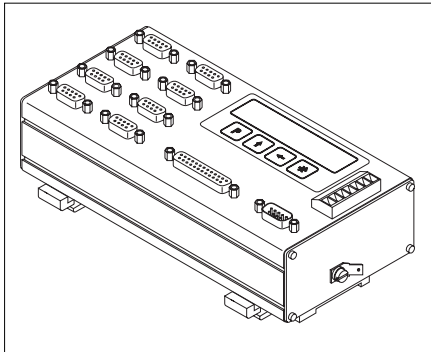


AEA8

8-Channel Translation Module Absolute



The AEA8 allows the connection of maximum 8 sensors. Either 8 x MSA or 8 x LSA200 sensors. A 6-digit 7-segment LED display and 4 keys are available for commissioning (parameterization) and control. The following output options are available: SSI, push-pull parallel or Profibus.

ENGLISH

1. Warranty information

- In order to carry out installation correctly, we strongly recommend this document is read very carefully. This will ensure your own safety and the operating reliability of the device.
- Your device has been quality controlled, tested and is ready for use. Please respect all warnings and information which are marked either directly on the device or in this document.
- Warranty can only be claimed for components supplied by SIKO GmbH. If the system is used together with other products, the warranty for the complete system is invalid.
- Repairs should be carried out only at our works. If any information is missing or unclear, please contact the SIKO sales staff.

2. Identification

Please check particular type of unit and type number from the identification plate. Type number and the corresponding version are indicated in the delivery documentation.

e.g. AEA8-0023 version number
 type of unit

3. Installation

The unit should be used only according to the protection level provided. If necessary, protect the unit against environmental influences such as sprayed water, dust, knocks, extreme temperatures.

Attention! System information! Before mounting sensor and/or magnetic tape please read chapter 6 (sensor alignment) and ensure that: the necessary alignment length is available; that sensor and magnetic tape are aligned correctly.

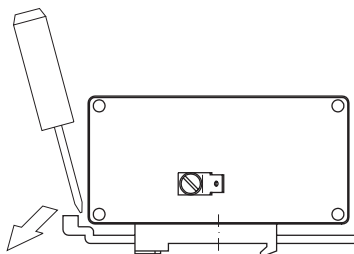


Fig. 1: Installation

The AEA8 has been designed for mounting on standard rails (35x7.5) accord. to DIN 50022. For mounting, snap the retainer onto the rail and ensure that the locking is at the device's bottom side. For dismantling press locking down.

4. Electrical connection

- **Switch power off before any plug is inserted or removed !!**
- If AEA8 is used in combination with drive systems, you must provide additional safety protection, eg. limit switches or other interlocking systems.
- Wiring must only be carried out with poweroff!
- Provide stranded wires with ferrules.
- Check all lines and connections before switching on the equipment.

Interference and distortion

All connections are protected against the effects of interference. **The location should be selected to ensure that no capacitive or inductive interferences can affect the translation module or the connection lines!** Suitable wiring layout and choice of cable can minimise the effects of interference (eg. interference caused by SMPS, motors, cyclic controls and contactors).

Necessary measures:

- Only screened cable should be used. Wire cross section is to be at least 0,14 mm², max. 0,5 mm².
- Wiring to the screen and the ground (0 V) must be secured to a good point and a large surface area to allow minimum impedance.
- The unit should be positioned well away from cables with interference; if necessary a **protective screen or metal housing must be provided**. The running of wiring parallel to the mains supply should be avoided.
- Contactor coils must be linked with spark suppression.



- PE-connection with 2.5 – 4 mm² cable via PE-clamp (with 6,3x0,8 quick-connect receptacle).

Power supply

Operating voltage depends on execution and is indicated in the delivery documentation or on the identification plate.

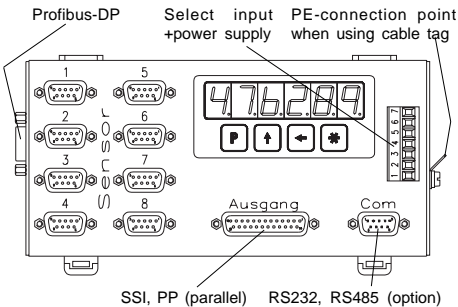
e.g. 24 VDC ±10%

Sensor connection

The connection is made via 8 DSUB connectors (9 poles) at the front panel (marked "Sensor"). Fixing of the D-SUB plug is to be made by using the screws on the plug. This will guarantee a neat and effective connection.



Attention! No modification of the sensor connection, eg. by cable extension, is permitted. The maximum cable length (with connector) for a MSA sensor is 20m and 10m for the LSA200 sensors.



SSI - output (25 pole DSUB connector)

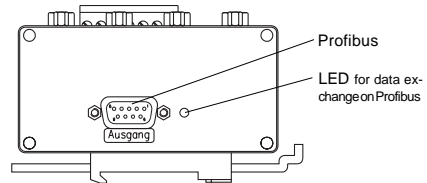
Pin	Description
1	Cycle +
2	Cycle -
3	Data +
4	Data -
5	GND
6	Not connected (N.C.)
...	
25	N.C.

Typical monoflop time is 20 to 25µs. The clock rate should be between 62.5 and 500Kbit/s. Data format: data is available either binary or Gray-code, in 24-bit data format, right-aligned and as two's complement. All subsequent bits (25,26 ...) are issued as "0". Data signals correspond to RS422. Cycle input is made via opto-coupler and in accordance with RS422.

PP, parallel - output (25 pole DSUB connector)

Pin	Description
1	D0
2	D1
...	
19	D18
20	D19
21	N.C.
22	N.C.
23	N.C.
24	GND
25	GND

Data is available as two's complement at the outputs which can be loaded with up to 20mA per channel. At a load current of 20mA the residual voltage is <=1V (High= ≥UB-2V; Low= ≤ 1V).



Profibus-DP output (9 pole DSUB connector)

Pin	Description
3	B-Line
4	RTS
5	2M
6	2P5
8	A-Line

Select input + power supply

(7 pole terminal strip, max. 2.5mm²)

Pin	Description
1	Sensor - Select 1 (only with SSI and PP)
2	Sensor - Select 2 (only with SSI and PP)
3	Sensor - Select 3 (only with SSI and PP)
4	0V (*)
5	PE (**)
6	0V (*)
7	+24V

(*) Pin 4 "0V" connected internally with pin 6 "0V".

(**) For reasons of interference protection, PE should be connected at least at the quickconnect receptacle on the side of the device!!!

Select input 1	Select input 2	Select input 3	active Sensor input
LOW	LOW	LOW	1
HIGH	LOW	LOW	2
LOW	HIGH	LOW	3
HIGH	HIGH	LOW	4
LOW	LOW	HIGH	5
HIGH	LOW	HIGH	6
LOW	HIGH	HIGH	7
HIGH	HIGH	HIGH	8

HIGH >8VDC to 24VDC

LOW <2VDC

not connected = LOW

Interface (option) (9 pole DSUB connector)

RS485		RS232	
Pin	Description	Pin	Description
3	DÜA	2	RXD
5	GND	3	TXD
8	DÜB	5	GND

Interface RS485 is available with two protocols: standard or SIKONETZ4. SIKONETZ4-protocol allows connection of the translation module AEA8 to the Interbus-S (via interface IF09I/1).

Connection between IF09I/1 and AEA8:

IF09I/1	Description	AEA8
PIN 3	DÜA	PIN 3
PIN 8	DÜB	PIN 8



Condition: IF09I/1 and AEA8 must be supplied with the same power supply, and the connection between IF09I/1 and the AEA8 should be as short as possible (< 1m).

5. Commissioning

The interpreting unit is operated and programmed by means of the 4 keys and the 6-digit display.

Keys' function and Operating modes

Depending on the operational status the keys can have additional functions. The device has two operational statuses: "normal operation" and "programming operation". The programming operation is for commissioning and parameterization of the system. Switching from normal to programming operation is by pressing the **P** button for 10 seconds. In programming operation, a parameter is edited by means of the two cursor keys. By means of the **☐** button, the edited value can now be saved non-transiently. The next parameter is reached at by pressing the **P** button. As soon as the last parameter is reached at, pressing the **P** button results in switching to normal operation.

SSI and parallel versions

In normal operation the number of the selected sensor (parameter "display" = "off") or, alternately, the positional value and the number of the selected sensor (parameter "display" = "on") is displayed.

Profibus version

The selected sensor number whose positional value is displayed can be changed by means of the cursor key (condition: parameter "display" = "on"). The positional value of the selected sensor and its number are displayed alternately.

SIKONETZ4 version

The selected sensor number whose positional value is displayed can be changed by means of the cursor key (condition: parameter "display" = "on"). The positional value of the selected sensor and its number are displayed alternately. Likewise, every position value can be queried via interface (condition: parameter "Baud" = "SN4", and there must be no gap in the pin assignment of AEA8, starting with sensor 1). The "number of sensors" parameter serves to indicate the numbers of sensors (= last assigned sensor input). The position values of the sensors "channel 1" until number "number of sensors" are logged cyclically. The protocol is addressable; each channel has an address of its own.

1. Programming
2. Select 'value'
3. Select 'digit'
4. Store value

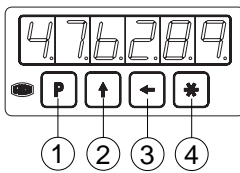


Fig. 3: Key functions

When switched on

and correctly connected:

- all LED segments are displayed (for approx. 1.5 s, display test)
- the software version (eg. 1.00) is displayed
- display of output circuit ("SSI", "Par" or "Pb")
- display of the Profibus address (only with output circuit Profibus)
- display of sensor type ("StD" = MSA; "LSA200")

Afterwards, the AEA8 is in the operational mode normal operation. Now, the interpreting unit may be programmed user-specifically.

Sensor alignment MSA

When the system is installed the first time or when a component (MSA sensor, MBA magnetic band or AEA8 interpreting electronics) is replaced, it is necessary to calibrate each sensor once.

Magnetic sensor and magnetic strip must be calibrated as shown below, ie. the arrows marked on sensor and magnetic strip must head in the same direction (see Fig. 3).

From the programming mode has to be activated to align the sensor keep the (P key pressed for 10 s). Now the appropriate sensor is selected by means of the cursor key and confirmed by pressing the (↵) key. Afterwards the value "100" is entered and saved (Ⓜ key) under the parameter "Code_X" (x = number of the selected sensor). The display shows alternatively 'abs' or 'inc' and the alignment values, thus signalling that automatic alignment is still running. **Move sensor with max. 1cm/s in the direction of the arrow. The alignment is finished after prox 2Centimeters**, now, the display shows a permanent length information. Now go on with parameter programming in programming menu and zero/calibrate the AEA8. (*Chapter 6 gives information on programming menu and available parameters*).

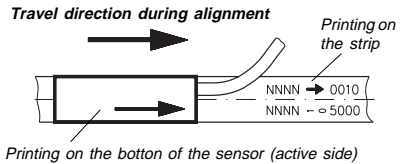


Fig. 3: Sensor alignment MSA

Sensor alignment LSA200

When the system is installed the first time or when a component (LSA200 sensor or AEA8 interpreting electronics) is replaced, it is necessary to calibrate each sensor once.

From the programming mode has to be activated to align the sensor keep the (P key pressed for 10 s). Now the appropriate sensor is selected by means of the cursor key and confirmed by pressing the (↵) key. Afterwards the value "100" is entered and saved (Ⓜ key) under the parameter "Code_X" (x = number of the selected sensor). The display shows alternatively 'abs' or 'inc' and the alignment values, thus signalling that automatic alignment is still running. **Move sensor with max. 1mm/s in the direction of the arrow. The alignment is finished after prox 20mm**, now, the display shows a permanent length information. Now go on with parameter programming in programming menu and zero/calibrate the AEA8. (*Chapter 6 gives information on programming menu and available parameters*).

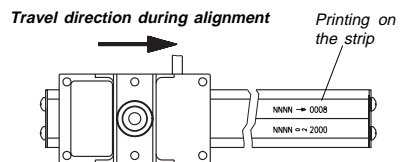


Fig. 4: Sensor alignment LSA200

5.1 Zeroing / Calibration

After sensor calibration the non-computed value encoded on the band will be displayed on the output or display, respectively. By means of the parameter "zeroing" it is possible to assign the zero point to any point of the measuring stretch (press the (↵) key under the menu item "zeroing"). If a value other than zero is to be displayed at this point, the calibration value must be programmed accordingly.

5.2 upper range limit

The system has normally an encoded path length of 5120mm (MSA), 1024mm (LSA200). It is interpreted in the numerical range of -1200mm to +5000mm (MSA), -24mm to +1000mm (LSA200). The positive numerical range can be reduced by changing the parameter "upper range limit". This results in a corresponding extension of the negative range.



Example MSA: upper range limit = 3000 (mm) -> numerical range: -2120mm ... 3000mm.

5.3 Parameterization (SIKONETZ4 protocol)

Parameterization via interface (according to the protocol) is also possible. During initialization of IF09I/1, IF09I/1 scans the addresses 1 to 8. In accordance with the sensors found, each 4 data bytes are made available to Interbus-S. The following should be taken into account when parameterizing resolution via interface. Indication of resolution per revolution is useful for rotating systems only. For the linear system AEA8 the following association of resolution and value on the interface is applicable.

Parameter value	Resolution
0	10mm
1	1mm
2	0,1 mm
3	0,01 mm
4	1inch
5	0,1 inch
6	0,01 inch
7	0,001 inch

6. Programming parameters

Parameterization: In the programming mode, the display changes from parameter name to parameter value and vice versa. The sensor number need **not** correspond to the sensor number chosen by the select inputs! The value can be edited by using the cursor keys. By pressing the  key the value is saved nontransiently. The  serves for switching on to the next parameter.

Parameter table:

Designation	Display	Value range	Comment
Sensor number	_S-nr_	SenS_x (x= 1 ... 8), SYS	indicates the sensor (channel) to be parameterized. SYS = elementary device parameters (system parameters)

If the value "SYS" was selected for the sensor number parameter (standard-protocol):

Designation	Display	Value range	Comment
resolution	_AUFL_	10 mm, 1 mm, 0.1 mm, 0.01 mm, 0.1 mm, 0.01 mm, 1 inch, 0.1 inch, 0.01 inch, 0.001 inch	this parameter is valid for all sensor inputs !
Output code	_AUSG_	GrAY ,bin	only for outputs SSI and PP
baud rate	_bAud_	300, 600, 1200, 2400, 4800, 9600, 19200	
language	_SPR_	dEUT , EnGL	To choose the language displayed
display	_diSP	on , oFF	on= in normal operation, the positional values of the selected sensors are displayed alternately oFF= display of the sensor number (PP, SSI) or "-----" (Pb), respectively
calibration	AbGL	00..ff	hexadecimal-encoded information, which channels have been calibrated. Example: 21Hex -> channels 1 + 6 are calibrated

Designation	Display	Value range	Comment
Profibus address	PbAdr	1...126	Address of AEA8 in the Profibus, only with Profibus output
number of sensors	SenSnr	1...8	Number of active sensors Pin outs: starting with channel no. 1 consecut., only with Profibus output

If the value "SYS" was selected for the sensor number parameter (standard-protocol):

Designation	Display	Value range	Comment
resolution	_AUFL_	10 mm, 1 mm, 0.1 mm, 0.01 mm, 0.1 mm, 0.01 mm, 1 inch, 0.1 inch, 0.01 inch, 0.001 inch	this parameter is valid for all sensor inputs !
baud rate	_bAud_	1200, 2400, 4800 9600, 19200, SN4	
language	_SPr_	dEUT , EnGL	To choose the language displayed
display	_diSP	on , oFF	on= in normal operation, the positional values of the selected sensors are displayed alternately oFF= " . "
calibration	AbGL	00..ff	hexadecimal-encoded information, which channels have been calibrated. Example: 21Hex -> channels 1 + 6 are calibrated
number of sensors	SenSnr	1...8	Number of active sensors Pin outs: starting with channel no. 1 consecut.
Number of measurements	_noS_	1, 2, 4, 8	Filtering of measured values, For applications in environments with high electromagnetic interference
Filter measurements	_Filt_	Lo, cEntEr, Hi	Filtering of measured values, For applications in environments with high electromagnetic interference

If the value "SenS_X" (X = 1 ... 8) was selected for the number of sensors parameter :

Designation	Display	Value range	Comment
calibration value	_CAL_X	-199999... 999999	Calibration value for sensor input X (see 1st parameter)
counting direction	ZAEHLX	AUF , Ab	Counting direction sensor input X
upper range limit	obG_X	0 ... 5000 (mm) - MSA 0 ... 1000 (mm) - LSA200	Upper limit value for sensor input X
Calibration	NULL_X	-	Setting the sensor input X to the corresponding calibration value X
code	CodE_X	0 ... 50000	Code 00100 is used to start the sensor alignment at sensor input X
control	Contr_X	Ein , Aus	Internal service funktion

7. Trouble shooting

Error states are recognized and shown in the display:

Message: display dark

Description: No power supply connected

Action: Check connection of power supply

Message: display blinking (display mode = position value)

Description: Sensor control of the selected channel is activated.

Action: Sensor is not connected or not mounted correctly to the tape.

Message: The display values does not change although the sensor is moving.

Description: Wrong channel is activated.

Action: Compare selected inputs to the desired channel.

Message: No SSI output.

Description: Sensor control is activated

Action: Sensor is not connected or not mounted correctly to the tape.

Message: Irregular changes of position value.

Description: Mounting or alignment of sensor is faulty.

Action: Check mounting of sensor and restart the alignment.

8. List of commands/service operation

Parameters: 300 ...19200 Baud,
no parity, 8 bit, 1stop bit,
no handshake

Data code: ASCII / hexadecimal

Value range: 2/3 Byte: 0...65535 /
0...±2²³

Command	Length	Reply	Description
A0	2/6	"AEA8>"	unit type
A1	2/7	"V1.01>"	software version
A2	2/5	"Par>"	output circuit (e.g. parallel)
A3 (only PB)	2/6	"xxxx"	SPC-data length
A4 (only PB)	2/8	"LSA200" "MSA__"	sensor identification
B	1/8	"±xxxxx"	position value without additional factors
Cxx	3/5	"yyyy"	read EEPROM cell xx= storage cell 00...63 (MSA) 00...127 (LSA200) yyyy= value expressed as Hex

Dyyuvwx 7/2 ">"

write EEPROM cell
yy= storage cell
00...63 (MSA)
00...127 (LSA200)
uvwx= value expressed as Hex

Ex 2/10 "±xxxxxx>" transmit parameter! of the active sensor!
y=0:positions value
y=1:zero position value
y=2:calibration value
y=3:positive range

Fx±yyyyy 9/2 ">" program parameter! of the active sensor!
(if remote flag is set)
x=2: yyyyy= calibration value (0...±999999)
MSA: x=3: yyyyy= positive range (0...+5000)
LSA200: x=3: yyyyy= positive range (0...+1000)

G 1/9 "x/.001i>" transmit resolution, valid for all sensors

Hy 2/2 ">" enter resolution, valid for all sensors (if remote flag is set)

I 1/3 "x>" transmit number of active sensor

Jx 2/2 ">" change active sensor input (if remote flag is set)
x= 0...8

K 1/- Software reset

L 1/2 ">" reset calibration of the active sensor (if remote flag is set)

M 1/3 "X>" transmit output code
X=0: Gray-Code
X=1: binary-Code

Nx 2/2 ">" enter output code (if remote flag is set)
x=0: Gray-Code
x=1: binary-Code

Ox 2/10 "±xxxxxxx>" transmit internal parameters
x=0: adc_0_max (internal value of the last aligned sensor)
x=1: adc_0_min (internal value of the last aligned sensor)
x=2: adc_1_max (internal value of the last aligned sensor)
x=3: adc_1_min (internal value of the last aligned sensor)
x=4: adc_0 Wert (analog value of active sensor)

		x=5: adc_1 Wert (analog value of active sensor)
P	1/4 "xy"	transmit operation mode (for internal use) x= mode flag y= alignment flag
Q	1/8 "xxxxxx>"	transmit baud rate xxxxxx= 300...19200, 115200
Rx	2/2 ">"	set or reset remote flag x=0: reset remote flag x=1: set remote flag
S	1/2 ">"	set AEA8 to default values (alignment parameters will not change)
Txy	3/2 ">"	counting direction of sensor (if remote flag is set) x= sensor number (1...8) y=0: counting direction "UP" y=1: counting direction "DOWN"
Ux	2/2 "yy"	transmit internal values (hexadecimal; only for internal use!) x=0: ADC_0-value of active sensor x=1: ADC_1-value of active sensor x=2: rough position value of active sensor x=3: precise position value of active sensor x=4: ABS-value of track "0" x=5: ABS-value of track "1" x=6: offset ADC_0 of active sensor x=7: offset ADC_1 of active sensor x=8: ABS-zero value of active sensor
W	1/3 "xyz"	binary position value as 3 bytes with two's complement
X	1/3 "y"	transmit select input y= 1...8
Y	1/6 "0Xyy>"	transmit flag register (Hex-ASCII)
Z	1/10 "±xxxxxx>"	transmit position value of active sensor

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