

Data sheet

CPU 015N (015-CEFNR00)

Technical data

Order no.	015-CEFNR00
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Type	CPU 015N
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Module ID	-
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General information

Note	-
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Features	<p>Powered by SPEED7 Work memory [KB]: 256...512 Integrated: Ethernet CP EtherCAT Controller Optional: Integrated motion Controller 4/8/20 axes, PROFIBUS master/slave Interface [1x RJ45]: EtherCAT-Master Interface [1x RJ45]: active Ethernet CP, ModbusTCP master/slave, openCommunication Interface [2x RJ45]: active Ethernet PG/OP-communication with DHCP support, switch, ModbusTCP master/slave, openCommunication, SmartPROFINET (I-Device) Interface [2x RS485]: MPI, PtP: ASCII, STX/ETX, 3964(R), USS master, Modbus master/slave OPC UA (from HW 03) / Web Server SD card slot with locking, up to 64 expansion modules, configurable with SPEED7 Studio, SIMATIC manager and TIA Portal</p>
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Technical data power supply

Power supply (rated value)	DC 24 V
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Power supply (permitted range)	DC 20.4...28.8 V
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Reverse polarity protection	yes
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Current consumption (no-load operation)	175 mA
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Current consumption (rated value)	1.1 A
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Inrush current	3 A
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$I_{\Delta t}$	0.1 A ² s
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Max. current drain at backplane bus	3 A
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Max. current drain load supply	10 A
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Power loss	8 W
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Load and working memory

Load memory, integrated	512 KB
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Load memory, maximum	512 KB
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Work memory, integrated	256 KB
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Work memory, maximal	512 KB
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Memory divided in 50% program / 50% data	yes
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Memory card slot	SD/MMC-Card with max. 2 GB
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Hardware configuration

Racks, max.	5
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Modules per rack, max.	total max. 64 minus number line extensions
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Number of integrated DP master	1
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Number of DP master via CP	-
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Operable function modules	64
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Operable communication modules PtP	64
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Operable communication modules LAN	-
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Status information, alarms, diagnostics

Status display	yes
Interrupts	no
Process alarm	no
Diagnostic interrupt	no
Diagnostic functions	yes
Diagnostics information read-out	possible
Supply voltage display	green LED
Group error display	red SF LED
Channel error display	none

Command processing times

Bit instructions, min.	0.01 μ s
Word instruction, min.	0.01 μ s
Double integer arithmetic, min.	0.01 μ s
Floating-point arithmetic, min.	0.06 μ s

Timers/Counters and their retentive characteristics

Number of S7 counters	512
S7 counter remanence	adjustable 0 up to 512
S7 counter remanence adjustable	C0 .. C7
Number of S7 times	512
S7 times remanence	adjustable 0 up to 512
S7 times remanence adjustable	not retentive

Data range and retentive characteristic

Number of flags	8192 Byte
Bit memories retentive characteristic adjustable	adjustable 0 up to 8192
Bit memories retentive characteristic preset	MB0 .. MB15
Number of data blocks	4096
Max. data blocks size	64 KB
Number range DBs	1 ... 8191
Max. local data size per execution level	4096 Byte
Max. local data size per block	4096 Byte

Blocks

Number of OBs	24
Maximum OB size	64 KB
Total number DBs, FBs, FCs	4096
Number of FBs	4096
Maximum FB size	64 KB
Number range FBs	0 ... 8191
Number of FCs	4096
Maximum FC size	64 KB
Number range FCs	0 ... 8191
Maximum nesting depth per priority class	16
Maximum nesting depth additional within an error OB	4

Time

Real-time clock buffered	yes
Clock buffered period (min.)	30 d
Type of buffering	Goldcap
Load time for 50% buffering period	15 min

Load time for 100% buffering period	1 h
Accuracy (max. deviation per day)	10 s
Number of operating hours counter	8
Clock synchronization	yes
Synchronization via MPI	Master/Slave
Synchronization via Ethernet (NTP)	Slave

Address areas (I/O)

Input I/O address area	2048 Byte
Output I/O address area	2048 Byte
Process image adjustable	yes
Input process image preset	128 Byte
Output process image preset	128 Byte
Input process image maximal	2048 Byte
Output process image maximal	2048 Byte
Digital inputs	16384
Digital outputs	16384
Digital inputs central	512
Digital outputs central	512
Integrated digital inputs	-
Integrated digital outputs	-
Analog inputs	1024
Analog outputs	1024
Analog inputs, central	512
Analog outputs, central	256
Integrated analog inputs	-
Integrated analog outputs	-

Communication functions

PG/OP channel	yes
Global data communication	yes
Number of GD circuits, max.	8
Size of GD packets, max.	22 Byte
S7 basic communication	yes
S7 basic communication, user data per job	76 Byte
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
S7 communication, user data per job	160 Byte
Number of connections, max.	32

Functionality Sub-D interfaces

Type	X2
Type of interface	RS485
Connector	Sub-D, 9-pin, female
Electrically isolated	yes
MPI	yes
MP ² I (MPI/RS232)	-
DP master	-
DP slave	-
Point-to-point interface	yes

5V DC Power supply	max. 90mA, isolated
24V DC Power supply	max. 100mA, non-isolated

Type	X3
Type of interface	RS485
Connector	Sub-D, 9-pin, female
Electrically isolated	yes
MPI	yes
MP2 ¹ (MPI/RS232)	-
DP master	optional
DP slave	optional
Point-to-point interface	-

5V DC Power supply	max. 90mA, isolated
24V DC Power supply	max. 100mA, non-isolated

Functionality MPI

Number of connections, max.	32
PG/OP channel	yes
Routing	yes
Global data communication	yes
S7 basic communication	yes
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
Transmission speed, min.	19.2 kbit/s
Transmission speed, max.	12 Mbit/s

Functionality PROFIBUS master

Number of connections, max.	32
PG/OP channel	yes
Routing	yes
S7 basic communication	yes
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
Activation/deactivation of DP slaves	yes
Direct data exchange (slave-to-slave communication)	-
DPV1	yes
Transmission speed, min.	9.6 kbit/s
Transmission speed, max.	12 Mbit/s
Number of DP slaves, max.	124
Address range inputs, max.	2 KB
Address range outputs, max.	2 KB
User data inputs per slave, max.	244 Byte
User data outputs per slave, max.	244 Byte

Functionality PROFIBUS slave

Number of connections, max.	32
PG/OP channel	yes
Routing	yes
S7 communication	yes

S7 communication as server	yes
S7 communication as client	-
Direct data exchange (slave-to-slave communication)	-
DPV1	yes
Transmission speed, min.	9.6 kbit/s
Transmission speed, max.	12 Mbit/s
Automatic detection of transmission speed	-
Transfer memory inputs, max.	244 Byte
Transfer memory outputs, max.	244 Byte
Address areas, max.	32
User data per address area, max.	32 Byte

Functionality RJ45 interfaces

Type	X1
Type of interface	Ethernet 10/100 MBit Switch
Connector	RJ45
Electrically isolated	yes
PG/OP channel	yes
Number of connections, max.	4
Productive connections	-
Fieldbus	-

Type	X5
Type of interface	Ethernet 10/100 MBit Switch
Connector	RJ45
Electrically isolated	yes
PG/OP channel	yes
Number of connections, max.	4
Productive connections	-
Fieldbus	-

Type	X4
Type of interface	Ethernet 100 MBit
Connector	RJ45
Electrically isolated	yes
PG/OP channel	-
Number of connections, max.	-
Productive connections	-

Type	X6
Type of interface	Ethernet 100 MBit
Connector	RJ45
Electrically isolated	yes
PG/OP channel	yes
Number of connections, max.	8
Productive connections	yes

Point-to-point communication

PtP communication	yes
Interface isolated	yes

RS232 interface	-
RS422 interface	-
RS485 interface	yes
Connector	Sub-D, 9-pin, female
Transmission speed, min.	1200 bit/s
Transmission speed, max.	115.5 kbit/s
Cable length, max.	500 m

Point-to-point protocol

ASCII protocol	yes
STX/ETX protocol	yes
3964(R) protocol	yes
RK512 protocol	-
USS master protocol	yes
Modbus master protocol	yes
Modbus slave protocol	yes
Special protocols	-

Properties PROFINET I/O-Controller via PG/OP

Realtime Class	-
Conformance Class	-
Number of PN IO devices	-
IRT support	-
Shared Device supported	-
MRP Client supported	-
Prioritized start-up	-
Number of PN IO lines	-
Address range inputs, max.	-
Address range outputs, max.	-
Transmitting clock	-
Update time	-
Isochronous mode	-
Parallel operation as controller and I-Device	-

Properties PROFINET I-Device via PG/OP

I/O Data range, max.	512 Byte
Update time	1 ms .. 512 ms
Mode as Shared I-Device	-

Properties PROFINET I-Device via CP

I/O Data range, max.	-
Update time	-
Mode as Shared I-Device	-

Management & diagnosis via PG/OP

Protocols	ICMP DCP LLDP / SNMP NTP
Web based diagnosis	yes
NCM diagnosis	-

Ethernet communication CP

Number of configurable connections, max.	8
Number of productive connections by Siemens NetPro, max.	8

S7 connections	BSEND, BRCV, GET, PUT, Connection of active and passive data handling
User data per S7 connection, max.	32 KB
TCP-connections	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling
User data per TCP connection, max.	64 KB
ISO-connections	-
User data per ISO connection, max.	-
ISO on TCP connections (RFC 1006)	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling
User data per ISO on TCP connection, max.	32 KB
UDP-connections	-
User data per UDP connection, max.	-
UDP-multicast-connections	-
UDP-broadcast-connections	-

Ethernet open communication

Number of connections, max.	8
ISO on TCP connections (RFC 1006)	TSEND, TRCV, TCON, TDISCON
User data per ISO on TCP connection, max.	8 KB
TCP-Connections native	TSEND, TRCV, TCON, TDISCON
User data per native TCP connection, max.	8 KB
User data per ad hoc TCP connection, max.	1460 Byte
UDP-connections	TUSEND, TURCV
User data per UDP connection, max.	1472 Byte

Ethernet communication via PG/OP

Number of productive connections via PG/OP, max.	4
Number of productive connections by Siemens NetPro, max.	4
S7 connections	BSEND, BRCV, GET, PUT, Connection of active and passive data handling
User data per S7 connection, max.	64 KB
TCP-connections	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling
User data per TCP connection, max.	8 KB
ISO on TCP connections (RFC 1006)	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling
User data per ISO connection, max.	8 KB

Ethernet open communication via PG/OP

Number of configurable connections, max.	4
ISO on TCP connections (RFC 1006)	TSEND, TRCV, TCON, TDISCON
User data per ISO on TCP connection, max.	32 KB
TCP-Connections native	TSEND, TRCV, TCON, TDISCON
User data per native TCP connection, max.	32 KB
User data per ad hoc TCP connection, max.	1460 Byte
UDP-connections	TUSEND, TURCV
User data per UDP connection, max.	1472 Byte

EtherCAT Master

Number of EtherCAT-slaves	128
Update time	1 ms .. 512 ms
Address range inputs, max.	2 KB
Address range outputs, max.	2 KB
EoE support	yes

CoE support	yes
FoE support	yes
Distributed Clock support	yes
Hotconnect Slaves	yes
Isochronous mode	yes

Management & diagnosis

Protocols	ICMP DCP
Web based diagnosis	-
NCM diagnosis	-

WebVisu via PG/OP

WebVisu is supported	yes
Max. number of connections WebVisu	4
WebVisu supports HTTP	yes
WebVisu supports HTTPS	yes

OPC UA server via PG/OP

OPC UA server is supported	yes
Max. number of connections per interface	6
Services	Data Access (Read, Write, Subscribe)
Security policies	None, Basic128Rsa15, Basic256, Basic256Sha256
Authentication	Anonymous, username and password

WebVisu via CP

WebVisu is supported	yes
Max. number of connections WebVisu	4
WebVisu supports HTTP	yes
WebVisu supports HTTPS	yes

OPC UA server via CP

OPC UA server is supported	yes
Max. number of connections per interface	6
Services	Data Access (Read, Write, Subscribe)
Security policies	None, Basic128Rsa15, Basic256, Basic256Sha256
Authentication	Anonymous, username and password

Housing

Material	PPE / PPE GF10
Mounting	Profile rail 35 mm

Mechanical data

Dimensions (WxHxD)	131.5 mm x 109 mm x 83 mm
Net weight	335 g
Weight including accessories	335 g
Gross weight	365 g

Environmental conditions

Operating temperature	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C

Certifications

UL certification	yes
KC certification	-
UKCA certification	-
ChinaRoHS certification	yes