AEG PU (KS Functions)

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AEG PU (KS Functions)

5.12 AEG - PU (KS-Functions)

5.12.1 General Information

The operating terminals allow for a simple connection to PLCs of the AEG Modicon series.
The operating terminal is connected to the interface of the ALU.
The data communication on the interface is handled by a protocol which is based on the KS-functions of the Modicon series.
Communication is possible with any system implementing the KS-functions based on the Modicon series:

AEG-MIKRO	PU-interface / RS232
AEG-120	PU-interface / RS232
AEG-250	PU-interface / RS232

The software components of the system are fully adapted to the parameters and marginal conditions of the interface.

This offers the user the following advantages:

– Random write and read access to any data within the PLC. Data of existing PLC programs can be displayed and modified directly in the operating terminal. It is not necessary to adapt the PLC program to the operating terminal in any respect. It is not required that communications data be stored in a specified address area or data type area.

– The operating terminal automatically polls the freely definable data areas for cyclic data.

– No configuration required within the PLC.

– The protocol is handled entirely by the firmware of the PLC. A PLC program (function blocks, etc.) in the PLC is not required for the handling of the communication.

– The protocol provides error control. Transmission errors are detected and, if possible, eliminated by repeating the transmission. An electrically isolated, noise-immune interface hardware in accordance with the RS232 standard permits the application even in a harsh industrial environment.

– The parameters of the interface SER1 are assigned in the programming software in a protocol-specific manner and are stored in the application description. Modifying of the parameters is also possible in the setup mask or any other I/O mask of the terminal at any time.

– The programming system provides a maximum of support to the operator in programming the operating terminal. The definitions (abbreviations) used here are identical with the definitions used within the PLC program.

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5.12.2 Technical Description

With the aid of the KS-functions, all PLC data can be accessed in read and write-mode as well as in bit, byte, word and double word-mode. The size of the address area depends on the respective PLC and its configuration.

5.12.3 Protocol Parameters AEG-KS

The operating terminal adapts to the default parameters of the interface. It is therefore **not** necessary to modify the interface parameters in the PLC.
To ensure proper communication, the parameters must **not** be altered.

Baud rate: 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 375000, 500000 Baud
Parity: none, even, **odd**
Data bits: 5, 6, 7, **8**
Stopbits: **1**, 1.5, 2
Handshake: **no handshake**, hardware handshake, software handshake

The default settings are printed in **bold**.

5.12.4 Data Type Structure

a) Alphanumerical Texts
Are stored in the memory byte for byte in ascending address order.

b) Counter
The count value is interpreted in the binary format. The maximum value is one word.

c) Timer
The time value is interpreted in the binary format. The maximum value is one word.

d) Binary Variables with a Length of 1, 2 or 4 Bytes
Data with a length of 2 bytes are interpreted in the PLC-conformal byte order for words.
Data with a length of 4 bytes are interpreted in the PLC-conformal byte order for double words.

e) Floating Point Numbers
Floating point numbers are interpreted in the IEEE floating point format.

5.12.4.1 Data Types

Direct accessing of the following data types is possible:

Type	Description
E	Input Bit
EB	Input Byte
EW	Input Word
ED	Input Double Word
A	Output
AB	Output Byte
AW	Output Word
AD	Output Double Word
M	Flag
MB	Flag Byte
MW	Flag Word
MD	Flag Double Word
MG	Flag Floating point
T	Timer-Status
TI	Timer Actual Value
TS	Timer Setpoint Value
Z	Counter
ZI	Counter Actual Value
ZS	Counter Setpoint Value

Table 5.12-1: Data types

The size of each area is governed by the configuration of the PLC.

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5.12.5 Additional Functions

In addition to the random write and read access to PLC variables, a memory area comprising 12 bytes is specified in the application description as poll area.
Only marginal conditions regarding this memory area is that the PLC must be able to access in bit-mode and the terminal in word-mode and that the memory area must be contiguous. The location of this memory area can be specified in the application description.

The data area has a maximum size of 6 words or 12 bytes.
It can optionally be located in a byte or word-structured area.

Byte-structured Memory Mapping

The data area comprises a maximum of 11 bytes

Example: The cyclic poll area is set to MB12 in the programming system.

Byte Address	Reference	Description
Byte Address + 0	MB12	Write Coordination Byte
Byte Address + 1	MB13	Message Channel High Byte
Byte Address + 2	MB14	Message Channel Low Byte
Byte Address + 3	MB15	Function Keys LED 1 to 4
Byte Address + 4	MB16	Function Keys LED 5 to 8
Byte Address + 5	MB17	Function Keys LED 9 to 12
Byte Address + 6	MB18	Function Keys LED 13 to 16
Byte Address + 7	MB19	Function Keys LED 17 to 20
Byte Address + 8	MB20	Function Keys LED 21 to 24
Byte Address + 9	MB21	Function Keys LED 25 to 28
Byte Address + 10	MB22	Function Keys LED 29 to 32

Table 5.12-2: Byte structured poll area

Word-structured Memory Mapping

The data area comprises a maximum of 12 bytes (6 words).

Example: The cyclic data area is set to MW10 in the programming system.

Word Address	Reference	High Byte	Low Byte
Word Address + 0	MW10	Write Coordination Byte	Reserved
Word Address + 1	MW11	Message Channel High Byte	Message Channel Low Byte
Word Address + 2	MW12	Function Keys LED 1 to 4	Function Keys LED 5 to 8
Word Address + 3	MW13	Function Keys LED 9 to 12	Function Keys LED 13 to 16
Word Address + 4	MW14	Function Keys LED 17 to 20	Function Keys LED 21 to 24
Word Address + 5	MW15	Function Keys LED 25 to 28	Function Keys LED 29 to 32

Table 5.12-3: Word structured poll area

5.12.6 Physical Interfacing

Pin	Designation	Function
1	nc	not connected
2	RD	Receive Data
3	TD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	nc	not connected
7	RTS	Request To Send
8	CTS	Clear To Send
9	nc	not connected

Table 5.12-4: Pin assignment X2 RS232

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Pin	Designation	Function
6	TD	Transmit Data
15	CTS	Clear To Send
17	RTS	Request To Send
18	RD	Receive Data
25	SGND	Signal Ground

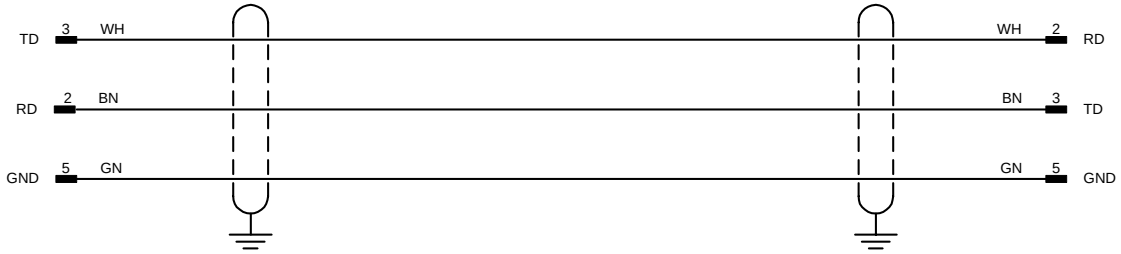
Table 5.12-5: Pin assignment universal interface SER1 RS232

5.12.6.1 Connecting Cable RS232 - AEG A120/A250

The following wiring diagram does not apply to terminals with universal interface.

TesiMod
Operating Terminal

AEG
A120 / A250



D-Subminiatur
Male Connector
9-pin

D-Subminiatur
Male Connector
9-pin

Each end of the shield is connected to the metallic enclosure.

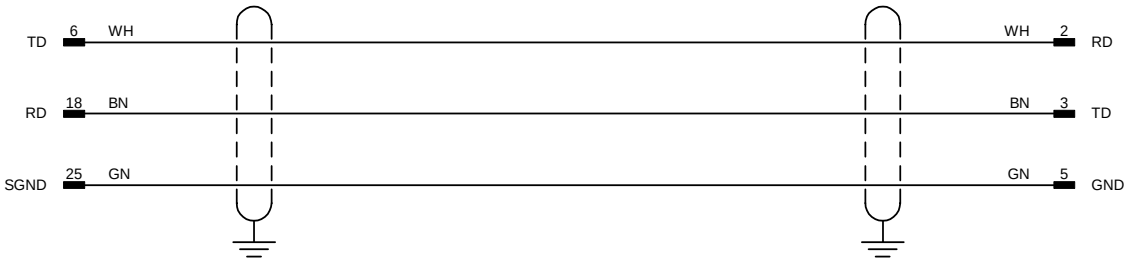
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5.12.6.2 Connecting Cable Universal Interface SER1 RS232 - AEG A120/ A250

The following wiring diagram applies to terminals with universal interface only.

TesiMod
Operating Terminal

AEG
A120 / A250



D-Subminiatur
Male Connector
25-pin

D-Subminiatur
Male Connector
9-pin

Each end of the shield is connected to the metallic enclosure.

5.12.7 Error Messages

Code 1 Error from the data transmission-layer

Subcode

1	E_SLAVE_NOT_READY	Slave not ready
2	E_PROTOKOL	Sequence of the packets
3	E_FRAME	Character frame error
4	E_TIMEOUT	Timeout error
5	E_CRC_BCC	CRC error
6	E_PARITY	Parity error
7	E_SEND_ABORT	Abort send process
8	E_REC_ABORT	Abort receive process
9	E_BUF_SIZE	Insufficient cyclic buffer
10	E_NO_DEFINE	No cyclic data defined
12	E_DEFINE	Cyclic data already defined
15	E_NO_PROTOCOL	Selected protocol is not supported
16	E_OVERRUN	Receive buffer overrun
40	E_SYS_ADDRESS	Undefined system variable

AEG - Specific Error Messages:

Code 1 Error from the data transmission-layer

Subcode

50	E_NO_POLL_QUIT	No acknowledge signal upon polling
51	E_NO_TELE_QUIT	No acknowledge signal upon order-message
52	E_NO_TELE_POLL_QUITT	No acknowledge signal upon tele-polling
54	E_POLL_TIMEOUT	Timeout - no response upon polling
55	E_TELE_TIMEOUT	Timeout - no response message
56	E_NO_RESP_QUIT_QUIT	Timeout - no response upon response-acknowledge signal

Code 3 Error from the PLC

Subcode

05	Wrong type of operand
06	Valid area exceeded

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