

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.



Preset counters

DC 10 ... 30 V Power supply	AC 100 ... 240 V Temperature range	-20° + 65° Temperature range	000000 DIN 48 x 48 DIN front bezel	t/Hz HRA Frequency meter HRA	Prog Menu-driven programming	IP65 High protection level	max. 65 kHz Count frequency	Plug-in screw terminal Plug-in screw terminal	1 ... 6 Presets	Multifunctional Multifunctional
2x6 LCD LCD display	Multicolor display Multicolor display	POSITION Position display	Batch Batch counter	Σ 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 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 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)²⁾

c LCD options

- 0 = no backlighting
- 1 = green backlighting¹⁾
- 2 = LED look, negative, red backlighting¹⁾
- 3 = multicolor, 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 level¹⁾

f Version

- 0 = standard 923/924
- B = 6 optocoupler outputs²⁾
- 924-6 (only **b** = 1)
- C = 4 relay outputs²⁾
- 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

1) 24 V AC on request

2) Not possible in 24 V AC.

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Accessories	Dimensions in mm [inch]			Order no.
Adapter front bezel, 55 x 55 [2.17 x 2.17]	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	T008853
	Gasket 58 x 58 [2.28 x 2.28], for cut-out 50.2 x 50.2 [1.98 x 1.98]			N511004
Adapter front bezel, 60 x 75 [2.36 x 2.95]	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	T008860
	gasket 60 x 75 [2.36 x 2.95] for cut-out 50 x 50 [1.97 x 1.97]			N511020
Adapter front bezel, 72 x 72 mm [2.83 x 2.83]	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	T008177
	mating clip			T009420
Sealing cover type K2, IP65	suitable for front bezel 75 x 60 [2.95 x 2.36] with screw mounting		transparent/black	G008303
Transparent cover, IP65	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	G008143 G008153
Mounting frame 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	G300003
Replacement parts				Order no.
8-pin connector	1 ... 8, pitch 3.81			N100498
7-pin connector	9 ... 15 (for 923 / 924), pitch 5.08			N100548u002
	9 ... 15 (for 924-4 / 924-6), pitch 5.08			N100400u002
5-pin connector	16 ... 20, pitch 3.81			N100399u002

Suitable gaskets, other accessories and installation examples for optional accessories can be found in chapter Accessories or in the Accessories section under: www.kuebler.com/accessories.

Technical data

General technical data		
Display	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)
Operating temperature		-20°C ... +65°C [-4°F ... +149°F] (non-condensing)
Storage temperature		-25°C ... +75°C [-13°F ... +167°F]
Humidity	at +40°C [+104°F]	RH 93 % (non-condensing)
Altitude		up to 2000 m [6562']
Mechanical characteristics		
Protection		IP65 (front side)
Weight		approx. 125 g [4.41 oz]

Electrical characteristics	
Sensor power supply	AC (50/60 Hz) 100 ... 240 V AC, ±10 %, max. 9.5 VA 24 V AC ±10 %, max. 6 VA DC 10 ... 30 V, max. 5.0 W
External fuse protection	100 ... 240 V AC T 0.1 A 24 V AC T 0.315 A 10 ... 30 V DC T 0.2 A
Data retention	> 10 years, EEPROM
Input modes	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.
Sensor power supply	AC supply 24 V DC ±15 %, 80 mA DC supply max. 80 mA, external power supply is connected through
EMC standards	EN55011 class B, EN 61000-6-2, EN 61000-6-3
Device safety	designed to EN61010 part 1 protection class 2 application area pollution level 2
UL approval	file E128604

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

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

Preset counters

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 x 10 ⁷
N° of switching cycles at 0.5 A / 125 V AC	1 x 10 ⁵
N° of switching cycles at 1 A / 30 V DC	1 x 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 x 10 ⁷
N° of switching cycles at 1 A / 110 V AC	1x10 ⁵
N° of switching cycles at 1 A / 30 V DC	1x10 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

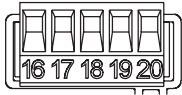
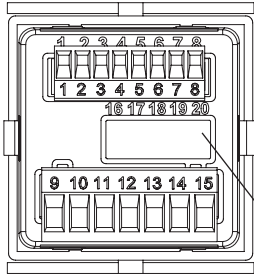
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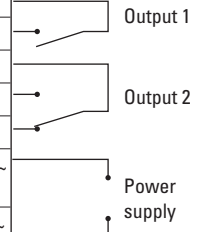
Codix 923 / 924

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)

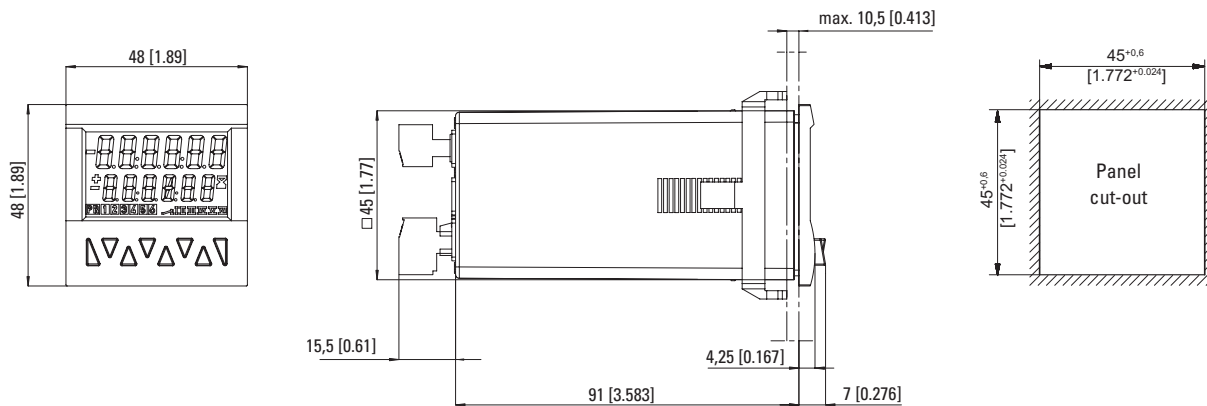


Pin	Additional connections 924-4
16	Relay contact N.C.4 output 4
17	Relay contact C.4 output 4
18	Relay contact N.O.4 output 4
19	Relay contact N.O.3 output 3
20	Relay contact C.3 output 3

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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Pulse counter

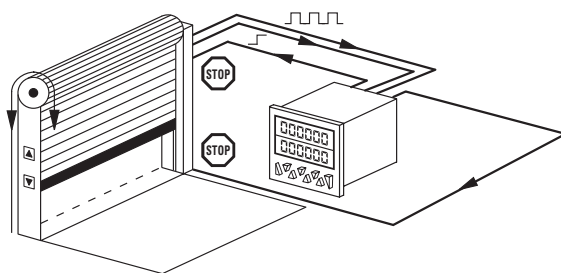
Functions / count modes:

- 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

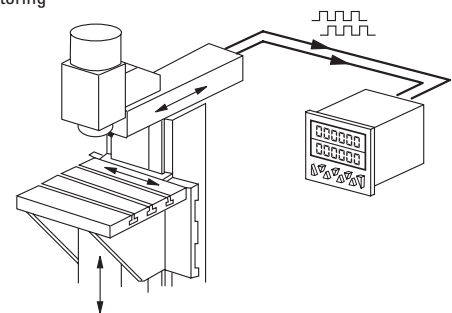
CountDir + Add

Roller shutter door with automatic shut-off



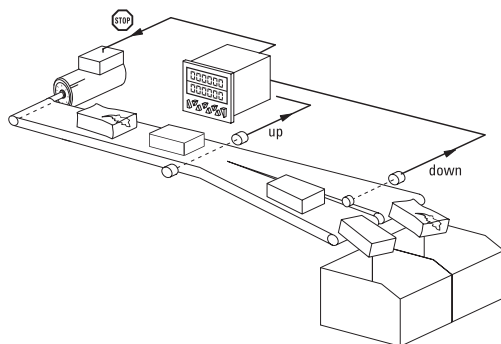
Quad + Add

Running direction and position on milling machines, Limit switch monitoring



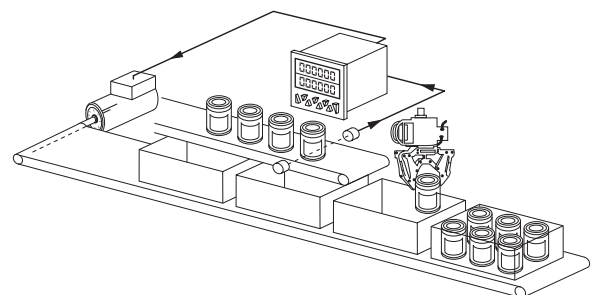
UpDown + Add

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



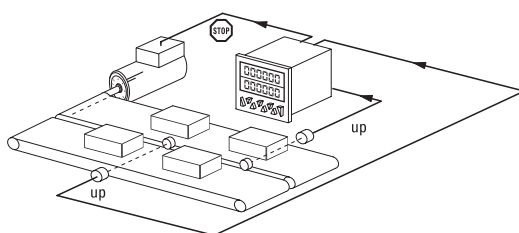
CountDir + Batch

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



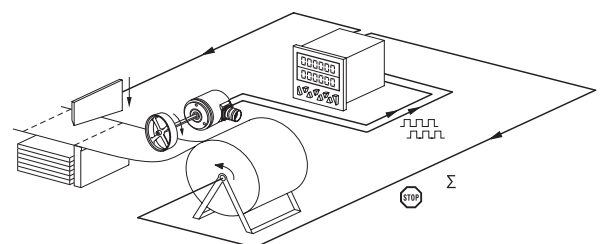
UpUp + Add

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)

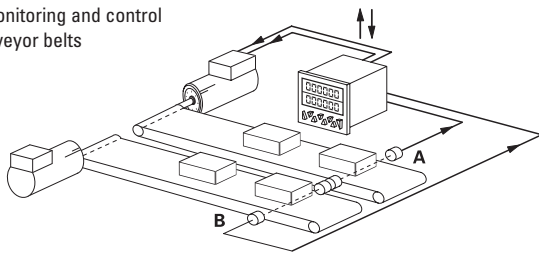
Functions / count modes:

- A
- A – B
- A + B
- A / B
- $(A - B) / A \times 100\%$ (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

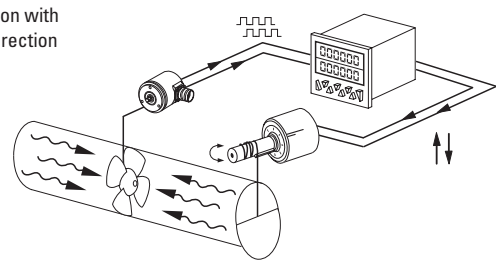
A – B

Synchro monitoring and control of two conveyor belts



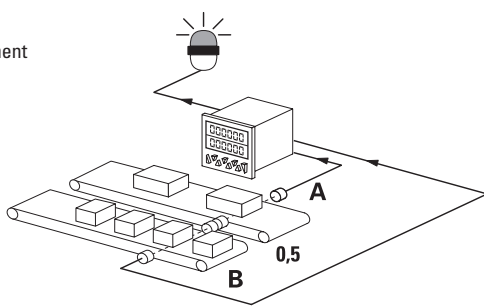
Quad

Speed regulation with indication of direction



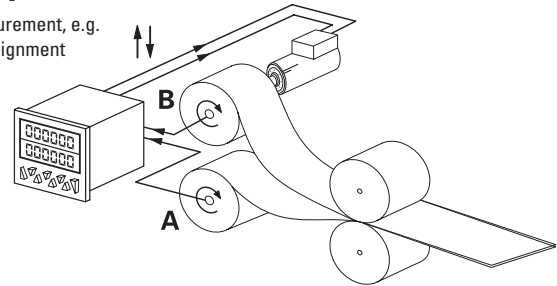
A/B

Ratio measurement



(A-B)/A [%]

Ratio measurement, e.g. for speed alignment



Time and Hours-run meter (timer)

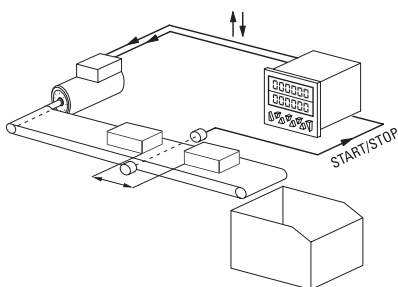
Functions / count modes:

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

Application examples

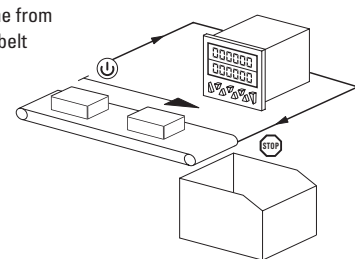
InpB. InpB

Interval measurement



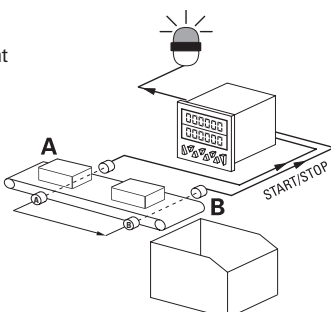
FrErUn

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



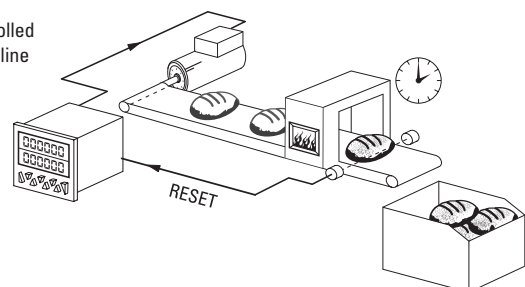
InpA. InpB

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



Preset counters

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

