

# Preset counters, electronic

LCD preset counters

Multifunction – 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 Power supply	<b>AC</b> 100 ... 240 V Temperature range	<b>-20° + 65°</b> Temperature range	<b>000000</b> DIN 48 x 48 DIN front bezel	<b>t/Hz</b> HRA Frequency meter HRA	<b>Prog</b> Menu-driven programming	<b>IP65</b> High protection level	<b>max. 65 kHz</b> Count frequency	<b>Plug-in screw terminal</b>	<b>1 ... 6</b> Presets	<b>Multifunction</b>
<b>123...</b> 2x6 LCD LCD display	<b>12.6</b> Multicolour display	<b>POSITION</b> Position display	<b>Batch</b> Batch counter	<b>Σ</b> Totaliser						

## Multifunction

- Counter, tachometer and timer in one device
- Can be used as a preset counter, batch counter or totaliser (overall cumulative count)
- 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 power supply

## 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 value and the presets, batch count or total count
- 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
- Multicolour display for improved differentiation

## Order Code

6.92 **X** . 0 1 **XX** . **XXX**  
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>1)</sup>

### c LCD options

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

### d Power supply

- 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>1)</sup>
- 924-6 (only **b** = 1)
- C = 4 relay outputs <sup>1)</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	6.924.0100.000
6.923.0100.300	6.924.0100.300
6.923.0101.000	6.924.0101.000
6.923.0101.300	6.924.0101.300
6.923.0102.000	6.924.0102.000
6.923.0102.300	6.924.0102.300
6.923.0103.000	6.924.0103.000
6.923.0103.300	6.924.0103.300
	6.924.0100.00C
	6.924.0100.30C
	6.924.0113.00B
	6.924.0113.30B

Additional inputs, outputs or interface types on request

<sup>1)</sup> 24 V AC on request

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Accessories	Dimensions in mm [inch]	Order-No.
<b>Adapter front bezel, 55 x 55 [2.17 x 2.17]</b>	For cut-out 50 x 50 [1.97 x 1.97] to cut-out 45 x 45 [1.77 x 1.77] with clip mounting for counters 48 x 48 [1.89 x 1.89]	black <b>T008853</b>
	Gasket 58 x 58 [2.28 x 2.28], for cut-out 50.2 x 50.2 [1.98 x 1.98]	<b>N511004</b>
<b>Adapter front bezel, 60 x 75 [2.36 x 2.95]</b>	For cut-out 50 x 50 [1.97 x 1.97] to cut-out 45 x 45 [1.77 x 1.77] with screw mounting for counters 48 x 48 [1.89 x 1.89]	black <b>T008860</b>
	Gasket 60 x 75 [2.36 x 2.95] for cut-out 50 x 50 [1.97 x 1.97]	<b>N511020</b>
<b>Adapter front bezel, 72 x 72 mm [2.83 x 2.83]</b>	For cut-out 68 x 68 [2.68 x 2.68] to cut-out 45 x 45 [1.77 x 1.77] (Mating clip T009420 must be ordered separately)	black mating clip <b>T008177</b>
		<b>T009420</b>
<b>Sealing cover type K2, IP65</b>	Suitable for front bezel 75 x 60 [2.95 x 2.36] with screw mounting	transparent/black <b>G008303</b>
<b>Transparent cover, IP65</b>	For cut-out 50 x 50 [1.97 x 1.97], with screw mounting for counters with cut-out 45 x 45 [1.77 x 1.77] and front bezel 48 x 48 [1.89 x 1.89]	lockable key lockable <b>G008143</b> <b>G008153</b>
<b>Mounting frame</b> with cut-out 50 x 50 [2.36 x 2.36] via separate adapter also for 45 x 45 [1.77 x 1.77]	For snap-on mounting on 35 [1.38] top-hat DIN rail, for counters 48 x 48 m [1.89 x 1.89], 53 x 53 [2.09 x 2.09] and 55 x 55 [2.17 x 2.17]	chromated <b>G300003</b>
<b>Replacement parts</b>		
<b>8-pin connector</b>	1 ... 8, pitch 3.81	<b>N100498</b>
<b>7-pin connector</b>	9 ... 15 (for 923 / 924), pitch 5.08	<b>N100548u002</b>
	9 ... 15 (for 924-4 / 924-6), pitch 5.08	<b>N100400u002</b>
<b>5-pin connector</b>	16 ... 20, pitch 3.81	<b>N100399u002</b>

Suitable gaskets as well as further accessories can be found in the accessories section or in the accessories area of our website at: [www.kuebler.com/accessories](http://www.kuebler.com/accessories).

### Technical data

General technical data	
<b>Display</b>	2 line 2 x 6 digits LCD display positive green with optional backlighting Standard LED Look Multicolour 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>Humidity</b>	at +40°C [+104°F] RH 93% (non-condensing)
<b>Altitude</b>	up to 2000 m [6562']

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

Electrical data	
<b>Sensor power supply</b>	AC (50/60 Hz) 100 ... 240 V AC, ±10%, max. 9 VA 24 V AC ±10%, max. 6 VA DC 10 ... 30 V, max. 4.5 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 x 100%) 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 power supply</b>	AC supply 24 V DC ±15%, 80 mA DC supply max. 80 mA, external power supply is connected through
<b>EMC</b>	Emitted interference EN55011 class B Immunity to interference EN 61000-6-2
<b>Device safety</b>	Designed to EN61010 part 1 Protection class 2 Application area Pollution level 2
<b>UL approval</b>	File-No.: E128604

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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> (output 1 not 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		
U <sub>CESAT</sub> at IC = 10 mA	30 V DC / 10 mA	
U <sub>CESAT</sub> at IC = 5 mA	max. 2.0 V 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

### 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)

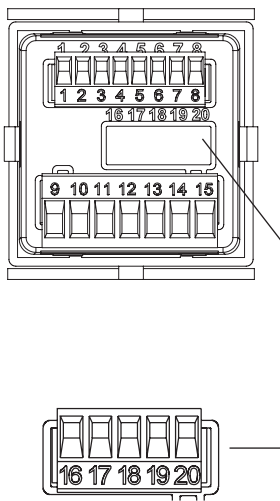
Additional technical data Codix 924-4	
<b>Output 3</b>	
<b>Relay with closing contact</b> (programmable as normally closed NC or normally open NO)	
Switching voltage	max. 125 V AC / 110 V DC
Switching current	max. 1 A AC / 1 A DC min. 1 mA AC/DC
Switching capacity	max. 62.5 VA / 30 W
Mech. service life (switching cycles)	5 x 10 <sup>7</sup>
N° of switching cycles at 0.5 A / 125 V AC	1 x 10 <sup>5</sup>
N° of switching cycles at 1 A / 30 V DC	1 x 10 <sup>5</sup>
<b>Output 4</b>	
<b>Relay with changeover contact</b>	
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 x 10 <sup>7</sup>
N° of switching cycles at 1 A / 110 V AC	1x10 <sup>5</sup>
N° of switching cycles at 1 A / 30 V DC	1x10 <sup>5</sup>
<b>Reaction time of the outputs, Relay</b>	
< 7 ms (only impulse and time counter)	
<b>Max. count frequency</b>	50 kHz

Additional technical data Codix 924-6	
<b>Output 1 ... 6</b>	
<b>NPN optocouplers</b>	
Switching capacity	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
output 3, 4, 5 and 6 with common emitter	
<b>Reaction time of the outputs, optocouplers</b> (only impulse and time counter)	
Add/Sub/ with auto repeat	< 1 ms
A/B; (A-B)/A	< 23 ms
<b>Max. count frequency</b>	50 kHz

# Preset counters, electronic

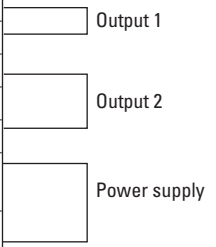
**LCD preset counters**    **Multifunction – pulse, frequency, time – 1...6 presets (AC+DC)**    **Codix 923 / 924**

## Terminal assignment



Pin	Signal and control inputs
1	Sensor power supply 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. / Kollektor
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)

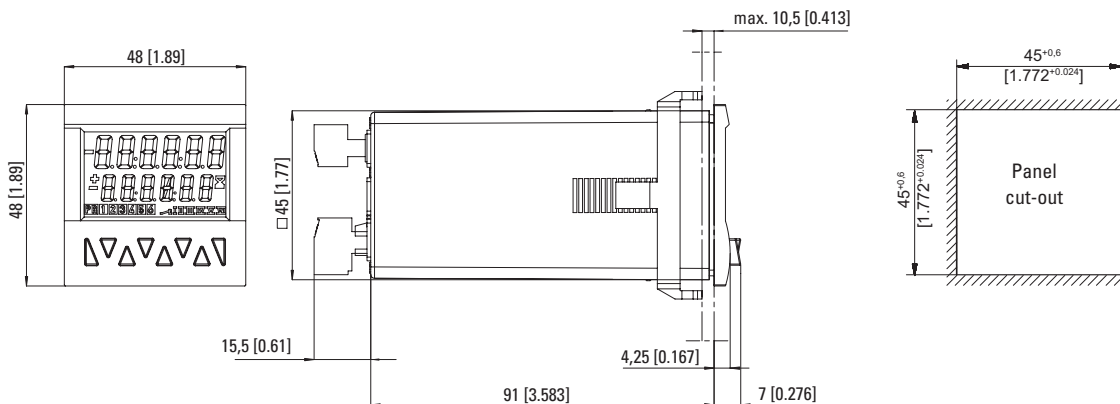


Pin	Additional connections 924-4
16	Relay contact N.C.4 output 4
17	Relay contact C.4 output 4
18	Relay contact N.O.4 output 4
19	Relay contact N.O.3 output 3
20	Relay contact C.3 output 3

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]



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**LCD preset counters**

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## Pulse counter

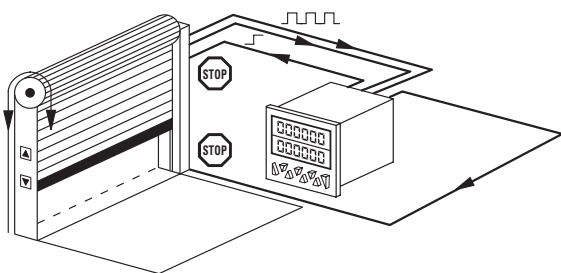
### Functions / count modes:

- 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
- Totaliser (overall total)
- Multiplication and division factor (up to 99.9999)
- Set value
- Step or tracking preset

## Application examples

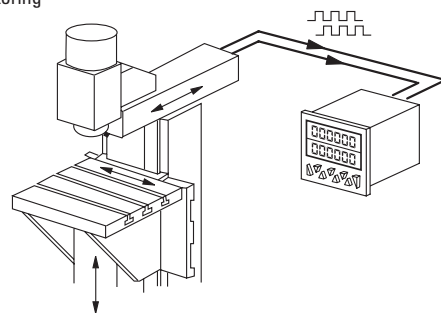
### CountDir + Add

Roller shutter door with automatic shut-off



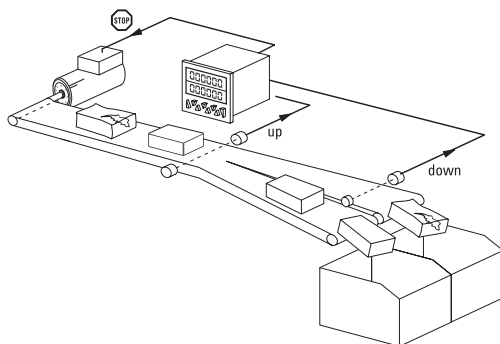
### Quad + Add

Running direction and position on milling machines, Limit switch monitoring



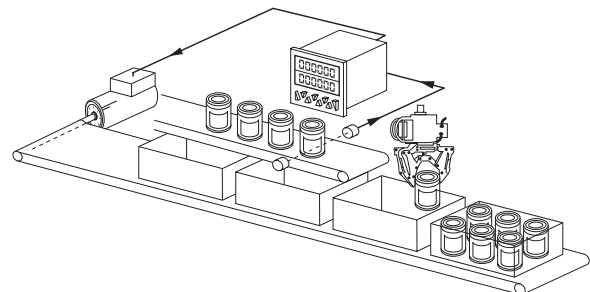
### UpDown + Add

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



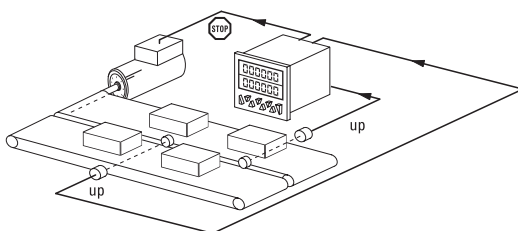
### CountDir + Batch

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



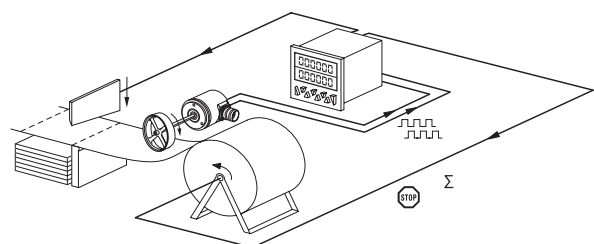
### UpUp + Add

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)**

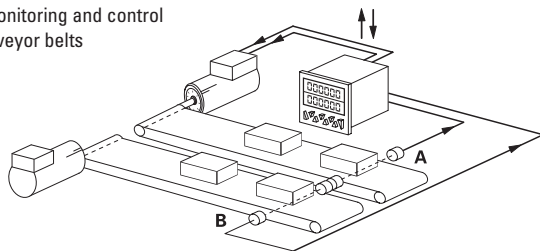
**Functions / count modes:**

- 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

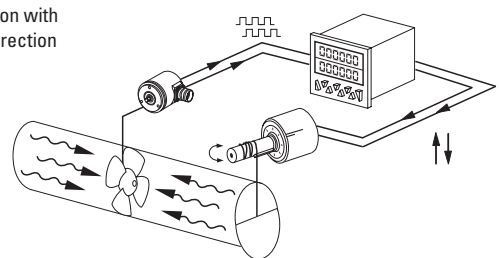
### A - B

Synchro monitoring and control of two conveyor belts



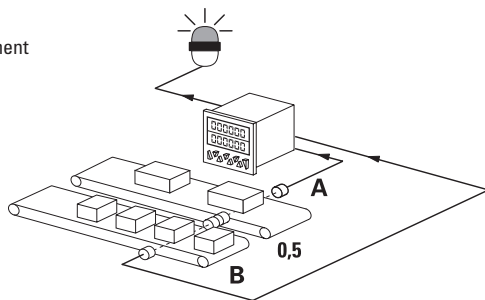
### Quad

Speed regulation with indication of direction



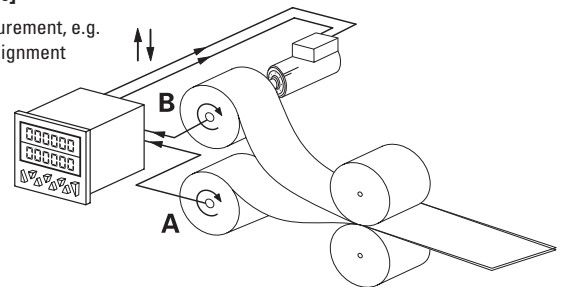
### A/B

Ratio measurement



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

Ratio measurement, e.g. for speed alignment



## Time and Hours-run meter (timer)

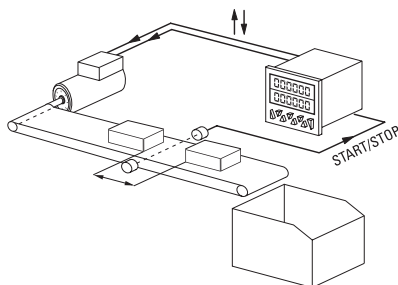
**Functions / Count modes:**

- 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.)
- Totaliser (overall total)
- Batch counting
- Set value
- Step or tracking preset

## Application examples

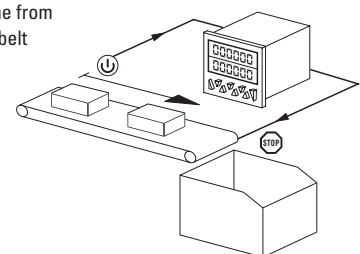
### InpB. InpB

Interval measurement



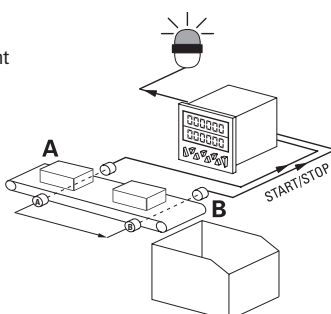
### FrErUn

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



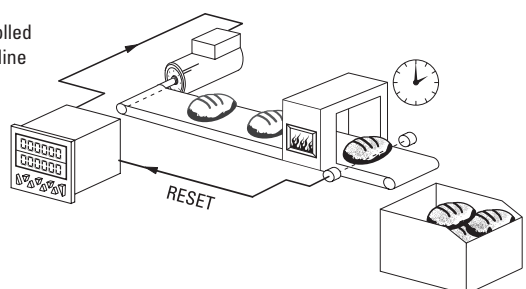
### InpA. InpB

Run-time measurement



### Auto

Time-controlled production line



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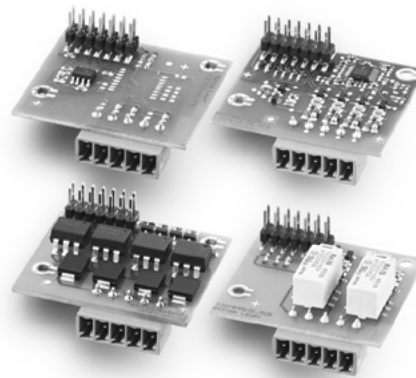
## Expandable hardware

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



## Customisable software

Individual customisation 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 Multicolour version, the display colour changes when reaching the preset, or blinking display with all versions



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