

\*\*\* SPARE PART\*\*\* SIMATIC DP, IM151-8F PN/DP CPU FOR ET200S, 192 KB WORKING MEMORY, INT. PROFINET INTERFACE (WITH THREE RJ45 PORTS) AS IO-CONTROLLER, W/O BATTERY MMC REQUIRED



Figure similar

General information	
Product type designation	IM151-8F PN/DP
Hardware product version	01
Firmware version	V2.7
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.4 SP4 or higher, Distributed Safety V5.4 SP4 or higher
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes; against destruction
external protection for power supply lines (recommendation)	24 V DC/16 A miniature circuit breaker with type B and C tripping characteristics. Note: The 24 V DC/16 A miniature circuit breaker with type B tripping characteristics trips before the device protection fuse. The 24 V DC/16 A miniature circuit breaker with type C tripping characteristics trips
Mains buffering	
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms

Input current	
Inrush current, max.	1.8 A; Typical
$I^2t$	0.21 A <sup>2</sup> ·s
from supply voltage 1L+, max.	380 mA; 460 mA with DP master module
Output current	
for backplane bus (5 V DC), max.	700 mA
Power loss	
Power loss, typ.	5.5 W
Memory	
Work memory	
<ul style="list-style-type: none"> <li>integrated</li> </ul>	192 kbyte; For program and data
<ul style="list-style-type: none"> <li>expandable</li> </ul>	No
<ul style="list-style-type: none"> <li>Size of retentive memory for retentive data blocks</li> </ul>	64 kbyte
Load memory	
<ul style="list-style-type: none"> <li>Plug-in (MMC)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Plug-in (MMC), max.</li> </ul>	8 Mbyte
<ul style="list-style-type: none"> <li>Data management on MMC (after last programming), min.</li> </ul>	10 y
Backup	
<ul style="list-style-type: none"> <li>present</li> </ul>	Yes; Ensured by SIMATIC Micro Memory Card (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	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	511; Number range: 1 to 511
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
FB	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
FC	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
OB	
<ul style="list-style-type: none"> <li>Description</li> </ul>	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	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 (OB83 only for centralized I/O and PROFINET IO)
• Number of synchronous error OBs	2; OB 121, 122
<b>Nesting depth</b>	
• per priority class	16
• additional within an error OB	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	255
Retentivity	
— adjustable	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
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	256
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	255
Retentivity	

— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	256 byte
• Retentivity available	Yes
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Number, max.	511; Number range: 1 to 511
• Size, max.	64 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	510 byte; per priority class
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>of which distributed</b>	
— Inputs	2 048 byte
— Outputs	2 048 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
• Inputs, default	128 byte
• Outputs, default	128 byte
<b>Subprocess images</b>	
• Number of subprocess images, max.	none
<b>Digital channels</b>	
• Inputs	16 336
— of which central	496

• Outputs	16 336
— of which central	496
<b>Analog channels</b>	
• Inputs	1 021
— of which central	124
• Outputs	1 021
— of which central	124
<b>Hardware configuration</b>	
Number of modules per system, max.	63; Centralized
<b>Mounting rail</b>	
• Number of mounting rails that can be used	1
• Length of mounting rail, max.	Station width: ≤ 1 m or < 2 m
<b>Time of day</b>	
<b>Clock</b>	
• 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
• Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
<b>Operating hours counter</b>	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
• supported	Yes
• to MPI, master	No
• to MPI, slave	No
• to DP, master	Yes; With DP master module
• to DP, slave	Yes; With DP master module
• in AS, master	No
• in AS, slave	No
• on Ethernet via NTP	Yes; As client
<b>Interfaces</b>	
Number of PROFINET interfaces	1
Number of wireless interfaces	0
<b>1. Interface</b>	
Interface type	PROFINET

Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
<b>Interface types</b>	
• Number of ports	3; RJ45
• integrated switch	Yes
<b>Functionality</b>	
• MPI	No
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	
— Number of HTTP clients	5
• Point-to-point connection	No
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s; full duplex
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes; With DP master module
— S7 communication	Yes; with loadable FBs
— Isochronous mode	No
— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
— IRT	Yes
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	32
— Number of connectable IO Devices, max.	128
— Number of IO Devices with IRT and the option "high flexibility"	128
— of which in line, max.	61
— Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
— Activation/deactivation of IO Devices	Yes
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8

— IO Devices changing during operation (partner ports), supported	Yes
— Number of IO Devices per tool, max.	8
— Device replacement without swap medium	Yes
— Send cycles	Adjustable: 250 µs, 500 µs and 1 ms
— Updating time	Minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the number of configured user data items.
— Updating times	250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)

<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	254 byte; with PROFINET I/O

<b>PROFINET CBA</b>	
• acyclic transmission	Yes
• cyclic transmission	Yes

<b>Open IE communication</b>	
• Number of connections, max.	8
• Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535

## 2. Interface

Interface type	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	No

<b>Functionality</b>	
• MPI	No
• PROFINET IO Controller	No
• PROFINET IO Device	No
• PROFINET CBA	No
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• Open IE communication	No
• Web server	No
• Point-to-point connection	No

<b>DP master</b>	
• Number of connections, max.	12; Notice: 12 connections per CPU, not per interface
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32; Per station

<b>Services</b>	
— 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
— Isochronous mode	No
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; With DP master module
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• supported	Yes; I blocks
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	76 byte
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FBs
• User data per job, max.	180 byte
• User data per job (of which consistent), max.	64 byte
<b>S5 compatible communication</b>	
• supported	No
<b>Standard communication (FMS)</b>	
• supported	No



Open IE communication	
<ul style="list-style-type: none"> <li>• TCP/IP <ul style="list-style-type: none"> <li>— Number of connections, max.</li> <li>— Data length for connection type 01H, max.</li> <li>— Data length for connection type 11H, max.</li> </ul> </li> <li>• ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> <li>— Number of connections, max.</li> <li>— Data length, max.</li> </ul> </li> <li>• UDP <ul style="list-style-type: none"> <li>— Number of connections, max.</li> <li>— Data length, max.</li> </ul> </li> </ul>	<p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>1 460 byte</p> <p>8 192 byte</p> <p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>8 192 byte</p> <p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>1 472 byte</p>
Web server	
<ul style="list-style-type: none"> <li>• supported</li> <li>• Number of HTTP clients</li> </ul>	<p>Yes</p> <p>5</p>
PROFINET CBA (at set setpoint communication load)	
<ul style="list-style-type: none"> <li>• Setpoint for the CPU communication load</li> <li>• Number of remote interconnection partners</li> <li>• Number of functions, master/slave</li> <li>• Total of all master/slave connections</li> <li>• Data length of all incoming connections master/slave, max.</li> <li>• Data length of all outgoing connections master/slave, max.</li> <li>• Number of device-internal and PROFIBUS interconnections</li> <li>• Data length of device-internal und PROFIBUS interconnections, max.</li> <li>• Data length per connection, max.</li> </ul>	<p>50 %</p> <p>32</p> <p>30</p> <p>1 000</p> <p>4 000 byte</p> <p>4 000 byte</p> <p>500</p> <p>4 000 byte</p> <p>1 400 byte</p>
Remote interconnections with acyclic transmission	
<ul style="list-style-type: none"> <li>— Sampling frequency: Sampling time, min.</li> <li>— Number of incoming interconnections</li> <li>— Number of outgoing interconnections</li> <li>— Data length of all incoming interconnections, max.</li> <li>— Data length of all outgoing interconnections, max.</li> <li>— Data length per connection, max.</li> </ul>	<p>500 ms</p> <p>100</p> <p>100</p> <p>2 000 byte</p> <p>2 000 byte</p> <p>1 400 byte</p>
Remote interconnections with cyclic transmission	
<ul style="list-style-type: none"> <li>— Transmission frequency: Transmission interval, min.</li> <li>— Number of incoming interconnections</li> <li>— Number of outgoing interconnections</li> </ul>	<p>1 ms</p> <p>200</p> <p>200</p>

— Data length of all incoming interconnections, max.	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	250 byte
<b>HMI variables via PROFINET (acyclic)</b>	
— Number of stations that can log on for HMI variables (PN OPC/iMap)	3; 2x PN OPC/1x iMap
— HMI variable updating	500 ms
— Number of HMI variables	200
— Data length of all HMI variables, max.	2 000 byte
<b>PROFIBUS proxy functionality</b>	
— supported	Yes
— Number of linked PROFIBUS devices	16
— Data length per connection, max.	240 byte; Slave-dependent
<b>iPAR server</b>	
• supported	Yes
<b>Number of connections</b>	
• 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 S7 communication	10; with loadable FBs
— adjustable for S7 communication, max.	10
• total number of instances, max.	32
• usable for routing	4; With DP master module
<b>S7 message functions</b>	
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
<b>Test commissioning functions</b>	
Status block	Yes
Single step	Yes
Number of breakpoints	2
<b>Status/control</b>	
• 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
<b>Forcing</b>	
• Forcing	Yes
• Forcing, variables	Inputs, outputs
• Number of variables, max.	10
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	500
— adjustable	No
— of which powerfail-proof	100; Only the last 100 entries are retained
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• Bus activity PROFINET P1-LINK (green)	Yes
• Bus activity PROFINET P2-LINK (green)	Yes
• Bus activity PROFINET P3-LINK (green)	Yes
• Bus fault BF-PN (red)	Yes
• Maintenance information MT (yellow)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
<b>Potential separation</b>	
between load voltage and all other switching components	Yes
between PROFIBUS DP and all other circuit components	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC
<b>Isolation</b>	
Isolation tested with	500 V DC

## Degree and class of protection

IP degree of protection IP20

## Configuration

### Configuration software

- STEP 7 Yes; V5.4 SP4

### 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 Yes
- SCL Yes; Optional
- CFC Yes; Optional
- GRAPH Yes; Optional
- HiGraph® Yes; Optional

### Know-how protection

- User program protection/password protection Yes

### Cycle time monitoring

- lower limit 1 ms
- upper limit 6 000 ms
- adjustable Yes
- preset 150 ms

## Dimensions

Width 120 mm; DP master module: 35 mm

Height 119.5 mm

Depth 75 mm

## Weights

Weight, approx. 320 g; DP master module: Approx. 100 g

**last modified:** 03/11/2017