

SIMATIC DP, IM154-8F PN/DP CPU f. ET200 PRO, 512 KB work memory, Int. PROFINET interface, Int. PROFIBUS DP master/slave interface Degree of protection IP65/67, Micro Memory Card and Connection module required



General information	
HW functional status	01
Firmware version	V3.2
Product function	
<ul style="list-style-type: none"> <li>• Isochronous mode</li> </ul>	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
<ul style="list-style-type: none"> <li>• Programming package</li> </ul>	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
Supply voltage	
Rated value (DC)	24 V
external protection for power supply lines (recommendation)	MCB 24 V DC / 16 A with tripping characteristic Type B and C (see ET 200pro manual)
Load voltage L+	
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• permissible range, lower limit (DC)</li> <li>• permissible range, upper limit (DC)</li> <li>• Reverse polarity protection</li> </ul>	24 V 20.4 V 28.8 V Yes
Input current	
Current consumption, typ.	350 mA

Current consumption (in no-load operation), typ.	250 mA; Typical, current consumption for CPU in STOP state
Inrush current, typ.	2 A
I <sup>2</sup> t	0.25 A <sup>2</sup> -s; Typical

### Power loss

Power loss, typ.	8.5 W
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### Memory

#### Work memory

• integrated	512 kbyte
• expandable	No

#### Load memory

• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 y

#### Backup

• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data

### CPU processing times

for bit operations, typ.	0.05 μs
for word operations, typ.	0.09 μs
for fixed point arithmetic, typ.	0.12 μs
for floating point arithmetic, typ.	0.45 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.
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#### DB

• Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte

#### FB

• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte

#### FC

• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte

#### OB

• 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 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 isochronous mode OBs 1; OB 61
- 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

#### 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

- 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
- 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

Retentive data area (incl. timers, counters, flags), max.	128 kbyte
<b>Flag</b>	
• Number, max.	2 048 byte
• Retentivity available	Yes; MB 0 to MB 2 047
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	32 768 byte; Max. 2048 bytes per block
<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.	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
<b>Digital channels</b>	
• Inputs	16 384
— of which central	128
• Outputs	16 384
— of which central	64
<b>Analog channels</b>	
• Inputs	1 024
— of which central	64
• Outputs	1 024
— of which central	64
<b>Hardware configuration</b>	
Integrated power supply	No
<b>Number of DP masters</b>	
• integrated	1

Rack	
• Racks, max.	1
• Modules per rack, max.	16; Expansion width max. 1 m
Time of day	
Clock	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> 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
• on Ethernet via NTP	Yes; As client
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	May only be used for external terminating resistor
Interface types	
• RS 485	Yes
• Design of the connection	2x M12 B-coded
Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
MPI	
• Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes

— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
<b>PROFIBUS DP master</b>	
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	124
<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; Connection configured on one side only
— Equidistance	Yes
— Isochronous mode	Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes; as subscriber
— 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>PROFIBUS DP slave</b>	
• 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
<b>Services</b>	
— Routing	Yes; with interface active
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes; Connection configured on one side only
— Direct data exchange (slave-to-slave communication)	Yes

— DPV1	No
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte
<b>2. Interface</b>	
Interface type	PROFINET
Isolated	Yes; Galvanic isolation for P3 is implemented in IM154-8, for P1 and P2 in CM
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
<b>Interface types</b>	
• Number of ports	3
• integrated switch	Yes
• Design of the connection	Ethernet (2x M12 D-coded; 1x RJ45)
<b>Protocols</b>	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• 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	Yes
• Media redundancy	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
— IRT	Yes
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	32
— Number of connectable IO Devices, max.	128
— Of which IO devices with IRT, max.	64
— of which in line, max.	64

— 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	250 $\mu$ s, 500 $\mu$ s, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)
— Updating time	250 $\mu$ s to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details)
<b>Address area</b>	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
— User data consistency, max.	1 024 byte
<b>PROFINET IO Device</b>	
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— S7 routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
<b>Transfer memory</b>	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
<b>Submodules</b>	
— Number, max.	64
— User data per submodule, max.	1 024 byte
<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, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
• Keep-alive function, supported	Yes

## Protocols

### Redundancy mode

#### Media redundancy

- Switchover time on line break, typ. 200 ms; PROFINET MRP
- Number of stations in the ring, max. 50

### Open IE communication

- TCP/IP
  - Number of connections, max. 8
  - Data length, max. 32 768 byte; 1 460 bytes with connection type 01H; 32 768 bytes with connection type 11H
  - several passive connections per port, supported Yes
- ISO-on-TCP (RFC1006) Yes
  - Number of connections, max. 8
  - Data length, max. 32 768 byte
- UDP Yes
  - Number of connections, max. 8
  - Data length, max. 1 472 byte

### Web server

- supported Yes
- User-defined websites Yes
- Number of HTTP clients 5

## Communication functions

PG/OP communication Yes

### 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)
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FBs
• 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)
<b>PROFINET CBA (at set setpoint communication load)</b>	
• Setpoint for the CPU communication load	50 %
• Number of remote interconnection partners	32
• Number of functions, master/slave	30
• Total of all master/slave connections	1 000
• Data length of all incoming connections master/slave, max.	4 000 byte
• Data length of all outgoing connections master/slave, max.	4 000 byte
• Number of device-internal and PROFIBUS interconnections	500
• Data length of device-internal und PROFIBUS interconnections, max.	4 000 byte
• Data length per connection, max.	1 400 byte
<b>Remote interconnections with acyclic transmission</b>	
— Sampling frequency: Sampling time, min.	500 ms
— Number of incoming interconnections	100
— Number of outgoing interconnections	100
— 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.	1 400 byte
<b>Remote interconnections with cyclic transmission</b>	
— Transmission frequency: Transmission interval, min.	1 ms
— Number of incoming interconnections	200
— Number of outgoing interconnections	200
— 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.	450 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>Number of connections</b>	
• overall	16
• usable for PG communication	15
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	15
• usable for OP communication	15
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	15
• usable for S7 basic communication	14
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	14
• usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
<b>S7 message functions</b>	
Number of login stations for message functions, max.	16; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300
<b>Test commissioning functions</b>	
Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
<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

Forcing	
• Forcing	Yes
• Forcing, variables	I/O
• Number of variables, max.	10
Diagnostic buffer	
• present	Yes
• Number of entries, max.	500; Only the last 100 entries are retentive at power on/off
— adjustable	No
— preset	10
Potential separation	
between backplane bus and electronics	No
between backplane bus and all other circuit components	Yes
between supply and all other circuits	Yes
Isolation	
Isolation tested with	In general, 707 V DC (type test), Ethernet interface 1 500 V AC (for P1 and P2 on CM, for P3 on IM)
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Configuration	
Configuration software	
• STEP 7	Yes; V5.5 or higher
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
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes

#### Know-how protection

• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy

#### Dimensions

Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket

#### Weights

Weight, approx.	720 g
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**last modified:** 07/10/2020