SIEMENS

Data sheet

6ES7414-3FM07-0AB0



SIMATIC S7-400, CPU414F-3 PN/DP Central processing unit with: Work memory 4 MB, (2 MB code, 2 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 414F-3 PN/DP	
HW functional status	01	
Firmware version	V7.0	
Product function		
Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface	
Engineering with		
 Programming package 	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	15 µs	
Supply voltage		
Rated value (DC)	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	
Memory		
Memory Type of memory	RAM	
	RAM	
Type of memory	RAM 4 Mbyte	
Type of memory Work memory		
Type of memory Work memory • integrated	4 Mbyte	
Type of memory Work memory • integrated • integrated (for program)	4 Mbyte 2 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data)	4 Mbyte 2 Mbyte 2 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable	4 Mbyte 2 Mbyte 2 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory	4 Mbyte 2 Mbyte 2 Mbyte No	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH)	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max.	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max.	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM)	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max.	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM)	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM, max. Backup	4 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM) 64 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM • expandable RAM • expandable RAM, max.	4 Mbyte 2 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM) 64 Mbyte Yes; With Memory Card (RAM)	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM • expandable RAM • expandable RAM • expandable RAM • expandable RAM • expandable RAM, max.	4 Mbyte 2 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM) 64 Mbyte Yes; with Memory Card (RAM) 64 Mbyte	
Type of memory Work memory • integrated • integrated (for program) • integrated (for data) • expandable Load memory • expandable FEPROM • expandable FEPROM, max. • integrated RAM, max. • expandable RAM • expandable RAM • expandable RAM, max. Backup • present • with battery • without battery	4 Mbyte 2 Mbyte 2 Mbyte 2 Mbyte No Yes; with Memory Card (FLASH) 64 Mbyte 512 kbyte Yes; with Memory Card (RAM) 64 Mbyte Yes; with Memory Card (RAM) 64 Mbyte	

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Backup current, max. Backup time, max.	850 μA Dealt with in the module data manual with the secondary conditions and the
Backup time, max.	Dealt with in the module data manual with the secondary conditions and the factors of influence
 Feeding of external backup voltage to CPU 	5 V DC to 15 V DC
CPU processing times	
for bit operations, typ.	18.75 ns
for word operations, typ.	18.75 ns
for fixed point arithmetic, typ.	18.75 ns
for floating point arithmetic, typ.	37.5 ns
CPU-blocks	
DB	
• Number, max.	6 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	3 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
Number, max.	3 000; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
Number, max.	see instruction list
• Size, max.	64 kbyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	4; OB 10-13
 Number of delay alarm OBs 	4; OB 20-23
Number of cyclic interrupt OBs	4; OB 32, 33, 34, 35 (shortest cycle that can be set = 500 μ s)
Number of process alarm OBs	4; OB 40-43
Number of DPV1 alarm OBs	3; OB 55-57
Number of isochronous mode OBs	3; OB 61-63
Number of multicomputing OBs	1; OB 60
Number of background OBs	1; OB 90
Number of startup OBs	2; OB 100, 102
Number of asynchronous error OBs	9; OB 80-88
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	-, -,
per priority class	24
additional within an error OB	1
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
— preset	No times retentive
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
·) = -	

Data areas and their researching Total aversign and back memory (with backup battery) Field Total aversign and back memory (with backup battery) Field Bobyte: Size of bit memory address area • Receiving present Mit 0 to Mit 15 • Receiving present Mit 0 to Mit 15 • Anuther of ock memories Bit 1 memory byte • adjustable: Bit Network • adjustable: Bit Network <th>Number</th> <th>Unlimited (limited only by RAM capacity)</th>	Number	Unlimited (limited only by RAM capacity)
Figs. Bit Stars, max. Bit Stars, Sta	Data areas and their retentivity	
• Reaching variableProvide Reserve Re	Retentive data area (incl. timers, counters, flags), max.	Total working and load memory (with backup battery)
• Renervisy positive Wein • Renervisy positive Bit Do Bit 5 • Auriber of clock memories Bit Nyte • adjustite, max. Bit Myte • function Bit Myte	Flag	
Headmin by preset M80 0 to M8 1 5 Number of clock memories B, in 1 memory byte Address B ktyte Address B ktyte Address B ktyte Outputs Getsuit Outputs Getsuit </td <td></td> <td>8 kbyte; Size of bit memory address area</td>		8 kbyte; Size of bit memory address area
• Rundber of clock memories 8, in 1 memory byte Local data • Ricyte • Individue, max. 16 ktyte • Inputs 8 ktyte Via dofess area • Ricyte • Inputs 8 ktyte • Inputs, adjustable 8 ktyte • Inputs, adjustable 8 ktyte • Outputs, adjustable 8 ktyte • Outputs 6 5 530 • of which central 6 5 536 • Outputs 6 6 536 • Outputs 4 086 • Outputs 4 086 • Outputs 4 086 • Outputs 4 086 • Outputs 10 ktyte	Retentivity available	Yes
Local data If Brbyte • adjustable, max. 16 Brbyte • adjustable, max. 8 Brbyte • Address series • Oppdis 9 Brbyte • Oppdis, digutable 8 Brbyte • Oppdis • Oppdis • Oppdis • Oppdis • Oppdis • Oppdis • Oppdis • Oppdis	Retentivity preset	MB 0 to MB 15
Local data 6 byte • adjustable, max. 16 byte • protest 8 kbyte Addross area 6 • (Diputs) 8 kbyte • (Diputs), diputs) 8 kbyte • (Diputs) 6 5 58 of which central 4 066		8; in 1 memory byte
- priset B ktyte Addross area - • inputs B ktyte • Oupputs B ktyte • Oupputs, adjustable B ktyte • Outputs, adjustable B ktyte • Outputs G 5 536 • Outputs G 5 536 • outputs G 5 536 • outputs 4 096 • of which central 4 096 • of which central 4 096 • outputs G 6 • outputs, max. 6 • outputs 6 <	Local data	
Address and ID address area • Inputs 8 kbyte • Outputs 8 kbyte Process image 8 kbyte • Outputs, default 266 byte • Outputs, default 266 byte • Coulputs, default 266 byte • Coulputs, default 266 byte • Councest intage 9 • Number of subprocess images, max. 15 Ølgtal channels 65 536 • Outputs 65 536 - of which central 65 536 • Outputs 65 536 - of which central 65 536 • Outputs 65 536 - of which central 65 536 • Outputs 4 096 • Outputs 4 096 • Outputs 4 096 • Outputs 63 • Munther of connectable IMs (total), max. 6 • Number of connectable IMs (total), max. 6 • Number of connectable IM 4035, max.	 adjustable, max. 	16 kbyte
IVD address area 8 kbyte • Outputs 8 kbyte Process image Inputs, adjustable B kbyte Outputs, adjustable B kbyte Subprocess images Number of subprocess images, max. Optist Outputs Outp	• preset	8 kbyte
 inputs inputs Keyle Outputs Keyle Outputs, adjustable Keyle Outputs, adjustable Keyle Stryte Outputs, adjustable Keyle Stryte Stryte outputs, default Stryte Constantion Stryte Control and an analysis Stryte Outputs, default Stryte Constantion Stryte Stryte	Address area	
Outputs B keyte Process image - - Inputs, adjustable B kbyte - Outputs, adjustable Steprocess images - Outputs, adjustable Yes Steprocess images Yes Steprocess images Yes Steprocess images Steprocess images, max. - Number of subprocess images, max. 15 Digital channels 65 536 - Or which central 65 536 - Or which central 4 096 - Number of connectab	I/O address area	
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Process image Inputs, adjustable Sktyte Oruputs, default 266 byte Oruputs, default Consistent data max. 244 byte Access to consistent data in process image Yes Subprocess images Inputs of statistent data in process image Statistent data in process images Inputs of visite data mases <l< td=""><td>-</td><td></td></l<>	-	
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• Outputs, adjustable8 kbyte• Inputs, default266 byte• Cudputs, default266 byte• consistent data, max.244 byte• Access to consistent data in process images245• Number of subprocess images, max.15• Dipital channes65 536- of which central65 536• Outputs65 536• of which central65 536• of which central4 096• of which central6• humber of connectable M& folio, max.6• humber of conne		8 kbyte
 Inputs, default Outputs, default Consistent data, max. Access to consistent data in process image Yes Subprocess images, max. 15 Digital channels - of which central 65 536 Outputs 65 536 Outputs 65 536 Outputs 65 536 Analog channels - of which central 65 536 Outputs 4096 Outputs Advare of connectable Ms (total), max. 6 Number of connectable Mde0s, max. 6 Number of connectable Mde0s, max. 70 CP 443-5 Extended 40 Mde32<		
Outputs, default consistent data, max. 244 byte consistent data, max. 244 byte consistent data in process image Supprocess images consistent data in process image supprocess images, max. Supprocess images, max. 15 Cipital channels converted to a supprocess images, max. fortunes converted to a supprocess images, max. inputs converted to a supprocess image data and supprocess images converted to a supprocess image data and supprocess images converted to a supprocess image data and supprocess images converted to a supprocess image data and supprocess image data and supprocess image converted to a supprocess image data and supprocess image data and supprocess image data and supprocess data and supprocess image data and supprocess data and suppro		
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• Number of subprocess images, max. 15 Digital channels 65 536 • Inputs 65 536 • Outputs 65 536 • Inputs 4096 • of which central 4096 • Outputs 4096 • Number of connectable Max, max. 21 • Number of connectable MMs (total), max. 6 • Number of connectable MM 460s, max. 6 • Via IM 477 4 • Via CP		
Digital channels 6 • Inputs 65 536 of which central 65 536 of which central 65 536 of which central 65 536 Analog channels 4 096 of which central 4 096 ot which central 4 096 ot which central 4 096 ot which central 1 0; CP 443-5 - Number of connectable IM 460s, max. 6 - integrated 1 <		15
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• Outputs 65 536 Analog channels 4096 • Inputs 4096 • of which central 4096 • Outputs 4096 • Outputs 4096 • of which central 4096 • Outputs 4096 • of which central 4096 • Outputs 4096 • of which central 4096 • Muthe configuration 21 Connectable OPs 63 Multicomputing Yes; 4 CPUs max. (with UR1 or UR2) Interface modules 6 • Number of connectable IMs (total), max. 6 • Number of connectable IMs (total), max. 6 • Number of connectable IMs 460s, max. 6 • wia Interface module 1); CP 443-5 Extended • wia CP No; IM 467 cannot be use		
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Multicomputing Yes; 4 CPUs max. (with UR1 or UR2) Interface modules 6 • Number of connectable IMs (total), max. 6 • Number of connectable IM 460s, max. 6 • Number of connectable IM 460s, max. 6 • Number of DP masters 1 • via CP 10; CP 443-5 Extended • via IM 467 4 • Mixed mode IM + CP permitted 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 • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 1 • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 1 • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 4 • via CP 4 • Vumber of operable FMs and CPs (recommended) 1 <		
Interface modules 6 • Number of connectable IMs (total), max. 6 • Number of connectable IM 460s, max. 6 • Number of connectable IM 463s, max. 4; IM 463-2 Number of DP masters 1 • via CP 10; CP 443-5 Extended • via IM 467 4 • Wixed mode IM + CP permitted 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 • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 1 • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 1 • via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode • via CP 1 • Via CP<		
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• Number of connectable IM 460s, max. 6 • Number of connectable IM 463s, max. 4; IM 463-2 Number of DP masters 1 • integrated 1 • via CP 10; CP 443-5 Extended • via IM 467 4 • Mixed mode IM + CP permitted 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 • via interface module 1; IF 964-DP • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 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) 1 • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots; and number of slots; CP 441: Limited by number of slots; CP 440: Limited by		0
• Number of connectable IM 463s, max. 4; IM 463-2 Number of DP masters 1 • integrated 1 • via CP 10; CP 443-5 Extended • via IM 467 4 • Mixed mode IM + CP permitted 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 • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 1 • 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) Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limite		
Number of DP masters integrated 1 via CP 10; CP 443-5 Extended integrated 4 Nixed mode IM + CP permitted No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode interface module 1; IF 964-DP Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 1 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) 1 FM Limited by number of slots and number of connections CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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		
• integrated 1 • via CP 10; CP 443-5 Extended • via IM 467 4 • Mixed mode IM + CP permitted 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 • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 6 • 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) 1 • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of slots and number of slots; CP 441: Limited by number of slots and number of slots and number of slots and number of slots and number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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		4, IVI 403-2
• via CP10; CP 443-5 Extended• via IM 4674• Mixed mode IM + CP permittedNo; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode• via interface module1; IF 964-DP• Number of pluggable S5 modules (via adapter capsule in central device), max.6Number of IO Controllers1• via CP1• via CP1• via CP4; 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)1• FMLimited by number of slots and number of connections• CP, PtPCP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections• PROFIBUS and Ethernet CPs14; 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		4
• via IM 4674• Mixed mode IM + CP permittedNo; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode• via interface module1; IF 964-DP• Number of pluggable S5 modules (via adapter capsule in central device), max.6Number of IO Controllers1• via CP4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode• via CP4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO mode• FM • CP, PtPLimited by number of slots and number of connections CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections• PROFIBUS and Ethernet CPs14; 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	C	
• Mixed mode IM + CP permittedNo; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in PROFINET IO mode• via interface module1; IF 964-DP• Number of pluggable S5 modules (via adapter capsule in central device), max.6Number of IO Controllers1• integrated1• via CP4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO modeNumber of operable FMs and CPs (recommended)Limited by number of slots and number of connections• FMLimited by number of slots; CP 441: Limited by number of slots and number of connections• PROFIBUS and Ethernet CPs14; 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		
PROFINET IO mode • via interface module 1; IF 964-DP • Number of pluggable S5 modules (via adapter capsule in central device), max. 6 Number of IO Controllers 1 • 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) Limited by number of slots and number of connections • FM Limited by number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 14; In total max. 10 CPs as DP master and PROFINET controller; or which up to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller		
• via interface module1; IF 964-DP• Number of pluggable S5 modules (via adapter capsule in central device), max.6Number of IO Controllers1• integrated1• via CP4; Max. 4 in the central controller; no mixed operation of different CP 443-1 types in PROFINET IO modeNumber of operable FMs and CPs (recommended)Limited by number of slots and number of connections• FMLimited by number of slots and number of connections• CP, PtPCP 440: Limited by number of slots; CP 441: Limited by number of slots and number of slots; and number of slots 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	 Mixed mode IM + CP permitted 	
 Number of pluggable S5 modules (via adapter capsule in central device), max. Number of IO Controllers integrated via CP Mumber of operable FMs and CPs (recommended) FM CP, PtP CP 440: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of slots and number of slots and number of slots; CP 441: Limited by number of slots and number of slots; CP 441: Limited by number of slots and number of connections PROFIBUS and Ethernet CPs 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 	• via interface module	
central device), max. 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) Example • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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		
• 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 and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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		
• 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) • EM • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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	Number of IO Controllers	
types in PROFINET IO mode Number of operable FMs and CPs (recommended) • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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	• integrated	1
Number of operable FMs and CPs (recommended) • FM Limited by number of slots and number of connections • CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs 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	• via CP	
 FM CP, PtP CP 440: Limited by number of slots and number of connections CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections PROFIBUS and Ethernet CPs 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 		types in PROFINET IO mode
 CP, PtP CP 440: Limited by number of slots; CP 441: Limited by number of slots and number of connections PROFIBUS and Ethernet CPs 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 		
PROFIBUS and Ethernet CPs PROFIBUS and Ethernet CPs 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		-
• PROFIBUS and Ethernet CPs 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	• CP, PtP	
to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller	• DECEIDING and Ethernet CDa	
	■ FRUFIDUS and Ethemet UPS	
SIOIS	Slots	

•	required	slots
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required slots	2		
Time of day			
Clock			
 Hardware clock (real-time) 	Yes		
 retentive and synchronizable 	Yes		
Resolution	1 ms		
 Deviation per day (buffered), max. 	1.7 s; Power off		
 Deviation per day (unbuffered), max. 	8.6 s; For power On		
Operating hours counter			
• Number	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		
retentive	Yes		
Clock synchronization			
• supported	Yes		
• to MPI, master	Yes		
• on MPI, device	Yes		
• to DP, master	Yes		
	Yes		
• on DP, device			
• in AS, master	Yes		
• in AS, device	Yes		
• on Ethernet via NTP	Yes; As client		
• to IF 964 DP	Yes		
Time difference in system when synchronizing via			
 Ethernet, max. 	10 ms		
• MPI, max.	200 ms		
Interfaces			
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)		
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-		
A Interface	0AB0)		
1. Interface			
Interface type	MPI/PROFIBUS DP		
Isolated	Yes		
Interface types			
• RS 485	Yes		
Output current of the interface, max.	150 mA		
Protocols			
• MPI	Yes		
 PROFIBUS DP master 	Yes		
PROFIBUS DP device	Yes		
MPI			
Number of connections	32; 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			
— PG/OP communication	Yes		
— Routing	Yes		
— Global data communication	Yes		
— S7 basic communication	Yes		
— S7 communication	Yes		
- S7 communication, as client	Yes		
— S7 communication, as server	Yes		
PROFIBUS DP master			
Number of connections, max.	16; 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		
• max. number of DP devices	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		
 activation/deactivation of DP devices 	Yes		
 — Direct data exchange (slave-to-slave 	Yes		
communication)			
— DPV1	Yes		
Address area			
— Inputs, max.	2 kbyte		
— Outputs, max.	2 kbyte		
User data per DP device			
— user data per DP device, max.	244 byte		
— Inputs, max.	244 byte		
— Outputs, max.	244 byte		
— Slots, max.	244		
— per slot, max.	128 byte		
1st interface / PROFIBUS DP device / header			
 Number of connections 	16		
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		
 User data per address area, max. 	32 byte		
— of which consistent, max.	32 byte		
Services			
— PG/OP communication	Yes; with interface active		
— 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		
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"		
Interface types			
RJ 45 (Ethernet)	Yes		
Number of ports	2		
 integrated switch 	Yes		
Protocols			
PROFINET IO Controller	Yes		
PROFINET IO Device	Yes		
PROFINET CBA	Yes		
PROFIBUS DP master	No		
	No		

Open IE communication	Yes	
Web server	Yes	
Point-to-point connection	No	
Media redundancy	Yes	
PROFINET IO Controller		
Transmission rate, max.	100 Mbit/s	
Services		
— PG/OP communication	Yes	
— S7 communication	Yes	
— Isochronous mode	Yes; Only with IRT and the High Performance option	
— Shared device	Yes	
— Prioritized startup	Yes	
 — Number of IO devices with prioritized startup, max. 	32	
 Number of connectable IO Devices, max. 	256	
 — Of which IO devices with IRT, max. 	64	
— of which in line, max.	64	
 — Number of IO Devices with IRT and the option "high flexibility" 	256	
— of which in line, max.	61	
— Number of connectable IO Devices for RT, max.	256	
— of which in line, max.	256	
Activation/deactivation of IO Devices	Yes	
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8	
 IO Devices changing during operation (partner ports), supported 		
— 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 μs to 4 ms in 125 μs 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 communication	Yes	
— Isochronous mode	No	
— IRT	Yes	
— Prioritized startup	Yes	
— Shared device	Yes	
— Number of IO Controllers with shared device, max.	2	
Transfer memory	1.440 byte: Por IO Controllor with abared device	
— Inputs, max. — Outputs, max	1 440 byte; Per IO Controller with shared device	
— Outputs, max. Submodules	1 440 byte; Per IO Controller with shared device	
— Number, max.	64	
— User data per submodule, max.	1 024 byte	
PROFINET CBA		
acyclic transmission	Yes	
cyclic transmission	Yes	
Open IE communication		
Number of connections, max.	62	
Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535	
 Keep-alive function, supported 	Yes	
3. Interface		
Interface type	Pluggable interface module (IF)	

Plug_in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	
Plug-in interface modules Isolated	Yes	
automatic detection of transmission rate	No	
	NO	
Interface types	Vaa	
RS 485	Yes	
Output current of the interface, max.	150 mA	
Protocols	Na	
• MPI	No	
PROFIBUS DP master	Yes	
PROFIBUS DP device	Yes	
PROFIBUS DP master	40	
Number of connections, max.	16 40 MFW	
Transmission rate, max.	12 Mbit/s	
max. number of DP devices	96	
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	
 activation/deactivation of DP devices 	Yes	
 — Direct data exchange (slave-to-slave communication) 	Yes	
— DPV0	Yes	
— DPV1	Yes	
Address area		
— Inputs, max.	6 kbyte	
— Outputs, max.	6 kbyte	
User data per DP device		
— user data per DP device, max.	244 byte	
— Inputs, max.	244 byte	
— Outputs, max.	244 byte	
— Slots, max.	244	
— per slot, max.	128 byte	
3rd interface / PROFIBUS DP device / header		
 Number of connections 	16	
• GSD file	http://support.automation.siemens.com/WW/view/en/113652	
 transfer rate / at the 3rd interface / as DP slave / maximum 	12 Mbit/s	
 automatic baud rate search 	No	
 Address area, max. 	32; Virtual slots	
 User data per address area, max. 	32 byte	
— of which consistent, max.	32 byte	
Services		
— PG/OP communication	Yes	
— 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	

Protocols		
Redundancy mode		
Media redundancy		
— Switchover time on line break, typ.	200 ms	
 Number of stations in the ring, max. 	50	
SIMATIC communication		
S7 routing	Yes	
Open IE communication		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	
- Number of connections, max.	62	
— Data length, max.	32 kbyte	
— bata length, max. — several passive connections per port, supported	Yes	
ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs	
	62	
— Data length, max.● UDP	32 kbyte; 1 452 bytes via CP 443-1 Adv.	
	Yes; via integrated PROFINET interface and loadable FBs 62	
— Number of connections, max.		
— Data length, max. Web server	1 472 byte	
	Yes	
supported		
User-defined websites Number of HTTP clients	Yes 5	
Number of HTTP clients		
Isochronous mode		
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 / header		
PG/OP communication	Yes	
 Number of connectable OPs with message processing 	63; When using Alarm_S/SQ and Alarm_D/DQ	
 Number of connectable OPs without message processing 	63	
Data record routing	Yes	
Global data communication		
supported	Yes	
 Number of GD loops, max. 	8	
 Number of GD packets, transmitter, max. 	8	
 Number of GD packets, receiver, max. 	16	
 Size of GD packets, max. 	54 byte	
 Size of GD packet (of which consistent), max. 	1 variable	
S7 basic communication		
 supported 	Yes	
 User data per job, max. 	76 byte	
 User data per job (of which consistent), max. 	1 variable	
S7 communication		
supported	Yes	
• as server	Yes	
• as client	Yes	
 User data per job, max. 	64 kbyte	
 User data per job (of which consistent), max. 	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	
	240 byte	
 User data per job (of which consistent), max. 	24/24	
Number of simultaneous AG-SEND/AG-RECV orders per	24/24	
Number of simultaneous AG-SEND/AG-RECV orders per CPU, max.	24/24	
Number of simultaneous AG-SEND/AG-RECV orders per CPU, max. Standard communication (FMS)		
Number of simultaneous AG-SEND/AG-RECV orders per CPU, max. Standard communication (FMS) supported	Yes; Via CP and loadable FB	
Number of simultaneous AG-SEND/AG-RECV orders per CPU, max. Standard communication (FMS) supported communication functions / PROFINET CBA (with set target communication)	Yes; Via CP and loadable FB Inication load) / header	
Number of simultaneous AG-SEND/AG-RECV orders per CPU, max. Standard communication (FMS) supported	Yes; Via CP and loadable FB	

number of master/device functions	150		
 total of all master/device connections 	4 500		
 data length of all incoming master/device connections, max. 	45 000 byte		
 data length of all outgoing master/device connections, max. 	45 000 byte		
Number of device-internal and PROFIBUS interconnections	1 000		
 Data length of device-internal und PROFIBUS interconnections, max. 	16 000 byte		
Data length per connection, max.	2 000 byte		
performance data / PROFINET CBA / remote interconnection			
— Sampling interval, min.	200 ms; Depending on preset communication load, number of interconnections		
- Number of incoming interconnections	and data length used		
-	250		
 Number of outgoing interconnections Data length of all incoming interconnections 			
 Data length of all incoming interconnections, max. 	8 000 byte		
— Data length of all outgoing interconnections, max.	8 000 byte		
— Data length per connection, max.	2 000 byte		
performance data / PROFINET CBA / remote interconnection			
 Transmission frequency: Transmission interval, min. 	1 ms; Depending on preset communication load, number of interconnections and data length used		
 — Number of incoming interconnections 	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		
performance data / PROFINET CBA / HMI variables via PROF	INET / acyclic / header		
— 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 	1 000		
 — Data length of all HMI variables, max. 	32 000 byte		
performance data / PROFINET CBA / PROFIBUS proxy functi	onality / header		
— supported	Yes; 32 PROFIBUS slaves max. connectable		
 — Data length per connection, max. 	240 byte; Slave-dependent		
Number of connections			
• overall	64		
 usable for PG communication 	63		
 reserved for PG communication 	1		
 adjustable for PG communication, max. 	0		
 usable for OP communication 	63		
 reserved for OP communication 	1		
- adjustable for OP communication, max.	0		
usable for S7 basic communication	62		
- reserved for S7 basic communication	0		
— adjustable for S7 basic communication, max.	0		
usable for S7 communication	62		
reserved for S7 communication	0		
— adjustable for S7 communication, max.	0		
usable for routing	31		
- reserved for routing	0		
reserved for routing adjustable for routing max	0		
— adjustable for routing, max.	0 0		
-	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm,		
— adjustable for routing, max. S7 message functions Number of login stations for message functions, max.	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes 400; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks		
	0 63; Max. 63 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 8 with Alarm, Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC) Yes Yes Yes Yes		

blocks, max.	
• preset, max.	300
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	16
Number of messages	
• overall, max.	512
• in 100 ms grid, max.	128
• in 500 ms grid, max.	256
• in 1000 ms grid, max.	512
Number of additional values	
● 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	
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	
• Forcing	Yes
Forcing, variables	Inputs/outputs, bit memories, distributed I/Os
 Number of variables, max. 	256
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	3 200
— adjustable	Yes
— preset	120
Service data	
• can be read out	Yes
Standards, approvals, certificates	
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 °C
• max.	60 °C
configuration / header	
Configuration software	
• STEP 7	Yes
configuration / programming / header	
Command set	see instruction list
Nesting levels	7
 Access to consistent data in process image 	Yes
 System functions (SFC) 	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
500	No
— FBD	Yes
— FBD — STL — SCL	Yes

— CFC	Yes			
— GRAPH	Yes			
— HiGraph®	Yes			
configuration / programming / number of simultaneously active	SFC / header			
– 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			
- WR_DPARM	2; SFC 56; per interface			
— DPNRM_DG	8; SFC 13; per interface			
- RDSYSST	8; SFC 51			
- DP_TOPOL	1; SFC 103; per interface			
configuration / programming / number of simultaneously active	SFB / header			
- RDREC	8; SFB 52; per interface, but no	t 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				
 User program protection/password protection 	Yes			
Block encryption	Yes; With S7 block Privacy			
Dimensions				
Width	50 mm			
Height	290 mm			
Depth	219 mm			
Weights				
Weight, approx.	900 g			
Classifications				
		Version	Classification	
	eClass	14	27-24-22-07	
	eClass	12		

Approvals	/ Certificates	
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General Product Approval

Miscellaneous







eClass

eClass

eClass eClass

eClass

ETIM

ETIM ETIM

IDEA

UNSPSC

Miscellaneous

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7.1

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32-15-17-05

For use in hazardous locations							
IECE×	KEX ATEX	<u>EM</u>	CCC	IECE×	KEx ATEX		
For use in hazard- ous locations	Functional Saftey		Maritime application				

5/29/2025

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<u>Type Examination Cer-</u> <u>tificate</u>	TUV	<u>Type Examination Cer-</u> <u>tificate</u>	ABS	B U REAU VERITAS	
Maritime application				Environment	
Llovd's Register urs	<u>NK / Nippon Kaiji Ky-</u> <u>okai</u>	RINA	<u>CCS (China Classifica-</u> tion Society)	EPD	
last modified: 12/8/2024 C					