

Electronic Displays

Display and Control...

... Functionality
reduced to the
basics



Short overview...

Functional comparison of electronic displays.

	MA07/1	MA10/4	MA20	MA23	MA50	MA55	MA90/91
Display							
1-row	LED	LCD			LED	LED	
2-row			LCD				LCD
3-row				LED			
Versions							
panel-mount housing (EG)	•	•	•	•	•	•	•
bench-top housing (TG)		•	•	•			•
Operating voltage							
230 V AC		•	TG	TG			TG
115 V AC		•					
24 V AC		•					
24 V DC	•	•	•	•	•	•	•
Kind of measurement							
Distance/angle measurement	•	•	•	•	•	•	
Speed	•	•					
Number of pieces	•	•					
Position control							•
Additional functions							
Limit monitoring		•	I/O card		•		•
Reset key		•	•	•	•	•	•
Bus operation (on request)		•	•				
I/O card			•				•
Interface RS232/RS485 (option)		•	•	•			•
Inputs							
Incremental	•	•	•	•		•	•
Absolute (SSI)		•	•	•			•
Analog (current, voltage, resistance)				•	•		

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SIKO electronic displays are freely programmable via robust, front-side membrane keyboards ensuring easy and flexible adaptation for displaying different measured values.

Without effort, the user can individually program all parameters including display/revolution, sense of rotation, decimal point as well as reference value and offset value (except for MA50).

In addition to the incremental measurement function they enable referencing via keyboard or external input (except for MA50).

The MA90/91 single-axis positioning allows one axis to be controlled. Position values can be either held in memory or recalled or directly set to the required value.

For scanning multiple axes in one device, the two SIKO multifunctional displays MA20 (double display, switchable to up to four axes) and MA23 (triple display) offer a powerful solution. The additional hardware technology enables the representation of position values captured by different measuring sensors.

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Measurement Displays: Intelligent Operation Electronic Displays, Controls, Remote Indicators. at the Push of a Button.

Clear and easy-to-read front foils with recessed areas for pressure-sensitive and unambiguous key depression.



Very good readability, ergonomic handling and smart application: SIKO's measurement displays are first choice wherever unambiguous values from transducers are to be displayed digitally and linked to logical functions.

All displays are equipped with scalable intelligence. They enable synchronous monitoring of up to three measuring processes.

The information is displayed on a single compact device, independent of the type and combination of the connected sensors or transducers.

As a rule, the measurement displays can be easily and quickly adapted to various sensor interfaces via exchange or addition of modules or simply via software modification. Nearly all requirements of customer application are met by means of standardised and – above all – individual solutions developed by SIKO.

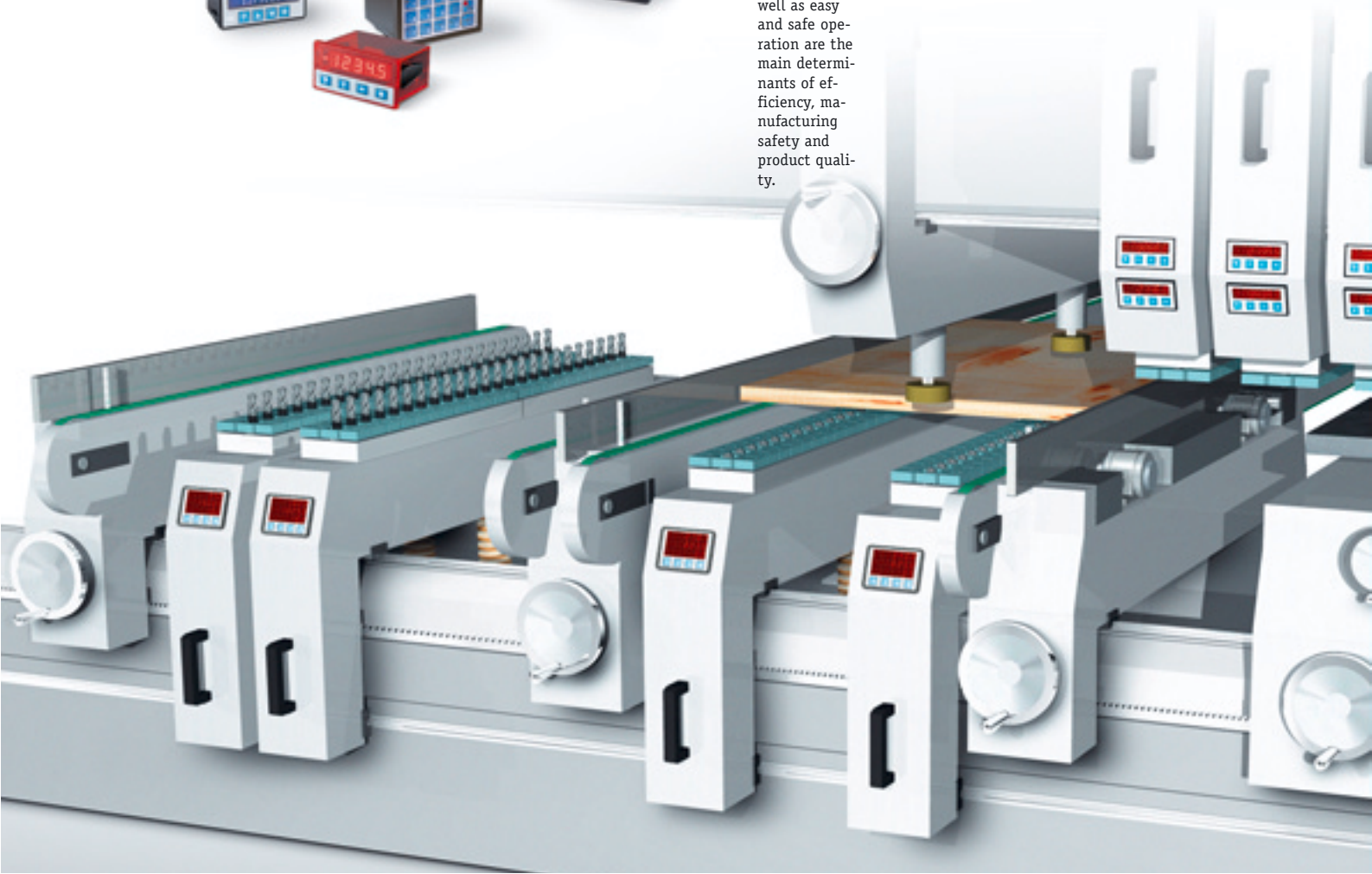
The measured data is transferred to master controls via serial interfaces. The freely programmable measurement displays permit direct input of specific parameters. Moreover, some MA versions, offer the possibility of executing signal functions via addi-

tional switching outputs, thus enabling complete single-axis positioning control.

SIKO's measurement displays are multi-functional electronic measurement solutions. Particularly easy is the representation of distance and angle information, speed or number of pieces. Additionally, the displays provide directly usable data for interpretation or further processing.



Measurement displays are control devices: Good readability as well as easy and safe operation are the main determinants of efficiency, manufacturing safety and product quality.



Housings for mounting are practical and are available for nearly all measurement displays.

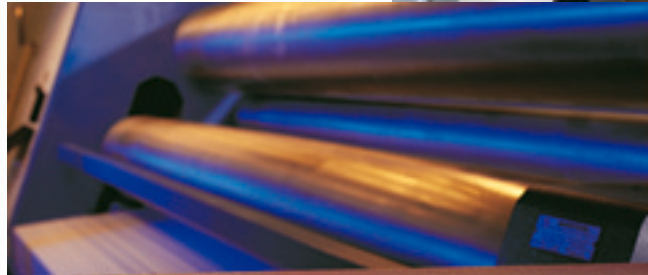
Thanks to their geometry, SIKO's multi-functional measurement displays are compact and easily installable units that can be integrated in every control console. Clear electroluminescent displays guarantee good readability even in dim light or dirt applications. Standard design versions ensure direct integration, e.g., the stop of a sliding table saw. Alpha-numerical displays represent text information in addition to the common numerical values with arithmetical signs.

All displays can be programmed individually. The ready-for-use panel-mount or bench-top housings offer a practical alternative to costly engineering changes where production plants are to be upgraded to achieve higher standards.

This intelligent stop takes over the incremental measurement function besides calculation of offset values.

Control tasks are freely programmable on this punching machine. The values are centrally input via moveable control console and visually guided by measurement displays.

Low installation depth combined with high functionality: The control unit on a sliding table saw.



Focus on application

Measurement displays: easy operation, reliable results.

Measurement of...

Functional range/advantages

Distance and length



... incremental or absolute

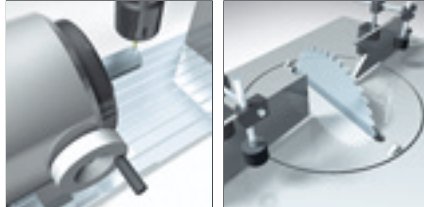


e.g., stop adjustment, length measurement...

Angle

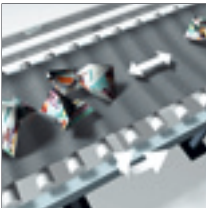


... 0° - 360° , 0° - 90° - 0°



e.g., with mitre saws, with a rotary encoder on a rotary table...

Speed



... with incremental encoders in PP/OC output switches



e.g., on a belt conveyor, for speed measurement ...

Number of pieces



e.g., with light barriers, with pulse encoders, combined with proximity switches...

Analog measurement



e.g., ... of resistance, current or voltage. Absolute measurement in connection with wire-actuated encoders and analog rotary encoders (geared potentiometers)

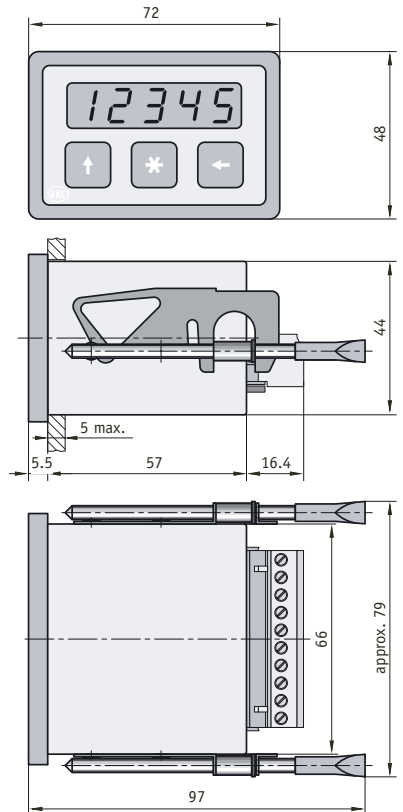
Electronic Display MA07/1

MA07/1, the most compact electronic display, is freely programmable. Combined with incremental measuring systems it indicates positions and combined with proximity switches or light barriers, the MA07/1 displays information on speed or number of pieces.



Features:

- compact design
- 5-digit LED-display
- incremental measurement function (operating mode I)
- actual value memory (operating modes I and S)
- programming enabled via external input (keyswitch)



Feature	MA07/1	Technical data	Additional information
Display		5-digit, LED, 10 mm, red	
Display range		-19 999 ... 99 999	
Counting frequency		max. 60 kHz	with referencing max. 1 kHz
Encoder power supply		24 V DC (200 mA), 5 V DC (100 mA)	
Counter capacity		2 ²³ increments	
Pulse interpretation		quadruple	
Operating voltage		12 ... 28 V DC	
Power consumption		<2 VA	
Connections		edge connector	
Type of protection		IP40 overall	IP60 front-side with plugboard installation
Temperature ranges		operating temperature 0 ... +50 °C	storage temperature -20 ... +85 °C
Housing/weight		plastic, with clamping clips, approx. 0.15 kg	plugboard cut-out 45 x 68 mm, DIN 43700

Ordering data

Operating mode	I	A	incremental	
	D		speed measurement	
	S		quantity measurement	
Encoder input	PP	B	Push-Pull	standard
	OC		Open Collector	
	OE		open emitter 24 V	
	TTL/5		5 V	only operating mode I
	TTL/24		24 V	only operating mode I

All mating connectors are included in the delivery.

Pin outs

PIN	Incremental	Speed	Number of pieces
1	+ Ub enc. power supply	+ Ub enc. power supply	+ Ub enc. power supply
2	A signal	A signal	A signal
3	B signal	n.c.	n.c.
4	index signal I/O	n.c.	n.c.
5	GND, screen enc. supply	GND, screen enc. supply	GND, screen enc. supply

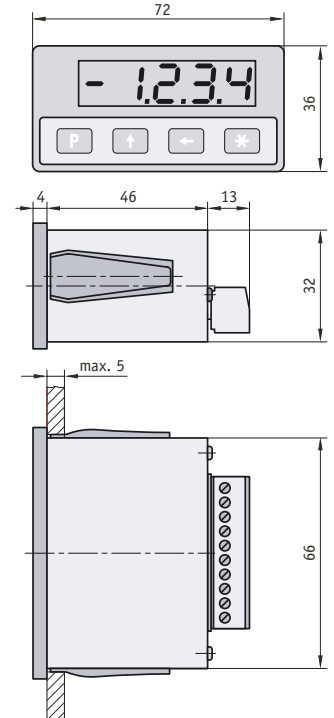
PIN	Incremental	Speed	Number of pieces
6	RFS	n.c.	Reset
7	GND	GND	GND
8	configuration	configuration	configuration
9	L (+ Ub)	L (+ Ub)	L (+ Ub)
10	N	N	N

Your order:

MA07/1 - -

Electronic Display MA50

Extremity compact, freely programmable 4-digit electronic display. The measured information captured by absolute sensors with analog signal output. The display can be freely programmed by the user.



Features:

- programming via front keyboard
- programmable parameters to adapt the device to varying applications
- non-volatile parameter storage (EEPROM)
- voltage, current and resistor inputs
- 2 limit-dependent switching outputs (programmable)

Feature	Ordering data	Technical data	Additional information
Operating voltage		10 ... 30 V DC	power consumption approx. 80 mA
Signal inputs			
voltage		0 ... 10 V DC	
current		0 ... 20 mA or 4 ... 20 mA	
resistance		0 ... 10 kΩ	
Switching outputs		≤30 V/mA	
Display/display range		4-digit LED red (7-segment)	-9 999 ... 9 999
Connection		10-pin edge connector	
Accuracy		max. 0.1 %	
Temperature drift		<1 %	
Test mark/interference prot. class		CE	3 acc. to IEC 801
Temperature range		operating temperature: 0 °C ... 50 °C	storage temperature: -20 °C ... 80 °C
Type of protection		IP40 acc. to DIN 40050 for whole unit	IP60 acc. to DIN 40050 for front side
Humidity		max. 95 % rH	condensation not permitted
Resolution		max. 10 Bit	
Housing		plastic	plugboard cut-out 33 x 68 mm, DIN 43700
Weight		approx. 0.2 kg	

All mating connectors are included in the delivery.

Pin outs

PIN	Resistance measurement	Voltage measurement	Current sensing
1	n.c.	n.c.	I+ (0 ... 20 V/4 ... 20 mA)
2	potentiometer E (end-point position)	n.c.	n.c.
3	potentiometer S (slider)	n.c.	n.c.
4	n.c.	U+ (0 ... 10 V)	n.c.
5	n.c.	n.c.	I- (0 ... 20 mA/4 ... 20 mA)
6	potentiometer A (start position)	U-	n.c.
7	switching output O (upper limit)	switching output O (upper limit)	switching output O (upper limit)
8	switching output U (lower limit)	switching output U (lower limit)	switching output U (lower limit)
9	+ Ub Operating voltage	+ Ub operating voltage	+ Ub operating voltage
10	0 V GND	0 V GND	0 V GND

Your order:

MA50

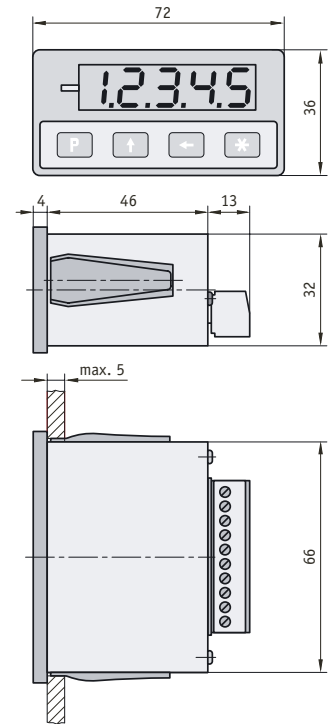
Electronic Display MA55

Extremely compact, 5-digit electronic display. Incremental measurement information of length and angle sensors. The display is freely programmable for use with various sensors and applications.



Features:

- free programming via front keyboard
- non-volatile parameter storage (EEPROM)
- input for incremental encoders with recognition of the counting direction
- integrated quadruplication of counting pulses



Feature	Ordering data	Technical data	Additional information
Operating voltage		24 V DC $\pm 20\%$	power consumption approx. 60 mA
Encoder input		square-wave signals 90° phase-shifted PP (push-pull), OE (open emitter)	with reference signal
Encoder power supply		24 V DC (200 mA)	
Display/display range		5-digit LED red (7-segment)	-99 999 ... 99 999
Connection		10-pin edge connector	
Input frequency		max. 25 kHz	
Test mark/interference prot. class		CE	3 acc. to IEC 801
Temperature range		operating temperature: 0 °C ... 50 °C	storage temperature: -20 °C ... 80 °C
Type of protection		IP40 acc. to DIN 40050 for whole unit	IP60 acc. to DIN 40050 for front side
Humidity		max. 95 % rH	condensation not permitted
Housing		plastic, with clamping clips	plugboard cut-out 33 x 68 mm, DIN 43700
Weight		approx. 0.2 kg	

All mating connectors are included in the delivery.

Pin outs

PIN	PP, OE
1	+ U _b encoder power supply
2	A signal
3	B signal
4	index signal I/O
5	GND, screen encoder power supply
6	RFS
7	GND
8	PE
9	0 V GND
10	+24 V operating voltage

Your order:

MA55

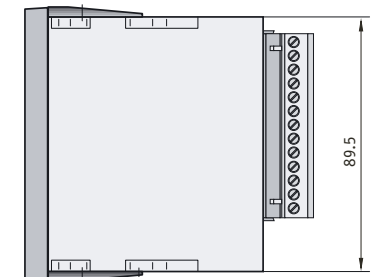
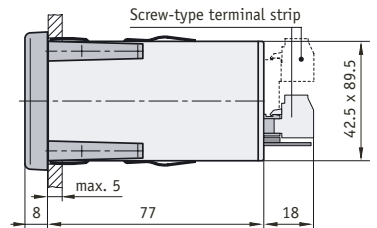
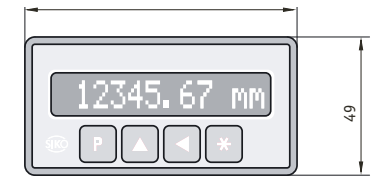
Electronic Display MA10/4

Freely programmable electronic display for indicating position values captured by incremental and absolute measurement systems. The alphanumeric display enables clear representation of measured values and user-defined representation of length and angle units.



Features:

- high-contrast LCD, 12-digit, dot matrix
- connection to incremental or absolute-value (SSI) encoders
- freely programmable via front keyboard
- serial interface as an option
- speed/number of pieces measurement as an option



MA10/4 panel-mount housing (EG)

Pin outs

PIN	Incremental PP, OC, OP, LD5, LD24	Speed/number of pieces Rot/PP, Rot/OC, S/PP, S/OC	Absolute SSI/5, SSI/24
1	+Ub encoder power supply	+Ub encoder power supply	+Ub encoder power supply
2	A signal	A signal	clock+
3	B signal	n.c.	data+
4	index signal	n.c.	n.c.
5	GND, screen encoder power supply	GND, screen encoder power supply	GND, screen encoder power supply
6	24 V DC out	24 V DC out	24 V DC out
7	RFS	RFS	CAL
8	n.c.	n.c.	n.c.
9	GND	GND	GND
10	n.c.	n.c.	n.c.
11	PE	PE	PE
12	0 V GND	0 V GND	0 V GND
13	+ Ub operating voltage encoder power supply	+ Ub operating voltage encoder power supply	+ Ub operating voltage encoder power supply
14	/A signal (LD, OP)	n.c.	clock-
15	/B signal (LD, OP)	/index signal (LD, OP)	data-
16	/index signal (LD, OP)	n.c.	n.c.
17	GND	GND	GND
18	n.c.	n.c.	n.c.
19	GND	GND	GND
20	n.c.	n.c.	n.c.
21	DÜA/TXD/A1	DÜA/TXD/A2	DÜA/TXD/A1
22	DÜB/RXD/A2	DÜB/RXD/A3	DÜB/RXD/A2
23	n.c.	n.c.	n.c.
24	n.c.	n.c.	n.c.
25	n.c.	n.c.	n.c.
26	n.c.	n.c.	n.c.

Feature	MA10/4	Technical data	Additional information
Display/display range		12-digit LCD dot matrix	-999 999 ... 9999 999 + arithmetical sign + unit of measurement
Counting frequency		max. 500 kHz	
Counting capacity		±2 ²³ increments	
Encoder power supply		24 V DC (200 mA), 5 V DC (200 mA)	
Pulse interpretation		quadruple	incremental encoder
Power consumption		<9 VA	
Type of protection		IP40 for whole unit	IP60 front-side, with plugboard installation
Operating temperature		0 ... +50 °C	
Storage temperature		-20 ... +85 °C	
Housing		EG: plastic TG: aluminium profile	plugboard cut-out 45 x 92 mm, DIN 43700
Condensation		not permitted	
Test mark/interference prot. class		CE	3 acc. to IEC 801

Ordering data

Design	EG	A	panel-mount housing	standard*	
	TG		bench-top housing		
Operating voltage	1	B	230 V AC ±10 %		
	2		115 V AC ±10 %		
	3		24 V AC ±10 %		
	4		24 V DC ±20 %		
Encoder input	PP	C	push-pull		
	OC		open collector		
	OP		PP inverted		
	LD/5		line driver/5 V DC encoder power supply		
	LD/24		line driver/24 V DC encoder power supply		
	SSI/5		SSI/5 V DC encoder power supply		
	SSI/24		SSI/24 V DC encoder power supply		
	DREH/PP		speed/24 V DC encoder power supply		push-pull
	DREH/OC		speed/24 V DC encoder power supply		open collector
	S/PP		quantity/24 V DC encoder power supply		push-pull
S/OC	quantity/24 V DC encoder power supply	open collector			
Counting frequency (kHz)	25	D		standard	
	250				
	500				
Switching output	S0	E	without	2 freely programmable outputs	
	SM		with, ≤30 V/100 mA		
Reference connection	RM	F	with	grounding; standard with „EG“ Design	
	RO		without		
Interface/protocol	XX/XX	G	without		
	S1/00		RS232/standard		
	S3/00		RS485/standard		
Front foil	BS	H	blue	standard	
	BN		blue neutral		without company logo
Software	S	I		standard	

* All mating connectors are included in the delivery.

Your order: MA10/4 - - - - - - - - -

Multi-functional Display MA20

Variable display for synchronous representation of the position values captured from two axes. Four slots provide various possibilities to combine input and functional cards. Various external measuring systems can be easily combined and programmed via the display.



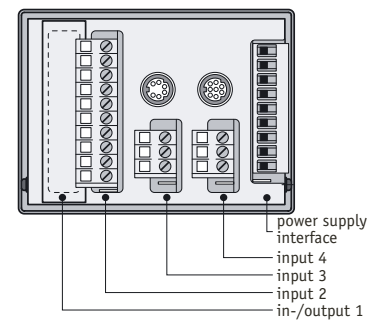
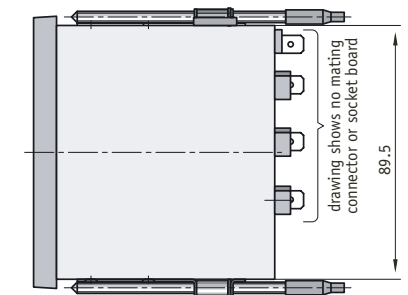
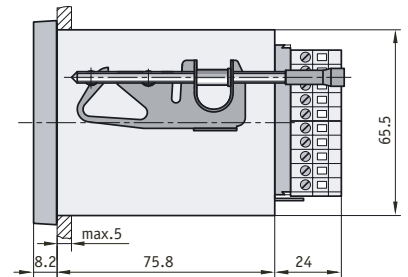
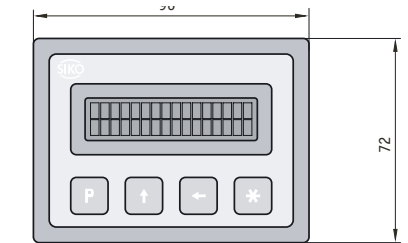
Features:

- easily operatable, menu-based user interface
- input cards for rotary encoders and magnetic sensors (incremental and absolute)
- optional RS232 or RS485 interface
- output card for upper and lower limits

Pin outs

PIN	Powerpack unit+interface	RS232	RS485
1	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
2	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
3	0 V GND	0 V GND	0 V GND
4	0 V GND	TXD	DÜA
5	n.c.	RXD	DÜB
6	n.c.	GND interface	GND interface
7	n.c.	n.c.	n.c.
8	n.c.	n.c.	n.c.
9	n.c.	n.c.	n.c.

PIN	PP, OC	LD5, LD	NPN	PNP	SSI
1	+ Ub encoder power supply	+ Ub encoder power supply	IN 1	IN 1	+ Ub enc. power supply
2	A signal	A signal	IN 2	IN 2	clock+
3	n.c.	/A signal	IN 3	IN 3	clock-
4	B signal	B signal	IN 4	IN 4	data+
5	n.c.	/B signal	GND	GND	data-
6	index signal	index signal	Out 1	Out 1	GND, screen enc. supply
7	n.c.	/index signal	Out 2	Out 2	+24 V
8	GND	GND	Out 3	Out 3	CAL
9	RFS	RFS	Out 4	Out 4	GND
10	+24 V	+24 V	GND	U in	SE



MA20 panel-mount housing (EG), mounting example

Feature	MA20	Technical data	Additional information
Display		text display LED, 2 rows per 16 characters	5 mm height, 5 x 7 matrix
Functional card I/O		4 transistor outputs 30 V DC (100 mA)	galvanically isolated e.g., for upper and lower limits
		4 opto-coupler inputs	15 to 30 V DC
Input card incremental encoder		PP/OC, LD5, LD24	
counter frequency		25 kHz, optional 150 kHz	
encoder power supply		5 V DC (200 mA), 24 V DC (200 mA)	
Input card absolute		SSI	synchronous serial interface
bit width		max. 25 bit	
encoder power supply		24 V DC (200 mA)	
Input card MLI		SIKO magnetic sensor, type MS500	
Input card MLA		SIKO magnetic sensor, type MSA	
Data- and actual value memory		EEPROM min. 25 years	
Keyboard		membrane keys with key force	
Electrical connection		edge clip, mini-DIN-connector for MS500	
Housing		EG: plastic TG: aluminium profile	plugboard cut-out 68 x 92 mm, DIN 43700
Weight		approx. 0.35 kg EG design	

Ordering data

Design	EG	A	panel-mount housing	standard*
	TG		bench-top housing	
Operating voltage	4	B	24 V DC $\pm 20\%$	standard only TG design
	1		230 V DC $+6/-10\%$	
Input/output 1	X	C	without	standard
	I/O, NPN		grounding	
	I/O, PNP		positive switching	
	PP/OC		push-pull/open collector 24 V DC	
	LD/5		RS422/5 V	
	LD/24		RS422/24 V	
Input 2	X	D	without	standard
	PP/OC		push-pull/open collector 24 V DC	
	LD/5		RS422/5 V	
	LD/24		RS422/24 V	
	SSI		synchronous serial interface	
	MLI		magnetic measuring system incremental	
	MLA		magnetic measuring system absolute	
BUS		BUS card		
Input 3		E	see input 2	
Input 4		F	see input 2	
Interface/protocol	X	G	without	standard
	S1/00		RS232/standard	
	S3/00		RS485/standard	
	S3/07		RS485/SIKO-Netz 4	

* All mating connectors are included in the delivery.

Your order: MA20 - A - B - C - D - E - F - G

3 Axis Display MA23

Freely programmable electronic display with a three-row LED display enabling individual configuration of three measuring systems. Even the standard version is equipped with three input cards that may be combined depending on the respective sensor inputs.



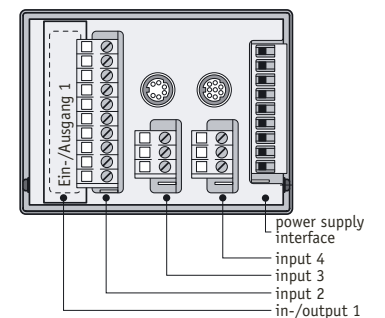
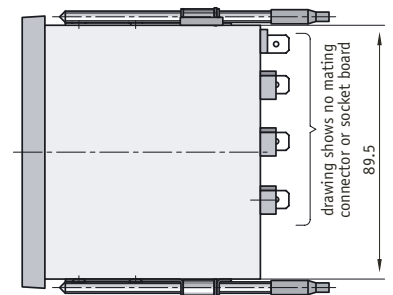
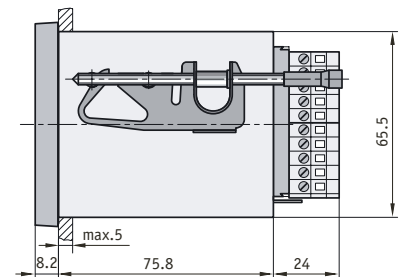
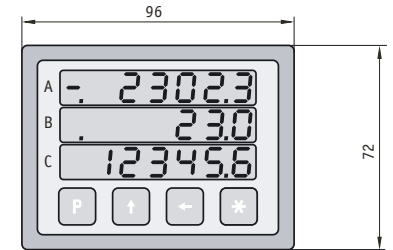
Features:

- easily to use, menu-based user interface
- input cards for rotary encoders and magnetic sensors (incremental and absolute)
- optional RS232 or RS485 interface
- up to three measuring systems can be connected

Pin outs

PIN	Powerpack unit+interface	RS232	RS485
1	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
2	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
3	0 V GND	0 V GND	0 V GND
4	0 V GND	0 V GND	0 V GND
5	n.c.	TXD	DÜA
6	n.c.	RXD	DÜB
7	n.c.	GND interface	GND interface
8	n.c.	n.c.	n.c.
9	n.c.	n.c.	n.c.

PIN	PP, OC	LD5, LD	NPN	PNP	SSI
1	+ Ub encoder power supply	+ Ub encoder power supply	IN 1	IN 1	+ Ub enc. power supply
2	A signal	A signal	IN 2	IN 2	clock+
3	n.c.	/A signal	IN 3	IN 3	clock-
4	B signal	B signal	IN 4	IN 4	data+
5	n.c.	/B signal	GND	GND	data-
6	index signal	index signal	Out 1	Out 1	GND, screen enc. supply
7	n.c.	/index signal	Out 2	Out 2	+24 V
8	GND	GND	Out 3	Out 3	CAL
9	RFS	RFS	Out 4	Out 4	GND
10	+24 V	+24 V	GND	U in	SE



MA23 panel-mount housing (EG), mounting example

Feature	MA23	Technical data	Additional information
Power supply		24 V DC \pm 20 %	for TG also 230 V AC +6 ... -10 % available
Display		7-digit, 7-segment LED red, 10 mm, 3-row	
Display range		-999 999 ... 999 999	e.g., for upper and lower limits
Power consumption		approx. 150 mA without encoder	
Input card incremental		PP/OC, LD5, LD24	
counting frequency		25 kHz, optional 150 kHz	
encoder power supply		24 V DC (200 mA), 5 V DC (200 mA)	
Input card absolute		SSI	synchronous serial interface
bit width		max. 25 Bit	
encoder power supply		24 V DC (200 mA)	
Input card MLI		SIKO magnetic sensor, type MS500	
Input card MLA		SIKO magnetic sensor, type MSA	
Data and actual value memory		EEPROM min. 25 years	
Keyboard		membrane keys with key force	
Electric connection		edge clip, mini-DIN connector for sensors	
Type of protection		IP40 overall	IP60 front-side with plugboard installation
Operating temperature		0 ... +50 °C, no condensation	
Storage temperature		-20 ... +85 °C	
Housing		EG: plastic TG: aluminium profile	plugboard cut-out 68 x 92 mm, DIN 43700
Weight		approx. 0.35 kg EG design	

Ordering data

Design	EG	A	panel-mount housing	standard*
	TG		bench-top housing	
Operating voltage	4	B	24 V DC \pm 20 %	standard
	1		230 V DC +6/-10 %	TG design
Input/output 1	X	C	without	standard
Input 2	X	D	without	
	PP/OC		push-pull/open collector 24 V DC	
	LD/5		RS422/5 V	
	LD/24		RS422/24 V	
	SSI		synchronous serial interface	
	MLI		magnetic measuring system incremental	
	MLA		magnetic measuring system absolute	
URI		analog		
Input 3		E	see input 2	
Input 4		F	see input 2	
Interface/protocol	X	G	without	standard
	S1/00		RS232/standard	
	S3/00		RS485/standard	
	S3/07		RS485/SIKO-Netz 4	

* All mating connectors are included in the delivery.

Your order: MA23 - A - B - C - D - E - F - G

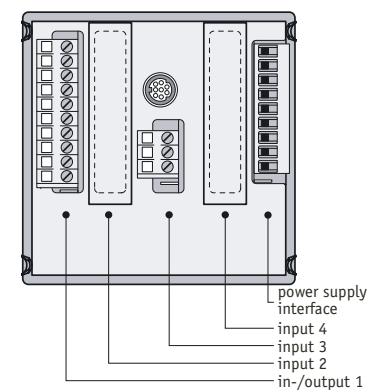
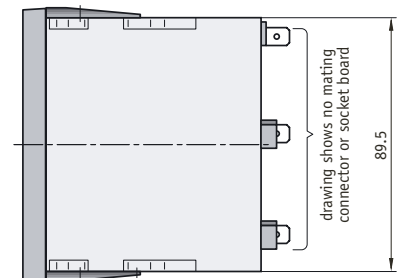
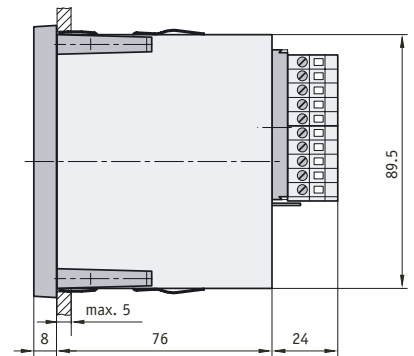
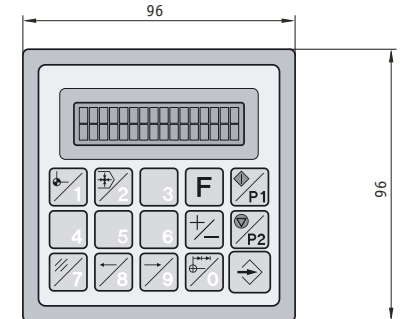
Single-Axis Positioning Control MA90/MA91

Single-axis control for direct positioning via required-value input. Its memory enables the storage of 99 required values. Required and actual values can be read simultaneously from the two-digit display. Various drives can be positioned via switching outputs.



Features:

- easy to use (10-key pad, programming menus)
- input cards for rotary encoders and magnetic sensors (incremental and absolute)
- optional RS232 or RS485 interface
- position control via tolerance window, pre-switching point and loop positioning
- set positioning, piece counter (MA91)



MA90 panel-mount housing (EG), mounting example

Pin outs

PIN	Powerpack unit+interface	RS232	RS485
1	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
2	+24 V operating voltage	+24 V operating voltage	+24 V oper. volt.
3	0 V GND	0 V GND	0 V GND
4	0 V GND	0 V GND	0 V GND
5	n.c.	TXD	DÜA
6	n.c.	RXD	DÜB
7	n.c.	GND interface	GND interface
8	n.c.	n.c.	n.c.
9	n.c.	n.c.	n.c.

PIN	PP, OC	LD5, LD	NPN	PNP	SSI
1	+ Ub encoder power supply	+ Ub encoder power supply	IN 1 start of positioning	IN 1 start of positioning	+ Ub enc. power supply
2	A signal	A signal	IN 2 stop of positioning	IN 2 stop of positioning	clock+
3	n.c.	/A signal	IN 3 jog mode left-h. motion	IN 3 jog mode left-h. motion	clock-
4	B signal	B signal	IN 4 jog mode right-h. motion	IN 4 jog mode right-h. motion	data+
5	n.c.	/B signal	GND	GND	data-
6	index signal	index signal	Out 1 right-h. motor motion	Out 1 right-h. motor motion	GND, screen enc. supply
7	n.c.	/index signal	Out 2 left-h. motor motion	Out 2 left-h. motor motion	+24 V
8	GND	GND	Out 3 fast motor motion	Out 3 fast motor motion	CAL
9	RFS	RFS	Out 4 position reached	Out 4 position reached	GND
10	+24 V	+24 V	GND	U in	SE

Feature	MA90	MA91	Technical data	Additional information
Power supply			24 V DC \pm 20 %	
Display			text display LCD, 2 x 16 characters	backlighted
Functional card I/O			4 transistor outputs	galvanically isolated
			30 V DC (100 mA) for motor control	
			4 opto-coupler inputs, 15 to 30 V DC	
Input card incremental			PP/OC, LD5, LD24	
counting frequency			25 kHz, optional 150 kHz	
encoder power supply			24 V DC (200 mA), 5 V DC (200 mA)	
Input card absolute			SSI	synchronous serial interface
bit width			max. 25 bit	
encoder power supply			24 V DC (200 mA)	
Input card MLI			SIKO magnetic sensor, type MS500	
Input card MLA			SIKO magnetic sensor, type MSA	
Data and actual value memory			EEPROM min. 25 years	
Memory			up to 99 position values	(required values)
Keyboard			membrane keys with key force	
Electrical connection			edge clip, mini-DIN connector for MS500	
Operating temperature			0 ... +50 °C, no condensation	
Housing			EG: plastic TG: aluminium profile	plugboard cut-out 92 x 92 mm, DIN 43700
Weight			approx. 0.37 kg EG design	

Ordering data

Design	EG	EG	panel-mount housing	standard*
	TG	TG	bench-top housing	
Operating voltage	4	4	24 V DC \pm 20 %	standard
	1	1	230 V DC +6/-10 %	
Input/output 1	X	X	without	standard
	I/O,NPN	I/O,NPN	grounding	
	I/O,PNP	I/O,PNP	positive switching	
input 2	X	X	without	standard
	PP/OC	PP/OC	push-pull/ open collector 24 V DC	
	LD/5	LD/5	RS422/ 5 V	
	LD/24	LD/24	RS422/ 24 V	
	SSI	SSI	synchronous serial interface	
	MLI		magnetic measuring system incremental	
input 3	see input 2	
input 4	X	X	without	standard
	MLI		magnetic measuring system incremental	
	MLA		magnetic measuring system absolute	
Interface/protocol	X	X	without	standard
	S1/00	S1/00	RS232/ standard	
	S3/00	S3/00	RS485/ standard	

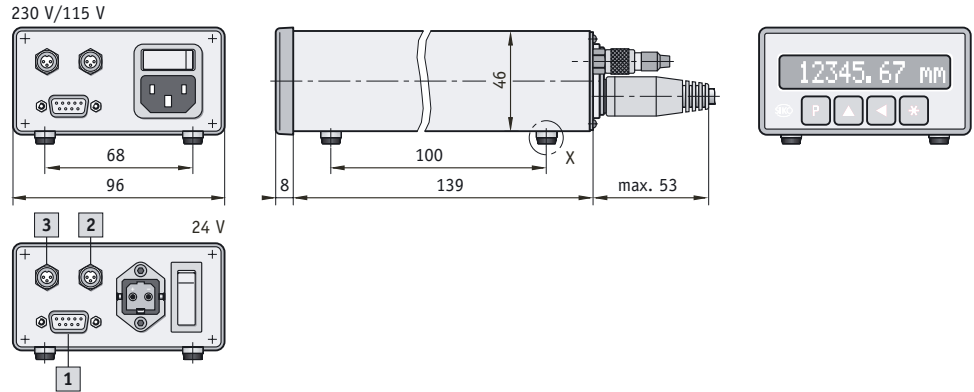
* All mating connectors are included in the delivery.

Your order: MA90/91 - - - - - - -

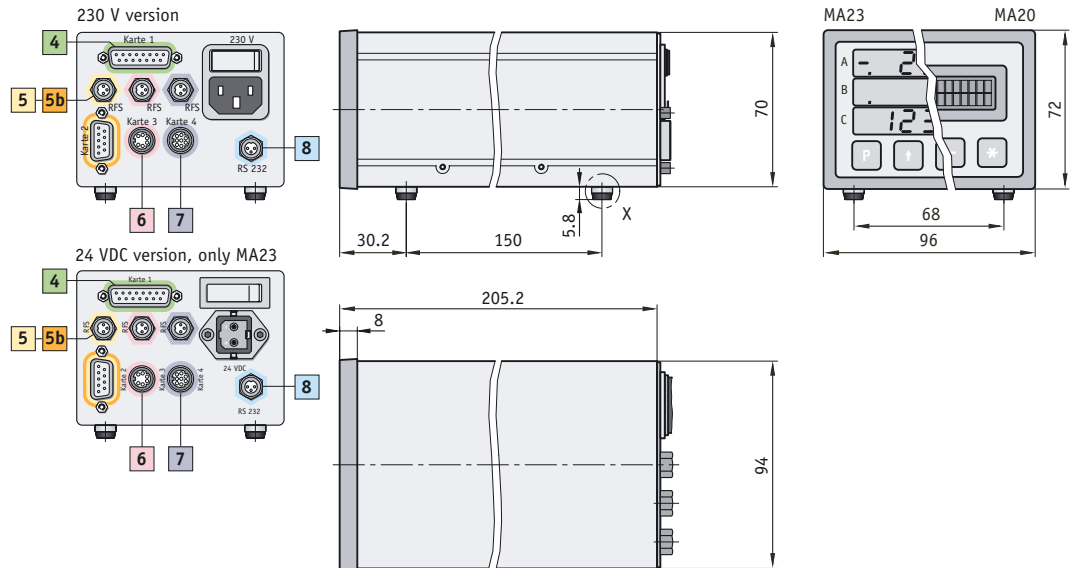
Pin outs

SIKO electronic displays in the bench-top housing (TG)

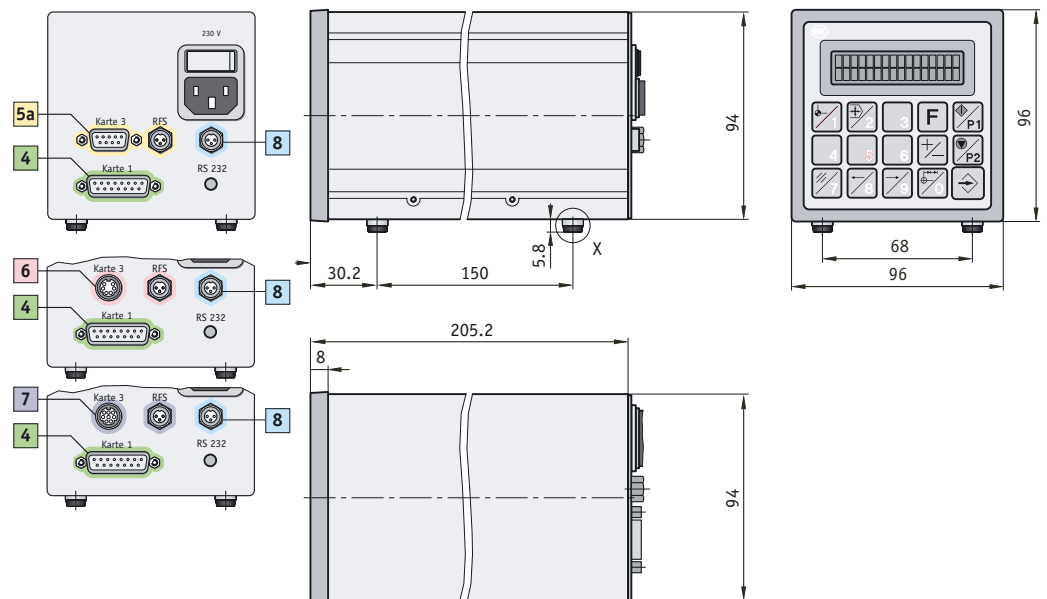
MA10/4
Mounting examples



MA20, MA23
Mounting examples



MA90, MA91
Mounting examples



MA10/4

1	9-pin D-SUB Encoder connection			
	PP, OC	OP, LD5, LD	SSI/5, SSI/24	DREH/PP, S/PP, DREH/OC, S/OC
1	+ Ub encoder power supply	+ Ub encoder power supply	+ Ub encoder power supply	+ Ub encoder power supply
2	A signal	A signal	clock+	A signal
3	B signal	B signal	data+	n.c.
4	index signal	index signal	n.c.	n.c.
5	GND	GND	GND	GND
6	n.c.	n.c.	n.c.	n.c.
7	n.c.	/A signal	clock-	n.c.
8	n.c.	/B signal	data-	n.c.
9	n.c.	/index signal I/O	n.c.	n.c.

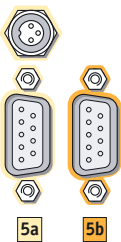
2	3-pin connector Reference connection/calibration switch			
	PP, OC	OP, LD5, LD	SSI/5, SSI/24	S/PP, S/OC
1	RFS	RFS	CAL	RFS
2	GND	GND	GND	GND
3	+24 V	+24 V	+24 V	+24 V

3	3-pin connector Interface	
	RS485	RS232
1	GND	GND
2	DÜB	RXD
3	DÜA	TXD

or

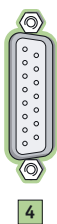
3	3-pin connector Switching output	
	1	GND
2	A2	
3	A1	

MA20, MA23, MA90, MA91



9-pin D-SUB	5a: MA20, MA23, MA90, MA91			5b: only MA23
	PP, OC	LD5, LD	SSI	analog
1	+ Ub encoder power supply	+ Ub encoder power supply	+ Ub encoder power supply	24 V / I+ (=...20 mA)
2	A signal	A signal	clock+	I- (0...20mA)
3	B signal	B signal	data+	U+ /0...10 V
4	index signal	index signal	n.c.	U- /GND
5	GND	GND	GND	GND
6	n.c.	n.c.	n.c.	n.c.
7	n.c.	/A signal	clock-	potentiometer S (slider)
8	n.c.	/B signal	data-	potentiometer E (end-point position)
9	n.c.	/index signal	n.c.	potentiometer O (start position)

3-pin connector	Reference connect. (RFS)	Reference connection (RFS)	Calibration switch (CAL)
1	RFS	RFS	CAL
2	GND	GND	GND
3	+24 V	+24 V	+24 V



15-pin D-SUB	I/O card
1	IN 1
2	IN 2
3	IN 3
4	IN 4
5	Out1
6	Out2
7	Out3
8	Out4
9	GND
10	GND
11	GND
12	n.c.
13	+ Ub
14	+ Ub
15	+ Ub



3-pin connector	
1	Reset
2	GND
3	+24 V



The connector pin assignment of the encoder depends on the pin assignment of the SIKO-MLA*/MLI*sensor.
 *MLA = MAGLINE absolute sensor
 *MLI = MAGLINE incremental sensor



3-pin connector	Interface	
	RS232	RS485
1	GND	GND
2	RXD	DÜB
3	TXD	DÜA



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