

CUBE20S

SMALL, SPEEDY, SAFE

- Extremely modular
- Up to 64 modules per bus node
- Quick reaction time: up to 20 μ s

A MEMBER OF THE CUBE-FAMILY

Murrelektronik's modular Cube20S I/O system expands the field-tested Cube family with another product line that is extremely useful.

The compact modules are only 12.9 millimeters wide and have modular design, allowing them to be installed in series easily, quickly and according to individual requirements – the integrated backplane bus connects the modules to energy and data.

Bus nodes for Cube20S are available for standard fieldbus protocols.



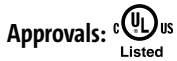
Cube20S I/O Modules

 <p>Bus nodes/Power modules</p> <p><i>Page 4.3.1</i></p>	 <p>Supply module</p> <p><i>Page 4.3.4</i></p>
 <p>Digital inputs</p> <p><i>Page 4.3.6</i></p>	 <p>Digital outputs</p> <p><i>Page 4.3.8</i></p>
 <p>Analog inputs</p> <p><i>Page 4.3.11</i></p>	 <p>Analog outputs</p> <p><i>Page 4.3.13</i></p>
 <p>Safety modules</p> <ul style="list-style-type: none"> • Digital inputs • Digital outputs  <p><i>Page 4.3.7/4.3.10</i></p>	

CUBE20S

Bus Nodes

– Power module included



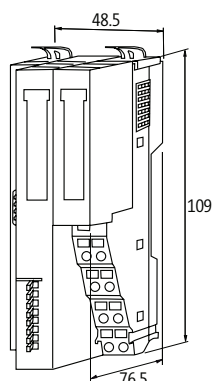
Cube20S



Cube20S



Order Data	Art-No.	Art-No.
PROFIBUS DP	57101	
PROFINET IO		57106
Connections		
Fieldbus	PROFIBUS 12 Mbit/s; SUB-D9	Ethernet 10/100 Mbit/s; 2 × RJ45 (female)
Internal system connection	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Sensor-system/actuator supply	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Module supply		
Operating voltage	24 V DC (EN 61131-2)	
Current consumption	max. 95 mA	
PROFIBUS		
Addressing	Adress switch 1...125	–
PROFINET		
Addressing	–	DCP
Shared Device/Input	–	yes, for 3 controls
Specification	–	V2.2, Conformance Class B
MRP	–	yes
Cube system		
Module capacity	max. 64	
I/O capacity	max. 244 Byte (Input), max. 244 Byte (Output)	max. 512 Byte (Input), max. 512 Byte (Output)
Machine Option Management	–	yes
Output		
Output voltage (I/Os /Backplane)	24 V DC/5 V DC	
Output current (I/Os /Backplane)	10 A/3 A	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	no	
Monitoring - no voltage	yes	
Short circuit and overload	yes	
Actuator warning	no	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (max. 10 A)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		



CUBE20S

Bus Nodes

– Power module included

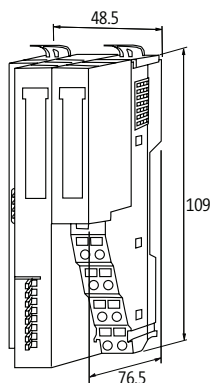
EtherNet/IP EtherCAT

Cube20S



Approvals:  Listed

Order Data	Art-No.	Art-No.
EtherNet/IP	57105	
EtherCAT		57103
Connections		
Fieldbus	Ethernet 10/100 Mbit/s; 1 × RJ45 (female)	Ethernet 10/100 Mbit/s; 2 × RJ45 (female)
Internal system connection	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Sensor-system/actuator supply	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Module supply		
Operating voltage	24 V DC (EN 61131-2)	
Current consumption	max. 95 mA	
EtherNet/IP		
Addressing	DHCP, BOOTP or IP address by rotary switch	–
EtherCAT		
Addressing	–	automatic
Operating modes	–	FreeRun, SyncManager-Event, Distributed Clock, HotConnect
Cube system		
Module capacity	max. 64	
I/O capacity	max. 1024 Byte (Input), max. 1024 Byte (Output)	
Output		
Output voltage (I/Os /Backplane)	24 V DC/5 V DC	
Output current (I/Os /Backplane)	10 A/3 A	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	no	
Monitoring - no voltage	yes	
Short circuit and overload	yes	
Actuator warning	no	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (max. 10 A)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		




Notes

CUBE20S

Bus Nodes

– Power module included

CANopen 

Approvals: 

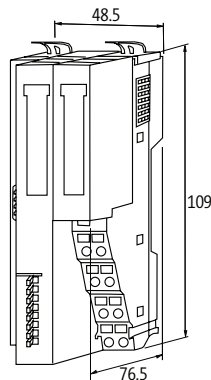
Cube20S



Cube20S



Order Data	Art-No.	Art-No.
CANopen	57104	
Modbus TCP		57108
Connections		
Fieldbus	CAN 1 Mbit/s; SUB-D9	Ethernet 10/100 Mbit/s; 1 × RJ45 (female)
Internal system connection	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Sensor-system/actuator supply	4 × Spring clamp plug-in terminals, max. 1.5 mm ² (max. 10 A)	
Module supply		
Operating voltage	24 V DC (EN 61131-2)	
Current consumption	max. 95 mA	
CANopen		
Addressing	DIP switch	–
Modbus		
Addressing	–	Webserver
Cube system		
Module capacity	max. 64	
I/O capacity	max. 128 Byte (Input), max. 128 Byte (Output)	max. 1024 Byte (Input), max. 1024 Byte (Output)
Output		
Output voltage (I/Os /Backplane)	24 V DC/5 V DC	
Output current (I/Os /Backplane)	10 A/3 A	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	no	
Monitoring - no voltage	yes	
Short circuit and overload	yes	
Actuator warning	no	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (max. 10 A)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		



Notes


CUBE20S

Power supplies

Cube20S

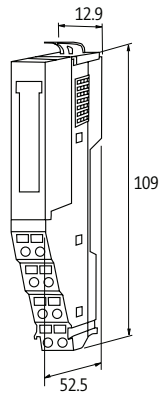
Potential distributor



Approvals:  Listed

Cube20S

Order Data	Art-No.	Art-No.	Art-No.
8 × 24 V DC	57120		
8 × 0 V DC		57121	
4×24 + 4×0 V DC			57122
Module supply			
Operating voltage	max. 30 V DC	max. 0 V DC	max. 30 V DC
Total current	max. 10 A		
General data			
Protection	IP20		
Connection	Spring clamp terminals: 0.08...2.5 mm ² (AWG 28...14)		
Mounting method	DIN-rail mountable (EN 60715)		
Temperature range	0...+60 °C (storage temperature -25...+70 °C)		
Dimension drawing			



Notes

CUBE20S

Power supplies

Cube20S

for external voltage supply

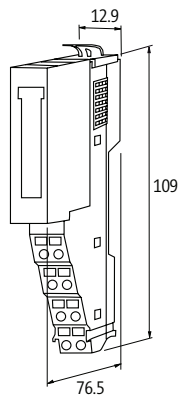


Cube20S

for external voltage supply and internal backplane

Approvals:  UL
Listed

Order Data	Art-No.	Art-No.
Power module	57130	57131
Module supply		
Operating voltage	max. 28.8 V DC	
Total current	max. 10 A	max. 6 A
Output		
Output current (I/Os /Backplane)	10/0 A	4 A/2 A
Output voltage (I/Os /Backplane)	24 V AC	24 V DC/5 V DC
General data		
Protection	IP20	
Connection	Spring clamp terminals: 0.08...2.5 mm ² (AWG 28...14)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		



Notes

CUBE20S

Digital inputs

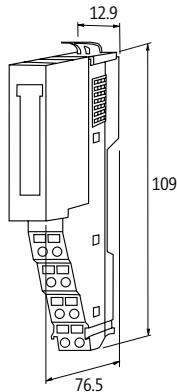
Cube20S



Approvals:  UL US
Listed

Cube20S

Order Data		Art-No.
DI2 - (E) NPN		57220
DI4 - (E)		57240
DI8 - (E)		57280
Internal communication		
Module supply	via system connection	
Current consumption	max. 55 mA	
Input		
Sensor supply US	24 V DC (EN 61131-2), max. 500 mA per module	
Type	PNP (EN 61131-2)	
Input filter	3 ms	
Galvanic isolation	500 V DC between inputs and internal communication	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	no	
Monitoring - no voltage	yes	
Short circuit and overload	yes	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -20...+70 °C)	
Dimension drawing		



Notes

CUBE20S

Safe inputs (Safety)

– active safety

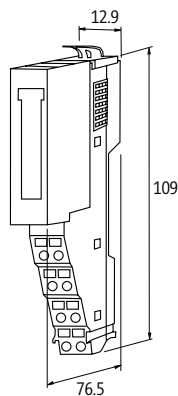


Approvals: UL^{us}
Listed

Cube20S FDI4/2



Order Data	Art-No.
FDI4/2 - (E)	57290
Internal communication	
Module supply	via system connection
Current consumption	max. 95 mA
Safety Indicators	
PL	up to e
Category	up to 4
PFH	0.25E-9
DC	high
SIL	up to 3
SIL CL	up to 3
Service life	20 years
Input	
Sensor supply US	24 V DC (EN 61131-2), max. 500 mA per module
Type	PNP (EN 61131-2)
Input filter	3 ms
Galvanic isolation	500 V DC between inputs and internal communication
Diagnostic	
Communication status	via LED
Diagnostic via LED	per module and channel
Diagnostic via BUS	per module and channel
Short circuit and overload	yes
General data	
Protection	IP20
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)
Mounting method	DIN-rail mountable (EN 60715)
Temperature range	0...+60 °C (storage temperature -20...+70 °C)
Dimension drawing	



Notes

CUBE20S

Digital outputs

Cube20S



Approvals:  UL US
Listed

Cube20S

Order Data	Art-No.
DO2 - (E)	57320
DO4 - (E)	57340
DO8 - (E)	57380

Internal communication

Module supply	via system connection
Current consumption	max. 55 mA

Output

Actuator supply UA	24 V DC (EN 61131-2), max. 1 A
Switching current per output	max. 0.5 A (short-circuit and overload protected)
Galvanic isolation	500 V DC between outputs and internal communication
Lamp load	5 W
Output delay time	175 ns

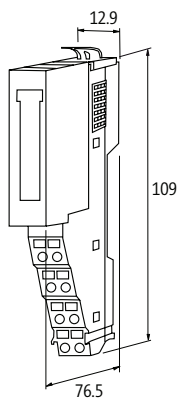
Diagnostic

Communication status	via LED
Diagnostic via LED	per module and channel
Diagnostic via BUS	per module
Monitoring - under voltage	yes
Monitoring - no voltage	no
Short circuit and overload	yes

General data

Protection	IP20
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)
Mounting method	DIN-rail mountable (EN 60715)
Temperature range	0...+60 °C (storage temperature -25...+70 °C)

Dimension drawing



Notes


CUBE20S

Digital outputs

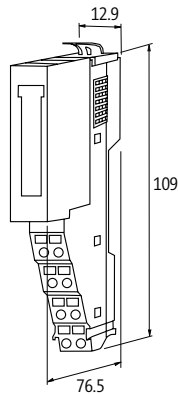
Cube20S - 2 A

Cube20S - 230 V AC (Relays)



Approvals:  UL_{us}
Listed

Order Data	Art-No.	Art-No.
DO2 - (E)	57325	57327
DO4 - (E)	57345	
Internal communication		
Module supply	via system connection	
Current consumption	max. 60 mA	max. 130 mA
Output		
Actuator supply UA	24 V DC (EN 61131-2), max. 4 A	max. 30 V DC/230 V AC
Switching current per output	max. 2 A (short-circuit and overload protected)	max. 3 A (short-circuit and overload protected)
Galvanic isolation	500 V DC between outputs and internal communication	
Lamp load	10 W	–
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	yes	
Monitoring - no voltage	no	
Short circuit and overload	yes	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		



Notes

CUBE20S

Safe outputs (Safety)

– active safety



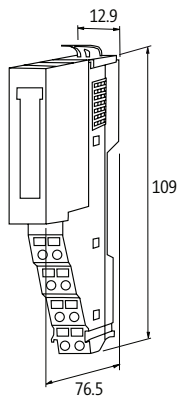
Approvals: UL US Listed

Cube20S FDO4/2



Cube20S

Order Data		Art-No.
FDO4/2 - (E)		57390
Internal communication		
Module supply	via system connection	
Current consumption	max. 75 mA	
Safety Indicators		
PL	up to e	
Category	up to 4	
PFH	0.22E-9	
DC	high	
SIL	up to 3	
SIL CL	up to 3	
Service life	20 years	
Output		
Actuator supply UA	24 V DC (EN 61131-2), max. 2 A	
Switching current per output	max. 0.5 A (short-circuit and overload protected)	
Galvanic isolation	500 V DC between outputs and internal communication	
Lamp load	5 W	
Output delay time	175 µs	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module and channel	
Short circuit and overload	yes	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+60 °C (storage temperature -25...+70 °C)	
Dimension drawing		



Notes

Analog inputs

Cube20S

Voltage



Cube20S

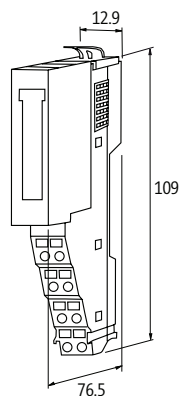
Current

Cube20S

Voltage

Approvals: UL Listed

Order Data	Art-No.	Art-No.	Art-No.
AI2 - (E)	57231	57232	57233
AI4 - (E)	57261	57262	57263
Internal communication			
Module supply	via system connection		
Current consumption	max. 60 mA from system, max. 25 mA externally (UI)	max. 60 mA from system, max. 15 mA externally (UI)	max. 60 mA from system, max. 25 mA externally (UI)
Input			
Conversion time (analog)	240 µs (all channels)		
Resolution (analog)	15 Bit + sign		
Accuracy	max. ±0.2%	max. 0.3%	max. ±0.2%
Connection	Differential voltage input	Differential current input	Differential voltage input
Voltage inputs			
Input resistor	200 kOhm	–	200 kOhm
Input range	0...10 V	–	-10 V DC...+10 V DC
Current input signals			
Load	–	max. 60 Ohm, (EN 61131-2)	–
Input range	–	0...20 mA, 4...20 mA	–
Diagnostic			
Communication status	via LED		
Diagnostic via LED	per module and channel		
Diagnostic via BUS	per module		
Monitoring - under voltage	yes		
Monitoring - no voltage	no		
Short circuit and overload	yes		
Wire break upper/lower limit overload	per module via LED and BUS		
General data			
Protection	IP20		
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)		
Mounting method	DIN-rail mountable (EN 60715)		
Temperature range	0...+60 °C (storage temperature -25...+70 °C)		
Dimension drawing			



Notes

CUBE20S

Analog inputs


Cube20S (TH)

for thermo elements

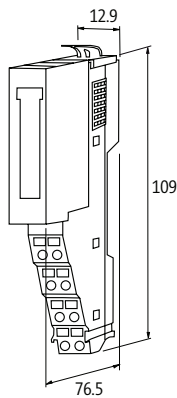
Cube20S (RTD)

for resistors and temperature



Approvals:  Listed

Order Data	Art-No.	Art-No.
AI2 - (E)	57230	
AI4 - (E)		57265
Internal communication		
Module supply	via system connection	
Current consumption	max. 75 mA from the system, max. 30 mA externally (UI)	max. 75 mA
Input		
Conversion time (analog)	max. 4.2...324.1 ms, 50 Hz (per channel)	
Type	B, C, E, J, K, L, N, R, S, T	Pt100, Pt1000, Ni100, Ni1000, R 0...3000 Ohm
Resolution (analog)	15 Bit + sign	
Accuracy	max. $\pm 0.3\%$, cold junction compensation	0.7...1.4%
Connection	2-wire input; TH+x, TH-x	2-wire (4 input); 3-, 4-wire (2 input)
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel	
Diagnostic via BUS	per module	
Monitoring - under voltage	yes	
Monitoring - no voltage	no	
Short circuit and overload	yes	
Wire break upper/lower limit overload	per channel via LED and BUS	
General data		
Protection	IP20	
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)	
Mounting method	DIN-rail mountable (EN 60715)	
Temperature range	0...+55 °C (storage temperature -20...+85 °C)	0...+60 °C (storage temperature -25...+70 °C)
Dimension drawing		



Notes


CUBE20S

Analog outputs

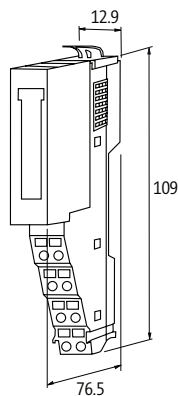
Cube20S

Voltage



Approvals:  UL Listed



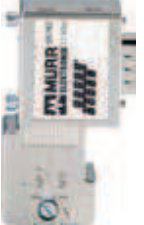




Order Data	Art-No.	Art-No.	Art-No.	Art-No.
AO2 - (E)	57331		57333	
AO4 - (E)		57361		57363
Internal communication				
Module supply	via system connection			
Current consumption	max. 60 mA from system, max. 25 mA externally (UI), idle load			
Output				
Conversion time (analog)	200 µs (all channels)			
Resolution (analog)	15 Bit + sign			
Accuracy	max. 0.5%		max. 0.2%	
Galvanic isolation	500 V DC between inputs and internal communication			
Voltage output signals				
Load	5 kOhm			
Input range	0...10 V		-10 V DC...+10 V DC	
Diagnostic				
Communication status	via LED			
Diagnostic via LED	per module and channel			
Diagnostic via BUS	per module			
Monitoring - under voltage	yes			
Monitoring - no voltage	no			
Short circuit and overload	yes			
Actuator warning	per module via LED and BUS			
Wire break upper/lower limit overload	per module via LED and BUS			
General data				
Protection	IP20			
Connection	Spring clamp plug-in terminals: max. 1.5 mm ² (AWG 16)			
Mounting method	DIN-rail mountable (EN 60715)			
Temperature range	0...+60 °C (storage temperature -25...+70 °C)			
Dimension drawing				



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Cube20S

CUBE20S

Connection accessories			Art-No.
	Bus cover Black plastic		57190
	Shield bus carrier Black plastic	Quantity: 10 pcs.	57191
	Bus connection plug 90° SUB-D9 (male), screw terminals	PROFIBUS	55762
	SUB-D9 (female), screw terminals	CANopen	55760
	Bus connection plug 180° SUB-D9 (male), IDC terminals, rigid cable	PROFIBUS	55584
	SUB-D9 (male), IDC terminals, flexible cable	PROFIBUS	55583
	Bus connection plug 90° SUB-D9 (male), IDC terminals, rigid cable	PROFIBUS	55585
	SUB-D9 (male), IDC terminals, flexible cable	PROFIBUS	55587
	Bus connection plug 90° SUB-D9 (male), IDC terminals, rigid cable, programming device conn.	PROFIBUS	55586
	SUB-D9 (male), IDC terminals, flexible cable, programming device conn.	PROFIBUS	55588
	Bus connection plug 90° SUB-D9 (male); M12 × 1, B-coded	PROFIBUS	7000-99441-000000