Data sheet
CPU 013C (013-CCF0R00)

Technical data

Order no.	013-CCF0R00
Type	CPU 013C
Module ID	-

General information

Note	-
Features	SPEED7 technology 16 x DI, 12 x DO, 2 x AI 64 kB work memory Memory extension (max. 128 kB) optionell PROFIBUS-DP slave / PtP (switchable)

Technical data power supply

Power supply (rated value)	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V
Reverse polarity protection	yes
Current consumption (no-load operation)	120 mA
Current consumption (rated value)	360 mA
Inrush current	3 A
I^2t	0.1 A^2s
Max. current drain at backplane bus	1 A
Max. current drain load supply	6 A
Power loss	7 W

Technical data digital inputs

Number of inputs	16
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	yes
Current consumption from load voltage L+ (without load)	25 mA
Rated value	DC 24 V
Input voltage for signal "0"	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V
Input voltage hysteresis	-
Frequency range	-
Input resistance	-
Input current for signal "1"	3 mA
Connection of Two-Wire-BEROs possible	yes
Max. permissible BERO quiescent current	0.5 mA
Input delay of "0" to "1"	3 µs – 15 ms / 0.5 ms – 15 ms
Input delay of "1" to "0"	3 µs – 15 ms / 0.5 ms – 15 ms
Number of simultaneously utilizable inputs horizontal configuration	16
Number of simultaneously utilizable inputs vertical configuration	16
Input characteristic curve	IEC 61131-2, type 1

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Initial data size	16 Bit

Technical data digital outputs

Number of outputs	12
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	yes
Current consumption from load voltage L+ (without load)	20 mA
Total current per group, horizontal configuration, 40°C	6 A
Total current per group, horizontal configuration, 60°C	6 A
Total current per group, vertical configuration	6 A
Output voltage signal "1" at min. current	L+ (-0.8 V)
Output voltage signal "1" at max. current	L+ (-0.8 V)
Output current at signal "1", rated value	0.5 A
Output current, permitted range to 40°C	5 mA to 0.6 A
Output current, permitted range to 60°C	5 mA to 0.6 A
Output current at signal "0" max. (residual current)	0.5 mA
Output delay of "0" to "1"	2 µs / 30 µs
Output delay of "1" to "0"	3 µs / 175 µs
Minimum load current	-
Lamp load	10 W
Parallel switching of outputs for redundant control of a load	not possible
Parallel switching of outputs for increased power	not possible
Actuation of digital input	yes
Switching frequency with resistive load	max. 1000 Hz
Switching frequency with inductive load	max. 0.5 Hz
Switching frequency on lamp load	max. 10 Hz
Internal limitation of inductive shut-off voltage	L+ (-45 V)
Short-circuit protection of output	yes, electronic
Trigger level	1 A
Number of operating cycle of relay outputs	-
Switching capacity of contacts	-
Output data size	12 Bit

Technical data analog inputs

Number of inputs	2
Cable length, shielded	200 m
Rated load voltage	-
Reverse polarity protection of rated load voltage	-
Current consumption from load voltage L+ (without load)	-
Voltage inputs	yes
Min. input resistance (voltage range)	100 kOhm
Input voltage ranges	0 V ... +10 V
Operational limit of voltage ranges	+/-3.5%
Operational limit of voltage ranges with SFU	-
Basic error limit voltage ranges	+/-3.0%
Basic error limit voltage ranges with SFU	-
Destruction limit voltage	max. 30V

Current inputs	-
Max. input resistance (current range)	-
Input current ranges	-
Operational limit of current ranges	-
Operational limit of current ranges with SFU	-
Basic error limit current ranges	-
Radical error limit current ranges with SFU	-
Destruction limit current inputs (electrical current)	-
Destruction limit current inputs (voltage)	-
Resistance inputs	-
Resistance ranges	-
Operational limit of resistor ranges	-
Operational limit of resistor ranges with SFU	-
Basic error limit	-
Basic error limit with SFU	-
Destruction limit resistance inputs	-
Resistance thermometer inputs	-
Resistance thermometer ranges	-
Operational limit of resistance thermometer ranges	-
Operational limit of resistance thermometer ranges with SFU	-
Basic error limit thermoresistor ranges	-
Basic error limit thermoresistor ranges with SFU	-
Destruction limit resistance thermometer inputs	-
Thermocouple inputs	-
Thermocouple ranges	-
Operational limit of thermocouple ranges	-
Operational limit of thermocouple ranges with SFU	-
Basic error limit thermoelement ranges	-
Basic error limit thermoelement ranges with SFU	-
Destruction limit thermocouple inputs	-
Programmable temperature compensation	-
External temperature compensation	-
Internal temperature compensation	-
Technical unit of temperature measurement	-
Resolution in bit	12
Measurement principle	successive approximation
Basic conversion time	0.5 ms
Noise suppression for frequency	40 dB
Initial data size	4 Byte

Technical data analog outputs

Number of outputs	-
Cable length, shielded	-
Rated load voltage	-
Reverse polarity protection of rated load voltage	-
Current consumption from load voltage L+ (without load)	-
Voltage output short-circuit protection	-
Voltage outputs	-
Min. load resistance (voltage range)	-

Max. capacitive load (current range)	-
Max. inductive load (current range)	-
Output voltage ranges	-
Operational limit of voltage ranges	-
Basic error limit voltage ranges with SFU	-
Destruction limit against external applied voltage	-
Current outputs	-
Max. in load resistance (current range)	-
Max. inductive load (current range)	-
Typ. open circuit voltage current output	-
Output current ranges	-
Operational limit of current ranges	-
Radical error limit current ranges with SFU	-
Destruction limit against external applied voltage	-
Settling time for ohmic load	-
Settling time for capacitive load	-
Settling time for inductive load	-
Resolution in bit	-
Conversion time	-
Substitute value can be applied	-
Output data size	-

Technical data counters

Number of counters	4
Counter width	32 Bit
Maximum input frequency	100 kHz
Maximum count frequency	400 kHz
Mode incremental encoder	yes
Mode pulse / direction	yes
Mode pulse	yes
Mode frequency counter	yes
Mode period measurement	yes
Gate input available	yes
Latch input available	yes
Reset input available	-
Counter output available	yes

Load and working memory

Load memory, integrated	128 KB
Load memory, maximum	128 KB
Work memory, integrated	64 KB
Work memory, maximal	128 KB
Memory divided in 50% program / 50% data	yes
Memory card slot	SD/MMC-Card with max. 2 GB

Hardware configuration

Racks, max.	5
Modules per rack, max.	total max. 64 minus number line extensions
Number of integrated DP master	-
Number of DP master via CP	-

Operable function modules	64
Operable communication modules PtP	64
Operable communication modules LAN	-

Status information, alarms, diagnostics

Status display	yes
Interrupts	yes
Process alarm	yes
Diagnostic interrupt	yes
Diagnostic functions	yes, parameterizable
Diagnostics information read-out	possible
Supply voltage display	green LED
Group error display	red SF LED
Channel error display	red LED per group

Isolation

Between channels	yes
Between channels of groups to	16
Between channels and backplane bus	yes
Between channels and power supply	-
Max. potential difference between circuits	DC 75 V/ AC 50 V
Max. potential difference between inputs (Ucm)	-
Max. potential difference between Mana and Mintern (Uiso)	-
Max. potential difference between inputs and Mana (Ucm)	-
Max. potential difference between inputs and Mintern (Uiso)	-
Max. potential difference between Mintern and outputs	-
Insulation tested with	DC 500 V

Command processing times

Bit instructions, min.	0.02 µs
Word instruction, min.	0.02 µs
Double integer arithmetic, min.	0.02 µs
Floating-point arithmetic, min.	0.12 µs

Timers/Counters and their retentive characteristics

Number of S7 counters	512
Number of S7 times	512

Data range and retentive characteristic

Number of flags	8192 Byte
Number of data blocks	1024
Max. data blocks size	64 KB
Max. local data size per execution level	4096 Byte

Blocks

Number of OBs	22
Number of FBs	1024
Number of FCs	1024
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
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)	no

Address areas (I/O)

Input I/O address area	2048 Byte
Output I/O address area	2048 Byte
Input process image maximal	2048 Byte
Output process image maximal	2048 Byte
Digital inputs	528
Digital outputs	524
Digital inputs central	528
Digital outputs central	524
Integrated digital inputs	16
Integrated digital outputs	12
Analog inputs	514
Analog outputs	256
Analog inputs, central	514
Analog outputs, central	256
Integrated analog inputs	2
Integrated analog outputs	-
Number of outputs	1
Output voltage (typ)	L+ (-1.5 V)
Output voltage (rated value)	300 mA
Short-circuit protection	yes, electronic
Binding of potential	Power supply of PLC

Communication functions

PG/OP channel	yes
Global data communication	yes
Number of GD circuits, max.	8
Size of GD packets, max.	54 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

PWM data

PWM channels	2
PWM time basis	1 µs / 0.1 ms / 1 ms
Period length	50µs...65.535ms / 0.1...87ms / 1...87ms

Minimum pulse width	0...0.5 * Period duration
Type of output	Highside

Functionality Sub-D interfaces

Type	X3
Type of interface	RS485
Connector	Sub-D, 9-pin, female
Electrically isolated	yes
MPI	yes
MP²I (MPI/RS232)	-
DP master	-
DP slave	optional
Point-to-point interface	yes
5V DC Power supply	max. 90mA, isolated
24V DC Power supply	max. 100mA, non-isolated

Type	-
Type of interface	-
Connector	-
Electrically isolated	-
MPI	-
MP²I (MPI/RS232)	-
DP master	-
DP slave	-
Point-to-point interface	-
5V DC Power supply	-
24V DC Power supply	-

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 slave

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	yes
Transfer memory inputs, max.	244 Byte
Transfer memory outputs, max.	244 Byte
Address areas, max.	32
User data per address area, max.	32 Byte

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.	150 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	-

Functionality RJ45 interfaces

Type	X1/X2
Type of interface	Ethernet 10/100 MBit Switch
Connector	2 x RJ45
Electrically isolated	yes
PG/OP channel	yes
Number of connections, max.	4
Productive connections	-

Type	-
Type of interface	-
Connector	-
Electrically isolated	-
PG/OP channel	-
Number of connections, max.	-
Productive connections	-

Housing

Material	PPE / PPE GF10
Mounting	Profile rail 35 mm

Mechanical data

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Dimensions (WxHxD)	147 mm x 100 mm x 83 mm
Weight	310 g

Environmental conditions

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

Certifications

UL certification	in preparation
KC certification	in preparation

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