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## Data sheet 6ES7151-7FA21-0AB0



*** spare part *** 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 |
| Product function | |
| ● Isochronous mode | No |
| Engineering with | |
| ● Programming package | as of STEP 7 V5.5 + SP1 or as of V5.2 + SP1 + HSP 219 + Distributed Safety or as of STEP 7 TIA Portal V11 |
| **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 $A^2 \cdot s$ |
| 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 |
| **Storage** | |
| Work memory | |
| ● integrated | 192 kbyte |
| ● expandable | No |
| Load memory | |
| ● Plug-in (MMC) | Yes |
| ● Plug-in (MMC), max. | 8 Mbyte |
| ● Data management on MMC (after last programming), min. | 10 a |
| Backup | |
| ● 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 |


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| 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 | |
| ● 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 | |
| ● Number, max. | 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 | 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 | |
| — can be set | Yes |
| — 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 timer | |
| ● Number | 256 |
| Retentivity | |
| — adjustable | Yes |
| — 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. | 64 kbyte |
| Flag | |
| ● Size, max. | 256 byte |
| ● Retentivity available | Yes; MB 0 to MB 255 |
| ● Retentivity preset | MB 0 to MB 15 |


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| ● 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 | the clock continues at the time of day it had when power was switched off |
| 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 |
| ● on MPI, device | Yes |
| ● to DP, master | Yes; With DP slave only slave clock |
| ● on DP, device | Yes |
| ● in AS, master | No |
| ● in AS, device | No |
| **Interfaces** | |
| Interfaces/bus type | 1x PROFIBUS DP |


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| **1. Interface** | |
| Interface type | Integrated RS 485 interface |
| Isolated | Yes |
| Interface types | |
| ● RS 485 | Yes |
| ● Output current of the interface, max. | 80 mA |
| Protocols | |
| ● MPI | Yes |
| ● PROFIBUS DP master | No |
| ● PROFIBUS DP device | 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 device | |
| ● GSD file | The latest GSD file is available on the Internet (https://www.siemes.plc.com/?s=6ES7151-7FA21-0AB0) |
| ● 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 |
| Isolated | Yes |
| Interface types | |
| ● RS 485 | Yes |
| ● Output current of the interface, max. | No |
| Protocols | |
| ● MPI | No |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP device | No |
| PROFIBUS DP master | |
| ● Transmission rate, max. | 12 Mbit/s |
| ● max. number of DP devices | 32; Per station |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | No |


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| — 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 devices | Yes |
| — max. number of DP devices that can be activated/deactivated at the same time | 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 device | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| **Protocols** | |
| Open IE communication | |
| ● TCP/IP | 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 |
| ● as server | Yes |
| ● as client | No |
| ● 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) |
| ● 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 | |
| ● 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 |


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| ● 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 |
| ● Forcing, variables | Inputs, outputs |
| ● Number of variables, max. | 10 |
| Diagnostic buffer | |
| ● present | Yes |
| ● Number of entries, max. | 500 |
| — can be set | No |
| — of which powerfail-proof | 100; Only the last 100 entries are retained |
| ● Number of entries readable in RUN, max. | 499 |
| — can be set | 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 |
| **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 | Yes |
| — SCL | Yes; Optional |
| — CFC | Yes; Optional |
| — GRAPH | Yes; Optional |
| — HiGraph® | Yes; Optional |


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| **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 |
| ● can be set | 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 |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 16 | 27-24-26-07 |
| eClass | 14 | 27-24-26-07 |
| eClass | 12 | 27-24-26-07 |
| eClass | 9.1 | 27-24-26-07 |
| eClass | 9 | 27-24-26-07 |
| eClass | 8 | 27-24-26-07 |
| eClass | 7.1 | 27-24-26-07 |
| eClass | 6 | 27-24-26-07 |
| ETIM | 10 | EC001603 |
| ETIM | 9 | EC001603 |
| ETIM | 8 | EC001603 |
| ETIM | 7 | EC001603 |
| IDEA | 4 | 3565 |
| UNSPSC | 15 | 32-15-17-05 |

**Approvals / Certificates**

| General Product Approval | EMV | Test Certificates |
|---|---|---|
| | | Type Test Certificates/Test Report |

| Maritime application | other | Environment |
|---|---|---|
| | Confirmation | Environmental Confirmations |

**Environment**

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