

Series 200

Hardware Platform

The Series 200 platform is a powerful, modern and flexible hardware platform.

It includes a range of Central Processing Units, Communication units, I/O units, I/O adapters and terminal bases.

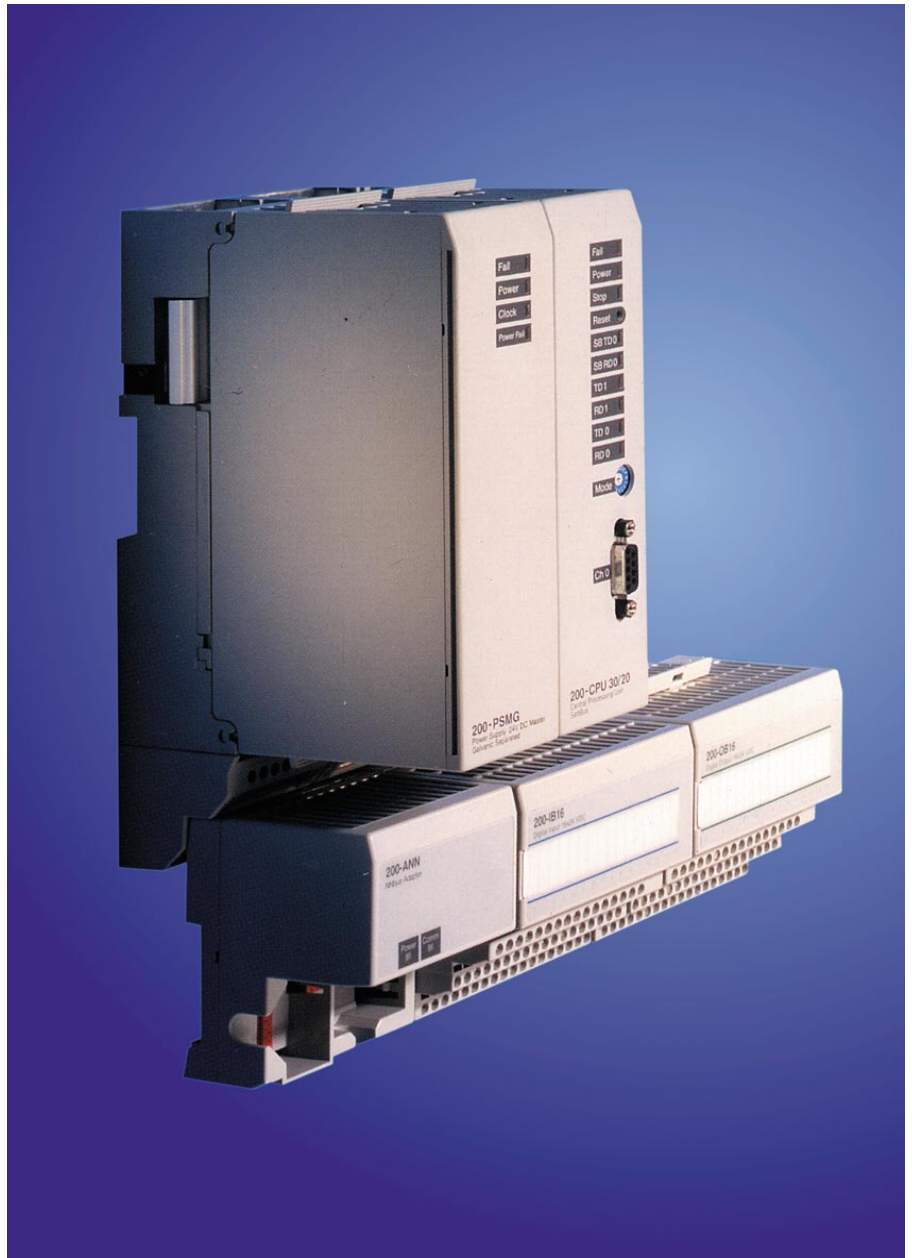
The Series 200 platform supports the distributed control systems SattLine and SattCon 200 in various configurations (please refer to the respective data sheets for more information).

The modular, space saving design of the Series 200 facilitates the configuration and expansion of both the Central System and the I/O System. A minimum set of system units and components will be able to satisfy a large number of application requirements.

The flexibility of the Series 200 system extends to the Central Processing Units and the Communication units too. For example, Ethernet, SattBus and serial communication can be easily added to any application when required.

The Series 200 I/O units are compatible with the 200C I/O units and can be freely interchanged.

In addition to the Series 200 I/O system, both rack-based I/O and Alert I/O can be connected to the Series 200 Central System.



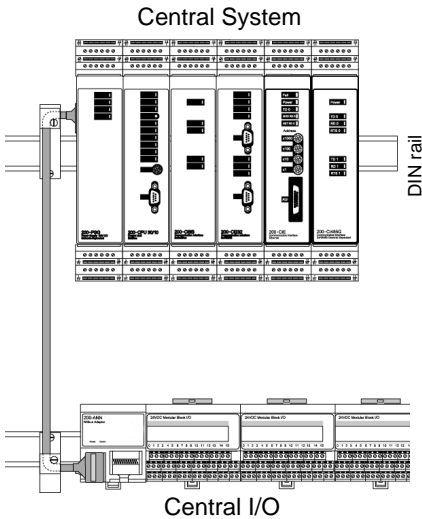
The Series 200 platform delivers these main features:

- Compact and modular design making it simple to expand.
- Optimization for any specific application, through a choice of Central Processing Units delivering a comprehensive range of performance.
- Units connect to screw terminal blocks and terminal bases, reducing wiring, and thus simplifying installation and improving reliability.
- Reduced installation and maintenance costs through DIN rail mounting.
- Freely interchangeable Central and Remote I/O units reduce spares holding.
- I/O units are easily configured using the system software.
- Compatible with 200C I/O units.
- Continuity and compatibility with Central and Remote rack-based I/O.
- Mechanical code keys prevent the units from being damaged during replacement.
- Extensive external communication support through serial communication (RS232 and RS485), ControlNet™, SattBus, Ethernet and PROFIBUS-DP.
- Safety I/O function in the case of Remote I/O communication failure.

System Overview

The Series 200 platform consists of a Central System and one or more I/O Systems. The I/O Systems may be both central and/or remote.

The units of the Series 200 Central System are snapped onto backplanes mounted on DIN rails or mounting profiles.



Central System

The Central System can accommodate up to 16 possible units, one of which is the Central Processing Unit (CPU), taken from a range of models.

Communication between the units in the Central System and the Central I/O uses the Central System bus called the NNbus.

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

Central Processing Units

The CPU20, 30 and 40 units are based on the Motorola MC68020 processor, and include a floating point processor. They have 1, 2, 4, 8 or 12 Mbyte of RAM memory, a real time clock and battery back-up. There is one SattBus channel and two serial channels (RS232), one of which is for maintenance and service.

The CPU50 units are based on the Motorola MC68060 processor and also include a floating point processor. These CPUs have 4, 8, 16 or 20 Mbyte of RAM memory, a real time clock and battery back-up. They incorporate one serial channel for maintenance and service, but no SattBus channel.

Communication Units

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

Ethernet communication (via 802.3 Ethernet, AUI) uses the 200-CIE Communication Unit.

Fieldbus communication uses the SattBus protocol on the 200-CISB unit.

Asynchronous serial communication, e.g. the COMLI protocol, is achieved through the 200-CI232 and 200-CI485G units.

Communication to Remote I/O can be achieved by either ControlNet (by means of the 200-CICN), or a PROFIBUS-DP Gateway (using the 200-CIPB/DP-G unit).

Power Supply

For internal system supply, one or more 200-PSMG or 200-PSSG power supply units are required.

Accessories

A control system could require a number of accessories, such as a 200-BPN backplane, dummy unit, screw terminal blocks, a termination pair and cables.

I/O System

The Series 200 has in the I/O System a number of interface units for various process applications. The units may be mounted centrally or remotely.

The Series 200 I/O system and the I/O of the 200C system are interchangeable.

Configuration of the I/O units' functions and measuring ranges are made using the system software.

The inputs and outputs have status indicators, are filtered and galvanically isolated by optocouplers.

I/O units available are listed below in the "Units Overview" table.

Existing rack-based I/O may be connected to the Central System via 200-RANN or 200-RACN adapters.

Alert I/O system units may be connected with the 200-BIAL adapter.

Central I/O

The Central I/O, connected to the Central System, can support between one and six 200-ANN adapters, each with up to eight I/O units. The largest possible number of I/O units is 48, with each I/O unit having up to 16 I/O points.

Remote I/O – ControlNet

To save cabling the I/O System may be located closer to the process by means of Remote I/O.

A maximum of 31 200-ACN Remote I/O adapters, each with up to eight I/O units, may be connected to one ControlNet.

ControlNet is a serial communications network starting in the Central System from a 200-CICN unit. The maximum length is 500 to 1000 metres depending on the number of Remote I/O adapters attached.

Repeaters make it possible to extend the length up to 6000 metres maximum, though a typical range is 3000 metres for 31 remote adapters.

Remote I/O – PROFIBUS-DP

The I/O system may also be connected to a PROFIBUS-DP network using a PROFIBUS-DP Gateway.

System Configuration

Central System

The Central System can have up to eight backplanes providing 2 to 16 slots for CPU units, power supply units, backup units and communication interface units.

Central I/O

The I/O System of Series 200 is connected centrally and/or remotely to the Central System.

When a Central I/O System is used the bus is extended with a cable from the leftmost backplane to the first Central I/O adapter 200-ANN. Other cables are used to extend the bus between the adapters.

It is recommended that digital and analog units be installed on separate rows.

The Central I/O System must be installed together with the Central System in one cabinet.

Remote I/O – ControlNet

When a remote I/O system is used with ControlNet network, the connection is made using the communication interface 200-CICN, located in one of the backplane slots of the Central System with the remote I/O system.

The adapter 200-ACN is used on the I/O side.

Remote I/O – PROFIBUS-DP

When a remote I/O system is used with PROFIBUS-DP, the connection is made using the communication interface 200-CIPB/DP-G, located in one of the backplane slots of the Central System.

Communication is established using a PROFIBUS-DP Gateway. Other PROFIBUS-DP slave products on the market can also be connected.

The adapter 200-APB12 is used on the I/O side.

Power Supplies and Calculation

The system requires both internal and external power supplies.

One or several internal power supply units 200-PSMG/200-PSSG supply the Central System units, the Central I/O adapters (200-ANN) and I/O units.

An external power supply of 24 V DC is required for the internal power supply, for some Central System units and for the input and output load in the I/O System.

One 200-PSMG (master) is always required. For enhanced power a 200-PSSG (slave) has to be used.

An internal and an external current load calculation must be carried out. These are easily made using a table in the “Series 200 Central System, Installation and Maintenance” manual. Each unit in the system has a rated current consumption. The sum of the units’ current requirements determines the number of internal power supplies, 200-PSMG/200-PSSGs, and also the size and number of the external power supplies.

If enhanced power is needed, add another 200-PSSG.

The total current consumption for the central I/O system must be considered and must not exceed 3 A.

Termination

Both ends of the Central System bus must be terminated by a pair of 200-BPT backplane terminators, one start (green) and one stop (red).

Operation Requirements

In normal installations under normal operational conditions within temperature specifications there is no requirement for a cooling fan.

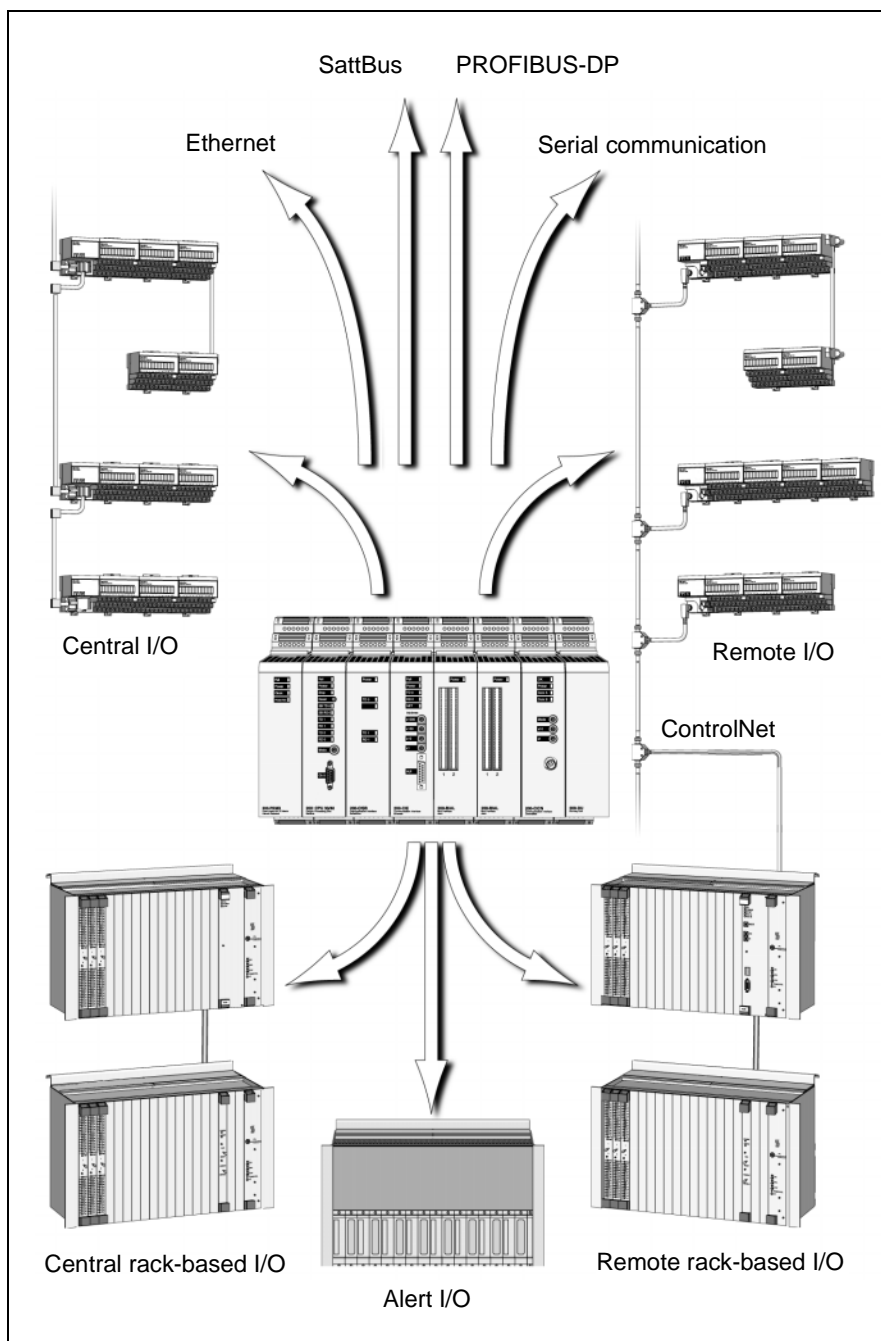






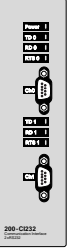
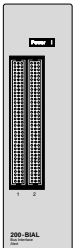




Illustration of possible combinations, but not all of them may be used in the same installation. The types of units to use and the maximum number of them are governed by the different system software packages.

Units Overview

Order codes and technical data for the Series 200 units.

CPU systems	
 <p>All CPUs have floating point processor (FPU), real time clock, battery back-up, two RS232 serial channels and one SattBus supervisor channel, unless stated otherwise.</p> <p><i>SattCon 200 units:</i></p> <p>200-CPU20/10 16.7 MHz / 1 MB RAM without FPU and SattBus</p> <p>200-CPU30/10 16.7 MHz / 2 MB RAM</p> <p>200-CPU30/20 16.7 MHz / 2 MB RAM</p> <p>200-CPU30/30 16.7 MHz / 4 MB RAM</p> <p>200-CPU30/40 16.7 MHz / 4 MB RAM</p> <p>200-CPU40/40 28.8 MHz / 4 MB RAM</p> <p>200-CPU50/40 50 MHz / 4 MB RAM One RS232 and none SattBus channel</p> <p>200-CPU50/80 50 MHz / 8 MB RAM One RS232 and none SattBus channel</p> <p><i>SattLine units:</i></p> <p>200-CPU30/40-SL 16.7 MHz / 4 MB RAM</p> <p>200-CPU40/40-SL 28.8 MHz / 4 MB RAM</p> <p>200-CPU40/80-SL 28.8 MHz / 8 MB RAM</p> <p>200-CPU40/120-SL 28.8 MHz / 12 MB RAM</p> <p>200-CPU50/160-SL 50 MHz / 16 MB RAM One RS232 and none SattBus channel</p> <p>200-CPU50/200-SL 50 MHz / 20 MB RAM One RS232 and none SattBus channel</p>	 <p>200-CISB Communication interface unit with two SattBus channels including supervisory function. The two channels are available via the screw terminal blocks with individual galvanic isolation.</p>
 <p>200-CIE Communication interface unit with one IEEE 802.3 Ethernet channel for AUI connection to an external transceiver MAU.</p>	 <p>200-CICN Communication interface unit with ControlNet connection for Remote I/O.</p>
 <p>200-CIPB/DP-G Communication interface unit with PROFIBUS-DP connection for Remote I/O. The unit is a gateway between COMLI and PROFIBUS-DP.</p>	 <p>200-BUP Backup unit using a "SmartMedia" memory card to store the application program from the Series 200. Cards for 4 or 8 MB sizes are available.</p>
 <p>200-CI232 Communication interface unit with two RS232-C asynchronous serial channels. The two channels are available via two 9-pin female D-type connectors on the front of the unit or via the screw terminal blocks.</p>	 <p>200-BIAL Communication interface unit with two communication interfaces for two Alert I/O racks corresponding to 128 digital I/Os or 128 analog inputs or 32 analog outputs or a mix of these.</p>
 <p>200-CI485G Communication interface unit with two RS485 asynchronous serial channels with individual galvanic isolation. The two channels are available via the screw terminal blocks.</p>	 <p>200-PSMG Internal master power supply unit. Input 24 V DC (19.2–30 V incl. max. 5% ripple), max. 1.3 A. Output maximum 2.2 A (1.8 A when one or more PSSG are used).</p> <p>200-PSSG Internal slave power supply unit. Input 24 V DC (19.2–30 V incl. max. 5% ripple), max. 1.3 A. Output maximum 1.8 A.</p>

I/O systems



200-ANN
Adapter for Central I/O System



200-ACN
Adapter for Remote I/O System connected via ControlNet



200-APB12
Adapter for Remote I/O System connected via PROFIBUS-DP



All I/Os are galvanically isolated

200-IB16
16 digital inputs. Nominal 24 V DC / 8 mA per input. One input is equipped with a 5-bit pulse counter for 500 Hz maximum.

200-OB16
16 digital outputs. Nominal 24 V DC / 0.5 A per output. Outputs may be connected in parallel.

200-OB16P
16 digital short-circuit proof outputs. Nominal 24 V DC / 0.5 A per output. Outputs may be connected in parallel.

200-IB10xOB6
10 digital inputs 24 V DC/8 mA per input, 6 digital outputs 24 V DC / 2 A per output (max 10 A per unit).

200-OB8EP
8 digital outputs, short circuit proof. Nominal 24 V DC / 2 A per output.

200-IP2
2 pulse counter interfaces, each with 4 inputs. Maximum counting frequency is 100 kHz. 6–24 V DC (3–24 mA).

200-IP4
4 frequency counter interfaces, each with 2 inputs. Maximum counting frequency is 100 kHz. 6–24 V DC (3–24 mA).

200-IE8
8 single-ended analog inputs. 12 bit resolution. Ranges; Input current 4–20, 0–20 mA. Input voltage 2–10, ±10 or 0–10 V DC.

200-OE4
Unit for 4 analog outputs. 12 bit resolution + sign. Range 4–20 mA, 0–20 mA. Output voltage 2–10, ±10 or 0–10 V DC.

200-IE4xOE2
4 analog inputs, 2 outputs. Resolution and ranges as for 200-IE8 and 200-OE4.

200-IT8
8 thermocouple inputs. The unit has 16 bit resolution and support different types of sensors.

200-IR8
8 inputs of 3-wire RTD signals. The unit has 16 bit resolution and supports different types of sensors.

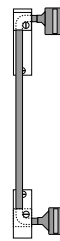
200-IR8R
8 inputs of 4-wire RTD signals. The unit has 16 bit resolution and supports one type of sensor (pt100).

200-IA8
8 digital inputs for 120 V AC signals

200-OA8
8 digital outputs for 120 V AC signals, max. 4 A (8 outputs at 500 mA)

200-OW8
8 relay outputs 24 V DC/2 A resistive, 240 V AC/2 A resistive

Cables



200-CBB/R360
Cable for backplane to backplane at a distance between centres of 360 mm.

200-CBA/L260
Cable for backplane to adapter at a distance between centres of 255 mm.

200-CBA/L260V
Cable for backplane to adapter for vertical mounting, 255 mm.

200-CAA/L190
Cable for adapter to adapter at a distance between centres of 190 mm.

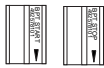
200-CAA/L380
Cable for adapter to adapter at a distance between centres of 380 mm.



200-CE1
I/O extension cable, 300 mm

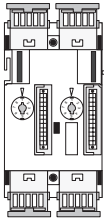
200-CE3
I/O extension cable, 900 mm

Accessories



200-BPT

A backplane termination pair with one green START plug and one red STOP plug.



200-BPN

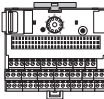
Backplane unit for the Central System units. Each backplane has two slots which hold the attached control system unit, using snap locks.

One backplane interconnector 200-BPF included.



200-BPP

A screw terminal block for connecting power and communication signals.



I/O terminal base units:

200-TB2

16 terminals for I/O signals. 18 terminals for common 0 V.
2 terminals for 24 V DC or 115 V AC supply.

200-TB3

16 terminals for I/O signals. 18 terminals for common 0 V.
18 terminals for 24 V DC or 115 V AC supply.

200-TB3T

Special terminal base for the thermocouple I/O unit 200-IT8.

200-TBN

16 terminals for I/O signals and 2 terminals for common 0 V.
2 terminals for 24 V DC or 230 V AC supply.

200-TBNF

Same as 200-TBN with fuses for 8 I/O terminals.

200-TB3S

16 spring clamp terminals for I/O signals. 18 spring clamp terminals for common 0 V. 18 spring clamp terminals for supply 24 V DC or 115 V AC.

200-DU

Dummy unit for CPU systems

200-DUTB

Dummy unit for I/O systems

200-GDS

Grounding device for shielded cables

200-MOUNTKIT/BIAL

Kit which enables mounting of the Series 200 in a rack for connection to Alert I/Os

MP500

Mounting profile 500 mm with integrated cable duct for I/O units and adapters

MP590

Mounting profile 590 mm with integrated cable duct for I/O units and adapters

MP890

Mounting profile 890 mm with integrated cable duct for I/O units and adapters

MP990

Mounting profile 990 mm with integrated cable duct for I/O units and adapters

MP-CLIPS

Clips for cable duct, 10 pcs.

200-CJC

Cold Junction Compensator to be used with 200-IT8

Spare Parts



200-BPF

Interconnector for Central System backplane units



200-MEM4*

SmartMedia memory card for 200-BUP, 4 Mbyte

200-MEM8*

SmartMedia memory card for 200-BUP, 8 Mbyte

BAT200-CPU

Battery for 200-CPU20,CPU30 and CPU40

BAT200-CPU50

Battery for 200-CPU50

BAT200-CIE

Battery for 200-CIE

FUSE2.0AT

Fuse for 200-PSMG and PSSG

FUSE1.25AT

Fuse for 200-CIE

* Available in the near future

Installation

The system is to be mounted on DIN rails or mounting profiles on the mounting plate inside a cabinet as shown in the figure. Minimum depth is 200 mm.

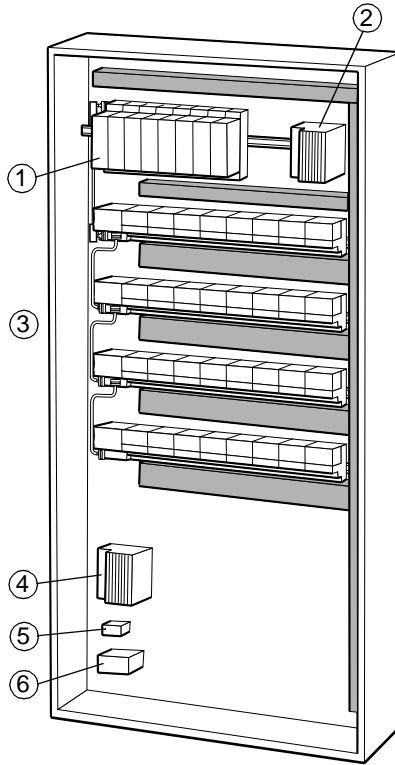
Systems consisting of a small number of units may be installed in a standard wall mounted cabinet. Larger systems are preferably mounted in a floor standing cabinet.

A Central System with 16 units on one DIN rail has a width less than 800 mm. A Central I/O System with adapter and eight I/O units on one DIN rail requires a width of 1000 mm.

The total height is about 1210 mm for a Central System and a Central I/O System with four rows of I/O units on DIN rails, spaced at equal distances of 220 mm.

For narrower cabinets the I/O rows may be divided into two DIN rails using extension cable CE1.

In a Central System, with a software package permitting a division into two DIN rails, the system bus may be extended using the cable CBB/R360.



Installation requirements

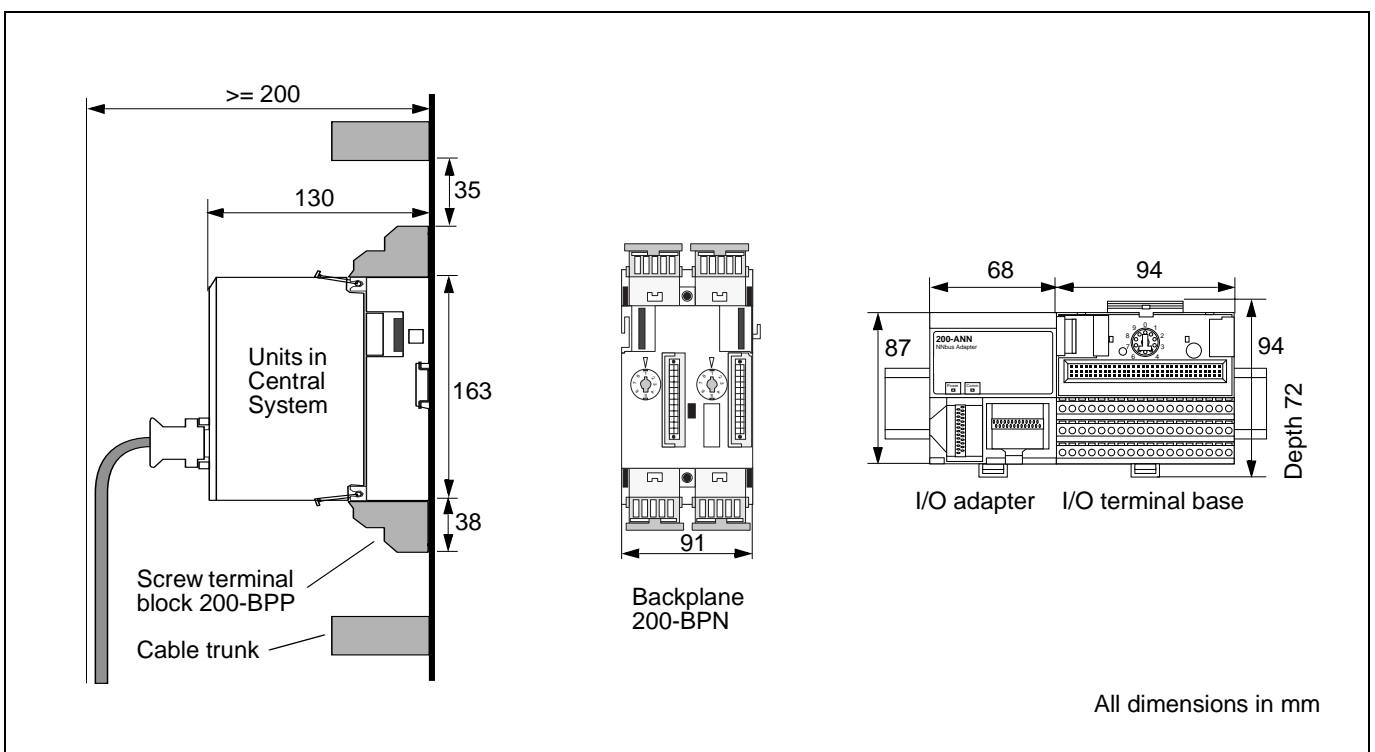
This section gives an installation overview. Before installation, you must read the installation manuals.

The external 24 V DC power supplies, a mains fuse and the power-line filter must be mounted inside the cabinet.

The mains are recommended to be overvoltage protected, lightning protected and certain grounding requirements should also be fulfilled.

- 1) Central System
- 2) External power supply for Central System
- 3) Central I/O
- 4) External power supply for I/Os
- 5) Mains switch and fuse
- 6) Power-line filter

Dimensions



Common Technical Data

Temperature	Operating +5 °C to +55 °C Non-operating -25 °C to +70 °C	Mounting	On DIN rail 35 x 7.5 mm according to EN 50022 standard
Humidity	Maximum 90%, non condensing	External power supply	External power supply specifications must be according to the standard IEC-1131-2; i.e. 24 V DC +20%, -15% + max. 5% ripple (19.2-30V DC incl. 5% ripple)
Protection form	IP20		
Environment	Industrial premises		
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: EN 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-G. Class 1 div 2 hazardous locations.		

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