

SIEMENS

Product data sheet

6ES7151-7AA21-0AB0


SIMATIC DP, IM151-7 CPU FOR ET200S,
128 KB WORKING MEMORY INTEGR. PROFIBUS
DP INTERFACE (9 PIN SUB-D, FEMALE) AS DP
SLAVE,
W/O BATTERY SIMATIC MMC REQUIRED

General information

Hardware product version 01

Engineering with

Programming package V5.5 + SP1 or higher or V5.2 + SP1 or higher + HSP 219

Supply voltage

24 V DC Yes

permissible range, lower limit (DC) 19.2 V

permissible range, upper limit (DC) 28.8 V

Reverse polarity protection Yes ; against destruction

External protection for supply cables (recommendation) 24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: A 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before and with type C tripping characteristic after the device protection fuse.

Mains buffering

Mains/voltage failure stored energy time 5 ms

Input current	
Inrush current, max.	1.8 A ; typ.
I^2t	0.09 A ² ·s
from supply voltage 1L+, max.	320 mA ; 410 mA with DP master module
Output current	
Current output to backplane bus (DC 5 V), max.	700 mA
Power losses	
Power loss, typ.	4.2 W
Memory	
Work memory	
integrated	128 kbyte
expandable	No
Size of retentive memory for retentive data blocks	64 kbyte
Load memory	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
Backup	
present	Yes ; Ensured by SIMATIC Micro Memory Card (maintenance-free)
CPU processing times	
for bit operations, min.	0.06 µs
for word operations, min.	0.12 µs
for fixed point arithmetic, min.	0.16 µs
for floating point arithmetic, min.	0.59 µs
CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
FB	
Number, max.	1024 ; Number range: 0 to 7999

Size, max.	64 kbyte
FC	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 kbyte
OB	
Description	See S7-300 operation list
Size, max.	64 kbyte
Number of free cycle OBs	1 ; OB 1
Number of time alarm OBs	1 ; OB 10
Number of delay alarm OBs	2 ; OB 20, 21
Number of time interrupt OBs	4 ; OB 32, 33, 34, 35
Number of process alarm OBs	1 ; OB 40
Number of DPV1 alarm OBs	3 ; OB 55, 56, 57
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	6 ; OB 80, 82, 83 (for centralized I/O only, not for distributed I/O), 85, 86, 87
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	16
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
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	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	No retentivity
Time range	
lower limit	10 ms
upper limit	9990 s
IEC timer	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Flag	
Number, max.	256 byte
Retentivity available	Yes ; MB 0 to MB 255
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 kbyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	Yes
Local data	
per priority class, max.	32 kbyte ; Max. 2048 bytes per block
Address area	
I/O address area	
Inputs	2048 byte
Outputs	2048 byte
of which, distributed	

Inputs	2048 byte
Outputs	2048 byte
Process image	
Inputs	2048 byte
Outputs	2048 byte
Inputs, adjustable	2048 byte
Outputs, adjustable	2048 byte
Inputs, default	128 byte
Outputs, default	128 byte
Digital channels	
Inputs	16336
Outputs	16336
Inputs, of which central	496
Outputs, of which central	496
Analog channels	
Inputs	1021
Outputs	1021
Inputs, of which central	124
Outputs, of which central	124
Hardware configuration	
Number of mounting rails that can be used	1
Max. length of mounting rail	Station width: ≤ 1 m or < 2 m
Number of modules per system, max.	63 ; Centralized
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Deviation per day, max.	10 s ; Typ.: 2 s
Backup time	6 wk ; At 40 °C ambient temperature, typically
Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
Number	1

Number/Number range	0
Range of values	0 to 2 ³¹ hours (when using SFC 101)
Granularity	1 hour
retentive	Yes ; Must be restarted at each restart
Clock synchronization	
supported	Yes
to MPI, master	Yes
to MPI, slave	Yes
to DP, master	Yes ; With DP slave only slave clock
to DP, slave	Yes
in AS, master	No
in AS, slave	No
Interfaces	
Interfaces	1 x MPI/PROFIBUS DP
Supports protocol for PROFINET IO	
Number of PROFINET interfaces	0
WLAN	
Number of wireless interfaces	0
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	80 mA
Functionality	
MPI	Yes
DP master	No
DP slave	Yes ; active / passive
Point-to-point connection	No
MPI	
Services	
PG/OP communication	Yes
Routing	Yes ; With master module
Global data communication	Yes

S7 basic communication	Yes
S7 communication	Yes ; Only server, configured on one side
S7 communication, as client	No
S7 communication, as server	Yes
Transmission rate, max.	12 Mbit/s
DP slave	
Services	
PG/OP communication	Yes
Routing	Yes ; Only with active, integrated DP slave interface and inserted DP master module in DP master mode
Global data communication	No
S7 basic communication	No
S7 communication	Yes ; Only server, configured on one side
S7 communication, as client	No
S7 communication, as server	Yes
Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
GSD file	The latest GSD file is available on the Internet (http://www.siemens.com/profibus-gsd)
Transmission rate, max.	12 Mbit/s
Automatic baud rate search	Yes ; only with passive interface
Transfer memory	
Inputs	244 byte
Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte ; Up to max. size of the transfer memory
2nd interface	
Type of interface	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	No
Functionality	

MPI	No
DP master	Yes
DP slave	No
DP master	
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	Yes ; I blocks only
S7 communication	Yes ; Only server, configured on one side
S7 communication, as client	No
S7 communication, as server	Yes
Equidistance mode support	Yes
Isochronous mode	No
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Number of DP slaves that can be simultaneously activated/deactivated, max.	8
Direct data exchange (slave-to-slave communication)	Yes
DPV1	Yes
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	32 ; Per station
Address area	
Inputs, max.	2 kbyte
Outputs, max.	2 kbyte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Communication functions	
PG/OP communication	Yes

Data record routing	Yes ; With DP master module
Global data communication	
supported	Yes
Number of GD loops, max.	8
Number of GD packets, max.	8
Number of GD packets, transmitter, max.	8
Number of GD packets, receiver, max.	8
Size of GD packets, max.	22 byte
Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
supported	Yes
User data per job, max.	76 byte
User data per job (of which consistent), max.	76 byte ; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	
supported	Yes
as server	Yes
as client	No
User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
User data per job (of which consistent), max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
Number of connections	
overall	12
usable for PG communication	11
reserved for PG communication	1
Adjustable for PG communication, min.	1
Adjustable for PG communication, max.	11
usable for OP communication	11
reserved for OP communication	1
adjustable for OP communication, min.	1
adjustable for OP communication, max.	11
usable for S7 basic communication	10
Reserved for S7 basic communication	0

adjustable for S7 basic communication, min.	0
adjustable for S7 basic communication, max.	10
usable for routing	4 ; As slave only with active interface, with IM 151-7 CPU as DP master
S7 message functions	
Number of login stations for message functions, max.	12 ; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes ; ALARM_S, ALARM_SC, ALARM_SQ, ALARM_D, ALARM_DQ
simultaneously active Alarm-S blocks, max.	300
Test commissioning functions	
Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
of which status variables, max.	30
of which control variables, max.	14
Forcing	
Forcing	Yes
Force, variables	Inputs, outputs
Number of variables, max.	10
Status block	Yes ; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	
present	Yes
Number of entries, max.	500
adjustable	No
Of which powerfail-proof	100 ; Only the last 100 entries are retained
Number of entries readable in RUN, max.	499
adjustable	Yes ; From 10 to 499
preset	10
Service data	
Can be read out	Yes

Interrupts/diagnostics/status information	
Alarms	
Alarms	Yes
Diagnostic messages	
Diagnostic functions	Yes
Diagnostics indication LED	
Group error SF (red)	Yes
Monitoring 24 V voltage supply ON (green)	Yes
Galvanic isolation	
between PROFIBUS DP and all other circuit components	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation checked with	500 V DC
Degree and class of protection	
Type of protection	IP20
Configuration	
Configuration rules	max. 63 peripheral modules per station; station width < 1 m or < 2 m; max. 10 A per load group (power module); master interface module on right next to IM 151-7 CPU (X2 interface)
Configuration software	
STEP 7 Lite	No
programming	
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes ; optional
CFC	Yes ; optional
GRAPH	Yes ; optional
HiGraph®	Yes ; optional
Command set	see instruction list

Nesting levels	8
Software libraries	
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes ; With S7 block Privacy
Cycle time monitoring	
lower limit	1 ms
upper limit	6000 ms
adjustable	Yes
preset	150 ms
Dimensions	
Width	60 mm ; DP master module: 35 mm
Height	119.5 mm
Depth	75 mm
Weight	
Weight, approx.	200 g ; DP master module: Approx. 100 g
Status	Jul 17, 2012