trumeter
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# *Model 898X*

# *Model 899X*

**Electronic Preset Counter**
with two presets

022792-01 Issue 2.0 02/20

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## 1 Preface

Please read this instruction manual entirely and carefully before installation and start-up. Please observe all warnings and advice, both for your own safety and for general plant safety. If the device is not used in accordance with this instruction manual, then the intended protection can be impaired.

## 2 Safety instructions and Warnings

Please use the device only if its technical condition is perfect. It should be used only for its intended purpose.
Please bear in mind safety aspects and potential dangers and adhere to the operating instructions at all times.
Defective or damaged devices should be disconnected from the mains immediately and taken out of operation.
The device shall not be opened. Use the repair service of the manufacturer.
Only connect the device to the electricity networks provided to that purpose.
The safety of the system in which the device is integrated is the responsibility of the installer.
Disconnect all electricity networks prior to any installation or maintenance work.
Use exclusively cables approved in your country and designed for your temperature and power ranges.
Installation and service work shall be carried out exclusively by qualified personnel.
The device must compulsorily be protected with approved external fuses. The value of these fuses can be found in the technical information.

| | |
|---|---|
| ⚠ | This symbol is used on the device to remind of the existence of dangers, which are referred to in this manual. |

### 2.1 Use according to the intended purpose

The preset counter detects and measures pulses, times and frequencies up to max. 60 kHz and offers a wide variety of different operating modes. At the same time, the preset counter processes programmed presets. Use for any purpose over and beyond this will be deemed as not in accordance with its intended purpose and thus not complying with the requirements.

The application area for this device lies in industrial processes and controls, in the fields of manufacturing lines for the metal, wood, plastics, paper, glass, textile and other like industries. Over-voltages at the terminals of the device must be kept within the limits of over-voltage Category II.
The device must only be operated when mounted in a panel in the correct way and in accordance with the section “Technical Data”.

The device is not suitable for use in hazardous areas and for areas excluded in EN 61010 Part 1. If the device is used to monitor machines or processes in which, in the event of a failure of the device or an error made by the operator, there might be the risk of damaging the machine or causing an accident to the operators, it is your responsibility to take the appropriate safety measures.

The device has been designed for indoor operation. It may nevertheless be used outdoors, provided the technical data is adhered to. In this case, take care to provide suitable UV protection.

### 2.2 Mounting in a control panel

⚠ **CAUTION**

Mount the device away from heat sources and avoid direct contact with corrosive liquids, hot steam or similar.

Provide a free space of 10mm all around the device for its ventilation.

The device should be mounted so that the terminals are out of the reach of the operator and cannot be touched by him. When mounting the device, consider the fact that only the front side is classified as accessible for the operator.

**Mounting instructions**

1. Remove the mounting clip from the device.
2. Insert the device from the front into the panel cut-out, ensuring the front-panel gasket is correctly seated.
3. Slide the fixing clip from the rear onto the housing, until the spring clamps are under tension and the upper and lower latching lugs have snapped into place.

Note: *In case of proper installation, IP65 can be reached on the front side.*

## 2.3 Electrical Installation

**DANGER**

The device must be disconnected from any power supply prior to any installation or maintenance work. Make sure that no more voltages LIABLE TO CAUSE AN ELECTROCUTION are present.

AC-powered devices must only be connected to the low-voltage network via a switch or circuit breaker installed close to the device and marked as their disconnecting device.

Installation or maintenance work must only be carried out by qualified personnel and in compliance with the applicable national and international standards.

Take care to separate all extra-low voltages entering or exiting the device from hazardous electrical conductors by means of a double or reinforced insulation (SELV circuits).

**DANGER**

The device must be protected externally for its proper operation. Information about the prescribed fuses can be found in the technical information.

The relay outputs are not protected internally in the device. Without suitable protection of the relay outputs, undesired heat development or even fire may occur. The relay outputs must be protected externally by the manufacturer of the plant. It must also be made sure that, even in case of a malfunction, the values stated in the technical data are under no circumstances exceeded.

- During installation, make sure that the supply voltage and the wiring of the output contacts are both fed from the same mains phase, in order not to exceed the maximum permitted voltage of 250V.
- The cables and their insulation must be designed for the planned temperature and voltage ranges. Regarding the type of the cables, adhere to the applicable standards of the country and of the plant. The cross sections allowed for the screw terminals can be found in the technical data.
- Before starting the device, check the cables for proper wiring and tightening. The screws of unused screw terminals must be screwed to the stop, so that they cannot loosen and get lost.
- The device has been designed for overvoltage category II. If higher transient voltages cannot be excluded, additional protection measures must be taken in order to limit the overvoltage to the values of CAT II.

**Advice on noise immunity**

All connections are protected against external sources of interference. The installation location should be chosen so that inductive or capacitive interference does not affect the device or its connecting lines! Interference (e.g. from switch-mode power supplies, motors, clocked controllers or contactors) can be reduced by means of appropriate cable routing and wiring.

**Measures to be taken:**

Use only shielded cable and control lines. Connect shield at both ends. The conductor cross-section of the cables should be a minimum of 0.14 mm².
The shield connection to the equipotential bonding should be as short as possible and with a contact area as large as possible (low-impedance).
Only connect the shields to the control panel, if the latter is also earthed.
Install the device as far away as possible from noise-containing cables.
Avoid routing signal or control cables parallel to power lines.

## 2.4 Cleaning and maintenance

The front side of the unit should only be cleaned using a soft damp (water!) cloth. Cleaning of the embedded rear side is not planned and is the responsibility of the service personnel or of the installer.

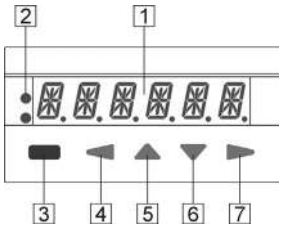
In normal operation, this device is maintenance-free. Should the device nevertheless not operate properly, it must be sent back to the manufacturer or to the supplier. Opening and repairing the device by the user is not allowed and can adversely affect the original protection level.

# 3 Description

6-digit 14-segment LED display, 14 mm
Help Text display
Preset counter with two relay outputs
Preset entry via the front keys or via the Teach-In function
Step or tracking preset
Pulse counter, Frequency meter, Timer or Hour meter
Preset-, Batch- or Total counter
Set function for pulse counter and timer

Multiplication and division factor
Averaging and Start Delay for frequency meter
Input modes:
Pulse counter: cnt.dir, up.dn, up.up, quad, quad2, quad4, A/B, (A-B)/Ax100%
Frequency meter: A, A – B, A + B, quad, A/B, (A-B)/Ax100%
Timer: FrErun, Auto, InpA.InpB, InpB.InpB
Output operations:
Add, Sub, AddAr, SubAr, AddBat, SubBat, AddTot, SubTot, Trail, TrailAr
4-stage RESET mode
3-stage keypad locking (Lock)
MPI input for Display Latch, Teach-In or Set function
Supply voltage 100 … 240 V AC ±10% or
10 ... 30 VDC

## 4 Display/Operating elements




| | |
|---|---|
| 1 | 6-digit LED display |
| 2 | Status display LED1 / LED2 |
| 3 | RESET key / ENTER key |
| 4 | Key LEFT |
| 5 | Key UP |
| 6 | Key DOWN |
| 7 | Key RIGHT |

## 5 Inputs

### 5.1 INP A, INP B

Signal inputs: function acc. to operating mode.
Max. frequency 60 kHz, can be damped in the programming menu to 30 Hz.

| | |
|---|---|
| Pulse counter: | Count inputs |
| Frequency meter: | Frequency inputs |
| Timer: | Start input or Start/Stop inputs |

### 5.2 RESET

Dynamic reset input: resets the pulse counter or timer to zero ('Add' output operations) or to preset value 2 ('Sub' output operations). The reset input can be inhibited in the programming menu.

| | |
|---|---|
| Pulse counter: | RESET input |
| Frequency meter: | no function |
| Timer: | RESET input |

### 5.3 GATE

Static gate input: function dependent on operating mode.

| | |
|---|---|
| Pulse counter: | no counting while active |
| Frequency meter: | no counting while active |
| Timer: | no time measurement while active |

### 5.4 LOC.INP

Static keypad lock input for preset or programming. Lock-out level can be set in the programming menu.

### 5.5 MPI 1 / MPI 2

User Input. Programmable as Display Latch, Set or Teach-In input.

## 6 Outputs

### 6.1 Output 1 / Output 2

Relays with potential-free changeover contacts.

### 6.2 Active Outputs

LED1 and LED2 indicate an active output.
For safety switching the relays can be inverted, i.e. the relays will be de-energized when the presets are reached. To do this, the parameters Pr.OUT1 and Pr. OUT2 must be set to ⌐L (for permanent signal) and to ⌐⌐ or ⌐⌐⌐ (for timed signal).

## 7 Programming

### 7.1 Entering the programming

| | |
|---|---|
| ▭◁▲▼▷ | Simultaneously press the UP key and the DOWN key for 3 sec. |
| PROG / NO | The security prompt appears alternately in the display |
| ■◁△▽▷ | Programming can be exited again using the ENTER key. |
| ▭◁▲▽▷ | Press the UP key or DOWN key to continue with the programming. |
| ▭◁△▼▷ | |

YES — The security prompt YES appears in the display

 — Enter the main menu by pressing the ENTER key

LANGU — The first menu item in the main menu appears in the display

When ending the programming via PROG. NO the counter contents are not reset.

## 7.2 Selecting the main menus

 — The main menus are selected using the UP and DOWN keys

INP1 — Indicated by LED1

## 7.3 Entering a sub-menu

 — Press the ENTER key. The first parameter is displayed with the current setting flashing.

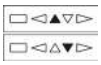
IN — Indicated by LED1 and LED2

## 7.4 Selecting the parameters

 — The parameters are selected using either the RIGHT key or the LEFT key.

## 7.5 Changing parameter values

 — Press the ENTER key.

 — Change the parameter value using the UP or DOWN keys.

 — Press the ENTER key. The new setting is again displayed flashing.

## 7.6 Setting count values

 — Press the ENTER key.

 — Select the decade using the RIGHT key or the LEFT key.

206489 ⇨ the corresponding decade flashes

 — Change the count value using the UP key or the DOWN key.

 — Press the ENTER key. The new setting is again displayed flashing.

## 7.7 Ending the programming

END.PRG NO — Select the menu item

 — Pressing the ENTER key acknowledges this prompt and allows the programming to be repeated. The previously-programmed values are preserved. These can now be checked or changed once again.

 — Pressing the UP key or the DOWN key selects the termination of the programming.

YES — The security prompt YES appears in the display

 — Pressing the ENTER key acknowledges this prompt and terminates the programming; the modified settings are saved in the EEPROM.

SAVE — The text SAVE is shown in the display for 2 sec.

When ending the programme via END.PRG. YES the counter contents are reset.

No count pulses, frequencies or times are detected or measured whilst programming is taking place.

## 7.8 Programming menu

Factory settings are highlighted in grey

### 7.8.1 Select language

LANGU — Submenu: Select language

HLP.TXT — **Help Text**

YES — Help Text ON

NO — Help Text OFF

english

SL.LANG **Select language for Help Text**

EN English

DE German (Deutsch)

When 'Help Text ON' is selected, a running text in English or German automatically appears after 3 sec. in the display. This provides an explanation of the menu item. Once a running text has started, it can be cancelled by pressing any key.

### 7.8.2 Setting the Basic Function

FUNCT. Submenu: Basic function

FUNCT. **Basic Function**

COUNT Pulse counter (7.8.3)

TIMER Timer/Hour meter (7.8.5)

TACHO Tacho/Frequency meter (7.8.4)

Changing the basic function causes all parameters to be reset to factory settings.

### 7.8.3 Pulse Counter

#### 7.8.3.1 Submenu for the Signal and Control inputs

INPUT Submenu for programming the signal and control inputs

INP.POL. **Input polarity**

PNP PNP: switching to Plus for all inputs in common

NPN NPN: switching to 0 V for all inputs in common

FILTER **Filter for signal inputs INP A and INP B**

OFF Maximum count frequency

ON Damped to approx. 30 Hz (for control with mechanical contacts)

CNT.INP. **Count Input mode** (See also under 15.)

CNT.DIR **Count/Direction control**
INP A: count input
INP B: count direction input

UP.IN **Differential counting [A – B]**
INP A: count input add
INP B: count input sub

UP.UP **Totalising [A + B]**
INP A: count input add
INP B: count input add

QUAD **Quadrature input**
INP A: count input 0°
INP B: count input 90°

QUAD2 **Quadrature with pulse doubling (x2)**
INP A: count input 0°
INP B: count input 90°
Each pulse edge of INP A will be counted

QUAD4 **Quadrature x4**
INP A: count input 0°
INP B: count input 90°
Each pulse edge of INP A and INP B will be counted.

A/B **Ratio measurement [A / B]**
INP A: count input A
INP B: count input B

A%oB **Percentage differential counting**
**[(A – B) / A in %]**
INP A: count input A
INP B: count input B

MP.INP.1 **User input 1**

MP.INP.2 **User input 2**

LATCH When the MPI input is activated the display is "frozen" and remains "frozen" until the MPI input is deactivated. Internally the preset counter continues counting.

TEACH When the MPI input is activated the current count value for the preset that has just been selected will be adopted as the new preset value. (See also 8.2.2)

SET When the MPI input is activated the preset counter will be set to the value specified in the parameter *SETPT*. (See also 8.3)

LOC.INP. **Lock input**

PROG. When the Lock input is activated, the programming is inhibited.

PRESET When the Lock input is activated, the setting of the preset values is inhibited.

PRG.PRE. When the Lock input is activated, the setting of the preset values and the programming are both inhibited.

#### 7.8.3.2 Submenu for Output operations

MODE Submenu for determining the operation of the outputs

MODE **Output operation**
(See also under 18.)

ADD **Count mode ADDING**
Outputs active when count status ≥ preset value
Reset to zero

SUB **Count mode SUBTRACTING**
Output 1 active when count status ≤ preset value 1
Output 2 active when count status ≤ 0
Reset to preset 2

ADD.AR **Count mode ADDING with automatic reset**
Output 1 active when count status ≥ preset value 1
Output 2 (timed signal) active when count status = preset value 2
Automatic reset to zero when count status = preset value 2
Reset to zero

SUB.AR **Count mode SUBTRACTING with automatic reset**
Output 1 active when count status ≤ preset value 1
Output 2 (timed signal) active when count status = 0
Automatic reset to preset 2 when count status = 0
Reset to preset 2

ADD.BAT **Count mode ADDING with automatic reset and Batch counter**
Output 2 (timed signal) active when main counter = preset value 2
Automatic reset to zero when main counter = preset 2
Batch counter counts the number of automatic repetitions of preset 2
Output 1 active when Batch counter ≥ preset 1
Manual reset sets both counters to zero.
Electrical reset sets only the main counter to zero.

SUB.BAT **Count mode SUBTRACTING with automatic reset and Batch counter**
Output 2 (timed signal) active when main counter = zero
Automatic reset to preset 2 when main counter = zero
Batch counter counts the number of automatic repetitions of preset 2
Output 1 active when Batch counter ≥ preset 1
Manual reset sets main counter to preset value 2 batch counter to zero
Electrical reset only sets the main counter to preset value 2

ADD.TOT **Count mode ADDING with automatic reset and Total counter**
Output 2 (timed signal) active when main counter = preset value 2
Automatic reset to zero when main counter = preset value 2
Total counter counts all the count pulses from the main counter
Output 1 active when total counter ≥ preset value 1
Manual Reset sets both counters to zero
Electrical reset sets only the main counter to zero

SUB.TOT **Count mode SUBTRACTING with automatic reset and Total counter**
Output 2 (timed signal) active when main counter = zero
Automatic reset to preset value 2 when main counter = zero
Total counter counts (sub from preset value 1) all count pulses from main counter
Output 1 active when Total counter ≤ zero
Manual reset sets both counters to the preset values
Electrical reset sets only main counter to preset value 2

TRAIL **Tracking Preset mode**
When preset 2 is changed then preset 1 automatically tracks it.
Reset to zero
Preset 1 relative to Preset 2

TR.AR **Tracking Preset mode with automatic reset**

When preset 2 is changed then preset 1 automatically tracks it.
Reset to zero.
Automatic reset to zero when main counter = preset value 2.
Preset 1 relative to Preset 2

#### 7.8.3.3 Submenu for configuration

CONFIG. Submenu for matching the input pulses to the display.

FACTOR 0 1.0000 **Multiplication factor**
can be programmed from 00.0001 to 99.9999 The setting 00.0000 will not be accepted.

DIVISO 0 1.0000 **Division factor**
can be programmed from 01.0000 to 99.9999
A setting < 01.0000 will not be accepted.

DP 0 **Decimal point setting**
(only optical function)

| | |
|---|---|
| 0 | no decimal place |
| 0.0 | 1 decimal place |
| 0.00 | 2 decimal places |
| 0.000 | 3 decimal places |
| 0.0000 | 4 decimal places |
| 0.00000 | 5 decimal places |

SETPT 000000 **Set value**
Set value can be programmed from -999999 to 999999
A previously programmed decimal point will be displayed

#### 7.8.3.4 Submenu for reset mode

RESMOD Submenu for setting the reset mode

RESMOD MANEL **Reset mode**
Manual reset (reset key) and electrical reset (reset input)

NO.RES No reset possible
(reset key and reset input inhibited)

EL.RES Only electrical reset possible
(reset input)

MAN.RES Only manual reset possible
(reset key)

**Electrical Reset:**
Always resets only the main counter.

**Manual Reset:**
Resets the main counter (ACTUAL) and auxiliary counters (BATCH or TOTAL), if the value of the main counter or the value of an auxiliary counters is shown on the display.

#### 7.8.3.5 Preset 1

see below 7.9.5.5

#### 7.8.3.6 Preset 2

see below 7.9.5.6

### 7.8.4 Tacho/Frequency meter

#### 7.8.4.1 Submenu for the Signal and Control inputs

INPUT Submenu for programming the signal and control inputs

INP.POL. **Input polarity**

PNP PNP: switching to Plus for all inputs in common

NPN NPN: switching to 0 V for all inputs in common

FILTER **Filter for signal inputs INP A and INP B**

OFF maximum count frequency

ON Damped to approx. 30 Hz (for control with mechanical contacts)

TAC.INP. **Input mode Frequency measurement**
(see also under 17.)

A **Simple frequency measurement**
INP A: Frequency input
INP B: no function

A-B **Differential measurement [A – B]**
INP A: Frequency input A
INP B: Frequency input B

A+B **Total measurement [A + B]**
INP A: Frequency input A
INP B: Frequency input B

QUAD **Frequency measurement with direction detection [Quad]**
INP A: Frequency input 0°
INP B: Frequency input 90°

A/B **Ratio measurement [A / B]**

INP A: Frequency input A
INP B: Frequency input B

A%oB **Percentage differential measurement [(A-B) / A in %]**
INP A: Frequency input A
INP B: Frequency input B

MP.INP.1 **User input 1**
MP.INP.2 **User input 2**

LATCH When the MPI input is activated the display is “frozen” and remains “frozen” until the MPI input is deactivated.
Internally the frequency meter continues running
(Display store).

TEACH When the MPI input is activated the current frequency for the preset that has just been selected will be adopted as the new preset value.
(See also 8.2.2)

LOC.INP **Lock input**

PROG When the Lock input is activated the programming is inhibited

PRESET When the Lock input is activated the setting of the preset values is inhibited.

PRG.PRE When the Lock input is activated the setting of the preset values and the programming are both inhibited

#### 7.8.4.2 Submenu for configuration

CONFIG Submenu for matching the input pulses to the display.

FACTOR 01.0000 **Multiplication factor**
can be programmed from 00.0001 to 99.9999 .The setting 00.0000 will not be accepted

DIVISO 01.0000 **Division factor**
can be programmed from 01.0000 to 99.9999
A setting < 01.0000 will not be accepted.

TMODE **Display mode**
SEC-1 Calculation and display of the frequency / speed in 1/sec

MIN-1 Calculation and display of the frequency / speed in 1/min

DP 0 **Decimal point setting**
(determines the resolution)
0 no decimal place
0.0 1 decimal place
0.00 2 decimal places
0.000 3 decimal places

AVG OFF **Moving average**
Moving average calculated
AVG 2 over 2 measurements
AVG 5 over 5 measurements
AVG 10 over 10 measurements
AVG 20 over 20 measurements

START 00.0 **Start delay**
Programmable from 00.0 up to 99.9 sec.
At the start of a measurement the measurement results within this time-period are ignored.

WAIT 0 00.1 **Waiting time**
Programmable from 00.1 up to 99.9 sec.
This value specifies how much time should elapse, after the last valid edge, before zero is to be displayed.

#### 7.8.4.3 Preset 1

See below 7.9.5.5

#### 7.8.4.4 Preset 2

See below 7.9.5.6

### 7.8.5 Timer

#### 7.8.5.1 Submenu for the Signal and Control inputs

INPUT Submenu for programming the signal and control inputs

INP.POL **Input polarity**
PNP PNP: switching to Plus for all inputs in common

NPN NPN: switching to 0 V for all inputs in common

FILTER **Filter for signal inputs INP A and INP B**

OFF for electronic control of the signal inputs

ON for mechanical control of the signal inputs (for control with mechanical contacts)

START **Input mode Time measurement**
(see also under 16.)

INA.INB Start: Edge to INP A
Stop: Edge to INP B

INB.INB Start: 1. Edge to INP B
Stop: 2. Edge to INP B

FREERUN Timing can only be controlled via the Gate input. INP A and INP B have no function.

AUTO The timer is reset by means of a RESET (to zero when adding, to preset 2 when subtracting) and then starts timing again. Timing is stopped with adding operations when preset 2 is reached. Timing is stopped with subtracting operations when zero is reached. A RESET during the timing process also causes this to stop. .
INP A and INP B: no function.

With AUTO: no output operations with automatic repeat.

MP.INP.1 **User input 1**

MP.INP.2 **User input 2**

LATCH When the MPI input is activated the display is “frozen” and remains “frozen” until the MPI input is deactivated.
Internally the preset timer continues counting.

TEACH When the MPI input is activated the current count value for the preset that has just been selected will be adopted as the new preset value.
(See also under 8.2.2)

SET When the MPI input is activated the preset counter will be set to the value specified in the parameter *SETPT*. (See also under 8.3)

LOC.INP. **Lock input**

PROG. When the Lock input is activated the programming is inhibited

PRESET When the Lock input is activated the setting of the preset values is inhibited.

PRG.PRE. When the Lock input is activated the setting of the preset values and the programming is both inhibited.

#### 7.8.5.2 Submenu for output operations

MODE Submenu for determining the operation of the outputs

MODE **Output operation**
(See also under 18.)

ADD **Count mode ADDING**
Outputs active when count status ≥ preset value
Reset to zero

SUB **Count mode SUBTRACTING**
Output 1 active when
count status ≤ preset value 1
Output 2 active when
count status ≤ 0
Reset to preset 2

ADD.AR **Count mode ADDING with automatic reset**
Output 1 active when count status ≥ preset value 1
Output 2 (timed signal) active when count status = preset value 2
Automatic reset to zero when count status = preset value 2
Reset to zero

SUB.AR **Count mode SUBTRACTING with automatic reset**
Output 1 active when count status ≤ preset value 1
Output 2 (timed signal) active when count status = 0
Automatic reset to preset 2 when count status = 0
Reset to preset 2

ADD.BAT **Count mode ADDING with automatic reset and Batch counter**
Output 2 (timed signal) active when main counter = preset value 2
Automatic reset to zero when main counter = preset 2
Batch counter counts the number of automatic repetitions of preset 2
Output 1 active when Batch counter ≥ preset 1
Manual reset sets both counters to zero.
Electrical reset sets only the main counter to zero.

SUB.BAT **Count mode SUBTRACTING with automatic reset and Batch counter**
Output 2 (timed signal) active when main counter = zero
Automatic reset to preset 2 when

main counter = zero
Batch counter counts the number of automatic repetitions of preset 2
Output 1 active when batch counter ≥ Preset 1

Manual reset sets main counter to preset value 2 and batch counter to zero
Electronic reset only sets the main counter to preset value 2

ADDTOT **Count mode ADDING with automatic reset and Total counter**
Output 2 (timed signal) active when main counter = preset value 2
Automatic reset to zero when main counter = preset value 2
Total counter counts all the count pulses from the main counter
Output 1 active when total counter ≥ preset value 1
Manual Reset sets both counters to zero
Electrical reset sets only the main counter to zero

SUBTOT **Count mode SUBTRACTING with automatic reset and Total counter**
Output 2 (timed signal) active when main counter = zero
Automatic reset to preset value 2 when main counter = zero
Total counter counts (sub from preset value 1) all count pulses from main counter
Output 1 active when Total counter ≤ zero
Manual reset sets both counters to the preset values
Electrical reset sets only main counter to preset value 2

TRAIL **Tracking Preset mode**
When preset 2 is changed then preset 1 automatically tracks it.
Reset to zero
Preset 1 relative to Preset 2

TRAP **Tracking Preset mode with automatic reset**
When preset 2 is changed then preset 1 automatically tracks it.
Reset to zero.
Automatic reset to zero when main counter = preset value 2.
Preset 1 relative to Preset 2

#### 7.8.5.3 Submenu for configuration

CONFIG Submenu for matching the input pulses to the display.



T.MODE **Unit of time**
SEC **Seconds**
Decimal point setting determines the resolution

MIN **Minutes**
Decimal point setting determines the resolution

HOUR **Hours**
Decimal point setting determines the resolution

HH.MM.SS **Hrs. Min. Sec.**

DP **Decimal point setting**
0 (determines the resolution)

| | |
|---|---|
| 0 | no decimal place |
| 0.0 | 1 decimal place |
| 0.00 | 2 decimal places |
| 0.000 | 3 decimal places |

SETPT **Set value**
000000
Set value can be programmed from 000000 to 999999
A previously programmed decimal point will be displayed

#### 7.8.5.4 Submenu for reset mode

RESMOD Submenu for setting the reset mode

RESMOD **Reset mode**
MANEL Manual reset (reset key) and electrical reset (reset input)

NORES No reset possible (reset key and reset input inhibited)

ELRES Only manual reset possible (reset key)

MANRES Only manual reset possible (reset key)

**Electrical Reset:**
Always resets only the main counter.

**Manual Reset:**
Resets the main counter (ACTUAL) and auxiliary counters (BATCH or TOTAL), if the value of the main counter or the value of an auxiliary counters is shown on the display.

#### 7.8.5.5 Submenu for Preset 1

Submenu Preset 1

**Preset 1 ON/OFF**

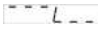
Preset 1 ON



Preset 1 OFF and no function

**Output signal**


ADD mode output operations: permanent signal at Output 1, becomes active when count ≥ Preset 1
SUB mode output operations: permanent signal at Output 1, becomes active when count ≤ Preset 1


ADD mode output operations: permanent signal at Output 1, becomes passive when count ≥ Preset 1
SUB mode output operations: permanent signal at Output 1, becomes passive when count ≤ Preset 1


ADD mode output operations: timed signal at Output 1, becomes active when count ≥ Preset 1. (Activation only in positive direction)
SUB mode output operations: timed output at Output 1, becomes active when count ≤ Preset 1 (Activation only in negative direction)


ADD mode output operations: timed signal at Output 1, becomes passive when count ≥ Preset 1. (Deactivation only in positive direction)
SUB mode output operations: timed output at Output 1, becomes passive when count ≤ Preset 1. (Deactivation only in negative direction)


ADD mode output operations: timed signal at Output1, becomes active with positive direction and when count ≥ Preset 1 and subsequently active with negative direction and when count ≤ Preset 1
SUB mode output operations: timed signal at Output 1, becomes active with negative direction and when count ≤ Preset 1 and subsequently active with positive direction and when count ≥ Preset 1


ADD mode output operations: timed signal at Output1, becomes passive with positive direction and when count ≥ Preset 1 and subsequently passive with negative direction and when count ≤ Preset 1
SUB mode output operations: timed output at Output 1, becomes passive with negative direction and when count ≤ Preset 1 and subsequently passive with positive direction and when count ≥ Preset 1

**Duration of timed signal of Output 1**

programmable from 00.01 to 99.99 sec.
Timed signal is post-triggered

#### 7.8.5.6 Submenu for Preset 2

**Output signal**


ADD mode output operations: permanent signal at Output 2, becomes active when count ≥ Preset 2
SUB mode output operations: permanent signal at Output 2, becomes active when count ≤ zero


ADD mode output operations: permanent signal at Output 2, becomes passive when count ≥ Preset 2
SUB mode output operations: permanent signal at Output 2, becomes passive when count ≤ zero


ADD mode output operations: timed signal at Output 2, becomes active when count ≥ Preset 2 (Activation only in positive direction).
SUB mode output operations: timed signal at Output 2, becomes active when count ≤ zero (Activation only in negative direction)


ADD mode output operations: timed signal at Output 2, becomes passive when count ≥ Preset 2 (Deactivation only in positive direction)
SUB mode output operations: timed signal at Output 2,

becomes passive when count ≤ zero (Deactivation only in negative direction).

ADD mode output operations: timed signal at Output 2, becomes active with positive direction and when count ≥ Preset 2 and subsequently with negative direction and when count ≤ Preset 2
SUB mode output operations: timed signal at Output 2, becomes active with negative direction and when count ≤ zero and subsequently with positive direction and when count ≥ zero

ADD mode output operations: timed signal at Output 2, becomes passive with positive direction and when count ≥ Preset 2 and subsequently with negative direction and when count ≤ Preset 2
SUB mode output operations: timed signal at Output 2, becomes passive with negative direction and when count ≤ zero and subsequently with positive direction and when count ≥ zero

**Duration of timed signal of Output 2**

programmable from 00.01 to 99.99 sec.
Timed signal is post-triggered

Active:
Relays are activated when the preset value is reached.
Passive:
Relays becomes de-energized when the preset value is reached.

Timed outputs that have started are not aborted by a RESET.

# 8 Operation

## 8.1 Switching the display during operation

t = 2 sec

Pressing the DOWN key or the UP key once causes the name of the currently selected display function to be displayed for 2 sec. If within this time the DOWN key or the UP key is pressed a second time, then the display switches to the next or previous display function. This is confirmed by displaying the new name for a period of 2 sec. After 2 sec the count value that corresponds to the selected display function is displayed.

Main counter



Batch counter

Total counter



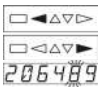
Preset 1

Preset 2

## 8.2 Setting the presets

### 8.2.1 Setting via front keys

Using the UP key or the DOWN key, select the preset to be changed, either PRES1 or PRES2 (see 8.1).



Select the decade using the RIGHT key or the LEFT key.

⇨ the corresponding decade flashes

Set the count value using the UP key or the DOWN key.

The new setting is accepted either by pressing the ENTER key or after a period of 2 sec.

Preset setting is inhibited if the lock function for the presets is active (Parameter LOC.INP set to PRESET or PRG.PRE and keypad lock input LOCK active).

### 8.2.2 Teach Function

1. In the programming menu, programme MPI input 1 or MPI input 2 (MP.INP.1 / MP.INP.2) to ***TEACH***
2. In operating mode, select the preset to be changed: PRES1 or PRES2
3. In operating mode, briefly activate MPI input 1 or MPI input 2 (NPN or PNP input logic)

⇨ the current count value will be adopted as the new preset value

See also 9. Error messages.

The preset value can subsequently be further modified via the keypad. If preset entry is inhibited (see note 8.2.1), then the Teach Function is also locked out.

### 8.2.3 Teach-In with tracking presets

If a tracking (trailing) preset (TRAIL or TR.AR) has been programmed, the value for Preset 2 can be set either via the keypad or via the Teach-In function.
However the value for Preset 1 must be entered via the keypad. In this instance, it is not possible to use the Teach-In function.
.

With output operations ADD.BAT, SUB.BAT, ADD.TOT, SUB.TOT, TRAIL and TR.AR, the Teach-In function is not available for Preset 1.

## 8.3 Set Function

The pulse counter and the timer can be set to a value by means of the Set function.

1. In the programming menu, programme MPI Input 1 or MPI Input 2 (MP.INP1 / MP.INP2) to ***SET***
2. In the programming menu, set the parameter ***SETPT*** to the desired value
3. In operating mode, briefly activate MPI input 1 or MPI input 2 (NPN or PNP input logic)

⇨ For add. output operations the pulse counter or timer will be set to the ***SETPT*** value

⇨ For sub. output operations the pulse counter or timer will be set to the difference between the value of Preset 2 and the value of ***SETPT***

See also 9. Error messages

## 8.4 Default Parameters

Note: Three default parameter sets have been permanently stored; these can be adapted as required. With each acknowledgment of the parameter sets, all parameters will be reset to the values listed in the table.

### 8.4.1 Entry into the default setting


Simultaneously press the UP key and the DOWN key for 3 sec.

The security prompt appears in the display


Programming can be exited again using the ENTER key.

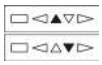

Press the UP key or the DOWN key to continue with the programming.

The security prompt YES appears in the display


Enter the default menu by pressing the ENTER key

The parameter set last programmed appears in the display

### 8.4.2 Selecting the parameter sets


The parameter sets are selected using the UP key and the DOWN key.

Default parameter set 1
Default parameter set 2
Default parameter set 3

### 8.4.3 Accepting the setting


Pressing the ENTER key accepts the current setting and returns to the operating mode.

The text SAVE is shown in the display for 2 sec.

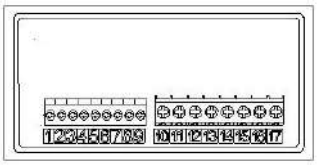
### 8.4.4 Parameter Set Table

| | P.SET1 | P.SET2 | P.SET3 |
|---|---|---|---|
| **HLP.TXT.** | ON | ON | ON |
| **SL.LANG.** | EN | EN | EN |
| **FUNCT** | COUNT | COUNT | COUNT |
| **INP.POL.** | PNP | PNP | PNP |
| **FILTER** | ON | OFF | OFF |
| **COUNT** | CNT.DIR | UP.DN | QUAD |
| **MP.INP.1** | LATCH | LATCH | SET |
| **MP.INP.2** | TEACH | SET | TEACH |
| **LOC.INP.** | PROG | PROG | PROG |
| **MODE** | ADD | SUB | TRAIL |
| **FACTOR** | 01.0000 | 01.0000 | 01.0000 |
| **DIVISO.** | 01.0000 | 01.0000 | 01.0000 |
| **DP** | 0 | 0 | 0.00 |
| **SETPT.** | 000000 | 000000 | 0000.00 |
| **RES.MOD.** | MAN.EL | MAN.EL | MAN.EL |
| **PRES.1** | ON | ON | ON |
| **PR.OUT1** | ⎍ | ⎍ | ⎍ |
| **T.OUT1** | | 00.10 | |
| **PR.OUT2** | ⎍ | ⎍ | ⎍ |
| **T.OUT2** | | 00.10 | 00.10 |

## 9 Error Message

| | |
|---|---|
| Err 1 | Set value ≤ 0 not allowed |
| Err 2 | Set value ≥ Preset 2 not allowed |
| Err 3 | negative Teach-In value for Preset 1 not permitted |
| Err 4 | Zero or negative Teach-In value for Preset 2 not permitted |
| Err 45 | EEPROM error |

## 10 Connections



### 10.1 Signal and Control Inputs

| N° | Designation | Function |
|---|---|---|
| 1 | INP A | Signal input A |
| 2 | INP B | Signal input B |
| 3 | RESET | Reset input |
| 4 | LOCK | Keypad lock |
| 5 | GATE | Gate input |
| 6 | MPI 1 | User input 1 |
| 7 | MPI 2 | User input 2 |
| 8 | AC: 24 VDC/80 mA<br>DC: $U_B$ connected through | Sensor supply voltage |
| 9 | GND (0 VDC) | Common connection Signal and Control inputs |

### 10.2 Supply Voltage and Outputs

| N° | Designation | Function |
|---|---|---|
| 10 | Relay contact C.2 | Output 2 |
| 11 | Relay contact N.O.2 | |
| 12 | Relay contact N.C.2 | |
| 13 | Relay contact C.1 | Output 1 |
| 14 | Relay contact N.O.1 | |
| 15 | Relay contact N.C.1 | |
| 16 | AC: 100…240 V AC ±10% N~<br>DC: 10..30 VDC | Supply voltage |
| 17 | AC: 100…240 V AC ±10% L~<br>DC: GND (0 VDC) | Supply voltage |

## 11 Technical Data

### 11.1 General Data

| | |
|---|---|
| Display | 6-digit, 14-segment LED |
| Digit height | 14 mm |
| Overload/ Underload | Blinking, 1 sec., counter loses no pulses up to 1 decade |
| Data retention | > 10 years, EEPROM |
| Operation | 5 keys |

### 11.2 Pulse Counter

Count frequency max. 55 kHz (see under 14. Frequencies - typical)

Response time of the outputs:

| | |
|---|---|
| Add;Sub;Trail | < 13 ms |
| With automatic repeat | < 13 ms |
| A/B; (A-B)/A | < 34 ms |

### 11.3 Tacho/Frequency Meter

| | |
|---|---|
| Frequency range | 0.01 Hz to 65 kHz (see under 14. Frequencies typ. |
| Measuring principle | ≤ 76.3 Hz Time interval (Period measurement)<br>> 76.3 Hz Gate time<br>Gate time approx. 13.1 ms |
| Measuring error | < 0.1% per channel |
| Response time of the outputs: | |
| 1-channel operation | < 100 ms @ 40 kHz<br>< 350 ms @ 65 kHz |
| 2-channel operation | < 150 ms @ 40 kHz<br>< 600 ms @ 65 kHz |

### 11.4 Timer

| | |
|---|---|
| Seconds | 0.001 sec ... 999 999 sec |
| Minutes | 0.001 min ... 999 999 min |
| Hours | 0.001 hrs … 999 999 hrs |
| Hrs.Min.Sec | 00hrs.00min.01sec ...<br>99hrs.59min.59sec |
| Min. time measurable | 500µs |
| Measuring error | < 100 ppm |
| Output response time: | < 13 ms |

### 11.5 Signal and Control Inputs

SELV circuits, reinforced / double insulation

| | | |
|---|---|---|
| Polarity: | programmable NPN/PNP<br>for all inputs in common | |
| Input resistance | 5 kΩ | |
| Pulse shape | any | |
| Switching level with AC supply: | | |
| HTL level | Low: | 0 ... 4 VDC |
| | High: | 12 ... 30 VDC |
| 4…30 V DC level | Low: | 0 ... 2VDC |
| | High: | 3.5 … 30 VDC |
| Switching level with DC supply: | | |
| HTL level | Low: | 0 ... 0,2 x $U_B$ |
| | High: | 0.6 x $U_B$ ... 30 VDC |
| 4…30 V DC level | Low: | 0 ... 2 VDC |
| | High: | 3.5 ... 30 VDC |

Minimum pulse length of the Reset input: 1 ms
Minimum pulse length of the Control inputs:10 ms

### 11.6 Outputs

**Output 1 / Output 2**

Relays with changeover contacts

| | |
|---|---|
| Prescribed fuse: | 3A |
| Switching voltage | max. 250 V AC/ 150 V DC |
| Switching current | max. 3 A AC/ DC<br>min. 30 mA DC |
| Switching capacity | max. 750 VA/ 90 W |

⚠ The maximum values shall in no case be exceeded!

| | |
|---|---|
| Mechanical service life (switching cycles) | $20x10^6$ |
| N° of switching cycles at 3 A/ 250 V AC | $5x10^4$ |
| N° of switching cycles at 3 A/ 30 V DC | $5x10^4$ |

### 11.7 Supply Voltage

| | |
|---|---|
| AC supply: | 100 ... 240 V AC / max. 11 VA<br>50/60 Hz, Tolerance ± 10%<br>ext. fuse protection: T 0.1 A |
| DC supply: | 10 ... 30 V DC/ max. 5.5 W<br>reverse polarity protection,<br>SELV, CLASS II (Limited Power Source)<br>ext. fuse protection T 0.25 A |

### 11.8 Sensor Supply Voltage

(Voltage output for external sensors)
SELV circuits, reinforced / double insulation

| | |
|---|---|
| for AC supply: | 24 V DC ±15%, 80 mA |
| for DC supply: | max. 80 mA, ext. voltage supply is connected through |

### 11.9 Climatic Conditions

| | |
|---|---|
| Operating temperature: | -20°C … +65°C |
| Storage temperature: | -25°C … +75°C |
| Relative humidity: R.H. | 93% at +40°C,<br>Non-condensing |
| Altitude: | up to 2000 m |

### 11.10 EMC

| | |
|---|---|
| Noise immunity: | EN 61000-6-2<br>with shielded signal and control cables |
| Noise emission: | EN 55011 Class B |

### 11.11 Device Safety

| | |
|---|---|
| Design to: | EN 61010 Part 1 |
| Protection Class: | Protection Class 2 (front side) |

⚠ Only the front side is classified as accessible for the operator.

| | |
|---|---|
| Application area: | Pollution level 2<br>over-voltage Category II |
| Insulation: | Front: double insulation,<br>Rear side: basic insulation, |

Signal inputs and und sensor power supply: SELV

### 11.12 Mechanical Data

| | |
|---|---|
| Housing: | Panel-mount housing<br>to DIN 43 700, RAL 7021 |
| Dimensions: | 96 x 48 x 102 mm |
| Panel cut-out: | $92^{+0,8}$ x $45^{+0,6}$ mm |
| Installation depth: | ca. 92 mm incl. terminals |
| Weight: | ca. 180 g |
| Protection: | IP65 (front, device only) |
| Housing material: | Polycarbonate UL94 V-2 |
| Vibration resistance: | 10 - 55 Hz / 1 mm / XYZ |
| EN 60068-2-6 | 30 min. in each direction |
| Shock resistance: | |
| EN 60068-2-27 | 100G / 2 ms / XYZ<br>3 times in each direction |
| EN 60068-2-29 | 10G / 6 ms / XYZ<br>2000 times in each direction |

## 11.13 Connections

Supply voltage and outputs:
Plug-in screw terminal, 8-pin, RM 5.00
Core cross - section, max. 2.5 mm²

Signal and control inputs:
Plug-in screw terminal, 9-pin, RM 3.50
Core cross - section, max. 1.5 mm²

## 12 Scope of Delivery

Preset counter
Mounting clip
Instruction manual

## 13 Ordering Codes

89XX-X

- Interface
  1 = None
  5 = RS485
- Supply voltage
  0 = 10 … 30 V DC
  1 = 100 … 240 V AC ± 10%
- Input trigger levels
  8 = 4 … 30 V DC level
  9 = HTL level

## 14 Frequencies (typical)

**NOTE: Switching levels of the inputs**

Switching levels with AC supply:

| | | |
|---|---|---|
| HTL level | Low: | 0 …4 V DC |
| | High: | 12 … 30 V DC |
| 4 … 30 V DC level | 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 level | Low: | 0 … 2 V DC |
| | High: | 3.5 … 30 V DC |

### 14.1 Pulse Counter

**HTL level, signal shape square wave 1:1**

| | | |
|---|---|---|
| AC supply | typ. Low | 2.5 V |
| | typ. High | 22 V |
| DC supply 12V | typ. Low | 2 V |
| | typ. High | 10 V |
| DC supply 24V | typ. Low | 2.5 V |
| | typ. High | 22 V |

| | **Add Sub Trail** | **AddAr SubAr AddBat SubBat TrailAr** | **AddTot SubTot** |
|---|---|---|---|
| Cnt.Dir | 55 kHz | 2.6 kHz | 2.5 kHz |
| Up.Dn ; Up.Up | 29 kHz | 2.6 kHz | 2.5 kHz |
| Quad ; Quad 2 | 28 kHz | 1.2 kHz | 1.1 kHz |
| Quad 4 | 18 kHz | 1.1 kHz | 0.8 kHz |
| A/B ; (A-B)/A | 29 kHz | | |

**4…30 V DC level, signal shape square wave 1:1**

| | |
|---|---|
| typ. Low | 1.0 V |
| typ. High | 4.0 V |

| | **Add Sub Trail** | **AddAr SubAr AddBat SubBat TrailAr** | **AddTot SubTot** |
|---|---|---|---|
| Cnt.Dir | 9 kHz | 2.5 kHz | 2.2 kHz |
| Up.Dn ; Up.Up | 9 kHz | 2.5 kHz | 2.2 kHz |
| Quad ; Quad 2 | 9 kHz | 1.1 kHz | 1.1 kHz |
| Quad 4 | 9 kHz | 1.1 kHz | 0.9 kHz |
| A/B ; (A-B)/A | 9 kHz | | |

### 14.2 Frequency Meter

**HTL level, signal shape square wave 1:1**

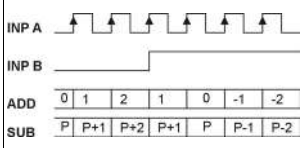
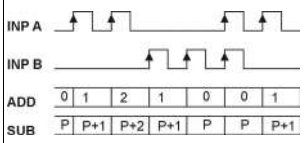
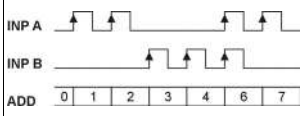
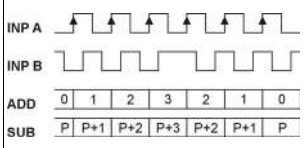
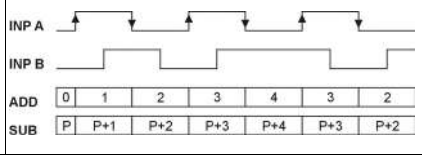
| | | |
|---|---|---|
| AC supply | typ. Low | 2.5 V |
| | typ. High | 22 V |
| DC supply 12V | typ. Low | 2 V |
| | typ. High | 10 V |
| DC supply 24V | typ. Low | 2.5 V |
| | typ. High | 22 V |

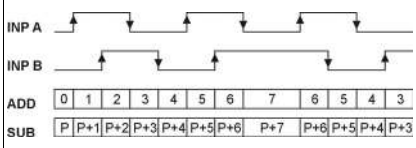
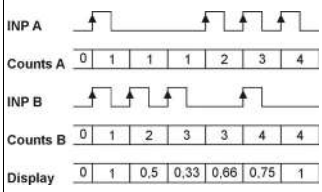
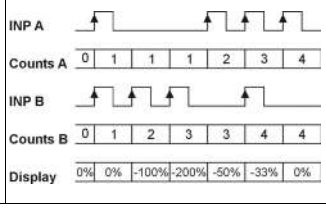
**4…30 V DC level, signal shape square wave 1:1**

| | |
|---|---|
| typ. Low | 1.0 V |
| typ. High | 4.0 V |

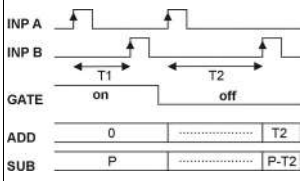
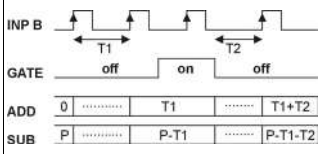
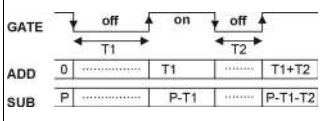
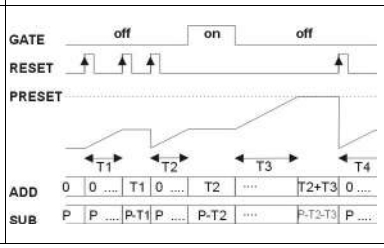
| | **HTL** | **5V** |
|---|---|---|
| A | 65 kHz | 9 kHz |
| A – B ; A + B<br>A / B ; (A-B)/A | 65 kHz | 9 kHz |
| Quad | 30 kHz | 9 kHz |

## 15 Input modes: Pulse counting

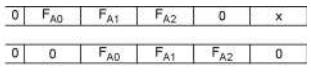
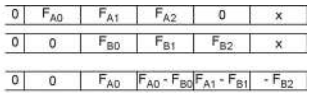
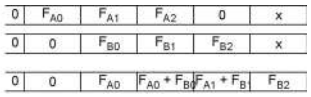
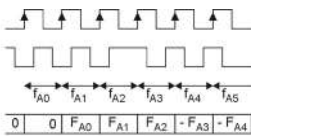
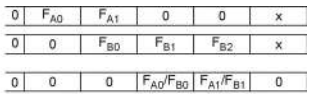
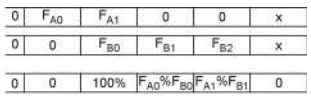
| Function | Diagram<br><br>Note: No counting when GATE input is active<br>P = Preset | PNP: Count on rising edge<br>NPN: Count on falling edge |
|---|---|---|
| CNT.DIR |  | Inp A: Count input<br>Inp B: Count direction<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| UP.DN |  | Inp A: Count input add<br>Inp B: Count input sub<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| UP.UP |  | Inp A: Count input 1 add<br>Inp B: Count input 2 add<br>Add: Display 0 --> Preset |
| QUAD |  | A 90° B<br>Inp A: Count input<br>Count on one edge<br>Inp B: Reverse direction<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| QUAD2 |  | A 90° B<br>Inp A: Count input<br>Count on rising and on falling edges<br>Inp B: Reverse direction<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |

| Function | Diagram<br><br>Note: No counting when GATE input is active | PNP: Count on rising edge<br>NPN: Count on falling edge |
|---|---|---|
| QUAD4 |  | A 90° B<br>Inp A: Count input<br>Count on rising and on falling edges<br>Inp B: Count input<br>Count on rising and on falling edges, Reverse direction<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| A / B |  | Inp A: Count input 1<br>Inp B: Count input 2<br><br>Formula:<br>A / B |
| A % B |  | Inp A: Count input 1<br>Inp B: Count input 2<br><br>Formula:<br>(A – B)/A x100 |

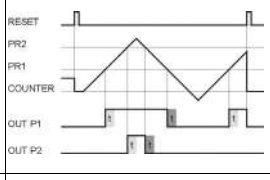
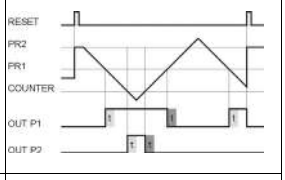
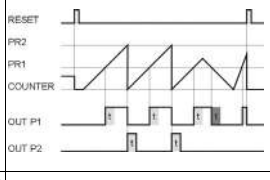
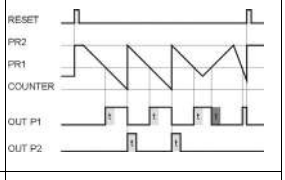
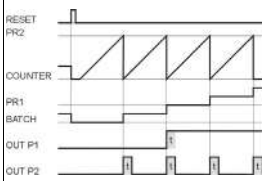
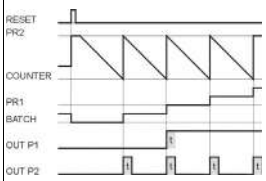
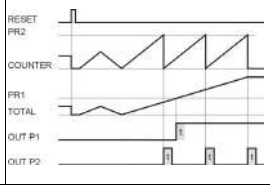
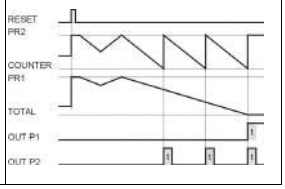
## 16 Input modes: Timing

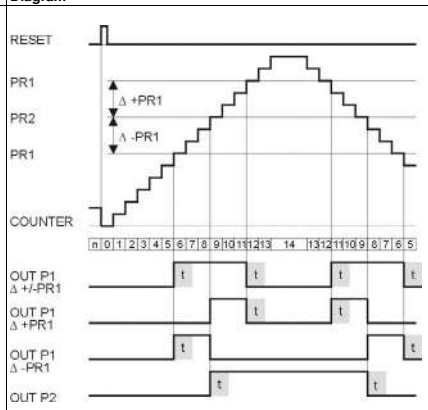
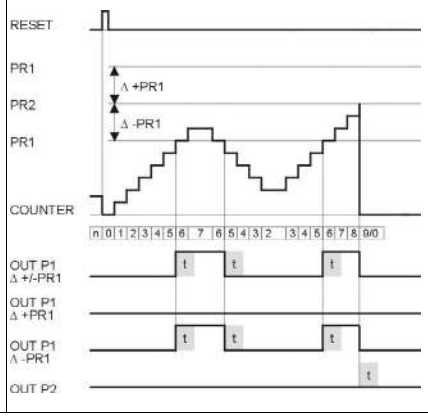
| Function | Diagram | PNP: Count on rising edge<br>NPN: Count on falling edge |
|---|---|---|
| INA.INB |  | Inp A: Start<br>Inp B: Stop<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| INB.INB |  | Inp A: no function<br>Inp B: Start/Stop<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| FREE.RN |  | Inp A: no function<br>Inp B: no function<br>Control of the timing only via the GATE input<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |
| AUTO |  | Inp A: no function<br>Inp B: no function<br>Control of the timing via RESET (manual or electrical)<br>Add: Display 0 --> Preset<br>Sub: Display Preset -> 0 |

## 17 Input modes: Frequency meter

| Function | Diagram | PNP: Count on rising edge<br>NPN: Count on falling edge |
|---|---|---|
| A |  | Inp A: Frequency input<br>Inp B: no function |
| A - B |  | Inp A: Frequency input 1<br>Inp B: Frequency input 2<br><br>Formula:<br>A - B |
| A + B |  | Inp A: Frequency input 1<br>Inp B: Frequency input 2<br><br>Formula:<br>A + B |
| QUAD |  | A 90° B<br>Inp A: Frequency input 1<br>Inp B: Reverse direction |
| A / B |  | Inp A: Frequency input 1<br>Inp B: Frequency input 2<br><br>Formula:<br>A / B |
| A % B |  | Inp A: Frequency input 1<br>Inp B: Frequency input 2<br><br>Formula:<br>(A – B)/A x100 |

## 18 Output operations

| Mode | Diagram | Mode | Diagram |
|---|---|---|---|
| | t Only in mode and | | t Additionally in mode and |
| ADD |  | SUB |  |
| ADD.AR |  | SUB.AR |  |
| ADD.BAT |  | SUB.BAT |  |
| ADD.TOT |  | SUB.TOT |  |

| Mode | Diagram |
|---|---|
| TRAIL |  |
| TR.AR |  |

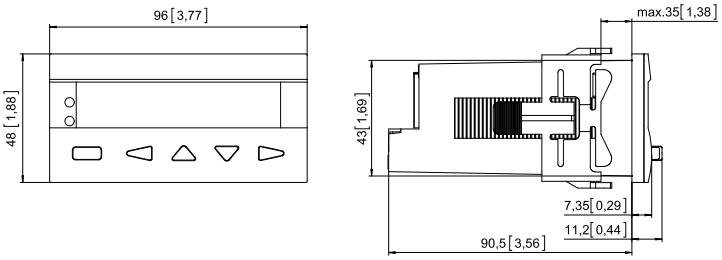
## 19 Help Texts

| | | |
|---|---|---|
| PROG. | NO | NO PROGRAMMING |
| PROG. | YES | START PROGRAMMING |
| LANGU. | | MAIN MENU SELECT LANGUAGE |
| HLP.TXT. | YES | HELPTEXT ON |
| SL.LANG. | DE | DEUTSCH |
| SL.LANG. | EN | ENGLISH |
| FUNCT. | | MAIN MENU BASIC FUNCTION |
| FUNCT. | COUNT | BASIC FUNCTION COUNTER |
| FUNCT. | TIMER | BASIC FUNCTION TIMER |
| FUNCT. | TACHO | BASIC FUNCTION TACHOMETER/FREQUENCY METER |
| INPUT | | MAIN MENU INPUTS |
| INP.POL. | PNP | INPUT POLARITY PNP |
| INP.POL. | NPN | INPUT POLARITY NPN |
| FILTER | OFF | INPUT 30HZ FILTER OFF |
| FILTER | ON | INPUT 30HZ FILTER ON |
| CNT.INP. | CNT.DIR | INPUT MODE COUNT DIRECTION |
| CNT.INP. | UP.DN | INPUT MODE UP-DOWN |
| CNT.INP. | UP.UP | INPUT MODE UP-UP |
| CNT.INP. | QUAD | INPUT MODE QUADRATURE |
| CNT.INP. | QUAD2 | INPUT MODE QUADRATURE x 2 |
| CNT.INP. | QUAD4 | INPUT MODE QUADRATURE x 4 |
| CNT.INP. | A/B | INPUT MODE A/B |
| CNT.INP. | A%B | INPUT MODE (A-B)/A IN % |
| START | INA.INB | START INPUT A / STOP INPUT B |
| START | INB.INB | START INPUT B / STOP INPUT B |
| START | FRE.RUN | TIMER IN FREE RUN MODE |
| START | AUTO | TIMER IN AUTO STOP MODE |
| TAC.INP. | A | ONLY INPUT A |
| TAC.INP. | A-B | INPUT MODE A-B |
| TAC.INP. | A+B | INPUT MODE A+B |
| TAC.INP. | QUAD | INPUT MODE QUADRATURE |
| TAC.INP. | A/B | INPUT MODE A/B |
| TAC.INP. | A%B | INPUT MODE (A-B)/A IN % |
| MP.INP._ | LATCH | FUNCTION MP-INPUT_ LATCH |
| MP.INP._ | TEACH | FUNCTION MP-INPUT_ TEACH |
| MP.INP._ | SET | FUNCTION MP-INPUT_ SET |
| LOC.INP. | PROG. | LOCK PROGRAMMING |
| LOC.INP. | PRESET | LOCK EDITING OF PRESETS |
| LOC.INP. | PRG.PRE. | LOCK PROGRAMMING AND EDITING OF PRESETS |
| MODE | | MAIN MENU OPERATION MODE |
| MODE | ADD | MODE ADDING |
| MODE | ADD.AR | MODE ADDING WITH AUTOMATIC RESET |
| MODE | ADD.BAT | MODE ADDING WITH AUTOMATIC RESET + BATCH COUNTER |
| MODE | ADD.TOT | MODE ADDING WITH AUTOMATIC RESET + TOTAL COUNTER |
| MODE | TRAIL | MODE ADDING OUTPUT 1 TRACKING PRESET OF OUTPUT 2 |
| MODE | TR.AR | MODE ADDING OUTPUT 1 TRACKING PRESET OF OUTPUT 2 WITH AUTOMATIC RESET |
| MODE | SUB | MODE SUBTRACTING |

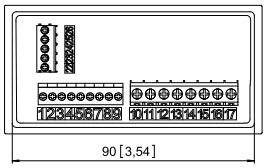
| | | |
|---|---|---|
| MODE | SUB.AR | MODE SUBTRACTING WITH AUTOMATIC RESET |
| MODE | SUB.BAT | MODE SUBTRACTING WITH AUTOMATIC RESET + BATCH COUNTER |
| MODE | SUB.TOT | MODE SUBTRACTING WITH AUTOMATC RESET + TOTAL COUNTER |
| CONFIG. | | MAIN MENU CONFIGURATION |
| FACTOR | | MULTIPLICATION FACTOR |
| DIVISO. | | DIVISION FACTOR |
| T.MODE | SEC | TIME RANGE SECONDS |
| T.MODE | MIN | TIME RANGE MINUTES |
| T.MODE | HOUR | TIME RANGE HOURS |
| T.MODE | HH.MM.SS | TIME RANGE HH.MM.SS |
| T.MODE | SEC-1 | TACHO RANGE SEC-1 |
| T.MODE | MIN-1 | TACHO RANGE MIN-1 |
| DP | | DECIMAL POINT |
| SETPT. | | SET VALUE |
| AVG | OFF | NO AVERAGE |
| AVG | AVG 2 | AVERAGE OF 2 MEASUREMENTS |
| AVG | AVG 5 | AVERAGE OF 5 MEASUREMENTS |
| AVG | AVG10 | AVERAGE OF 10 MEASUREMENTS |
| AVG | AVG20 | AVERAGE OF 20 MEASUREMENTS |
| START | | START DELAY TIME [SEC] |
| WAIT 0 | | WAIT TIME UNTIL DISPLAY ZERO [SEC] |
| RES.MOD | | MAIN MENU RESET MODE |
| RES.MOD. | NO.RES. | NO RESET FUNCTION |
| RES.MOD. | MAN.RES. | RESET VIA FRONT BUTTON |
| RES.MOD. | EL.RES. | RESET VIA RESET INPUT |
| RES.MOD. | MAN.EL. | RESET VIA FRONT BUTTON OR RESET INPUT |
| PRES. 1 | | MAIN MENU PRESET 1 |
| PRES. 1 | ON | PRESET 1 ON |
| PRES. 1 | OFF | PRESET 1 OFF |
| PR.OUT1 | ____------ | PERMANENT SIGNAL FORM AT OUTPUT 1 |
| PR.OUT1 | ------____ | PERMANENT SIGNAL FORM AT OUTPUT 1 |
| PR.OUT1 | __---__ | TIMED SIGNAL FORM IN MAIN DIRECTION AT OUTPUT 1 |
| PR.OUT1 | ---__--- | TIMED SIGNAL FORM IN MAIN DIRECTION AT OUTPUT 1 |
| PR.OUT1 | __--__-- | TIMED SIGNAL FORM IN BOTH DIRECTION AT OUTPUT 1 |
| PR.OUT1 | --_--_-- | TIMED SIGNAL FORM IN BOTH DIRECTION AT OUTPUT 1 |
| T.OUT 1 | | ACTIVE TIME FOR OUTPUT 1 |
| PRES. 2 | | MAIN MENU PRESET 2 |
| PR.OUT2 | ____------ | PERMANENT SIGNAL FORM AT OUTPUT 2 |
| PR.OUT2 | ------____ | PERMANENT SIGNAL FORM AT OUTPUT 2 |
| PR.OUT2 | __---__ | TIMED SIGNAL FORM IN MAIN DIRECTION AT OUTPUT 2 |
| PR.OUT2 | ---__--- | TIMED SIGNAL FORM IN MAIN DIRECTION AT OUTPUT 2 |
| PR.OUT2 | __--__--__ | TIMED SIGNAL FORM IN BOTH DIRECTION AT OUTPUT 2 |
| PR.OUT2 | --_--_-- | TIMED SIGNAL FORM IN BOTH DIRECTION AT OUTPUT 2 |
| T.OUT 2 | | ACTIVE TIME FOR OUTPUT 2 |
| END.PRG. | NO | REPEAT PROGRAMMING |
| END.PRG. | YES | EXIT PROGRAMMING AND STORE DATAS |

## 20 Dimensional Drawings

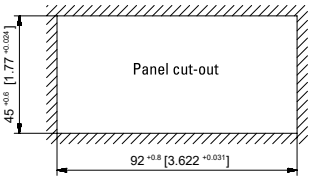
Dimensions in mm [inch]



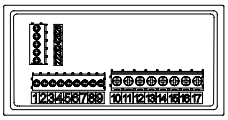

Rear view:




Panel cut-out:




Terminal Assignment:



| Pin | RS232 (optional) |
|---|---|
| 22 | GND |
| 23 | RXD |
| 24 | TXD |
| 25 | – |
| 26 | – |

| Pin | RS485 (optional) |
|---|---|
| 22 | – |
| 23 | D0 |
| 24 | DI |
| 25 | – |
| 26 | – |

| Pin | Signal and control inputs |
|---|---|
| 1 | INP A (Signal input A) |
| 2 | INP B (Signal input B) |
| 3 | RESET (Reset input) |
| 4 | LOCK (Keypad lock) |
| 5 | GATE (Gate input) |
| 6 | MPI 1 (User input 1) |
| 7 | MPI 2 (User input 2) |
| 8 | Sensor power supply<br>AC: 24 V DC/80 mA<br>DC: $U_B$ connected through |
| 9 | Shared connection for signal and control inputs GND (0 VDC) |

| Pin | Version with relay/optocoupler | |
|---|---|---|
| 10 | Relay contact C.2 | Output 2 |
| 11 | Relay contact N.O.2 | |
| 12 | Relay contact N.C.2 | |
| 13 | Relay contact C.1 | Output 1 |
| 14 | Relay contact N.O.1 | |
| 15 | Relay contact N.C.1 | |
| 16 | AC: 100 ... 240 V AC, ±10%, N~<br>DC: 10 ... 30 V DC | Power supply |
| 17 | AC: 100 ... 240 V AC, ±10%, L~<br>DC: GND (0 V DC) | |