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Data sheet 6ES7151-7AA20-0AB0

	Spare part SIMATIC DP, IM151-7 CPU for ET200S, 96 KB work memory with integrated PROFIBUS DP interface (9-pole D-sub socket) as DP slave, without battery
General information	
HW functional status	01
Firmware version	V2.6
Product function	
● Isochronous mode	No
Engineering with	
● Programming package	STEP 7 V5.2 + SP1 or higher with HW update
Supply voltage	
Load voltage L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	20.4 V
● permissible range, upper limit (DC)	28.8 V
● Short-circuit protection	Yes
● Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	250 mA; 280 mA with DP master module
Output current	
for backplane bus (5 V DC), max.	700 mA
Power loss	
Power loss, typ.	3.3 W
Memory	
Work memory	
● integrated	96 kbyte
● expandable	No
Load memory	
● Plug-in (MMC)	Yes
● Plug-in (MMC), max.	8 Mbyte
● Data management on MMC (after last programming), min.	10 a
Backup	
● present	Yes; Guaranteed by MMC (maintenance-free)
CPU processing times	
for bit operations, typ.	0.1 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	3 µs
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
● Number, max.	511; Number range: 1 to 511
● Size, max.	16 kbyte
FB	
● Number, max.	1 024; Number range: 0 to 2047
● Size, max.	16 kbyte
FC	
● Number, max.	1 024; Number range: 0 to 2047
● Size, max.	16 kbyte
OB	
● Size, max.	16 kbyte

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● Number of free cycle OBs	1; OB 1
● Number of time alarm OBs	1; OB 10
● Number of delay alarm OBs	1; OB 20
● Number of cyclic interrupt OBs	1; OB 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, 85, 86, 87
Nesting depth	
● per priority class	8
● additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
● Number	256
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— 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
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
● present	Yes
● Type	SFB
● Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	
● Size, max.	256 byte
● Retentivity available	Yes
● Retentivity preset	MB 0 to MB 15
● Number of clock memories	8; 1 memory byte
Local data	
● per priority class, max.	510 byte
Address area	
I/O address area	
● Inputs	2 048 byte
● Outputs	2 048 byte
Process image	
● Inputs	128 byte; Not adjustable
● Outputs	128 byte; Not adjustable
Digital channels	
● Inputs	16 336
— of which central	248
● Outputs	16 336
— of which central	248
Analog channels	
● Inputs	1 021

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— of which central	124
● Outputs	1 021
— of which central	124
Hardware configuration	
Number of modules per system, max.	63; Centralized
Time of day	
Clock	
● Hardware clock (real-time)	Yes
● retentive and synchronizable	Yes
● Backup time	6 wk; At 40 °C ambient temperature, typically
● Deviation per day, max.	10 s
Operating hours counter	
● Number	1
● Number/Number range	0
● Range of values	0 to 2^31 hours (when using SFC 101)
● Granularity	1 h
● retentive	Yes; Must be restarted at each restart
Clock synchronization	
● supported	Yes
● to MPI, master	Yes
● on MPI, device	Yes
● to DP, master	Yes
● on DP, device	Yes
● in AS, master	No
● in AS, device	No
Interfaces	
Interfaces/bus type	1 x MPI/PROFIBUS DP
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Interface types	
● RS 485	Yes
● Output current of the interface, max.	80 mA
Protocols	
● MPI	Yes
● PROFIBUS DP master	No
● PROFIBUS DP device	Yes; active / passive
● Point-to-point connection	No
MPI	
● Number of connections	12; Notice: 12 connections per CPU, not per interface
● Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes; With master module
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
PROFIBUS DP slave	
● Number of connections	12; Notice: 12 connections per CPU, not per interface
● GSD file	http://www.siemens.com/profibus-gsd
● Transmission rate, max.	12 Mbit/s
● automatic baud rate search	Yes; only with passive interface
● Address area, max.	32
● User data per address area, max.	32 byte; Up to max. size of the transfer memory
Services	
— Routing	Yes; Only when interface active and in master mode
— S7 communication, as client	No
— S7 communication, as server	Yes

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— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
2. Interface	
Interface type	External interface via master module 6ES7138-4HA00-0AB0
Isolated	Yes
Interface types	
● RS 485	Yes
● Output current of the interface, max.	No
Protocols	
● MPI	No
● PROFIBUS DP master	Yes
● Point-to-point connection	No
PROFIBUS DP master	
● Number of connections, max.	12; Notice: 12 connections per CPU, not per interface
● Transmission rate, max.	12 Mbit/s
● max. number of DP devices	32; Per station
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	Yes; I blocks only
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— activation/deactivation of DP devices	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
communication functions / header	
PG/OP communication	Yes
Global data communication	
● supported	Yes
● Number of GD packets, max.	4
● Number of GD packets, transmitter, max.	4
● Number of GD packets, receiver, max.	4
● 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.	180 byte
● User data per job (of which consistent), max.	64 byte
S5 compatible communication	

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● supported	No
Standard communication (FMS)	
● supported	No
Number of connections	
● overall	12
● usable for PG communication	11
— reserved for PG communication	1
— adjustable for PG communication, max.	11
● usable for OP communication	11
— reserved for OP communication	1
— adjustable for OP communication, max.	11
● usable for S7 basic communication	10
— reserved for S7 basic communication	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.	40
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	2
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
● Forcing, variables	Inputs, outputs
● Number of variables, max.	10
Diagnostic buffer	
● present	Yes
● Number of entries, max.	100
— adjustable	No
Potential separation	
between load voltage and all other switching components	Yes
between PROFIBUS DP and all other circuit components	Yes
Isolation	
Isolation tested with	500 V DC
Degree and class of protection	
IP degree of protection	IP20
configuration / header	
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	Yes
configuration / programming / header	
● Command set	see instruction list
● Nesting levels	8
● System functions (SFC)	see instruction list
● System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes; Optional

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— GRAPH	Yes; Optional
Know-how protection	
● User program protection/password protection	Yes
programming / cycle time monitoring / header	
● lower limit	1 ms
● upper limit	6 000 ms
● adjustable	Yes
● preset	150 ms
Dimensions	
Width	60 mm; DP master module: 35 mm
Height	119.5 mm
Depth	75 mm
Weights	
Weight, approx.	200 g; DP master module: Approx. 100 g

last modified: 4/25/2024

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