Counter   **EZM - 4931**

O1
O2   S2

SET1 P   SET2   RESET

CE EAC

EZM-4931 96 x 48 DIN 1/8
Incremental Encoder Input Programmable Counter

- *6 digits Process (PV) and 6 digits Set (SV) Value Display*
- *Operation with 2 Set Value*
- *Reset , Pause and ChA-ChB Counting Inputs*
- *Operation with Automatic and Manual Reset*
- *NPN/PNP input Types*
- *x1 / x2 / x4 Phase Shifting Property*
- *Multiplication Coefficient, Division Coefficient and Point Position*
- *Parametric , Two point (Low Scale - High Scale) and Multiplication - Division Coefficient Reading Adjustment*
- *RS-232 Serial Communication with Modbus RTU Protocol*
- *Input Frequency Max. 200kHz*
- *Max. Input Frequency Selection*

ABOUT INSTRUCTION MANUAL

Instruction manual of EZM-4931 Programmable Counter consists of two main sections. Explanation of these sections are below. Also, there are other sections which include order information and technical specifications of the device. All titles and page numbers in instruction manual are in "**CONTENTS**" section. User can reach to any title with section number.

Installation:

In this section, physical dimensions of the device, panel mounting, electrical wiring, module mounting in the device, physical and electrical installation of the device to the system are explained.

Operation and Parameters:

In this section, user interface of the device, how to access to the parameters, description of parameters are explained.

Also in these sections, there are warnings to prevent serious injury while doing the physical and electrical mounting or using the device.

Explanation of the symbols which are used in these sections are given below.

This symbol is used for safety warnings. User must pay attention to these warnings.

This symbol is used to determine the dangerous situations as a result of an electric shock. User must pay attention to these warnings definitely.

This symbol is used to determine the important notes about functions and usage of the device.

CONTENTS

EU DECLARATION OF CONFORMITY

Manufacturer's Name   : **EMKO ELEKTRONIK A.S.**
Manufacturer's Address : **DOSAB, Karanfil Sk., No:6,**
                                   16369 Bursa, TURKEY

The manufacturer hereby declares that the product:

      Product Name   **: Programmable Counter**

      Type Number   **: EZM-4931**

      Product Category   **: Electrical equipment for measurement, control and laboratory use**

Conforms to the following directives :

2006 / 95 / EC The Low Voltage Directive

2004 / 108 / EC The Electromagnetic Compatibility Directive

has been designed and manufactured to the following specifications:

EN 61000-6-4:2007 EMC Generic Emission Standard for Industrial Environments

EN 61000-6-2:2005 EMC Generic Immunity Standard for Industrial Environments

EN 61010-1:2001   Safety Requirements for electrical equipment for measurement, control and laboratory use

When and Where Issued   **Authorized Signature**

06th December 2010   Name   : Serpil YAKIN

Bursa-TURKEY   Position   : Quality Manager

1.Preface

EZM Series Programmable Counter can be used in package machines, production and quality control rollers, in cutting and processing machine of glass, plastic, marble, sheet, iron, fabric all measuring and controlling of dimension, count, total count, speed, cycle, productivity, time and can be adapted easily to all mechanical construction and automation system. They can be used in many application with their control outputs, serial communication unit and output modules.

Some application fields which they are used are below:

Application Fields
Measuring Dimension and Control Automation,
In Cutting and Processing machine of glass, plastic, marble, sheet, iron and fabric
Package machines,
Quality Control rollers,
Filling Systems,
Tool Benchs,

1.1 General Specifications
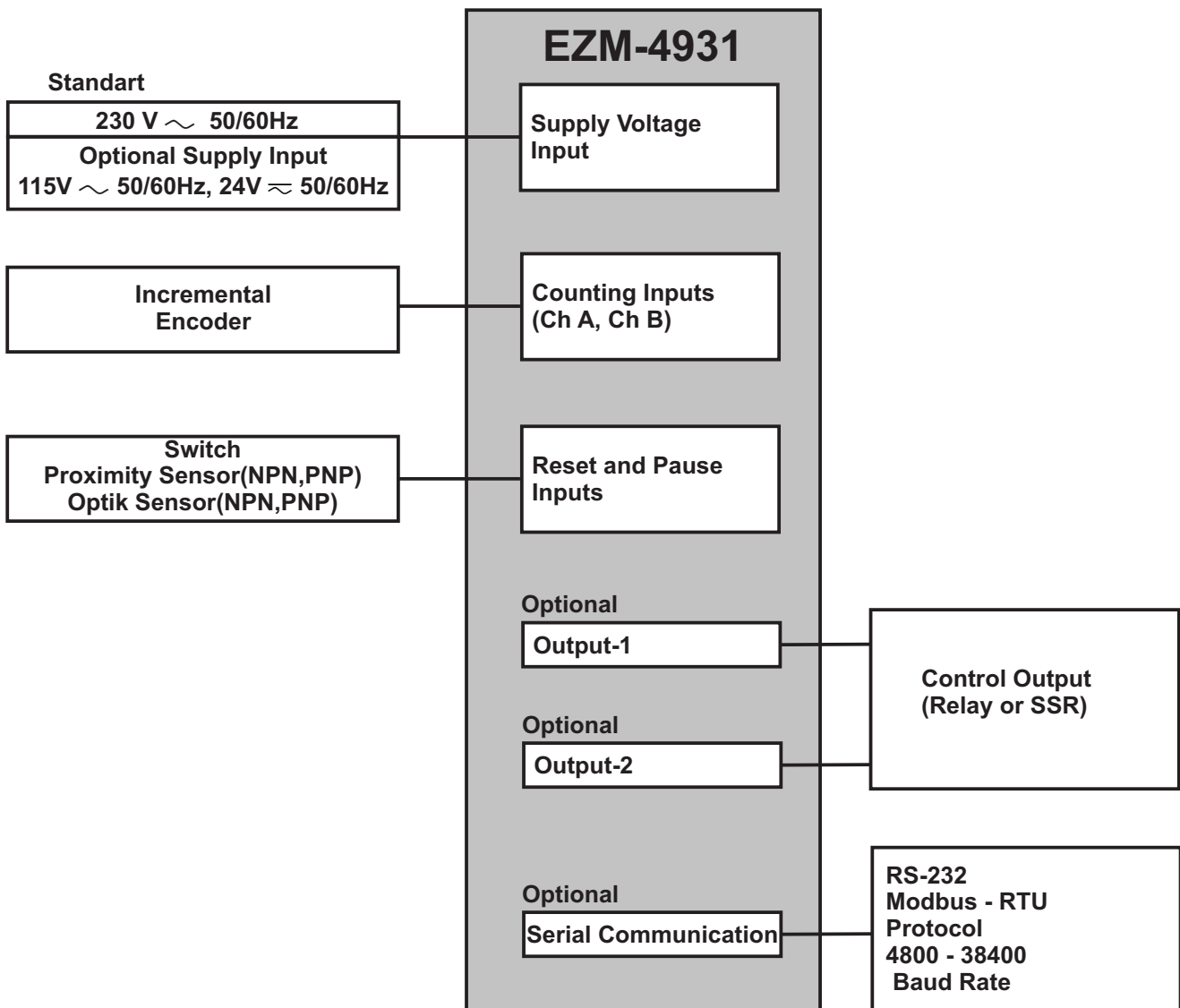
1.2 Ordering Information

EZM-4931 (96x48 1/8 DIN)		A	BC	D	E	/	FG	HI	/	U	V	W	Z
			00			/		0	/		0	0	0

A	Supply Voltage
2	24V ⎓ (-%15;+%10), 50/60Hz
4	115 V ∿ (-%15;+%10), 50/60 Hz
5	230 V ∿ (-%15;+%10), 50/60 Hz

D	Serial Communication
0	None
1	RS-232

E	Output-1
00	None
01	Relay Output (5A@250V∿Resistive Load)
02	SSR Driver Output (Maximum 14mA , 10V ⎓)

FG	Output-2
00	None
01	Relay Output (5A@250V∿Resistive Load)
02	SSR Driver Output (Maximum 14mA , 10V ⎓)

U	Encoder Supply Voltage
0	12V ⎓
1	5V ⎓

All order information of EZM-4931 Programmable Counter are given on the table at left. User may form appropriate device configuration from information and codes that at the table and convert it to the ordering codes.

Firstly, supply voltage then output modules and other specifications must be determined. Please fill the order code blanks according to your needs.

Please contact us, if your needs are out of the standards.

⚠ ∿ Symbol means Vac,
⎓ Symbol means Vdc
≈ Symbol means Vac and Vdc

1.3 Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

1.4 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

2.Installation

⚠ **Before beginning installation of this product, please read the instruction manual and warnings below carefully.**

In package ,
- One piece unit
- Two pieces mounting clamps
- One piece instruction manual

A visual inspection of this product for possible damage occured during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.

The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required.

Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.

Do not use the unit in combustible or explosive gaseous atmospheres.

During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage of the product on a system must be done with it's fixing clamps. Do not do the montage of the device with inappropriate fixing clamp. Be sure that device will not fall while doing the montage.

It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

2.1 General Description

Mounting Clamp

Product Label

Front Panel
IP65 protection
NEMA 4X

Panel surface
(maximum thickness 15 mm / 0.59 inch)

2.2 Dimensions

Maksimum 15mm / 0.59 inch

48mm/ 1.89 inch

96mm / 3.78 inch

10.5 ± 1 mm / 0.41 inch   76 mm / 2.99 inch

129 mm / 5.08 inch (min)

65 mm / 2.56 inch (min)

46 mm / 1.81 inch (min)

92mm / 3.62 inch
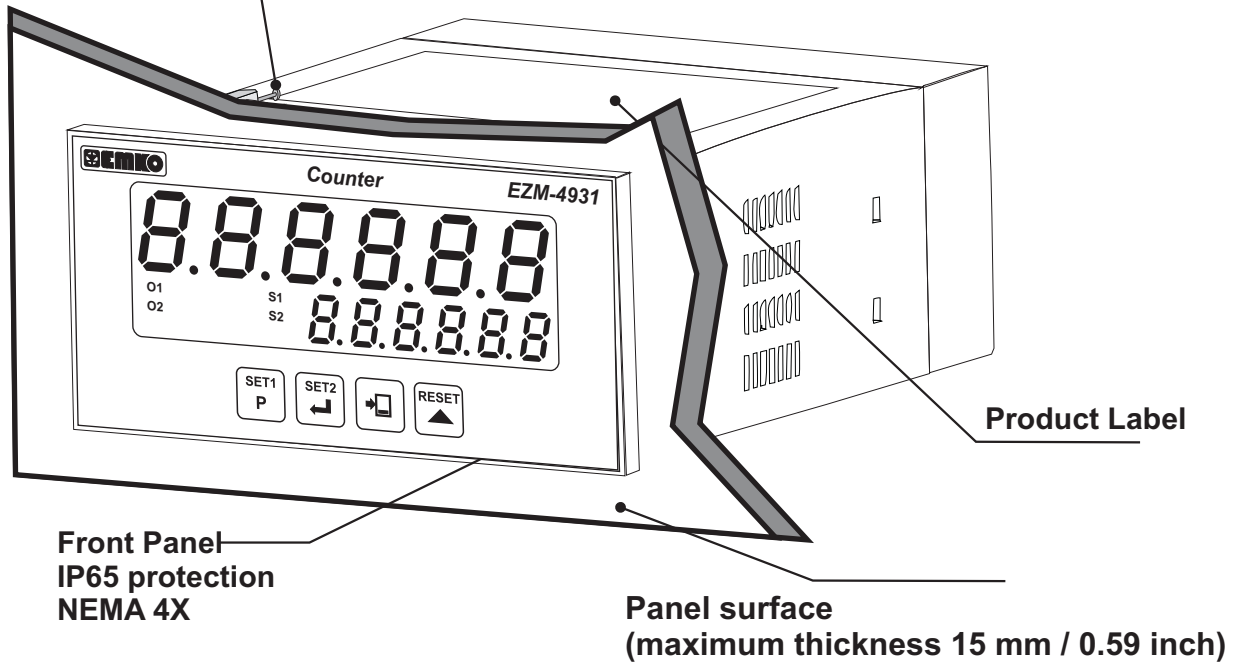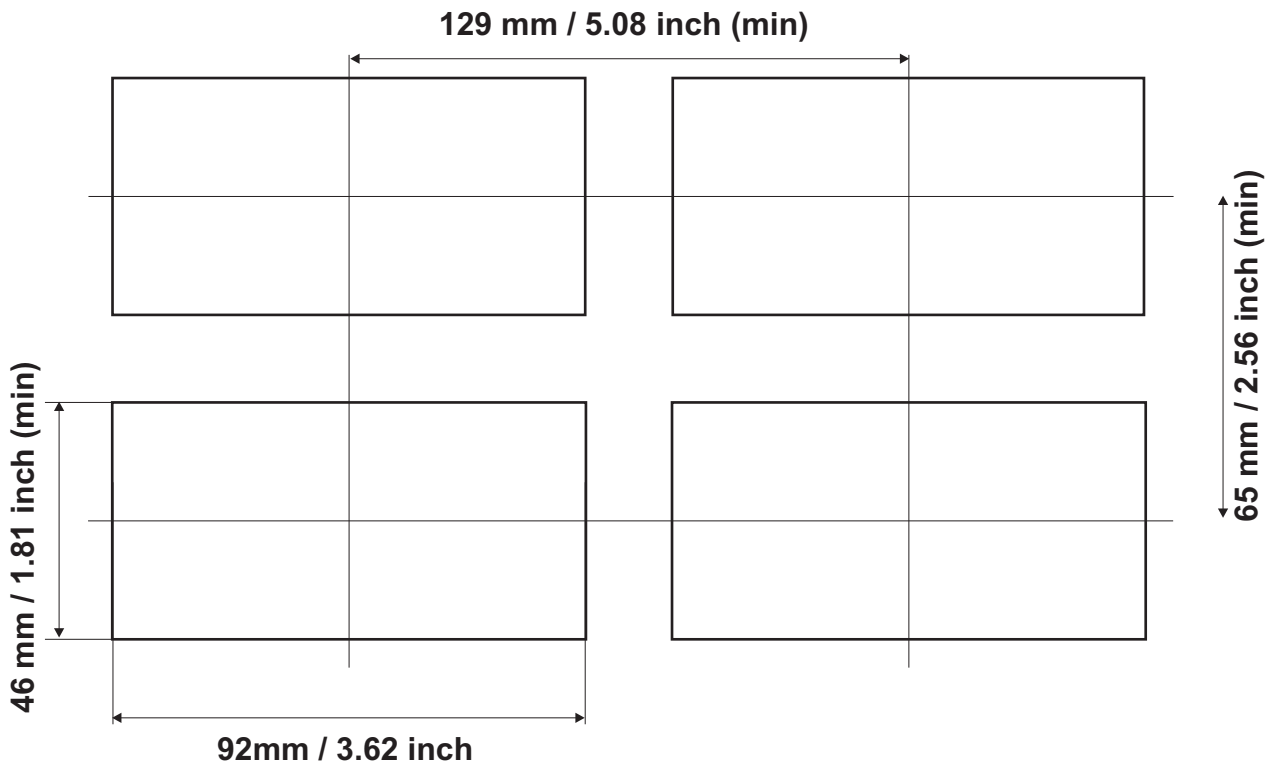
2.4 Environmental Ratings

Operating Conditions

Operating Temperature : 0 to 50 °C

Max. Operating Humidity : 90% Rh (non-condensing)

Altitude : Up to 2000m.

Forbidden Conditions:
Corrosive atmosphere
Explosive atmosphere
Home applications (The unit is only for industrial applications)

2.5 Panel Mounting

1

3

2
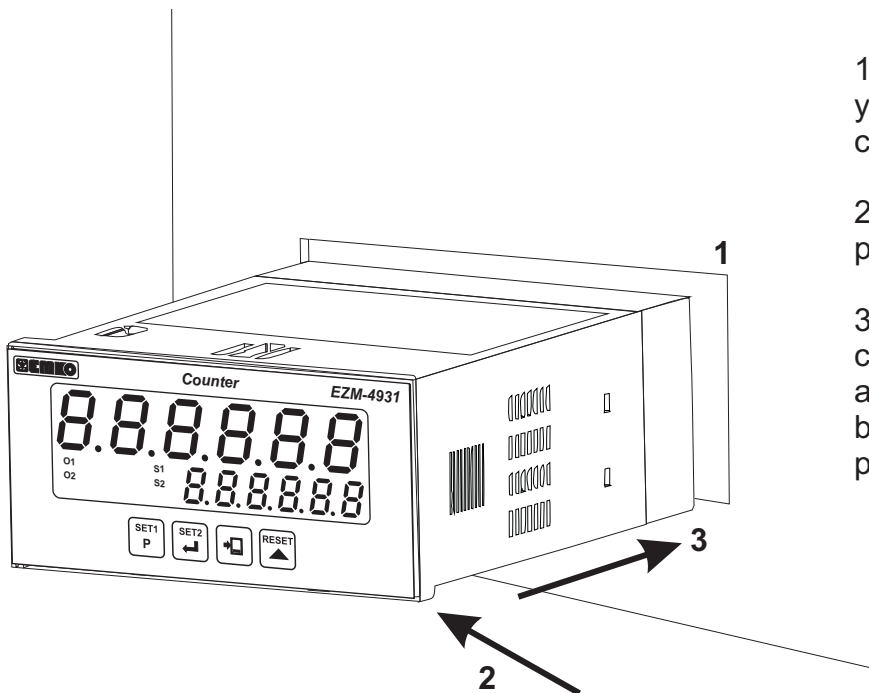
1-Before mounting the device in your panel, make sure that the cut-out is the right size.

2-Check front panel gasket position

3-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

During installation into a metal panel, care should be taken to avoid injury from metal burrs which might be present. The equipment can loosen from vibration and become dislodged if installation parts are not properly tightened. These precautions for the safety of the person who does the panel mounting.
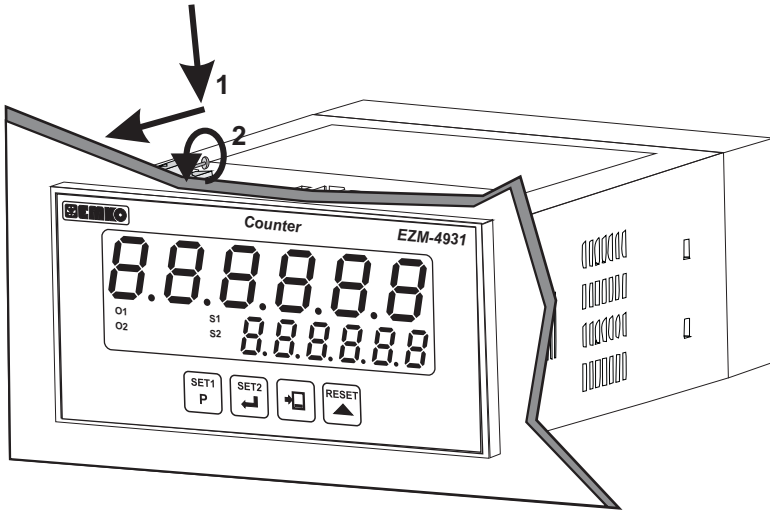
The unit is designed for panel mounting.

1-Insert the unit in the panel cut-out from the front side.

2- Insert the mounting clamps to the holes that located top and bottom sides of device and screw up the fixing screws until the unit completely immobile within the panel

Montage of the unit to a system must be done with it's own fixing clamps. Do not do the montage of the device with inappropriate fixing clamps. Be sure that device will not fall while doing the montage.
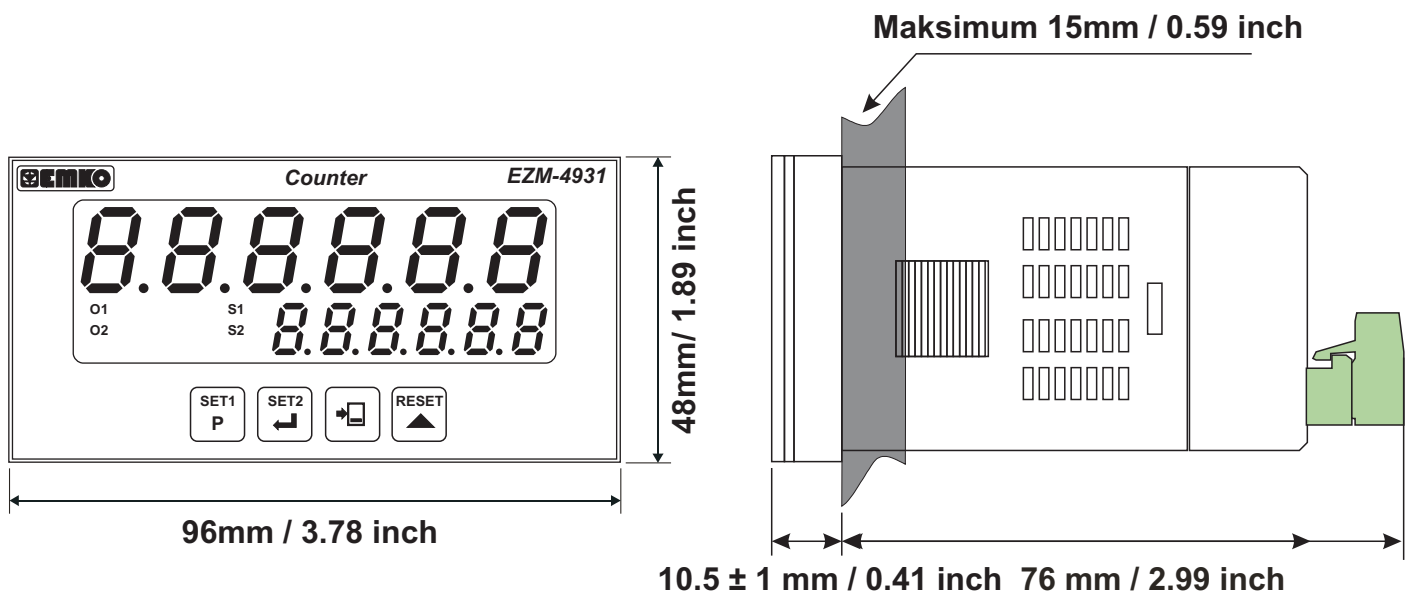
2.7 Removing from the Panel

Before starting to remove the unit from panel, power off the unit and the related system.
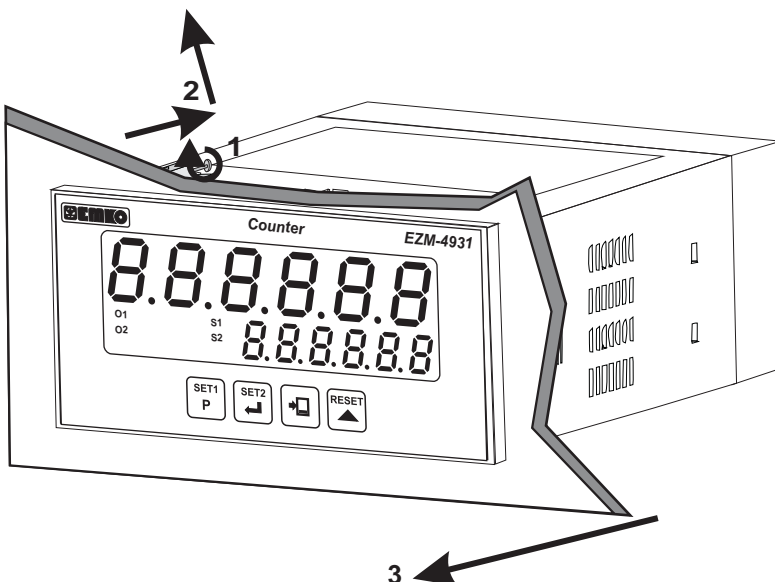
1-Loosen the screws.

2-Pull mounting clamps from top and bottom fixing sockets.

3-Pull the unit through the front side of the panel

3.Electrical Wirings

⚠ You must ensure that the device is correctly configured for your application. Incorrect configuration could result in damage to the process being controlled, and/or personal injury. It is your responsibility, as the installer, to ensure that the configuration is correct.
Parameters of the device has factory default values. These parameters must be set according to the system's needs.

⚠ Only qualified personnel and technicians should work on this equipment. This equipment contains internal circuits with voltage dangerous to human life. There is severe danger for human life in the case of unauthorized intervention.

⚠ Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

⚠ Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.

3.1 Terminal Layout and Connection Instructions

EMKO
P/N : EZM-4931 CE
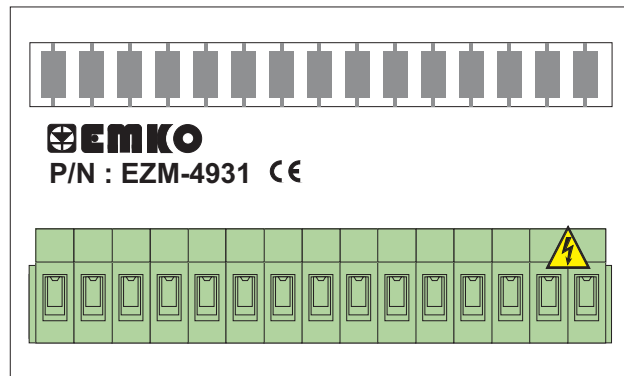
Max. 2.5mm / 0.098 inch
Wire Size:
14AWG/1mm²
Solid /Stranded
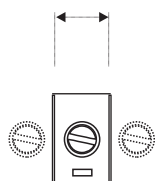
Torque
0,5Nm

Screw driver
0,8 x3mm

⚠ **Electrical wiring of the device must be the same as 'Electrical Wiring Diagram' below to prevent damage to the process being controlled and personnel injury.**

P/N : EZM-4931 CE

Count Inputs

NOTE-1

Sensor Supply Voltage
12 V $---$ or 5 V $---$
(It must be determined in order.)

RS-232 Communication

Relay or SSR Outputs

Supply Voltage Input
230V $\sim$ (-%15;+%10) 50/60Hz
115V $\sim$ (-%15;+%10) 50/60Hz
24V $\overline{\sim}$ (-%15;+%10)
(It must be determined in order.)
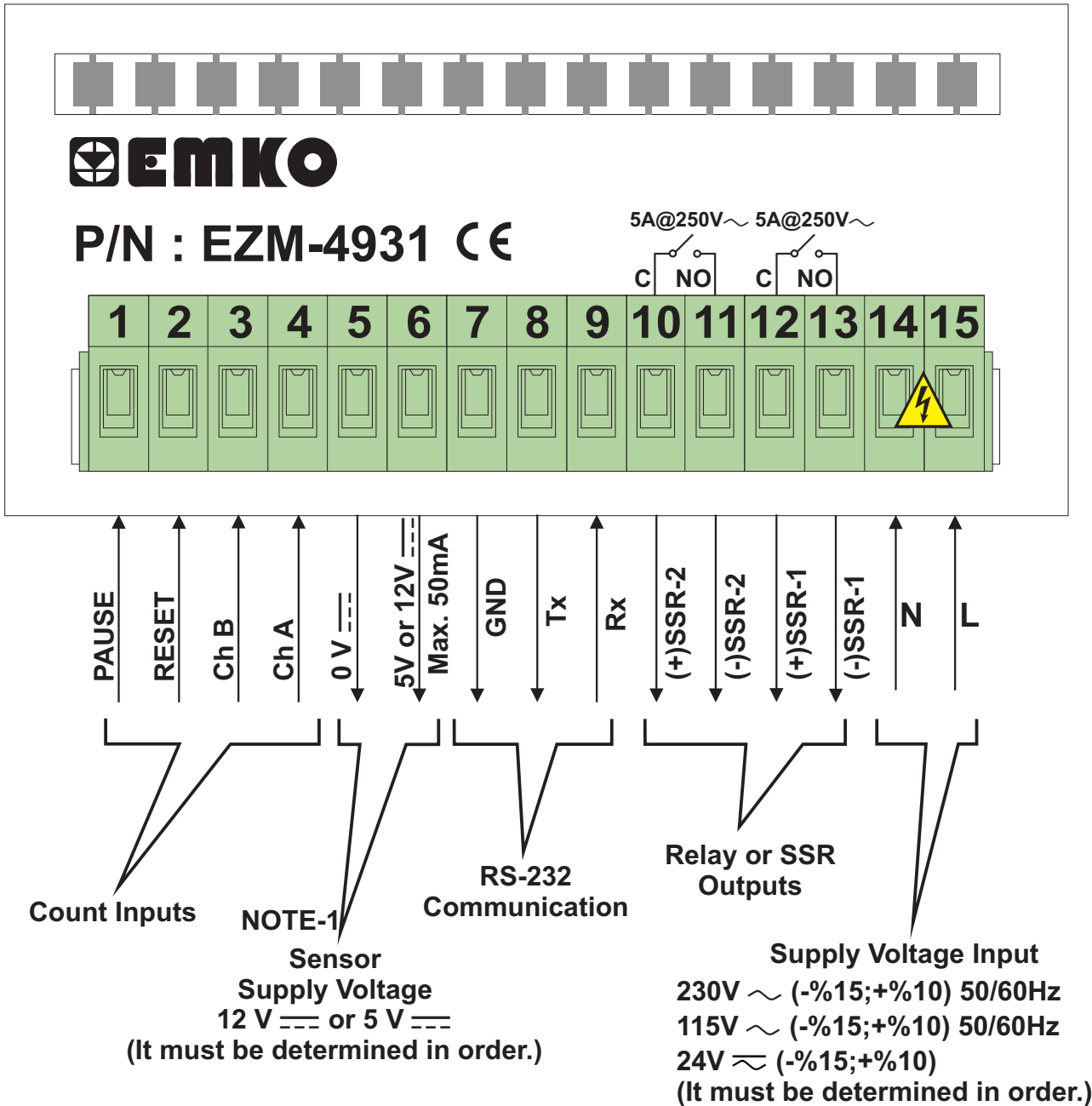
NOTE-1 : Sensor supply voltage:
If Power Supply is 230V$\sim$ or 115V$\sim$, then Sensor supply voltage is 5V$---$ ($\pm$ 05%)
or
12V $---$ (- %30;+%10), 50 mA maximum short circuit protection.
If Power Supply is 24V$\overline{\sim}$, then Sensor supply voltage is (12V$---$ or 5V$---$)$\pm$ 05%,

Device Label for 230V $\sim$ Supply Voltage Input and Relay Outputs
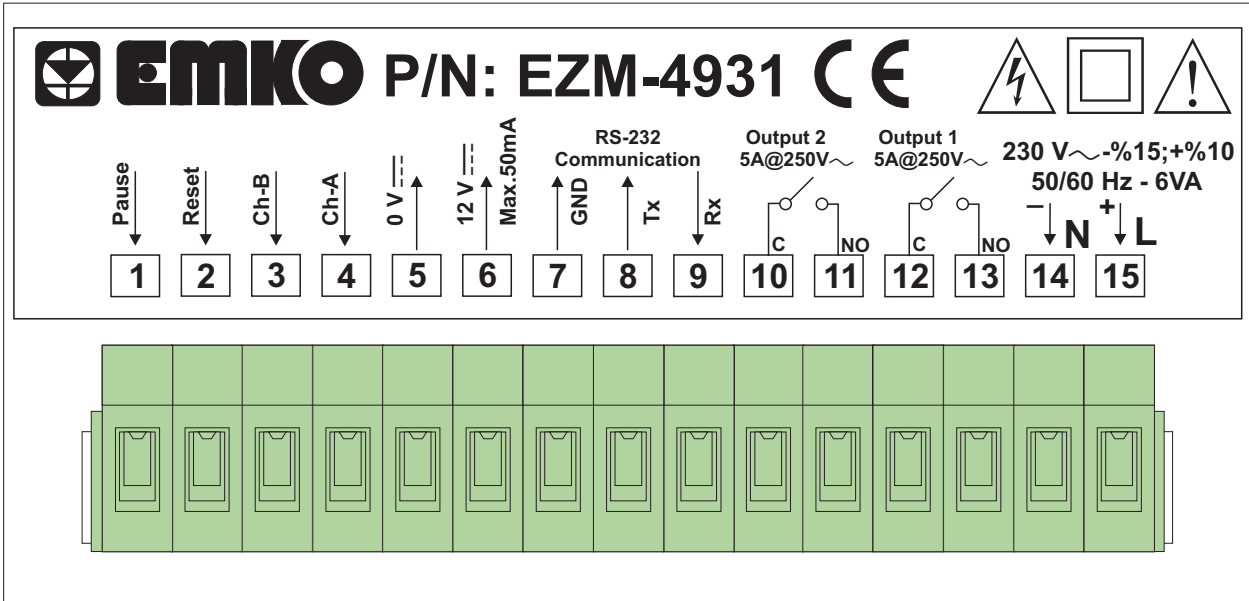
Device Label for 24V $\overline{\sim}$ Supply Voltage Input and Relay Outputs
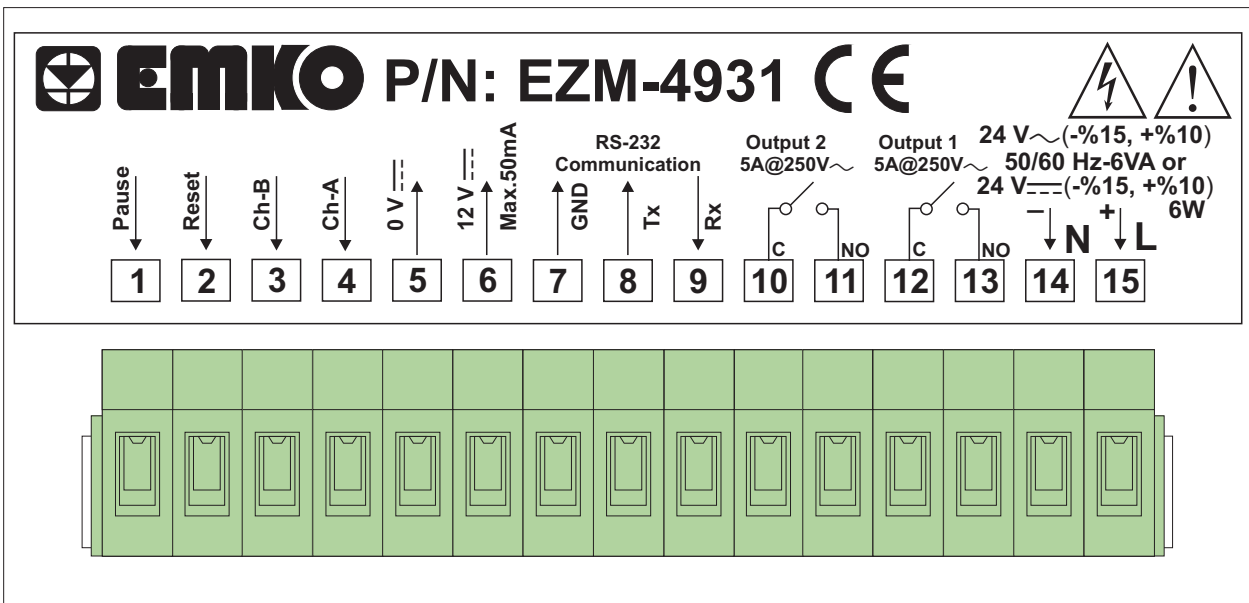
Connection of Universal Supply Voltage Input

Connection of Universal Supply Voltage Input

N   L

14   **15**

Fuse   Note-1

Note-2   **External Fuse (1 A ∼ T)**

Power Supply Switch ⚠

Supply Voltage 115V∼, 230 V ∼ (-%15;+%10) 50/60 Hz

N   L

14   **15**

Fuse   Note-1

Note-2   **External Fuse (1 A ∼ T)**

Power Supply Switch ⚠
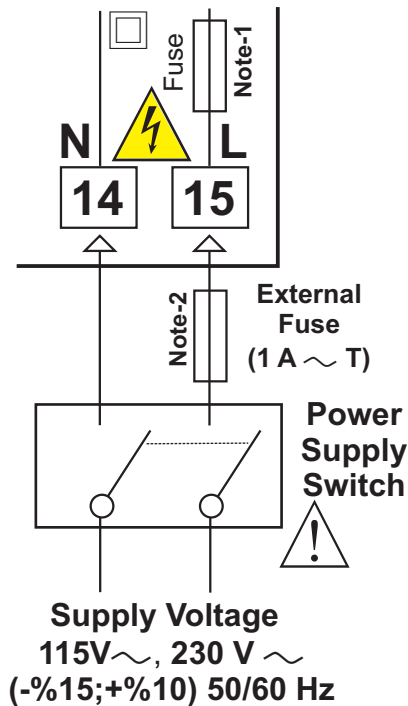
Supply Voltage 24V ⎓ (-%15;+%10) 50/60Hz
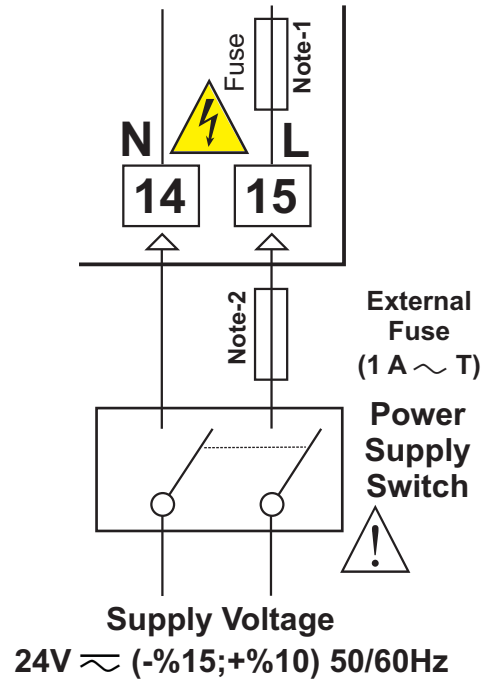
Note-1 :

There is internal 33 R Ω fusible flameproof resistor in 115V ∼ 50/60 Hz and 230V∼ 50/60 Hz
There is internal 4R7 Ω fusible flameproof resistor in 24V ⎓ (-%15;+%10) 50/60Hz

Note-2 : External fuse is recommended

⚠ **Make sure that the power supply voltage is the same indicated on the instrument.**

Switch on the power supply only after that all the electrical connections have been completed.

Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit. Controlling prevents damages in unit and system and possible accidents as a result of incorrect supply voltage.

⚠ **There is no power supply switch on the device. So a power supply switch must be added to the supply voltage input. In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument.Power supply switch shall be easily accessible by the user.**

Power switch must be two poled for seperating phase and neutral. On/Off condition of power switch is very important in electrical connection. On/Off condition of power switch must be signed for preventing the wrong connection.

If an external fuse is used, it must be on phase connection in ∼supply input.

3.5 Counting Input Connection

3.5.1 Incremental Encoder & Switch Connection

$Pro-05 = 000001$ **PNP type operation**

INCREMENTAL ENCODER

6	**5**	**4**	**3**	**2**	**1**
12 V === or 5 V === Max. 50mA	0 V ===	ChA	ChB	RESET	PAUSE

Switch — Switch

NOTE-1

$Pro-05 = 000000$ **NPN type operation**

INCREMENTAL ENCODER

6	**5**	**4**	**3**	**2**	**1**
12 V === or 5 V === Max. 50mA	0 V ===	ChA	ChB	RESET	PAUSE

Switch — Switch
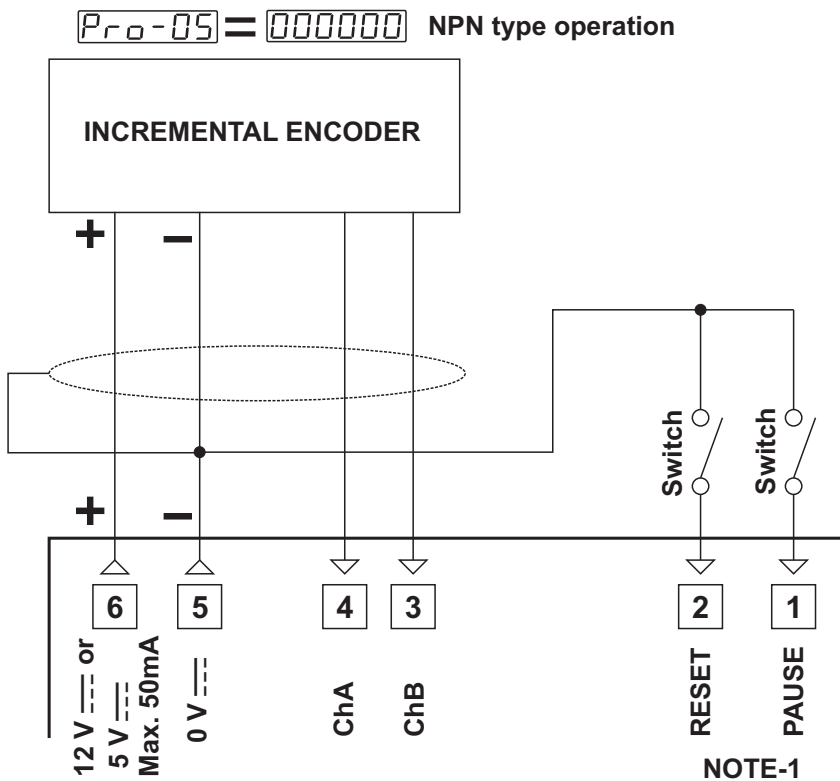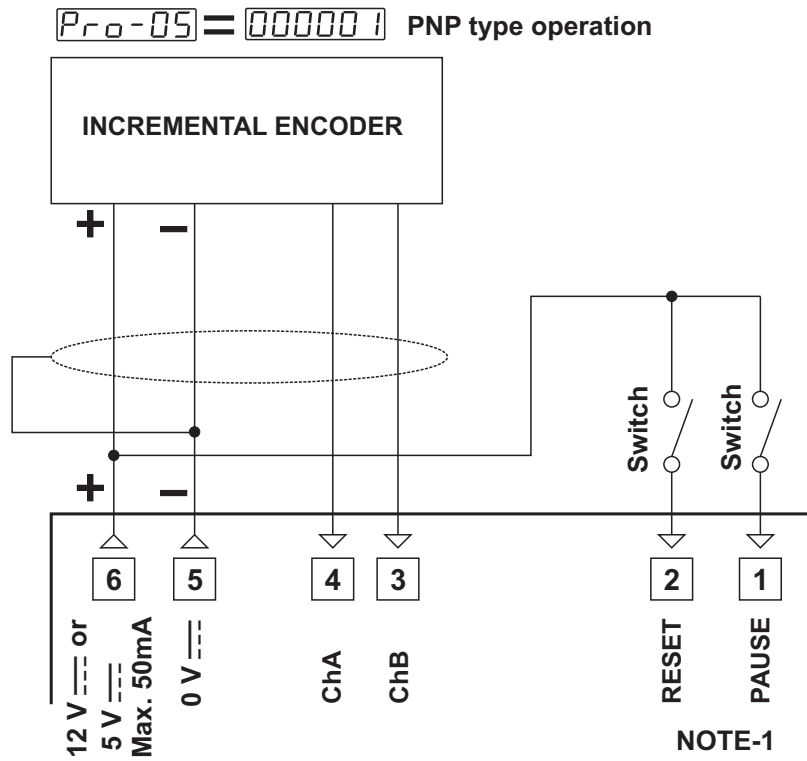
NOTE-1

NOTE-1 : Reset and Pause inputs have protection time against electrical contact debounce. Protection time can be set with $Pro-03$ parameter (2 - 50 msec.).

2000V ∿ (for EZM-4931.1... and EZM-4931.2...)

| Supply Voltage Input | 15 |
| | 14 |

0 V ⎓ | 5 |

2000V ∿

| 12 | Relay-1 Output | 12 |
| 13 | | 13 |

2000V ∿

2000V ∿

| 11 | Relay-2 Output | 11 |
| 10 | | 10 |

2000V ∿

2000V ∿

| 12 | Optional SSR Driver-1 | 12 |
| 13 | | 13 |

2000V ∿

| 11 | Optional SSR Driver-2 | 11 |
| 10 | | 10 |

2000V ∿

RS-232 Serial Communication

2000V ∿

| 6 | 12V ⎓ or 5V ⎓ Sensor Supply Voltage | 6 |

2000V ∿

4	Digital Inputs	4
3		3
2		2
1		1

Galvanic Isolation Test Values For 24 V ⏦ Power Supply

Supply Voltage Input	15		0 V ⎓	5
	14			

2000V ~   **2000V ~**

12	Relay-1 Output	12
13		13

2000V ~   **2000V ~**

11	Relay-2 Output	11
10		10

12	Optional SSR Driver-1	12
13		13

11	Optional SSR Driver-2	11
10		10

RS-232 Serial Communication

6	12V ⎓ or 5V ⎓ Sensor Supply Voltage	6

4	Digital Inputs	4
3		3
2		2
1		1
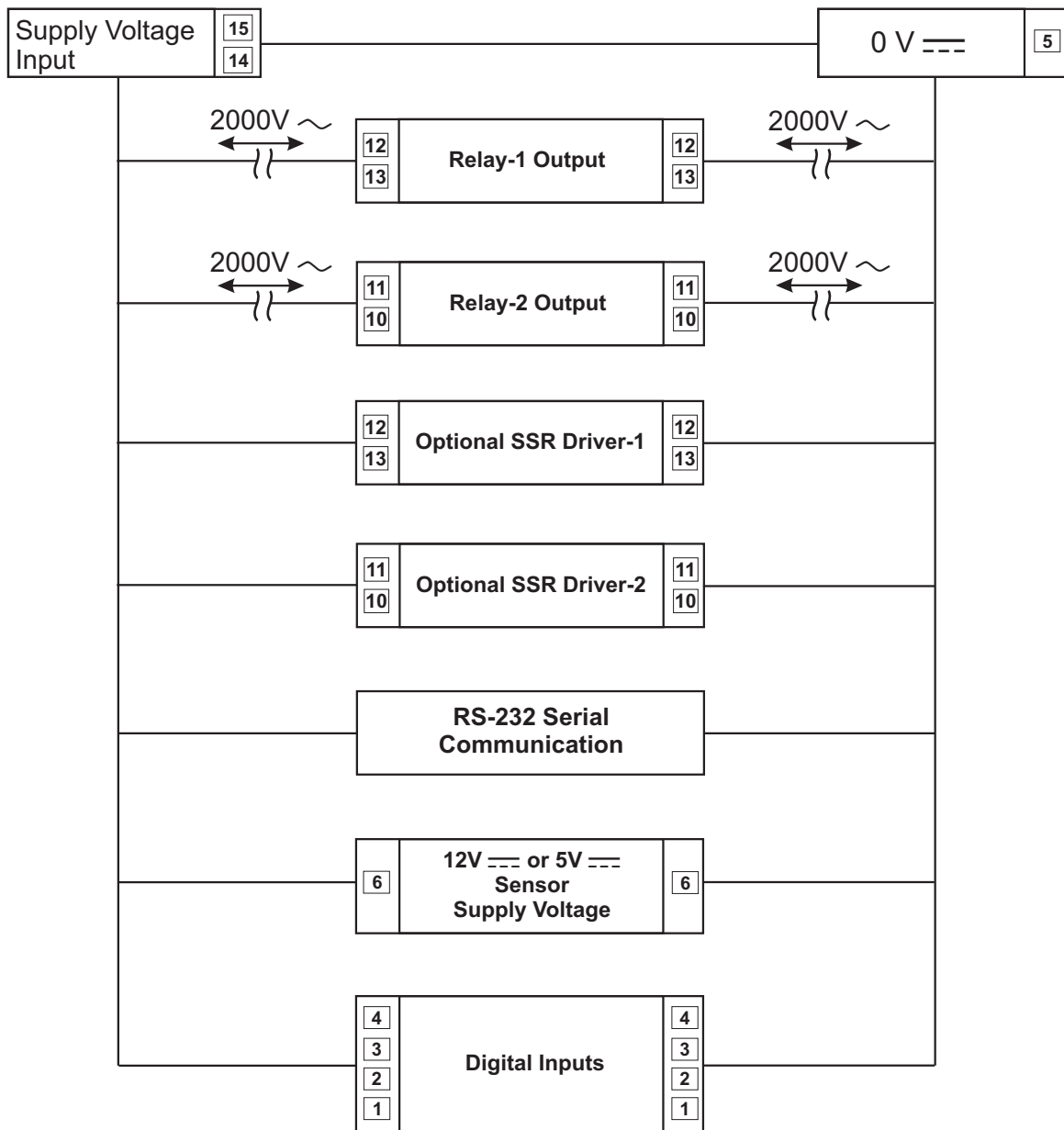
3.7 Output Connections

3.7.1 Relay-1 Output Connection
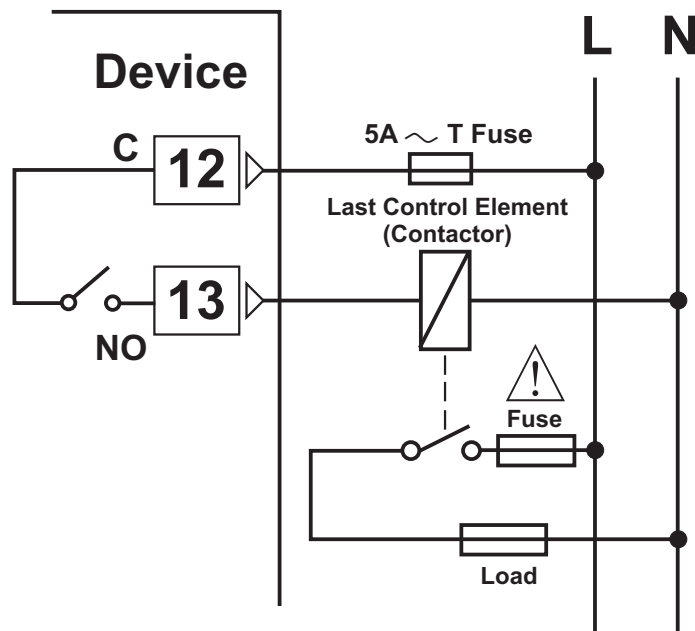
⚠ **Fuses must be selected according to the applications.**

3.7.2 SSR Driver-1 Output Connection
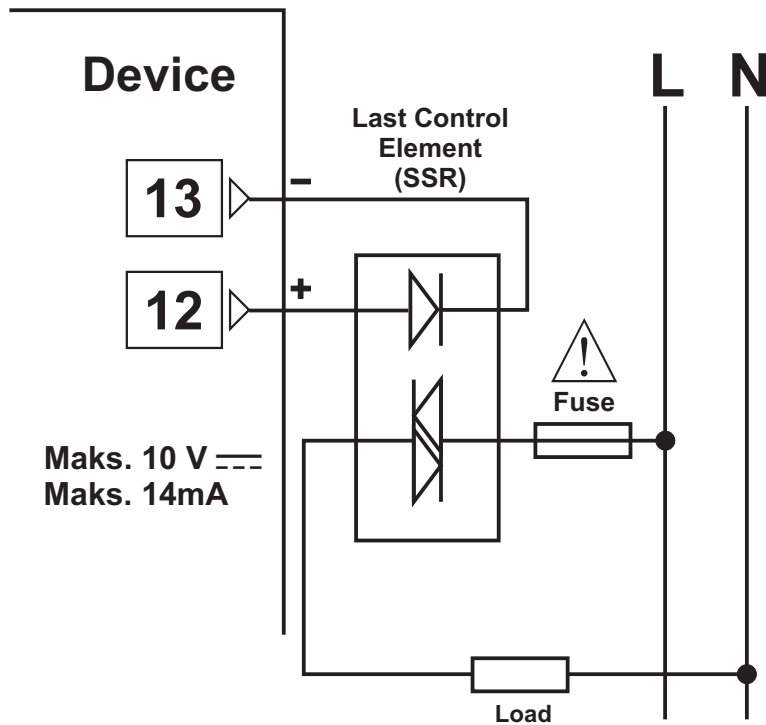
⚠ **Fuses must be selected according to the applications.**

3.7.3 Relay-2 Output Connection

Device

L N

C **10** 5A ⏦ T Fuse

Last Control Element
(Contactor)

NO **11**

⚠ Fuse

Load
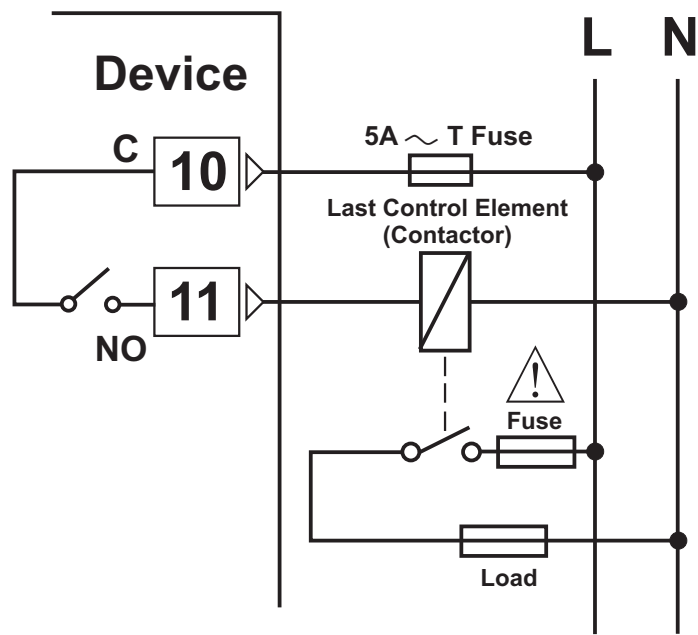
⚠ **Fuses must be selected according to the applications.**

3.7.4 SSR Driver-2 Output Connection

Device

L N

11 **–** Last Control
Element
(SSR)

10 **+**

⚠ Fuse

Maks. 10 V ⎓
Maks. 14mA

Load
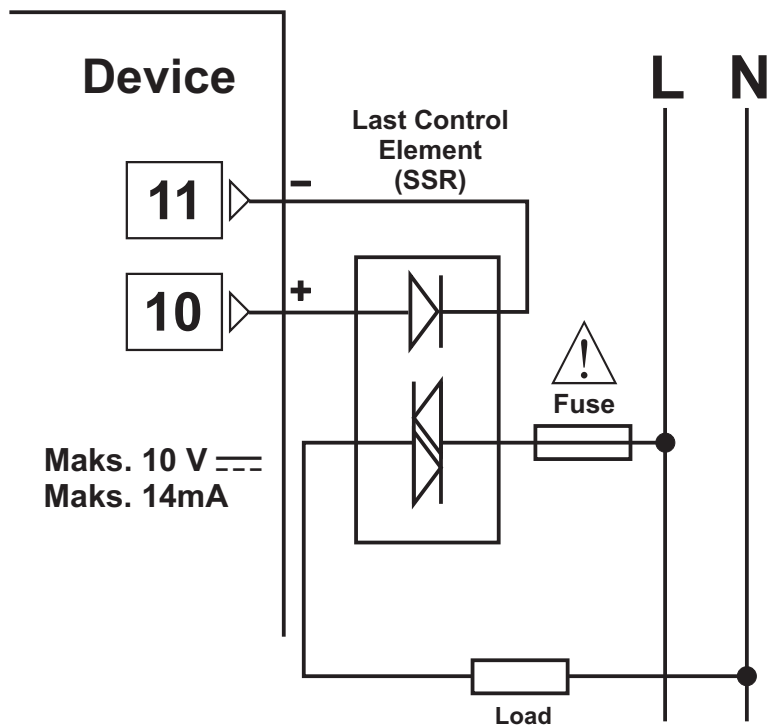
⚠ **Fuses must be selected according to the applications.**

4.1 Definition of Front Panel

Displays Actual Value and Parameter

Led indication of O1 / O2 : OUT1 / OUT2 output is active

Displays SET1, SET2 value and Parameters

Led indication of SV1 / SV2 : SET1 / SET2 value

SET1 and PROG Button:
It is used for accessing to SET1 value and changing this value. Also, if it is pressed for 3 seconds continuously it is used for entering to the programming mode.

NOTE-1

RESET and INCREMENT Button:
It used for resetting the value on Actual Value Display. Also It is used for increasing the value which is selected with shifting button.

SET2 and ENTER Button:
It is used for accessing to SET2 value and changing this value. Also it is used for saving all changes and accessing to the parameters.

SHIFTING Button:
It is used for Changing the cursor position in Programming mode and entering the SET Value.

NOTE-1 : Adjusting the device, while the Two Point Reading Adjustment mode ($Pro-10$ = 000001), lower adjustment value $Pro-13$ and Upper adjustment value $Pro-14$ can be negative. For example ; While most significant digit (6th digit) of lower adjustment value is changed from 0 to 9 with increment button, after 9, "-" character is shown. If when "-" character is on the most significant digit (6th digit) of Lower adjustment value and Enter button is pressed, adjustment value becomes negative.

When power is applied to the device, software revision number of the controller is momentarily illuminated on actual value display. Then operation screen is observed.

When power on, view of the screen is shown below:

" rEu" ⇒ **Revision**   **Revision number**
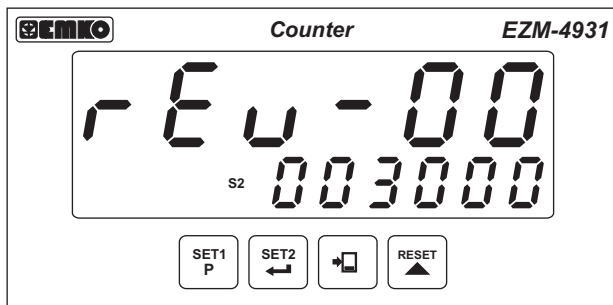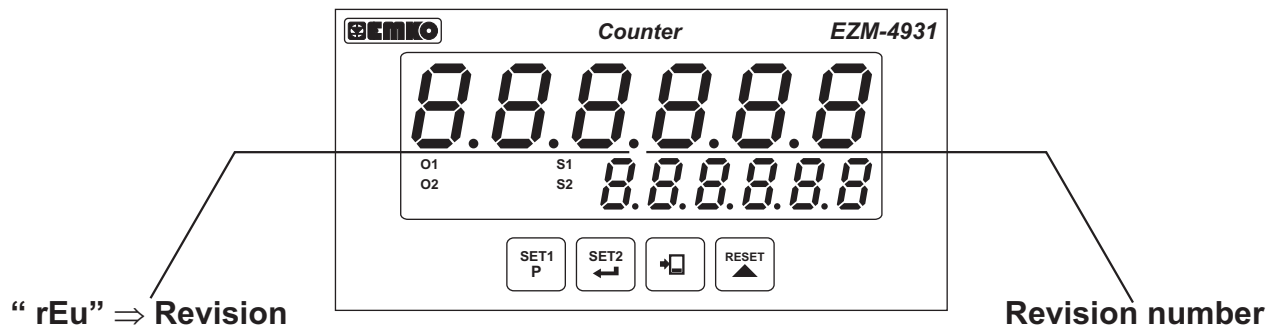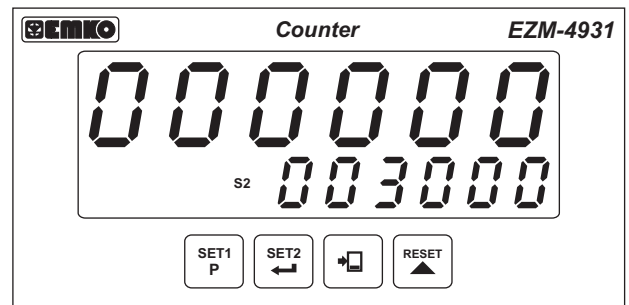
Software Revision   Operation Screen is shown

⚠ **If there is an unexpected situation while opening the device, power off the device and inform a qualified personnel.**

4.3 Adjustment of SET Value

Changing SET1 value.

```
000000
S1   002000
```
Operation Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]

```
000000
S1   002000
```
SET1 Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]
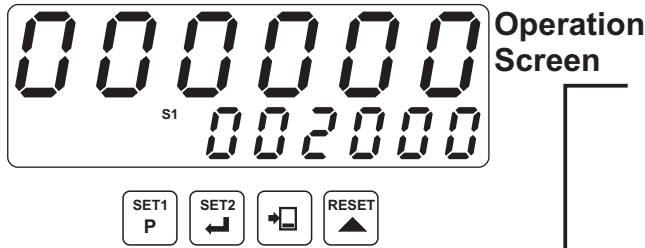
When shift button is pressed, 6th digit of SET1 value starts to flash.
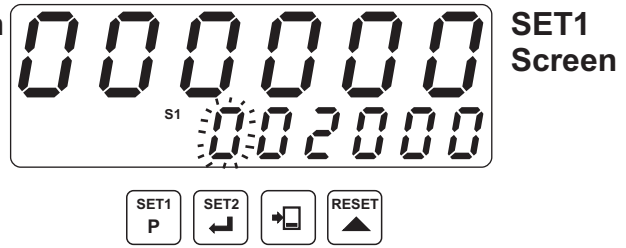
Press SET1 button to exit without saving Set value.

When shift button is pressed, 5th digit of SET1 value starts to flash.

```
000000
S1   002000
```
SET1 Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]

```
000000
S1   002000
```
SET1 Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]
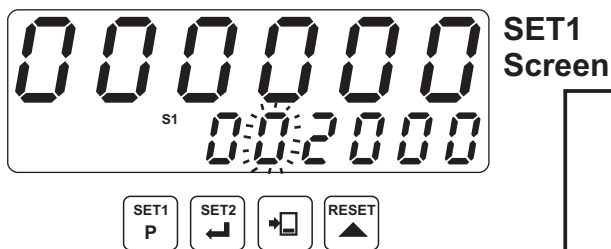
When shift button is pressed, 4th digit of SET1 value starts to flash.
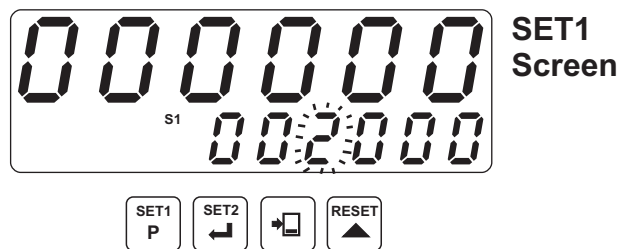
Increase the flashing value with increment button.

```
000000
S1   003000
```
SET1 Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]

```
000000
S1   003000
```
Operation Screen

[SET1 P] [SET2 ↵] [→] [RESET ▲]
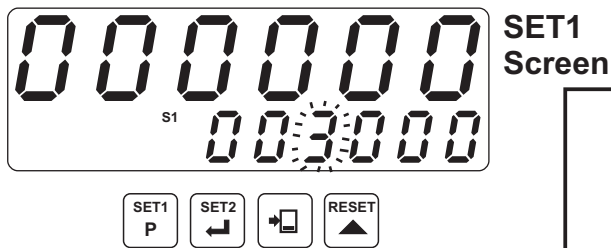
Save the value as SET1 value by pressing Enter button.
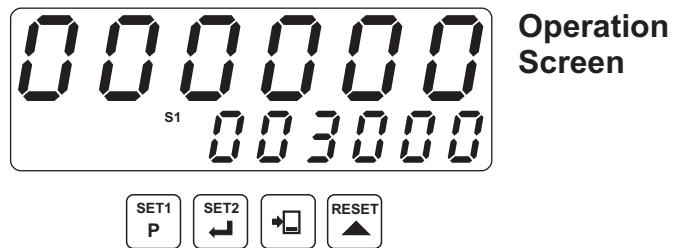
(i) **If** `Pro-07` **Reset and Set Protection parameter is** `000002` **,** `000003` **or** `000004` **then SET1 value can not be changed. For details, refer to parameters section.**

4.4 Resetting the Count Value
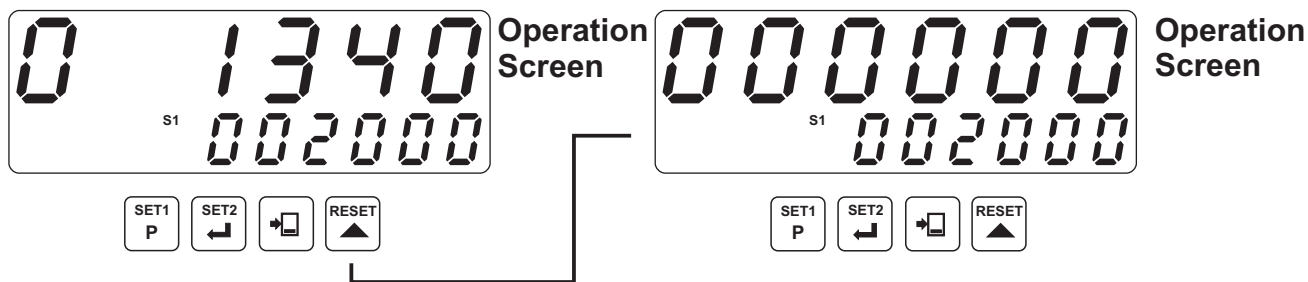
When RESET button is pressed, Actual Value becomes the Reset-Offset Value.

ⓘ **If** `Pro-07` **Reset and Set Protection parameter is** `000001` **or** `000003` **then Count Value can not be reset. For details, refer to parameters section.**

ⓘ **RESET operation can be realized by Reset button or applying signal to the RESET input. These two operations are named MANUAL RESET in parameters section.**
At the end of MANUAL RESET operation, Count Value becomes Reset Offset Value `Pro-09`**.**

4.5 Accessing to the Program Parameters

In this section Accessing to the Program parameters process is shown.
For details on parameters refer to **PROGRAM PARAMETERS** section.
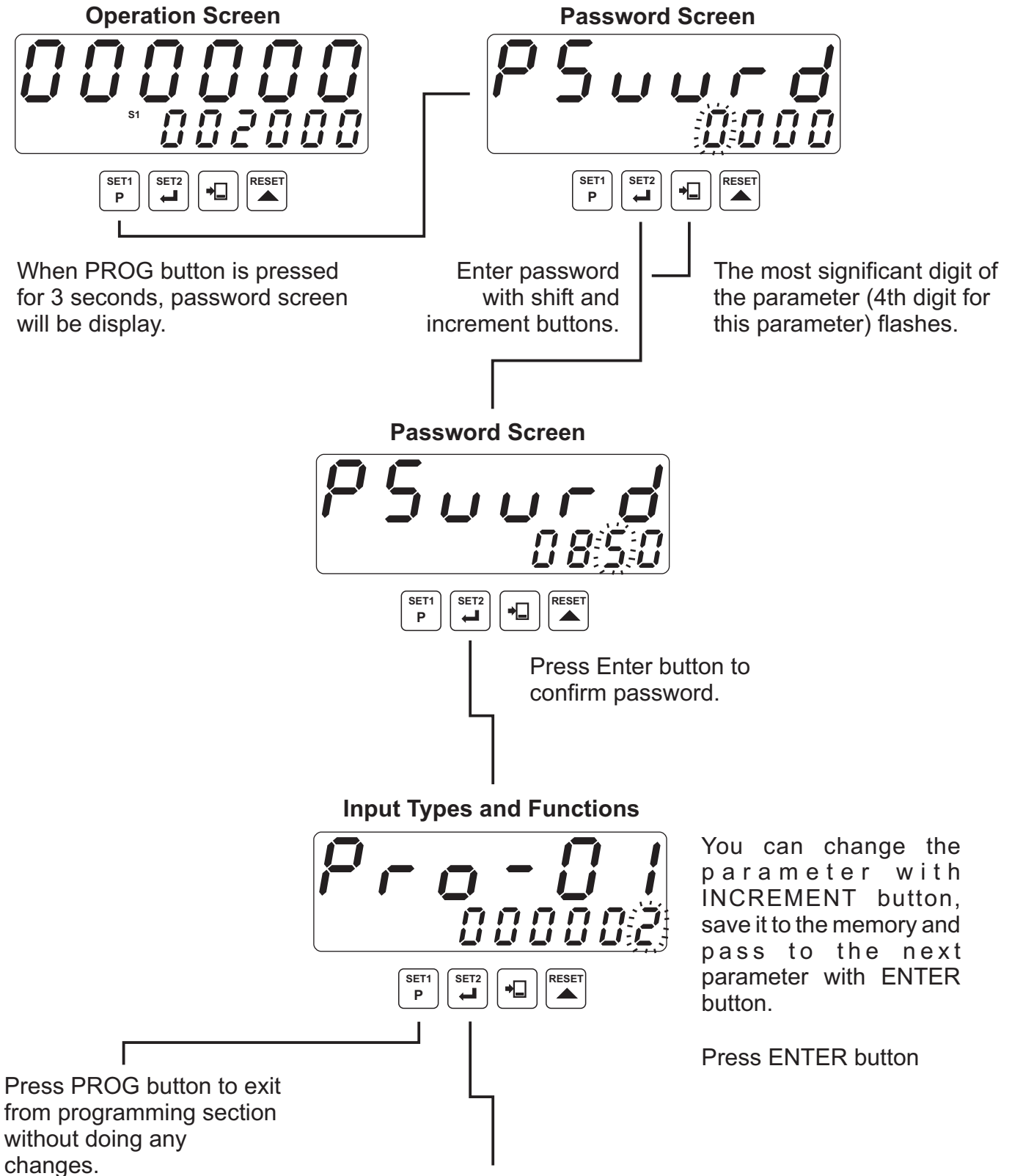
Operation Screen

```
000000
  S1   002000
```

SET1 P | SET2 ↵ | ↷ | RESET ▲

Password Screen

```
PSuurd
        0000
```

SET1 P | SET2 ↵ | ↷ | RESET ▲

When PROG button is pressed for 3 seconds, password screen will be display.

Enter password with shift and increment buttons.

The most significant digit of the parameter (4th digit for this parameter) flashes.

Password Screen

```
PSuurd
        0850
```

SET1 P | SET2 ↵ | ↷ | RESET ▲

Press Enter button to confirm password.

Input Types and Functions

```
Pro-01
       000002
```

SET1 P | SET2 ↵ | ↷ | RESET ▲

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Press ENTER button

Press PROG button to exit from programming section without doing any changes.

$\boxed{Pro - 02}$
$\boxed{000000}$

Max. Input Frequency

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Press PROG button to exit from programming section without doing any changes.

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Press ENTER button.

$\boxed{Pro - 10}$
$\boxed{000000}$

Adjustment Type Selection

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Press PROG button to exit from programming section without doing any changes.

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Press ENTER button.

If $\boxed{Pro - 10}$ is $\boxed{000000}$;
Parametric Reading Adjustment

Encoder Type

$\boxed{Pro - 11}$
$\boxed{001000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Pitch

$\boxed{Pro - 12}$
$\boxed{001000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

If $\boxed{Pro - 10}$ is $\boxed{000001}$;
Two Point Reading Adjustment

Min. Value for dual point adjustment value

$\boxed{Pro - 13}$
$\boxed{000000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Max. Value for dual point adjustment value

$\boxed{Pro - 14}$
$\boxed{001000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

If $\boxed{Pro - 10}$ is $\boxed{000002}$;
Multiplication - Division Coefficient Reading Adjustment

Multiplication Coefficient

$\boxed{Pro - 15}$
$\boxed{01.0000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Division Coefficient

$\boxed{Pro - 16}$
$\boxed{01.0000}$

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Pro - 17
`000001`
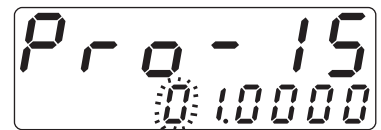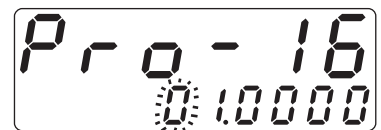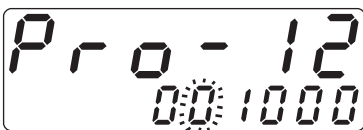
Output Functions

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Press ENTER button.

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Press PROG button to exit from programming section without doing any changes.

Pro - 30
`000000`

Return to Factory Settings

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Press ENTER button.

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Press PROG button to exit from programming section without doing any changes.

Pro - PS
`000000`

Program Password

When `PSuurd` password screen is shown if ENTER button is pressed without entering the password, this Parameter can not be observed.

The most significant digit of the parameter (4th digit for this parameter) flashes.

User can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Continue to press ENTER button for scanning all parameters.

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Operation Screen

`000000`
S2 `003000`

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

Input Types and Functions

Pro - 01
`000002`

| SET1 P | SET2 ↵ | ⇥ | RESET ▲ |

`Pro-01` **Input Types and Functions.**
(Default = 2) MODBUS ADDRESS:40001.

`000000` **x1 Phase Shifting** (for incremental encoders)
Upcount on rising edge of Ch-A input when Ch-B is at 0
Downcount on rising edge of Ch-A input when Ch-B is at 1

Encoder is travelling in the Reverse Direction — **Ch-A**
Encoder is travelling in the Forward Direction — **Ch-A**
Ch-B

Value on the Screen	Start Value = 5					Counting to upwards
		6	7	8	9	
	6	7	8	9	10	

Value on the Screen	Start Value = 8					Counting to downwards
		7	6	5	4	
	7	6	5	4	3	
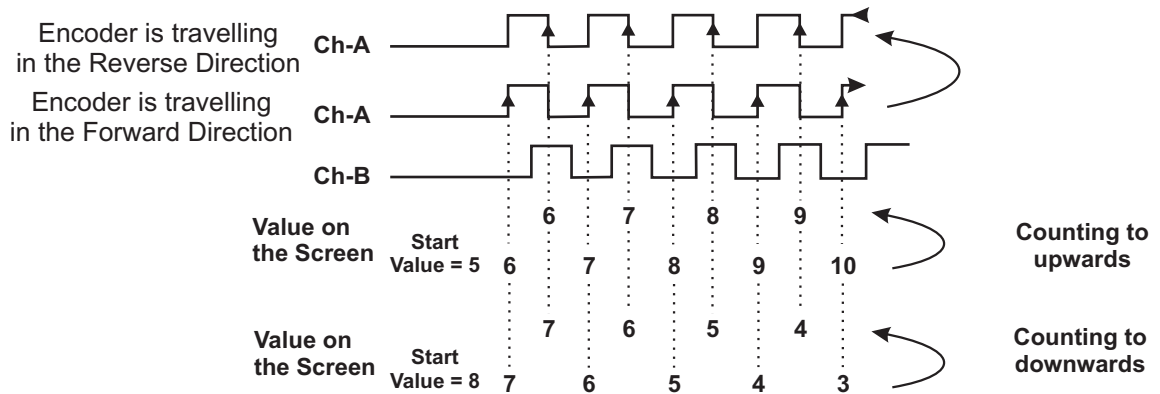
`000001` **x2 Phase Shifting** (for incremental encoders)
Upcount on rising edge of Ch-A when Ch-B is at 0
Downcount on rising edge of Ch-A when Ch-B is at 1
Upcount on falling edge of Ch-A when Ch-B is at 1
Downcount on falling edge of Ch-A when Ch-B is at 0

Encoder is travelling in the Reverse Direction — **Ch-A**
Encoder is travelling in the Forward Direction — **Ch-A**
Ch-B

Value on the Screen	Start Value = 5						Counting to upwards
		5	6	7	8	9	10
	6	7	8	9	10	11	

Value on the Screen	Start Value = 14						Counting to downwards
		14	13	12	11	10	9
	13	12	11	10	9	8	

000002	**x4 Phase Shifting** (for incremental encoders)

Upcount on rising edge of Ch-A when Ch-B is at 0
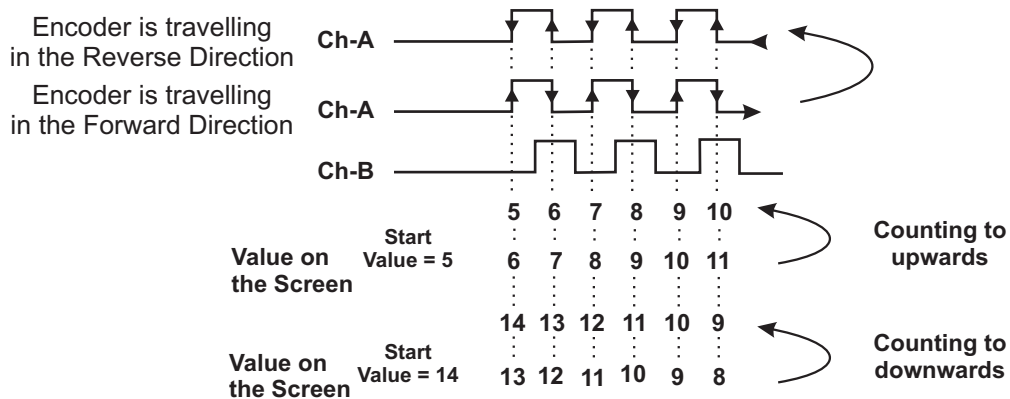Downcount on falling edge of Ch-A when Ch-B is at 0
Downcount on rising edge of Ch-A when Ch-B is at 1
Upcount on falling edge of Ch-A when Ch-B is at 1

Downcount on rising edge of Ch-B when Ch-A is at 0
Upcount on falling edge of Ch-B when Ch-A is at 0
Upcount on rising edge of Ch-B when Ch-A is at 1
Downcount on falling edge of Ch-B when Ch-A is at 1
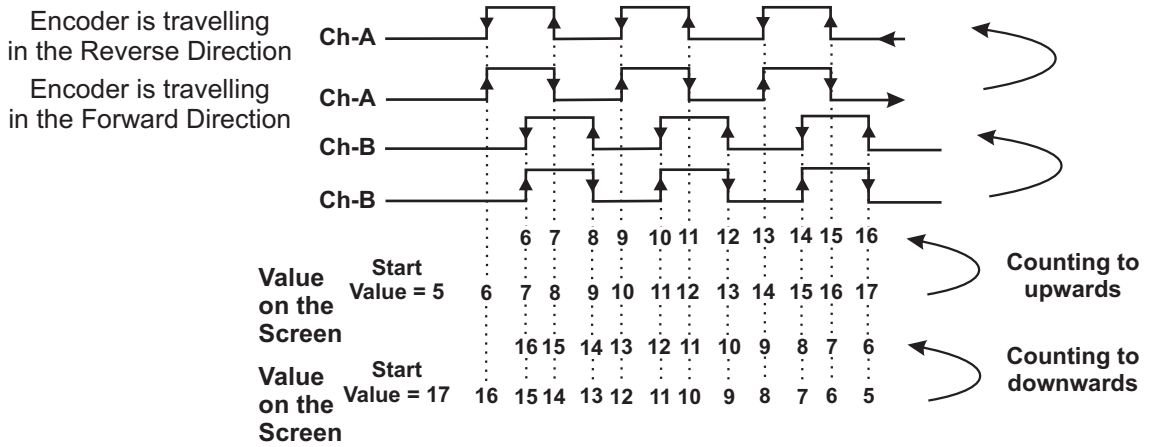
Pro-02	***Max. Input Frequency*** **(Default = 0) MODBUS ADDRESS:40002.**

000000	100kHz < *Input Frequency* < 200kHz
000001	50kHz < *Input Frequency* < 100kHz
000002	25kHz < *Input Frequency* < 50kHz
000003	12kHz < *Input Frequency* < 25kHz
000004	0kHz < *Input Frequency* < 12kHz

`Pro-03`

Filter time for Reset and Pause Input
(Default = 50) MODBUS ADDRESS:40003.

It is used to protect against the electrical contact debounce or the signal that is less than the determined pulse time.
It can be adjusted from `000002` to `000050` milisecond.

`Pro-04`

Counting Direction
(Default = 0) MODBUS ADDRESS:40004.

`000000` Upcount ($0 \Rightarrow$ Preset).

`000001` Downcount (Preset $\Rightarrow 0$).

`Pro-05`

Sensor Type Selection
(Default = 0) MODBUS ADDRESS:40005.

`000000` NPN type sensor selected

`000001` PNP type sensor selected

`Pro-06`

Point Position for Display
(Default = 0) MODBUS ADDRESS:40006.

`000000` No point `000000`

`000001` Between first and second digits `00000.0`

`000002` Between second and third digits `0000.00`

`000003` Between third and fourth digits `000.000`

`000004` Between fourth and fifth digits `00.0000`

Pro-07   Reset and Set protection (For accessing from front panle)
(Default = 0)   MODBUS ADDRESS:40007.

`000000`   There is no Reset and Set protection.

`000001`   Only RESET button protection is active. Actual value can not be reset by Reset button.
Actual value can be reset only reset input is active.

`000002`   SET1 and SET2 can not be changed.

`000003`   Full protection ; Reset protection is active, also SET1 and SET2 can not be changed.

`000004`   SET1 can not be changed.

`000005`   SET2 can not be changed.

Pro-08   Reset Input Change
(Default = 0)   MODBUS ADDRESS:40008.

`000000`   Reset on rising edge of Reset input.

`000001`   Reset on falling edge of Reset input.

Pro-09   Reset Offset
(Default = 0)   MODBUS ADDRESS: LOW WORD = 40009,HIGH WORD = 40010.

It can be adjusted from `000000` to `999999` .
For details, refer to the section where output functions `Pro-17` are defined.

Pro-10   Reading Adjustment Type Selection
(Default = 0)   MODBUS ADDRESS:40011.

`000000`   Parametric (one point) Reading Adjustment
Encoder Type and Pitch value must be entered

`000001`   Two Point Reading Adjustment
Min. Value for dual point adjustment value and Max. Value for dual point adjustment value must be entered.

`000002`   Multiplication - Division Coefficient Reading Adjustment
Multiplication and Division Coefficient value must be entered.

`Pro- 11` **Encoder Type**
(Default = 1000) MODBUS ADDRESS:40012.

NOTE-1
Number of pulse of Encoder is used pulse.
It can be adjusted from `00000 1` to `0 10000` pulse/rnd.

`Pro- 12` **Pitch**
(Default = 1000) MODBUS ADDRESS:40013.

NOTE-1
Encoder's amount of progress on an round.
It can be adjusted from `000000` to `0 10000` mm/rnd.

`Pro- 13` **Min. Value for dual point adjustment value**
(Default = 0) MODBUS ADDRESS: LOW WORD = 40014,HIGH WORD = 40015.

NOTE-2
Encoder, manually brought to the lower point after that low point value is entered for two point reading adjustment. It can be adjusted from `-99999` to `999999` .

`Pro- 14` **Max. Value for dual point adjustment value**
(Default = 1000) MODBUS ADDRESS: LOW WORD = 40016,HIGH WORD = 40017.

NOTE-2
Encoder, manually brought to the upper point after that high point value is entered for two point reading adjustment. It can be adjusted from `-99999` to `999999`.

`Pro- 15` **Multiplication Coefficient**
(Default=01.0000)MODBUS ADDRESS: LOW WORD=40018,HIGH WORD= 40019.

NOTE-3
It can be adjusted from `00000 1` to `99.9999` . Changes in this parameter is evaluated when counting starts.
If this value is `0 10000` Multiplication is not performed.

`Pro- 16` **Division Coefficient**
(Default=01.0000)MODBUS ADDRESS: LOW WORD=40020,HIGH WORD= 40021.

NOTE-3
It can be adjusted from `00.000 1` to `99.9999`. Changes in this parameter is evaluated when counting starts.
If this value is `0 10000` Division is not performed.

NOTE - 1 : Reading Adjustment Type Selection parameter `Pro- 10` is `000000` , then these parameters can be accessed.

NOTE - 2 : Reading Adjustment Type Selection parameter `Pro- 10` is `00000 1` , then these parameters can be accessed.

NOTE - 3 : Reading Adjustment Type Selection parameter `Pro- 10` is `000002` , then these parameters can be accessed.

$Pro - 17$ Output Functions
(Default = 1) MODBUS ADDRESS:40022.

$Pro - 17 = 000000$ **Manual Reset-0.**
Device continues to count till manual reset is applied.

Counting direction : 0 $\Rightarrow$ P (Upcount) $Pro-04 = 000000$
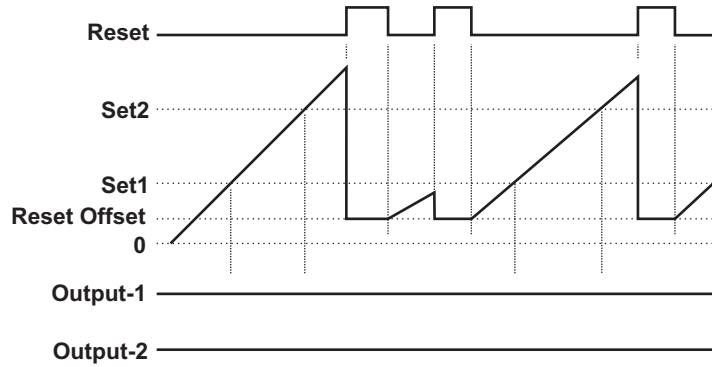
Device continues to count till manual reset is applied.
When Manual Reset happens, count value becomes Reset Offset value.Outputs are not active in this parameter.

Counting direction : P $\Rightarrow$ 0 (Downcounting) $Pro-04 = 000001$

Device continues to count till manual reset is applied.
When Manual Reset happens, count value becomes Reset Offset value.Outputs are not active in this parameter.

$\boxed{Pro-17}=\boxed{000001}$ **Manual Reset-1.**
Device continues to count till manual reset is applied.
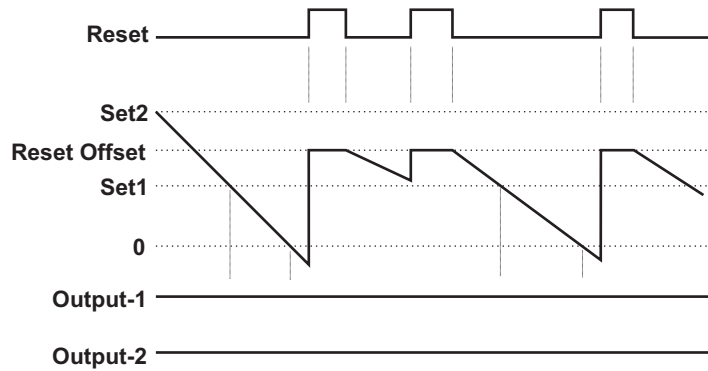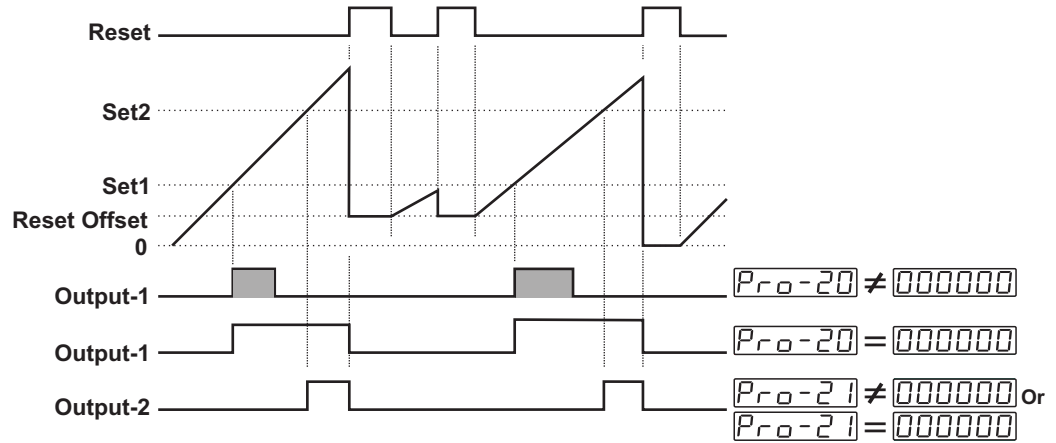**(Output PulseTime $\boxed{Pro-21}$ is not considered)**

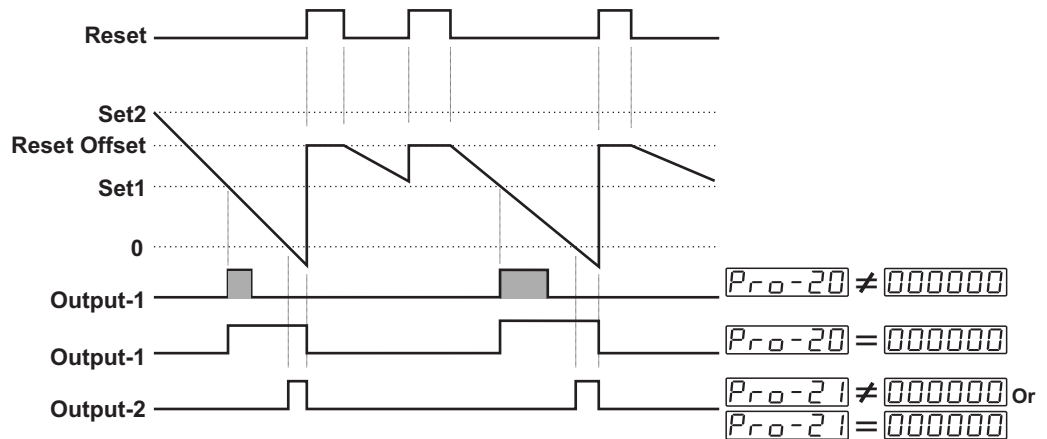**Counting direction : 0 ⇒ P (Upcount)** $\boxed{Pro-04} = \boxed{000000}$

Reset

Set2

Set1
Reset Offset
0

Output-1 $\boxed{Pro-20} \neq \boxed{000000}$

Output-1 $\boxed{Pro-20} = \boxed{000000}$

Output-2 $\boxed{Pro-21} \neq \boxed{000000}$ **Or**
             $\boxed{Pro-21} = \boxed{000000}$

When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-20}$ is $\boxed{000000}$, Output-1 does not change condition until manual reset input is active. If Output-1 pulse time $\boxed{Pro-20}$ is not 0, at the end of the pulse time Output-1 becomes inactive.
 When count value reaches to SET2 value, Output-2 becomes active.
Counting continues over SET2 value.When Manual Reset happens, count value becomes Reset Offset value.
 Output-2 pulse time $\boxed{Pro-21}$ is not considered.

Counting direction : P ⇒ 0 (Downcounting) $\boxed{Pro-04} = \boxed{000001}$

Reset

Set2
Reset Offset

Set1

0

Output-1 $\boxed{Pro-20} \neq \boxed{000000}$

Output-1 $\boxed{Pro-20} = \boxed{000000}$

Output-2 $\boxed{Pro-21} \neq \boxed{000000}$ **Or**
             $\boxed{Pro-21} = \boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 Pulse Time $\boxed{Pro-20}$ is $\boxed{000000}$, Output-1 does not change condition until manual reset input is active. If Output-1 pulse time $\boxed{Pro-20}$ is not 0, Output-1 becomes inactive at the end of the pulse time. When actual value reaches to $\boxed{000000}$, Output-2 becomes active. Counting countinues under $\boxed{000000}$.   When Manual Reset happens, count value becomes Reset Offset value.
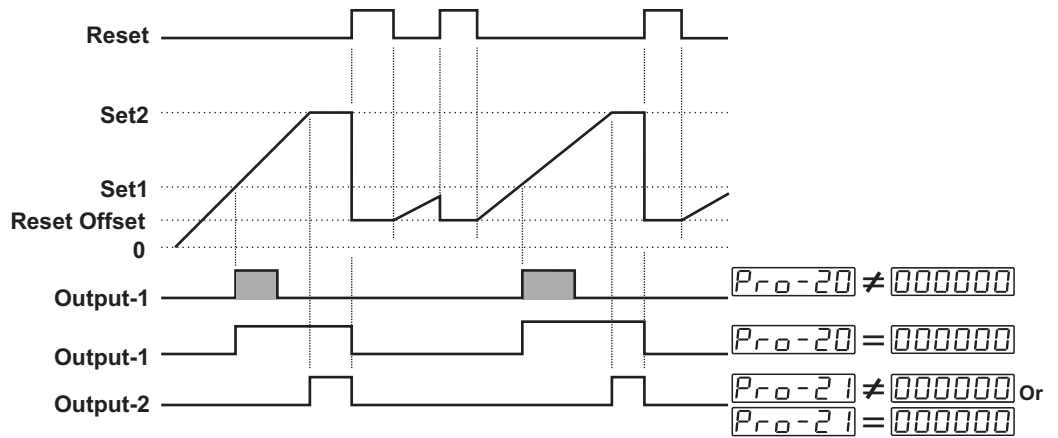Output-2 pulse time $\boxed{Pro-21}$ is not considered.

$Pro-17 = 000002$ **Manual Reset-2.**
(Output-2 Pulse Time $Pro-21$ is not considered)

Counting direction : 0 ⇒ P (Upcount) $Pro-04 = 000000$

Reset	
Set2	
Set1	
Reset Offset	
0	
Output-1	$Pro-20 \neq 000000$
Output-1	$Pro-20 = 000000$
Output-2	$Pro-21 \neq 000000$ Or $Pro-21 = 000000$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is 000000 , Output-1 does not change position until manual reset input is active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 becomes inactive at the end of the pulse time.

When the count value reaches to SET2 value, Output-2 becomes active. Counting does not continue over SET2 value. For starting to count manual reset input must be active.When Manual Reset happens, count value becomes Reset Offset value.

Output-2 Pulse Time $Pro-21$ is not considered.

Counting direction : P ⇒ 0 (Downcounting) $Pro-04 = 000001$

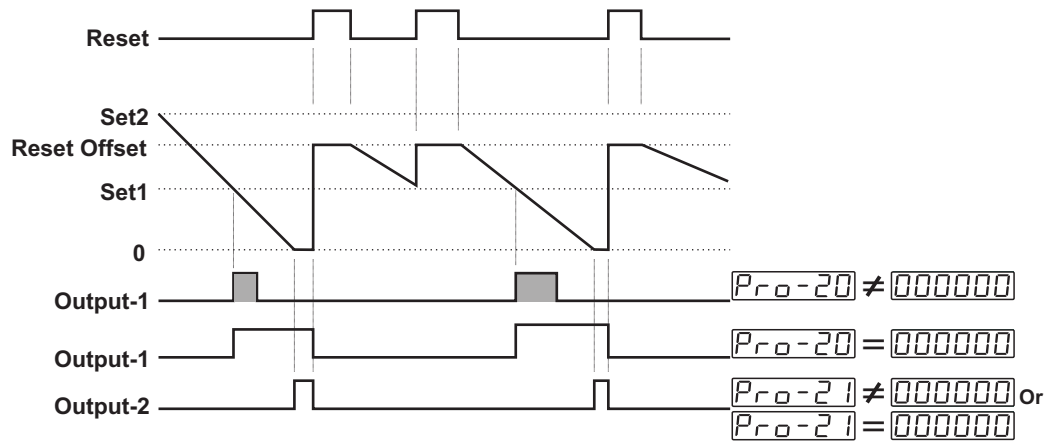|	
Reset	
Set2	
Reset Offset	
Set1	
0	
Output-1	$Pro-20 \neq 000000$
Output-1	$Pro-20 = 000000$
Output-2	$Pro-21 \neq 000000$ Or $Pro-21 = 000000$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is 000000 , Output-1 does not change condition until manual reset input is active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 becomes inactive at the end of the pulse time.

When the count value reaches to 000000 value, Output-2 becomes active. Counting does not continue under 000000 . For starting to count manual reset input must be active. When Manual Reset happens, count value becomes Reset Offset value.

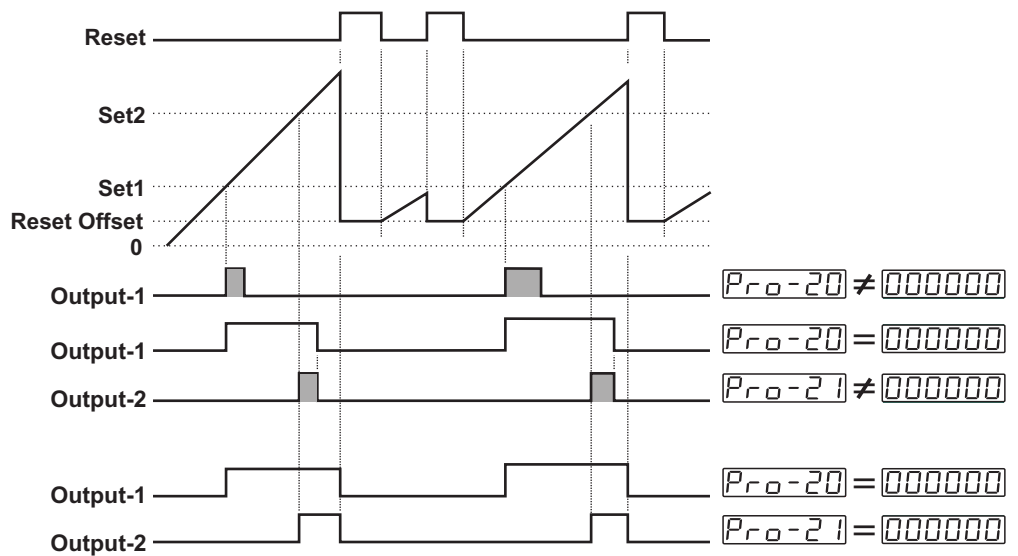Output-2 pulse time $Pro-21$ is not considered.

$\boxed{Pro-17}=\boxed{000003}$ **Manual Reset-3.**
Counting continues until Manual Reset input is active.

Counting direction : 0 ⇒ P (Upcount) $\boxed{Pro-04}=\boxed{000000}$

Reset

Set2

Set1
Reset Offset
0

Output-1 $\boxed{Pro-20}\neq\boxed{000000}$

Output-1 $\boxed{Pro-20}=\boxed{000000}$

Output-2 $\boxed{Pro-21}\neq\boxed{000000}$

Output-1 $\boxed{Pro-20}=\boxed{000000}$

Output-2 $\boxed{Pro-21}=\boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 Pulse Time $\boxed{Pro-20}$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $\boxed{Pro-20}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2.

When the count value reaches to SET2 value, Output-2 becomes active. Counting continues until manual reset input is active. If Output-2 Pulse Time $\boxed{Pro-21}$ is not 0, Output-2 changes position at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.When Manual Reset happens, count value becomes Reset Offset value.

Counting direction : P ⇒ 0 (Downcount) $\boxed{Pro-04}=\boxed{000001}$

Reset

Set2
Reset Offset
Set1
0

Output-1 $\boxed{Pro-20}\neq\boxed{000000}$

Output-1 $\boxed{Pro-20}=\boxed{000000}$

Output-2 $\boxed{Pro-21}\neq\boxed{000000}$

Output-1 $\boxed{Pro-20}=\boxed{000000}$

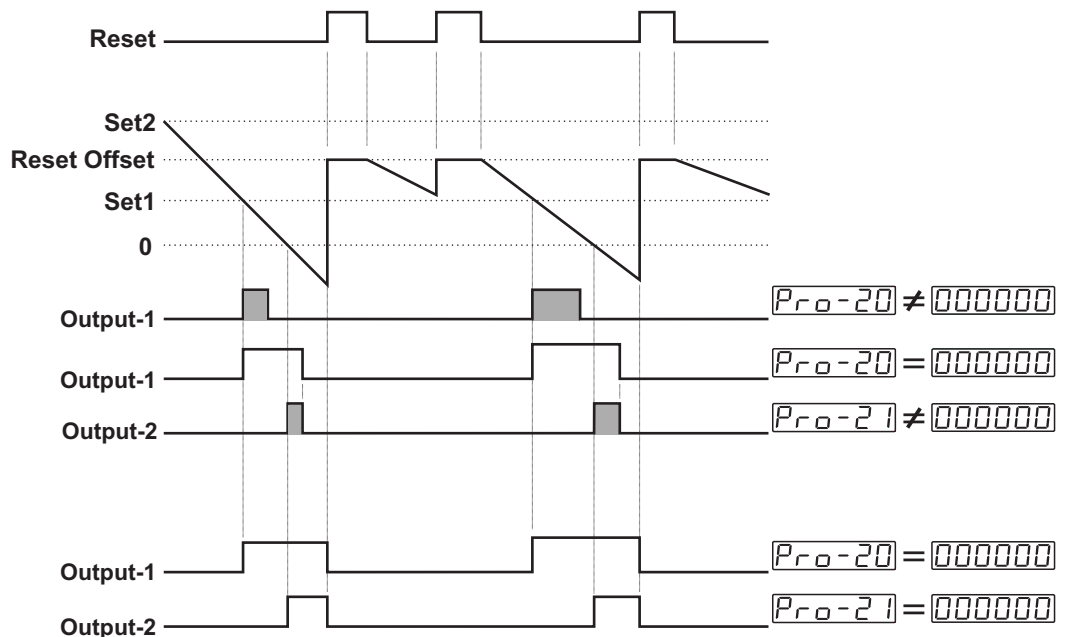Output-2 $\boxed{Pro-21}=\boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $Pro-20$ is 000000, it changes position until Manual Reset input is active or according to Output-2.
When count value reaches to 000000 value, Output-2 becomes active. Counting continues until manual reset input is active. If Output-2 Pulse time $Pro-21$ is not 0, Output-2 changes position at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.When Manual Reset happens, count value becomes Reset Offset value.
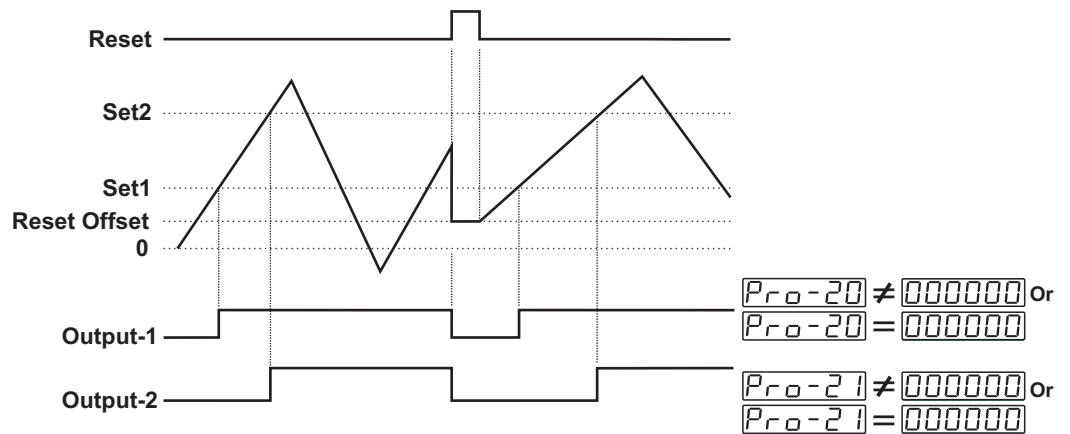
$Pro-17 = 000004$
Manual Reset-4.
Counting continues until Manual Reset input is active.
Pulse times $Pro-20$ and $Pro-21$ is not considered.

Counting direction : 0 ⇒ P (Upcount) $Pro-04 = 000000$

Reset

Set2

Set1
Reset Offset
0

Output-1 $Pro-20 \neq 000000$ Or
             $Pro-20 = 000000$

Output-2 $Pro-21 \neq 000000$ Or
             $Pro-21 = 000000$

When the count value reaches to SET1 value, Output-1 becomes active. Output-1 does not change position until manual reset input is active. Output-1 pulse time $Pro-20$ is not considered.
When the count value reaches to SET2 value, Output-2 becomes active. Output-2 does not change position until manual reset input is active. Output-2 pulse time $Pro-21$ is not considered.When Manual Reset happens, count value becomes Reset Offset value.

Counting direction : P ⇒ 0 (Downcount) $Pro-04 = 000001$

Reset

Set2
Reset Offset
Set1

0

Output-1 $Pro-20 \neq 000000$ Or
             $Pro-20 = 000000$

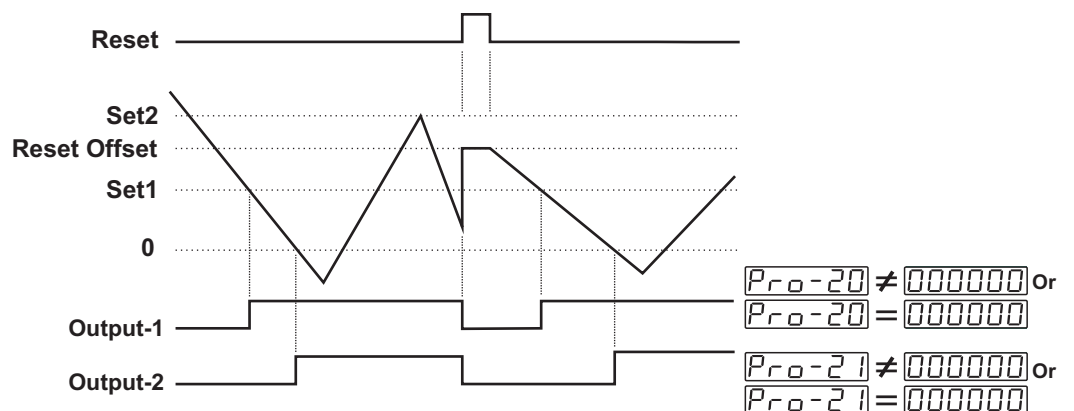Output-2 $Pro-21 \neq 000000$ Or
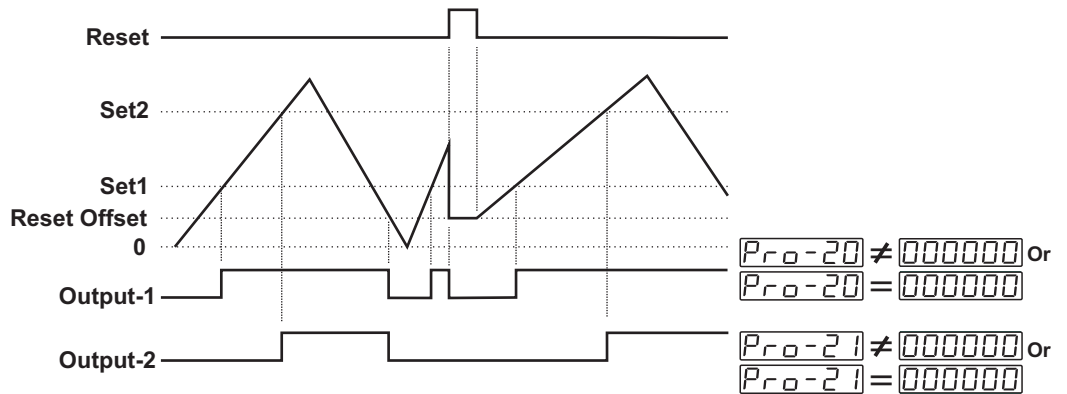 $Pro-21 = 000000$

When the count value reaches to SET1 value, Output-1 becomes active. Output-1 does not change position until manual reset input is active. Output-1 pulse time $\boxed{Pro-20}$ is not considered.

When the count value reaches to $\boxed{000000}$ value, Output-2 becomes active. Output-2 does not change position until manual reset input is active. Output-2 pulse time $\boxed{Pro-21}$ is not considered. When Manual Reset happens, count value becomes Reset Offset value.

$\boxed{Pro-17} = \boxed{000005}$ **Manual Reset-5.**
Counting continues until Manual Reset input is active.
Pulse times $\boxed{Pro-20}$ and $\boxed{Pro-21}$ is not considered.

Counting direction : 0 $\Rightarrow$ P (Upcount) $\boxed{Pro-04} = \boxed{000000}$

Reset
Set2
Set1
Reset Offset
0
Output-1 $\boxed{Pro-20} \neq \boxed{000000}$ **Or** $\boxed{Pro-20} = \boxed{000000}$
Output-2 $\boxed{Pro-21} \neq \boxed{000000}$ **Or** $\boxed{Pro-21} = \boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. Output-1 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.
Output-1 pulse time $\boxed{Pro-20}$ is not considered.
When the count value reaches to SET2 value, Output-2 becomes active. Output-2 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.
Output-1 pulse time $\boxed{Pro-21}$ is not considered.

Counting direction : P $\Rightarrow$ 0 (Downcount) $\boxed{Pro-04} = \boxed{000001}$

Reset
Set2
Reset Offset
Set1
0
Output-1 $\boxed{Pro-20} \neq \boxed{000000}$ **Or** $\boxed{Pro-20} = \boxed{000000}$
Output-2 $\boxed{Pro-21} \neq \boxed{000000}$ **Or** $\boxed{Pro-21} = \boxed{000000}$
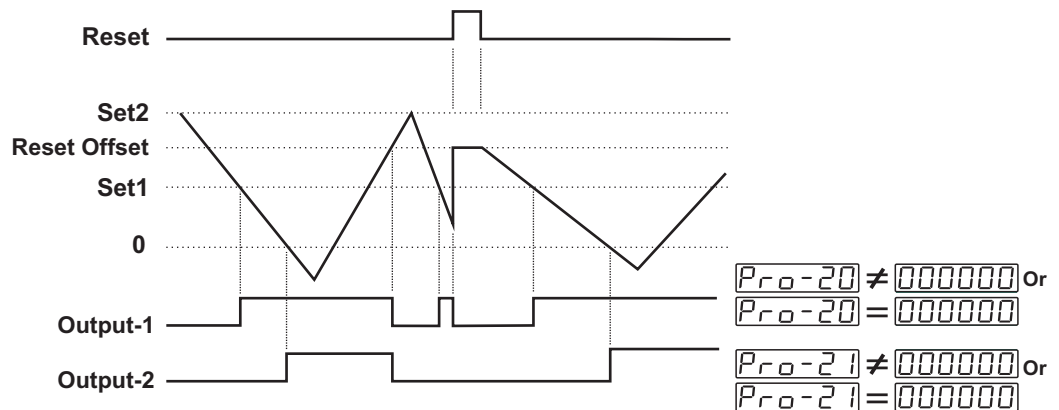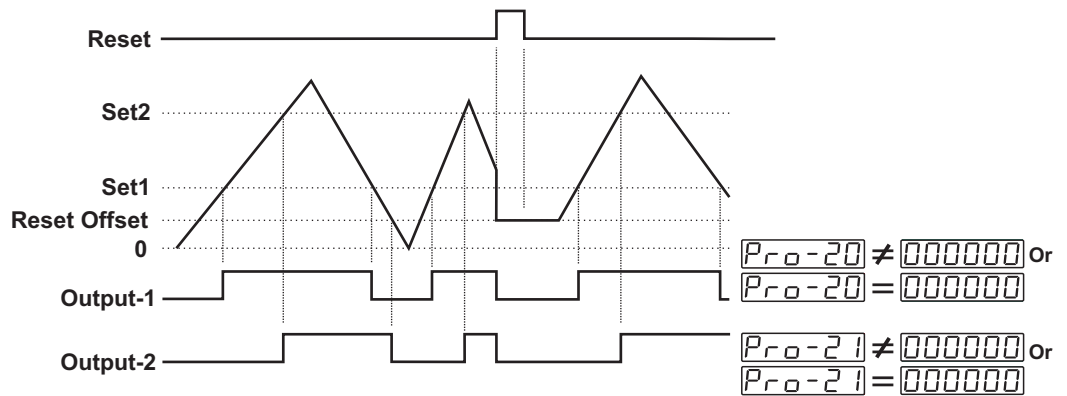
When the count value reaches to SET1 value, Output-1 becomes active.Output-1 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.
Output-1 pulse time $Pro-20$ is not considered.
When the count value reaches to 000000 value,Output-2 becomes active.Output-2 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.
Output-1 pulse time $Pro-21$ is not considered.

$Pro-17 = 000006$ **Manual Reset-6.**
Counting continues until Manual Reset input is active.
(Output-2 Pulse Time $Pro-21$ is not considered)

Counting direction : 0 ⇒ P (Upcount) $Pro-04 = 000000$

Reset
Set2
Set1
Reset Offset
0
Output-1 $Pro-20 \neq 000000$ Or
              $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$ Or
              $Pro-21 = 000000$

When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is 000000 , Output-1 does not change condition until manual reset input is active.If Output-1 pulse time
   $Pro-20$ is not 0, at the end of the pulse time Output-1 becomes inactive.
 When count value reaches to SET2 value,Output-2 becomes active.
Output-2 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.
 Output-2 pulse time $Pro-21$ is not considered.

Counting direction : P ⇒ 0 (Downcount) $Pro-04 = 000001$

Reset
Set2
Reset Offset
Set1
0
Output-1 $Pro-20 \neq 000000$ Or
              $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$ Or
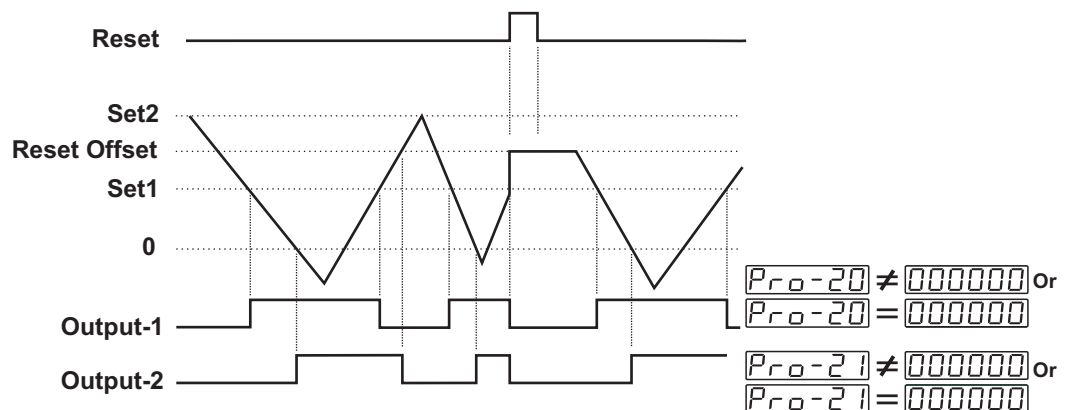 $Pro-21 = 000000$

When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is 000000 , Output-1 does not change condition until manual reset input is active.If Output-1 pulse time $Pro-20$ is not 0, at the end of the pulse time Output-1 becomes inactive.

When count value reaches to 000000 value,Output-2 becomes Active.Output-2 does not change, condition until manual reset input is active or Count value becomes equal to Reset Offset value.

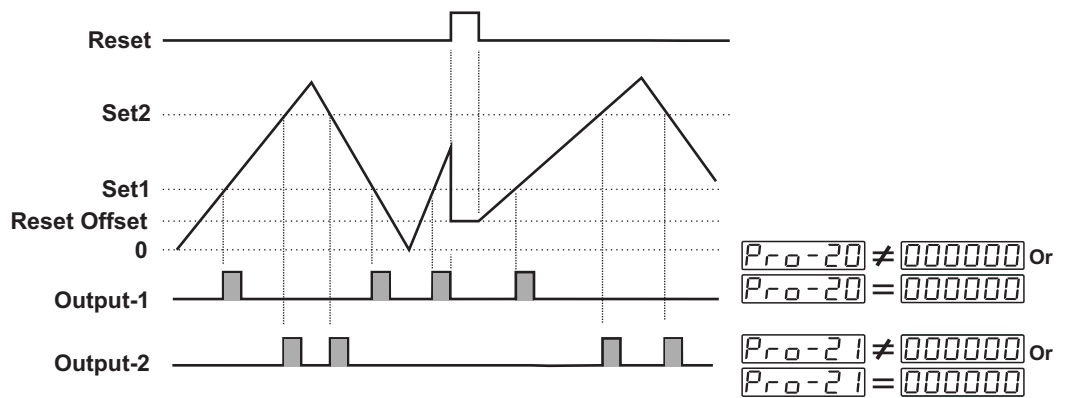Output-2 pulse time $Pro-21$ is not considered.

$Pro - 17 = 000007$ Manual Reset-7.
Counting continues until Manual Reset input is active.

Counting direction : 0 $\Rightarrow$ P (Upcount) $Pro-04 = 000000$

$Pro-20 \neq 000000$ Or
$Pro-20 = 000000$

$Pro-21 \neq 000000$ Or
$Pro-21 = 000000$

When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is 000000 , Output-1 does not change condition until manual reset input is active.If Output-1 pulse time $Pro-20$ is not 0, at the end of the pulse time Output-1 becomes inactive.
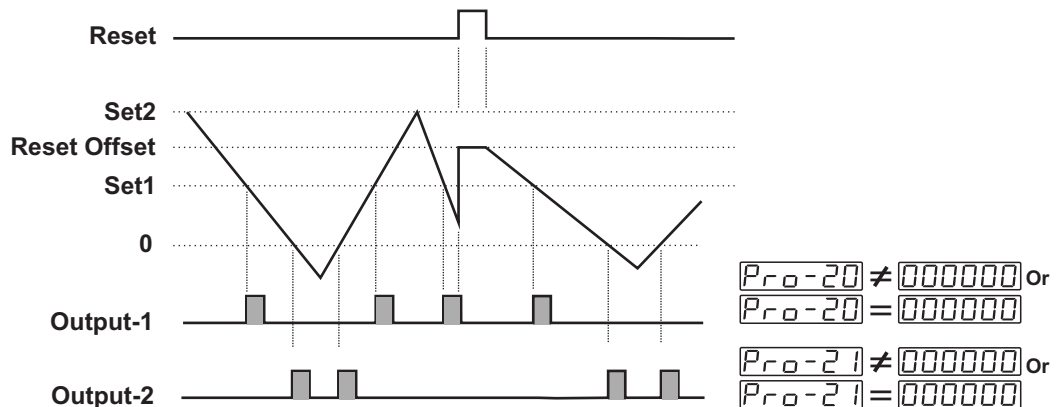
When count value reaches to SET2 value, Output-2 becomes active. If Output-2 pulse time $Pro-21$ is 000000 , Output-2 does not change condition until manual reset input is active.If Output-2 pulse time $Pro-21$ is not 0, at the end of the pulse time Output-2 becomes inactive.

**Counting direction : P $\Rightarrow$ 0 (Downcount)** $Pro-04 = 000001$

$Pro-20 \neq 000000$ Or
$Pro-20 = 000000$

$Pro-21 \neq 000000$ Or
$Pro-21 = 000000$

When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-20}$ is $\boxed{000000}$, Output-1 does not change condition until manual reset input is active.If Output-1 pulse time $\boxed{Pro-20}$ is not 0, at the end of the pulse time Output-1 becomes inactive.

When count value reaches to $\boxed{000000}$ value, Output-2 becomes active. If Output-2 pulse time $\boxed{Pro-21}$ is $\boxed{000000}$, Output-2 does not change condition until manual reset input is active.If Output-2 pulse time $\boxed{Pro-21}$ is not 0, at the end of the pulse time Output-2 becomes inactive.

$\boxed{Pro-17} = \boxed{000008}$ **Automatic Reset-1.**

Counting direction : 0 $\Rightarrow$ P (Upcount) $\qquad \boxed{Pro-04} = \boxed{000000}$
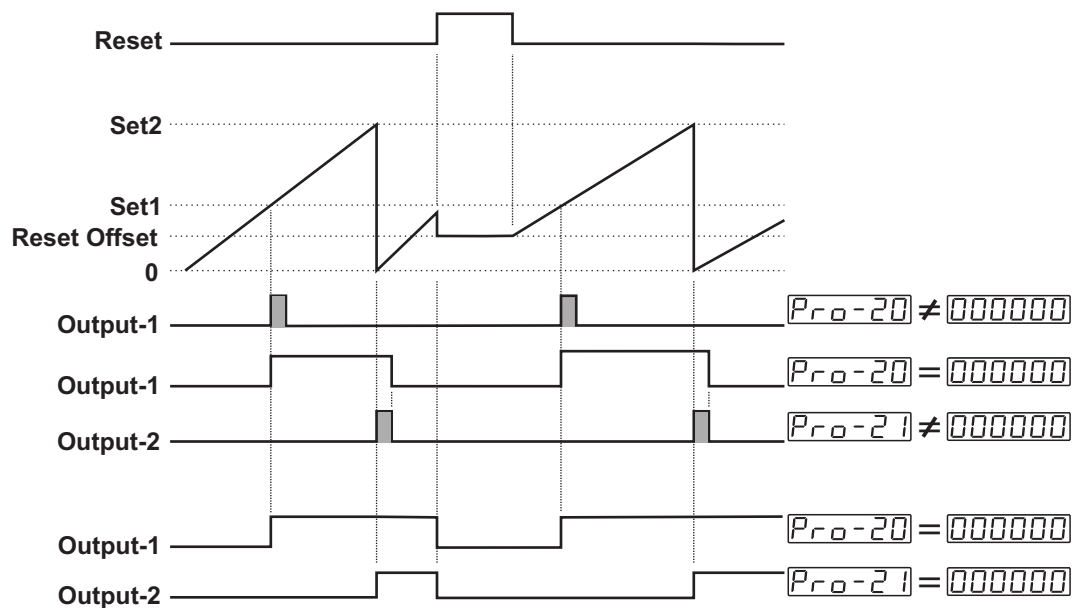
When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-20}$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $\boxed{Pro-20}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to SET2 value, Output-2 becomes active. Count value is reset. If Output-2 pulse time $\boxed{Pro-21}$ is not 0, Output-2 changes position at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.

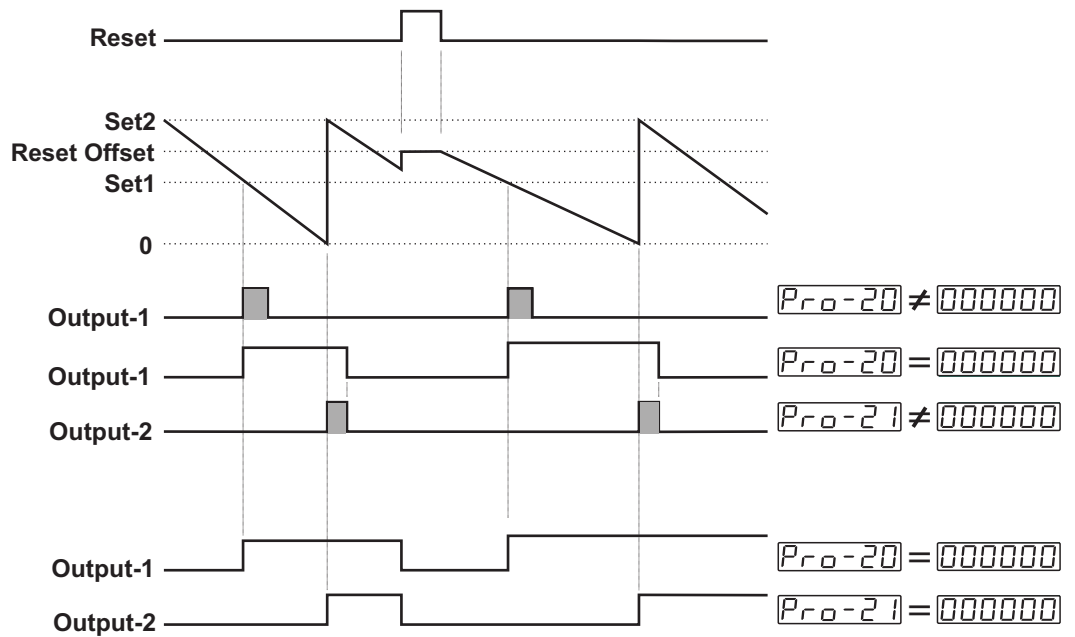**Counting Direction : P $\Rightarrow$ 0 (Downcount)**　$Pro-04 = 000001$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $Pro-20$ is 000000, it changes position until Manual Reset input is active or according to Output-2 position.
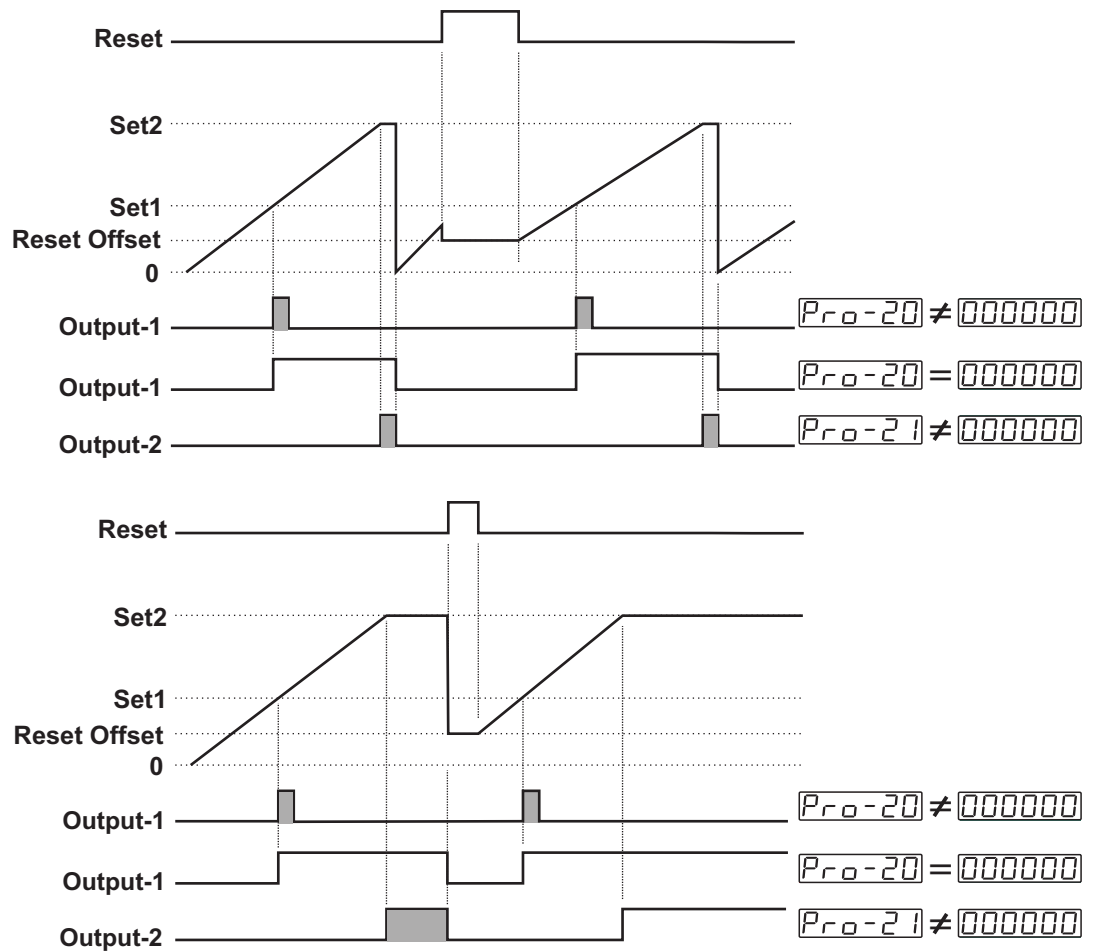
When the count value reaches to 000000 value, Output-2 becomes active. Count value becomes equal to Set-2 value and counting is started again. If Output-2 pulse time $Pro-21$ is not 0, Output-2 changes position at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.

$Pro-17 = 000009$ **Automatic Reset-2.**

Counting direction : 0 $\Rightarrow$ P (Upcount) $Pro-04 = 000000$

Reset
Set2
Set1
Reset Offset
0
Output-1 $Pro-20 \neq 000000$
Output-1 $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$

Reset
Set2
Set1
Reset Offset
0
Output-1 $Pro-20 \neq 000000$
Output-1 $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-20$ is 000000, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to SET2, Output-2 becomes active. Counting is stopped. If Output-2 pulse time $Pro-21$ is not 0, count value is reset and Output-2 becomes inactive at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.

Counting direction : P $\Rightarrow$ 0 (Downcount) $Pro-04 = 000001$

Reset

Set2
Reset Offset
Set1
0

Output-1 $Pro-20 \neq 000000$
Output-1 $Pro-20 = 000000$
Output-1 $Pro-21 \neq 000000$

Reset

Set2
Reset Offset
Set1
0

Output-1 $Pro-20 \neq 000000$
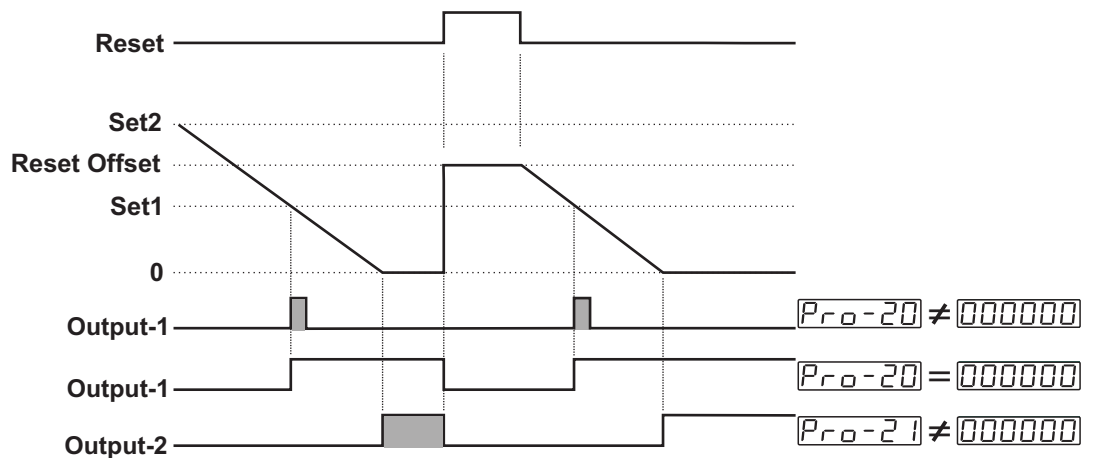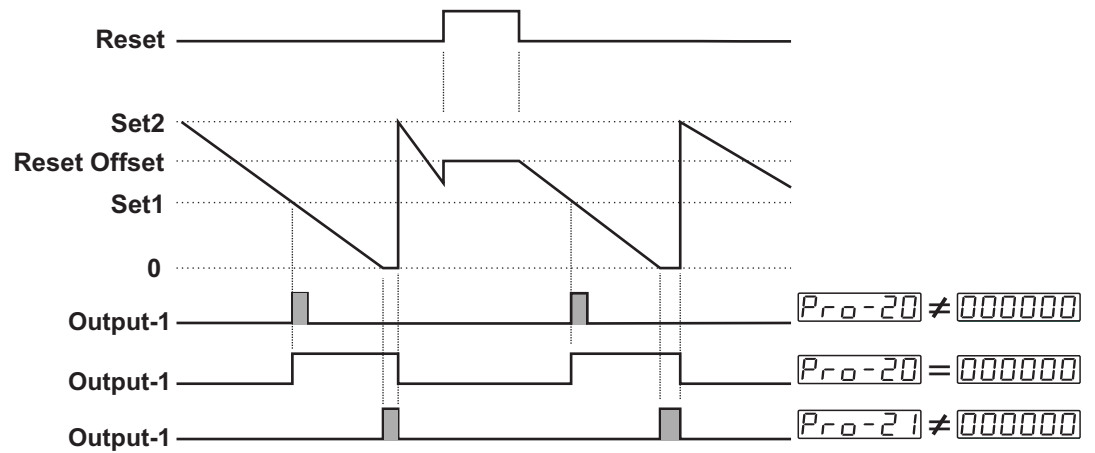Output-1 $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-20$ is 000000, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to 000000 value, Output-2 becomes active. Counting is stopped. If Output-2 pulse time $Pro-21$ is not 0, count value becomes equal to SET2 value, counting is started again and Output-2 becomes inactive. In this case, if Output-1 is active, it becomes inactive with Output-2.

$\boxed{Pro-17}=\boxed{000010}$ **Automatic Reset-3.**

Counting direction : 0 ⇒ P (Upcount) $\boxed{Pro-04}=\boxed{000000}$

$\boxed{Pro-20}\neq\boxed{000000}$

$\boxed{Pro-20}=\boxed{000000}$

$\boxed{Pro-21}\neq\boxed{000000}$

$\boxed{Pro-20}\neq\boxed{000000}$

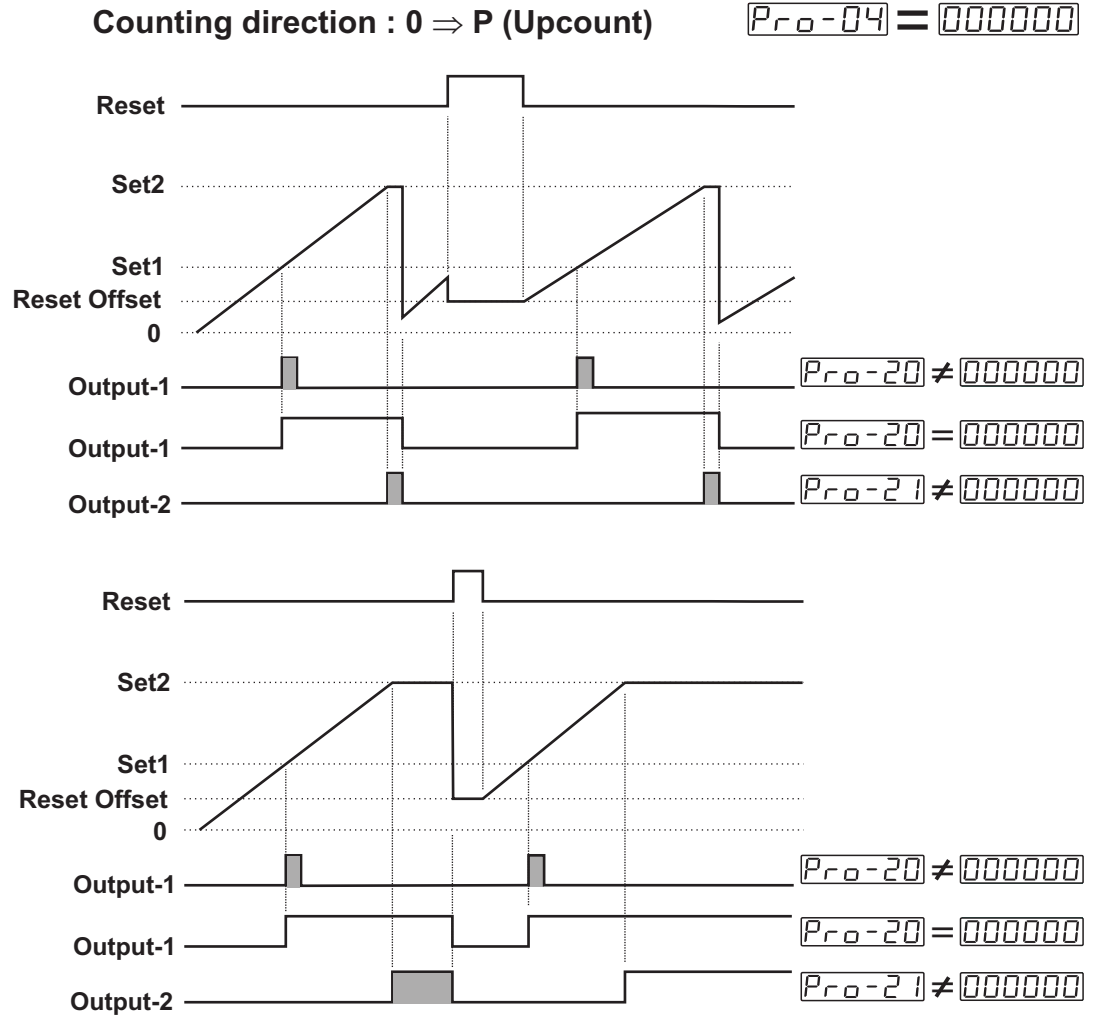$\boxed{Pro-20}=\boxed{000000}$

$\boxed{Pro-21}\neq\boxed{000000}$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-20}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $\boxed{Pro-20}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to SET2, Output-2 becomes active and count value is reset.

When the count value reaches to SET2, Output-2 becomes active and count value is reset. But SET2 value is observed in actual value display. If Output-2 pulse time $\boxed{Pro-21}$ is not 0, count value is observed in actual value display and Output-2 becomes inactive. In this case, if Output-1 is active, it becomes inactive with Output-2.

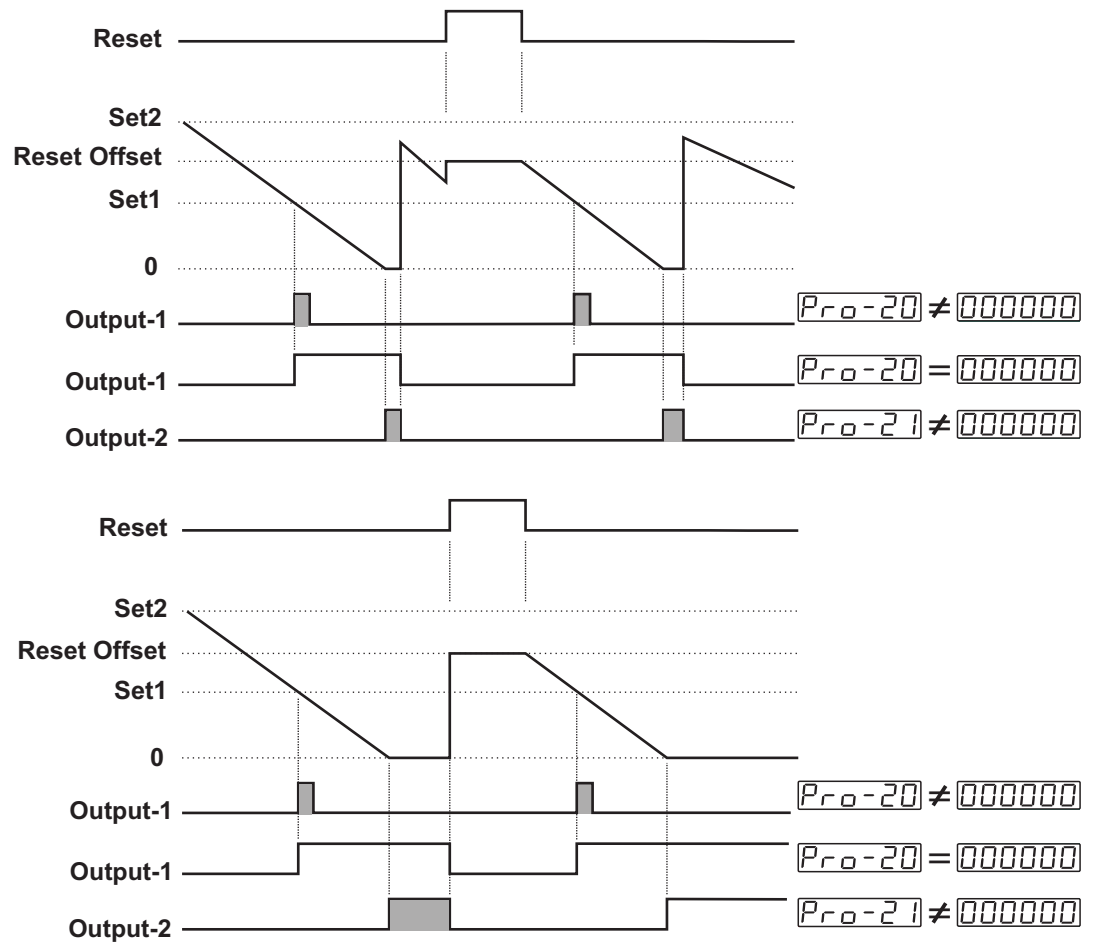**Counting direction : P ⇒ 0 (Downcount)**　　$Pro\text{-}04 = 000001$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro\text{-}20$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro\text{-}20$ is 000000 , it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to 000000 value, Output-2 becomes active, count value becomes equal to SET2and counting continues. But 000000 Is observed in actual value display. If Output-2 pulse time $Pro\text{-}21$ Is not 0, count value is observed in actual value screen and Output-2 becomes inactive at the end of the pulse time. In this case, if Output-1 is active, it becomes inactive with Output-2.

$Pro-17 = 000011$ **Automatic Reset-4.**

Counting direction : 0 ⇒ P (Upcount) $Pro-04 = 000000$

Reset
Set2
Set1
Reset Offset
0
Output-1 $Pro-20 \neq 000000$
Output-1 $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$

Reset
Set2
Set1
Reset Offset
0
Output-1 $Pro-20 \neq 000000$
Output-1 $Pro-20 = 000000$
Output-2 $Pro-21 \neq 000000$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro-20$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-20$ is 000000 , it changes position until Manual Reset input is active or according to Output-2 position.
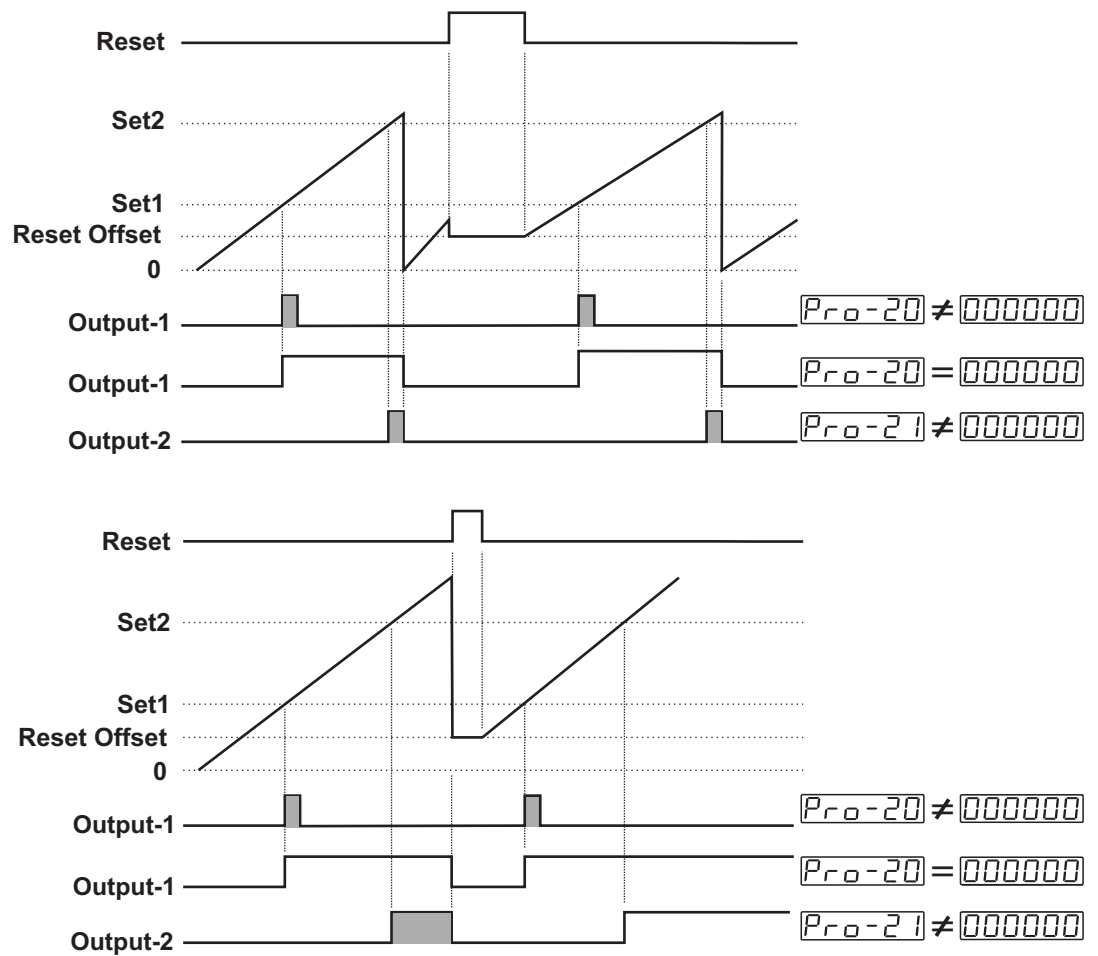
When the count value reaches to SET2, Output-2 becomes active and counting continues over 0. If Output-2 pulse time $Pro-21$ is not 0, count value is reset and Output-2 becomes inactive at the end of the pulse time.In this case, if Output-1 is active, it becomes inactive with Output-2.

Counting Direction : P $\Rightarrow$ 0 (Downcount) $\boxed{Pro-04} = \boxed{000001}$

Reset	
Set2	
Reset Offset	
Set1	
0	
Output-1	$\boxed{Pro-20} \neq \boxed{000000}$
Output-1	$\boxed{Pro-20} = \boxed{000000}$
Output-2	$\boxed{Pro-21} \neq \boxed{000000}$

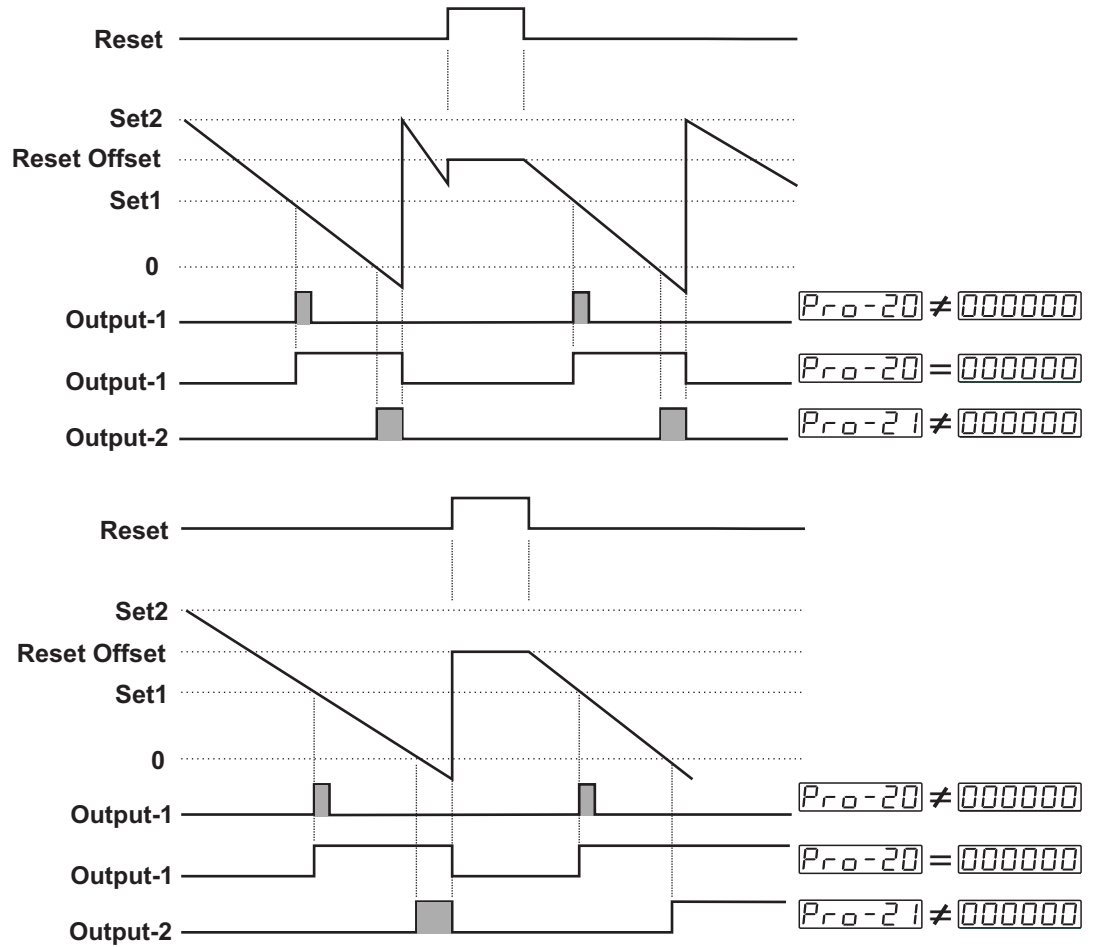|	
Reset	
Set2	
Reset Offset	
Set1	
0	
Output-1	$\boxed{Pro-20} \neq \boxed{000000}$
Output-1	$\boxed{Pro-20} = \boxed{000000}$
Output-2	$\boxed{Pro-21} \neq \boxed{000000}$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-20}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $\boxed{Pro-20}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2 position.

When count value reaches to $\boxed{000000}$ value, Output-2 becomes active and counting continues under 0. If Output-2 pulse $\boxed{Pro-21}$ time is not 0, count value becomes equal to SET2 and Output-2 becomes inactive. In this case, if Output-1 is active, it becomes inactive with Output-2.
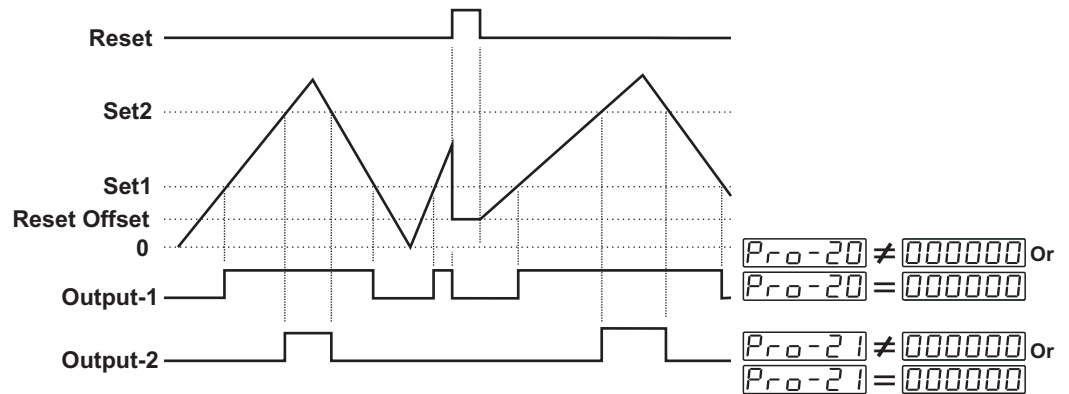
$\boxed{Pro-17}=\boxed{000012}$ **Automatic Reset-5.**
Pulse times $\boxed{Pro-20}$ and $\boxed{Pro-21}$ is not considered.

Counting direction : 0 $\Rightarrow$ P (Upcount) $\boxed{Pro-04} = \boxed{000000}$

Reset

Set2

Set1
Reset Offset
0

$\boxed{Pro-20} \neq \boxed{000000}$ **Or**
$\boxed{Pro-20} = \boxed{000000}$

Output-1

Output-2

$\boxed{Pro-21} \neq \boxed{000000}$ **Or**
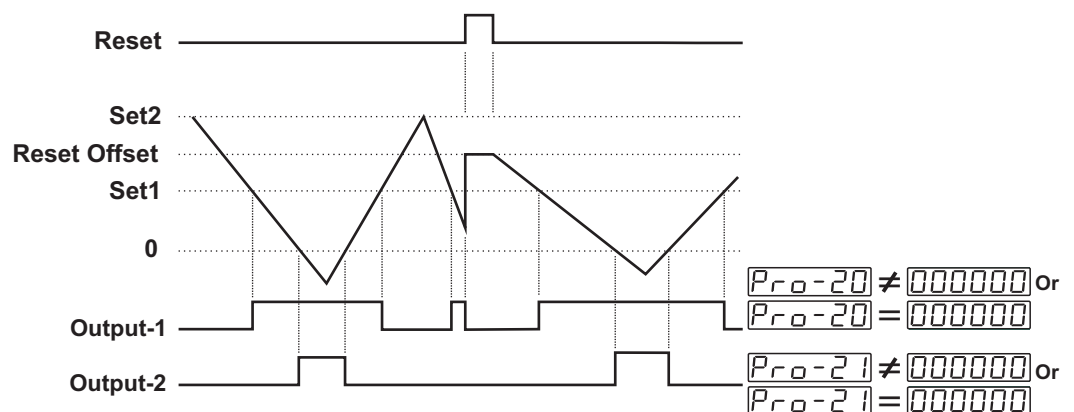$\boxed{Pro-21} = \boxed{000000}$

If count value is equal or greater than SET1 value, then Output-1 becomes active. Output-1 pulse time $\boxed{Pro-20}$ is not considered.
If count value is equal or greater than SET2 value, then Output-2 becomes active. If count value is less than SET2 value, Output-2 becomes inactive. Output-2 pulse time $\boxed{Pro-21}$ is not considered.

Counting direction : P $\Rightarrow$ 0 (Downcount) $\boxed{Pro-04} = \boxed{000001}$

Reset

Set2
Reset Offset
Set1

0

$\boxed{Pro-20} \neq \boxed{000000}$ **Or**
$\boxed{Pro-20} = \boxed{000000}$

Output-1

Output-2

$\boxed{Pro-21} \neq \boxed{000000}$ **Or**
$\boxed{Pro-21} = \boxed{000000}$

If count value is equal or less than SET1 value, then Output-1 becomes active. If it is greater than SET1 value, Output-1 becomes inactive. Output-1 pulse time $\boxed{Pro-20}$ is not considered.
If count value is equal or less than $\boxed{000000}$ value, then Output-2 becomes active. If count value is greater than $\boxed{000000}$ value, then Output-2 becomes inactive. Output-2 pulse time $\boxed{Pro-21}$ is not considered.

$Pro-18$ **Output-1 Operation Form**
(Default = 0) MODBUS ADDRESS:40023.

000000 Output-1 Normally non-energised.

000001 Output-1 Normally energised.

$Pro-19$ **Output-2 Operation Form**
(Default = 0) MODBUS ADDRESS:40024.

000000 Output-2 Normally non-energised.

000001 Output-2 Normally energised.

$Pro-20$ **Output-1 Pulse Time**
(Default = 0000.00) MODBUS ADDRESS:40025.
It determines how long Output-1 will be active.
It can be adjusted from 000000 to 009999 seconds.
If it is 000000 second, then it operates indefinitely.
For details, refer to the section where output functions $Pro-17$ are defined.

$Pro-21$ **Output-2 Pulse Time**
(Default = 0000.00) MODBUS ADDRESS:40026.
It determines how long Output-2 will be active.
It can be adjusted from 000000 to 009999 seconds.
If it is 000000 second, then it operates indefinitely.
For details, refer to the section where output functions $Pro-17$ are defined.

$Pro-22$ **Max Set Value**
(Default=999999)MODBUS ADDRESS: LOW WORD=40027,HIGH WORD= 40028.

Maximum value for Set Values.
It can be adjusted from 000000 to 999999 .

$Pro-23$ **Min Set Value**
(Default=000000)MODBUS ADDRESS: LOW WORD=40029,HIGH WORD= 40030.

Minimum value for Set Values.
It can be adjusted from 000000 to 999999 .

$Pro-24$ **Display Type Selection**
(Default = 0) MODBUS ADDRESS:40031.

000000 Display value is incremental encoder counter value.

000001 Display value is calculated value.

`Pro-25` **Saving Count Value (Power down back-up)**
(Default = 0) MODBUS ADDRESS:40032.

`000000` Count value is saved to memory when power is disconnected and restored on power up.

`000001` Count value is not saved to memory when power is disconnected. When power up `000000` is shown on the screen.

`Pro-26` **Slave Address**
(Default = 1) MODBUS ADDRESS:40033.

Device address for serial communication bus.
It can be adjusted from `000001` to `000247`.

`Pro-27` **Communication Parity Selection**
(Default = 0) MODBUS ADDRESS:40034.

`000000` No parity.

`000001` Odd Parity.

`000002` Even Parity.

`Pro-28` **Baud Rate**
(Default = 1) MODBUS ADDRESS:40035.

`000000` 4800 Baud Rate.

`000001` 9600 Baud Rate.

`000002` 19200 Baud Rate.

`000003` 38400 Baud Rate.

`Pro-29` **Communication Stop Bit selection**
(Default = 0) MODBUS ADDRESS:40036.

`000000` 1 Stop Bit.

`000001` 2 Stop Bits.

`Pro-30` **Return to Factory Settings**
(Default = 0) MODBUS ADDRESS:40037.

Restore all settings to factory default. This parameter has a special password.

`Pro-PS` **Program Password**
(Default = 0) MODBUS ADDRESS:40038.

It is used for accessing to the program parameters. It can be adjusted from `000000` to `009999` .
If it is `000000` , there is no password protection while accessing to the parameters.
When programming button is pressed, `ProG` will appear on the display.
If program password is not "0" while accessing to the program parameters ;
1- If user does not enter the `PSuurd` value correctly ; operation screen will appear without entering to operator parameters.

2- When `PSuurd` in top display and `000000` in bottom display,if user presses ENTER button without entering password (for observing the parameters):
User can see all parameters except Program Password but device does not allow to do any changes with parameters.
(Please refer to Section 7. Failure Messages in EZM-4931 Programmable Counter (1))

6. Read Input Register Command

Input registers can not be changed by the user. Input registers can be only read.

Adres	Parameter Name	Range
30001	Preset Active Value Signed	0 – Positive / 1 – Negative
30002	Preset Active Value High	0 - 1
30003	Preset Active Value Low	0 - 65535
30004	None	0
30005	None	0
30006	NPN / PNP Status	0 – NPN / 1 – PNP
30007	None	0
30008	Out1 Status	0 – Passive / 1 – Active
30009	Out2 Status	0 – Passive / 1 – Active
30010	SSR1 Status	0 – Passive / 1 – Active
30011	SSR2 Status	0 – Passive / 1 – Active
30012	None	0
30013	Count Active Value High	0 - 1
30014	Count Active Value Low	0 - 65535
30015	Device Type & Revision	0 - 65535
30016	Display Decimal Point	0 - 4
30017	Set Point-1 Value High	0 - 1
30018	Set Point-1 Value Low	0 - 65535
30019	Set Point-2 Value High	0 - 1
30020	Set Point-2 Value Low	0 - 65535

7. Failure Messages in EZM-4931 Programmable Counter

1-If the password is not ⌐⌐⌐⌐⌐⌐ , user can access to the parameters without entering the password and by pressing ENTER button.
User can see all parameters except for programming password parameter 『Pro-PS』 but user can not do any changes in parameters. If password is entered for accessing to the parameters correctly, most significant digit of the parameter flashes. But if the password is not entered, flashing of the most significant digit is not realised.
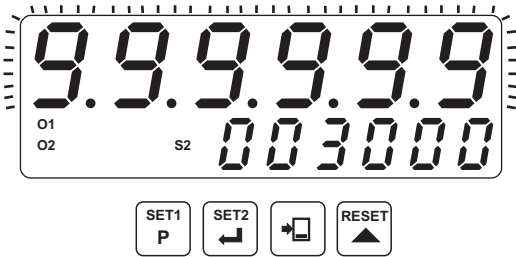
2-If Actual Value is flashing;
It appears if any of the count value is greater than the maximum count value.
To remove this warning and reset the count value press RESET button.
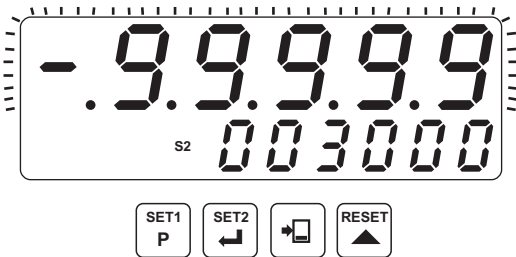
3-If Actual Value is flashing and counting is stopped ;
It appears if any of the count value is lower than the minimum count value.
To remove this warning and reset the count value press RESET button.

8. Specifications

Device Type	: Programmable Counter.
Housing & Mounting	: 96mm x 48mm x 86.5mm 1/8 DIN 43700 plastic housing. For panel mounting. Panel cut-out is 92x46mm.
Protection Class	: NEMA 4X (IP65 at front, IP20 at rear).
Weight	: Approximately 0.29 Kg.
Environmental Ratings	: Standard, indoor at an altitude of less than 2000 meters with none condensing humidity.
Storage / Operating Temperature	: -40 $^{\circ}$C to +85 $^{\circ}$C / 0 $^{\circ}$C to +50 $^{\circ}$C.
Storage / Operating Humidity	: 90 % max. (None condensing).
Installation	: Fixed installation.
Over Voltage Category	: II.
Pollution Degree	: II. Office or workplace, none conductive pollution.
Operating Conditions	: Continuous.
Supply Voltage and Power	: 230 V $\sim$ (-%15 / +%10) 50/60 Hz. 6VA.
	115 V $\sim$ (-%15 / +%10) 50/60 Hz. 6VA.
	24 V $\sim$ (-%15 / +%10) 50/60 Hz. 6VA.
	24 V $=$ (-%15 / +%10) 6W.
Electrical Characteristics	
Of Digital Inputs	: Rated voltage : 16 V$=$ @ 5mA.
	Maximum continuous permissible voltage : 30 V$=$.
	Logic 1 minimum level : 3 V$=$.
	Logic 0 maximum level : 2 V$=$.
Maximum Input Frequency	: If $\boxed{Pro\text{-}02}$ = 0 ; 200 kHz.
	If $\boxed{Pro\text{-}02}$ = 1 ; 100 kHz.
	If $\boxed{Pro\text{-}02}$ = 2 ; 50 kHz.
	If $\boxed{Pro\text{-}02}$ = 3 ; 25 kHz.
	If $\boxed{Pro\text{-}02}$ = 4 ; 12 kHz.
Output Types	:-Relay Output on Resistive Load 5A@250V$\sim$.
	100.000 operation (Full Load).
	- SSR Driver Output.
	(Maximum 14mA,Maximum 10V $=$).
Optional Communication Type	: RS-232 Communication.
Communication Protocol	: MODBUS RTU.
Process Display	: 13 mm Red 6 digit LED display.
Set Display	: 8 mm Green 6 digit LED display.
Led Indicators	: SV1 (Set1 value), SV2 (Set2 value), O1 / 2 (Control Output) LEDs.
Approvals	: GOST-R, $C\epsilon$.

9. Other Informations

Manufacturer Information:
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