## **SIEMENS**

## Data sheet

## 6ES7212-1AD30-0XB0



\*\*\* SPARE PART\*\*\* SIMATIC S7-1200, CPU 1212C, COMPACT CPU, DC/DC/DC, ONBOARD I/O: 8 DI 24V DC; 6 DO 24 V DC; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY: 25 KB

General information	
Engineering with	
Programming package	STEP 7 V10.5 or higher
Display	
with display	No
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.	1.2 A; 24 V DC
Inrush current, max.	12 A; at 28.8 V DC
Encoder supply	
24 V encoder supply	
• 24 V	Permissible range: 20.4V to 28.8V
Output current	
for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM

Power loss, typ.    Memory   Type of memory   Other	Power loss	
Type of memory  Work memory  Integrated  Expandable  Expandable  Integrated  I	Power loss, typ.	9 W
Type of memory  Work memory  Integrated  Expandable  Expandable  Integrated  I	Memory	
Integrated  expandable  No  Load memory  Integrated  Plug-in (SIMATIC Memory Card), max.  Prosest  Prosest  Ves; Entire project maintenance-free in the integral EEPROM  Vithout battery  Processing times  for bit operations, typ.  Integrations, typ.  Ol 1 µs; / Operation  To word operations, typ.  Integrations, typ.  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  DBs areas and their retentivity  Telentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  Address area  In outputs  Outputs  Outputs  1 024 byte  Outputs  Outputs, adjustable  1 kbyte  Outputs, adjustable  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock  Time of day  Clock  Time of day  Clock  Telegrated  1 Mbyte  1 Mbyte  1 Signal board, 2 signal modules  Time of day  Clock  Time of ay  Clock  Time of ay  Clock  Time of day  Clock  Time of Agency and Time of Agency and Time an		other
Integrated  expandable  No  Load memory  Integrated  Plug-in (SIMATIC Memory Card), max.  Prosest  Prosest  Ves; Entire project maintenance-free in the integral EEPROM  Vithout battery  Processing times  for bit operations, typ.  Integrations, typ.  Ol 1 µs; / Operation  To word operations, typ.  Integrations, typ.  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  DBs areas and their retentivity  Telentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  Address area  In outputs  Outputs  Outputs  1 024 byte  Outputs  Outputs, adjustable  1 kbyte  Outputs, adjustable  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock  Time of day  Clock  Time of day  Clock  Telegrated  1 Mbyte  1 Mbyte  1 Signal board, 2 signal modules  Time of day  Clock  Time of ay  Clock  Time of ay  Clock  Time of day  Clock  Time of Agency and Time of Agency and Time an	Work memory	
expandable Load memory  Integrated Integrated Plug-in (SIMATIC Memory Card), max.  Backup  present Without battery  Processing times  for bit operations, typ. If or word operations, typ. Or floating point arithmetic, typ.  PUB-blocks  Number of blocks (total)  Be Number, max.  Data areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Flag Number, max.  Address area  I Oaddress area  I Data dress are		25 kbyte
Integrated     Plug-in (SIMATIC Memory Card), max.      Backup		No
Plug-in (SIMATIC Memory Card), max.  Backup  present  present  Without battery  Preservations, typ.  for word operations, typ.  for floating point arithmetic, typ.  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 of blocks (total)  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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address area	·	
Backup  present present Without battery  Preserversing times For bit operations, typ. For word operations, typ. For word operations, typ. For word operations, typ. 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 of blocks (total)  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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address area  I/	Integrated	1 Mbyte
Persent Without battery  Yes; Entire project maintenance-free in the integral EEPROM Yes  CPU processing times  for bit operations, typ.  O.1 µs; / Operation for word operations, typ.  12 µs; / Operation  To floating point arithmetic, typ.  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.  Flag Number, max.  4 kbyte; Size of bit memory address area  I/O address area  I/O address area  I/O address area  I/O address area  I/D usp adjustable Outputs  1 024 byte Outputs  Process image  I puts, adjustable Outputs, adjusta	<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	24 Mbyte; with SIMATIC memory card
Without battery      Wes  CPU processing times  for bit operations, typ.     O.1 µs; / Operation  for word operations, typ.     12 µs; / Operation      18 µs; / Operation  CPU-blocks  Number of blocks (total)  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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Nodress area  Inputs Outputs Outputs, adjustable Outputs, adjus	Backup	
Per Without battery  Without battery  Per S  CPU processing times  for bit operations, typ.  12 µs; / Operation  for word operations, typ.  18 µs; / Operation  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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Vo address area  Vo address area  Inputs  Outputs  1 024 byte  Outputs  Process image  Inputs, adjustable  Outputs, adjustable  Outputs, adjustable  Valued only by RAM for code  1 kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock	• present	Yes; Entire project maintenance-free in the integral EEPROM
for bit operations, typ. for word operations, typ. for floating point arithmetic, typ.  Publocks  Number of blocks (total)  Number of blocks (total)  Number, max.  Data areas and their retentivity retentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  Address area  I/O address area  I/		Yes
for bit operations, typ.  for word operations, typ.  for word operations, typ.  for floating point arithmetic, typ.  CPU-blocks  Number of blocks (total)  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  Number, max.  Limited only by RAM for code  Data areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  4 kbyte; Size of bit memory address area  // O address area  // O address area  // O address area  // O address area  // Outputs  Process image  Inputs, adjustable  Outputs, adjustable  Outputs, adjustable  1 kbyte  Outputs, adjustable  1 kbyte  Addware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock	-	
for word operations, typ.  for floating point arithmetic, typ.  CPU-blocks  Number of blocks (total)  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  Limited only by RAM for code  Data areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  4 kbyte; Size of bit memory address area  VO address area  I/O utputs  Outputs  1 024 byte  Process image  I lnputs, adjustable  I kbyte  Outputs, adjustable  Voutputs, adjustable  Voutputs, adjustable  I kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock		0.4
for floating point arithmetic, typ.  CPU-blocks  Number of blocks (total)  BBs, 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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  //O address area  //O address area  I/O address area  I/O address area  I/O address area  I/O at byte  Outputs  Outputs  1 024 byte  Process image  Inputs, adjustable  I kbyte  Outputs, adjustable  Addware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock		
CPU-blocks  Number of blocks (total)  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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  //O address area  //O address area  I/O address area  I nouts  Outputs  Outputs  1 024 byte  1 024 byte  Process image  I hputs, adjustable  Outputs, adjustable  I kbyte  1 kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock		
Number of blocks (total)  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  DB  Number, max.  Limited only by RAM for code  Limited only by RAM for code  Data areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Flag  Number, max.  Address area  Number, max.  Address area  No address area  I/O address a	for floating point arithmetic, typ.	18 μs; / Operation
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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  // O address area  // O address area  // O address area  I/O address are	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.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Address area  //O address area  I/O ad	Number of blocks (total)	addressable blocks ranges from 1 to 65535. There is no
Pata areas and their retentivity  retentive data area in total (incl. times, counters, flags), max.  Flag  • Number, max.  Address area  I/O address area  • Inputs • Outputs  Process image  • Inputs, adjustable • Outputs, adjustable • Outputs, adjustable • Outputs, adjustable • Time of day  Clock  2 048 byte 2 048 byte 2 048 byte  1 024 byte 1 024 byte 1 024 byte 1 024 byte 1 byte 1 kbyte 1 kbyte 1 kbyte 1 signal board, 2 signal modules	OB	
retentive data area in total (incl. times, counters, flags), max.  Flag  • Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address area  • Inputs  • Outputs  1 024 byte  • Outputs  Process image  • Inputs, adjustable  • Inputs, adjustable  • Outputs, adjustable  1 kbyte  • Outputs, adjustable  1 kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock	Number, max.	Limited only by RAM for code
retentive data area in total (incl. times, counters, flags), max.  Flag  • Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address area  • Inputs  • Outputs  Process image  • Inputs, adjustable  • Outputs, adjustable  • Outputs, adjustable  1 kbyte  • Outputs, adjustable  1 kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock	Data areas and their retentivity	
flags), max.  Flag  Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address area  Inputs Outputs  Outputs  Process image  Inputs, adjustable Outputs, adjustable Outputs, adjustable Time of day  Clock  Address area  4 kbyte; Size of bit memory address area  4 kbyte; Size of bit memory address area  4 kbyte; Size of bit memory address area		2 048 byte
Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address a	·	
Number, max.  4 kbyte; Size of bit memory address area  Address area  I/O address a	Flag	
I/O address area  Inputs Outputs Outputs  Process image Inputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable I kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day Clock		4 kbyte; Size of bit memory address area
I/O address area  Inputs Outputs Outputs  Process image Inputs, adjustable Outputs, adjustable Outputs, adjustable Outputs, adjustable I kbyte  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day Clock		
<ul> <li>Inputs         <ul> <li>Outputs</li> <li>1 024 byte</li> </ul> </li> <li>Process image         <ul> <li>Inputs, adjustable</li> <li>Outputs, adjustable</li> <li>I kbyte</li> </ul> </li> <li>Outputs, adjustable</li> <li>I kbyte</li> <li>Hardware configuration</li> <li>Number of modules per system, max.</li> <li>3 comm. modules, 1 signal board, 2 signal modules</li> </ul> <li>Time of day</li> <li>Clock</li>		
<ul> <li>Outputs</li> <li>Process image</li> <li>Inputs, adjustable</li> <li>Outputs, adjustable</li> <li>I kbyte</li> <li>Outputs, adjustable</li> <li>I kbyte</li> <li>Hardware configuration</li> <li>Number of modules per system, max.</li> <li>3 comm. modules, 1 signal board, 2 signal modules</li> <li>Time of day</li> <li>Clock</li> </ul>		1 024 byte
Process image	·	
<ul> <li>Inputs, adjustable</li> <li>Outputs, adjustable</li> <li>Hardware configuration</li> <li>Number of modules per system, max.</li> <li>3 comm. modules, 1 signal board, 2 signal modules</li> <li>Time of day</li> <li>Clock</li> </ul>	·	1 024 Dyle
Outputs, adjustable  Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock		1 khuto
Hardware configuration  Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock		
Number of modules per system, max.  3 comm. modules, 1 signal board, 2 signal modules  Time of day  Clock	Outputs, adjustable	і коуіе
Time of day Clock	Hardware configuration	
Clock	-	3 comm. modules, 1 signal board, 2 signal modules
Clock	Time of day	
	Hardware clock (real-time clock)	Yes



<ul><li>Deviation per day, max.</li><li>Backup time</li></ul>	+/- 60 s/month at 25 °C 240 h; Typical
gital inputs	
umber of digital inputs	8; Integrated
<ul> <li>of which inputs usable for technological functions</li> </ul>	4; HSC (High Speed Counting)

integrated channels (DI)	8
m/p-reading	Yes
Input voltage	

'	
• Rated value (DC)	24 V
• for signal "0"	5 V DC at 1 mA

• for signal "1"	15 VDC at 2.5 mA
• IOI Signal I	13 VDC at 2.3 IIIA

<ul><li>for signal "1", typ.</li></ul>	

Input current

input delay (for fated value of input voltage)	
for standard inputs	
— Parameterizable	0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms

— i arameterizable	0.2 mg, 0.1 mg, 0.0 mg, 1.0 mg, 0.2 mg, 0.1 mg and 12.0 mg,
	selectable in groups of four
— at "0" to "1", min.	0.2 ms

1 mA

— at "0" to "1", max.	12.8 ms
for interrupt inputs	

— Parameterizable	Yes
for counter/technological functions	
	0: 1 1 0 1400111 0 4 100111 1:55 1:10 1:00 1

— Parameterizable	Single phase: 3 at 100 kHz & 1 at 30 kHz, differential: 3 at 80 kHz
	& 1 at 30 kHz

Cable length	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	300 m; For technological functions: No

6		
2; 100 kHz Pulse Train Output		
6		
No; to be provided externally		
L+ (-48 V)		
Switching capacity of the outputs		
0.5 A		
5 W		
Output voltage		
0.1 V; with 10 kOhm load		
20 V		

0.5 A

• for signal "1" rated value

• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
● "0" to "1", max.	1 μs
• "1" to "0", max.	5 μs
Switching frequency	
• of the pulse outputs, with resistive load, max.	100 kHz
Relay outputs	
Number of relay outputs, integrated	0
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
integrated channels (AI)	2; 0 to 10V
Input ranges	
Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
<ul><li>Input resistance (0 to 10 V)</li></ul>	≥100k ohms
Cable length	
• shielded, max.	100 m; twisted and shielded
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation	
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	10 bit
<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
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Functionality	
<ul> <li>PROFINET IO Controller</li> </ul>	Yes



Communication functions	
S7 communication	
• supported	Yes
• as server	Yes
Open IE communication	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
Web server	
• supported	Yes
User-defined websites	Yes
Number of connections	100
• overall	15; dynamically
Overall	13, dynamicany
Test commissioning functions	
Status/control	
<ul><li>Status/control variable</li></ul>	Yes
<ul> <li>Variables</li> </ul>	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
• Forcing	Yes
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	2
Limit frequency (pulse)	100 kHz
Potential separation	
Potential separation digital inputs	
Potential separation digital inputs	No
• between the channels, in groups of	1
Potential separation digital outputs	
Potential separation digital outputs	Yes
• between the channels	No
• between the channels, in groups of	2
Permissible potential difference	
between different circuits	500 V DC between 24 V DC and 5 V DC



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	
<ul> <li>Interference immunity on supply lines acc. to IEC 61000-4-4</li> </ul>	Yes
<ul> <li>Interference immunity on signal cables acc. to IEC 61000-4-4</li> </ul>	Yes
Interference immunity against voltage surge	
• on the supply lines acc. to IEC 61000-4-5	Yes
Interference immunity against conducted variable distu	irbance induced by high-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	
Limit class A, for use in industrial areas	Yes; Group 1
<ul> <li>Limit class B, for use in residential areas</li> </ul>	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 acc. to EN 60529	
● IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Ambient conditions	
Free fall	
Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
Ambient temperature during operation	
permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• 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>	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	



Operation, min.	795 hPa
<ul><li>Operation, max.</li></ul>	1 080 hPa
Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<ul> <li>permissible operating height</li> </ul>	-1000 to 2000 m
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, tested according to IEC 60068-2-6</li> </ul>	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
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
— FBD	Yes
— SCL	Yes
Cycle time monitoring	
• can be set	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

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