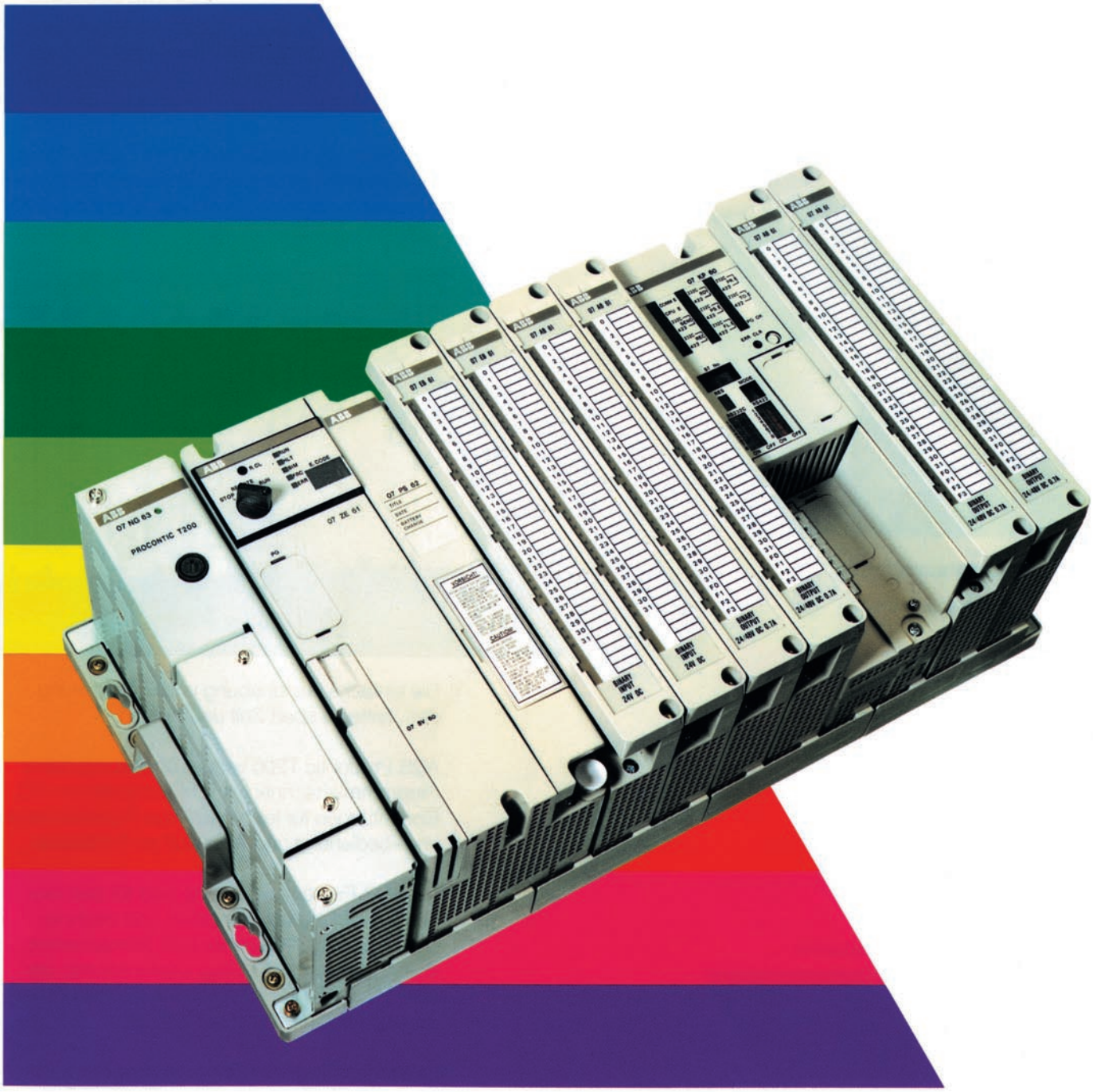
Automation System ABB Procontic T200.
Modular, powerful, decentrally expandable



Low Voltage Apparatus

ABB Procontic T200

A high-performance member of the ABB Procontic family

A high-performance member of the ABB Procontic family

Centralized systems
Remote systems

Networking with PROFIBUS,
ABB Procontic T200 bus ZB20,
ABB Procontic field bus ZB10

Details for practice
Efficient diagnostics

Programming
Program display

Structured programming
Operation and monitoring

Module racks, Power supply units
Central units, program memories

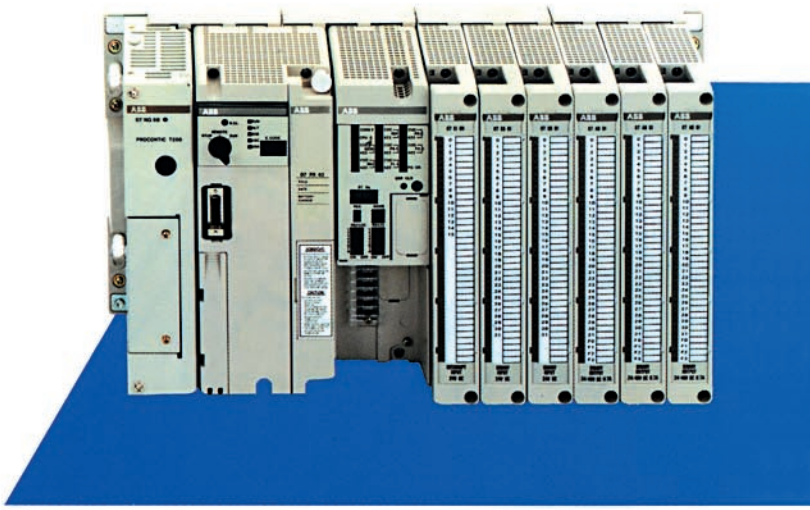
Connection to the process

Equipment for station expansion and networking
Interface equipment, pre-processors

System data
Accessories

The ABB Procontic T200 automation system is a modular control system that largely satisfies the requirements of today and tomorrow.

Thanks to its rack based architecture and wide range of modules, the ABB Procontic T200 can be assembled to suit most any application.



The simple handling and planning of the system saves time and money.

ABB Procontic T200 programming software is IBM-compatible and provides efficient process display, PLC operation, and connection to field buses.

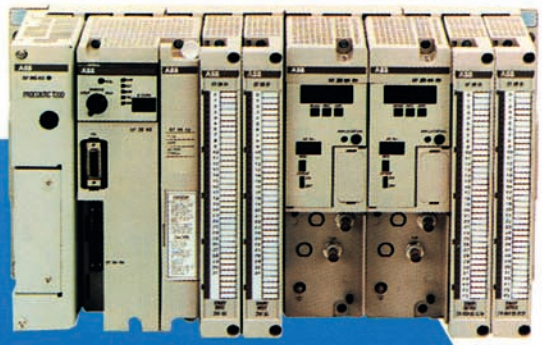
ABB Procontic systems are designed for heavy-duty industrial operation and are distinguished by their resistance to interference (EMC). Extensive diagnostic functions of the ABB Procontic T200 simplify commissioning and troubleshooting of the system.

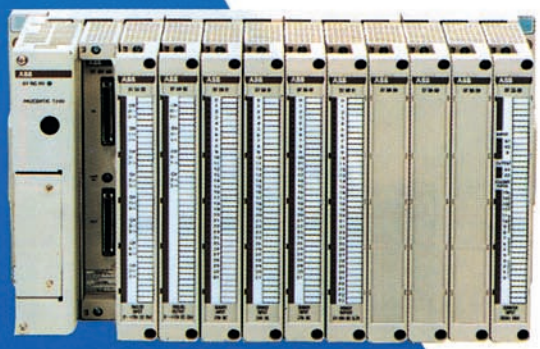
Efficient and easy-to-program serial bus systems connect separately located stations

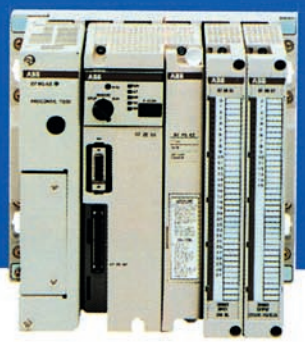
- The ABB Procontic field bus, ZB10, exchanges process data with the other ABB Procontic systems.

ABB Procontic T200

A high-performance member of the ABB Procontic family







An ABB Procontic T200 control consists, in its simplest form, of a module rack, a central unit, program memory, an input module, an output module, and a power supply unit.

Expansion module racks provide ample room for further input and output devices. Four central units classified according to their expandability and a series of pre-processors and interface equipment enable optimum adaptation of the ABB Procontic T200 to the respective control task. The T200 can be configured centrally (in the immediate vicinity) or decentrally.

Equipment overview

- 4 central units per rack, T200 offers a choice of 4 central units graduated in performance with the same instruction set
- RAM and EPROM memories with different memory capacities
- 3 basic module racks in 2, 5 and 8 slot configurations
- 3 expansion module racks with 4, 7 or 10 I/O slots
- Descrete input and output devices available in common voltages
- Analog input and output devices for voltage and current
- Input devices for temperatures
- Interrupt input device, fast counter, positioning device
- Modules for central and decentral coupling of expansion module racks
- Interface equipment
- Couplers for the ABB Procontic field bus ZB10, ABB Procontic T200 bus ZB20, and PROFIBUS
- High-performance industrial computer

- The ABB Procontic T200 bus ZB20 is designed specially for data exchange between ABB Procontic T200 stations, transporting parameters, and downloading programs.
- Serial interfaces on the communication processor are also available for transfer of programs and signal states to an operating station.

ABB Procontic T200

Centralized Systems

The ABB Procontic T200 with a number of subracks and its central unit can be suited to any application within wide limits.

Smallest System

- Basic rack with central unit 07 ZE 60 and 2, 5 or 8 peripheral slots

Medium System

- Basic rack with central unit 07 ZE 61 and 2, 5 or 8 peripheral slots
- Expansion rack with 4, 7 or 10 peripheral slots

This makes a maximum of 18 peripheral slots

Maximum System

- Basic rack with central unit 07 ZE 62 or 07 ZE 63 and 2, 5 or 8 peripheral slots
- up to 5 racks for central I/O expansion with 4, 7 or 10 peripheral slots each

This makes a maximum of 58 peripheral slots

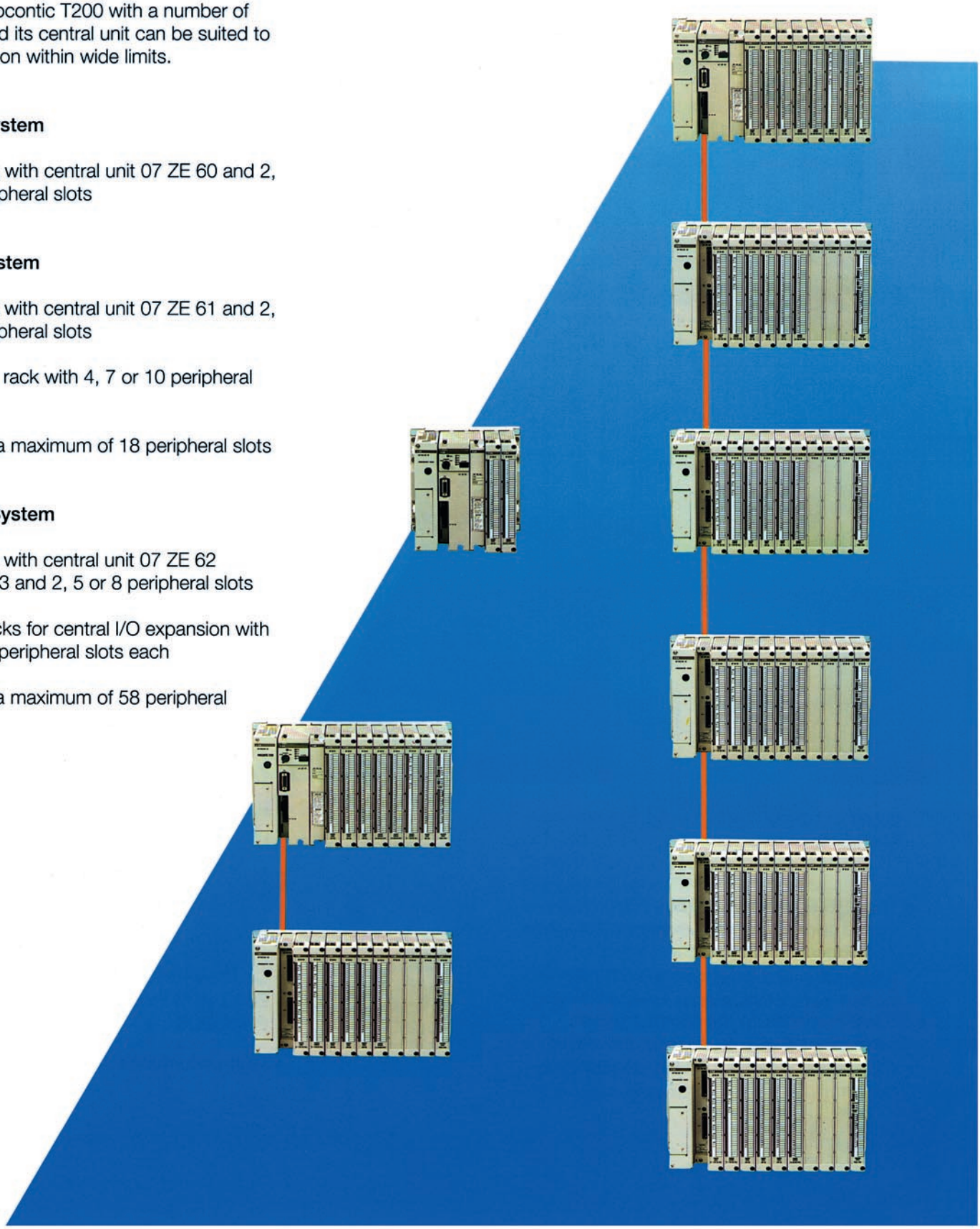
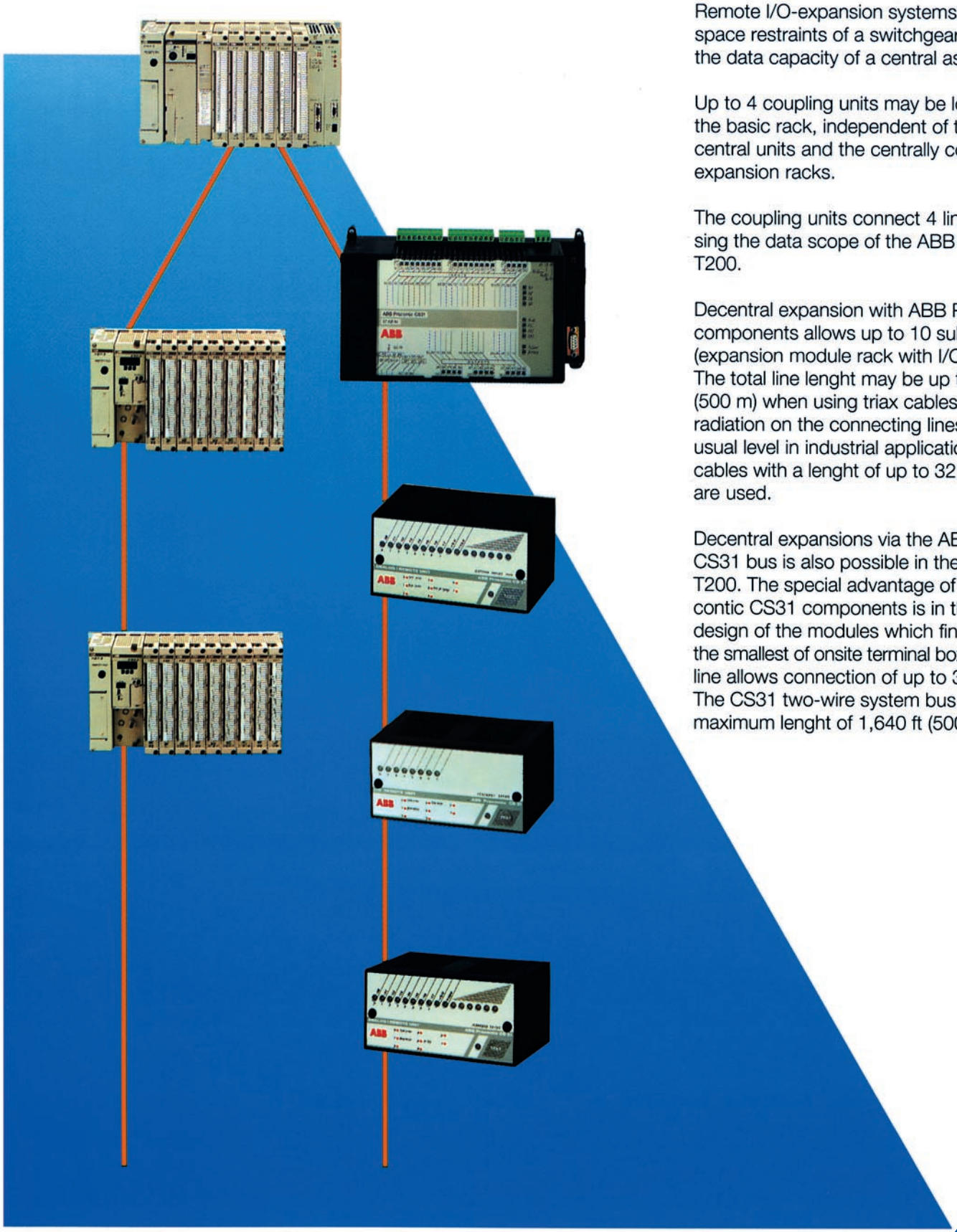


ABB Procontic T200

Remote Systems



Remote I/O-expansion systems overcome the space restraints of a switchgear cabinet, and of the data capacity of a central assembly.

Up to 4 coupling units may be located within the basic rack, independent of the type of central units and the centrally connected expansion racks.

The coupling units connect 4 lines, thus increasing the data scope of the ABB Procontic T200.

Decentral expansion with ABB Procontic T200 components allows up to 10 substations (expansion module rack with I/O units per line). The total line lenght may be up to 1,640 ft (500 m) when using triax cables. If the spurious radiation on the connecting lines is above the usual level in industrial applications, fibre optic cables with a lenght of up to 32,800 ft (10 km) are used.

Decentral expansions via the ABB Procontic CS31 bus is also possible in the ABB Procontic T200. The special advantage of the ABB Procontic CS31 components is in the compact design of the modules which find room even in the smallest of onsite terminal boxes. Every CS31 line allows connection of up to 31 modules. The CS31 two-wire system bus may reach a maximum lenght of 1,640 ft (500 m).

ABB Procontic T200

Networking with ABB Procontic T200 bus ZB20, ABB Procontic field bus ZB10, PROFIBUS

Automatic control systems today require flexible networks. ABB networks individual parts of a production plant with each cell having their own intelligent processing units. There is a choice of two robust serial buses for networking: the ZB20 bus and the ZB10 field bus. The ZB20 bus supports the capabilities of the ABB Procontic T200 system whereas the ZB10 field bus connects other ABB Procontic systems.

The ZB20 bus connects up to 64 T200 stations of the automatic control system. Each one of these stations can be fully expanded centrally and decentrally. The distance between the stations may be up to 1,640 ft (500 m) when using triax cables. Every station can include 2 couplers providing connectivity with two different bus systems for a total distance of 3,280 ft (1000 m). Fiber optic media is also available for industrial applications that require high noise immunity. Maximum distance for fiber optic is 32,800 ft (10 km)

ZB20 bus offers high performance as well as data integrity. Throughput can range from 50 ms for small data volume and up to 400 ms for full expansion (with 2,048 bytes).

The ZB20 station addresses are conveniently set during creation of the user program.

The ABB Procontic T200 ZB20 bus features program transfer with parameters in addition to processing data. A programming device, connected anywhere in the automation system, offers insight into the user programs of all central units, with all the appropriate functions (for example down line loading).

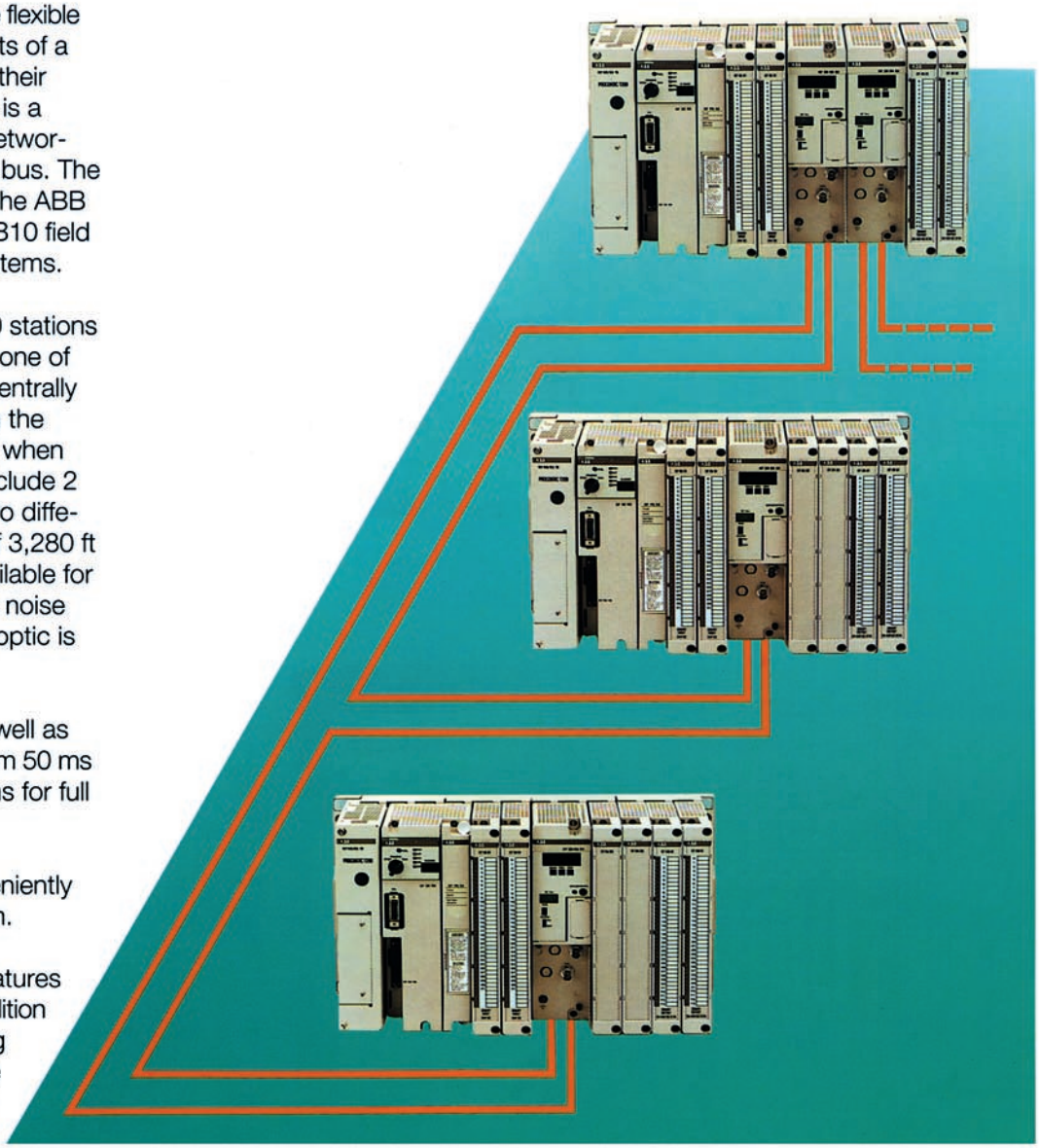
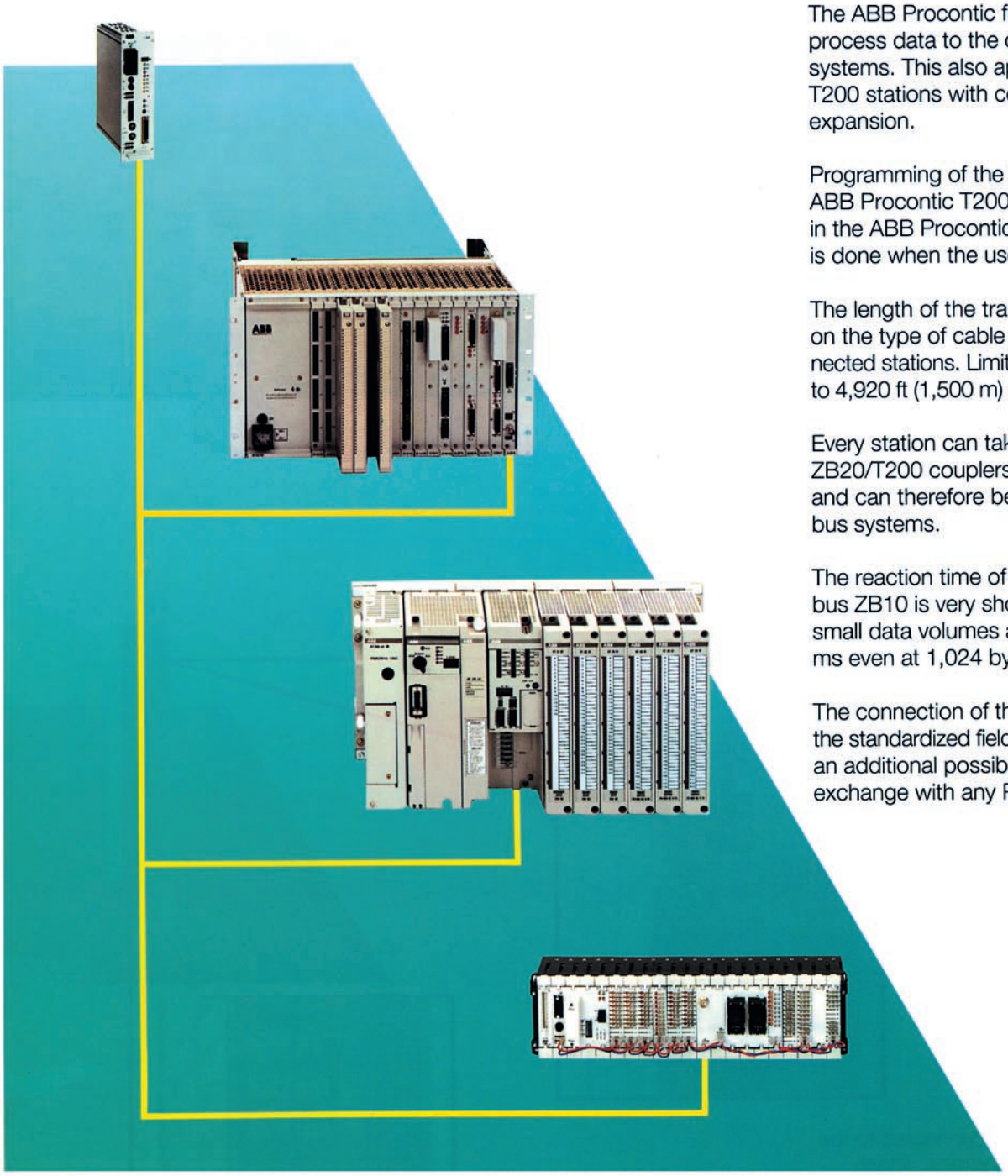


ABB Procontic T200

Networking with ABB Procontic T200 bus ZB20, ABB Procontic field bus ZB10, PROFIBUS



The ABB Procontic field bus ZB10 transfers process data to the other ABB Procontic systems. This also applies to ABB Procontic T200 stations with central and decentral expansion.

Programming of the ZB10 connections in the ABB Procontic T200 station is just as easy as in the ABB Procontic T200 bus ZB20 and is done when the user program is created.

The length of the transmission cable depends on the type of cable and the number of connected stations. Limit values are 1,640 ft (500 m) to 4,920 ft (1,500 m) and 10 to 50 connections.

Every station can take - alternatively to the ZB20/T200 couplers - up to 2 coupling devices and can therefore be connected to separate bus systems.

The reaction time of the ABB Procontic field bus ZB10 is very short. It is below 10 ms for small data volumes and still stays below 300 ms even at 1,024 bytes.

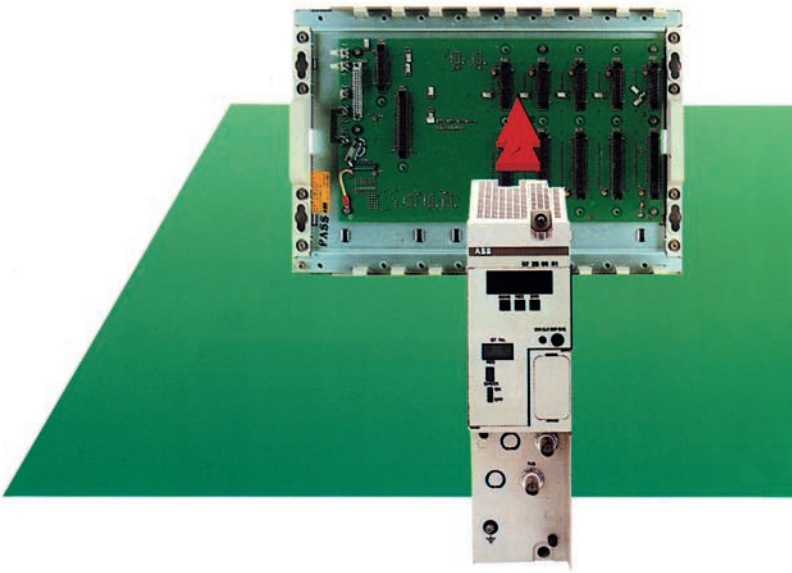
The connection of the ABB Procontic T200 to the standardized field bus PROFIBUS represents an additional possibility of networking for data exchange with any PROFIBUS subscribers.

ABB Procontic T200

Details for Practice

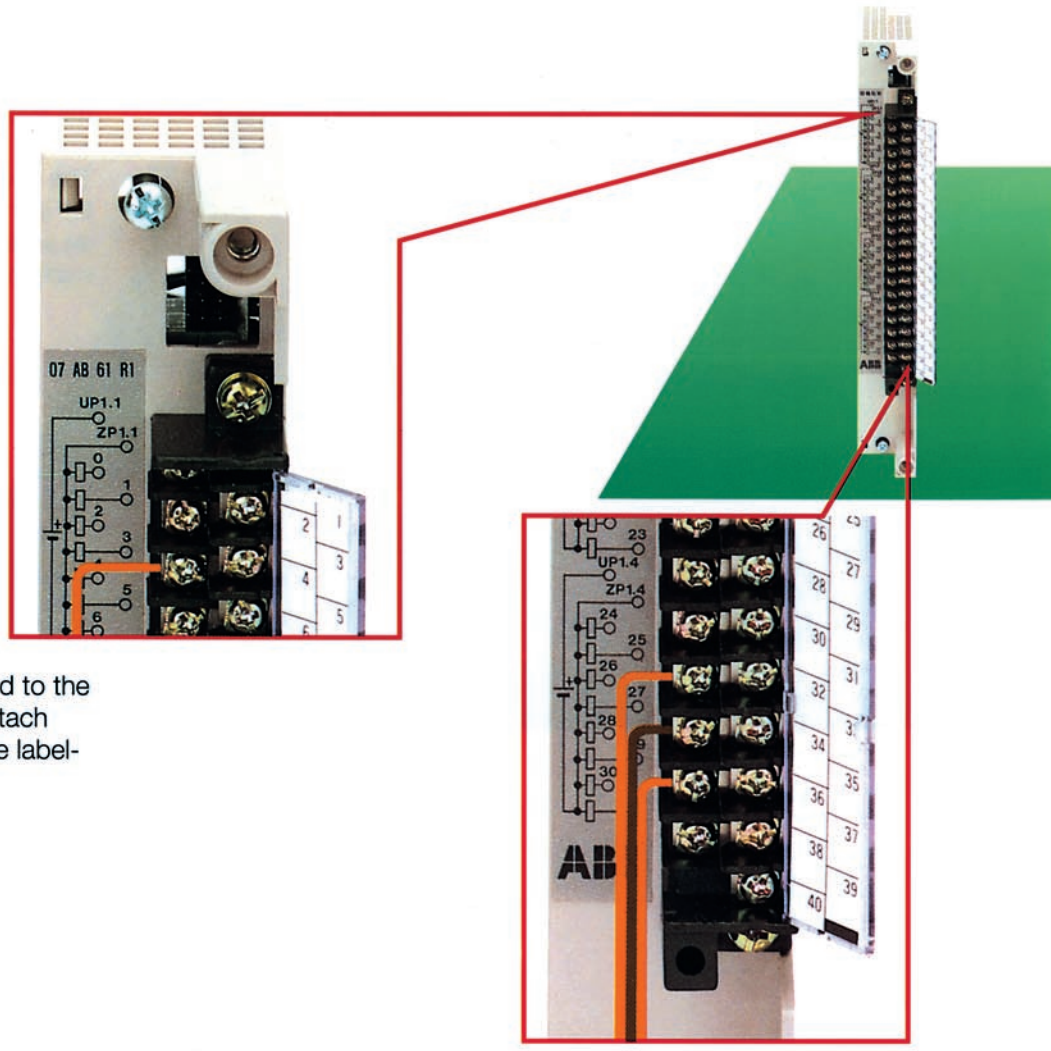
Easy handling is what distinguishes the assembly and connection technology of the ABB Procontic T200 and thus reduces costs and time.

Simple assembly of plug-in modules:
Insert the module, screw tight.



Connect the wires as shown in the connection plan. 2 wires per terminal are no problem.

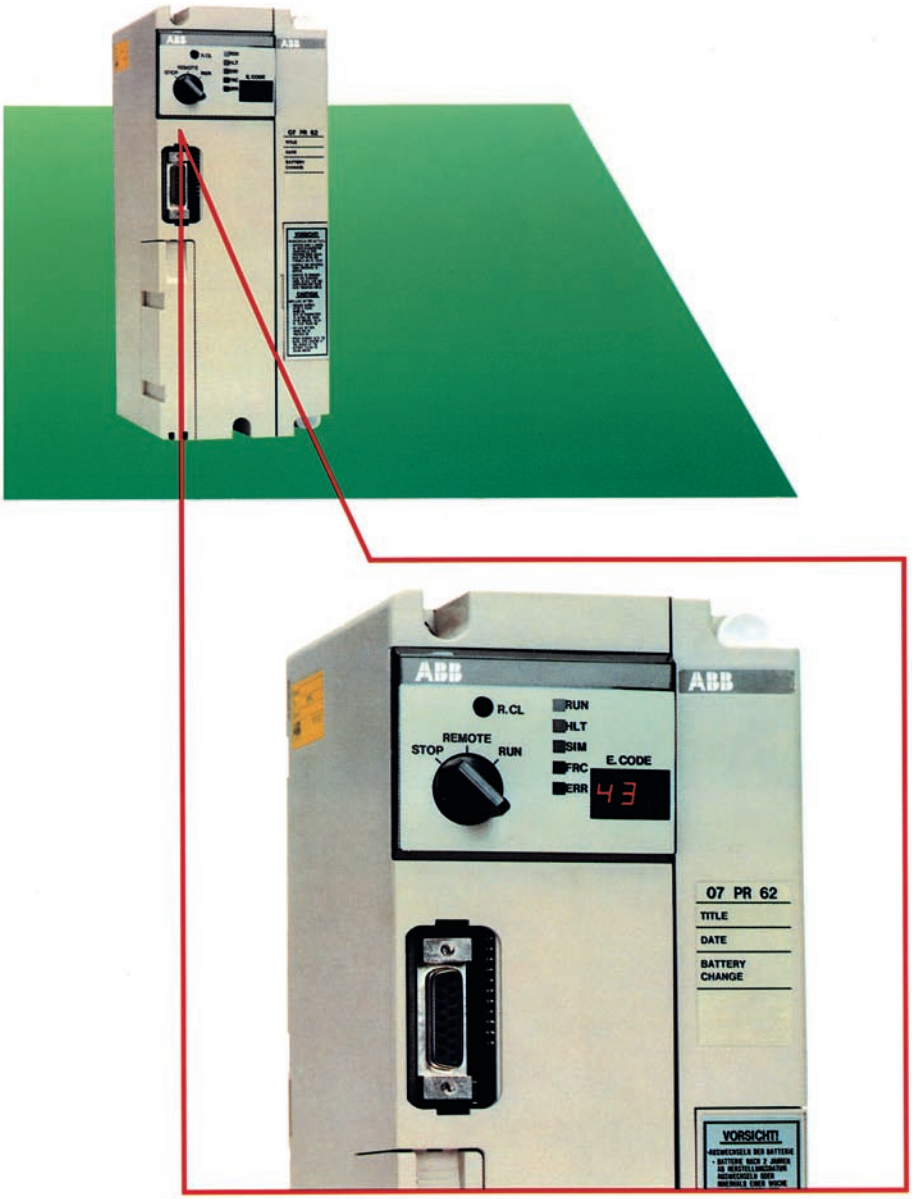
Pull out the front connector if necessary for easier handling.



When all the wires have been connected to the terminals: fix wires with cable straps, attach front panel and screw tight. Remove the labelling plate, label it and reinsert.

ABB Procontic T200

Efficient Diagnostics



The modern automation system ABB Procontic T200 contains an efficient diagnostic without the need for extra equipment in the stations. This simplifies commissioning and trouble-shooting during operation and reduces outage times.

Examples for diagnostic functions:

- The ABB Procontic T200 diagnostic shows the user when the configuration selected by assembly does not match the configuration determined in the programming.
- It checks whether equipment and system parts are operating correctly when switching on and during operation and displays any errors.
- It reports interference on the remote connections to the user.

The two-digit display of the error code on the central unit provides a detailed overview of the errors.

If you want to find out more, you can connect a programming device and read the error register which describes the error in detail.

Depending on the detected error, the central unit decides whether the system goes into operation or is shut down.

ABB Procontic T200

Programming

A commercially available IBM-AT-compatible Personal Computer is used to program the ABB Procontic T200. The software 907 PC 332 is capable of display types **Function Block Diagram** (FBD), **Ladder Diagram** (LD) and **Instruction List** (IL).

The Personal Computer is connected to the central unit's serial interface to transport the programs. For testing and commissioning the user can interrogate the status of variables in Function Block Diagram, Ladder Diagram, and Instruction List online and change times or counter values.

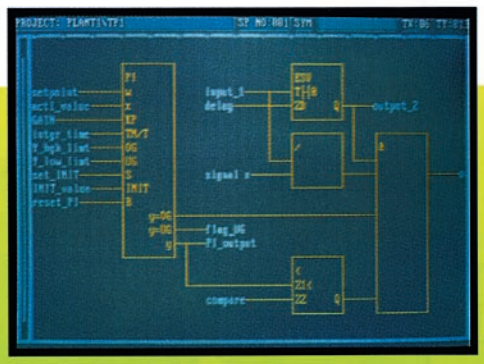
Documentation can be made by a printer. The printer outputs the program lists, symbol lists, cross reference lists, variables lists and Ladder Diagram lists belonging to the user program in the same form as displayed on the screen.

Hardware:
IBM-AT-compatible (286 on above) Personal Computer,
operating system as of MS-DOS V5.0,
serial mouse (optional).

ABB Procontic T200

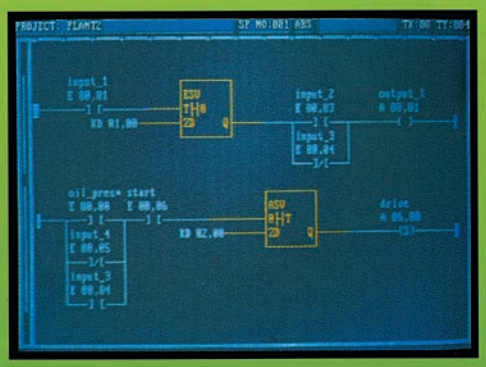
Program display

- Graphic display of links, multi-step logical processes with absolute variables (FBD, LD). FBD and LD can also be used in a combination.
- Display of program instructions with comments in text form and definition of the symbolic variables (IL).

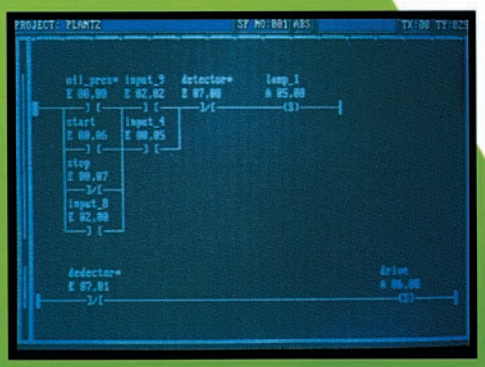


Function Block Diagram (FBD)

Instruction List (IL)



Function Block Diagram and
Ladder Diagram combined



Ladder Diagram (LD)

ABB Procontic T200

Structured Programming

Automation tasks are becoming more and more complex. As a result the programs are becoming more complex and more extensive too. Todays users require structure to assist with complex program development. ABB Procontic software includes structuring tools for program development.

Main program:

The main program is a collection of module groups. Module groups provides the users with a convenient method to organize and develop main programs. Mutiple programmers can contribute to the main program developing using module groups. Module group structure adheres to IEC standards and saves time.

Software capabilities:

The extensive instruction set includes all types of logic and arithmetic commands.

A comprehensive set of speciality function modules simplifies complex tasks. ABB is continuously expanding this catalog for the user.

The user combines related modules groups and can use them repeatedly if necessary.

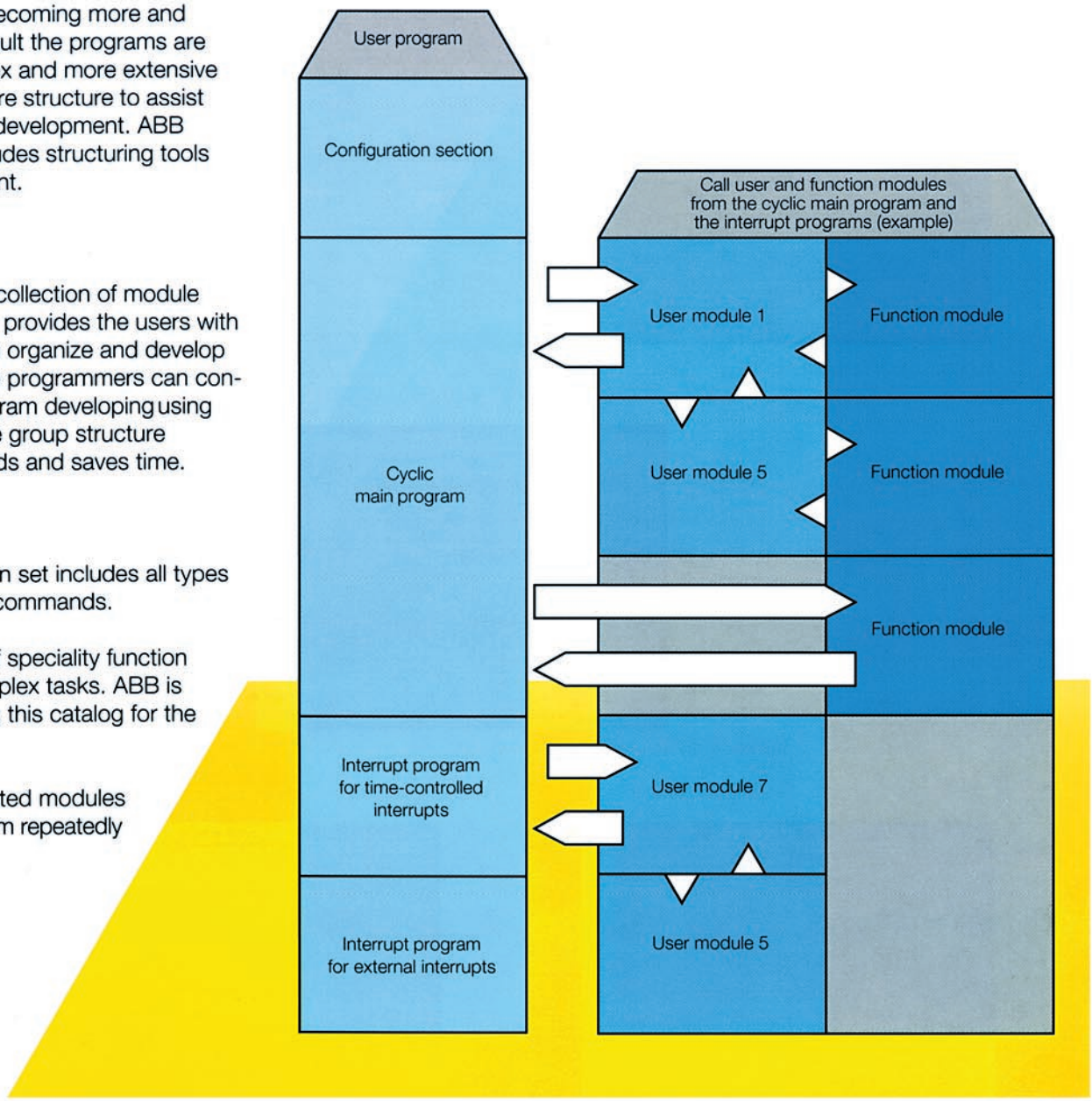
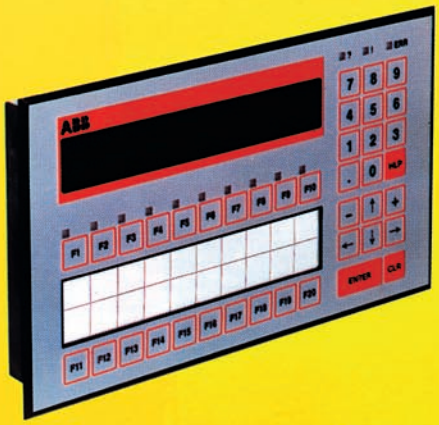


ABB Procontic T200

Operation and Monitoring



The economy of production machines depends, to a great extent, on up time. Faults must be detected, localized and displayed quickly and reliably. The menu simplifies and shortens the start-up procedure like nothing you have every seen. Efficient control units with varying capabilities are available for the ABB Procontic T200.

The hand held control unit 07 BG 60 accesses times and counter values.

The operator station 35 BS 40 offers a 40 character by two-line display. Membrane keypad with 40 keys suffices for simple applications. Up to 999 texts can be stored in the unit and displayed together with variables from the ABB Procontic family of central units.

The market offers a number of software packages for operation, monitoring and supervision. These generally have software drivers which make the connection to the ABB Procontic T200 system.

ABB Procontic T200

Module Racks, Power Supply Units

Module Racks

07 BT 60 R1
Basic module rack with slots for one central unit and 2 I/O modules

07 BE 60 R1
Expansion module rack with 4 I/O slots

07 BT 61 R1
Basic module rack with slots for one central unit and 5 I/O modules

07 BE 61 R1
Expansion module rack with 7 I/O slots

07 BT 62 R1
Basic module rack with slots for one central unit and 8 I/O modules

07 BE 62 R1
Expansion module rack with 10 I/O slots

07 BE 69 R1
Expansion module rack with 4 slots for 07 BR 60

Power supply units

07 NG 60 R1
Power supply unit 115/230 V AC for 5 V DC/2 A, 24 V DC/2 A

07 NG 61 R1
Power supply unit 115/230 V AC for 5 V DC/4 A, 24 V DC/1.5 A

07 NG 63 R1
Power supply unit 115/230 V AC for 5 V DC/9 A, 24 V DC/0.5 A (for basic module racks with 07 ZE 62 or with couplers/pre-processors).

07 NG 66 R1
Power supply unit 24 V DC for 5 V DC/4 A, 24 V DC/1.5 A

07 NG 68 R1
Power supply unit 24 V DC for 5 V DC/9 A, 24 V DC/0.5 A

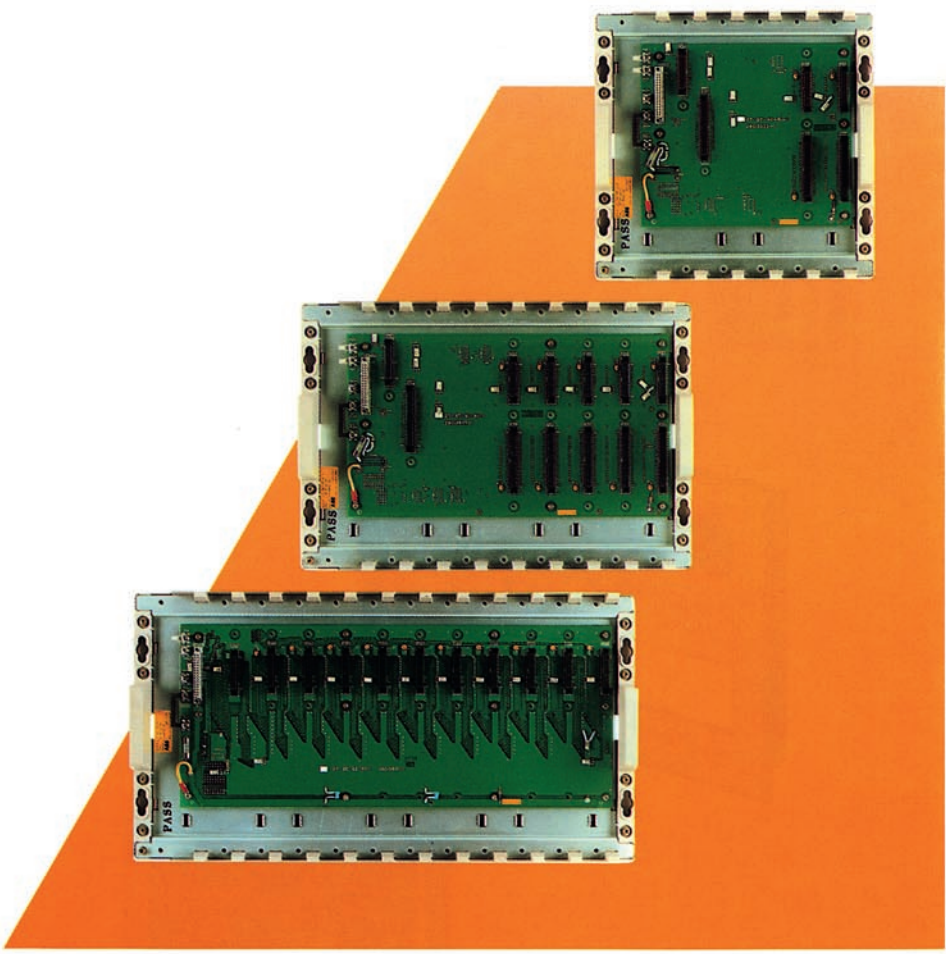
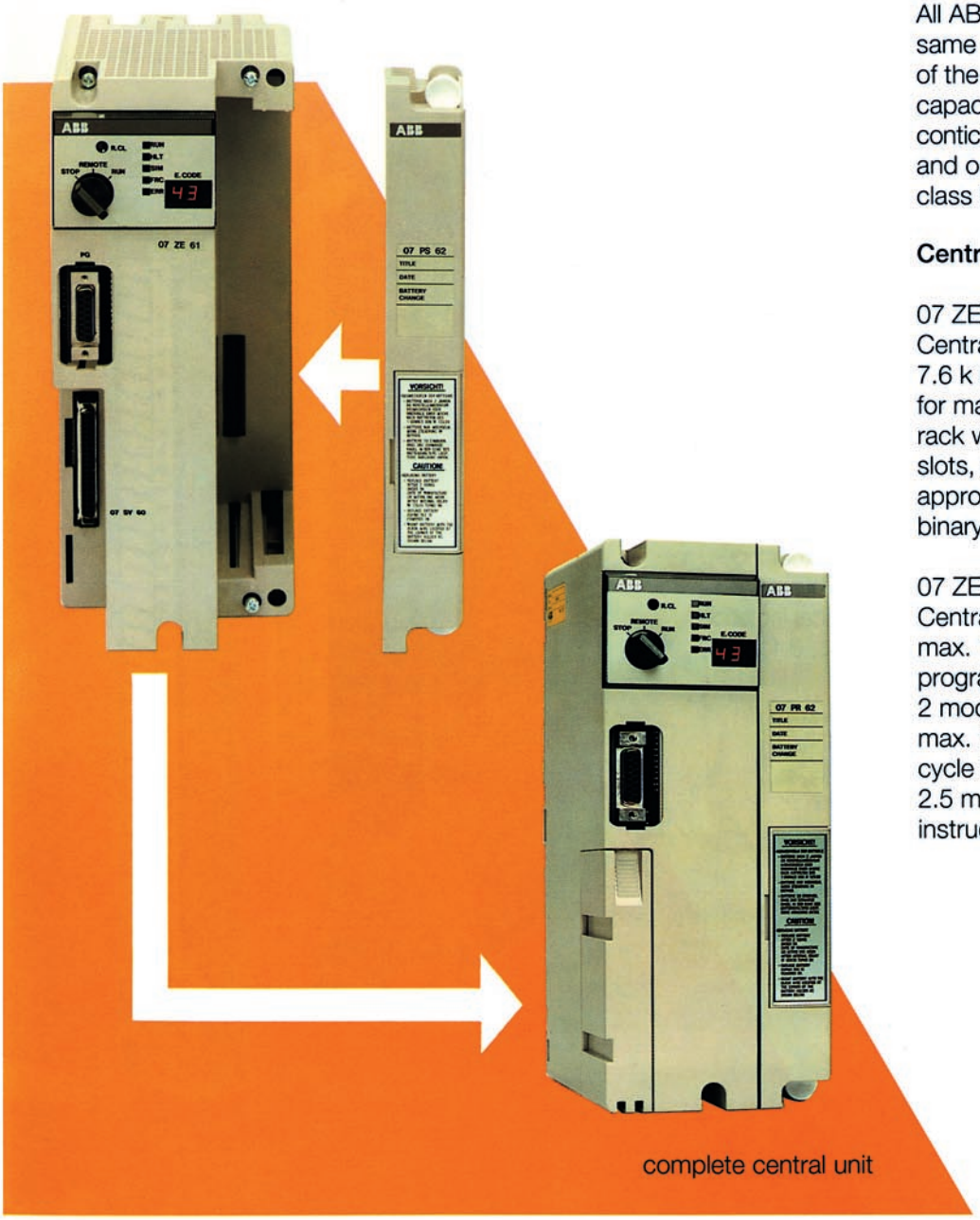


ABB Procontic T200

Central Units, Program Memories



complete central unit

All ABB Procontic T200 central units use the same instruction set; they differ only in the size of the program memory, the station expansion capacity and the operating speed. ABB Procontic T200 processors contain a realtime clock and online programming with the memories of class R3.

Central units

07 ZE 60 R302
Central unit for max. 7.6 k user program, for max. 1 module rack with max. 8 I/O slots, cycle time approx. 2.5 ms/1 k binary instruction.

07 ZE 61 R302
Central unit for max. 15.7 k user program, for max. 2 module racks with max. 18 I/O slots, cycle time approx. 2.5 ms/1 k binary instruction.

07 ZE 62 R302
Central unit for max. 48.5 k user program, for max. 6 module racks with max. 58 I/O slots, cycle time approx. 1.7 ms/1 k binary instruction.

07 ZE 63 R302
Central unit for max. 15.7 k user program, for max. 6 module racks with max. 58 I/O slots, cycle time approx. 2.5 ms/1 k binary instruction.

Program memories

07 PS 60 R2
Program memory (CMOS-RAM) for 3.5 k instructions, data memory for 2 k word flags

07 PS 61 R2/R3
Program memory (CMOS-RAM) for 7.6 k instructions, data memory for 2 k word flags

07 PS 62 R2/R3
Program memory (CMOS-RAM) for 15.7 k instructions, data memory for 16 k word flags

07 PS 63 R2/R3
Program memory (CMOS-RAM) for 48.5 k instructions, data memory for 50 k word flags

07 PR 62 R2
Program memory (EPROM) for 15.7 k instructions, data memory for 16 k word flags

07 PR 63 R2
Program memory (EPROM) for 48.5 k instructions, data memory for 50 k word flags

ABB Procontic T200

Connection to the Process

Binary input devices

07 EB 60 R1
Binary input device
24 V AC/DC, electrical isolation, 16-fold

07 EB 61 R1
Binary input device
24 V AC/DC, electrical isolation, 32-fold

07 EB 62 R1
Fast binary input device 24 V DC, electrical isolation, 32-fold

07 EB 63 R1
Binary input device
48 V AC/DC, electrical isolation, 16-fold

07 EB 64 R1
Binary input device
48 V AC/DC, electrical isolation, 32-fold

07 EB 66 R1
Binary input device
115 V AC, electrical isolation, 16-fold

07 EB 67 R1
Binary input device
230 V AC, electrical isolation, 16-fold

Analog input devices

07 EA 60 R1
Analog input device
0 ... 10 V, electrical isolation, 8 bits, 8-fold

07 EA 61 R1
Analog input device
4 ... 20 mA, electrical isolation, 8 bits, 8-fold

07 EA 62 R1
Analog input device
-10 ... +10 V, electrical isolation, 12 bits, 8-fold

07 EA 63 R1
Analog input device
4 ... 20 mA, electrical isolation, 12 bits, 8-fold

07 EA 64 R1
Analog input device
0 ... 20 mA, electrical isolation, 8 bits, 8-fold

07 EA 65 R1
Analog input device
0 ... 20 mA, electrical isolation, 12 bits, 8-fold

07 EA 66 R1
Temperature input device Pt100
- 50 ... +400 °C, electrical isolation, 12 bits, 8-fold

07 EA 67 R1
Temperature input device thermoelement
0 ... 1600 °C, electrical isolation, 12 bits, 8-fold

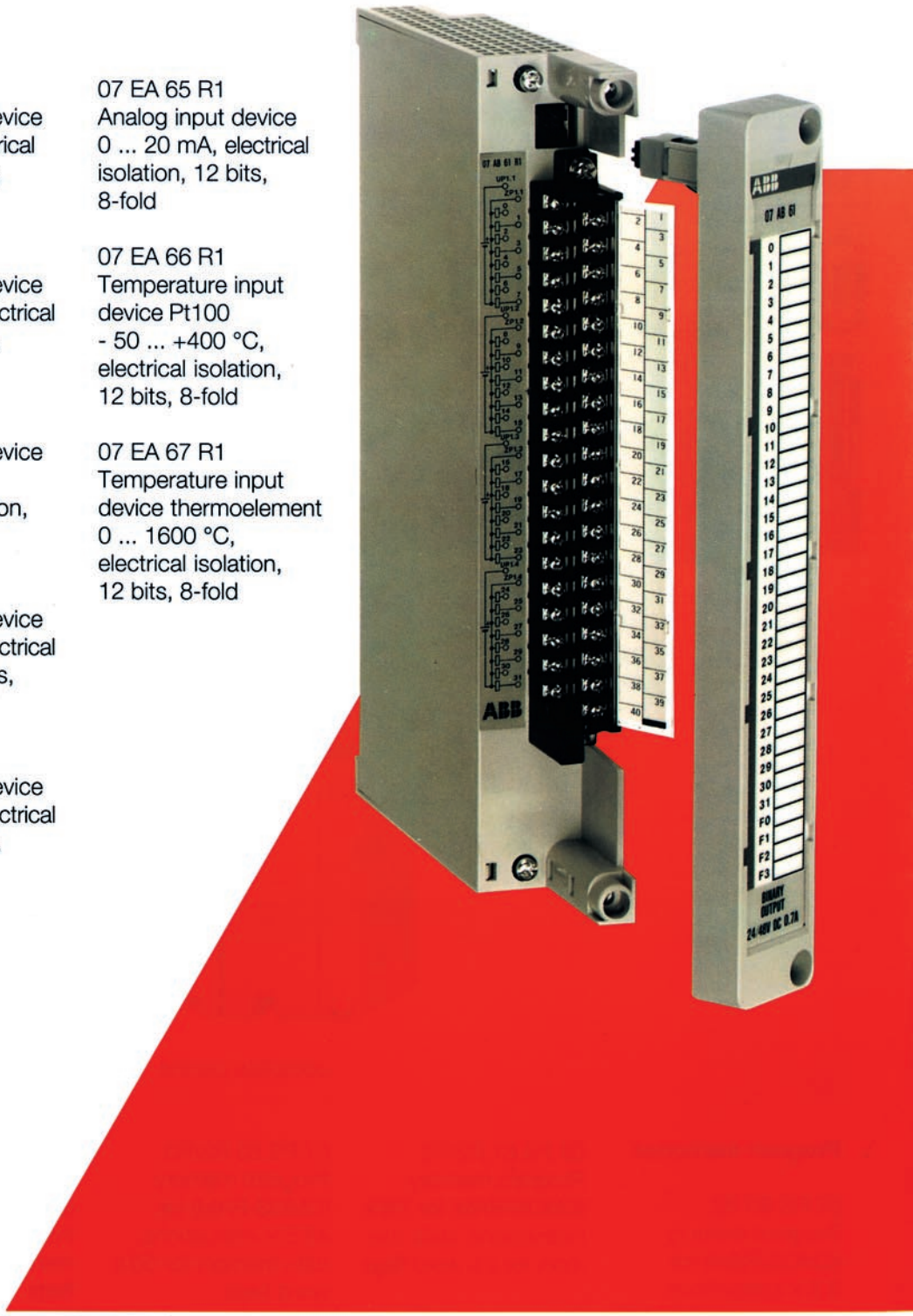
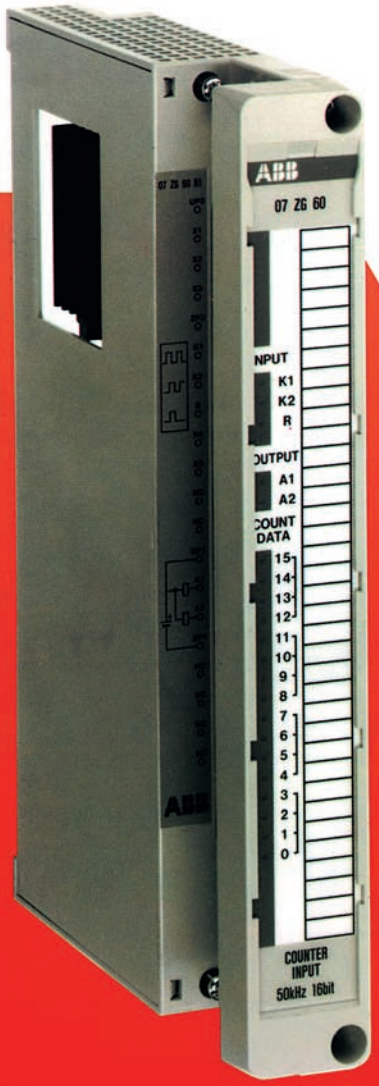


ABB Procontic T200

Connection to the Process



Special input devices

07 EI 60 R1
Interrupt input device
24 V DC, electrical isolation, 16 interrupt channels

07 ZG 60 R1
Fast counter
1-fold, 16 bits, 50 kHz

Binary output devices

07 AB 60 R1
Binary output device, transistor outputs, 24/48 V DC, 2 A, electrical isolation, 16-fold

07 AB 61 R1
Binary output device, transistor outputs, 24/48 V DC, 500 mA, electrical isolation, 32-fold

07 AB 62 R1
Binary output device, transistor outputs, 24 V DC, 2 A, short-circuit-proof, electrical isolation, 16-fold

07 AB 63 R1
Binary output device, transistor outputs, 24 V DC, 0.5 A, short-circuit-proof, electrical isolation, 32-fold

07 AB 67 R1
Binary output device, relay outputs, 240 V AC/24 V DC, electrical isolation, 16-fold

Analog output devices

07 AA 60 R1
Analog output device 0 ... 10 V, 8 bits, electrical isolation, 4-fold

07 AA 61 R1
Analog output device 4 ... 20 mA, 8 bits, electrical isolation, 4-fold

07 AA 62 R1
Analog output device -10 ... +10 V, 12 bits, electrical isolation, 4-fold

07 AA 63 R1
Analog output device 4 ... 20 mA, 12 bits, electrical isolation, 4-fold

07 AA 65 R1
Analog output device 0 ... 20 mA, 8 bits, electrical isolation, 4-fold

ABB Procontic T200

Equipment for Station Expansion and Networking

07 BV 60 R1
Bus link for central I/O expansion on bus link slot in the expansion module rack (not required in the basic module rack)

07 BR 60 R1
Decentral I/O coupler with triax cable for max. 512 I/O. 2 slots in the basic module rack of the central station.

07 BR 60 R2
Decentral I/O coupler with optic fibre for max. 512 I/O. 2 slots in the basic module rack of the central station.

07 BR 61 R1
Decentral I/O coupler with triax cable for sub-station. 1 additional I/O slot in decentral module rack.

07 BR 61 R2
Decentral I/O coupler with optic fibre for sub-station. 1 additional I/O slot in the decentral module rack.

07 ZB 60 R1
Coupler for connection to ABB Procontic field bus ZB10. 2 slots in the basic module rack.

07 ZB 69 R1
Coupler with triax cable for connection to ZB20 bus. 2 slots in the basic module rack.

07 ZB 69 R2
Coupler with optic fibre for connection to ZB20 bus. 2 slots in the basic module rack.

07 CS 61 R101
Coupler to the system bus ABB Procontic CS31.

ABB Procontic T200

Interface Equipment, Pre-processors

07 KP 60 R1
Communication processor with RS-232 and RS-422 interface. The device communicates with external computers through a defined protocol. 2 slots in the basic module rack.

07 KP 62 R101
Communication processor with 2 interfaces RS-232 for connecting devices with ASCII interface. (Freely definable message structure and protocol).

07 KP 64 R101
Communication processor with 2 interfaces RS-232 for communicating through the RCOM protocol.

07 PO 60 R1
Positioning device with microprocessor for 5 V/ 15 V increment encoder for one axis, with analog setpoint output. The control unit 35 AB 50 is used for entering and displaying programs. 2 slots.

07 IR 60 R1
Industrial Computer Basic with 3 interfaces RS-232. High-performance realtime computer with 16 tasks. Memory capacity 115 kbyte. Programming with IBM-compatible Personal Computer with easy to use software. 3 slots in the basic module rack.

Central units	07 ZE 60	07 ZE 61	07 ZE 62	07 ZE 63
Program memory (maximum expansion) Double words (32 bits), RAM/EPROM	7.6 k	15.7 k	48.5 k	15.7 k
Timers Counters	256 with timebase 10 ms, 100 ms, 1 s 256 with counting range 00000 to 65,535			
Interrupt module Arithmetic Number of control instructions	1 device with 16 channels add, subtract, multiply, divide, integer with sign, +/-32,767 58 + function modules for complex commands			
Cycle times 1 k binary instructions 1 k (65% binary, 35% word)	 approx. 2,5 ms approx. 12 ms	 approx. 2,5 ms approx. 12 ms	 approx. 1,7 ms approx. 6,8 ms	 approx. 2,5 ms approx. 12 ms
Serial interface Bus systems	RS-232, RS-422 ABB Procontic field bus ZB10, ABB Procontic T200 bus ZB20, PROFIBUS			
Local I/O capacity Number of racks Number of slots for I/O devices Number of bits (1 binary value = 1 bit, 1 analog value = 16 bits) Number of binary inputs/outputs Number of analog inputs Number of analog outputs	 1 8 1024 256 64 32	 2 18 2304 576 144 72	 6 58 4096 1856 256 232	 6 58 4096 1856 256 232
Remote I/O capacity Total number of bits (1 binary value = 1 bit, 1 analog value = 16 bits) Number of lines Number of bits per line Number of racks per line	 2048 (with ABB Procontic CS31: 4096) 4 512 (with ABB Procontic CS31: 1024) 10 (with ABB Procontic CS31: 31)			
Binary inputs/outputs Number of inputs/outputs per device Number of inputs Number of outputs Electrical isolation	 16 and 32 24 VAC/DC, 48 VAC/DC, 115 VAC, 230 VAC 24 VDC 0.5...2 A, 48 VDC 0.5...2 A, 240 VAC / 24 VDC, relay 2A yes			
Analog inputs/outputs Number of inputs per device Type of inputs Number of outputs per device Type of outputs Resolution Electrical isolation	 8 0...10 V, ± 10 V, 4...20 mA, 0...20 mA, Pt100, thermoelement 4 0...10 V, ± 10 V, 4...20 mA 8 bits, 12 bits yes			
Supply voltage	24 VDC, 115 VAC, 230 VAC; 150 VA			
Environmental	0...55°C in operation -25...+75°C out of operation humidity class F operation without fan			
Mechanical structure	flat module rack for screwing to plates or in 19" frame encapsulated devices			
Terminal connection	Screw terminals			

ABB Procontic T200

Important Accessories

07 BA 60 R1
Empty casing for unused slots

07 SV 60 R1
System connecting cable for central I/O expansion between the central unit and the expansion module rack (cable length 1.640 ft / 500 mm)

07 SV 61 R1
System connecting cable for central I/O expansion between two expansion module racks (cable length 1.640 ft / 500 mm)

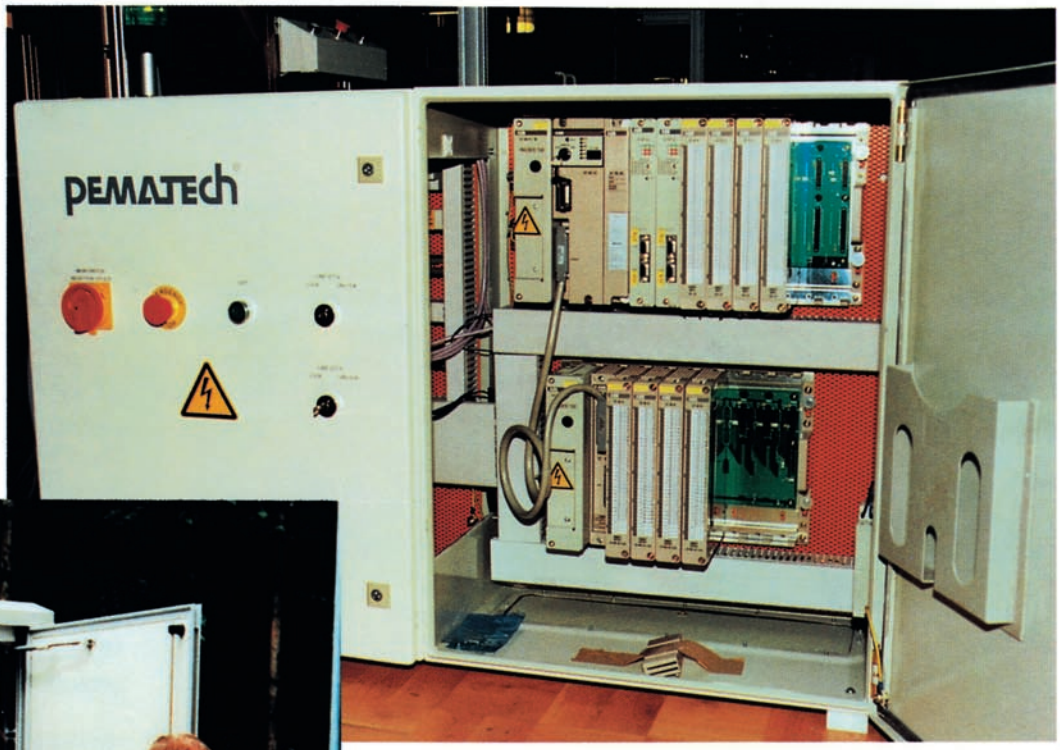
07 SK 60 R2
Interface cable for connecting the data interface of a central unit to the control unit 07 BG 60 (cable length 6.5 ft / 2 m)

07 SK 61 R1
Interface cable for serial data transfer for connecting the programming device, SUB-D plug: socket 25-pole, pins 15-pole

07 SK 62 R1
Interface cable for serial data transfer for connecting the programming device, SUB-D plug: socket 9-pole, pins 15-pole

07 SK 63
Interface cable for serial data transfer for connecting the industrial computer basic 07 IR 60

07 SK 65
Interface cable for serial data transfer for connecting the positioning device 07 PO 60



On the machine:
Control of a fully-automatic PCB testing system with ABB Procontic T200

On site:
Control of sludge in a sewage works with ABB Procontic T200

Publication No. GATS 121401 R2003 Printed in the Federal Republic of Germany (07.96 · 5 · At)

ABB STOTZ-KONTAKT GmbH
P. O. Box 10 16 80
69006 Heidelberg
Germany
Telephone: ++49 (0) 62 21 / 701-0
Telefax: ++49 (0) 62 21 / 701-729
Email: desst.info@de.abb.com
http://www.abb.de/stotz-kontakt

ABB Global Contact Directory

The ABB Contact Directory (http://www.abb.com/contacts/) helps you find local contacts for ABB products in your country. Please select the relevant product group from the dropdown menu to the right or from the page.