

Advant® OCS

Open Control System

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 Advant Control Builder, a Windows NT® 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: MMS, Sattlink, COMLI, SattBus, 3964R, 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 Advant 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 MMS on serial channel (SattLink).

Communication with other systems, e.g. HMI, SCADA and control systems, may be achieved

- via MMS or SattBus on Ethernet.
- via SattBus fieldbus.
- via serial channels (RS232 or RS485). Available protocols are 3964R (as client), COMLI and MMS (SattLink). Also user-defined protocols may be used.

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 are interconnected via the controller bus.

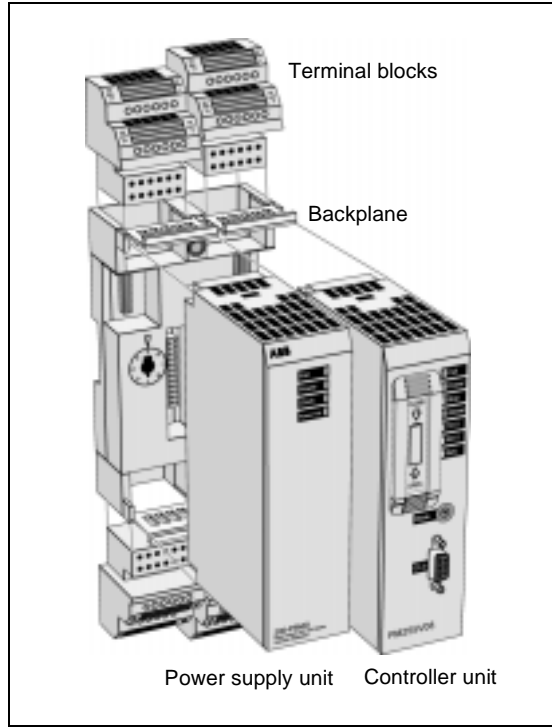
All hardware units have LEDs on the front, indicating signal status, error, etc

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. Two RS232 serial channels and a SattBus interface are also included on all types, except the PM255s, which have one RS232 channel.

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



Unit connection

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

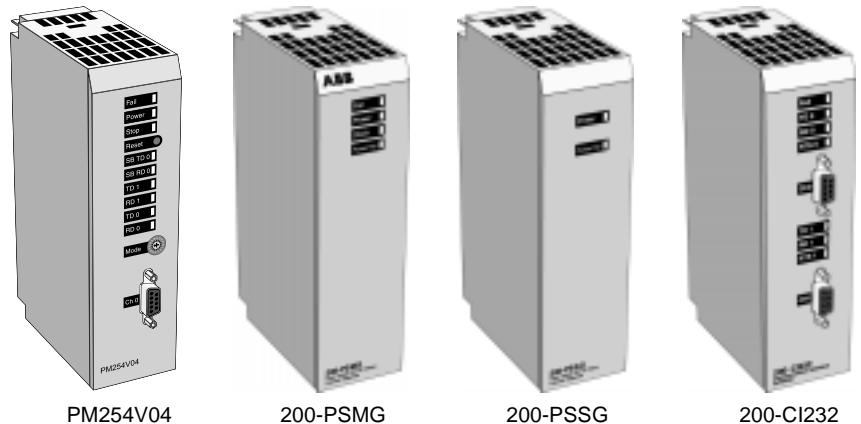
The Advant Controller 250 system power supply units use an external 24 V DC supply to generate the galvanically isolated internal power supply for the Controller and the central I/O system.

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) via a drop cable. 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 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. 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.



200-CI485G

200-CIE

200-CISB

200-CICN

200-CIPB/DP

200-DU

200-BPN

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.

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.

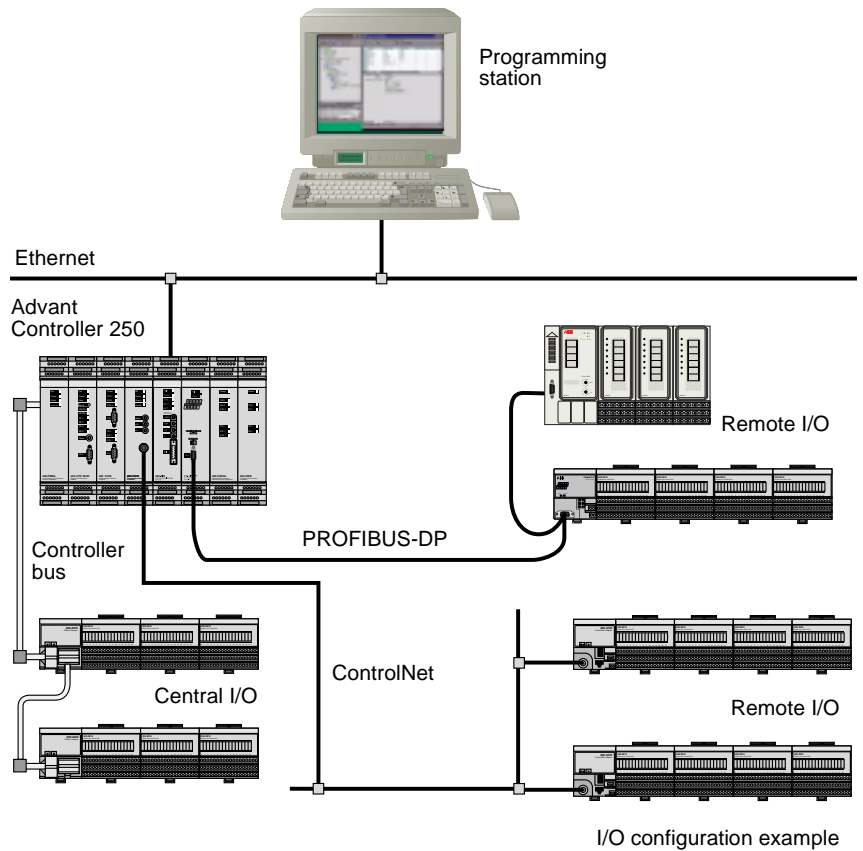
For remote I/O connection, S200 I/O, S200L I/O and S800 I/O can be used.

Advant Controller 250 can handle up to 512 I/O units, depending on the chosen controller type.

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.



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.

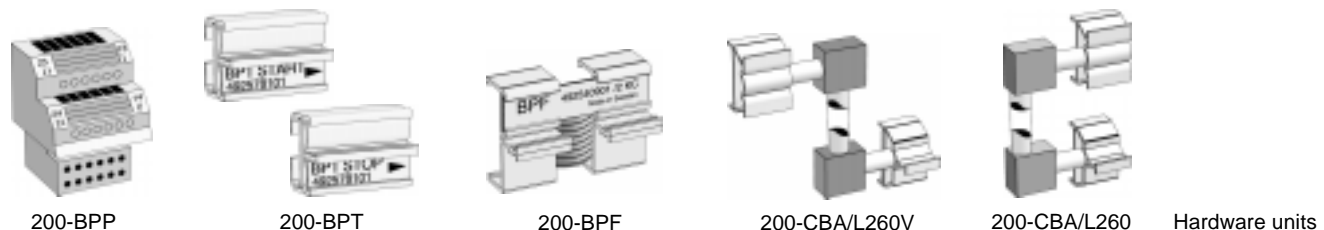
Using fiber cable, the maximum length is, under specific circumstances, seven kilometers between two fiber repeaters. Additional fiber links can be added.

The interface unit, 200-CICN, can handle up to 248 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 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, with the exception for 200-CIPB/DP.
Package 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	
PM253V01	1 Mbyte RAM, 32 I/O units
PM253V02	2 Mbyte RAM, 64 I/O units
PM254V04	4 Mbyte RAM, 128 I/O units
PM254V08	8 Mbyte RAM, 256 I/O units
PM255V04	4 Mbyte RAM, 256 I/O units
PM255V08	8 Mbyte RAM, 512 I/O units

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), 19200 and 38400 baud.
PM253 and PM254	2 RS232 channels. Channel 0 for TD, RD, RTS, CTS, DCD and DTR. Available protocols for channel 0 is MMS (SattLink). Channel 1 for RD and TD. Data bits 7 or 8 (default). Parity odd, even or none. Stop bits 1 (default) or 2. Available protocols for channel 1, see 200-CI232
PM255	1 RS232 channel. Channel 0 for TD, RD, RTS and CTS. Available protocol for channel 0 is MMS (SattLink).
SattBus	1 channel, supervisor (not available on PM255). Available protocol, see 200-CISB
Real-time clock	
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	
PM253V01 PM253V02 PM254V04 PM254V08 PM255V04 PM255V08	

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 (client and server), 3964R (client), MMS (SattLink) (client and server), 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), 19200 and 38400 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 (client and server), 3964R (client), MMS (SattLink) (client and server), 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), 19200 and 38400 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	SattBus (client and server), MMS (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

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

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 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

Programming Cable 200-CPC (Option)

Connectors	One 9-pole female D-type One 9-pole male D-type connector
Weight	125 g
Length	3.0 m
Order code	200-CPC

ControlNet is a trademark of Allen-Bradley Company, Inc., a Rockwell International Company.
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