CL200

R200P
Module description

Version 101

BOSCH
Automationstechnik

CL200

R200P
Module description

1070 072 162-101 (97.10) GB

Reg. Nr. 16149-03

Discretionary charge 20.– DM

Safety Instructions and Information

Before you start working with the R200P Communication Module, we recommend that you thoroughly familarise yourself with the contents of this manual. Keep this manual in a place where it is always accessible to all users.

Standard operation

This instruction manual presents a comprehensive set of instructions and information required for the standard operation of the described products.

The products described hereunder

- were developed, manufactured, tested and documented in accordance with the relevant safety standards. In standard operation, and provided that the specifications and safety instructions relating to the project phase, installation and correct operation of the product are followed, there should arise no risk of danger to personnel or property.
- are certified to be in full compliance with the guidelines on electromagnetic compatibility (89/336/EWG, 93/68/EWG and 93/44/EWG). Specific compliance with harmonized standards EN 50081-2 and EN 50082-2 is hereby certified.
- are designed for operation in an industrial environment. Prior to the intended installation and/or operation within a private residence or business area, on retail premises or in a small-industry setting, the user will be required to obtain a single operating license issued by the appropriate national authority or approval body. In Germany, this is the Federal Institute for Posts and Telecommunications, and/or its local branch offices.

Qualified personnel

This instruction manual is designed for specially trained PLC personnel. The relevant requirements are based on the job specifications as outlined by the German Electrical and Electronics Manufacturers Association (ZVEI). Please refer to the following German-language publication:
Weiterbildung in der Automatisierungstechnik
Hrsg.: ZVEI und VDMA
MaschinenbauVerlag
Postfach 71 08 64
60498 Frankfurt

This instruction manual is specifically designed for trained PLC personnel.

Interventions in the hardware and software of our products which are not described in this instruction manual may only be performed by our skilled personnel.

Unqualified interventions in the hardware or software or non-compliance with the warnings listed in this instruction manual or indicated on the product may result in serious personal injury or damage to property.

Qualified personnel are persons who

- as **planning personnel**, are familiar with the safety guidelines used in electrical engineering and automation technology.
- as **operating personnel**, are familiar with the equipment used in the field of automation technology and are thus familiar with the operating instructions in this manual.
- as **commissioning personnel**, are authorized to commission, ground and classify electric circuits and devices/systems in accordance with the relevant safety standards.

Safety instructions on the control components

The following warnings and notices may be indicated on the control components themselves and have the following meaning:


Danger: High voltage!


Danger: Battery acid!


Electrostatically sensitive components!


Disconnect mains before opening!


Pin for connecting PE conductor only!


This connection for functional earthing or low-noise earth only!


For screened conductor only!

Safety instructions in this manual

These symbols are used throughout this manual subject to the following conditions.

DANGER

This symbol is used to warn of the presence of **dangerous electrical current.** Insufficient or lacking compliance with these instructions can result in **personal injury.**

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all the official EC languages.

DANGER

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **personal injury**.

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all the official EC languages.

CAUTION

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **damage to equipment or files**.

Safety instructions accompanied by this symbol are serially numbered, for example 0.1. The appendix provides translations of the safety notes shown here in all official EC languages.

☞

This symbol is used to inform the user of special features.

☞

We would greatly appreciate any contributions toward the continuous improvement of this manual. If you have any suggestions, please fill out and return the page provided at the end of this manual.

Safety Instructions

DANGER

0.1

Danger to persons and equipment!

Test every new program before operating the system!

CAUTION

0.2

Danger to the module!

Do not insert or remove the module while the controller is switched ON! This may destroy the module. Prior to inserting or removing the module, switch OFF or remove the power supply module of the controller, external power supply and signal voltage!

CAUTION

0.3

Danger to the module!

All ESD protection measures must be observed when using the module! Prevent electrostatic discharges!

Observe the following protective measures for electrostatically endangered modules (EEM)!

- The employees responsible for the storage, transport and handling must be trained in ESD protection.
- EEMs must be stored and transported in the protective packaging specified.
- EEMs may basically only be handled at special ESD work places set up specifically for this purpose.
- Employees, work surfaces and all devices and tools, which could come into contact with EEMs must be same potential (e.g. earthed).
- Wear an approved earthing strap around your wrist. The grounding bracelet must be connected via a cable with integrated 1 MΩ resistance with the work surface.
- EEMs may on no account come into contact with chargeable objects, these include most plastics.
- When inserting EEMs into devices and removing them, the power source of the device must be switched off.

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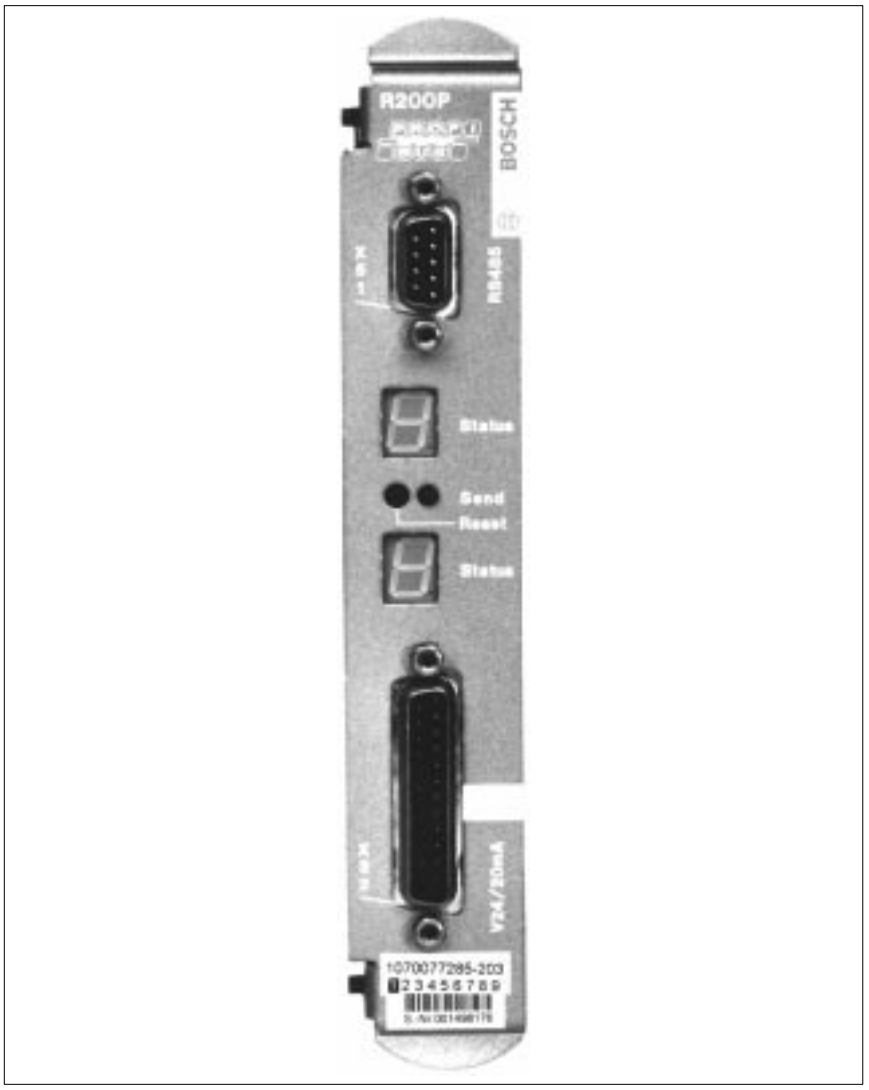

Fig. 1–1 R200P

The R200P module facilitates the interconnection of the CL200 control unit with other types of Bosch-proprietary controllers or other intelligent devices.

The R200P features a female DB-9 PROFIBUS connection for connecting the CL200 control unit to other communication devices that support the PROFIBUS protocol, as per DIN EN 50170.

For direct point-to-point connections, the R200P provides an additional V.24/20 mA combination interface.

The V.24/20 mA interface is assigned channel 0, and the PROFIBUS interface uses channel 1. Both channels can be operated simultaneously.

1.1 Front Panel

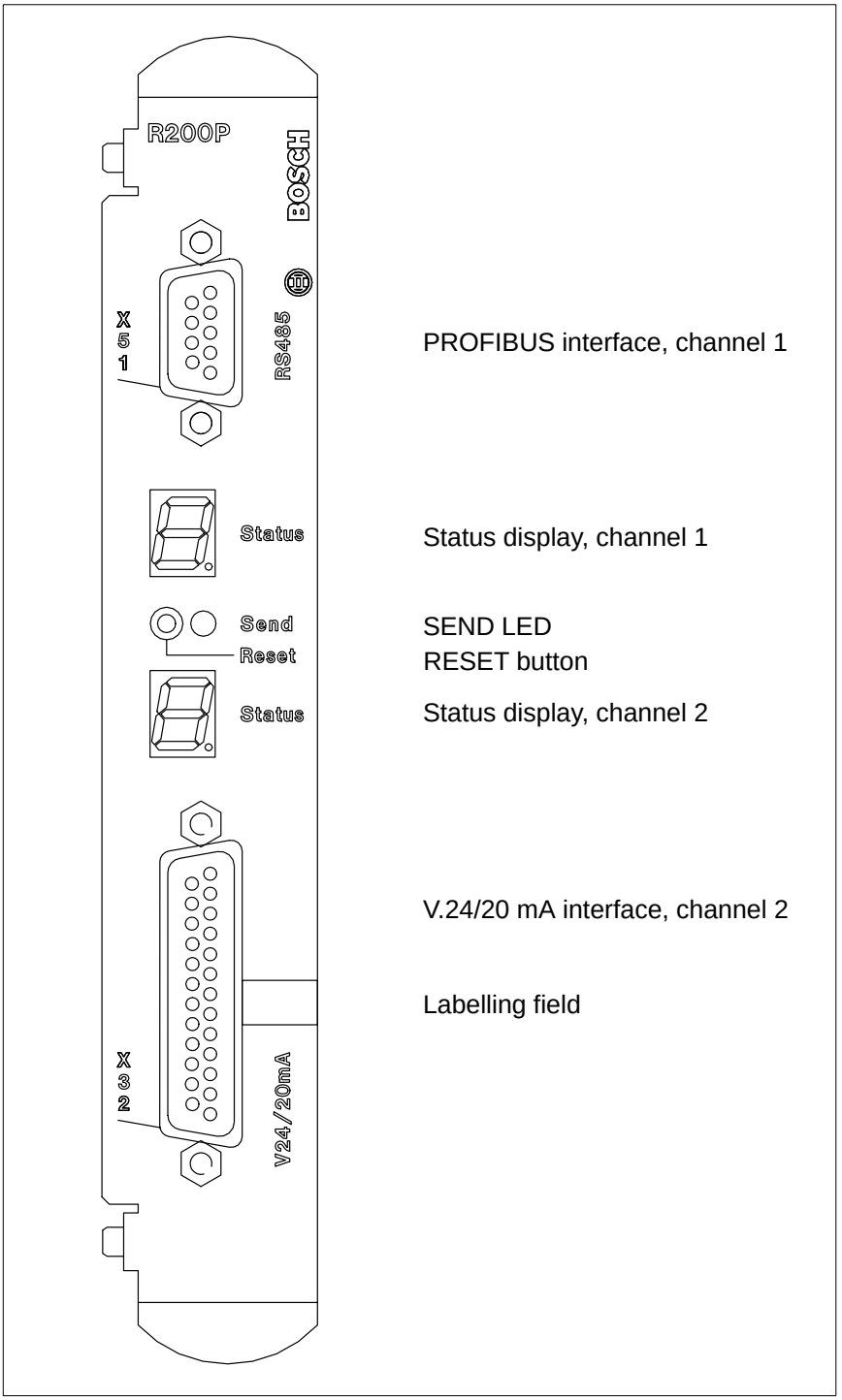

Fig. 1–2 Front Panel

1.1.1 SEND LED

The SEND LED illuminates upon transmitting a job via channel 1 of the R200P, provided that valid project ID data was included in the request.

It also illuminates when the R200P has received the Send READY signal, i.e., the token, within a logical token ring topology. In the event that no transmit requests are present, the module will hand off the token immediately. If transmit requests do exist, the transfer of the token will occur no later than after the expiry of the token hold time.

The SEND LED extinguishes upon transfer of the token.

During periods in which no transmit requests are executed, the SEND LED will merely glow darkly. However, as transmit requests are executed, the SEND LED will flash briefly because the token remains with the module for a longer time interval.

1.1.2 RESET Button

Actuating the RESET button causes the module to be returned to its default status. All requests that are currently being processed will be aborted, returned error code 3160H and PLC response 10H. In addition, the job/task list is cleared, and the PROFIBUS protocol is restarted.

A default start-up by means of the RESET button requires pressing the RESET button while switching ON the control unit, and holding the RESET button until the version ID in the status display extinguishes.

☞ **This procedure causes all established connections, objects and bus parameters to be cleared:**

- **Active tasks will be aborted without prior warning.**
- **Job queue will be deleted.**
- **STOP and CLAB requests of the module will be deleted.**

1.1.3 Status Display

A status display is provided for each of the two channels on the R200P.

Channel 1 (PROFIBUS connection) statuses are represented by the top 7-segment display.

Channel 0 (V.24/20 mA connection) statuses are indicated by the bottom 7-segment display.

The following displays are possible on the R200P:

* denotes that this 7-segment display may also show other random displays.

Bottom display	Top display	Explanation
*	U	No PROFIBUS configuration loaded.
*	.	Displays active centralized PROFIBUS task.
*	0 - F	Displays faulty or errored PROFIBUS tasks.
P	*	No protocol activated on this channel.
.	*	Displays active centralized task.
0 thru F	*	Displays faulty or errored jobs/tasks.
0,1,2	-	Three-digit error code, system fault/alarm.
0	H	Flash error
1	H	RAM fault
*	C	System fault/alarm

Fig. 1–3 Status Display

During the module start-up routine, the status displays indicate the software version used by the module. The top display shows the main version ID, with the release number appearing in the bottom display.

1.1.4 Interfaces

The R200P control unit features two interfaces. The X51 interface connection comprises the connection to a PROFIBUS network. For more information, see Section 1.3, ”PROFIBUS Interface.”

The X32 interface connection comprises the V.24/20 mA interface, a detailed description of which appears in Section 1.4, ”V.24/20 mA Interface.” This interface is used to establish direct point-to-point connections between the R200P and an external device, such as a protocol monitor (see Section 6, ”Configuration”).

1.1.5 Version ID

The version ID is used to identify the individual release versions of the module. Each version change is identified by a white dot.

1.1.6 Labelling Field

The labelling field enables the user to identify the module with an identification label that has particular significance within the context of his unique system configuration.

1.2 Slot

A maximum of 3 system modules can be operated in a CL200.

Available system modules are listed below:

- R200P
- R200

The CL200 provides slot numbers 3 through 7 in the GG3 module rack for this purpose.

CAUTION

1.1
Danger to the module!
All ESD protection measures must be observed when using the module! Prevent electrostatic discharges!

CAUTION

1.2
Danger to the module!
Do not insert or remove the module while the controller is switched ON! This may destroy the module. Prior to inserting or removing the module, switch OFF or remove the power supply module of the controller, external power supply and signal voltage!

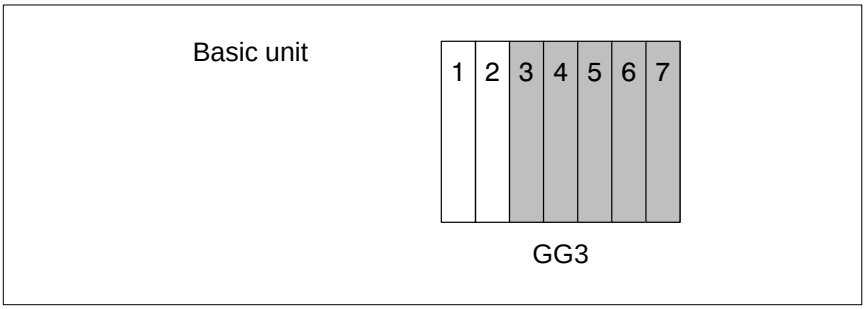

Fig. 1–4 Slots

1.3 PROFIBUS Interface

All devices conforming to the PROFIBUS standard specified in accordance with the DIN EN 50 170 standard (including devices from other manufacturers) can be connected to the PROFIBUS interface. PROFIBUS comprises an open, manufacturer-independent and standardized transmission protocol.

The designated PROFIBUS interface is potential-isolated, and permanently assigned to channel 1 of the R200P.

The hardware connector of the PROFIBUS interface, a female DB–9 connector, conforms with the DIN EN 50170 standard. It is mounted on the front panel of the R200P.

1.3.1 Pin Assignment and Connecting Cable

Pin assignment

The following pin assignment applies to both the bus cable connector and the connection on the opposite cable end:

Pin no.	RS-485	Signal	Explanation
1		unused	
2		unused	
3	B/B’	RxD/TxD-P	Receive and transmit data, P
4		RTS-P	Repeater control signal, P
5	C/C’	DGND	Reference potential, data
6		VP	Input power, positive
7		unused	
8	A/A’	RxD/TxD-N	Receive and transmit data, N
9		RTS-N	Repeater control signal, N
Housing		Shield	Shield and/or PE conductor

Fig. 1–5 PROFIBUS Pin Assignment

Connecting cable

The connecting cable to be used shall be double-shielded twisted-pair cable, order no. 1070 917 201 or 1070 917 202, as per DIN EN 50170.

Connectors

Connecting cables shall be wired via IP20 bus connectors, order no. 1070 918 538 or 1070 918 539. This connectors shall be used on line ends. At the respective line ends, the bus termination is enabled inside the connectors.

1.3.2 Transmission Speeds and Line Lengths

The data transmission over the PROFIBUS can take place at 9 different transmission speeds.

It should be noted, however, that the maximum possible line length decreases with increasing transmission speed.

Baudrate	**Maximum line length [m]**			
[kBaud]	**No Repeater**	**1 Repeater**	**2 Repeaters**	**3 Repeaters**
9.6/19.2/93.75	1200 m	2400 m	3600 m	4800 m
187.5	600 m	1200 m	1800 m	2400 m
500	200 m	400 m	600 m	800 m
1500	100 m	200 m	300 m	400 m
3000	100 m	200 m	300 m	400 m
6000	100 m	200 m	300 m	400 m
12000	100 m	200 m	300 m	400 m

Fig. 1–6 Transmission Speeds and Line Lengths

The potential difference between the DGND data reference potential of all connected devices may not exceed ± 7 V.

No equalization currents must flow across the bus cable shield connector. If applicable, the required potential equalization must be effected.

1.4 V.24/20 mA Interface

The V.24/20 mA combination interface is available on channel 0. It can be used to connect devices that are also equipped with a V.24 or 20 mA interface.

The following protocols are available:

- BUEP19E, Bosch transmission protocol
- BUEP03E, Bosch transmission protocol, free ASCII protocol
- BUEP64, Siemens 3964R transmission protocol

More detailed information appears in the manual supplied with the R200.

1.5 Required R200P Settings

The required settings must be completed prior to starting up the R200P.

CAUTION

1.3
Danger to the module!
Do not insert or remove the module while the controller is switched ON! This may destroy the module. Prior to inserting or removing the module, switch OFF or remove the power supply module of the controller, external power supply and signal voltage!

CAUTION

1.4
Danger to the module!
All ESD protection measures must be observed when using the module! Prevent electrostatic discharges!

DIP Switch	Interface	Explanation
S1	X32 V.24/20 mA	Selecting transmission format, character length, transmission speed for serial interface, and control signals for the V.24/20 mA-interface.
S2	X51 PROFIBUS	Defining the PROFIBUS device address, and specifying whether module is to operate in master or slave mode.
S3	–	Number of system module, and protocol-specific settings.

Fig. 1–7 DIP Switches

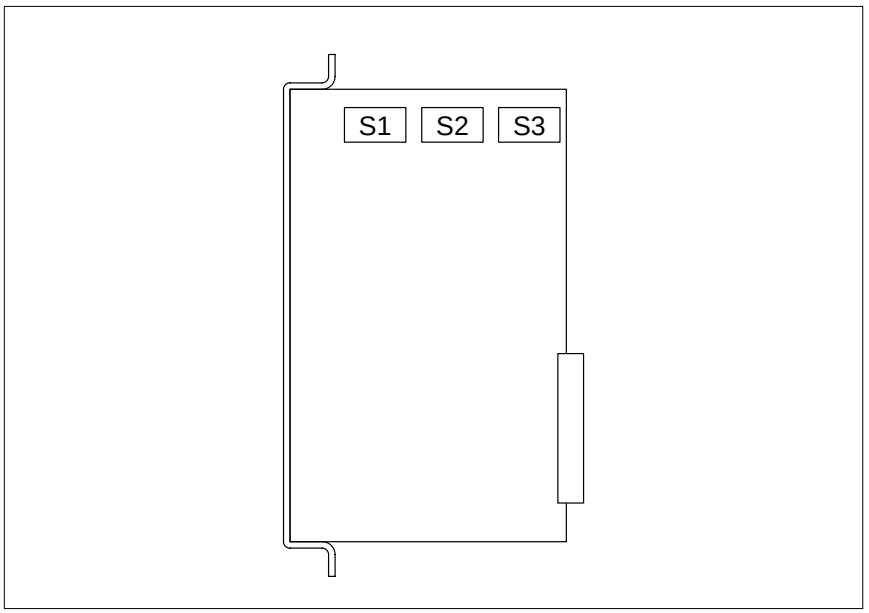

Fig. 1–8 S1, S2, S3 DIP Switches

1.5.1 PROFIBUS Station Address

The PROFIBUS station (node) address is selected by means of switch numbers SS1 through SS7 on DIP switch S2. There are 126 station numbers available. The station number 0 (zero) is reserved for the PROFIBUS configurator, and may not be used by other bus stations.

The positions of switch SS8 in DIP switch module S2 define whether the R200P is to be operated as a master or slave in a PROFIBUS network.

SS8 in ON position: Slave

SS8 in OFF position: Master

1.5.2 PROFIBUS Transmission Speed

For each of both channels on the R200P, four bits are provided on DIP switch module S3 for protocol-specific settings. In the case of the PROFIBUS protocol, the S3 DIP switch provides transmission speed selections by means of switches SS3 through SS6.

S3				
SS3	**SS4**	**SS5**	**SS6**	**Transmission speed**
OFF	OFF	OFF	OFF	9.6 kBaud
ON	OFF	OFF	OFF	19.2 kBaud
OFF	ON	OFF	OFF	93.75 kBaud
ON	ON	OFF	OFF	187.5 kBaud
OFF	OFF	ON	OFF	500 kBaud
ON	OFF	ON	OFF	spare
OFF	ON	ON	OFF	1500 kBaud
ON	ON	ON	OFF	3000 kBaud
OFF	OFF	OFF	ON	6000 kBaud
ON	OFF	OFF	ON	12000 kBaud

Fig. 1–9 PROFIBUS Transmission Speeds

The DIP switch settings take priority over any transmission speed selections made via software settings in the file named XXX*Name*.BUS.

1.5.3 Control Signals for V.24/20 mA Interface

The issuance or suppression of the control signals (DTR/DSR) for the V.24/20 mA interface is determined by the position of switch SS8 on DIP switch module S1.

Available settings:

SS8 in ON position: Control signal query enabled

SS8 in OFF position: Control signal query disabled

1.5.4 Transmission Speeds – V.24/20 mA Interface

The transmission speed for the V.24/20 mA interface is selected by means of switches SS5 through SS7 of DIP switch module S1.

S1			
SS5	**SS6**	**SS7**	**Transmission speed**
ON	ON	ON	19200 Baud
OFF	ON	ON	9600 Baud
ON	OFF	ON	4800 Baud
OFF	OFF	ON	2400 Baud
ON	ON	OFF	1200 Baud
OFF	ON	OFF	600 Baud
ON	OFF	OFF	57600 Baud
OFF	OFF	OFF	38400 Baud

Fig. 1–10 V.24/20 mA Interface Transmission Speeds

1.5.5 Transmission Format – V.24/20 mA Interface

The transmission format for the V.24/20 mA interface is permanently set to 8 information bits and 1 stopbit.

The parity can be set with switches SS3 and SS4 on DIP switch module S1.

SS3:

ON - Parity even

OFF - Parity odd

SS4:

ON - Parity

OFF - No parity

1.5.6 Protocol Selection

The protocol selection for the V.24/20 mA interface can be accomplished with the use of switches SS1 and SS2 on DIP switch module S1.

S1		
SS1	**SS2**	**Protocol**
OFF	OFF	No protocol (task protocol can be enabled)
ON	OFF	BUEP19E
OFF	ON	BUEP03E
ON	ON	BUEP64

Fig. 1–11 Protocol Selection

1.5.7 System Module Number

The system module number is selected by means of switches SS1 and SS2 on DIP switch module S3.

The system module with the lowest system module number has the highest priority on the periphery bus.

SS1	SS2	System module number
OFF	OFF	0
ON	OFF	1
OFF	ON	2
ON	ON	3

Fig. 1–12 System Module Number

1.5.8 V.24 Interface

The signal voltage levels and the connector pin assignments comply with VDI guidelines 2880, Sheet 2, for programmable logic controllers, process and data interfaces.

Signal level, data line

- logic 1 –15 to –3 V
- logic 0 +3 to +15 V

Signal level, signal and control line

- active +3 to +15 V
- passive –15 to –3 V

Signal Type	Label	Pin No.	Signal Direction
Shield	Shield	*	
Transmit data, SPS	TxD	2	→
Receive data, SPS	RxD	3	←
Reference conductor	Signal-Ground	7	
Data Set Ready	DSR	6	←
Data Terminal Ready	DTR	20	→

Fig. 1–13 Pin Assignment – V.24 Interface

* : The shield conductor is connected to the metal shells of the D–SUB connectors.

1.5.9 20mA Interface

The signal voltage levels and the connector pin assignments comply with VDI guidelines 2880, Sheet 2, for programmable logic controllers, process and data interfaces (exception: maximum blocking voltage 27 V). Dependent upon the pin assignment, operation of the 20 mA interfaces can be active (i.e., with power source)

Line statuses

- logic 1 20 mA
- logic 0 no current

20 mA passive

Signal function	Label	Pin no.	Signal direction
Shield	Shield	*	
Receive data, SPS (+)	RxD +	22	←
Receive data, SPS (–)	RxD –	12	
Transmit data, SPS (+)	TxD +	23	→
Transmit data, SPS (–)	TxD –	13	
Data Set Ready (+)	DSR +	11	←
Data Set Ready (–)	DSR –	14	
Reader Control (+)	RDRCTL +	19	→
Reader Control (–)	RDRCTL –	16	

Fig. 1–14 Pin Assignment – 20mA Passive Interface

* : The shield conductor is connected to the metal shells of the D-SUB connectors.

1.5.10 Line Length

The maximum permissible line length depends upon the selected baudrate. The following line length specifications apply to the use of Bosch cable 14 x 0.14, twisted and shielded, order no. 1070 910 152:

Transmission speed [Baud]	Line length [m]	
	V.24	20mA
600 to 4800	15	350
9600	15	300
19200	15	150
38400	15	100
57600	15	50

Fig. 1–15 Line Lengths for V.24/20 mA Interface

As a prerequisite it is assumed that the potential difference between transmitter and receiver is minimal (-2 V < U_{diff} < +2 V).

The interface cable must not be routed in parallel with immediately adjacent power cables.

1.6 Module Initialization Values

For the R200P module, the following identifiers and versions can be taken from the initialization values of the CL200.

The module initialization values for the system modules are located in the system area, beginning with word 160. Eight words are reserved for each system module.

System module number	System area
0	S160 through S175
1	S176 through S191
2	S192 through S207
3	S208 through S223

Fig. 1–16 System Module Number

Syst. word	Value		Explanation	
			High byte	Low byte
1	20H		Module type ID for R200P	
2	xx	xx	Hardware version	Firmware version 1)
3	xx	xx	Protocol version, channel 0 1)	Protocol, channel 0 2)
4	xxxx		reserved	
5	xxxx		reserved	
6	xx	04	Protocol version, channel 1 1)	Protocol, channel 1 2)
7	xxxx		PROFIBUS station address	
8	xx	xx	Master (1) / Slave (0)	PROFIBUS baudrate 3)

Fig. 1–17 System Words

Permissible values for individual entries:

1) Version indentifiers are displayed as follows:

   Version 1.1 11H

   Version 2.3 23H

2) Protocols on individual channels are coded as follows:

Value	Protocol
0H	No protocol
1H	BUEP19E
2H	BUEP03E
3H	BUEP64
4H	PROFIBUS

Fig. 1–18 Protocol Coding

3) The PROFIBUS baudrate is coded as follows:

Value	PROFIBUS Baudrate
0H	9.6 kBaud
1H	19.2 kBaud
2H	93.75 kBaud
3H	187.5 kBaud
4H	500 kBaud
5H	reserved
6H	1.5 Mbaud
7H	3 Mbaud
8H	6 Mbaud
9H	12MBaud

Fig. 1–19 Baudrate Coding

1.7 Specifications

Specifications	R200P
Interfaces	• V.24/20 mA, VDI 2880, Sheet 2 • RS 485 as per EIA Standard • 20 mA, passive, interface is potential-isolated
Baudrates • V.24/20 mA interface • PROFIBUS interface	 600 through 57600 baud 9.6 through 12000 kbaud
Current draw I_{Sys}	0.5 A
Interference-field strength	as per DIN EN 61131
Resistance to line transient interference of mains supply	as per DIN EN 61131
Max. number of R200P per CL200	3
Modular width	single
Weight	205 g

Fig. 1–20 Specifications

Notes:

2 PROFIBUS Transmission Protocol

The PROFIBUS transmission protocol is available for the RS-485 interface. It is based upon the ISO/OSI layer model for open communications.

The PROFIBUS utilizes the physical layer 1, data security layer 2 and application layer 7. The respective layers are described in the DIN EN 50170 standard.

2.1 PROFIBUS Services

The table below comprises an overview of the functionalities provided by the R200P module.

Dienst	Client	Server
Initiate	X	X
Abort	X	X
Reject	–	X
Status	X	X
Identify	X	X
Read	X	X
Write	X	X
physical – Read	X	X
physical – Write	X	X
Information-Report	X	X
Get-OD	X[1)]	X
Initiate-Put-OD	–	X
Put-OD	–	X
Terminate-Put-OD	–	X
FMA7-Event	X[1)]	X
FMA7-Initiate	–	X
FMA7-Abort	–	X
Initiate-Load-CRL-Rem	–	X
Load-CRL-Rem	–	X
Terminate-Load-CRL-Rem	–	X
Read-CRL-Rem	–	X
Set-Value-Rem	–	X
Read-Value-Rem	–	X
Ident-Rem	–	X
LSAP-Status-Rem	–	X

Fig. 2–1 PROFIBUS Services

[1)] Not accessible to the user

Key applying to above table:

X Supported function

– Not supported

2.2 PROFIBUS Object Types

Object Types	Supported
Single Variables	X
Array	X
Record	X
Variable List	–

Fig. 2–2 PROFIBUS Object Types

2.3 PROFIBUS Data Types

Description	Identifier
Boolean (1)	1
Integer8	2
Integer16	3
Integer32	4
Unsigned8	5
Unsigned16	6
Unsigned32	7
Floating-Point (1)	8
Visible-String (1)	9
Octet-String	10
Date (1)	11
Time-of-Day (1)	12
Time-Difference (1)	13
Bit-String (1)	14

Fig. 2–3 PROFIBUS Data Types

(1) The support of these data types merely indicates that the listed data types can be transferred via the PROFIBUS. However, no interpretation or content monitoring takes place.

2.4 PROFIBUS Connections

The R200P module supports the following connection types:

Connection types		as Client	as Server
MMAZ	Master-Master, noncyclical	X	X
MSAZ	Master-Slave, noncyclical	X	X
MSAZ-SI	Master-Slave, noncyclical, with Slave initiative	X	X
MSZY	Master-Slave, cyclical	X	X
MSZY-SI	Master-Slave, cyclical, with Slave initiative	X	X
MULTI	Multicast	X	X
BROAD	Broadcast	X	X

Fig. 2–4 PROFIBUS Connections

2.5 PROFIBUS Communications Model for the CL200

In order to ensure the use of uniform terminology with all computer interface modules of the CL200 series and the R200P PROFIBUS module, some deviation from the standard PROFIBUS nomenclature will be made in this documentation. Accordingly, the terms **centralized task** and **peripheral task** are hereby introduced.

PROFIBUS module	PROFIBUS standard	Explanation
Centralized task	Client mode/behaviour	Task requested from within the PLC program.
Peripheral task	Server mode/behaviour	Task request received by the communications partner.

Fig. 2–5 Terminology of the PROFIBUS Communications Model

The user has access to communications via a PLC interface that is implemented with the aid of function modules.

The data exchange between the R200P and a centralized unit is accomplished via the serial peripheral bus.

2.6 PLC Interface

The PLC interface comprises the access tool to communications. It is implemented by means of the three function modules listed below.

- R2REQ
- R2CON
- R2IND

The PLC interface provides the option to issue tasks/requests to the R200P (R200P client mode/behavior), or to monitor the requests that were issued by the communication partner (R200P server mode/behavior). In addition, occurring events are indicated.

The function modules do not provide a task monitoring function (time-out). This function is handled by the R200P firmware.

As an additional function, the PROFIBUS provides a connection monitoring option. This function checks in definable time intervals whether an established connection to the communications partner still exists.

The release of the connection is signalled to the user by means of the R2IND.

☞ **If the R200P is operated purely in dedicated server or slave mode, the use of function modules is not required.**

Notes:

3 R2REQ

3.1 Characteristic Data

Characteristic Data	R2REQ
Module name	R2REQ
Command length	16 bytes
Number of parameters	6
Processing time	0.3 ms + 1.6 ms per request
Occupied markers	none

Fig. 3–1 R2REQ Characteristic Data

3.2 Parameters

The R2REQ function module has 4 inputs and 2 output parameters.

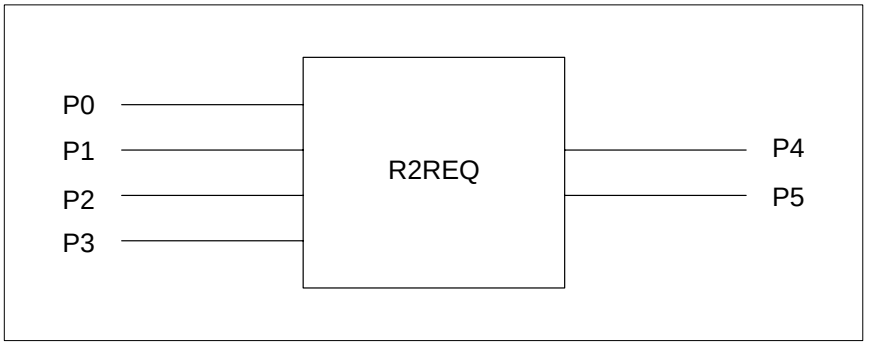

Fig. 3–2 R2REQ Parameters

☞ **The transfer of parameters by means of data words is not possible!**

3.2.1 Input Parameters

Parameter	Attr.	Description
P0	W	Data type

Fig. 3–3 P0, Input Parameter

This parameter defines the type of a data range. It specifies, for each request, a 16-word data range for protocol-specific parameters. Possible permitted data ranges are data modules (44H) and the data field (43H). The user must always reserve 16 words per request for the request-specific parameters.

Parameter	Attr.	Description
P1	W	Data type attribute

Fig. 3–4 P1, Input Parameter

If P0 specifies a data module as the data range, P1 indicates the data module number. In all other cases, P1 is without significance, and should be occupied by FFFFH.

Permissible values are 0 thru 255, and FFFFH

Parameter	Attr.	Description
P2	W	Byte offset

Fig. 3–5 P2, Input Parameter

This parameter specifies the start address for the request parameters in the selected data range.

Parameter	Attr.	Description
P3	W	JBA Job Bit Array

Fig. 3–6 P3, Input Parameter

Each of the 16 bits of this parameter represents a reference to a block of request parameters within the data range defined by parameters P0 thru P2. Accordingly, bit 0 of P3 refers to request parameter block 0 (zero), bit 15 refers to the 15th request parameter block in the declared data range. the setting of a bit in P3 represents the start of the request described in the accociated request parameter block. If several bits are set simultaneously, the associated requests are transferred to the R200P in the same cycle. The one-time cycling of the R2REQ with the request bits set HIGH is sufficient to comprise the complete request start. The request bits must then again be reset by means of the application program.

3.2.2 Output Parameters

P4 Output Parameter

Parameter	Attr.	Description
P4	W	Fault message

Fig. 3–7 P4, Output Parameter

This parameter is used to enter basic status and error codes that will be recognized by the R2REQ at the time a request is issued:

- The LOW byte of parameter P4 then contains the status or error code, and
- The HIGH byte contains a coded recommendation for the appropriate response to the former.

Code	Explanation
00H	No error, correct call
01H	The P3 JBA (job bit array) parameter equals zero
02H	The specified data module is not available
03H	The specified data range is too short
04H	The specified byte offset is invalid
08H	Invalid parameter P0 (not equal to 43H or 44H)

Fig. 3–8 Error Codes in LOW Byte

Code	Explanation
00H	No error, correct call
01H	Repeat R2REQ call-up
02H	Modify PLC program
03H	Modify protocol parameters in data module / data field
05H	The R2REQ function block must be processed again
06H	The R2CON function block must be processed again
07H	Reserved/spare; no relevance for the R200P

Fig. 3–9 PLC Responses in HIGH Byte

If the R2REQ function module recognizes additional error messages at the time the request is started, it places them into the zeroth word of the associated request block.

P5 Output Parameter

Parameter	Attr.	Description
P5	W	RBA Result Bit Array

Fig. 3–10 P5, Output Parameter

This parameter signals to the user whether errors were detected at the time the requests were issued. In this process, a request is assigned to each result bit, the assignment corresponding to that used with input parameter P3. A result bit that goes HIGH indicates that the request that was addressed in P3 with the same bit number could not be issued. In addition, a detailed error code is returned in the first word of the associated request block.

3.3 Explanation of Parameters in Data Range

For each request, a 16-word parameter field must be reserved either in data field **DF** or data module **DM**.

Address and offset of this data range is defined by means of R2REQ parameters P0 thru P2.

Each parameter field is assigned one bit each, beginning with bit __, in both the **JBA** (job bit array) and the **RBA** (result bit array).

JBA Request Bit	Associated Data Range	Byte Addresses
0	DW0 - DW15	0 - 31
1	DW16 - DW31	32 - 63
2	DW32 - DW47	64 - 95
3	DW48 - DW63	96 - 127
4	DW64 - DW79	128 - 159
5	DW80 - DW95	160 - 191
6	DW96 - DW111	192 - 223
7	DW112 - DW127	224 - 255
8	DW128 - DW143	256 - 287
9	DW144 - DW159	288 - 319
10	DW160 - DW175	320 - 351
11	DW176 - DW191	352 - 383
12	DW192 - DW207	384 - 415
13	DW208 - DW223	416 - 447
14	DW224 - DW239	448 - 479
15	DW240 - DW255	480 - 511

Fig. 3–11 R2REQ Parameter List

The maximum of 16 request parameters are differentiated into two groups:

- Protocol-independent parameters:
  Their contents are always the same, regardless of which protocol or service is addressed by the subsequent parameters.
- Protocol-dependent parameters:
  These parameters are different with all protocols and/or services.

3.3.1 Protocol-independent Parameters

Data Word	Contents	
	HIGH Byte	LOW Byte
PW0	PLC response	Error code
PW1	System module number	Channel number
PW2	Request number	

Fig. 3–12 Protocol-independent Parameters

PW0

Parameter Word 0 (PW0) returns the result of the request execution. The request result is transferred here subsequent to each time the R2REQ module is called.

In the result word, a differentiation is made between the HIGH byte (PLC response) and the LOW byte (error code). These are explained in the following Error Code and PLC Reaction tables, respectively.

Error Code (LOW byte)

Code	Explanation
00H	Error-free request transfer to system module
02H	Request is entered in the list
03H	Request acknowledged but not yet confirmed
04H	Invalid channel number
05H	Invalid system module number
06H	Invalid request number
07H	Request cancellation/abort not possible
08H	Unavailable free request number on system module
20H	CXN not equipped
24H	No request possible in request queue
30H	Communication failure between FM, ZE and CXN
90H	No protocol defined on CXN for selected channel

Fig. 3–13 Error Codes

PLC Response (HIGH byte)

Code	Explanation
00H	Fault-free request transfer to intelligent module (IM)
02H	Modify PLC program
03H	Change protocol parameters
05H	Reinitiate R2REQ
06H	Reinitiate R2CON

Fig. 3–14 PLC Responses

PW1

Parameter Word 1 (PW1) defines both the R200P and the channel on which this request is to be processed.

The system module number is entered in the HIGH byte of this data word (0 thru 3).

The channel number specifies the module interface to be used for processing this request. The channel number for the PROFIBUS connection on the R200P – indicated by the HIGH byte – is always 1.

On the R200P, the other available connection, i.e., the serial interface, occupies channel number 0.

PW2

The computer interfaces on the CL200 enable the parallel start of up to 16 requests. These requests can be differentiated by defining individual request numbers. An additional request tagged with an indeticval number can be started only after the previous request was concluded. While the processing of a request is in progress, the R2REQ will reject an attempted intervention of this kind while returning an error message.

By contrast, starting several centralized requests with differing request numbers within a single PLC cycle is permitted.

With its 16 request channels, the R200P is capable of processing up to 16 PROFIBUS requests in parallel. The request numbers 0 thru 15 are directly assigned to the request channels. Reuests bearing higher request numbers seek the nearest free request channel on the R200P. For this reason, the request numbers 0 thru 15 should not be interspersed by larger higher request numbers because this would lead to the rejection of requests regardless of the apparent availability of free request channels.

The request numbers can have a value of up to 7FFFH.

The 16th bit of the request number is used to remove any requests that were transferred to the computer interface, and are still awaiting processing, from the request queue.

The request numbers 12 thru 15 are reserved for high-priority requests. If this specification is made for this parameter, the respective request will be assigned a high priority and processed accordingly.

In the event of a simultaneous start of several requests, the resquests will be transferred to the module in the following sequence:

- 15 thru 12 for high-priority requests
- 11 thru 0 for low-priority requests

3.3.2 Protocol-dependent Parameters

Services	Context Management		Variable Access			
Data Word	**Initiate**	**Abort**	**Read**	**Write**	**physical Read**	**physical Write**
PW3	KR	KR	KR	KR	KR	KR
PW4	IN	AB	RE	WR	PR	PW
PW5	-	Reason code	Index	Index	-	-
PW6	-	-	PR-Typ	PR-Typ	-	-
PW7	-	-	Field type	Field type	Field type	Field type
PW8	-	-	Field index	Field index	Field index	Field index
PW9	-	-	Field offset	Field offset	Field offset	Field offset
PW10	-	-	-	Number	Number	Number
PW11	-	-	Subindex	Subindex	Physical address (LOW word)	Physical address (LOW word)
PW12	-	-	-	-	Physical address (HIGH word)	Physical address (HIGH word)
PW13	-	-	-	-	-	-
PW14	-	-	-	-	-	-
PW15	-	-	-	-	-	-

Fig. 3–15 PROFIBUS Client Services – Part 1

Services	Variable Access		VFD Support			Local
Data Word	**Establish Information Report**	**Information Report**	**Status**	**Identify**	**Set Status**	**Conn. Attribute**
PW3	KR	KR	KR	KR	KR	KR
PW4	EI	IF	ST	ID	SS	CA
PW5	-	Index	-	-	-	-
PW6	PR-Type	PR-Type	-	-	-	-
PW7	Field type	Field type	Field type	Field type	Phy.Status	Field type
PW8	Field index	Field index	Field index	Field index	L.-Detail	Field index
PW9	Field offset	Field offset	Field offset	Field offset	-	Field offset
PW10	Number	Number	-	-	-	-
PW11	-	Subindex	-	-	-	-
PW12	-	-	-	-	-	-
PW13	-	-	-	-	-	-
PW14	-	-	-	-	-	-
PW15	-	-	-	-	-	-

Fig. 3–16 PROFIBUS Client Services – Part 2

3.4 Services

3.4.1 Initiate Service

This service is required to establish a connection between two communications partners. Only the successful completion of this service will make the connection useful for data communications.

3.4.2 Abort Service

This service is required to clear an existing connection between two communications partners.

Parameter	Attr.	Description
PW5	W	Reason code

Fig. 3–17 Abort Service

This parameter is used to indicate the reason for the release of the connection. Some reason codes are defined, and are listed in the table below. All other reason codes are user specific.

Value	Explanation
00H	Disconnect. The FMS user releases the connection
01H	Object dictionary (OD) incompatible version. The object dictionary versions (source OD and remote OD) of both communications partners are incompatible.
02H	Password error. A communications connection using the same password exists already.
03H	Incompatible profile number. The profile of the server is not supported.
04H	Limited services permitted. The device has entered into the Limited Services Permitted logical status.
05H	OD Loading Interacting. Put-OD services are enabled.

Fig. 3–18 Abort Service, Reason Codes

3.4.3 Read Service

The value of a variable object on the communications partner is read. The description of the variable is defined in the object dictionary (OD) of the communications partner.

Parameter	Attr.	Description
PW5	W	Index

Fig. 3–19 PW5, Read Service

Logical address on the server of the variable to be read.

Parameter	Attr.	Description
PW6	W	PROFIBUS Data type

Fig. 3–20 PW6, Read Service

This parameter indicates the data type of the data obtained from the remote communications partner. The number of transferred bytes must be a multiple integer of the length of the indicated data type. If this is not the case, a negative acknowledgement is returned locally.

Description	Identification
Boolean (1)	1
Integer8	2
Integer16	3
Integer32	4
Unsigned8	5
Unsigned16	6
Unsigned32	7
Floating Point (1)	8
Visible String (1)	9
Octet String	10
Date (1)	11
Time of Day (1)	12
Time Difference (1)	13
Bit String (1)	14

Fig. 3–21 Read Service, PROFIBUS Data Types

(1) The support of these data types is limited to their transferability via the PROFIBUS. The data is neither interpreted nor the data content monitored.

Parameter	Attr.	Description
PW7	W	Destination - Field type
PW8	W	Destination - Field index
PW9	W	Destination - Field offset

Fig. 3–22 PW7 / PW8 / PW9, Read Service

These parameters indicate the destination memory range into which the R200P is to write the data obtained from the communications partner.

Destination Field type	Destination Field index	Destination Field offset
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–23 Read, Destination Address

Parameter	Attr.	Description
PW11	W	Subindex

Fig. 3–24 PW11, Read Service

Logical subaddress of the object. In the event that the variable comprises an array object, the addressing of single elements of a variable on the server is enabled.

Example:

Subindex	0001H	1st element of variable
Subindex	0064H	100th element of variable
Subindex	0000H	addresses entire variable, no subindex

3.4.4 Write Service

This function assigns a value to a variable object on the communications partner. The description of the variable is defined in the object dictionary (OD) of the communications partner.

Parameter	Attr.	Description
PW5	W	Index

Fig. 3–25 PW5, Write Service

Logical address on the server of the variable to be assigned a value.

Parameter	Attr.	Description
PW6	W	PROFIBUS Data type

Fig. 3–26 PW6, Write Service

This parameter indicates the data type of the data to be written.

Description	Identification
Boolean (1)	1
Integer8	2
Integer16	3
Integer32	4
Unsigned8	5
Unsigned16	6
Unsigned32	7
Floating Point (1)	8
Visible String (1)	9
Octet String	10
Date (1)	11
Time of Day (1)	12
Time Difference (1)	13
Bit String (1)	14

Fig. 3–27 Write, PROFIBUS Data Types

(1) The support of these data types is limited to their transferability via the PROFIBUS. The data is neither interpreted nor the data content monitored.

Parameter	Attr.	Description
PW7	W	Source field type
PW8	W	Source field index
PW9	W	Source field index

Fig. 3–28 PW7 / PW8 / PW9, Write Service

These parameters indicate the source address area from which the data will be transferred to the communications partner.

Source field type	Source field index	Source field offset
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–29 Write Service, Source Addresses

Parameter	Attr.	Description
PW10	W	Amount

Fig. 3–30 PW10, Write Service

Amount of data specified in PW6 to be transferred.

Parameter	Attr.	Description
PW11	W	Subindex

Fig. 3–31 PW11, Write Service

Logical subaddress of the object. In the event that the variable comprises an array object, the addressing of single elements of a variable on the server is enabled.

Example:

Subindex	0001H	1st element of variable
Subindex	0064H	100th element of variable
Subindex	0000H	addresses entire variable, no subindex

3.4.5 Physical Read Service

This function reads the value of a physical address of the communications partner. The access to the address of the partner occurs in bytewise fashion.

In the case of the CL200 the physical address is interpreted as the field address.

The following overview indicates the most significant field types in conjunction with field indexes and offsets:

Field	Field type	Field index	Field offset
Outputs	41H	FFH	0 thru 15
Inputs	45H	FFH	0 thru 23
Markers	4DH	FFH	0 thru 191
Data modules	44H	0 thru 255	0 thru 511
Data field	43H	FFH	0 thru 1023
System range	25H	FFH	0 thru 255

Fig. 3–32 Physical-Read, Field Types

Parameter	Attr.	Description
PW7	W	Destination field type
PW8	W	Destination field index
PW9	W	Destination field offset

Fig. 3–33 PW7 / PW8 / PW9, Physical Read Service

These parameters indicate the destination memory range into which the R200P is to write the data obtained from the communications partner.

Destination Field type	Destination Field index	Destination Field offset
4DH = Markers	FFFFH	Byte no. 0 thru 191
44H = Data modules	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–34 Physical Read, Destination Address

This parameter indicates the number of databytes to be read.

Parameter	Attr.	Description
PW10	W	Number

Fig. 3–35 PW10, Physical Read Service

These parameters indicate the physical source address of the partner, which is a 32-bit address. The HIGH word of the address consists of the field type and the field index (8 bit each). The LOW word represents the field offset.

Parameter	Attr.	Description		
PW11	W	Physical address (LOW word)	Field offset	
PW12	W	Physical address (HIGH word)	Field type	Field index

Fig. 3–36 PW11 / PW12, Physical Read Service

3.4.6 Physical Write Service

This function writes the value of a physical address of the partner. The access to the address on the partner occurs in a bytewise manner.

In the case of the CL200, the physical address is interpreted as the field address.

The following overview indicates the most significant field types in conjunction with field indexes and offsets:

Feld	Field type	Field index	Field offset
Outputs	41H	FFH	0 thru 15
Inputs	45H	FFH	0 thru 23
Markers	4DH	FFH	0 thru 191
Data modules	44H	0 thru 255	0 thru 511
Data fields	43H	FFH	0 thru 1023
System range	25H	FFH	0 thru 255

Fig. 3–37 Physical Write Service, Field Types

Parameter	Attr.	Description
PW7	W	Source field type
PW8	W	Source field index
PW9	W	Source field offset

Fig. 3–38 PW7 / PW8 / PW9, Physical Write Service

These parameters indicate the source memory range from which the data is to be transferred to the communications partner.

Destination Field type	Destination Field index	Destination Field offset
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–39 Physical Read Service, Destination Address

This parameter indicates the number of databytes to be written.

Parameter	Attr.	Description
PW10	W	Number

Fig. 3–40 PW10, Physical Write Service

These parameters indicate the physical destination address of the partner, which is a 32-bit address. The HIGH word of the address consists of the field type and the field index (8 bit each). The LOW word represents the field offset.

Parameter	Attr.	Description		
PW11	W	Physical address (LOW word)	Field offset	
PW12	W	Physical address (HIGH word)	Field type	Field index

Fig. 3–41 PW11 / PW12, Physical Write Service

3.4.7 Establish Information Report

As an incoming information report does not describe a local object (source-addressed service), the user is required to indicate where the incoming data representing an information report indication is to be stored. For this purpose, the Establish Information report is required. This service defines a local pointer to a memory address on the PLC. The size of the memory range is dependent upon the maximum PDU length of the corresponding communications reference, always exceeding that size by 3 words.

The Establish Information report must be requested only once for each connection on which an information report is expected. If this request is not issued or its execution is faulty, any information reports incoming via the respective connection will be discarded.

The configuration of the data storage range designated for incoming information reports is structured as follows:

Wort	**Contents**	
1	PROFIBUS index	Information originates from the request by the partner
2	PROFIBUS subindex	
3	Number	
4	Payload data	
...	Payload data	

Fig. 3–42 Data Storage for incoming Information Reports

As each PROFIBUS station possess a maximum of one broadcast reception KR, the information contained in the index and/or subindex can provide an indication of where the data originates, and the number of databytes can indicate when new data has arrived in the controller.

Parameter	**Attr.**	**Description**
PW6	W	PROFIBUS data type

Fig. 3–43 PW6, Establish Information Report Service

This parameter indicates the data type of the information report received from the partner.

Description	Identification
Boolean (1)	1
Integer8	2
Integer16	3
Integer32	4
Unsigned8	5
Unsigned16	6
Unsigned32	7
Floating Point (1)	8
Visible String (1)	9
Octet String	10
Date (1)	11
Time of Day (1)	12
Time Difference (1)	13
Bit String (1)	14

Fig. 3–44 Establish Information Report Service, PROFIBUS Data Types

(1) The support of these data types is limited to their transferability via the PROFIBUS. The data is neither interpreted nor the data content monitored.

Parameter	Attr.	Description
PW7	W	Destination field type
PW8	W	Destination field index
PW9	W	Destination field offset

Fig. 3–45 PW7 / PW8 / PW9, Establish Information Report Service

These parameters indicate the destination memory range into which the R200P is to write the data obtained from the communications partner.

Destination Field type	Destination Field index	Destination Field offset
4DH = Marker	FFFFH	Byte-Nr. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte-Nr. 0 thru 511
43H = Data field	FFFFH	Byte-Nr. 0 thru 8191

Fig. 3–46 Establish Information Report Service, Destination Addresses

Parameter	Attr.	Description
PW10	W	Number

Fig. 3–47 PW10, Establish Information Report Service

This parameter indicates the maximum amount of data that is expected via the information report service. If more than data is received than specified, the information report will also be discarded.

3.4.8 Information Report Service

The information report comprises an unacknowledged service. It can also be multicast to a group or broadcast to all communications partners. As this service is not acknowledged at the PROFIBUS level, there exists no direct means of verifying whether the transmitted objecdt has actually been received by the communications partners.

Parameter	Attr.	Description
PW5	W	Index

Fig. 3–48 PW5, Information Report Service

Although this information is not interpreted, it is deposited in the partner as mere information.

Parameter	Attr.	Description
PW6	W	PROFIBUS data type

Fig. 3–49 PW6, Information Report Service

This parameter indicates the data type of the information report data.

Description	Permissible Values
Boolean (1)	1
Integer8	2
Integer16	3
Integer32	4
Unsigned8	5
Unsigned16	6
Unsigned32	7
Floating Point (1)	8
Visible String (1)	9
Octet String	10
Date (1)	11
Time of Day (1)	12
Time Difference (1)	13
Bit String (1)	14

Fig. 3–50 Information Report Service, PROFIBUS Data Types

(1) The support of these data types is limited to their transferability via the PROFIBUS. The data is neither interpreted nor the data content monitored.

Parameter	Attr.	Description
PW7	W	Source field type
PW8	W	Source field index
PW9	W	Source field offset

Fig. 3–51 PW7 / PW8 / PW9, Information Report Service

These parameters indicate the destination memory range into which the R200P is to write the data obtained from the communications partner.

Destination Field type	Destination Field index	Destination Field offset
4DH = Marker	FFFFH	Byte-Nr. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte-Nr. 0 thru 511
43H = Data field	FFFFH	Byte-Nr. 0 thru 8191

Fig. 3–52 Information Report Service, Destination Address

Parameter	Attr.	Description
PW10	W	Number

Fig. 3–53 PW10, Information Report Service

This parameter indicates the volume of data of the type specified in PW6 that was transmitted.

Parameter	Attr.	Description
PW11	W	Subindex

Fig. 3–54 PW11, Information Report Service

Logical subaddress of the object. This parameter is also not interpreted but deposited in the partner.

3.4.9 Status Service

This service is used to read the device/user status of the communications partner.

The data thus obtained comprises 5 bytes which are written into the specified memory area as follows:

Logical Status	Physical Status	Local Detail		
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5

Fig. 3–55 Status, Byte Arrangement in Memory

Parameter	Attr.	Description
PW7	W	Destination field type
PW8	W	Destination field index
PW9	W	Destination field offset

Fig. 3–56 PW7 / PW8 / PW9, Status Service

Destination Field type PW7	Destination Field index PW8	Destination Field offset PW9
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–57 Status Service, Destination Address

The individual statuses are described below:

Logical Status

Value	Explanation
0	Ready to communicate Standard features of all service can be used
2	Limited number of services The server supports a minimum of the following services: - Initiate - Abort - Reject - Identify - Status - Get-OD
4	OD-LOADING-NON-INTERACTING If the object dictionary is in the OD-LOADING-NON-INTERACTING status, the processing of the Initate-Put-OD is not permitted.
5	OD-LOADING-INTERACTING If the object dictionary is in the OD-LOADING-INTERACTING status, all connections, with the exception of the connection on which the Initiate-Put-OD-Service was received, are disabled. An attempt to establish a connection is rejected.

Fig. 3–58 Status Service – Logical Statuses

Physical Status

Value	Explanation
0	Ready to operate
1	Partially operational
2	Not ready to operate
3	Maintenance required

Fig. 3–59 Status Service – Physical Statuses

Local Detail

The Local Detail indicates the local status of both application and device. The significance of the individual bits is defined by the PROFIBUS profiles. (See PROFIBUS profiles of the PROFIBUS user organization.)

In the event that the status service is answered by the R200P (server functionality), the R200P being addressed encodes the operating mode of the associated central processing unit (ZS) in byte 5 of the Local Detail.

ZS operating mode is STOP Byte 5= 10D

ZS operating mode is RUN Byte 5= 11D

3.4.10 Identify Service

This service, comprising the identification of a *virtual field device* (VFD), is used to read and obtain vendor name (manufacturer), model name (device type), and version ID of a device.

The data thus read is of the PROFIBUS Visible String data type. The length is application-specific. It can be a maximum of 238 bytes.

The identification string of the R200P is structured as follows:

Vendor Name : ‘ROBERT BOSCH GmbH’

Model name : ‘R200P 077285’

Version ID : ‘V 1.2’

The version ID is formed from the software version of the firmware. There is no connection with the version ID on the front panel.

The parameters indicate the destination memory range into which the IDENTIFY data obtained from the communications partner is to be written.

Parameter	Attr.	Description
PW7	W	Destination field type
PW8	W	Destination field index
PW9	W	Destination field offset

Fig. 3–60 PW7 / PW8 / PW9, Identify Service

Destination Field type PW7	Destination Field index PW8	Destination Field offset PW9
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–61 Identify Service, Destination Addresses

3.4.11 Set Status Service

This service is used to write the local device/user status. The Set Status service is a local service, and not defined in the PROFIBUS standard. With regard to this local service, the communications reference (PW3) is of no significance.

Parameter	Attr.	Description
PW7	W	Physical Status
PW8	W	Local Detail

Fig. 3–62 PW7 / PW8, Set Status Service

The Physical Status service provides a rough overview of the operating status of a physical device.

The permissible values for the LOW byte of PW7 are as follows:

Value	Explanation
0	Ready to operate
1	Partially operational
2	Not ready to operate
3	Maintenance required

Fig. 3–63 Set Status, Physical Status Service

The Local Detail indicates the local status of both application and device. The significance of the individual bits is defined by the PROFIBUS profiles of the PROFIBUS user organization.

The LOW byte of PW8 defines byte 3 of the status.

The HIGH byte of PW8 defines byte 4 of the status.

Permissible values are 0 through FFFFH.

3.4.12 Connection Attributes Service

The Connection Attributes service transfers the parameters obtained from the communications partner during the Initiate service to the PLC program.

Parameter	Attr.	Description
PW7	W	Destination field type
PW8	W	Destination field index
PW9	W	Destination field offset

Fig. 3–64 PW7 / PW8 / PW9, Connection Attributes Service

Destination Field type PW7	Destination Field index PW8	Destination Field offset PW9
4DH = Marker	FFFFH	Byte no. 0 thru 191
44H = Data module	DM no. 0 thru 255	Byte no. 0 thru 511
43H = Data field	FFFFH	Byte no. 0 thru 8191

Fig. 3–65 Connection Attributes Service, Destination Addresses

At the address defined in PW7 thru PW9, 8 words are deposited. Their respective contents are listed below.

Wort	Contents
PW0	00FFH Connection established 0000H Connection failed
PW1	LOW byte, profile number HIGH byte, version number/ID
PW2	OD Version
PW3	-
PW4	-
PW5	-
PW6	-
PW7	-

Fig. 3–66 Connection Attributes Service, Significance

Notes:

4 R2CON

4.1 Characteristic Data

Characteristic Data	R2CON
Module name	R2CON
Call/command length	16 bytes
Number of parameters	5
Processing time	0.18 ms
Occupied markers	none

Fig. 4–1 R2CON Characteristic Data

The **R2CON Confirmation** module provides the means of controlling centralized requests. Its purpose is to return information to the user both during processing and subsequent to concluding processing of a specific request. For this purpose it obtains the status and the error word from the request table, and returns this information at the address specified by the user.

With the R2CON module, either only a single request per call-up or all error-free and one errored request can be acknowledged. The R2CON transfers the status and the error word from the request table to the PLC. However, if all error-free requests are acknowledged, the status and error word will contain only the information of the one permitted errored request.

The R2CON module is required to acknowledge all requests that are issued by the R2REQ module. In the process, the results of the individual requests are read out. For unconfirmed services, a local acknowledgement is generated.

A new request with the same request number can be started only once the acknowledgement has been read.

4.2 Parameters

The R2CON function module features two input and three output parameters.

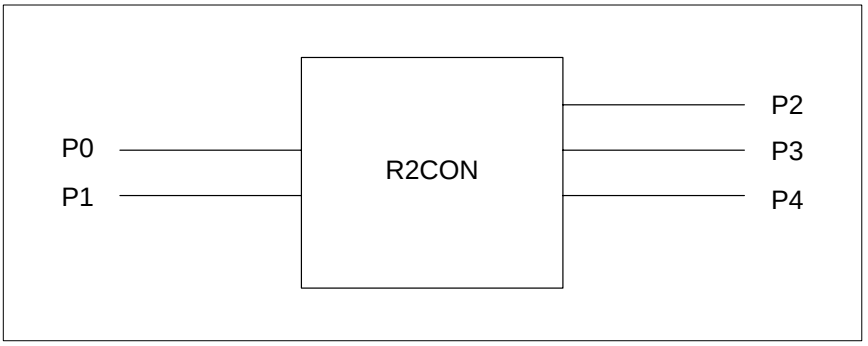

Fig. 4–2 R2CON Parameters

☞ **The transfer of parameters by means of data words is not possible!**

4.2.1 Input Parameters

P0 Input Parameter

Parameter	Attr.	Description
P0	W	System module number, channel number

Fig. 4–3 P0, Input Parameter

This parameter indicates the number of both the system module and the channel on which the respective request was handled.

P1 Input Parameter

Parameter	Attr.	Description
P1	W	Request number (0 thru 7FFFH, FFFEH or FFFFH)

Fig. 4–4 P1, Input Parameter

The following entries are permitted:

- Request numbers from 0 thru 7FFFH or
- the FFFFH and FFFEH wildcard characters

By defining a request number between 0 and 7FFFH, the user selects exactly the request for which he requires an acknowledgement. Thus it is possible to exert direct control over a specific request.

The specified request number is written into the P2 output parameter.

If the FFFEH wildcard character is specified as the request number, the R2CON function module will acknowledge all error-free completions of requests handled by the R200P identified in the P0 input parameter.

In the event that additional requests were concluded with errors, the R2CON function module will issue an additional acknowledgement for the errored request with the highest request number, and returns its status and error codes in the output parameters. Any other errored requests that may be detected are not acknowledged by this R2CON call-up.

If not request is concluded, the value FFFH is returned in the P2 output parameter.

In the event that only error-free requests are concluded, all of them will be acknowledged, and the value FFFEH returned in the P2 output parameter.

If the FFFFH wildcard character is specified in the P1 parameter, the R2CON function module returns the acknowledgement matching the request that was processed by the R200P, but the acknowledgement of which was not yet picked up. If this applies to several requests, the request with the highest request number will be acknowledged. Its request number is subsequently entered into the P2 output parameter. All other equests are not acknowledged.

4.2.2 Output Parameters

P2 Output Parameter

Parameter	Attr.	Description
P2	W	Request number

Fig. 4–5 P2, Output Parameter

The R2CON function module writes into this parameter the request number of the request, the status and error codes of which are contained in the P3 and P4 output parameters.

If an explicit request number was specified in P1, that number will also be written to the P2 output parameter.

In the event that, subsequent to parameterization using P1 = FFFFH, no request is concluded, the value FFFFH is returned in P2 as the request number.

In the event that, subsequent to parameterization using P1 = FFFEH, no errored request but one or more requests are concluded without error, the value FFFEH will be returned in P2.

P3 Output Parameter

Parameter	Attr.	Description
P3	W	Status

Fig. 4–6 P3, Output Parameter

This word is used to return the current status of the request each time the R2CON function module is called up. The current status of the request is indicated in the HIGH byte of this word.

HIGH byte	Explanation
00H	Request concluded error-free
02H	Request being processed on system module
03H	Request concluded with error
04H	No request with this request number being processed

Fig. 4–7 Status HIGH Byte

The LOW byte in P3 provides a code suggesting to the user a suitable remedy in the case of an error occurrence (SPS_Reaktion = PLC response). This code comes into effective once the request has been concluded.

LOW byte	Explanation
00H	Error-free operation
01H	Repeat call-up of R2CON function module
02H	Modify PLC program (program fault)
03H	Check and modify request parameters
05H	Run R2REQ function module again
06H	Run R2CON function module again
08H	Check configuration data
0AH	Check call-up parameters for R2CON function module
10H	Repeat request that was interrupted by PLC program or RESET button
20H	Request error-free; however, read-access occurred with reduced data length.
30H	Use Initiate service to reestablish connection
40H	Reset module. Restart required.

Fig. 4–8 Status LOW Byte

P4 Output Parameter

Parameter	Attr.	Description
P4	W	Fehlermeldung

Fig. 4–9 P4, Output Parameter

In the event that an error occurs – i.e., HIGH byte of P3 = 03 – the detailed error code appears in P4. As a rule, the interpretation of such codes is required only during initial start-up or in a service/repair situation. If the protocol monitor function is enabled, the error messages will also be output via the Trace interface.

In the error word, the HIGH byte indicates the error class, and the LOW byte the error code.

FMS Errors

Error Class	Error Code	Explanation
Initiate		
00H	00H	Other
00H	01H	Max PDU Size Insufficient
00H	02H	Feature Not Supported
00H	03H	Version OD Incompatible
00H	04H	User Initiate Denied
00H	05H	Password Error
00H	06H	Profile Number Incompatible
VFD State		
01H	00H	VFD – Other
Application		
02H	00H	Application – Other
02H	01H	Application Unreachable
Definition		
03H	00H	Definition – Other
03H	01H	Object Undefined
03H	02H	Object Attribute Inconsistent
03H	03H	Object Already Exists
Resource		
04H	00H	Resource – Other
04H	01H	Memory Unvailable
Service		
05H	00H	Service – Other
05H	01H	Object State Conflict
05H	02H	PDU Size
05H	03H	Object Constraint Conflict
05H	04H	Parameter Inconsistent
05H	05H	Illegal Parameter

Error Class	Error Code	Explanation
Access		
06H	00H	Access – Other
06H	01H	Object Invalidated
06H	02H	Hardware Fault
06H	03H	Object Access Denied
06H	04H	Invalid Address
06H	05H	Object Attribute Inconsistent
06H	06H	Object Access Unsupported
06H	07H	Object Non-existent
06H	08H	Type Conflict
06H	09H	Name Access Unsupported
OD		
07H	00H	OD – Other
07H	01H	Name Length Overflow
07H	02H	OD Overflow
07H	03H	OD Write-protected
07H	04H	Extension Length Overflow
07H	05H	Object Description Length Overflow
07H	06H	Operational Problem
Other		
08H	00H	Other FMS Error

Fig. 4–10 FMS Errors

FMA7 Errors

Error Class	Error Code	Explanation
Initiate		
09H	00H	Other
09H	01H	Max PDU Size Insufficient
09H	02H	Feature Not Supported
09H	03H	User Initiate Denied
Application		
0AH	00H	Application – Other
0AH	01H	Application Unreachable

Error Class	Error Code	Explanation
Resource		
0BH	00H	Resource – Other
0BH	01H	Memory Unavailable
Service		
0CH	00H	Service – Other
0CH	01H	Object State Conflict
0CH	02H	Object Constraint Conflict
0CH	03H	Parameter Inconsistent
0CH	04H	Illegal Parameter
0CH	05H	Permanent Internal Fault
User		
0DH	00H	User Other
0DH	01H	Don’t Worry Be Happy
0DH	02H	Memory Unavailable
Access		
0EH	00H	Access Other
0EH	01H	Object Access Unsupported
0EH	02H	Object Non Existent
0EH	03H	Object Access Denied
0EH	04H	Hardware Fault
0EH	05H	Type Conflict
CRL		
0FH	00H	CRL – Other
0FH	01H	Invalid CRL Error
0FH	02H	No CRL Entry
0FH	03H	Invalid CRL
0FH	04H	No CRL
0FH	05H	CRL Write Protected
FH	6H	No CRL Entry found
FH	7H	Multiple VFD’s Not Supported
Other		
10H	00H	Other FMA7 Error

Fig. 4–11 FMA7 Errors

ALI-/FMS- und CMI-Errors

Error Class	Error Code	Explanation
11H	0AH	Protocol stack not responding
11H	0BH	Invalid controller type or software version
11H	0CH	Specified instance (FMS/FMA7) invalid
11H	0DH	Specified service invalid
11H	0EH	Specified primitive (REQ/RES) invalid
11H	0FH	Data block in CMI too small
11H	10H	Specified KR does not exist
11H	13H	Invalid driver function
11H	14H	Severe error in CMI or driver
11H	15H	No resources for service processing
11H	16H	No parallel service permitted
11H	17H	Service currently unavailable
11H	18H	Service not part of supported subset
11H	19H	Service cannot be executed

Fig. 4–12 ALI, FMS, and CMI Errors

System Bus Errors

Error Class	Error Code	Explanation
30H	21H	Command cannot be executed in RUN
30H	23H	Prohibited access mode (read/write)
30H	24H	Field protection enabled
30H	25H	Timer disabled
30H	26H	Module number (in data) too large
30H	27H	(Data) module not available
30H	28H	(Data) module too large / small
30H	90H	Field type unknown on ZE
30H	91H	Firmware not loaded on ZE
30H	92H	ZE is in BOOT mode
30H	93H	SysBus Unknown Parameter
30H	95H	System clock read/write error
30H	97H	SysBus Unknown Command
30H	98H	Buffer overflow
30H	C1H	Coordination not achieved
30H	C2H	Coordination unknown
30H	F0H-FFH	Communication error with ZE200

Fig. 4–13 System Bus Errors

Internal Computer Interface Errors

Error Class	Error Code	Explanation
31H	10H	Wrong module
31H	60H	Passive request abort
31H	61H	Active request abort
31H	97H	Command code not defined
31H	98H	Buffer overflow (data block length)
31H	E0H to EFH	R200 communication fault

Fig. 4–14 System module, Interface Errors

ALI Errors

Error Class	Error Code	Explanation
F0H	00H	ABORT message received on specified connection
F0H	01H	Protocol-specific parameters are outside of specified value range
F0H	02H	Connection not established
F0H	03H	Connection already established
F0H	04H	Invalid communications reference
F0H	05H	Payload data size exceeds max. value of 220 bytes.
F0H	06H	Initiate service currently not possible
F0H	17H	Permitted number of communications objects exceeded
F0H	18H	Permitted number of entries in communications reference list exceeded
F0H	21H	Too many parallel services
F0H	22H	Service rejected with Reject

Fig. 4–15 ALI Errors

Function Module Errors

Error Class	Error Code	Explanation
FFH	00H	Invalid channel number
FFH	03H	Invalid request number
FFH	04H	No request being processed
FFH	05H	Invalid computer interface number (CXN)
FFH	D0H	No protocol preset for selected channel
FFH	D1H	Request queue full

Fig. 4–16 Function Module Errors

Notes:

5 R2IND

5.1 Characteristic Data

Characteristic Data	R2IND
Module name	R2IND
Call/command length	16 bytes
Number of parameters	6
Processing time	2.4 ms to 6.6 ms
Occupied markers	none

Fig. 5–1 R2IND Characteristic Data

5.2 Parameters

The R2IND function module features four input and two output parameters.

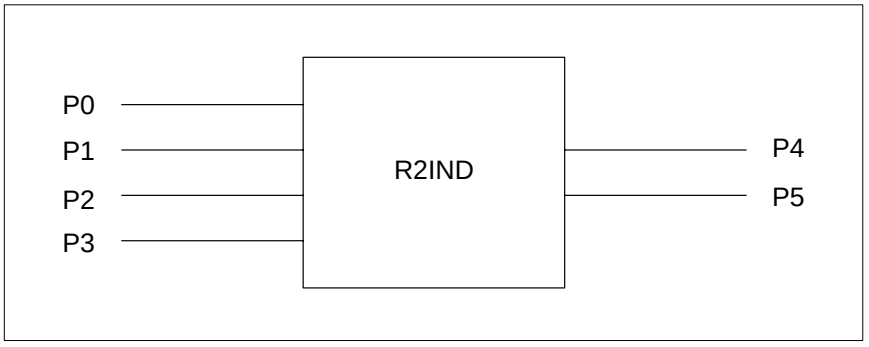

Fig. 5–2 R2IND Parameters

☞ **The transfer of parameters by means of data words is not possible!**

5.2.1 Input Parameters

Parameter	Attr.	Explanation
P0	W	Data type

Fig. 5–3 P0, Input Parameter

This parameter sepcifies the data type within a specific data range. This also defines the range in which the request-specific parameters and the event messages referring to the peripheral request are stored. Valid data ranges may be data modules (44H), and the data field (43H).

Parameter	Attr.	Explanation
P1	W	Data type attribute

Fig. 5–4 P1, Input Parameter

If the data range specified in P0 comprises a data module, P1 will indicate the data module number. In all other cases, P1 has no significance, and should be occupied by FFFFH.

Permissible values are 0 through 255, and FFFFH.

Parameter	Attr.	Explanation
P2	W	Byte offset

Fig. 5–5 P2, Input Parameter

This parameter indicates the start address of the request-specific parameters and the event messages in the selected data range.

Parameter	Attr.	Explanation
P3	W	System module number and channel number

Fig. 5–6 P3, Input Parameter

With this parameter, the HIGH byte indicates the system module number, and the LOW byte the channel number.

5.2.2 Output Parameters

P4 Output Parameter

Parameter	Attr.	Explanation
P4	W	Ergebnis

Fig. 5–7 P4, Output Parameter

This parameter returns programming and parameterization errors as well as the status at the time of calling the R2IND.

LOW byte	Explanation
00H	Correct input parameters, no indications/events available
01H	Correct input parameters, no indications/events available
04H	The specified memory range (DM) was not configured
05H	The specified memory range is too small
06H	Invalid Channel Number input parameter
07H	Invalid Offset input parameter
08H	Invalid Data Module Number input parameter
09H	Wrong memory management list
20H	Computer interface not started
24H	Queue Empty indication
30H	No indication queue for channel available
90H	No indication queue available for selected channel

Fig. 5–8 R2IND, Result Codes

If the parameter result equals = 0001H, the request-specific parameters in the specified data range will be undefined.

The permissible values are selected in such a fashion that the LOW byte contains a consecutive number, and the HIGH byte the PLC response.

HIGH byte	Explanation
00H	No response, correct processing routines
01H	Repeat function module call, temporary condition
02H	Modify PLC program due to programming fault
03H	Change input parameters due to programming fault
08H	Check system configuration

Fig. 5–9 PLC Responses

P5 Output Parameter

Parameter	Attr.	Explanation
P5	W	Number

Fig. 5–10 P5, Output Parameter

This parameter indicates the number of messages the R2IND has stored in the specified data range. The entries are made successively and without gaps.

5.3 Request-specific Output Parameters

In the specified data range, 8 request-specific parameter fields of 8 words each must be reserved. Here the function module stores the parameters of the peripheral request or of the event.

Parameter	Attr.	Explanation
PW1	W	Communications reference
PW2	W	Service / Event
PW3 thru PW8	W	Parameter dependent upon incoming PROFIBUS service and/or event

Fig. 5–11 Request-specific Output Parameters

5.3.1 Context Management Service

The Context Management Services are used to establish and/or release a connection, and to reject prohibited services.

Parameter	Initiate	Abort	Reject
PW2	IN	AB	RJ
PW3	-	Reason-Code	Detected Here
PW4	-	Locally Generated	-
PW5	-	Abort Identifier	Reject Code
PW6	-	Abort Detail	Original IV ID
PW7	-	-	-
PW8	-	-	-

Fig. 5–12 Context Management Services

Initiate Service

A connection has been established by one of the communications partners.

Abort Service

An existing connection to a communications partner has been released.

Parameter	Attr.	Explanation
PW3	W	Reason Code

Fig. 5–13 PW3, Abort Service

This parameter is used to indicate the reason for the connection relase.

The permitted value corresponds to the PROFIBUS standard values appearing in the tables below.

Parameter	Attr.	Explanation
PW4	W	Locally Generated

Fig. 5–14 PW4, Abort Service

This parameter indicates whether the Abort was caused locally or by the communications partner.

Permissible values:

0000H Abort caused by the communications partner

0001H Abort was caused locally

Parameter	Attr.	Explanation
PW5	W	Abort Identifier

Fig. 5–15 PW5, Abort Service

This parameter identifies the location at which the cause of the connection release was detected.

Permissible values:

Abort Identifier	Fault Location
0000H	USER
0001H	FMS
0002H	LLI
0003H	FDL
0004H	FMA7
0005H	FMA2
0006H	ALI
0007H	FMI

Fig. 5–16 Abort Identifiers, Overview

User

Abort Identifier	Reason Code	Explanation
0000H	0000H	Disconnect
0000H	0001H	Version OD Incompatible
0000H	0002H	Password Error
0000H	0003H	Profile Number Incompatible
0000H	0004H	Limited Service Permitted
0000H	0005H	OD Loading interacted

Fig. 5–17 User

FMS – File Management System

Abort Identifier	Reason Code	Explanation
0001H	0000H	FMS CRL Error
0001H	0001H	User Error
0001H	0002H	FMS PDU Error
0001H	0003H	Connection state conflict LLI
0001H	0004H	LLI Error
0001H	0005H	PDU Size exceeds max. PDU size
0001H	0006H	Feature not supported
0001H	0007H	Invoke-ID Error
0001H	0008H	max. Services overflow
0001H	0009H	Connection state conflict FMS
0001H	000AH	Service Error
0001H	000BH	Invoke ID Error Request
0001H	000CH	FMS disabled

Fig. 5–18 FMS

LLI – Lower Layer Interface

Abort Identifier	Reason Code	Explanation
0002H	0000H	LLI context check negative
0002H	0001H	Invalid LLI-PDU during associate or abort
0002H	0002H	Invalid LLI-PDU during data transfer phase
0002H	0003H	Unknown or invalid LLI-PDU received
0002H	0004H	DTA_ACK_PDU received and SAC=0
0002H	0005H	Max no. of parallel services exceeded by LLI
0002H	0006H	Unknown Invoke-ID
0002H	0007H	Priority-Error
0002H	0008H	Local error at the remote station
0002H	0009H	Timeout during associate
0002H	000AH	Timeout of cyclic control timer
0002H	000BH	Timeout of idle receive timer
0002H	000CH	Error while activating LSAP (state in AD)
0002H	000DH	Illegal FDL-primitive during associate or abort (see AD)
0002H	000EH	Illegal FDL-primitive during data transfer (see AD)
0002H	000FH	Unknown FDL-primitive
0002H	0010H	Unknown LLI-primitive
0002H	0011H	Illegal LLI-primitive during associate
0002H	0012H	Illegal LLI-primitive during data transfer
0002H	0013H	Invalid CRL-entry
0002H	0014H	associate connection conflict
0002H	0015H	Error during cyclic data transfer
0002H	0016H	max no of parallel services exceeded by FMS
0002H	0017H	CRL is loaded from FMA7; LLI is disabled
0002H	0018H	Confirm / indication mode error
0002H	0019H	Illegal FMA1/2 primitive
0002H	001AH	Illegal FMS-service on cyclic connection
0002H	001BH	FMS PDU too large on cyclic connection

Fig. 5–19 LLI

FDL – Field Bus Data Link

Abort Identifier	Reason Code	Explanation
0003H	0001H	UE remote user interface error
0003H	0002H	RR no remote resources available
0003H	0003H	RS service not activated at remote SAP
0003H	000CH	RDL no resource for send response data low
0003H	000DH	RDH no resource for send response data high
0003H	0010H	LS service not activated at local SAP
0003H	0011H	NA no reaction from remote station
0003H	0012H	Disconnected station
0003H	0013H	NO FDL service not OK
0003H	0014H	LR no local resources available
0003H	0015H	IV invalid request parameters

Fig. 5–20 FDL

Parameter	Attr.	Explanation
PW6	W	Abort Detail

Fig. 5–21 PW6, Abort Service

This parameter returns the abort detail associated with the Abort Identifier and Reason Code.

This is additional information regarding the reason for the connection release/abort.

Permissible values:

00H Error on loading the UPDATE buffer

01H Error on enabling a poll list entry

02H Error on disabling a poll list entry

03H Error on transmission (SDA)

04H Error on transmission (CSRD)

05H Error on transmission (SRD)

06H Error on receiving (CSDR)

Reject Service

The Reject service is used by the FMS to reject a prohibited PDU.

Parameter	Attr.	Explanation
PW3	W	Detected Here

Fig. 5–22 PW3, Reject Service

This parameter indicates whether the error was detected locally (TRUE). The value FALSE is valid only if the Reject PDU Type parameter indicates the value Confirmed Response PDU, and the Reason Code parameter contains the PDU Size value.

Permissible values:

0000H FALSE

00FFH TRUE

Parameter	Attr.	Explanation
PW5	W	Reject Code

Fig. 5–23 PW5, Reject Service

This parameter indicates the reason for which the PDU is rejected. Permissible values:

0000H	Other
0001H	Invoke-ID-Exists Confirmed Service request received from FMS User, and Invoke-ID exists already
0002H	Max-Services-Overflow Confirmed Service request received from FMS User, and Outstanding Service Counter Client ≥ Outstanding Services Client.
0003H	Service-Not-Supported-Connection-Oriented Service request received from FMS User, and the service is not supported as a client.
0004H	Service-Not-Supported-Connectionless Unconfirmed Service request received from FMS User, and the service is not supported as a client.
0005H	PDU-Size PDU Size > max. PDU size
0006H	User-Error-Connectionless Illegal or errored Service primitive from FMS User

Fig. 5–24 PW5, PDU Rejection

Parameter	Attr.	Explanation
PW6	W	Original Invoke ID

Fig. 5–25 PW6, Reject Service

The Invoke ID of the rejected PDU. Permissible values are 0000H thru 00FFH.

5.3.2 Variable Access Services

The Variable Access model provides services permitting reading or writing variables, as well as dynamic creation or deletion of new variable list objects. The explanation of the variables is defined by the configuration in the object dictionary of the communications partner. The variables are addressed via a logical address, the so-called *index*. Name addressing is not supported.

Parameter	Read	Write	Info. Report	Phys. Read	Phys. Write
PW2	RE	WR	IF	PR	PW
PW3	Index	Index	Index	Phys. address (LOW)	Phys. address (LOW)
PW4	PROFIBUS Data type	PROFIBUS Data type	PROFIBUS Data type	Phys. address (HIGH)	Phys. address (HIGH)
PW5	Number	Number	Number	Number	Number
PW6	Subindex	Subindex	Subindex	-	-
PW7	-	-	-	-	-
PW8	-	-	-	-	-

Fig. 5–26 Variable Access Services

Read Service

The object addressed in PW3 and PW6 was obtained from the communications partner.

Parameter	Attr.	Explanation
PW3	W	Index

Fig. 5–27 PW3, Read Service

Logical address of the variable object that was read by the incoming request.

Parameter	Attr.	Explanation
PW4	W	PROFIBUS Data type

Fig. 5–28 PW4, Read Service

This parameter indicates the data type of the data that has been read.

Parameter	Attr.	Explanation
PW5	W	Number/size

Fig. 5–29 PW5, Read Service

Size of the data that has been read, of the data type specified in PW4.

Parameter	Attr.	Explanation
PW6	W	Subindex

Fig. 5–30 PW6, Read-Service

Logical subaddress of the variable object that was read by means of the incoming request.

If no subaddress was used, this parameter will have a value of 0.

Write Service

The object addressed by PW3 and PW6 was written by the communications partner.

Parameter	Attr.	Explanation
PW3	W	Index

Fig. 5–31 PW3, Write Service

Logical address of variable object that was written by means of the incoming request.

Parameter	Attr.	Explanation
PW4	W	PROFIBUS Data type

Fig. 5–32 PW4, Write Service

This parameter indicates the data type of the data that has been written.

Parameter	Attr.	Explanation
PW5	W	Number/size

Fig. 5–33 PW5, Write Service

Size of the data that has been written, of the data type specified in PW4.

Parameter	Attr.	Explanation
PW6	W	Subindex

Fig. 5–34 PW6, Write-Service

Logical subaddress of the variable object that was written by means of the incoming request.

If no subaddress was used, this parameter will have a value of 0.

Information Report

This parameter protocols the arrival of an information report. If applicable, the data has been written to the address defined by means of the Establish Information Report function.

Parameter	Attr.	Explanation
PW3	W	Index

Fig. 5–35 PW3, Information Report

Logical address of the variable object of the communications partner. This value can be interpreted for data identification purposes.

Parameter	Attr.	Explanation
PW4	W	PROFIBUS Data type

Fig. 5–36 PW4, Information Report

This parameter indicates the data type of the data that has been received.

Parameter	Attr.	Explanation
PW5	W	Number/size

Fig. 5–37 PW5, Information Report

Size of the data that has been written, of the data type specified in PW3.

Parameter	Attr.	Explanation
PW6	W	Subindex

Fig. 5–38 PW6, Information Report

Logical subaddress of the variable object on the communications partner.

Physical Read Service

Parameter	Attr.	Explanation
PW2	W	Physical address (LOW)
PW3	W	Physical address (HIGH)

Fig. 5–39 PW2 / PW3, Physical Read Service

Physical (logical) address used to access the ZE.

Parameter	Attr.	Explanation
PW5	W	Number

Fig. 5–40 PW5, Physical Read Service

Number of bytes transferred.

Physical Write Service

Parameter	Attr.	Explanation
PW2	W	Physical address (LOW)
PW3	W	Physical address (HIGH)

Fig. 5–41 PW2 / PW3, Physical Write Service

Physical (logical) address used to access the ZE.

Parameter	Attr.	Explanation
PW5	W	Number

Fig. 5–42 PW5, Physical Write Service

Number of bytes transferred.

5.3.3 VFD Support Services

Parameter	Status	Identify
PW2	ST	ID
PW3	-	-
PW4	-	-
PW5	-	-
PW6	-	-
PW7	-	-
PW8	-	-

Fig. 5–43 VFD Support Services

Status Service

The local device/user status was read/accessed by a communications partner.

Identify Service

The local identification string was read/accessed ny a communications partner. The identification string of the R200P has a length of 57 bytes and reads as follows:

‘ROBERT BOSCH GmbH R200P 077285 V x.xx - xxx’

5.3.4 OD Management Services

The OD management services are used to manipulate the object dictionary (OD).

Parameter	Get OD	Initiate Put OD	Put OD	Terminate Put OD
PW2	GO	IO	PO	TO
PW3	Index	Consequence	-	-
PW4	Format	-	-	-
PW5	-	-	-	-
PW6	-	-	-	-
PW7	-	-	-	-
PW8	-	-	-	-

Fig. 5–44 OD Management Services

Get OD Service

The Get OD service is used to read one or more object descriptions.

Parameter	Attr.	Explanation
PW3	W	Index

Fig. 5–45 PW3, Get OD Service

Logical address of the variable object, the object description of which was read.

Parameter	Attr.	Explanation
PW3	W	Index

Fig. 5–46 PW3, Get OD Service

This parameter indicates whether the short-form or long-form version of the object description was read.

Permissible values:

00H Short-form version

FFH Long-form version

Initiate Put OD Service

The Initiate Put OD service initates the process of non-interactive or interactive object dictionary loading from a remote station.

Put OD Service

The Put OD service is used to write one or more object descriptions into the the object dictionary of a remote station.

Terminate Put OD Service

The Terminate Put OD service is used to conclude the process of loading an object dictionary from another station.

5.3.5 FMA7 Context Management

The FMA7 Context Management services are used to establisjh and/or release the management connection.

Parameter	FMA7-Initiate	FMA7-Abort
PW2	MI	MA
PW3	-	Reason Code
PW4	-	Locally Generated
PW5	-	Abort Identifier
PW6	-	Abort Detail
PW7	-	-
PW8	-	-

Fig. 5–47 FMA7 Context Management

FMA7 Initiate Service

The FMA7 management connection was set up by the configurator.

FMA7 Abort Service

The existing management connection with the configurator was released.

Parameter	Attr.	Explanation
PW3	W	Reason Code

Fig. 5–48 PW3, FMA7 Abort Service

This parameter is used to indicate the reason for the connection release.

The permitted value corresponds to the PROFIBUS standard values appearing in the tables below.

Parameter	Attr.	Explanation
PW4	W	Locally Generated

Fig. 5–49 PW4, FMA7 Abort Service

This parameter indicates whether the Abort was coaused locally or by the communications partner.

Permissible values:

0000H Abort caused by the communications partner

0001H Abort was caused locally

Parameter	Attr.	Explanation
PW5	W	Abort Identifier

Fig. 5–50 PW5, FMA7 Abort Service

This parameter indicates the location at which the cause of the connection release was detected. Permissible values:

Abort Identifier	Fault Location
0000H	USER
0001H	FMS
0002H	LLI
0003H	FDL
0004H	FMA7
0005H	FMA2
0006H	ALI
0007H	FMI

Fig. 5–51 Abort Identifiers, Overview

User

Abort-Identifier	Reason-Code	Bedeutung
0000H	0000H	Disconnect

Fig. 5–52 User

FMS

Abort-Identifier	Reason-Code	Bedeutung
0001H	0000H	FMS-CRL-Error
0001H	0001H	User Error
0001H	0002H	FMS PDU Error
0001H	0003H	Connection state conflict LLI
0001H	0004H	LLI Error
0001H	0005H	PDU Size exceeds maximum PDU size
0001H	0006H	feature not supported
0001H	0007H	Invoke-ID Error
0001H	0008H	max. Services overflow
0001H	0009H	Connection state conflict FM7
0001H	000AH	Service Error

Fig. 5–53 FMS

LLI – Lower Layer Interface

Abort Identifier	Reason Code	Explanation
0002H	0000H	LLI context check negative
0002H	0001H	Invalid LLI-PDU during associate or abort
0002H	0002H	Invalid LLI-PDU during data transfer phase
0002H	0003H	Unknown LLI-PDU received
0002H	0004H	DTA_ACK_PDU received and SAC=0
0002H	0005H	max no of parallel services exceeded by PDU
0002H	0006H	Unknown Invoke-ID
0002H	0007H	Priority-Error
0002H	0008H	Local error at the remote partner
0002H	0009H	Timeout during associate
0002H	000AH	Timeout of cyclic control timer
0002H	000BH	Timeout of idle receive timer
0002H	000CH	Error while activating LSAP (state in AD)
0002H	000DH	Illegal FDL-primitive during associate or abort (see AD)
0002H	000EH	Illegal FDL-primitive during data transfer (see AD)
0002H	000FH	Unknown FDL-primitive
0002H	0010H	Unknown LLI-primitive
0002H	0011H	Illegal LLI-primitive during associate
0002H	0012H	Illegal LLI-primitive during data transfer
0002H	0013H	Invalid CRL-entry
0002H	0014H	associate connection conflict
0002H	0015H	Error during cyclic data transfer
0002H	0016H	Max no. of parallel services exceeded by FMS
0002H	0017H	CRL is loaded from FMA7; LLI is disabled
0002H	0018H	Confirm / indication mode error
0002H	0019H	Illegal FMA1/2 primitive
0002H	001AH	Illegal FMS-service on cyclic connection
0002H	001BH	FMS PDU too large on cyclic connection

Fig. 5–54 LLI

FDL – Field Bus Data Link

Abort Identifier	Reason Code	Explanation
0003H	0001H	UE remote user interface error
0003H	0002H	RR no remote resources available
0003H	0003H	RS service not activated at remote SAP
0003H	0004H	No access to remote SAP (PROFIBUS-PA only)
0003H	000CH	RDL no resource for send response data low
0003H	000DH	RDH no resource for send response data high
0003H	0010H	LS service not activated at local SAP
0003H	0011H	NA no reaction from remote station
0003H	0012H	Local station not in token ring
0003H	0013H	NO FDL service not ok
0003H	0014H	LR no local resources available
0003H	0015H	IV invalid request parameters

Fig. 5–55 FDL

Parameter	Attr.	Explanation
PW6	W	Abort Detail

Fig. 5–56 PW6, FMA7 Abort Service

This parameter returns the abort detail associated with the Abort Identifier and Reason Code.

This is additional information regarding the reason for the connection release/abort.

Permissible values:

00H Error on loading the UPDATE buffer

01H Error on enabling a poll list entry

02H Error on disabling a poll list entry

03H Error on transmission (SDA)

04H Error on transmission (CSRD)

05H Error on transmission (SRD)

06H Error on transmission (CSDR)

5.3.6 FMA7 Configuration Management

The configuration management provides the following functions:

- Loading and read-access to the communications reference list (CRL)
- Access to Layer $^1/_2$ variables, statistics counters and parameters
- Identification of bus station communications components
- Bus station protocol/logging

CRL Rem Service

Loading the communications reference list (CRL) into another station is accomplished through the use of a sequence containing the Initiate Load CRL Rem service, one or several Load CRL Rem services, and one Terminate Load CRL Rem service.

To read a CRL entry from a management-capable station, the Read CRL Rem service is available.

Parameter	Initiate Load CRL Rem	Load CRL Rem	Terminate Load CRL Rem	Read CRL Rem
PW2	IK	LK	TK	RK
PW3	-	Loaded KR	-	Read KR
PW4	-	-	-	-
PW5	-	-	-	-
PW6	-	-	-	-
PW7	-	-	-	-
PW8	-	-	-	-

Fig. 5–57 FMA7 Configuration Management

Initiate Load CRL Rem Service

Using the Initiate Load CRL Rem service, the configurator initiates loading of the CRL into a management-capable station.

Load CRL Rem Service

Using the Load CRL Rem service, the configurator loads both the CRL header and the static parts of a CRL entry into a management-capable station.

Terminate Load CRL Rem Service

Using the Terminate Load CRL Rem service, the configurator terminates the loading of the CRL into a management-capable station.

Read CRL Rem Service

Using the Read CRL Rem service, the configurator is able to read the CRL header plus the static parts of a CRL entry of a management-capable station.

5.3.7 Layer 1/2 Value Rem Service

Using these services, the configurator is able to set or read FDL operating parameters in a management-capable station.

As only variables that are noncritical with regard to token ring stability can be changed, the address of the station itself, the baudrate and the release of the PROFIBUS connection cannot be modified.

Parameter	Set Value Rem	Read Value Rem
PW2	SV	RV
PW3	Variable Identifier	Variable Identifier
PW4	-	-
PW5	-	-
PW6	-	-
PW7	-	-
PW8	-	-

Fig. 5–58 Layer 1/2 Value Rem Services

Set Value Rem Service

The Set Value Rem service is used to set variables in the FDL of the remote station.

Identifier	FDL Operating Parameter	Explanation
3	Medium_Red	Redundancy
6	TSL	Slot Time
7	MIN_TSDR	Minimum Station Delay Time
8	MAX_TSDR	Maximum Station Delay Time
9	TQUI	Modulator decay time
10	TSET	Setup time
11	TTR	Token cycle time
12	G	Gap Update Factor
13	In_ring_desired	Acceptance request for logical token ring
14	HSA	Highest-numbered station address on the bus
15	max_retry_limit	Maximum number of retries
20	Frame_sent_count	Number of messages sent
21	Retry_count	Number of message retries

Identifier	FDL Operating Parameter	Explanation
22	SD_count	Number of valid start delimiters
23	SD_error_count	Number of errored start delimiters

Fig. 5–59 Set Value Rem Service

Read Value Rem Service

The Read Value Rem service is used to read variables from FDL or PHY of the remote station.

Identifier	FDL Operating Parameters	Explanation
1	TS	Local station address and segment
2	Baud_rate	Baudrate
3	Medium_Red	Redundancy
4	HW-Release	Hardware Release
5	SW-Release	Software Release
6	TSL	Slot Time
7	MIN_TSDR	Minimum Station Delay Time
8	MAX_TSDR	Maximum Station Delay Time
9	TQUI	Modulator decay time
10	TSET	Setup Time
11	TTR	Token cycle time
13	In_ring_desired	Acceptance request for logical token ring
14	HSA	Highest-numbered station address on the bus
15	max_retry_limit	Maximum number of retries
16	TRR	Real Rotation Time
17	LAS	List of active Stations
18	GAPL	List of all stations within local GAP range
20	Frame_sent_count	Number of messages sent
21	Retry_count	Number of message retries
22	SD_count	Number of valid start delimiters
23	SD_error_count	Number of errored start delimiters

Fig. 5–60 Read Value Rem Service

5.3.8 FMA7 Identification Services

The FMA7 identification services enable the FMA7 user to query manufacturer ID, software and hardware versions and characteristics of a PROFIBUS connection. In contrast to the FMS identification service, this service identifies the communications components.

Parameter	Ident Rem	LSAP Status Rem
PW2	IR	LS
PW3	Instance Identifier	LSAP value
PW4	-	-
PW5	-	-
PW6	-	-
PW7	-	-
PW8	-	-

Fig. 5–61 FMA7 Identification Service

Ident Rem Service

The Ident Rem service is used to read the Ident List of the FMS, FMA7, and LLI, or the station ID of a remote station.

Identifier	Instance
0	FMA7
1	FMS
2	LLI
3	FDL
4	STATION
5	PHY

Fig. 5–62 Ident Rem Service

Remote LSAP Status Query

The FMA7 user is provided with services enabling him to obtain information about the configuration of service access points (SAP) of layer 2 on the remote station with regard to their FDL services.

5.3.9 Network Management Services

Parameter	FMA7 Event
PW2	EV
PW3	Instance Identifier
PW4	Event/Fault
PW5	Additional Detail
PW6	-
PW7	-
PW8	-

Fig. 5–63 Network Management Services

FMA7 Event Service

This service is used to inform the user of local events or errors occurring in the local instances.

Parameter	Attr.	Explanation
PW3	W	Instance Identifier

Fig. 5–64 PW3, FMA7 Event Service

This parameter indicates the instance in which the error or event has occurred. Permissible values:

0002H LLI

0003H FMA2

Parameter	Attr.	Explanation
PW4	W	Event/Fault

Fig. 5–65 PW4, FMA7 Event Service

This parameter identifies the event or error. Permissible values:

Instance	Fault	Explanation
0002H	0001H	Error during SAP activation (.con(-))
0002H	0002H	Error during SAP deactivation (.con(-))
0002H	0003H	Error during leading the update buffer
0002H	0004H	Activate cycle polling failed
0002H	0005H	Deactivate cyclic polling failed
0002H	0006H	Invalid FDL primitive during associate or abort

Instance	Fault	Explanation
0002H	0007H	Invalid FDL primitive during data transfer phase
0002H	0008H	Unknown FDL primitive
0002H	0009H	Unknown LLI primitive
0002H	000AH	Illegal LLI primitive during associate or abort
0002H	000BH	Illegal LLI primitive during data transfer
0002H	000CH	Error during sending (SDA.con)
0002H	000DH	Error during sending (CSRD.con)
0002H	000EH	Error during sending (SRD.con)
0002H	000FH	Error during sending (SDN.con)
0002H	0010H	Error during receiving (CSRD.con)
0002H	0011H	Poll list loading failed (CSRD.con)
0002H	0012H	Timeout during associate
0002H	0013H	Timeout during abort
0002H	0014H	Poll list deactivation failed
0002H	0015H	No matching communication reference in LLI
0002H	0016H	Illegal FMA1/2 primitive received
0002H	0017H	Invalid FDL primitive received during LLI start
0002H	0018H	Confirm / indication-mode error
0002H	0019H	Timer error
0002H	001AH	resource transfer to FDL failed
0002H	001BH	resource error during association
0002H	001CH	resource error in data transfer phase
0002H	001DH	resource error during abort
0002H	001EH	LLI state error
0003H	0001H	Address duplication detected
0003H	0002H	Transceiver Error occured
0003H	0003H	Timeout am Bus
0003H	0004H	No Receiver Synchronization
0003H	0005H	Station out of Ring
0003H	0006H	New Station in Ring

Fig. 5–66 FMA7 Event Service

Parameter	Attr.	Explanation
PW6	W	Abort Detail

Fig. 5–67 PW6, FMA7 Event Service

This parameter contains additional information about the respective event or error.

6 Configuration

The PROFIBUS protocol is specifically optimized for high-efficiency message transmission. This is accomplished by dispensing with the requirement to negotiate parameters, and describe objects and communications references during the data transmission phase. Instead, these items are defined prior to the start-up of the bus system.

In the case of the R200P, the PROFIBUS Configurator provides a convenient means for the secure and comfortable preparation of configuration data.

PROFIBUS Configurator

The PROFIBUS Configurator is suitable for both local and remote configuration procedures.

In the case of local configuration, the required data is stored in the programming device in the form of several ASCII files. The data transfer is handled by the WIN-SPS software via the **Editor** menu option in the **Control / PROFIBUS** menu.

Here, too, the user can avail himself of the convenience and options provided by the error detection function of the configurator.

It is instructive to note that the ASCII files to be transferred can also be created without a configurator being available. However, this should be attempted only by users possessing considerable PROFIBUS experience.

Under no circumstances should users with rudimentary PROFIBUS skills attempt to work without having the benefit of the useful PROFIBUS Configurator configuration tool. As the configurator features a consistency check enabling complete fault diagnostics routines of the entire PROFIBUS configuration, this is the only way possible to prevent classic configuration faults.

Local Configuration

Using the **Editor** option of the WIN-SPS software, the files created by means of the PROFIBUS Configurator (CRL, OD and BUS) can be loaded.

For this purpose, the **Controller** menu option must be selected in the **Editor** menu. the option contains commands for loading, unloading and comparing the PROFIBUS configuration. As a prerequisite for enabling this menu command, the programming unit must be connected to the controller (ZE200).

Global Configuration

In the case of global configuration, the configuration data is transferred to the R200P via the PROFIBUS. This requires the PROFIBUS Configurator (order no. 1070 075 077), and the PROFIBUS CP5412 Interface Card (order no. 1070 917 151).

PROFIBUS Request Logging

The PROFIBUS request logging function is activated by the connected terminal via the lower interface connection.

This also requires the selection of the ”No Protocol” position for the lower interface by appropriately setting DIP switch S1.

The following keyboard input is essential:

T	Enable/disable request logging.
E	Enable/disable error logging, possible only while request logging is disabled.
D	Display format of Hex/String switchover for string output.
H or ?	Displays permissible keyboard commands.
K or C	Displays configured communications references.
O	Displays configured object lists.
B	Displays bus parameters.
V	Displays the LiveList
L	Displays the message that was last output

Fig. 6–1 Keyboard Inputs

If request logging is enabled, channel 0 will be disabled for the V.24/20 mA protocols (BUEP19E, BUEP64 and BUEP03E).

The PROFIBUS protocol software will then output test messages via this interface, enabling the user to track the course of the communication by connecting a terminal or a printer. This is a very useful tool especially during the system start-up phase.

☞ **As the request logging function causes a significant reduction in data exchange on the PROFIBUS interface, activation and use of the function is intended only for the start-up phase.**

The request logging function comprises a local bus monitor by means of which all protocol messages, as well as all network management messages (even and fault indications) of this station are presented to the user for logging purposes.

The messages for productive services contain:

- the communications reference
- the VFD number
- the Invoke ID
- the Index and Subindex (for read and write-access)
- the transferred data values in hex format

The messages for management services contain:

- the communications reference
- the VFD number
- the fault location (local or remote)
- the Instance Identifier, and the Reason Code of the error that has occurred
- a closer description of the error (Additional Detail)

To faciliate a better differentiation between the correct protocol messages and other indications, all Event, Fault, and Abort indications, and all internal fault messages are identified by a characteristic error ID.

☞ **Because all error messages are also accompanied by an Identifier and a Reason Code, a fault can in most cases be precisely identified via the error report lists in the description of the R2CON and/or R2IND function modules.**

Notes:

7 Connection Example

In the following example, two CL200 Control Units are linked by a PROFIBUS connection. One CL200 is responsible for monitoring the connection. Both controllers exchange data via the specified connection.

This example is also available for downloading as a complete PLC project from the mailbox of Robert Bosch GmbH (Tel. +49 60 62 / 72 17).

7.1 PROFIBUS Configuration

7.1.1 Station 1 Communications Reference List (CRL)

```
;     PROFIBUS CONFIGURATOR   Z.No.: 075077–103
;     Documentation of Communications Reference List
;     Project: Bei_200
;     Programmer: Eberhardt
;     Date: 08/01/96
;     Brief description: Sample program for R200P. In this example,
;     two R200P are connected via PROFIBUS.
;     Symb. Name of partner:  Station 1
1    ;Station address
255  ;Segment address
255  ;In Ring Desired
0    ;Reserved
;
;CRL Header
;Parameter  Description
;_____________________________________________
0     ;Communications reference of CRL header
2     ;Number of CRL entries
255   ;Poll List SAP
4096  ;Time Out for Associate and Abort
0     ;Symbol length in the FMS CRL
0     ;VFD Pointer Supported
;
;
;CRL entries
;KR LSAP RemAdr RemSegm DSAP Type    LLI VerbAtt SCC RCC SAC RAC CI    Mult PDUSH PDUSL PDURH PDURL
FMS0 FMS1 FMS2 FMS3 FMS4 FMS5 VFD–Nr SymName      Ext. Pass AccGrp
;_____________________________________________________________________________________________________
;1  Default Management – KR
 2  0    2      255     0    MMAZ    0   D       1   1   0   0   1000  0    0     241   0     241   0
  30   0    0    30   0    0     [          ]  0     0     00
 3  2    0      255     0    MMAZ    0   D       1   1   0   0   1000  0    0     241   0     241   0
  0    0    A0   0    0    0     [          ]  0     0     00
```

7.1.2 Station 2 Communications Reference List (CRL)

```
;     PROFIBUS CONFIGURATOR   Z.Nr.: 075077–103
;     Documentation of Communications Reference List
;     Project: Bei_200
;     Programmer: Eberhardt
;     Date: 08/01/96
;     Brief description: Sample program for R200P. In this example,
;     two R200P are connected via PROFIBUS.
;
;
;
;     Symb. Name of partner:  Station 2
2    ;Station address
255  ;Segment address
255  ;In Ring Desired
0    ;Reserved
;
;CRL Header
;Parameter  Description
;_____________________________________________
0     ;Communications reference of CRL header
2     ;Number of CRL entries
255   ;Poll List SAP
4096  ;Time Out for Associate and Abort
0     ;Symbol length in the FMS CRL
0     ;VFD–Pointer Supported
;
;
;
;
;
;CRL entries
;KR LSAP RemAdr RemSegm DSAP Type    LLI VerbAtt SCC RCC SAC RAC CI    Mult PDUSH PDUSL PDURH PDURL
FMS0 FMS1 FMS2 FMS3 FMS4 FMS5 VFD–Nr SymName      Ext. Pass AccGrp
;_____________________________________________________________________________________________
_____________________________________________________
;1  Default Management – KR
 2  0    1      255     0    MMAZ    0   D       1   1   0   0   1000  0    0     241   0     241   0
  30   0    0    30   0    0     [          ]  0     0     00
 3  2    0      255     2    MMAZ    0   D       1   1   0   0   1000  0    0     241   0     241   0
  0    0    A0   0    0    0     [          ]  0     0     00
```

7.1.3 Station 1 Object Dictionary (OD)

```
;     PROFIBUS CONFIGURATOR   Z.Nr.: 075077–103
;     Object List Documentation
;     Project: Bei_200
;     Programmer: Eberhardt
;     Date: 08/01/96
;     Brief description: Sample program for R200P. In this example,
;     two R200P are connected via PROFIBUS.
;
;
; Station 1 : Symbolic name of partner
;      1    : Station address
#0          ; VFD number
;
;
;OD Header Object
;Parameter  Description
;_____________________________
1          ;OD Header Object Code
0          ;OD Header Index
255        ;ROM/RAM Flag
0          ;Length of symbolic names
255        ;Access Protection
1          ;OD Version
FFFFFFFF   ;Local Address OD OB
14         ;ST OD Length
FFFFFFFF   ;Local address ST OD
20         ;1st Index S OD
1          ;S OD Length
FFFFFFFF   ;Local address S OD
0          ;1st Index DV OD
0          ;DV OD Length
FFFFFFFF   ;Local address DV OD
0          ;1st Index DP OD
0          ;DP OD Length
FFFFFFFF   ;Local address DP OD
;
;
;Basic types
;OC Index Description
;_________________________
 5   6     [Unsigned16];
;
;
;Static Data Types
;OC Index #Elems  Type/Length ( x #Elems)
;_____________________________________
;No static data types found!
;
;
;Objects ’Single variable’
;OC Index  Type  Length Pass  AccGrp AccR  Adr      SymName    Ext  KoordMrk
;_____________________________________________________________________________
;No Object ’single variable’ found!
;
;
```

```
;'Array' objects
;OC Index #Elems Type  Length Pass  AccGrp  AccR  Adr     SymName   Ext  CoordMrk
;_____________________________________________________________________________
 8    20   100     6     2   00     00    0003 44000000 [ ]       0    7FFF;
;
;
;'Record' objects
;OC Index  Type   Pass  AccGrp AccR Adr    SymName  Ext
;_____________________________________________________
;No 'Record' object found!
;
;
;'Event' objects
;OC Index  Type  Length Pass  AccGrp AccR Enable  Adr  SymName  Ext
;_____________________________________________________________________
;No 'Event' object found!
;
;
;'Domain' objects
;OC Index Length Pass  AccGrp AccR State   Adr  SymName  Ext
;_____________________________________________________________
;No 'Domain' object found!
;
;
;'Variable list' objects
;OC Index #Objects  Pass AccGrp AccR   Del    Adr  SymName  Ext  ObjectList
;_____________________________________________________________________________
;No 'Variable list' object found!
;
;
;'Program invocation' objects
;OC Index #Doms  Pass AccGrp AccR   Del Reuse State   Adr  SymName  Ext  IndexList
;_____________________________________________________________________________
;No 'Program invocation' object found!
;
;
```

7.1.4 Station 2 Object Dictionary (OD)

```
;     PROFIBUS CONFIGURATOR   Z.Nr.: 075077–103
;     Object List Documentation
;     Project: Bei_200
;     Programmer: Eberhardt
;     Date: 08/01/96
;     Brief description: Sample program for R200P. In this example,
;     two R200P are connected via PROFIBUS.
;
;
; Station 2 : Symbolic Name of partner
;      2    : Station address
#0          ; VFD Number
;
;
;OD Header Object
;Parameter  Description
;_____________________________
1          ;OD Header Object Code
0          ;OD Header Index
255        ;ROM/RAM Flag
0          ;Length of symbolic names
255        ;Access Protection
1          ;OD Version
FFFFFFFF   ;Local address OD OB
14         ;ST OD Length
FFFFFFFF   ;Local address ST OD
20         ;1st Index S OD
1          ;S OD Length
FFFFFFFF   ;Local address S OD
0          ;1st Index DV OD
0          ;DV OD Length
FFFFFFFF   ;Local address DV OD
0          ;1st Index DP OD
0          ;DP OD Length
FFFFFFFF   ;Local address DP OD
;
;
;Basic types
;OC Index Description
;_________________________
 5   6     [Unsigned16];
;
;
;Statische Datentypen
;OC Index #Elems  Typ/Length ( x #Elems)
;_____________________________________
;No static data types found!
;
;
;'Single variable' objects
;OC Index  Type  Length Pass  AccGrp AccR  Adr      SymName    Ext  KoordMrk
;_____________________________________________________________________________
;No 'Single variable' object found!
;
;
```

```
;'Array' objects
;OC Index #Elems Type  Length Pass  AccGrp  AccR  Adr     SymName   Ext  CoordMrk
;_____________________________________________________________________________
 8    20   100     6     2   00     00    0003 44000000 [ ]       0    7FFF;
;
;
;'Record' objects
;OC Index  Type   Pass  AccGrp AccR Adr    SymName  Ext
;_____________________________________________________
;No 'Record' object found!
;
;
;'Event' objects
;OC Index  Type  Length Pass  AccGrp AccR Enable  Adr  SymName  Ext
;_____________________________________________________________________
;No 'Event' object found!
;
;
;'Domain' objects
;OC Index Length Pass  AccGrp AccR State   Adr  SymName  Ext
;_____________________________________________________________
;No 'Domain' object found!
;
;
;'Variable list' objects
;OC Index #Objects  Pass AccGrp AccR   Del    Adr  SymName  Ext  ObjectList
;_____________________________________________________________________
;No 'Variable list' object found!
;
;
;'Program invocation' objects
;OC Index #Doms  Pass AccGrp AccR   Del Reuse State   Adr  SymName  Ext  IndexList
;_____________________________________________________________________________
;No 'Program invocation' object found!
;
;
;
```

7.1.5 BUS Parameters

```
;     PROFIBUS CONFIGURATOR   Z.Nr.: 075077–103
;     BUS Parameter Documentation
;     Project: Bei_200
;     Programmer: Eberhardt
;     Date: 08/01/96
;     Brief description: Sample program for R200P. In this example,
;     two R200P are connected via PROFIBUS.
;
;
;Parameter Description
;_____________________________________________
126       ;Highest station address
4         ;Baudrate
0         ;Redundancy
3500      ;Slot Time
22        ;Modulator decay time
500       ;Minimum Station Delay Time
1000      ;Maximum Station Delay Time
50        ;Setup Time
100000    ;Target Rotation Time
1         ;GAP Update factor
1         ;Max. Call retrys
```

7.2 Control Unit 1

```
+------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date :   8. Jan. 1996 |
| Project: R200P–1/ZS0   File:  OB1.PBO         (OB1)    Page :       2        |
+------------------------------------------------------------------------------+


1    BA      –DM2

2    L    W  D0,A
3    INC  W  A,1
4    T    W  A,D0
5    T    W  A,A0

6    BA      –PROFIBUS


7    EP               ;End of program ...


 –DM2      DM2     Source data module
 –PROFIBUS PB3
```

```
+------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/ZS0   File:   OB5.PBO         (OB5)   Page:        3        |
+------------------------------------------------------------------------------+
1    L    W  K1H,A
2    T    W  A,M10

3    EM
```

```
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/BIB   File:  R2REQ.PBL       (PB0)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 101      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | DTyp     | < |Data range for protocol parameters                  |
| P1  | W  |   | DBNr     | < |Data module number                                 |
| P2  | W  |   | Offset   | < |Offset                                              |
| P3  | W  |   | ABL      | < |JBL Job bit array                                   |
| P4  | W  |   | FbStatus | > |Function module error message                       |
| P5  | W  |   | EBL      | > |RBA Result bit array                                |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/BIB   File:  R2CON.PBL       (PB1)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 100      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | RSSKANAL | < |Computer interface and channel number               |
| P1  | W  |   | AUFTRNR  | < |Request number                                      |
| P2  | W  |   | BEARBNR  | > |Processed request number                            |
| P3  | W  |   | STATUS   | > |Status of processed request number                  |
| P4  | W  |   | FEHLER   | > |Function module error message                       |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/BIB   File:  R2IND.PBL       (PB2)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 100      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | DATENTYP | < |Destination area for indication queue               |
| P1  | W  |   | DBNR     | < |Data module number for indication queue             |
| P2  | W  |   | OFFSET   | < |Start address for indication queue                  |
| P3  | W  |   | RSSKANAL | < |Computer interface and channel number               |
| P4  | W  |   | ERGEBNIS | > |Function module error message                       |
| P5  | W  |   | ANZAHL   | > |Number of stored events                             |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
```

```
+-------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/ZS0   File:  PROFIBUS.PBO    (PB3)    Page:        5        |
+-------------------------------------------------------------------------------+
     ;*************************************************************************
     ;*                                                                       *
     ;*           Function Module for PROFIBUS Communications                 *
     ;*                                                                       *
     ;*************************************************************************
1    BA      –R2REQ,6
     P0   W  K44H       ;Data module
     P1   W  K0H        ;Data module number = 0
     P2   W  K0H        ;Offset in data module
     P3   W  M10        ;JBA Job bit array
     P4   W  M20        ;Error message
     P5   W  M22        ;RBA Result bit array

2    L    W  K0H,A
3    T    W  A,M10

4    BA      –R2CON,5
     P0   W  K0001H     ;Computer interface and channel number
     P1   W  K0H        ;Request number
     P2   W  M30        ;Request number, mirrored
     P3   W  M32        ;Status
     P4   W  M34        ;Error message

5    L    W  M30,A
6    L    W  M32,A
7    L    W  M34,A

8    L    W  M32,A
9    U    W  KFF00H,A
10   L    W  K0300H,B
11   VGLA W  B,A
     PZ:  1
12   A    B  Z
13   S    B  M10.0      ;Repeat Initate request due to error

14   L    W  M32,A
     ;A   W  KFF00H,A
15   L    W  K0H,B
16   VGLA W  B,A
     PZ:  2
17   A    B  Z
18   S    B  M10.1      ;Initiated request successfully concluded, productive service initiated.

19   BA      –R2CON,5
     P0   W  K0001H     ;Computer interface and channel number
     P1   W  K1H        ;Request number
     P2   W  M40        ;Request number, mirrored
     P3   W  M42        ;Status
     P4   W  M44        ;Error message

20   L    W  M44,A
21   L    W  KF002H,B   ;Connection is not set up
22   VGLA W  B,A
     PZ:  3
23   A    B  Z
24   S    B  M10.0
```

```
25   L    W  M44,A
26   L    W  KFF04H,B  ;No request currently being processed
27   VGLA W  B,A
     PZ:  4
28   A    B  Z
29   S    B  M10.1


30   EM              ;End Module ...


 -R2CON    PB1
 -R2REQ    PB0
```

```
+-------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/ZS0   File:  R200P–1.SBS              Page:        2        |
+-------------------------------------------------------------------------------+
+----------+----------+-----------------------------+-----+-------+------------+
|  DM no.  |   Name   |          Comment            | R/E |Length |            |
+----------+----------+-----------------------------+-----+-------+------------+
| DM    0  | DM0      |PROFIBUS request parameter   |  R  |  512  |            |
| DM    1  | DM1      |Destination data module      |  R  |  512  |            |
| DM    2  | DM2      |Source data module           |  R  |  512  |            |
+----------+----------+-----------------------------+-----+-------+------------+
+-------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–1/ZS0   File:  R200P–1.SBS              Page:        3        |
+-------------------------------------------------------------------------------+
+-------------------------------------------------------------------------------+
| DM    0 Name: DM0      Comment  : PROFIBUS Request parameters   RAM/EPROM: R |
+---------+--------+------+---+-----------------------------------------------+---+
|   Nr.   | Symbol | Typ  |Vz |                 Data field                    | F |
+---------+--------+------+---+-----------------------------------------------+---+
|         |        |;     |   |Result of 1st request                          |   |
| D     0 |        |Word  | N |FFFF                                           | H |
|         |        |;     |   |Computer interface and channel number          |   |
| D     2 |        |Word  | N |001                                            | H |
|         |        |;     |   |Request number                                 |   |
| D     4 |        |Word  | N |0                                              | H |
|         |        |;     |   |Communications reference                       |   |
| D     6 |        |Word  | N |2                                              | H |
|         |        |;     |   |Service (Initiate)                             |   |
| D     8 |        |Ascii | N |IN                                             |   |
| D    10 |        |Word  | N |                                               | H |
| D    12 |        |Word  | N |                                               | H |
| D    14 |        |Word  | N |                                               | H |
| D    16 |        |Word  | N |                                               | H |
| D    18 |        |Word  | N |                                               | H |
| D    20 |        |Word  | N |                                               | H |
| D    22 |        |Word  | N |                                               | H |
| D    24 |        |Word  | N |                                               | H |
| D    26 |        |Word  | N |                                               | H |
| D    28 |        |Word  | N |                                               | H |
| D    30 |        |Word  | N |                                               | H |
|         |        |;     |   |Result of 2nd request                          |   |
| D    32 |        |Word  | N |FFFF                                           | H |
|         |        |;     |   |Computer interface and channel number          |   |
| D    34 |        |Word  | N |0001                                           | H |
|         |        |;     |   |Request number                                 |   |
| D    36 |        |Word  | N |1                                              | H |
|         |        |;     |   |Communications reference                       |   |
| D    38 |        |Word  | N |2                                              | H |
|         |        |;     |   |Service (Write)                                |   |
| D    40 |        |Ascii | N |WR                                             |   |
|         |        |;     |   |Index                                          |   |
| D    42 |        |Word  | N |20                                             | D |
|         |        |;     |   |PROFIBUS Data type (Unsigned16)                |   |
| D    44 |        |Word  | N |6                                              | D |
|         |        |;     |   |Source field type                              |   |
| D    46 |        |Word  | N |44                                             | H |
|         |        |;     |   |Source field index                             |   |
| D    48 |        |Word  | N |2                                              | H |
|         |        |;     |   |Source offset                                  |   |
```

D	50		Word	N	0	H
			;		Number of elements	
D	52		Word	N	100	D
D	54		Word	N	0	H
D	56		Word	N		H
D	58		Word	N		H
D	60		Word	N		H
D	62		Word	N		H

7.3 Control Unit 2

```
+------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/ZS0   File:  OB1.PBO         (OB1)    Page:        2        |
+------------------------------------------------------------------------------+


1    BA      –DM2

2    L    W  D0,A
3    INC  W  A,1
4    T    W  A,D0
5    T    W  A,A0

6    BA      –PROFIBUS


7    EP               ;End of program ...


 –DM2      DM2     Source data module
 –PROFIBUS PB3
+------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/ZS0   File:  OB5.PBO         (OB5)    Page:        3        |
+------------------------------------------------------------------------------+
1    L    W  K2H,A
2    T    W  A,M10

3    EM
```

```
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/BIB   File:  R2REQ.PBL       (PB0)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 101      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | DTyp     | < |Data range for protocol parameters                  |
| P1  | W  |   | DBNr     | < |Data module number                                 |
| P2  | W  |   | Offset   | < |Offset                                              |
| P3  | W  |   | ABL      | < |JBA Job bit array                                   |
| P4  | W  |   | FbStatus | > |Function module error message                       |
| P5  | W  |   | EBL      | > |RBA Result bit array                                |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/BIB   File:  R2CON.PBL       (PB1)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 100      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | RSSKANAL | < |Computer interface and channel number               |
| P1  | W  |   | AUFTRNR  | < |Request number                                      |
| P2  | W  |   | BEARBNR  | > |Processed request number                            |
| P3  | W  |   | STATUS   | > |Status of request number being processed            |
| P4  | W  |   | FEHLER   | > |Function module error message                       |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
+-------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/BIB   File:  R2IND.PBL       (PB2)    Page:        4        |
+-------------------------------------------------------------------------+
+-----+----+---+----------+---+-----------------------------------------------+
|Para.|Attr|Ind|  Symbol  |< >|       Comment              | Version: 100      |
+-----+----+---+----------+---+-----------------------------------------------+
| P0  | W  |   | DATENTYP | < |Destination range for indication queue              |
| P1  | W  |   | DBNR     | < |Data module number for indication queue             |
| P2  | W  |   | OFFSET   | < |Start address for indication queue                  |
| P3  | W  |   | RSSKANAL | < |Computer interface and channel number               |
| P4  | W  |   | ERGEBNIS | > |Function module error message                       |
| P5  | W  |   | ANZAHL   | > |Number of stored events                             |
+-----+----+---+----------+---+-----------------------------------------------+
Internal Function Module
```

```
+-------------------------------------------------------------------------------+
| PLC – Documentation    Bosch – CL200  V 4.30 alpha     Date:    8. Jan. 1996 |
| Project: R200P–2/ZS0   File:  PROFIBUS.PBO    (PB3)    Page:        5        |
+-------------------------------------------------------------------------------+
     ;*************************************************************************
     ;*                                                                       *
     ;*           Function Module for PROFIBUS Communications                 *
     ;*                                                                       *
     ;*************************************************************************


1    BA      –R2REQ,6
     P0   W  K44H       ;Data module
     P1   W  K0H        ;Data module number = 0
     P2   W  K0H        ;Offset in data module
     P3   W  M10        ;JBA Job bit array
     P4   W  M20        ;Error message
     P5   W  M22        ;RBA Result bit array

2    L    W  K0H,A
3    T    W  A,M10


4    BA      –R2CON,5
     P0   W  K0001H     ;Computer interface and channel number
     P1   W  K1H        ;Request number
     P2   W  M40        ;Request number, mirrored
     P3   W  M42        ;Status
     P4   W  M44        ;Error mmessage

5    L    W  M44,A
6    L    W  KFF04H,B  ;no request currently being processed
7    VGLA W  B,A
     PZ:  1
8    A    B  Z
9    S    B  M10.1

10   EM              ;End Module ...


 –R2CON    PB1
 –R2REQ    PB0
```

PLC – Documentation	Bosch – CL200 V 4.30 alpha	Date: 8. Jan. 1996
Project: R200P–2/ZS0	File: R200P–2.SBS	Page: 2

DM no.	Name	Comment	R/E	Length	
DM 0	DM0	PROFIBUS request parameters	R	512	
DM 1	DM1	Destination data module	R	512	
DM 2	DM2	Source data module	R	512	

PLC – Documentation	Bosch – CL200 V 4.30 alpha	Date: 8. Jan. 1996
Project: R200P–2/ZS0	File: R200P–2.SBS	Page: 3

DM 0	Name: DM0	Comment : PROFIBUS request parameter		RAM/EPROM: R

No.	Symbol	Type	Vz	Data Field	F
		;		Result of 1st request	
D 0		Word	N	FFFF	H
		;		Computer interface and channel number	
D 2		Word	N	001	H
		;		Request number	
D 4		Word	N	0	H
		;		Communications reference	
D 6		Word	N	2	H
		;		Service (Initiate)	
D 8		Ascii	N	IN	
D 10		Word	N		H
D 12		Word	N		H
D 14		Word	N		H
D 16		Word	N		H
D 18		Word	N		H
D 20		Word	N		H
D 22		Word	N		H
D 24		Word	N		H
D 26		Word	N		H
D 28		Word	N		H
D 30		Word	N		H
		;		Result of 2nd request	
D 32		Word	N	FFFF	H
		;		Computer interface and channel number	
D 34		Word	N	0001	H
		;		Request number	
D 36		Word	N	1	H
		;		Communications reference	
D 38		Word	N	2	H
		;		Service (Write)	
D 40		Ascii	N	WR	
		;		Index	
D 42		Word	N	20	D
		;		PROFIBUS data type (Unsigned16)	
D 44		Word	N	6	D
		;		Source field type	
D 46		Word	N	44	H
		;		Source field index	
D 48		Word	N	2	H
		;		Source offset	
D 50		Word	N	0	H
		;		Number of elements	
D 52		Word	N	100	D
D 54		Word	N	0	H
D 56		Word	N		H
D 58		Word	N		H
D 60		Word	N		H
D 62		Word	N		H

A Appendix

A.1 Index

A.2 PLC Terminology – DEUTSCH / ENGLISH

Operanden / Operands

Deutsch		**English**	
AST	Anwender-Stack	AST	Application stack
AWP	Anwenderprogrammzähler	UPP	User program pointer counter
A	Ausgang	O	Output
AZ	Ausgangszusatzfeld	EO	Extended output
D	Datum	D	Data
DB	Datenbaustein	DM	Data module
DF	Datenfeld	DF	Data field
DP	Datenpuffer	DB	Data buffer
E	Eingang	I	Input
EZ	Eingangszusatzfeld	EI	Extended input
F	Fehler	E	Error
FI	FIFO-Operand (Warteschlange)	FI	FIFO operand
IA	Interface-Ausgang	IO	Interface output
IE	Interface-Eingang	II	Interface input
K	Konstante	K	Constant
KD	Doppelwort-Konstante	KD	Constant double word
KF	Gleitkomma-Konstante	KF	Constant floating point
KME	Koordinierungsmerker einfach	CFS	Coordination flag single
KMP	Koordinierungsmerker permanent	CFP	Coordination flag permanent
Kx.y	Zeitkonstante	Kx.y	Constant of time
M	Merker	M	Marker
’nr’	Parameternummer	’nr’	Number as parameter
P	Parameter	P	Parameter
PI	Peripherieinterrupt	PI	Peripheral interrupt
S	Systembereich	S	System range
SI	Systeminterrupt	SI	System interrupt
SM	Sondermerker	SM	Special marker
T	Zeit	T	Time
TI	Zeitinterrupt	TI	TIme interrupt
Z	Zähler	C	Counter
$	direkte Adreßeingabe für die Befehle L und T	$	Operand absolute
−xx	Symbolischer Operand	−xx	Symbol

Befehle / Instructions

Deutsch		English	
ADC	Addition mit Carry	ADC	Addition with carry
ADD	Addition	ADD	Addition
AF	Alarm freigeben	AE	Alarm enable
AS	Alarm sperren	AD	Alarm disable
BA	Bausteinaufruf unbedingt	CM	Call module
BAAG	Bausteinaufruf arithmetisch größer, AG=1	CMAG	Call module arithmetical greater, AG=1
BAB	Bausteinaufruf bedingt, VKE=1	CMC	Call module conditional, RES=1
BAC	Bausteinaufruf Carry, C=1	CMCY	Call module carry, C=1
BACN	Bausteinaufruf Carry nicht, C=0	CMCN	Call module carry not, C=0
BACZ	Bausteinaufruf Carry oder Null, C=1 oder Z=1	CMCZ	Call module carry or zero, C=1 or Z=1
BAI	Bausteinaufruf invers, VKE=0	CMCI	Call module conditional invers, RES=0
BALG	Bausteinaufruf logisch größer, LG=1	CMLG	Call module logical greater, LG=1
BAM	Bausteinaufruf Minus, N=1	CMM	Call module minus, N=1
BAMZ	Bausteinaufruf Minus oder Null, N=1 oder Z=1	CMMZ	Call module minus or zero, N=1 or Z=1
BAN	Bausteinaufruf nicht Null, Z=0	CMN	Call module not zero, Z=0
BAO	Bausteinaufruf Overflow, O=1	CMO	Call module overflow, O=1
BAON	Bausteinaufruf Overflow nicht, O=0	CMON	Call module overflow not, O=0
BAP	Bausteinaufruf Plus, N=0	CMP	Call module plus, N=0
BAX	Bausteinaufruf im zweiten Segment	CMX	Call module into second segment
BAZ	Bausteinaufruf Null, Z=1	CMZ	Call module zero, Z=1
BE	Bausteinende unbedingt	EM	End of module
BEAG	Bausteinende arithmetisch größer, AG=1	EMAG	End of module arithmetical greater, AG=1
BEB	Bausteinende bedingt, VKE=1	EMC	End of module conditional, RES=1
BEC	Bausteinende Carry, C=1	EMCY	End of module carry, C=1
BECN	Bausteinende Carry nicht, C=0	EMCN	End of module carry not, C=0
BECZ	Bausteinende Carry oder Null, C=1 oder Z=1	EMCZ	End of module carry zero, C=1 or Z=1
BEI	Bausteinende invers, VKE=0	EMI	End of module invers, RES=0
BELG	Bausteinende logisch größer, LG=1	EMLG	End of module logical greater, LG=1
BEM	Bausteinende Minus, N=1	EMM	End of module minus, N=1
BEMZ	Bausteinende Minus oder Null, N=1 oder Z=1	EMMZ	End of module minus Zero, N=1 or Z=1
BEN	Bausteinende nicht Null, Z=0	EMN	End of module not zero, Z=0

Deutsch		English	
BEO	Bausteinende Overflow, O=1	EMO	End of module overflow, O=1
BEON	Bausteinende Overflow nicht, O=0	EMON	End of module overflow Not, O=0
BEP	Bausteinende Plus, N=0	EMP	End of module plus, N=0
BEZ	Bausteinende Null, Z=1	EMZ	End of module zero, Z=1
BID	Wandlung Binär in Dezimal	BID	Binary to decimal conversion
BLA	Blockanfang	SBL	Start of block
BLAA	Blockanfang absolut	SBLA	Start of block absolute
BLE	Blockende	EBL	End of block
BX	2. Datenbausteinaufruf	CX	2nd call data module
BXB	2. Datenbausteinaufruf bedingt, VKE=1	CXC	2nd call data module conditional, RES=1
BXI	2. Datenbausteinaufruf bedingt invers VKE=0	CXCI	2nd call data module conditional invers, RES=0
CH	Tausche unbedingt	CH	Change
CHAG	Tausche arithmetisch größer, AG=1	CHAG	Change arithmetical greater, AG=1
CHB	Tausche bedingt, VKE=1	CHC	Change conditional, RES=1
CHC	Tausche Carry, C=1	CHCY	Change carry, C=1
CHCN	Tausche Carry nicht, C=0	CHCN	Change carry not, C=0
CHCZ	Tausche Carry oder Null, C=1 oder Z=1	CHCZ	Change carry or zero, C=1 or Z=1
CHI	Tausche bedingt invers, VKE=0	CHCI	Change conditional invers, RES=0
CHLG	Tausche logisch größer, LG=1	CHLG	Change logical greater LG=1
CHM	Tausche Minus, N=1	CHM	Change minus, N=1
CHMZ	Tausche Minus oder Null, N=1 oder Z=1	CHMZ	Change minus or zero, N=1 or Z=1
CHN	Tausche nicht Null, Z=0	CHN	Change not zero, Z=0
CHO	Tausche Overflow, O=1	CHO	Change overflow, O=1
CHON	Tausche Overflow nicht, O=0	CHON	Change overflow not, O=0
CHP	Tausche Plus, N=0	CHP	Change plus, N=0
CHZ	Tausche Null, Z=1	CHZ	Change zero, Z=1
CLSB	Lösche Systembefehle	CLSI	Clear system instruction
CMP	Zweier-Komplement	TC	Tow's complement
DBA	Bausteinaufruf registerindirekt	DCM	Dynamical call module
DEB	Wandlung Dezimal in Binär	DEB	Decimal to binary conversion
DEC	Dekrement	DEC	Decrement
DEF	Definition	DEF	Define
DEFW	Definition Wort	DEFW	Define word
DI	Sperren Interruptgruppe	DAI	Disable all interrupts
DIV	Division	DIV	Division

Deutsch		English	
DX		DX	
EI	Freigeben Interruptgruppe	EAI	Enable all interrupts
ERE	Anwenderereignis erreicht	EVA	Event achieved
ERH	Anwenderereignis anfordern im Hintergrund	EVB	Event instruction background
ERS	Anwenderereignis anfordern im Hintergrund mit Systeminterrupt	EVS	Event with system interrupt
ERU	Anwenderereignis anfordern unmittelbar	EVD	Event instruction directly
EXC	Tausche Registerinhalt	EXC	Exchange
FF	Feld freigeben	FR	Field release
FS	Feld schützen	FS	Field save
G	Größer	GT	Greater than
GG	Größer oder gleich	GTE	Greater than or equal
GL	Gleich	EQ	Equal
HLT	Halt	HLT	Halt
ID	Interface direkt (CL100)	ID	Interface direct
IF	Interrupt freigeben	EI	Enable interrupt
INC	Inkrement	INC	Increment
IR	Interrupt rücksetzen (löschen)	RI	Reset interrupt
IS	Interrupt sperren	DI	Disable interrupt
K	Kleiner	LT	Less than
KG	Kleiner oder gleich	LTE	Less than or equal
KL	Kleiner	LT	Less than
L	Laden	L	Load
LA	Laden Akku (CL100)	LA	Load accu
LABB	Laden Inhalt des Abbildbereiches	LIMR	Load image range
LAH	Laden absolut adressiert im Hintergrund	LAB	Load absolut range in background
LAS	Laden absolut adressiert im Hintergrund mit Systeminterrupt	LAS	LAB with system interrupt
LAU	Laden absolut adressiert unmittelbar	LAD	Load absolut range directly
LFH	Laden feldadressiert im Hintergrund	LFB	Load field in background
LFI	Laden aus FIFO-Speicher	LFI	Load from FIFO
LFS	Laden feldadressiert im Hintergrund mit Systeminterrupt	LFS	LFB with system interrupt
LFU	Laden feldadressiert unmittelbar	LFD	Load field directly

Deutsch		English	
LI	Laden Interruptregister der Interrupt-gruppe	LAI	Load all interrupts
LM	Laden der Interruptmaske	LIM	Load interrupt mask
LMB	Laden des Inhalts des Memoryberei-ches	LMB	Load memory band
LMBX	LMB im zweiten Segment	LMBX	LMB into second segment
LO	Leer Oder, entspricht: O(	LO	Empty logical or, O=(
LPB	Laden Peripherie Bus	LPB	Load periphery bus
LPC	Laden Programmzähler	LPC	Load program counter
LSP	Laden Stack Pointer	LSP	Load stack pointer
LSV	Laden und starten Zeit als verlängerten Impuls (CL100)	SPE	Start puls extended
LUZ	Laden Uhrzeit zyklisch	LCC	Load clock cyclical
LUZS	Laden Uhrzeit zyklisch mit Systeminter-rupt	LCCS	LCC with system interrupt
LZS	Laden Zeit-Sollwert	LNT	Load normalize time
MUL	Multiplikation	MUL	Multiplication
N	Einer-Komplement	N	Negation, one’s complement
NOP	Leeranweisung, 0000H (CL100)	NOP	No operation, 0000H (CL100)
NOP0	Leeranweisung 0, 0000H	NOP0	No operation, 0000H
NOP1	Leeranweisung 1, FFFFH	NOP1	No operation, FFFFH
O	Oder	O	Or
ON	Oder nicht	ON	Or not
O(	Oder Klammer auf	O(	Empty logical or, O(
P	Prüfe Bit	TST	Test
PE	Programmende	EP	End of program
Pi	Parameterfestlegung bei parametrierten Bausteinaufruf, i=’nr’	Pi	Parameter line, i=’nr’
PN	Prüfe negiert Bit	TSTZ	Test on zero
POP	Transferiere vom Stack	POP	Transfer out from stack
PSi	Parameterfestlegung bei Systembefeh-len, i=’nr’	PSi	Parameter line of system instructions, i=’nr’
PUSH	Lade auf Stack	PUSH	Load into stack
R	Rücksetzen	R	Reset
RC	Rücksetze Carry Flag	RCY	Reset carry
RCL	Rotieren links durch Carry	RCL	Rotate through carry left
RCR	Rotieren rechts durch Carry	RCR	Rotate through carry right
RFI	Rücksetzen FIFO (Lösche FIFO)	RFI	Reset FIFO

Deutsch		English	
RI	Rücksetzen der Interruptregister der Interruptgruppe	RAI	Reset all interrupts
ROL	Rotieren links	ROL	Rotate left
ROM	Rücksetzen ohne Monitoranzeige	RWM	Reset without monitoring
ROR	Rotiere rechts	ROR	Rotate right
RT	Rücksetzen Zeit	RT	Reset time
RU	Rücksetzen unbedingt (PC600)	RU	Reset unit (bit)
RZ	Rücksetzen Zähler	RC	Reset counter
S	Setzen	S	Set
SA	Starte Zeit als Ausschaltverzögerung	SF	Start time as falling delay
SAR	Schiebe arithmetisch rechts	SAR	Shift arithmetical to right
SBB	Subtraktion mit borgen	SBB	Subtraction with borrow
SC	Setze Carry Flag	SCY	Set carry
SE	Starte Zeit als Einschaltverzögerung	SR	Start time as raising delay
SI	Starte Zeit als Impuls	SP	Start time as puls
SINT	Sende Interrupt	SINT	Send interrupt
SLL	Schiebe logisch links	SLL	Shift logical to left
SLR	Schiebe logisch rechts	SLR	Shift logical to right
SOM	Setzen ohne Monitoranzeige	SWM	Set without monitoring
SP	Sprung unbedingt	JP	Jump
SPAG	Sprung arithmetisch größer, AG=1	JPAG	Jump arithmetical greater, AG=1
SPB	Sprung bedingt, VKE=1	JPC	Jump conditional, RES=1
SPC	Sprung Carry, C=1	JPCY	Jump carry, C=1
SPCN	Sprung Carry nicht, C=0	JPCN	Jump carry not
SPCZ	Sprung Carry oder Null, C=1 oder Z=1	JPCZ	Jump carry or zero, C=1 or Z=1
SPI	Sprung bedingt invers, VKE=0	JPCI	Jump conditional invers, RES=0
SPLG	Sprung logisch größer, LG=1	JPLG	Jump logical greater, LG=1
SPM	Sprung Minus, N=1	JPM	Jump minus, N=1
SPMZ	Sprung Minus oder Null, N=1 oder Z=1	JPMZ	Jump minus or zero, N=1 or Z=1
SPN	Sprung nicht Null, Z=0	JPN	Jump not zero, Z=0
SPO	Sprung Overflow, O=1	JPO	Jump overflow, O=1
SPON	Sprung Overflow nicht, O=0	JPON	Jump overflow not, O=0
SPP	Sprung Plus, N=0	JPP	Jump plus, N=0
SPZ	Sprung Null, Z=1	JPZ	Jump zero, Z=1
SS	Starte Zeit als speichernde Einschaltverzögerung	SRE	Start time as raising delay extended
SUB	Subtraktion	SUB	Subtraction

Deutsch		English	
SV	Starte Zeit als verlängerter Impuls	SPE	Start puls extended
SWAP	Vertausche Hi-/Lo-Byte im Register	SWAP	Interchange operand bytes
SYN	Synchronisationspunkt erreicht	SYN	Synchronisation point achieved
SZ	Setze Zähler	SC	Set counter
T	Transfer	T	Transfer
TA	Transfer (CL100)	TA	Transfer
TABB	Transferiere in den Abbildbereich	TIMR	Transfer image range
TAH	Transfer absolut adressiert im Hinter-grund	TAB	Transfer absolut range in background
TAS	Transfer absolut adressiert im Hinter-grund mit Systeminterrupt	TAS	TAB with system interrupt
TAU	Transfer absolut adressiert unmittelbar	TAD	Transfer absolut range directly
TDEC	Zeit dekrementieren	TDEC	Time decrement
TFH	Transfer feldadressiert im Hintergrund	TFB	Transfer field in background
TFI	Transfer in FIFO-Speicher	TFI	Transfer FIFO
TFS	Transfer feldadressiert im Hintergrund mit Systeminterrupt	TFS	TFB with system interrupt
TFU	Transfer feldadressiert unmittelbar	TFD	Transfer field directly
TH	Zeit halt	TH	Timer halt
TM	Transfer der Interruptmaske	TIM	Transfer interrupt mask
TMB	Transfer in Memory-Bereich	TMB	Transfer memory band
TMBX	TMB im zweiten Segment	TMBX	TMB into second segment
TPB	Transfer Peripherie Bus	TPB	Transfer periphery bus
TSP	Transferier Stack Pointer	TSP	Transfer stack pointer
U	Und	A	And
UG	Ungleich	NEQ	Not equal
UN	Und nicht	AN	And not
U(	Und Klammer auf (CL100)	A(	Empty logical and
VGL	Vergleichen logisch	CPL	Compare logical
VGLA	Vergleichen logisch und arithmetisch	CPLA	Compare logical and arithmetical
WE	Wecken	AB	Alarm bell request
WES	Wecken mit Systeminterrupt	ABS	AB with system interrupt
WEZ	Wecken zyklisch	ABC	Alarm bell request cyclical
WEZS	Wecken zyklisch mit Systeminterrupt	ABCS	ABC with system interrupt
XO	Exklusiv Oder	XO	Exclusive or
XON	Exklusiv Oder nicht	XON	Exclusive or not
ZR	Zähle rückwärts	CD	Count down

Deutsch		English	
ZV	Zähle vorwärts	CU	Count up
=	Zuweisung	=	Equal-to sign
=OM	Zuweisung ohne Monitoranzeige	=WM	Equal without monitoring
*	Hilfsmarke setzen	*	Set help label
(	Klammer auf	(	Left bracket
)	Klammer zu	)	Right bracket
)N	Klammer zu negiert	)N	Right bracket with negation

Bausteine / Modules

Deutsch		English	
ASS	Assemblerbaustein	ASS	Assembler module
DB	Datenbaustein	DM	Data module
FB	Funktionsbaustein	FM	Function module
OB	Organisationsbaustein	OM	Organisation module
PB	Programmbaustein	PM	Program module
ZB	Zusatzbaustein	EM	Extended module

Sonstige Software-Begriffe / Miscellaneous software terminology

Deutsch		English	
AWL	Anweisungsliste	IL	Instruction list
FUP	Funktionsplan	FUD	Function diagram
KPL	Kontaktplan	LD	Ladder diagram
OKN	Operandenkennzeichnen	OID	Operand identifier
OPD	Operand	OPD	Operand
OPE	Operandenergänzung	OPA	Operand attribute
OPR	Operator	OPR	Operator
OPT	Operationsteil	OPP	Operation part
PA	Programmanweisung	PI	Program instruction
PAE	Parameterergänzung	PAA	Parameter attribute
PAR	Parameter	PAR	Parameter
PZ	Programmzweig	RG	Programm rung
Q	Quelloperand	SRC	Source operand
WSB	Weiterschaltbedingung		Step-on condition
Z	Zieloperand	DEST	Destination operand

A.3 Safety instructions

A.3.1 Dansk

Sikkerhedshenvisningerne i denne brugsanvisning

Disse symboler anvendes i den foreliggende brugsanvisning i følgende tilfælde:

FORSIGTIG

Dette symbol benyttes, hvis der skal advares mod **farlig elektrisk spænding**. Hvis advarslen ikke følges nøjagtigt eller ignoreres kan det medføre **personskader**.

FORSIGTIG

Dette symbol benyttes, hvis en unøjagtig eller manglende overholdelse af anvisningerne kan medføre beskadigelser af **personer**.

VIGTIGT

Dette symbol benyttes, hvis en unøjagtig eller manglende overholdelse af anvisningerne kan medføre beskadigelser af **apparater eller filer**.

Dette symbol benyttes for at gøre Dem opmærksom på noget særligt.

FORSIGTIG

0.1

Risiko for personer og ting!

Prøv hvert nyt program, inden De tager et anlæg i drift!

VIGTIGT

0.2/1.2/1.3

Risiko for modulet!

Modulet må ikke sættes i eller trækkes ud af stikket, når der er tændt for styringen! Modulet kan blive ødelagt. Der skal først slukkes for styringens netdelmodul, den eksterne spændingsforsyning og signalspændingen eller disse skal trækkes ud af stikket, inden modulet må sættes i eller trækkes ud af stikket!

VIGTIGT

0.3/1.1/1.4

Risiko for modulet!

Ved omgang med modulet skal alle forholdsregler til ESD-beskyttelse iagttages!

Undgå elektrostatiske udladninger!

Sikkerhedshenvisninger på styrekomponenterne

På styrekomponenterne selv kan der være anbragt følgende advarsler og henvisninger, som skal gøre Dem opmærksom på bestemte ting:

Advarsel mod farlig elektrisk spænding!

Advarsel mod farer fra batterier!

Elektrostatisk udsatte komponenter!

Træk netstikket ud, inden De åbner!

Bolt kun til tilslutning af jordledningen PE!

Tilslutning kun for funktionsjording, fremmedspændingsfattig jord!

Kun til tilslutning af en afskærmningsledning!

A.3.2 Deutsch

Sicherheitshinweise in dieser Gebrauchsanweisung

Diese Symbole werden in dieser Gebrauchsanweisung unter den folgenden Bedingungen verwendet.

VORSICHT

Dieses Symbol wird benutzt, wenn vor einer **gefährlichen elektrischen Spannung** gewarnt werden soll. Durch ungenaues Befolgen oder Nichtbefolgen dieser Anweisung kann es zu **Personenschäden** kommen.

VORSICHT

Dieses Symbol wird benutzt, wenn es durch ungenaues Befolgen oder Nichtbefolgen von Anweisungen zu **Personenschäden** kommen kann.

ACHTUNG

Dieses Symbol wird benutzt, wenn es durch ungenaues Befolgen oder Nichtbefolgen von Anweisungen zu **Beschädigungen von Geräten oder Dateien** kommen kann.

Dieses Symbol wird benutzt, wenn Sie auf etwas Besonderes aufmerksam gemacht werden sollen.

VORSICHT

0.1

Gefahr für Personen und Sachen!

Testen Sie jedes neue Programm bevor Sie eine Anlage in Betrieb nehmen!

ACHTUNG

0.2/1.2/1.3

Gefahr für die Baugruppe!

Baugruppe nicht bei eingeschalteter Steuerung stekken oder ziehen! Baugruppe kann zerstört werden. Zuerst Netzteilbaugruppe der Steuerung, externe Spannungsversorgung und Signalspannung ausschalten oder abziehen und erst dann Baugruppe stekken oder ziehen!

ACHTUNG

0.3/1.1/1.4

Gefahr für die Baugruppe!

Beim Umgang mit der Baugruppe müssen alle Vorkehrungen zum ESD-Schutz eingehalten werden! Elektrostatische Entladungen vermeiden!

Sicherheitshinweise an den Steuerungskomponenten

An den Steuerungskomponenten selbst können folgende Warnungen und Hinweise angebracht sein, die Sie auf bestimmte Dinge aufmerksam machen sollen:

Warnung vor gefährlicher elektrischer Spannung!

Warnung vor Gefahren durch Batterien!

Elektrostatisch gefährdete Bauelemente!

Vor dem Öffnen Netzstecker ziehen!

Bolzen nur für Anschluß des Schutzleiters PE!

Anschluß nur für Funktionserde, fremdspannungsarme Erde!

Nur für Anschluß eines Schirmleiters!

A.3.3 Ελληνικά

Υποδείξεις ασφαλείας στις παρούσες οδηγίες χρήσεως

Τα σύμβολα αυτά στις παρούσες οδηγίες χρήσεως χρησιμοποιούνται υπό τους ακόλουθους όρους:


ΚΙΝΔΥΝΟΣ

Αυτό το σύμβολο χρησιμοποιείται για να σας προειδοποιήσει από επικίνδυνη ηλεκτρική τάση. Αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οι οδηγίες μπορεί να προκληθούν σωματικές βλάβες.


ΚΙΝΔΥΝΟΣ

Το σύμβολο αυτό χρησιμοποιείται, όταν μπορεί να προκληθούν σωματικές βλάβες, αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οδηγίες.


ΠΡΟΣΟΧΗ

Το σύμβολο αυτό χρησιμοποιείται, όταν μπορεί να προκληθούν ζημίες σε συσκευές ή σε αρχεία, αν δεν τηρούνται με ακρίβεια ή δεν τηρούνται καθόλου οδηγίες.

Το σύμβολο αυτό χρησιμοποιείται, όταν θα πρέπει να επιστηθεί η προσοχή σας σε κάτι το σημαντικό.


ΚΙΝΔΥΝΟΣ

0.1

Κίνδυνος για πρόσωπα και αντικείμενα!

Δοκιμάστε κάθε καινούριο πρόγραμμα πριν θέσετε μια εγκατάσταση σε λειτουργία!


ΠΡΟΣΟΧΗ

0.2/1.2/1.3

Κίνδυνος για το στοιχείο κατασκευής!

Μην αφαιρείτε ή τοποθετείτε το στοιχείο κατασκευής σε κύκλωμα που είναι σε λειτουργία! Το στοιχείο κατασκευής μπορεί να καταστραφεί. Πρώτα αφαιρείτε ή αποσυνδέετε το στοιχείο κατασκευής της ρύθμισης του ηλεκτρικού κυκλώματος, κατόπιν την παροχή τάσης και την τάση σήματος και μετά τοποθετείτε ή αφαιρείτε το στοιχείο κατασκευής.


ΠΡΟΣΟΧΗ

0.3/1.1/1.4

Κίνδυνος για το στοιχείο κατασκευής!

Οταν έχετε στα χέρια σας το στοιχείο κατασκευής πρέπει να τηρείτε όλα τα μέτρα για την ηλεκτροστατική προστασία! Αποφεύγετε ηλεκτροστατικές εκφορτίσεις!

Υποδείξεις ασφαλείας σε εξαρτήματα ρύθμισης και ελέγχου

Τα εξαρτήματα ρύθμισης και ελέγχου μπορεί να φέρουν τις ακόλουθες προειδοποιήσεις και υποδείξεις, που επιστούν την προσοχή σας σε ορισμένα πράγματα:


Προειδοποίηση σχετικά με επικίνδυνη τάση ηλεκτρικού ρεύματος!


Προειδοποίηση σχετικά με κινδύνους, που προέρχονται από μπαταρίες!


Στοιχεία κατασκευής, για τα οποία υπάρχει ηλεκτροστατικός κίνδυνος!


Πριν από το άνοιγμα βγάλτε το φις από την πρίζα!

Πείροι μόνο για σύνδεση προστατευτικού αγωγού (γείωσης) PE!

Σύνδεση για γείωση λειτουργίας, γείωση για άσχετο ασθενές ρεύμα!

Μόνο για σύνδεση θωρακισμένου αγωγού!

A.3.4 English

Safety instructions in this manual

These symbols are used throughout this manual subject to the following conditions.

DANGER

This symbol is used to warn of the presence of **dangerous electrical current.** Insufficient or lacking compliance with these instructions can result in **personal injury.**

DANGER

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **personal injury**.

CAUTION

This symbol is used wherever an insufficient or lacking compliance with instructions can result in **damage to equipment or files**.

This symbol is used to inform the user of special features.

DANGER

0.1

Danger to persons and equipment!

New programs must be tested before a system is put into operation!

CAUTION

0.2/1.2/1.3

Danger to the module!

Do not insert or remove module when the control is switched on! This can destroy the module. Switch off or remove control power supply module, external power supply and signal voltage before inserting or removing the module!

CAUTION

0.3/1.1/1.4

Danger for the module!

When handling the module, follow all precautions for e.s.d. protection! Avoid electrostatic discharges!

Safety instructions on the control components

The following warnings and notices may be indicated on the control components themselves and have the following meaning:

Danger: High voltage!

Danger: Battery acid!

Electrostatically-sensitive components!

Disconnect at mains before opening!

Pin for connecting PE conductor only!

This connection for functional earthing or low-noise earth only!

For screened conductor only!

A.3.5 Español

Indicaciones de seguridad en estas instrucciones de empleo

Estos símbolos se utilizan en estas instrucciones de empleo bajo las siguientes condiciones.

PRECAUCION

Este símbolo se utiliza para advertir de una **tensión eléctrica peligrosa**. La ejecución inexacta o la no ejecución de esta instrucción puede provocar **daños a personas**.

PRECAUCION

Este símbolo se utiliza cuando por una ejecución inexacta o la no ejecución de instrucciones pueden llegar a producirse **daños a personas**.

ATENCION

Este símbolo se utiliza cuando por la ejecución inexacta o la no ejecución de instrucciones pueden llegar a producirse **daños en equipos o ficheros**.

Este símbolo se utiliza cuando se le debe llamar al usuario la atención respecto a algo especial.

PRECAUCION

0.1

¡Peligro para personas y bienes materiales!

¡Compruebe cada nuevo programa antes de poner en funcionamiento una instalación!

ATENCION

0.2/1.2/1.3

¡Peligro para el módulo!

¡No enchufe ni extraiga el módulo cuando el control está conectado! Puede destruirse el módulo. ¡Desconecte o desenchufe primero el módulo de fuente de alimentación del control, la alimentación de tensión externa y la tensión de señalización y sólo después enchufe o extraiga el módulo!

ATENCION

0.3/1.1/1.4

¡Peligro para el módulo!

¡Observe en la manipulación del módulo todas las precauciones en cuanto a la protección ESD! ¡Evite descargas estáticas!

Indicaciones de seguridad en los componentes de control

Los componentes de control mismos pueden estar marcados por las siguientes advertencias e indicaciones que le deben llamar la atención al usuario:

¡Advertencia ante tensión eléctrica peligrosa!

¡Advertencia ante riesgos por baterías!

¡Elementos constructivos con riesgos de descargas electrostáticas!

¡Antes de abrir, desenchufar el conector de la red!

¡Perno sólo para la conexión del conductor protector PE!

¡Conexión sólo para toma de tierra de funcionamiento, tierra de poca tensión externa!

¡Sólo para la conexión de un conector blindado!

A.3.6 Français

Directives de sécurité relatives au présent mode d'emploi

Ces symboles sont utilisés dans les conditions suivantes:


DANGER

Ce symbole est utilisé lorsque l'on veut mettre en garde contre une **tension électrique dangereuse**. Risque de **dommage corporel** si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.


DANGER

Ce symbole est utilisé s'il y a un risque de **dommage corporel** si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.


ATTENTION

Ce symbole est utilisé s'il y a un risque de dommage matériel ou risque de destruction de fichier si les consignes données ne sont pas respectées ou lorsqu'elles sont mal respectées.

Ce symbole est utilisé lorsqu'il s'agit d'attirer votre attention sur un point particulier.


DANGER

0.1

Risque pour les personnes et le matériel !

Testez chaque nouveau programme avant de mettre une installation en service!


ATTENTION

0.2/1.2/1.3

Risque pour l'unité !

Ne branchez ou ne débranchez pas l'unité lorsque la commande est activée ! Risque de destruction de l'unité. Avant de brancher ou de débrancher l'unité, coupez ou déconnectez d'abord le bloc d'alimentation de la commande, l'alimentation en courant électrique externe et la tension de signal !


ATTENTION

0.3/1.1/1.4

Risque pour l'unité !

Respectez toutes les mesures de protection ESD lors du maniement de l'unité ! Evitez les décharges électrostatiques !

Mesures de sécurité relatives aux despositifs de commande

Les pictogrammes et messages d'avertissement suivants peuvent se trouver sur les éléments de commande afin d'attirer votre attention sur certains points:


Présence de tension électrique dangereuse


Danger lié à la présence de batteries


Modules sensibles à l'électricité statique


Eniever la fiche secteur avant l'ouverture


Uniquement pour le raccordement de la terre PE !


Uniquement pour le raccordement à la terre, terre sans bruit !


Uniquement pour le raccordement d'un câble blindé

A.3.7 Italiano

Avvertenze per la sicurezza in queste istruzioni per l'uso

Questi simboli vengono impiegati in queste istruzioni per l'uso nelle seguenti condizioni.

 PERICOLO

Questo simbolo viene impiegato per segnalare la presenza di **tensioni elettriche pericolose**. La mancata osservanza, anche parziale, di queste istruzioni può provocare danni alle **persone**.

 PERICOLO

Questo simbolo viene impiegato qualora l'osservanza imprecisa o la mancata osservanza delle istruzioni possono provocare danni alle **persone**.

 ATTENZIONE

Questo simbolo viene impiegato qualora l'osservanza imprecisa o la mancata osservanza delle istruzioni può provocare danni agli **apparecchi o ai file**.

Questo simbolo viene impiegato quando si voglia richiamare l'attenzione su qualcosa di particolare.

 PERICOLO

0.1

Pericolo per persone ed oggetti!

Provare ogni nuovo programma prima di mettere in funzione l'impianto!

 ATTENZIONE

0.2/1.2/1.3

Pericolo per il modulo!

Non innestare o rimuovere il modulo quando il comando è acceso! Il modulo potrebbe venire distrutto. Spegnere prima il modulo d'alimentazione del comando, l'alimentazione esterna di tensione e la tensione del segnale e solo successivamente innestare o rimuovere il modulo!

 ATTENZIONE

0.3/1.1/1.4

Pericolo per i moduli!

Durante operazioni con i moduli rispettare tutte le misure di protezione ESD! Evitare scariche elettrostatiche!

Avvertenze per la sicurezza sul componenti di comando

Sui componenti di comando stessi possono essere applicate le seguenti targhette di avvertimento e di avvertenza, che richiamano l'attenzione su particolari pericoli:

 Avvertimento per tensione elettrica pericolosa!

 Avvertimento per pericoli dovuti alle batterie!

 Elementi costruttivi danneggiabili da cariche elettrostatiche!

 Sfilare la spina dalla rete prima di aprire!

 Perno solo per il collegamento del conduttore di protezione PE!

Collegamento per messa a terra funzionale, terra senza rumore!

Solo per il collegamento di un conduttore schermato!

A.3.8 Nederlands

Veiligheidsrichtlijnen in deze gebruiksaanwijzing

Deze symbolen worden in deze gebruiksaanwijzing onder de volgende voorwaarden gebruikt.


ATTENTIE

Dit symbool wordt gebruikt, als de aandacht op een **gevaarlijke elektrische spanning** gevestigd moet worden. Wordt deze aanwijzing niet precies gevolgd of zelfs genegeerd, dan is **lichamelijk letsel** niet uitgesloten.


ATTENTIE

Dit symbool wordt gebruikt wanneer door onnauwkeurige of niet-naleving van aanwijzingen **schade aan personen** kan worden berokkend.


LET OP

Dit symbool wordt gebruikt wanneer door onnauwkeurige of niet-naleving van aanwijzingen **schade aan toestellen of bestanden** kan worden berokkend.

Dir symbool wordt gebruikt wanneer wij u op iets bijzonders willen attent maken.


ATTENTIE

0.1

Gevaar voor lichamelijk letsel en materiële schade!

Test elk nieuw programma voor u een installatie opstart!


LET OP

0.2/1.2/1.3

Gevaar voor de module!

Als de besturing ingeschakeld is, de module niet insteken of uittrekken! De module kan hierdoor kapot gaan. De module van het netdeel van de besturing, de externe spanningstoevoer en de signaalspanning uitschakelen of aftrekken en pas dan de module insteken of uittrekken.


LET OP

0.3/1.1/1.4

Gevaar voor de module!

In de omgang met de module alle voorschriften m.b.t. de ESD-beveiliging in acht nemen! Elektrostatische ontladingen vermijden!

Veiligheidsaanwijzingen bij de besturingscomponenten

Aan de besturingscomponenten zelf kunnen de volgende waarschuwingen en richtlijnen aangebracht zijn. Zij zijn bedoeld om u op bepaalde zaken te attenderen:


Waarschuwing voor gevaarlijke elektrische spanning.


Waarschuwing voor gevaar veroorzaakt door akku's.


Elektrostatisch gevoelige componenten.


Trek de stekker uit alvorens te openen.


Bouten alleen voor aansluiting van de veiligheidsaarding PE.

Aansluiting uitsluitend voor functionele, spanningsarme aarde!

Alleen voor aansluiting van een afgeschermde kabel.

A.3.9 Português

Instruções de segurança contidas nas presentes instruções de serviço

Estes símbolos são utilizados nas presentes instruções de serviço nos seguintes casos:

CUIDADO

Este símbolo é utilizado para indicar uma **tensão eléctrica perigosa**. Em caso de não observância ou observância incorrecta desta instrução, existe **perigo de ferimento de pessoas**.

CUIDADO

Este símbolo é utilizado quando existe o **perigo de ferimento de pessoas** por observância incorrecta ou não observância das instruções.

ATENÇÃO

Este símbolo é utilizado quando existe o perigo de danificação de aparelhos ou ficheiros por observância incorrecta ou não observância das instruções.

Este símbolo é utlizado para chamar a atenção para algo de especial.

CUIDADO

0.1

Perigos de ferimentos de pessoas e de danos materiais!

Antes de colocar uma instalação em funcionamento há que experimentar sempre qualquer programa novo!

ATENÇÃO

0.2/1.2/1.3

Perigo para o módulo!

Não retire ou introduza o módulo quando o comando estiver ligado! O módulo poderá ser danificado. Primeiro desligue ou retire o módulo de alimentação do comando, o cabo alimentador da rede e a tensão de sinal, e em seguida, poderá introduzir ou retirar o módulo!

ATENÇÃO

0.3/1.1/1.4

Perigo para o módulo!

Na utilização do módulo, respeitar todas as prescrições para a protecção do ESD! Evitar descargas electrostáticas!

Instruções de segurança nos componentes de comando

Nos próprios componentes de comando podem estar afixados os avisos ou as instruções seguidamente descritos para chamar à atenção para determinados pontos.

Aviso referente a uma tensão eléctrica perigosa!

Aviso referente a perigos relacionados com baterias!

Módulos em perigo electrostático!

Antes de abrir tirar o cabo alimentador da rede!

Borne apenas para ligação do condutor de protecção à massa PE!

Ligação apenas para ligação à terra funcional, terra com baixa tensão externa!

Só para ligação de um condutor blindado!

A.3.10 Suomi

Tämän käyttöohjeen turvallisuusohjeet

Näitä symboleja käytetään tässä käyttöohjeessa seuraavasti.


VAROITUS

Tätä symbolia käytetään, kun varoitetaan **vaarallisesta sähköjännitteestä**. Seurauksena voi olla **henkilövahinko**, jos ohjetta ei seurata tai sitä ei seurata tarkkaan.


VAROITUS

Tätä symbolia käytetään, jos ohjeiden noudattamatta jättäminen voi johtaa **henkilövahinkoihin**.


HUOMIO

Tätä symbolia käytetään, jos ohjeiden noudattamatta jättäminen tai niiden epätarkka seuraamihen voi johtaa **laitteiden tai tiedostojen vahingoittumiseen**.

Tätä symbolia käytetään, kun halutaan kiinnittää lukijan huomio johonkin erikoisseikkaan.


VAROITUS

0.1

Henkilö- ja tavaravahinkovaara!

Testaa jokainen uusi ohjelma, ennen laitteiston käyttöönottoa!


HUOMIO

0.2/1.2/1.3

Rakenneosaryhmä voi vioittua!

Älä liitä tai irrota rakenneosaryhmää ohjauksen ollessa päällekytkettynä! Rakenneosaryhmä voi tuhoutua. Kytke ensin ohjauksen verkko-osarakenneryhmä, ulkoinen jännitteentulo ja signaalijännite pois päältä tai irrota ne ja liitä tai irrota rakenneosaryhmä vasta sitten!


HUOMIO

0.3/1.1/1.4

Rakenneosaryhmä voi vioittua!

Rakenneosaryhmän kanssa toimittaessa on kaikkia ESD-suojaan liittyviä toimenpiteitä noudatettava! Elektrostaattista latausta on vältettävä!

Ohjauskomponenttien turvallisuusohjeet

Ohjauskomponentteihin voi olla merkittynä seuraavat varoitukset ja ohjeet, joiden tarkoitus on kiinnittää käyttäjän huomio tiettyihin seikkoihin:


Varoitus, vaarallinen sähköjännite!


Varoitus, akkujen aiheuttamat vaarat!


Sähköstaattisesti vaarannetut rakenneosat!


Vedä verkkopistoke irti pistorasiasta ennen avaamista!


Pultti vain suojajohtimen PE liitännälle!


Liitäntä häiriösuojattuun erilliseen suoja-maadoituspisteeseen!


Vain suojajohtimen litäntää varten!

A.3.11 Svenska

Säkerhetsanvisningar i denna driftsinstruktion

Dessa symboler används i denna driftsinstruktion för följande förutsättningar.

 VARNING

Denna symbol används, vid varning för **farlig elektrisk späning**. Om denna anvisning inte exakt följs eller inte följs alls kan det medföra **personskador**.

 VARNING

Denna symbol används, när **personer kan skadas** om anvisningar inte exakt följs eller inte följs alls.

 OBS

Denna symbol används, när **apparater eller filer kan skada**s om anvisningar inte exakt följs eller inte följs alls.

Denna symbol används, när Ni skall göras uppmärksam på något särskilt.

 VARNING

0.1

Fara för person- och sakskador!

Prova varje nytt program innan Ni tar en anläggning i drift!

 OBS

0.2/1.2/1.3

Fara för en komponentgrupp!

Stick inte in och drag inte heller ur en komponentgrupp när styrningen är tillkopplad! Komponentgruppen kan förstöras. Frånkoppla eller drag först ur styrningens nätdelskomponentgrupp, extern spänningsförsörjning och signalspänningen och stick in eller drag först därefter ut komponentgruppen!

 OBS

0.3/1.1/1.4

Fara för en komponentgrupp!

Vid arbeten med komponentgruppen skall alla åtgärder för ESD-skydd innehållas! Statiska urladdningar skall undvikas!

Säkerhetsanvisningar på styrningskomponenterna

På styrningskomponenterna kan följande varningar och anvisningar vara placerade, som vill göra Er uppmärksam på vissa saker:

 Varning för farlig elektrisk spänning!

 Varning för faror genom batterier!

 Komponenter som kan skadas av elektrostatisk urladdning!

 Drag ur kontakten innan öppning!

 Bultar endast för anslutning av skyddsledaren PE!

Anslutning endast för funktionsjordning, jordning med läg interferens!

Endast för anslutning av en avskärmningsledare!

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Technische Änderungen vorbehalten

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