SIEMENS

## Data sheet 6AG1151-7AA20-7AB0

***Spare part*** SIPLUS ET 200S IM 151-7 CPU -25...+70°C based on 6ES7151-7AA20-0AB0

Figure similar

| | |
|---|---|
| **General information** | |
| HW functional status | 01 |
| Firmware version | V2.6 |
| Engineering with | |
| • Programming package | STEP 7 V5.2 + SP1 or higher with HW update |
| **Supply voltage** | |
| Load voltage L+ | |
| • Rated value (DC) | 24 V |
| • permissible range, lower limit (DC) | 20.4 V |
| • permissible range, upper limit (DC) | 28.8 V |
| • Short-circuit protection | Yes |
| • Reverse polarity protection | Yes |
| **Input current** | |
| from supply voltage 1L+, max. | 250 mA; 280 mA with DP master module |
| **Output current** | |
| for backplane bus (5 V DC), max. | 700 mA |

| | |
|---|---|
| **Power loss** | |
| Power loss, typ. | 3.3 W |
| **Memory** | |
| Work memory | |
| • integrated | 96 kbyte; For program and data |
| • 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) |
| **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 | |
| • Number, max. | 511; Number range: 1 to 511 |
| • Size, max. | 16 kbyte |
| FB | |
| • Number, max. | 1 024; Number range: 0 to 2047 |
| • Size, max. | 16 kbyte |
| FC | |
| • Number, max. | 1 024; Number range: 0 to 2047 |
| • Size, max. | 16 kbyte |
| OB | |
| • Size, max. | 16 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 |
| Nesting depth | |

| | |
|---|---|
| • per priority class | 8 |
| • 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. | 64 kbyte |
| Flag | |
| • Number, max. | 256 byte |
| • Retentivity available | Yes |
| • Retentivity preset | MB 0 to MB 15 |
| • Number of clock memories | 8; 1 memory byte |
| Local data | |

| | |
|---|---|
| • per priority class, max. | 510 byte |

| Address area | |
|---|---|
| I/O address area | |
| • Inputs | 2 048 byte |
| • Outputs | 2 048 byte |
| Process image | |
| • Inputs | 128 byte; Not adjustable |
| • Outputs | 128 byte; Not adjustable |
| Digital channels | |
| • Inputs | 16 336 |
| — of which central | 248 |
| • Outputs | 16 336 |
| — of which central | 248 |
| 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 |

| 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 |
| 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 |
| • to DP, slave | Yes |
| • in AS, master | No |
| • in AS, slave | No |

| Interfaces | |
|---|---|
| Interfaces/bus type | 1 x MPI/PROFIBUS DP |
| Number of industrial Ethernet interfaces | 0 |
| Number of PROFINET interfaces | 0 |
| Number of wireless 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 | |
| • Number of connections | 12; Notice: 12 connections per CPU, not per interface |
| • 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 |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| PROFIBUS DP slave | |
| • Number of connections | 12; Notice: 12 connections per CPU, not per interface |
| • GSD file | 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 | |
| — Routing | Yes; Only when interface active and in master mode |
| — 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 |
| • Point-to-point connection | No |
| PROFIBUS DP master | |
| • 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 |
| Services | |
| — 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 |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — 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 |
| Global data communication | |

| | |
|---|---|
| • supported | Yes |
| • Number of GD packets, max. | 4 |
| • Number of GD packets, transmitter, max. | 4 |
| • Number of GD packets, receiver, max. | 4 |
| • 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. | 180 byte |
| • User data per job (of which consistent), max. | 64 byte |
| S5 compatible communication | |
| • supported | No |
| Standard communication (FMS) | |
| • supported | No |
| Number of connections | |
| • overall | 12 |
| • usable for PG communication | 11 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, max. | 11 |
| • usable for OP communication | 11 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, max. | 11 |
| • usable for S7 basic communication | 10 |
| — reserved for S7 basic communication | 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. | 40 |

| Test commissioning functions |
|---|

| | |
|---|---|
| Status block | Yes |
| Single step | Yes |
| Number of breakpoints | 2 |
| 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. | 100 |
| — adjustable | No |
| **Potential separation** | |
| between load voltage and all other switching components | Yes |
| 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 |
| **Standards, approvals, certificates** | |
| CE mark | Yes |
| **Ambient conditions** | |
| Ambient temperature during operation | |
| • min. | -25 °C; = Tmin |
| • max. | 70 °C; = Tmax |
| Altitude during operation relating to sea level | |
| • Ambient air temperature-barometric pressure-altitude | Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) |
| Relative humidity | |

| | |
|---|---|
| • With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state) |
| Resistance | |
| Use in stationary industrial systems | |
| — to biologically active substances according to EN 60721-3-3 | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request |
| — to chemically active substances according to EN 60721-3-3 | Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation! |
| — to mechanically active substances according to EN 60721-3-3 | Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation! |
| **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 | Yes |
| 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 |
| — GRAPH | 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 | 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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