## **SIEMENS**

## Data sheet

## 6ES7515-2AM01-0AB0

SIMATIC S7-1500, CPU 1515-2 PN, Central processing unit with work memory 500 KB for Program and 3 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 30 ns bit performance, SIMATIC Memory Card required



General information	
Product type designation	CPU 1515-2 PN
HW functional status	FS03
Firmware version	V2.5
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V15 (FW V2.5) / V13 SP1 Update 4 (FW V1.8) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Type of supply voltage	24 V DC
permissible range, lower limit (DC)	19.2 V

permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	163
Mains/voltage failure stored energy time	5 ms
Repeat rate, min.	1/s
• Repeat rate, min.	1/3
Input current	
Current consumption (rated value)	0.8 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus	6.2 W
(balanced)	
Power loss	
Power loss, typ.	6.3 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	500 kbyto
• integrated (for program)	500 kbyte
• integrated (for data)	3 Mbyte
Load memory	00 Ob 4:
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	V
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	30 ns
for word operations, typ.	36 ns
for fixed point arithmetic, typ.	48 ns
for floating point arithmetic, typ.	192 ns
CPU-blocks	
Number of elements (total)	6 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by
•	the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
● Size, max.	3 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
FB	
Number range	0 65 535
• Size, max.	500 kbyte

FC	
Number range	0 65 535
• Size, max.	500 kbyte
OB	
• Size, max.	500 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	100
<ul> <li>Number of time alarm OBs</li> </ul>	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 500 μs
<ul> <li>Number of process alarm OBs</li> </ul>	50
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	1
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of startup OBs</li> </ul>	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
<ul> <li>Number of diagnostic alarm OBs</li> </ul>	1
Nesting depth	
• per priority class	24
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags),	512 kbyte; In total; available retentive memory for bit memories,
max.	timers, counters, DBs, and technology data (axes): 472 KB
Extended retentive data area (incl. timers, counters,	3 Mbyte; When using PS 60W 24/48/60V DC HF
flags), max.	

Flag	
Number, max.	16 kbyte
Number of clock memories	8; 8 clock memory bits, grouped into one clock memory byte
Data blocks	o, o diodk monery she, grouped into one diodk monery syle
	Yes
Retentivity adjustable	No
Retentivity preset	NO
Local data	OA liberton cross AO MD combined
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	8 192; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
<ul><li>Outputs</li></ul>	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
<ul><li>Outputs (volume)</li></ul>	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	•
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the
	integration of distributed I/O via PROFINET or PROFIBUS
	communication modules, but also by the connection of I/O via AS-
	i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
● Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	2
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Туре	Hardware clock

Deviation per day, max.  Operating hours counter      Number     Supported     Supported     Number     Interface     Interface  Interface  Number of PROFINET interfaces  - Number of ports - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max.	Backup time	6 wk; At 40 °C ambient temperature, typically
Operating hours counter  Number  Number  Number  Number  Number of PROFINET interfaces  Number of Porosition  PROFINET IO Controller  New Services  PGIOP communication  New Services  PGIOP communication  PROFINET IO Controller  Services  PGIOP communication  PROFINET IO Controller  New Services  PGIOP communication  PROFINET IO Controller  PROFINET IO Controller  New Services  PGIOP communication  PROFINET IO Controller  PROFINET IO Controller  New Services  PGIOP communication  PROFINET IO Controller  Services  PGIOP communication  Yes  New Services  PGIOP communication  Yes  New Services  PGIOP communication  Yes  New Services  PROFINET IO Controller  Services  PROFORE communication  Yes  Yes  New Services  PROFORE communication  Yes  Yes  Yes  New Services  PROFORE communication  Yes  Yes  New Services  PROFORE communication  Yes  Yes  New Services  PROFORE communication  Yes  Services  PROFORE communication  Yes  Services  PROFORE communication  Yes  Services  PROFORE communication  Yes  New Services  PROFORE communication  Yes  New Services  New Services  New Services  New Services  PROFORE communication  Yes  New Services  New Serv	·	
Number   16  Clock synchronization  supported   Yes   in AS, snaster   Yes   in AS, siave   Yes   interfaces  Number of PROFINET interfaces   2  1. Interface   Interface types	· · · · · · · · · · · · · · · · · · ·	
in AS, master     in AS, slave      in AS, slave		16
in AS, master     in AS, slave      in AS, slave	Clock synchronization	
in AS, master in AS, slave on Ethernet via NTP Yes  nterfaces  Number of PROFINET interfaces  2  1. Interface  Interface types  Number of ports integrated switch RJ 45 (Ethernet)  PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy  PROFINET IO Controller Services  PROFINET IO Controller  Yes  Media redundancy Yes  MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  PCO/OP communication Yes Open IE communication Yes Media redundancy Yes  MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  PCO/OP communication Yes  - PG/OP communication Yes - PSF routing - Isochronous mode - Open IE communication Yes - PSF routing - IRT - MRP - Yes: As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 Yes: Requirement: IRT - PROFIenergy - Prioritized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, - MRPO- PROFINET - Of which IO devices with IRT, max Number of connectable IO Devices for RT, - Number of connectable IO Devices for RT, - 256		Yes
interfaces  Number of PROFINET interfaces  2  1 Interface  Interface Vpes  Interface bypes  Interface bypes  Interface bypes  Interface vpes	• •	Yes
Number of PROFINET interfaces 2  1. Interface Interface types  • Number of ports • integrated switch • RJ 45 (Ethernet)  • IP protocol • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy  PROFINET IO Controller  Services  - PG/OP communication - S7 routing - Isochronous mode - Open IE communication - IRT - MRP - PROFINET Wes, MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  - PG/OP communication - Yes - Use, MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  - PG/OP communication - Yes - PG/OP communication - Yes - Use, MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  - PG/OP communication - Yes - PG/OP communication - Yes - Use, MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  - PG/OP communication - Yes - PG/OP communication - Yes - Ves - PG/OP communication - Yes - Yes - Number of devices with IRT, max - Number of connectable IO Devices for RT, -	● in AS, slave	Yes
Number of PROFINET interfaces  1. Interface Interface types  • Number of ports • Integrated switch • RJ 45 (Ethernet)  • IP protocol • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy • PROFINET IO Controller  Services  — PG/OP communication — S7 routing — Isochronous mode — Open IE communication — Yes — IRT — MRP — MRP — Wes — MRP — Yes, As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 — Yes, Requirement: IRT — Yes — Prioritized startup — Prioritized startup — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT,  12  2  Yes 12  Yes 2  Yes  Yes  Yes  Yes  Yes  Yes	• on Ethernet via NTP	Yes
Interface Interface types  Number of ports Integrated switch RJ 45 (Ethernet) PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services  PROFORE TO Controller Services PROFORE TO Controller Services PROFINET IO Controller Services PROFINET IO Controller Services PROFINET IO Controller Services PROFORE TO CONTROLLER PROFORE TO CONTROLLER PROFORE TO THE TOWN OF	Interfaces	
Interface types  Number of ports Integrated switch RJ 45 (Ethernet) PROFINET IO Controller PROFINET IO Device SiMATIC communication Web server Media redundancy PROFINET IO Controller Services PROFOP communication Yes PROFOP communication Yes PROFINET IO Controller Services PROFOP communication Yes PROFINET Yes Proviting Yes Proviting Yes Provitized startup PROFINET Yes Provitized startup PROFINET devices Services PROFIBUS or PROFINET devices can be connected via AS-i, PROFIBUS or PROFINET PROFINET IO Controller Services PROFIBUS or PROFINET PROFIBUS or PROFINET	Number of PROFINET interfaces	2
Number of ports  integrated switch  RJ 45 (Ethernet)  Proctionality  IP protocol  PROFINET IO Controller  Services  PROFINET IO Controller  Yes  Profinitized startup  PROFINET Yes  Prioritized startup  Prioritized startup  Number of connectable IO Devices, max.  Services  PROFIBUS or PROFINET  64  256	1. Interface	
integrated switch RJ 45 (Ethernet) Prunctionality  IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication Web server Media redundancy PROFINET IO Controller PROFINET IO Controller Yes Media redundancy PROFINET IO Controller  Services  PROFINET Wes  Services  PROFINET Wes  Prioritized controller  Yes Prioritized startup Profitized startup Profitized startup Number of connectable IO Devices, max.  Services  PROFIBUS or PROFINET  64  Services  PROFIBUS or PROFINET  Of which IO devices with IRT, max. Pumber of connectable IO Devices for RT,  Services  PROFIBUS or PROFINET	Interface types	
RJ 45 (Ethernet)  Protocol  PROFINET IO Controller  PROFINET IO Communication  Web server  Media redundancy  PROFINET IO Controller  Services  PG/OP communication  Yes  PG/OP communication  Yes  PG/OP communication  Yes  PROFINET IO Controller  Services  PG/OP communication  Yes  PROFINET IO Controller  Services  PG/OP communication  Yes  PS routing  Pes  Popen IE communication  Yes  Popen IE communication  Yes  Popen IE communication  Yes  Pes  Popen IE communication  Yes  Pes  Popen IE communication  Yes  Pes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50  Yes; Requirement: IRT  PROFlenergy  Perioritized startup  Profrioritized startup  Profrioritized startup  Pof which IO devices with IRT, max.  Number of connectable IO Devices, max.  Polymetric profice in total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  PROFIBUS or PROFINET	Number of ports	2
Functionality  IP protocol PROFINET IO Controller PROFINET IO Device PROFINET IO Device SIMATIC communication Pes Web server Media redundancy PROFINET IO Controller Services  PROFINET IO Controller  Services  PG/OP communication Yes Services  PG/OP communication Yes Popen IE communication Yes Profinet IO Controller  Services  PG/OP communication Yes Popen IE communication Yes Popen IE communication Yes Popen IE communication Yes Popen IE communication Yes Profinet Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50  MRPD PROFIenergy Prioritized startup PROFIenergy Prioritized startup Number of connectable IO Devices, max. PNUmber of connectable IO Devices for RT, PROFIBUS or PROFINET	• integrated switch	Yes
PROFINET IO Controller PROFINET IO Device PROFINET IO Device SIMATIC communication Pes Web server Media redundancy PROFINET IO Controller Services  PROFINET IO Controller  Services  PG/OP communication Yes Popen IE communication Yes PROFINET IO Controller  Services  PG/OP communication Yes Popen IE Communication Popen IE Commu	• RJ 45 (Ethernet)	Yes; X1
PROFINET IO Controller PROFINET IO Device SIMATIC communication Yes Open IE communication Yes Media redundancy Yes; MRP Automanager according to IEC 62439-2 Edition 2.0  PROFINET IO Controller  Services  — PG/OP communication — S7 routing — Isochronous mode — Open IE communication — IRT — MRP — Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50  — MRPD — PROFIenergy — Prioritized startup — Number of connectable IO Devices, max. — Of which IO devices with IRT, max. — Number of connectable IO Devices for RT,  Pes  Yes Yes  Yes  Yes  Yes  Yes  Yes	Functionality	
PROFINET IO Device SIMATIC communication Open IE communication Yes Web server Media redundancy PROFINET IO Controller  Services  PROFOP communication Yes Proprintized startup Number of connectable IO Devices, max. SIMATIC communication Yes Proprintized startup Simature Simature Simature Yes Yes Yes Yes Yes NarP Automanager according to IEC 62439-2 Edition 2.0 Yes	IP protocol	Yes; IPv4
SIMATIC communication Open IE communication Yes Web server Media redundancy PROFINET IO Controller Services  - PG/OP communication Yes - Isochronous mode - Open IE communication Yes - Open IE communication Yes - Open IE communication Yes - MRP - MRP - MRP - MRP - MRP - MRPD - Prioritized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, - MRP - Ves - Of which IO devices with IRT, max Number of connectable IO Devices for RT, - MRP - Ves - Of which IO devices with IRT, max Services - Yes	<ul> <li>PROFINET IO Controller</li> </ul>	Yes
<ul> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> </ul> PROFINET IO Controller Services <ul> <li>PG/OP communication</li> <li>Yes</li> <li>Sorvices</li> <li>PG/OP communication</li> <li>Yes</li> <li>Isochronous mode</li> <li>Yes</li> <li>Open IE communication</li> <li>Yes</li> <li>IRT</li> <li>MRP</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>Yes; Requirement: IRT</li> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> </ul> Yes; Max. 32 PROFINET devices <ul> <li>PROFIBUS or PROFINET</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> </ul>	PROFINET IO Device	Yes
<ul> <li>◆ Web server</li> <li>◆ Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> </ul> PROFINET IO Controller Services <ul> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— MRP</li> <li>— MRP</li> <li>— MRP</li> <li>— Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>— MRPD</li> <li>— PROFlenergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	<ul> <li>SIMATIC communication</li> </ul>	Yes
<ul> <li>Media redundancy</li> <li>Yes; MRP Automanager according to IEC 62439-2 Edition 2.0</li> <li>PROFINET IO Controller</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— MRP</li> <li>— MRP</li> <li>— Wes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>— MRPD</li> <li>— PROFlenergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	<ul> <li>Open IE communication</li> </ul>	Yes
PROFINET IO Controller  Services  - PG/OP communication Yes - S7 routing Yes - Isochronous mode Yes - Open IE communication Yes - IRT Yes - MRP Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 - MRPD Yes; Requirement: IRT - PROFlenergy Yes - Prioritized startup Yes; Max. 32 PROFINET devices - Number of connectable IO Devices, max.  256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET - Of which IO devices with IRT, max Number of connectable IO Devices for RT, 256	• Web server	Yes
Services  - PG/OP communication Yes - S7 routing Yes - Isochronous mode Yes - Open IE communication Yes - IRT Yes - MRP Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 - MRPD Yes; Requirement: IRT - PROFlenergy Yes - Prioritized startup Yes; Max. 32 PROFINET devices - Number of connectable IO Devices, max.  256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET - Of which IO devices with IRT, max Number of connectable IO Devices for RT, - 256	Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
<ul> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— MRP</li> <li>— MRP</li> <li>— Was; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>— MRPD</li> <li>— PROFlenergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	PROFINET IO Controller	
<ul> <li>S7 routing</li> <li>Isochronous mode</li> <li>Yes</li> <li>Open IE communication</li> <li>IRT</li> <li>MRP</li> <li>MRP</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>MRPD</li> <li>Yes; Requirement: IRT</li> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	Services	
<ul> <li>Isochronous mode</li> <li>Open IE communication</li> <li>IRT</li> <li>MRP</li> <li>MRPD</li> <li>MRPD</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>MRPD</li> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>100 devices</li> <li>100 devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>Mumber of connectable IO Devices for RT,</li> <li>256</li> </ul>	— PG/OP communication	Yes
<ul> <li>Open IE communication</li> <li>IRT</li> <li>MRP</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>MRPD</li> <li>Yes; Requirement: IRT</li> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> <li>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	— S7 routing	Yes
<ul> <li>— IRT</li> <li>— MRP</li> <li>— Wes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>— MRPD</li> <li>— PROFlenergy</li> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT,</li> <li>— Number of connectable IO Devices for RT,</li> </ul>	— Isochronous mode	Yes
<ul> <li>MRP</li> <li>Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50</li> <li>MRPD</li> <li>Yes; Requirement: IRT</li> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> <li>Yes; Max. 32 PROFINET devices</li> <li>Number of connectable IO Devices, max.</li> <li>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>256</li> </ul>	<ul> <li>Open IE communication</li> </ul>	Yes
number of devices in the ring: 50  - MRPD Yes; Requirement: IRT - PROFlenergy Yes - Prioritized startup - Number of connectable IO Devices, max.  256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET - Of which IO devices with IRT, max Number of connectable IO Devices for RT,  256	— IRT	Yes
<ul> <li>PROFlenergy</li> <li>Prioritized startup</li> <li>Number of connectable IO Devices, max.</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>Yes</li> <li>Yes; Max. 32 PROFINET devices</li> <li>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>Of which IO devices with IRT, max.</li> <li>256</li> </ul>	— MRP	
<ul> <li>— Prioritized startup</li> <li>— Number of connectable IO Devices, max.</li> <li>— Of which IO devices with IRT, max.</li> <li>— Number of connectable IO Devices for RT,</li> </ul> Yes; Max. 32 PROFINET devices 256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET 64 256	— MRPD	Yes; Requirement: IRT
<ul> <li>Number of connectable IO Devices, max.</li> <li>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>Of which IO devices with IRT, max.</li> <li>Number of connectable IO Devices for RT,</li> <li>256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET</li> <li>256</li> </ul>	— PROFlenergy	Yes
via AS-i, PROFIBUS or PROFINET  — Of which IO devices with IRT, max.  — Number of connectable IO Devices for RT,  256	— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices for RT, 256	— Number of connectable IO Devices, max.	
	— Of which IO devices with IRT, max.	64
max.	— Number of connectable IO Devices for RT,	256
	max.	

	252
— of which in line, max.	256
Number of IO Devices that can be	8; in total across all interfaces
simultaneously activated/deactivated, max.	
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8
— Updating times	The minimum value of the update time also depends on
	communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	across, and on the quantity of configurou accordant
— for send cycle of 250 μs	250 μs to 4 ms; Note: In the case of IRT with isochronous mode,
— for seria cycle of 200 μs	the minimum update time of 500 µs of the isochronous OB is decisive
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
<ul> <li>With IRT and parameterization of "odd"</li> </ul>	Update time = set "odd" send clock (any multiple of 125 µs: 375
send cycles	μs, 625 μs 3 875 μs)
Update time for RT	
— for send cycle of 250 μs	250 μs to 128 ms
— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
<ul><li>— Open IE communication</li></ul>	Yes
— IRT	Yes
— MRP	Yes
— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared</li> </ul>	4
device, max.	
<ul> <li>Asset management record</li> </ul>	Yes; Per user program
2. Interface	
Interface types	
Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes; X2

Functionality	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	No
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	No
— PROFlenergy	Yes
<ul> <li>Prioritized startup</li> </ul>	No
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	32
— of which in line, max.	32
<ul> <li>Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8; in total across all interfaces
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
<ul><li>— Prioritized startup</li></ul>	No

— Shared device
— Number of IO Controllers with shared device, max.

— Asset management record Yes; Per user program

## Interface types RJ 45 (Ethernet) • 100 Mbps • Autonegotiation • Autocrossing • Industrial Ethernet status LED Yes

<ul> <li>Industrial Ethernet status LED</li> </ul>	Yes
Protocols	
Number of connections	
Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10
<ul> <li>Number of connections via integrated interfaces</li> </ul>	108
<ul> <li>Number of S7 routing paths</li> </ul>	16
SIMATIC communication	
<ul> <li>S7 communication, as server</li> </ul>	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>User data per job, max.</li> </ul>	See online help (S7 communication, user data size)
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
<ul> <li>— several passive connections per port, supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes

	V 2.
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
<ul> <li>Application authentication</li> </ul>	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
Further protocols	
• MODBUS	Yes; MODBUS TCP
Media redundancy	
Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
<ul> <li>Number of stations in the ring, max.</li> </ul>	50
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 500 μs
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program alarms	10 000
Number of simultaneously active program alarms	
<ul> <li>Number of program alarms</li> </ul>	600
<ul> <li>Number of alarms for system diagnostics</li> </ul>	200
<ul> <li>Number of alarms for motion technology</li> </ul>	160
objects	
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering
	systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes
<ul> <li>Variables</li> </ul>	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul><li>Number of variables, max.</li></ul>	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing, variables	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	
• present	Yes

<ul><li>Number of entries, max.</li></ul>	3 200
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible

Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes

Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC
	program; selection guide via the TIA Selection Tool or SIZER
<ul> <li>Number of available Motion Control resources</li> </ul>	2 400
for technology objects (except cam disks)	
<ul> <li>Required Motion Control resources</li> </ul>	
<ul><li>per speed-controlled axis</li></ul>	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
<ul> <li>Positioning axis</li> </ul>	
<ul> <li>Number of positioning axes at motion</li> </ul>	7
control cycle of 4 ms (typical value)	
<ul> <li>Number of positioning axes at motion</li> </ul>	14
control cycle of 8 ms (typical value)	
Controller	
<ul><li>PID_Compact</li></ul>	Yes; Universal PID controller with integrated optimization
<ul><li>PID_3Step</li></ul>	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes

High-speed counter	Yes
mbient conditions	
Ambient temperature during operation	
horizontal installation, min.	0 °C
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C

	40 °C Disalam 40 °C at an arrantian town and the sizelly 40
vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection/password protection	Yes
Copy protection	Yes
<ul> <li>Block protection</li> </ul>	Yes
Access protection	
Password for display	Yes
<ul> <li>Protection level: Write protection</li> </ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
Cycle time monitoring	
• lower limit	adjustable minimum cycle time

Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm

adjustable maximum cycle time

Dopui	120 11111
Weights	
Weight, approx.	830 g
last modified:	02/05/2018

lower limitupper limit