## **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	
<ul> <li>Isochronous mode</li> </ul>	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
<ul> <li>Programming package</li> </ul>	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+	
<ul> <li>Rated value (DC)</li> </ul>	24 V
<ul> <li>permissible range, lower limit (DC)</li> </ul>	20.4 V
<ul> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
<ul> <li>Reverse polarity protection</li> </ul>	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 <sup>2</sup> ·s; Typical
Power loss	
Power loss, typ.	8.5 W
Memory	
Work memory	
• integrated	512 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes
<ul> <li>Plug-in (MMC), max.</li> </ul>	8 Mbyte
<ul> <li>Data management on MMC (after last programming), min.</li> </ul>	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
<ul> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul> <li>Number of time alarm OBs</li> </ul>	1; OB 10
<ul> <li>Number of delay alarm OBs</li> </ul>	2; OB 20, 21
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	4; OB 32, 33, 34, 35

<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55, 56, 57
<ul> <li>Number of isochronous mode OBs</li> </ul>	1; OB 61
<ul> <li>Number of startup OBs</li> </ul>	1; OB 100
<ul> <li>Number of asynchronous error OBs</li> </ul>	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for centralized I/O and PROFINET IO)
<ul> <li>Number of synchronous error OBs</li> </ul>	2; OB 121, 122
Nesting depth	
<ul> <li>per priority class</li> </ul>	16
<ul> <li>additional within an error OB</li> </ul>	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), max.	128 kbyte
Flag	
• Number, max.	2 048 byte
Retentivity available	Yes; MB 0 to MB 2 047
Retentivity available     Retentivity preset	MB 0 to MB 15
	8
Number of clock memories Data blocks	0
	Yes; via non-retain property on DB
Retentivity adjustable	Yes
Retentivity preset Local data	163
	32 768 byte; Max. 2048 bytes per block
• per priority class, max.	52 700 byte, Max. 2040 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	
<ul> <li>Inputs, adjustable</li> </ul>	2 048 byte
<ul> <li>Outputs, adjustable</li> </ul>	2 048 byte
<ul> <li>Inputs, default</li> </ul>	128 byte
<ul> <li>Outputs, default</li> </ul>	128 byte
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	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 <ul> <li>Hardware clock (real-lime)</li> <li>Yes</li> <li>retentive and synchronizable</li> <li>Gakup time</li> <li>Gakup time<!--</td--><td><ul> <li>Modules per rack, max.</li> </ul></td><td>16; Expansion width max. 1 m</td></li></ul>	<ul> <li>Modules per rack, max.</li> </ul>	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 <b>Operating hours counter</b> 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	<ul> <li>Hardware clock (real-time)</li> </ul>	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	<ul> <li>retentive and synchronizable</li> </ul>	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><ul> <li>Deviation per day, max.</li> </ul></td><td>10 s; Typ.: 2 s</td></td<>	<ul> <li>Deviation per day, max.</li> </ul>	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
• referitive         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; As client           • 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           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           PROFIBUS DP master         Yes           • PROFIBUS DP master         Yes           • PROFIBUS DP slave         Yes           • PROFIBUS DP slave         Yes           • PROFIDUS DP master         Yes           • Protocols         -           • Protocolin         No           MPI         Yes	<ul> <li>Range of values</li> </ul>	0 to 2^31 hours (when using SFC 101)
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	
to MPI, slaveYesto DP, masterYes; With DP slave only slave clockto DP, slaveYes; With DP slave only slave clockto DP, slaveYeson Ethernet via NTPYes; As clientInterface typeInterface typeIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface typese RS 485Yeso Design of the connection2x M12 B-codedProtocolse NPOFIBUS DP masterYese PROFIBUS DP slaveYese PROFIBUS DP slaveYese ProtocionNoMPIe PROFIBUS DP slaveYese PROFIBUS DP communicationNoMPIe Transmission rate, max.12 Mbit/sServices- PG/OP communicationYes- RoutingYes- Global data communicationYes	<ul> <li>supported</li> </ul>	Yes
to DP, masterYes; With DP slave only slave clock• to DP, slaveYes• on Ethernet via NTPYes; As clientIntegrated RS 485 interfaceInterface typeIntegrated RS 485 interfaceIsolatedYesPower supply to interface (15 to 30 V DC), max.May only be used for external terminating resistorInterface types• RS 485Yes• Design of the connection2x M12 B-codedProtocols• MPIYes• PROFIBUS DP masterYes• PROFIBUS DP slaveYes• Point-to-point connectionNoMPI12 Mbit/sServices- PG/OP communicationYes- RoutingYes- Global data communicationYes- Global data communicationYes	• to MPI, master	Yes
• 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	<ul> <li>on Ethernet via NTP</li> </ul>	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<>		
<ul> <li>PROFIBUS DP slave</li> <li>Point-to-point connection</li> <li>No</li> <li>MPI</li> <li>Transmission rate, max.</li> <li>12 Mbit/s</li> <li>Services</li> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>Yes</li> </ul>	• MPI	
<ul> <li>Point-to-point connection</li> <li>No</li> <li>MPI</li> <li>Transmission rate, max.</li> <li>12 Mbit/s</li> <li>Services</li> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>Yes</li> <li>Wes</li> <li>Wes</li></ul>	<ul> <li>PROFIBUS DP master</li> </ul>	
MPI       • Transmission rate, max.     12 Mbit/s       Services       - PG/OP communication     Yes       - Routing     Yes       - Global data communication     Yes	<ul> <li>PROFIBUS DP slave</li> </ul>	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
	No
— S7 communication, as client	Yes
<ul> <li>— S7 communication, as server</li> <li>PROFIBUS DP master</li> </ul>	Tes
	10 Mbb/a
• 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
<ul> <li>— S7 communication, as server</li> </ul>	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
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	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
<ul> <li>automatic baud rate search</li> </ul>	Yes; only with passive interface
<ul> <li>Address area, max.</li> </ul>	32
<ul> <li>User data per address area, max.</li> </ul>	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
<ul> <li>integrated switch</li> </ul>	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
<ul> <li>Media redundancy</li> </ul>	Yes
PROFINET IO Controller	
<ul> <li>Transmission rate, max.</li> </ul>	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	32
startup, max.	128
- Number of connectable IO Devices, max.	128
— Of which IO devices with IRT, max.	64
— of which in line, max.	64

	400
<ul> <li>— Number of IO Devices with IRT and the option "high flexibility"</li> </ul>	128
— of which in line, max.	61
— Number of connectable IO Devices for RT,	128
max.	
— of which in line, max.	128
<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8
<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	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	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
— Number of IO Controllers with shared	2
device, max.	
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
— Number, max. — User data per submodule, max.	64 1 024 byte

• aquella transmission	Yes
acyclic transmission	Yes
• cyclic transmission	res
Open IE communication	0
Number of connections, max.	8
<ul> <li>Local port numbers used at the system end</li> </ul>	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<ul> <li>Keep-alive function, supported</li> </ul>	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
<ul> <li>— several passive connections per port, supported</li> </ul>	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
<ul> <li>User-defined websites</li> </ul>	Yes
Number of HTTP clients	5
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
<ul> <li>Number of GD loops, max.</li> </ul>	8
<ul> <li>Number of GD packets, max.</li> </ul>	8
<ul> <li>Number of GD packets, transmitter, max.</li> </ul>	8
<ul> <li>Number of GD packets, receiver, max.</li> </ul>	8
<ul> <li>Size of GD packets, max.</li> </ul>	22 byte
<ul> <li>Size of GD packet (of which consistent), max.</li> </ul>	22 byte
S7 basic communication	
• supported	Yes

• User data per job, max.	76 byte
<ul> <li>User data per job, max.</li> <li>User data per job (of which consistent), max.</li> </ul>	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
<ul> <li>User data per job, max.</li> </ul>	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)	
<ul> <li>Setpoint for the CPU communication load</li> </ul>	50 %
<ul> <li>Number of remote interconnection partners</li> </ul>	32
<ul> <li>Number of functions, master/slave</li> </ul>	30
<ul> <li>Total of all master/slave connections</li> </ul>	1 000
<ul> <li>Data length of all incoming connections master/slave, max.</li> </ul>	4 000 byte
<ul> <li>Data length of all outgoing connections master/slave, max.</li> </ul>	4 000 byte
<ul> <li>Number of device-internal and PROFIBUS interconnections</li> </ul>	500
<ul> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> </ul>	4 000 byte
<ul> <li>Data length per connection, max.</li> </ul>	1 400 byte
Remote interconnections with acyclic transmission	
<ul> <li>— Sampling frequency: Sampling time, min.</li> </ul>	500 ms
- Number of incoming interconnections	100
<ul> <li>— Number of outgoing interconnections</li> </ul>	100
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	2 000 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	2 000 byte
— Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	
<ul> <li>Transmission frequency: Transmission interval, min.</li> </ul>	1 ms
- Number of incoming interconnections	200
- Number of outgoing interconnections	200
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	2 000 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	2 000 byte
— Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	

<ul> <li>— Number of stations that can log on for HMI variables (PN OPC/iMap)</li> </ul>	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
<ul> <li>— Number of linked PROFIBUS devices</li> </ul>	16
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• overall	16
<ul> <li>usable for PG communication</li> </ul>	15
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	15
<ul> <li>usable for OP communication</li> </ul>	15
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	15
<ul> <li>usable for S7 basic communication</li> </ul>	14
- reserved for S7 basic communication	0
— adjustable for S7 basic communication,	0
min.	
<ul> <li>adjustable for S7 basic communication,</li> </ul>	14
max.	V4 as MDI: may 40: V4 as DD master may 24: V4 as DD slave
<ul> <li>usable for routing</li> </ul>	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	

Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
<ul> <li>Number of variables, max.</li> </ul>	30
— of which status variables, max.	30
— of which control variables, max.	14

Forcing	
Forcing	Yes
<ul> <li>Forcing, variables</li> </ul>	I/O
<ul> <li>Number of variables, max.</li> </ul>	10
Diagnostic buffer	
present	Yes
<ul> <li>Number of entries, max.</li> </ul>	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
<ul> <li>Nesting levels</li> </ul>	8
<ul> <li>System functions (SFC)</li> </ul>	see instruction list
<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes

— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
<ul> <li>Block encryption</li> </ul>	Yes; With S7 block Privacy
Dimensions	
Width	135 mm
WIGHT	100 11111
Height	130 mm
	130 mm 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover
Height	130 mm
Height	130 mm 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover
Height Depth	130 mm 65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover