

# Preset Counters

LCD Preset Counters

1, 2, 4 or 6 Presets

Codix 923 / 924



The Codix 923/924 can be used universally. As a preset pulse counter, tachometer or preset timer with up to 6 presets it is able to solve a very wide range of control and monitoring tasks in every application.

With its 2-line display in 4 different versions the counter is very easy to read and is simple to programme using the clearly laid-out cursor keys. Using a batch counter or overall totalising function even more complex control tasks can be carried out.



<b>DC</b> 10 ... 30V Power supply	<b>AC</b> 24 ... 260V Temperature range	<b>-20° + 65°</b> Temperature range	<b>000000</b> DIN 48 x 48 Frequency meter HRA	<b>t/Hz</b> HRA Menu-driven programming	<b>IP 65</b> High degree of protection	<b>max. 60 kHz</b> count frequency	<b>1 ... 6</b> Presets	<b>Multifunction</b> Multifunction
<b>2x6 LCD</b> 2 x 6 LCDs	<b>Red/Green Display</b> Red/Green Display	<b>POSITION</b> Position display	<b>Batch</b> Batch counter	<b>Σ</b> Totaliser				

## Multifunction

- Counter, Tachometer and Timer – all in one device
- Can be used as preset counter, batch counter or totaliser (overall cumulative count)
- Presets: 923: 1, 924: 2, 924-4: 4, 924-6: 6
- Relay or optocoupler outputs
- Wide choice of count modes for pulse inputs, time or frequency
- Scalable display by means of multiplication and division factor
- Set value
- Averaging, start delay (Tachometer),
- 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 the Teach-In input
- Fast installation thanks to plug-in screw terminals
- Max. count frequency 60 kHz
- Simultaneous display of the actual value, presets, batch count or total count
- Annunciators for the displayed preset and for the output status
- 3 predefined settings for the most common parameter settings
- Direct entry into the programming
- Minimum installation depth
- 4 stage RESET modes
- 3 stage key lockout
- Multicolour display for improved differentiation of the two values

## 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>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 Supply voltage

- 0 = 90 ... 260 V AC
- 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

<b>Adapter front bezel 55 x 55 mm</b>	for panel cut-out 50 x 50 mm Gasket 58 x 58 mm / 50,2 x 50,2 mm	<b>T008853</b> <b>N511004</b>
<b>Adapter front bezel 60 x 75 mm</b>	with screw fixing for panel cut-out 50 x 50 mm Gasket 60 x 75 mm / 50 x 50 mm	<b>T008860</b> <b>N511020</b>

## Replacement parts

<b>8-pin connector</b>	1 ... 8	<b>N100498</b>
<b>7-pin connector</b>	9 ... 15 (for 923 / 924)	<b>N100548u002</b>
	9 ... 15 (for 924-4 / 924-6)	<b>N100400u002</b>
<b>5-pin connector</b>	16 ... 20	<b>N100399u002</b>

General technical data	
<b>Display</b>	2 line 2 x 6 digits LCD display Standard positive green with optional backlighting LED Look negative, red backlighting Multicolour upper line negative, red backlighting lower line negative, red or green backlighting (programmable)
<b>Operating temperature</b>	-20°C ... +65°C
<b>Storage temperature</b>	-25°C ... +75°C
<b>Humidity</b>	at +40°C r.F. 93%, non-condensing
<b>Altitude</b>	up to 2000 m

Mechanical data	
<b>Protection</b>	IP65 (front)
<b>Weight</b>	approx. 125 g

Electrical data	
<b>Sensor supply voltage</b>	AC (50/60 Hz) 90 ... 260 V AC, max. 9 VA 24 V AC $\pm$ 10%, max. 6 VA DC 10 ... 30 V, max. 4,5 W
<b>External fuse protection</b>	90 ... 260 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 supply voltage</b>	AC supply 24 V DC $\pm$ 15%, 80 mA DC supply max. 80 mA, external supply voltage is connected through
<b>EMV</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-Nr.: E128604

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 k $\Omega$
<b>Count frequency</b>	max. 55 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 the 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 (output 1 not with 923)</b>	
<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>	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

## LCD Preset Counters 1, 2, 4 or 6 Presets Codix 923 / 924

### Codix 924-4 and 924-6

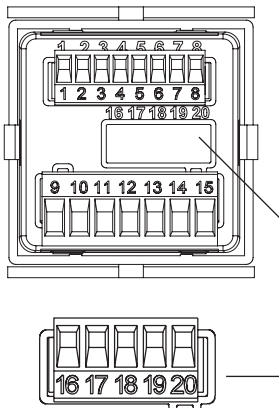
The preset counters 924-4 und 924-6 vary from the standard counters 923 and 924 as follows:

- 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)	$5 \times 10^7$
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	$1 \times 10^5$
<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)	$5 \times 10^7$
N° of switching cycles at 1 A / 110 V AC	$1 \times 10^5$
N° of switching cycles at 1 A / 30 V DC	$1 \times 10^5$
<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
$U_{CESAT}$ 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	
<b>Reaction time of the outputs, optocouplers</b> (only impulse and time counter)	
Add/Sub/	< 1 ms
with auto repeat	< 1 ms
A/B; (A-B)/A	< 23 ms
<b>Max. count frequency</b>	50 kHz

### Terminal assignment



#### Signal and control inputs

- 1 - Sensor voltage supply  
AC: 24 V DC/80 mA  
DC: UB 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)

#### 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, 90 ... 260 V AC N~  
DC: 10 ... 30 V DC
  - 15 - AC: 24 V AC, 90 ... 260 V AC L~  
DC: GND (0 V DC)
- Output 1: 9, 10  
Output 2: 11, 12, 13  
Supply voltage: 14, 15

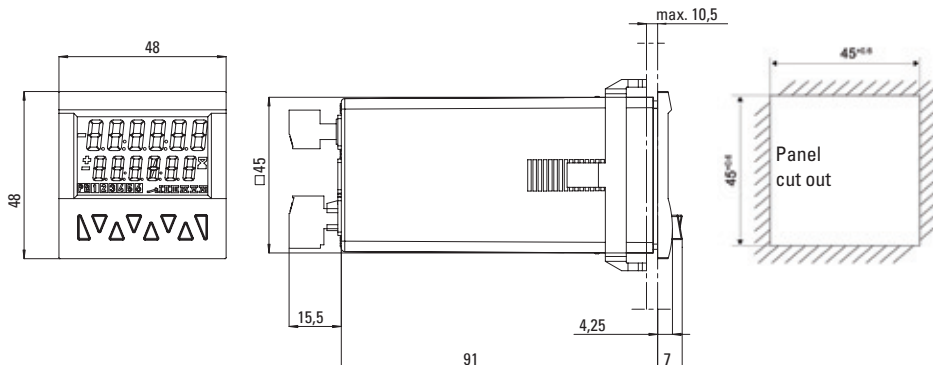
#### Additional connections 924-4

- 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

#### 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



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## Pulse counter

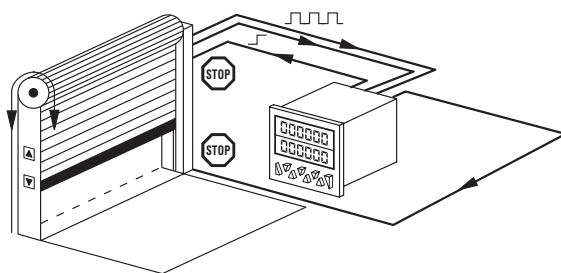
### Functions / Count modes:

- 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

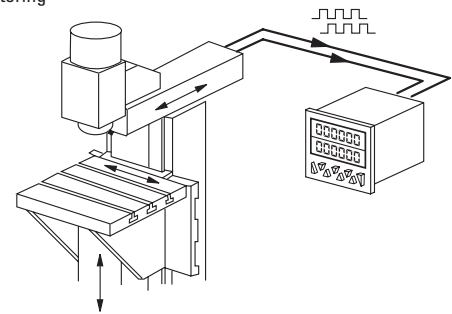
### CountDir + Add

Roller shutter door with automatic shut-off



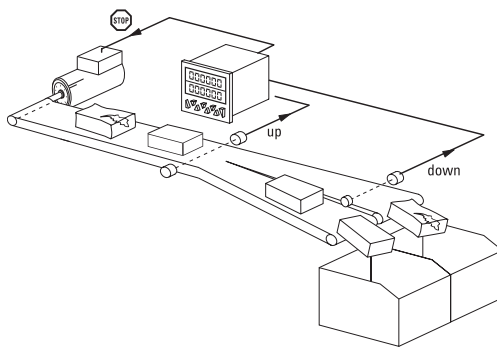
### Quad + Add

Running direction and position on milling machines, Limit switch monitoring



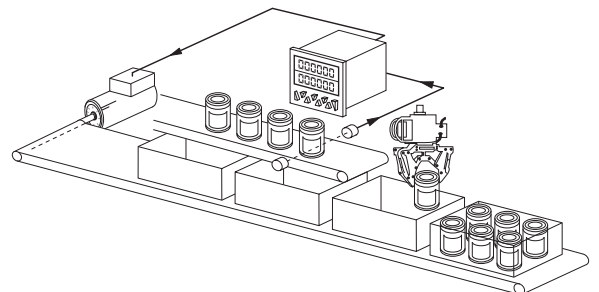
### UpDown + Add

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



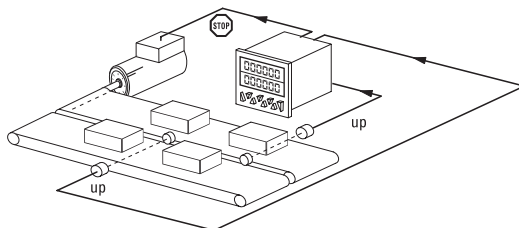
### CountDir + Batch

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



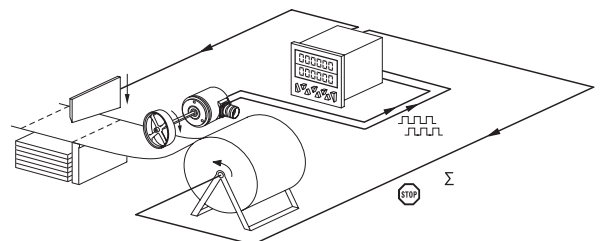
### UpUp + Add

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)

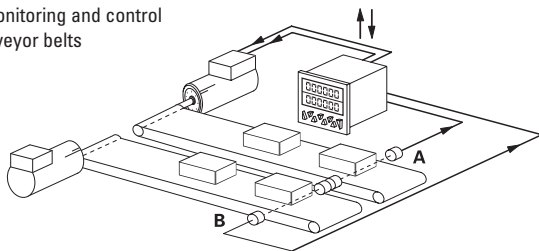
Functions / Count modes:

- A
- A - B
- A + B
- A / B
- $(A - B) / A \times 100\%$  (percentage display)
- Quad (phase discriminator with recognition of direction)
- Averaging
- Start delay
- 2nd tach input
- Gate input
- Multiplication and division factor (up to 99,9999)

### Application examples

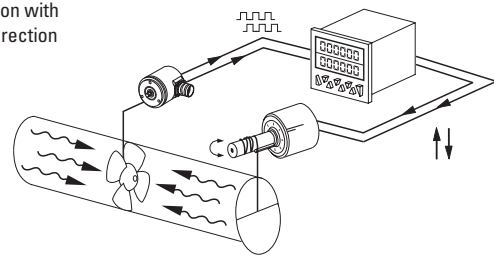
#### A - B

Synchro monitoring and control of two conveyor belts



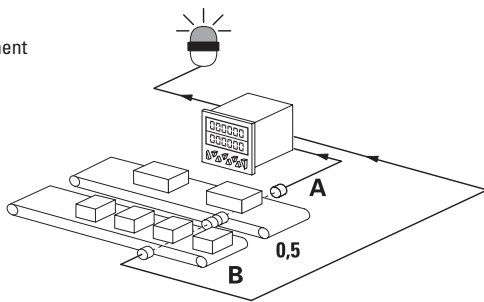
#### Quad

Speed regulation with indication of direction



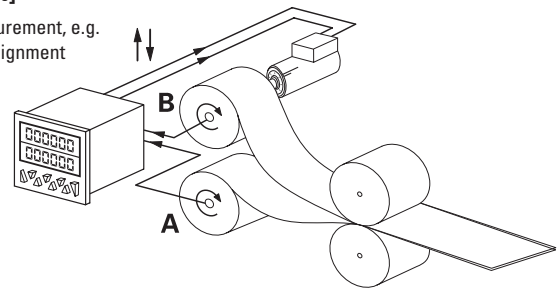
#### A/B

Ratio measurement



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

Ratio measurement, e.g. for speed alignment



## Time and Hours-run meter (Timer)

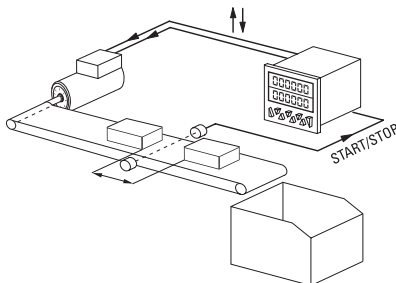
Functions / Count modes:

- 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

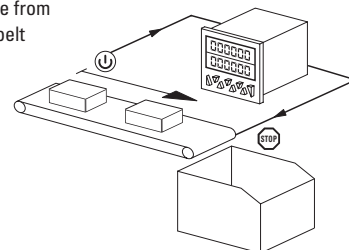
#### InpB. InpB

Interval measurement



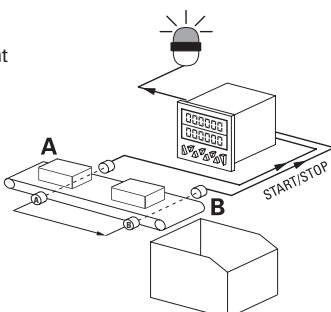
#### FrErUn

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



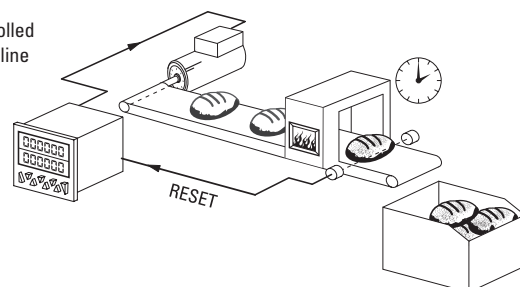
#### InpA. InpB

Run-time measurement



#### Auto

Time-controlled production line



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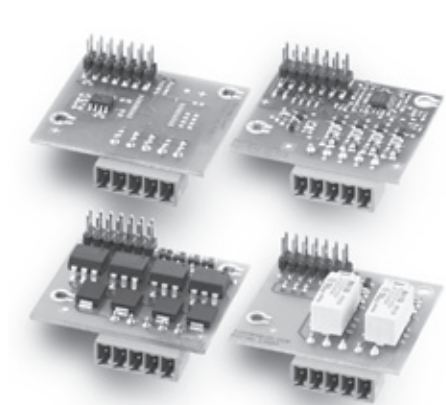
## Expandable hardware

Expandable on request via modules:

- 4 additional inputs
- Or 4 additional optocoupler outputs
- Or 2 additional relay outputs
- Or RS 232/485 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

