SIEMENS

Data sheet

6ES7214-1AF40-0XB0

SIMATIC S7-1200F, CPU 1214 FC, COMPACT CPU, DC/DC/DC, ONBOARD I/O: 14 DI 24V DC; 10 DO 24 V DC; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY 125 KB



General information		
Product type designation	CPU 1214FC DC/DC	
Firmware version	V4.2	
Engineering with		
Programming package	STEP 7 V14 or higher	
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	
permissible range, lower limit (DC)	20.4 V	
permissible range, upper limit (DC)	28.8 V	
Load voltage L+		
• Rated value (DC)	24 V	
permissible range, lower limit (DC)	20.4 V	
• permissible range, upper limit (DC)	28.8 V	
Input current		
Current consumption, max.	1 500 mA; max. with all expansion accessories	
Inrush current, max.	12 A; at 28.8 V DC	
l²t	0.5 A ² ·s	

Output current	
for backplane bus (5 V DC), max.	1 600 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
● 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	12 W
Memory	
Work memory	
• integrated	125 kbyte
expandable	No
Load memory	
• integrated	4 Mbyte
 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
Backup	
• present	Yes
maintenance-free	Yes
without battery	Yes
CPU processing times	
for bit operations, typ.	0.085 μs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction
CDI Market	
CPU-blocks Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of
Number of blocks (total)	addressable blocks ranges from 1 to 65535. There is no
	restriction, the entire working memory can be used
OB	
• Number, max.	Limited only by RAM for code
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags),	10 kbyte
max.	
Flag	
• Number, max.	8 kbyte; Size of bit memory address area
Local data	
• per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB
Address area	
I/O address area	
• Inputs	1 024 byte
Outputs	1 024 byte

Process image	
Inputs, adjustable	1 kbyte
Outputs, adjustable	1 kbyte
Culputo, adjustable	7.110
Hardware configuration	
Number of modules per system, max.	3 comm. modules, 1 signal board, 8 signal modules
Time of day	
Clock	
Hardware clock (real-time)	Yes
Backup time	480 h; typical; 12 days min. at 40 °C
 Deviation per day, max. 	±60 s per month
Digital inputs	
Number of digital inputs	14
of which inputs usable for technological	6; HSC (High Speed Counting)
functions	
Source/sink input	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	14; 14 inputs at 55 °C horizontal or 45 °C vertical
Input voltage	
Rated value (DC)	24 V; DC at 4 mA nominal
• for signal "0"	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA
Input current	
• for signal "1", typ.	4 mA; nominal
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1
·	/ 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
— at "0" to "1", min.	0.1 µs
— at "0" to "1", max.	20 ms
for interrupt inputs	
— parameterizable	Yes
for counter/technological functions	
— parameterizable	Yes; Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @
	80 kHz & 3 @ 30 kHz
Cable length	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	150 m; For technological functions: No
Digital outputs	
Number of digital outputs	10
of which high-speed outputs	4; 100 kHz Pulse Train Output

Short-circuit protection	No; to be provided externally
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Output voltage	
• for signal "0", max.	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V
Output current	
● for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
• "0" to "1", max.	1 μs
• "1" to "0", max.	3 µs
Switching frequency	
• of the pulse outputs, with resistive load, max.	100 kHz
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
A - last a ta	
Analog inputs Number of analog inputs	2
Input ranges	2
• Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• Input resistance (0 to 10 V)	≥100k ohms
Cable length	
• shielded, max.	100 m; twisted and shielded
Sincted, make	,
Analog outputs	
Number of analog outputs	0
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	10 bit
max.	
 Integration time, parameterizable 	Yes
Conversion time (per channel)	625 μs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	PROFINET
Interface type	PROFINET

Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
Number of ports	1
• integrated switch	Yes
Functionality	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	Yes; as MRP client
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	Yes; as MRP client
— MRPD	No
— PROFlenergy	No
 Prioritized startup 	Yes
 Number of IO devices with prioritized 	16
startup, max.	
 Number of connectable IO Devices, max. 	16
 Number of connectable IO Devices for RT, 	16
max.	
— of which in line, max.	16
 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
— Updating time	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes

— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	Yes; as MRP client
— MRPD	No
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	2

Protocols	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes; CM 1243-5 required
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Further protocols	
• MODBUS	Yes

Communication functions	
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
 User data per job, max. 	See online help (S7 communication, user data size)
Open IE communication	
• TCP/IP	Yes
— Data length, max.	8 kbyte
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	8 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
Web server	
• supported	Yes
 User-defined websites 	Yes
Number of connections	
• overall	16; dynamically

Test commissioning functions

Status/control

Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers,
Valiables	counters
Forcing	
• Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	
Number of configurable Traces	2
 Memory size per trace, max. 	512 kbyte
Integrated Functions	
Number of counters	6
Counting frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction	Up to 4 with SB 1222
interface	
PID controller	Yes
Number of alarm inputs	4
Potential separation	
Potential separation digital inputs	
Potential separation digital inputs	Functional isolation (Optocoupler)
EMC	
Interference immunity against discharge of static electri	city
Interference immunity against discharge of	Yes
static electricity acc. to IEC 61000-4-2	
 Test voltage at air discharge 	8 kV
 Test voltage at contact discharge 	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000-4-4 	Yes
 Interference immunity on signal cables acc. to IEC 61000-4-4 	Yes
Interference immunity against voltage surge	
• on the supply lines acc. to IEC 61000-4-5	Yes
Interference immunity against conducted variable distur	bance induced by high-frequency fields
 Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 	Yes
E : : (): : () (EN 55 044	
Emission of radio interference acc. to EN 55 011	

• Limit class B, for use in residential areas

Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011

Degree of protection acc. to EN 60529			
Standards, approvals, certificates CE mark UL approval CULus FM approval RCM (formerly C-TICK) Yes RCM (formerly C-TICK) Yes Marine approval • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508 Ambient conditions Free fall • Fall height, max. Ambient temperature during operation • min. • max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C vertical installation, min. • horizontal installation, min. • horizontal installation, min. • vertical installation, max. •	Degree and class of protection		
CE mark Yes UL approval Yes CULus Yes CULus Yes Marine approval Yes KC approval Yes KK approval Yes KR approval Yes Marine approval Yes Marine approval Yes Marine approval Yes Highest safety class achievable in safety mode • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508 SIL 3 Ambient conditions Free fall • * Fall height, max.	Degree of protection acc. to EN 60529		
CE mark	• IP20	Yes	
UL approval	Standards, approvals, certificates		
cullus Yes FM approval Yes RCM (formerly C-TICK) Yes KC approval Yes Marine approval Yes Highest safety class achievable in safety mode Performance level according to ISO 13849-1 • SilL acc. to IEC 61508 SIL 3 Ambient conditions SIL 3 Free fall • Fall height, max. 0.3 m; five times, in product package Ambient temperature during operation • 10 min. • 20 °C • max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical • 10 at 55 °C horizontal or 45 °C vertical • horizontal installation, min. • 20 °C • 20 °C • vertical installation, max. 50 °C • vertical installation, max. 50 °C • min. • 40 °C • max. 70 °C Ari pressure acc. to IEC 60088-2-13 * 1 139 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1 139 hPa • Coperation, max. 95 %; no condensation • Oper	CE mark	Yes	
FM approval RCM (formerly C-TICK) KC approval Marine approval Marine approval Pes Marine approval Pes Highest safety class achievable in safety mode Performance level according to ISO 13849-1 Silt acc. to IEC 61508 Pree fall Fall height, max. Ambient temperature during operation Min. Max. Phorizontal installation, min. Phorizontal installation, min. Phorizontal installation, min. Portical installation, min. Pertical installation, min. Pertical installation, min. Pertical installation, min. Pertical installation, max. Pertical installation, min. Pertical installation, max. Pertical installation, min. Pertical installatio	UL approval		
RCM (formerly C-TICK) Yes	cULus	Yes	
Marine approval Yes		Yes	
Highest safety class achievable in safety mode Performance level according to ISO 13849-1 SIL acc. to IEC 61508 Ambient conditions Free fall Fall height, max. Ambient temperature during operation min. max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical horizontal installation, min. cvertical installation, max. 60 °C vertical installation, max. 50 °C Ambient temperature during storage/transportation min. cvertical installation, max. 60 °C Ambient temperature during storage/transportation min. cvertical installation, max. 50 °C Ambient temperature during storage/transportation min. cmax. 60 °C Air pressure acc. to IEC 60068-2-13 cyperation, product package Ambient temperature during storage/transportation min. cyperation temperature during storage/transportation emin. cyperation temperature during storage/transportation emin. cyperation temperature during storage/transportation emin. cyperation, max. 9 Sw; no condensation Vibrations evilorations evilorations evilorations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Poperation, tested according to IEC 60068-2-6		Yes	
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Ple SIL acc. to IEC 61508 Ple SIL a SIL acc. to IEC 61508 Pree fall Fall height, max. Ambient temperature during operation min. max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical horizontal installation, min. horizontal installation, min. horizontal installation, max. overtical installation, min. vertical installation, max. for °C max. Ambient temperature during storage/transportation min. m		Yes	
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Ambient conditions Free fall Fine fall height, max. Abient temperature during operation min. max. 60°C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60°C horizontal or 50°C vertical, 14 or 10 at 55°C horizontal or 45°C vertical horizontal installation, min. horizontal installation, min. horizontal installation, max. horizontal installation, min. vertical installation, min. vertical installation, max. vertical installation, max. o'C min. max. Ado °C max. Ambient temperature during storage/transportation min. 40°C max. 70°C Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. 1139 hPa permissible operating height 1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Vibrations Vibrations Ogeration, tested according to IEC 60068-2-6 Yes	 Performance level according to ISO 13849-1 	PLe	
Free fall Fall height, max. O.3 m; five times, in product package Ambient temperature during operation min. max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical horizontal installation, min. horizontal installation, max. horizontal installation, min. vertical installation, max. vertical installation, max. overtical installation, max. foo °C vertical installation, max. overtical installation, max. foo °C vertical installation, max. overtical installation, max. foo °C Ambient temperature during storage/transportation min. min. min. min. foo °C At °C nax. Ati pressure acc. to IEC 60068-2-13 Storage/transport, min. foo hPa storage/transport, max. permissible operating height 1139 hPa permissible operating height 1139 hPa permissible operating height volue 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Vibrations Vibrations Operation, tested according to IEC 60068-2-6 Yes	• SIL acc. to IEC 61508	SIL 3	
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 min. -20 °C max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical horizontal installation, min. -20 °C horizontal installation, max. 60 °C vertical installation, min. -20 °C vertical installation, max. 50 °C Ambient temperature during storage/transportation min. -40 °C max. 70 °C Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. permissible operating height 1139 hPa permissible operating height -1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Operation, tested according to IEC 60068-2-6 Yes 	● Fall height, max.	0.3 m; five times, in product package	
max. 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal installation, min. • horizontal installation, max. • horizontal installation, max. • vertical installation, min. • vertical installation, min. • vertical installation, max. 50 °C Ambient temperature during storage/transportation • min. • max. 70 °C Air pressure acc. to IEC 60068-2-13 • Storage/transport, min. • Storage/transport, max. • permissible operating height • 1000 to 2000 m Relative humidity • Operation, max. 95 %; no condensation Vibrations • Vibrations • Vibrations • Q g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes	Ambient temperature during operation		
5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. • vertical installation, max. 50 °C Ambient temperature during storage/transportation • min. • max. -40 °C Air pressure acc. to IEC 60068-2-13 • Storage/transport, min. • Storage/transport, max. • Storage/transport, max. • permissible operating height -1000 to 2000 m Relative humidity • Operation, max. Vibrations • Vibrations • Vibrations • Operation, tested according to IEC 60068-2-6 Yes	• min.	-20 °C	
 horizontal installation, max. vertical installation, min. -20 °C vertical installation, max. 50 °C Ambient temperature during storage/transportation min. -40 °C max. 70 °C Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. permissible operating height 1139 hPa permissible operating height 1000 to 2000 m Relative humidity Operation, max. Vibrations Vibrations Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes 	● max.	5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or	
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 ◆ vertical installation, max. 50 °C Ambient temperature during storage/transportation ● min. ← 40 °C ← max. 70 °C Air pressure acc. to IEC 60068-2-13 ● Storage/transport, min. ← Storage/transport, max. ← permissible operating height ← 1000 to 2000 m Relative humidity ← Operation, max. ✓ Operation, max. ✓ Vibrations ← Vibrations ← Vibration, tested according to IEC 60068-2-6 Yes 	 horizontal installation, max. 	60 °C	
Ambient temperature during storage/transportation • min. • max. 70 °C Air pressure acc. to IEC 60068-2-13 • Storage/transport, min. • Storage/transport, max. • Storage/transport, max. 1 139 hPa • permissible operating height -1000 to 2000 m Relative humidity • Operation, max. 95 %; no condensation Vibrations • Vibrations • Vibrations • Operation, tested according to IEC 60068-2-6 Yes	• vertical installation, min.	-20 °C	
 min. -40 °C max. 70 °C Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. 1 139 hPa permissible operating height -1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Vibration, tested according to IEC 60068-2-6 Yes Yes Operation, tested according to IEC 60068-2-6 	• vertical installation, max.	50 °C	
 max. Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. permissible operating height 1 139 hPa permissible operating height 1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Q g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes 	Ambient temperature during storage/transportation		
Air pressure acc. to IEC 60068-2-13 Storage/transport, min. Storage/transport, max. 1 139 hPa permissible operating height -1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes	• min.	-40 °C	
 Storage/transport, min. Storage/transport, max. permissible operating height -1000 to 2000 m Relative humidity Operation, max. Vibrations Vibrations Q g (m/s²) wall mounting, 1 g (m/s²) DIN rail Operation, tested according to IEC 60068-2-6 	• max.	70 °C	
 Storage/transport, max. permissible operating height -1000 to 2000 m Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations Q g (m/s²) wall mounting, 1 g (m/s²) DIN rail Operation, tested according to IEC 60068-2-6 Yes 			
 permissible operating height Relative humidity Operation, max. 95 %; no condensation Vibrations Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Operation, tested according to IEC 60068-2-6 Yes 	Storage/transport, min.	660 hPa	
Relative humidity • Operation, max. 95 %; no condensation Vibrations • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes	Storage/transport, max.	1 139 hPa	
 Operation, max. Vibrations Vibrations Vibrations Operation, tested according to IEC 60068-2-6 Yes 	 permissible operating height 	-1000 to 2000 m	
Vibrations			
 Vibrations Operation, tested according to IEC 60068-2-6 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes 	Operation, max.	95 %; no condensation	
Operation, tested according to IEC 60068-2-6 Yes	Vibrations		
aparama, activiting to the course of	Vibrations	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail	
	Operation, tested according to IEC 60068-2-6	Yes	
	Shock test		

• tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Extended ambient conditions	
Pollutant concentrations	
— SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration	
Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— SCL	Yes
Know-how protection	
User program protection/password protection	Yes
Copy protection	Yes
 Block protection 	Yes
Cycle time monitoring	
adjustable	Yes
Dimensions	
Width	110 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	435 g

05/23/2017

last modified: