

Advant Controller 250

The Powerful, Compact and Modular Advant Controller



The Advant Controller 250 is a compact, modular controller system, built around small backplanes, which can be connected to suit the desired system configuration.

The Advant Controller 250 is configured and programmed using the Control Builder (Control^{IT}), a Windows 2000® application.

The Advant Controller 250 has interface units for communication to other systems and devices.

The basic hardware consists of controller unit, power supply unit, backplanes and associated cables.

- Compact and modular design makes it simple to expand.
- Optimization for any specific application, through a choice of controller units delivering a comprehensive range of performance.
- Remote programming via Ethernet network or serial channel.
- I/O support for S200 I/O and S200L I/O centrally via the serial I/O bus and remotely via PROFIBUS-DP or ControlNet
- I/O support for S800 I/O remotely via PROFIBUS-DP
- Communication alternatives to other control systems: OPC (via OPC server), COMLI, SattBus, 3964R, MODBUS RTU, and user-defined protocols (via serial channels).
- Units connect to screw terminal blocks and terminal bases, thereby simplifying installation and improving reliability.
- Reduced installation and maintenance costs through DIN rail mounting.
- Mechanical code keys prevent the units from being damaged during replacement.

Software

The Control Builder provides the controller system with a wide range of functionality such as logic functions, PID control, alarm handling and communication possibilities to other controllers, HMI systems and third party alternatives.

Logic Functions

Logic functions, flip-flops, timers, counters etc. are available as specified in IEC 61131-3.

PID Control

PID control functions are available in the controller system.

Alarm Handling

Functions are available for alarm and event detection and alarm printouts on local printer.

Communication

Communication with the programming tool is achieved via MMS on Ethernet or PPP on serial channel.

Communication with other systems, e.g. HMI, SCADA and control systems, may be achieved by means of:

- OPC (via OPC server)
- MMS on Control Network or SattBus on TCP/IP
- SattBus fieldbus
- Serial channels (RS232 or RS485). Available protocols are 3964R (as client), COMLI, MMS/PPP (not RS485) and MODBUS RTU (as master). Also user-defined protocols may be used. Dial-upmodem can be used with COMLI and MODBUS RTU.

Hardware

The Advant Controller 250 can accommodate up to 16 possible units, one of which is the controller unit, taken from a range of models.

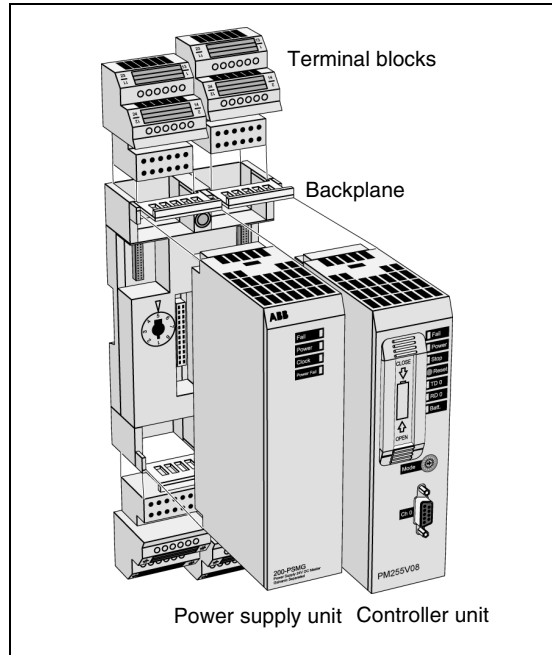
The units in the controller system and the I/O adapters in the central I/O system is interconnected via the controller bus.

All hardware units have LEDs on the front, indicating signal status, error, etc

Each backplane may hold two hardware units. The terminal blocks (200-BPP) dock with the backplanes, enabling easy signal connection.

Controller Unit

The controller unit is a high performance 32 bit single board computer, available in different models (PM253, PM254 and PM255). All have a floating point processor (FPU), to improve calculations, as well as RAM memory and a real time clock, both with battery back-up. All types has one or two RS232 serial channels. PM253 and PM254 has also a SattBus interface.



Unit connection

On the front of the unit is a start-mode switch to select different program modes and a reset button to reset the system.

A range of different controller units are available. Their memory size and performance vary. Please refer to the technical data for more information.

Power Supply Units

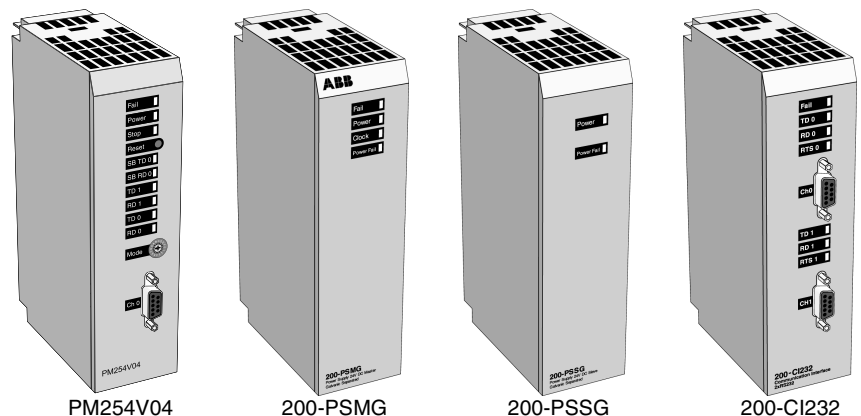
The Advant Controller 250 system power supply units use an external 24 V DC supply to generate the galvanically isolated internal power supply for the Controller and the central I/O system.

200-PSMG

The 200-PSMG is the master power supply unit that also generates the controller bus clock frequency. The clock frequency is automatically set depending on the actual size of the system configuration.

200-PSSG

The 200-PSSG is a slave power supply unit that is used in addition to the 200-PSMG, to enhance the power supply capacity in larger system configurations.



Communication Interface

External communication with the Controller is achieved through interface units for Ethernet, SattBus, RS232, RS485, ControlNet and PROFIBUS-DP.

All communication units interface to the system via the controller bus.

200-CI232

The 200-CI232 has two non-isolated RS232 asynchronous serial channels with overvoltage protection. Connection takes place via the front connectors or via the screw terminal blocks.

200-CI485G

The 200-CI485G has two opto-isolated RS485 asynchronous serial channels, available from the screw terminal blocks.

The signals are galvanically isolated by optocouplers and converted to RS485 levels in the RS485 interfaces. All signals have protection against overvoltage.

It can be used for both half duplex two wire connection and full duplex four wire connection.

The unit needs an external 24 V DC power supply for the two channels.

200-CIE

The 200-CIE has one IEEE 802.3 (Ethernet) channel and performs all the logic operations needed for communication.

It has an AUI port for connection to an external Ethernet transceiver (MAU). The transceiver is power supplied via the AUI port.

The 200-CIE needs an external 24 V DC supply.

200-CISB

The 200-CISB has two galvanically isolated SattBus supervisor channels available on the lower screw terminal block. A separate communication processor for each SattBus channel handles the field bus communication.

200-CICN

The 200-CICN is an interface to the ControlNet network. It is used for the remote connection of the I/O system.

Each 200-CICN acts as an I/O scanner for the 200-ACN remote I/O-adapters. A coaxial or fiber-optic cable is used for connection to the remote I/O system.

The 200-CICN is connected to the ControlNet cable system via a tap and a drop cable, one meter long.

The unit connects, galvanically isolated, to ControlNet via the front BNC connector.

200-CIPB/DP

The 200-CIPB/DP is an interface to PROFIBUS-DP fieldbus. It is used for remote connection to the I/O system.

The 200-CIPB/DP is a master of class 1 and acts as an I/O scanner for the 200-APB12 and CI830 remote I/O adapters.

The unit connects to PROFIBUS-DP via the front connector.

Dummy Unit

200-DU

The 200-DU is a dummy unit used to occupy empty slots in the backplane of the controller system. It protects the controller bus from external mechanical and electrical damage.

Backplane

200-BPN

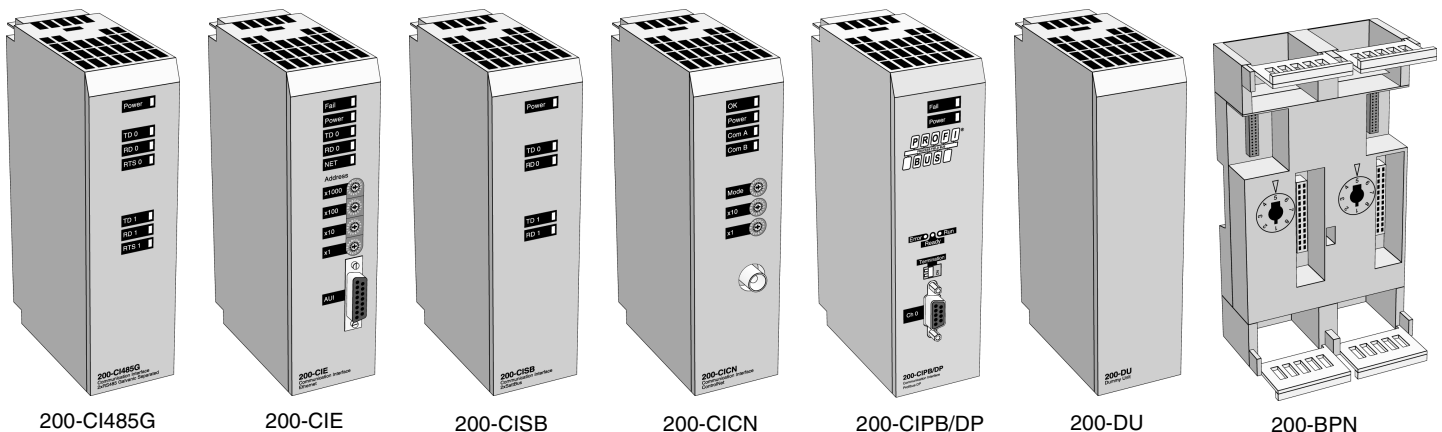
200-BPN is a backplane for Advant Controller 250 units and can be used in the maximum of eight. Each backplane has two slots and the units are held in place with two snap locks.

The backplane is designed to be mounted onto a DIN rail and can be secured by an additional screw if used in environments with severe mechanical stress.

It can be equipped with a maximum of four 200-BPP screw terminal blocks, two for each hardware unit.

Two eight-position rotary mechanical code keys prevent the inserted unit from damage if inserted into the wrong backplane slot.

A maximum of eight 200-BPN can be used.



200-BPP

The 200-BPP is a 12-pole screw terminal block for connecting power and communication signals to the Controller system.

When positioned above the hardware unit, the terminals are numbered 13–24. When positioned below, the terminals are numbered 1–12.

200-BPT

The 200-BPT is a pair of units used for termination of the controller bus.

Cables

200-CBA/L260, 200-CBA/L260V

These cables connect the controller backplane to the first central I/O adapter.

The 200-CBA/L260V is used for vertical central I/O mounting above the controller.

All necessary mounting details are included.

Miscellaneous

200-BPF

The 200-BPF backplane interconnector connects two controller backplanes to each other.

One 200-BPF is delivered with each 200-BPN backplane.

I/O System

For central I/O connection, S200 I/O and S200L I/O is used and can be mixed.

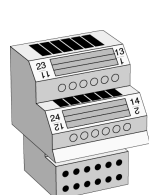
For remote I/O connection, S200 I/O, S200L I/O and S800 I/O can be used.

The maximum number of I/O units that Advant Controller 250 can handle depends on the chosen software license.

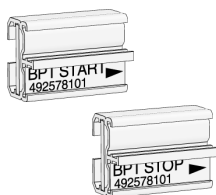
The I/O adapters 200-ANN, 200-ACN and 200-APB12, can handle up to eight I/O units. The I/O adapter CI830 can handle up to 24 I/O units. Up to seven additional rows of I/O units can be connected to the CI830 adapter via optical cables and optical interface units, TB820.

Central I/O

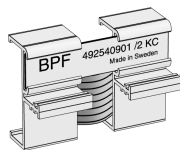
The central I/O system is mounted in the same cabinet as the Advant Controller 250 and can handle up to 48 I/O units, spread over a maximum of six adapters, 200-ANN.



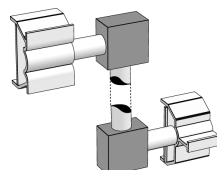
200-BPP



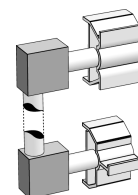
200-BPT



200-BPF



200-CBA/L260V



200-CBA/L260

Hardware units

Remote I/O – ControlNet

On a coaxial cable, the ControlNet fieldbus can handle a maximum length of 500 to 1000 meters (3000 to 6000 meters with repeaters) depending on the number of nodes.

Using fiber cable, the maximum length is, under specific circumstances, seven kilometers between two fiber repeaters. Additional fiber links can be added.

The interface unit, 200-CICN, can handle up to 120 I/O units divided on up to 15 I/O adapters, 200-ACN.

Remote I/O – PROFIBUS-DP

The PROFIBUS-DP fieldbus can handle a maximum length of 100 to 1200 meters depending on the transmission rate.

The interface unit, 200-CIPB/DP, can handle up to 512 I/O units divided on up to 99 adapters 200-APB12 or up to 79 adapters CI830 or a combination of both, up to a total of 99.

Technical Data

General specifications

Power supply	24 V DC (19.2–30 V DC) incl. 5% ripple according to IEC 61131-2 type 1 standard, i.e. +20%, –15% and max. 5% ripple.
Temperature	
Operating	+5°C to +55°C
Non-operating	–25°C to +70°C
Humidity	Max 90%, non-condensing
Protection rating	IP20
Approvals (when product or packaging is marked)	CE marked and meets EMC directive 89/336/EEC according to the following standards: EN 50081-2 and EN 50082-2. Low Voltage Directive 73/23/EEC with supplement 93/68/EEC according to the following standard: IEC 61131-2 (only applicable for units connected to 50–1000 V AC and/or 75–1500 V DC). UL listed for US and Canada according to UL 508 as open equipment. For hazardous locations listed according to UL 1604.
Packaged volume for the central system units	
1–2 units	H279 x W360 x D90 mm (9 dm ³)
3–8 units	H265 x W265 x D175 mm (12 dm ³)

Controller units

Processor type	
PM253	Motorola MC68020
PM254	Motorola MC68020
PM255	Motorola MC68060
Clock frequency	
PM253	16.7 MHz
PM254	28.8 MHz
PM255	50 MHz
Floating point co-processor	Yes
Memory and I/O unit support for system and application program	
PM253V02A	2 Mbyte RAM
PM254V08A	8 Mbyte RAM
PM255V08A	8 Mbyte RAM
Status indicators	
PM253 and PM254	Green LEDs for Power, SattBus signals (SB TD0, SB RD0), serial channel signals (TD0, TD1, RD0 and RD1). Red LEDs for Fail and Stop
PM255	Green LEDs for Power, serial channel signals TD0 and RD0. Red LEDs for Fail and Stop. Red/green LED for battery status

Communication channels

Serial channels	Max. cable length: 15 meters.
Baudrate	75, 110, 134, 150, 300, 600, 1200, 2400, 4800, 9600 (default) and 19200 baud.
PM253 and PM254	2 RS232 channels. Channel 0 for TD, RD, RTS, CTS, DCD and DTR. Channel 1 for RD and TD. Data bits 7 or 8 (default). Parity odd, even or none. Stop bits 1 (default) or 2. Channel 0 is used for maintenance. Available protocols for channel 1: COMLI (client and server), 3964R (client), MODBUS RTU (as master), and user-defined.
PM255	1 RS232 channel. Channel 0 for TD, RD, RTS and CTS. Channel 0 is used as tool port.
SattBus	1 channel, supervisor (not available on PM255). Available protocol is SattBus (client and server).
Real-time clock	Yes
Accuracy, normal mode	
PM253 and PM254	10 ppm (approx. 6 min/year)
PM255	100 ppm (approx. 60 min/year)
Accuracy, battery backup mode	50 ppm (approx. 0.2 s/hour)
Backup battery	Batteries are to be replaced every 3rd year. Note that for all PM254 units, the battery lifetime is max. 3000 h when the system is not powered.
PM253 and PM254	A lithium battery for the memory and real time clock (3.6 V, 1.75 Ah, size AA/R6/UM-3) incl. connection cable.
PM255	A NiMH rechargeable battery for the memory and real time clock (4.8 V, 200 mAh, size 4 x V250H). Backup time is about 1 hour.
Connectors	One 200-BPP screw terminal block. One 9-pin female D-type connector at the front.
Earthing	Directly connected via the 200-BPN backplane.
Power supply	From 200-PSMG/PSSG Power supply unit.
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.6 A
Backplane key code	5.
Weight	0.43 kg excl. packaging 0.50 kg incl. packaging
Dimensions	H 163 x W 45 x D 91 mm (excl. connectors and snap locks)
Order codes	PM253V02A PM254V08A PM255V08A

Power Supply 200-PSMG

Input	24 V DC (19.2–30 V incl. max. 5% ripple) max. 1.3 A
Input fuse	2 A slow 250 V. IEC-127-3 micro fuse, TR5
Inrush current	Max. 4 A for 10 ms
Power drop (hold up)	Max. 0.3 ms
Output	7–9 V DC, max. 2.2 A (1.8 A when also 200-PSSG are used)
Clock frequency	4, 6, 8 and 12 MHz, automatically set depending on the system configuration size
Status indicators	Green LEDs for Power (output voltage) and Clock output. Red LEDs for Fail (initialization) and Power Fail
Galvanic isolation	500 V AC rms between input and output
Connectors	A 200-BPP screw terminal block
Earthing	Directly connected via the 200-BPN backplane
Backplane key code	7
Weight	0.17 kg excl. packaging 0.24 kg incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connectors and snap locks)
Order code	200-PSMG

Power Supply 200-PSSG

Input	24 V DC (19.2–30 V incl. max. 5% ripple) max. 1.3 A
Input fuse	2 A slow 250 V. IEC-127-3 micro fuse, TR5
Inrush current	Max. 4 A for 10 ms
Output	7–9 V DC, max. 1.8 A
Status indicators	Green LEDs for Power (output voltage). Red LED for Power Fail
Galvanic isolation	500 V AC rms between input and output
Connectors	A 200-BPP screw terminal block
Earthing	Directly connected via the 200-BPN backplane
Backplane key code	7
Weight	0.17 kg excl. packaging 0.24 kg incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connectors and snap locks)
Order code	200-PSSG

RS232 Communication Interface 200-CI232

Number of channels	2
Communication protocols	COMLI (master and slave), 3964R (client), MMS/PPP (client and server), MODBUS RTU (as master), and user-defined
Communication interface	RS232C asynchronous serial communication for TD, RD, RTS, CTS, DCD and DTR

Status indicators

Green LEDs for Power and serial channel signals RD0, RD1, TD0, TD1, RTS0 and RTS1

Galvanic isolation

None

Transmission rate

75, 110, 134, 150, 300, 600, 1200, 2400, 4800, 9600 (default) and 19200 baud.
Max. cable length: 15 meters

Data bits

7 or 8 (default)

Parity

Odd, even or none

Stop bits

1 (default) or 2

Max load on DTR

5 mA

Power supply

From 200-PSMG/PSSG Power supply unit

Internal current consumption (from 200-PSMG/PSSG)

Max. 0.2 A

Connectors

Two 200-BPP screw terminal blocks.
Two 9-pin D-type female connectors located at the front

Backplane key code

8

Weight

0.20 kg excl. packaging
0.27 kg incl. packaging

Dimensions

H163 x W45 x D91 mm (excl. connectors and snap locks)

Order code

200-CI232

RS485 Communication Interface 200-CI485G

Number of channels

2

Number of nodes

32 per channel

Communication protocols

COMLI (master and slave), 3964R (client), MODBUS RTU (as master), and user-defined

Communication interface

RS485 asynchronous serial communication for TD, RD and RTS

Status indicators

Green LEDs for Power and serial channel signals RD0, RD1, TD0, TD1, RTS0 and RTS1

Galvanic isolation

500 V AC rms. The channels are individually isolated from the main logic and 24 V DC

Transmission rate

75, 110, 134, 150, 300, 600, 1200, 2400, 4800, 9600 (default), and 19200 baud.
Max. cable length: 1200 meters

Data bits

7 or 8 (default)

Parity

Odd, even or none

Stop bits

1 (default) or 2

Power supply

From 200-PSMG/PSSG Power supply units and external power supply (24 V DC)

Internal current consumption (from 200-PSMG/PSSG)

Max. 0.2 A

External current consumption

Max. 0.1 A (taken from external 24 V DC)

Connectors

Two 200-BPP screw terminal blocks

Backplane key code

8

Weight

0.22 kg excl. packaging
0.29 kg incl. packaging

Dimensions

H163 x W45 x D91 mm (excl. connectors and snap locks)

Order code

200-CI485G

Ethernet Interface 200-CIE	
Number of channels	1
Communication standard	IEEE 802.3 (Ethernet)
Communication protocols	MMS (client and server) SattBus (client and server)
Status indicators	Green LEDs for Power, Transmit data TD0, Received data RD0 and Ethernet traffic NET. Red LED for Fail (software controlled)
Galvanic isolation	500 V DC from 24 V DC supply. According to the IEEE 802.3 standard, the transceiver (MAU) must provide isolation between the AUI cable and the broadband coaxial medium. When taking current from the AUI, it must not exceed 0.5 A as provided by the AUI source. For further details see ANSI/IEEE Std. 802.3 and the SS-ISO 8802-3.
Transmission rate	10 Mbits/s
Access method	CSMA/CD (Carrier Sense, Multiple Access with Collision Detect)
Input fuse	Fuse 1.25 A slow. Microfuse TR5 IEC-127-3
Power supply	From 200-PSMG/PSSG power supply unit and external power supply (24 V DC)
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.25 A
External current consumption	Max. 0.5 A at 19.2V DC (typ. 0.2 A) taken from external 24 V DC supply (depending on transceiver type).
Connector	One 200-BPP screw terminal block. One 15-pin D-type female connector with slide latch located at the front.
Backplane key code	8
Weight	0.34 kg excl. packaging 0.41 kg incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connectors and snap locks)
Order code	200-CIE

SattBus Interface 200-CISB	
Number of channels	2
Number of nodes	120
Communication protocol	SattBus (client and server)
Transmission rate	62.5 kbits/s
Access method	Token bus
Status indicators	Green LEDs for Power, Transmit Data (TD 0, TD1), and Receive Data (RD 0, RD1).
Galvanic isolation	500 V AC rms. The channels are individually isolated via signal transformers.
Connector	One 200-BPP screw terminal block
Power supply	From 200-PSMG/PSSG Power supply unit
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.3 A
Backplane key code	8

Weight	0.25 kg excl. packaging 0.32 kg incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connectors and snap locks)
Order code	200-CISB

ControlNet Interface 200-CICN	
Number of channels	1
Communication protocol	ControlNet
Access method	CTDMA (Concurrent Time Division Multiple Access)
Galvanic isolation	Isolation via a signal transformer
Transmission rate	5 Mbit/s
Status indicators	Green/Red LEDs for OK (unit status) and for COM A and B (communication information). Green LED for Power.
Power supply	From 200-PSMG/PSSG Power supply unit
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.5 A
Connector	BNC 75 Ω at the front
Backplane key code	8
Weight	0.25 kg excl. packaging 0.33 kg incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connectors and snap locks)
Order code	200-CICN

PROFIBUS-DP Interface 200-CIPB/DP	
Type	DP master class 1
Number of channels	1
Communication protocol	PROFIBUS-DP
Transmission rate	9.6, 19.2, 93.75, 187.5, 500, 1500, 3000, 6000 or 12000 kbit/s
Galvanic isolation	None
Status indicators	Green LEDs for Power, Ready and Run. Red LED for Error (LED Fail is for future use).
Power supply	From 200-PSMG/PSSG Power supply unit
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.65 A
Connectors	One female 9-pin D-type connector
Backplane key code	8
Weight	270 g excl. packaging 330 g incl. packaging
Dimensions	H163 x W45 x D91 mm (excl. connector and snap locks)
Order code	200-CIPB/DP

Dummy Unit 200-DU	
Backplane key code	None
Weight	0.11 kg excl. packaging 0.18 kg incl. packaging
Dimensions	H163 x W45 x D91 mm
Order code	200-DU

Terminal Block 200-BPP	
Number of terminals	12
Wire size	Solid and stranded 0.5–2.5 mm ² or AWG 20–AWG 12
Weight	0.070 kg
Dimensions	H60 (only 37 mm once inserted) x W45 x D43 mm
Order code	200-BPP

Backplane 200-BPN	
Number of slots	2
Internal current consumption (from 200-PSMG/PSSG)	Max. 0.04 A Note that the current consumption is included in the current consumption data given for the Controller units, i.e. do not add this current when calculating the total system current.
Connectors	The number of 200-BPP screw terminal blocks depends of the type of Controller unit used. 2 x 32-pole Euro connector for electrical connections between the backplane and the Controller units.
Mounting	On DIN rail 35 x 7.5 mm according to the EN 50022 standard.
Weight	0.17 kg excl. packaging 0.24 kg incl. packaging
Dimensions	
Height	239 mm incl. one screw terminal block; 163 mm excl. terminal block.
Width	91 mm excl. a 5 mm bridge to the next backplane.
Depth	43 mm (127 mm including unit with front connectors and DIN rail)
Order code	200-BPN

Backplane Terminator 200-BPT	
Number of plugs	One start-plug (green) and one stop-plug (red)
Internal current consumption (from 200-PSMG/PSSG)	0.2 A
Weight	0.010 kg
Dimensions	H32 x W23 x D17 mm
Order code	200-BPT

Controller Bus Cable 200-CBA/L260	
DIN-rail distance C-C	255 mm max.
Weight	0.092 kg
Order code	200-CBA/L260

Controller Bus Cable 200-CBA/L260V	
Weight	0.092 kg
Order code	200-CBA/L260V

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