

SIEMENS

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SIMATIC

ET 200S

IM 151-7 CPU Interface Module

Product Information

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Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
⚠ WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
⚠ CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

⚠ WARNING
This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

Scope

This Product Information supplements Manual *ET 200S IM 151-7 CPU Interface Module* (A5E00058783-04), Edition 11/2003, and describes the new features of the interface modules:

- IM 151-7 CPU; Order Number 6ES7151-7AA20-0AB0
- IM 151-7 F-CPU; Order Number 6ES7151-7FA20-0AB0

The following information applies equally to both interface modules. If differences exist, the relevant module will be identified explicitly.

Software requirements

The following software requirements must be satisfied in order to utilize the full functionality of the IM 151-7 CPU:

CPU	Firmware version	Required <i>STEP 7</i> version
IM 151-7 CPU	V2.6	<i>STEP 7</i> V5.4 + SP3 or higher, or <i>STEP 7</i> V5.2 + SP1 with HSP 0128 or higher
IM 151-7 F-CPU	V2.6	<i>STEP 7</i> V5.4 + SP3 or higher, or <i>STEP 7</i> V5.2 + SP1 with HSP 0108 or higher

Note

Configurations created in HW Config for the predecessor versions of the above-indicated IM 151-7 CPU interface modules are upwardly compatible. The new features that must be configured are not supported in this case.

Changes compared to the predecessor modules

In comparison to the predecessors of the interface modules indicated above, the following new features are available:

- Firmware update via networks
- Reset of the IM 151-7 CPU to the as-delivered state
- Measuring initiator for diagnostic repeater (SFC 103 "DP_TOPOL")
- Time synchronization via PROFIBUS DP
- I&M data of the IM 151-7 CPU (e.g., plant and location ID)
- Changing the protection level with SFC 109 "PROTECT"
- Extension of block-specific messages (SFC 105 - SFC 108) *
 - SFC 105 "READ_SI"
 - SFC 106 "DEL_SI"
 - SFC 107 "ALARM_DQ"
 - SFC 108 "ALARM_D"
- SFC 64 "TIME_TCK" with 1 ms granularity *
- New blocks SFC 70 "GEO_LOG", SFC 71 "LOG_GEO" AND SFB 81 "RD_DPAR" *

* Detailed information on enhancements to the various SFCs can be found in the Instruction List and in Reference Manual *System Software for S7-300/400 System and Standard Functions*.

- Higher interrupt performance

Note

The IM 151-7xA20 interface modules do **not** support 32-byte data transmission with the 1SI modules (6ES7135-4DFx1-0AB0).

Additional documentation

You will find the following supplementary documentation online at:
<http://support.automation.siemens.com/WW/view/en/> with the corresponding entry ID

Name of manual	Description
Operating Instructions ET 200S Distributed I/O System Entry ID: 1144348	Application planning; assembling; wiring and assembly; commissioning; functions; alarm, error, and system messages; interface modules, COMPACT modules
Manual ET 200S Distributed I/O System Entry ID: 22167495	Description of functions and technical specifications of the terminal modules, power modules, and digital and analog electronic modules
Manual ET 200S IM 151-7 CPU Interface Module Entry ID: 12714722	Addressing, network integration, commissioning and diagnostics, functions, and cycle and response times
S7-300 Instruction List CPU 31xC, CPU 31x, IM 151-7 CPU, etc. Entry ID: 13206730	List of the operation set of the CPUs and their execution times. List of executable blocks
Reference Manual System Software for S7-300/400 System and Standard Functions Entry ID: 1214574	This manual, consisting of Volume 1 and Volume 2, provides a complete overview of the OBs, SFCs, SFBs, IEC functions, diagnostics data, system status list (SSL) as well as the events contained in the operating systems of the CPUs of the S7-300 and S7-400. This manual is part of the <i>STEP 7</i> reference information. You can also find the description in the <i>Online Help for STEP 7</i> .
Manual Programming with STEP 7 Entry ID: 18652056	This manual provides a complete overview of programming with <i>STEP 7</i> . This manual is part of the <i>STEP 7</i> basic information. You can also find the description in the <i>Online Help for STEP 7</i> .
Manual SIMATIC NET: Twisted Pair and Fiber-Optic Networks Entry ID: 8763736	Description of Industrial Ethernet networks, network configuration, components, installation guidelines for networked automation systems in buildings, etc.
Manual Communication with SIMATIC Entry ID: 1254686	Fundamentals, services, networks, communication functions, connection of PG/OP, configuring in <i>STEP 7</i>

New features

2.1 Updating the firmware online (via networks)

To update the IM 151-7 CPU firmware, you require the files (*.UPD) containing the latest FW version.

Prerequisites

- The firmware can be updated online with *STEP 7* V5.4 + SP 3 or higher, or *STEP 7* V5.2+SP 1 with HSP 0128 or 0108.
- The interface module of the station whose firmware is to be updated must be accessible online.
- The files containing the current firmware versions must be available in the file system of your programming device or PC. A folder may contain only the files of one firmware version.

Performing a firmware update

1. Start *STEP 7* and change to HW Config.
2. Open the station containing the IM 151-7 CPU you want to update.
3. Select the IM 151-7 CPU.
4. Select **PLC > Update Firmware**.
5. In the **Update Firmware** dialog, select the path to the firmware update files (*.UPD) using the **Browse** button.
6. After you select a file, the information in the lower fields of the **Update Firmware** dialog box shows you the module that the file is suitable for as of which version of the firmware.
7. Click the **Execute** button. *STEP 7* checks to determine whether the selected file can be interpreted by the IM 151-7 CPU and, if so, then downloads the file to the interface module. If this requires changing the operating state of the IM 151-7 CPU, you will be asked to perform these tasks in the relevant dialog boxes. The IM 151-7 CPU then automatically updates the firmware.
8. Use *STEP 7* (read out the CPU diagnostics buffer) to verify that the IM 151-7 CPU can start with the new firmware.

Result

You have updated your IM 151-7 CPU online with a new firmware version.

Note

On principle, a firmware update of the predecessor interface modules (up to order number 6ES7151-7AA13-0AB0 or 6ES7151-7FA01-0AB0) to firmware version V2.6 of the IM 151-7 CPUs described here is not possible.

This means that you have the option to perform firmware updates online via MPI or DP networks only for future updates (provided the IM 151-7 CPU has firmware version V2.6 or higher).

2.2 Resetting to the as-delivered state

As-delivered state of the IM 151-7 CPU

In the as-delivered state, the IM 151-7 CPU properties are set to the following values:

Table 2-1 Properties of the IM 151-7 CPU in the as-delivered state

Properties	Value
MPI address	2
MPI baud rate	187.5 kbps
Retentive memory bits, timers, counters	All retentive memory bits, timers and counters are cleared.
Set retentive area for memory bits, timers and counters	Default setting (16 memory bytes, no timers, 8 counters)
Contents of the diagnostic buffer	cleared
Operating hours counter	0
Time of day	1.1.1994 00:00:00

Procedure

Proceed as follows to reset an IM 151-7 CPU to the as-delivered state using the mode selector:

1. Switch off the power supply.
2. Remove the SIMATIC Micro Memory Card from the receptacle (see Chapter *SIMATIC Micro Memory Card* in Manual *IM 151-7 CPU Interface Module*).
3. Keep the mode selector switch in the MRES position and switch the power supply on again.
4. Wait until LED lamp image 1 from the subsequent overview is displayed.
5. Release the mode selector switch, set it back to MRES within 3 seconds and hold it in this position.
6. The LED lamp image 2 from the subsequent overview is displayed.
This lamp image lights up while the reset operation is running (approximately 5 seconds). During this period you can cancel the resetting procedure by releasing the mode selector.
7. Wait until LED lamp image 3 from the following overview is displayed and release the mode selector again.

The IM 151-7 CPU is now reset to the as-delivered state. It starts up unbuffered (all LEDs are lit) and changes to STOP mode.

Lamp images while the IM 151-7 CPU is being reset

While you are resetting the IM 151-7 CPU to the as-delivered state, the LEDs light up in succession in the following lamp images:

Table 2-2 Lamp images

LED	Color	Lamp image 1	Lamp image 2	Lamp image 3
SF	Red	□	○	△
BF	Red	□	□	□
ON	Green	△	△	△
FRCE	Yellow	○	□	□
RUN	Green	○	□	□
STOP	Yellow	○	□	□
Legend: △ = LED lit; □ = LED dark; ○ = LED flashes at 0.5 Hz				

2.3 Measuring initiator for diagnostic repeater

Triggering determination of the bus topology in a DP master system with SFC 103 "DP_TOPOL"

The diagnostic repeater makes it easier to identify faulty modules or an interruption on the DP cable when a fault occurs during operation. The repeater acts as a slave and is able to determine the topology of a DP segment and log faults on the basis of this topology.

You can use SFC103 "DP_TOPOL" to trigger the determination of the bus topology of a DP master system by the diagnostic repeater. SFC 103 is described in the *Online Help for STEP 7* and in Reference Manual *System and Standard Functions for S7-300/400*. The diagnostic repeater is described in Manual *Diagnostic Repeater for PROFIBUS DP*. The manuals are available at <http://support.automation.siemens.com/WW/view/en/> under entry IDs 1214574 and 7915183, respectively.

2.4 Time synchronization via PROFIBUS DP

Time synchronization is possible via the combined MPI/DP interface or the DP master interface of the IM 151-7 CPU.

The IM 151-7 CPU may act as the time-of-day master (with a corresponding assignable synchronization interval) or a time-of-day slave. You must configure this in HW Config. The default setting is no time synchronization.

Time-of-day master

As the time-of-day master, the IM 151-7 CPU sends synchronization message frames to the DP interface of the DP master module at the set synchronization interval in order to synchronize other stations on the connected PROFIBUS DP subnet.

If the IM 151-7 CPU on the DP master interface is assigned as the time-of-day master, there is still no time synchronization of the connected slaves as long as the clock of the IM 151-7 CPU is not set. As soon as the time of day is set the first time, the time synchronization starts as the time-of-day master.

You can set the time of day:

- Via a programming device
- Via an SFC call
- From another time-of-day master if the IM 151-7 CPU is also assigned as a time-of-day slave via the combined MPI/DP interface

Note that the clock of the IM 151-7 CPU is not set in the as-delivered state, after resetting to the as-delivered state, or after a FW update.

Time-of-day slave

As a time-of-day slave, the IM 151-7 CPU receives synchronization message frames from another time-of-day master and accepts this time of day as its own internal time of day of the IM 151-7 CPU.

2.5 Identification and maintenance data of the IM 151-7 CPU

Definition and properties

Identification and maintenance data (I&M) are data that are stored in a module for assisting you in:

- Checking the system configuration
- Locating hardware changes in a system
- Correcting errors in a system

Identification data (I data) is information regarding the module, such as, for example, order number and serial number, which is also printed on the housing of the module to some extent. I data is manufacturer's information about the module. It is fixed and can only be read.

Maintenance data (M data) is system-specific information, such as the installation location. M data are created during the configuration and written to the module.

I&M data enable modules to be uniquely identified online.

Reading and writing the I&M data of the IM 151-7 CPU with *STEP 7*

Reading:

- In *STEP 7* the I&M data are displayed under "Module state – IM 151-7 CPU" ("General" and "Identification" tabs) and via "Available nodes" (Detail view) (see *Online Help for STEP 7*).
- In the user program, the I&M data can be read via SFC 51. Specify the required SSL sublist number and the index in the input parameters of the SFC 51 (see table below).

Writing:

You will always need *STEP 7* HW Config to write the M data of modules.

For example, you can enter the following data during configuration:

- Name of the automation system (device name)
The device name is assigned when you create the station in SIMATIC Manager. In this case a "SIMATIC 300(1)" station is created by default. This name can be changed at any time.
- You can enter the following data in *STEP 7* HW Config on the "General" tab under "CPU Properties":
 - Name of the module
In this case, HW Config assigns a default name, e.g., IM 151-7 CPU (this can be changed).
 - Higher level designation of the module
No default setting
 - Location designation of a module
No default setting

Reading the I&M data of the IM 151-7 CPU with the user program

If you want to read the I&M data of the IM 151-7 CPU in the user program, you must use SFC 51 to read out the associated system status list, specifying the relevant SSL ID and the index. The SSL IDs and the associated indexes are listed in the following table.

SSL sublists with I&M data

The I&M data can be found in the following SSL sublists under the specified indexes.

Table 2-3 SSL sublists with I&M data

SSL ID W#16#...	Index W#16#...	Meaning
Module identification		
0111		an identification data record
	0001	Identification of the module This contains the module's order number and product version.
	0006	Identification of the basic software Provides information on the software version of the module. (The IM 151-7 CPU has no basic software so, in this case, the identification data are the same as index 0001.)
	0007	Identification of the basic firmware Provides information on the firmware version of the module.
Identification of a component		
011C		Identification of a component
	0001	Name of the automation system Contains the name of the automation system (device name).
	0002	Name of the module Contains the name of the module.
	0003	Higher level designation of the module Contains a system-wide unique identifier for the module.
	000B	Location designation of a module Contains the installation location of the module.

For detailed information on the structure and content of the system status lists, refer to Reference Manual *System and Standard Functions for S7-300/400*.

Additional information about reading the SSL with SFC 51 can be found in Reference Manual *System and Standard Functions for S7-300/400* or in the *Online Help for STEP 7*.

I&M data for the connected I/O devices

Information about the I&M data of the I/O devices connected to the IM 151-7 CPU can be found in the relevant I/O module manuals.

2.6 Changing the protection level with SFC 109 "PROTECT"

Changing the protection level of the IM 151-7 CPU

You can use system function SFC 109 "PROTECT" to switch back and forth between protection levels 1 and 2 of the IM 151-7 CPU from your user program.

If you have set protection level 1 in *STEP 7* HW Config, you can use SFC 109 to change this setting to "2" and then back to "1" again.

Note

SFC 109 is included in the standard library in *STEP 7* V5.4 + SP 2 and higher.

If you have set protection level 2 or 3 in *STEP 7* HW Config, nothing happens when SFC 109 is called.

If you have set protection level 1 and have selected the "Removable with password" option in *STEP 7* HW Config, an SFC 109 call also has no effect if the password has been entered.

Meaning of the protection levels

Protection levels 1 and 2 have the following meaning:

Table 2-4 Meaning of the protection levels

Protection level	Meaning
1	All programming device functions are permitted.
2	<ul style="list-style-type: none">• Loading of objects from the IM 151-7 CPU to the programming device is permitted, i.e., read-access only programming device functions are permitted.• Functions for process control, process monitoring and process communication are allowed.• All information functions are permitted.

Effects of operating mode transitions

Operating mode transitions of the IM 151-7 CPU affect the protection level set with SFC 109 as follows:

Table 2-5 Effects of operating mode transitions

Action	SFC 109 protection level ...
<ul style="list-style-type: none"> • Mode selector switch to STOP • Memory reset using the mode selector switch 	is set to protection level 1 (all programming device functions are allowed).
Warm restart	is set to protection level 1 by the operating system (all programming device functions are allowed). If required, you can set the protection level to "2" by calling SFC 109 with MODE = W#16#0001 in your program.
Buffered POWER ON	remains unchanged.
Operating mode transition RUN → STOP (due to an SFC 46 call, program error or associated error OB or due to a programming device operation)	remains unchanged.

Reference

For additional information on SFC 109, refer to the *Online Help for STEP 7*.

2.7 Response times

The following interrupt response times apply to the IM 151-7 CPU:

Table 2-6 Process interrupt and diagnostic interrupt response times of the IM 151-7 CPU

Interrupt response times (without communication) for ...	Duration
Hardware interrupt	1 ms to 2.5 ms
Diagnostic interrupt	2 ms to 5 ms

The times are dependent on the configuration of the station (number of I/O modules).

Technical specifications

3.1 IM 151-7 CPU

Technical specifications for the IM 151-7 CPU

Table 3-1 Technical specifications for the IM 151-7 CPU

Technical specifications	
CPU and product version	
Order no. [MLFB]	6ES7151-7AA20-0AB0
• Hardware version	01
• Firmware version	V2.6
• Associated programming package	STEP 7 V 5.4 + SP 3 or STEP 7 V 5.2 + SP 1 + HSP or higher
Memory	
Work memory	
• Integrated	96 Kbytes
• Expandable	No
Capacity of the retentive memory for retentive data blocks	64 Kbytes
Load memory	Pluggable by means of Micro Memory Card (max. 8 Mbytes)
Data storage life on the Micro Memory Card (following final programming)	At least 10 years
Buffering	Guaranteed by Micro Memory Card (maintenance-free)
Processing times	
Processing times for	
• Bit operation	Min. 0.1 μ s
• Word instruction	Min. 0.2 μ s
• Fixed-point arithmetic	Min. 2.0 μ s
• Floating-point arithmetic	Min. 3 μ s
Timers/counters and their retentivity	
S7 counters	256
• Retentivity	Configurable
• Default	From C0 to C7
• Counting range	0 to 999

Technical specifications	
IEC counters	Yes
• Type	SFB
• Number	Unlimited (limited only by work memory size)
S7 timers	256
• Retentivity	Configurable
• Default	Not retentive
• Timer range	10 ms to 9990 s
IEC timers	Yes
• Type	SFB
• Number	Unlimited (limited only by work memory size)
Data areas and their retentivity	
Bit memory	256 bytes
• Retentivity	Yes
• Preset retentivity	MB0 to MB15
Clock bit memory	8 (1 memory byte)
Data blocks	
• Number	511 (in the number range from 1 to 511)
• Size	16 Kbytes
• Non-retentive	Yes
Local data per priority class	Max. 510
Blocks	
Total	1024 (DBs, FCs, FBs) The maximum number of blocks that can be loaded may be reduced if you are using another Micro Memory Card.
OBs	See the Instruction List
• Size	16 Kbytes
• Number of free-cycle OBs	1 (OB 1)
• Number of time-of-day interrupt OBs	1 (OB 10)
• Number of time-delay interrupt OBs	1 (OB 20)
• Number of watchdog interrupts	1 (OB 35)
• Number of process interrupt OBs	1 (OB 40)
• Number of DPV1 interrupt 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) (OB 83 for distributed I/O only)
• Number of synchronous error OBs	2 (OB 121, 122)
Nesting depth	
• Per priority class	8
• Additional within an error OB	4

Technical specifications	
FBs	See the Instruction List
• Number, max.	1024 (in the number range from 0 to 2047)
• Size	16 Kbytes
FCs	See the Instruction List
• Number, max.	1024 (in the number range from 0 to 2047)
• Size	16 Kbytes
Address areas (inputs/outputs)	
Total I/O address area	
• Inputs	2048 bytes (user-specific addressing)
• Outputs	2048 bytes (user-specific addressing)
I/O process image	
• Inputs	128 bytes
• Outputs	128 bytes
Digital channels	
• Inputs	Max. 16336
• Outputs	Max. 16336
• Inputs, central	Max. 248
• Outputs, central	Max. 248
Analog channels	
• Inputs	Max. 1021
• Outputs	Max. 1021
• Inputs, central	Max. 124
• Outputs, central	Max. 124
Configuring rules	
I/O modules per station	Max. 63
Station width	< 1 m or < 2 m
Current per load group (power module)	Max. 10 A
Master interface	On the right next to IM 151-7 CPU (X2 interface)
Time of day	
Clock	Yes (HW clock)
• Buffered	Yes
• Buffered period	Typically 6 weeks (at an ambient temperature of 40°C)
• Behavior of the clock on expiration of the buffered period	The clock keeps running, continuing at the time-of-day it had when power was switched off.
• Accuracy	Deviation per day: < 10 s
Operating hours counter	1
• Number	0
• Range of values	2 ³¹ hours (if SFC 101 is used)
• Granularity	1 hour
• Retentive	Yes; must be manually restarted after every restart.

Technical specifications	
Time synchronization	Yes
• In the AS	No
• On MPI	Master/slave
• On DP	Master/slave
S7 message functions	
Number of stations that can log in for signaling functions (e.g. OS)	12 (depends on the connections configured for PG / OP and S7 basic communication)
Process diagnostics messages	Yes
• Simultaneously enabled interrupt S blocks	Max. 40
Test and startup functions	
Status/control variables	Yes
• Variable	Inputs, outputs, memory bits, DBs, timers, counters
• Number of variables	30
– Status variable	30
– Control variable	14
Forcing	Yes
• Variable	Inputs/outputs
• Number of variables	Max. 10
Block status	Yes
Single-step	Yes
Breakpoint	2
Diagnostic buffer	Yes
• Number of entries (not configurable)	Max. 100
Communication functions	
PG/OP communication	Yes
Global data communication	Yes
• Number of GD circuits	4
• Number of GD packets	Max. 4
– Sending stations	Max. 4
– Receiving stations	Max. 4
• Length of GD packets	Max. 22 bytes
– Consistent data	22 bytes
S7 basic communication	Yes
• User data per job	Max. 76 bytes
– Consistent data	76 bytes (for X_SEND or X_RCV) 64 bytes (for X_PUT or X_GET as the server)
S7 communication	Yes
• As server	Yes
• User data per job	Max. 180 (for PUT/GET)
– Consistent data	64 bytes
S5-compatible communication	No

Technical specifications	
Number of connections	12 (max. per CPU)
can be used for	
<ul style="list-style-type: none"> • PG communication <ul style="list-style-type: none"> – Reserved (default) – Configurable 	Max. 11 1 1 to 11
<ul style="list-style-type: none"> • OP communication <ul style="list-style-type: none"> – Reserved (default) – Configurable 	Max. 11 1 1 to 11
<ul style="list-style-type: none"> • S7 basic communication <ul style="list-style-type: none"> – Reserved (default) – Configurable 	Max. 10 0 0 to 10
Routing	Max. 4 <ul style="list-style-type: none"> • As slave only if interface is active • With IM 151-7 CPU as the DP master
Interfaces	
on IM 151-7 CPU (X1)	
Type of interface	Integrated RS 485 interface
Physics	RS 485
Electrically isolated	Yes
Interface power supply (15 to 30 VDC)	Max. 80 mA
Functionality	
<ul style="list-style-type: none"> • MPI 	Yes
<ul style="list-style-type: none"> • PROFIBUS DP 	DP slave (active/passive)
<ul style="list-style-type: none"> • Point-to-point connection 	No
MPI	
Services	
<ul style="list-style-type: none"> • PG/OP communication 	Yes
<ul style="list-style-type: none"> • Routing 	Yes (with master module)
<ul style="list-style-type: none"> • Global data communication 	Yes
<ul style="list-style-type: none"> • S7 basic communication 	Yes
<ul style="list-style-type: none"> • S7 communication 	Yes (server only)
Transmission rates	Up to 12 Mbaud
DP slave	
Services	
<ul style="list-style-type: none"> • PG/OP communication 	Yes
<ul style="list-style-type: none"> • Routing 	Yes (only if interface is active and in master mode)
<ul style="list-style-type: none"> • Global data communication 	No
<ul style="list-style-type: none"> • S7 basic communication 	No
<ul style="list-style-type: none"> • S7 communication 	Yes (server only)
<ul style="list-style-type: none"> • Direct data exchange 	Yes
Transmission rates	Up to 12 Mbaud

Technical specifications	
Automatic baud rate search	Yes (only if interface is passive)
Transfer memory	244 bytes I / 244 bytes O
Address areas	Max. 32, with max. 32 bytes each
DPV1	No
GSD file	The latest GSD file is available at: http://www.automation.siemens.com/csi/gsd
on DP master module (X2)	
Type of interface	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
Electrically isolated	Yes
Interface power supply (15 to 30 VDC)	No
Functionality	
• MPI	No
• PROFIBUS DP	DP master
• Point-to-point connection	No
DP master	
Services	
• PG/OP communication	Yes
• Routing	Yes
• Global data communication	No
• S7 basic communication	No
• S7 communication	Yes (server only)
• Direct data exchange	Yes
• Equidistant mode support	Yes
• Isochronous mode	No
• SYNC/FREEZE	Yes
• DPV1	Yes
• Enable/disable DP slave	Yes
Transmission rates	Up to 12 Mbaud
Number of DP slaves per station	32
• Address areas	Max. 2 Kbytes I / max. 2 Kbytes O
• User data per DP slave	Max. 244 bytes I / max. 244 bytes O
Programming	
Programming language	LAD/FBD/STL
Instruction set	See the Instruction List
Nesting levels	8
System functions (SFC)	See the Instruction List
System function blocks (SFB)	See the Instruction List
User program protection	Yes

Technical specifications	
Dimensions and weight	
Mounting dimensions W x H x D (mm)	
• IM 151-7 CPU	60 x 119.5 x 75
• DP master module	35 x 119.5 x 75
Weight	
• IM 151-7 CPU	Approx. 200 g
• DP master module	Approx. 100 g
Voltages, currents, potentials	
Power supply (rated value)	24 VDC
• Permissible range	20.4 V to 28.8 V
• Reverse polarity protection	Yes
• Short-circuit protection	Yes
• Power loss ride-through	5 ms
Galvanic isolation	
• Between supply voltage 1L+ and all other circuitry parts	Yes
• Between PROFIBUS DP and all other circuitry parts	Yes
• Between supply voltage 1L+ and PROFIBUS DP	Yes
• Between PROFIBUS DP and PROFIBUS DP master	Yes
Permissible potential difference	
• Between the various electric circuits	75 VDC; 60 VAC
Insulation test voltage	500 VDC
Current consumption from supply voltage 1L+	
• IM 151-7 CPU	Approx. 250 mA
• IM 151-7 CPU + DP master module	Approx. 280 mA
• Power supply for the ET 200S backplane bus	Max. 700 mA
Power loss	Typ. 3.3 W

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