## **SIEMENS**

## Data sheet

General information

## 6ES7215-1AF40-0XB0

SIMATIC S7-1200F, CPU 1215 FC, COMPACT CPU, DC/DC/DC, 2 PROFINET PORT, ONBOARD I/O: 14 DI 24VDC; 10 DO 24V DC 0.5A; 2 AI 0-10V DC, 2 AO 0-20MA DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY 150 KB



General Information	
Engineering with	
Programming package	STEP 7 V13 SP1 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
<ul><li>permissible range, lower limit (DC)</li></ul>	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
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power losses	
Power loss, typ.	12 W
Memory	
Work memory	
• Integrated	150 kbyte

Integrated Plug-in (SIMATIC Memory Card), max.  Backup  present persent viithout battery  Pes  CPU processing times for bit operations, typ. for loading point arithmetic, typ.  CPU-blocks  Number of blocks (total) Number, max.  Limited only by RAM for code  Number, max.  Limited only by RAM for code  Pata areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Address area  I/O address area  I/O address area  I/O address area  I/O putputs  I/O 1/O 24 byte O tuputs  I/O 24 byte O tuputs, adjustable O tuputs, a	Load memory	
Plug-in (SIMATIC Memory Card), max.  Backup  present present vithout battery  Yes: maintenance-free vithout battery  Yes  CPU processing times for bit operations, typ. for lod operations, typ. for word operations, typ. for word operations, typ. for lod operations  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 referitive data area in total (incl. times, counters, flags), max.  Address area  I/O address area  I/O address area  I/O address area  I/O lotputs Outputs Outputs Outputs Outputs Outputs, adjustable Outputs, adjustab		4 Mbvte
Backup  Present  vithout battery  Present  vithout battery  Present  vithout battery  Descriptions, typ.  for bit operations, typ.  for foating point arithmetic, typ.  2.3 µs; / Operation  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  I/O addre		
Present  Without battery  Yes: maintenance-free  Yes  CPU processing times  for bit operations, typ.  For floating point arithmetic, typ.  O.08 µs; / Operation  For floating point arithmetic, typ.  2.3 µs; / Operation  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  Process image  I/O address area		
Process area  I/O address area  I/O putputs  Processing e  I/O putputs  Processing e  I/O putputs  I/O putputputputputputputputputputputputputp		Yes: maintenance-free
for bit operations, typ.  for word operations, typ.  for word operations, typ.  for word operations, typ.  for floating point arithmetic, typ.  2.3 µs; / Operation  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  I/O address area  I/O address area  • Inputs  • Outputs  Process image  • Inputs, adjustable • Outputs, adjustable • Out	·	
for bit operations, typ. for word operations, typ. for word operations, typ. for floating point arithmetic, typ.  2.3 µs; / Operation  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  • Inputs • Inputs • Outputs  • Inputs • Outputs  • Inputs, adjustable • Outputs, adjusta	• without battery	163
for word operations, typ.  for floating point arithmetic, typ.  2.3 µs; / Operation  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  • Inputs • Outputs • Outputs • Outputs • Outputs, adjustable • Inputs, adjustable • Outputs, adjustable • Outputs, adjustable • Outputs, adjustable • Total kbyte  Process image  • Inputs, adjustable • Outputs, adjustable • Total kbyte  Process image  • Inputs, adjustable • Total kbyte  • Outputs, adjustable • Outputs, adjustable • Outputs, adjustable • Total kbyte  •	CPU processing times	
for floating point arithmetic, typ.  CPU-blocks  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 6535. 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 in total (incl. times, counters, flags), max.  Address area  I/O address area	for bit operations, typ.	0.08 μs; / Operation
Number of blocks (total)  Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  // O utputs  Outputs  Outputs  1 024 byte  Process image  I 024 byte  1 024 byte  1 024 byte  Address area  // Outputs, adjustable  O utputs, adjustable  O utputs, adjustable  O utputs, adjustable  O utputs, adjustable  Process image  I 024 byte  1 024 byte  1 024 byte  Douglat, adjustable  O utputs, adjus	for word operations, typ.	1.7 µs; / Operation
Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  1/O address	for floating point arithmetic, typ.	2.3 µs; / Operation
Number of blocks (total)  1 024; DBs, FCs, FBs, counters and timers. The maximum number of 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 in total (incl. times, counters, flags), max.  Address area  1/O address	CPU-blocks	
Number, max.  Limited only by RAM for code  Data areas and their retentivity retentive data area in total (incl. times, counters, flags), max.  Address area  I/O address area  I/O address area  I/O tiputs  Outputs  I 024 byte  Outputs  I 024 byte  Outputs, adjustable  I 024 kbyte  Outputs, adjustable  I 024 kbyte  Outputs, adjustable  I 024 kbyte  I 024		number of addressable blocks ranges from 1 to 65535. There is
Data areas and their retentivity retentive data area in total (incl. times, counters, flags), max.  Address area  I/O ad	ОВ	
retentive data area in total (incl. times, counters, flags), max.  Address area  I/O	• Number, max.	Limited only by RAM for code
retentive data area in total (incl. times, counters, flags), max.  Address area  I/O	Data areas and their retentivity	
Address area  I/O address area		10 kbyte
I/O address area  Inputs Outputs Outputs Outputs Outputs Outputs, adjustable Inputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable I 024 kbyte  1 024 kbyte  Hardware configuration Number of modules per system, max. 8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock) Outputs, adjustable  Hardware configuration  Yes Outputs, adjustable  1 024 kbyte  1 024 kbtyte  1 024 kbyte  1 024 kbtyte  1 024 kbtyte  1 024 kbtyte  1 024 kbtyte  1 024	flags), max.	
Inputs Outputs Outputs  Process image Inputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable  I 024 kbyte  Outputs, adjustable  I 024 kbyte  Hardware configuration  Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock) Outputs, adjustable  Yes  Hardware configuration  Yes  Hardware configuration  Yes  Hardware clock (real-time clock) Outputs  Hardware configuration Outputs  Outputs  Hardware configuration Outputs  Outputs  Outputs  Hardware configuration Outputs	Address area	
Outputs Process image  Inputs, adjustable Outputs, adjustable  1 024 kbyte  Outputs, adjustable  1 024 kbyte  Hardware configuration  Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock) Deviation per day, max.  Backup time  Process with the permitted of digital inputs  Number of digital inputs  Number of digital inputs  Of which, inputs usable for technological functions  integrated channels (DI)  M/p-reading  1 024 kbyte  1 024	I/O address area	
Process image  Inputs, adjustable Outputs, adjustable 1 024 kbyte  Hardware configuration Number of modules per system, max.  Number of day  Clock  Hardware clock (real-time clock) Deviation per day, max.  Backup time  Process image  1 024 kbyte  8; 3 comm. modules, 1 signal board, 8 signal modules  Yes  4 60 s per month 4 80 h; typical; 12 days min. at 40 °C  Digital inputs  Number of digital inputs  1 4  Of which, inputs usable for technological functions integrated channels (DI)  1 4  1 7 m/p-reading  Yes	• Inputs	1 024 byte
Inputs, adjustable Outputs, adjustable  Outputs, adjustable  1 024 kbyte  1 024 kbyte  Hardware configuration  Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock) Deviation per day, max.  Backup time  480 h; typical; 12 days min. at 40 °C  Digital inputs  Number of digital inputs  Of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  Yes	Outputs	1 024 byte
Outputs, adjustable  Hardware configuration  Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  • Hardware clock (real-time clock) • Deviation per day, max. • Backup time  Digital inputs  Number of digital inputs  • of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  1 024 kbyte  1 024 kbyte  1 4 6; 3 comm. modules, 1 signal board, 8 signal modules  **Yes**  Yes**  1 4 6; HSC (High Speed Counting)  1 4 7 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Process image	
Hardware configuration  Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  • Hardware clock (real-time clock) • Deviation per day, max. • Backup time  Digital inputs  Number of digital inputs  • of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  8; 3 comm. modules, 1 signal board, 8 signal modules  Yes	● Inputs, adjustable	1 024 kbyte
Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock)  Deviation per day, max.  Backup time  Pigital inputs  Number of digital inputs  of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  8; 3 comm. modules, 1 signal board, 8 signal modules  Yes  140  6; 9 sper month  480 h; typical; 12 days min. at 40 °C  14  6; HSC (High Speed Counting)	Outputs, adjustable	1 024 kbyte
Number of modules per system, max.  8; 3 comm. modules, 1 signal board, 8 signal modules  Time of day  Clock  Hardware clock (real-time clock) Deviation per day, max.  Backup time  Packup time  14 Of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  8; 3 comm. modules, 1 signal board, 8 signal modules  Yes  480 h; typical; 12 days min. at 40 °C	Hardware configuration	
Clock      Hardware clock (real-time clock)     Deviation per day, max.     Backup time  Digital inputs  Number of digital inputs  of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  Yes  Yes  ±60 s per month  480 h; typical; 12 days min. at 40 °C  6; HSC (High Speed Counting)  14  Yes		8; 3 comm. modules, 1 signal board, 8 signal modules
Clock      Hardware clock (real-time clock)     Deviation per day, max.     Backup time  Digital inputs  Number of digital inputs  of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  Yes  Yes  460 s per month  480 h; typical; 12 days min. at 40 °C  6; HSC (High Speed Counting)  14  Yes	Time of day	
Digital inputs  Number of digital inputs  of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  ±60 s per month  480 h; typical; 12 days min. at 40 °C   5; HSC (High Speed Counting)  14  7yes		
<ul> <li>Deviation per day, max.</li> <li>Backup time</li> <li>Backup time</li> <li>480 h; typical; 12 days min. at 40 °C</li> <li>Digital inputs</li> <li>Number of digital inputs</li> <li>of which, inputs usable for technological functions</li> <li>integrated channels (DI)</li> <li>m/p-reading</li> <li>±60 s per month</li> <li>480 h; typical; 12 days min. at 40 °C</li> <li>6; HSC (High Speed Counting)</li> <li>14</li> <li>Yes</li> </ul>	Hardware clock (real-time clock)	Yes
Backup time      480 h; typical; 12 days min. at 40 °C      Digital inputs     Number of digital inputs	·	±60 s per month
Number of digital inputs       14         ● of which, inputs usable for technological functions       6; HSC (High Speed Counting)         integrated channels (DI)       14         m/p-reading       Yes		480 h; typical; 12 days min. at 40 °C
Number of digital inputs       14         ● of which, inputs usable for technological functions       6; HSC (High Speed Counting)         integrated channels (DI)       14         m/p-reading       Yes	Digital inputs	
● of which, inputs usable for technological functions  integrated channels (DI)  m/p-reading  6; HSC (High Speed Counting)  14  Yes		14
functions integrated channels (DI) m/p-reading  14  Yes		
integrated channels (DI)  m/p-reading  14  Yes	-	., (
m/p-reading Yes		14
	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 VDC 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 / 0.2 / 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 at 100 kHz & 3 at 30 kHz, differential: 3 at 80 kHz & 3 at 30 kHz
Cable length	
• shielded, max.	500 m; 50 m for technological functions
• Unshielded, max.	300 m; For technological functions: No
igital outputs	
Number of digital outputs	10
<ul><li>of which high-speed outputs</li></ul>	4; 100 kHz Pulse Train Output
integrated channels (DO)	10
short-circuit protection	No; to be provided externally
Switching capacity of the outputs	
<ul><li>with resistive load, max.</li></ul>	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

• shielded, max.	500 m
Unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Integrated channels (AI)	2; 0 to 10 V
Input ranges	
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
Analog outputs	
Number of analog outputs	2
Integrated channels (AO)	2; 0 to 20 mA
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value creation	
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign),</li> </ul>	10 bit
max.	
<ul> <li>Integration time, parameterizable</li> </ul>	Yes
<ul><li>Conversion time (per channel)</li></ul>	625 µs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1st interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes
Automatic detection of transmission speed	Yes
Autonegotiation	Yes
Autocrossing	Yes
Functionality	
PROFINET IO Device	Yes
PROFINET IO Controller	Yes
PROFINET IO Controller	
Prioritized startup	
— Number of IO Devices, max.	16
Communication functions	

S7 communication	
• supported	Yes
• as server	Yes
• As client	Yes
Open IE communication	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
Web server	
• supported	Yes
User-defined websites	Yes
Test commissioning functions	
Status/control	
Status/control variable	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
• Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	
Number of configurable Traces	2; Up to 512 KB of data per trace are possible
Integrated Functions	
Number of counters	6
Counter frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	100 kHz
Galvanic isolation	
Galvanic isolation digital inputs	
Galvanic isolation digital inputs	Functional isolation (Optocoupler)
Permissible potential difference	
between different circuits	500 V DC between 24 V DC and 5 V DC
EMC	
Interference immunity against discharge of static electricity	
<ul> <li>Interference immunity against discharge of static electricity acc. to IEC 61000-4-2</li> </ul>	Yes
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	Yes
IEC 61000-4-4	
<ul> <li>Interference immunity on signal lines acc. to IEC 61000-4-4</li> </ul>	Yes
Surge immunity	
• on the supply lines acc. to IEC 61000-4-5	Yes
Immunity against conducted interference induced by high	gh-frequency fields
<ul> <li>Interference immunity against high-frequency radiation acc. to IEC 61000-4-6</li> </ul>	Yes
Emission of radio interference acc. to EN 55 011	
<ul> <li>Limit class A, for use in industrial areas</li> </ul>	Yes; Group 1
• 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 and class of protection	
Degree of protection to EN 60529	
● IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
FM approval	Yes
Marine approval	
Marine approval	Yes
Ambient conditions	
Free fall	
<ul><li>Drop height, max. (in packaging)</li></ul>	0.3 m; five times, in dispatch package
Ambient temperature in operation	
• Min.	0°C
• max.	55 °C
<ul><li>horizontal installation, min.</li></ul>	0 °C
<ul> <li>horizontal installation, max.</li> </ul>	55 °C
• vertical installation, min.	0 °C
<ul> <li>vertical installation, max.</li> </ul>	55 °C
Storage/transport temperature	
• Min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Operation, min.	795 hPa
Operation, max.	1 080 hPa

Storage/transport, min.	660 hPa
Storage/transport, max.	1 080 hPa
Relative humidity	
Operation, max.	95 %; no condensation
<ul> <li>Permissible range (without condensation) at 25</li> <li>°C</li> </ul>	95 %
Vibrations	
Vibrations	2G wall mounting, 1G DIN rail
<ul><li>Operation, checked according to IEC 60068-2-</li></ul>	Yes
Shock test	
<ul> <li>checked according to IEC 60068-2-27</li> </ul>	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Pollutant concentrations	
— SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— SCL	Yes
Cycle time monitoring	
• can be set	Yes
Dimensions	
Width	130 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	520 g
last modified:	07.03.2015

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