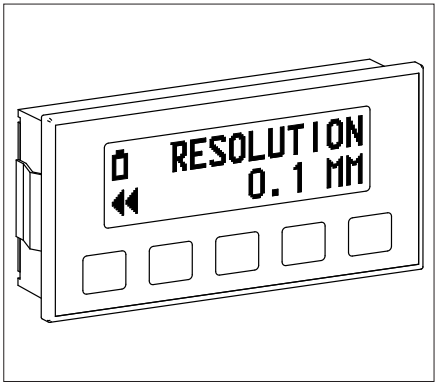
MA501

Electronic Display



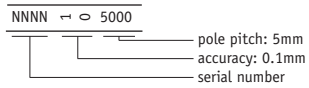
ENGLISH

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 observe all warnings and information which are marked either directly on the device or specified in this document.
- Warranty can only be claimed for components supplied by SIKO GmbH. If the system is used together with other products, there is no warranty for the complete system.
- Repairs should be carried out only at our works. If any information is missing or unclear, please contact the SIKO sales staff.

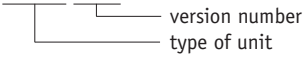
2. Identification

Magnetic strip: identification by printing on the strip. Example Magnetic strip printing:



Electronic display: Please check the 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. MA501-0023



3. Installation

For mounting, the degree of protection specified must be observed. If necessary, protect the unit against environmental influences such as sprayed water, dust, knocks, extreme temperatures, solvents.

3.1 Panel case type EG

For switchboard installation the recommended dimensions of DIN 43700 are valid.

3.2 Mounting the magnetic strip

The mounting surface / measuring track must be flat. Buckles or bumps will lead to measuring inaccuracies.

For applications which do not allow properly glueing of the magnetic strip, it can be inserted into a **profile rail** (accessory) - eg. rail type **PS** thus forming a compact mounting unit.

For technical reasons the strip should be approx. 100mm longer than the actual measuring distance.

Attention! To guarantee **optimal adhesion** oil, grease dust etc. must be removed by using cleansing agents which evaporate without leaving residues. Suitable cleansing agents are eg. ketones (acetone) or alcohols; Messrs. Loctite and 3M can both supply such cleansing liquid. Make sure that the surface to be glued is dry and apply the strip with maximum pressure. Glueing should preferably be undertaken at temperatures between 20 to 30°C and in dry atmosphere.

Advice! When applying long pieces of magnetic strip do not immediately remove the complete protective foil, but rather peel back a short part from the end sufficient to fix the strip. Now align the strip. As the protective strip is then peeled back and out press the tape firmly onto the mounting surface. A wall paper roller wheel could be used to assist in applying pressure onto the magnetic strip when fixing it in position.

Mounting steps (see fig. 1)

- Clean mounting surface (1) carefully.
- Remove protective foil (2) from the adhesive side of the magnetic strip (3).
- Stick down the magnetic strip (4).
- Clean surface of magnetic strip carefully.

- Remove protective foil (6) from adhesive tape on the cover strip (5).
- Fix cover strip (both ends should slightly overlap).
- Also fix cover strip's ends to avoid unintentional peeling.

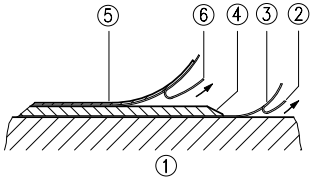


Fig. 1: Mounting of the magnetic strip

Attention! Do not expose the system to magnetic fields. Any direct contact of the magnetic strip with magnetic fields (eg. adhesive magnets or other permanent magnets) is to be avoided. Sensor movements during power loss are not captured by the follower electronics.

Mounting examples

Mounting with chamfered ends (fig. 2) is not recommended unless the strip is installed in a safe and protected place without environmental influences. In less protected mounting places the strip may peel. There we recommend mounting accord. to fig. 3 and 4.

Mounting in a groove (fig. 5) best protects the magnetic strip. The groove should be deep enough to totally embed the magnetic strip.

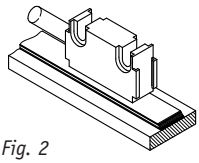


Fig. 2

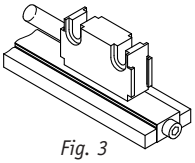


Fig. 3

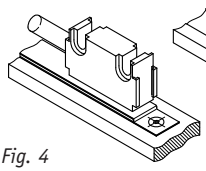


Fig. 4

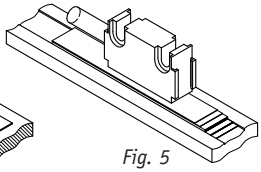


Fig. 5

3.3 Mounting the sensor

Use two M3 screws to fix the magnetic **sensor L** via the ø3.2 mm through holes.

- Cable layout should avoid damages due to cable strain or other machine parts. If necessary use a drag chain or protective hose and provide for strain relief.
- When mounting the magnetic sensor, ensure that the gap between strip and sensor and the max. admissable deviation are maintained over the total measuring length! (see fig. 6)

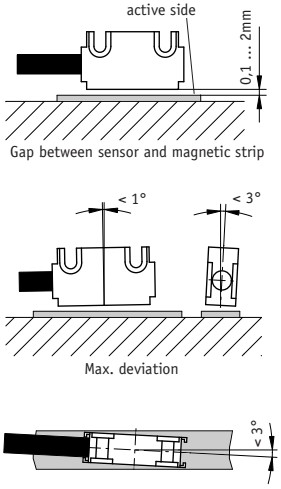


Fig. 6: Mounting of sensor

3.4 Mounting of the battery box

The battery box supplied together with the display are for panel mounting. The battery box should be mounted at a 'cold' site: heat accelerates the self-discharge of batteries.

Below are the dimensions for panel mounting:

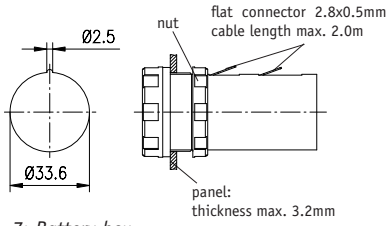


Fig. 7: Battery box

4. Electrical connection

- Wiring must only be carried out with power off!
- Provide standed 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 sensor 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).

The sensor 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.

Power supply

Power is supplied via connection cables.

Color	Designation
black	GND
brown	10..24VDC/8mA
red	1.5VDC (power supply backup)
orange	Data GND (interface RS485)
yellow	Data B (interfacee RS485-DÜB)
green	Data A (interface RS485-DÜA)

For bus operation, connecting a bus terminator to the last device (at the end of the bus line) is recommended. It should have the value 120Ω and be connected between DÜA and DÜB.

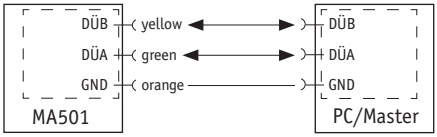


Fig. 8: Pinout scheme RS485 interface

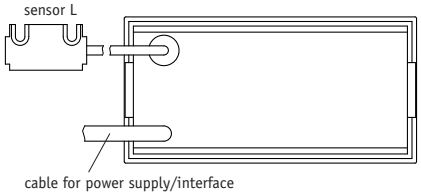


Fig. 9: Built-in housing EG10

Attention! All programmed parameters will survive battery change. The position value will not be stored and the display must be referenced anew.

Connection of the battery box

The battery box (mounted as described in chapter 3.4) has to be connected as follows:

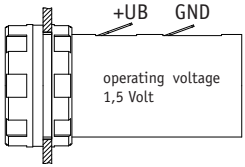


Fig. 10: Connection of the battery box

Battery types

Batteries are **not** supplied together with the MA501. The following standard types could be used:

for *battery box (1,5Volt):*

1 x Baby / R14

Change of batteries

When display shows battery symbol, battery should be replaced as soon as possible.

Unscrew cap to insert / remove batteries.

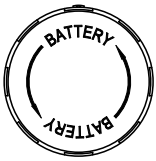


Fig. 11: Change of batteries

When exchanging the batteries take care that their polarity is correct! Take the marking on the bottom of the box as orientation.

Attention! No modifiction of the sensor connection, eg. by cable extension, is permitted.

5. Commissioning

Having connected the MA501 properly and switched on the operating voltage the following will be displayed for a moment:

- device identification (MA501)
- address
- software version

Subsequently the display can be programmed application-specifically.

6. Maintenance of the magnetic strip

We recommend cleaning the magnetic strip's surface from time to time with a soft rag. This avoids dirt (dust, chips, humidity ...) sticking to the strip.

See enclosed page with user information MA501

Software S (Standard)

ENGLISH

1. Keys' function

Depending on the operating mode the keys may have additional function (see 'Programming mode' and 'Input mode'). The keys are pressed singly or in pairs (two together).

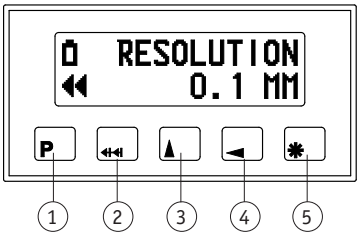


Fig. 1: Key's function EG

1. Programming
2. Switching between absolute measurement and incremental measurement
3. Select 'value'
4. Select 'digit'
5. Store value

Operating modes

There are two operating modes:

1.1 Programming mode:

Single set-up of the display for the intended application.

1.2 Input mode:

Functions required during normal application.

2. Display description

The MA501 has a DOT matrix display. The display and the individual symbols will be explained below.

Einschalten

MA501

Upload

ADDR 00 — Address
SV 1.02 — Software version

Display in the normal mode

167.9

Display in the normal mode "incremental measurement"

0.5

Battery status: Replace backup battery

Display of target value

200.0 — Target value
97.5 — Actual value

Arrow indicating the direction

Target bar

Approximate to target value

200.0 — Target value
205.0 — Actual value

Actual value = target value

200.0 — Target value
200.0 — Actual value

Display of difference value

4.9 — Difference value = act. val. - targ. val.
204.9 — Actual value

Example: target value = 200mm

3. Programming mode

The display is either pre-programmed to standard values at our works. Enter programming mode for parameter modification/programming Normally programming is only necessary at initial installation. Parameters can be modified and checked at any time. They are stored in a non-volatile memory. For the precise designation as well as description of function and selection of programmable values see chapter 4, 'Parameter description'.

***To enter** into programming mode:*

Press key [P] for at least 4s.

***To leave** programming mode:*

If no key has been actuated for more than 30s or advance to the end of the parameter list by pressing the [P] key.

***To scroll** menu points:*

Use key [P].

***Input of numerical values**:*

With the input of numerical values the smallest decade is the first to blink. By actuating the [▲] key, the numerical value of the blinking digit can be changed. The [◀] key serves for advancing to the next digit.

***To change** parameters:*

Use keys [▲].

***To store** modified parameters:*

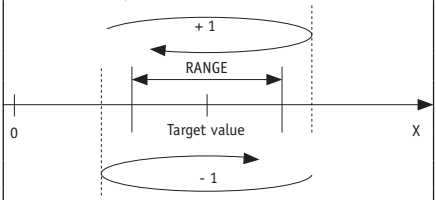
Press key [✱], then message "-STO-" will be briefly displayed.

4. Parameter description

At the end of this user information brochure you will find a detailed parameter list showing all programmable parameters and offering space for customer-specific programming values.

After entering into the programming mode (see chapter 3) the parameters described below can be configured.

Display "choicel"	Designation / description
ADDRESS	*Unit address* Value range: 00 ... 31
BAUDRATE	*Baudrate* Value range: 4800, 9600, 19200
VIEW	*Contrast adjustment of the display* via [◀] and [▲] keys.
ABS ON	*Activation of the star key for referencing.* **ON:** referencing via [✱] key enabled **OFF:** referencing via [✱] key disabled
FACTOR	*Factor input:* value calculation of the scaled factor. Value range: 000.0001 ... 999.9999
RESOLUTION	*Resolution of the display* Value range: 0,01mm; 0,05mm; 0,1mm; 0,5mm; 1mm; 0,001 inch; 0,005 inch; 0,01 inch; 0,01°; 0,05°; 0,1°
REF	*Reference value:* Value which the display is set to when resetting. Value range: -99999.99 ... +99999.99 (input in 1/100mm)
OFFS	*Offset value:* value by which the display value is corrected (tool correction). Value range: -99999.99 ... +99999.99 (input in 1/100mm)
DIR	*Counting direction* Value range: UP, DOWN
FUNCTION	*Selection of measurement type:* linear or rotative. **LINEAR:** with this setting, travel to the target value is enabled from both sides; i.e., if the RANGE value was exceeded, traveling to the opposite direction is immediately possible. **ROTARY:** This function is intended for rotary measuring arrangements (using a magnetic ring MR500), where loop travel must be conducted to compensate spindle play. The function defines the direction from which the target value is driven to and the value by which it must be exceeded if travel was beyond the range of validity. To attain compensation of spindle play, the target value must be traveled to always from the same side (=loop travel). The direction and the value are defined by the 'LOOP' parameter.



INPOSITION	*Defines the the control range* (= range of how long the filled bar is displayed.) Value range: 0.01mm ... 99.99mm
RANGE	*Defines the range of target proximity* (= display of the arrows and the bar) Value range: 0.01mm ... 99.99mm
LOOP	*Defines the excess loop travel* (= value that must be exceeded to compensate spindle play) **-**: travel from below **+**: travel from above Value range: 0.01mm ... 99.99mm

Display "choicel"	Designation / description
SCOPE	*Display of the loop travel orientation sign* (display of arrow and bar) Value range: ON, OFF
BATTERY	*Battery monitoring:* indication by the electronic display, whether a backup battery is connected. The battery status is transferred in the protocol with every query by the master. The battery symbol is displayed when the battery should be replaced. Value range: ON, OFF

5. Input mode

5.1 Reset (to reference + offset value)

Precondition: Parameter 'Reset enable' **ABS ON** in programming mode must be programmed to **'ON'** but unit must not be left in programming mode.

- Press key ✱ to set the display to reference + offset value.

5.2 Incremental measurement

Precondition: The display is in the normal mode, not in the programming mode.

- Pressing the ◀◀ key switches the display to incremental measurement.
- The display is zeroed and the ◀◀ appears bottom left. When the sensor travels (or the magnetic ring rotates) the value in the incremental measurement mode is displayed right-aligned.
- Switchin off by pressing the ◀◀ key once more. The absolute measuring value is displayed again.
- While in the incremental measurement mode the display can also be set to zero by pressing key ✱. This does not change the absolute measurement in the background.

6. Referencing

Eine Referenzierung der Anzeige ist generell erforderlich:

- before the first use of the measuring system.
- in case of a displacement during power failure (if no backup supply is connected).

During reference the counter is set to the programmed reference value (+ offset value). Thus, the electronic display can be zeroed if both reference and offset values are 0.

6.1 Manual referencing

Manual referencing is enabled:

- by pressing key ✱. Therefore menu point 'Release of reset function' **ABS ON** must be programmed to **ON**.

7. Serial Interface

only for interface option!

Data can be exchanged with a PC or SPS (Master) via the serial interface (bus-compatible protocol) of the MA501.

7.1 RS485 protocol

Communication RS485

The electronic display transfers various commands and offset values via the RS485 interface. The data is transferred via a byte stream consisting of a total of 20 bytes. The frame is initiated with "STX", the last characters are "ETX". The value transfer is always 10-digit, without a comma. The electronic display acknowledges by using the same byte stream. If the response of the electronic display contains a valid value, this value is entered on the positions of byte #7...17 (including arithmetical sign).

This display value is determined as follows:

(1) Display value = position (= 1/100 mm)/factor + offset value + reference value

Interface data

Baud rates of 4800, 9600 and 19200 are available, which can be set in the parameter menu.

Settings for standard transfer:

- 9600 baud
- 8 data bit
- 1 stop bit
- transfer of ASCII characters

Transfer errors

In the case of transfer errors, e.g., if not all char-acters have been received or the checksum is wrong, the electronic display sets the receive parameters to 'Zero' and, therefore, does not respond. There is no acknowledgement by the electronic display in this case.

Value transfer

The data is transferred as scaled values in 1/100 mm (see 1). Transfer of loop travel parameters is always in 1/100 mm for linear measurement (mm, inch).

7.2 List of commands RS485 protocol

Byte #	Perm. values	Description (example)
1	Start of text	STX; sign for Start of text (0x02 hex)
2	0 ... 3	Device address decimal place, defines, which electronic display is addressed in bus operation. ('1' 0x31)
3	0 ... 9	Device address right-hand position, defines, which electronic display is addressed in bus operation. ('5' 0x35)
4	X; Y	X or Y defines, which measuring axis is addressed. ('X' 0x58 "**X**" - axis 1 "**Y**" - axis 2 (optional)
5	R; W	Read/Write ('R' 0x52; 'W' 0x57) "**R**" - electronic display sends data to the master. "**W**" - master sends data to the electronic display.
6	U; D; C; I; M; E; P; Z	"**U**" - transfer target value, master sends the target value to the electronic display ('U' 0x55) "**D**" - Difference display, shows the difference between target and actual values ('D' 0x44) "**C**" - switch display value to display of actual value, switches electronic display to normal mode (single-line display of measured value) ('C' 0x43) "**I**" - read actual value, electronic display sends the displayed value in 1/100mm as the response ('I' 0x49).

Example: value displayed is "-15.35".
The electronic display responds:

Arithm. sign(byte#7)	Data (byte#8 - #17)
"-" (0x2D)	"0" (0x30), "0", "0", "0", "0", "0", "1"(0x31), "5"(0x35), "3" (0x33), "5" (0x35)

Example: value displayed is "-15.35".
The electronic display responds:

Arithm. sign(byte#7)	Data (byte#8 - #17)
"-" (0x2D)	"0" (0x30), "0", "0", "0", "0", "0", "1"(0x31), "5"(0x35), "3" (0x33), "5" (0x35) "**M**" - counter-value transfer ('M' 0x4D); the display value is composed of: displayed value = [pulses (1/100mm)/factor] + reference value + offset value. The value 'pulses/factor' is called counter value and can be read out via 'read'. "**E**" - Save EEPROM ('E' 0x45); saves the total parameter set in the internal EEPROM.

Byte #	Perm. values	Description (example)
		"**P**" - Parameter transfer ('P' 0x50); 'P' and read/write 'W': master sends to electronic display; 'P' and read/write 'R': master reads out the data from the electronic display. The parameters are taken over in the RAM. To save the parameters in the EEPROM send the 'Save EEPROM' command. "**Z**" - Reset ('Z' 0x5A); referencing of the electronic display. This has the same function as the ✱ key, if 'Abs_on' is "on".
7	-; +	Arithmetic sign ('-' 0x2D; '+' 0x2B) "**-**" - negative value "**+**" - positive value
8	0 ... 9	Data (MSB) ('0' 0x30)
9	0 ... 9	Data ('1' 0x31)
10	0 ... 9	Data ('2' 0x32)
11	0 ... 9	Data ('3' 0x33)
12	0 ... 9	Data ('4' 0x34)
13	0 ... 9	Data ('5' 0x35)
14	0 ... 9	Data ('6' 0x36)
15	0 ... 9	Data ('7' 0x37)
16	0 ... 9	Data ('8' 0x38)
17	0 ... 9	Data (LSB) ('9' 0x39)
18		Statusbyte
19	Cyclic Redundancy Check	CRC
20	End of text	ETX (0x03 hex)

Status byte (byte #18)

A status byte is additionally transferred with every transfer. This byte informs about sensor, EEPROM, battery voltage and whether loop travel has been completed.

The bit# 7 is always "1" to prevent bit pattern STX or ETX from occurring!

Bit 7	always	1
Bit 6	empty	0
Bit 5	empty	0
Bit 4	Battery changed	0-Battery not changed;1-Battery changed
Bit 3	Sensorerror	0-Sensor ok; 1-Sensor ERROR
Bit 2	Parameter	0-Parameter ok; 1-Parameter ERROR
Bit 1	Battery	0-Battery ok; 1-Battery ERROR
Bit 0	In Position	0-Position ok; 1-Position not ok

Battery changed:	Flag indicates whether voltage interruption occurred during battery buffering. The bit is set to 0 when the control writes a write command on the parameter reference value.

Sensor Error:	Flag indicates whether the sensor is on the magnetic strip/magnetic ring.
Parameter:	Flag indicates whether the EEPROM checksum is ok.
Battery:	Flag indicates whether battery voltage level is too low. (on P5.1)
InPosition:	Flag indicates whether loop travel has been completed, actual position = target value.

Checksum Exklusiv-ODER XOR (byte #19)

Calculate checksum acc. to linkage method byte-XOR from bytes# 2 to 18.

CRCn+1 = CRCn XOR Byte#2+n

To set the protocol transparent, bit #7 is always set to "1".

Example of code in programming language C:

```
static char checksum(void)
{
// Variables
  char              crc;
  int               i;
// CRC start value = 0
  crc = 0;
// Byte#2 to 18 link from XOR protocol.
//Byte#2-cmd_array[1]....Byte#18-cmd_array[17]
  for (i = 1; i <= 17; i++) {
// XOR linkage
    crc = crc ^ cmd_array[i];
  }
// transparent protocol
  return crc | 0x80;
}
```

7.3 Examples for parameters

(Below, MA = Electronic display)

Stream data [09 ... 00] (ASCII sign):

D[9]	D[8]	D[7]	D[6]	D[5]	D[4]	D[3]	D[2]	D[1]	D[0]

Parameter #01 ADDRESS MA slave address 01... (default)

0	1	0	0	0	0	0	0	0	0

Parameter #01 ADDRESS MA slave address 02...

0	1	0	0	0	0	0	0	0	2

Parameter #01 ADDRESS MA slave address 31...

0	1	0	0	0	0	0	0	3	1

Parameter #02 BAUDRATE MA baud rate 9600... (default)

0	2	0	0	0	0	9	6	0	0

Parameter #02 BAUDRATE MA baud rate 4800...

0	2	0	0	0	0	4	8	0	0

Parameter #02 BAUDRATE MA baud rate 19200...

0	2	0	0	0	1	9	2	0	0

Parameter #03 VIEW MA display contrast 32... (default)

0	3	0	0	0	0	0	0	3	2

Parameter #03 VIEW MA display contrast 64... (max.)

0	3	0	0	0	0	0	0	6	4

Parameter #03 VIEW MA display contrast 0... (min.)

0	3	0	0	0	0	0	0	0	0

Parameter #04 ABS ON star key active ON (default)

0	4	0	0	0	0	0	0	0	1

Parameter #09 ABS ON star key inactive OFF

0	4	0	0	0	0	0	0	0	0

Parameter #05 FACTOR MA factor 35.0000... (default)

0	5	0	0	3	5	0	0	0	0

Parameter #05 FACTOR MA factor 999.9999... (max.)

0	5	0	9	9	9	9	9	9	9

Parameter #05 FACTOR MA factor 000.0001... (min.)

0	5	0	0	0	0	0	0	0	0

Para. #06 RESOLUTION MA resolution display...MM 0.01

0	6	0	0	0	0	0	0	0	0

Para. #06 RESOLUTION MA resolution display...MM 0.05

0	6	0	0	0	0	0	0	0	1

Para. #06 RESOLUTION MA res. display...MM 0.1(Default)

0	6	0	0	0	0	0	0	0	2

Para. #06 RESOLUTION MA resolutiong display...MM 0.5

0	6	0	0	0	0	0	0	0	3

Para. #06 RESOLUTION MA resolution display...MM 1

0	6	0	0	0	0	0	0	0	4

Para. #06 RESOLUTION MA resolution display...INCH 0.001

0	6	0	0	0	0	0	0	0	5

Para. #06 RESOLUTION MA resolution display...INCH 0.005

0	6	0	0	0	0	0	0	0	6

Para. #06 RESOLUTION MA resolution display...INCH 0.01

0	6	0	0	0	0	0	0	0	7

Para. #06 RESOLUTION MA resolution display...DEG 0.01

0	6	0	0	0	0	0	0	0	8

Para. #06 RESOLUTION MA resolution display...DEG 0.05

0	6	0	0	0	0	0	0	0	9

Para. #06 RESOLUTION MA resolution display...DEG 0.1

0	6	0	0	0	0	0	0	1	0

Para. #07 REF Reference value 100.0mm (input in 1/100mm)

0	7	0	0	0	0	0	0	0	0

Para. #08 OFFS Offset value 20.0mm (input in 1/100mm)

0	8	0	0	0	0	2	0	0	0

Parameter #09 DIR MA counting direction UP (default)

0	9	0	0	0	0	0	0	0	1

Parameter #09 DIR MA counting direction DOWN...

0	9	0	0	0	0	0	0	0	0

Values for loop-travel transfer in 1/100mm

Parameter #10 FUNCTION Linear (default)

1	0	0	0	0	0	0	0	0	0

Parameter #10 FUNCTION Rotativ

1	0	0	0	0	0	0	0	0	1

Para. #11 INPOSITION MA control range +/-...0.05

1	1	0	0	0	0	0	0	0	5

Parameter #12 RNAGE MA loop range...0.20

1	2	0	0	0	0	0	0	2	0

Parameter #13 LOOP MA excess loop range...-1.00

1	3	0	0	0	0	0	1	0	0

Para. #14 SCOPE MA loop travel orientation sign ...ON (default)

1	4	0	0	0	0	0	0	0	1

Para. #14 SCOPE MA loop travel orientation sign...OFF

1	4	0	0	0	0	0	0	0	0

Para. #15 BATTERY MA battery connected...yes (default)

1	5	0	0	0	0	0	0	0	1

Para. #15 BATTERY MA battery connected...no

1	5	0	0	0	0	0	0	0	0

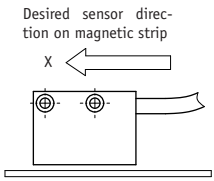
Via **BATTERY** parameter, the electronic display is informed of whether or not a backup battery is connected. If **BATTERY** is 0 battery monitoring is not displayed, either (this applies to the status byte as well as to the display). If the battery level is still high enough, then the status of the flag is always on "1".

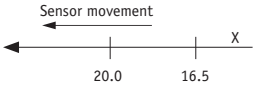
8. Examples of use

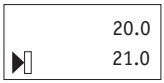
8.1 Loop travel with "ROTATIVE" setting

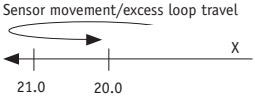
Condition: 'FUNCTON' parameter set to 'ROTATIVE'.

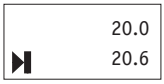
Settings example:
Display of target values
Target value: 20.0mm
FACTOR: 001.0000
RESOLUTION: 0.1 MM
DIR: DOWN
FUNCTION: ROTATIVE
INPOSITION: 00.20
RANGE: 00.60
LOOP: +01.00
SCOPE: ON
BATTERY: OFF

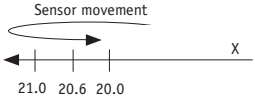


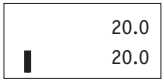




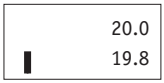


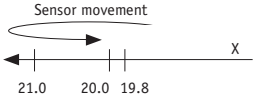






Actual value = target value

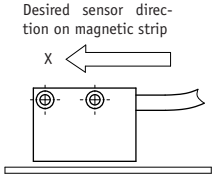


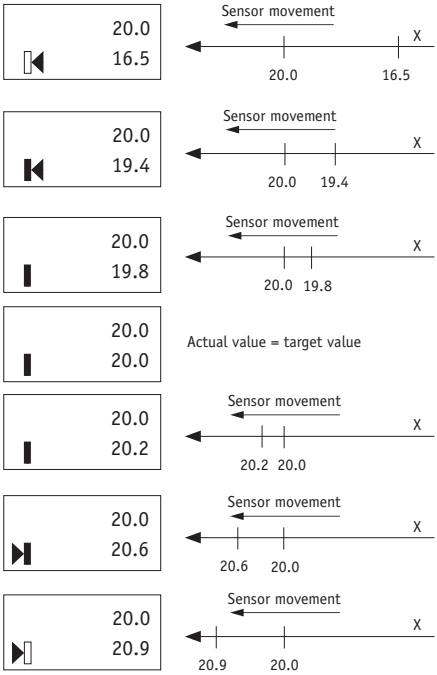


8.2 Loop travel with "LINEAR" setting

Condition: 'FUNCTON' parameter set to 'LINEAR'.

Settings example:
Display of target values
Target value: 20.0mm
FACTOR: 001.0000
RESOLUTION: 0.1 MM
DIR: DOWN
FUNCTION: LINEAR
INPOSITION: 00.20
RANGE: 00.60
LOOP: +01.00
SCOPE: ON
BATTERY: OFF




20.0
16.5
Sensor movement
X
20.0
16.5
20.0
19.4
Sensor movement
X
20.0
19.4
20.0
19.8
Sensor movement
X
20.0
19.8
20.0
20.0
Actual value = target value
20.0
20.2
Sensor movement
X
20.2
20.0
20.0
20.6
Sensor movement
X
20.6
20.0
20.0
20.9
Sensor movement
X
20.9
20.0

Appendix: Parameter list

Display	Designation/value range	Standard programm.	Your programming
ADDRESS	Unit addresse: 00 ... 31	00	
BAUDRATE	Baud rate: 4800, 9600, 19200	9600	
VIEW	Contrast adjustment		
ABS ON	Star key for referencing: ON, OFF	ON	
FACTOR	Factor input: 000.0001 ... 999.9999	001.0000	
RESOLUTION	Resolution: 0,01 MM; 0,05 MM; 0,1 MM; 0,5 MM; 1 MM; 0,001 IN; 0,005 IN; 0,01 IN; 0,01 DEG; 0,05 DEG; 0,1 DEG	0.1 MM	
REF	Reference value: -99999.99 .. +99999.99	00000.00	
OFFS	Offset value: -99999.99 .. +99999.99	00000.00	
DIR	Counting direction: UP, DOWN	DOWN	
FUNCTION	Type of measurement: LINEAR, ROTATIVE	LINEAR	
INPOSITION	Control range: 0.01 ... 99.99	00.20	
RANGE	Target proximity: 0.01 ... 99.99	00.30	
LOOP	Loop travel: 0.01 ... 99.99	+01.00	
SCOPE	Loop travel orientation sign: ON, OFF	ON	
BATTERY	Battery monitoring: ON, OFF	ON	

SIKO GmbH

Werk / Factory:
Weihermattenweg 2
79256 Buchenbach-Unteribental

Postanschrift / Postal address:
Postfach 1106
79195 Kirchzarten

Telefon/Phone +49 7661 394-0
Telefax/Fax +49 7661 394-388
E-Mail info@siko.de
Internet www.siko.de