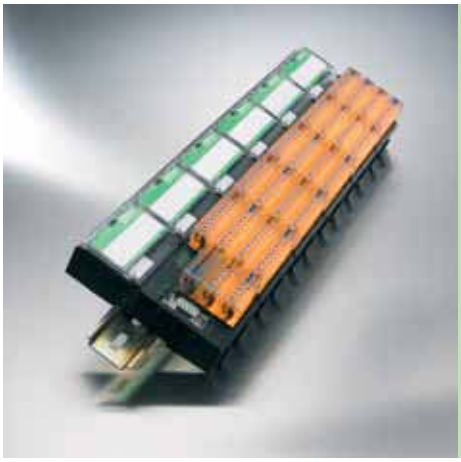


CUBE20
MODULAR I/O STATION IP20

- **High channel density due to compact design**
- **Modular structure**
- **I/O connections with maintenance-free terminals**

INNOVATIVE INSTALLATION TECHNOLOGY

Cube20 is a modular fieldbus I/O station that's expandable and can be integrated into the Cube67 I/O system. The modules are designed for modern wiring requirements in control cabinets. Using Cube20 reduces unnecessary costs from dealing with many individual components. This is because of its compact design which includes a high channel density of 32 channels per I/O module.

PROFIBUS
PROFINET
EtherNet/IP

Cube20 I/O Modules

Bus Nodes
- PROFIBUS
- PROFINET
- Ethernet/IP
- IP20 protection

Page 4.2.1

System Connection to Cube67
- IP20 protection

Page 4.2.2

Digital Inputs
- IP20 protection

Page 4.2.3

Digital Inputs/Outputs
- IP20 protection

Page 4.2.3

Digital Outputs
- IP20 protection

Page 4.2.3

Analog Inputs
- IP20 protection

Page 4.2.4

Analog Outputs
- IP20 protection

Page 4.2.6

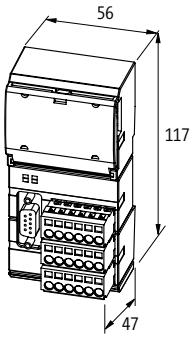
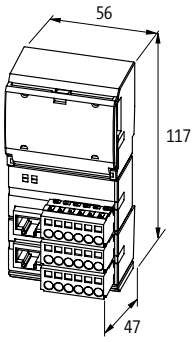
Accessories

Page 4.2.7

Bus Nodes

– Digital inputs

Approvals:

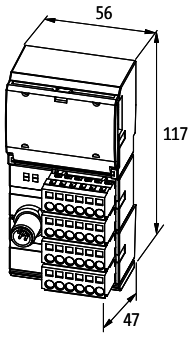
	Cube20 BN-P DI8	Cube20 BN-E DI8	Cube20 BN-PNIO DI8
Order Data	**Art-No.**	**Art-No.**	**Art-No.**
PROFIBUS DP	**56001**		
EtherNet-IP		**56005**	
PROFINET IO			**56006**
Fieldbus			
Operating modes	Sync- and freeze mode are supported	Autonegotiation/Auto MDI/MDI-X	
Transfer rate	to 12 Mbit/s	10/100 MBit/s full duplex	to 100 MBit/s Full Duplex
Addressing	Rotary switch 1...99	DHCP, BOOTP or IP address by rotary switch	Name assignment via PROFINET
Connector	SUB-D9	2 × RJ45	
I/O capacity	with modular expandability by up to 15 Cube20/67 I/O modules		
Input			
Galvanic isolation	500 V DC between I/O and system electronics		
Supply voltage			
Operating voltage	24 V DC (EN 61131-2)		
Sensor-system/actuator supply	via terminal UB		
Current consumption	max. 150 mA		
Diagnostic			
Communication status	per LED and BUS		
Diagnostic via LED	per module		
Diagnostic via BUS	per module and channel		
Monitoring - under voltage	yes		
Monitoring - no voltage	no		
Short circuit and overload	yes		
General data			
Protection	IP20		
Temperature range	0...+55 °C (storage temperature -20...+85 °C)		
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (max. 12 A)		
Mounting method	DIN-rail mountable (EN 60715)		
Dimension drawing			
			
Notes			

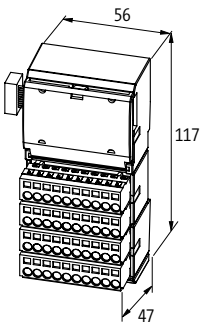
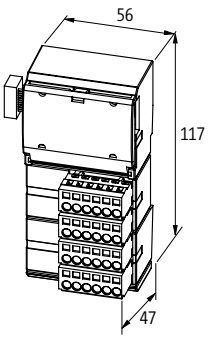
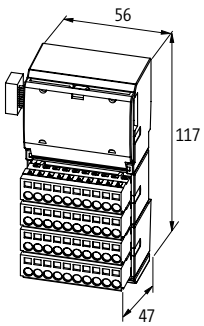
Bus Nodes

– Multifunctional I/Os

– Cube67

Approvals: c UL us Listed, PCT

	Cube20 BN-67 DIO8 Power external	**Cube20 BN-67 DIO8** Power via M12
Order Data	**Art-No.**	**Art-No.**
Cube67 system connection	**56450**	**564501**
Internal communication		
Module supply	via system connection	
Current consumption	max. 100 mA	
Cube67 System supply		
I/O capacity	with modular expandability by up to 3 Cube20 I/O modules	
Inputs/outputs (multifunctional)		
Operating voltage	24 V DC (EN 61131-2)	
Galvanic isolation	500 V DC between I/O and system electronics	
Multifunctional I/Os	8 channels alternatively inputs/outputs (EN 61131-2), load of outputs up to 0.5 A/channel, short-circuit and overload protected	
Sensor supply US	24 V DC, (EN 61131-2), max. 700 mA per module, (short-circuit and overload protected)	
Actuator supply UA	24 V DC, (EN 61131-2), max. 12 A	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module and channel (only outputs)	
Diagnostic via BUS	per module and channel	
Monitoring - under voltage	yes	
Monitoring - no voltage	no	
Short circuit and overload	yes	
General data		
Protection	IP20	
Temperature range	0...+55 °C (storage temperature -20...+85 °C)	
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (AWG 14)	
Mounting method	DIN-rail mountable (EN 60715)	
Dimension drawing		
		
Notes		

Expansion module	Cube20 DI32 E	Cube20 DI16 DO16 E	Cube20 DO16 E	Cube20 DO32 E
– Digital inputs				
– Digital outputs				
– Digital inputs and outputs				
Approvals:				
Order Data	**Art-No.**	**Art-No.**	**Art-No.**	**Art-No.**
DI32 - (E)	cULus **56112**			
DI16/DO16 - (E)		**56168**		
DO16 - (E)			cULus **56117**	
DO32 - (E)				cULus **56118**
Internal communication				
Module supply	via system connection			
Current consumption	max. 25 mA			
Input				
Sensor supply US	24 V DC (EN 61131-2), max. 700 mA per module		–	
Type	p-switching (EN 61131-2)		–	
Input filter	1 ms		–	
Galvanic isolation	500 V DC between inputs and internal communication		–	
Output				
Actuator supply UA	–	24 V DC, (EN 61131-2), max. 12 A		
Galvanic isolation	–	500 V DC between outputs and internal communication		
Switching current per output	–	max. 0.5 A (short-circuit and overload protected)	max. 2 A	max. 0.5 A (short-circuit and overload protected)
Lamp load	–	10 W	40 W	10 W
Diagnostic				
Communication status	via LED			
Diagnostic via LED	per module	per module and channel (only outputs)	per module and channel	
Diagnostic via BUS	per module and channel			
Monitoring - under voltage	yes			
Monitoring - no voltage	no			
Short circuit and overload	yes			
General data				
Protection	IP20			
Temperature range	0...+55 °C (storage temperature -20...+85 °C)			
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (AWG 14)			
Mounting method	DIN-rail mountable (EN 60715)			
Dimension drawing				
				
Notes				

Analog inputs

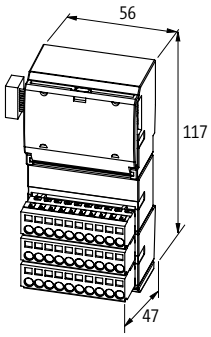
– Voltage/current

Approvals:

Cube20 AI4 E

Voltage/current

Order Data		Art-No.
AI4 - (E)		56200
Internal communication		
Module supply	via system connection	
Current consumption	max. 25 mA from system, max. 60 mA externally (UI)	
Technical Data		
Operating voltage	24 V DC (EN 61131-2)	
Input		
Conversion time (analog)	max. 2 ms (per channel)	
Resolution (analog)	15 Bit + sign	
Accuracy	max. 0.3 %	
Connection	Differential voltage/current input	
Voltage inputs		
Input resistor	min. 1 MOhm, (EN 61131-2)	
Input range	±10 V DC, 0...10 V DC	
Current input signals		
Load	max. 300 Ohm (20 mA), (EN 61131-2)	
Input range	0...20 mA, 4...20 mA	
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module	
Diagnostic via BUS	per module and channel	
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	
Temperature range	0...+55 °C (storage temperature -40...+85 °C)	
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (AWG 14)	
Mounting method	DIN-rail mountable (EN 60715)	
Dimension drawing		



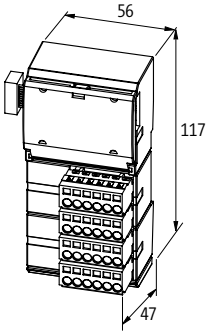
Notes	

Analog inputs

– Temperature converter

Approvals: cULus Listed, PCT

	Cube20 AI4 E RTD for resistors and temperature	Cube20 AI4 E TH for thermo elements
Order Data	**Art-No.**	**Art-No.**
AI4 - (E) RTD	**56230**	
AI4 - (E) TH		**56240**
Internal communication		
Module supply	via system connection	
Current consumption	max. 25 mA from system, max. 70 mA externally (UI)	max. 25 mA from system, max. 45 mA externally (UI)
Technical Data		
Operating voltage	24 V DC (EN 61131-2)	
Input		
Conversion time (analog)	max. 600 ms (per channel)	max. 300 ms (per channel)
Type	Pt100, 200, 500; Ni100, 120, 200, 500, 1000, R 0...3000 Ohm	K, N, E, J, R
Resolution (analog)	15 Bit + sign	
Accuracy	0.7...1.4 %	max. ±2 %, cold junction compensation
Connection	2-wire input: +Rx, -Rx / 3-wire input: +Rx, RLx, -Rx	2-wire input; TH+x, TH-x
Diagnostic		
Communication status	via LED	
Diagnostic via LED	per module	
Diagnostic via BUS	per module and channel	
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	
Temperature range	0...+55 °C (storage temperature -20...+85 °C)	
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (AWG 14)	
Mounting method	DIN-rail mountable (EN 60715)	
Dimension drawing		



Notes

Analog outputs

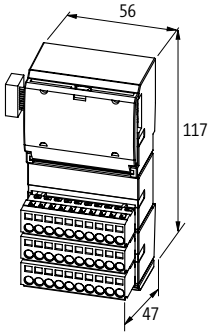
– Voltage/current

Approvals: cULus Listed, PCT

Cube20 AO4 E

Expansion module
Voltage/current

Order Data		Art-No.
AO4 - (E) U/I		56220
Internal communication		
Module supply	via system connection	
Current consumption	max. 25 mA from system, max. 90 mA externally (UI), idle load max. 20 mA externally (UA)	
Technical Data		
Operating voltage	24 V DC (EN 61131-2)	
Output		
Conversion time (analog)	max. 1 ms (per channel)	
Resolution (analog)	15 Bit + sign	
Accuracy	max. 0.5 %	
Galvanic isolation	500 V DC between inputs and internal communication	
Voltage output signals		
Load	min. 1 kOhm, (EN 61131-2)	
Input range	±10 V DC, 0...10 V DC	
Current outputs		
Load	max. 600 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 and channel	
Monitoring - under voltage	yes	
Monitoring - no voltage	no	
Short circuit and overload	yes	
Actuator warning	per channel via LED and BUS	
Wire break upper/lower limit overload	per channel via LED and BUS	
General data		
Protection	IP20	
Temperature range	0...+55 °C (storage temperature -20...+85 °C)	
Connection	Spring clamp plug-in terminals: max. 2.5 mm² (AWG 14)	
Mounting method	DIN-rail mountable (EN 60715)	
Dimension drawing		



Notes	

Connection accessories			Art-No.
	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), cut clamps, rigid cable	PROFIBUS	**55584**
	SUB-D9 (male), cut clamps, flexible cable	PROFIBUS	**55583**
	Bus Connection Plug 90°		
	SUB-D9 (male), cut clamps, rigid cable	PROFIBUS	**55585**
	SUB-D9 (male), cut clamps, flexible cable	PROFIBUS	**55587**
	Bus Connection Plug 90°		
	SUB-D9 (male), cut clamps, rigid cable, programming device conn.	PROFIBUS	**55586**
	SUB-D9 (male), cut clamps, flexible cable, programming device conn.	PROFIBUS	**55588**
	Bus Connection Plug 90°		
	SUB-D9 (male); M12 × 1, B-coded	PROFIBUS	**7000-99441-0000000**
	Label-sheet		
	Quantity: 40 pcs.		**56113**
	Potential terminal block		
	gray/gray/brown/blue		**56078**
	gray/gray/yellow/blue		**56079**
	yellow/blue/yellow/blue		**56080**
	brown/blue/brown/blue		**56081**
	brown/brown/blue/blue		**56109**
	blue/yellow		**56110**
	blue/yellow/brown/blue		**56111**

Connection accessories			Art-No.
	Potential terminal block		
	SlimLine		**56082**