

# Preset counters, electronic

**LCD preset counters**      **Multifunctional – pulse, frequency, time – 1...6 presets (AC+DC)**      **Codix 923 / 924**



The multifunction preset counters Codix 923 / 924 can be used universally. These preset pulse counters, tachometers or preset timers with up to 6 presets can solve a wide variety of control and monitoring tasks in every application.

With their two-line display in 4 different versions the counters are very easy to read and simple to programme using the clearly laid-out decade keys. Complex control tasks can be carried out using a batch count or total count function.



<b>DC</b> 10 ... 30 V Supply voltage	<b>AC</b> 10 ... 240 V Supply voltage	<b>-20...+65°C</b> Temperature range	<b>000000</b> DIN 48x48	<b>HRA</b> Frequency meter HRA	<b>Prog</b> Menu-driven programming	<b>IP65</b> High protection level	<b>max.</b> 65 kHz Count frequency	<b>Plug-in screw terminal</b>	<b>1 ... 6</b> Presets	<b>Multifunctional</b>
<b>123...</b> 2x6 LCDs LCD display	<b>12.6</b> Multicolor display	<b>Position</b> Position display	<b>Batch</b> Batch counter	<b>Σ</b> Totalizer						

## Multifunctional

- Counter, tachometer and timer in one device.
- Can be used a preset counter, batch counter, totalizer or position display with tracking preset.
- Presets: 923: 1, 924: 2, 924-4: 4, 924-6: 6.
- Relay or optocoupler outputs.
- Many different count modes for pulse inputs, time and frequency.
- Scalable input using multiplication and division factor
- Set value.
- Averaging, start delay (tachometer).
- Step or tracking presets (eliminate the need for reprogramming of the pre-signal).
- Multi-range supply voltage.

## Fast and user-friendly

- Direct input of the presets via the front keys or via the Teach-In input.
- Fast installation thanks to plug-in screw terminals.
- Max. count frequency 65 kHz.
- Simultaneous display of the actual and of the preset value, or of the actual value and of the batch / totalizing counter.
- Annunciators for the displayed preset and for the output status.
- 3 predefined parameter settings.
- Direct entry into the programming.
- Minimal installation depth.
- 4-stage RESET modes.
- 3-stage key lockout.
- Multicolor display for improved differentiation.

## Order code

6.92 X . 0 1 X X . X X X  
a b c d e f

### **a** Number of presets

- 3 = 1 preset
- 4 = 2, 4 or 6 presets

### **b** Output

- 0 = relays
- 1 = optocouplers (only **a** = 4)<sup>2)</sup>

### **c** LCD options

- 0 = no backlighting
- 1 = green backlighting<sup>1)</sup>
- 2 = LED look, negative, red backlighting<sup>1)</sup>
- 3 = multicolor, negative red/green backlighting

### **d** Supply voltage

- 0 = 100 ... 240 V AC, ±10 %
- 2 = 24 V AC, ±10 %
- 3 = 10 ... 30 V DC

### **e** Input trigger level

- 0 = standard level (HTL)
- A = 4 ... 30 V DC level<sup>1)</sup>

### **f** Version

- 0 = standard 923/924
- B = 6 optocoupler outputs<sup>2)</sup>
- 924-6 (only **b** = 1)
- C = 4 relay outputs<sup>2)</sup>
- 924-4 (only **b** = 0)

### Delivery specification

- Preset counter
- Mounting clip
- 8 pin screw terminal
- 7 pin screw terminal
- Operating instructions

### Stock types

- 6.923.0100.000
- 6.923.0100.300
- 6.923.0103.000
- 6.924.0100.300
- 6.924.0101.000
- 6.924.0102.000
- 6.924.0103.000
- 6.924.0103.300

Additional inputs, outputs or interface types on request

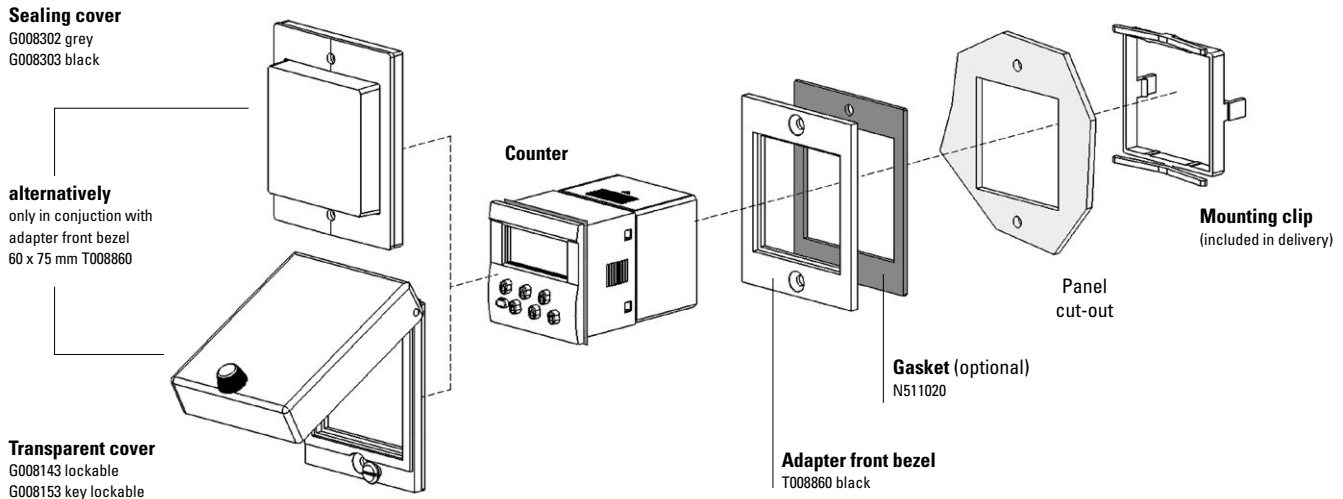
1) 24 V AC on request

2) Not possible in 24 V AC.

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**Accessories / Mounting examples**



		Type / size	Description		Order no.	suitable gasket
<b>Adapter front bezel</b>		<b>55 x 55 mm</b> <b>[2.17 x 2.17]</b>	for cut-out 50 x 50 mm [1.97 x 1.97"] or ø 50,5 mm [1.99"] to cut-out 45 x 45 mm [1.77 x 1.77"]	grey black	<b>T008170</b> <b>T008171</b>	<b>N511017</b>
		<b>55 x 55 mm</b> <b>[2.17 x 2.17]</b>	for cut-out 50 x 50 mm [1.97 x 1.97"] to cut-out 45 x 45 mm [1.77 x 1.77"]	black	<b>T008853</b>	<b>N511004</b>
		<b>60 x 75 mm</b> <b>[2.36 x 2.95]</b>	for cut-out 50 x 50 mm [1.97 x 1.97"] to cut-out 45 x 45 mm [1.77 x 1.77"]	black	<b>T008860</b>	<b>N511020</b>
		<b>72 x 72 mm</b> <b>[2.83 x 2.83]</b>	for cut-out 68 x 68 mm [2.68 x 2.68"] to cut-out 45 x 45 mm [1.77 x 1.77"]	grey black Mating clip	<b>T008176</b> <b>T008177</b> <b>T009420</b>	<b>N511016</b>
		<b>ø 72 mm</b> <b>[2.83]</b>	for cut-out ø 60 mm [2.36"] to cut-out 45 x 45 mm [1.77 x 1.77"]	black	<b>N510226</b>	–
<b>Sealing cover IP65</b>		<b>K2</b>	only in conjunction with adapter front bezel 60 x 75 mm T008860	transparent / grey transparent / black	<b>G008302</b> <b>G008303</b>	–
		<b>2 Dv</b> (mounted on bezel)	cover lockable, for cut-out 50 x 50 [1.97 x 1.97], only in conjunction with adapter front bezel 60 x 75 mm T008860	transparent / black	<b>G008143</b>	–
<b>Transparent cover IP65</b>		<b>2 Dvs</b> (mounted on bezel)	cover key lockable, for cut-out 50 x 50 [1.97 x 1.97], only in conjunction with adapter front bezel 60 x 75 mm T008860	transparent / black	<b>G008153</b>	–
		<b>cut-out</b> <b>50 x 50 mm</b> <b>[2.36 x 2.36]</b>	for snap-on mounting on 35 mm [1.38"] top-hat DIN rail	chromated	<b>G300003</b>	
<b>Screw terminal (replacement part)</b>			1 ... 8, pitch 3.81	8-pin	<b>N100498</b>	
			9 ... 15 (for 923 / 924), pitch 5.08	7-pin	<b>N100548u002</b>	
			9 ... 15 (for 924-4 / 924-6), pitch 5.08	7-pin	<b>N100400u002</b>	
			16 ... 20 (for 924-4 / 924-6), pitch 3.81	5-pin	<b>N100399u002</b>	

incl. in delivery

# Preset counters, electronic

## LCD preset counters      Multifunctional – pulse, frequency, time – 1...6 presets (AC+DC)      Codix 923 / 924

### Technical data

General technical data		
<b>Display</b>	standard	2 line 2 x 6 digits LCD display positive green with optional backlighting
	LED look multicolor	negative red backlighting upper line negative, red backlighting lower line negative, red or green backlighting (programmable)
<b>Operating temperature</b>		-20 °C ... +65 °C [-4 °F ... +149 °F] (non-condensing)
<b>Storage temperature</b>		-25 °C ... +75 °C [-13 °F ... +167 °F]
<b>Relative humidity at +40 °C [+104 °F]</b>		93 % (non-condensing)
<b>Altitude</b>		up to 2000 m [6562']

Mechanical characteristics	
<b>Protection</b>	IP65 (front side)
<b>Weight</b>	approx. 125 g [4.41 oz]

Electrical characteristics		
<b>Sensor supply voltage</b>	AC (50/60 Hz)	100 ... 240 V AC, ±10 %, max. 15 VA 24 V AC ±10 %, max. 6 VA
	DC	10 ... 30 V, max. 5.5 W
<b>External fuse protection</b>	100 ... 240 V AC	T 0.1 A
	24 V AC	T 0.315 A
	10 ... 30 V DC	T 0.2 A
<b>Data retention</b>		> 10 years, EEPROM
<b>Input modes</b>	pulse counters:	Count direction (cnt.dir), Difference (up.dn), Addition A+B (up.up), phase discriminator x1, x2, x4 (quad, quad x2, quad x4), Ratio (A/B), Ratio in % ((A-B)/A x100%)
	frequency meter:	A, A-B, A+B quad, A/B, (A-B)/A x 100 %
	timer:	4 Start modes: FrErun, Auto, InpA.InpB., InpB.InpB.
<b>Sensor supply voltage</b>	AC supply	24 V DC ±15 %, 80 mA
	DC supply	max. 80 mA, external supply voltage is connected through
<b>Device safety</b>	designed to protection class	EN 61010-1, EN 61010-2-201 2
	application area	pollution level 2

Approvals	
<b>UL compliant</b> in accordance with	File no. E128604
<b>CE compliant</b> in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
Low Voltage Directive	2014/35/EU

Inputs		
<b>Count inputs</b>		A and B
<b>Polarity of the inputs</b>		programmable for all inputs in common NPN/PNP
<b>Input resistance</b>		5 kΩ
<b>Count frequency</b>	pulse counters	max. 55 kHz
	tachometers	max. 65 kHz (details see manual) can be damped to 30 Hz (mechanical contacts)
<b>Control / Reset input</b>		MPI, Lock, Gate, Reset
<b>Min pulse duration of signal and control inputs</b>		10 ms / 1 ms
<b>Switching levels with AC supply</b>	HTL level:	LOW 0 ... 4 V DC HIGH 12 ... 30 V DC
	4 ... 30 V DC:	LOW 0 ... 2 V DC HIGH 3.5 ... 30 V DC
<b>Switching levels with DC supply</b>	HTL level:	LOW 0 ... 0.2 x U <sub>B</sub> HIGH 0.6 x U <sub>B</sub> ... 30 V DC
	4 ... 30 V DC:	LOW 0 ... 2 V DC HIGH 3.5 ... 30 V DC
<b>Pulse shape</b>		variable, Schmitt-Trigger characteristics

Outputs		
<b>Outputs relay version</b> (1 changeover contact with 923)		
<b>Switching voltage</b>	max. 250 V AC / 110 V DC	
<b>Switching current</b>	max. 3 A AC/DC min. 30 mA DC	
<b>Switching capacity</b>	max. 750 VA / 90 W	
<b>Output 1</b> (Relay closing contact, programmable as normally open (NO) or normally closed (NC))		
Mech. service life (switching cycles)	2 x 10 <sup>7</sup>	
N° of switching cycles at 3 A / 250 V AC	1 x 10 <sup>5</sup>	
N° of switching cycles at 3 A / 30 V DC	1 x 10 <sup>5</sup>	
<b>Output 2</b> (Relay with changeover contact)		
Mech. service life (switching cycles)	2 x 10 <sup>7</sup>	
N° of switching cycles at 3 A / 250 V AC	5 x 10 <sup>4</sup>	
N° of switching cycles at 3 A / 30 V DC	5 x 10 <sup>4</sup>	
<b>Outputs optocoupler version</b>		
<b>Output 1 and 2</b> (npn optocoupler)		
switching power	30 V DC / 10 mA	
U <sub>CESAT</sub> at IC = 10 mA	max. 2.0 V	
U <sub>CESAT</sub> at IC = 5 mA	max. 0.4 V	
<b>Reaction time of the outputs</b> (pulse / time)	relay	approx. 13 ms
	optocoupler	approx. 1 ms Details see instruction manual
<b>Response time of the frequency meter</b>		100/600 ms details see instruction manual

# Preset counters, electronic

## LCD preset counters

## Multifunctional – pulse, frequency, time – 1...6 presets (AC+DC)

## Codix 923 / 924

### Codix 924-4 and 924-6

The preset counters 924-4 and 924-6 vary from the standard counters 923 and 924 as follows:

- Relay version: 924-4, 4 presets, 2 additional relays
- Optocoupler version: 924-6: 6 presets, 4 additional optocoupler outputs
- No tracking presets
- Presets 1 and 4 affect the batch or total counter
- Presets 2, 3, 5 and 6 (Type: 924-6) or presets 2 and 3 (Type 924-4) affect the main counter
- Preset 2 is the main preset; it triggers the automatic reset
- Preset 2 is likewise the main preset for all further counting modes (the other presets are pre-signals)

#### Additional technical data Codix 924-4

##### Output 3

**Relay with closing contact** (programmable as normally closed NC or normally open NO)

Switching voltage	max. 125 V AC / 110 V DC
Switching current	max. 1 A AC / 1 A DC min. 1 mA AC/DC
Switching capacity	max. 62.5 VA / 30 W
Mech. service life (switching cycles)	$5 \times 10^7$
N° of switching cycles at 0.5 A / 125 V AC	$1 \times 10^5$
N° of switching cycles at 1 A / 30 V DC	$1 \times 10^5$

##### Output 4

**Relay with changeover contact**

Switching voltage	max. 125 V AC / 110 V DC
Switching current	max. 1 A AC / 1 A DC min. 1 mA AC/DC
Switching capacity	max. 62.5 VA / 30 W
Mech. service life (switching cycles)	$5 \times 10^7$
N° of switching cycles at 1 A / 110 V AC	$1 \times 10^5$
N° of switching cycles at 1 A / 30 V DC	$1 \times 10^5$

##### Reaction time of the outputs, Relay

< 7 ms  
(only impulse and time counter)

##### Max. count frequency

50 kHz

##### Operating temperature

-20 °C ... +55 °C  
[-4 °F ... +131 °F]

#### Additional technical data Codix 924-6

##### Output 1 ... 6

**NPN optocouplers**

Switching capacity	30 V DC / 10 mA
$U_{CESAT}$ at IC = 10 mA	max. 2.0 V
$U_{CESAT}$ at IC = 5 mA	max. 0.4 V

output 3, 4, 5 and 6 with common emitter

##### Reaction time of the outputs, optocouplers

(only impulse and time counter)

Add/Sub/	< 1 ms
with auto repeat	< 1 ms
A/B; (A-B)/A	< 23 ms

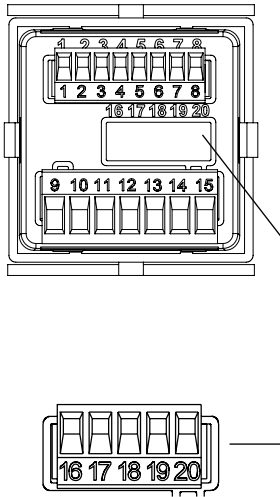
##### Max. count frequency

50 kHz

# Preset counters, electronic

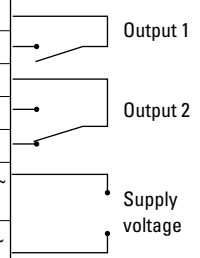
## LCD preset counters      Multifunctional – pulse, frequency, time – 1...6 presets (AC+DC)      Codix 923 / 924

### Terminal assignment



Pin	Signal and control inputs
1	Sensor supply voltage AC: 24 V DC / 80 mA DC: $U_B$ interconnected
2	GND (0 V DC)
3	INP A (Signal input A)
4	INP B (Signal input B)
5	RESET (Reset input)
6	LOCK (Key locking input)
7	GATE (Gate input)
8	MPI (User input)

Pin	Version with relays/optocouplers
9	Relay contact C. / Collector
10	Relay contact N.O. / Emitter
11	Relay contact C. / Emitter
12	Relay contact N.O. / not assigned
13	Relay contact N.C. / Collector
14	AC: 24 V AC, 100 ... 240 VAC, $\pm 10\%$ N- DC: 10 ... 30 V DC
15	AC: 24 V AC, 100 ... 240 VAC, $\pm 10\%$ L- DC: GND (0 VDC)

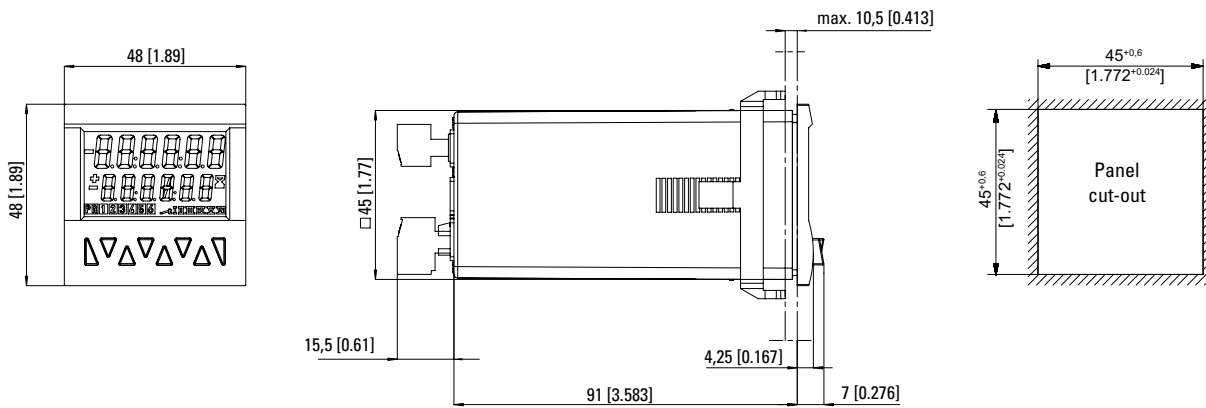


Pin	Additional connections 924-4
16	Relay contact N.C.4 output 4
17	Relay contact C.4 output 4
18	Relay contact N.O.4 output 4
19	Relay contact N.O.3 output 3
20	Relay contact C.3 output 3

Pin	Additional connections 924-6
16	Common-Emitter output 3 to 6
17	Collector 6 output 6
18	Collector 5 output 5
19	Collector 4 output 4
20	Collector 3 output 3

### Dimensions

Dimensions in mm [inch]



# Preset counters, electronic

## LCD preset counters

Multifunctional – pulse, frequency, time – 1...6 presets (AC+DC)

Codix 923 / 924

### Pulse counter

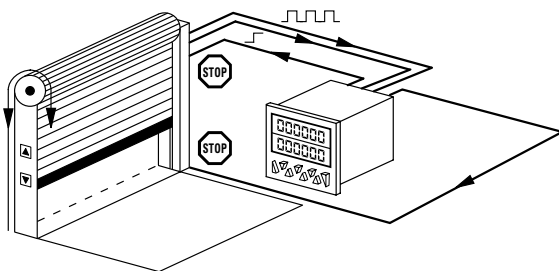
#### Functions / count modes:

- Count with direction mode
- Difference mode
- Quadrature mode quad/quad2/quad4
- Add, Sub, automatic reset
- 2-input adding mode A+B
- Ratio measurement A/B
- Percentage difference measurement  $(A-B)/A \times 100 \%$
- Batch counting
- Totalizer (overall total)
- Multiplication and division factor (up to 99.9999)
- Set value
- Step or tracking preset

## Application examples

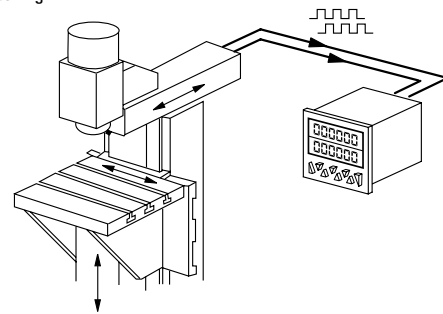
### CountDir + Add

Roller shutter door with automatic shut-off



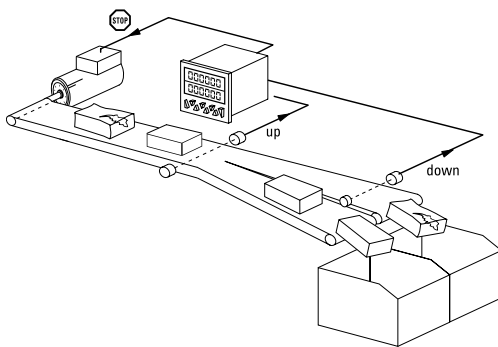
### Quad + Add

Running direction and position on milling machines, Limit switch monitoring



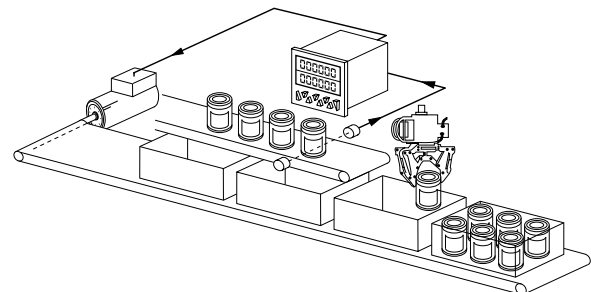
### UpDown + Add

Automatic subtraction of faulty or reject parts from the total piece count



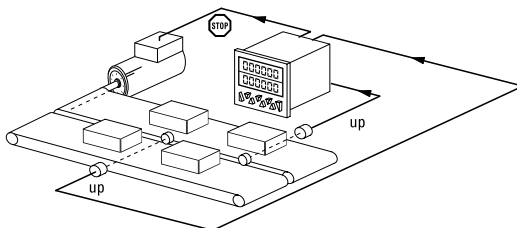
### CountDir + Batch

Logging of piece numbers and packing units plus control of replenishment of packing cartons



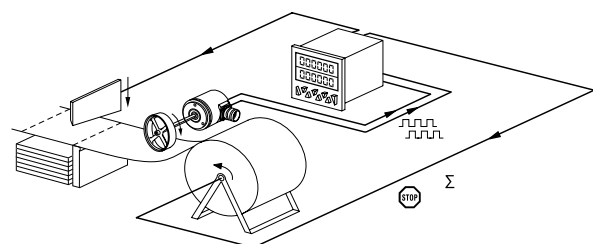
### UpUp + Add

Adding up of two parallel or staggered production lines



### Quad + Add tot

Cut-to-length with overall total count and control of the machine



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**Frequency meter (tachometer)**

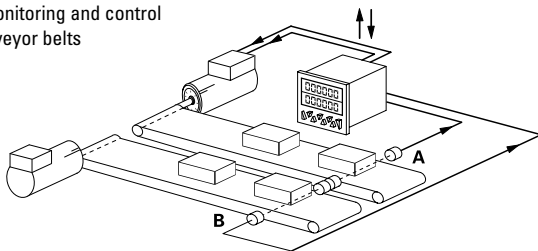
**Functions / count modes:**

- A
- A – B
- A + B
- A / B
- (A – B) / A x 100 % (percentage display)
- Quad (phase discriminator with recognition of direction)
- Averaging
- Start delay
- 2nd tacho input
- Gate input
- Multiplication and division factor (up to 99.9999)

## Application examples

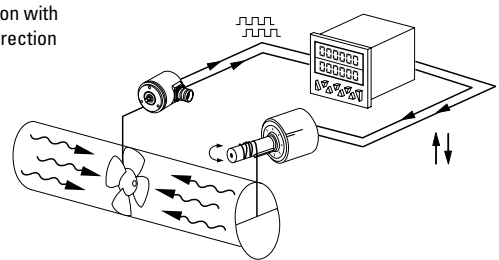
### A – B

Synchro monitoring and control of two conveyor belts



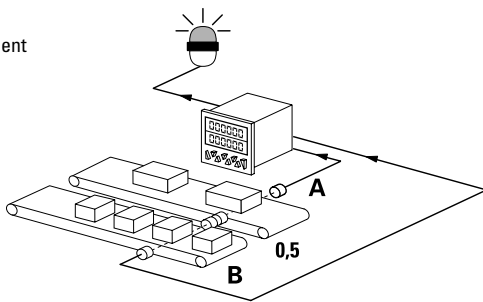
### Quad

Speed regulation with indication of direction



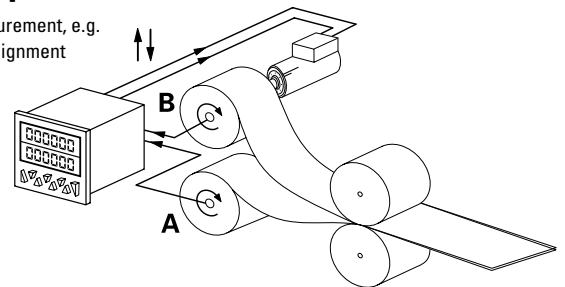
### A/B

Ratio measurement



### (A-B)/A [%]

Ratio measurement, e.g. for speed alignment



**Time and Hours-run meter (timer)**

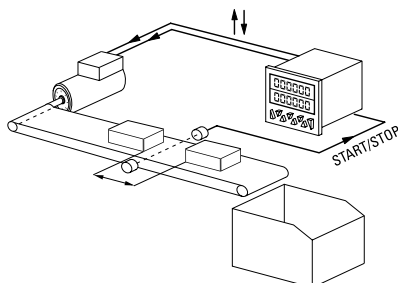
**Functions / count modes:**

- FrErUn (control via gate input)
- Auto (start via reset, stop at preset)
- InpB.InpB (start with first edge at InpB., stop with second edge InpB.)
- InpA. InpB (start with InpA., stop with InpB.)
- Totalizer (overall total)
- Batch counting
- Set value
- Step or tracking preset

## Application examples

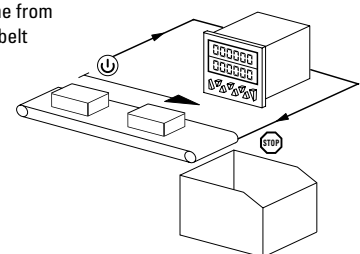
### InpB. InpB

Interval measurement



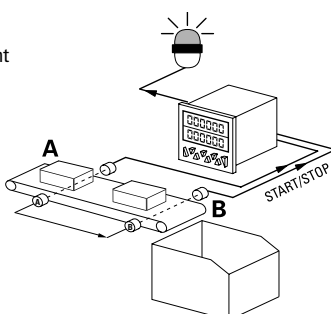
### FrErUn

Measurement of overall time from switching on the conveyor belt till switching off



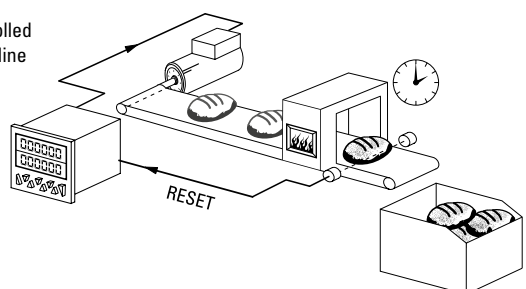
### InpA. InpB

Run-time measurement



### Auto

Time-controlled production line



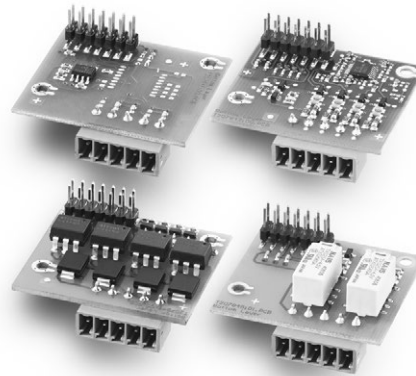
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## Expandable hardware

Expandable on request via modules:

- 4 additional inputs
- Or 4 additional optocoupler outputs
- Or 2 additional relay outputs
- Or RS232/485 communications interfaces



Application examples

- Limit switch monitoring
- Special functions/PLC function
- Initiation of fixed program sequences
- Control of several processes
- Special protocols
- Print commands for logging

## Customizable software

Individual customization of software to your application.

For example:

- Separate inputs for total counter and preset counter
- Separate scaling of input A and B
- Programmable measuring period for the tachometer
- Measurement of rotary speeds based on time
- Processing time, measurement of time based on frequency
- With the Multicolor version, the display color changes when reaching the preset, or blinking display with all versions

