Manuals+ — User Manuals Simplified.

Kubler 521 Electronic Display Counter

Kubler 521 Electronic Display Counter Instruction Manual

Contents

Kubler 521 Electronic Display Counter

Safety Instructions

Safety instructions and warnings

Only use this display

- in a way according to its intended purpose
- if its technical condition is perfect
- adhering to the operating instructions and the general safety instructions.

General safety instructions

1. Before carrying out any installation or maintenance work, make sure that the power supply of the digital display is switched off.
2. Only use this digital display in a way according to its intended purpose: If its technical condition is perfect. Adhering to the operating instructions and the general safety instructions.
3. Adhere to country or user specific regulations.
4. The digital display is not intended for use in areas with risks of explosion and in the branches excluded by the standard EN 61010 Part 1.
5. The digital display shall only operated if it has been correctly mounted in a panel, in accordance with the chapter "Technical features".

Use according to the intended purpose

The digital display may be used only as a panel-mounted device. Applications of this product may be found in industrial processes and controls, in manufacturing lines for the metal, wood, plastics, paper, glass, textile and

other processing industries. Over-voltages at the terminals of the digital display must be kept within the limits in Category II.

If the digital display is used to monitor machines or processes in which, in case of a failure of the device or an error made by the operator, there might be risks of damaging the machine or causing accidents to the operators, it is your responsibility to take appropriate safety measures.
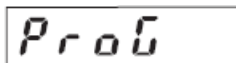
Description

- **Codix 521**
    - **Please note:** Read first chapter 2 of Codix 524 and go on.
- **Codix 522**
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- **Codix 523**
    - **Please note:** Read first chapter 2 of Codix 524 and go on.
- **Codix 524**

    Codix 524 is a multipurpose device. Depending on the programmed basic function, the device operates like

    - the pulse counter Codix 521 or
    - the frequency meter Codix 522 or
    - the time meter Codix 523
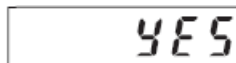
Setting of the operating parameters

- Press both front side keys keys and switch on the supply voltage or, if the supply voltage is already on, press both keys simultaneously during 5 s.
- The display shows

$$\boxed{P \, r \, o \, \overline{L}}$$

- After releasing the keys, the display shows

$$\boxed{\qquad n \, o}$$

    - Hold the left key pressed and press the right key to leave the programming operation.
    - Press the right key to switch to

$$\boxed{\qquad Y E S}$$

- Hold the left key pressed and press the right key to switch to the first parameter.
- After releasing the keys, the display alternates between the menu title and the current menu item setting. After pressing any key, only the menu item setting is displayed.
- Pressing the right key, the menu item setting will be switched to the next value. If figures are to be input (e.g. when setting the scaling factor), select first the decade using the left key, and then set the value using the right key.
- Hold the left key pressed and press the right key to switch to the next menu item.
- The last menu title "EndPro" allows, when selecting "Yes", to exit the programming menu and to take over (store) the new values. If "no" is selected, the programming routine is repeated, the latest values set remaining active. They can now be checked again or modified.

Programming Routine

The first menu item is the selection of the basic operating mode, which determines the functions of the device.

`ПodE`	
`Count`	Operating mode pulse counter. Continued in point 4. of Codix 521
`tAcho`	Operating mode frequency meter. Continued in point 4. of Codix 522
`tinEr`	Operating mode time meter. Continued in point 4. of Codix 523

Pulse counter/Position indicator Codix 521

(**Codix 524:** Operating mode pulse counter)

Description

- 6-digit display counter with SET/RESET-function
- Red LED display, character height 8 mm
- Display range from -199 999 to 999 999
- Leading zeros suppression
- Programming via two setting keys on the front side
- During programming, the display guides the user with text prompts
- Counter operating modes:
  - Count input INP A + count direction input INP B (Cnt.Dir)
  - Differential count INP A – INP B (up.dn)
  - Totalising INP A + INP B (up.up)
  - Count Up/Down INP A 90° INP B x 1 (quAd)
  - Count Up/Down INP A 90° INP B x 2 (quAd2)
  - Count Up/Down INP A 90° INP B x 4 (quAd4)
- Optional optocoupler output

Inputs

- **INP A**
  - Dynamic count input.
- **INP B**
  - Dynamic count input.

SET/RESET

- Dynamic SET/RESET input. Linked in parallel to the red SET/RESET key. Resets the counter to the predefined setting value.

Optocoupler output (optional)

- Active if count value < 0. Simple preset counter can be realized, when using subtract mode.

Programming routine

The programmable parameters of the device are described below, in the order in which they can be set. The device is fully programmed after one pass of the routine.

The first values stated correspond to the factor settings.

Polarity of the inputs

$$InPoL$$

nPn	npn: switching for 0 V
PnP	pnp: switching for $+U_B$

Switching on the 30 Hz filter

(INP A, INP B)

$$FiLtEr$$ The filter provides input damping*

oFF	30 Hz filter off (f_{max})
on	30 Hz filter on

Input mode

`InPut`		
	`Cnt.dir`	Count input and count direction input INP A: Count input INP B: Count direction input
	`uP .dn`	Differential input INP A: count input adding INP B: count input subtracting
	`uP .uP`	Totalising INP A: count input adding INP B: count input adding
	`quAd`	Quadrature input INP A: count input 0° INP B: count input 90°
	`quAd 2`	Quadrature input with pulse doubling INP A: count input 0° INP B: count input 90° Each pulse edge of INP A will be counted
	`quAd 4`	Quadrature input with pulse quadrupling INP A: count input 0° INP B: count input 90° Each pulse edge of INP A and INP B will be counted.

Multiplying factor

`FActor`	
`01.0000`	It can be set from 00.0001 up to 99.9999.
`99.9999`	The decimal point is set to 4 decimal places. „0" is not accepted!

Dividing factor

```
diUiso
```

```
01.0000
```
It can be set from 00.0001 up to 99.9999.

```
99.9999
```
The decimal point is set to 4 decimal places.
„0" is not accepted!

Decimal point

```
dP
```
The decimal point defines the way of displaying the count values. It does not affect counting.

```
0
```
0	no decimal place
0.0	one decimal place
0.00	two decimal places

```
0.000
```
0.000   three decimal places

SET/RESET Mode

```
rESnid
```

```
MAn.EL
```
manual reset via the red SET/RESET key and electrical reset via the SET/RESET input

```
no rES
```
no reset (red SET/RESET key and SET/RESET input locked)

```
EL rES
```
only electrical reset via the SET/RESET input

```
MAnrE
```
only manual reset via the red SET/RESET key

SET value

`SEtPt`

`000000`

`999999`

The device will be set to the set point by pressing the red SET/ RESET key or activating the SET/RESET input.
SET value -199999…999999 (number of decimal places depends on the decimal point option)

- For programming the decimal point see 4.6

End of programming

`EndPro`

`no`

The programming routine is repeated once more. The values set until now can be checked and modified.

`YES`

The programming routine will be left and all values set will be stored as new parameters. Afterwards the device is ready for operation.

Tachometer/Frequency meter Codix 522

(**Codix 524:** Operating mode frequency meter)

Description

- 6 digit frequency meter
- Red LED display, character height 8 mm
- Display range from 0 to 999 999
- Leading zeros suppression.
- Programming via two setting keys on the front side
- During programming, the display guides the user with text prompts
- Value conversion and display in 1/s or 1/min

- Optional optocoupler output

Inputs

- INP A
  - Dynamic count input.

Optocoupler output (optional)

- Active at f=0. Can be used e.g. to activate a „No operation" lamp.

Programming routine

- The programmable parameters of the device are described below, in the order in which they can be set.
- The device is fully programmed after one pass of the routine.

The first values stated correspond to the factor settings.

Polarity of the inputs

$InPoL$

nPn	npn: switching for 0 V
PnP	pnp: switching for $+U_B$

Switching on the 30 Hz filter

$FiLtEr$	The filter provides input damping*
oFF	30 Hz filter off (f_{max})
on	30 Hzfilter on

Multiplying factor

FActor

01.0000

It can be set from 00.0001 up to 99.9999.

99.9999

The decimal point is set to 4 decimal places.

„0" is not accepted!

Dividing factor

diUiso

00.0001

It can be set from 00.0001 up to 99.9999.

99.9999

The decimal point is set to 4 decimal places.

„0" is not accepted!

Decimal point

dP

The decimal point defines the resolution in the selected measuring range 1/min or 1/sec

0

0.000

0   no decimal place
0.0   one decimal place
0.00   two decimal places
0.000   three decimal places

Display mode

diSPn1

SEC -1

Value conversion and display in 1/s

Prin-1

Value conversion and display in 1/min

Max. time to wait until „0" is displayed

- This parameter indicates, how long it takes, when measuring is active, until „0" is displayed.

| LUAItO |

| 00.1 | Max. time to wait 00.1 s (min. value) |

| 99.9 | Max. time to wait 99.9 s |

End of programming

| EndPro |

| no | The programming routine is repeated once more. The values set until now can be checked and modified. |

| YES | The programming routine will be left and all values set will be stored as new parameters. Afterwards the device is ready for operation. |

Time meter Codix 523

(**Codix 524:** Operating mode time meter)

Description

- 6 digit time meter with SET/RESET function
- Red LED display, character height 8 mm
- Display range from 0 to 999 999
- Leading zeros suppression.
- **Operation indicator:** the decimal point of the lowest digit blinks while the count is active.
- Programming via two setting keys on the front side
- During programming, the display guides the user with text prompts
- Time meter operating modes
    - Counting while INP B is inactive (GAtE.Lo)
    - Counting while INP B is active (GatE.hi)
    - Count Start/Stop with INP B edge (Inb.Inb)
    - Count Start with INP A edge, count Stop with INP B edge (InA.Inb)

- Counting ranges h; min; s; h.min.s
- Optional optocoupler output

Inputs

- **INP A**
  - Start input (depending on the input mode chosen)
- **INP B**
  - Start/Stop or gate input (depending on the input mode chosen)

SET/RESET input

- Dynamic SET/RESET input. Linked in parallel to the red RESET key. Resets the counter to the predefined setting value.

Optocoupler output (optional)

- On active counting the output alternates at a frequency of 1 Hz between active and inactive.

Programming routine

- The programmable parameters of the device are described below, in the order in which they can be set. The device is fully programmed after one pass of the routine.

The first values stated correspond to the factor settings.

Polarity of the inputs

| InPoL |

| nPn | npn: switching for 0 V

| PnP | pnp: switching for $+U_B$

Switching on the 30 Hz filter
(INP A, INP B)

`FiLtEr`	The filter provides input damping*
`oFF`	30 Hz filter off Start/Stop inputs not damped
`on`	30 Hz filter on Start/Stop inputs damped for use with mechanical switches.

Input mode

`StArt`	
`GAtE.Lo`	Start/Stop via Inp B. counting while Inp B (Gate) not active or open
`GAtE.hi`	Start/Stop via Inp B counting while Inp B (Gate) active (High level with pnp; Low level with npn).
`Inb.Inb`	Count Start/Stop via INP B (LOW-HIGH edge with pnp; HIGH-LOW edge with npn). Every active edge changes the counter status.
`InA.Inb`	Count start via INP A, stop via INP B (LOW-HIGH edge with pnp; HIGH-LOW edge with npn).

Operating mode

`tPModE`	
`SEC`	Time unit: seconds (accuracy depending on position of the decimal point*)
`PMin`	Time unit: minutes (accuracy depending on position of the decimal point*)
`hour`	Time unit: hours (accuracy depending on position of the decimal point*)
`h.PMin.S`	Time units: Hours:Minutes:Seconds (decimal point setting is ignored)

- *0, 0.1, 0.01, 0.001 means: time measurement in 0, 0.1, 0.01, 0.001 time units

Decimal point

`dP`	The decimal point defines the resolution of the programmed time unit.
`0` `0.000`	0 no decimal place 0.0 one decimal place 0.00 two decimal places 0.000 three decimal places

SET/RESET mode

`rESnid`	
`MAn.EL`	manual reset via the red SET/RESET key and electrical reset via the SET/RESET input
`no rES`	no reset (red SET/RESET key and SET/RESET input locked)
`EL rES`	only electrical reset via the SET/RESET input
`MAnrE`	only manual reset via the red SET/RESET key

SET value

`SEtPt`	
`000000`	The device will be set to the set point by pressing the red SET/RESET key or activating the SET/RESET input.
`999999`	SET value 0 …999 999 or 99.59.59 (number of decimal places depends on the decimal point option)

End of programming

$EndPro$

| no | The programming routine is repeated once more. The values set until now can be checked and modified. |

| YES | The programming routine will be left and all values set will be stored as new parameters. Afterwards the device is ready for operation. |

Technical data

- **Supply voltage**
  - **DC power supply:** 10…30 V DC/max. 55 mA with inverse-polarity protection
- **Display:** 6 digits, red 7 segment
  - LED display, height 8 mm
- **Data retention:** EEPROM
- **Polarity of the inputs:** Programmable, npn or pnp for all inputs
- **Input resistance:** appr. 5 kOhm

Count frequency Codix 521:

Power supply DC:	24 V	12 V	10…30 V
Input Level:	Standard		5 V
typ. Low Level:	2.5 V	2.0 V	1.0 V
typ. High Level:	22.0 V	10 V	4.0 V
Fmax*:	kHz	kHz	kHz
CntDir	60	20	8
UpDown	25	15	8
Up.Up	25	15	8
Quad1	25	15	8
Quad2	25	15	8
Quad4	15	15	8

Count frequency Codix 522:

- Frequency measurement
- Accuracy <0.1 %
- Measuring principle:
    - **≤ 38 Hz:** period measurement
    - **> 38 Hz:** gating time measurement
    - gating time 26,3 ms

Power supply DC:	24 V	12 V	10…30 V
Input Level:	Standard		5 V
typ. Low Level:	2.5 V	2.0 V	1.0 V
typ. High Level:	22.0 V	10 V	4.0 V
Fmax*:	**kHz**	**kHz**	**kHz**
Tacho	60	20	8

Counting ranges Codix 523:

- **Seconds** 0.001 s…999999 s
- **Minutes** 0.001min…999999 min
- **Hours** 0.001 h…999999 h
- **h.min.s** 00 h 00 min 01 s
    - …99 h 59 min 59 s
- **Accuracy** <50 ppm

Minimum pulse length for the Reset input: 5 ms

Input sensitivity:

- **Standard sensitivity: Low:** 0…0.2 x UB [V DC]
    - **High:** 0.6 x UB…30 V DC
- **4…30 V DC level: Low:** 0…2 V DC
    - **High:** 4…30 V DC
- **Pulse shape:** any*, Schmitt-Trigger inputs

Optocoupler output (optional): NPN optocoupler with open collector and open emitter; max. switching performance: 30 V DC/10 mA

- **Ambient temperature:** -20…+65 °C at 10 … 26 V DC
    - -20…+55 °C at >26 … 30 V DC
- **Storage temperature:** –25…+70 °C

- **Altitude:** to 2000 m

1. **EMC:**
   - Interference resistance:
     - with shielded signal and control cables

Housing: For front panel mounting: 48 x 24 mm acc. to DIN 43700, RAL7021, dark grey

- **Weight:** appr. 50 g
- **Protection:** IP65 (front)
- **Cleaning:** The front of the units is to be cleaned only with a soft wet (water !) cloth.

Approvals

- UL compliant in accordance with
  - File no. E128604

CE compliant in accordance with

- **EMC Directive:** 2014/30/EU
- **RoHS Directive:** 2011/65/EU

UKCA compliant in accordance with

- **EMC Regulations S.I.:** 2016/1091
- **RoHS Regulations S.I.:** 2012/3032

Terminal assignment

- **PIN / without optocoupler**
  - **1** 10…30 V DC
  - **2** 0 V GND
  - **3** INP A
  - **4** INP B (Codix 522: n.c.)
  - **5** SET/RESET (Codix 522: n.c.)

- **PIN / with optocoupler**
  - **1** 10…30 V DC
  - **2** 0 V GND
  - **3** INP A
  - **4** INP B (Codix 522: n.c.)
  - **5** SET/RESET (Codix 522: n.c.)
  - **6** Emitter
  - **7** Collector

Delivery Includes

- 1 Digital display
- 1 Panel mounting clip
- 1 Bezel for screw mounting, panel cut out 50 x 25 mm
- 1 Bezel for clip mounting, panel cut out 50 x 25 mm
- 1 Seal
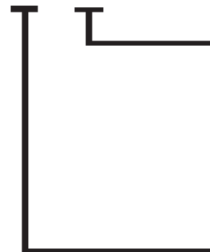- 1 Multilingual operating instructions

Ordering code

6.521.01X.3X0
6.522.01X.3X0
6.523.01X.3X0
6.524.01X.3X0

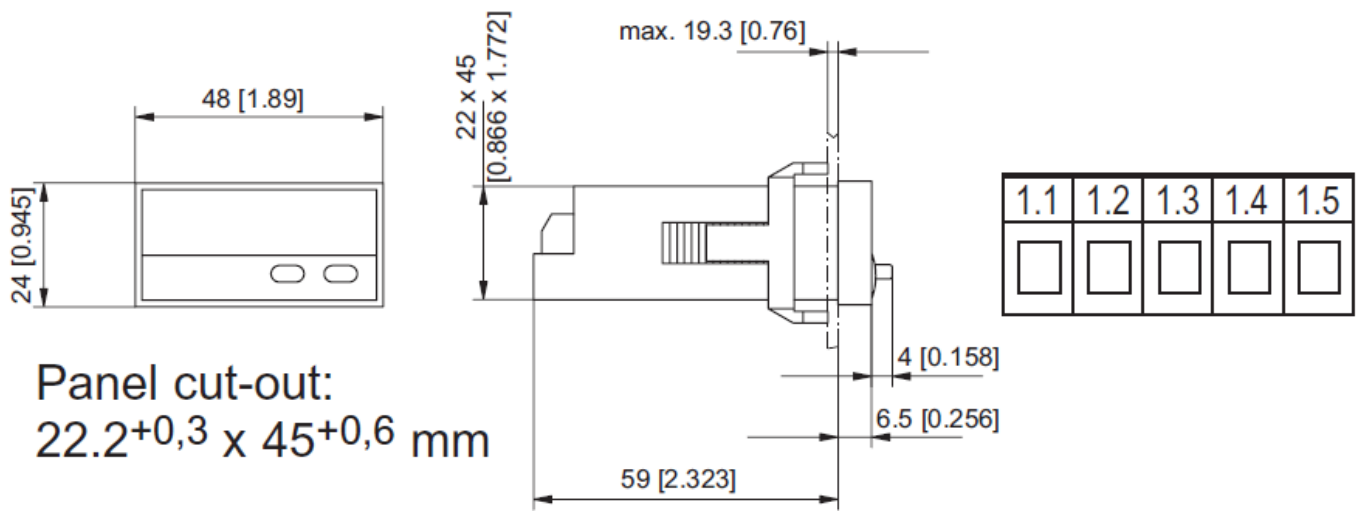Input sensitivity
0 = Standard sensitivity
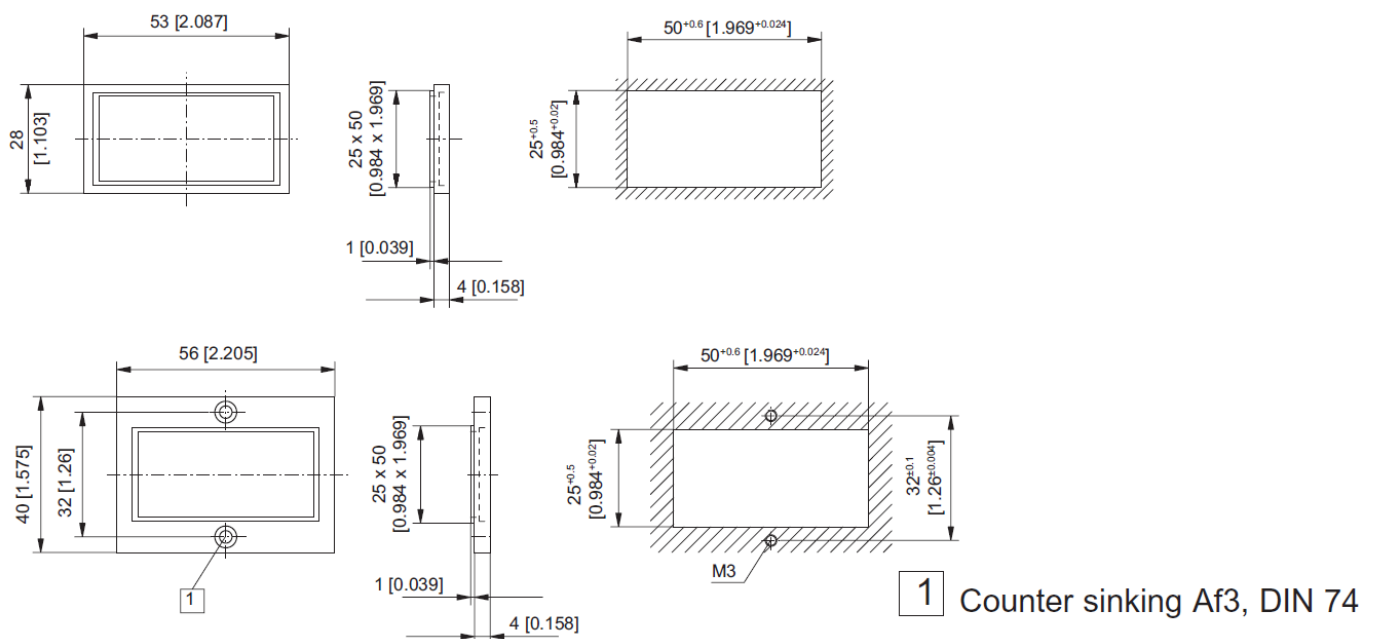A = 4…30 V DC level

Output
1 = Optocoupler output
2 = No output

Dimensions

max. 19.3 [0.76]

48 [1.89]

22 x 45
[0.866 x 1.772]

24 [0.945]

1.1	1.2	1.3	1.4	1.5
□	□	□	□	□

4 [0.158]

6.5 [0.256]

59 [2.323]

Panel cut-out:
22.2$^{+0,3}$ x 45$^{+0,6}$ mm

Front bezel

53 [2.087]

28 [1.103]

25 x 50
[0.984 x 1.969]

1 [0.039]

4 [0.158]

50$^{+0.6}$ [1.969$^{+0.024}$]

25$^{+0.5}$ [0.984$^{+0.02}$]

56 [2.205]

40 [1.575]

32 [1.26]

25 x 50
[0.984 x 1.969]

1 [0.039]

4 [0.158]

50$^{+0.6}$ [1.969$^{+0.024}$]

25$^{+0.5}$ [0.984$^{+0.02}$]

32$^{±0.1}$ [1.26$^{±0.004}$]

M3

1

[1] Counter sinking Af3, DIN 74

www.kuebler.com

Documents / Resources

References

- **User Manual**