SIEMENS

Product data sheet 6ES7151-7AA20-0AB0

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

Product version	
Hardware product version	01
Firmware version	V2.6
General information	
associated 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	

Current output to backplane bus (DC 5 V), max.	700 mA
Power losses	
Power loss, typ.	3.3 W
Memory	
Work memory	
integrated	96 Kibyte ; For program and data
expandable	No
Load memory	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
Backup	
present	Yes ; Guaranteed by MMC (maintenance-free)
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.	511 ; Number range: 1 to 511
Size, max.	16 Kibyte
FB	
Number, max.	1024 ; Number range: 0 to 2047
Size, max.	16 Kibyte
FC	
Number, max.	1024 ; Number range: 0 to 2047
Size, max.	16 Kibyte
OB	
Size, max.	16 Kibyte
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 time alarm 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
CPU processing times	
for bit operations, min.	0.1 µs
for word operations, min.	0.2 µs
for fixed point arithmetic, min.	2 µs
for floating point arithmetic, min.	3 µs
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
can be set	Yes
lower limit	0
upper limit	255
preset	Z 0 to Z 7
Counting range	
can be set	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	
can be set	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	
retentive data area in total (incl. times, counters, flags), max.	64 Kibyte
Flag	
Number, max.	256 byte
Retentivity available	Yes
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	511 ; Number range: 1 to 511
Size, max.	16 Kibyte
Local data	
per priority class, max.	510 byte
Address area	
I/O address area	
Inputs	2048 byte
Outputs	2048 byte
Process image	
Inputs	128 byte ; Not adjustable
Outputs	128 byte ; Not adjustable
Digital channels	
Inputs	16336
Outputs	16336
Inputs, of which central	248
Outputs, of which central	248
Analog channels	
Inputs	1021

Outputs	1021
Inputs, of which central	124
Outputs, of which central	124
Hardware configuration	
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
Backup time	6 wk ; At 40 °C ambient temperature, typically
Runtime meter	
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
to DP, slave	Yes
in AS, master	No
in AS, slave	No
Interfaces	
Number of USB interfaces	0
Number of parallel interfaces	0
Number of 20 mA interfaces (TTY)	0
Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of other hardware 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	
Number of connections	12 ; Notice: 12 connections per CPU, not per interface
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
Transmission rate, max.	12 Mbit/s
DP slave	
Number of connections	12 ; Notice: 12 connections per CPU, not per interface
Services	
Routing	Yes ; Only when interface active and in master mode
S7 communication, as client	No
S7 communication, as server	Yes
Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
GSD file	http://www.siemens.de/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
Local Operating Network	No
DP master	
Number of connections, max.	12 ; Notice: 12 connections per CPU, not per interface
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 mode support	Yes
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
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 Kibyte
Outputs, max.	2 Kibyte

User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
Communication functions	
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	
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/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
Single step	Yes
Number of breakpoints	2
Diagnostic buffer	
present	Yes
Number of entries, max.	100
can be set	No
Isochronous mode	
Isochronous mode	No
Galvanic isolation	

between load voltage and all other switching components	Yes
between PROFIBUS DP and all other circuit components	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation checked with	500 VDC
Degree and class of protection	
IP (rear)	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	Yes
STEP 7	Yes
programming	
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes ; Optional
GRAPH	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
Cycle time monitoring	
lower limit	1 ms
upper limit	6000 ms

can be set	Yes
preset	150 ms
Dimensions and weight	
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	May 23, 2011