SIEMENS

SPARE PART SIPLUS ET200S IM151-7 F-CPU -25 ... +60 DGR C, WITH CONFORMAL COATING BASED ON 6ES7151-7FA20-0AB0 . 128 KB WORKING MEMORY WITH INTEGRATED PROFIBUS-DP-INTERFACE (9-PIN SUB-D, FEMALE) AS DP-SLAVE, W/O BATTERY

Figure similar

General information	
Hardware product version	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

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Power loss

Power loss, typ.	3.3 W

Memory

Work memory

• integrated	128 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 (for centralized I/O only, not for distributed I/O), 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	
— can be set	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

Data blocks	
● Number, max.	511; Number range: 1 to 511
● Size, max.	16 kbyte
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 hour
● retentive	Yes; Must be restarted at each restart
Clock synchronization	
● supported	Yes
● to MPI, master	Yes
● to MPI, slave	Yes

• in AS, master	No
• in AS, slave	No

Interfaces

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

Functionality

• 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

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

Functionality

• MPI	No
• PROFIBUS DP master	Yes
• Point-to-point connection	No

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
RCM (formerly C-TICK)	Yes
Ambient conditions	
Ambient temperature during operation	
● min.	-25 °C; = Tmin
● max.	60 °C; = Tmax
Extended ambient conditions	
● relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
Relative humidity	

— With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
— against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) 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!
— against mechanically active substances / conformity with 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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