

SIMATIC DP, IM151-7 F-CPU for ET200S, 192 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 |
| Engineering with | |
| <ul style="list-style-type: none"> Programming package | V5.5 + SP1 or higher or V5.2 + SP1 or higher + HSP 219 + Distributed Safety |
| 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 | |
| <ul style="list-style-type: none"> Mains/voltage failure stored energy time | 5 ms |
| Input current | |
| Inrush current, max. | 1.8 A; Typical |
| 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 | 192 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 μ s |
| for word operations, typ. | 0.12 μ s |
| for fixed point arithmetic, typ. | 0.16 μ s |
| for floating point arithmetic, typ. | 0.59 μ s |
| 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 |
| <ul style="list-style-type: none"> 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 |
| 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 |
| 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: $\leq 1\text{ m}$ or $< 2\text{ m}$ |
| 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 | 1x PROFIBUS DP |
| Number of industrial Ethernet interfaces | 0 |
| Number of PROFINET interfaces | 0 |
| 1. Interface | |
| Interface type | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 80 mA |
| 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 |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | No |

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 |
| — 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 |
| Isochronous mode | |
| Isochronous operation (application synchronized up to terminal) | No |
| Communication functions | |
| PG/OP communication | Yes |
| Data record routing | Yes; With DP master module |
| 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 | |
| • supported | Yes |

| | |
|--|--|
| <ul style="list-style-type: none"> • as server • as client • User data per job, max. • User data per job (of which consistent), max. | <p>Yes</p> <p>No</p> <p>See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)</p> <p>See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)</p> |
|--|--|

| Number of connections | |
|---|--|
| • 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 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 | |
| • 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 |

| | |
|---|---|
| <ul style="list-style-type: none"> • Forcing, variables • Number of variables, max. | Inputs, outputs 10 |
| Diagnostic buffer | |
| <ul style="list-style-type: none"> • present • Number of entries, max. <ul style="list-style-type: none"> — adjustable — of which powerfail-proof • Number of entries readable in RUN, max. <ul style="list-style-type: none"> — adjustable — preset | Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10 |
| Service data | |
| <ul style="list-style-type: none"> • can be read out | Yes |
| Interrupts/diagnostics/status information | |
| Alarms | Yes |
| Diagnostics function | Yes |
| Diagnostics indication LED | |
| <ul style="list-style-type: none"> • Group error SF (red) • Monitoring 24 V voltage supply ON (green) | Yes Yes |
| Potential separation | |
| between PROFIBUS DP and all other circuit components | Yes |
| Permissible potential difference | |
| between different circuits | 75 V DC/60 V AC |
| 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 | |
| <ul style="list-style-type: none"> • STEP 7 Lite | No |
| Programming | |
| <ul style="list-style-type: none"> • Command set • Nesting levels • System functions (SFC) • System function blocks (SFB) | see instruction list 8 see instruction list 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 |
| • Block encryption | Yes; With S7 block Privacy |

Cycle time monitoring

| | |
|---------------|----------|
| • 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 |
|-----------------|--|

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