

# User Manual

## Connection to Bosch BUEP19E

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<b>Version</b>	<b>Date</b>	<b>Modifications</b>
1	2005-07-04	First edition
2	2005-11-22	Validation extended, chapter "Important Notes" added, physical connection corrected
3	2007-11-19	New layout, index modified, data types corrected

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# 1 Important Notes

## 1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.



### **Danger**

This symbol is used to refer to instructions which, if ignored or not carefully followed could result in personal injury.

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### **Note**

This symbol indicates application tips or supplementary notes.

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### **Reference to source of information**

This symbol refers to detailed sources of information on the current topic.

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## 1.2 Safety Notes

- Read this manual carefully before using the software. Keep this manual in a place where it is always accessible to all users.
- The user manual, in particular the safety notes, must be observed by all personnel working with the software and the programmed device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

## 1.3 Intended Use

- The software has to be used for programming operating devices exclusively. Every other use is not permitted.

## 1.4 Target Group

All configuration and programming work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.



## 2 Bosch BU EP19E

The Bosch BU EP19E protocol allows you:

- random read and write access to all PLC data
- bit-by-bit access to all byte, word and double-word oriented data types
- byte-by-byte access to all data words in a data block.

The size of the address area depends on the controller being used.

This protocol supports a connection to the following CPU modules:

- CL150
- CL200
- CL350
- CL400
- CL500
- CL550
- PCL

### 2.1 Data Types

Direct access is possible to the following data types.

The size of the individual data areas depends on the controller of the controller's CPU.

Table 2-1 Data types for Bosch BU EP19E

Type	Mnemonic	Access
Input Bit	BE	Bit Access
Input Byte	BYE	Byte Access
Input Word	WE	Word Access
Input Double-Word	DWE	Word Access
Output Bit	BA	Bit Access
Output Byte	BYA	Byte Access
Output Word	WA	Word Access
Output Double-Word	DWA	Word Access
Flag Bit	BM	Bit Access
Flag Byte	BYM	Byte Access
Flag Word	WM	Word Access
Flag Double-Word	DWM	Word Access
Timer Word	WT	Word Access 0 to 127
Counter Word	WZ	Word Access 0 to 127
Data Buffer Byte	BYDP	Byte Access 0 to 511

Table 2-1 Data types for Bosch BUEP19E

Type	Mnemonic	Access
Data Buffer Word	WDP	Word Access 0 to 510
Data Block Byte	DBxBYD	Byte Access 0 to 511
Data Block Word	DBxWD	Word Access 0 to 510
Data Block Double-Word	DBxDWD	Word Access 0 to 508
Data Field Byte	BLxBYDF	Byte Access 0 to 24575
Data Field Word	BLxWDF	Word Access 0 to 24574
Data Field Double-Word	BLxDWDF	Word Access 0 to 24572

**Counter:**

When a counter address is accessed, the counter value is interpreted in binary form. The maximum counter value is 8191.

**Timer:**

Timer values are made up of a time value and a time base.

The operating device reads the 2-byte variable and converts it internally into an imaginary, unsigned 4-byte variable, that represents the time value in reference for the base 0.01 seconds.

Before the operating device writes a timer value to the controller, it converts the unsigned 4-byte variable back into a 2-byte variable with a time value for the smallest possible time base.

**Data field:**

If you defined the data field as a linear area, the data field number must be set to the value 255.

## 2.2 Programming

### 2.2.1 Protocol parameters

With the protocol parameters, you can adapt the communication of the controller used.

### 2.2.1.1 Baud Rate

This parameter specifies the communication rate.

Table 2-2 Baud rate

Configurable Values (Baud)	Default Value
300	
600	
1200	
2400	
4800	
9600	
19200	X
38400	
57600	
76800	
115200	

### 2.2.1.2 Parity

This parameter specifies the parity used to control the communication.

Table 2-3 Parity

Configurable Values	Default Value
None	
Even	X
Odd	

### 2.2.1.3 Handshake

This parameter specifies the method used to control the communication.

Table 2-4 Handshake

Configurable values	Default Value
No Handshake	X
Hardware	
Software	

**2.2.1.4 Data Bits**

This parameter specifies the number of data bits.

Table 2-5 Data bits

Configurable Values	Default Value
5	
6	
7	
8	X

**2.2.1.5 Stop Bits**

This parameter specifies the number of stop bits.

Table 2-6 Stop bits

Configurable Values	Default Value
1	X
1.5	
2	

**2.2.1.6 Use Coordination Flag**

This parameter specifies whether you are using a coordination flag for the communication.

Table 2-7 Use coordination flag

Configurable Values	Default Value
OFF	X
ON	

**2.2.1.7 Coordination Flag**

This parameter contains the number of the coordination flag you want to use for the communication.

Table 2-8 Coordination flag

Configurable Values	Default Value
0 to 255	0

### 2.2.1.8 Process Coordination Flag

This parameter specifies the number of the process coordination flag.

Table 2-9 Process Coordination Flag

Configurable Values	Default Value
0 (System stop state)	X
1 (System RUN state)	
2 (I/O status)	
3 (I/O status or STOP)	
4 (PE)	
5 (PE or STOP)	
6 (OB1)	
7 (OB1 or STOP)	
15 (no process coordination)	

### 2.2.1.9 Destination Module

This parameter specifies the CPU module you are using.

Table 2-10 Destination Module

Configurable Values	Default Value
CL500	X
CL350/CL400	
CL150/CL200/CL550/ PCL	

### 2.2.1.10 Block Check

This parameter specifies the block check to be performed for the communication.

Table 2-11 Block Check

Configurable Values	Default Value
CRC16	
LRC8	X

### 2.2.2 Input Syntax

The following image illustrates the structure of the input syntax for variables in the programming software.

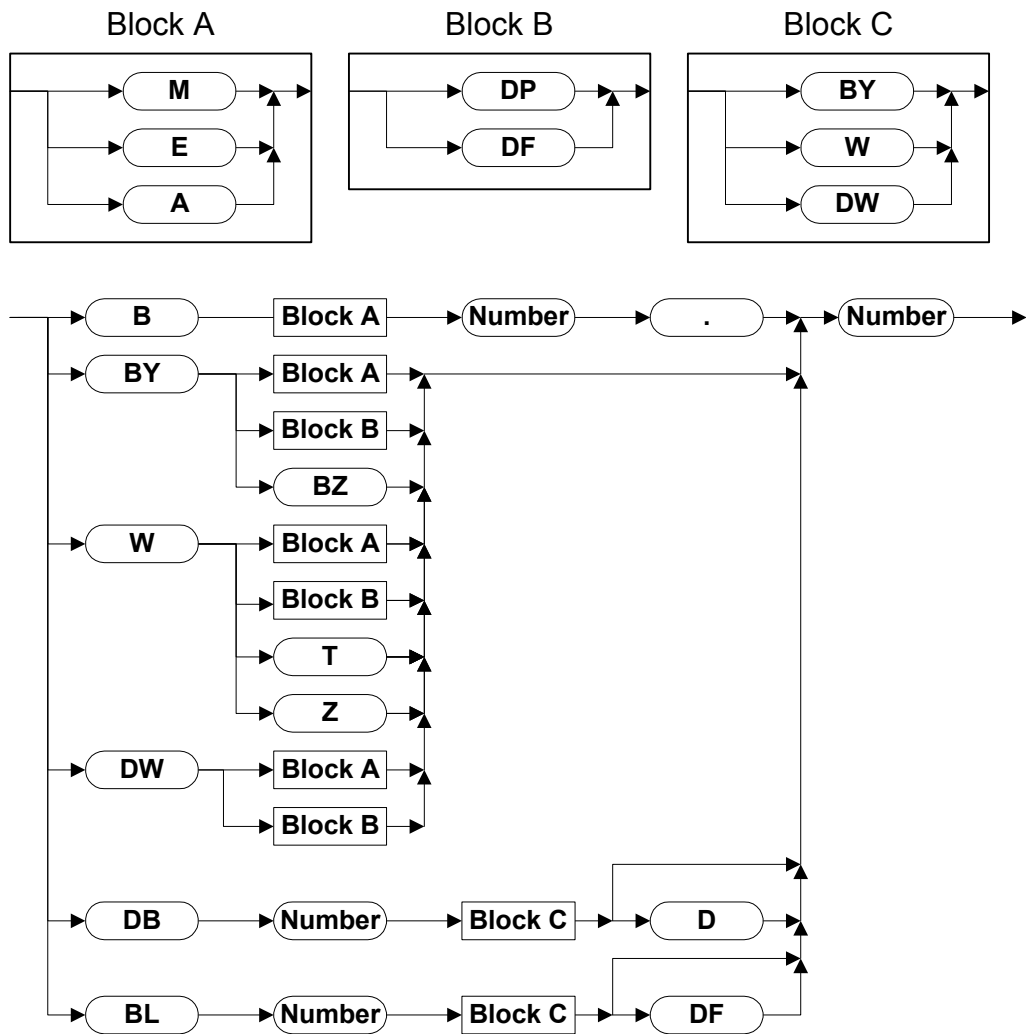


Figure 2-1 Syntax diagram

### 2.2.3 Physical Connection

Plug-in connectors on the operating device for connection to the controller.

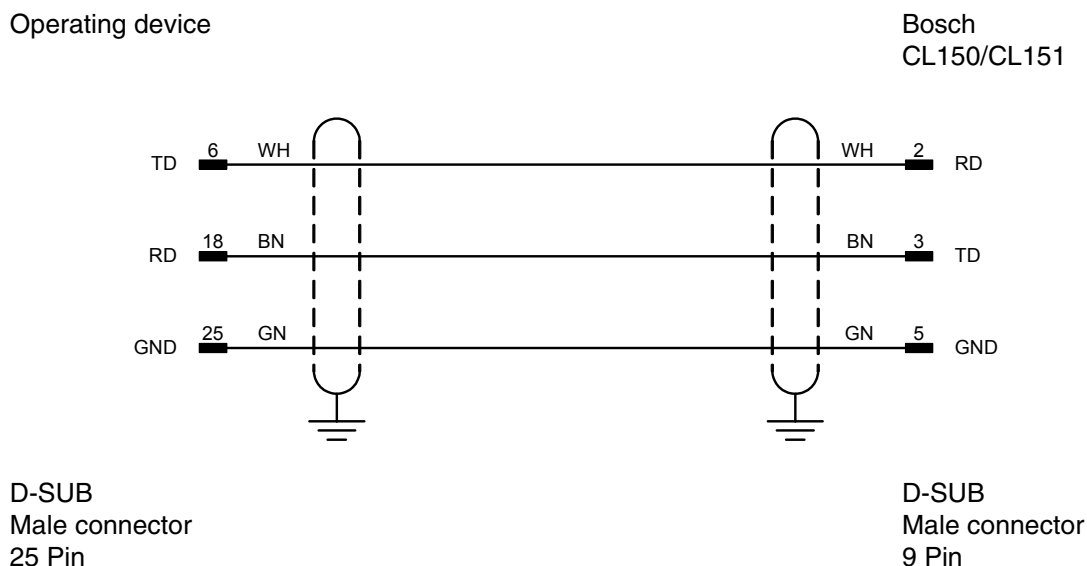
#### 2.2.3.1 Pin Assignment for Operating Devices with an Universal Interface

Table 2-12 Pin assignment RS232

Pin	Designation	Function
6	TD	Transmitted Data
15	CTS	Clear to send
17	RTS	Request to send
18	RD	Received data
25	SGND	Signal Ground

#### 2.2.3.2 Cable SER1 RS232 - Bosch CL150/CL151

The following cabling diagram applies to operating devices with an universal interface **only**.



Both ends of the shield are connected to the metallic housing.

## 2.3 Error Messages

Error messages are displayed on the operating device along with a code and sub-code. Error messages are composed as follows:

Communication Error

Code           XXXXX

Subcode       XXXXX

Retries        XXXXX

Table 2-13 Error Messages for Bosch BUEP19E

Code	Subcode	Description	Possible Cause
1	1	Slave not ready	Wrong baud rate or cable defective
	3	Error in protocol frame	
	5	CRC error	
	6	Wrong parity	
	10	No cyclic data defined	
	16	Receive buffer overrun	
<b>Bosch-Specific Error Messages</b>			
1	50	No connection setup	
	51	Wrong acknowledgment during connection setup	
	52	Wrong acknowledgment after sending information block	Wrong block check set, PG uses LRC8. The first peripheral participant determines the block check used !
	53	No response telegram	
	54	Timeout - No response telegram	
	55	Block time exceeded	
	56	No acknowledgment	
	57	EOT - Aborted by controller	
2	58	Incorrect number of data received	Check if the screen, in which the error occurred, contains a variable with an odd number of bytes which accesses a word address or a double-word address.

Table 2-13 Error Messages for Bosch BUEP19E

Code	Subcode	Description	Possible Cause
Error from Programmable Controller			
3	1	Addressed module does not exist	
	16	Module can not be addressed	
	35	The address field has been protected by the user	
	36	Access to this address field is not permitted	
	37	Writing to timer is not permitted	
	38	Block number too large	
	39	Block does not exist	
	40	Block too small	
	147	Flag area (CL200 only) exceeded	Flag area defined is outside of BYM0 to BYM191
4	32	Addressed data type (command code) unknown in PST (peripheral station)	
	33	Protocol code unknown in PST	
	35	Specified coordination flag unknown in PST	
	37	Parameter code in telegram and specified parameters do not match	
	38	Block length and actual number of data do not match	
	40	Telegram type unknown	
	41	Command type unknown	
	58	Starting address and operand type do not match (word at odd address)	Defective R500 module possible
	59	Starting address outside of specified address range	
	60	Invalid parameter for specified command	
	61	Invalid operand type	
	64	PST has not received an identification telegram	
	99	Specified data length greater than addressed data area	
	210	Coordination flag is disabled	
Error from Operating Device			
40		System variable error	Undefined system variable



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