

SIMATIC DP, IM151-7 CPU for ET200S, 128 KB work memory with integrated PROFIBUS DP interface (9-pole D-sub socket) as DP slave, without battery SIMATIC MMC required



General information	
HW functional status	01
Firmware version	V3.3
Product function	
• Isochronous mode	No
Engineering with	
• Programming package	V5.5 + SP1 or higher or V5.2 + SP1 or higher + HSP 219
Supply voltage	
Rated value (DC)	24 V
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 power supply lines (recommendation)	2 A min.
Mains buffering	
• Mains/voltage failure stored energy time	5 ms
Input current	
Inrush current, typ.	1.8 A

I^2t	0.09 A ² ·s
from supply voltage 1L+, max.	320 mA; 410 mA with DP master module
Output current	
for backplane bus (5 V DC), max.	700 mA
Power loss	
Power loss, typ.	4.2 W
Memory	
Work memory	
<ul style="list-style-type: none"> integrated 	128 kbyte
<ul style="list-style-type: none"> expandable 	No
<ul style="list-style-type: none"> Size of retentive memory for retentive data blocks 	64 kbyte
Load memory	
<ul style="list-style-type: none"> Plug-in (MMC) 	Yes
<ul style="list-style-type: none"> Plug-in (MMC), max. 	8 Mbyte
<ul style="list-style-type: none"> Data management on MMC (after last programming), min. 	10 y
Backup	
<ul style="list-style-type: none"> present 	Yes; Ensured by SIMATIC Micro Memory Card (maintenance-free)
CPU processing times	
for bit operations, typ.	0.06 μs
for word operations, typ.	0.12 μs
for fixed point arithmetic, typ.	0.16 μs
for floating point arithmetic, typ.	0.59 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	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 1 to 16000
<ul style="list-style-type: none"> Size, max. 	64 kbyte
FB	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> Size, max. 	64 kbyte
FC	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> Size, max. 	64 kbyte
OB	
<ul style="list-style-type: none"> Description 	See S7-300 operation list
<ul style="list-style-type: none"> Size, max. 	64 kbyte
<ul style="list-style-type: none"> 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 cyclic 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
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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
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Retentivity

— adjustable	Yes
— lower limit	0
— upper limit	255
— 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

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	
• 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	2 048 byte
• Outputs	2 048 byte
of which distributed	
— Inputs	2 048 byte
— Outputs	2 048 byte
Process image	
• Inputs	2 048 byte
• Outputs	2 048 byte
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
• Inputs, default	128 byte
• Outputs, default	128 byte
Digital channels	
• Inputs	16 336
— of which central	496
• Outputs	16 336
— of which central	496
Analog channels	
• Inputs	1 021
— of which central	124
• Outputs	1 021
— of which central	124
Hardware configuration	
Number of modules per system, max.	63; Centralized
Mounting rail	
• Number of mounting rails that can be used	1
• Length of mounting rail, max.	Station width: ≤ 1 m or < 2 m

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; Typ.: 2 s
• 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 h
• 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/bus type	1 x MPI/PROFIBUS DP
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	80 mA
Interface types	
• RS 485	Yes
Protocols	
• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	Yes; active / passive
• Point-to-point connection	No
MPI	
• 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; Only server, configured on one side
— S7 communication, as client	No
— S7 communication, as server	Yes

PROFIBUS DP slave

• 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
• Address area, max.	32
• User data per address area, max.	32 byte; Up to max. size of the transfer memory

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

Transfer memory

— Inputs	244 byte
— Outputs	244 byte

2. Interface

Interface type	External interface via master module 6ES7138-4HA00-0AB0
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Isolated	Yes
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Power supply to interface (15 to 30 V DC), max.	No
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Interface types

• RS 485	Yes
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Protocols

• MPI	No
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No

PROFIBUS DP master

• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32; Per station

Services

— PG/OP communication	Yes
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— 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	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

Address area

— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte

User data per DP slave

— Inputs, max.	244 byte
— Outputs, max.	244 byte

Protocols

Open IE communication

• TCP/IP	No
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Communication functions

PG/OP communication	Yes
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Data record routing	Yes; With DP master module
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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

<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> as server 	Yes
<ul style="list-style-type: none"> as client 	No
<ul style="list-style-type: none"> 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)
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> overall 	12
<ul style="list-style-type: none"> usable for PG communication 	11
<ul style="list-style-type: none"> <ul style="list-style-type: none"> reserved for PG communication 	1
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for PG communication, min. 	1
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for PG communication, max. 	11
<ul style="list-style-type: none"> usable for OP communication 	11
<ul style="list-style-type: none"> <ul style="list-style-type: none"> reserved for OP communication 	1
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for OP communication, min. 	1
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for OP communication, max. 	11
<ul style="list-style-type: none"> usable for S7 basic communication 	10
<ul style="list-style-type: none"> <ul style="list-style-type: none"> reserved for S7 basic communication 	0
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for S7 basic communication, min. 	0
<ul style="list-style-type: none"> <ul style="list-style-type: none"> adjustable for S7 basic communication, max. 	10
<ul style="list-style-type: none"> 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 block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Status/control	
<ul style="list-style-type: none"> Status/control variable 	Yes
<ul style="list-style-type: none"> Variables 	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> Number of variables, max. 	30
<ul style="list-style-type: none"> <ul style="list-style-type: none"> of which status variables, max. 	30
<ul style="list-style-type: none"> <ul style="list-style-type: none"> 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.	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	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Potential separation	
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	
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	
• 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
- SCL
- CFC
- GRAPH
- HiGraph®

Yes
 Yes; Optional
 Yes; Optional
 Yes; Optional
 Yes; Optional

Know-how protection

- User program protection/password protection
- Block encryption

Yes
 Yes; With S7 block Privacy

Cycle time monitoring

- lower limit
- upper limit
- adjustable
- preset

1 ms
 6 000 ms
 Yes
 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

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