SIEMENS

Data sheet

6ES7154-8FB01-0AB0

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	
 Isochronous mode 	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
 Programming package 	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
Supply voltage	
Rated value (DC)	24 V
external protection for power supply lines	MCB 24 V DC / 16 A with tripping characteristic Type B and C
(recommendation)	(see ET 200pro manual)
Load voltage L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	20.4 V
• permissible range, upper limit (DC)	28.8 V
 Reverse polarity protection 	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
l²t	0.25 A ² ·s; Typical
Power loss	
Power loss, typ.	8.5 W
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 у
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.
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 delay alarm OBs Number of cyclic interrupt OBs 	2; OB 20, 21 4; OB 32, 33, 34, 35

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
• Туре	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
• Туре	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	

Retentive data area (incl. timers, counters, flags),	128 kbyte
max. Flag	
• 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
Data blocks	0
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	1.00
per priority class, max.	32 768 byte; 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, adjustable 	2 048 byte
 Outputs, adjustable 	2 048 byte
 Inputs, default 	128 byte
• Outputs, default	128 byte
Subprocess images	
 Number of subprocess images, max. 	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
Inputs	16 384
— of which central	128
Outputs	16 384
— of which central	64
Analog channels	
Inputs	1 024
— of which central	64
Outputs	1 024
— of which central	64
Hardware configuration	
Integrated power supply	No
Number of DP masters	
• integrated	1

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 1 • 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 Yes • to MPI, master Yes • to MPI, slave Yes • to DP, slave Yes; With DP slave only slave clock • to DP, slave Yes • on Ethernet via NTP Yes; As client	Rack	
Clock • Hardware clock (real-time) Yes • retentive and synchronizable Yes • Backup time 6 wk; Al 40 °C ambient temperature • Deviation per day, max. 10 s; Typ.: 2 s Operating hours counter 1 • Number 1 • Number/Number range 0 • Range of values 0 to 2*31 hours (when using SFC 101) • Granularity 1 h • retentive Yes • Suported Yes • to MPI, master Yes • to MPI, slave Yes • to DP, slave Yes • to DP, slave Yes • on Ethernet via NTP Yes: As client 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 type Integrated RS 485 interface Isolated Yes • Design of the connection Zx M12 E-coded Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes	• Racks, max.	1
Clock Hardware clock (real-lime) Yes retentive and synchronizable Gakup time Gakup time<!--</td--><td> Modules per rack, max. </td><td>16; Expansion width max. 1 m</td>	 Modules per rack, max. 	16; Expansion width max. 1 m
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 1 • Number 1 • Number 1 • Number/Number range 0 • Granularity 1 h • retentive Yes; Must be restarted at each restart Clock synchronization Yes • to MPI, master Yes • to MPI, slave Yes; With DP slave only slave clock • to MPI, slave Yes; As client Interface Yes Interface type Integrated RS 485 interface isolated Yes Power supply to interface (15 to 30 V DC), max. May be used for external terminating resistor Interface type Integrated RS 485 interface • RS 485 Yes • Design of the connection 2x M12 B-coded Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes <t< td=""><td>Time of day</td><td></td></t<>	Time of day	
r etentive and synchronizable Yes Backup time 6 wi: At 40 °C ambient temperature beviation per day, max. 10 s; Typ. 2 s Operating hours counter Number 0 Number 1 Number 0 Number 0	Clock	
Backup time6 wk; At 40 °C ambient temperature• Boxkup time10 s; Typ.: 2 sOperating hours counter1• Number / Number range0• Range of values0 to 2^31 hours (when using SFC 101)• Granularity1 h• retentiveYes; Must be restarted at each restartClock synchronizationVes• to MPI, masterYes• to MPI, slaveYes• to DP, slaveYes; With DP slave only slave clock• to DP, slaveYes• on Ethernet via NTPYes• Interface typeIntegrated RS 485 interfaceIsolatedYes• Power supply to interface (15 to 30 V DC), max.May only be used for external terminating resistor• RS 485Yes• DP, FIBUS DP masterYes• PROFIBUS DP slaveYes• PROFIBUS DP slaveYe	 Hardware clock (real-time) 	Yes
• Deviation per day, max.10 % Typ.: 2 %Operating hours counter• Number1• Number/Number range0• Granularity1 h• Granularity1 h• techniveVes; Must be restarted at each restartClock synchronizationYes• supportedYes• to MPI, masterYes; With DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; Must DP slave only slave clock• to DP, slaveYes; As client• to DP, slaveYes• to StaveYes• to StaveYes	 retentive and synchronizable 	Yes
Operating hours counter 1 • Number 1 • Number range 0 • Range of values 0 to 2^31 hours (when using SFC 101) • Granularity 1 h • retentive Ves; Must be restarted at each restart • Clock synchronization Yes • to MPI, master Yes • to MPI, slave Yes • to MP, slave Yes • to DP, master Yes; With DP slave only slave clock • to DP, slave Yes; So client • on Ethernet via NTP Yes; As client Interface type Integrated RS 485 interface Isolated Yes • RS 485 Yes • Design of the connection Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • PRO/OP communication Yes • PR/OP communication Yes • PR/OP communication Yes • PRO/OP comm	Backup time	6 wk; At 40 °C ambient temperature
• Number1• Number/Number range0• Range of values0 to 2^31 hours (when using SFC 101)• Granularity1 h• tetentiveVes• tetentiveYes• supportedYes• to MPI, masterYes• to DP, masterYes• to DP, slaveYes• on Ethernet via NTPYes: As client• Interface typeIntegrated RS 485 interface• IsolatedYes• SupportedYes• on Ethernet via NTPYes: As client• Interface typeIntegrated RS 485 interface• IsolatedYes• Power supply to interface (15 to 30 V DC), max.Yes• RS 485Yes• Design of the connection2x M12 B-coded• ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• Protocols <td< td=""><td> Deviation per day, max. </td><td>10 s; Typ.: 2 s</td></td<>	 Deviation per day, max. 	10 s; Typ.: 2 s
Number Number range0• Range of values0 to 2^31 hours (when using SFC 101)• Granularity1 h• retentiveVes; Must be restarted at each restart• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes; With DP slave only slave clock• to DP, masterYes; Xuith DP slave only slave clock• to DP, masterYes; As client• netternet via NTPYes; As client• Interface typeIntegrated RS 485 interface• solatedYes• RS 485Yes• Design of the connectionXuit 2B-coded• ProtocolYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• PROFOCOUTInterface• PROFIBUS DP slaveYes• PROFOCOUTYes• PROFOCOUTYes <td>Operating hours counter</td> <td></td>	Operating hours counter	
Range of values0 to 2v31 hours (when using SFC 101)Granularity1 h• retentiveYes; Must be restarted at each restantClock synchronizationYes• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes; With DP slave only slave clock• to DP, masterYes; With DP slave only slave clock• to DP, slaveYes• on Ethernet via NTPYes; As clientInterface typeIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typeMay only be used for external terminating resistorInterface typeXes• RS 485Yes• Design of the connectionYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• Pransmission rate, max.12 Mbit/sServices PG/OP communicationYes- RoutingYes- Routing- Routing<	Number	1
• Granularity1 h• retentiveYes; Must be restarted at each restartClock synchronizationYes• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes; With DP slave only slave clock• to DP, masterYes; With DP slave only slave clock• to DP, slaveYes; Scient• on Ethernet via NTPYes; As clientInterface typeIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typeYes• RS 485Yes• Design of the connectionYesPROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP master12 Mbit/s• Pransmission rate, max.12 Mbit/sServices PG/OP communicationYes- RoutingYes- RoutingYes <td< td=""><td>Number/Number range</td><td>0</td></td<>	Number/Number range	0
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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 Interface Yes 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 type Integrated RS 485 interface Power supply to interface (15 to 30 V DC), max. May only be used for external terminating resistor Interface types Yes • RS 485 Yes • Design of the connection 2x M12 B-coded Protocols Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • PROFIBUS DP slave Yes • PROFIBUS DP slave Yes • Protocolon No MPI - • Transmission rate, max. 12 Mbit/s Services - - Routing Yes	Granularity	1 h
• supportedYes• to MPI, masterYes• to MPI, slaveYes• to DP, masterYes; With DP slave only slave clock• to DP, slaveYes• on Ethernet via NTPYes; As clientInterfaceIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typeIntegrated RS 485 interfacePower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface types2x M12 B-coded• RS 485Yes• Design of the connection2x M12 B-codedPROFIBUS DP masterYes• PROFIBUS DP slaveYes• Point-to-point connectionNoMPIIt Mbit/sServices PG/OP communicationYes- RoutingYes- RoutingYes- Global data communicationYes- State Assister	• retentive	Yes; Must be restarted at each restart
to MPI, masterYesto MPI, slaveYes; With DP slave only slave clockto DP, masterYes; With DP slave only slave clockto DP, slaveYes; A clienton Ethernet via NTPYes; A clientInterfaceInterface typeIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typesYese RS 485Yeso besign of the connection2x M12 B-codedProtocolsYese PROFIBUS DP masterYese PROFIBUS DP slaveYese PROFIBUS DP slaveYese ProtocolinNoMPIYese PROFIBUS DP slaveYese ProtocolinYesfor anyYese Transmission rate, max.12 Mbit/sServices— Global data communicationYes— RoutingYes- Global data communicationYes- State SlaveYes- State SlaveYes- State SlaveYes- State SlaveYes- State SlaveYes- State SlaveYes- RoutingYes- RoutingYes- RoutingYes- State SlaveYes- RoutingYes- RoutingYes <t< td=""><td>Clock synchronization</td><td></td></t<>	Clock synchronization	
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• to DP, slaveYes• on Ethernet via NTPYes; As clientInterfaceIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typesYes• RS 485Yes• Design of the connection2x M12 B-codedProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• PROFIBUS DP slaveYes• ProtocolsXesInterface typeYes• RoutingYes• CommunicationYes• ProtocolsYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• ProtocolsYes• ProtocolsYes• OnlyYes• ProtocolsYes• ProtocolsYes<	• to MPI, slave	Yes
• on Ethernet via NTP Yes; As client Interface 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 • RS 485 Yes • Design of the connection 2x M12 B-coded PROFIBUS DP master Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • PROFORC Yes • PROFORC Yes • PROFIBUS DP slave Yes • PROFIBUS DP slave Yes • PROFIDE Yes • Routing Yes • PG/OP communication Yes • Routing Yes • Global data communication Yes	• to DP, master	Yes; With DP slave only slave clock
Interface 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 Integrated RS 485 interface • RS 485 Yes • Design of the connection 2x M12 B-coded Protocols Yes • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave 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	• to DP, slave	Yes
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 Yes • RS 485 Yes • Design of the connection 2x M12 B-coded Protocols Yes • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • Point-to-point connection No MPI Yes • Profice rate, max. 12 Mbit/s Services - - PG/OP communication Yes - Routing Yes - Global data communication Yes	 on Ethernet via NTP 	Yes; As client
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 • PROFIBUS DP slave Yes • Protocols Yes Transmission rate, max. 12 Mbit/s Services - PG/OP communication Yes - Routing Yes - Routing Yes - Global data communication Yes	1. Interface	
Power supply to interface (15 to 30 V DC), max. May only be used for external terminating resistor Interface types Yes • RS 485 2x M12 B-coded • Design of the connection 2x M12 B-coded Protocols Yes • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • Protocols Yes MPI No • Protornation rate, max. 12 Mbit/s Services Yes - PG/OP communication Yes - Routing Yes - Routing Yes - Global data communication Yes		
Interface types • RS 485 Yes • Design of the connection 2x M12 B-coded Protocols Yes • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • Point-to-point connection No MPI Ves • ProtoflBUS DP slave Yes • Protoflation connection No MPI 12 Mbit/s • Protoconservices Yes • Transmission rate, max. 12 Mbit/s • PG/OP communication Yes • Routing Yes • Routing Yes • Global data communication Yes		
• RS 485Yes• Design of the connection2x M12 B-codedProtocols• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• ProtocolsNoMPINo• Protocols12 Mbit/s• Pransmission rate, max.12 Mbit/s• PROFOP communicationYes• RoutingYes• RoutingYes• Global data communicationYes		May only be used for external terminating resistor
• Design of the connection 2x M12 B-coded Protocols Yes • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • Point-to-point connection No MI • Transmission rate, max. 12 Mbit/s Services - PG/OP communication Yes - Routing Yes - Global data communication Yes		
Protocols • MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP slave Yes • PROFIBUS DP slave Yes • Point-to-point connection No MPI Ves • Transmission rate, max. 12 Mbit/s Services – • PG/OP communication Yes • Routing Yes • Global data communication Yes		
• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• Point-to-point connectionNoMPII2 Mbit/s• Transmission rate, max.12 Mbit/sServices PG/OP communicationYes- RoutingYes- Global data communicationYes	-	2x M12 B-coded
PROFIBUS DP masterYesPROFIBUS DP slaveYesPoint-to-point connectionNoMPIIServices12 Mbit/sPG/OP communicationYesPG/OP communicationYesServicesYes <t< td=""><td></td><td></td></t<>		
 PROFIBUS DP slave Point-to-point connection No MPI Transmission rate, max. 12 Mbit/s Services — PG/OP communication — Routing — Global data communication Yes 	• MPI	
 Point-to-point connection No MPI Transmission rate, max. 12 Mbit/s Services — PG/OP communication — Routing — Global data communication Yes Wes Wes	 PROFIBUS DP master 	
MPI • Transmission rate, max. 12 Mbit/s Services - PG/OP communication Yes - Routing Yes - Global data communication Yes	 PROFIBUS DP slave 	Yes
• Transmission rate, max. 12 Mbit/s Services - - PG/OP communication Yes - Routing Yes - Global data communication Yes	· · · · · · · · · · · · · · · · · · ·	No
Services — PG/OP communication Yes — Routing Yes — Global data communication Yes		
PG/OP communication Yes Routing Yes Global data communication Yes	• Transmission rate, max.	12 Mbit/s
— Routing Yes — Global data communication Yes	Services	
— Global data communication Yes	— PG/OP communication	Yes
	— Routing	Yes
— S7 basic communication Yes	— Global data communication	Yes
	— S7 basic communication	Yes

— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
PROFIBUS DP master	
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
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; 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
Address area	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• 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
Services	
— 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
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
2. Interface	PROFINET
Interface type 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
Interface types	
Number of ports	3
 integrated switch 	Yes
 Design of the connection 	Ethernet (2x M12 D-coded; 1x RJ45)
Protocols	
• 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
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— 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

	400
 — 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, 	128
max.	
— 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 μs to 512 ms (depending on the operating mode, see "IM 154-8 CPU Interface Module" operating instructions for more details)
Address area	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
— User data consistency, max.	1 024 byte
PROFINET IO Device	
PROFINET IO Device Services	
	Yes
Services	Yes Yes
Services — PG/OP communication	
Services — PG/OP communication — Routing	Yes
Services — PG/OP communication — Routing — S7 routing	Yes Yes; With loadable FBs, max. configurable connections: 14, max.
Services — PG/OP communication — Routing — S7 routing — S7 communication	Yes Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
Services — PG/OP communication — Routing — S7 routing — S7 communication — Isochronous mode	Yes Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No
Services — PG/OP communication — Routing — S7 routing — S7 communication — Isochronous mode — IRT	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy
Services PG/OP communication Routing S7 routing S7 communication Isochronous mode IRT PROFlenergy	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes
Services - PG/OP communication - Routing - S7 routing - S7 communication - Isochronous mode - IRT - PROFlenergy - Shared device - Number of IO Controllers with shared device, max. Transfer memory	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes 2
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes 2
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes 2
Services 	Yes Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 No Yes Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device Yes 2 1 440 byte; Per IO Controller with shared device 1 440 byte; Per IO Controller with shared device

• aquella transmission	Yes
acyclic transmission	Yes
• cyclic transmission	res
Open IE communication	0
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	Yes; via integrated PROFINET interface and loadable FBs
— 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, max. 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	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)
PROFINET CBA (at set setpoint communication load)	
 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
Remote interconnections with acyclic transmission	
 — 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
Remote interconnections with cyclic transmission	
 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
HMI variables via PROFINET (acyclic)	

 — 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
PROFIBUS proxy functionality	
— supported	Yes
 — Number of linked PROFIBUS devices 	16
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• 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, 	0
min.	
 — 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.
S7 message functions	
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
Test commissioning functions	
Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Status/control	
	Vac

 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	Yes
components 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
 Nesting levels System functions (SFC) 	see instruction list
 System functions (SFC) System function blocks (SFB) 	see instruction list
Programming language	Yes
— LAD	
— 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
Height Depth	130 mm 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
-	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover