesInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally plugable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0) <b>1 Interface</b> 1Interface typeIntegratedInterface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 1 2 Mbit/s• Transmission rate, max.12 Mbit/s	<ul> <li>on Ethernet via NTP</li> </ul>	Yes; As client
• Ethernet, max.10 ms 200 msInterfaces200 msInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)Interface1Interface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 1 24 Mbit/sServicesServices	• to IF 964 DP	Yes
American and a service of the s	Time difference in system when synchronizing via	
InterfacesInterfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)1. InterfaceIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP master • PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 1 2 Mbit/s• Transmission rate, max.12 Mbit/s	• Ethernet, max.	10 ms
Interfaces/bus type1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)Number of RS 485 interfaces1; Combined MPI / PROFIBUS DPNumber of other interfaces1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)Interface1Interface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP master • PROFIBUS DP slaveYesMPIVes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 transmission rate, max.12 Mbit/sServicesServices	• MPI, max.	200 ms
Image: Properties of the set of the	Interfaces	
Number of RS 485 interfaces       1; Combined MPI / PROFIBUS DP         Number of other interfaces       1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)         1. Interface       Integrated         Interface type       Integrated         Physics       RS 485 / PROFIBUS + MPI         Isolated       Yes         Power supply to interface (15 to 30 V DC), max.       150 mA         Number of connection resources       MPI: 44, DP: 32         Protocols       Yes         • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         MPI       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         Protocols       Yes         MPI		1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS
Number of other interfaces       1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)         Interface       Integrated         Interface type       Integrated         Physics       RS 485 / PROFIBUS + MPI         Isolated       Yes         Power supply to interface (15 to 30 V DC), max.       150 mA         Number of connection resources       MPI: 44, DP: 32         Protocols       Yes         • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s         Services       Services		DP (optionally pluggable)
6ES7964-2AA04-0AB0)         Interface         Interface type       Integrated         Physics       RS 485 / PROFIBUS + MPI         Isolated       Yes         Power supply to interface (15 to 30 V DC), max.       150 mA         Number of connection resources       MPI: 44, DP: 32         Protocols       Yes         • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s         Services       Services	Number of RS 485 interfaces	
1. Interface         Interface type       Integrated         Physics       RS 485 / PROFIBUS + MPI         Isolated       Yes         Power supply to interface (15 to 30 V DC), max.       150 mA         Number of connection resources       MPI: 44, DP: 32         Protocols       Yes         • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s	Number of other interfaces	······································
Interface typeIntegratedPhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1• Transmission rate, max.12 Mbit/s		6ES7964-2AA04-0AB0)
PhysicsRS 485 / PROFIBUS + MPIIsolatedYesPower supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1• Transmission rate, max.12 Mbit/s	1. Interface	
Isolated       Yes         Power supply to interface (15 to 30 V DC), max.       150 mA         Number of connection resources       MPI: 44, DP: 32         Protocols       Yes         • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       12 Mbit/s         • Services       Yes	Interface type	Integrated
Power supply to interface (15 to 30 V DC), max.150 mANumber of connection resourcesMPI: 44, DP: 32ProtocolsYes• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPIYes• Number of connections44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1• Transmission rate, max.12 Mbit/sServicesYes	Physics	RS 485 / PROFIBUS + MPI
Number of connection resources       MPI: 44, DP: 32         Protocols          • MPI       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         • PROFIBUS DP slave       Yes         • PROFIBUS DP slave       Yes         • PROFIBUS DP slave       Yes         • PROFISE       Yes         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s         Services       Yes		Yes
Protocols       Yes         • PROFIBUS DP master       Yes         • PROFIBUS DP slave       Yes         MPI       Yes         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s         Services       Services		
• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYesMPI		MPI: 44, DP: 32
<ul> <li>PROFIBUS DP master</li> <li>PROFIBUS DP slave</li> <li>Yes</li> <li>MPI</li> <li>Number of connections</li> <li>44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1</li> <li>Transmission rate, max.</li> <li>Services</li> </ul>		
PROFIBUS DP slave Yes MPI      Number of connections 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1      Transmission rate, max. 12 Mbit/s Services	• MPI	
MPI         • Number of connections       44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1         • Transmission rate, max.       12 Mbit/s         Services       12 Mbit/s	PROFIBUS DP master	
<ul> <li>Number of connections</li> <li>44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1</li> <li>Transmission rate, max.</li> <li>Services</li> </ul>	PROFIBUS DP slave	Yes
Connection resources on the line is reduced by 1     Transmission rate, max. 12 Mbit/s Services		
Services	<ul> <li>Number of connections</li> </ul>	
	• Transmission rate, max.	12 Mbit/s
- PG/OP communication Yes	Services	
	— PG/OP communication	Yes

— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
- S7 communication	Yes
	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
PROFIBUS DP master	
<ul> <li>Number of connections, max.</li> </ul>	32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
<ul> <li>Number of DP slaves, max.</li> </ul>	32
Services	
— PG/OP communication	Yes
— Routing	Yes; S7 routing
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	Yes
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	Yes
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	•
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	
Number of connections	32
GSD file	http://support.automation.siemens.com/WW/view/en/113652
Transmission rate, max.	12 Mbit/s
automatic baud rate search	No
Address area, max.	32; Virtual slots
<ul> <li>User data per address area, max.</li> </ul>	32 byte
- User vala per avuress area, Max.	

— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes; with interface active
— S7 routing	Yes; with interface active
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Direct data exchange (slave-to-slave	No
communication)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte

2. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes; Assignment by higher-level IO-Controller or by the user program with SFB104 "IP_CONF"
Number of connection resources	96
Interface types	
<ul> <li>Number of ports</li> </ul>	2
<ul> <li>integrated switch</li> </ul>	Yes
Media redundancy	
<ul> <li>supported</li> </ul>	Yes
<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms
<ul> <li>Number of stations in the ring, max.</li> </ul>	50
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
• PROFINET CBA	Yes
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes
• Web server	Yes
<ul> <li>Point-to-point connection</li> </ul>	No
PROFINET IO Controller	

• Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— S7 communication	Yes
— Isochronous mode	Yes; Only with IRT and the High Performance option
— Open IE communication	Yes
— Shared device	Yes
— Prioritized startup	Yes
<ul> <li>— Number of IO devices with prioritized startup, max.</li> </ul>	32
- Number of connectable IO Devices, max.	256
— Of which IO devices with IRT, max.	64
— of which in line, max.	64
<ul> <li>— Number of IO Devices with IRT and the option "high flexibility"</li> </ul>	256
— of which in line, max.	61
<ul> <li>— Number of connectable IO Devices for RT, max.</li> </ul>	256
— of which in line, max.	256
- Activation/deactivation of IO Devices	Yes
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8
<ul> <li>— IO Devices changing during operation (partner ports), supported</li> </ul>	Yes
— Number of IO Devices per tool, max.	8; 8 parallel calls of the SFC 12 "D_ACT_DP" possible per line. Max. 32 IO Devices changing during operation (partner ports) are supported
- Device replacement without swap medium	Yes
— Send cycles	250 $\mu s,$ 500 $\mu s,$ 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 $\mu s$ to 4 ms in 125 $\mu s$ frame
— Updating time	250 μs to 512 ms; minimum value depends on preset communication share for PROFINET IO, on the number of IO Devices and on the amount of configured user data, see PROFINET system description
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
— User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes

	Yes
— S7 communication	No
— Isochronous mode	Yes
— Open IE communication	
— IRT	Yes
— Prioritized startup	Yes
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared</li> </ul>	2
device, max.	
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
— User data per submodule, max.	1 024 byte
PROFINET CBA	
<ul> <li>acyclic transmission</li> </ul>	Yes
cyclic transmission	Yes
Open IE communication	
<ul> <li>Number of connections, max.</li> </ul>	94
<ul> <li>Local port numbers used at the system end</li> </ul>	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<ul> <li>Keep-alive function, supported</li> </ul>	Yes
Keep-alive function, supported 3. Interface	Yes
	Yes Pluggable interface module (IF)
3. Interface	
3. Interface Interface type	Pluggable interface module (IF)
3. Interface Interface type Plug-in interface modules	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS
3. Interface Interface type Plug-in interface modules Physics Isolated	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols         • MPI	Pluggable interface module (IF)         IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)         RS 485 / PROFIBUS         Yes         150 mA         No         32         No
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols         • MPI         • PROFIBUS DP master	Pluggable interface module (IF)         IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)         RS 485 / PROFIBUS         Yes         150 mA         No         32         No         Yes
3. Interface Interface type Plug-in interface modules Physics Isolated Power supply to interface (15 to 30 V DC), max. automatic detection of transmission rate Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave	Pluggable interface module (IF)         IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)         RS 485 / PROFIBUS         Yes         150 mA         No         32         No         Yes
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols         • MPI         • PROFIBUS DP master         • PROFIBUS DP slave         PROFIBUS DP master	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32 No Yes Yes
3. Interface Interface type Plug-in interface modules Physics Isolated Power supply to interface (15 to 30 V DC), max. automatic detection of transmission rate Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave PROFIBUS DP master • Number of connections, max.	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32 No Yes Yes Yes
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols         • MPI         • PROFIBUS DP master         • PROFIBUS DP slave         PROFIBUS DP master         • Number of connections, max.         • Transmission rate, max.	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32 No Yes Yes 32 32 32 32
3. Interface Interface type Plug-in interface modules Physics Isolated Power supply to interface (15 to 30 V DC), max. automatic detection of transmission rate Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave PROFIBUS DP master • Number of connections, max. • Transmission rate, max. • Number of DP slaves, max.	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32 No Yes Yes 32 32 32 32
3. Interface Interface type Plug-in interface modules Physics Isolated Power supply to interface (15 to 30 V DC), max. automatic detection of transmission rate Number of connection resources Protocols • MPI • PROFIBUS DP master • PROFIBUS DP slave PROFIBUS DP master • Number of connections, max. • Transmission rate, max. • Number of DP slaves, max. Services	Pluggable interface module (IF)         IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)         RS 485 / PROFIBUS         Yes         150 mA         No         32         No         Yes         12 Mbit/s         125
3. Interface         Interface type         Plug-in interface modules         Physics         Isolated         Power supply to interface (15 to 30 V DC), max.         automatic detection of transmission rate         Number of connection resources         Protocols         • MPI         • PROFIBUS DP master         • PROFIBUS DP slave         PROFIBUS DP master         • Number of connections, max.         • Transmission rate, max.         • Number of DP slaves, max.         Services         — PG/OP communication	Pluggable interface module (IF) IF 964-DP (MLFB: 6ES7964-2AA04-0AB0) RS 485 / PROFIBUS Yes 150 mA No 32 No Yes Yes 32 32 32 32 32 32 32 32 32 32 32 32 32

— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes
- SYNC/FREEZE	Yes
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes
— Direct data exchange (slave-to-slave	Yes
communication)	
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	
Number of connections	32
• GSD file	http://support.automation.siemens.com/WW/view/en/113652
<ul> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
<ul> <li>automatic baud rate search</li> </ul>	No
<ul> <li>Address area, max.</li> </ul>	32; Virtual slots
<ul> <li>User data per address area, max.</li> </ul>	32 byte
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes
— S7 routing	Yes; with interface active
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	No
— DPV1	No
Transfer memory	

— Inputs	244 byte
— Outputs	244 byte
Protocols	
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	94
— Data length, max.	32 kbyte
<ul> <li>— several passive connections per port, supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
— Number of connections, max.	94
— Data length, max.	32 kbyte; 1452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	94
— Data length, max.	1 472 byte
Web server	
• supported	Yes
<ul> <li>User-defined websites</li> </ul>	Yes
Number of HTTP clients	5
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
Equidistance	Yes
Number of DP masters with isochronous mode	2
User data per isochronous slave, max.	244 byte
shortest clock pulse	1 ms; 0.5 ms without use of SFC 126, 127
max. cycle	32 ms
Communication functions	
PG/OP communication	Yes
<ul> <li>Number of connectable OPs without message processing</li> </ul>	95
<ul> <li>Number of connectable OPs with message processing</li> </ul>	95; When using Alarm_S/SQ and Alarm_D/DQ
Data record routing	Yes

processing		
Data record routing	Yes	
Global data communication		
• supported	Yes	
<ul> <li>Number of GD loops, max.</li> </ul>	16	
<ul> <li>Number of GD packets, transmitter, max.</li> </ul>	16	
<ul> <li>Number of GD packets, receiver, max.</li> </ul>	32	
<ul> <li>Size of GD packets, max.</li> </ul>	54 byte	
<ul> <li>Size of GD packet (of which consistent), max.</li> </ul>	1 variable	

(

S7 basic communication	
supported	Yes
• User data per job, max.	76 byte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	1 variable
S7 communication	
supported	Yes
• as server	Yes
● as client	Yes
• User data per job, max.	64 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	462 byte; 1 variable
S5 compatible communication	
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
• User data per job, max.	8 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	240 byte
Number of simultaneous AG-SEND/AG-RECV	64/64
orders per CPU, max.	
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
PROFINET CBA (at set setpoint communication load)	
<ul> <li>Setpoint for the CPU communication load</li> </ul>	20 %
<ul> <li>Number of remote interconnection partners</li> </ul>	32
<ul> <li>Number of functions, master/slave</li> </ul>	150
<ul> <li>Total of all master/slave connections</li> </ul>	6 000
<ul> <li>Data length of all incoming connections master/slave, max.</li> </ul>	65 000 byte
<ul> <li>Data length of all outgoing connections master/slave, max.</li> </ul>	65 000 byte
<ul> <li>Number of device-internal and PROFIBUS interconnections</li> </ul>	1 000
<ul> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> </ul>	16 000 byte
<ul> <li>Data length per connection, max.</li> </ul>	2 000 byte
Remote interconnections with acyclic transmission	
— Sampling frequency: Sampling time, min.	200 ms; Depending on preset communication load, number of interconnections and data length used
- Number of incoming interconnections	500
- Number of outgoing interconnections	500
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	16 000 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	16 000 byte
— Data length per connection, max.	2 000 byte

Remote interconnections with cyclic transmission	
— Transmission frequency: Transmission	1 ms; Depending on preset communication load, number of
interval, min.	interconnections and data length used
<ul> <li>Number of incoming interconnections</li> </ul>	300
— Number of outgoing interconnections	300
— Data length of all incoming interconnections, max.	4 800 byte
— Data length of all outgoing interconnections, max.	4 800 byte
— Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	
— Number of stations that can log on for HMI variables (PN OPC/iMap)	2x PN OPC/1x iMap
— HMI variable updating	500 ms
— Number of HMI variables	1 500
— Data length of all HMI variables, max.	48 000 byte
PROFIBUS proxy functionality	
— supported	Yes; 32 PROFIBUS slaves max. connectable
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• overall	96
<ul> <li>usable for PG communication</li> </ul>	95
- reserved for PG communication	1
— adjustable for PG communication, max.	0
<ul> <li>usable for OP communication</li> </ul>	95
— reserved for OP communication	1
— adjustable for OP communication, max.	0
<ul> <li>usable for S7 basic communication</li> </ul>	94
- reserved for S7 basic communication	0
<ul> <li>adjustable for S7 basic communication, max.</li> </ul>	0
<ul> <li>usable for S7 communication</li> </ul>	94
- reserved for S7 communication	0
— adjustable for S7 communication, max.	0
<ul> <li>usable for routing</li> </ul>	47
— reserved for routing	0
— adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	95; Max. 95 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	Yes
SCAN procedure	Yes

Process diagnostic messages         Yes           simultaneously active alarm S blocks, max.         1000. Simultaneously active alarm S/SQ blocks or alarm_D/DQ blocks           Alarm 8-blocks         Yes           • Number of instances for alarm 8 and S7 communication blocks, max.         600           • preset, max.         600           Process control messages         Yes           Number of messages         Yes           Number of messages         Yes           • overall, max.         1024           • in 100 ms grid, max.         128           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         10           • with 500, 1000 ms grid, max.         1           • status/control variable         Yes, Up to 16 simultaneously           Single step         Yes, Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed VOs, timers, counters           • Number of variable	Program alarms	Yes
blocks         Yes           Alama Subber of instances for alarm 8 and S7 communication blocks, max.         4000           • prosest, max.         600           • prosest, max.         600           • prosest, max.         600           • process control messages         Yes           • Number of archives that can log on simultaneously (SFB 37 AR_SEND)         22           • Number of messages         1024           • in 100 ms grid, max.         128           • in 100 ms grid, max.         121           • in 100 ms grid, max.         1024           • with 500, 1000 ms grid, max.         10           • with 500, 1000 ms grid, max.         1           • with 500, 1000 ms grid, max.         1           • with 500, 1000 ms grid, max.         1           • with 500, 1000 ms grid, max.         16           Single step         Yes. Up to 16 simultaneously           Single step         Yes.           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters           • Number of variables, max.         70; Status/control           • Forcing, variables, max.         512           • Proring         Yes           • Forcing, variables, max.         512           • Proresent	Process diagnostic messages	Yes
• Number of instances for alarm 8 and S7 communication blocks, max.         4000           • Process control messages         Ves           Number of archives that can log on simultaneously (SFB 37 AR SEND)         32           Number of archives that can log on simultaneously (SFB 37 AR SEND)         32           • Number of messages         1024           • overall, max.         1024           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • with 500, 1000 ms grid, max.         1024           • with 500, 1000 ms grid, max.         10           Status block         Yes; Up to 16 simultaneously           Single step         Yes           Number of variables, max.         16           Status control variable         Yes; Up to 16 simultaneously           Single step         Yes; Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, courters           • Number of variables, max.         Yes; Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os           • Forcing         Yes           • Forcing         Yes           • Inputs/outputs, bit memories, distributed I/Os	simultaneously active Alarm-S blocks, max.	
• preset, max.         600           • preset, max.         98           • preset, max.         1024           • preset, max.         1024           • in 100 ms grid, max.         128           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • with 100 ms grid, max.         10           • with 500, 1000 ms grid, max.         10           • with 500, 1000 ms grid, max.         10           • forbining functions         15           • Status block         Yes: Up to 16 simultaneously           Single step         Yes           • Number of breakpoints         16           • Status/control variables, max.         70           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters           • Number of variables, max.         70           • Prorcing         Yes           • Forcing, variables, max.         10           • Forcing, var	Alarm 8-blocks	Yes
Process control messages         Yes           Number of archives that can log on simultaneously (SFB 37 AR_SEND)         32           Number of messages         1024           • overall, max.         1024           • in 100 ms grid, max.         512           • in 100 ms grid, max.         512           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         10           • with 500, ng grid, max.         1           • with 500, 1000 ms grid, max.         1           • with 500, 1000 ms grid, max.         10           Test commissioning functions         10           Status block         Yes; Up to 16 simultaneously           Single step         Yes           Number of breakpoints         16           Status/control variable         Yes; Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters           • Number of variables, max.         70; Status/control           Forcing         Yes           • Forcing, variables, max.         170; Status/control           • Number of variables, max.         3200           • Number of entries, max.         3200           • present         Yes           • number of entries, ma		4 000
Number of archives that can log on simultaneously (SFB 37 AR, SEND)         32           Number of messages         1024           • overall, max.         1024           • in 100 ms grid, max.         128           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • in 100 ms grid, max.         1024           • with 100 ms grid, max.         1024           • with 100 ms grid, max.         10           • with 500, 1000 ms grid, max.         10           • with 500, 1000 ms grid, max.         10           • with 500, 1000 ms grid, max.         10           Status block         Yes; Up to 16 simultaneously           Single step         Yes; Up to 16 simultaneously           Single step         Yes; Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters           • Number of variables, max.         70; Status/control           Forcing         Yes           • Forcing under of variables, max.         512           Diagnostic buffer         Yes           • Number of variables, max.         512           Diagnostic buffer         Yes           • present         Yes           • Number of entries, ma	● preset, max.	600
(SFB 37 AR_SEND)Number of messages• overall, max.1024• in 100 ms grid, max.128• in 500 ms grid, max.1024Number of additional values1024• with 100 ms grid, max.10• with 500, 1000 ms grid, max.10Test commissioning functions10Status blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70ForcingYes• Forcing, variables, max.512Diagnostic bufferYes• Number of entriels, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3200• AdjustableYes• Number of entries, max.3200• adjustable120Status/controt120Status/controt entries, max.120• Cer markYes• Can be read outYes• Cer markYes• Cer markYes <trt< td=""><td>Process control messages</td><td>Yes</td></trt<>	Process control messages	Yes
• overall, max.1 024• in 100 ms grid, max.128• in 500 ms grid, max.512• in 1000 ms grid, max.1 024Number of additional values1• with 100 ms grid, max.1• with 500, 1000 ms grid, max.10Test commissioning functions10Status blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/control16Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing, variables, max.512Diagnostic bufferYes• Number of variables, max.512Diagnostic bufferYes• Number of entries, max.3200- adjustableYes- preset120Service dataYes• can be read outYesCE markYes		32
in 100 ms grid, max.128in 500 ms grid, max.512in 1000 ms grid, max.1024Number of additional values1with 100 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/controlYes; Up to 16 variable tablesVariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, countersNumber of variables, max.70; Status/controlForcingYesProreingYesOptimizer of variables, max.70; Status/controlForcingYesInputs/outputs, bit memories, distributed I/Os, timers, countersNumber of variables, max.320Diagnostic bufferYesorgesentYesNumber of entries, max.3200- adjustableYesStatus/controlYesStatus/controlYesDiagnostic bufferYesOutputs, bit memories, distributed I/OsNumber of entries, max.3200- adjustableYesStatus/controlYesStatus/controlYesDiagnostic bufferYesOutputs, bit memories, distributed I/OsOutputs, bit memories, distributed I/OsOutputs, bit memories, distributed I/OsOtherYesOtherYesOtherYesOtherYesOtherYesOtherYesOther	Number of messages	
in too me grid, max. 512 in 1000 ms grid, max. 1024 Number of additional values i with 100 ms grid, max. 1 with 500, 1000 ms grid, max. 10 Test commissioning functions Status block Yes; Up to 16 simultaneously Single step Yes Number of breakpoints 16 Status/control I Status/control variable Houses Variables Name of variables, max. 70; Status/control Forcing i Forcing, variables, max. 70; Status/control Forcing i Forcing, variables, max. 512 Diagnostic buffer i present Yes Number of entries, max. 3200 i mputs/outputs, bit memories, distributed I/Os i Ruse of variables, max. 3200 i mputs/outputs, bit memories, distributed I/Os i Ruse of variables, max. 3200 i present Yes i Number of entries, max. 3200 i present Yes i Ruse i Maximum Association i	• overall, max.	1 024
in 1000 ms grid, max.1024Number of additional values1• with 100 ms grid, max.1• with 500, 1000 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/controlYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing or variables, max.512Diagnostic bufferYes• Number of variables, max.512Diagnostic bufferYes• Number of entries, max.3 200- adjustableYes- preset120Service dataYes• can be read outYesCE markYes	• in 100 ms grid, max.	128
Number of additional values• with 100 ms grid, max.1• with 500, 1000 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/controlYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing variables, max.512Diagnostic bufferYes• number of variables, max.512Diagnostic bufferYes• presentYes• number of entries, max.3200- adjustableYes• number of entries, max.3200- adjustableYes• can be read outYesStatus/controlYesStatus/controlYesCE markYes	• in 500 ms grid, max.	512
• with 100 ms grid, max.1• with 500, 1000 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/control16Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing, variables, max.512Diagnostic bufferYes• Number of variables, max.512Diagnostic bufferYes• Number of entries, max.3 200- adjustableYes• Diagnostic bufferYes• Diagnostic bufferYes• Can be read outYesStatus/controlYesStatus/controlYesCE markYes	• in 1000 ms grid, max.	1 024
with 500, 1000 ms grid, max.10Test commissioning functionsStatus blockYes; Up to 16 simultaneouslySingle stepYesNumber of breakpoints16Status/controlStatus/control variable• Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingYes• Forcing, variables, max.512Diagnostic bufferYes• number of entries, max.3 200- adjustableYes- preset120Service dataYes• can be read outYesCE markYes	Number of additional values	
Test commissioning functions         Status block       Yes; Up to 16 simultaneously         Single step       Yes         Number of breakpoints       16         Status/control       Yes; Up to 16 variable tables         • Status/control variable       Yes; Up to 16 variable tables         • Variables       Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters         • Number of variables, max.       70; Status/control         Forcing       Yes         • Forcing, variables, max.       512         Diagnostic buffer       Yes         • Number of entries, max.       3 200         — adjustable       Yes         — preset       3 200         — adjustable       Yes         • can be read out       Yes         Status/control       Yes	• with 100 ms grid, max.	1
Status block     Yes; Up to 16 simultaneously       Single step     Yes       Number of breakpoints     16       Status/control        • Status/control variable     Yes; Up to 16 variable tables       • Variables     Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters       • Number of variables, max.     70; Status/control       Forcing     Yes       • Forcing, variables     Inputs/outputs, bit memories, distributed I/Os       • Number of variables, max.     512       Diagnostic buffer     Yes       • number of entries, max.     3 200       — adjustable     Yes       — preset     120       Service data     Yes       • can be read out     Yes       Status/control     Yes	• with 500, 1000 ms grid, max.	10
Status block     Yes; Up to 16 simultaneously       Single step     Yes       Number of breakpoints     16       Status/control        • Status/control variable     Yes; Up to 16 variable tables       • Variables     Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters       • Number of variables, max.     70; Status/control       Forcing     Yes       • Forcing, variables     Inputs/outputs, bit memories, distributed I/Os       • Number of variables, max.     512       Diagnostic buffer     Yes       • number of entries, max.     3 200       — adjustable     Yes       — preset     120       Service data     Yes       • can be read out     Yes       Status/control     Yes	T	
Single step       Yes         Number of breakpoints       16         Status/control       Yes; Up to 16 variable tables         • Variables       Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters         • Number of variables, max.       70; Status/control         Forcing       Yes         • Forcing       Yes         • Forcing, variables, max.       512         • Number of variables, max.       512         Diagnostic buffer       Yes         • present       Yes         • Number of entries, max.       3 200         - adjustable       Yes         - preset       120         Service data       Yes         • can be read out       Yes         Status/control       Yes		Ves: Up to 16 simultaneously
Number of breakpoints         16           Status/control         Yes; Up to 16 variable tables           • Variables         Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters           • Number of variables, max.         70; Status/control           Forcing         Yes           • Forcing, variables         Inputs/outputs, bit memories, distributed I/Os, timers, counters           • Forcing         Yes           • Forcing, variables, max.         512           • Diagnostic buffer         Status/control           • present         Yes           • Number of entries, max.         3 200           - adjustable         Yes           - preset         120           Service data         Yes           • can be read out         Yes           Status/control         Yes		
Status/control       Yes; Up to 16 variable tables         • Status/control variable       Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters         • Number of variables, max.       70; Status/control         Forcing       Yes         • Forcing, variables       Inputs/outputs, bit memories, distributed I/Os         • Forcing, variables, max.       512         Diagnostic buffer       Yes         • present       Yes         • number of entries, max.       3 200         - adjustable       Yes         - preset       Yes         • can be read out       Yes         Status/control       Yes		
• Status/control variableYes; Up to 16 variable tables• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcing• ForcingYes• Forcing, variablesInputs/outputs, bit memories, distributed I/Os• Forcing, variables, max.512• Number of variables, max.512Diagnostic bufferYes• presentYes• number of entries, max.3 200- adjustableYes- preset120Service dataYes• can be read outYesStandards, approvals, certificatesYes	-	
• VariablesInputs/outputs, memory bits, DBs, distributed I/Os, timers, counters• Number of variables, max.70; Status/controlForcingVes• Forcing, variablesInputs/outputs, bit memories, distributed I/Os• Forcing, variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3200- adjustableYes- preset120Service dataYes• can be read outYesStandards, approvals, certificatesYesCE markYes		Yes: Up to 16 variable tables
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• ForcingYes• Forcing, variablesInputs/outputs, bit memories, distributed I/Os• Number of variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3 200- adjustableYes- adjustable120Service dataYes• can be read outYesStandards, approvals, certificatesYes<	<ul> <li>Number of variables, max.</li> </ul>	70; Status/control
• Forcing, variablesInputs/outputs, bit memories, distributed I/Os• Number of variables, max.512Diagnostic bufferYes• presentYes• Number of entries, max.3 200— adjustableYes— preset120Service dataYes• can be read outYesStandards, approvals, certificatesYesVesYes <td>Forcing</td> <td></td>	Forcing	
• Number of variables, max.       512         Diagnostic buffer       Yes         • present       Yes         • Number of entries, max.       3 200         - adjustable       Yes         - preset       120         Service data       Yes         • can be read out       Yes         Standards, approvals, certificates       Yes	• Forcing	Yes
Diagnostic buffer• presentYes• Number of entries, max.3 200- adjustableYes- preset120Service data• can be read outYesStandards, approvals, certificatesCE markYes	<ul> <li>Forcing, variables</li> </ul>	Inputs/outputs, bit memories, distributed I/Os
• presentYes• Number of entries, max.3 200- adjustableYes- preset120Service dataYes• can be read outYesStandards, approvals, certificatesCE markYes	<ul> <li>Number of variables, max.</li> </ul>	512
<ul> <li>Number of entries, max.</li> <li>adjustable</li> <li>preset</li> <li>Service data</li> <li>can be read out</li> <li>Yes</li> <li>Standards, approvals, certificates</li> <li>CE mark</li> <li>Yes</li> </ul>	Diagnostic buffer	
adjustable     Yes       preset     120       Service data        • can be read out     Yes       Standards, approvals, certificates        CE mark     Yes	• present	Yes
preset     120       Service data        • can be read out     Yes       Standards, approvals, certificates     Yes	<ul> <li>Number of entries, max.</li> </ul>	3 200
- preset     120       Service data        • can be read out     Yes       Standards, approvals, certificates     Yes	— adjustable	Yes
• can be read out Yes Standards, approvals, certificates CE mark Yes	— preset	120
Standards, approvals, certificates CE mark Yes	Service data	
CE mark Yes	• can be read out	Yes
CE mark Yes	Standards, approvals, certificates	
CSA approval Yes	CE mark	Yes
	CSA approval	Yes

UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• ATEX	ATEX II 3G Ex nA IIC T4 Gc

Ambient conditions	
Ambient temperature during operation	
• min.	0°0
● max.	60 °C
Configuration	
Configuration software	Yes
• STEP 7	res
Programming	and instruction list
Command set	see instruction list
Nesting levels	7
<ul> <li>Access to consistent data in process image</li> </ul>	Yes
<ul> <li>System functions (SFC)</li> </ul>	see instruction list
<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Number of simultaneously active SFCs	
— DPSYC_FR	2; SFC 11; per interface
— D_ACT_DP	8; SFC 12; per interface
	8; SFC 59; per interface
— WR_REC	8; SFC 58; per interface
— WR_PARM	8; SFC 55; per interface
— PARM_MOD	1; SFC 57; per interface
	2; SFC 56; per interface
— DPNRM_DG	8; SFC 13; per interface
- RDSYSST	8; SFC 51
- DP_TOPOL	1; SFC 103; per interface

Number of simultaneously active SFBs

- RDREC	8; SFB 52; per interface, but not more than 32 across all external interfaces
— WRREC	8; SFB 53; per interface, but not more than 32 across all external interfaces
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	900 g
last modified:	07/16/2018