EMKO

Programmable Counter

EZM-4931 96x48 DIN 1/8

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

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When and Where Issued

06th December 2010

Bursa-TURKEY

Authorized Signature

Name : Serpil YAKIN

Position : Quality Manager

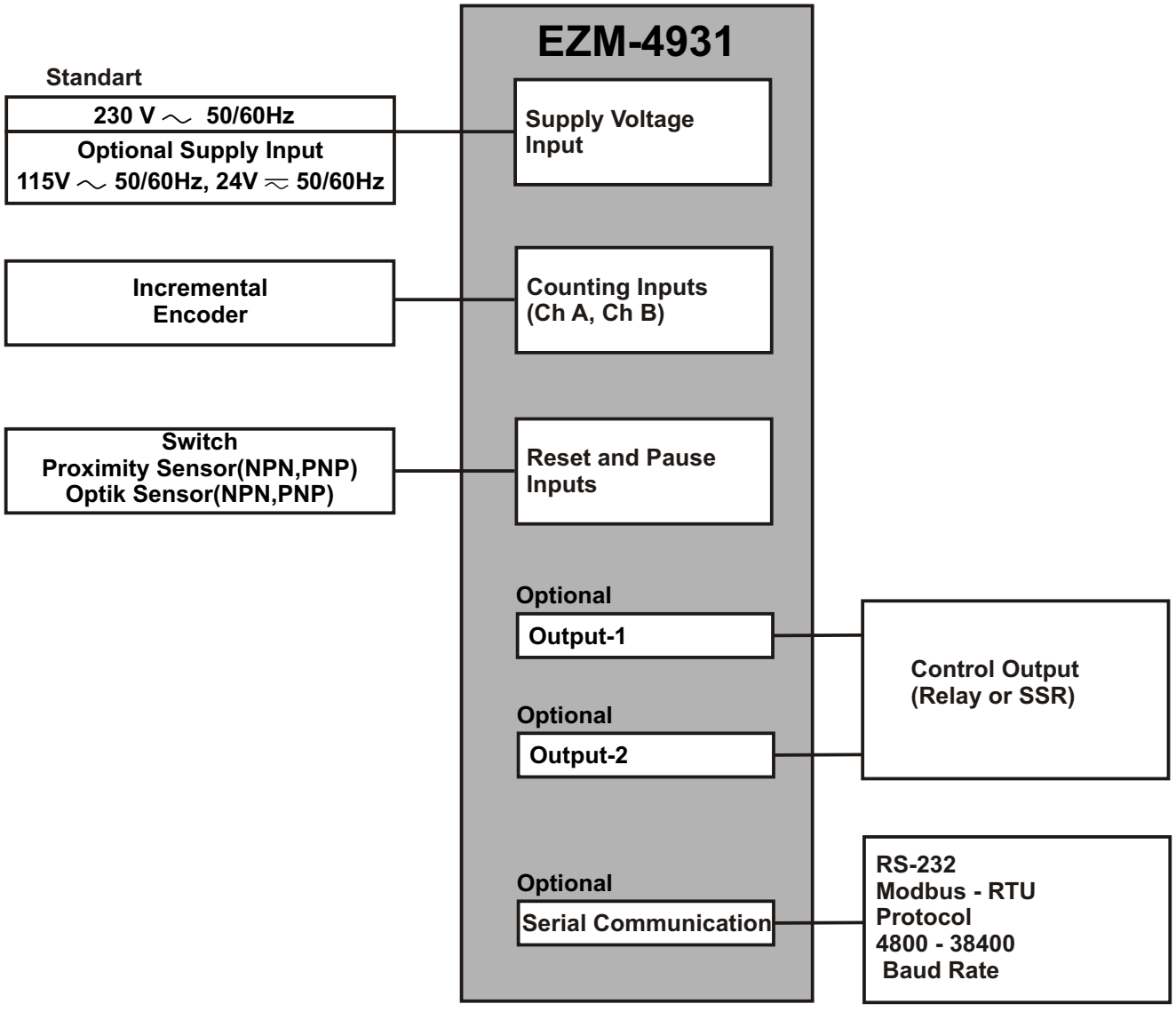
1.Preface

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.

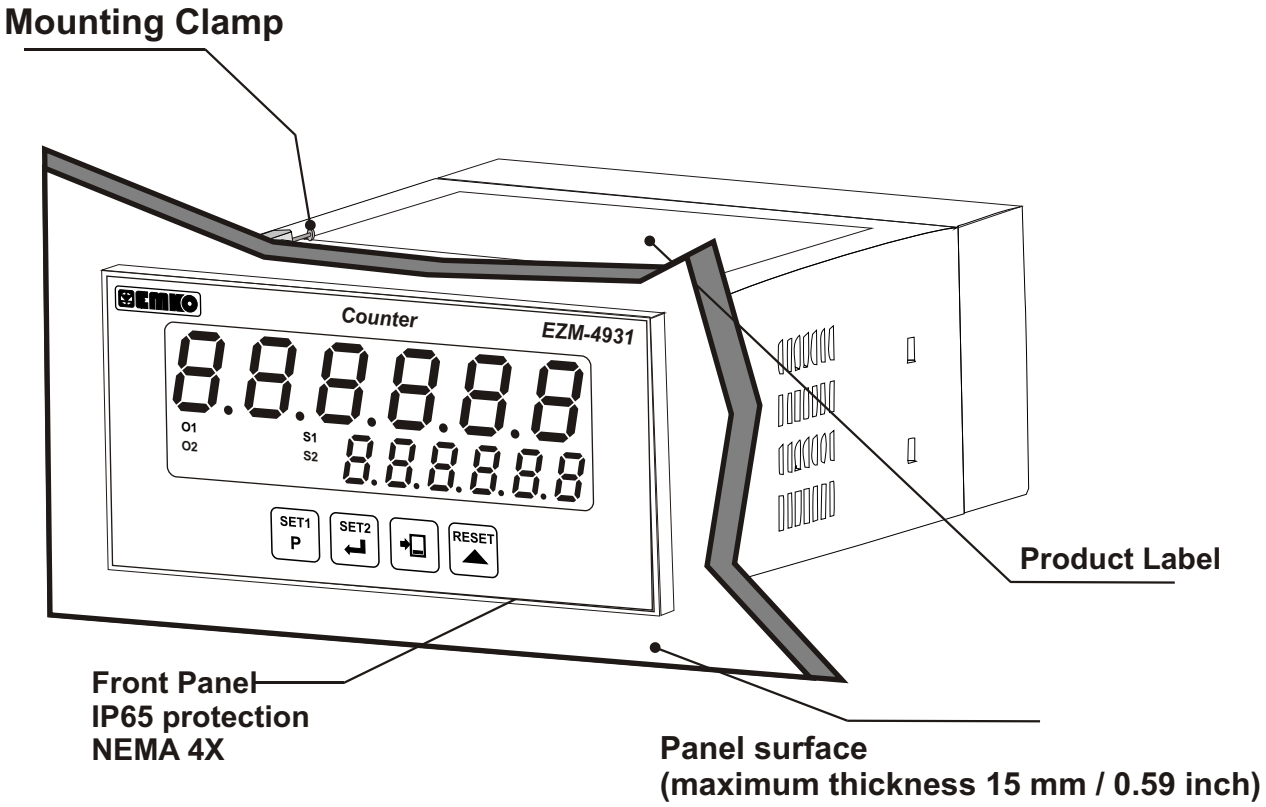
Do not use the unit in combustible or explosive gaseous atmospheres.

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.

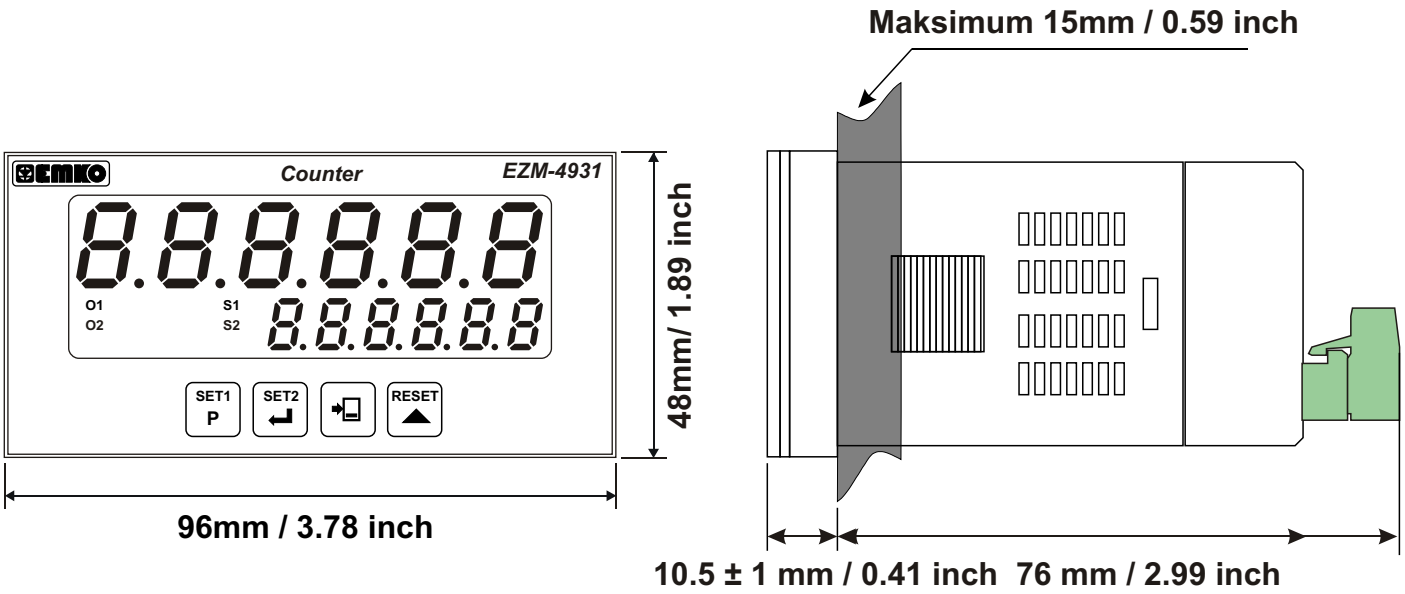
Montage of the product on a system must be done with it's fixing clamps. Do not do the montage of the device with inappropriate fixing clamp. Be sure that device will not fall while doing the montage.

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

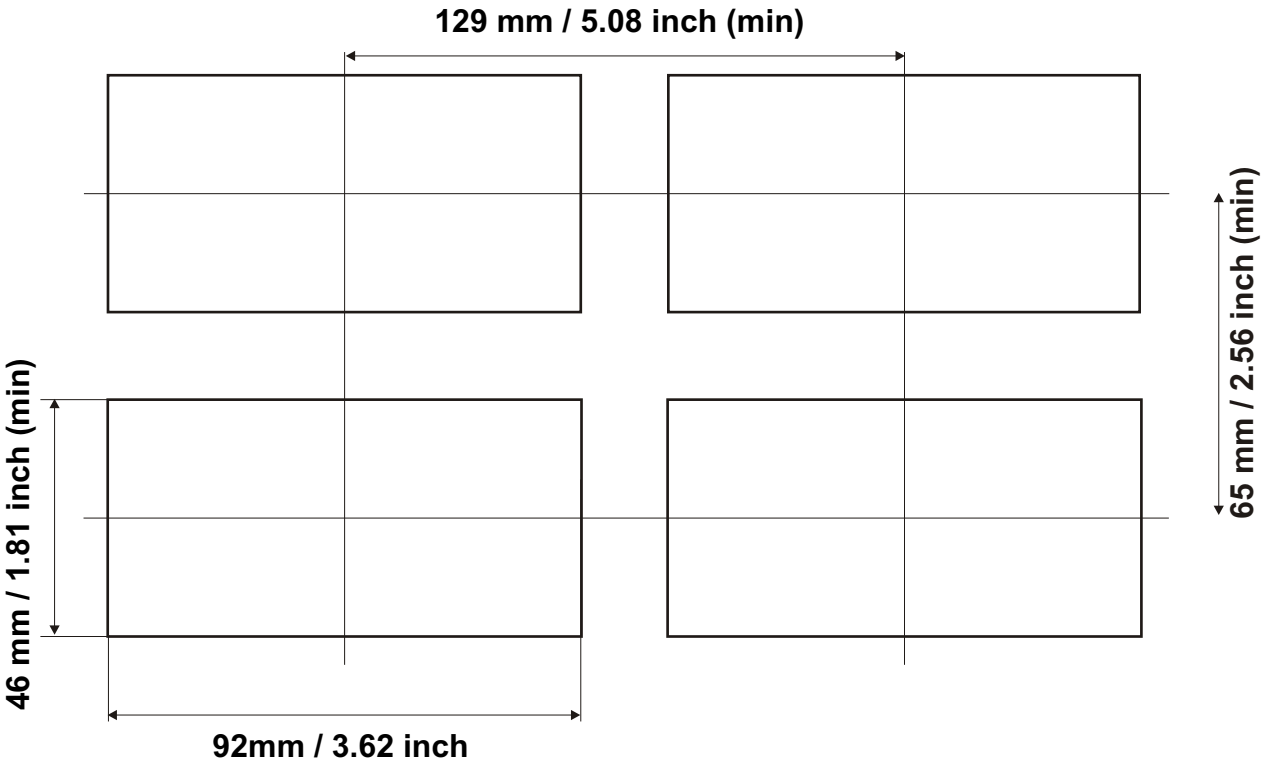
2.1 General Description



2.2 Dimensions



2.3 Panel Cut-Out



2.4 Environmental Ratings

Operating Conditions

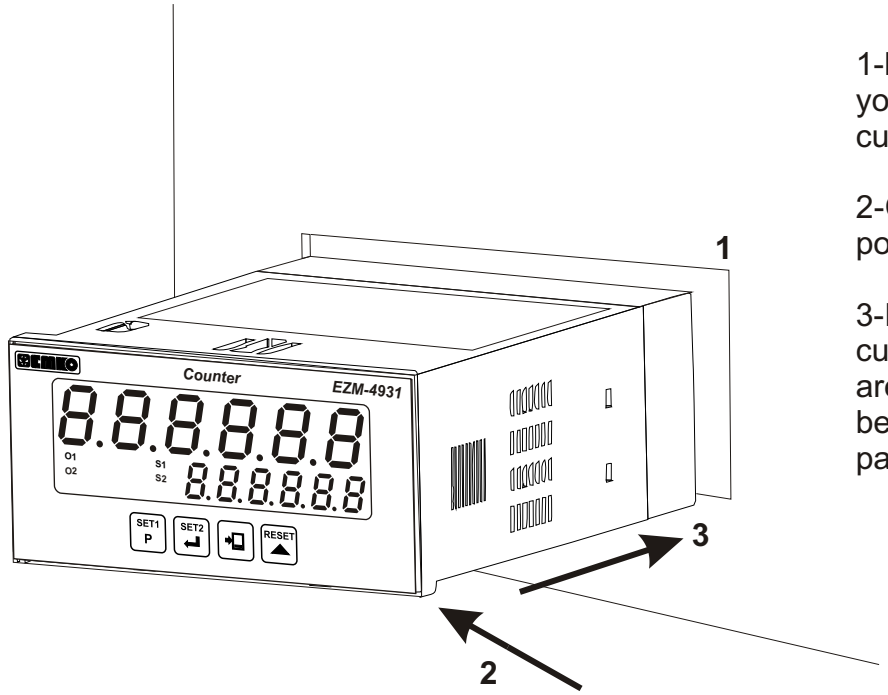
Operating Temperature : 0 to 50 °C

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



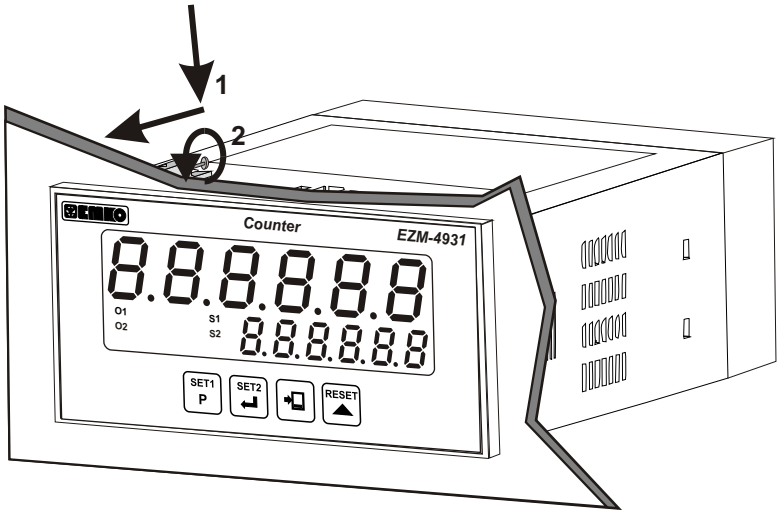
1-Before mounting the device in your panel, make sure that the cut-out is the right size.

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.

2.6 Installation Fixing Clamp



The unit is designed for panel mounting.

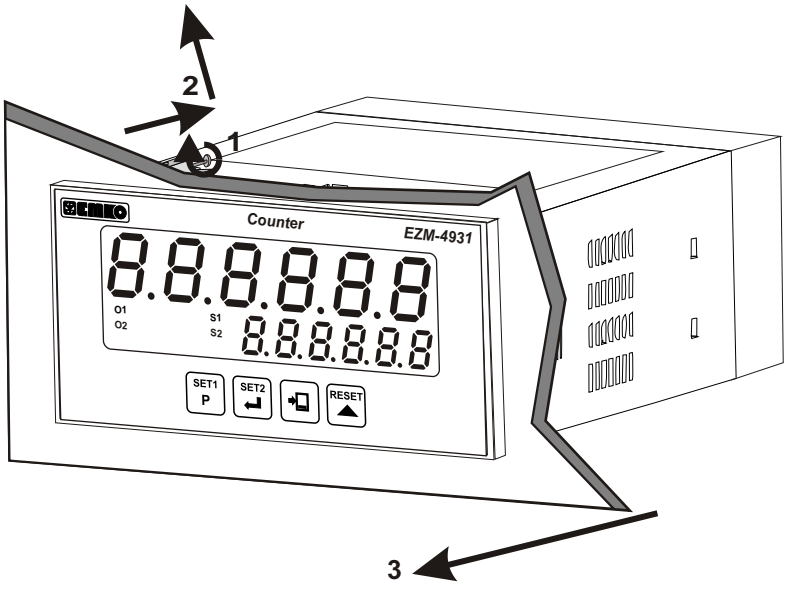
1-Insert the unit in the panel cut-out from the front side.

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

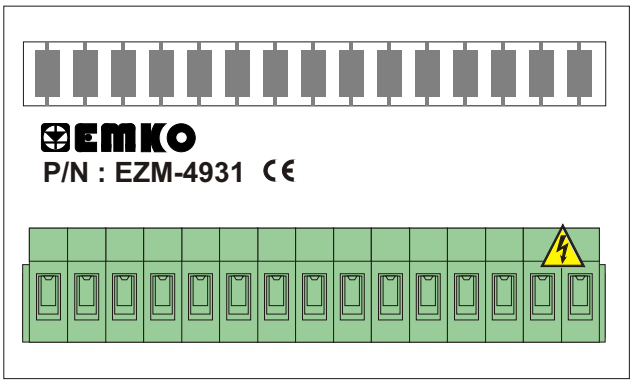
You must ensure that the device is correctly configured for your application. Incorrect configuration could result in damage to the process being controlled, and/or personal injury. It is your responsibility, as the installer, to ensure that the configuration is correct.
Parameters of the device has 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.

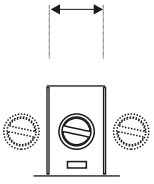
Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.

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



Max. 2.5mm / 0.098 inch
Wire Size:
14AWG/1mm²
Solid /Stranded

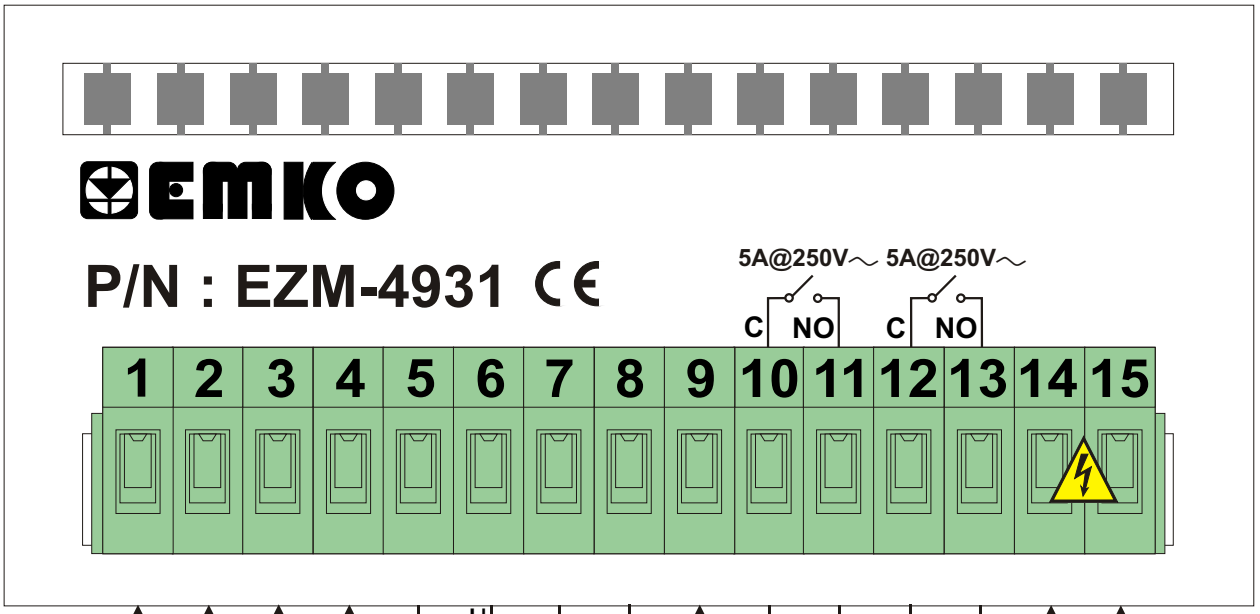


Torque
0,5Nm

Screw driver
0,8 x3mm

3.2 Electrical Wiring Diagram

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.



PAUSE
RESET
Ch B
Ch A
0 V ⎓
5V or 12V ⎓ Max. 50mA
GND
Tx
Rx
(+)SSR-2
(-)SSR-2
(+)SSR-1
(-)SSR-1
N
L

Count Inputs

NOTE-1
Sensor Supply Voltage
12 V ⎓ or 5 V ⎓
(It must be determined in order.)

RS-232 Communication

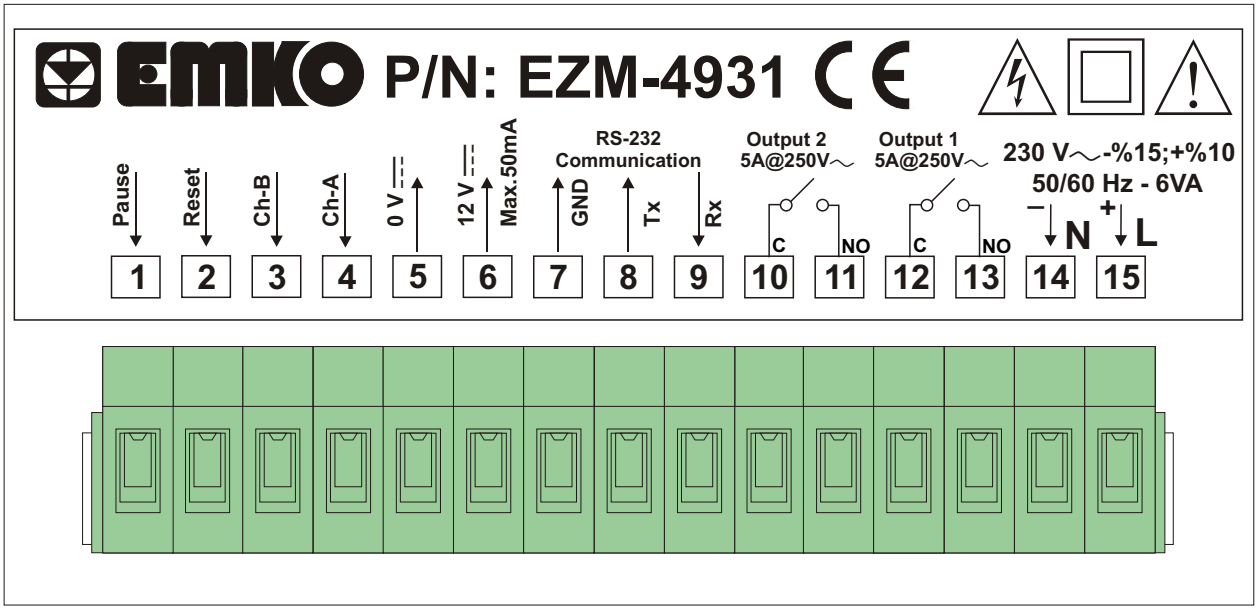
Relay or SSR Outputs

Supply Voltage Input
230V ~ (-%15;+%10) 50/60Hz
115V ~ (-%15;+%10) 50/60Hz
24V ≂ (-%15;+%10)
(It must be determined in order.)

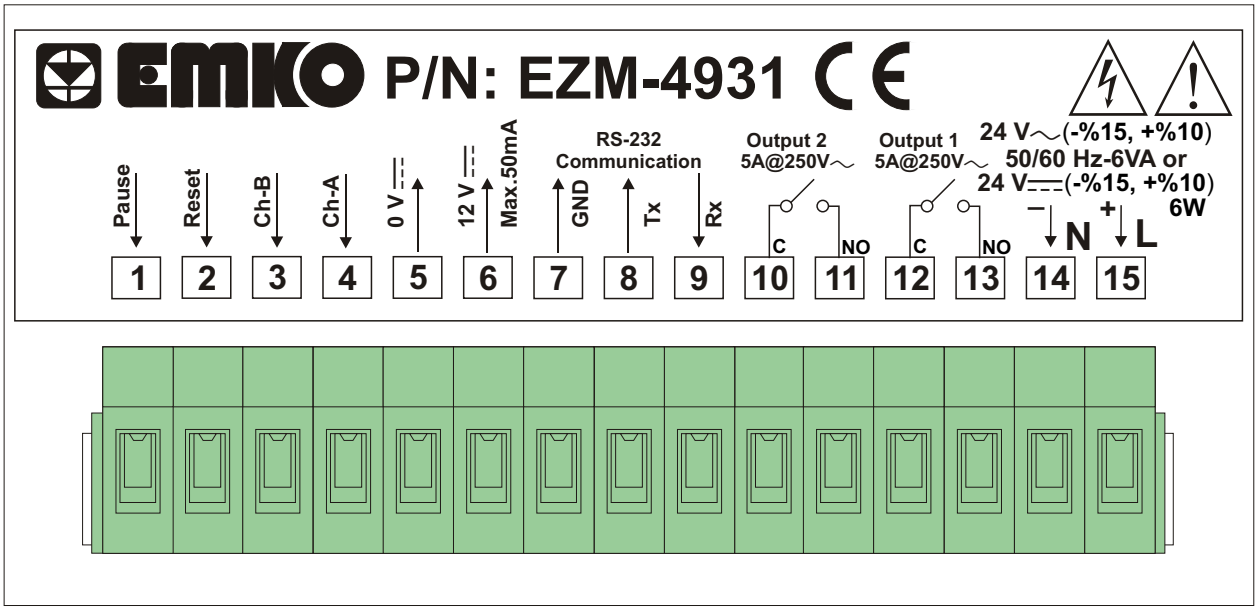
NOTE-1 : Sensor supply voltage:
If Power Supply is 230V~ or 115V~ , then Sensor supply voltage is 5V⎓ (± 05%) or 12V ⎓ (- %30;+%10), 50 mA maximum short circuit protection.
If Power Supply is 24V ≂ , then Sensor supply voltage is (12V⎓ or 5V⎓)± 05%, 50 mA maximum short circuit protection.

3.3 View of Device Label

Device Label for 230V ~ Supply Voltage Input and Relay Outputs

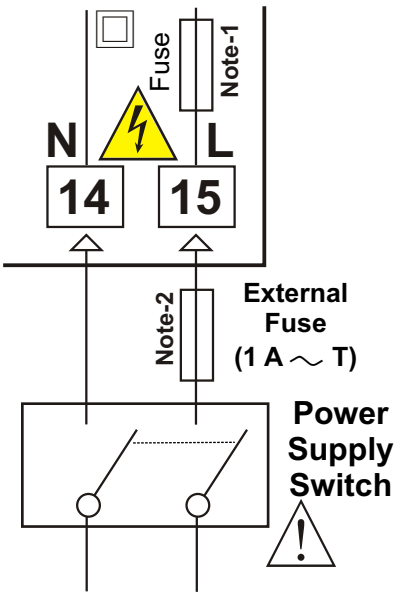


Device Label for 24V ⎓ Supply Voltage Input and Relay Outputs



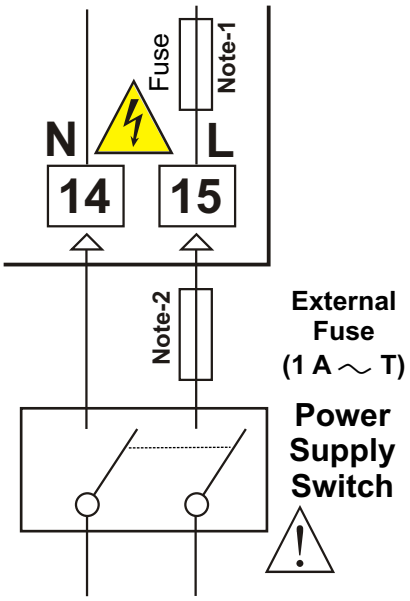
3.4 Connection of Device Supply Voltage Input

Connection of Universal Supply Voltage Input



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

Connection of Universal Supply Voltage Input



Supply Voltage
24V ⎓ (-%15;+%10) 50/60Hz

Note-1 :
There is internal 33 R fusible flameproof resistor in 115V ~ 50/60 Hz and 230V ~ 50/60 Hz
There is internal 4R7 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.

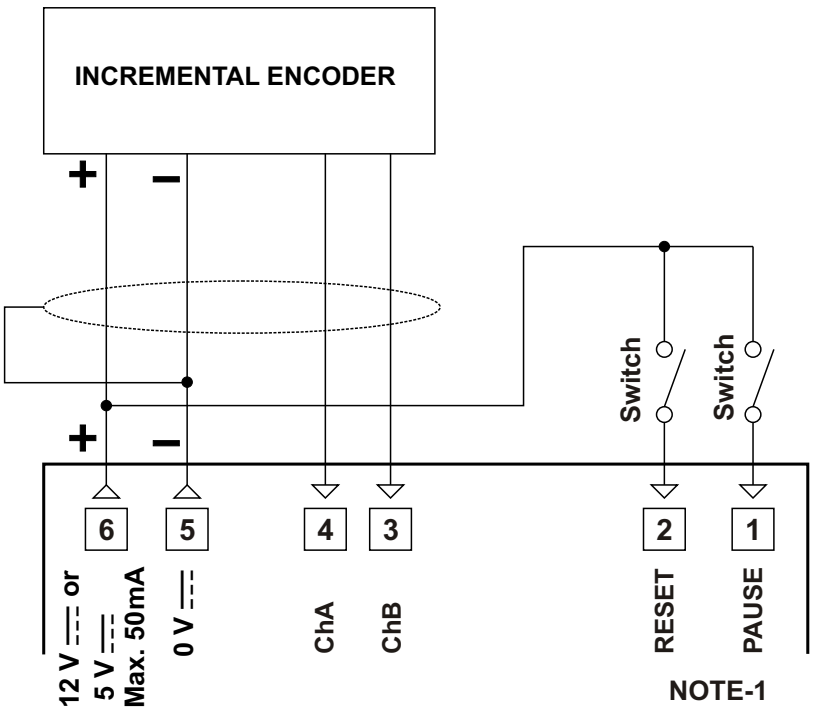
Power switch must be two poled for seperating phase and neutral. On/Off condition of power switch is very important in electrical connection. On/Off condition of power switch must be signed for preventing the wrong connection.

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

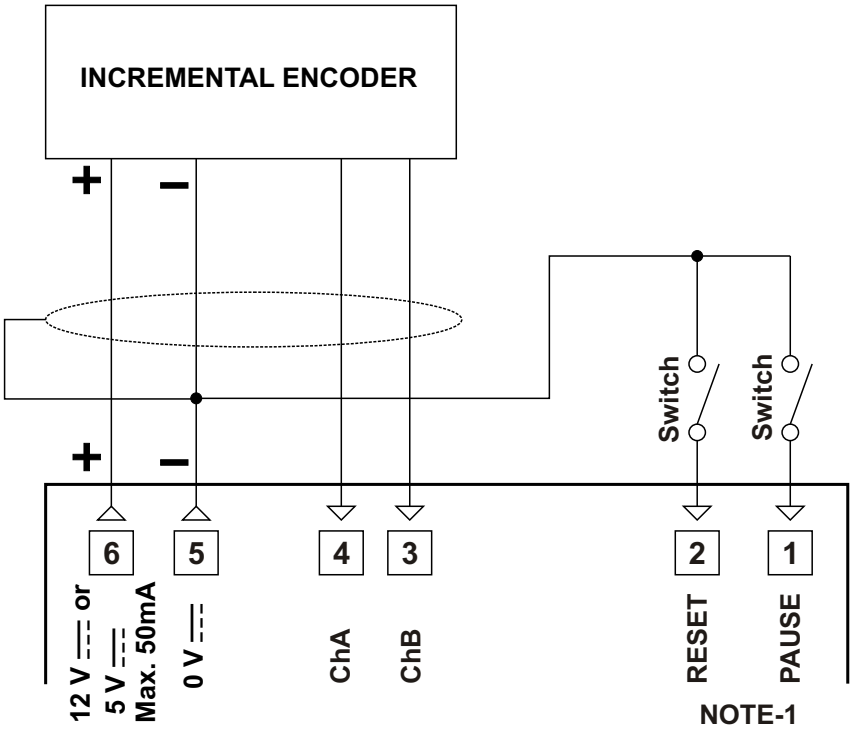
3.5 Counting Input Connection

3.5.1 Incremental Encoder & Switch Connection

Pro-05 = 000001 PNP type operation

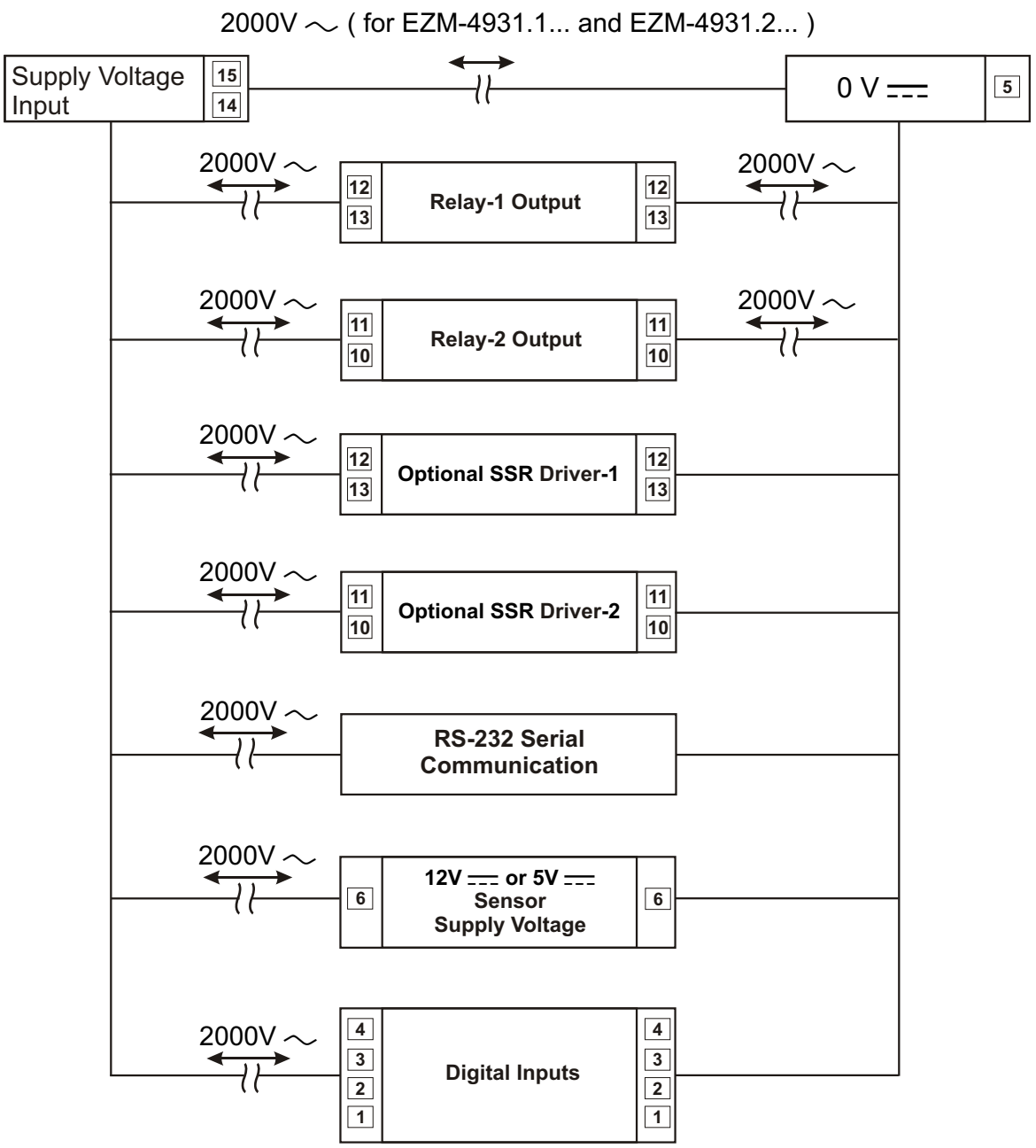


Pro-05 = 000000 NPN type operation

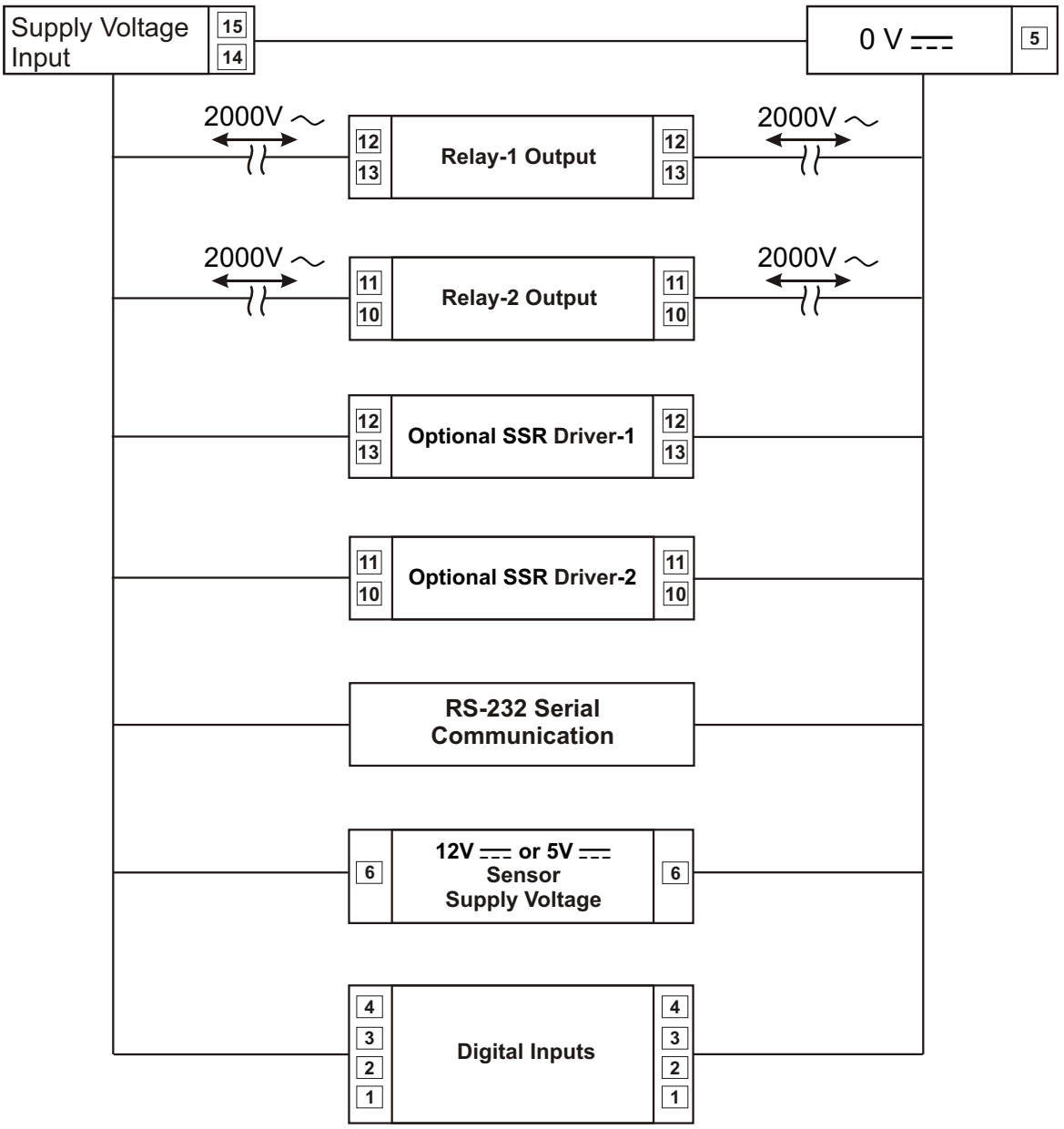


NOTE-1 : Reset and Pause inputs have protection time against electrical contact debounce. Protection time can be set with Pro-03 parameter (2 - 50 msec.).

3.6 Galvanic Isolation Test Values of EZM-4931 Programmable Counter

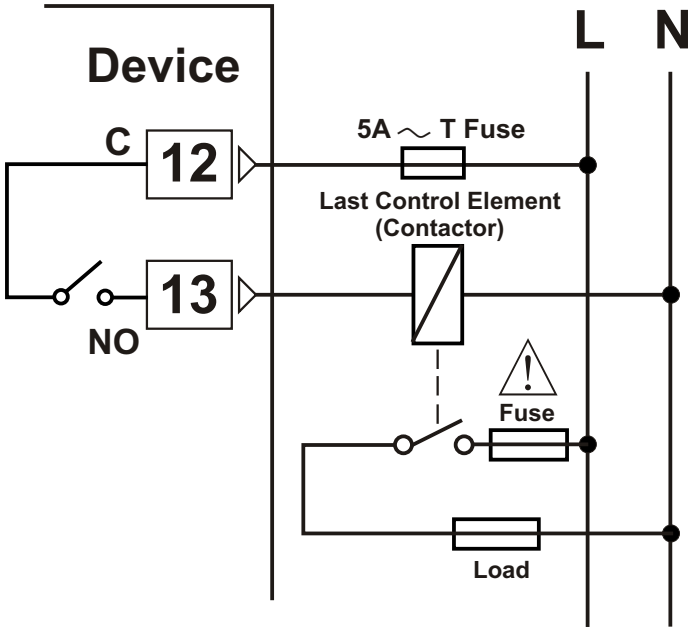


Galvanic Isolation Test Values For 24 V ≂ Power Supply



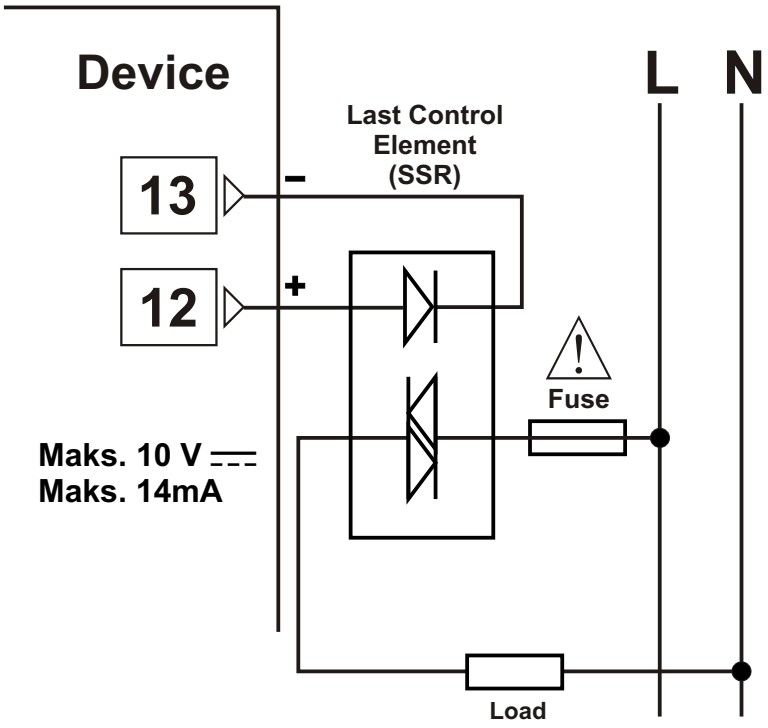
3.7 Output Connections

3.7.1 Relay-1 Output Connection



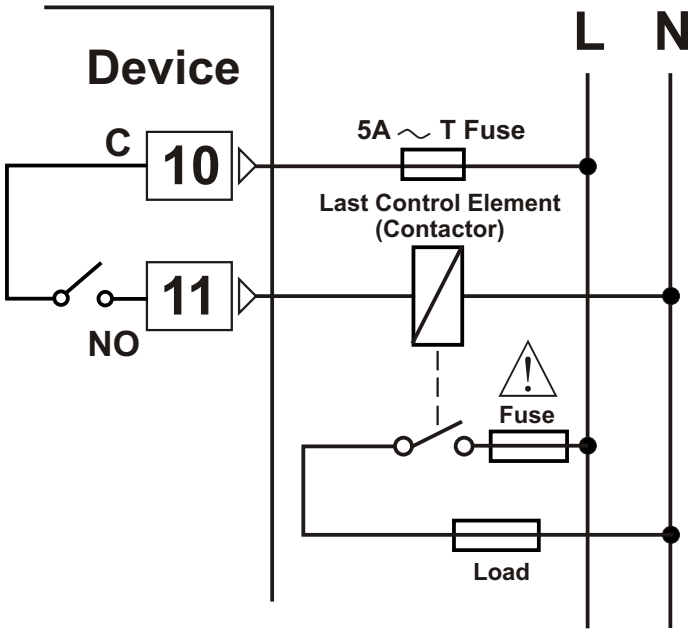
Fuses must be selected according to the applications.

3.7.2 SSR Driver-1 Output Connection



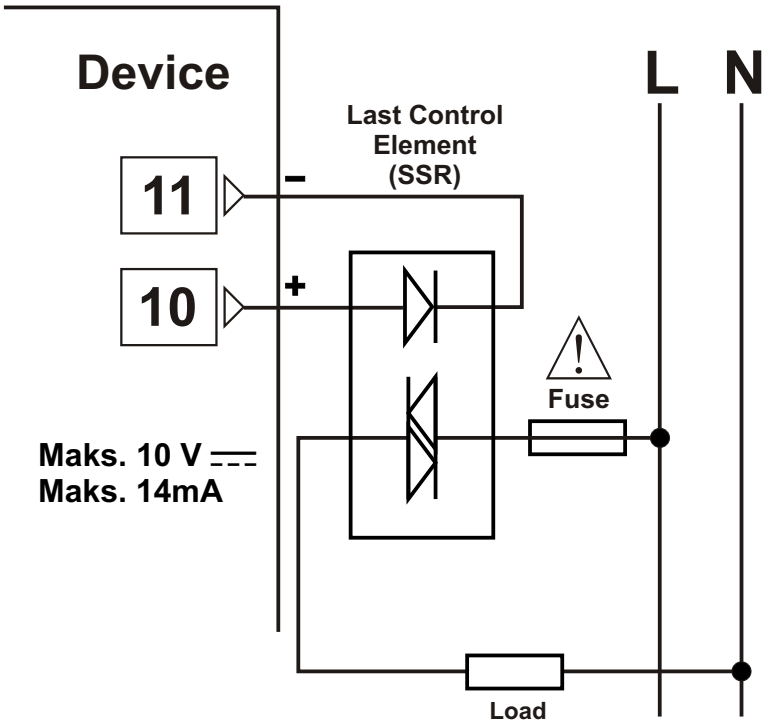
Fuses must be selected according to the applications.

3.7.3 Relay-2 Output Connection



Fuses must be selected according to the applications.

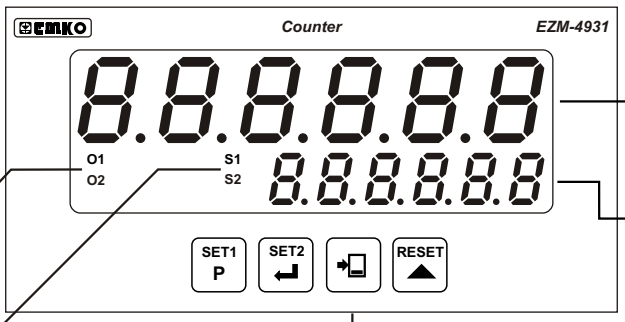
3.7.4 SSR Driver-2 Output Connection



Fuses must be selected according to the applications.

4. Definition of Front Panel and Accessing to the Set Parameters

4.1 Definition of Front Panel



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

Led indication of SV1 / SV2 : SET1 / SET2 value

Displays Actual Value and Parameter

Displays SET1, SET2 value and Parameters

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.

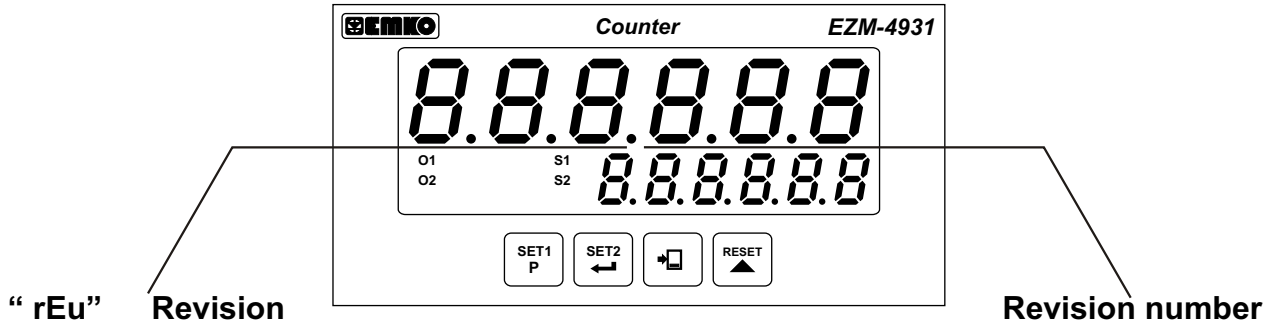
SHIFTING Button:
It is used for Changing the cursor position in Programming mode and entering the SET Value.

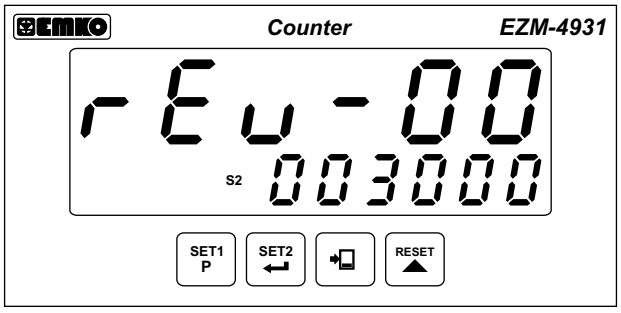
NOTE-1 : Adjusting the device, while the Two Point Reading Adjustment mode (Pro-10 = 00001), lower adjustment value Pro-13 and Upper adjustment value Pro-14 can be negative. For example ; While most significant digit (6th digit) of lower adjustment value is changed from 0 to 9 with increment button, 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.

4.2 Power On Observation of EZM - 4931 Programmable Counter and Software Revision on the Display

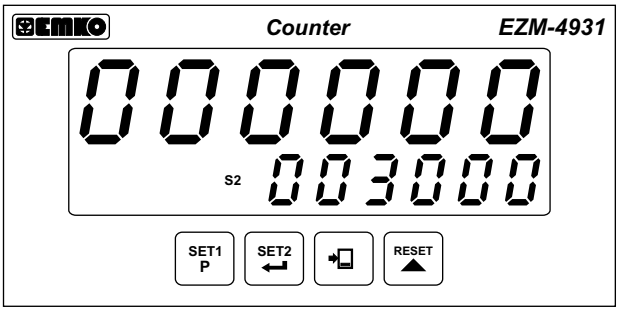
When power is applied to the device, software revision number of the controller is momentarily illuminated on actual value display. Then operation screen is observed.

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





Software Revision

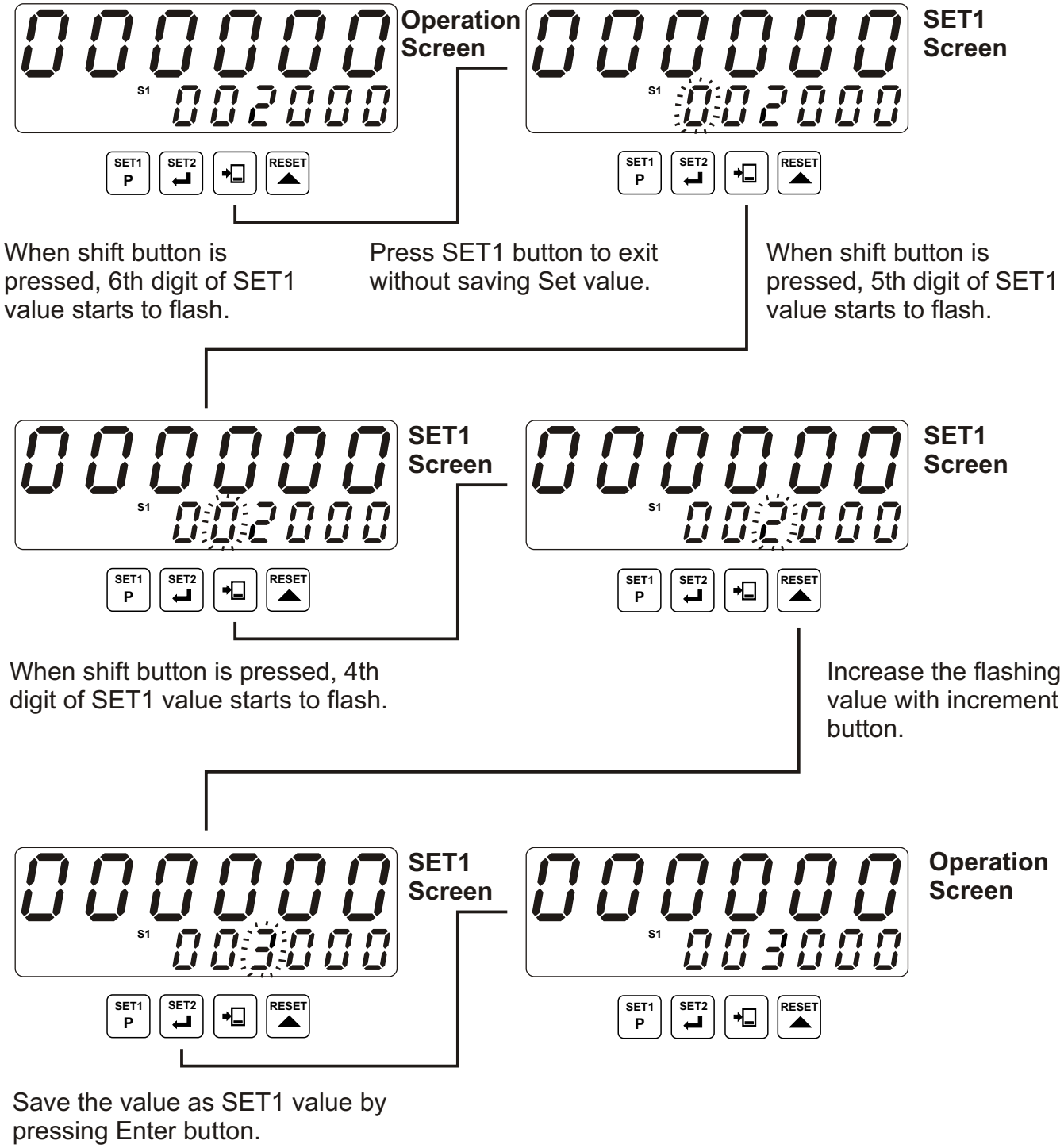


Operation Screen is shown

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

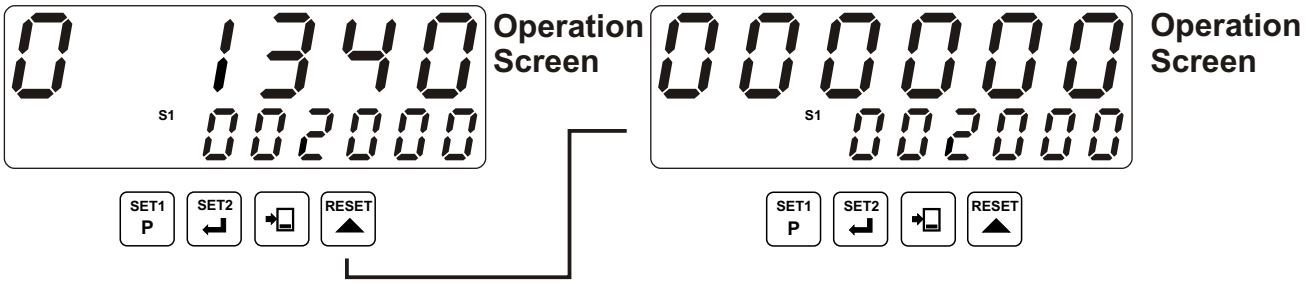
4.3 Adjustment of SET Value

Changing SET1 value.



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



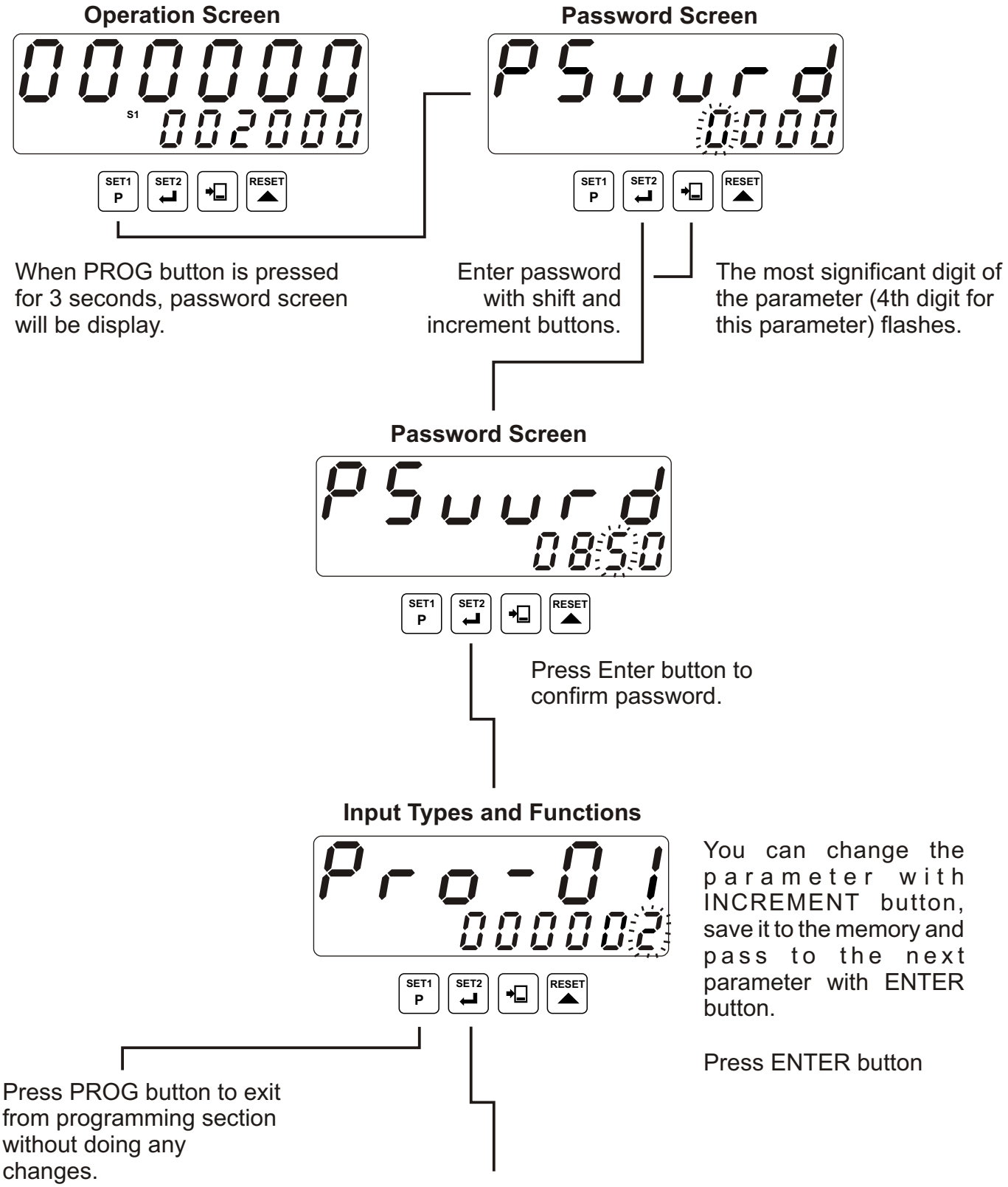
When RESET button is pressed, Actual Value becomes the Reset-Offset Value.

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.



Max. Input Frequency

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.

Adjustment Type Selection

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.

If Pro-10 is 000000 ;
Parametric Reading Adjustment

If Pro-10 is 000001 ;
Two Point Reading Adjustment

If Pro-10 is 000002 ;
Multiplication - Division Coefficient Reading Adjustment

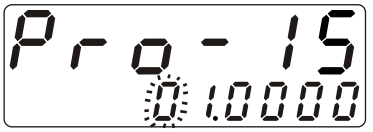
Encoder Type

Pitch

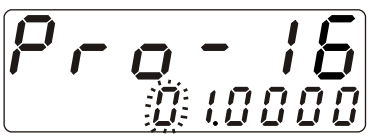
Min. Value for dual point adjustment value

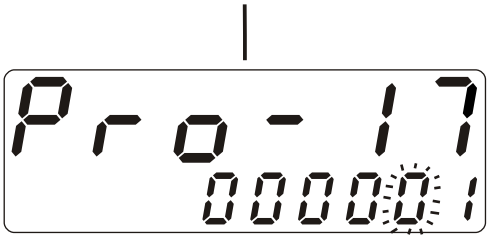
Max. Value for dual point adjustment value

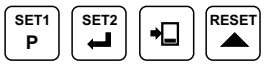
Multiplication Coefficient



Division Coefficient





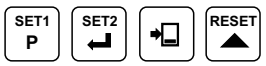


Output Functions

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.

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

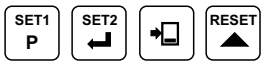


Return to Factory Settings

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.

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



Program Password

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

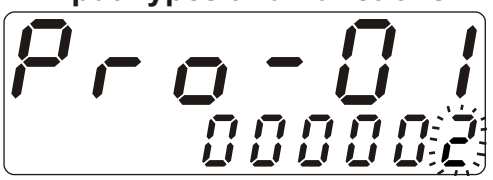
The most significant digit of the parameter (4th digit for this parameter) flashes.

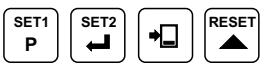
User can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.

Continue to press ENTER button for scanning all parameters.

Operation Screen

Input Types and Functions



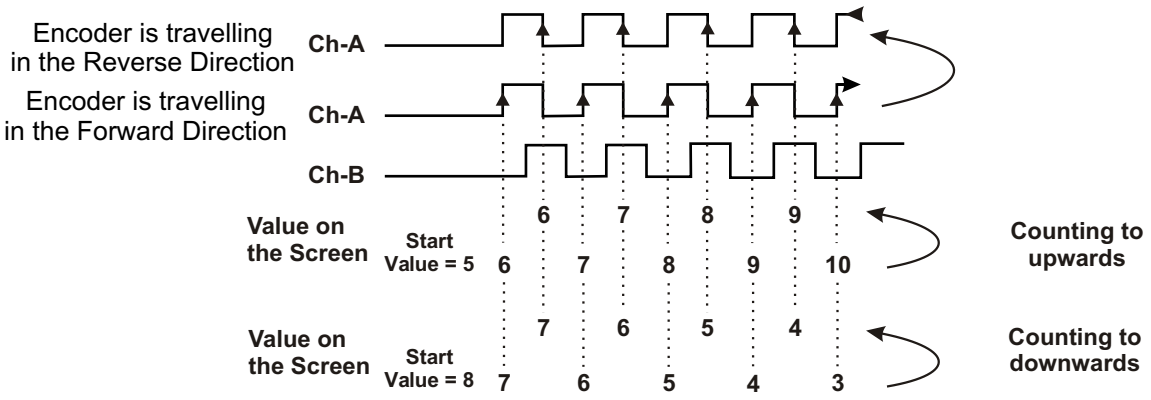


Pro-01

Input Types and Functions.
(Default = 2) MODBUS ADDRESS:40001.

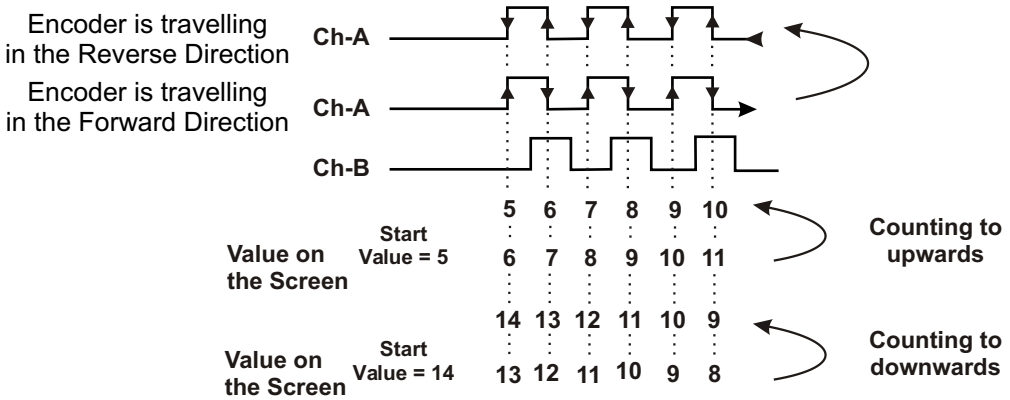
000000

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



000001

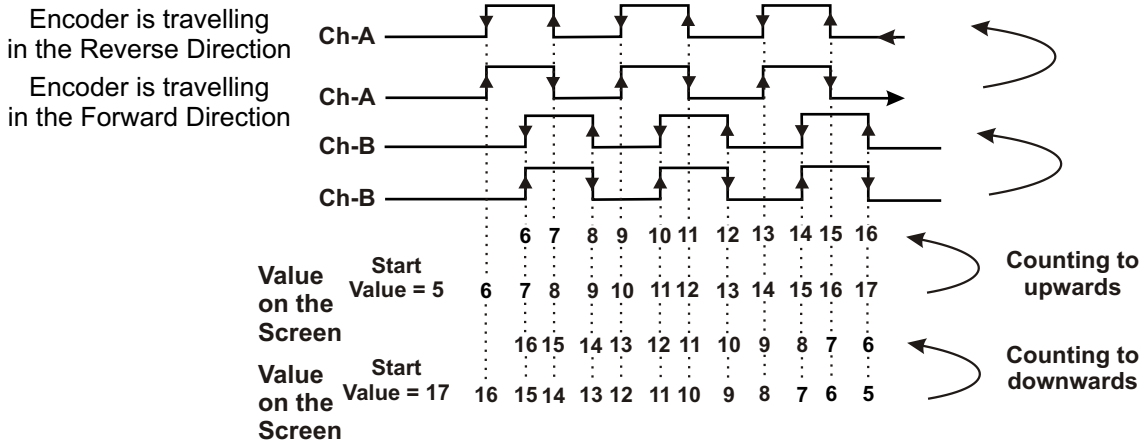
x2 Phase Shifting (for incremental encoders)
Upcount on rising edge of Ch-A when Ch-B is at 0
Downcount on rising edge of Ch-A when Ch-B is at 1
Upcount on falling edge of Ch-A when Ch-B is at 1
Downcount on falling edge of Ch-A when Ch-B is at 0



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.

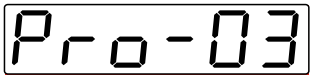
000000 100kHz < *Input Frequency* < 200kHz

000001 50kHz < *Input Frequency* < 100kHz

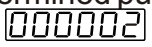
000002 25kHz < *Input Frequency* < 50kHz

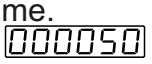
000003 12kHz < *Input Frequency* < 25kHz

000004 0kHz < *Input Frequency* < 12kHz

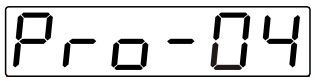


Filter time for Reset and Pause Input
(Default = 50) MODBUS ADDRESS:40003.

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 

to 

milisecond.



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

Upcount (0 Preset).

Downcount (Preset 0).

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

NPN type sensor selected

PNP type sensor selected

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

No point 

Between first and second digits 

Between second and third digits 

Between third and fourth digits 

Between fourth and fifth digits 

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 000001 to 010000 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 010000 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 00.0001 to 99.9999 . Changes in this parameter is evaluated when counting starts.
If this value is 01.0000 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 00.0001 to 99.9999. Changes in this parameter is evaluated when counting starts.
If this value is 01.0000 Division is not performed.

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

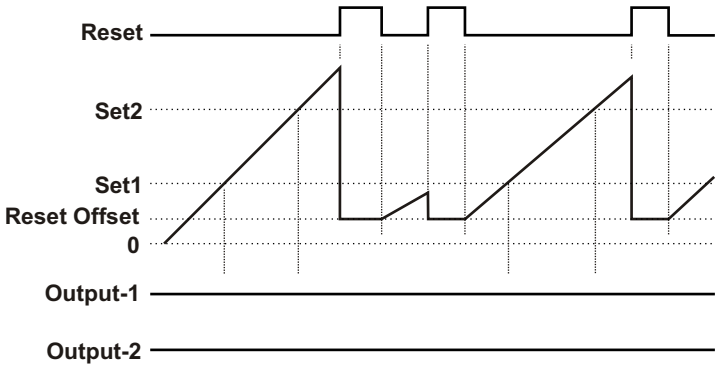
NOTE - 2 : Reading Adjustment Type Selection parameter Pro- 10 is 000001 , then these parameters can be accessed.

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.

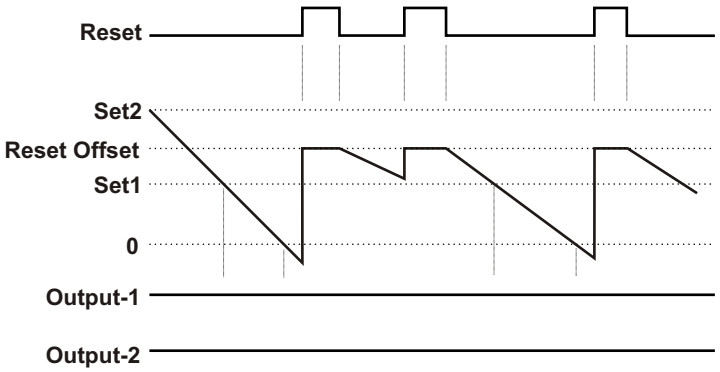
Pro- 17 = 000000 **Manual Reset-0.**
Device continues to count till manual reset is applied.

Counting direction : 0 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.

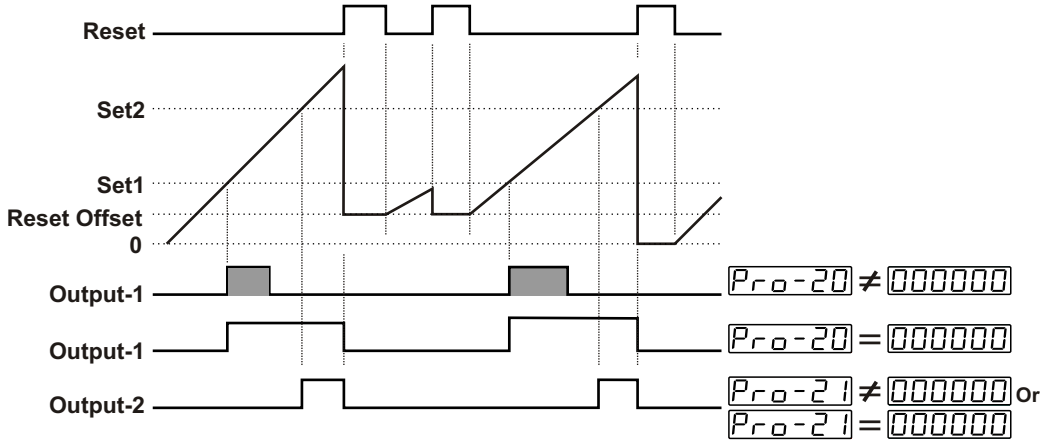
Counting direction : P 0 (Downcounting) **Pro-04 = 000001**



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.

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

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

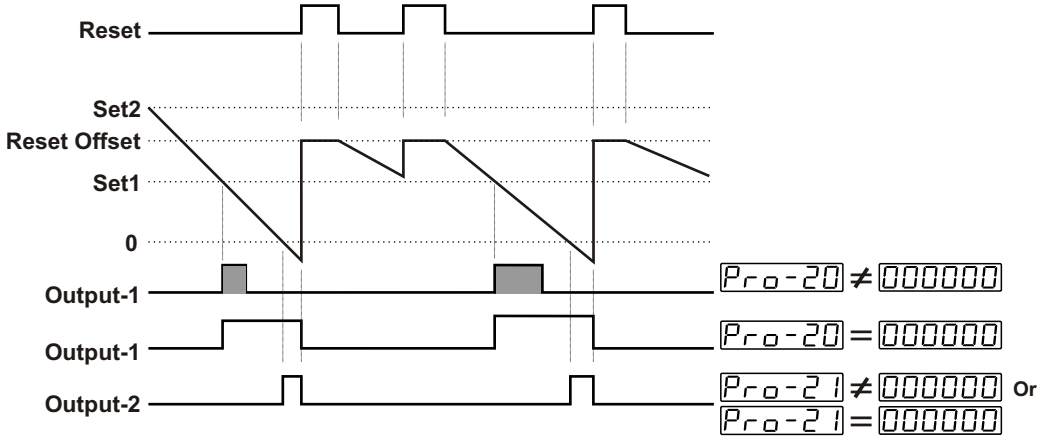


When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time Pro-20 is 000000, Output-1 does not change condition until manual reset input is active. If Output-1 pulse time Pro-20 is not 0, at the end of the pulse time Output-1 becomes inactive.

When count value reaches to SET2 value, Output-2 becomes active. Counting continues over SET2 value.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**

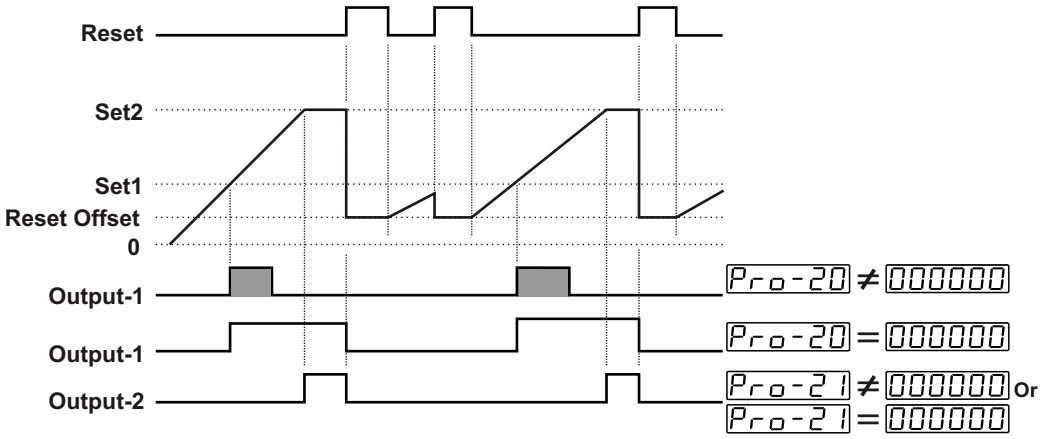


When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 Pulse Time Pro-20 is 000000 , Output-1 does not change condition until manual reset input is active. If Output-1 pulse time Pro-20 is not 0, Output-1 becomes inactive at the end of the pulse time. When actual value reaches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

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

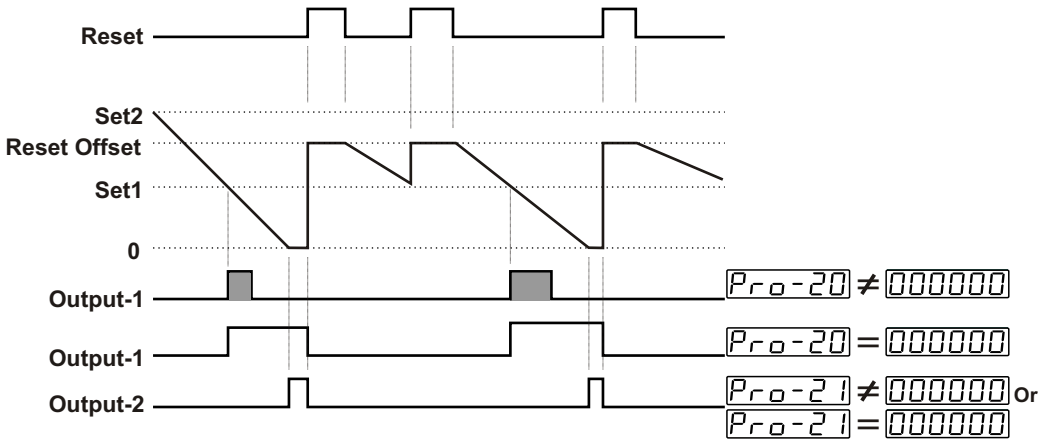
Pro-17 = 000002 **Manual Reset-2.**
(Output-2 Pulse Time Pro-21 is not considered)

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



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.

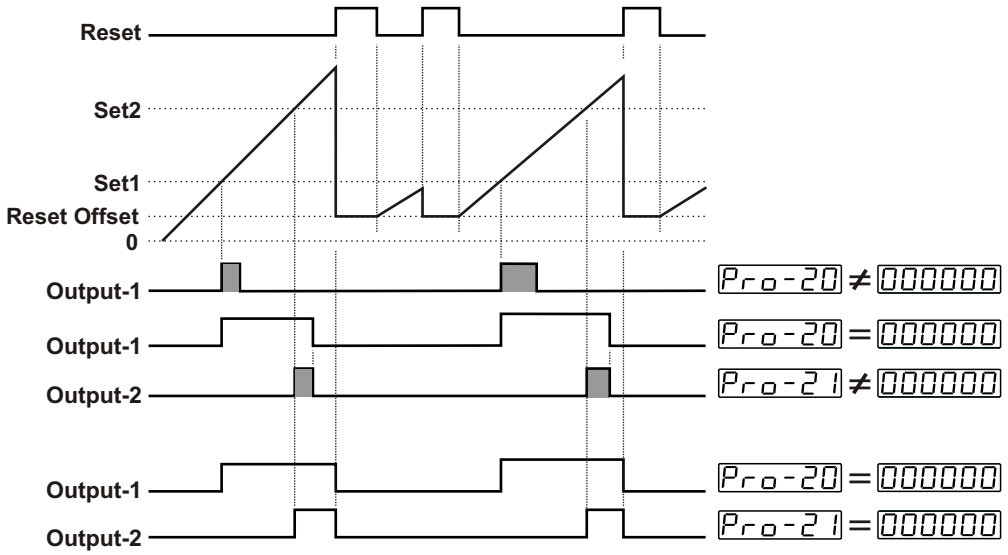
Counting direction : P 0 (Downcounting) **Pro-04 = 000001**



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.

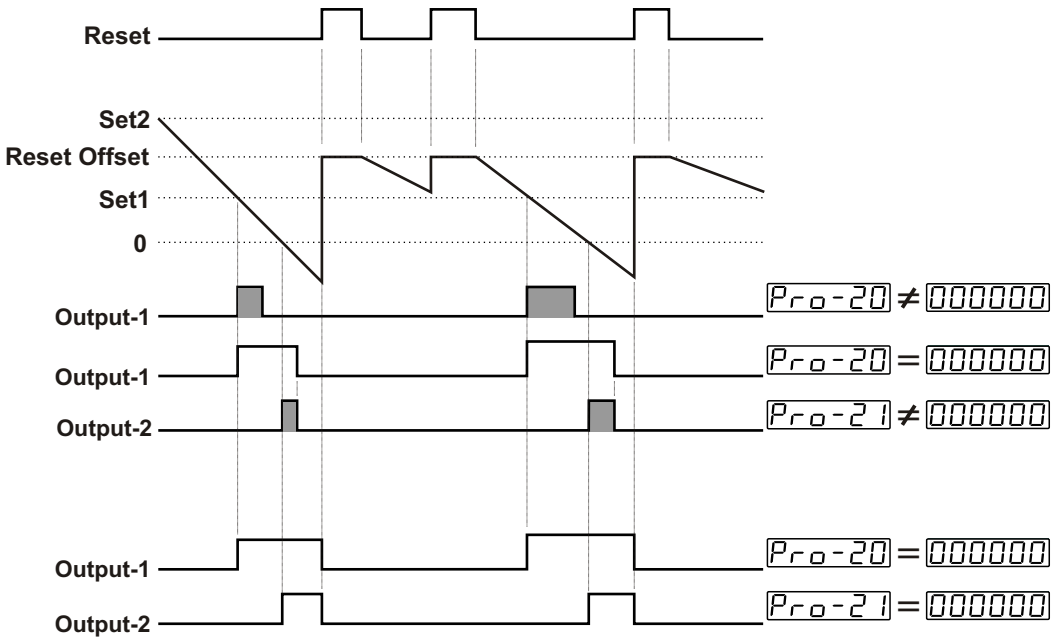
Pro-17=000003 **Manual Reset-3.**
Counting continues until Manual Reset input is active.

Counting direction : 0 P (Upcount) **Pro-04 = 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 the count value reaches to SET2 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.

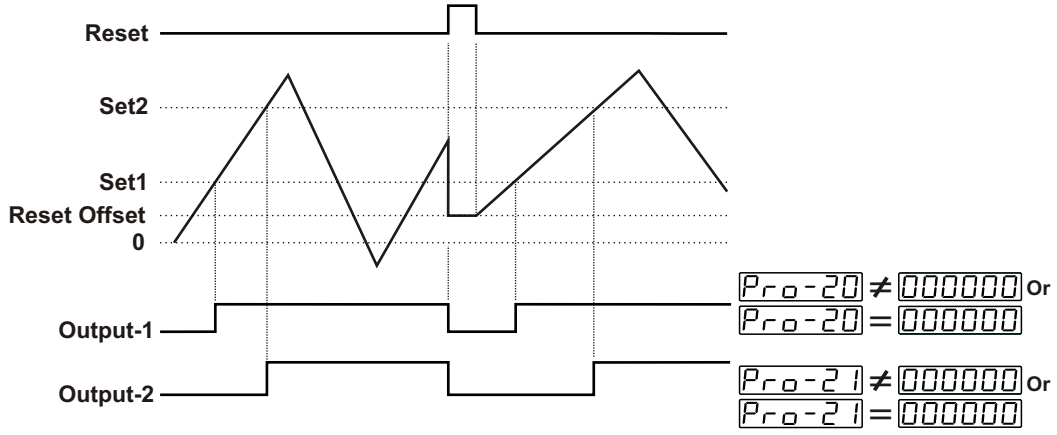
Counting direction : P 0 (Downcount) **Pro-04 = 000001**



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.
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.

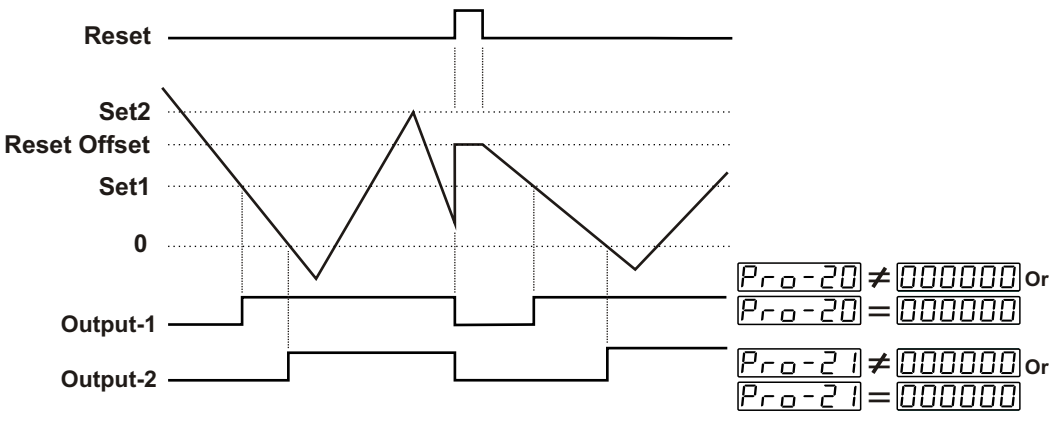
Pro-17=000004 **Manual Reset-4.**
Counting continues until Manual Reset input is active.
Pulse times Pro-20 and Pro-21 is not considered.

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



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.

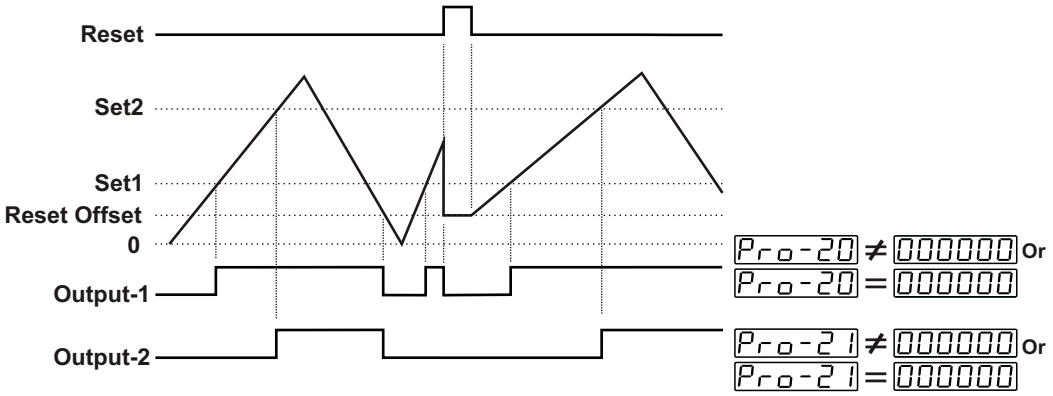
Counting direction : P 0 (Downcount) Pro-04 = 000001



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 000000 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.

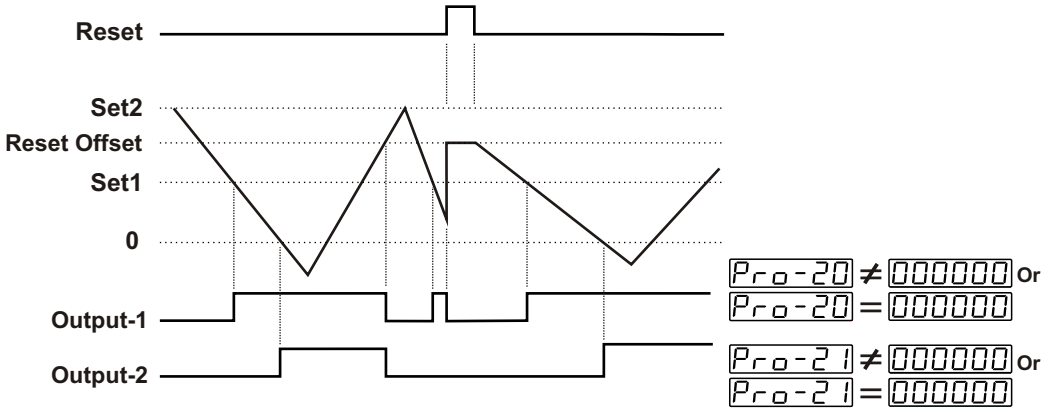
Pro-17=000005 **Manual Reset-5.**
Counting continues until Manual Reset input is active.
Pulse times Pro-20 and Pro-21 is not considered.

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



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 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 Pro-21 is not considered.

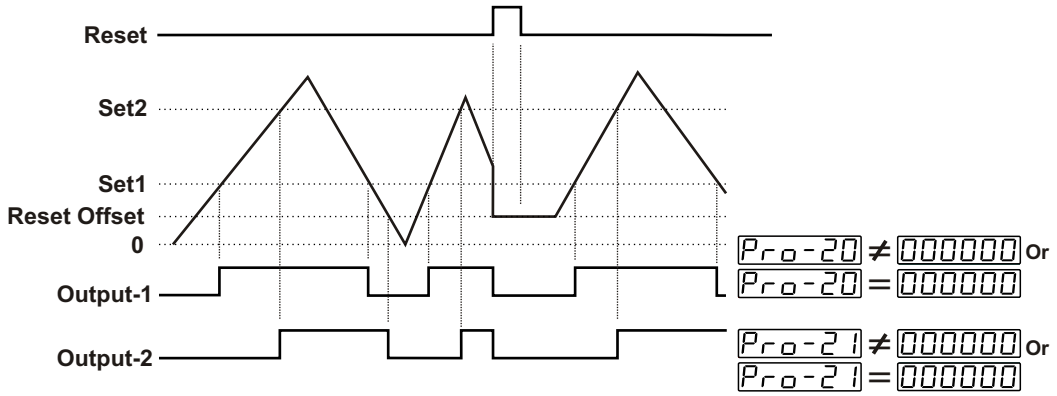
Counting direction : P 0 (Downcount) **Pro-04 = 000001**



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.

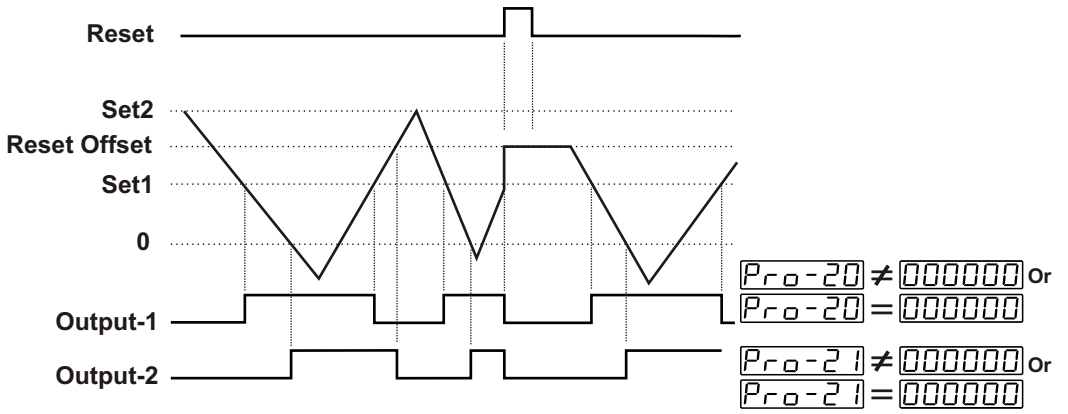
Pro-17=000006 **Manual Reset-6.**
Counting continues until Manual Reset input is active.
(Output-2 Pulse Time Pro-21 is not considered)

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



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.

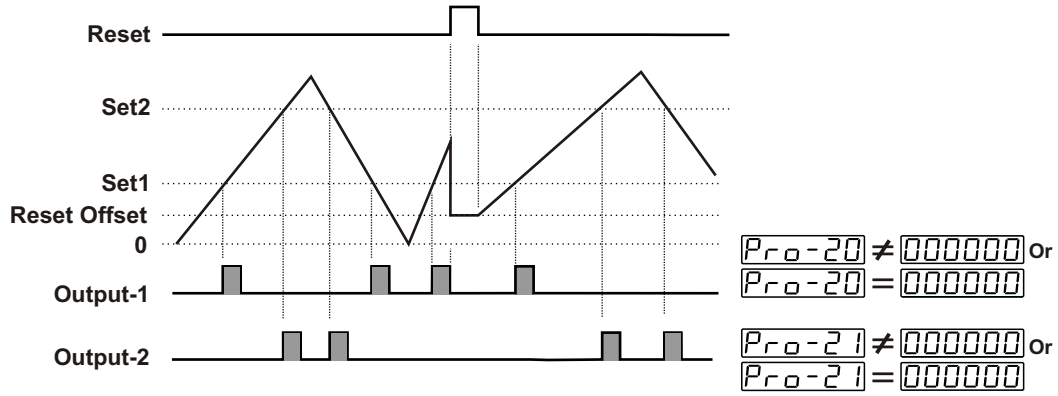
Counting direction : P 0 (Downcount) **Pro-04 = 000001**



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.

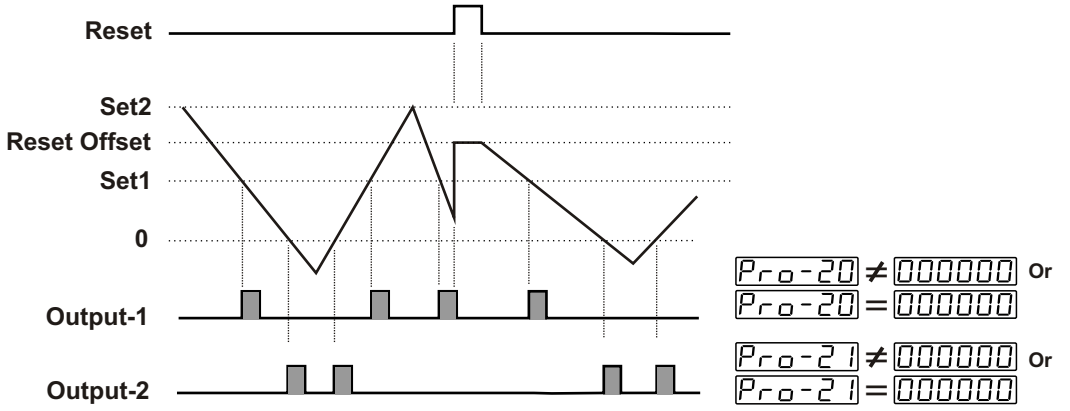
Pro-17=000007 **Manual Reset-7.**
Counting continues until Manual Reset input is active.

Counting direction : 0 P (Upcount) **Pro-04 = 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.

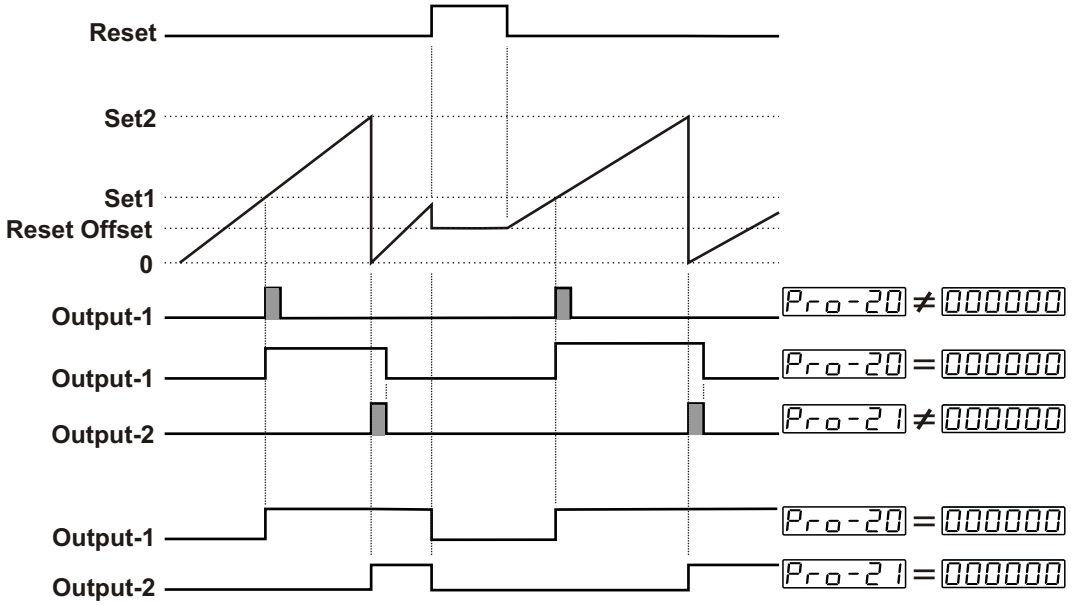
Counting direction : P 0 (Downcount) **Pro-04 = 000001**



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. 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.

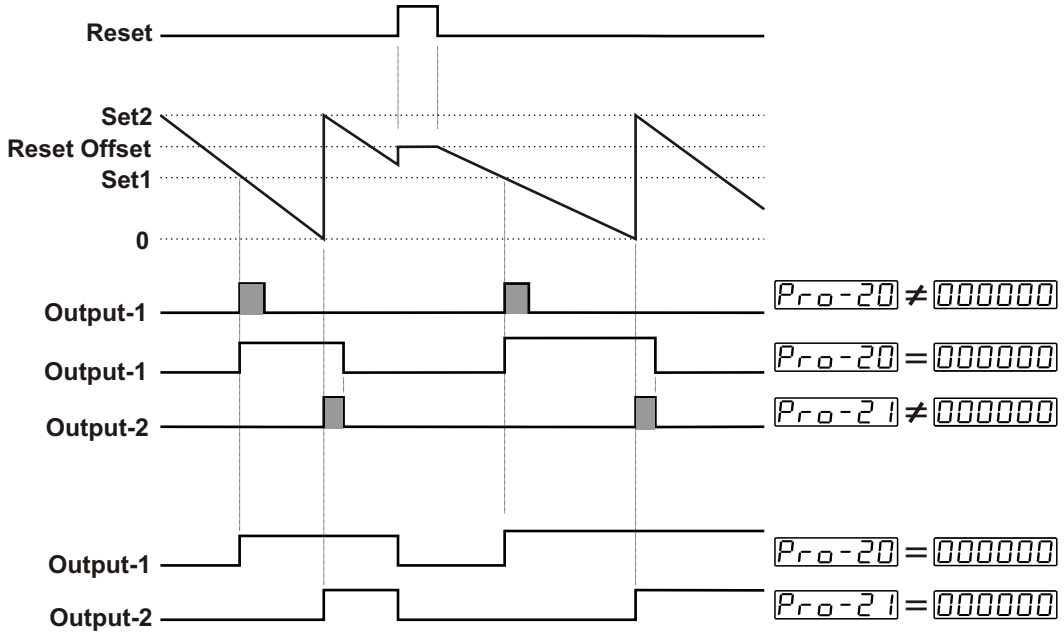
Pro-17=000008 Automatic Reset-1.

Counting direction : 0 P (Upcount) Pro-04 = 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 position.
When the count value reaches to SET2 value, Output-2 becomes active. Count value is reset. 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.

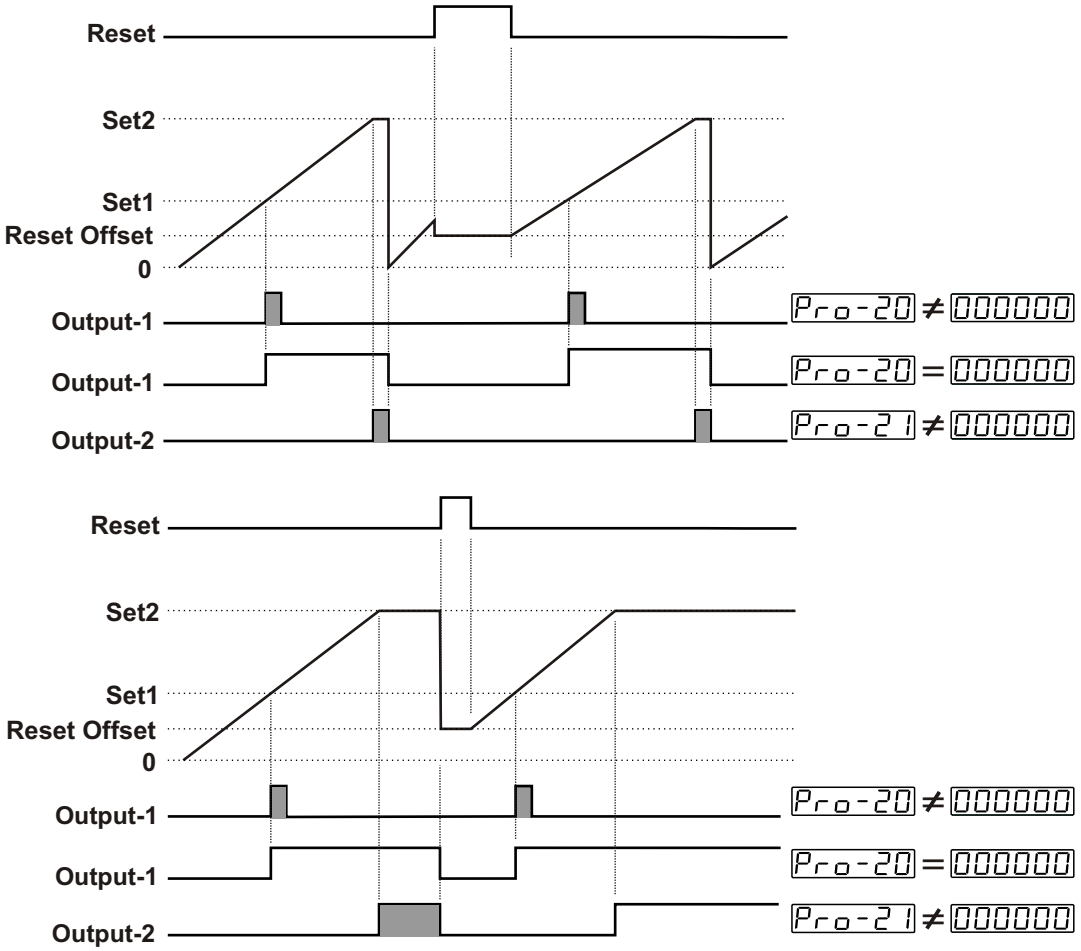
Counting Direction : P 0 (Downcount) Pro-04 = 000001



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.**

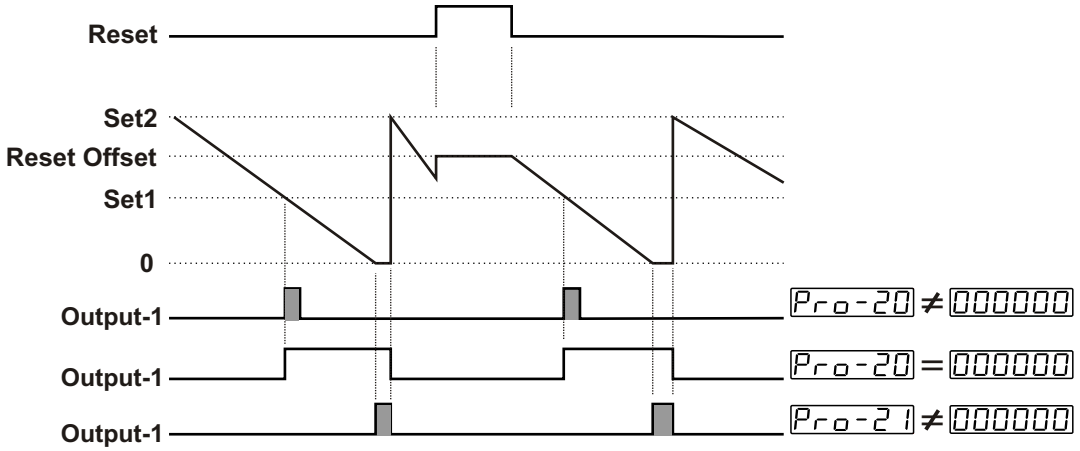
Counting direction : 0 P (Upcount) **Pro-04 = 000000**

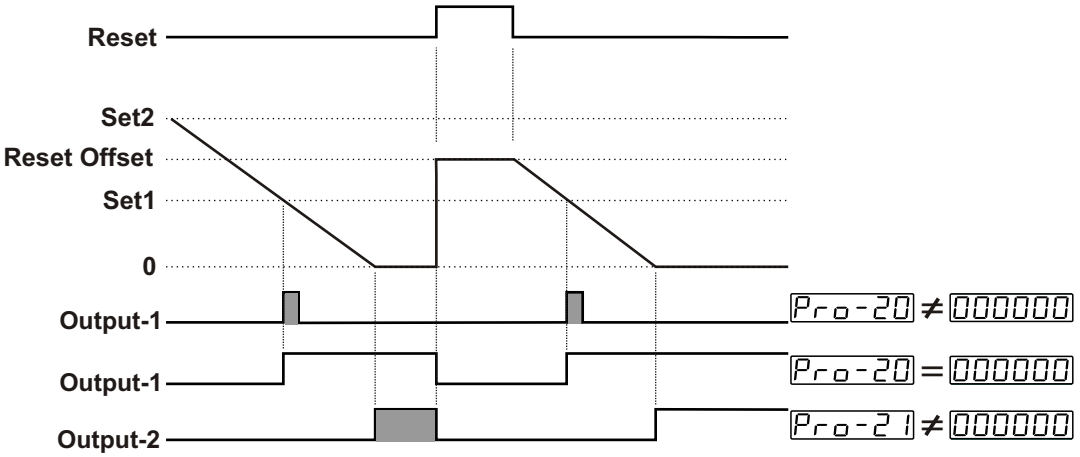


When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time **Pro-20** is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time **Pro-20** is **000000**, it changes position until Manual Reset input is active or according to Output-2 position.

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 0 (Downcount) Pro-04 = 000001

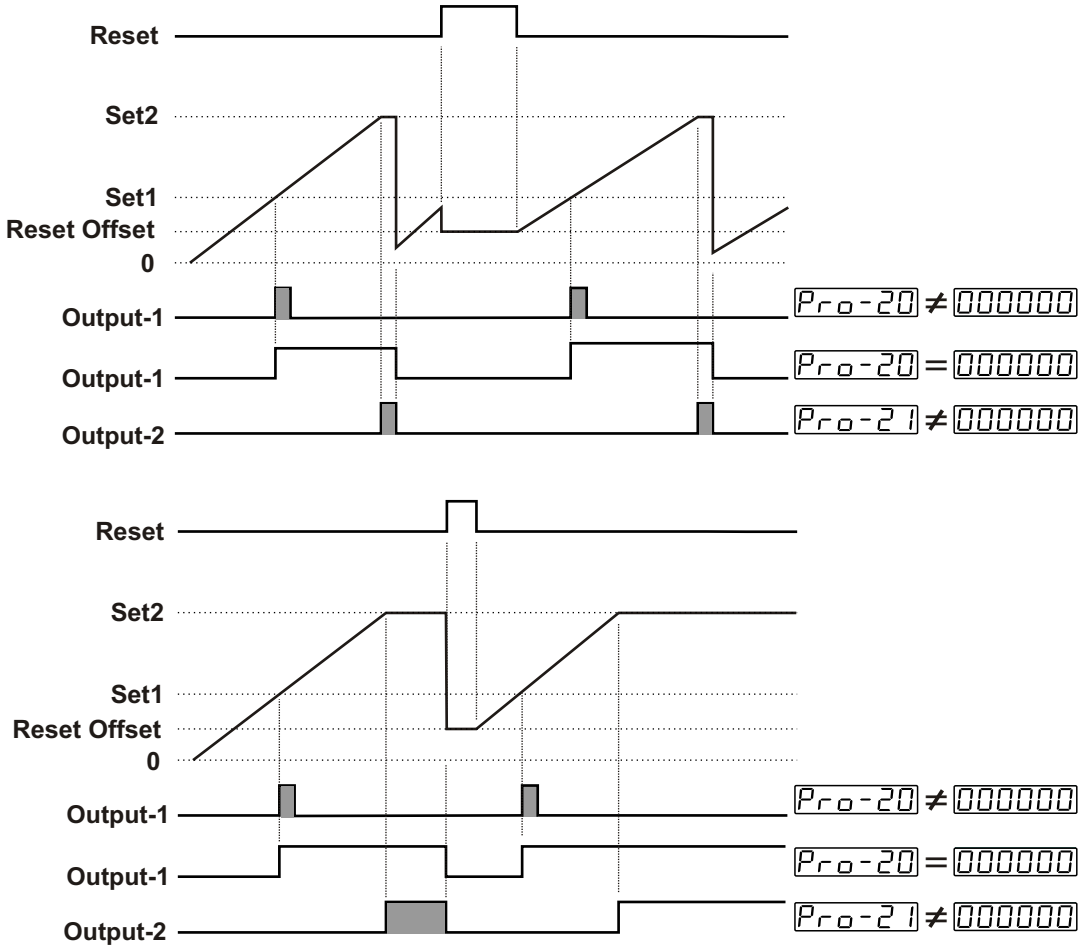




When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time Pro-20 is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time Pro-20 is 000000, it changes position until Manual Reset input is active or according to Output-2 position.
When the count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

Pro-17 = 00010 Automatic Reset-3.

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

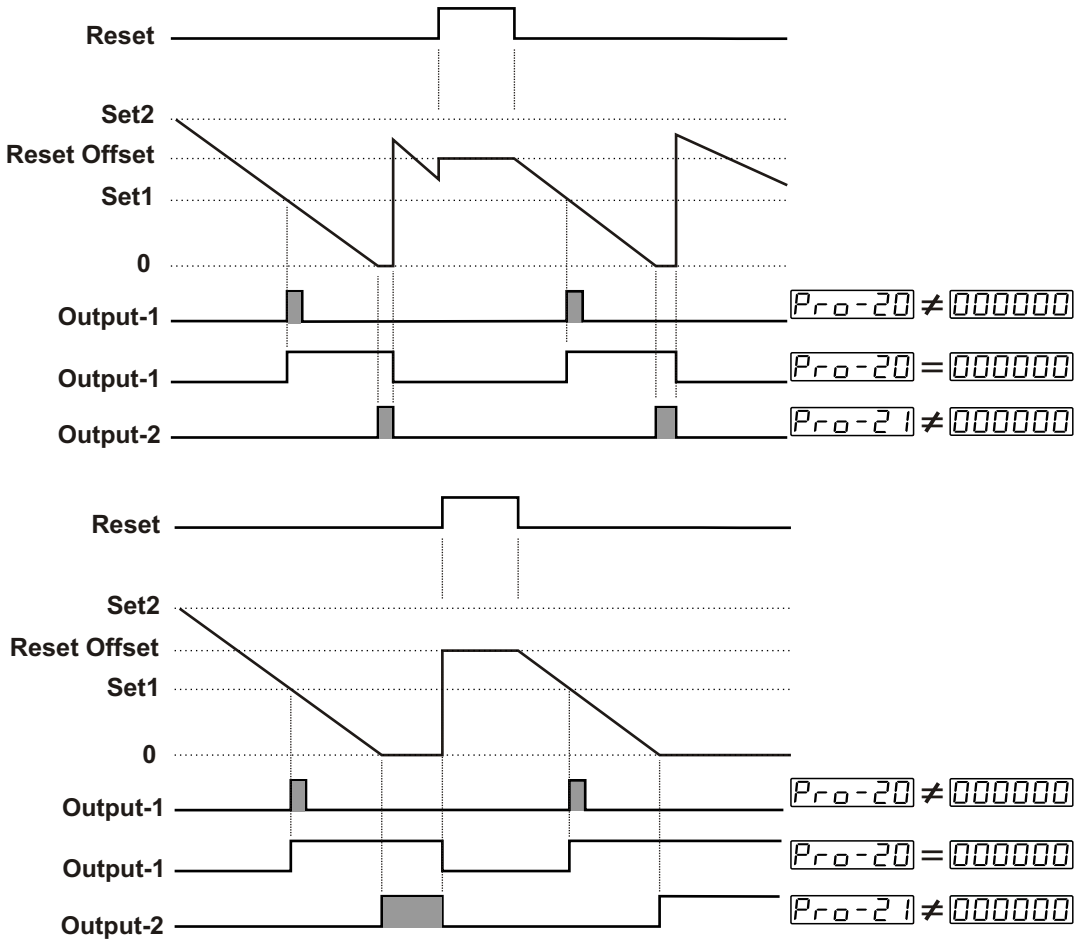


When the count value reaches to SET1, Output-1 becomes active.If Output-1 pulse time Pro-20 is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time Pro-20 is 000000, it changes position until Manual Reset input is active or according to Output-2 position.

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

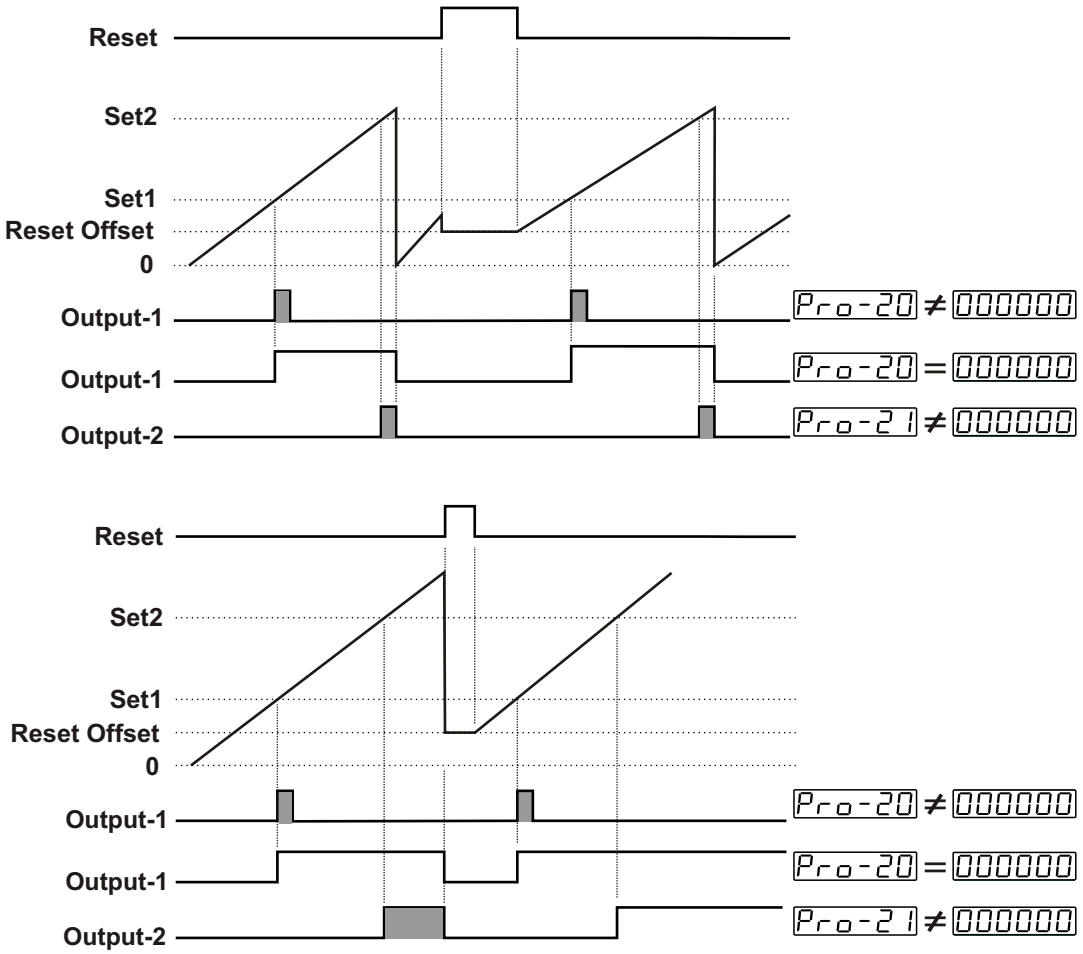
Counting direction : P 0 (Downcount) Pro-04 = 000001



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, count value becomes equal to SET2and counting continues. But 000000 Is observed in actual value display. If Output-2 pulse time Pro-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.**

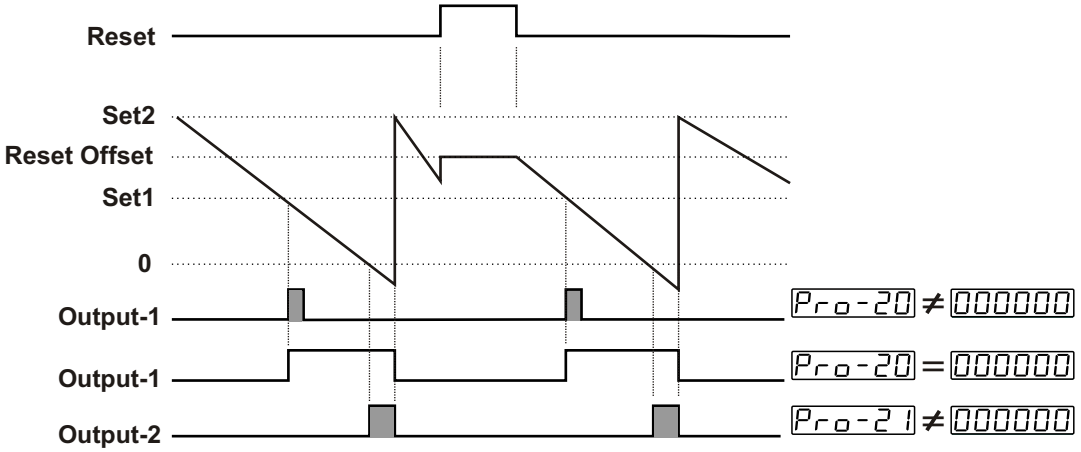
Counting direction : 0 P (Upcount) **Pro-04 = 000000**

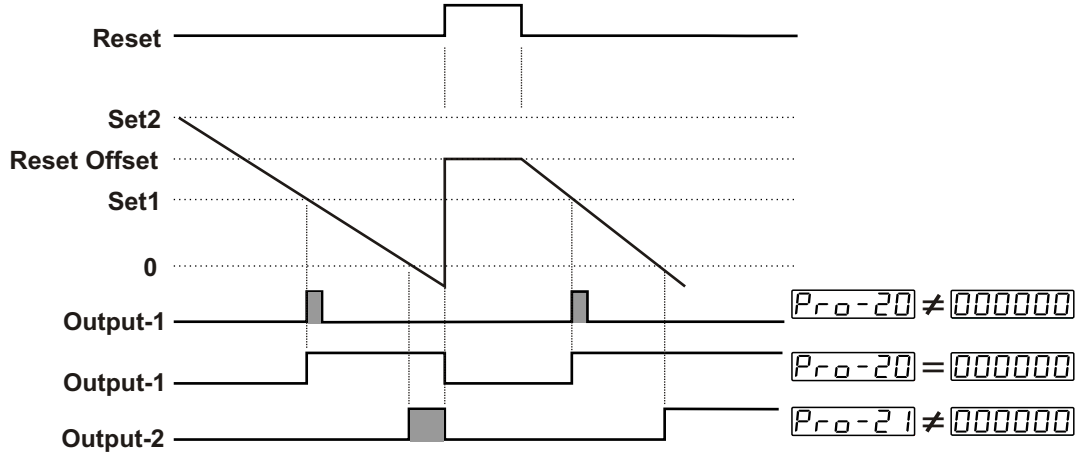


When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time **Pro-20** is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time **Pro-20** is **000000**, it changes position until Manual Reset input is active or according to Output-2 position.

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 0 (Downcount) Pro-04 = 000001

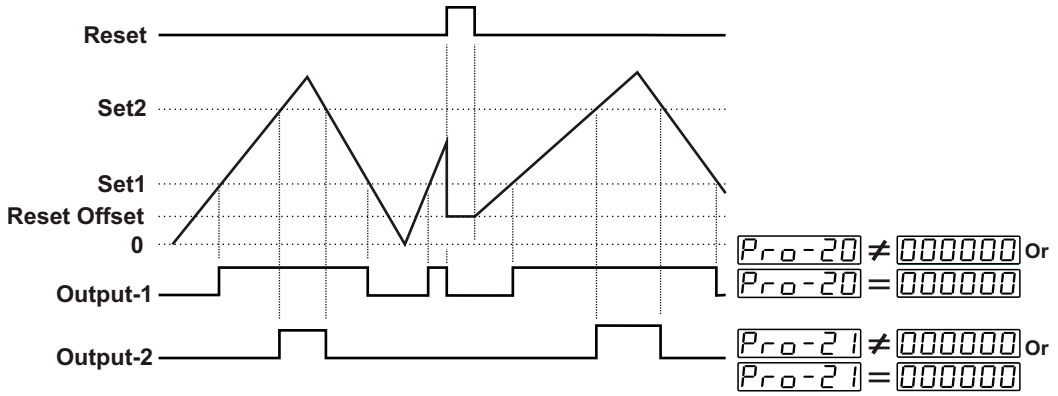




When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time Pro-20 is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time Pro-20 is 000000 , it changes position until Manual Reset input is active or according to Output-2 position.
When count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

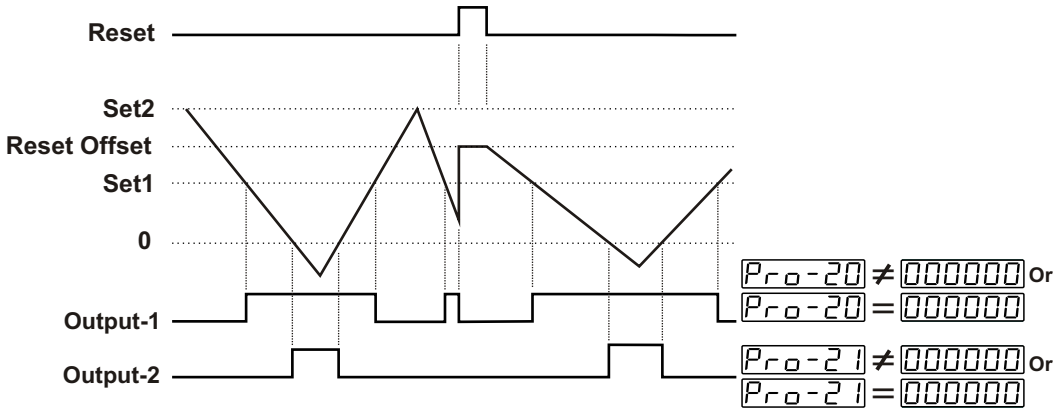
Pro-17=000012 **Automatic Reset-5.**
Pulse times Pro-20 and Pro-21 is not considered.

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

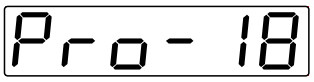


If count value is equal or greater than SET1 value, then Output-1 becomes active. Output-1 pulse time Pro-20 is not considered.
If count value is equal or greater than SET2 value, then Output-2 becomes active. If count value is less than SET2 value, Output-2 becomes inactive. Output-2 pulse time Pro-21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

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



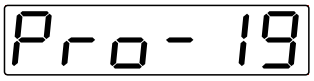
If count value is equal or less than SET1 value, then Output-1 becomes active. If it is greater than SET1 value, Output-1 becomes inactive. Output-1 pulse time Pro-20 is not considered.
If count value is equal or less than 000000 value, then Output-2 becomes active. If count value is greater than 000000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



Output-1 Operation Form
(Default = 0) MODBUS ADDRESS:40023.

Output-1 Normally non-energised.

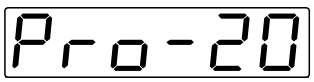
Output-1 Normally energised.



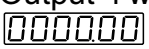
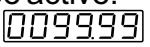
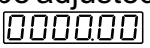
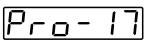
Output-2 Operation Form
(Default = 0) MODBUS ADDRESS:40024.

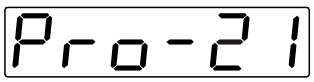
Output-2 Normally non-energised.

Output-2 Normally energised.

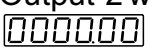
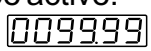
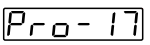


Output-1 Pulse Time
(Default = 0000.00) MODBUS ADDRESS:40025.

It determines how long Output-1 will be active.
It can be adjusted from  to  seconds.
If it is  second, then it operates indefinitely.
For details, refer to the section where output functions  are defined.

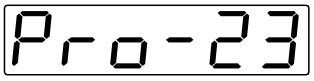


Output-2 Pulse Time
(Default = 0000.00) MODBUS ADDRESS:40026.

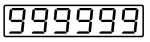
It determines how long Output-2 will be active.
It can be adjusted from  to  seconds.
If it is  second, then it operates indefinitely.
For details, refer to the section where output functions  are defined.

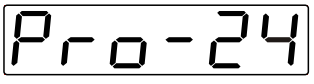
Max Set Value
(Default=999999)MODBUS ADDRESS: LOW WORD=40027,HIGH WORD= 40028.

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



Min Set Value
(Default=000000)MODBUS ADDRESS: LOW WORD=40029,HIGH WORD= 40030.

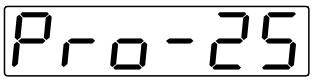
Minimum value for Set Values.
It can be adjusted from  to  .



Display Type Selection
(Default = 0) MODBUS ADDRESS:40031.

Display value is incremental encoder counter value.

Display value is calculated value.

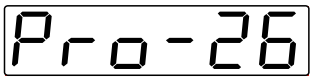


Saving Count Value (Power down back-up)
(Default = 0) MODBUS ADDRESS:40032.

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

Count value is not saved to memory when power is disconnected. When power up 

is shown on the screen.

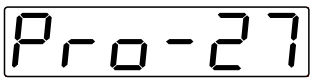


Slave Address
(Default = 1) MODBUS ADDRESS:40033.

Device address for serial communication bus.
It can be adjusted from

to

.

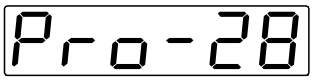


Communication Parity Selection
(Default = 0) MODBUS ADDRESS:40034.

No parity.

Odd Parity.

Even Parity.



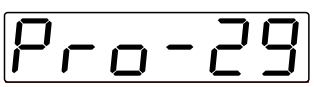
Baud Rate
(Default = 1) MODBUS ADDRESS:40035.

4800 Baud Rate.

9600 Baud Rate.

19200 Baud Rate.

38400 Baud Rate.



Communication Stop Bit selection
(Default = 0) MODBUS ADDRESS:40036.

1 Stop Bit.

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 PSword value correctly ; operation screen will appear without entering to operator parameters.

2- When PSword 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))

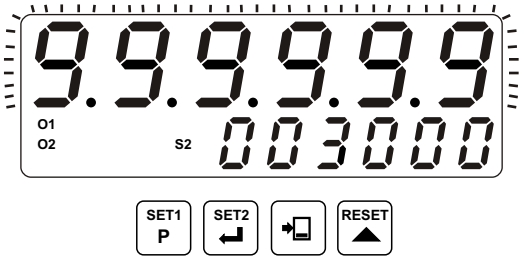
6. Read Input Register Command

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

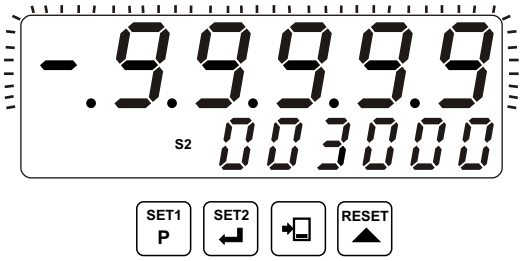
Adres	*Parameter Name*	*Range*
30001	Preset Active Value Signed	0 – Positive / 1 – Negative
30002	Preset Active Value High	0 - 1
30003	Preset Active Value Low	0 - 65535
30004	None	0
30005	None	0
30006	NPN / PNP Status	0 – NPN / 1 – PNP
30007	None	0
30008	Out1 Status	0 – Passive / 1 – Active
30009	Out2 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 000000 , 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 °C to +85 °C / 0 °C to +50 °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 ~ (-%15 / +%10) 50/60 Hz. 6VA.
115 V ~ (-%15 / +%10) 50/60 Hz. 6VA.
24 V ~ (-%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 Pro-02 = 0 ; 200 kHz.
If Pro-02 = 1 ; 100 kHz.
If Pro-02 = 2 ; 50 kHz.
If Pro-02 = 3 ; 25 kHz.
If Pro-02 = 4 ; 12 kHz.
Output Types :-Relay Output on Resistive Load 5A@250V~.
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, CE .

9. Other Informations

Manufacturer Information:
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