



**HENGSTLER**





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## General

## Information

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### 1 General Information

#### 1.1 Information about the Operating Instructions

These operating instructions provide important information about the operation and handling of the multifunctional counter. To ensure safe operation it is vital that the safety information and instructions be strictly observed.

For Counters with interfaces Tico 773 and Tico 774 please see the amendment 2 772 069

The multifunction counter has been designed for industrial use and for installation in machinery or industrial plants.

The party responsible for the end use/application has the ultimate responsibility to ensure that the multifunction counter is installed and set-up in accordance with the operating guidelines set forth in this manual.

The manufacturer's safety rules shall be applicable.

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All local regulations applicable to safety and accident prevention must be adhered to for the installation and

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operation of this multifunction counter.

Before starting any work on the machine/plant, the operating instructions and in particular, the Safety chapter and the respective safety information must be fully read.

These operating instructions are an integral part of the product and must be maintained in the direct vicinity of the machine/plant and in a place that is readily accessible for the operating staff.

## General Information

These operating instructions contain important information concerning the installation, connection and programming of the multifunction counter.

Description of the programming sequence:

- Programming of the basic functions
- Programming of the function codes

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General

Information

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- Programming of the user times
- Programming of the prescaler
- Programming of the presets

Before commissioning the multifunction counter, consider locking-out functions not required for regular operation.



**The executed programming functions must be documented.**





## 1.2 Explanation of symbols

The warnings in these operating instructions are designated by symbols. Signal words at the beginning of the warnings indicate the severity of a safety hazard.

These notes have to be observed by all means, and all actions have to be taken with utmost care so as to prevent any accidents or damage or personal injury.



### Danger!

This warning indicates a direct safety hazard, which may lead to serious injuries or even death if preventative action is not taken.



### Warning!

This warning indicates a possible safety hazard, which may lead to serious injuries or even death if preventative action is not taken.



### Caution!

This warning indicates a possible safety hazard, which may lead to minor damage or injuries if preventative action is not taken.





## General

## Information

### General Information



#### Note!

This symbol indicates a potentially hazardous situation, which may lead to damage to property or to the environment if preventative action is not taken.



#### Tips and recommendations

This symbol is used to point out to useful tips, recommendations and information for optimal operation.

### 1.3 Limitation of Liability

The information and notes contained in these operating instructions were gathered in accordance with applicable standards and regulations, the state-of-the-art, as well our long-standing experience and know-how.

The manufacturer shall not assume any liability for damage caused by:

- Non-adherence to the operating instructions

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- Improper use
- Employment of unskilled or untrained personnel
- Modifications or changes to the multifunction counter
- Opening of the multifunction counter

We reserve the right to make changes or modifications to the design, specifications or options without notice.  
The

**10**

actual product may not appear exactly as illustrated in this manual.

#### **1.4 Copyright protection**

The operating instructions must be treated confidentially and used exclusively by the personnel responsible for the setup, maintenance, repair and operation of the machine/plant. Disclosure of these operating instructions to any third parties is not permissible without the prior written consent of the manufacturer.



**The data and information stated here, including text, drawings, images and other illustrations, are protected by copyright laws and subject to industrial property rights. Any misuse of such information will be subject to prosecution.**

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## General

## Information

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### 1.5      Guarantee      conditions

Our guarantee conditions are available for download from our homepage at [www.hengstler.com](http://www.hengstler.com) – DOWNLOAD – General Terms & Delivery Terms.

### 1.6      Customer      Service

Our customer service is available to provide technical information and assistance for our customers. Detailed information on your responsible contact partner is given on our homepage ([www.hengstler.com](http://www.hengstler.com)) under Contact and How to find us.





## Safety

### 2 Safety

This section provides an overview of important consideration to ensure the safe and trouble-free operation of your counter. Non-adherence to these instructions may result in serious injury or death.

#### 2.1 Intended Use

The multifunctional counter is exclusively designed and constructed for the intended use and purposes described herein.

**The multifunctional counter serves together with a corresponding sensor for the counting of pieces, lengths, flow rates, velocities and times, as well as for the controlling and monitoring of machinery and equipment by sending control signals.**



**Warning!**

**Safety hazards due to improper use!**

**Using the multifunction counter for any purposes other than those described may cause hazardous situations.**

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Claims for damages resulting from any kind of misuse shall be expressly excluded.

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## Safety 2.2      Assembly,      connection,      programming

The multifunction counter is built and tested in accordance with IEC/EN 61010-1, Protection Class II – Safety Measures for Electronic Measuring Equipment. They have left the factory in a condition that is in compliance with all safety-relevant requirements. In order to maintain this condition and ensure operational safety, the User is required to observe the safety notes and warnings in these operating instructions.



### Danger!

#### Risk of safety hazards due to incorrect/faulty assembly and connection.

- The max. operating voltages must not be exceeded!
- 12 – 24VDC and 24VAC multifunction counters must be operated at safety extra-low voltages (SELV) and under potential-compensated conditions in order to prevent hazardous shock.
- An external fuse must be provided to protect the multifunction counter (see Chapter 10, Technical Data).

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## Safety

- Installation and assembly shall be carried out by skilled and trained electricians only.
- Do not connect or disconnect a multifunction counter while it is in contact with a live current. Always disconnect the main power supply before connecting or disconnecting the multifunction counter.
- Make sure that live terminals are properly protected against inadvertent contact.

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- To ensure proper protection of terminals against hand contact, make sure that the live conductors are properly connected to the terminals.
- The rules and regulations set forth by the local electricity providers have to be observed.
- Do not establish any connections with non-allocated (NC) terminals.
- Multifunction counters may only be operated when properly installed.

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- If safe operation is impaired, make the multifunction counter inoperable and secure it against inadvertent operation.
- Scope of applications: industrial processes and controls. Overvoltage across the terminals must be limited to the values specified in overvoltage category II.
- The installation and wiring has considerable impact on the electromagnetic properties of the multifunction counter. Therefore, electromagnetic compatibility of the entire application must be ensured during the installation.
- In areas presenting the risk of ESD (electrostatic discharge), use ESD-protected plugs and switches.
- If the functions “prescaler input”, “preset input” and “key reset” are not allowed to be used by the machine/ plant operator, access to these functions must be locked. Depending on the machine/plant design or concept, non-permissible input may impair the operational safety and function of the machine or plant.





## Safety



### Danger!

**The party responsible for the commissioning of the multifunction counter must take precautions to ensure the safe operation of the device.**

- The party responsible for the commissioning of the multifunction counter is responsible for the preparation of operating instructions including:
  - o Description of functions according to the programming of the multifunction counter; o Description of the settings to be adjusted by the machine/plant operator;
  - o Information concerning the occupational safety requirements and possible hazards arising from the operation of the machine/plant.



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## Safety

### 2.3 Responsibilities of the manufacturer and operator machine/plant

Multifunctional counters are designed for installation and use in machines/plants. Therefore, the manufacturer and operator of the machine/plant are subject to the legal obligations concerning occupational safety and health.

Besides the safety notes given in these operating instructions, the relevant rules and regulations concerning safety and the prevention of accidents, and the applicable environmental requirements have to be met. In particular:

- The machine/plant manufacturer shall be obligated to ensure that all the requirements mentioned in section 2.2 be adhered to during the assembly, connection and programming.
- The operator shall obtain all the required information regarding applicable occupational safety rules. In addition, the operator shall be obligated to prepare a risk assessment of possible hazards that

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## Safety

may arise at the place of operation. This risk assessment shall be documented in the form of operating instructions for the machine/plant.

- The machine/plant manufacturer and operator are responsible for regularly checking local occupational safety and health requirements and, if required, making appropriate revisions to the application instructions.
- The operator shall ensure that all staff members who are involved in the machine/plant operation have read and fully understood these instructions. Moreover, the operator shall be obligated to train the operating personnel at regular intervals and inform them about any potential hazards.

- The owner shall ensure that the operation, maintenance and repair of the machine/plant is exclusively carried out by skilled and trained personnel.
- The operator shall ensure that all maintenance and repair work shall only be carried out by skilled and trained personnel.





## Safety



### 2.4 Operator requirements



#### Warning:

**Danger of personal injuries if handled by insufficiently qualified staff!**

**Improper handling may cause severe personal injuries and damage to property.**

- Actions requiring special skills must be carried out only by trained personnel as designated in these instructions.
- Keep unqualified/untrained personnel away from hazard areas.





# Safety

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The following staff qualification requirements have been defined for the various scopes of activities:

- **Instructed personnel**

These persons have been instructed by the operator with regard to the tasks assigned and the potential hazards caused by improper handling.

- **Skilled personnel**

Due to their educational and professional skills, know-how and experience, as well as due to their knowledge of the relevant regulations, these persons are capable of executing their assigned tasks and recognize potential hazards independently.

- **Skilled and trained electricians**

Due to their educational and professional skills, know-how and experience, and due to their knowledge of the relevant regulations in the field of electrical engineering, these persons are capable of executing electrical work and recognizing potential hazards independently.

## 2.5 Hazards

This section indicates certain residual risks, which may arise as a result of the risk assessment.

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## Safety



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The safety information and warnings in these instructions must be observed in order to reduce the risk of hazards or injury.

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## Safety



### Danger!

**Lethal hazard of electric shock!**

**Any contact with live currents presents a direct lethal hazard.**

**Damages to the insulation or individual components present a potential lethal hazard.**

- In the event of immediate damage disconnect to the power supply and appropriate repair the insulation, supply the work.
- All electrical work must be carried out by skilled and trained electricians.

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## Safety

- Before the supply no longer commencing electrical and longer your system, main check carries work disconnect that any on it power it live currents.
- Prior maintenance, disconnect to cleaning the supply against inadvertent conducting or main and engagement. any repair power secure work, it
- Do fuses. not short-circuit or bypass/jump

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## Safety

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### 2.6 Safety devices



**Warning! Lethal hazard by non-functional or non-existent safety devices!**  
**Safety devices must be installed to ensure operational safety.**

The multifunction counter does not include any installed safety devices.

These safety devices must be installed externally.

Protect the electrical supply of the multifunction counter by means of external fuses (see Chapter 10, Technical Data).

Whether or not additional safety devices (e.g. emergency-off buttons) have to be provided depends on the application and construction of the machine or plant.

The machine/plant manufacturer shall be responsible for providing such additional safety devices in accordance with their own risk assessment and applicable local laws and regulations.

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## Safety



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3



## Setup and

## Operation

### 3 Setup and Operation

- 1 Display
- 2 Operating keys
- 3 Flat gasket
- 4 Bracket
- 5 Enclosure
- 6 Plug for DC or  
sensor supply;  
Electronic inputs and  
outputs
- 7 Connection terminal AC supply



and relay contacts

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## Setup and



## Operation

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8 Circuit diagram

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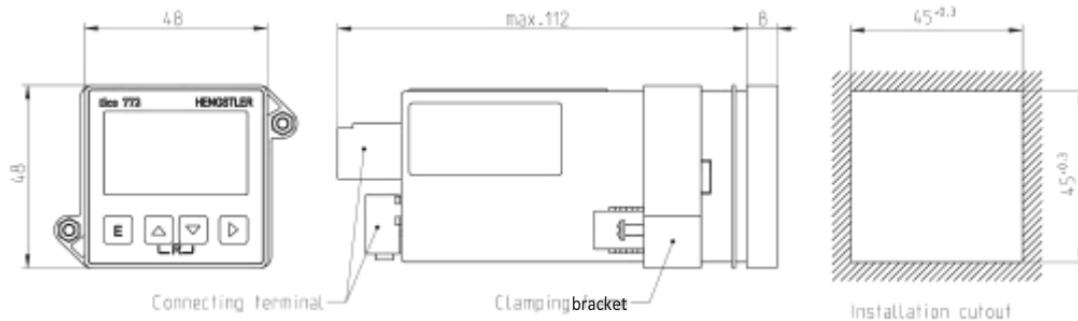
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## Operation

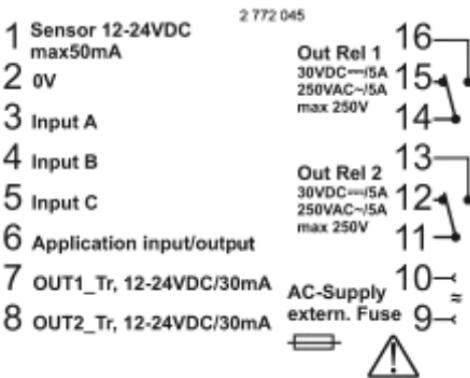
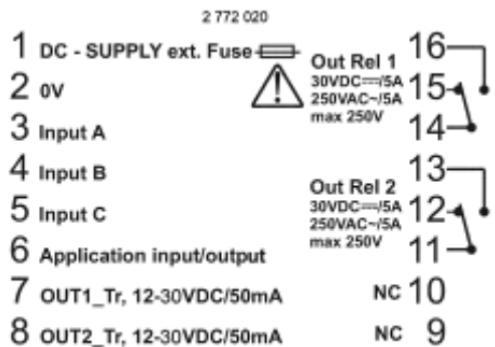
### 3.1 Dimension Sheet / Installation of Multifunction Counter



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### 3.2 Connecting the Multifunction Counter



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3



## Setup and

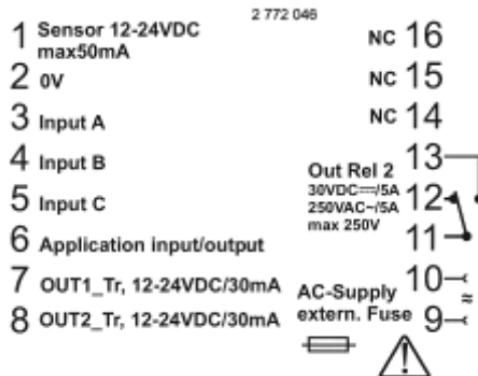
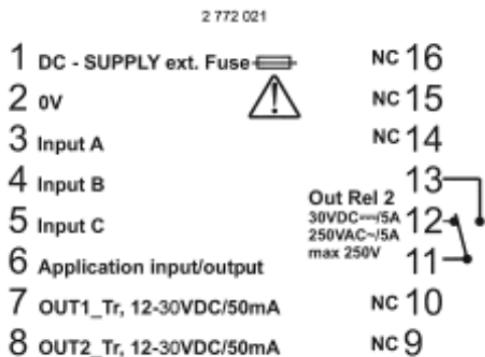


# Operation

VDC 2 relays / 2 transistors

VAC 2 relays / 2 transistors

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VDC 1 relays / 2 transistors

VAC transformer 1 Relays / 2 transistors

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2 772 034

1	DC - SUPPLY ext. Fuse	NC 16
2	ov	NC 15
3	Input A	NC 14
4	Input B	NC 13
5	Input C	NC 12
6	Application input/output	NC 11
7	OUT1_Tr, 12-30VDC/50mA	NC 10
8	OUT2_Tr, 12-30VDC/50mA	NC 9

2 772 047

1	Sensor 12-24VDC max50mA	NC 16
2	ov	NC 15
3	Input A	NC 14
4	Input B	NC 13
5	Input C	NC 12
6	Application input/output	NC 11
7	OUT1_Tr, 12-24VDC/30mA	10
8	OUT2_Tr, 12-24VDC/30mA	=
	AC-Supply extern. Fuse	9

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## Setup and



# Operation

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VDC 2 transistors

VAC 2 transistors

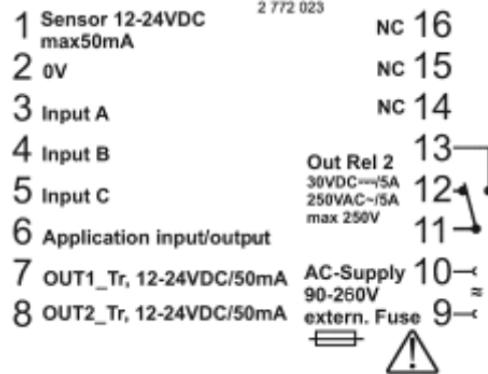
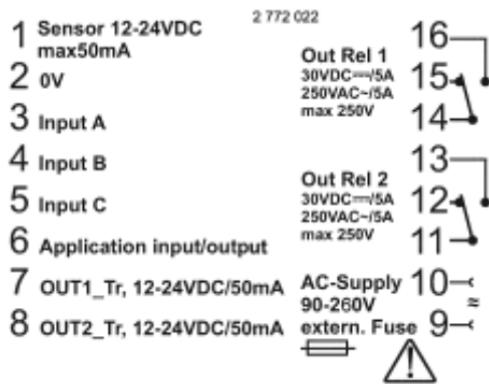
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VAC switching power supply 2 relays / 2 transistors

VAC switching power supply 1 relay / 2 transistors

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3

## Setup and



# Operation

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3

Se

The plug has to be disconnected from the counter before the cables are fastened by means of screws or screw-type terminals.

1	Sensor 12-24VDC max50mA	2 772 036	NC 16
2	0V		NC 15
3	Input A		NC 14
4	Input B		NC 13
5	Input C		NC 12
6	Application input/output		NC 11
7	OUT1_Tr, 12-24VDC/50mA	AC-Supply 90-260V	10
8	OUT2_Tr, 12-24VDC/50mA	extern. Fuse	9



Do not connect the encoder to a direct current line voltage without protective circuit for EMC. For cable lengths > 30 m a protective circuit is always required!

When programming the input level to TTL an additional protective circuit is required.

We recommend installation in a metal, grounded panel.

VAC switching power supply 2 transistors

**HENGSTLER**





## Operation

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### For DC-Versions:

When switching on the device in PNP-Mode, a short signal is applied to inputs A,B,C and the application input.

To suppress the pulse in TTL-Mode, each input should be connected to 10 kOhm resistor and the 0 V

When switching on the device a short signal is applied to the application output.

To suppress this pulses connect a resistor of 10 kOhm / 0,225 W to the 0 V and the application-output.



### 3.3

### Display

After powering on, all characters are illuminated for approx. 2 seconds; then the display changes over to the Display or Programming Mode.

The display is available in four different versions:

Transflective Positive: black figures on back lit background

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3



## Setup and



## Operation

Transmissive Negative: white figures on black background

Transmissive red: red figures on black background

Transmissive green: green figures on black background

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## Operation



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## Setup and



## Operation

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## Operation

### 3.4 Key functions

E	▲	▼	▶
Enter	UP	DOWN	SHIFT
Key	Key	Key	Key

### Programming

If                    pressed                    together                    with                    POWER                    ON  
                  (keep                    keys                    with                    pressed                    and                    switch  
                  on                    the                    device)                    device)

E + ▲	Selects	standard	functions
E + ▼	Sets	function	codes

# HENGSTLER





+	Selects (Article	ID code manufacturing number,...)	data (ID date, No.), serial
+	Sets	User	Times

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During	the	Programming	of	Function	Codes
+	Display Switches	of between and	function function function	code code code	text number
During	Operation	Sets reset			
+	Sets reset				

HEN





## Operation

E + ►	Sets	preset	0
E + ▼	Sets	preset	1
E + ▲	Sets	preset	2
▲ + ►	Sets	prescaler	

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Additional function counters for shift and batch

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## Setup and

## Operation

	Switches between and/or and batch	total partial count totalizer or sum sums value or counter
Additional functions for timers		
	Timer start (If enabled with function code F15)	
	Timer stop (If enabled with function code F15)	
Additional fu bæ ve Go	to	the adjustment menu
	(hold for 5 seconds)	
+	Adjust the intensity	(brighter or darker)

HEN



## Operation

---

**E**

Save and go back to  
display mode  
(press within 15 seconds)



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3



Setup and



Operation

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## 3.5 Overview of Operating Elements



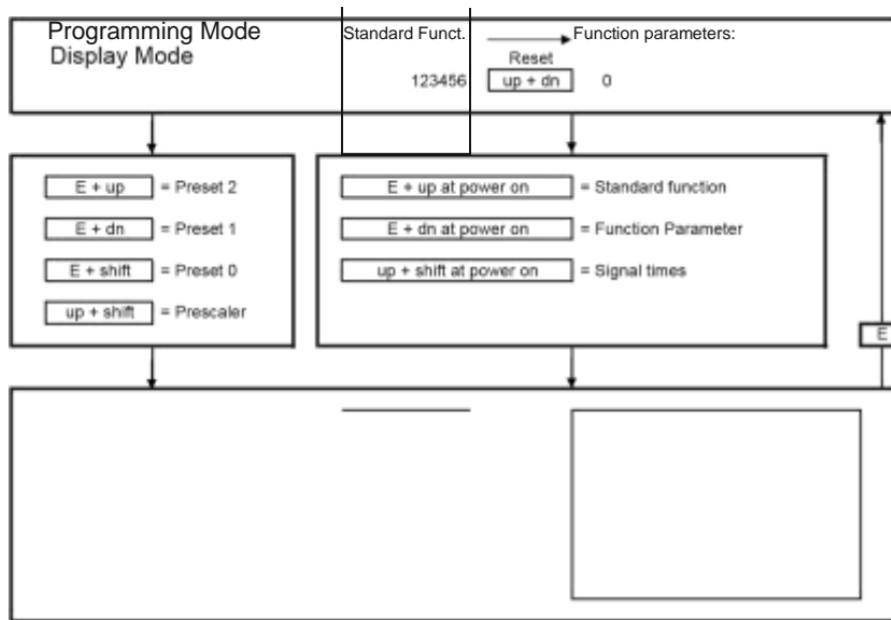
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## Operation



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Pulse counter  
Tachometer  
Timer  
Shift counter  
Batch counter

Operat. Mode  
Decimal point  
Set/Reset-Mode  
Display-Mode  
Output signals  
Applic. Input/Output  
+ many other function parameters

Count frequency  
Reset Behavior  
Output Memory  
Keylock  
npn/pnp selection

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### 3.6

### Programming the Standard Function

The device described here is a multifunctional counter, which can be programmed for a variety of functions and applications, i.e. pulse counter, tachometer, timer, shift counter or batch counter. The first step is to set the standard function (the factory setting of the device is the “pulse counter” setting).

Now continue with the programming of the function codes (Chapters 5-9) or User Times (Chapter 3.10)

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## Setup and



# Operation

Programming mode



+



Change function setting:

Save, return to counter operation

Keep pressed and switch **Power on**  
simultaneously

press

press

34

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Function code	Display Row 1	Function sets	No.	Display Row 2	
Fn	<b>FUN000</b>	Setting of Standard Function	0*	<b>PULSE0</b>	Pulse Counter
			1	<b>ECHO0</b>	Tachometer
			2	<b>TIME0</b>	Timer
			3	<b>SHIF00</b>	Shift Counter
			4	<b>BATCH0</b>	Batch Counter

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3

## Setup and



# Operation

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## 3.7

## Programming the Function Codes

The function codes (system parameters) are used to program the function and behavior of the inputs and outputs, as well as the behavior of the device in its adjusted basic mode. The selection options are described in detail in Chapters 5 to 9.

Programming mode	Change function setting	Save and change to next function code	Save and change to counter operation
+			
Keep pressed and switch <b>Power on</b> simultaneously	press	press	press

HEN



## Operation

Change

between  
Display  
Numerical

Text  
and  
Display



In the function code Programming Mode, the first row shows the name of the function code in the form of text (7-segment display). The second row shows the selectable option in a text form. By simultaneously pressing the Up and Down buttons, the display in the first row changes to a numerical display; after pressing these buttons once again, the display in the second row also changes to a numerical display. Pressing these buttons for a third time reverts both rows back to the text display.

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**Attention:** With each change among text and numeric display, the currently selected function code will return to the factory default setting and may have to be readjusted.

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The factory default setting is designated with an asterisk \*.

### 3.8 Programming the Preset Values

By simultaneously pressing the E + Up, E + Down or E + Shift key you can change to the Preset programming mode:

Use the shift key in the programming mode to change a setting position. The selected position will start to flash. Use the shift key again to move one position to the right. Then use the UP or Down key to increment or decrement the position by 1.

Rule for the 6th position: The change from 9 to 0 or 0 to 9 is indicated by a changing prefix.

Use the E key to leave the programming mode and return to the display mode. Your entries will be saved.

On leaving the programming mode, the presets are tested for attainability and recalculated, if necessary, because not all the values may be attained at a prescaler value of >1. The presetting is then rounded to the next attainable value.





## Operation

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If no key is pressed for more than 16 seconds in the programming mode, the counter will automatically return to the display mode. In this case, however, no entries will be saved except the last value saved with the E-key.

Set the preset value to 0 by pressing Up and Down keys simultaneously.

Programming mode	Select a position: (starts flashing)	Set position:	Save and return to display mode
E +	press	 press	press
Preset 2  + +			Zero in

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### 3.9 Prescaler programming

By pressing the Up + Shift keys simultaneously you can change to the Prescaler Programming Mode.

In the Programming mode, the position to be changed is selected by means of the shift key. The selected position will start flashing. Use the shift key again to move by one position to the right. Then use the UP or Down key to increment or decrement the position by 1. It is not possible to save a value of 00,0000. In this case the system will save 01,0000.

Use the E key to leave the programming mode and return to the display mode. Your entries will be saved.

---

**HEN**



## Operation

On leaving the programming mode, all the presets are recalculated because not all the values may be attained with a prescaler value of >1. Therefore, the presets have to be checked and corrected as necessary after setting the prescaler.

If no key is pressed for more than 16 seconds in the programming mode, the counter will automatically return to the display mode. In this case, no entries will be saved except the last value saved with the E-key.

Press the Up and Down keys simultaneously to set the prescaler to 01,0000.



Enter Programming mode

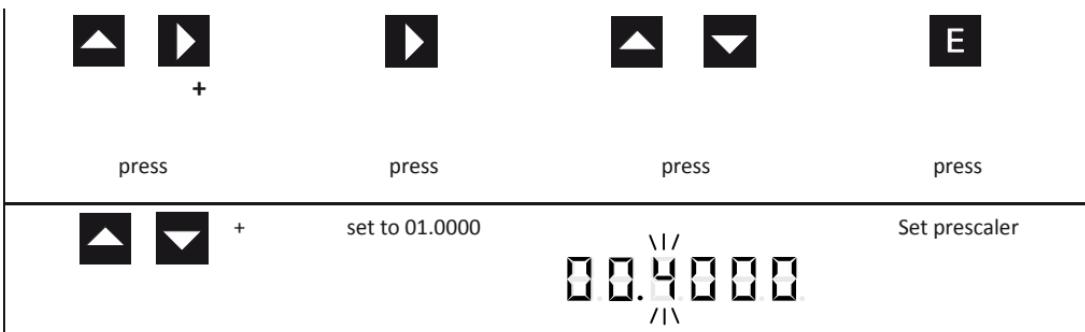
Select a position:  
(starts flashing)

Set position

Save and return to  
display mode

**HENGSTLER**





### 3.10

### Programming the

user

times

For programming the signal time for monostable (timed) output signals, 9 fixed signal times between 0.02 s and 10 s are available. In addition, three different signal times between 0,01s and 599,99s can be set by the user. The outputs are deactivated if the setting is 0,00 s.

HEN



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## Setup and



# Operation

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06.07.2010 10:31:49

Programming mode

Select a position:  
(starts flashing)

Set position

Save and go to the next  
user setting; after user  
3,  
return to display mode

+

Keep pressed and switch  
**Power on** simultaneously

press

press

press

---

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Function code	Display Row 1	Function No.	Display Row 2
Fn	04000 m	Sets the Signal Times	0* USE001 Signal time 1
		1	USE002 Signal time 2
		2	USE003 Signal time 3

### 3.11 Output of Device ID

This function is used to retrieve ID data, e.g. article numbers and various manufacturing information.

Output mode

Change to the next output

Return to counter operation

HEN



## Operation



+



Keep pressed and switch **Power on**  
simultaneously

press

press

Display row 1

AEEBAA

Display row 2

Model number

BEECAB

Manufacturing date

SECBAA

Serial number

SUBBAA

Software number

SUOEEB

Software release

**HENGSTLER**





3



## Setup and



## Operation

06.07.2010 10:31:50



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**HEN**





### 3.12 Adjusting the intensity of the backlight

For counters that come with a backlight you have the possibility to adjust the intensity of their backlight.

To adjust the backlight, press SHIFT for more than 5 seconds. The display then shows:



By pressing the UP or DOWN key the display gets brighter or darker.

If the E-button is pressed within 15 s, you go back to the normal counter display and the adjusted setting is saved. If the E-button is not pressed within 15 seconds, you will go back automatically to the normal counter menu without saving any changes.

---

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## description of the multifunction counter

Go to the adjustment menu



press > 5 s

Adjust intensity



press

Save and going back to  
display mode



press within 15 s

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### 4 General description of the multifunction counter

The following description is applicable for all standard settings. Special functions and configurations can be found in the appropriate chapters of this manual.

Factory ting efaults)	set  (D	Sets all the function codes to the default factory settings, i.e. all codes designated with *.
-----------------------------	---------------	---

**HENGSTLER**





## description of the multifunction counter

<b>Prescaler pulse etering tor):</b> [PSC]	(p m fac  The "Prescaler" is a multiplier. Each input pulse is multiplied by the adjustment factor. The display shows integers only. After a reset the counter is completely reset to 0; this also includes the non-visible value of < 1. At a prescaler of >1 not all the values are selectable. If invalid Preset values are selected, the counter will round them up to the next possible value. Example: PSC 5 cannot select (reach) Preset value 7. In this case, the counter automatically changes the Preset value to 10. If the Prescaler is changed, this may also affect the Preset values, which would have to be changed accordingly.  Adjusting range 0,0001 to 99,9999
---	---





## General

### description of the multifunction counter

	<p>The Prescaler is used, for example, to convert counter pulses into meaningful units, to adapt the units of measurements (e.g. cm-pulses to inch-pulses), or to compensate for worn out measuring wheels.</p> <p>Formula: <math>PSC = \text{Desired/nominal display} / \text{number of pulses}</math></p> <p>Example: Flowmeter 173 pulses per 100 liters; display in liters <math>PSC = 100 / 173 = 0,5780</math></p> <p>Example: 1 pulse per cm; display in inch <math>PSC = 1 / 2,54 = 0,3937</math></p> <p><b>Attention: This is only valid for counters and tachometers. For timers please refer to chapter 7.</b></p>
<b>Display w:</b>	<b>2<sup>nd</sup> ro</b> <p>The display of the 2nd row can be programmed as follows: Preset 2 (P 2), Preset 1 (P 1), Preset 0 (P 0), Prescaler, Batch counter, totalizer or partial sums (shift counter)</p>

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## description of the multifunction counter

<b>Counter d ntrol uts:</b>	<b>an co inp</b>	The counter is fitted with 3 counter and control inputs and an application input (see below). These inputs are assigned various counter or control functions by means of function code settings.
<b>Input ic:</b>	<b>log</b>	The input logic can be programmed to NPN or PNP, each at the 8V-level or TTL level; see chapter 10 for the switching threshold.





## General

### description of the multifunction counter

<b>Reset/Set:</b>	<p>Manual setting via keys (lockable) Electronic setting via control input (and/or application input) Automatic programming after reaching the main Preselection Programmable Power-On Reset</p> <p>Depending on the function code the counter is:</p> <p>1.) Reset: reset to 0 P 2 is the main Preset (preselect) value During unidirectional counting the counter will add up.</p> <p>or</p> <p>2.) Set: reset to P 2 Signal 2 at 0 During unidirectional counting the counter will subtract.</p> <p>For time counting, batch counting or shift counting, it is possible to reset partial sums or the total sum, batch counter or second totalizer individually or at the same time via the application input.</p>
-------------------	--

**HENGSTLER**





## description of the multifunction counter

	<p>Independently the counter can be reset to Preset value 0 via the application input (see below).</p> <p><b>Exception: Tachometers do not have a reset/set function</b></p>
--	--

---

**HENGSTLER**



## General

### description of the multifunction counter

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<b>Static/dynamic reset:</b> <b>r</b>	Static reset: Reset over the entire pulse width of the reset pulse Dynamic reset: Reset via the active edge; thereafter, counter operation is possible independently of the pulse width of the reset pulse.  <b>Exception: Tachometers do not have a reset/set function</b>
<b>Teach input:</b>  <b>in</b>	Using the Teach Input (application input) the counter status is imported in Preset 2.
<b>Decimal point:</b>  <b>p</b>	The decimal point is only an optical reading assistance on the display and does not change the value. For example, for a value of 1 pulse per cm, the setting 0,00 makes it easier to read the value in m and cm.  <b>Exception: This does not apply to tachometers and timers.</b> <b>Please refer to chapters 6 and 7.</b>

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## description of the multifunction counter

<b>Input ping enuation)</b>	<p>The inputs A and B are limited to 60 kHz. The Application Input is limited to 6 kHz.</p> <p>Following maximum input frequencies are not to be exceeded:</p> <p>Phasediscriminator single evaluation: A and B each 30 kHz (TTL 15 kHz) Phasediscriminator double evaluation: A and B each 30 kHz (TTL 15 kHz) Phasediscriminator quadruple evaluation: A and B each 15 kHz (TTL 15 kHz) Unidirectional counting and directional input: Input A 60 kHz (TTL 15 kHz) Differential counting, summation (totalizing): Input A + B 60 kHz (TTL 15 kHz)</p> <p>When the application input is used as an additional count input, the above mentioned input frequencies have to be reduced by the frequency of the application input:</p> <p>If mechanical contacts are triggered (i.e. relays, switches, Reed contacts, etc.), the input frequency has to be damped (attenuated) to 30 Hz, so as to filter out bounce pulses. If damping to 30 Hz is selected, all inputs can be used at 30 Hz.</p> <p>To reach these values the amplitude thresholds are to be hold.</p>
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## description of the multifunction counter

(See technical data - chapter 10)



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## description of the multifunction counter

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<b>Signals:</b>	P 1 and P 2 are available as relay changeover contacts and electronic output signals (PNP). P 0 is available as an electronic output signal across the application output (PNP).  If a signal is active, this will be shown on the LCD display. Optionally, the multifunctional counter can be set to have the display flash if one or all the preset values are active.  This is also valid for Preset 0 (if no output has been assigned).
<b>Signalzeiten:</b>	<b>1.) bistable (latching):</b> Cleared by electronic or manual reset. P 0 + P 1 = bistable – additionally cleared by signal 2 Attention: Signal 2 must not be bistable for automatic reset. <b>2.) monostable (timed):</b> Up to 9 fixed signal times are available between 0,02s and 10s. In addition, user times can be programmed between 0,01s to 599,99s. <b>3.) Range signals:</b> active as long as the counter reading is within the adjusted range.

---

**HENGSTLER**



## General

### description of the multifunction counter

<b>Signals</b> active n/off	During normal operation the relay is energized if the signal is active. This behavior can also be inverted (also applicable to the transistor outputs).
<b>Application</b> put/output:	Depending on the standard function, up to 11 (eleven) functions can be assigned to the application input/output. Note, however, that only one of these functions can be selected. Further details are given in the Function Code section (5.4).

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<b>Application</b> – <b>Set</b> <b>to</b>	Programs the application input to act as a Set Input. The counter is set to Preset 0, independently of the reset via input C or the keyboard.  This function is not available for tachometers.
--	--

**HENGSTLER**



## description of the multifunction counter

set	pre 0	
<b>Application</b>	<b>keyl ock:</b>	All keyboard functions can be locked (latched) individually (Reset, P 0, P 1, P 2, Prescaler) Lock mode: release after 10s, complete keylock or keylock depending on keylock input (application input)

**i After setting up the system, lock all the keyboard functions you do not want to be changed by the user.**





## 5.1 Description of the Pulse Counter

(Supplementing the General Description in Chapter 4)

<b>Counter mode</b>	The following counter modes can be selected: Unidirectional counting, adding or subtracting; Unidirectional counting with directional input; Differential counting, summation (totalizing) or phase discriminator (quad) with single, double or quadruple evaluation.
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**HENGSTLER**



## counter

<b>Output on:</b>	<p><b>signals mode of operati</b></p> <p><b>1.) coincidence signal:</b> The counter operates in the coincidence mode, i.e. output signals are activated after reaching the Preset value for the programmed period of time.</p> <p><b>2.) Trail:</b> P 2 and P 0 are under coincidence operation; they operate as described in item A. P 1 is the trail. P 1 is not absolute to 0, but relative to P 2. If the setting is F8=1, the following will apply: Signal 1 is returned at <math>P_2 - P_1</math> Example: <math>P_2=1000</math>, <math>P_1=200</math>, Signal 1 at 800; If <math>P_1</math> is negative: <math>P_2=1000</math>, <math>P_1=(-200)</math>, Signal 1 at 1200 If the setting is F8=2, the following will be applicable: Signal 1 is returned at <math>P_2 + \text{and} - P_1</math> (Example: <math>P_2=1000</math>, <math>P_1=200</math>, Signal 1 at 800 or/and 1200)</p> <p><b>3.) range signal:</b> P 1 and P 2 are range signals: Signal 1 is active at a counter reading <math>&lt; P_1</math> and Signal 2 is active at a counter reading <math>&gt; P_2</math></p>
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**HENGSTLER**





Intermediate : :	<b>cut</b>	Depending on the application it may become necessary to isolate the main signal during the reset, e.g. when the first material lengths or certain lengths showing material defects have to be cut on length-cutting systems.
<b>Additional alizer mmation nter)</b>	<b>tot (su cou</b>	The additional totalizer sums up all values, even if the main counter is continually reset. The shift key can be used to switch between the counter reading and the total sum. The totalizer can only be reset manually. To do this, select the total sum from the first row; then press the reset keys.





## counter

<b>Prescaler</b> <b>put</b> <b>-out:</b>	The prescaler output is an application output. With each increase of the counter reading the number of output pulses corresponds to the respective number of increments.  <b>PSC</b> The pulse length of the prescaler output corresponds to a frequency of 500 Hz. When using the prescaler output the max. count frequency is: $F_{max} = 500 / PSC$ . So it is possible that the maximum input frequency can not be reached.
<b>Application</b> <b>nter</b> <b>ut</b> <b>d</b>	<b>cou</b> The application input may be assigned to the Count Up or Count Down function. This is a counter input, which is available in addition to the counter mode adjusted with F1.  <b>inp</b>  <b>ad</b> <b>/</b> <b>sub</b>

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<b>Application ch/Reset</b>	<b>Lat</b>	Latch/Reset is an application input. If the counter is reset via the application input, the counter reading is held constant. The counter continues to remain fully functional and operates in the background mode. During the next reset the current (updated) value will be shown on the display.
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5



Pulse



## counter

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5.2              Signal              diagrams  
input            signals  
(PNP-Logic)



---

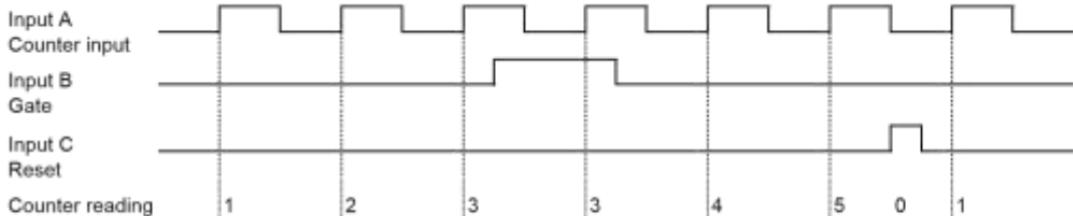
# HENGSTLER



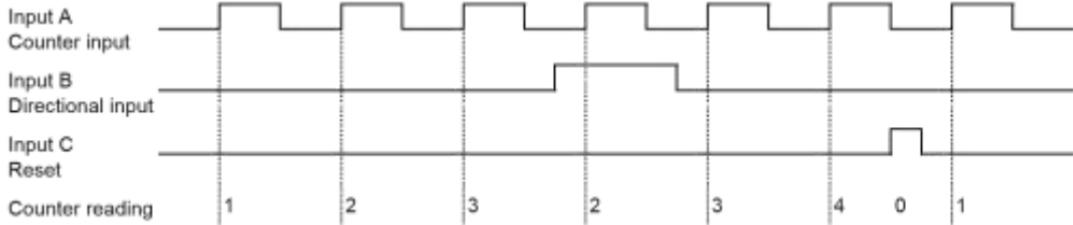


---

Unidirectional counting ( $F1 = C G r = 0$ )



Directional input ( $F1 = C d r = 1$ )





5

Pulse



counter

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**HENGSTLER**

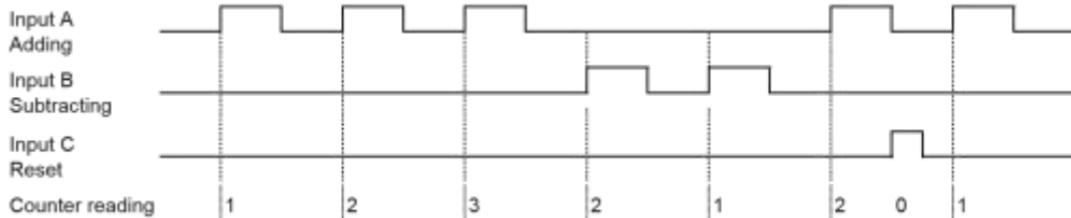


5

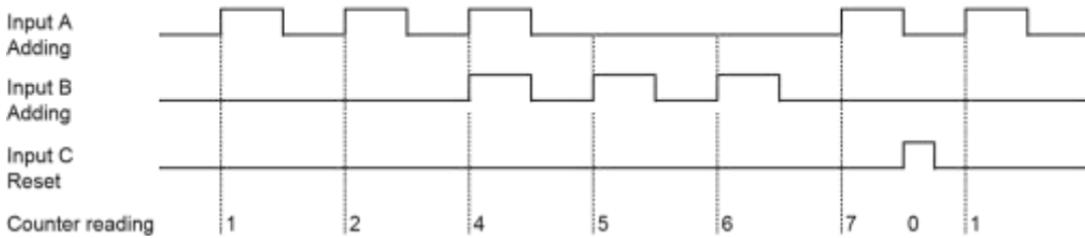


## Pulse counter

Differential input ( $F1 = A S r = 3$ )



Summation (totalizer) input ( $F1 = A A r = 5$ )



# HENGSTLER





5



## Pulse counter



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Phase discriminator (F1 = QUAd r) = 6

Change of rotating direction

Channel A



Channel B



Input C

Reset (dynamic)



Counter reading single 1

2

3

4

5

4

0

-1

Evaluat. (F2=0)

Counter reading double1 2

3

4

5

6

7

8

9

Evaluat. (F2=1)

Counter reading quad. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 15 14 13 0

-1

-2

-3

-4

Evaluat. (F2=2)

---

# HENGSTLER





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5.3              Signal              diagrams              -  
Output              signals

Output signals monostable (timed)  
Coincidence signals P0 (F10), P1 (F11), P2 (F12) monostable (timed)



---

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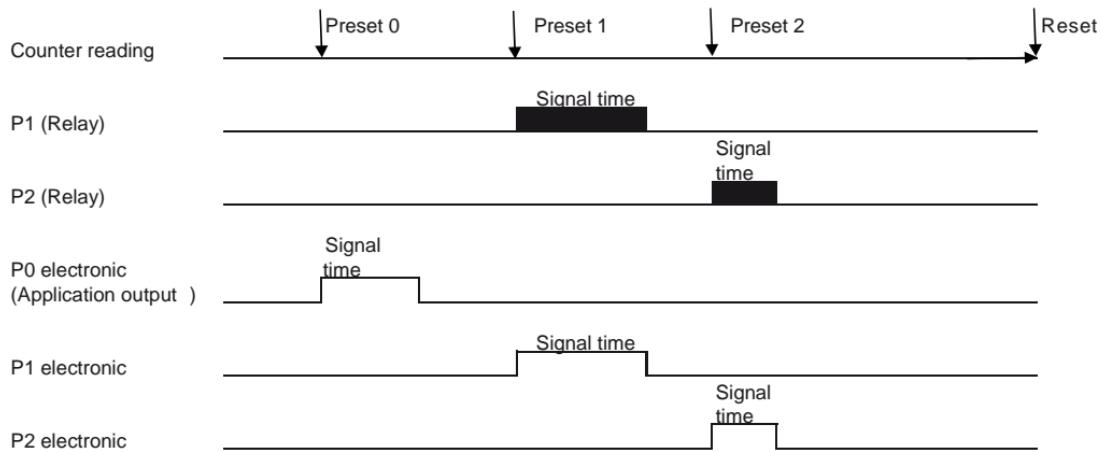




5



## Pulse counter



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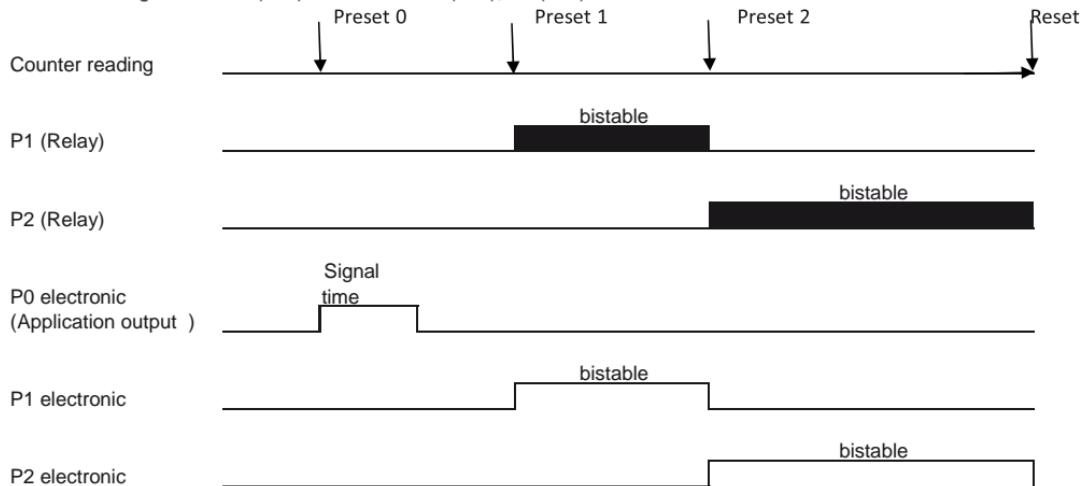
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Output signals bistable (latching)

Coincidence signal time P0 (F10) monostable P1 (F11), P2 (F12) bistable



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5



## Pulse counter



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Trail Preset

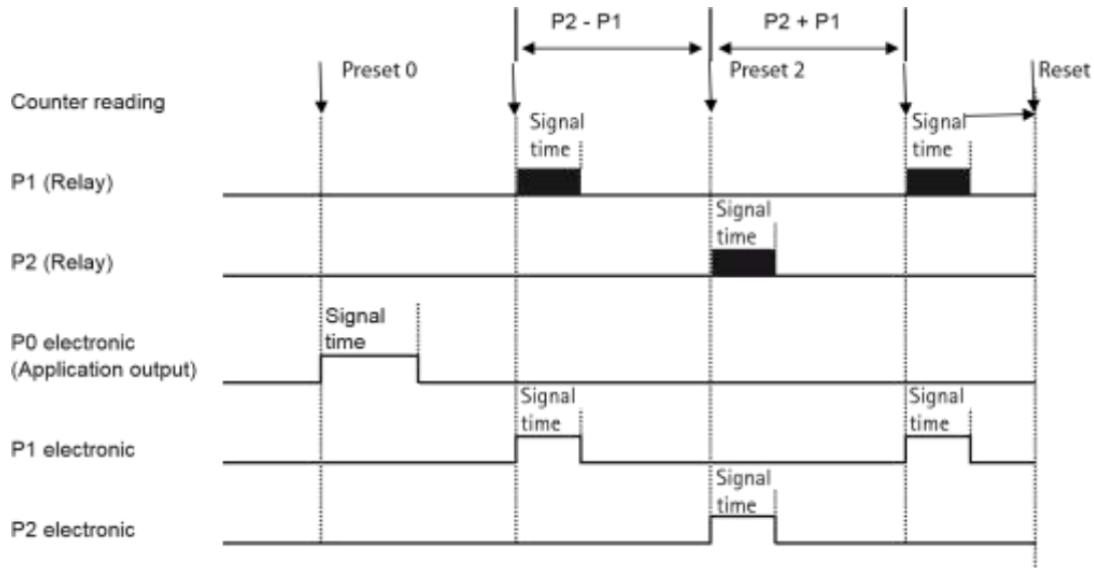
P0 (F10) Coincidence signal monostable, P1 (F8+F11) trail signal, symmetrical,  
P2 (F12) Coincidence signal monostable



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# HENGSTLER





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Range signals  
P0 (F10) Coincidence signal monostable P1 + P2 range signal

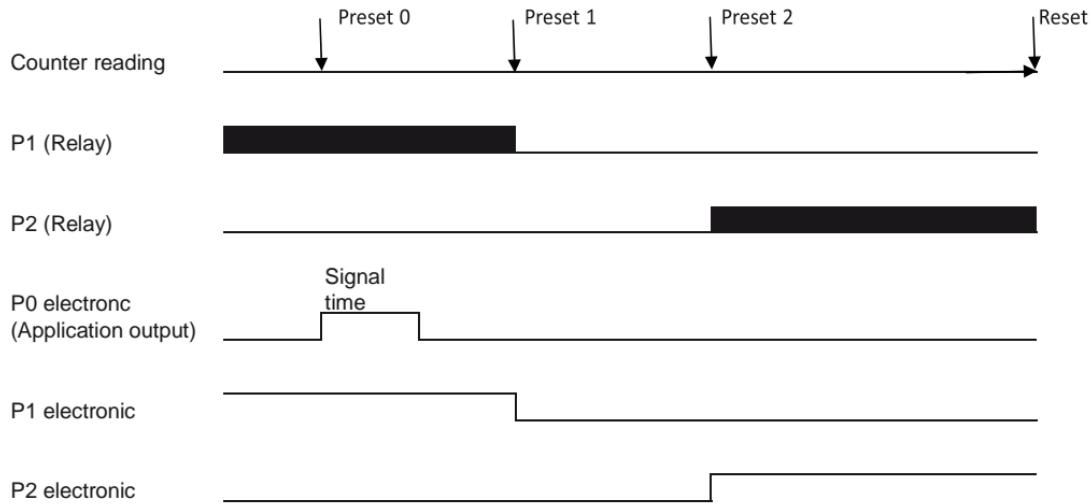
HEN



5



## Pulse counter





5



## Pulse counter



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**HEN**





## Pulse counter

5.4	Programming the counter function codes
Programming mode	Change function setting Save and change to mode next function Return to display
<b>E</b> + Keep pressed and simultaneously turn <b>Power On</b>	or press   press  <b>E</b> press
Alternative display of function codes	+ The function codes are displayed as text in row 1. By pressing both keys simultaneously you can change to the numerical display (F 0 to F 35). After pressing these keys once again the number of the selectable options will be displayed in addition. This setting will be stored.





5



## Pulse counter

**HEN**

Function code	Display Row 1	Function No.	Display Row 2
F0	ECHELL	Factory Setting	0* 000000 - No Function





5



## Pulse counter



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06.07.2010 10:31:55



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**HENGSTLER**





## Pulse counter

	5	<b>888888</b>	Adding	Adding	Reset
	6	<b>988888</b>	Channel A	Channel B	Reset
	7	<b>988888</b>	Channel A	Channel B	Gate/Inhibit
F2	<b>988888</b>	Edge Evaluation /Quadrat. evaluation	0*	<b>888888</b>	Single evaluation
			1	<b>888888</b> 2	Double evaluation
			2	<b>888888</b> 4	Quadruple evaluation
F3	<b>000000</b>	PNP/NPN- Logic	0	<b>0000H8</b>	NPN 8V-Level
			1*	<b>0000H8</b>	PNP 8-V Level
			2	<b>000000</b>	NPN TTL-Level

**HEN**



5



## Pulse counter



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5  
●

## Pulse counter



HEN

IN300E

Input-  
damping

0

IN300F

30 Hz damping (e.g. for mechanical contacts)



## Pulse counter

		1	dyRSEB	Dynamic Reset (ready to count after reset (even if reset signal is applied for a longer time)
F8	PRESB	Mode Preset 1	0*	PRESB P 1 normal preset; absolute to the counter reading (coincidence signal)
			1	EERBEB P 1 as a trail preset with prefix (relative to P 2)
			2	EERBES P 1 as a trail preset symmetrical (relative to P 2)
			3	ERAGEB P 1 and P 2 as a range signal (Sign.1 < P 1, Sign.2 > P 2)
F9	OBESIG	Output signal	0*	ReEBOA Active On
			1	ReEOFF Active Off
F10	SIGSEB	Signal time P 0	0	disRSEB Disabled / No output signal
			1	BSERB Bistable (latching), reset with Preset 2 or Reset

**HENGSTLER**





5



## Pulse counter



64



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**HEN**



5



## Pulse counter

2 000 002 0,02 s

3 000 005 0,05 s

4\* 000 010 0,10 s

5 000 020 0,20 s

6 000 050 0,50 s

7 000 100 1,00 s

8 000 200 2,00 s

9 000 500 5,00 s

10 000 000 10,00 s

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**HENGSTLER**





## Pulse counter

11 **USER1** User setting 1 (0-599,99 s)

12 **USER2** User setting (0-599,99 s)

13 **USER3** User setting 3 (0-599,99 s)

F11 **SIGER1** Signal  
time P 1 0 **000000** Disabled / No output signal

1 **01SER6** Bistable (latching); with Preset 2 or Reset

2 **000002** 0,02 s

3 **000005** 0,05 s

4\* **000010** 0,10 s

5 **000020** 0,20 s

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5



## Pulse counter



66

06.07.2010 10:31:57



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**HENGSTLER**



5



## Pulse counter



**HEN**



5



## Pulse counter



06.07.2  
010  
10:31:5  
7



---

# HENGSTLER



5  
●

## Pulse counter



HEN

1 685EAB

Bistable (latching); Reset  
Cannot be used in conjunction with automatic  
Reset



2 000003 0025



5



## Pulse counter



10,00 s

**HEN**

06.07.2010 10:31:58

11

USER

User setting 1 (0-599,99 s)



## Pulse counter

F14      **FLASH**      Display flashes

0\*      **FLASH**      No flashing

1      **FLASH P0**      Flashes as long as P 0 is active

2      **FLASH P1**      Flashes as long as P 1 is active

3      **FLASH P2**      Flashes as long as P 2 is active

4      **FLASH 2**      Flashes as long as any preset is active

F15      **2ROW**      2<sup>nd</sup> row display

0      **FLASH P0**      Preset 0

1      **FLASH P1**      Preset 1

2\*      **FLASH P2**      Preset 2

3      **FLASH PS**      Prescaler

**HEN**



5



## Pulse counter



70



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**HENGSTLER**

5  
█

## Pulse counter



HEN





5



## Pulse counter



06.07.2  
010  
10:31:5  
9



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**HENGSTLER**



## Pulse counter

F22	<b>RPLDOP</b>	Applica. Input/ Output	0	<b>PSC00E</b>	Prescaler output
			1	<b>PO000E</b>	Output Preset 0
			2	<b>DIR00E</b>	Directional output
			3*	<b>CAC00P</b>	Counter input - adding
			4	<b>CAC00A</b>	Counter input - subtracting
			5	<b>CESEE5</b>	Reset input
			6	<b>GREE00</b>	Gate/Inhibit input
			7	<b>LOCK00</b>	Keylock input
			8	<b>HOLD00</b>	Hold input (display lock)

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5



## Pulse counter

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9 **EERCH** Teach input  
(count value becomes P 2)

10 **SEE000** Set input (Set to Preset 0)

11 **LAREES** Latch and Reset  
(Save display at Reset)



F24 - F27 are applicable to multifunction counters with a USB or Ethernet interface. Consult the supplement included with those versions.

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**HENGSTLER**



## Pulse counter

F30	<b>0E5B00</b>	Lock Reset key	0*	<b>00A100</b>	Enable keyboard reset
			1	<b>000000</b>	Keyboard reset locked/delayed
F31	<b>001100</b>	Lock Preset 0	0*	<b>00A100</b>	P 0 Setting enabled
			1	<b>000000</b>	P 0 Setting locked / delayed



## Pulse counter

F32      **P1LOC** Lock Preset 1      0\*      **000000** P1 Setting enabled

.....  
1      **000000** P1 Setting locked / delayed

F33      **P2LOC** Lock Preset 2      0\*      **000000** P2 Setting enabled

.....  
1      **000000** P2 Setting locked / delayed

F34      **PSCLOC** Lock Prescaler setting      0\*      **000000** PSC setting enabled

.....  
1      **000000** PSC Setting locked / delayed

F35      **000000** Lock Mode      0\*      **000SEC** 10 seconds delay

.....  
1      **000000** Completely locked

.....  
2      **00P000** Lock depends on keylock input





## 6 Tachometer

### 6.1 Tachometer Description

(Supplementing the General Description given in Chapter 4)

<b>Operation:</b>	A tachometer measures the period (PNP: time from one rising edge to the next one); NPN: time period from a falling edge to the next one), and converts and displays this time in 1/sec or 1/min.
<b>Tachometer on:</b>	The following modes of tachometer operation can be selected: Unidirectional counting; Unidirectional counting with directional input; Differential counting, summation (totalizing); Phase discrimination (quad) with single, double or quadruple evaluation; Indication of ratio A/B and Indication of percentage (A-B) /A in %
<b>Decimal point</b>	Tachometer mode of operation 0-4 (function code F1) The decimal point only serves for better legibility and does not change the value.  Tachometer mode of operation 5 & 6 (function code F1) The decimal point is included in the calculation and increases the resolution.

HEN





<b>Output on:</b>	<b>signals Mode of operati</b>	The tachometer uses the following limit values: P 1 and 2 are limit (range) signals Output-Signal 1 is active at the displayed value of < P 1 and Output-Signal 2 is active at the displayed value of > P 2 Output-Signal 0 is active at the displayed value of > P 0; (application output)
<b>Display</b>	<b>unit:</b>	Programmable: 1/sec or 1/min Using the setting 1/min and prescaler 60 the display will show 1/hour.
<b>Min. cy:</b>	<b>input frequen</b>	Programmable 1 Hz or 0.1 Hz. If two edges do not occur within 1 s or respectively, 10s, a value of 0 will be displayed.
<b>Startup suppres</b>	<b>sion:</b>	Programmable Yes/No During the startup the lower limit signal is suppressed until the lower limit value is exceeded for the first time.  The startup suppression will become active again, if the minimum frequency is fallen below.



6



## Tachometer



6.2

Signal

diagram

-

Output

signals

**HEN**



Input frequency

P0

P2

P1

Output signals

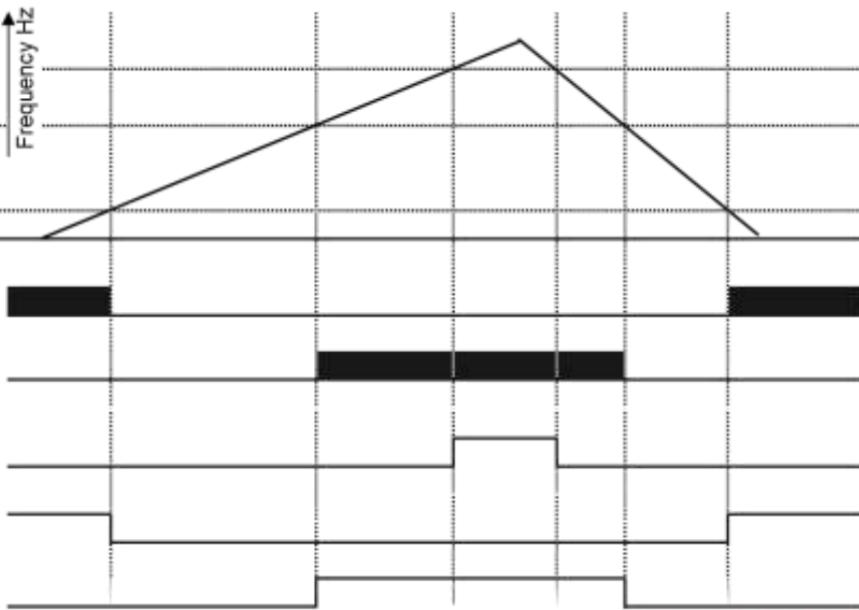
P1 (Relay)

P2 (Relay)

P0 electronic  
(Application output)

P1 electronic

P2 electronic





6



## Tachometer



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06.07.2010 10:32:01



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**HEN**





## 6.3

## Programming the

## tachometer function

## codes

Programming mode	Change function setting	Save and change to mode next function	Return to display
<b>E</b> <b>▼ +</b>	<b>▲ or ▼</b>	<b>▶</b>	<b>E</b>
Keep pressed and simultaneously turn <b>Power On</b>	press	press	press
Alternative display of Function code:	<b>▲</b> <b>▼ +</b>		

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**HENGSTLER**



---

**HEN**

---

Funktion code	Display Row 1	Function No.	Display Row 2
Eq	FACTORY	Factory Setting	No function



6



## Tachometer



---

06.07.2010 10:32:02



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**HENGSTLER**





6



## Tachometer



**HEN**

4

RUSH

Channel A

Channel B

Hold (Display memory)

Hold (Display

5

RUSH

Channel A / Channel B



6



## Tachometer



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6



## Tachometer



**HEN**



6



## Tachometer



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**HENGSTLER**





## Tachometer

---

F7      **SEN SUP**      Startup-suppress.      0      **0009E5**      With startup suppression

1\*      **000000**      Without startup suppression

---

F9      **00E500**      Output signal      0\*      **AEE000**      Active On

1      **AEE0FF**      Active Off

---

F10      **SB0000**      P 0 Addtl. Upper limit      0\*      **005A00**      Disabled / no Output signal

1      **EABBLE**      Additional range signal > P 0

---

F11      **SB0001**      P 1 Lower limit      0\*      **005A00**      Disabled / no Output signal

1      **EABBLE**      Range signal < P 1

---

**HEN**



6



## Tachometer



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**HENGSTLER**





6



## Tachometer

---

F12      **SB00E2** P 2 Upper limit    0\*    **000000** Disabled / no Output signal

1    **E00000** Range signal > P 2

---

F13      **dP00E8** Decimal place    0\*    **000000** No decimal point

1    **0000.00** 1 Decimal place

2    **000.000** 2 Decimal places

3    **00.0000** 3 Decimal places

4    **0.00000** 4 Decimal places

---

F14      **REFLASH** Display flashes    0\*    **REFLASH** Do not flash

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6



## Tachometer



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---

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## Tachometer

1 8888P0 Flashes as long as P0 active

2 8888P1 Flashes as long as P1 active

3 8888P2 Flashes as long as P2 active

4 P0P1P2 Flashes if any preset is active

F15

2.0000E 2<sup>nd</sup> row  
display

0 8888P0 Preset 0

1 8888P1 Preset 1

2\* 8888P2 Preset 2

3 888P50 Prescaler

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6



## Tachometer



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## Tachometer

F22	APL10P	Application Input/ Output	0	P000E	Output Preset 0
			1	B000E	Directional output
			2*	C000A	Count input adding, or 2nd count input A
			3	C000B	Count input subtracting, or 2nd counter input B
			4	GATE00	Gate/Inhibit Input
			5	HLD000	Hold-Input (display memory)
			6	EACH0	Teach Input (count value becomes P 2)
			7	LOC000	Keylock-Input



## Tachometer



F24 - F27 are applicable to multifunction counters with a USB or Ethernet interface. Consult the supplement included with those versions.

F31	<b>P000002</b>	Lock Pre-set 0 Setting	0°	<b>0000002</b>	P 0 Setting enabled
			.....		
			1	<b>0000002</b>	P 0 Setting locked / delayed
.....					
F32	<b>P100002</b>	Lock Pre-set 1 Setting	0°	<b>0000002</b>	P 1 Setting enabled
			.....		
			1	<b>0000002</b>	P 1 Setting locked / delayed
.....					
F33	<b>P200002</b>	Lock Pre-set 2 Setting	0°	<b>0000002</b>	P 2 Setting enabled
			.....		
			1	<b>0000002</b>	P 2 Setting locked / delayed
.....					

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F34	PSC0000	Lock Prescaler Setting	0*	000000	PSC Setting enabled
			.....		
			1	000000	PSC Setting locked / delayed
			.....		
F35	000000	Lock Mode	0*	000500	10 seconds delay
			.....		
			1	000200	Completely locked
			.....		
			2	000100	Lock mode depends on Keylock Input
			.....		

**HENGSTLER**



## 7 Timer

### 7.1 Timer Description

(Supplementing the General Description in Chapter 4)

<b>Function:</b>	The timer counts seconds, minutes or hours. Depending on the resolution (see below) the smallest units to be recorded are 0,1 ms.  Combined with the prescaler (see below), quantities can be measured as a function of time.
<b>Time for mats:</b>	4 time formats are available: Seconds, minutes, hours and HH:MM:SS
<b>Resolution:</b>	By shifting the decimal place, a resolution of up to 4 decimal places can be programmed; the smallest resolution is 0,1 ms.  The time format "seconds with four decimal places" shows 0.1 milliseconds. The time format "seconds with three decimal places" shows milliseconds. The time format "minutes with two decimal places" shows 1/100 minutes.

---

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6

**Tachometer**

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<b>Prescaler:</b>	During the timer operation the prescaler has to be disabled or set to 01,0000. The prescaler can be used to record quantities, provided that the quantity per time unit is known and constant. Example: A volume of 3 liters per second is supplied. Settings: Time format "seconds", prescaler 3,0000 Display: Supplied volume in liters as a function of time. The prescaler cannot be used with the time format HH:MM:SS as it is not applicable in this application
<b>Timer on:</b>	<b>mode of operati</b> The following modes of timer operation can be selected: <b>Cumulative measurement following the pulse-width measuring principle</b> (Cumulative measurement as long as input A is active) <b>Cumulative measurement following the cycle-duration principle</b> (Cumulative measurement from rising edge Input A to falling edge of Input A) <b>Cumulative measurement A=Run, B=Stop</b> (cumulative measurement from rising edge Input A to rising edge Input B) <b>Single-pulse measurement following the pulse-width measurement principle</b> (Measure as long as Input A is active) <b>Single-pulse measurement following the cycle-duration principle</b> (Measurement from rising edge Input A to rising edge of Input A) <b>Single-pulse measurement A=Run, B=Stop</b> (Cumulative measurement from rising edge Input A to rising edge Input B)

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<b>Manual d:</b>	<b>Start / Stop via keyboar</b>	The Start / Stop function can be set via the keyboard. Start: Press the UP button for 0.5s Stop: Press the DOWN button.
----------------------	---	--





## Timer

<b>Output signals Function:</b>	<b>si</b> -	<p><b>A coincidence signal:</b> The timer operates in the “coincidence” mode, i.e. the output signals are enabled for the programmed period of time after reaching the selected preset value <b>B trail signal:</b> P 2 and P 0 operate in the “coincidence” mode, i.e. the output signals are enabled for the programmed period of time when reaching the selected preset value. P 1 is a trail preset and not absolute to 0, but relative to P 2. If the setting is F8=1, the following will apply: Signal 1 is returned at P 2 – P 1 Example: P 2=1000, P 1=200, Signal 1 at 800; If P1 is negative: P 2=1000, P 1=(-200), Signal 1 at 1200 If the setting is F8=2, the following will be applicable: Signal 1 is returned at P 2 + und – P 1 (Example: P 2=1000, P 1=200, Signal 1 at 800 or/and 1200) <b>C range signal:</b> P 1 and 2 are range signals: Output-Signal 1 is active at timer reading &lt; P 1 and Output-Signal 2 is active at timer reading &gt; P 2 <b>D batch mode:</b> The timer can also be programmed to act as a batch counter. In this case, P 2= main preset value; P 1= Batch preset. In the Batch mode of operation, only positive entries are possible for P1; negative entries will be stored as positive values. This mode is ideal to default a process time and the number of process sequences (runs).</p>
---	----------------	--

---

# HENGSTLER





<b>Additional totalizer</b>	<b>to</b>	The additional totalizer is used to sum up all the times (even after repeated resetting of the main counter). The totalizer is reset separately.
---------------------------------	-----------	--

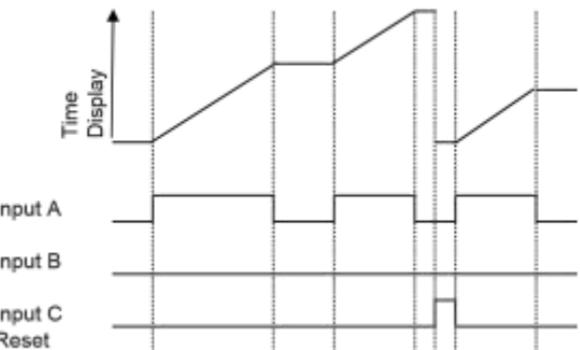
90

**7.2****Signal****Diagrams**

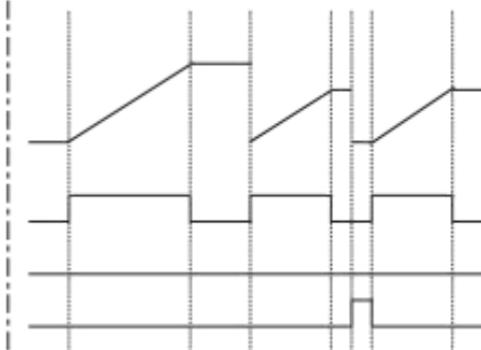
-

**Input****signals**

F7 = 0

Cumulative Measurement acc. to  
pulse-width measuring principle

F7 = 3

Single-pulse Measurement acc. to  
pulse-width measuring principle**HEN**



7



Timer



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**GSTLER**

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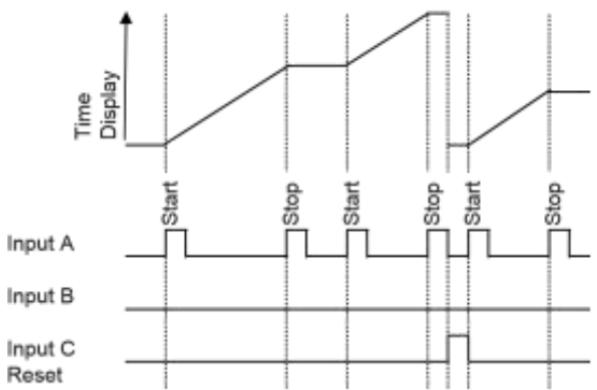
**HENGSTLER**



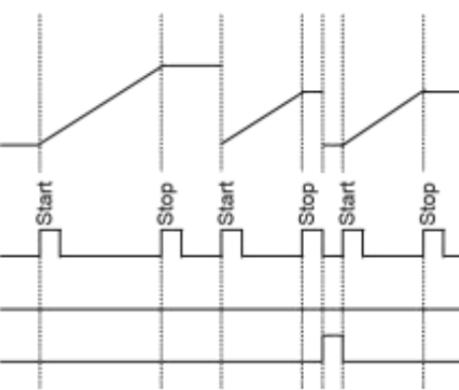
## Timer



F7 = 1

Cumulative measurement acc. to  
cycle-duration measuring principle

F7 = 4

Cumulative measurement acc. to  
cycle-duration measuring principle

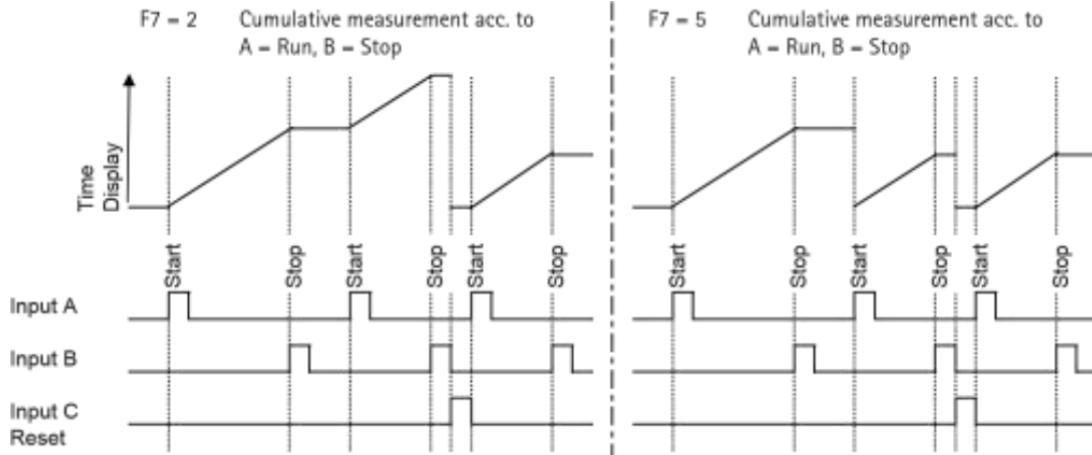


7

## Timer



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## 7.3

## Signal

## Diagrams

-

## Output

## signals

The output signals of the timer can be derived from the pulse counter (see 5.3) or, respectively, batch counter (see 9.2) functions.

## 7.4

## Programming the

## Timer

## Function

## Codes

Programming mode	Change function setting	Save and change to mode next function	Return to display
+	oder		
Keep pressed and simultaneously turn Voltage On	press	press	press
Alternative display of function codes	+	The function codes are displayed as text in row 1. By pressing both keys simultaneously you can change to the numerical display (F 0 to F 35). After pressing these keys once again the number of the selectable options will be displayed in addition. This setting will be stored.	

HEN



7



Timer



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**HENGSTLER**



## Timer

Function code	Display Row 1	Function No.	Display Row 2
F0	EEEEE8	Factory Setting (Defaults)	0* 000000 No function
		1	000YES All function codes are set to the values marked with *
F1	UUUUEEE	Time unit	0* SE2000 Seconds
		1	00000E Minutes
		2	0H000S Hours
		3	HH:MM:SS HH:MM:SS
F2	EE5008	Resolution	0* 000000 No decimal point

HEN



7

Timer



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**GSTLER**

06.07.2010 10:32:08



---

**HENGSTLER**



## Timer

1 8888.00 1 decimal place

2 88.88.00 2 decimal places

3 888.888 3 decimal places

4 8.88888 4 decimal places

F3      **NPPL00** PNP/NPN-  
Logic

0 8888H8 NPN 8 V-Level

1\* 8888H8 PNP 8 V-Level

2 8888L8 NPN TTL-Level

3 8888L8 PNP TTL-Level

**HENGSTLER**





7

Timer



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**HENGSTLER**



## Timer

---

F4      **INPUT**      Input  
(Attenuat) 0      **DAMPING**      30 Hz damping (attenuation)  
(e.g. for mechanical contacts)

---

1\*      **HOLDING**      F max. (see chapter 4 and 10)

---

F5      **RESET**      Set / Re-  
set- Mode 0\*      **RESET**      Reset to 0

---

1      **RESET0**      Automatic reset to 0  
after reaching Preset value 2

---

2      **SETP2**      Set to Preset 2

---

3      **RESETP2**      Automatically sets to Preset 2  
after reaching 0.

---

F6      **RESET**      dynam/  
static  
Reset 0\*      **SERIAL**      Static Reset (as long as the signal is applied)

---

1      **READY**      Dynamic Reset (ready for operation, even if reset  
signal has been applied for a longer time)

---

**HENGSTLER**





7

Timer



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**HENGSTLER**



## Timer

F7	<b>EBRERA</b>	Timer- Mode of Operation	0	<b>CUSPUL</b>	Cumulative measurement - pulse-width (counts as long as Input A is active)
			1*	<b>CUSPER</b>	Cumulative measurement – cycle duration (counts from rising edge of start signal to rising edge of stop signal).
			2	<b>CUSCNS</b>	Cumulative measurement – A=Run B=Stop (counts from rising edge of start signal to rising edge of stop signal).
			3	<b>SUPPUL</b>	Single-pulse measurement – pulse-width (counts as long as Input A is active)
			4	<b>SUPPER</b>	Single-pulse measurement – cycle duration (counts from rising edge of start signal to rising edge of stop signal).
			5	<b>SUPCNS</b>	Single-pulse measurement – A=Run B=Stop (counts from rising edge of start signal to rising edge of stop signal)
F8	<b>PRES00</b>	Mode Preset 1	0*	<b>PRES00</b>	P 1 normal preset; absolute to counter reading (coincidence signal)

**HENGSTLER**





7



Timer



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**HENGSTLER**



## Timer

1 **EPR001** P 1 is a trail preset with prefix (relative to P 2)

2 **EPR005** P 1 is a symmetric trail  
(relative to P 2)

3 **EPR008** P 1 and P 2 are range signals  
(Sign.1<P1, Sign.2>P2)

---

F9      **00E500** Output signal    0\* **ActEOn** Active On

1 **ActEOFF** Active Off

---

F10      **5000E0** Signal time P 0    0 **disABlE** Disabled / No output signal

1 **60SEAB** Bistable (latched), reset with Preset 2 or  
Reset

2 **00.002** 0,02 s

**HENGSTLER**





7

Timer



99



---

**HENGSTLER**



7



## Timer

3 888.005 0,05 s

4\* 888.010 0,10 s

5 888.020 0,20 s

6 888.050 0,50 s

7 888.100 1,00 s

8 888.200 2,00 s

9 888.500 5,00 s

10 888.1000 10,00 s

**HENGSTLER**





7

Timer



100



---

**HENGSTLER**



## Timer

11 **USER01** User setting 1 (0-599,99 s)

12 **USER02** User setting 2 (0-599,99 s)

13 **USER03** User setting 3 (0-599,99 s)

---

F11 **500000** Signal time P 1      0 **000000** Disabled / no output signal

1 **655360** Bistable (latched), reset with Preset 2 or Reset

2 **0000002** 0,02 s

3 **0000005** 0,05 s

4\* **0000010** 0,10 s

**HENGSTLER**





7

Timer



101



---

**HENGSTLER**



7



## Timer

5 000.20 0,20 s

6 000.50 0,50 s

7 000.00 1,00 s

8 000.200 2,00 s

9 000.500 5,00 s

10 000.000 10,00 s

11 056.000 User setting 1 (0-599,99 s)

12 056.002 User setting 2 (0-599,99 s)

**HENGSTLER**





7



Timer



102



---

**HENGSTLER**



## Timer

13 **USER3** User setting 3 (0-599,99 s)

F12 **500E2** Signal time P 2 0 **000000** Disabled / No output signal

1 **005E86** Bistable (latched); Reset function cannot be used in connection with automatic Reset

2 **000002** 0,02 s

3 **000005** 0,05 s

4\* **000010** 0,10 s

5 **000020** 0,20 s

6 **000050** 0,50 s

**HENGSTLER**





7



## Timer

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7 000.00 1,00 s

8 000.200 2,00 s

9 000.500 5,00 s

10 000.000 10,00 s

11 USE.88 User setting 1 (0-599,99 s)

12 USE.82 User setting 2 (0-599,99 s)

13 USE.83 User setting 3 (0-599,99 s)

---

**HENGSTLER**



7



Timer



104



---

**HENGSTLER**



---

**HEN**



7



Timer



---

06.07.2  
010  
10:32:1  
2



---

**HENGSTLER**





## Timer

1 **8888P1** Preset 1

2\* **8888P2** Preset 2

3 **888PSC** Prescaler

4 **E6E6AE** Totalizer / Batchcounter

---

F16 **88A0SE** Start /  
Stop via  
Keyboard  
(manual)

0\* **845A8E** Start / Stop locked via keys  
UP key=Start; DOWN key = Stop

1 **E8A8E** Start / Stop enabled via keys  
UP key =Start; DOWN key =Stop

---

F17 **8000ES** Power- On  
Reset

0\* **8888ES** Restore counter value

1 **8888ES** Reset at Power On

---

**HENGSTLER**





7



Timer



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06.07.2010 10:32:12



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**HENGSTLER**



## Timer

F18	00E000	Output Signal Memory	0000000000000000	Restart signal time after power fail output switches
			0000000000000000	Do not restart signal time after power fail
F19	00E000	Addtl. Totalizer	0000000000000000	Enabled
			0000000000000000	Disabled
F20	00E500	Prescaler	0000000000000000	Prescaler not active
			0000000000000000	Prescaler active
F21	000000	Timer Type	0000000000000000	Preset timer
			0000000000000000	Batch timer

**HENGSTLER**



7



Timer



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---

**HENGSTLER**



7



## Timer

F22

APL010P

Appli-  
cation  
Output

0 P0000E Output Preset 0

1\* R0000E Run-Input

2 S00P0E Stop-Input

3 R00S0E Reset counter and totalizer or batch counter

4 R00S0E Reset - only counter

5 R00S0E Reset - only totalizer or batch counter

6 L0000E Keylock input

7 H00d0E Hold input (display memory)

**HENGSTLER**



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8 **EACH** Teach Input (count value becomes P 2)

9 **SET** Set Input (set to Preset 0)



F24 - F27 are applicable to multifunction counters with a USB or Ethernet interface. Consult the supplement included with those versions.



**HENGSTLER**





7



## Timer

---

F30      **0E5E0E** Lock Reset Key    0°      **00H000** Keyboard reset enabled

1      **000000** Keyboard reset locked / delayed

---

F31      **P0E000** Lock Pre-set 0 Setting    0°      **00H000** P 0 Setting enabled

1      **000000** P 0 Setting locked / delayed

---

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---

**HENGSTLER**

**Timer**

F32	<b>P1</b> <del>LOCK</del>	Lock Pre-set 1 Setting	0*	<b>000000</b>	P 1 Setting enabled
			1	<b>000000</b>	P 1 Setting locked / delayed
F33	<b>P2</b> <del>LOCK</del>	Lock Pre-set 2 Setting	0*	<b>000000</b>	P 2 Setting enabled
			1	<b>000000</b>	P 2 Setting locked / delayed
F34	<b>PSC</b> <del>LOCK</del>	Lock Prescaler Setting	0*	<b>000000</b>	PSC Setting enabled
			1	<b>000000</b>	PSC Setting locked / delayed
F35	<b>LOCK</b> <del>MODE</del>	Lock Mode	0*	<b>000500</b>	10 seconds delay
			1	<b>000000</b>	Completely locked
			2	<b>000000</b>	Lock function depending on Keylock input





## Counter

### 8 Shift Counter

#### 8.1 Shift Counter

##### Description

(Supplementing the general description under 4)

<b>Function:</b>	2-shift counters enable the acquisition of 2 separate partial sums. Counter input A acts on partial sum 1, whereas counter input B acts on partial sum 2.  Both partial sums are counted positively; the total sum is calculated mathematically and corresponds to the summed-up total (or respectively, the difference) of the partial sums. The total sum remains unchanged after resetting one of the partial sums.
<b>Counter mode of</b>	The following counter modes of operation can be selected: Difference counting and summation (totalizing)

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<b>on:</b>  <b>Output</b> <b>signals</b> - <b>mode</b> <b>of</b> <b>operati</b> <b>on:</b>	The counter operates in the "coincidence" mode, i.e. the output signals are enabled for the programmed period of time after reaching the selected Preset value.  The total sum acts on Preset 0 Partial sum 1 acts on Preset 1 Partial sum 2 acts on Preset 2
--	---

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<b>Reset</b>	After a reset at input C, both partial sums and the total sum are reset.  When resetting via the application input it is possible to reset one or both of the partial sums or the total sum, depending on the selected programming.  When resetting via the keyboard, only the value shown on the display is reset.
--------------	---





## Counter

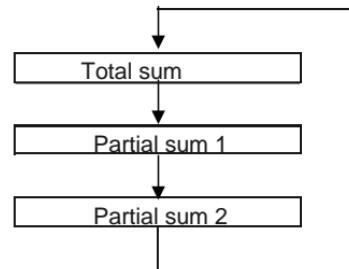
### Totalizer

The totalizer sums up all the input pulses, even if the partial sums and the total sum are reset. The totalizer can only be reset manually.

### 8.2 Scrolling between Total Sum and Partial Sums

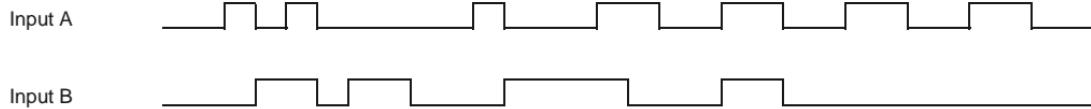
The Shift key is used to scroll between the total sum and partial sums 1 and 2.

If a partial sum is shown, SU1 or SU2 will flash in the lower display bar.



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8.3      Signal      diagrams      -  
Inputs  
(PNP      Logic)Adding/Adding ( $F_1 = A \cdot A \cdot r$ )

Counter reading

Partial sum 1	1	2		3	4	5	6	7
Partial sum 2		1	2		3		4	
Total sum	1	2	3	4	5	6	7	10

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8  
Shift



## Counter

---

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---

**HENGSTLER**





8



Shift



## Counter

---

Adding/Subtracting (F1= A S r)

Input A



Input B



Counter reading

Partial sum 1

1      2                          3                          4                          5

Partial sum 2

1                2    3                                  4

Total sum

1 0 1 0    1 0                                  1                                  2                                  3



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---

**HENGSTLER**





8



Shift

Counter



06.07.2010 10:32:15

8.4

Signal

Diagrams

-

Output

signals

Output signals - monostable

Coincidence signals P 0/Total Sum (F10), P 1/Partial sum 1 (F11), P 2/Partial sum 2 (F12) monostable



---

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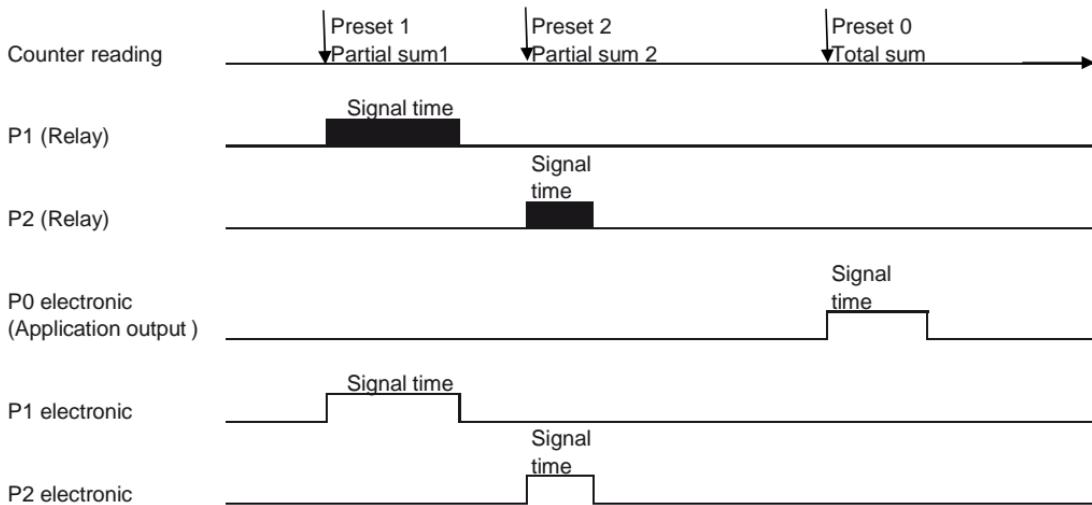


8



Shift

Counter



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**GSTLER**

06.07.2010 10:32:15

**HEN**



8



Shift



Counter

## 8.5 Codes

### Programming the

Shift

Counter

Function

Programming mode	Change function setting	Save and change to next mode function	Return to display
<b>E</b> +	or		<b>E</b>
Keep pressed and simultaneously turn <b>Power On</b>	press	press	press
Alternative display of Function codes	+		

The function codes are displayed as text in row 1. By pressing both keys simultaneously you can change to the numerical display (F 0 to F 35). After pressing these keys once again the number of the selectable options will be displayed in addition. This setting will be stored.

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**HENGSTLER**



8



Shift



## Counter

Function code	Display Row 1	Function No.	Display Row 2			
F0	F0E5EE	Factory Setting (Defaults)	0*	00000000	No function	
			1	0009E5	All function codes are set to the values marked with *	
F1	C0UN08	Counter mode of Operation		Input A	Input B	Input C
			0	005000	Adding	Subtracting
F3	NPNLOG	PNP/NPN-Logic	0	000000	Adding	Reset
			1*	000000	NPN 8 V-Level	

HEN



8



Shift

Counter



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---

**HENGSTLER****GSTLER**



8



Shift



Counter

---

1\* **PNPPNPHA** PNP 8 V-Level

---

2 **PNPNEEEA** NPN TTL-Level

---

3 **PNPNEEEA** PNP TTL-Level

---

F4 **IINSEREE** Input Attenuat. 0 **COMFFART** 30 Hz damping (attenuation); e.g. for mechanical contacts

---

1\* **HASEFFFA** F max. (see chapter 4 and 10)

---

F5 **PRESEEE** With / without Preset 0 **SABYES** With Preset

---

1\* **SABYESA** Without Preset

---

---

**HEN**



8



Shift

Counter



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---

**HENGSTLER**



8



Shift



Counter



---

HEN



8



Shift

Counter



---

06.07.2  
010  
10:32:1  
7



---

**HENGSTLER**





8



Shift

**Counter**

4\* 0000.10 0,10 s

5 0000.20 0,20 s

6 0000.50 0,50 s

7 0001.00 1,00 s

8 0002.00 2,00 s

9 0005.00 5,00 s

10 00010.00 10,00 s

11 USE 0.00 User setting 1 (0-599,99 s)

**HENGSTLER**



8



Shift

Counter



120

06.07.2010 10:32:17



---

**HENGSTLER**



8



Shift



Counter

12 USE~~00~~2 User setting 2 (0-599,99 s)13 USE~~00~~3 User setting 3 (0-599,99 s)

F11 580081 Signal time P 1  
Partial sum 1 0 000000 Disabled / no output signal

1 615886 Bistable (latched); reset with Reset

2 000002 0,02 s

3 000005 0,05 s

4\* 000010 0,10 s

5 000020 0,20 s

**HENGSTLER**



8



Shift

Counter



121



---

**HENGSTLER**



8



Shift

Counter



6 0000.50 0,50 s

7 0001.00 1,00 s

8 0002.00 2,00 s

9 0005.00 5,00 s

10 0000.00 10,00 s

11 USE0.01 User setting 1 (0-599,99 s)

12 USE0.02 User setting 2 (0-599,99 s)

13 USE0.03 User setting 3 (0-599,99 s)

**HENGSTLER**



8



Shift

Counter



122



---

**HENGSTLER**



8



Shift



Counter

F12

**510002** Signal  
time P 2  
Partial  
sum 2

0

**000000**

Disabled / no output signal

1

**000000**

Bistable (latched); reset with Reset

2

**000002**

0,02 s

3

**000005**

0,05 s

4\*

**000010**

0,10 s

5

**000020**

0,20 s

6

**000050**

0,50 s

7

**000100**

1,00 s

**HENGSTLER**



8



Shift

Counter



123



---

**HENGSTLER**



8



Shift

Counter



8 8882.00 2,00 s

9 8885.00 5,00 s

10 88810.00 10,00 s

11 USEE88 User-Einstellung 1 (0-599,99 s)

12 USEE82 User-Einstellung 2 (0-599,99 s)

13 USEE83 User-Einstellung 3 (0-599,99 s)

F13 8P000E Decimal Point

0\* 888880 No decimal point

1 888880.0 1 decimal place

**HENGSTLER**



8



Shift

Counter



124



---

**HENGSTLER**



8



Shift

## Counter



---

2 888.000 2 decimal places

---

3 88.0000 3 decimal places

---

4 8.00000 4 decimal places

---

F14 **FLASH** Display flashes

0\* **0FLASH** Do not flash

---

1 888.8P0 Flashes as long as P 0 is active

---

2 888.8P1 Flashes as long as P 1 is active

---

3 888.8P2 Flashes as long as P 2 is active

---

4 **P08182** Flashes if any preset is active

---

---

**HENGSTLER**





8



Shift

**Counter**

---

125

---

F15

2.000 HZ 2<sup>nd</sup> row  
display

0 0000P0 Preset 0

1 0000P1 Preset 1

2\* 0000P2 Preset 2

3 0000P50 Prescaler

4 000501 Partial sum 1

5 000502 Partial sum 2

6 000E0E Totalizer

---

---

**HENGSTLER**



8



Shift  
Counter



---

126



---

**HENGSTLER**





8



Shift

Counter



---

HEN



8



Shift

Counter



---

06.07.2  
010  
10:32:2  
0



---

**HENGSTLER**





8



Shift



## Counter

2 62888P 2nd counter input partial sum 2

3 EES88I Reset of partial sum 1

4 EES882 Reset of partial sum 2

5 EES8812 Reset of both partial sums

6 EEE88E Reset of total sum

7 H88888 Hold Input (display memory)

9 L88888 Keylock Input

---

# HENGSTLER





8



Shift

Counter



F24 - F27 are applicable to multifunction counters with a USB or Ethernet interface. Consult the supplement included with those versions.

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06.07.2010 10:32:20



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**HENGSTLER**



8



Shift



## Counter

---

F30      **RESLOC** Lock  
Reset key    0\*      **SUNLOC** Keyboard reset enabled

1      **SSSLOC** Keyboard reset locked / delayed

---

F31      **P0SL0C** Lock  
Preset 0    0\*      **SUNSL0C** P 0 Setting enabled

1      **SSS0L0C** P 0 Setting locked / delayed

---

F32      **P1SL0C** Lock  
Preset 1    0\*      **SUNSL0C** P 1 Setting enabled

1      **SSS1L0C** P 1 Setting locked / delayed

---

F33      **P2SL0C** Lock  
Preset 2    0\*      **SUNSL0C** P 2 Setting enabled

1      **SSS2L0C** P 2 Setting locked / delayed

---

**HENGSTLER**





8



Shift

Counter



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---

**HENGSTLER**



8



Shift



## Counter

F34	PSC0000	Lock Prescaler Setting	0*	000000	PSC Setting enabled
			.....		
			1	000000	PSC Setting locked / delayed
			.....		
F35	LOCK000	Lock Mode	0*	000500	10 seconds delay
			.....		
			1	000000	Completely locked
			.....		
			2	000000	Lock mode depends on keylock input
			.....		

**HENGSTLER**



## 9 Batch Counter

### 9.1      Batch      Counter      Description

(Supplementing the general description in Chapter 4)

<b>Function:</b>	Preset 2 is the main Preset setting. Preset 1 is the Batch Preset or, respectively, the preset value of the 2nd totalizer.  In the batch operation the batch counter counts how often the main Preset is activated. Example of an application: during length cutting operations, for example, both the lengths (main preset) and number (batch preset) can be monitored. In the Batch mode of operation, only positive entries are possible for P1; negative entries will be stored as positive values.
<b>Counter n:</b>	<b>mode of operatio</b> n: The following modes of operation can be adjusted for the counter: Unidirectional counting, adding or subtracting; Unidirectional counting with directional input; Difference counting, summation and phase discrimination (quad) with single, double or quadruple evaluation.





## Batch Counter

<b>Output Mode of Operati on:</b>	The counter operates in the coincidence mode, i.e. the output signals are enabled for the programmed duration when the selected preset value is reached.
---	--

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<b>Prescaler put out: Out PSC-</b>	<p>The Prescaler output is an application output.</p> <p>With each increase of the counter reading the number of output pulses corresponds to the respective number of increments.</p> <p>The pulse length of the prescaler output corresponds to a frequency of 500 Hz.</p> <p>When using the prescaler output the max. input frequency is:</p> <p><math>F_{max} = 500 / PSC</math>.</p> <p>So it is possible that the maximum input frequency can not be reached.</p>
--	---

---

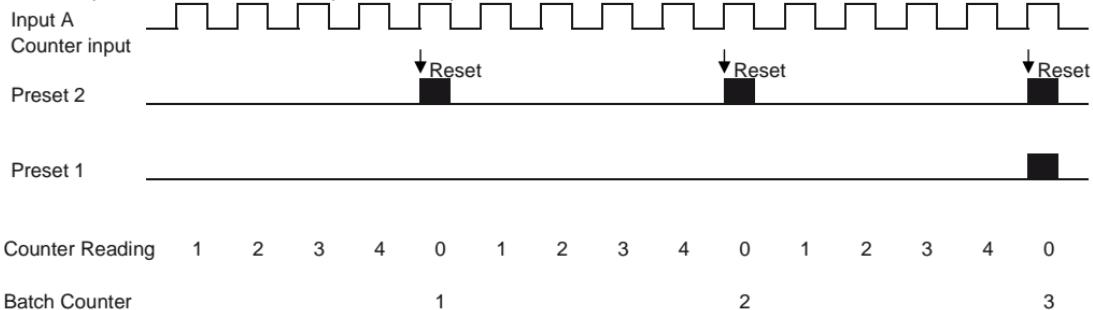
**HENGSTLER**



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## 9.2 Signal Diagrams - Inputs and Outputs

Unidirectional count (F1 = C G r), Batch counter (F19 = batch),  
Preset 2 (Main Preset = 5, Preset 1 (Batch Preset) = 3



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# HENGSTLER





9



## Batch Counter



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## Batch Counter

### 9.3 Programming the Codes Batch Counter Function

Programming mode	Change setting	function	Save and change to next mode function	Return to display
<b>E</b> + <b>▼</b> Keep pressed and simultaneously turn <b>Power On</b>	<b>▲</b> or <b>▼</b> press	<b>▶</b> press	<b>E</b> press	
Alternative display of Function codes	<b>▲</b> + <b>▼</b>	The function codes are displayed as text in row 1. By pressing both keys simultaneously you can change to the numerical display (F 0 to F 35). After pressing these keys once again the number of the selectable options will be displayed in addition. This setting will be stored.		

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06.07.2010 10:32:22

**HEN**



## Batch Counter

Function code	Display Row 1	Function No.	Display Row 2	
F0	EEEEE	Factory Setting (Defaults)	0* 888888	No function
			1 888985	All function codes are set to the values marked with *
F1	COURSES	Counter Mode of Operation	0* EEEEEE	Input A
			Subtracting	Input B
			1 EEEEEE	Gate/Inhibit
			2 EEEEEE	Reset
			3 ESSSSS	Input C
			Count Input	Directional input
			4 ESSSSS	Directional input
			Adding	Gate/Inhibit
			Adding	Reset
			Subtracting	Reset
			Subtracting	Reset

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9



## Batch Counter



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**HEN**





9



## Batch Counter

5	RRRRRR	Adding	Adding	Reset
6	RURURU	Channel A	Channel B	Reset
7	RURURU	Channel A	Channel B	Gate/Inhibit

F2	RURURU	Edge Evalua- tion Quadrat. Evalua- tion	0*	RRRRRR	Single evaluation
			1	RRRRR2	Double evaluation
			2	RRRRR4	Quadruple evaluation

F3	PNPLOG	PNP/ NPN-Lo- gic	0	PPPLHH	NPN 8 V-Level
			1*	PPPLHH	PNP 8 V-Level





9



## Batch Counter



---

06.07.2010 10:32:23



---

**HEN**





9



## Batch Counter

2 **OPP000** NPN TTL-Level

3 **PPP000** PNP TTL-Level

F4 **HSEEE** Input damping (Attenuat) 0 **LSEEE9** 30 Hz damping (e.g. for mechanical contacts)  
.....  
1\* **HSEEE9** F max. (see chapter 4 and 10)

F5 **ESER00** Set / Re-set- Mode 0\* **RES00** Reset to 0  
.....  
1 **RRES00** Automatic reset to 0 when Preset value 2 is reached  
.....  
2 **SEEP2** Sets to Preset value 2  
.....  
3 **RSEEP2** Automatic setting to Preset 2 after reaching 0

---

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9



## Batch Counter



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## Batch Counter

F6	<b>SESEE</b>	Dynamic/ static Reset	0*	<b>SEERE</b>	Static Reset (reset as long signal is applied)
			.....		
			1	<b>dyneeee</b>	Dynamic Reset (ready for counting after reset, even if reset signal has been applied for a longer time)
F9	<b>00E580</b>	Output signal	0*	<b>82E000</b>	Active On
			.....		
			1	<b>82E0FF</b>	Active Off
F10	<b>SIGREO</b>	Signal time P 0	0	<b>815AB0</b>	Disabled / no output signal
			.....		
			1	<b>605EAR</b>	Bistable (latched); reset with Preset 2 or Reset
			.....		
			2	<b>0000002</b>	0,02 s
			.....		
			3	<b>0000005</b>	0,05 s
			.....		





9



## Batch Counter

4\* 0000.00 0,10 s

5 0000.20 0,20 s

6 0000.50 0,50 s

7 0001.00 1,00 s

8 0002.00 2,00 s

9 0005.00 5,00 s

10 0010.00 10,00 s

11 USE 0.00 User-setting 1 (0-599,99 s)

**HENGSTLER**





9



## Batch Counter



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**HENGSTLER**



9



## Batch Counter

12 **USER02** User-setting 2 (0-599,99 s)

13 **USER03** User-setting 3 (0-599,99 s)

F11 **SIGE1** Signal  
time P 1

Batch-  
Preset

0 **000000** Disabled / no output signal

1 **000000** Bistable (latched); reset with Reset

2 **000002** 0,02 s

3 **000005** 0,05 s

4\* **000010** 0,10 s

5 **000020** 0,20 s

**HENGSTLER**





9



## Batch Counter



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**HENGSTLER**



9



## Batch Counter

6 888.050 0,50 s

7 888.100 1,00 s

8 888.200 2,00 s

9 888.500 5,00 s

10 888.000 10,00 s

11 USE0.01 User-setting 1 (0-599,99 s)

12 USE0.02 User-setting 2 (0-599,99 s)

13 USE0.03 User-setting 3 (0-599,99 s)

**HENGSTLER**





9



## Batch Counter



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**HENGSTLER**



9



## Batch Counter

F12

S000E2  
Signal  
time P 2

0

005ABL

Disabled / no output signal

1

005SER

Bistable (latched); reset with Reset  
Cannot be used in connection with automatic  
Reset

2

0000002

0,02 s

3

0000005

0,05 s

4\*

0000010

0,10 s

5

0000020

0,20 s

6

0000050

0,50 s

7

0000100

1,00 s



9



## Batch Counter

8 8882.00 2,00 s

9 8885.00 5,00 s

10 8880.00 10,00 s

11 USE001 User-setting 1 (0-599,99 s)

12 USE002 User-setting 2 (0-599,99 s)

13 USE003 User-setting 3 (0-599,99 s)

---

F13 88888 Decimal point

0\* 88888.0 No decimal point

1 88888.0 1 decimal place

---

**HENGSTLER**





9



## Batch Counter



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**HENGSTLER**



9



## Batch Counter

2 2 decimal places

3 3 decimal places

4 4 decimal places

---

F14 **FLASH** Display flashes

0\* Do not flash

1 Flashes as long as P 0 is active

2 Flashes as long as P 1 is active

3 Flashes as long as P 2 is active

4 Flashes if any preset is active

---

**HENGSTLER**





9



## Batch Counter



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---

**HENGSTLER**



9



## Batch Counter

F15

2<sup>nd</sup> row  
display

0

0000P0

Preset 0

1

0000P1

Preset 1

2\*

0000P2

Preset 2

3

0000P3

Prescaler

4

000020

Batch counter or 2nd counter

F16

External  
Reset  
signal

0

0000R0

Only resets the counter

1

0000R1

Only resets the batch counter

2\*

0000R2

Resets all counters

**HENGSTLER**



9



## Batch Counter



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**HENGSTLER**



## Batch Counter

F17	<b>P000ES</b>	Power On Reset	0*	<b>0000ES</b>	Restores the counter value
			1	<b>0000ES</b>	Reset at Power On
F18	<b>0000EN</b>	Output signal- Memory	0	<b>0000YES</b>	Restart signal time after power fail  output switches
			1*	<b>0000NO</b>	Do not restart signal time after power fail
F19	<b>0000HC</b>	Batch- Counter or 2nd totalizer	0*	<b>0000HC</b>	Batch counter
			1	<b>0000HB</b>	2nd totalizer
F22	<b>APL000P</b>	Appli- cation in- put/ output	0	<b>PSC000E</b>	Prescaler output
			1	<b>PO000E</b>	Output Preset 0

**HENGSTLER**





9



## Batch Counter



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06.07.2010 10:32:27



---

**HEN**



9



## Batch Counter

2 **DAP00E** Directional count output

3\* **CAC00P** Count input, adding

4 **CAC00A** Count input, subtracting

5 **CES00E** Reset counter and Batch counter or 2nd totalizer

6 **CES00E** Resets only counter

7 **CES00E** Resets only Batch counter or 2nd totalizer

8 **GRIE00** Gate/Inhibit input

9 **C00000** Keylock input





## Batch Counter

06.07.2  
010  
10:32:2  
7

10 **HOLD** Hold input (display memory)

11 **EERH** Teach input Count value becomes P 2

12 **SEE** Set-input (sets to Preset 0)



F24 - F27 are applicable to multifunction counters with a USB or Ethernet interface. Consult the supplement included with those versions.

**HEN**



9



## Batch Counter

F30	<b>0E5100</b>	Lock Re-set key	0*	<b>000000</b>	Keyboard reset enabled
			1	<b>000000</b>	Keyboard reset locked / delayed
F31	<b>P00100</b>	Lock Preset 0 Setting	0*	<b>000000</b>	P 0 Setting enabled
			1	<b>000000</b>	P 0 Setting locked / delayed

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**HENGSTLER**



9



## Batch Counter



ma	P1	Lock	Lock	P 1 Setting enabled
Betriebsanweisungen 72_030909 engl. überarbeitet.indd	Preset	Preset	Setting	.....
0*247	0	0	1	8888 P 1 Setting locked / delayed

**HENGSTLER**

06.07.2010 10:32:28



---

## 10 Technical Data

### General

**Display** LCD reflective,  
Transflective Positive: black figures on back lit background  
Transmissive Negative: white, red or green figures on black background  
2 lines, counter reading/presettings 6-digits;  
decimal point (up to 4 decimals)

---

<b>Digit</b>	<b>height</b>	1st line 9.3 mm; 2nd line 7.2 mm
--------------	---------------	----------------------------------

---

<b>Supply</b>	SELV: 12-30 VDC; protected against polarity reversal
<b>voltage</b>	SELV: 24 VAC, 50/60 Hz, ± 10%
e	115 VAC; 230 VAC, 50/60 Hz, ± 10%
	90-260 VAC; 50/60 Hz

---

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# HENGSTLER





## Technical Data

<b>Current</b>	12 ... 30 VDC < 200 mA, <b>consu</b> 24 VAC < 250 mA; including sensor supply
<b>option</b>	115/230 VAC < 50 mA; incl. sensor supply 90 - 260 VAC < 400 mA; incl. sensor supply

<b>Power</b>	< 5 W <b>consu</b>
--------------	-----------------------

**option**

Duty cycle	100%
------------	------

<b>Overload</b>	external fuse DC: 0,16 AT (IEC 127); DC: 0,2 AT (UL 198)
<b>protec</b>	24 VAC: 315 mA T; 230 VAC: 32 mA T; 115 VAC: 63 mA T

**tion****150**

Overload protection	external fuse 230 V, 2,5 mA T
Relay output	

Sensor supply	Only for AC operation: 12-24 VDC load-dependent; max. 50 mA
---------------	---

Storage of values	NV-memory > 10 years
-------------------	----------------------

Electrical connections	Plug-in screw-type connections / Terminals
------------------------	--

**HENGSTLER**



## Technical Data

Cable cross-section	1...1.5 mm <sup>2</sup> with wire-end sleeves
Amplitude threshold	< 2 V and > 8 V or < 1 V and > 4 V at TTL-level amplitude max. 40 VDC
Active edge	programmable positive for PNP-input, negativ for NPN-input
Input resistance	approx. 10 kOhm
Count frequency	max. 60 kHz (TTL 15 kHz): single-channel counting max. 60 kHz (TTL 15 kHz): Different. counting and totalizing channel (A+B together) max. 30 kHz (TTL 15 kHz): phase discriminator single or double evaluation max. 15 kHz (TTL 15 kHz): phase discriminator, quadruple evaluation damped (attenuated) 30 Hz
Pulse form	any desired form (at max. frequency square 1:1)
Pulse duration min.	17 ms (30 Hz); 8 µs (60 kHz)
Prescaler	0,0001 - 99,9999
Reset	manual reset via keyboard, external reset static or dynamic programmable; pulse length min. 5 ms,

---

**HENGSTLER**



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## Technical Data



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**HENGSTLER**



## Technical Data

	automatic reset after reaching Preset 2, (No pulse losses at max. counter frequency due to automatic reset function). via application input (programmable) and programmable Power-On Reset
Set function	Setting to Preset 0 (independent of reset)
Display and Preset Range	- 999 999 up to + 999 999
Warning signal	Display flashes when preset 0, 1 or 2 are active
Signal times	0,01 s to 599,99 s or bistable (latched) programming; tolerance + 10ms; active On or Off
Relay Output for P 1 and P 2	Change-over contact max. 250 VAC / 30 VDC / 5 A Change-over contact min. 5 VAC / 5 VDC / 10 mA delay < 10 ms
Transistor Output for P 1 and P 2	PNP-output 12 - 30 VDC max. 50 mA at DC-supply 12 - 24 VDC max. 30 mA at AC-supply (24/115/230 VAC) 12 - 24 VDC, max 50 mA at AC-supply with switching power supply
Application Output	PNP-output 12 - 30 VDC max. 20 mA at DC supply 12 - 24 VDC max. 20 mA at AC supply (24/115/230 VAC)

---

**HENGSTLER**



## Technical Data

Current load of the outputs (Sensor 12-24 VDC, Out 1, Out 2, Application-Output) is not allowed to exceed 65 mA in sum.

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### Counter

Counter mode of operation Input A,B add / add;

Unidirectional; adding or subtracting; directional input; Differential operation, add / sub; Summation (Totalizing)

Phase discriminator single, double or quadruple evaluation

Control Input Reset; Gate/Inhibit

Preselect Mode Absolute or trail, Range signal /limit values (Signal 1 < P1, Signal 2 > P 2)

Application Input/Output Output: Prescaler-out, Preset 0-out, Direction-out  
Input: addtl. counter input add / sub, Reset, Set, Gate, Keylock, Hold, Teach in

### Batch Counter

Mode Batch counter with Preset or 2nd totalizer with Preset

**HENGSTLER**



**Shift****Counter**

Counter Mode of Operation Differential counting add/sub, totalizing add/add

---

**Tachometer**

Measuring Principle	Period (cycle) measurement (1/Tau)
	1/min or 1/s

---

Time base

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Min. frequency	1 Hz or 0,1 Hz
Limit values	2 alarms with programmable startup suppression + 1 additional upper limit value on the application output
Tachometer	Unidirectional add oder sub; directional input;

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**HENGSTLER**



## Technical Data

mode of operation	Differential add / sub; totalizing add / add; Phase discriminator single, double or quadruple evaluation, A / B or (A-B) / A %
Application Input/Output	Output: Preselect 0-out, Direction-out Input: addtl. counter input add / sub, Keylock, Hold, Teach in
Accuracy of the tachometer function	Time base: ± 30 ppm Measuring principle: Periodic measurement Measuring time: min. 0,5s / max. 1s oder 10s Measuring resolution: 0,4µs (<30 ppm) Display resolution: 4 decimal places, 1 Digit = 100 ppm
Overall tolerance	= Shown resolution + tolerance of timebase = 130 ppm

### Timer

Measuring Principle	Pulse-width or cycle duration measurement Start Inp. A + Stop Inp. B; Start/Stop key
Time base	Programmable in sec, min, h or hh.mm.ss
Resolution	1; 0,1; 0,01; 0,001; 0,0001

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Function	Single-pulse or cumulative measurement
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**HENGSTLER**



## Technical Data

### Application Input/Output

Output: Preselect 0-out  
Input: addtl. Run, Stop, Reset, Set, Keylock, Hold, Teach in

### Accuracy of the timer

Time base:  $\pm 30 \text{ ppm}$   
Start / Stop-point in time:  $16 \mu\text{s} / 16 \text{ ms}$  (not damped / damped)  
Resolution:  $100 \mu\text{s} = 100 \text{ ppm}$   
= Shown resolution + tolerance of timebase = 130 ppm

### Total tolerance

### Environment. cond.

#### General design

EN 61 010 / IEC 61010-1

#### Protection Class

II; EN 61010-1 / IEC 61010-1

#### Pollution degree

V 2, EN 50178

#### EMC - Interference immunity

EN 61326-1 industrial environment \*

#### EMC - Emission

EN 61326-1 Class B \*

#### Ambient temperature

0°... 50°C EN 60 068-2-1/2

#### Storage temperature

- 20° ... + 65°C EN 60 068-2-1/2

### Safety

### Rules

**HENGSTLER**





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## Technical Data

Climate	40°C / 93% rel hum. class 4K4H, EN 60 068-2-78 25 - 50°C / 93% rel hum., cyclic, EN 60 068-2-38
Degree of protection	IP 65 front side; EN 60529

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**HENGSTLER**



## Technical Data

	IP 20 terminals
Vibration resistance	10 m/s <sup>2</sup> (10 ... 150 Hz); IEC 60 068-2-6
Shock resistance	100 m/s <sup>2</sup> (18 ms); IEC 60 068-2-27
Resistance to chemicals	Frontfoil acc. to DIN 42 115-2
Approvals	UL, CSA (pending)
RoHS	compliant

### Mechanical Data

Installation	Front-panel installation with tenter (frame) Front panel thickness max. 11 mm
Dimensions	48 mm x 48 mm x 118 mm, installation depth 110 mm DIN 43700
Front-panel cutout	45 mm x 45 mm + 0,3 mm
Weight	approx. 200 g

\* For cable length > 30 m, for connection to a DC-supply-network and input level TTL an additional protection circuit is necessary.

**HENGSTLER**





## 11 Transport, Packaging, Storage / 12 Maintenance and cleaning

### 11 Transport, Packaging, Storage



**Note! Damage may be caused by improper transport!**

**Improper transport may cause considerable damage.**

**Do not remove packaging before assembly and installation.**

The packaging offers ideal protection against mechanical damage and loss of parts, such as the plugs or operating instructions. Therefore, do not take the multifunctional counter out of its packaging until you actually start your assembly and installation work.

Inspect the shipment for completeness and possible signs of transport damage immediately after receipt.

## 12 Maintenance and cleaning

The multifunction counter does not require any maintenance.

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The front side may be cleaned with commercially available household detergents.

For additional environmental protection, a flexible transparent face plate protector is available as an accessory..

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## 13 Trouble shooting

### 13 Trouble shooting



**Warning!**

**Danger of injuries due to improper fault correction!**

**Improper fault correction may cause serious damage or personal injury.**

The machine/plant manufacturer is responsible for the preparation of operating instructions or a description stating the potential errors and the appropriate corrective action, as well as potential hazards and the behavior in the event of malfunctions. This is dependent on the end use design and application.

---

**HENGSTLER**





The first step is to determine if the cause of an error or malfunction implies a possible fault of the multifunction counter.

## Possible Errors

Error	Possible cause	To be corrected by:
Display remains dark	Machine/plant not powered on	Operator
Value is not stored	Defective voltage supply	Qualified electrician
	Power-on reset is active (F17)	Skilled personnel





## 13 Malfunctions

Counter/tachometer does not count	Defective signal generator; Counter does not receive any counting signals	Skilled personnel
	Adjusted to incorrect mode of operation (F1), Single-channel, directional input, differential counting, phase discriminator	Skilled personnel
	Incorrect adjustment of PNP/NPN logic and input level (F3)	Skilled personnel
	High-level does not exceed the upper amplitude threshold; low-level does not fall below the lower amplitude threshold	Qualified electrician
	Continuous reset signal is applied	Qualified electrician
	Continuous gate/inhibit signal is applied	Qualified electrician
Incorrect counting of counter/tachometer	Prescaler value is not correct	Skilled personnel

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	Phase discriminator - edge evaluation not correctly adjusted (F2) Input frequency too high (F4)	Skilled personnel
Keyboard Reset not possible	Keys are locked (F30 + F35)	Skilled personnel
Presetting not possible	Keys are locked (F31, F32, F33 + F35)	Skilled personnel

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## 14 Spare Parts / 15 Dismantling and Disposal

Prescaler adjustment not possible	Keys are locked (F34+ F35)	Skilled personnel
Signal 0, 1 or 2 not received	Signal deactivated (F10, F11, F12)	Skilled personnel
	User signal time adjusted to 0,000	Skilled personnel

## 14 Spare Parts



**Warning!**

**Use only OEM spare parts!**

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The use of incorrect or faulty spare parts may cause damage, malfunction or safety hazards. Therefore, use only the spare parts provided by the OEM.

The multifunction counter may only be opened and serviced by the manufacturer.  
Only external components are available as spare parts.

The order numbers are given in Chapter 17.

## 15 Dismantling and Disposal

After reaching the end of its useful life the multifunction counter has to be disposed of or recycled according to applicable local environmental laws.

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## 16 Ordering Information

### 16 Ordering Information

Display	Relay	12-24 VDC	24 VAC	115 VAC	230 VAC	90-260 VAC*
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LCD reflective	1	0 772 101	0 772 111	0 772 121	0 772 131	0 772 141
LCD reflective	2	0 772 102	0 772 112	0 772 122	0 772 132	0 772 142
LCD transreflective positive	1	0 772 201	-	-	-	0 772 241
LCD transreflective positive	2	0 772 202	-	-	-	0 772 242
LCD transmissive negative	1	0 772 301	-	-	-	0 772 341
LCD transmissive negative	2	0 772 302	-	-	-	0 772 342
LCD transmissive red	1	0 772 401	-	-	-	0 772 441
LCD transmissive red	2	0 772 402	-	-	-	0 772 442
LCD transmissive green	1	0 772 501	-	-	-	0 772 541
LCD transmissive green	2	0 772 502	-	-	-	0 772 542

Transreflective Positive: black figures on back lit background

Transmissive Negative: white figures on black background

Transmissive red: red figures on black background

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Transmissive green:

green figures on

black background \*not yet available

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## 17 Accessories and spare parts

### 17 Accessories



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**Panel Adapter****Order no.**

1 405 675

**Dimensions**

60 x 75 mm

**Front panel cutout**

55 x 55 mm

1 405 676

72 x 72 mm

68 x 68 mm

1 405 679

125 x 60 mm

106 x 55 mm for installation of 2  
counters 48 x 48

2 772 052

1 721 014

**Protective Cover****Frame**

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48 x 48 mm



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